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ภาคผนวก

ภาคผนวก ก

สภาวะแวดล้อมและอาคารอ้างอิง

สิ่งแวดล้อมของอาคารซึ่งได้ถูกพิจารณาว่าเป็นความไม่แน่นอนที่เกิดขึ้นสำหรับการคำนวณภาระการทำความเย็นและการส่องสว่าง รวมไปถึงเป็นปัจจัยสำคัญที่มีผลต่อการพิจารณานโยบายประหยัดพลังงานของอาคาร จะแสดง ตามลำดับ ดังนี้

1. ตารางที่ ก.1 ถึง ตารางที่ ก.3 แสดงรูปแบบรังสีดวงอาทิตย์ และ รูปที่ ก.1 ถึง รูปที่ ก.3 แสดงการแจกแจงรังสีดวงอาทิตย์
2. ตารางที่ ก.4 ถึง รูปที่ ก.6 แสดงรูปแบบอุณหภูมิสิ่งแวดล้อม และ รูปที่ ก.4 ถึง รูปที่ ก.6 แสดงการแจกแจงอุณหภูมิ
3. ตารางที่ ก.7 ถึง ตารางที่ ก.8 แสดงรูปแบบความชื้นจำเพาะ และ รูปที่ ก.7 ถึง รูปที่ ก.8 แสดงการแจกแจงอุณหภูมิความชื้นจำเพาะ

อาคารอ้างอิงที่ใช้ในการศึกษาวิจัย ประกอบด้วย 3 ขนาด ที่ความสูงคือ 40 เมตร และความสูงจากพื้นถึงเพดานเท่ากับ 3.25 เมตรและความสูงจากพื้นถึงระนาบทำงาน 0.75 เมตร เท่ากัน ตามลำดับคือ ขนาดเล็ก ขนาดกลาง และ ขนาดใหญ่ ซึ่งจัดจำแนกตามพื้นที่ใช้สอยทั้งหมดของอาคาร กล่าวคือ อาคารอ้างอิงขนาดเล็ก พื้นที่ใช้สอยทั้งหมดเท่ากับ 10,800 ตารางเมตร อาคารอ้างอิงขนาดกลางพื้นที่ใช้สอย 30,000 ตารางเมตร และอาคารอ้างอิงขนาดใหญ่พื้นที่ใช้สอย 120,000 ตารางเมตร นอกจากการพิจารณาของขนาดอาคารแล้วการศึกษาวิจัยนี้ยังคงพิจารณาอิทธิพลของรูปร่างอาคารและทิศการวางตัวของอาคารที่มีผลต่อการใช้พลังงานน้อยที่สุดของพลังงานสุทธิจากระบบไฟส่องสว่างและระบบทำความเย็น และการสูญเสียโอกาสของการประหยัดพลังงานของอาคารอ้างอิงทั้ง 3 ขนาดที่พิจารณาคือ รูปร่างอาคาร ประกอบด้วย อาคารด้านเท่ากันและอาคารด้านไม่เท่า ทิศการวางตัวของอาคารที่พิจารณาประกอบด้วยอาคารวางตัวในทิศหลัก และอาคารวางตัวในทิศเฉียง ดังนั้น อาคารอ้างอิงที่พิจารณาประกอบด้วย 3 ขนาด 2 รูปร่าง และ 2 ทิศการวางตัว กล่าวคือจะมีอาคารอ้างอิงทั้งหมด 18 อาคารสำหรับการพิจารณา ขนาด รูปร่าง และทิศการวางตัวของอาคาร ภายใต้การพิจารณาในแต่ละรูปแบบของปริมาณรังสีดวงอาทิตย์ อุณหภูมิ และความชื้นจำเพาะต่างๆ อาคารอ้างอิงทั้ง 18 รูปแบบจะแสดงในตารางที่ ก.9 ถึงตารางที่ ก.10 และการวางตัวของอาคารจะแสดงในรูปที่ ก.9 ถึงรูปที่ ก.10

ตารางที่ ก.1 แสดงรูปแบบรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 99% หน่วย W/m^2

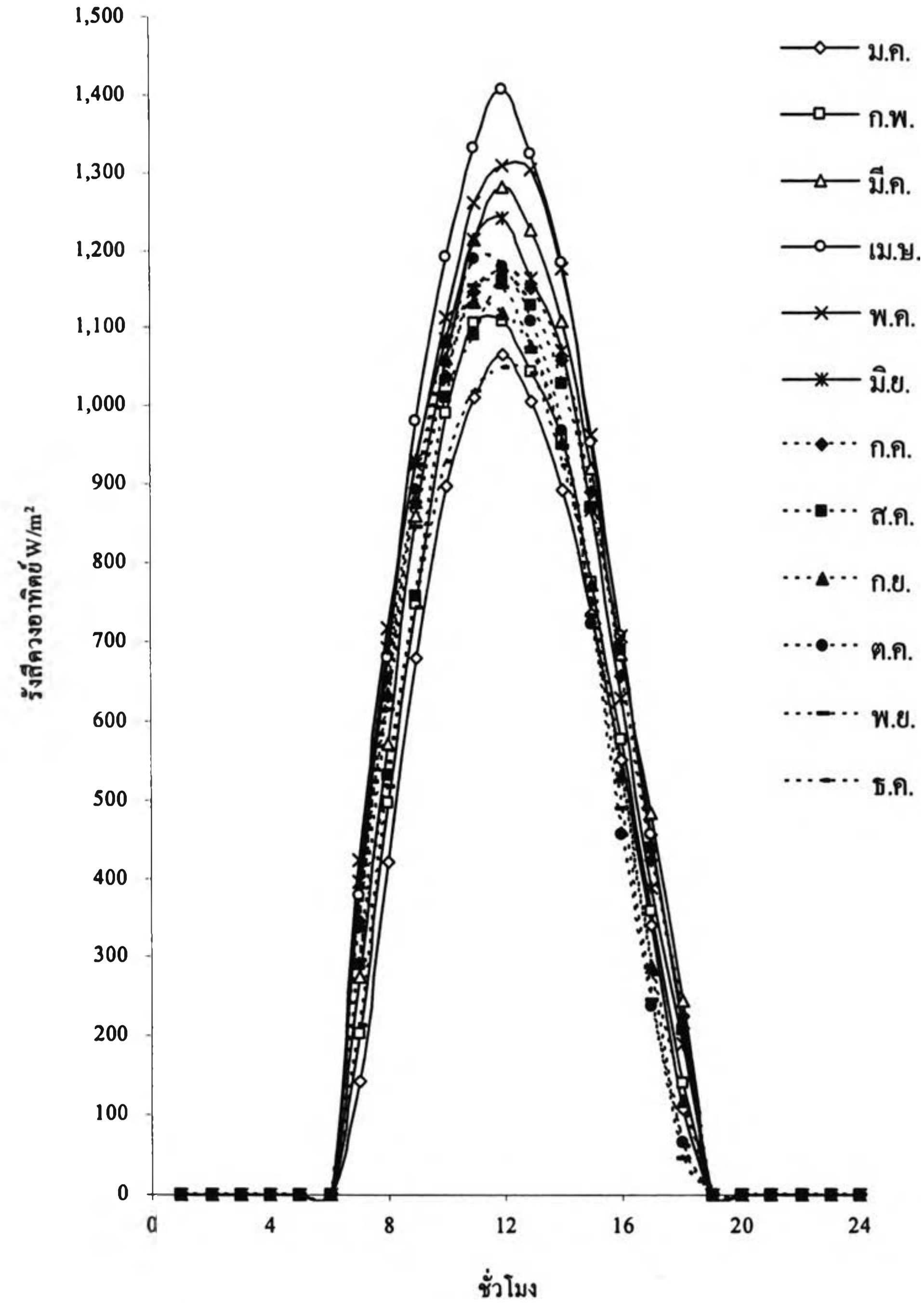
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	144.14	203.87	276.84	379.78	423.84	397.13	346.73	291.99	342.26	341.08	296.81	214.13
8	421.16	495.71	573.10	679.29	718.41	691.10	632.60	531.42	635.79	654.21	613.31	516.34
9	678.58	748.52	859.45	980.67	926.24	930.94	877.04	758.22	877.04	893.88	846.29	743.42
10	898.40	990.46	1060.13	1190.54	1114.07	1086.98	1039.11	1010.54	1084.00	1056.29	1032.35	928.48
11	1012.07	1105.64	1212.96	1332.23	1262.28	1213.35	1146.35	1090.38	1134.91	1188.92	1154.64	1018.75
12	1064.86	1109.13	1280.82	1407.78	1310.36	1241.21	1174.74	1161.04	1119.36	1178.57	1151.35	1047.48
13	1005.03	1044.37	1225.82	1325.03	1303.93	1163.33	1150.24	1127.87	1076.21	1107.81	1073.33	1040.44
14	892.08	958.01	1107.51	1182.97	1176.57	1072.25	1057.92	1028.74	954.41	967.23	947.96	924.15
15	735.25	774.95	920.24	952.62	964.42	868.82	889.71	870.13	773.12	722.64	733.12	751.02
16	550.61	577.97	683.78	707.94	708.25	629.18	655.96	690.82	530.64	457.77	489.24	524.89
17	340.37	357.98	484.60	456.16	450.21	387.84	423.47	438.08	288.21	238.38	244.59	279.54
18	108.99	140.73	245.44	211.33	218.32	190.31	224.89	208.35	118.48	64.90	43.98	60.98
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0

ตารางที่ ก.2 แสดงรูปแบบรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 80% หน่วย W/m^2

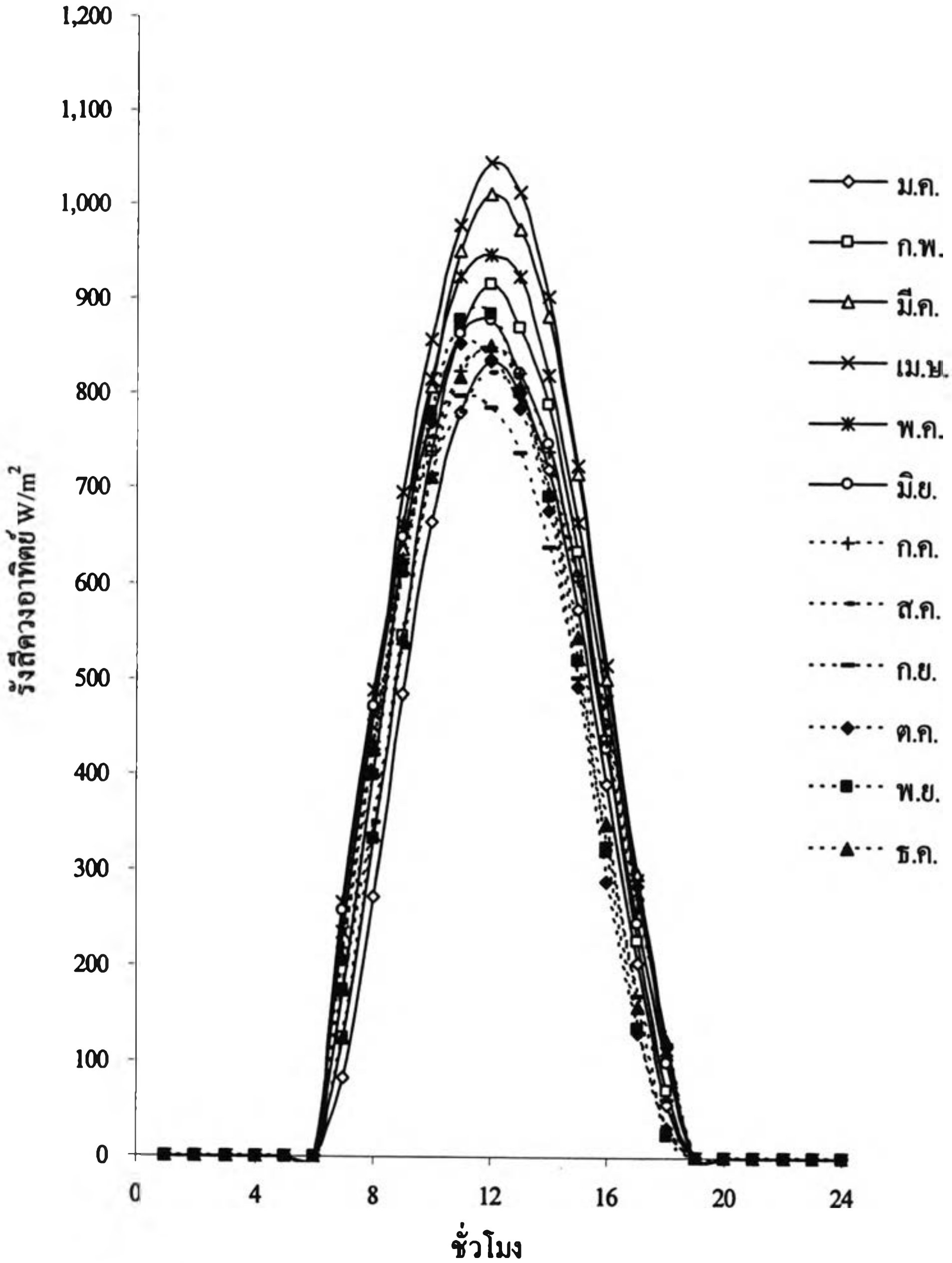
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	83.54	124.07	173.79	235.26	265.28	257.91	219.24	171.14	208.22	206.63	174.81	125.08
8	271.71	333.39	403.54	463.79	488.82	471.16	435.16	350.06	420.11	425.99	400.00	336.03
9	484.79	545.55	637.02	695.99	664.29	648.94	625.52	532.79	608.96	622.75	611.57	541.81
10	666.05	739.52	809.39	857.92	816.60	772.67	741.03	715.26	754.98	772.52	781.97	713.43
11	782.45	866.38	951.89	978.98	925.18	865.41	826.47	781.42	797.88	853.93	879.00	818.44
12	836.84	917.24	1012.33	1045.73	948.12	879.51	849.96	824.07	785.13	837.27	886.53	852.73
13	802.71	871.00	975.37	1014.56	926.00	822.82	823.77	792.13	738.10	785.98	803.81	809.40
14	720.90	790.30	884.79	905.50	821.39	748.77	741.41	714.89	637.61	678.01	691.56	697.70
15	573.99	634.96	717.07	726.80	666.30	608.08	609.67	599.88	500.26	493.66	520.58	544.95
16	391.18	436.82	501.06	516.39	478.49	428.85	436.73	453.53	329.54	289.97	319.44	349.43
17	203.62	226.55	296.49	291.93	278.61	244.43	261.59	269.60	168.04	130.14	134.39	158.38
18	56.55	70.90	122.04	110.75	114.12	100.47	119.78	117.21	60.40	31.34	22.22	31.39
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0

ตารางที่ ก.3 แสดงรูปแบบรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 50% หน่วย W/m^2

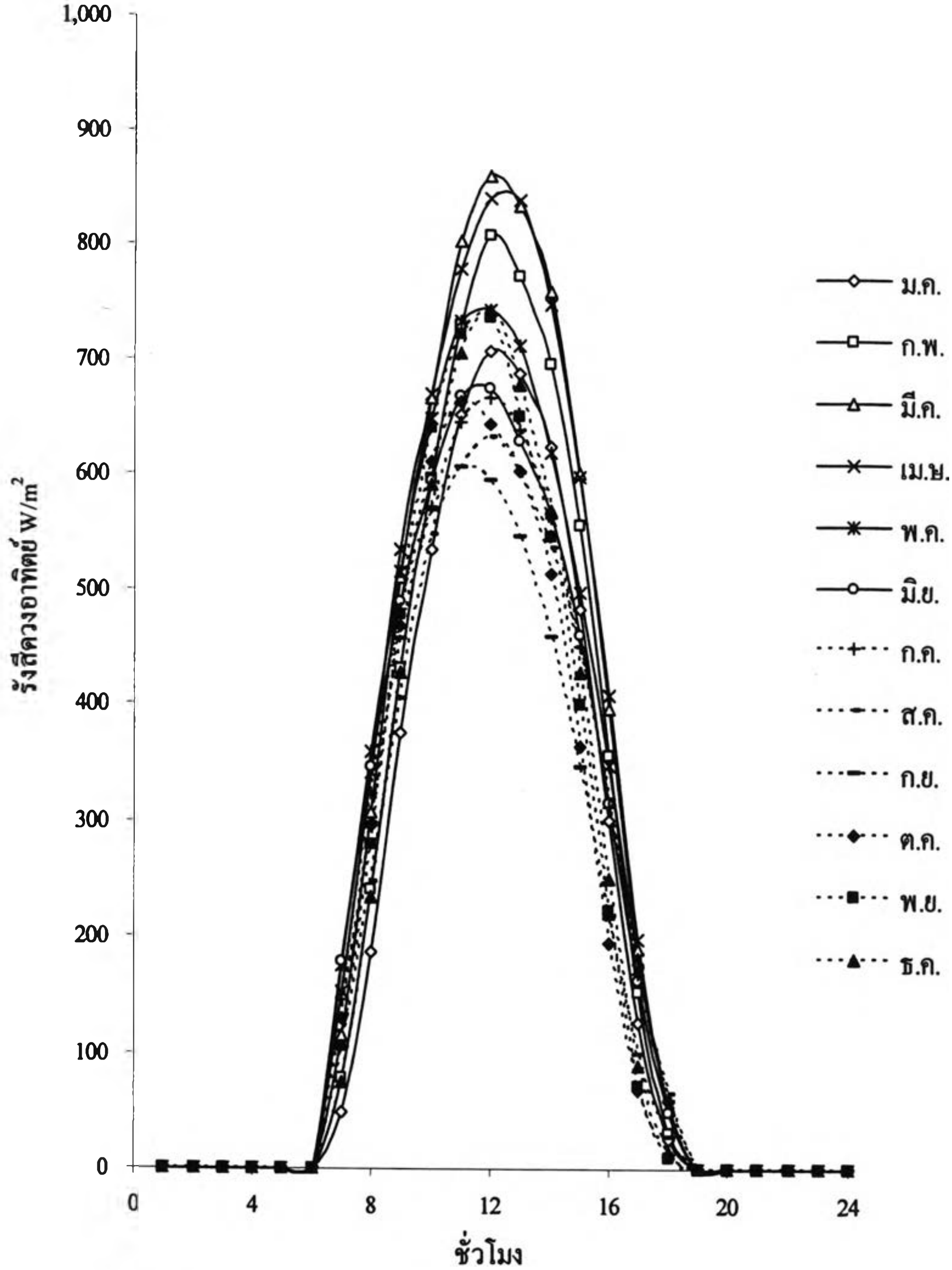
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	49.18	78.83	115.37	153.33	175.40	179.00	146.97	102.63	132.23	130.41	105.65	74.60
8	187.00	241.37	307.42	341.63	358.68	346.48	323.23	247.26	297.86	296.62	279.08	233.83
9	374.94	430.50	510.94	534.62	515.81	489.09	482.94	405.00	457.00	469.06	478.52	427.53
10	534.34	597.28	667.25	669.37	647.99	594.50	572.06	547.89	568.47	611.67	640.05	591.53
11	652.30	730.75	803.91	778.75	734.10	668.18	645.14	606.29	606.83	664.03	722.75	704.89
12	707.58	808.47	860.13	840.50	742.77	674.48	665.86	633.06	595.67	643.80	736.42	742.34
13	688.03	772.73	833.41	838.56	711.77	629.80	638.71	601.82	546.44	603.56	651.04	678.44
14	623.87	695.23	758.55	748.21	620.06	565.41	561.99	536.98	458.04	514.06	546.21	569.33
15	482.57	555.60	601.91	598.79	497.30	460.27	450.93	446.68	345.58	363.85	400.10	428.15
16	300.81	356.81	397.48	407.81	348.25	315.29	312.46	319.02	215.55	194.85	223.19	249.98
17	126.10	152.05	189.87	198.84	181.34	163.14	169.83	174.09	99.93	68.78	71.93	89.70
18	26.83	31.32	52.09	53.73	55.05	49.55	60.19	65.54	27.47	12.31	9.89	14.62
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0



รูปที่ ก.1 แสดงรูปแบบการแจกแจงรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 99%



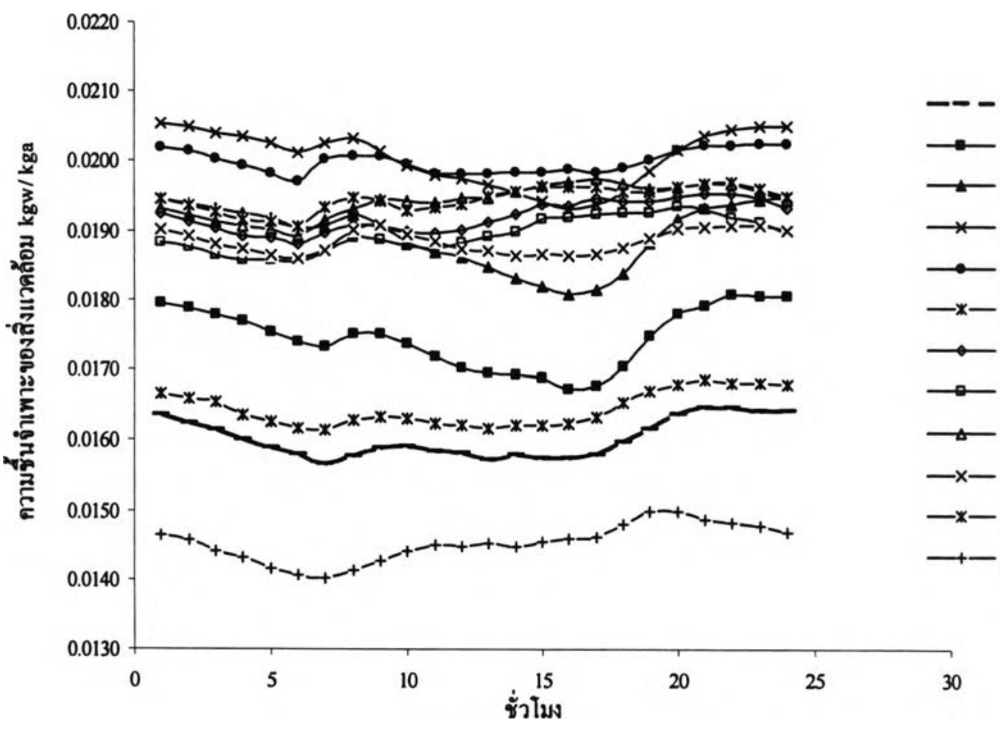
รูปที่ ก.2 แสดงรูปแบบการแจกแจงรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 80%



รูปที่ ก.3 แสดงรูปแบบการแจกแจงรังสีดวงอาทิตย์ ที่ความน่าจะเป็น 50%

ตารางที่ ก.4 แสดงรูปแบบความชื้นจำเพาะ ที่ความน่าจะเป็น 99% หน่วย kg_w/kg_a

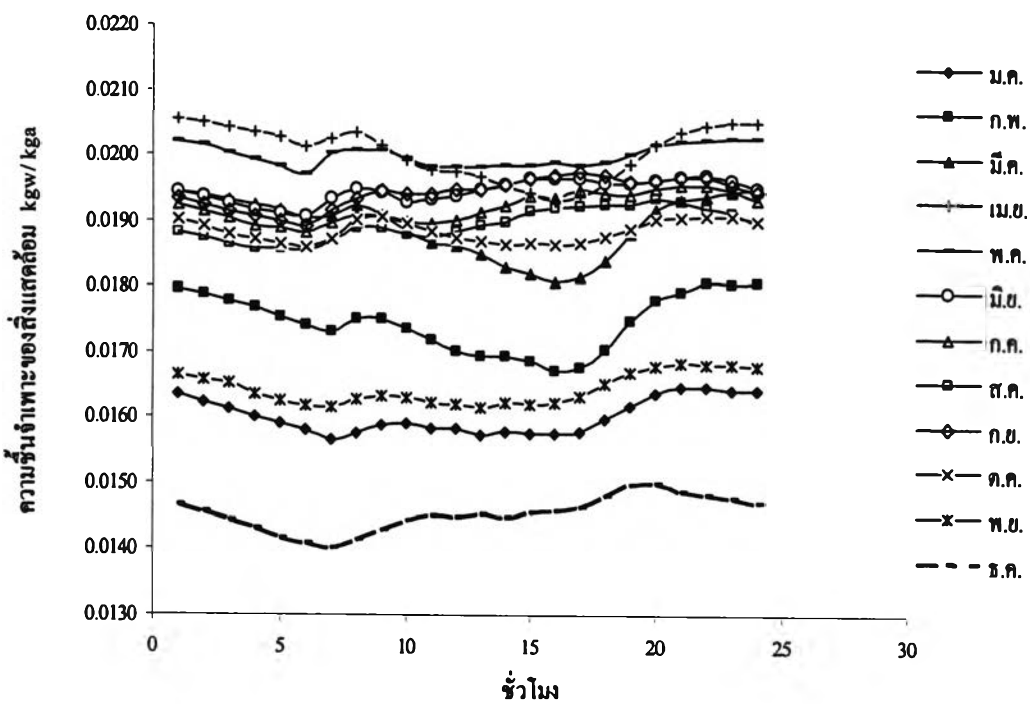
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0.0163452	0.0179593	0.0194451	0.0205386	0.0202043	0.0194465	0.0192478	0.0188287	0.0193262	0.0190201	0.0166527	0.0146474
2	0.0162373	0.0178842	0.019396	0.0204865	0.0201392	0.0193667	0.01914	0.0187506	0.0192275	0.0189268	0.0165829	0.0145629
3	0.0161362	0.0177823	0.0193193	0.0204126	0.0200367	0.0192611	0.0190344	0.0186444	0.0191419	0.0188004	0.0165362	0.0144202
4	0.0160135	0.0176935	0.0192445	0.0203528	0.0199359	0.0191589	0.0189236	0.0185849	0.0190605	0.0187327	0.0163502	0.0143184
5	0.015899	0.0175366	0.0191691	0.0202655	0.0198335	0.0191218	0.0189014	0.0185648	0.019004	0.0186522	0.0162538	0.0141662
6	0.0157994	0.0174027	0.0190439	0.020116	0.0197037	0.01907	0.0188183	0.0185544	0.018928	0.0185988	0.0161742	0.0140734
7	0.0156662	0.0173166	0.0190638	0.0202564	0.0200278	0.0193345	0.0189731	0.0187021	0.0191611	0.0187196	0.0161468	0.0140164
8	0.0157736	0.0175023	0.0192331	0.0203443	0.0200694	0.0194807	0.0190805	0.0189045	0.019327	0.0190066	0.0162907	0.014125
9	0.0158959	0.0175027	0.0190855	0.0201548	0.0200792	0.0194259	0.0190539	0.0188847	0.0194541	0.0190778	0.0163358	0.0142814
10	0.0159186	0.0173678	0.0188339	0.0199316	0.0199538	0.0193001	0.0189995	0.0187926	0.0194221	0.0189576	0.016306	0.0144194
11	0.0158464	0.0171937	0.0186834	0.0197911	0.0198367	0.0193296	0.0189778	0.0187363	0.0194076	0.0188441	0.0162277	0.0144937
12	0.0158251	0.0170311	0.0186165	0.0197519	0.0198257	0.0193798	0.0190237	0.0188356	0.0194803	0.0187468	0.0162061	0.0144916
13	0.0157317	0.0169545	0.018493	0.0196727	0.0198259	0.0194954	0.0191281	0.0189336	0.0194781	0.0187035	0.01616	0.014525
14	0.0157925	0.0169379	0.0183108	0.0195427	0.0198538	0.0195678	0.0192399	0.018994	0.0195656	0.0186511	0.016223	0.014484
15	0.0157647	0.016883	0.0182052	0.0194318	0.0198548	0.019651	0.0193971	0.0191723	0.0196573	0.0186604	0.0162157	0.0145535
16	0.0157546	0.0167281	0.0180828	0.0193134	0.0198921	0.0196462	0.0193708	0.0192034	0.0197071	0.0186549	0.0162298	0.0145859
17	0.0157978	0.0167751	0.0181489	0.0193777	0.0198552	0.0196513	0.0194872	0.0192361	0.0197563	0.0186765	0.0163386	0.0146207
18	0.015991	0.0170405	0.0183883	0.0195718	0.0199112	0.0195734	0.0194243	0.01926	0.0196957	0.0187599	0.0165358	0.0147978
19	0.0161802	0.0174972	0.0188199	0.0198779	0.020028	0.01958	0.0194204	0.0192681	0.0196134	0.0188986	0.0166942	0.0149806
20	0.0163725	0.0178137	0.0191807	0.0201779	0.0201832	0.0196394	0.0195053	0.0193711	0.0196354	0.019033	0.0167949	0.0149917
21	0.0164805	0.0179366	0.0193315	0.0203739	0.0202311	0.0196798	0.019551	0.0193147	0.0196941	0.0190655	0.0168553	0.0148709
22	0.0164661	0.0180866	0.0193811	0.0204739	0.0202425	0.0197076	0.0195496	0.0192062	0.019681	0.0190798	0.016829	0.0148262
23	0.0164215	0.018062	0.0194632	0.0205211	0.0202637	0.0196235	0.0194861	0.0191343	0.0195704	0.0190807	0.0168106	0.0147863
24	0.0164214	0.0180733	0.0194809	0.0205284	0.0202718	0.019498	0.019349	0.01896	0.019453	0.019011	0.0167862	0.0146987



รูปที่ ก.4 แสดงรูปแบบการแจกแจงความชื้นจำเพาะ ที่ความน่าจะเป็น 99%

ตารางที่ ก.5 แสดงรูปแบบความชื้นจำเพาะ ที่ความน่าจะเป็น 80% หน่วย kg_w/kg_a

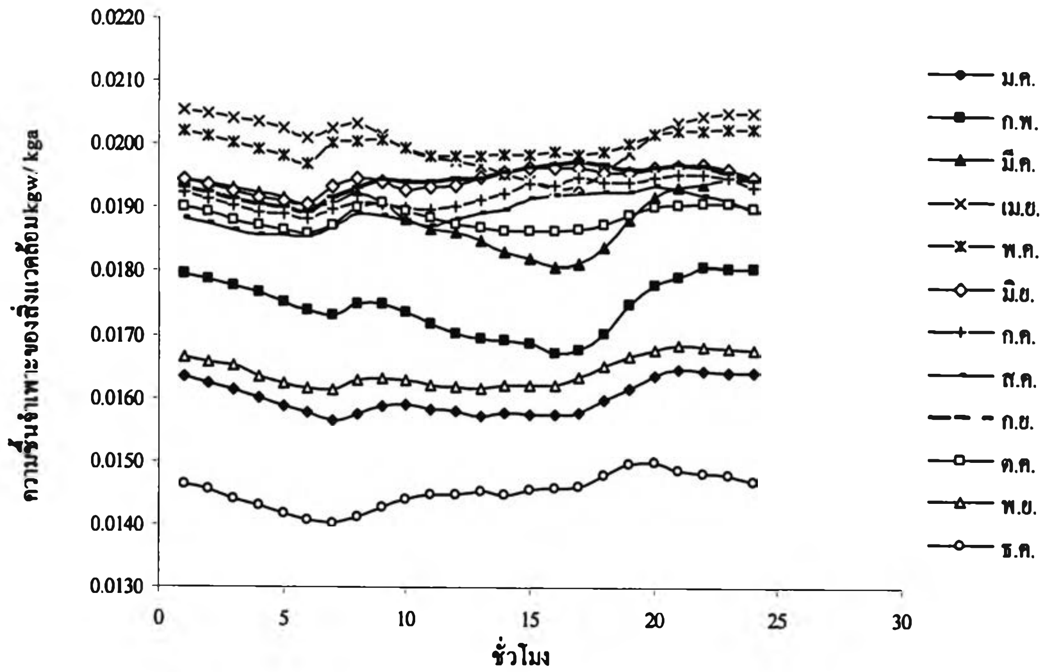
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0.0163444	0.0179587	0.0194449	0.0205384	0.0202042	0.0194463	0.0192476	0.0188285	0.019326	0.0190199	0.0166522	0.0146466
2	0.0162366	0.0178836	0.0193958	0.0204863	0.0201391	0.0193665	0.0191398	0.0187505	0.0192274	0.0189266	0.0165824	0.0145622
3	0.0161355	0.0177817	0.0193191	0.0204124	0.0200365	0.0192609	0.0190343	0.0186443	0.0191418	0.0188002	0.0165357	0.0144195
4	0.0160128	0.0176927	0.0192442	0.0203526	0.0199358	0.0191587	0.0189234	0.0185848	0.0190604	0.0187325	0.0163497	0.0143177
5	0.0158983	0.0175359	0.0191689	0.0202653	0.0198334	0.0191217	0.0189013	0.0185647	0.0190039	0.0186519	0.0162532	0.0141655
6	0.0157987	0.0174019	0.0190437	0.0201157	0.0197035	0.0190698	0.0188181	0.0185543	0.0189279	0.0185986	0.0161736	0.0140727
7	0.0156654	0.0173159	0.0190635	0.0202562	0.0200277	0.0193344	0.018973	0.018702	0.019161	0.0187194	0.0161463	0.0140156
8	0.0157728	0.0175015	0.0192327	0.020344	0.0200693	0.0194805	0.0190803	0.0189043	0.0193269	0.0190062	0.0162901	0.0141242
9	0.015895	0.0175019	0.0190851	0.0201545	0.020079	0.0194257	0.0190537	0.0188845	0.019454	0.0190775	0.0163352	0.0142807
10	0.0159177	0.0173671	0.0188335	0.0199313	0.0199536	0.0192999	0.0189994	0.0187925	0.019422	0.0189572	0.0163054	0.0144187
11	0.0158457	0.017193	0.018683	0.0197908	0.0198366	0.0193294	0.0189776	0.0187362	0.0194074	0.0188438	0.0162272	0.014493
12	0.0158244	0.0170304	0.0186161	0.0197516	0.0198256	0.0193796	0.0190235	0.0188355	0.0194801	0.0187465	0.0162056	0.014491
13	0.015731	0.0169538	0.0184926	0.0196724	0.0198258	0.0194953	0.019128	0.0189335	0.019478	0.0187032	0.0161596	0.0145244
14	0.0157918	0.0169372	0.0183104	0.0195423	0.0198536	0.0195676	0.0192397	0.0189939	0.0195654	0.0186509	0.0162226	0.0144834
15	0.0157639	0.0168822	0.0182048	0.0194315	0.0198547	0.0196508	0.019397	0.0191722	0.0196572	0.0186601	0.0162152	0.014553
16	0.0157539	0.0167274	0.0180825	0.0193131	0.0198919	0.019646	0.0193707	0.0192033	0.0197069	0.0186546	0.0162294	0.0145854
17	0.0157971	0.0167745	0.0181485	0.0193774	0.0198551	0.0196511	0.0194871	0.019236	0.0197561	0.0186762	0.0163381	0.0146202
18	0.0159905	0.01704	0.018388	0.0195716	0.0199111	0.0195732	0.0194241	0.0192599	0.0196956	0.0187596	0.0165354	0.0147973
19	0.0161797	0.0174966	0.0188196	0.0198777	0.0200279	0.0195799	0.0194203	0.019268	0.0196133	0.0188984	0.0166937	0.01498
20	0.016372	0.0178132	0.0191805	0.0201778	0.0201831	0.0196392	0.0195051	0.0193709	0.0196353	0.0190328	0.0167945	0.0149911
21	0.0164799	0.0179361	0.0193313	0.0203737	0.0202309	0.0196796	0.0195508	0.0193146	0.019694	0.0190653	0.0168548	0.0148703
22	0.0164655	0.018086	0.0193809	0.0204737	0.0202424	0.0197074	0.0195495	0.019206	0.0196808	0.0190796	0.0168285	0.0148256
23	0.0164208	0.0180614	0.019463	0.0205209	0.0202635	0.0196233	0.0194859	0.0191342	0.0195703	0.0190805	0.0168102	0.0147856
24	0.0164207	0.0180727	0.0194807	0.0205282	0.0202716	0.0194978	0.0193489	0.0189598	0.0194528	0.0190108	0.0167857	0.014698



รูปที่ ก.5 แสดงรูปแบบการแจกแจงความชื้นจำเพาะ ที่ความน่าจะเป็น 80%

ตารางที่ ก.6 แสดงรูปแบบความชื้นจำเพาะ ที่ความน่าจะเป็น 50% หน่วย kg_w/kg_a

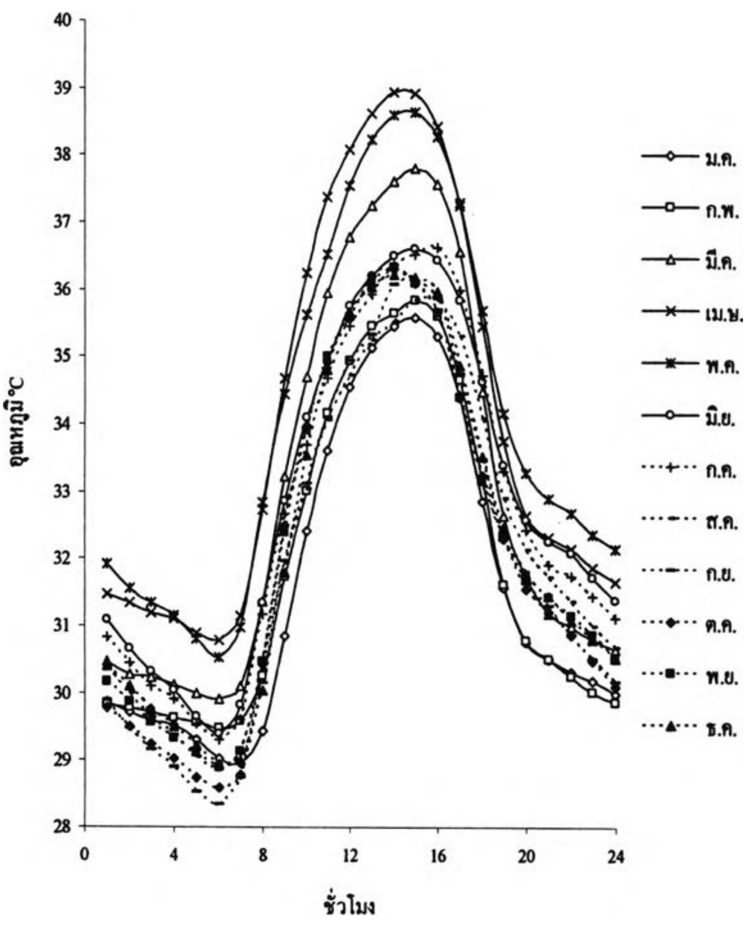
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	0.0163429	0.0179574	0.0194445	0.0205381	0.0202038	0.0194459	0.0192472	0.0188282	0.0193257	0.0190195	0.0166512	0.0146451
2	0.0162351	0.0178822	0.0193954	0.020486	0.0201388	0.0193662	0.0191395	0.0187502	0.0192271	0.0189261	0.0165814	0.0145607
3	0.0161339	0.0177803	0.0193186	0.020412	0.0200362	0.0192606	0.0190339	0.0186441	0.0191415	0.0187997	0.0165346	0.0144179
4	0.0160111	0.0176912	0.0192438	0.0203521	0.0199354	0.0191584	0.0189231	0.0185845	0.0190601	0.018732	0.0163486	0.0143162
5	0.0158966	0.0175345	0.0191684	0.0202649	0.0198331	0.0191214	0.018901	0.0185645	0.0190036	0.0186514	0.0162521	0.014164
6	0.0157971	0.0174004	0.0190431	0.0201153	0.0197032	0.0190696	0.0188179	0.0185541	0.0189277	0.0185981	0.0161724	0.0140712
7	0.0156638	0.0173144	0.0190629	0.0202557	0.0200273	0.0193341	0.0189727	0.0187018	0.0191607	0.0187188	0.0161451	0.014014
8	0.015771	0.0174998	0.0192321	0.0203434	0.0200689	0.0194801	0.01908	0.0189041	0.0193266	0.0190055	0.0162888	0.0141225
9	0.0158932	0.0175002	0.0190844	0.0201539	0.0200787	0.0194253	0.0190534	0.0188842	0.0194537	0.0190767	0.0163339	0.0142791
10	0.015916	0.0173654	0.0188326	0.0199307	0.0199533	0.0192995	0.018999	0.0187922	0.0194216	0.0189565	0.0163041	0.0144172
11	0.0158441	0.0171915	0.0186821	0.0197902	0.0198363	0.019329	0.0189773	0.018736	0.0194071	0.0188431	0.016226	0.0144917
12	0.015823	0.0170289	0.0186152	0.0197509	0.0198253	0.0193792	0.0190231	0.0188352	0.0194798	0.0187458	0.0162046	0.0144898
13	0.0157295	0.0169523	0.0184917	0.0196716	0.0198255	0.0194949	0.0191276	0.0189333	0.0194776	0.0187026	0.0161586	0.0145232
14	0.0157902	0.0169357	0.0183096	0.0195417	0.0198534	0.0195672	0.0192394	0.0189937	0.0195651	0.0186502	0.0162216	0.0144823
15	0.0157624	0.0168805	0.018204	0.0194309	0.0198544	0.0196504	0.0193966	0.019172	0.0196568	0.0186595	0.0162142	0.0145519
16	0.0157524	0.0167259	0.0180817	0.0193124	0.0198917	0.0196457	0.0193703	0.019203	0.0197066	0.018654	0.0162283	0.0145842
17	0.0157957	0.0167731	0.0181478	0.0193769	0.0198548	0.0196507	0.0194867	0.0192358	0.0197558	0.0186756	0.0163371	0.0146191
18	0.0159893	0.0170388	0.0183874	0.0195711	0.0199108	0.0195729	0.0194238	0.0192597	0.0196953	0.018759	0.0165343	0.0147962
19	0.0161786	0.0174955	0.0188191	0.0198773	0.0200276	0.0195795	0.01942	0.0192677	0.019613	0.0188979	0.0166928	0.0149789
20	0.0163708	0.0178121	0.01918	0.0201774	0.0201828	0.0196388	0.0195048	0.0193707	0.019635	0.0190323	0.0167936	0.0149899
21	0.0164787	0.017935	0.0193308	0.0203734	0.0202307	0.0196792	0.0195505	0.0193143	0.0196937	0.0190648	0.0168539	0.0148691
22	0.0164642	0.0180848	0.0193804	0.0204734	0.0202421	0.019707	0.0195492	0.0192057	0.0196805	0.0190791	0.0168275	0.0148243
23	0.0164193	0.0180602	0.0194625	0.0205206	0.0202632	0.0196229	0.0194855	0.0191339	0.01957	0.01908	0.0168091	0.0147843
24	0.0164193	0.0180714	0.0194803	0.0205278	0.0202713	0.0194974	0.0193485	0.0189595	0.0194526	0.0190103	0.0167846	0.0146966



รูปที่ ก.6 แสดงรูปแบบการแจกแจงความชื้นจำเพาะ ที่ความน่าจะเป็น 50%

ตารางที่ ก.7 แสดงรูปแบบอุณหภูมิ ที่ความน่าจะเป็น 99% หน่วย °C

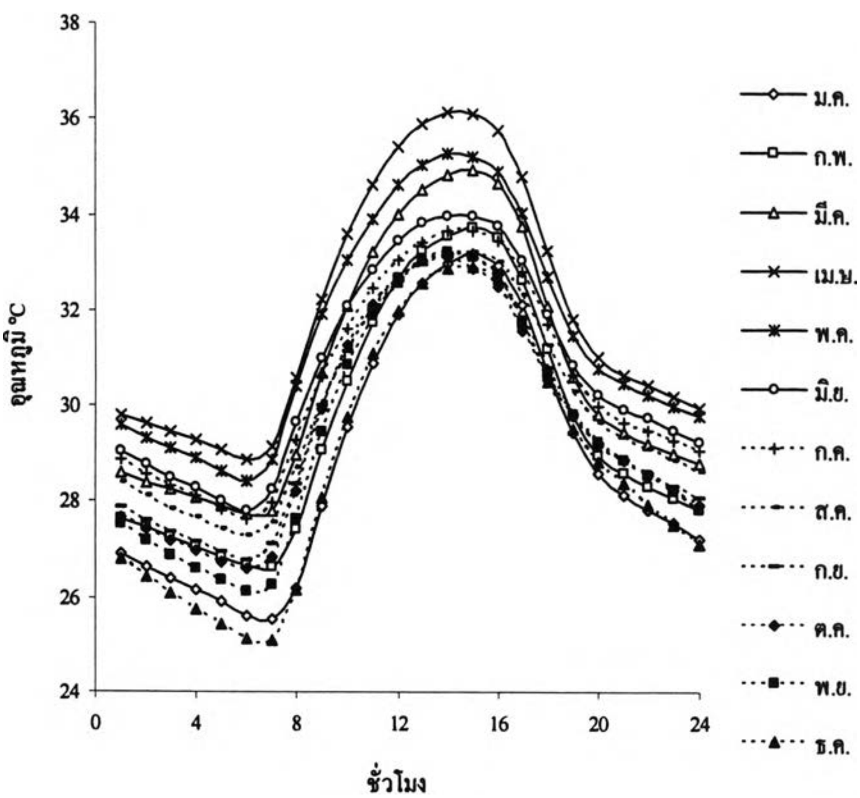
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	29.86	29.81	30.46	31.48	31.91	31.09	30.83	30.37	29.89	29.77	30.17	30.41
2	29.72	29.77	30.27	31.33	31.56	30.66	30.45	29.99	29.47	29.50	29.86	30.10
3	29.58	29.71	30.23	31.19	31.34	30.32	30.11	29.62	29.16	29.25	29.56	29.76
4	29.52	29.63	30.12	31.10	31.14	30.04	29.91	29.37	28.89	29.03	29.32	29.49
5	29.31	29.56	30.00	30.89	30.81	29.66	29.54	29.06	28.54	28.74	29.11	29.22
6	29.02	29.49	29.91	30.79	30.53	29.40	29.30	28.88	28.34	28.59	28.91	28.95
7	28.97	29.58	30.11	31.16	30.98	29.82	29.61	29.12	28.76	28.80	29.15	29.01
8	29.43	30.25	31.36	32.73	32.83	31.34	31.18	30.34	30.14	30.42	30.47	30.04
9	30.85	31.73	33.22	34.69	34.45	32.87	32.67	31.94	31.97	32.51	32.40	31.80
10	32.41	33.01	34.71	36.26	35.63	34.11	33.70	33.04	33.13	33.97	33.92	33.55
11	33.61	34.17	35.94	37.38	36.53	34.94	34.69	34.07	34.11	34.93	35.00	34.82
12	34.55	34.95	36.79	38.09	37.56	35.76	35.46	34.72	34.95	35.57	35.59	35.67
13	35.13	35.45	37.26	38.63	38.24	36.20	35.92	35.25	35.33	36.21	36.11	36.05
14	35.45	35.66	37.62	38.95	38.60	36.52	36.38	35.52	36.07	36.32	36.33	36.23
15	35.59	35.85	37.82	38.92	38.66	36.62	36.54	35.84	36.12	36.10	36.11	36.19
16	35.31	35.60	37.58	38.43	38.29	36.44	36.63	35.85	35.87	35.68	35.64	35.98
17	34.41	34.65	36.56	37.26	37.30	35.84	35.99	35.31	34.75	34.43	34.40	34.87
18	32.86	33.18	34.49	35.46	35.69	34.64	34.72	34.08	33.48	33.24	33.16	33.53
19	31.58	31.62	32.65	33.75	34.18	33.41	33.31	32.92	32.34	32.31	32.32	32.49
20	30.76	30.79	31.76	32.65	33.30	32.59	32.44	32.14	31.65	31.55	31.76	31.78
21	30.51	30.50	31.20	32.33	32.90	32.27	31.92	31.74	31.29	31.22	31.44	31.45
22	30.31	30.25	31.00	32.16	32.69	32.09	31.74	31.37	30.87	30.87	31.16	31.09
23	30.18	30.02	30.80	31.87	32.37	31.72	31.46	30.99	30.50	30.49	30.87	30.83
24	30.00	29.87	30.65	31.66	32.15	31.38	31.14	30.68	30.17	30.09	30.52	30.53



รูปที่ ก.7 แสดงรูปแบบการแจกแจงอุณหภูมิ ที่ความน่าจะเป็น 99%

ตารางที่ ก.8 แสดงรูปแบบอุณหภูมิ ที่ความน่าจะเป็น 80% หน่วย °C

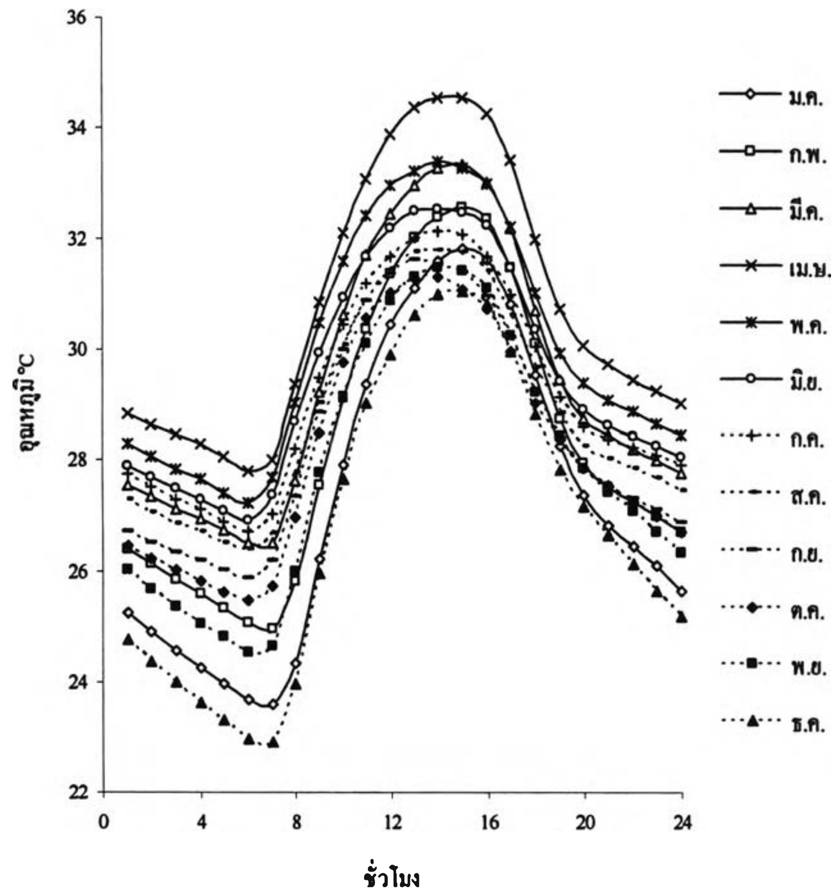
ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	26.92	27.64	28.60	29.79	29.59	29.05	28.86	28.40	27.86	27.66	27.52	26.82
2	26.65	27.46	28.41	29.61	29.33	28.76	28.57	28.12	27.59	27.42	27.19	26.44
3	26.39	27.26	28.25	29.44	29.11	28.51	28.31	27.86	27.37	27.19	26.88	26.08
4	26.16	27.06	28.10	29.30	28.91	28.29	28.13	27.67	27.17	26.98	26.61	25.75
5	25.91	26.86	27.93	29.08	28.64	28.02	27.85	27.44	26.93	26.75	26.37	25.45
6	25.62	26.67	27.75	28.89	28.42	27.82	27.64	27.29	26.78	26.61	26.12	25.14
7	25.54	26.64	27.81	29.15	28.88	28.26	27.97	27.57	27.13	26.84	26.27	25.11
8	26.19	27.43	28.98	30.58	30.41	29.64	29.29	28.70	28.36	28.21	27.62	26.16
9	27.90	29.07	30.68	32.23	31.92	31.01	30.64	30.08	29.99	29.94	29.45	28.08
10	29.54	30.53	32.11	33.61	33.05	32.08	31.63	31.16	31.14	31.29	30.87	29.78
11	30.90	31.74	33.24	34.65	33.91	32.86	32.47	32.03	32.06	32.14	31.89	31.12
12	31.93	32.67	34.03	35.41	34.63	33.48	33.05	32.63	32.67	32.68	32.60	32.00
13	32.57	33.27	34.52	35.91	35.05	33.85	33.43	33.03	32.97	33.06	33.06	32.58
14	32.99	33.58	34.85	36.14	35.28	33.98	33.67	33.15	33.18	33.12	33.23	32.89
15	33.19	33.75	34.96	36.12	35.23	33.98	33.69	33.24	33.11	32.90	33.12	32.91
16	32.96	33.53	34.67	35.77	34.91	33.77	33.48	33.03	32.75	32.53	32.75	32.69
17	32.13	32.63	33.78	34.82	34.06	33.07	32.80	32.32	31.86	31.57	31.76	31.75
18	30.74	31.22	32.09	33.25	32.72	31.92	31.74	31.27	30.79	30.56	30.65	30.53
19	29.45	29.78	30.61	31.84	31.47	30.86	30.64	30.32	29.83	29.79	29.83	29.52
20	28.60	28.97	29.83	31.02	30.81	30.25	30.00	29.66	29.21	29.19	29.27	28.83
21	28.16	28.60	29.44	30.67	30.47	29.94	29.65	29.37	28.88	28.87	28.87	28.38
22	27.85	28.34	29.22	30.44	30.25	29.76	29.49	29.12	28.59	28.57	28.55	27.94
23	27.58	28.09	29.01	30.20	29.99	29.50	29.30	28.89	28.34	28.26	28.21	27.53
24	27.24	27.85	28.81	29.99	29.79	29.27	29.09	28.63	28.08	27.94	27.85	27.12



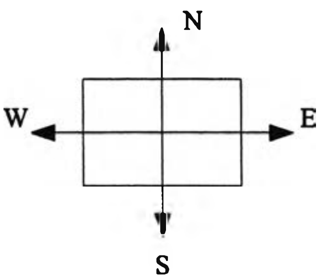
รูปที่ ก.8 แสดงรูปแบบการแจกแจงอุณหภูมิ ที่ความน่าจะเป็น 80%

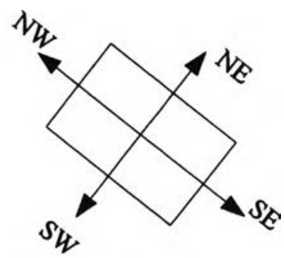
ตารางที่ ก.9 แสดงรูปแบบอุณหภูมิ ที่ความน่าจะเป็น 50% หน่วย °C

ชั่วโมง	ม.ค.	ก.พ.	มี.ค.	เม.ย.	พ.ค.	มิ.ย.	ก.ค.	ส.ค.	ก.ย.	ต.ค.	พ.ย.	ธ.ค.
1	25.26	26.41	27.55	28.83	28.27	27.90	27.74	27.28	26.72	26.46	26.02	24.78
2	24.91	26.14	27.35	28.63	28.07	27.68	27.51	27.06	26.52	26.24	25.69	24.37
3	24.58	25.87	27.13	28.45	27.84	27.48	27.29	26.86	26.35	26.02	25.36	23.99
4	24.26	25.60	26.95	28.27	27.64	27.29	27.12	26.70	26.20	25.83	25.07	23.62
5	23.98	25.34	26.75	28.06	27.41	27.10	26.89	26.52	26.03	25.63	24.82	23.32
6	23.69	25.07	26.52	27.81	27.22	26.92	26.70	26.39	25.89	25.48	24.54	22.98
7	23.59	24.98	26.51	28.01	27.69	27.38	27.04	26.69	26.21	25.73	24.64	22.91
8	24.36	25.82	27.63	29.36	29.04	28.69	28.21	27.76	27.35	26.96	26.01	23.97
9	26.22	27.55	29.24	30.84	30.48	29.95	29.48	29.03	28.87	28.48	27.77	25.97
10	27.91	29.12	30.63	32.11	31.59	30.94	30.46	30.09	30.01	29.76	29.14	27.64
11	29.36	30.37	31.71	33.10	32.42	31.68	31.21	30.87	30.89	30.56	30.13	29.01
12	30.45	31.38	32.46	33.89	32.97	32.19	31.69	31.44	31.38	31.04	30.90	29.92
13	31.12	32.04	32.97	34.37	33.24	32.51	32.02	31.77	31.63	31.27	31.33	30.62
14	31.59	32.41	33.27	34.55	33.39	32.55	32.13	31.80	31.54	31.30	31.47	31.00
15	31.83	32.57	33.34	34.54	33.29	32.49	32.08	31.76	31.40	31.09	31.43	31.05
16	31.62	32.36	33.02	34.26	32.99	32.26	31.69	31.42	30.98	30.74	31.11	30.82
17	30.84	31.49	32.20	33.44	32.22	31.49	31.00	30.63	30.22	29.96	30.27	29.98
18	29.54	30.11	30.73	32.00	31.03	30.38	30.04	29.68	29.26	29.03	29.22	28.83
19	28.24	28.74	29.45	30.75	29.93	29.42	29.14	28.85	28.40	28.36	28.42	27.84
20	27.38	27.94	28.74	30.10	29.40	28.93	28.61	28.26	27.83	27.85	27.85	27.16
21	26.82	27.52	28.44	29.74	29.10	28.62	28.37	28.02	27.51	27.54	27.42	26.65
22	26.46	27.25	28.21	29.47	28.87	28.43	28.21	27.84	27.30	27.27	27.08	26.15
23	26.10	26.99	27.99	29.25	28.65	28.24	28.07	27.69	27.11	26.99	26.71	25.67
24	25.67	26.70	27.76	29.04	28.45	28.07	27.92	27.47	26.90	26.72	26.34	25.19



รูปที่ ก.9 แสดงรูปแบบการแจกแจงอุณหภูมิ ที่ความน่าจะเป็น 50%





รูป ก.10 แสดงทิศการวางตัวของอาคารที่พิจารณา

ตารางที่ ก.10 มิติอาคารอ้างอิงวางตัวในทิศหลัก หน่วยเมตร

ลำดับที่	ขนาด	L(S)	L(W)	L(N)	L(E)	H
1	ใหญ่	100	100	100	100	40
2	ใหญ่	200	50	200	50	40
3	ใหญ่	50	200	50	200	40
4	กลาง	50	50	50	50	40
5	กลาง	100	25	100	25	40
6	กลาง	25	100	25	100	40
7	เล็ก	30	30	30	30	40
8	เล็ก	60	15	60	15	40
9	เล็ก	15	60	15	60	40

ตารางที่ ก.11 มิติอาคารอ้างอิงวางตัวในทิศเฉียง หน่วยเมตร

ลำดับที่	ขนาด	L(SW)	L(NW)	L(NE)	L(SE)	H
1	ใหญ่	100	100	100	100	40
2	ใหญ่	200	50	200	50	40
3	ใหญ่	50	200	50	200	40
4	กลาง	50	50	50	50	40
5	กลาง	100	25	100	25	40
6	กลาง	25	100	25	100	40
7	เล็ก	30	30	30	30	40
8	เล็ก	60	15	60	15	40
9	เล็ก	15	60	15	60	40

ภาคผนวก ข

ปัจจัยควบคุมได้จากการออพติไมเซชั่น

เพื่อให้การศึกษาวิจัยมีข้อมูลอย่างสมบูรณ์เพียงพอ จึงได้ทำการศึกษารูปแบบของปัจจัยควบคุมได้ที่ทำให้อาคารใช้พลังงานน้อยที่สุด จากการออพติไมเซชั่นทั้งหมด 486 กรณี สำหรับการพิจารณา รูปร่าง ขนาด และ การวางตัวของอาคารอ้างอิง รวมไปถึงสภาวะสิ่งแวดล้อมซึ่งประกอบด้วย ความน่าจะเป็นของรูปแบบรังสีดวงอาทิตย์ ความน่าจะเป็นของรูปแบบอุณหภูมิของสิ่งแวดล้อม และ ความน่าจะเป็นของรูปแบบความชื้นจำเพาะ รายละเอียดบ่งชี้กรณีศึกษาทั้ง 486 กรณี จะแสดงในตารางที่ ข.1 และผลการออพติไมเซชั่นของกรณีต่างๆ แสดงในตารางที่ ข.2

จากผลการออพติไมเซชั่นพบว่าพลังงานสูญเสียต่ำสุดและพารามิเตอร์ควบคุมได้ประกอบด้วย ความยาวแนวระดับและความยาวแนวตั้งของกระจกในแต่ละทิศทาง สัมประสิทธิ์การส่งผ่านและสัมประสิทธิ์การสะท้อนในย่านความยาวคลื่นมองเห็นได้ และสัมประสิทธิ์การส่งผ่านและการดูดกลื่นในย่านความยาวคลื่นมองไม่เห็น จากการศึกษาวิจัยพบว่ารูปแบบความชื้นจำเพาะในช่วงที่พิจารณาคือ ความน่าจะเป็น 50% ถึง 99% มีผลต่อผลเฉลยจากการออพติไมเซชั่นน้อยมาก ดังนั้นผลการออพติไมเซชั่นในตารางที่ ข.2 จึงรายงานเฉพาะผลการออพติไมเซชั่นที่ความน่าจะเป็นของรูปแบบอุณหภูมิและรูปแบบรังสีดวงอาทิตย์ ของสิ่งแวดล้อมอาคารต่างๆ ที่รูปแบบความชื้นจำเพาะคงที่ คือที่ความน่าจะเป็น 50%ซึ่งมีทั้งสิ้น 162 กรณี

สัญลักษณ์ของรูปร่างและขนาดของอาคาร ดังแสดงในตารางที่ ข.1 อักษร สองตัวแรก แทน สัญลักษณ์บ่งรูปร่างของอาคาร ซึ่งประกอบด้วย SQ แทน อาคารด้านเท่ากัน และ RC แทน อาคารด้านไม่เท่า อักษรตัวที่สาม แทน สัญลักษณ์บ่งขนาดของอาคาร ประกอบด้วยอักษร S แทน อาคารอ้างอิงขนาดเล็ก M แทน อาคารอ้างอิงขนาดกลาง และ L แทน อาคารอ้างอิงขนาดใหญ่

ตารางที่ ข.1 รายการกรณีศึกษา

กรณีศึกษา	ทิศการวางตัว	ขนาด/รูปร่าง	SP (%)	TP (%)	HP (%)
1	ทิศหลัก	SQM	99	50	50
2	ทิศหลัก	SQM	80	50	50
3	ทิศหลัก	SQM	50	50	50
4	ทิศหลัก	RCM	99	50	50
5	ทิศหลัก	RCM	80	50	50
6	ทิศหลัก	RCM	50	50	50
7	ทิศหลัก	RCM	99	50	50
8	ทิศหลัก	RCM	80	50	50
9	ทิศหลัก	RCM	50	50	50
10	ทิศเฉียง	SQM	99	50	50
11	ทิศเฉียง	SQM	80	50	50
12	ทิศเฉียง	SQM	50	50	50
13	ทิศเฉียง	RCM	99	50	50
14	ทิศเฉียง	RCM	80	50	50
15	ทิศเฉียง	RCM	50	50	50
16	ทิศเฉียง	RCM	99	50	50
17	ทิศเฉียง	RCM	80	50	50
18	ทิศเฉียง	RCM	50	50	50
19	ทิศหลัก	SQL	99	50	50
20	ทิศหลัก	SQL	80	50	50
21	ทิศหลัก	SQL	50	50	50
22	ทิศหลัก	RCL	99	50	50
23	ทิศหลัก	RCL	80	50	50
24	ทิศหลัก	RCL	50	50	50
25	ทิศหลัก	RCL	99	50	50
26	ทิศหลัก	RCL	80	50	50
27	ทิศหลัก	RCL	50	50	50
28	ทิศเฉียง	SQL	99	50	50
29	ทิศเฉียง	SQL	80	50	50
30	ทิศเฉียง	SQL	50	50	50
31	ทิศเฉียง	RCL	99	50	50
32	ทิศเฉียง	RCL	80	50	50
33	ทิศเฉียง	RCL	50	50	50
34	ทิศเฉียง	RCL	99	50	50
35	ทิศเฉียง	RCL	80	50	50
36	ทิศเฉียง	RCL	50	50	50
37	ทิศหลัก	SQS	99	50	50
38	ทิศหลัก	SQS	80	50	50
39	ทิศหลัก	SQS	50	50	50
40	ทิศหลัก	RCS	99	50	50
41	ทิศหลัก	RCS	80	50	50
42	ทิศหลัก	RCS	50	50	50
43	ทิศหลัก	RCS	99	50	50
44	ทิศหลัก	RCS	80	50	50
45	ทิศหลัก	RCS	50	50	50
46	ทิศเฉียง	SQS	99	50	50
47	ทิศเฉียง	SQS	80	50	50
48	ทิศเฉียง	SQS	50	50	50
49	ทิศเฉียง	RCS	99	50	50
50	ทิศเฉียง	RCS	80	50	50
51	ทิศเฉียง	RCS	50	50	50
52	ทิศเฉียง	RCS	99	50	50
53	ทิศเฉียง	RCS	80	50	50
54	ทิศเฉียง	RCS	50	50	50

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
55	ทิศหลัก	SQM	99	80	50
56	ทิศหลัก	SQM	80	80	50
57	ทิศหลัก	SQM	50	80	50
58	ทิศหลัก	RCM	99	80	50
59	ทิศหลัก	RCM	80	80	50
60	ทิศหลัก	RCM	50	80	50
61	ทิศหลัก	RCM	99	80	50
62	ทิศหลัก	RCM	80	80	50
63	ทิศหลัก	RCM	50	80	50
64	ทิศเฉียง	SQM	99	80	50
65	ทิศเฉียง	SQM	80	80	50
66	ทิศเฉียง	SQM	50	80	50
67	ทิศเฉียง	RCM	99	80	50
68	ทิศเฉียง	RCM	80	80	50
69	ทิศเฉียง	RCM	50	80	50
70	ทิศเฉียง	RCM	99	80	50
71	ทิศเฉียง	RCM	80	80	50
72	ทิศเฉียง	RCM	50	80	50
73	ทิศหลัก	SQL	99	80	50
74	ทิศหลัก	SQL	80	80	50
75	ทิศหลัก	SQL	50	80	50
76	ทิศหลัก	RCL	99	80	50
77	ทิศหลัก	RCL	80	80	50
78	ทิศหลัก	RCL	50	80	50
79	ทิศหลัก	RCL	99	80	50
80	ทิศหลัก	RCL	80	80	50
81	ทิศหลัก	RCL	50	80	50
82	ทิศเฉียง	SQL	99	80	50
83	ทิศเฉียง	SQL	80	80	50
84	ทิศเฉียง	SQL	50	80	50
85	ทิศเฉียง	RCL	99	80	50
86	ทิศเฉียง	RCL	80	80	50
87	ทิศเฉียง	RCL	50	80	50
88	ทิศเฉียง	RCL	99	80	50
89	ทิศเฉียง	RCL	80	80	50
90	ทิศเฉียง	RCL	50	80	50
91	ทิศหลัก	SQS	99	80	50
92	ทิศหลัก	SQS	80	80	50
93	ทิศหลัก	SQS	50	80	50
94	ทิศหลัก	RCS	99	80	50
95	ทิศหลัก	RCS	80	80	50
96	ทิศหลัก	RCS	50	80	50
97	ทิศหลัก	RCS	99	80	50
98	ทิศหลัก	RCS	80	80	50
99	ทิศหลัก	RCS	50	80	50
100	ทิศเฉียง	SQS	99	80	50
101	ทิศเฉียง	SQS	80	80	50
102	ทิศเฉียง	SQS	50	80	50
103	ทิศเฉียง	RCS	99	80	50
104	ทิศเฉียง	RCS	80	80	50
105	ทิศเฉียง	RCS	50	80	50
106	ทิศเฉียง	RCS	99	80	50
107	ทิศเฉียง	RCS	80	80	50
108	ทิศเฉียง	RCS	50	80	50

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
109	ทิศหลัก	SQM	99	99	50
110	ทิศหลัก	SQM	80	99	50
111	ทิศหลัก	SQM	50	99	50
112	ทิศหลัก	RCM	99	99	50
113	ทิศหลัก	RCM	80	99	50
114	ทิศหลัก	RCM	50	99	50
115	ทิศหลัก	RCM	99	99	50
116	ทิศหลัก	RCM	80	99	50
117	ทิศหลัก	RCM	50	99	50
118	ทิศเฉียง	SQM	99	99	50
119	ทิศเฉียง	SQM	80	99	50
120	ทิศเฉียง	SQM	50	99	50
121	ทิศเฉียง	RCM	99	99	50
122	ทิศเฉียง	RCM	80	99	50
123	ทิศเฉียง	RCM	50	99	50
124	ทิศเฉียง	RCM	99	99	50
125	ทิศเฉียง	RCM	80	99	50
126	ทิศเฉียง	RCM	50	99	50
127	ทิศหลัก	SQL	99	99	50
128	ทิศหลัก	SQL	80	99	50
129	ทิศหลัก	SQL	50	99	50
130	ทิศหลัก	RCL	99	99	50
131	ทิศหลัก	RCL	80	99	50
132	ทิศหลัก	RCL	50	99	50
133	ทิศหลัก	RCL	99	99	50
134	ทิศหลัก	RCL	80	99	50
135	ทิศหลัก	RCL	50	99	50
136	ทิศเฉียง	SQL	99	99	50
137	ทิศเฉียง	SQL	80	99	50
138	ทิศเฉียง	SQL	50	99	50
139	ทิศเฉียง	RCL	99	99	50
140	ทิศเฉียง	RCL	80	99	50
141	ทิศเฉียง	RCL	50	99	50
142	ทิศเฉียง	RCL	99	99	50
143	ทิศเฉียง	RCL	80	99	50
144	ทิศเฉียง	RCL	50	99	50
145	ทิศหลัก	SQS	99	99	50
146	ทิศหลัก	SQS	80	99	50
147	ทิศหลัก	SQS	50	99	50
148	ทิศหลัก	RCS	99	99	50
149	ทิศหลัก	RCS	80	99	50
150	ทิศหลัก	RCS	50	99	50
151	ทิศหลัก	RCS	99	99	50
152	ทิศหลัก	RCS	80	99	50
153	ทิศหลัก	RCS	50	99	50
154	ทิศเฉียง	SQS	99	99	50
155	ทิศเฉียง	SQS	80	99	50
156	ทิศเฉียง	SQS	50	99	50
157	ทิศเฉียง	RCS	99	99	50
158	ทิศเฉียง	RCS	80	99	50
159	ทิศเฉียง	RCS	50	99	50
160	ทิศเฉียง	RCS	99	99	50
161	ทิศเฉียง	RCS	80	99	50
162	ทิศเฉียง	RCS	50	99	50

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
163	ทิศหลัก	SQM	99	50	80
164	ทิศหลัก	SQM	80	50	80
165	ทิศหลัก	SQM	50	50	80
166	ทิศหลัก	RCM	99	50	80
167	ทิศหลัก	RCM	80	50	80
168	ทิศหลัก	RCM	50	50	80
169	ทิศหลัก	RCM	99	50	80
170	ทิศหลัก	RCM	80	50	80
171	ทิศหลัก	RCM	50	50	80
172	ทิศเฉียง	SQM	99	50	80
173	ทิศเฉียง	SQM	80	50	80
174	ทิศเฉียง	SQM	50	50	80
175	ทิศเฉียง	RCM	99	50	80
176	ทิศเฉียง	RCM	80	50	80
177	ทิศเฉียง	RCM	50	50	80
178	ทิศเฉียง	RCM	99	50	80
179	ทิศเฉียง	RCM	80	50	80
180	ทิศเฉียง	RCM	50	50	80
181	ทิศหลัก	SQL	99	50	80
182	ทิศหลัก	SQL	80	50	80
183	ทิศหลัก	SQL	50	50	80
184	ทิศหลัก	RCL	99	50	80
185	ทิศหลัก	RCL	80	50	80
186	ทิศหลัก	RCL	50	50	80
187	ทิศหลัก	RCL	99	50	80
188	ทิศหลัก	RCL	80	50	80
189	ทิศหลัก	RCL	50	50	80
190	ทิศเฉียง	SQL	99	50	80
191	ทิศเฉียง	SQL	80	50	80
192	ทิศเฉียง	SQL	50	50	80
193	ทิศเฉียง	RCL	99	50	80
194	ทิศเฉียง	RCL	80	50	80
195	ทิศเฉียง	RCL	50	50	80
196	ทิศเฉียง	RCL	99	50	80
197	ทิศเฉียง	RCL	80	50	80
198	ทิศเฉียง	RCL	50	50	80
199	ทิศหลัก	SQS	99	50	80
200	ทิศหลัก	SQS	80	50	80
201	ทิศหลัก	SQS	50	50	80
202	ทิศหลัก	RCS	99	50	80
203	ทิศหลัก	RCS	80	50	80
204	ทิศหลัก	RCS	50	50	80
205	ทิศหลัก	RCS	99	50	80
206	ทิศหลัก	RCS	80	50	80
207	ทิศหลัก	RCS	50	50	80
208	ทิศเฉียง	SQS	99	50	80
209	ทิศเฉียง	SQS	80	50	80
210	ทิศเฉียง	SQS	50	50	80
211	ทิศเฉียง	RCS	99	50	80
212	ทิศเฉียง	RCS	80	50	80
213	ทิศเฉียง	RCS	50	50	80
214	ทิศเฉียง	RCS	99	50	80
215	ทิศเฉียง	RCS	80	50	80
216	ทิศเฉียง	RCS	50	50	80

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
217	ทิศหลัก	SQM	99	80	80
218	ทิศหลัก	SQM	80	80	80
219	ทิศหลัก	SQM	50	80	80
220	ทิศหลัก	RCM	99	80	80
221	ทิศหลัก	RCM	80	80	80
222	ทิศหลัก	RCM	50	80	80
223	ทิศหลัก	RCM	99	80	80
224	ทิศหลัก	RCM	80	80	80
225	ทิศหลัก	RCM	50	80	80
226	ทิศเฉียง	SQM	99	80	80
227	ทิศเฉียง	SQM	80	80	80
228	ทิศเฉียง	SQM	50	80	80
229	ทิศเฉียง	RCM	99	80	80
230	ทิศเฉียง	RCM	80	80	80
231	ทิศเฉียง	RCM	50	80	80
232	ทิศเฉียง	RCM	99	80	80
233	ทิศเฉียง	RCM	80	80	80
234	ทิศเฉียง	RCM	50	80	80
235	ทิศหลัก	SQL	99	80	80
236	ทิศหลัก	SQL	80	80	80
237	ทิศหลัก	SQL	50	80	80
238	ทิศหลัก	RCL	99	80	80
239	ทิศหลัก	RCL	80	80	80
240	ทิศหลัก	RCL	50	80	80
241	ทิศหลัก	RCL	99	80	80
242	ทิศหลัก	RCL	80	80	80
243	ทิศหลัก	RCL	50	80	80
244	ทิศเฉียง	SQL	99	80	80
245	ทิศเฉียง	SQL	80	80	80
246	ทิศเฉียง	SQL	50	80	80
247	ทิศเฉียง	RCL	99	80	80
248	ทิศเฉียง	RCL	80	80	80
249	ทิศเฉียง	RCL	50	80	80
250	ทิศเฉียง	RCL	99	80	80
251	ทิศเฉียง	RCL	80	80	80
252	ทิศเฉียง	RCL	50	80	80
253	ทิศหลัก	SQS	99	80	80
254	ทิศหลัก	SQS	80	80	80
255	ทิศหลัก	SQS	50	80	80
256	ทิศหลัก	RCS	99	80	80
257	ทิศหลัก	RCS	80	80	80
258	ทิศหลัก	RCS	50	80	80
259	ทิศหลัก	RCS	99	80	80
260	ทิศหลัก	RCS	80	80	80
261	ทิศหลัก	RCS	50	80	80
262	ทิศเฉียง	SQS	99	80	80
263	ทิศเฉียง	SQS	80	80	80
264	ทิศเฉียง	SQS	50	80	80
265	ทิศเฉียง	RCS	99	80	80
266	ทิศเฉียง	RCS	80	80	80
267	ทิศเฉียง	RCS	50	80	80
268	ทิศเฉียง	RCS	99	80	80
269	ทิศเฉียง	RCS	80	80	80
270	ทิศเฉียง	RCS	50	80	80

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
271	ทิศหลัก	SQM	99	99	80
272	ทิศหลัก	SQM	80	99	80
273	ทิศหลัก	SQM	50	99	80
274	ทิศหลัก	RCM	99	99	80
275	ทิศหลัก	RCM	80	99	80
276	ทิศหลัก	RCM	50	99	80
277	ทิศหลัก	RCM	99	99	80
278	ทิศหลัก	RCM	80	99	80
279	ทิศหลัก	RCM	50	99	80
280	ทิศเฉียง	SQM	99	99	80
281	ทิศเฉียง	SQM	80	99	80
282	ทิศเฉียง	SQM	50	99	80
283	ทิศเฉียง	RCM	99	99	80
284	ทิศเฉียง	RCM	80	99	80
285	ทิศเฉียง	RCM	50	99	80
286	ทิศเฉียง	RCM	99	99	80
287	ทิศเฉียง	RCM	80	99	80
288	ทิศเฉียง	RCM	50	99	80
289	ทิศหลัก	SQL	99	99	80
290	ทิศหลัก	SQL	80	99	80
291	ทิศหลัก	SQL	50	99	80
292	ทิศหลัก	RCL	99	99	80
293	ทิศหลัก	RCL	80	99	80
294	ทิศหลัก	RCL	50	99	80
295	ทิศหลัก	RCL	99	99	80
296	ทิศหลัก	RCL	80	99	80
297	ทิศหลัก	RCL	50	99	80
298	ทิศเฉียง	SQL	99	99	80
299	ทิศเฉียง	SQL	80	99	80
300	ทิศเฉียง	SQL	50	99	80
301	ทิศเฉียง	RCL	99	99	80
302	ทิศเฉียง	RCL	80	99	80
303	ทิศเฉียง	RCL	50	99	80
304	ทิศเฉียง	RCL	99	99	80
305	ทิศเฉียง	RCL	80	99	80
306	ทิศเฉียง	RCL	50	99	80
307	ทิศหลัก	SQS	99	99	80
308	ทิศหลัก	SQS	80	99	80
309	ทิศหลัก	SQS	50	99	80
310	ทิศหลัก	RCS	99	99	80
311	ทิศหลัก	RCS	80	99	80
312	ทิศหลัก	RCS	50	99	80
313	ทิศหลัก	RCS	99	99	80
314	ทิศหลัก	RCS	80	99	80
315	ทิศหลัก	RCS	50	99	80
316	ทิศเฉียง	SQS	99	99	80
317	ทิศเฉียง	SQS	80	99	80
318	ทิศเฉียง	SQS	50	99	80
319	ทิศเฉียง	RCS	99	99	80
320	ทิศเฉียง	RCS	80	99	80
321	ทิศเฉียง	RCS	50	99	80
322	ทิศเฉียง	RCS	99	99	80
323	ทิศเฉียง	RCS	80	99	80
324	ทิศเฉียง	RCS	50	99	80

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
325	ทิศหลัก	SQM	99	50	99
326	ทิศหลัก	SQM	80	50	99
327	ทิศหลัก	SQM	50	50	99
328	ทิศหลัก	RCM	99	50	99
329	ทิศหลัก	RCM	80	50	99
330	ทิศหลัก	RCM	50	50	99
331	ทิศหลัก	RCM	99	50	99
332	ทิศหลัก	RCM	80	50	99
333	ทิศหลัก	RCM	50	50	99
334	ทิศเฉียง	SQM	99	50	99
335	ทิศเฉียง	SQM	80	50	99
336	ทิศเฉียง	SQM	50	50	99
337	ทิศเฉียง	RCM	99	50	99
338	ทิศเฉียง	RCM	80	50	99
339	ทิศเฉียง	RCM	50	50	99
340	ทิศเฉียง	RCM	99	50	99
341	ทิศเฉียง	RCM	80	50	99
342	ทิศเฉียง	RCM	50	50	99
343	ทิศหลัก	SQL	99	50	99
344	ทิศหลัก	SQL	80	50	99
345	ทิศหลัก	SQL	50	50	99
346	ทิศหลัก	RCL	99	50	99
347	ทิศหลัก	RCL	80	50	99
348	ทิศหลัก	RCL	50	50	99
349	ทิศหลัก	RCL	99	50	99
350	ทิศหลัก	RCL	80	50	99
351	ทิศหลัก	RCL	50	50	99
352	ทิศเฉียง	SQL	99	50	99
353	ทิศเฉียง	SQL	80	50	99
354	ทิศเฉียง	SQL	50	50	99
355	ทิศเฉียง	RCL	99	50	99
356	ทิศเฉียง	RCL	80	50	99
357	ทิศเฉียง	RCL	50	50	99
358	ทิศเฉียง	RCL	99	50	99
359	ทิศเฉียง	RCL	80	50	99
360	ทิศเฉียง	RCL	50	50	99
361	ทิศหลัก	SQS	99	50	99
362	ทิศหลัก	SQS	80	50	99
363	ทิศหลัก	SQS	50	50	99
364	ทิศหลัก	RCS	99	50	99
365	ทิศหลัก	RCS	80	50	99
366	ทิศหลัก	RCS	50	50	99
367	ทิศหลัก	RCS	99	50	99
368	ทิศหลัก	RCS	80	50	99
369	ทิศหลัก	RCS	50	50	99
370	ทิศเฉียง	SQS	99	50	99
371	ทิศเฉียง	SQS	80	50	99
372	ทิศเฉียง	SQS	50	50	99
373	ทิศเฉียง	RCS	99	50	99
374	ทิศเฉียง	RCS	80	50	99
375	ทิศเฉียง	RCS	50	50	99
376	ทิศเฉียง	RCS	99	50	99
377	ทิศเฉียง	RCS	80	50	99
378	ทิศเฉียง	RCS	50	50	99

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
379	ทิศหลัก	SQM	99	80	99
380	ทิศหลัก	SQM	80	80	99
381	ทิศหลัก	SQM	50	80	99
382	ทิศหลัก	RCM	99	80	99
383	ทิศหลัก	RCM	80	80	99
384	ทิศหลัก	RCM	50	80	99
385	ทิศหลัก	RCM	99	80	99
386	ทิศหลัก	RCM	80	80	99
387	ทิศหลัก	RCM	50	80	99
388	ทิศเฉียง	SQM	99	80	99
389	ทิศเฉียง	SQM	80	80	99
390	ทิศเฉียง	SQM	50	80	99
391	ทิศเฉียง	RCM	99	80	99
392	ทิศเฉียง	RCM	80	80	99
393	ทิศเฉียง	RCM	50	80	99
394	ทิศเฉียง	RCM	99	80	99
395	ทิศเฉียง	RCM	80	80	99
396	ทิศเฉียง	RCM	50	80	99
397	ทิศหลัก	SQL	99	80	99
398	ทิศหลัก	SQL	80	80	99
399	ทิศหลัก	SQL	50	80	99
400	ทิศหลัก	RCL	99	80	99
401	ทิศหลัก	RCL	80	80	99
402	ทิศหลัก	RCL	50	80	99
403	ทิศหลัก	RCL	99	80	99
404	ทิศหลัก	RCL	80	80	99
405	ทิศหลัก	RCL	50	80	99
406	ทิศเฉียง	SQL	99	80	99
407	ทิศเฉียง	SQL	80	80	99
408	ทิศเฉียง	SQL	50	80	99
409	ทิศเฉียง	RCL	99	80	99
410	ทิศเฉียง	RCL	80	80	99
411	ทิศเฉียง	RCL	50	80	99
412	ทิศเฉียง	RCL	99	80	99
413	ทิศเฉียง	RCL	80	80	99
414	ทิศเฉียง	RCL	50	80	99
415	ทิศหลัก	SQS	99	80	99
416	ทิศหลัก	SQS	80	80	99
417	ทิศหลัก	SQS	50	80	99
418	ทิศหลัก	RCS	99	80	99
419	ทิศหลัก	RCS	80	80	99
420	ทิศหลัก	RCS	50	80	99
421	ทิศหลัก	RCS	99	80	99
422	ทิศหลัก	RCS	80	80	99
423	ทิศหลัก	RCS	50	80	99
424	ทิศเฉียง	SQS	99	80	99
425	ทิศเฉียง	SQS	80	80	99
426	ทิศเฉียง	SQS	50	80	99
427	ทิศเฉียง	RCS	99	80	99
428	ทิศเฉียง	RCS	80	80	99
429	ทิศเฉียง	RCS	50	80	99
430	ทิศเฉียง	RCS	99	80	99
431	ทิศเฉียง	RCS	80	80	99
432	ทิศเฉียง	RCS	50	80	99

ตารางที่ ข.1 รายการกรณีศึกษา (ต่อ)

กรณีศึกษา	ทิศการวางตัว	ขนาด	SP (%)	TP (%)	HP (%)
433	ทิศหลัก	SQM	99	99	99
434	ทิศหลัก	SQM	80	99	99
435	ทิศหลัก	SQM	50	99	99
436	ทิศหลัก	RCM	99	99	99
437	ทิศหลัก	RCM	80	99	99
438	ทิศหลัก	RCM	50	99	99
439	ทิศหลัก	RCM	99	99	99
440	ทิศหลัก	RCM	80	99	99
441	ทิศหลัก	RCM	50	99	99
442	ทิศเฉียง	SQM	99	99	99
443	ทิศเฉียง	SQM	80	99	99
444	ทิศเฉียง	SQM	50	99	99
445	ทิศเฉียง	RCM	99	99	99
446	ทิศเฉียง	RCM	80	99	99
447	ทิศเฉียง	RCM	50	99	99
448	ทิศเฉียง	RCM	99	99	99
449	ทิศเฉียง	RCM	80	99	99
450	ทิศเฉียง	RCM	50	99	99
451	ทิศหลัก	SQL	99	99	99
452	ทิศหลัก	SQL	80	99	99
453	ทิศหลัก	SQL	50	99	99
454	ทิศหลัก	RCL	99	99	99
455	ทิศหลัก	RCL	80	99	99
456	ทิศหลัก	RCL	50	99	99
457	ทิศหลัก	RCL	99	99	99
458	ทิศหลัก	RCL	80	99	99
459	ทิศหลัก	RCL	50	99	99
460	ทิศเฉียง	SQL	99	99	99
461	ทิศเฉียง	SQL	80	99	99
462	ทิศเฉียง	SQL	50	99	99
463	ทิศเฉียง	RCL	99	99	99
464	ทิศเฉียง	RCL	80	99	99
465	ทิศเฉียง	RCL	50	99	99
466	ทิศเฉียง	RCL	99	99	99
467	ทิศเฉียง	RCL	80	99	99
468	ทิศเฉียง	RCL	50	99	99
469	ทิศหลัก	SQS	99	99	99
470	ทิศหลัก	SQS	80	99	99
471	ทิศหลัก	SQS	50	99	99
472	ทิศหลัก	RCS	99	99	99
473	ทิศหลัก	RCS	80	99	99
474	ทิศหลัก	RCS	50	99	99
475	ทิศหลัก	RCS	99	99	99
476	ทิศหลัก	RCS	80	99	99
477	ทิศหลัก	RCS	50	99	99
478	ทิศเฉียง	SQS	99	99	99
479	ทิศเฉียง	SQS	80	99	99
480	ทิศเฉียง	SQS	50	99	99
481	ทิศเฉียง	RCS	99	99	99
482	ทิศเฉียง	RCS	80	99	99
483	ทิศเฉียง	RCS	50	99	99
484	ทิศเฉียง	RCS	99	99	99
485	ทิศเฉียง	RCS	80	99	99
486	ทิศเฉียง	RCS	50	99	99

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย

กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_m(0)^*$	$\alpha_m(0)^*$
1	44.44	44.56	43.88	44.94	35.69	35.06	35.06	35.06	0.213	0.550	0.038	0.088
2	44.94	44.94	44.06	45.00	28.94	36.00	36.00	36.00	0.300	0.463	0.012	0.113
3	45.00	44.94	45.00	45.00	35.75	36.00	35.63	36.00	0.263	0.500	0.013	0.113
4	77.19	22.50	89.56	22.50	33.19	35.94	36.00	33.56	0.213	0.550	0.013	0.113
5	72.06	20.75	83.69	20.75	34.25	34.19	34.19	36.00	0.287	0.475	0.013	0.113
6	89.75	22.50	89.44	22.50	36.00	35.94	35.06	36.00	0.263	0.500	0.012	0.112
7	22.50	24.06	22.50	82.19	30.44	34.31	34.31	34.44	0.213	0.550	0.013	0.113
8	21.50	58.06	22.50	88.06	34.19	34.44	34.44	35.50	0.275	0.488	0.013	0.113
9	22.50	66.69	22.50	89.44	31.31	35.94	35.94	35.94	0.338	0.425	0.013	0.113
กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_m(0)^*$	$\alpha_m(0)^*$
10	45.00	45.00	45.00	45.00	36.00	36.00	36.00	36.00	0.200	0.563	0.075	0.063
11	45.00	45.00	45.00	45.00	36.00	36.00	36.00	36.00	0.288	0.475	0.012	0.113
12	45.00	45.00	43.06	43.00	33.88	33.94	34.00	34.00	0.300	0.463	0.012	0.112
13	80.44	22.50	89.56	22.13	35.81	35.69	36.00	33.44	0.188	0.575	0.013	0.113
14	68.31	22.50	79.06	20.31	35.94	35.94	35.69	35.94	0.200	0.563	0.012	0.113
15	89.81	22.50	89.06	22.44	35.94	35.94	36.00	35.94	0.288	0.475	0.013	0.113
16	22.31	89.75	22.06	89.25	34.63	35.19	35.13	35.25	0.175	0.588	0.025	0.100
17	22.50	89.19	22.44	89.94	35.31	35.94	35.94	35.06	0.288	0.475	0.013	0.112
18	22.50	89.06	22.50	89.88	35.94	36.00	35.94	35.94	0.288	0.475	0.013	0.112
กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_m(0)^*$	$\alpha_m(0)^*$
19	90.00	90.00	90.00	90.00	24.88	34.50	35.94	36.00	0.200	0.563	0.013	0.113
20	90.00	90.00	90.00	90.00	29.50	36.00	36.00	36.00	0.297	0.463	0.072	0.048
21	90.00	90.00	90.00	90.00	36.00	36.00	35.94	36.00	0.363	0.400	0.013	0.113
22	116.44	44.94	120.69	43.00	35.94	36.00	36.00	35.94	0.213	0.550	0.013	0.113
23	179.94	44.94	179.94	45.00	36.00	36.00	36.00	35.06	0.263	0.500	0.012	0.113
24	148.81	44.19	150.75	44.31	35.94	34.00	36.00	36.00	0.313	0.450	0.013	0.112
25	45.00	116.13	45.00	125.75	34.88	35.00	35.00	34.94	0.175	0.588	0.025	0.100
26	45.00	154.75	44.94	160.13	24.57	36.00	34.60	36.54	0.300	0.462	0.013	0.112
27	45.00	178.25	45.00	179.94	35.94	35.81	35.94	35.94	0.300	0.550	0.013	0.112

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย (ต่อ)

กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_n(0)^*$	$\alpha_n(0)^*$
28	90.00	90.00	90.00	90.00	35.63	36.00	36.00	35.31	0.213	0.550	0.063	0.063
29	90.00	89.78	89.78	89.81	35.66	35.84	35.84	35.53	0.231	0.531	0.044	0.081
30	90.00	89.56	89.56	89.63	35.69	35.69	35.69	35.75	0.250	0.513	0.025	0.100
31	130.13	45.00	138.25	42.88	36.00	35.88	36.00	35.88	0.187	0.575	0.050	0.075
32	137.70	44.81	177.40	44.56	34.52	35.81	35.81	35.19	0.263	0.500	0.037	0.088
33	125.00	45.00	123.00	44.80	33.76	33.90	36.00	34.00	0.328	0.450	0.050	0.075
34	45.00	142.19	45.00	142.19	34.56	36.00	34.63	36.00	0.200	0.563	0.088	0.038
35	45.00	135.69	44.56	135.81	35.94	35.06	34.56	35.56	0.213	0.550	0.012	0.113
36	45.00	135.20	45.00	140.00	35.90	35.02	35.00	35.50	0.250	0.540	0.125	0.110
กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_n(0)^*$	$\alpha_n(0)^*$
37	20.69	15.94	26.50	26.44	35.31	34.31	34.81	35.06	0.213	0.538	0.113	0.013
38	19.31	16.75	26.94	26.94	34.81	34.94	35.94	35.94	0.275	0.488	0.088	0.050
39	22.25	18.50	27.00	26.75	35.13	34.25	35.88	35.50	0.313	0.450	0.025	0.100
40	21.88	10.50	53.63	13.50	35.00	35.00	35.06	36.00	0.200	0.563	0.025	0.100
41	37.38	12.06	53.63	13.50	31.50	34.94	35.94	36.00	0.288	0.475	0.050	0.088
42	38.19	11.69	53.06	13.31	35.44	35.19	35.94	35.81	0.338	0.425	0.087	0.038
43	10.50	7.00	13.50	53.06	34.06	34.94	35.94	35.06	0.200	0.538	0.012	0.113
44	10.06	18.38	11.31	53.75	33.94	33.81	35.94	35.81	0.263	0.487	0.100	0.025
45	12.75	19.13	13.25	52.31	35.06	35.31	35.44	35.69	0.312	0.400	0.187	0.188
กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_n(0)^*$	$\alpha_n(0)^*$
46	23.00	26.13	26.25	26.81	34.75	35.31	35.31	35.25	0.188	0.575	0.050	0.075
47	26.56	27.00	27.00	27.00	35.94	35.94	36.00	35.80	0.288	0.463	0.013	0.113
48	27.00	27.00	27.00	27.00	36.00	36.00	36.00	36.00	0.375	0.588	0.013	0.113
49	32.94	13.31	53.88	13.50	35.63	36.00	35.88	35.63	0.188	0.575	0.025	0.100
50	32.88	13.50	53.19	13.50	34.31	35.31	35.63	35.50	0.250	0.513	0.075	0.050
51	52.25	13.50	53.94	13.50	34.75	33.31	35.94	19.81	0.375	0.388	0.025	0.112
52	13.50	45.44	13.50	53.44	30.56	34.56	34.56	35.56	0.188	0.550	0.113	0.013
53	13.50	49.81	13.44	53.63	31.38	36.00	36.00	36.00	0.275	0.463	0.100	0.025
54	13.44	52.56	12.88	53.50	25.31	34.31	33.44	34.94	0.388	0.575	0.013	0.113

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย (ต่อ)

กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
55	44.69	43.69	44.94	44.56	35.94	34.00	36.00	35.06	0.200	0.563	0.113	0.013
56	45.00	44.63	45.00	45.00	35.06	35.31	35.31	35.31	0.288	0.475	0.013	0.113
57	45.00	45.00	45.00	45.00	35.63	35.50	35.50	35.50	0.337	0.425	0.013	0.113
58	78.44	21.94	89.69	22.38	34.94	34.50	35.88	35.25	0.200	0.563	0.012	0.113
59	83.13	21.56	89.31	21.63	35.06	34.06	35.06	35.88	0.275	0.488	0.038	0.088
60	72.56	22.44	80.81	22.50	35.13	35.00	35.13	35.13	0.263	0.500	0.013	0.112
61	22.50	47.56	22.50	89.06	35.69	34.19	35.19	35.31	0.175	0.588	0.112	0.013
62	22.50	52.63	22.50	89.69	35.94	34.06	35.13	35.19	0.275	0.488	0.012	0.113
63	22.50	63.81	22.50	90.00	31.38	35.13	35.13	35.19	0.337	0.425	0.012	0.113
กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
64	45.00	45.00	45.00	45.00	36.00	36.00	36.00	35.88	0.200	0.563	0.063	0.075
65	45.00	45.00	45.00	45.00	36.00	36.00	36.00	36.00	0.263	0.500	0.050	0.088
66	44.88	45.00	45.00	45.00	35.81	36.00	36.00	35.94	0.338	0.425	0.012	0.113
67	81.81	22.50	89.31	22.50	35.69	35.63	36.00	35.44	0.200	0.563	0.012	0.113
68	88.19	22.50	89.69	22.25	36.00	35.94	35.81	33.44	0.250	0.513	0.013	0.113
69	88.94	22.50	90.00	22.44	35.94	35.94	35.94	31.94	0.363	0.400	0.013	0.113
70	22.50	89.56	22.50	89.81	34.94	35.06	34.94	36.00	0.200	0.563	0.075	0.063
71	22.50	85.19	22.50	89.69	35.06	35.94	34.13	36.00	0.262	0.500	0.025	0.112
72	22.50	89.06	22.50	89.06	35.94	36.00	35.94	36.00	0.288	0.475	0.012	0.113
กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
73	89.81	89.88	89.81	89.94	35.94	35.94	35.94	35.94	0.200	0.563	0.012	0.113
74	89.81	89.44	89.81	89.75	30.25	35.25	35.31	35.94	0.298	0.465	0.010	0.110
75	90.00	89.94	90.00	89.88	35.06	36.00	36.00	35.25	0.312	0.450	0.012	0.113
76	140.63	42.81	142.81	44.94	36.00	35.56	35.94	35.81	0.212	0.550	0.012	0.113
77	157.75	44.94	173.19	45.00	36.00	35.94	36.00	36.00	0.288	0.475	0.012	0.113
78	126.75	45.00	132.81	43.94	35.94	35.06	36.00	34.94	0.313	0.450	0.012	0.113
79	45.00	108.94	45.00	121.19	34.94	34.94	35.94	34.44	0.175	0.588	0.038	0.088
80	45.00	147.56	44.94	155.56	24.56	35.94	35.69	36.00	0.300	0.463	0.013	0.113
81	45.00	178.25	45.00	179.94	35.94	35.81	35.94	35.94	0.300	0.550	0.012	0.113

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย (ต่อ)

กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
82	90.00	90.00	90.00	89.94	35.94	36.00	36.00	35.88	0.200	0.563	0.087	0.038
83	90.00	90.00	89.94	89.94	35.88	35.88	36.00	33.88	0.288	0.475	0.013	0.113
84	90.00	90.00	90.00	90.00	36.00	35.19	35.19	36.00	0.262	0.500	0.025	0.113
85	112.56	44.50	122.63	44.75	34.75	35.38	35.88	34.38	0.200	0.563	0.075	0.050
86	127.31	45.00	137.19	42.94	35.81	35.56	35.56	35.56	0.262	0.500	0.012	0.113
87	125.06	44.94	131.06	43.94	35.06	34.06	36.00	35.00	0.313	0.450	0.012	0.113
88	45.00	145.56	44.94	145.94	35.81	35.94	35.44	35.81	0.188	0.575	0.088	0.038
89	45.00	123.81	44.44	123.94	33.50	35.94	35.50	35.56	0.262	0.500	0.013	0.113
90	45.00	121.00	45.00	121.19	35.94	34.94	35.94	35.06	0.313	0.450	0.012	0.113
กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
91	22.00	17.69	26.81	26.69	35.69	35.81	35.81	35.81	0.213	0.550	0.075	0.050
92	21.31	18.81	26.31	26.44	27.31	33.44	35.94	35.44	0.288	0.463	0.113	0.013
93	25.63	15.88	26.25	27.00	28.50	34.38	35.13	35.25	0.350	0.413	0.025	0.100
94	29.50	13.25	53.94	13.50	34.00	36.00	36.00	35.38	0.213	0.550	0.013	0.113
95	30.00	12.94	53.88	13.50	36.00	34.50	35.50	35.50	0.250	0.513	0.025	0.100
96	53.31	13.31	53.94	13.50	35.81	35.81	35.94	35.94	0.300	0.525	0.013	0.113
97	10.50	7.00	13.50	53.06	34.06	34.94	35.94	35.06	0.175	0.588	0.012	0.113
98	10.06	18.38	11.31	53.75	33.94	33.81	35.94	35.81	0.175	0.588	0.050	0.088
99	12.56	6.81	13.06	54.00	28.81	35.44	35.81	36.00	0.325	0.438	0.100	0.013
กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
100	25.69	26.75	27.00	27.00	35.69	35.06	35.31	35.31	0.188	0.575	0.013	0.113
101	25.19	27.00	27.00	26.69	35.06	35.31	35.06	35.06	0.288	0.475	0.038	0.088
102	26.56	26.94	27.00	26.94	34.50	36.00	36.00	32.13	0.375	0.388	0.063	0.075
103	32.94	13.50	54.00	13.50	33.94	35.94	35.81	34.69	0.200	0.563	0.062	0.063
104	36.81	13.44	52.94	13.44	34.81	35.19	34.81	28.94	0.288	0.475	0.012	0.113
105	39.88	13.50	54.00	13.50	35.13	33.88	36.00	35.13	0.338	0.425	0.050	0.075
106	10.50	53.06	13.50	53.06	35.56	35.06	35.06	35.06	0.188	0.575	0.038	0.088
107	10.50	52.56	13.44	53.94	34.19	35.94	34.94	35.94	0.275	0.488	0.013	0.113
108	13.44	52.56	12.88	53.50	25.31	34.31	33.44	34.94	0.388	0.375	0.100	0.013

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย (ต่อ)

กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
109	44.81	44.81	44.25	45.00	36.00	35.88	36.00	35.88	0.200	0.562	0.025	0.100
110	44.94	44.94	44.94	44.94	35.94	35.81	35.94	35.81	0.200	0.563	0.012	0.113
111	44.13	44.63	45.00	44.06	35.94	35.94	36.00	36.00	0.337	0.425	0.012	0.113
112	66.63	21.63	89.50	22.38	35.50	35.13	35.88	35.63	0.200	0.563	0.025	0.100
113	72.88	22.50	90.00	22.50	35.50	35.06	35.56	35.94	0.213	0.550	0.013	0.112
114	87.25	21.63	89.63	22.50	35.06	35.94	35.25	35.13	0.263	0.500	0.012	0.113
115	22.50	36.25	22.19	89.94	33.56	35.06	35.69	35.94	0.200	0.563	0.075	0.050
116	20.56	52.25	21.88	89.44	35.19	33.31	35.31	35.31	0.275	0.488	0.075	0.063
117	22.44	55.19	22.44	89.56	35.19	34.00	36.00	36.00	0.325	0.438	0.012	0.113
กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
118	44.50	44.94	45.00	44.63	36.00	35.63	35.94	35.63	0.200	0.563	0.025	0.100
119	44.63	44.94	45.00	44.69	35.69	35.94	35.69	35.56	0.225	0.538	0.037	0.088
120	44.94	45.00	45.00	44.88	36.00	36.00	35.06	35.88	0.300	0.463	0.013	0.113
121	85.56	22.44	89.69	22.50	35.94	35.44	35.94	35.56	0.200	0.563	0.013	0.113
122	88.25	22.50	89.31	22.44	35.56	33.44	35.81	35.69	0.238	0.525	0.013	0.113
123	68.94	22.50	78.19	20.44	35.25	35.94	36.00	36.00	0.300	0.463	0.013	0.113
124	22.50	89.94	22.44	89.19	35.81	35.81	35.81	35.94	0.188	0.575	0.013	0.113
125	22.50	89.75	22.50	89.69	35.94	35.81	35.81	36.00	0.213	0.550	0.013	0.113
126	22.50	86.50	20.44	86.19	34.81	35.94	34.00	35.88	0.362	0.400	0.012	0.113
กรณีศึกษา	Lg*(S)	Lg*(W)	Lg*(N)	Lg*(E)	Hg*(S)	Hg*(W)	Hg*(N)	Hg*(E)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
127	90.00	90.00	90.00	90.00	36.00	36.00	36.00	36.00	0.200	0.563	0.075	0.063
128	89.94	89.81	89.94	89.63	30.31	35.25	35.31	36.00	0.298	0.465	0.010	0.110
129	89.94	90.00	89.94	90.00	35.56	35.94	35.81	36.00	0.262	0.500	0.075	0.063
130	124.13	45.00	131.25	44.94	36.00	33.94	36.00	36.00	0.213	0.550	0.013	0.113
131	178.38	44.94	179.13	45.00	36.00	36.00	36.00	35.94	0.275	0.488	0.013	0.113
132	133.00	44.90	124.00	44.94	35.94	34.26	36.00	35.12	0.325	0.451	0.013	0.113
133	45.00	174.81	44.94	179.25	35.56	35.81	35.56	36.00	0.175	0.588	0.062	0.063
134	45.00	133.75	44.88	146.75	32.63	34.88	35.88	35.88	0.287	0.475	0.012	0.113
135	45.00	177.19	44.94	179.69	35.94	35.94	35.63	36.00	0.300	0.563	0.012	0.113

ตารางที่ ข.2 ผลการออพติไมเซชั่นสำหรับรูปแบบความชื้นจำเพาะเฉลี่ย (ต่อ)

กรณีศึกษา	Lg*(SW)	Lg*(NW)	Lg*(NE)	Lg*(SE)	Hg*(SW)	Hg*(NW)	Hg*(NE)	Hg*(SE)	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
136	82.06	89.81	89.69	89.81	35.94	35.81	35.69	35.31	0.200	0.563	0.063	0.063
137	89.94	89.94	89.38	90.00	36.00	35.81	36.00	35.25	0.288	0.475	0.013	0.113
138	90.00	90.00	90.00	90.00	36.00	36.00	36.00	36.00	0.363	0.400	0.013	0.113
139	114.63	45.00	126.38	42.63	36.00	33.88	35.63	35.88	0.188	0.575	0.025	0.100
140	171.75	45.00	179.75	44.56	35.06	35.94	36.00	35.50	0.263	0.500	0.013	0.113
141	119.25	45.00	123.94	44.94	33.94	33.94	36.00	32.00	0.363	0.400	0.013	0.113
142	45.00	168.06	44.94	166.56	33.75	36.00	35.75	36.00	0.188	0.575	0.013	0.113
143	44.94	178.69	45.00	178.31	33.69	35.81	35.94	35.31	0.262	0.500	0.012	0.113
144	45.00	179.94	44.94	179.81	35.94	35.56	35.94	36.00	0.313	0.538	0.012	0.113
กรณีศึกษา	**Lg*(S)**	**Lg*(W)**	**Lg*(N)**	**Lg*(E)**	**Hg*(S)**	**Hg*(W)**	**Hg*(N)**	**Hg*(E)**	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
145	12.56	11.69	26.56	26.69	35.94	34.69	35.94	35.81	0.213	0.550	0.100	0.025
146	22.00	18.94	27.00	26.75	33.38	35.50	35.63	35.88	0.238	0.525	0.075	0.050
147	20.81	14.81	25.94	27.00	30.88	36.00	34.94	36.00	0.325	0.438	0.025	0.100
148	24.56	12.00	54.00	13.50	35.94	35.06	36.00	35.19	0.213	0.550	0.013	0.113
149	23.31	12.81	52.88	13.50	35.44	35.94	36.00	35.06	0.263	0.500	0.037	0.088
150	30.31	12.50	53.50	13.50	35.75	35.75	35.56	35.94	0.300	0.463	0.050	0.075
151	9.56	9.06	13.31	53.81	35.81	35.81	35.81	35.81	0.200	0.562	0.075	0.050
152	10.63	19.30	11.43	53.13	35.43	34.94	35.03	35.93	0.200	0.563	0.095	0.075
153	11.63	16.63	12.06	52.56	34.25	33.50	34.25	36.00	0.313	0.450	0.100	0.075
กรณีศึกษา	**Lg*(SW)**	**Lg*(NW)**	**Lg*(NE)**	**Lg*(SE)**	**Hg*(SW)**	**Hg*(NW)**	**Hg*(NE)**	**Hg*(SE)**	$\tau_v(0)^*$	$\rho_v(0)^*$	$\tau_a(0)^*$	$\alpha_a(0)^*$
154	14.13	25.19	27.00	26.94	35.94	35.94	35.00	35.94	0.188	0.563	0.013	0.113
155	24.63	26.56	26.56	26.19	33.94	36.00	34.75	34.81	0.288	0.475	0.050	0.075
156	26.81	26.81	26.94	26.81	35.94	35.94	35.81	35.81	0.375	0.563	0.013	0.113
157	35.44	13.50	53.19	13.50	35.44	35.94	35.94	34.69	0.200	0.563	0.013	0.113
158	33.63	13.44	53.81	13.50	35.94	33.94	35.81	35.06	0.275	0.488	0.038	0.088
159	37.56	13.44	53.00	13.50	36.00	35.06	36.00	35.75	0.300	0.462	0.013	0.113
160	9.50	46.06	13.50	53.44	35.69	35.31	35.31	35.31	0.200	0.563	0.013	0.113
161	10.50	47.13	13.50	53.69	34.31	35.06	35.06	35.06	0.275	0.488	0.012	0.113
162	12.13	53.88	13.00	54.00	35.75	35.13	36.00	35.94	0.338	0.425	0.050	0.075

ภาคผนวก ค

ผลการสูญเสียโอกาสของการประหยัดพลังงาน

การพิจารณาปัจจัยควบคุมได้ซึ่งประกอบด้วย ความยาวแนวระดับและความยาวแนวตั้งของกระจกในแต่ละทิศทาง สัมประสิทธิ์การส่งผ่านและสัมประสิทธิ์การสะท้อนในย่านความยาวคลื่นมองเห็นได้ และสัมประสิทธิ์การส่งผ่านและการดูดกลืนในย่านความยาวคลื่นมองไม่เห็น การเปลี่ยนแปลงรูปแบบความชื้นจำเพาะในช่วงความน่าจะเป็นที่พิจารณาคือ 50% ถึง 99% มีผลต่อผลการออพติไมเซชั่นน้อยมาก ซึ่งจะส่งผลให้การสูญเสียโอกาสของการประหยัดพลังงานมีการเปลี่ยนแปลงน้อยมากเมื่อรูปแบบความชื้นจำเพาะเปลี่ยนไป ดังนั้นรายงานการสูญเสียโอกาสของการประหยัดพลังงานจะแสดงเฉพาะการสูญเสียโอกาสของการประหยัดพลังงานภายใต้การเปลี่ยนแปลงรูปแบบอุณหภูมิและรังสีดวงอาทิตย์ที่รูปแบบความชื้นจำเพาะเฉลี่ย นั่นคือที่ รูปแบบความชื้นจำเพาะ 50% ตารางที่ ค.1 แสดงการสูญเสียโอกาสของการประหยัดพลังงาน

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
1	99%	99%	99%	25.92	1.3621E+12	7.7142E+12	9.0763E+12	9.2483E+11
			80%	25.92	1.3621E+12	7.7141E+12	9.0762E+12	9.2480E+11
			50%	25.92	1.3621E+12	7.7140E+12	9.0761E+12	9.2472E+11
		80%	99%	25.92	1.3621E+12	7.1169E+12	8.4790E+12	3.2756E+11
			80%	25.92	1.3621E+12	7.1168E+12	8.4789E+12	3.2752E+11
			50%	25.92	1.3621E+12	7.1168E+12	8.4789E+12	3.2744E+11
		50%	99%	25.92	1.3621E+12	6.7894E+12	8.1515E+12	1.1590E+08
			80%	25.92	1.3621E+12	6.7894E+12	8.1515E+12	7.8600E+07
▶			50%	25.92	1.3621E+12	6.7893E+12	8.1514E+12	0.0000E+00
	80%	99%	99%	25.13	1.8066E+12	7.5123E+12	9.3189E+12	7.2302E+11
			80%	25.13	1.8066E+12	7.5123E+12	9.3189E+12	7.2298E+11
			50%	25.13	1.8066E+12	7.5122E+12	9.3188E+12	7.2290E+11
		80%	99%	25.13	1.8066E+12	6.9302E+12	8.7368E+12	1.4086E+11
			80%	25.13	1.8066E+12	6.9301E+12	8.7367E+12	1.4083E+11
			50%	25.13	1.8066E+12	6.9301E+12	8.7366E+12	1.4075E+11
		50%	99%	25.13	1.8066E+12	6.5979E+12	8.4045E+12	-1.9139E+11
			80%	25.13	1.8066E+12	6.5979E+12	8.4045E+12	-1.9142E+11
			50%	25.13	1.8066E+12	6.5978E+12	8.4044E+12	-1.9150E+11
	50%	99%	99%	24.65	2.2285E+12	7.4364E+12	9.6649E+12	6.4713E+11
			80%	24.65	2.2285E+12	7.4364E+12	9.6649E+12	6.4709E+11
			50%	24.65	2.2285E+12	7.4363E+12	9.6648E+12	6.4702E+11
		80%	99%	24.65	2.2285E+12	6.8547E+12	9.0832E+12	6.5427E+10
			80%	24.65	2.2285E+12	6.8547E+12	9.0832E+12	6.5389E+10
			50%	24.65	2.2285E+12	6.8546E+12	9.0831E+12	6.5311E+10
		50%	99%	24.65	2.2285E+12	6.5239E+12	8.7524E+12	-2.6544E+11
			80%	24.65	2.2285E+12	6.5238E+12	8.7523E+12	-2.6548E+11
			50%	24.65	2.2285E+12	6.5238E+12	8.7522E+12	-2.6555E+11
3	99%	99%	99%	26.52	1.1475E+12	7.7316E+12	8.8792E+12	7.7316E+12
			80%	26.52	1.1475E+12	7.7316E+12	8.8791E+12	7.7316E+12
			50%	26.52	1.1475E+12	7.7315E+12	8.8790E+12	7.7315E+12
		80%	99%	26.52	1.1475E+12	7.1257E+12	8.2732E+12	7.1257E+12
			80%	26.52	1.1475E+12	7.1257E+12	8.2732E+12	7.1257E+12
			50%	26.52	1.1475E+12	7.1256E+12	8.2731E+12	7.1256E+12
		50%	99%	26.52	1.1475E+12	6.7943E+12	7.9418E+12	6.7943E+12
			80%	26.52	1.1475E+12	6.7942E+12	7.9418E+12	6.7942E+12
			50%	26.52	1.1475E+12	6.7941E+12	7.9417E+12	6.7941E+12
	80%	99%	99%	26.11	1.4670E+12	7.5056E+12	8.9726E+12	7.5056E+12
			80%	26.11	1.4670E+12	7.5056E+12	8.9726E+12	7.5056E+12
			50%	26.11	1.4670E+12	7.5055E+12	8.9725E+12	7.5055E+12
		80%	99%	26.11	1.4670E+12	6.9146E+12	8.3817E+12	6.9146E+12
			80%	26.11	1.4670E+12	6.9146E+12	8.3816E+12	6.9146E+12
			50%	26.11	1.4670E+12	6.9145E+12	8.3815E+12	6.9145E+12
		50%	99%	26.11	1.4670E+12	6.5848E+12	8.0518E+12	6.5848E+12
			80%	26.11	1.4670E+12	6.5847E+12	8.0518E+12	6.5847E+12
			50%	26.11	1.4670E+12	6.5847E+12	8.0517E+12	6.5847E+12
	50%	99%	99%	25.25	1.8465E+12	7.4190E+12	9.2655E+12	7.4190E+12
			80%	25.25	1.8465E+12	7.4190E+12	9.2655E+12	7.4190E+12
			50%	25.25	1.8465E+12	7.4189E+12	9.2654E+12	7.4189E+12
		80%	99%	25.25	1.8465E+12	6.8299E+12	8.6764E+12	6.8299E+12
			80%	25.25	1.8465E+12	6.8299E+12	8.6764E+12	6.8299E+12
			50%	25.25	1.8465E+12	6.8298E+12	8.6763E+12	6.8298E+12
		50%	99%	25.25	1.8465E+12	6.4955E+12	8.3420E+12	6.4955E+12
			80%	25.25	1.8465E+12	6.4954E+12	8.3419E+12	6.4954E+12
▶			50%	25.25	1.8465E+12	6.4954E+12	8.3419E+12	6.4954E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
2	99%	99%	99%	26.88	1.1156E+12	7.6893E+12	8.8049E+12	1.1046E+12
			80%	26.88	1.1156E+12	7.6893E+12	8.8049E+12	1.1045E+12
			50%	26.88	1.1156E+12	7.6892E+12	8.8048E+12	1.1044E+12
		80%	99%	26.88	1.1156E+12	7.0950E+12	8.2106E+12	5.1023E+11
			80%	26.88	1.1156E+12	7.0950E+12	8.2106E+12	5.1019E+11
			50%	26.88	1.1156E+12	7.0949E+12	8.2105E+12	5.1011E+11
		50%	99%	26.88	1.1156E+12	6.7734E+12	7.8890E+12	1.8865E+11
			80%	26.88	1.1156E+12	6.7734E+12	7.8890E+12	1.8861E+11
			50%	26.88	1.1156E+12	6.7733E+12	7.8889E+12	1.8853E+11
	80%	99%	99%	25.99	1.3869E+12	7.4616E+12	8.8485E+12	8.7681E+11
			80%	25.99	1.3869E+12	7.4615E+12	8.8484E+12	8.7677E+11
			50%	25.99	1.3869E+12	7.4615E+12	8.8483E+12	8.7669E+11
		80%	99%	25.99	1.3869E+12	6.8764E+12	8.2633E+12	2.9167E+11
			80%	25.99	1.3869E+12	6.8764E+12	8.2633E+12	2.9164E+11
			50%	25.99	1.3869E+12	6.8763E+12	8.2632E+12	2.9156E+11
		50%	99%	25.99	1.3869E+12	6.5549E+12	7.9418E+12	-2.9898E+10
			80%	25.99	1.3869E+12	6.5548E+12	7.9417E+12	-2.9935E+10
▶			50%	25.99	1.3869E+12	6.5548E+12	7.9416E+12	-3.0013E+10
	50%	99%	99%	25.51	1.7524E+12	7.3730E+12	9.1255E+12	7.8828E+11
			80%	25.51	1.7524E+12	7.3730E+12	9.1254E+12	7.8824E+11
			50%	25.51	1.7524E+12	7.3729E+12	9.1253E+12	7.8816E+11
		80%	99%	25.51	1.7524E+12	6.7908E+12	8.5432E+12	2.0602E+11
			80%	25.51	1.7524E+12	6.7907E+12	8.5432E+12	2.0598E+11
			50%	25.51	1.7524E+12	6.7907E+12	8.5431E+12	2.0590E+11
		50%	99%	25.51	1.7524E+12	6.4678E+12	8.2202E+12	-1.1699E+11
			80%	25.51	1.7524E+12	6.4677E+12	8.2202E+12	-1.1703E+11
			50%	25.51	1.7524E+12	6.4677E+12	8.2201E+12	-1.1711E+11
4	99%	99%	99%	25.92	1.4212E+12	8.1176E+12	9.5389E+12	8.1176E+12
			80%	25.92	1.4212E+12	8.1176E+12	9.5388E+12	8.1176E+12
			50%	25.92	1.4212E+12	8.1175E+12	9.5387E+12	8.1175E+12
		80%	99%	25.92	1.4212E+12	7.4136E+12	8.8349E+12	7.4136E+12
			80%	25.92	1.4212E+12	7.4136E+12	8.8348E+12	7.4136E+12
			50%	25.92	1.4212E+12	7.4135E+12	8.8348E+12	7.4135E+12
		50%	99%	25.92	1.4212E+12	7.0326E+12	8.4538E+12	7.0326E+12
			80%	25.92	1.4212E+12	7.0325E+12	8.4538E+12	7.0325E+12
▶			50%	25.92	1.4212E+12	7.0325E+12	8.4537E+12	7.0325E+12
	80%	99%	99%	25.05	1.8470E+12	7.8931E+12	9.7401E+12	7.8931E+12
			80%	25.05	1.8470E+12	7.8931E+12	9.7401E+12	7.8931E+12
			50%	25.05	1.8470E+12	7.8930E+12	9.7400E+12	7.8930E+12
		80%	99%	25.05	1.8470E+12	7.2154E+12	9.0624E+12	7.2154E+12
			80%	25.05	1.8470E+12	7.2154E+12	9.0624E+12	7.2154E+12
			50%	25.05	1.8470E+12	7.2153E+12	9.0623E+12	7.2153E+12
		50%	99%	25.05	1.8470E+12	6.8416E+12	8.6886E+12	6.8416E+12
			80%	25.05	1.8470E+12	6.8416E+12	8.6886E+12	6.8416E+12
			50%	25.05	1.8470E+12	6.8415E+12	8.6885E+12	6.8415E+12
	50%	99%	99%	24.58	2.2673E+12	7.8076E+12	1.0075E+13	7.8076E+12
			80%	24.58	2.2673E+12	7.8076E+12	1.0075E+13	7.8076E+12
			50%	24.58	2.2673E+12	7.8075E+12	1.0075E+13	7.8075E+12
		80%	99%	24.58	2.2673E+12	7.1369E+12	9.4041E+12	7.1369E+12
			80%	24.58	2.2673E+12	7.1368E+12	9.4041E+12	7.1368E+12
			50%	24.58	2.2673E+12	7.1368E+12	9.4040E+12	7.1368E+12
		50%	99%	24.58	2.2673E+12	6.7617E+12	9.0290E+12	6.7617E+12
			80%	24.58	2.2673E+12	6.7617E+12	9.0289E+12	6.7617E+12
			50%	24.58	2.2673E+12	6.7616E+12	9.0289E+12	6.7616E+12

▶ แทน สภาวะภายใต้กระบวนการออพติไมเซชั่น

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
5	99%	99%	99%	26.89	1.2366E+12	8.0486E+12	9.2851E+12	1.2669E-12
			80%	26.89	1.2366E+12	8.0485E+12	9.2851E+12	1.2669E-12
			50%	26.89	1.2366E+12	8.0484E+12	9.2850E+12	1.2668E+12
		80%	99%	26.89	1.2366E+12	7.3618E+12	8.5984E+12	5.8015E+11
			80%	26.89	1.2366E+12	7.3617E+12	8.5983E+12	5.8012E+11
			50%	26.89	1.2366E+12	7.3617E+12	8.5982E+12	5.8004E+11
		50%	99%	26.89	1.2366E+12	6.9907E+12	8.2273E+12	2.0907E+11
			80%	26.89	1.2366E+12	6.9906E+12	8.2272E+12	2.0903E+11
			50%	26.89	1.2366E+12	6.9906E+12	8.2272E+12	2.0895E+11
	80%	99%	99%	25.97	1.6010E+12	7.8152E+12	9.4162E+12	1.0336E+12
			80%	25.97	1.6010E+12	7.8152E+12	9.4162E+12	1.0334E+12
			50%	25.97	1.6010E+12	7.8151E+12	9.4161E+12	1.0335E+12
		80%	99%	25.97	1.6010E+12	7.1515E+12	8.7525E+12	3.6991E+11
			80%	25.97	1.6010E+12	7.1515E+12	8.7525E+12	3.6987E+11
			50%	25.97	1.6010E+12	7.1514E+12	8.7524E+12	3.6979E+11
		50%	99%	25.97	1.6010E+12	6.7817E+12	8.3827E+12	1.1690E+08
			80%	25.97	1.6010E+12	6.7817E+12	8.3827E+12	7.9700E+07
▶			50%	25.97	1.6010E+12	6.7816E+12	8.3826E+12	0.0000E+00
	50%	99%	99%	25.49	1.9792E+12	7.7195E+12	9.6987E+12	9.3790E+11
			80%	25.49	1.9792E+12	7.7195E+12	9.6987E+12	9.3786E+11
			50%	25.49	1.9792E+12	7.7194E+12	9.6986E+12	9.3778E+11
		80%	99%	25.49	1.9792E+12	7.0670E+12	9.0462E+12	2.8539E+11
			80%	25.49	1.9792E+12	7.0670E+12	9.0462E+12	2.8535E+11
			50%	25.49	1.9792E+12	7.0669E+12	9.0461E+12	2.8527E+11
		50%	99%	25.49	1.9792E+12	6.7008E+12	8.6800E+12	-8.0852E+10
			80%	25.49	1.9792E+12	6.7007E+12	8.6799E+12	-8.0890E+10
			50%	25.49	1.9792E+12	6.7006E+12	8.6799E+12	-8.0969E+10
7	99%	99%	99%	25.94	1.4869E+12	7.7101E+12	9.1970E+12	7.7101E+12
			80%	25.94	1.4869E+12	7.7100E+12	9.1969E+12	7.7100E+12
			50%	25.94	1.4869E+12	7.7100E+12	9.1969E+12	7.7100E+12
		80%	99%	25.94	1.4869E+12	7.1506E+12	8.6375E+12	7.1506E+12
			80%	25.94	1.4869E+12	7.1506E+12	8.6375E+12	7.1506E+12
			50%	25.94	1.4869E+12	7.1505E+12	8.6374E+12	7.1505E+12
		50%	99%	25.94	1.4869E+12	6.8191E+12	8.3060E+12	6.8191E+12
			80%	25.94	1.4869E+12	6.8190E+12	8.3059E+12	6.8190E+12
▶			50%	25.94	1.4869E+12	6.8189E+12	8.3059E+12	6.8189E+12
	80%	99%	99%	25.15	2.0006E+12	7.5123E+12	9.5129E+12	7.5123E+12
			80%	25.15	2.0006E+12	7.5122E+12	9.5129E+12	7.5122E+12
			50%	25.15	2.0006E+12	7.5121E+12	9.5128E+12	7.5121E+12
		80%	99%	25.15	2.0006E+12	6.9463E+12	8.9469E+12	6.9463E+12
			80%	25.15	2.0006E+12	6.9463E+12	8.9469E+12	6.9463E+12
			50%	25.15	2.0006E+12	6.9462E+12	8.9468E+12	6.9462E+12
		50%	99%	25.15	2.0006E+12	6.6137E+12	8.6144E+12	6.6137E+12
			80%	25.15	2.0006E+12	6.6137E+12	8.6143E+12	6.6137E+12
			50%	25.15	2.0006E+12	6.6136E+12	8.6142E+12	6.6136E+12
	50%	99%	99%	24.68	2.4187E+12	7.4181E+12	9.8368E+12	7.4181E+12
			80%	24.68	2.4187E+12	7.4181E+12	9.8368E+12	7.4181E+12
			50%	24.68	2.4187E+12	7.4180E+12	9.8367E+12	7.4180E+12
		80%	99%	24.68	2.4187E+12	6.8565E+12	9.2752E+12	6.8565E+12
			80%	24.68	2.4187E+12	6.8565E+12	9.2752E+12	6.8565E+12
			50%	24.68	2.4187E+12	6.8564E+12	9.2751E+12	6.8564E+12
		50%	99%	24.68	2.4187E+12	6.5217E+12	8.9404E+12	6.5217E+12
			80%	24.68	2.4187E+12	6.5216E+12	8.9403E+12	6.5216E+12
			50%	24.68	2.4187E+12	6.5215E+12	8.9402E+12	6.5215E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
6	99%	99%	99%	26.56	1.1378E+12	8.2045E+12	9.3423E+12	1.4498E+12
			80%	26.56	1.1378E+12	8.2044E+12	9.3422E+12	1.4498E+12
			50%	26.56	1.1378E+12	8.2044E+12	9.3421E+12	1.4497E+12
		80%	99%	26.56	1.1378E+12	7.4636E+12	8.6014E+12	7.0894E+11
			80%	26.56	1.1378E+12	7.4636E+12	8.6014E+12	7.0891E+11
			50%	26.56	1.1378E+12	7.4635E+12	8.6013E+12	7.0883E+11
		50%	99%	26.56	1.1378E+12	7.0797E+12	8.2175E+12	3.2506E+11
			80%	26.56	1.1378E+12	7.0797E+12	8.2175E+12	3.2502E+11
			50%	26.56	1.1378E+12	7.0796E+12	8.2174E+12	3.2494E+11
	80%	99%	99%	26.23	1.4459E+12	7.9301E+12	9.3761E+12	1.1755E+12
			80%	26.23	1.4459E+12	7.9301E+12	9.3760E+12	1.1754E+12
			50%	26.23	1.4459E+12	7.9300E+12	9.3760E+12	1.1754E+12
		80%	99%	26.23	1.4459E+12	7.2346E+12	8.6805E+12	4.7993E+11
			80%	26.23	1.4459E+12	7.2346E+12	8.6805E+12	4.7989E+11
			50%	26.23	1.4459E+12	7.2345E+12	8.6804E+12	4.7981E+11
		50%	99%	26.23	1.4459E+12	6.8518E+12	8.2978E+12	9.7160E+10
			80%	26.23	1.4459E+12	6.8518E+12	8.2977E+12	9.7121E+10
			50%	26.23	1.4459E+12	6.8517E+12	8.2977E+12	9.7043E+10
	50%	99%	99%	25.17	1.7856E+12	7.8269E+12	9.6125E+12	1.0723E+12
			80%	25.17	1.7856E+12	7.8269E+12	9.6125E+12	1.0722E+12
			50%	25.17	1.7856E+12	7.8268E+12	9.6124E+12	1.0721E+12
		80%	99%	25.17	1.7856E+12	7.1387E+12	8.9242E+12	3.8399E+11
			80%	25.17	1.7856E+12	7.1386E+12	8.9242E+12	3.8394E+11
			50%	25.17	1.7856E+12	7.1385E+12	8.9241E+12	3.8388E+11
		50%	99%	25.17	1.7856E+12	6.7548E+12	8.5404E+12	1.1700E+08
			80%	25.17	1.7856E+12	6.7547E+12	8.5403E+12	7.9700E+07
▶			50%	25.17	1.7856E+12	6.7547E+12	8.5402E+12	0.0000E+00
8	99%	99%	99%	26.75	1.0748E+12	7.8978E+12	8.9726E+12	7.8978E+12
			80%	26.75	1.0748E+12	7.8978E+12	8.9725E+12	7.8978E+12
			50%	26.75	1.0748E+12	7.8977E+12	8.9725E+12	7.8977E+12
		80%	99%	26.75	1.0748E+12	7.2732E+12	8.3480E+12	7.2732E+12
			80%	26.75	1.0748E+12	7.2732E+12	8.3480E+12	7.2732E+12
			50%	26.75	1.0748E+12	7.2731E+12	8.3479E+12	7.2731E+12
		50%	99%	26.75	1.0748E+12	6.9284E+12	8.0032E+12	6.9284E+12
			80%	26.75	1.0748E+12	6.9284E+12	8.0032E+12	6.9284E+12
			50%	26.75	1.0748E+12	6.9283E+12	8.0031E+12	6.9283E+12
	80%	99%	99%	25.96	1.2490E+12	7.5984E+12	8.8473E+12	7.5984E+12
			80%	25.96	1.2490E+12	7.5983E+12	8.8473E+12	7.5983E+12
			50%	25.96	1.2490E+12	7.5982E+12	8.8472E+12	7.5982E+12
		80%	99%	25.96	1.2490E+12	6.9825E+12	8.2315E+12	6.9825E+12
			80%	25.96	1.2490E+12	6.9825E+12	8.2315E+12	6.9825E+12
			50%	25.96	1.2490E+12	6.9824E+12	8.2314E+12	6.9824E+12
		50%	99%	25.96	1.2490E+12	6.6435E+12	7.8925E+12	6.6435E+12
			80%	25.96	1.2490E+12	6.6434E+12	7.8924E+12	6.6434E+12
▶			50%	25.96	1.2490E+12	6.6434E+12	7.8923E+12	6.6434E+12
	50%	99%	99%	25.48	1.5504E+12	7.4699E+12	9.0203E+12	7.4699E+12
			80%	25.48	1.5504E+12	7.4699E+12	9.0203E+12	7.4699E+12
			50%	25.48	1.5504E+12	7.4698E+12	9.0202E+12	7.4698E+12
		80%	99%	25.48	1.5504E+12	6.8615E+12	8.4119E+12	6.8615E+12
			80%	25.48	1.5504E+12	6.8615E+12	8.4119E+12	6.8615E+12
			50%	25.48	1.5504E+12	6.8614E+12	8.4118E+12	6.8614E+12
		50%	99%	25.48	1.5504E+12	6.5187E+12	8.0691E+12	6.5187E+12
			80%	25.48	1.5504E+12	6.5187E+12	8.0691E+12	6.5187E+12
			50%	25.48	1.5504E+12	6.5186E+12	8.0690E+12	6.5184E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
9	99%	99%	99%	27.25	1.0436E+12	8.0187E+12	9.0623E+12	1.4745E+12
			80%	27.25	1.0436E+12	8.0187E+12	9.0622E+12	1.4745E+12
			50%	27.25	1.0436E+12	8.0186E+12	9.0622E+12	1.4744E+12
		80%	99%	27.25	1.0436E+12	7.3795E+12	8.4230E+12	8.3531E+11
			80%	27.25	1.0436E+12	7.3794E+12	8.4230E+12	8.3527E+11
			50%	27.25	1.0436E+12	7.3794E+12	8.4229E+12	8.3519E+11
		50%	99%	27.25	1.0436E+12	7.0166E+12	8.0602E+12	4.7245E+11
			80%	27.25	1.0436E+12	7.0166E+12	8.0601E+12	4.7242E+11
			50%	27.25	1.0436E+12	7.0165E+12	8.0601E+12	4.7234E+11
	80%	99%	99%	26.47	1.1048E+12	7.6771E+12	8.7818E+12	1.1329E+12
			80%	26.47	1.1048E+12	7.6770E+12	8.7818E+12	1.1329E+12
			50%	26.47	1.1048E+12	7.6770E+12	8.7817E+12	1.1328E+12
		80%	99%	26.47	1.1048E+12	7.0474E+12	8.1521E+12	5.0324E+11
			80%	26.47	1.1048E+12	7.0474E+12	8.1521E+12	5.0320E+11
			50%	26.47	1.1048E+12	7.0473E+12	8.1520E+12	5.0312E+11
		50%	99%	26.47	1.1048E+12	6.7018E+12	7.8065E+12	1.5761E+11
			80%	26.47	1.1048E+12	6.7017E+12	7.8065E+12	1.5757E+11
			50%	26.47	1.1048E+12	6.7016E+12	7.8064E+12	1.5749E+11
	50%	99%	99%	25.99	1.2718E+12	7.5148E+12	8.7866E+12	9.7065E+11
			80%	25.99	1.2718E+12	7.5148E+12	8.7865E+12	9.7062E+11
			50%	25.99	1.2718E+12	7.5147E+12	8.7865E+12	9.7054E+11
		80%	99%	25.99	1.2718E+12	6.8912E+12	8.1629E+12	3.4700E+11
			80%	25.99	1.2718E+12	6.8911E+12	8.1629E+12	3.4697E+11
			50%	25.99	1.2718E+12	6.8910E+12	8.1628E+12	3.4689E+11
		50%	99%	25.99	1.2718E+12	6.5443E+12	7.8160E+12	1.1640E+08
			80%	25.99	1.2718E+12	6.5442E+12	7.8160E+12	7.9200E+07
			50%	25.99	1.2718E+12	6.5442E+12	7.8159E+12	0.0000E+00
11	99%	99%	99%	26.94	1.3847E+12	7.8380E+12	9.2227E+12	1.1557E+12
			80%	26.94	1.3847E+12	7.8380E+12	9.2226E+12	1.1557E+12
			50%	26.94	1.3847E+12	7.8379E+12	9.2226E+12	1.1556E+12
		80%	99%	26.94	1.3847E+12	7.2123E+12	8.5969E+12	5.2996E+11
			80%	26.94	1.3847E+12	7.2122E+12	8.5969E+12	5.2992E+11
			50%	26.94	1.3847E+12	7.2122E+12	8.5968E+12	5.2984E+11
		50%	99%	26.94	1.3847E+12	6.8826E+12	8.2672E+12	2.0024E+11
			80%	26.94	1.3847E+12	6.8825E+12	8.2672E+12	2.0020E+11
			50%	26.94	1.3847E+12	6.8824E+12	8.2671E+12	2.0012E+11
	80%	99%	99%	25.98	1.7999E+12	7.6052E+12	9.4051E+12	9.2290E+11
			80%	25.98	1.7999E+12	7.6052E+12	9.4051E+12	9.2286E+11
			50%	25.98	1.7999E+12	7.6051E+12	9.4050E+12	9.2278E+11
		80%	99%	25.98	1.7999E+12	7.0108E+12	8.8107E+12	3.2846E-11
			80%	25.98	1.7999E+12	7.0107E+12	8.8107E+12	3.2842E+11
			50%	25.98	1.7999E+12	7.0107E+12	8.8106E+12	3.2834E+11
		50%	99%	25.98	1.7999E+12	6.6824E+12	8.4823E+12	1.1690E+08
			80%	25.98	1.7999E+12	6.6824E+12	8.4823E+12	7.9200E+07
			50%	25.98	1.7999E+12	6.6823E+12	8.4822E+12	0.0000E+00
	50%	99%	99%	25.30	2.1943E+12	7.5124E+12	9.7067E+12	8.3006E+11
			80%	25.30	2.1943E+12	7.5123E+12	9.7067E+12	8.3003E+11
			50%	25.30	2.1943E+12	7.5123E+12	9.7066E+12	8.2995E+11
		80%	99%	25.30	2.1943E+12	6.9243E+12	9.1186E+12	2.4194E+11
			80%	25.30	2.1943E+12	6.9242E+12	9.1185E+12	2.4190E+11
			50%	25.30	2.1943E+12	6.9241E+12	9.1185E+12	2.4183E+11
		50%	99%	25.30	2.1943E+12	6.5904E+12	8.7847E+12	-9.1964E+10
			80%	25.30	2.1943E+12	6.5903E+12	8.7846E+12	-9.2002E+10
			50%	25.30	2.1943E+12	6.5902E+12	8.7846E+12	-9.2080E+10
10	99%	99%	99%	25.89	1.8244E+12	7.8676E+12	9.6920E+12	9.4142E+11
			80%	25.89	1.8244E+12	7.8676E+12	9.6919E+12	9.4138E+11
			50%	25.89	1.8244E+12	7.8675E+12	9.6918E+12	9.4130E+11
		80%	99%	25.89	1.8244E+12	7.2620E+12	9.0864E+12	3.3584E+11
			80%	25.89	1.8244E+12	7.2620E+12	9.0863E+12	3.3580E+11
			50%	25.89	1.8244E+12	7.2619E+12	9.0863E+12	3.3572E+11
		50%	99%	25.89	1.8244E+12	6.9263E+12	8.7507E+12	1.1640E+08
			80%	25.89	1.8244E+12	6.9263E+12	8.7506E+12	7.9100E+07
			50%	25.89	1.8244E+12	6.9262E+12	8.7505E+12	0.0000E+00
	80%	99%	99%	24.94	2.3164E+12	7.6559E+12	9.9722E+12	7.2968E+11
			80%	24.94	2.3164E+12	7.6558E+12	9.9722E+12	7.2964E+11
			50%	24.94	2.3164E+12	7.6557E+12	9.9721E+12	7.2956E+11
		80%	99%	24.94	2.3164E+12	7.0623E+12	9.3787E+12	1.3613E+11
			80%	24.94	2.3164E+12	7.0623E+12	9.3786E+12	1.3610E+11
			50%	24.94	2.3164E+12	7.0622E+12	9.3785E+12	1.3601E+11
		50%	99%	24.94	2.3164E+12	6.7332E+12	9.0495E+12	-1.9298E+11
			80%	24.94	2.3164E+12	6.7332E+12	9.0495E+12	-1.9302E+11
			50%	24.94	2.3164E+12	6.7331E+12	9.0494E+12	-1.9310E+11
	50%	99%	99%	24.25	2.6708E+12	7.5515E+12	1.0222E+13	6.2537E+11
			80%	24.25	2.6708E+12	7.5515E+12	1.0222E+13	6.2533E+11
			50%	24.25	2.6708E+12	7.5514E+12	1.0222E+13	6.2526E+11
		80%	99%	24.25	2.6708E+12	6.9615E+12	9.6323E+12	3.5313E+10
			80%	24.25	2.6708E+12	6.9614E+12	9.6322E+12	3.5275E+10
			50%	24.25	2.6708E+12	6.9614E+12	9.6322E+12	3.5196E+10
		50%	99%	24.25	2.6708E+12	6.6277E+12	9.2984E+12	-2.9851E+11
			80%	24.25	2.6708E+12	6.6276E+12	9.2984E+12	-2.9855E+11
			50%	24.25	2.6708E+12	6.6275E+12	9.2983E+12	-2.9863E+11
12	99%	99%	99%	27.05	1.4693E+12	7.7909E+12	9.2602E+12	1.2108E+12
			80%	27.05	1.4693E+12	7.7909E+12	9.2602E+12	1.2107E+12
			50%	27.05	1.4693E+12	7.7908E+12	9.2601E+12	1.2107E+12
		80%	99%	27.05	1.4693E+12	7.1830E+12	8.6524E+12	6.0289E+11
			80%	27.05	1.4693E+12	7.1830E+12	8.6523E+12	6.0285E+11
			50%	27.05	1.4693E+12	7.1829E+12	8.6522E+12	6.0277E+11
		50%	99%	27.05	1.4693E+12	6.8615E+12	8.3308E+12	2.8133E+11
			80%	27.05	1.4693E+12	6.8614E+12	8.3308E+12	2.8129E+11
			50%	27.05	1.4693E+12	6.8614E+12	8.3307E+12	2.8122E+11
	80%	99%	99%	26.10	1.9020E+12	7.5796E+12	9.4815E+12	9.9941E+11
			80%	26.10	1.9020E+12	7.5795E+12	9.4815E+12	9.9938E+11
			50%	26.10	1.9020E+12	7.5794E+12	9.4814E+12	9.9930E+11
		80%	99%	26.10	1.9020E+12	6.9882E+12	8.8902E+12	4.0804E+11
			80%	26.10	1.9020E+12	6.9882E+12	8.8901E+12	4.0801E+11
			50%	26.10	1.9020E+12	6.9881E+12	8.8901E+12	4.0793E+11
		50%	99%	26.10	1.9020E+12	6.6665E+12	8.5685E+12	8.6340E+10
			80%	26.10	1.9020E+12	6.6665E+12	8.5684E+12	8.6304E+10
			50%	26.10	1.9020E+12	6.6664E+12	8.5683E+12	8.6226E+10
	50%	99%	99%	25.41	2.3053E+12	7.4834E+12	9.7887E+12	9.0324E+11
			80%	25.41	2.3053E+12	7.4834E+12	9.7886E+12	9.0320E+11
			50%	25.41	2.3053E+12	7.4833E+12	9.7885E+12	9.0312E+11
		80%	99%	25.41	2.3053E+12	6.9060E+12	9.2112E+12	3.2581E+11
			80%	25.41	2.3053E+12	6.9059E+12	9.2112E+12	3.2577E+11
			50%	25.41	2.3053E+12	6.9058E+12	9.2111E+12	3.2569E+11
		50%	99%	25.41	2.3053E+12	6.5803E+12	8.8855E+12	1.1640E+08
			80%	25.41	2.3053E+12	6.5802E+12	8.8855E+12	7.9700E+07
			50%	25.41	2.3053E+12	6.5801E+12	8.8854E+12	0.0000E+00

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_a (J)	W (J)	OPL
13	99%	99%	99%	25.73	1.7172E+12	8.4011E+12	1.0118E+13	8.4011E+12
			80%	25.73	1.7172E+12	8.4011E+12	1.0118E+13	8.4011E+12
			50%	25.73	1.7172E+12	8.4010E+12	1.0118E+13	8.4010E+12
		80%	99%	25.73	1.7172E+12	7.6645E+12	9.3817E+12	7.6645E+12
			80%	25.73	1.7172E+12	7.6645E+12	9.3817E+12	7.6645E+12
			50%	25.73	1.7172E+12	7.6644E+12	9.3816E+12	7.6644E+12
		50%	99%	25.73	1.7172E+12	7.2686E+12	8.9858E+12	7.2686E+12
			80%	25.73	1.7172E+12	7.2686E+12	8.9858E+12	7.2686E+12
			50%	25.73	1.7172E+12	7.2685E+12	8.9857E+12	7.2685E+12
	80%	99%	99%	24.77	2.1991E+12	8.1209E+12	1.0320E+13	8.1209E+12
			80%	24.77	2.1991E+12	8.1209E+12	1.0320E+13	8.1209E+12
			50%	24.77	2.1991E+12	8.1208E+12	1.0320E+13	8.1208E+12
		80%	99%	24.77	2.1991E+12	7.4057E+12	9.6048E+12	7.4057E+12
			80%	24.77	2.1991E+12	7.4057E+12	9.6048E+12	7.4057E+12
			50%	24.77	2.1991E+12	7.4056E+12	9.6047E+12	7.4056E+12
		50%	99%	24.77	2.1991E+12	7.0254E+12	9.2245E+12	7.0254E+12
			80%	24.77	2.1991E+12	7.0254E+12	9.2245E+12	7.0254E+12
			50%	24.77	2.1991E+12	7.0253E+12	9.2244E+12	7.0253E+12
	50%	99%	99%	24.08	2.5770E+12	7.9797E+12	1.0557E+13	7.9797E+12
			80%	24.08	2.5770E+12	7.9797E+12	1.0557E+13	7.9797E+12
			50%	24.08	2.5770E+12	7.9796E+12	1.0557E+13	7.9796E+12
		80%	99%	24.08	2.5770E+12	7.2823E+12	9.8593E+12	7.2823E+12
			80%	24.08	2.5770E+12	7.2822E+12	9.8593E+12	7.2822E+12
			50%	24.08	2.5770E+12	7.2822E+12	9.8592E+12	7.2822E+12
		50%	99%	24.08	2.5770E+12	6.9095E+12	9.4866E+12	6.9095E+12
			80%	24.08	2.5770E+12	6.9095E+12	9.4865E+12	6.9095E+12
			50%	24.08	2.5770E+12	6.9094E+12	9.4865E+12	6.9094E+12
15	99%	99%	99%	27.02	1.1809E+12	8.4460E+12	9.6268E+12	8.4460E+12
			80%	27.02	1.1809E+12	8.4459E+12	9.6268E+12	8.4459E+12
			50%	27.02	1.1809E+12	8.4459E+12	9.6267E+12	8.4459E+12
		80%	99%	27.02	1.1809E+12	7.6768E+12	8.8577E+12	7.6768E+12
			80%	27.02	1.1809E+12	7.6768E+12	8.8577E+12	7.6768E+12
			50%	27.02	1.1809E+12	7.6767E+12	8.8576E+12	7.6767E+12
		50%	99%	27.02	1.1809E+12	7.2789E+12	8.4598E+12	7.2789E+12
			80%	27.02	1.1809E+12	7.2789E+12	8.4598E+12	7.2789E+12
			50%	27.02	1.1809E+12	7.2788E+12	8.4597E+12	7.2788E+12
	80%	99%	99%	26.07	1.5154E+12	8.1104E+12	9.6257E+12	8.1104E+12
			80%	26.07	1.5154E+12	8.1103E+12	9.6257E+12	8.1103E+12
			50%	26.07	1.5154E+12	8.1102E+12	9.6256E+12	8.1102E+12
		80%	99%	26.07	1.5154E+12	7.3832E+12	8.8986E+12	7.3832E+12
			80%	26.07	1.5154E+12	7.3832E+12	8.8985E+12	7.3832E+12
			50%	26.07	1.5154E+12	7.3831E+12	8.8985E+12	7.3831E+12
		50%	99%	26.07	1.5154E+12	6.9960E+12	8.5114E+12	6.9960E+12
			80%	26.07	1.5154E+12	6.9960E+12	8.5114E+12	6.9960E+12
			50%	26.07	1.5154E+12	6.9959E+12	8.5113E+12	6.9959E+12
	50%	99%	99%	25.38	1.8739E+12	7.9650E+12	9.8389E+12	7.9650E+12
			80%	25.38	1.8739E+12	7.9650E+12	9.8388E+12	7.9650E+12
			50%	25.38	1.8739E+12	7.9649E+12	9.8388E+12	7.9649E+12
		80%	99%	25.38	1.8739E+12	7.2569E+12	9.1307E+12	7.2569E+12
			80%	25.38	1.8739E+12	7.2568E+12	9.1307E+12	7.2568E+12
			50%	25.38	1.8739E+12	7.2567E+12	9.1306E+12	7.2567E+12
		50%	99%	25.38	1.8739E+12	6.8748E+12	8.7487E+12	6.8748E+12
			80%	25.38	1.8739E+12	6.8748E+12	8.7486E+12	6.8748E+12
			50%	25.38	1.8739E+12	6.8747E+12	8.7485E+12	6.8747E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_a (J)	W (J)	OPL
14	99%	99%	99%	25.99	1.8526E+12	8.2999E+12	1.0152E+13	8.2999E+12
			80%	25.99	1.8526E+12	8.2998E+12	1.0152E+13	8.2998E+12
			50%	25.99	1.8526E+12	8.2997E+12	1.0152E+13	8.2997E+12
		80%	99%	25.99	1.8526E+12	7.5916E+12	9.4442E+12	7.5916E+12
			80%	25.99	1.8526E+12	7.5915E+12	9.4441E+12	7.5915E+12
			50%	25.99	1.8526E+12	7.5914E+12	9.4440E+12	7.5914E+12
		50%	99%	25.99	1.8526E+12	7.2133E+12	9.0659E+12	7.2133E+12
			80%	25.99	1.8526E+12	7.2133E+12	9.0659E+12	7.2133E+12
			50%	25.99	1.8526E+12	7.2132E+12	9.0658E+12	7.2132E+12
	80%	99%	99%	25.04	2.3487E+12	8.0284E+12	1.0377E+13	8.0284E+12
			80%	25.04	2.3487E+12	8.0284E+12	1.0377E+13	8.0284E+12
			50%	25.04	2.3487E+12	8.0283E+12	1.0377E+13	8.0283E+12
		80%	99%	25.04	2.3487E+12	7.3491E+12	9.6978E+12	7.3491E+12
			80%	25.04	2.3487E+12	7.3491E+12	9.6978E+12	7.3491E+12
			50%	25.04	2.3487E+12	7.3490E+12	9.6977E+12	7.3490E+12
		50%	99%	25.04	2.3487E+12	6.9839E+12	9.3326E+12	6.9839E+12
			80%	25.04	2.3487E+12	6.9839E+12	9.3325E+12	6.9839E+12
			50%	25.04	2.3487E+12	6.9838E+12	9.3325E+12	6.9838E+12
	50%	99%	99%	24.35	2.6971E+12	7.9027E+12	1.0600E+13	7.9027E+12
			80%	24.35	2.6971E+12	7.9026E+12	1.0600E+13	7.9026E+12
			50%	24.35	2.6971E+12	7.9026E+12	1.0600E+13	7.9026E+12
		80%	99%	24.35	2.6971E+12	7.2282E+12	9.9253E+12	7.2282E+12
			80%	24.35	2.6971E+12	7.2281E+12	9.9252E+12	7.2281E+12
			50%	24.35	2.6971E+12	7.2280E+12	9.9252E+12	7.2280E+12
		50%	99%	24.35	2.6971E+12	6.8619E+12	9.5590E+12	6.8619E+12
			80%	24.35	2.6971E+12	6.8619E+12	9.5590E+12	6.8619E+12
			50%	24.35	2.6971E+12	6.8618E+12	9.5589E+12	6.8618E+12
16	99%	99%	99%	25.44	1.7716E+12	8.0775E+12	9.8490E+12	8.0775E+12
			80%	25.44	1.7716E+12	8.0774E+12	9.8490E+12	8.0774E+12
			50%	25.44	1.7716E+12	8.0773E+12	9.8489E+12	8.0773E+12
		80%	99%	25.44	1.7716E+12	7.4194E+12	9.1910E+12	7.4194E+12
			80%	25.44	1.7716E+12	7.4194E+12	9.1909E+12	7.4194E+12
			50%	25.44	1.7716E+12	7.4193E+12	9.1909E+12	7.4193E+12
		50%	99%	25.44	1.7716E+12	7.0634E+12	8.8350E+12	7.0634E+12
			80%	25.44	1.7716E+12	7.0634E+12	8.8350E+12	7.0634E+12
			50%	25.44	1.7716E+12	7.0633E+12	8.8349E+12	7.0633E+12
	80%	99%	99%	24.47	2.2570E+12	7.8394E+12	1.0096E+13	7.8394E+12
			80%	24.47	2.2570E+12	7.8394E+12	1.0096E+13	7.8394E+12
			50%	24.47	2.2570E+12	7.8393E+12	1.0096E+13	7.8393E+12
		80%	99%	24.47	2.2570E+12	7.1992E+12	9.4562E+12	7.1992E+12
			80%	24.47	2.2570E+12	7.1991E+12	9.4561E+12	7.1991E+12
			50%	24.47	2.2570E+12	7.1990E+12	9.4561E+12	7.1990E+12
		50%	99%	24.47	2.2570E+12	6.8434E+12	9.1004E+12	6.8434E+12
			80%	24.47	2.2570E+12	6.8433E+12	9.1003E+12	6.8433E+12
			50%	24.47	2.2570E+12	6.8432E+12	9.1003E+12	6.8432E+12
	50%	99%	99%	23.82	2.6228E+12	7.7279E+12	1.0351E+13	7.7279E+12
			80%	23.82	2.6228E+12	7.7279E+12	1.0351E+13	7.7279E+12
			50%	23.82	2.6228E+12	7.7278E+12	1.0351E+13	7.7278E+12
		80%	99%	23.82	2.6228E+12	7.0966E+12	9.7193E+12	7.0966E+12
			80%	23.82	2.6228E+12	7.0965E+12	9.7193E+12	7.0965E+12
			50%	23.82	2.6228E+12	7.0964E+12	9.7192E+12	7.0964E+12
		50%	99%	23.82	2.6228E+12	6.7426E+12	9.3653E+12	6.7426E+12
			80%	23.82	2.6228E+12	6.7425E+12	9.3653E+12	6.7425E+12
			50%	23.82	2.6228E+12	6.7425E+12	9.3652E+12	6.7425E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
17	99%	99%	99%	26.93	1.1881E+12	8.0717E+12	9.2599E+12	8.0717E+12
			80%	26.93	1.1881E+12	8.0717E+12	9.2598E+12	8.0717E+12
			50%	26.93	1.1881E+12	8.0716E+12	9.2598E+12	8.0716E+12
		80%	99%	26.93	1.1881E+12	7.4087E+12	8.5969E+12	7.4087E+12
			80%	26.93	1.1881E+12	7.4087E+12	8.5968E+12	7.4087E+12
			50%	26.93	1.1881E+12	7.4086E+12	8.5968E+12	7.4086E+12
		50%	99%	26.93	1.1881E+12	7.0299E+12	8.2180E+12	7.0299E+12
			80%	26.93	1.1881E+12	7.0298E+12	8.2180E+12	7.0298E+12
			50%	26.93	1.1881E+12	7.0298E+12	8.2179E+12	7.0298E+12
	80%	99%	99%	25.91	1.5317E+12	7.7810E+12	9.3127E+12	7.7810E+12
			80%	25.91	1.5317E+12	7.7809E+12	9.3127E+12	7.7809E+12
			50%	25.91	1.5317E+12	7.7808E+12	9.3126E+12	7.7808E+12
		80%	99%	25.91	1.5317E+12	7.1525E+12	8.6842E+12	7.1525E+12
			80%	25.91	1.5317E+12	7.1525E+12	8.6842E+12	7.1525E+12
			50%	25.91	1.5317E+12	7.1524E+12	8.6841E+12	7.1524E+12
		50%	99%	25.91	1.5317E+12	6.7955E+12	8.3273E+12	6.7955E+12
			80%	25.91	1.5317E+12	6.7955E+12	8.3272E+12	6.7955E+12
►			50%	25.91	1.5317E+12	6.7954E+12	8.3271E+12	6.7954E+12
	50%	99%	99%	25.31	1.8985E+12	7.6850E+12	9.5835E+12	7.6850E+12
			80%	25.31	1.8985E+12	7.6850E+12	9.5835E+12	7.6850E+12
			50%	25.31	1.8985E+12	7.6849E+12	9.5834E+12	7.6849E+12
		80%	99%	25.31	1.8985E+12	7.0525E+12	8.9510E+12	7.0525E+12
			80%	25.31	1.8985E+12	7.0525E+12	8.9510E+12	7.0525E+12
			50%	25.31	1.8985E+12	7.0524E+12	8.9509E+12	7.0524E+12
		50%	99%	25.31	1.8985E+12	6.6854E+12	8.5839E+12	6.6854E+12
			80%	25.31	1.8985E+12	6.6853E+12	8.5838E+12	6.6853E+12
			50%	25.31	1.8985E+12	6.6853E+12	8.5837E+12	6.6853E+12
19	99%	99%	99%	25.75	9.5506E+12	2.8202E+13	3.7753E+13	2.8202E+13
			80%	25.75	9.5506E+12	2.8202E+13	3.7752E+13	2.8202E+13
			50%	25.75	9.5506E+12	2.8201E+13	3.7752E+13	2.8201E+13
		80%	99%	25.75	9.5506E+12	2.6366E+13	3.5917E+13	2.6366E+13
			80%	25.75	9.5506E+12	2.6366E+13	3.5916E+13	2.6366E+13
			50%	25.75	9.5506E+12	2.6365E+13	3.5916E+13	2.6365E+13
		50%	99%	25.75	9.5506E+12	2.5364E+13	3.4915E+13	2.5364E+13
			80%	25.75	9.5506E+12	2.5364E+13	3.4914E+13	2.5364E+13
►			50%	25.75	9.5506E+12	2.5363E+13	3.4914E+13	2.5363E+13
	80%	99%	99%	24.95	1.1259E+13	2.7660E+13	3.8919E+13	2.7640E+13
			80%	24.95	1.1259E+13	2.7660E+13	3.8919E+13	2.7660E+13
			50%	24.95	1.1259E+13	2.7660E+13	3.8918E+13	2.7660E+13
		80%	99%	24.95	1.1259E+13	2.5826E+13	3.7084E+13	2.5826E+13
			80%	24.95	1.1259E+13	2.5825E+13	3.7084E+13	2.5825E+13
			50%	24.95	1.1259E+13	2.5825E+13	3.7084E+13	2.5825E+13
		50%	99%	24.95	1.1259E+13	2.4837E+13	3.6096E+13	2.4837E+13
			80%	24.95	1.1259E+13	2.4837E+13	3.6096E+13	2.4837E+13
			50%	24.95	1.1259E+13	2.4837E+13	3.6096E+13	2.4837E+13
	50%	99%	99%	24.47	1.2292E+13	2.7360E+13	3.9652E+13	2.7360E+13
			80%	24.47	1.2292E+13	2.7360E+13	3.9652E+13	2.7360E+13
			50%	24.47	1.2292E+13	2.7360E+13	3.9652E+13	2.7360E+13
		80%	99%	24.47	1.2292E+13	2.5533E+13	3.7824E+13	2.5533E+13
			80%	24.47	1.2292E+13	2.5532E+13	3.7824E+13	2.5532E+13
			50%	24.47	1.2292E+13	2.5532E+13	3.7824E+13	2.5532E+13
		50%	99%	24.47	1.2292E+13	2.4537E+13	3.6829E+13	2.4537E+13
			80%	24.47	1.2292E+13	2.4537E+13	3.6829E+13	2.4537E+13
			50%	24.47	1.2292E+13	2.4537E+13	3.6829E+13	2.4537E+13

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
18	99%	99%	99%	26.94	1.1761E+12	8.0697E+12	9.2459E+12	8.0697E+12
			80%	26.94	1.1761E+12	8.0697E+12	9.2458E+12	8.0697E+12
			50%	26.94	1.1761E+12	8.0696E+12	9.2458E+12	8.0696E+12
		80%	99%	26.94	1.1761E+12	7.4106E+12	8.5867E+12	7.4106E+12
			80%	26.94	1.1761E+12	7.4105E+12	8.5867E+12	7.4105E+12
			50%	26.94	1.1761E+12	7.4105E+12	8.5866E+12	7.4105E+12
		50%	99%	26.94	1.1761E+12	7.0314E+12	8.2075E+12	7.0314E+12
			80%	26.94	1.1761E+12	7.0314E+12	8.2075E+12	7.0314E+12
			50%	26.94	1.1761E+12	7.0313E+12	8.2074E+12	7.0313E+12
	80%	99%	99%	26.01	1.5128E+12	7.7901E+12	9.3029E+12	7.7901E+12
			80%	26.01	1.5128E+12	7.7901E+12	9.3028E+12	7.7901E+12
			50%	26.01	1.5128E+12	7.7900E+12	9.3028E+12	7.7900E+12
		80%	99%	26.01	1.5128E+12	7.1535E+12	8.6662E+12	7.1535E+12
			80%	26.01	1.5128E+12	7.1534E+12	8.6662E+12	7.1534E+12
			50%	26.01	1.5128E+12	7.1533E+12	8.6661E+12	7.1533E+12
		50%	99%	26.01	1.5128E+12	6.7956E+12	8.3084E+12	6.7956E+12
			80%	26.01	1.5128E+12	6.7955E+12	8.3083E+12	6.7955E+12
			50%	26.01	1.5128E+12	6.7955E+12	8.3082E+12	6.7955E+12
	50%	99%	99%	25.32	1.8761E+12	7.6840E+12	9.5602E+12	7.6840E+12
			80%	25.32	1.8761E+12	7.6840E+12	9.5601E+12	7.6840E+12
			50%	25.32	1.8761E+12	7.6839E+12	9.5600E+12	7.6839E+12
		80%	99%	25.32	1.8761E+12	7.0525E+12	8.9286E+12	7.0525E+12
			80%	25.32	1.8761E+12	7.0525E+12	8.9286E+12	7.0525E+12
			50%	25.32	1.8761E+12	7.0524E+12	8.9285E+12	7.0524E+12
		50%	99%	25.32	1.8761E+12	6.6883E+12	8.5644E+12	6.6883E+12
			80%	25.32	1.8761E+12	6.6882E+12	8.5643E+12	6.6882E+12
►			50%	25.32	1.8761E+12	6.6881E+12	8.5643E+12	6.6881E+12
20	99%	99%	99%	26.88	7.5856E+12	2.7854E+13	3.5440E+13	2.7854E+13
			80%	26.88	7.5856E+12	2.7854E+13	3.5440E+13	2.7854E+13
			50%	26.88	7.5856E+12	2.7854E+13	3.5439E+13	2.7854E+13
		80%	99%	26.88	7.5856E+12	2.6041E+13	3.3627E+13	2.6041E+13
			80%	26.88	7.5856E+12	2.6041E+13	3.3627E+13	2.6041E+13
			50%	26.88	7.5856E+12	2.6041E+13	3.3626E+13	2.6041E+13
		50%	99%	26.88	7.5856E+12	2.5065E+13	3.2650E+13	2.5065E+13
			80%	26.88	7.5856E+12	2.5065E+13	3.2650E+13	2.5065E+13
			50%	26.88	7.5856E+12	2.5064E+13	3.2650E+13	2.5064E+13
	80%	99%	99%	25.98	9.6887E+12	2.7406E+13	3.7095E+13	2.7406E+13
			80%	25.98	9.6887E+12	2.7406E+13	3.7095E+13	2.7406E+13
			50%	25.98	9.6887E+12	2.7406E+13	3.7094E+13	2.7406E+13
		80%	99%	25.98	9.6887E+12	2.5593E+13	3.5282E+13	2.5593E+13
			80%	25.98	9.6887E+12	2.5593E+13	3.5281E+13	2.5593E+13
			50%	25.98	9.6887E+12	2.5592E+13	3.5281E+13	2.5592E+13
		50%	99%	25.98	9.6887E+12	2.4597E+13	3.4286E+13	2.4597E+13
			80%	25.98	9.6887E+12	2.4597E+13	3.4286E+13	2.4597E+13
►			50%	25.98	9.6887E+12	2.4597E+13	3.4286E+13	2.4597E+13
	50%	99%	99%	25.50	1.1036E+13	2.7165E+13	3.8201E+13	2.7165E+13
			80%	25.50	1.1036E+13	2.7165E+13	3.8201E+13	2.7165E+13
			50%	25.50	1.1036E+13	2.7164E+13	3.8200E+13	2.7164E+13
		80%	99%	25.50	1.1036E+13	2.5349E+13	3.6385E+13	2.5349E+13
			80%	25.50	1.1036E+13	2.5349E+13	3.6385E+13	2.5349E+13
			50%	25.50	1.1036E+13	2.5349E+13	3.6385E+13	2.5349E+13
		50%	99%	25.50	1.1036E+13	2.4364E+13	3.5400E+13	2.4364E+13
			80%	25.50	1.1036E+13	2.4363E+13	3.5399E+13	2.4363E+13
			50%	25.50	1.1036E+13	2.4363E+13	3.5399E+13	2.4363E+13

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
21	99%	99%	99%	27.44	6.8665E+12	2.7775E+13	3.4641E+13	2.7775E+13
			80%	27.44	6.8665E+12	2.7774E+13	3.4641E+13	2.7774E+13
			50%	27.44	6.8665E+12	2.7774E+13	3.4641E+13	2.7774E+13
		80%	99%	27.44	6.8665E+12	2.5963E+13	3.2830E+13	2.5963E+13
			80%	27.44	6.8665E+12	2.5963E+13	3.2830E+13	2.5963E+13
			50%	27.44	6.8665E+12	2.5963E+13	3.2829E+13	2.5963E+13
		50%	99%	27.44	6.8665E+12	2.4994E+13	3.1861E+13	2.4994E+13
			80%	27.44	6.8665E+12	2.4994E+13	3.1861E+13	2.4994E+13
			50%	27.44	6.8665E+12	2.4994E+13	3.1860E+13	2.4994E+13
	80%	99%	99%	26.47	8.9715E+12	2.7299E+13	3.6270E+13	2.7299E+13
			80%	26.47	8.9715E+12	2.7299E+13	3.6270E+13	2.7299E+13
			50%	26.47	8.9715E+12	2.7298E+13	3.6270E+13	2.7298E+13
		80%	99%	26.47	8.9715E+12	2.5504E+13	3.4476E+13	2.5504E+13
			80%	26.47	8.9715E+12	2.5504E+13	3.4476E+13	2.5504E+13
			50%	26.47	8.9715E+12	2.5504E+13	3.4475E+13	2.5504E+13
		50%	99%	26.47	8.9715E+12	2.4523E+13	3.3494E+13	2.4523E+13
			80%	26.47	8.9715E+12	2.4522E+13	3.3494E+13	2.4522E+13
			50%	26.47	8.9715E+12	2.4522E+13	3.3494E+13	2.4522E+13
	50%	99%	99%	25.99	1.0462E+13	2.7077E+13	3.7540E+13	2.7077E+13
			80%	25.99	1.0462E+13	2.7077E+13	3.7539E+13	2.7077E+13
			50%	25.99	1.0462E+13	2.7077E+13	3.7539E+13	2.7077E+13
		80%	99%	25.99	1.0462E+13	2.5272E+13	3.5734E+13	2.5272E+13
			80%	25.99	1.0462E+13	2.5272E+13	3.5734E+13	2.5272E+13
			50%	25.99	1.0462E+13	2.5272E+13	3.5734E+13	2.5272E+13
		50%	99%	25.99	1.0462E+13	2.4300E+13	3.4763E+13	2.4300E+13
			80%	25.99	1.0462E+13	2.4300E+13	3.4762E+13	2.4300E+13
			50%	25.99	1.0462E+13	2.4300E+13	3.4762E+13	2.4300E+13
23	99%	99%	99%	26.54	7.4764E+12	2.9010E+13	3.6487E+13	2.9010E+13
			80%	26.54	7.4764E+12	2.9010E+13	3.6487E+13	2.9010E+13
			50%	26.54	7.4764E+12	2.9010E+13	3.6486E+13	2.9010E+13
		80%	99%	26.54	7.4764E+12	2.6956E+13	3.4432E+13	2.6956E+13
			80%	26.54	7.4764E+12	2.6956E+13	3.4432E+13	2.6956E+13
			50%	26.54	7.4764E+12	2.6956E+13	3.4432E+13	2.6956E+13
		50%	99%	26.54	7.4764E+12	2.5817E+13	3.3294E+13	2.5817E+13
			80%	26.54	7.4764E+12	2.5817E+13	3.3294E+13	2.5817E+13
			50%	26.54	7.4764E+12	2.5817E+13	3.3293E+13	2.5817E+13
	80%	99%	99%	25.69	9.5488E+12	2.8513E+13	3.8062E+13	2.8513E+13
			80%	25.69	9.5488E+12	2.8513E+13	3.8062E+13	2.8513E+13
			50%	25.69	9.5488E+12	2.8513E+13	3.8062E+13	2.8513E+13
		80%	99%	25.69	9.5488E+12	2.6443E+13	3.5992E+13	2.6443E+13
			80%	25.69	9.5488E+12	2.6443E+13	3.5992E+13	2.6443E+13
			50%	25.69	9.5488E+12	2.6443E+13	3.5992E+13	2.6443E+13
		50%	99%	25.69	9.5488E+12	2.5314E+13	3.4863E+13	2.5314E+13
			80%	25.69	9.5488E+12	2.5314E+13	3.4863E+13	2.5314E+13
			50%	25.69	9.5488E+12	2.5314E+13	3.4863E+13	2.5314E+13
	50%	99%	99%	25.21	1.0927E+13	2.8251E+13	3.9178E+13	2.8251E+13
			80%	25.21	1.0927E+13	2.8250E+13	3.9177E+13	2.8250E+13
			50%	25.21	1.0927E+13	2.8250E+13	3.9177E+13	2.8250E+13
		80%	99%	25.21	1.0927E+13	2.6203E+13	3.7130E+13	2.6203E+13
			80%	25.21	1.0927E+13	2.6203E+13	3.7130E+13	2.6203E+13
			50%	25.21	1.0927E+13	2.6202E+13	3.7129E+13	2.6202E+13
		50%	99%	25.21	1.0927E+13	2.5069E+13	3.5995E+13	2.5069E+13
			80%	25.21	1.0927E+13	2.5068E+13	3.5995E+13	2.5068E+13
			50%	25.21	1.0927E+13	2.5068E+13	3.5995E+13	2.5068E+13

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
22	99%	99%	99%	26.00	1.0952E+13	2.8858E+13	3.9810E+13	2.8858E+13
			80%	26.00	1.0952E+13	2.8858E+13	3.9810E+13	2.8858E+13
			50%	26.00	1.0952E+13	2.8857E+13	3.9809E+13	2.8857E+13
		80%	99%	26.00	1.0952E+13	2.6927E+13	3.7879E+13	2.6927E+13
			80%	26.00	1.0952E+13	2.6927E+13	3.7879E+13	2.6927E+13
			50%	26.00	1.0952E+13	2.6927E+13	3.7879E+13	2.6927E+13
		50%	99%	26.00	1.0952E+13	2.5859E+13	3.6811E+13	2.5859E+13
			80%	26.00	1.0952E+13	2.5859E+13	3.6811E+13	2.5859E+13
			50%	26.00	1.0952E+13	2.5859E+13	3.6811E+13	2.5859E+13
	80%	99%	99%	25.16	1.2309E+13	2.8265E+13	4.0574E+13	2.8265E+13
			80%	25.16	1.2309E+13	2.8265E+13	4.0574E+13	2.8265E+13
			50%	25.16	1.2309E+13	2.8265E+13	4.0574E+13	2.8265E+13
		80%	99%	25.16	1.2309E+13	2.6330E+13	3.8639E+13	2.6330E+13
			80%	25.16	1.2309E+13	2.6330E+13	3.8639E+13	2.6330E+13
			50%	25.16	1.2309E+13	2.6330E+13	3.8638E+13	2.6330E+13
		50%	99%	25.16	1.2309E+13	2.5276E+13	3.7585E+13	2.5276E+13
			80%	25.16	1.2309E+13	2.5276E+13	3.7585E+13	2.5276E+13
			50%	25.16	1.2309E+13	2.5276E+13	3.7585E+13	2.5276E+13
	50%	99%	99%	24.68	1.3132E+13	2.7919E+13	4.1051E+13	2.7919E+13
			80%	24.68	1.3132E+13	2.7919E+13	4.1051E+13	2.7919E+13
			50%	24.68	1.3132E+13	2.7918E+13	4.1051E+13	2.7918E+13
		80%	99%	24.68	1.3132E+13	2.6002E+13	3.9134E+13	2.6002E+13
			80%	24.68	1.3132E+13	2.6002E+13	3.9134E+13	2.6002E+13
			50%	24.68	1.3132E+13	2.6002E+13	3.9134E+13	2.6002E+13
		50%	99%	24.68	1.3132E+13	2.4946E+13	3.8078E+13	2.4946E+13
			80%	24.68	1.3132E+13	2.4945E+13	3.8078E+13	2.4945E+13
			50%	24.68	1.3132E+13	2.4945E+13	3.8077E+13	2.4945E+13
24	99%	99%	99%	27.08	7.6177E+12	2.8730E+13	3.6347E+13	2.8730E+13
			80%	27.08	7.6177E+12	2.8730E+13	3.6347E+13	2.8730E+13
			50%	27.08	7.6177E+12	2.8729E+13	3.6347E+13	2.8729E+13
		80%	99%	27.08	7.6177E+12	2.6736E+13	3.4354E+13	2.6736E+13
			80%	27.08	7.6177E+12	2.6736E+13	3.4354E+13	2.6736E+13
			50%	27.08	7.6177E+12	2.6736E+13	3.4353E+13	2.6736E+13
		50%	99%	27.08	7.6177E+12	2.5645E+13	3.3263E+13	2.5645E+13
			80%	27.08	7.6177E+12	2.5645E+13	3.3263E+13	2.5645E+13
			50%	27.08	7.6177E+12	2.5645E+13	3.3263E+13	2.5645E+13
	80%	99%	99%	26.25	9.6971E+12	2.8251E+13	3.7948E+13	2.8251E+13
			80%	26.25	9.6971E+12	2.8251E+13	3.7948E+13	2.8251E+13
			50%	26.25	9.6971E+12	2.8251E+13	3.7948E+13	2.8251E+13
		80%	99%	26.25	9.6971E+12	2.6267E+13	3.5965E+13	2.6267E+13
			80%	26.25	9.6971E+12	2.6267E+13	3.5964E+13	2.6267E+13
			50%	26.25	9.6971E+12	2.6267E+13	3.5964E+13	2.6267E+13
		50%	99%	26.25	9.6971E+12	2.5176E+13	3.4873E+13	2.5176E+13
			80%	26.25	9.6971E+12	2.5176E+13	3.4873E+13	2.5176E+13
			50%	26.25	9.6971E+12	2.5175E+13	3.4872E+13	2.5175E+13
	50%	99%	99%	25.77	1.1045E+13	2.8006E+13	3.9051E+13	2.8006E+13
			80%	25.77	1.1045E+13	2.8006E+13	3.9051E+13	2.8006E+13
			50%	25.77	1.1045E+13	2.8005E+13	3.9051E+13	2.8005E+13
		80%	99%	25.77	1.1045E+13	2.6017E+13	3.7063E+13	2.6017E+13
			80%	25.77	1.1045E+13	2.6017E+13	3.7062E+13	2.6017E+13
			50%	25.77	1.1045E+13	2.6017E+13	3.7062E+13	2.6017E+13
		50%	99%	25.77	1.1045E+13	2.4922E+13	3.5968E+13	2.4922E+13
			80%	25.77	1.1045E+13	2.4922E+13	3.5968E+13	2.4922E+13
			50%	25.77	1.1045E+13	2.4922E+13	3.5967E+13	2.4922E+13

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
25	99%	99%	99%	25.39	1.0801E+13	2.8754E+13	3.9555E+13	2.8754E+13
			80%	25.39	1.0801E+13	2.8754E+13	3.9555E+13	2.8754E+13
			50%	25.39	1.0801E+13	2.8753E+13	3.9555E+13	2.8753E+13
		80%	99%	25.39	1.0801E+13	2.6885E+13	3.7687E+13	2.6885E+13
			80%	25.39	1.0801E+13	2.6885E+13	3.7686E+13	2.6885E+13
			50%	25.39	1.0801E+13	2.6885E+13	3.7686E+13	2.6885E+13
		50%	99%	25.39	1.0801E+13	2.5859E+13	3.6660E+13	2.5859E+13
			80%	25.39	1.0801E+13	2.5859E+13	3.6660E+13	2.5859E+13
▶			50%	25.39	1.0801E+13	2.5858E+13	3.6660E+13	2.5858E+13
	80%	99%	99%	24.59	1.2201E+13	2.8074E+13	4.0275E+13	2.8074E+13
			80%	24.59	1.2201E+13	2.8074E+13	4.0275E+13	2.8074E+13
			50%	24.59	1.2201E+13	2.8074E+13	4.0275E+13	2.8074E+13
		80%	99%	24.59	1.2201E+13	2.6204E+13	3.8405E+13	2.6204E+13
			80%	24.59	1.2201E+13	2.6204E+13	3.8405E+13	2.6204E+13
			50%	24.59	1.2201E+13	2.6204E+13	3.8405E+13	2.6204E+13
		50%	99%	24.59	1.2201E+13	2.5184E+13	3.7385E+13	2.5184E+13
			80%	24.59	1.2201E+13	2.5184E+13	3.7385E+13	2.5184E+13
			50%	24.59	1.2201E+13	2.5184E+13	3.7385E+13	2.5184E+13
	50%	99%	99%	24.11	1.3045E+13	2.7677E+13	4.0722E+13	2.7677E+13
			80%	24.11	1.3045E+13	2.7677E+13	4.0721E+13	2.7677E+13
			50%	24.11	1.3045E+13	2.7676E+13	4.0721E+13	2.7676E+13
		80%	99%	24.11	1.3045E+13	2.5807E+13	3.8852E+13	2.5807E+13
			80%	24.11	1.3045E+13	2.5807E+13	3.8852E+13	2.5807E+13
			50%	24.11	1.3045E+13	2.5807E+13	3.8852E+13	2.5807E+13
		50%	99%	24.11	1.3045E+13	2.4804E+13	3.7849E+13	2.4804E+13
			80%	24.11	1.3045E+13	2.4804E+13	3.7849E+13	2.4804E+13
			50%	24.11	1.3045E+13	2.4804E+13	3.7849E+13	2.4804E+13
27	99%	99%	99%	26.94	4.7563E+12	2.7845E+13	3.2601E+13	2.7845E+13
			80%	26.94	4.7563E+12	2.7845E+13	3.2601E+13	2.7845E+13
			50%	26.94	4.7563E+12	2.7844E+13	3.2601E+13	2.7844E+13
		80%	99%	26.94	4.7563E+12	2.5914E+13	3.0670E+13	2.5914E+13
			80%	26.94	4.7563E+12	2.5914E+13	3.0670E+13	2.5914E+13
			50%	26.94	4.7563E+12	2.5914E+13	3.0670E+13	2.5914E+13
		50%	99%	26.94	4.7563E+12	2.4853E+13	2.9609E+13	2.4853E+13
			80%	26.94	4.7563E+12	2.4853E+13	2.9609E+13	2.4853E+13
			50%	26.94	4.7563E+12	2.4852E+13	2.9609E+13	2.4852E+13
	80%	99%	99%	26.14	6.1732E+12	2.7376E+13	3.3549E+13	2.7376E+13
			80%	26.14	6.1732E+12	2.7376E+13	3.3549E+13	2.7376E+13
			50%	26.14	6.1732E+12	2.7376E+13	3.3549E+13	2.7376E+13
		80%	99%	26.14	6.1732E+12	2.5448E+13	3.1621E+13	2.5448E+13
			80%	26.14	6.1732E+12	2.5448E+13	3.1621E+13	2.5448E+13
			50%	26.14	6.1732E+12	2.5448E+13	3.1621E+13	2.5448E+13
		50%	99%	26.14	6.1732E+12	2.4393E+13	3.0566E+13	2.4393E+13
			80%	26.14	6.1732E+12	2.4392E+13	3.0566E+13	2.4392E+13
			50%	26.14	6.1732E+12	2.4392E+13	3.0565E+13	2.4392E+13
	50%	99%	99%	25.66	7.7997E+12	2.7257E+13	3.5057E+13	2.7257E+13
			80%	25.66	7.7997E+12	2.7257E+13	3.5057E+13	2.7257E+13
			50%	25.66	7.7997E+12	2.7257E+13	3.5056E+13	2.7257E+13
		80%	99%	25.66	7.7997E+12	2.5305E+13	3.3105E+13	2.5305E+13
			80%	25.66	7.7997E+12	2.5305E+13	3.3104E+13	2.5305E+13
			50%	25.66	7.7997E+12	2.5304E+13	3.3104E+13	2.5304E+13
		50%	99%	25.66	7.7997E+12	2.4266E+13	3.2066E+13	2.4266E+13
			80%	25.66	7.7997E+12	2.4266E+13	3.2065E+13	2.4266E+13
▶			50%	25.66	7.7997E+12	2.4265E+13	3.2065E+13	2.4265E+13

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
26	99%	99%	99%	26.91	6.0420E+12	2.7829E+13	3.3871E+13	2.7829E+13
			80%	26.91	6.0420E+12	2.7827E+13	3.3869E+13	2.7827E+13
			50%	26.91	6.0420E+12	2.7827E+13	3.3869E+13	2.7827E+13
		80%	99%	26.91	6.0420E+12	2.5948E+13	3.1991E+13	2.5948E+13
			80%	26.91	6.0420E+12	2.5948E+13	3.1990E+13	2.5948E+13
			50%	26.91	6.0420E+12	2.5948E+13	3.1990E+13	2.5948E+13
		50%	99%	26.91	6.0420E+12	2.4917E+13	3.0959E+13	2.4917E+13
			80%	26.91	6.0420E+12	2.4917E+13	3.0959E+13	2.4917E+13
			50%	26.91	6.0420E+12	2.4917E+13	3.0959E+13	2.4917E+13
	80%	99%	99%	25.97	8.0789E+12	2.7449E+13	3.5527E+13	2.7449E+13
			80%	25.97	8.0789E+12	2.7448E+13	3.5527E+13	2.7448E+13
			50%	25.97	8.0789E+12	2.7448E+13	3.5527E+13	2.7448E+13
		80%	99%	25.97	8.0789E+12	2.5563E+13	3.3642E+13	2.5563E+13
			80%	25.97	8.0789E+12	2.5563E+13	3.3642E+13	2.5563E+13
			50%	25.97	8.0789E+12	2.5562E+13	3.3641E+13	2.5562E+13
		50%	99%	25.97	8.0789E+12	2.4538E+13	3.2617E+13	2.4538E+13
			80%	25.97	8.0789E+12	2.4538E+13	3.2617E+13	2.4538E+13
▶			50%	25.97	8.0789E+12	2.4535E+13	3.2614E+13	2.4535E+13
	50%	99%	99%	25.49	9.7240E+12	2.7310E+13	3.7034E+13	2.7310E+13
			80%	25.49	9.7240E+12	2.7310E+13	3.7034E+13	2.7310E+13
			50%	25.49	9.7240E+12	2.7310E+13	3.7034E+13	2.7310E+13
		80%	99%	25.49	9.7240E+12	2.5419E+13	3.5143E+13	2.5419E+13
			80%	25.49	9.7240E+12	2.5419E+13	3.5143E+13	2.5419E+13
			50%	25.49	9.7240E+12	2.5416E+13	3.5140E+13	2.5416E+13
		50%	99%	25.49	9.7240E+12	2.4394E+13	3.4118E+13	2.4394E+13
			80%	25.49	9.7240E+12	2.4393E+13	3.4117E+13	2.4393E+13
			50%	25.49	9.7240E+12	2.4393E+13	3.4117E+13	2.4393E+13
28	99%	99%	99%	26.07	1.0911E+13	2.8469E+13	3.9380E+13	2.8469E+13
			80%	26.07	1.0911E+13	2.8469E+13	3.9380E+13	2.8469E+13
			50%	26.07	1.0911E+13	2.8469E+13	3.9380E+13	2.8469E+13
		80%	99%	26.07	1.0911E+13	2.6623E+13	3.7534E+13	2.6623E+13
			80%	26.07	1.0911E+13	2.6622E+13	3.7533E+13	2.6622E+13
			50%	26.07	1.0911E+13	2.6622E+13	3.7533E+13	2.6622E+13
		50%	99%	26.07	1.0911E+13	2.5622E+13	3.6534E+13	2.5622E+13
			80%	26.07	1.0911E+13	2.5622E+13	3.6533E+13	2.5622E+13
▶			50%	26.07	1.0911E+13	2.5622E+13	3.6533E+13	2.5622E+13
	80%	99%	99%	25.12	1.2254E+13	2.7855E+13	4.0109E+13	2.7855E+13
			80%	25.12	1.2254E+13	2.7855E+13	4.0109E+13	2.7855E+13
			50%	25.12	1.2254E+13	2.7855E+13	4.0109E+13	2.7855E+13
		80%	99%	25.12	1.2254E+13	2.6008E+13	3.8261E+13	2.6008E+13
			80%	25.12	1.2254E+13	2.6007E+13	3.8261E+13	2.6007E+13
			50%	25.12	1.2254E+13	2.6007E+13	3.8261E+13	2.6007E+13
		50%	99%	25.12	1.2254E+13	2.5020E+13	3.7274E+13	2.5020E+13
			80%	25.12	1.2254E+13	2.5020E+13	3.7274E+13	2.5020E+13
			50%	25.12	1.2254E+13	2.5020E+13	3.7274E+13	2.5020E+13
	50%	99%	99%	24.44	1.3079E+13	2.7505E+13	4.0584E+13	2.7505E+13
			80%	24.44	1.3079E+13	2.7505E+13	4.0584E+13	2.7505E+13
			50%	24.44	1.3079E+13	2.7503E+13	4.0581E+13	2.7503E+13
		80%	99%	24.44	1.3079E+13	2.5671E+13	3.8750E+13	2.5671E+13
			80%	24.44	1.3079E+13	2.5671E+13	3.8749E+13	2.5671E+13
			50%	24.44	1.3079E+13	2.5670E+13	3.8749E+13	2.5670E+13
		50%	99%	24.44	1.3079E+13	2.4673E+13	3.7752E+13	2.4673E+13
			80%	24.44	1.3079E+13	2.4673E+13	3.7752E+13	2.4673E+13
			50%	24.44	1.3079E+13	2.4673E+13	3.7751E+13	2.4673E+13

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
29			99%	26.31	1.0556E+13	2.8437E+13	3.8993E+13	3.4420E+12
		99%	80%	26.31	1.0556E+13	2.8437E+13	3.8993E+13	3.4419E+12
			50%	26.31	1.0556E+13	2.8437E+13	3.8993E+13	3.4416E+12
	99%		99%	26.31	1.0556E+13	2.6586E+13	3.7142E+13	1.5909E+12
		80%	80%	26.31	1.0556E+13	2.6586E+13	3.7142E+13	1.5907E+12
			50%	26.31	1.0556E+13	2.6586E+13	3.7142E+13	1.5904E+12
			99%	26.31	1.0556E+13	2.5592E+13	3.6148E+13	5.9708E+11
		50%	80%	26.31	1.0556E+13	2.5592E+13	3.6148E+13	5.9693E+11
			50%	26.31	1.0556E+13	2.5592E+13	3.6148E+13	5.9661E+11
			99%	25.36	1.1986E+13	2.7831E+13	3.9817E+13	2.8362E+12
		99%	80%	25.36	1.1986E+13	2.7831E+13	3.9817E+13	2.8361E+12
			50%	25.36	1.1986E+13	2.7831E+13	3.9816E+13	2.8358E+12
	80%		99%	25.36	1.1986E+13	2.5986E+13	3.7972E+13	9.9121E+11
		80%	80%	25.36	1.1986E+13	2.5986E+13	3.7972E+13	9.9106E+11
			50%	25.36	1.1986E+13	2.5986E+13	3.7971E+13	9.9074E+11
			99%	25.36	1.1986E+13	2.4996E+13	3.6981E+13	4.6100E+08
		50%	80%	25.36	1.1986E+13	2.4995E+13	3.6981E+13	3.1400E+08
▶			50%	25.36	1.1986E+13	2.4995E+13	3.6981E+13	0.0000E+00
			99%	24.67	1.2864E+13	2.7485E+13	4.0349E+13	2.4898E+12
		99%	80%	24.67	1.2864E+13	2.7485E+13	4.0348E+13	2.4896E+12
			50%	24.67	1.2864E+13	2.7484E+13	4.0348E+13	2.4893E+12
			99%	24.67	1.2864E+13	2.5659E+13	3.8522E+13	6.6348E+11
	50%	80%	80%	24.67	1.2864E+13	2.5658E+13	3.8522E+13	6.6333E+11
			50%	24.67	1.2864E+13	2.5658E+13	3.8522E+13	6.6301E+11
			99%	24.67	1.2864E+13	2.4663E+13	3.7527E+13	-3.3204E+11
		50%	80%	24.67	1.2864E+13	2.4663E+13	3.7527E+13	-3.3219E+11
			50%	24.67	1.2864E+13	2.4663E+13	3.7526E+13	-3.3251E+11
31			99%	25.75	1.1775E+13	2.9443E+13	4.1218E+13	3.0768E+12
		99%	80%	25.75	1.1775E+13	2.9443E+13	4.1218E+13	3.0767E+12
			50%	25.75	1.1775E+13	2.9443E+13	4.1218E+13	3.0764E+12
	99%		99%	25.75	1.1775E+13	2.7465E+13	3.9240E+13	1.0984E+12
		80%	80%	25.75	1.1775E+13	2.7465E+13	3.9240E+13	1.0983E+12
			50%	25.75	1.1775E+13	2.7464E+13	3.9239E+13	1.0980E+12
			99%	25.75	1.1775E+13	2.6367E+13	3.8142E+13	4.6100E+08
		50%	80%	25.75	1.1775E+13	2.6367E+13	3.8142E+13	3.1400E+08
▶			50%	25.75	1.1775E+13	2.6366E+13	3.8141E+13	0.0000E+00
			99%	24.80	1.2907E+13	2.8701E+13	4.1608E+13	2.3345E+12
		99%	80%	24.80	1.2907E+13	2.8701E+13	4.1608E+13	2.3344E+12
			50%	24.80	1.2907E+13	2.8700E+13	4.1607E+13	2.3341E+12
	80%		99%	24.80	1.2907E+13	2.6714E+13	3.9621E+13	3.4743E+11
		80%	80%	24.80	1.2907E+13	2.6714E+13	3.9621E+13	3.4728E+11
			50%	24.80	1.2907E+13	2.6713E+13	3.9620E+13	3.4696E+11
			99%	24.80	1.2907E+13	2.5643E+13	3.8550E+13	-7.2317E+11
		50%	80%	24.80	1.2907E+13	2.5643E+13	3.8550E+13	-7.2331E+11
			50%	24.80	1.2907E+13	2.5643E+13	3.8550E+13	-7.2363E+11
			99%	24.11	1.3603E+13	2.8267E+13	4.1870E+13	1.9006E+12
		99%	80%	24.11	1.3603E+13	2.8267E+13	4.1870E+13	1.9005E+12
			50%	24.11	1.3603E+13	2.8267E+13	4.1870E+13	1.9001E+12
			99%	24.11	1.3603E+13	2.6299E+13	3.9902E+13	-6.7122E+10
	50%	80%	80%	24.11	1.3603E+13	2.6299E+13	3.9902E+13	-6.7269E+10
			50%	24.11	1.3603E+13	2.6299E+13	3.9902E+13	-6.7587E+10
			99%	24.11	1.3603E+13	2.5237E+13	3.8840E+13	-1.1294E+12
		50%	80%	24.11	1.3603E+13	2.5237E+13	3.8840E+13	-1.1296E+12
			50%	24.11	1.3603E+13	2.5236E+13	3.8840E+13	-1.1299E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
30			99%	26.54	1.0187E+13	2.8410E+13	3.8597E+13	3.7597E+12
		99%	80%	26.54	1.0187E+13	2.8410E+13	3.8597E+13	3.7596E+12
			50%	26.54	1.0187E+13	2.8409E+13	3.8597E+13	3.7593E+12
	99%		99%	26.54	1.0187E+13	2.6555E+13	3.6742E+13	1.9050E+12
		80%	80%	26.54	1.0187E+13	2.6555E+13	3.6742E+13	1.9049E+12
			50%	26.54	1.0187E+13	2.6555E+13	3.6742E+13	1.9046E+12
			99%	26.54	1.0187E+13	2.5562E+13	3.5750E+13	9.1224E+11
		50%	80%	26.54	1.0187E+13	2.5562E+13	3.5750E+13	9.1209E+11
			50%	26.54	1.0187E+13	2.5562E+13	3.5749E+13	9.1177E+11
			99%	25.59	1.1707E+13	2.7807E+13	3.9514E+13	3.1574E+12
		99%	80%	25.59	1.1707E+13	2.7807E+13	3.9514E+13	3.1572E+12
			50%	25.59	1.1707E+13	2.7807E+13	3.9514E+13	3.1569E+12
	80%		99%	25.59	1.1707E+13	2.5971E+13	3.7678E+13	1.3213E+12
		80%	80%	25.59	1.1707E+13	2.5971E+13	3.7678E+13	1.3212E+12
			50%	25.59	1.1707E+13	2.5969E+13	3.7676E+13	1.3192E+12
			99%	25.59	1.1707E+13	2.4981E+13	3.6688E+13	3.3111E+11
		50%	80%	25.59	1.1707E+13	2.4981E+13	3.6688E+13	3.3096E+11
			50%	25.59	1.1707E+13	2.4981E+13	3.6687E+13	3.3065E+11
			99%	24.90	1.2640E+13	2.7470E+13	4.0110E+13	2.8200E+12
		99%	80%	24.90	1.3640E+13	2.7470E+13	4.0110E+13	2.8198E+12
			50%	24.90	1.2640E+13	2.7470E+13	4.0110E+13	2.8195E+12
			99%	24.90	1.2640E+13	2.5648E+13	3.8288E+13	9.9805E+11
	50%	80%	80%	24.90	1.2640E+13	2.5648E+13	3.8288E+13	9.9790E+11
			50%	24.90	1.2640E+13	2.5648E+13	3.8288E+13	9.9759E+11
			99%	24.90	1.2640E+13	2.4651E+13	3.7291E+13	4.6200E+08
		50%	80%	24.90	1.2640E+13	2.4650E+13	3.7291E+13	3.1500E+08
▶			50%	24.90	1.2640E+13	2.4650E+13	3.7290E+13	0.0000E+00
32			99%	26.73	9.4323E+12	2.9361E+13	3.8794E+13	3.7680E+12
		99%	80%	26.73	9.4323E+12	2.9361E+13	3.8793E+13	3.7678E+12
			50%	26.73	9.4323E+12	2.9361E+13	3.8793E+13	3.7675E+12
	99%		99%	26.73	9.4323E+12	2.7344E+13	3.6776E+13	1.7507E+12
		80%	80%	26.73	9.4323E+12	2.7344E+13	3.6776E+13	1.7505E+12
			50%	26.73	9.4323E+12	2.7343E+13	3.6776E+13	1.7502E+12
			99%	26.73	9.4323E+12	2.6233E+13	3.5665E+13	6.3959E+11
		50%	80%	26.73	9.4323E+12	2.6233E+13	3.5665E+13	6.3945E+11
			50%	26.73	9.4323E+12	2.6232E+13	3.5665E+13	6.3913E+11
			99%	25.78	1.1137E+13	2.8712E+13	3.9849E+13	3.1184E+12
		99%	80%	25.78	1.1137E+13	2.8712E+13	3.9849E+13	3.1183E+12
			50%	25.78	1.1137E+13	2.8711E+13	3.9848E+13	3.1180E+12
	80%		99%	25.78	1.1137E+13	2.6686E+13	3.7823E+13	1.0931E+12
		80%	80%	25.78	1.1137E+13	2.6686E+13	3.7823E+13	1.0929E+12
			50%	25.78	1.1137E+13	2.6686E+13	3.7823E+13	1.0926E+12
			99%	25.78	1.1137E+13	2.5594E+13	3.6731E+13	4.6400E+08
		50%	80%	25.78	1.1137E+13	2.5594E+13	3.6731E+13	3.1500E+08
▶			50%	25.78	1.1137E+13	2.5593E+13	3.6730E+13	0.0000E+00
			99%	25.09	1.2185E+13	2.8337E+13	4.0522E+13	2.7441E+12
		99%	80%	25.09	1.2185E+13	2.8337E+13	4.0522E+13	2.7440E+12
			50%	25.09	1.2185E+13	2.8337E+13	4.0522E+13	2.7437E+12
			99%	25.09	1.2185E+13	2.6328E+13	3.8513E+13	7.3447E+11
	50%	80%	80%	25.09	1.2185E+13	2.6328E+13	3.8513E+13	7.3432E+11
			50%	25.09	1.2185E+13	2.6327E+13	3.8512E+13	7.3400E+11
			99%	25.09	1.2185E+13	2.5239E+13	3.7424E+13	-3.5386E+11
		50%	80%	25.09	1.2185E+13	2.5239E+13	3.7424E+13	-3.5401E+11
			50%	25.09	1.2185E+13	2.5239E+13	3.7424E+13	-3.5432E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
33	99%	99%	99%	27.36	9.7662E+12	2.8720E+13	3.8486E+13	3.7478E+12
			80%	27.36	9.7662E+12	2.8720E+13	3.8486E+13	3.7476E+12
			50%	27.36	9.7662E+12	2.8720E+13	3.8486E+13	3.7473E+12
		80%	99%	27.36	9.7662E+12	2.6790E+13	3.6556E+13	1.8173E+12
			80%	27.36	9.7662E+12	2.6790E+13	3.6556E+13	1.8171E+12
			50%	27.36	9.7662E+12	2.6789E+13	3.6555E+13	1.8168E+12
		50%	99%	27.36	9.7662E+12	2.5730E+13	3.5496E+13	7.5755E+11
			80%	27.36	9.7662E+12	2.5730E+13	3.5496E+13	7.5740E+11
			50%	27.36	9.7662E+12	2.5729E+13	3.5496E+13	7.5708E+11
	80%	99%	99%	26.40	1.1389E+13	2.8219E+13	3.9608E+13	3.2465E+12
			80%	26.40	1.1389E+13	2.8219E+13	3.9607E+13	3.2463E+12
			50%	26.40	1.1389E+13	2.8218E+13	3.9607E+13	3.2460E+12
		80%	99%	26.40	1.1389E+13	2.6293E+13	3.7682E+13	1.3208E+12
			80%	26.40	1.1389E+13	2.6293E+13	3.7682E+13	1.3207E+12
			50%	26.40	1.1389E+13	2.6293E+13	3.7681E+13	1.3204E+12
		50%	99%	26.40	1.1389E+13	2.5238E+13	3.6627E+13	2.6598E+11
			80%	26.40	1.1389E+13	2.5238E+13	3.6627E+13	2.6583E+11
			50%	26.40	1.1389E+13	2.5238E+13	3.6627E+13	2.6551E+11
	50%	99%	99%	25.72	1.2386E+13	2.7949E+13	4.0335E+13	2.9766E+12
			80%	25.72	1.2386E+13	2.7949E+13	4.0335E+13	2.9765E+12
			50%	25.72	1.2386E+13	2.7949E+13	4.0335E+13	2.9762E+12
		80%	99%	25.72	1.2386E+13	2.6028E+13	3.8414E+13	1.0551E+12
			80%	25.72	1.2386E+13	2.6027E+13	3.8414E+13	1.0549E+12
			50%	25.72	1.2386E+13	2.6027E+13	3.8413E+13	1.0546E+12
		50%	99%	25.72	1.2386E+13	2.4973E+13	3.7359E+13	4.6400E+08
			80%	25.72	1.2386E+13	2.4973E+13	3.7359E+13	3.1500E+08
			50%	25.72	1.2386E+13	2.4972E+13	3.7359E+13	0.0000E+00
35	99%	99%	99%	26.10	1.1264E+13	2.8829E+13	4.0094E+13	3.5823E+12
			80%	26.10	1.1264E+13	2.8829E+13	4.0094E+13	3.5822E+12
			50%	26.10	1.1264E+13	2.8829E+13	4.0093E+13	3.5818E+12
		80%	99%	26.10	1.1264E+13	2.6941E+13	3.8205E+13	1.6940E+12
			80%	26.10	1.1264E+13	2.6941E+13	3.8205E+13	1.6939E+12
			50%	26.10	1.1264E+13	2.6941E+13	3.8205E+13	1.6935E+12
		50%	99%	26.10	1.1264E+13	2.5906E+13	3.7170E+13	6.5908E+11
			80%	26.10	1.1264E+13	2.5906E+13	3.7170E+13	6.5892E+11
			50%	26.10	1.1264E+13	2.5906E+13	3.7170E+13	6.5861E+11
	80%	99%	99%	25.15	1.2521E+13	2.8179E+13	4.0700E+13	2.9323E+12
			80%	25.15	1.2521E+13	2.8179E+13	4.0700E+13	2.9322E+12
			50%	25.15	1.2521E+13	2.8179E+13	4.0700E+13	2.9318E+12
		80%	99%	25.15	1.2521E+13	2.6275E+13	3.8795E+13	1.0276E+12
			80%	25.15	1.2521E+13	2.6275E+13	3.8795E+13	1.0274E+12
			50%	25.15	1.2521E+13	2.6274E+13	3.8795E+13	1.0271E+12
		50%	99%	25.15	1.2521E+13	2.5248E+13	3.7768E+13	4.6400E+08
			80%	25.15	1.2521E+13	2.5247E+13	3.7768E+13	3.1500E+08
			50%	25.15	1.2521E+13	2.5247E+13	3.7768E+13	0.0000E+00
	50%	99%	99%	24.47	1.3292E+13	2.7791E+13	4.1083E+13	2.5439E+12
			80%	24.47	1.3292E+13	2.7791E+13	4.1083E+13	2.5437E+12
			50%	24.47	1.3292E+13	2.7791E+13	4.1082E+13	2.5434E+12
		80%	99%	24.47	1.3292E+13	2.5894E+13	3.9186E+13	6.4709E+11
			80%	24.47	1.3292E+13	2.5894E+13	3.9186E+13	6.4694E+11
			50%	24.47	1.3292E+13	2.5894E+13	3.9186E+13	6.4662E+11
		50%	99%	24.47	1.3292E+13	2.4870E+13	3.8162E+13	-3.7718E+11
			80%	24.47	1.3292E+13	2.4870E+13	3.8162E+13	-3.7733E+11
			50%	24.47	1.3292E+13	2.4869E+13	3.8161E+13	-3.7765E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
34	99%	99%	99%	25.91	1.1256E+13	2.8830E+13	4.0086E+13	2.9454E+12
			80%	25.91	1.1256E+13	2.8830E+13	4.0086E+13	2.9452E+12
			50%	25.91	1.1256E+13	2.8829E+13	4.0085E+13	2.9449E+12
		80%	99%	25.91	1.1256E+13	2.6930E+13	3.8186E+13	1.0455E+12
			80%	25.91	1.1256E+13	2.6930E+13	3.8186E+13	1.0454E+12
			50%	25.91	1.1256E+13	2.6929E+13	3.8186E+13	1.0450E+12
		50%	99%	25.91	1.1256E+13	2.5885E+13	3.7141E+13	4.6500E+08
			80%	25.91	1.1256E+13	2.5885E+13	3.7141E+13	3.1600E+08
			50%	25.91	1.1256E+13	2.5884E+13	3.7140E+13	0.0000E+00
	80%	99%	99%	24.96	1.2514E+13	2.8180E+13	4.0695E+13	2.2958E+12
			80%	24.96	1.2514E+13	2.8180E+13	4.0695E+13	2.2957E+12
			50%	24.96	1.2514E+13	2.8180E+13	4.0694E+13	2.2954E+12
		80%	99%	24.96	1.2514E+13	2.6264E+13	3.8779E+13	3.7988E+11
			80%	24.96	1.2514E+13	2.6264E+13	3.8779E+13	3.7973E+11
			50%	24.96	1.2514E+13	2.6264E+13	3.8778E+13	3.7942E+11
		50%	99%	24.96	1.2514E+13	2.5235E+13	3.7749E+13	-6.4968E+11
			80%	24.96	1.2514E+13	2.5235E+13	3.7749E+13	-6.4983E+11
			50%	24.96	1.2514E+13	2.5234E+13	3.7749E+13	-6.5015E+11
	50%	99%	99%	24.27	1.3287E+13	2.7805E+13	4.1091E+13	1.9201E+12
			80%	24.27	1.3287E+13	2.7804E+13	4.1091E+13	1.9200E+12
			50%	24.27	1.3287E+13	2.7804E+13	4.1091E+13	1.9196E+12
		80%	99%	24.27	1.3287E+13	2.5893E+13	3.9180E+13	8.9780E+09
			80%	24.27	1.3287E+13	2.5893E+13	3.9180E+13	8.8230E+09
			50%	24.27	1.3287E+13	2.5893E+13	3.9180E+13	8.5080E+09
		50%	99%	24.27	1.3287E+13	2.4864E+13	3.8151E+13	-1.0200E+12
			80%	24.27	1.3287E+13	2.4864E+13	3.8151E+13	-1.0201E+12
			50%	24.27	1.3287E+13	2.4864E+13	3.8151E+13	-1.0204E+12
36	99%	99%	99%	26.58	1.0330E+13	2.9066E+13	3.9397E+13	4.1509E+12
			80%	26.58	1.0330E+13	2.9066E+13	3.9396E+13	4.1507E+12
			50%	26.58	1.0330E+13	2.9066E+13	3.9396E+13	4.1504E+12
		80%	99%	26.58	1.0330E+13	2.7164E+13	3.7494E+13	2.2487E+12
			80%	26.58	1.0330E+13	2.7164E+13	3.7494E+13	2.2485E+12
			50%	26.58	1.0330E+13	2.7164E+13	3.7494E+13	2.2482E+12
		50%	99%	26.58	1.0330E+13	2.6114E+13	3.6444E+13	1.1986E+12
			80%	26.58	1.0330E+13	2.6114E+13	3.6444E+13	1.1984E+12
			50%	26.58	1.0330E+13	2.6114E+13	3.6444E+13	1.1981E+12
	80%	99%	99%	25.63	1.1815E+13	2.8284E+13	4.0099E+13	3.3685E+12
			80%	25.63	1.1815E+13	2.8284E+13	4.0099E+13	3.3684E+12
			50%	25.63	1.1815E+13	2.8283E+13	4.0098E+13	3.3681E+12
		80%	99%	25.63	1.1815E+13	2.6377E+13	3.8192E+13	1.4620E+12
			80%	25.63	1.1815E+13	2.6377E+13	3.8192E+13	1.4619E+12
			50%	25.63	1.1815E+13	2.6377E+13	3.8192E+13	1.4615E+12
		50%	99%	25.63	1.1815E+13	2.5349E+13	3.7164E+13	4.3371E+11
			80%	25.63	1.1815E+13	2.5349E+13	3.7164E+13	4.3357E+11
			50%	25.63	1.1815E+13	2.5349E+13	3.7163E+13	4.3325E+11
	50%	99%	99%	24.94	1.2726E+13	2.7848E+13	4.0574E+13	2.9329E+12
			80%	24.94	1.2726E+13	2.7848E+13	4.0574E+13	2.9328E+12
			50%	24.94	1.2726E+13	2.7848E+13	4.0574E+13	2.9325E+12
		80%	99%	24.94	1.2726E+13	2.5941E+13	3.8667E+13	1.0259E+12
			80%	24.94	1.2726E+13	2.5941E+13	3.8667E+13	1.0258E+12
			50%	24.94	1.2726E+13	2.5941E+13	3.8667E+13	1.0255E+12
		50%	99%	24.94	1.2726E+13	2.4916E+13	3.7642E+13	4.6300E+08
			80%	24.94	1.2726E+13	2.4916E+13	3.7642E+13	3.1600E+08
			50%	24.94	1.2726E+13	2.4915E+13	3.7641E+13	0.0000E+00

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
37	99%	99%	99%	25.99	4.1740E+11	3.2196E+12	3.6370E+12	4.0003E+11
			80%	25.99	4.1740E+11	3.2196E+12	3.6370E+12	4.0002E+11
			50%	25.99	4.1740E+11	3.2196E+12	3.6370E+12	3.9999E+11
		80%	99%	25.99	4.1740E+11	2.9598E+12	3.3772E+12	1.4022E+11
			80%	25.99	4.1740E+11	2.9598E+12	3.3772E+12	1.4021E+11
			50%	25.99	4.1740E+11	2.9597E+12	3.3771E+12	1.4018E+11
		50%	99%	25.99	4.1740E+11	2.8196E+12	3.2370E+12	4.2300E+07
			80%	25.99	4.1740E+11	2.8196E+12	3.2370E+12	2.8900E+07
▶			50%	25.99	4.1740E+11	2.8196E+12	3.2370E+12	0.0000E+00
	80%	99%	99%	25.20	5.3821E+11	3.1120E+12	3.6502E+12	2.9241E+11
			80%	25.20	5.3821E+11	3.1120E+12	3.6502E+12	2.9240E+11
			50%	25.20	5.3821E+11	3.1119E+12	3.6501E+12	2.9237E+11
		80%	99%	25.20	5.3821E+11	2.8580E+12	3.3962E+12	3.8449E+10
			80%	25.20	5.3821E+11	2.8580E+12	3.3962E+12	3.8435E+10
			50%	25.20	5.3821E+11	2.8580E+12	3.3962E+12	3.8407E+10
		50%	99%	25.20	5.3821E+11	2.7192E+12	3.2574E+12	-1.0038E+11
			80%	25.20	5.3821E+11	2.7192E+12	3.2574E+12	-1.0039E+11
			50%	25.20	5.3821E+11	2.7191E+12	3.2574E+12	-1.0042E+11
	50%	99%	99%	24.73	6.7864E+11	3.0709E+12	3.7496E+12	2.5135E+11
			80%	24.73	6.7864E+11	3.0709E+12	3.7496E+12	2.5134E+11
			50%	24.73	6.7864E+11	3.0709E+12	3.7495E+12	2.5131E+11
		80%	99%	24.73	6.7864E+11	2.8153E+12	3.4939E+12	-4.2692E+09
			80%	24.73	6.7864E+11	2.8153E+12	3.4939E+12	-4.2826E+09
			50%	24.73	6.7864E+11	2.8153E+12	3.4939E+12	-4.3112E+09
		50%	99%	24.73	6.7864E+11	2.6772E+12	3.3558E+12	-1.4240E+11
			80%	24.73	6.7864E+11	2.6772E+12	3.3558E+12	-1.4241E+11
			50%	24.73	6.7864E+11	2.6771E+12	3.3558E+12	-1.4244E+11
39	99%	99%	99%	27.12	3.7603E+11	3.2705E+12	3.6465E+12	5.9013E+11
			80%	27.12	3.7603E+11	3.2705E+12	3.6465E+12	5.9012E+11
			50%	27.12	3.7603E+11	3.2704E+12	3.6465E+12	5.9009E+11
		80%	99%	27.12	3.7603E+11	3.0068E+12	3.3829E+12	3.2648E+11
			80%	27.12	3.7603E+11	3.0068E+12	3.3828E+12	3.2647E+11
			50%	27.12	3.7603E+11	3.0068E+12	3.3828E+12	3.2644E+11
		50%	99%	27.12	3.7603E+11	2.8619E+12	3.2380E+12	1.8159E+11
			80%	27.12	3.7603E+11	2.8619E+12	3.2380E+12	1.8158E+11
			50%	27.12	3.7603E+11	2.8619E+12	3.2379E+12	1.8155E+11
	80%	99%	99%	26.33	3.9732E+11	3.1441E+12	3.5414E+12	4.6374E+11
			80%	26.33	3.9732E+11	3.1441E+12	3.5414E+12	4.6372E+11
			50%	26.33	3.9732E+11	3.1440E+12	3.5414E+12	4.6370E+11
		80%	99%	26.33	3.9732E+11	2.8821E+12	3.2794E+12	2.0173E+11
			80%	26.33	3.9732E+11	2.8821E+12	3.2794E+12	2.0171E+11
			50%	26.33	3.9732E+11	2.8820E+12	3.2793E+12	2.0168E+11
		50%	99%	26.33	3.9732E+11	2.7394E+12	3.1368E+12	5.9103E+10
			80%	26.33	3.9732E+11	2.7394E+12	3.1368E+12	5.9089E+10
			50%	26.33	3.9732E+11	2.7394E+12	3.1367E+12	5.9061E+10
	50%	99%	99%	25.86	4.6277E+11	3.0828E+12	3.5456E+12	4.0248E+11
			80%	25.86	4.6277E+11	3.0828E+12	3.5456E+12	4.0247E+11
			50%	25.86	4.6277E+11	3.0828E+12	3.5455E+12	4.0244E+11
		80%	99%	25.86	4.6277E+11	2.8218E+12	3.2845E+12	1.4142E+11
			80%	25.86	4.6277E+11	2.8217E+12	3.2845E+12	1.4140E+11
			50%	25.86	4.6277E+11	2.8217E+12	3.2845E+12	1.4137E+11
		50%	99%	25.86	4.6277E+11	2.6804E+12	3.1431E+12	4.2200E+07
			80%	25.86	4.6277E+11	2.6804E+12	3.1431E+12	2.8600E+07
▶			50%	25.86	4.6277E+11	2.6803E+12	3.1431E+12	0.0000E+00

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
38	99%	99%	99%	26.78	3.8106E+11	3.2423E+12	3.6234E+12	5.2023E+11
			80%	26.78	3.8106E+11	3.2423E+12	3.6234E+12	5.2022E+11
			50%	26.78	3.8106E+11	3.2423E+12	3.6234E+12	5.2019E+11
		80%	99%	26.78	3.8106E+11	2.9824E+12	3.3635E+12	2.6030E+11
			80%	26.78	3.8106E+11	2.9824E+12	3.3635E+12	2.6028E+11
			50%	26.78	3.8106E+11	2.9824E+12	3.3634E+12	2.6026E+11
		50%	99%	26.78	3.8106E+11	2.8407E+12	3.2217E+12	1.1854E+11
			80%	26.78	3.8106E+11	2.8406E+12	3.2217E+12	1.1853E+11
			50%	26.78	3.8106E+11	2.8406E+12	3.2217E+12	1.1850E+11
	80%	99%	99%	26.00	4.2859E+11	3.1192E+12	3.5478E+12	3.9706E+11
			80%	26.00	4.2859E+11	3.1192E+12	3.5478E+12	3.9705E+11
			50%	26.00	4.2859E+11	3.1191E+12	3.5477E+12	3.9702E+11
		80%	99%	26.00	4.2859E+11	2.8614E+12	3.2900E+12	1.3929E+11
			80%	26.00	4.2859E+11	2.8614E+12	3.2900E+12	1.3927E+11
			50%	26.00	4.2859E+11	2.8614E+12	3.2899E+12	1.3924E+11
		50%	99%	26.00	4.2859E+11	2.7222E+12	3.1507E+12	4.1500E+07
			80%	26.00	4.2859E+11	2.7221E+12	3.1507E+12	2.8400E+07
▶			50%	26.00	4.2859E+11	2.7221E+12	3.1507E+12	0.0000E+00
	50%	99%	99%	25.52	5.2449E+11	3.0625E+12	3.5870E+12	3.4041E+11
			80%	25.52	5.2449E+11	3.0625E+12	3.5870E+12	3.4040E+11
			50%	25.52	5.2449E+11	3.0625E+12	3.5870E+12	3.4037E+11
		80%	99%	25.52	5.2449E+11	2.8068E+12	3.3313E+12	8.4653E+10
			80%	25.52	5.2449E+11	2.8068E+12	3.3312E+12	8.4640E+10
			50%	25.52	5.2449E+11	2.8067E+12	3.3312E+12	8.4611E+10
		50%	99%	25.52	5.2449E+11	2.6685E+12	3.1930E+12	-5.3592E+10
			80%	25.52	5.2449E+11	2.6685E+12	3.1930E+12	-5.3606E+10
			50%	25.52	5.2449E+11	2.6685E+12	3.1930E+12	-5.3634E+10
40	99%	99%	99%	25.85	4.8376E+11	3.3969E+12	3.8807E+12	4.6728E+11
			80%	25.85	4.8376E+11	3.3969E+12	3.8807E+12	4.6727E+11
			50%	25.85	4.8376E+11	3.3969E+12	3.8806E+12	4.6724E+11
		80%	99%	25.85	4.8376E+11	3.0960E+12	3.5798E+12	1.6641E+11
			80%	25.85	4.8376E+11	3.0960E+12	3.5798E+12	1.6640E+11
			50%	25.85	4.8376E+11	3.0960E+12	3.5798E+12	1.6637E+11
		50%	99%	25.85	4.8376E+11	2.9297E+12	3.4134E+12	4.1900E+07
			80%	25.85	4.8376E+11	2.9297E+12	3.4134E+12	2.8300E+07
▶			50%	25.85	4.8376E+11	2.9296E+12	3.4134E+12	0.0000E+00
	80%	99%	99%	24.92	6.3721E+11	3.2939E+12	3.9311E+12	3.6430E+11
			80%	24.92	6.3721E+11	3.2939E+12	3.9311E+12	3.6428E+11
			50%	24.92	6.3721E+11	3.2939E+12	3.9311E+12	3.6425E+11
		80%	99%	24.92	6.3721E+11	2.9960E+12	3.6332E+12	6.6345E+10
			80%	24.92	6.3721E+11	2.9960E+12	3.6332E+12	6.6332E+10
			50%	24.92	6.3721E+11	2.9959E+12	3.6331E+12	6.6304E+10
		50%	99%	24.92	6.3721E+11	2.8321E+12	3.4693E+12	-9.7539E+10
			80%	24.92	6.3721E+11	2.8321E+12	3.4693E+12	-9.7553E+10
			50%	24.92	6.3721E+11	2.8321E+12	3.4693E+12	-9.7581E+10
	50%	99%	99%	24.37	7.8962E+11	3.2565E+12	4.0462E+12	3.2690E+11
			80%	24.37	7.8962E+11	3.2565E+12	4.0461E+12	3.2688E+11
			50%	24.37	7.8962E+11	3.2565E+12	4.0461E+12	3.2686E+11
		80%	99%	24.37	7.8962E+11	2.9544E+12	3.7440E+12	2.4744E+10
			80%	24.37	7.8962E+11	2.9544E+12	3.7440E+12	2.4730E+10
			50%	24.37	7.8962E+11	2.9543E+12	3.7440E+12	2.4702E+10
		50%	99%	24.37	7.8962E+11	2.7911E+12	3.5807E+12	-1.3858E+11
			80%	24.37	7.8962E+11	2.7910E+12	3.5807E+12	-1.3859E+11
			50%	24.37	7.8962E+11	2.7910E+12	3.5806E+12	-1.3862E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
41	99%	99%	99%	26.88	3.7887E+11	3.4938E+12	3.8727E+12	6.3025E+11
			80%	26.88	3.7887E+11	3.4938E+12	3.8727E+12	6.3024E+11
			50%	26.88	3.7887E+11	3.4938E+12	3.8727E+12	6.3021E+11
		80%	99%	26.88	3.7887E+11	3.1739E+12	3.5528E+12	3.1031E+11
			80%	26.88	3.7887E+11	3.1739E+12	3.5528E+12	3.1029E+11
			50%	26.88	3.7887E+11	3.1739E+12	3.5527E+12	3.1026E+11
		50%	99%	26.88	3.7887E+11	3.0001E+12	3.3790E+12	1.3651E+11
			80%	26.88	3.7887E+11	3.0001E+12	3.3790E+12	1.3650E+11
			50%	26.88	3.7887E+11	3.0001E+12	3.3789E+12	1.3647E+11
	80%	99%	99%	25.97	4.1605E+11	3.3471E+12	3.7631E+12	4.8347E+11
			80%	25.97	4.1605E+11	3.3470E+12	3.7631E+12	4.8346E+11
			50%	25.97	4.1605E+11	3.3470E+12	3.7631E+12	4.8343E+11
		80%	99%	25.97	4.1605E+11	3.0355E+12	3.4516E+12	1.7194E+11
			80%	25.97	4.1605E+11	3.0355E+12	3.4516E+12	1.7192E+11
			50%	25.97	4.1605E+11	3.0355E+12	3.4515E+12	1.7189E+11
		50%	99%	25.97	4.1605E+11	2.8636E+12	3.2797E+12	4.1700E+07
			80%	25.97	4.1605E+11	2.8636E+12	3.2797E+12	2.8300E+07
▶			50%	25.97	4.1605E+11	2.8636E+12	3.2796E+12	0.0000E+00
	50%	99%	99%	25.49	5.0849E+11	3.2872E+12	3.7957E+12	4.2357E+11
			80%	25.49	5.0849E+11	3.2871E+12	3.7956E+12	4.2356E+11
			50%	25.49	5.0849E+11	3.2871E+12	3.7956E+12	4.2353E+11
		80%	99%	25.49	5.0849E+11	2.9730E+12	3.4815E+12	1.0941E+11
			80%	25.49	5.0849E+11	2.9730E+12	3.4815E+12	1.0940E+11
			50%	25.49	5.0849E+11	2.9730E+12	3.4814E+12	1.0937E+11
		50%	99%	25.49	5.0849E+11	2.8033E+12	3.3118E+12	-6.0308E+10
			80%	25.49	5.0849E+11	2.8033E+12	3.3118E+12	-6.0322E+10
			50%	25.49	5.0849E+11	2.8032E+12	3.3117E+12	-6.0350E+10
43	99%	99%	99%	25.84	3.9968E+11	3.3007E+12	3.7004E+12	4.1661E+11
			80%	25.84	3.9968E+11	3.3007E+12	3.7004E+12	4.1660E+11
			50%	25.84	3.9968E+11	3.3007E+12	3.7004E+12	4.1657E+11
		80%	99%	25.84	3.9968E+11	3.0314E+12	3.4310E+12	1.4724E+11
			80%	25.84	3.9968E+11	3.0313E+12	3.4310E+12	1.4723E+11
			50%	25.84	3.9968E+11	3.0313E+12	3.4310E+12	1.4720E+11
		50%	99%	25.84	3.9968E+11	2.8842E+12	3.2838E+12	4.1900E+07
			80%	25.84	3.9968E+11	2.8841E+12	3.2838E+12	2.8500E+07
▶			50%	25.84	3.9968E+11	2.8841E+12	3.2838E+12	0.0000E+00
	80%	99%	99%	25.05	4.8368E+11	3.1679E+12	3.6515E+12	2.8374E+11
			80%	25.05	4.8368E+11	3.1678E+12	3.6515E+12	2.8372E+11
			50%	25.05	4.8368E+11	3.1678E+12	3.6515E+12	2.8370E+11
		80%	99%	25.05	4.8368E+11	2.9015E+12	3.3852E+12	1.7400E+10
			80%	25.05	4.8368E+11	2.9015E+12	3.3852E+12	1.7387E+10
			50%	25.05	4.8368E+11	2.9015E+12	3.3852E+12	1.7358E+10
		50%	99%	25.05	4.8368E+11	2.7576E+12	3.2413E+12	-1.2654E+11
			80%	25.05	4.8368E+11	2.7576E+12	3.2412E+12	-1.2655E+11
			50%	25.05	4.8368E+11	2.7575E+12	3.2412E+12	-1.2658E+11
	50%	99%	99%	24.57	6.1270E+11	3.1097E+12	3.7224E+12	2.2554E+11
			80%	24.57	6.1270E+11	3.1096E+12	3.7223E+12	2.2553E+11
			50%	24.57	6.1270E+11	3.1096E+12	3.7223E+12	2.2550E+11
		80%	99%	24.57	6.1270E+11	2.8445E+12	3.4571E+12	-3.9666E+10
			80%	24.57	6.1270E+11	2.8444E+12	3.4571E+12	-3.9680E+10
			50%	24.57	6.1270E+11	2.8444E+12	3.4571E+12	-3.9709E+10
		50%	99%	24.57	6.1270E+11	2.7011E+12	3.3138E+12	-1.8297E+11
			80%	24.57	6.1270E+11	2.7011E+12	3.3138E+12	-1.8298E+11
			50%	24.57	6.1270E+11	2.7011E+12	3.3138E+12	-1.8301E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
42	99%	99%	99%	27.31	3.7509E+11	3.5310E+12	3.9061E+12	7.1352E+11
			80%	27.31	3.7509E+11	3.5310E+12	3.9061E+12	7.1351E+11
			50%	27.31	3.7509E+11	3.5310E+12	3.9060E+12	7.1348E+11
		80%	99%	27.31	3.7509E+11	3.2063E+12	3.5814E+12	3.8887E+11
			80%	27.31	3.7509E+11	3.2063E+12	3.5814E+12	3.8886E+11
			50%	27.31	3.7509E+11	3.2063E+12	3.5814E+12	3.8883E+11
		50%	99%	27.31	3.7509E+11	3.0295E+12	3.4046E+12	2.1205E+11
			80%	27.31	3.7509E+11	3.0295E+12	3.4046E+12	2.1203E+11
			50%	27.31	3.7509E+11	3.0295E+12	3.4046E+12	2.1200E+11
	80%	99%	99%	26.48	3.8586E+11	3.3782E+12	3.7641E+12	5.6077E+11
			80%	26.48	3.8586E+11	3.3782E+12	3.7641E+12	5.6076E+11
			50%	26.48	3.8586E+11	3.3782E+12	3.7641E+12	5.6073E+11
		80%	99%	26.48	3.8586E+11	3.0609E+12	3.4468E+12	2.4347E+11
			80%	26.48	3.8586E+11	3.0609E+12	3.4468E+12	2.4345E+11
			50%	26.48	3.8586E+11	3.0609E+12	3.4468E+12	2.4342E+11
		50%	99%	26.48	3.8586E+11	2.8872E+12	3.2730E+12	6.9695E+10
			80%	26.48	3.8586E+11	2.8872E+12	3.2730E+12	6.9682E+10
			50%	26.48	3.8586E+11	2.8871E+12	3.2730E+12	6.9653E+10
	50%	99%	99%	26.00	4.4321E+11	3.3072E+12	3.7504E+12	4.8970E+11
			80%	26.00	4.4321E+11	3.3072E+12	3.7504E+12	4.8969E+11
			50%	26.00	4.4321E+11	3.3071E+12	3.7503E+12	4.8966E+11
		80%	99%	26.00	4.4321E+11	2.9907E+12	3.4340E+12	1.7327E+11
			80%	26.00	4.4321E+11	2.9907E+12	3.4339E+12	1.7326E+11
			50%	26.00	4.4321E+11	2.9907E+12	3.4339E+12	1.7323E+11
		50%	99%	26.00	4.4321E+11	2.8175E+12	3.2607E+12	4.1600E+07
			80%	26.00	4.4321E+11	2.8175E+12	3.2607E+12	2.8500E+07
▶			50%	26.00	4.4321E+11	2.8175E+12	3.2607E+12	0.0000E+00
44	99%	99%	99%	26.74	3.8424E+11	3.3369E+12	3.7212E+12	5.6819E+11
			80%	26.74	3.8424E+11	3.3369E+12	3.7211E+12	5.6817E+11
			50%	26.74	3.8424E+11	3.3369E+12	3.7211E+12	5.6815E+11
		80%	99%	26.74	3.8424E+11	3.0728E+12	3.4571E+12	3.0410E+11
			80%	26.74	3.8424E+11	3.0728E+12	3.4571E+12	3.0409E+11
			50%	26.74	3.8424E+11	3.0728E+12	3.4570E+12	3.0406E+11
		50%	99%	26.74	3.8424E+11	2.9304E+12	3.3147E+12	1.6169E+11
			80%	26.74	3.8424E+11	2.9304E+12	3.3146E+12	1.6167E+11
			50%	26.74	3.8424E+11	2.9304E+12	3.3146E+12	1.6164E+11
	80%	99%	99%	25.96	4.3841E+11	3.1681E+12	3.6065E+12	3.9939E+11
			80%	25.96	4.3841E+11	3.1681E+12	3.6065E+12	3.9937E+11
			50%	25.96	4.3841E+11	3.1681E+12	3.6065E+12	3.9935E+11
		80%	99%	25.96	4.3841E+11	2.9092E+12	3.3476E+12	1.4045E+11
			80%	25.96	4.3841E+11	2.9092E+12	3.3476E+12	1.4043E+11
			50%	25.96	4.3841E+11	2.9091E+12	3.3476E+12	1.4041E+11
		50%	99%	25.96	4.3841E+11	2.7688E+12	3.2072E+12	4.2300E+07
			80%	25.96	4.3841E+11	2.7688E+12	3.2072E+12	2.8600E+07
▶			50%	25.96	4.3841E+11	2.7687E+12	3.2071E+12	0.0000E+00
	50%	99%	99%	25.49	5.3145E+11	3.0847E+12	3.6162E+12	3.1598E+11
			80%	25.49	5.3145E+11	3.0847E+12	3.6161E+12	3.1597E+11
			50%	25.49	5.3145E+11	3.0847E+12	3.6161E+12	3.1594E+11
		80%	99%	25.49	5.3145E+11	2.8287E+12	3.3601E+12	5.9920E+10
			80%	25.49	5.3145E+11	2.8286E+12	3.3601E+12	5.9906E+10
			50%	25.49	5.3145E+11	2.8286E+12	3.3601E+12	5.9878E+10
		50%	99%	25.49	5.3145E+11	2.6906E+12	3.2220E+12	-7.8142E+10
			80%	25.49	5.3145E+11	2.6906E+12	3.2220E+12	-7.8156E+10
			50%	25.49	5.3145E+11	2.6905E+12	3.2220E+12	-7.8184E+10

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
45	99%	99%	99%	27.22	3.7345E+11	3.5694E+12	3.9429E+12	7.9136E+11
			80%	27.32	3.7345E+11	3.5694E+12	3.9429E+12	7.9135E+11
			50%	27.22	3.7345E+11	3.5694E+12	3.9428E+12	7.9132E+11
		80%	99%	27.22	3.7345E+11	3.2877E+12	3.6611E+12	5.0961E+11
			80%	27.22	3.7345E+11	3.2876E+12	3.6611E+12	5.0960E+11
			50%	27.22	3.7345E+11	3.2876E+12	3.6611E+12	5.0957E+11
		50%	99%	27.22	3.7345E+11	3.1331E+12	3.5065E+12	3.5502E+11
			80%	27.22	3.7345E+11	3.1331E+12	3.5065E+12	3.5500E+11
			50%	27.22	3.7345E+11	3.1330E+12	3.5065E+12	3.5497E+11
	80%	99%	99%	26.44	3.9051E+11	3.3287E+12	3.7192E+12	5.5067E+11
			80%	26.44	3.9051E+11	3.3287E+12	3.7192E+12	5.5066E+11
			50%	26.44	3.9051E+11	3.3287E+12	3.7192E+12	5.5063E+11
		80%	99%	26.44	3.9051E+11	3.0514E+12	3.4419E+12	2.7335E+11
			80%	26.44	3.9051E+11	3.0514E+12	3.4419E+12	2.7334E+11
			50%	26.44	3.9051E+11	3.0514E+12	3.4419E+12	2.7331E+11
		50%	99%	26.44	3.9051E+11	2.8999E+12	3.2904E+12	1.2182E+11
			80%	26.44	3.9051E+11	2.8999E+12	3.2904E+12	1.2181E+11
			50%	26.44	3.9051E+11	2.8998E+12	3.2903E+12	1.2178E+11
	50%	99%	99%	25.96	4.4344E+11	3.1964E+12	3.6398E+12	4.1832E+11
			80%	25.96	4.4344E+11	3.1964E+12	3.6398E+12	4.1831E+11
			50%	25.96	4.4344E+11	3.1963E+12	3.6398E+12	4.1828E+11
		80%	99%	25.96	4.4344E+11	2.9265E+12	3.3699E+12	1.4842E+11
			80%	25.96	4.4344E+11	2.9265E+12	3.3699E+12	1.4841E+11
			50%	25.96	4.4344E+11	2.9264E+12	3.3699E+12	1.4838E+11
		50%	99%	25.96	4.4344E+11	2.7781E+12	3.2215E+12	4.1700E+07
			80%	25.96	4.4344E+11	2.7781E+12	3.2215E+12	2.8300E+07
►			50%	25.96	4.4344E+11	2.7781E+12	3.2215E+12	0.0000E+00
47	99%	99%	99%	26.89	3.8678E+11	3.3604E+12	3.7472E+12	5.5190E+11
			80%	26.89	3.8678E+11	3.3604E+12	3.7471E+12	5.5189E+11
			50%	26.89	3.8678E+11	3.3603E+12	3.7471E+12	5.5186E+11
		80%	99%	26.89	3.8678E+11	3.0831E+12	3.4699E+12	2.7461E+11
			80%	26.89	3.8678E+11	3.0831E+12	3.4699E+12	2.7460E+11
			50%	26.89	3.8678E+11	3.0830E+12	3.4698E+12	2.7457E+11
		50%	99%	26.89	3.8678E+11	2.9308E+12	3.3176E+12	1.2235E+11
			80%	26.89	3.8678E+11	2.9308E+12	3.3176E+12	1.2233E+11
			50%	26.89	3.8678E+11	2.9308E+12	3.3176E+12	1.2231E+11
	80%	99%	99%	25.88	4.7658E+11	3.2334E+12	3.7100E+12	4.2493E+11
			80%	25.88	4.7658E+11	3.2334E+12	3.7100E+12	4.2491E+11
			50%	25.88	4.7658E+11	3.2334E+12	3.7099E+12	4.2488E+11
		80%	99%	25.88	4.7658E+11	2.9590E+12	3.4356E+12	1.5051E+11
			80%	25.88	4.7658E+11	2.9590E+12	3.4356E+12	1.5050E+11
			50%	25.88	4.7658E+11	2.9589E+12	3.4355E+12	1.5047E+11
		50%	99%	25.88	4.7658E+11	2.8085E+12	3.2851E+12	4.1900E+07
			80%	25.88	4.7658E+11	2.8085E+12	3.2851E+12	2.8300E+07
►			50%	25.88	4.7658E+11	2.8085E+12	3.2851E+12	0.0000E+00
	50%	99%	99%	25.27	5.9123E+11	3.1725E+12	3.7637E+12	3.6403E+11
			80%	25.27	5.9123E+11	3.1725E+12	3.7637E+12	3.6402E+11
			50%	25.27	5.9123E+11	3.1725E+12	3.7637E+12	3.6399E+11
		80%	99%	25.27	5.9123E+11	2.9013E+12	3.4925E+12	9.2800E+10
			80%	25.27	5.9123E+11	2.9013E+12	3.4925E+12	9.2786E+10
			50%	25.27	5.9123E+11	2.9012E+12	3.4925E+12	9.2758E+10
		50%	99%	25.27	5.9123E+11	2.7523E+12	3.3435E+12	-5.6205E+10
			80%	25.27	5.9123E+11	2.7523E+12	3.3435E+12	-5.6218E+10
			50%	25.27	5.9123E+11	2.7522E+12	3.3435E+12	-5.6246E+10

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
46	99%	99%	99%	25.70	5.2563E+11	3.3158E+12	3.8415E+12	4.1848E+11
			80%	25.70	5.2563E+11	3.3158E+12	3.8415E+12	4.1847E+11
			50%	25.70	5.2563E+11	3.3158E+12	3.8414E+12	4.1844E+11
		80%	99%	25.70	5.2563E+11	3.0461E+12	3.5717E+12	1.4871E+11
			80%	25.70	5.2563E+11	3.0461E+12	3.5717E+12	1.4869E+11
			50%	25.70	5.2563E+11	3.0460E+12	3.5717E+12	1.4867E+11
		50%	99%	25.70	5.2563E+11	2.8974E+12	3.4230E+12	4.2400E+07
			80%	25.70	5.2563E+11	2.8974E+12	3.4230E+12	2.9100E+07
►			50%	25.70	5.2563E+11	2.8974E+12	3.4230E+12	0.0000E+00
	80%	99%	99%	24.75	6.8133E+11	3.2069E+12	3.8882E+12	3.0955E+11
			80%	24.75	6.8133E+11	3.2069E+12	3.8882E+12	3.0953E+11
			50%	24.75	6.8133E+11	3.2069E+12	3.8882E+12	3.0951E+11
		80%	99%	24.75	6.8133E+11	2.9407E+12	3.6220E+12	4.3327E+10
			80%	24.75	6.8133E+11	2.9407E+12	3.6220E+12	4.3313E+10
			50%	24.75	6.8133E+11	2.9407E+12	3.6220E+12	4.3285E+10
		50%	99%	24.75	6.8133E+11	2.7937E+12	3.4750E+12	-1.0371E+11
			80%	24.75	6.8133E+11	2.7936E+12	3.4750E+12	-1.0372E+11
			50%	24.75	6.8133E+11	2.7936E+12	3.4750E+12	-1.0375E+11
	50%	99%	99%	24.06	8.2670E+11	3.1622E+12	3.9889E+12	2.6485E+11
			80%	24.06	8.2670E+11	3.1622E+12	3.9889E+12	2.6484E+11
			50%	24.06	8.2670E+11	3.1622E+12	3.9889E+12	2.6481E+11
		80%	99%	24.06	8.2670E+11	2.8930E+12	3.7197E+12	-4.3967E+09
			80%	24.06	8.3670E+11	2.8930E+12	3.7197E+12	-4.4101E+09
			50%	24.06	8.2670E+11	2.8929E+12	3.7196E+12	-4.4386E+09
		50%	99%	24.06	8.2670E+11	2.7469E+12	3.5736E+12	-1.5044E+11
			80%	24.06	8.2670E+11	2.7469E+12	3.5736E+12	-1.5046E+11
			50%	24.06	8.2670E+11	2.7469E+12	3.5736E+12	-1.5049E+11
48	99%	99%	99%	27.66	3.7240E+11	3.4030E+12	3.7754E+12	6.5179E+11
			80%	27.66	3.7240E+11	3.4030E+12	3.7754E+12	6.5178E+11
			50%	27.66	3.7240E+11	3.4029E+12	3.7754E+12	6.5175E+11
		80%	99%	27.66	3.7240E+11	3.1208E+12	3.4932E+12	3.6959E+11
			80%	27.66	3.7240E+11	3.1208E+12	3.4932E+12	3.6957E+11
			50%	27.66	3.7240E+11	3.1207E+12	3.4931E+12	3.6955E+11
		50%	99%	27.66	3.7240E+11	2.9665E+12	3.3389E+12	2.1531E+11
			80%	27.66	3.7240E+11	2.9665E+12	3.3389E+12	2.1529E+11
			50%	27.66	3.7240E+11	2.9665E+12	3.3389E+12	2.1527E+11
	80%	99%	99%	26.71	3.7314E+11	3.2553E+12	3.6284E+12	5.0407E+11
			80%	26.71	3.7314E+11	3.2553E+12	3.6284E+12	5.0406E+11
			50%	26.71	3.7314E+11	3.2552E+12	3.6284E+12	5.0403E+11
		80%	99%	26.71	3.7314E+11	2.9771E+12	3.3503E+12	2.2591E+11
			80%	26.71	3.7314E+11	2.9771E+12	3.3502E+12	2.2590E+11
			50%	26.71	3.7314E+11	2.9771E+12	3.3502E+12	2.2587E+11
		50%	99%	26.71	3.7314E+11	2.8261E+12	3.1992E+12	7.4879E+10
			80%	26.71	3.7314E+11	2.8261E+12	3.1992E+12	7.4866E+10
			50%	26.71	3.7314E+11	2.8260E+12	3.1992E+12	7.4837E+10
	50%	99%	99%	26.02	3.9945E+11	3.1757E+12	3.5752E+12	4.2451E+11
			80%	26.02	3.9945E+11	3.1757E+12	3.5751E+12	4.2450E+11
			50%	26.02	3.9945E+11	3.1757E+12	3.5751E+12	4.2447E+11
		80%	99%	26.02	3.9945E+11	2.9007E+12	3.3001E+12	1.4950E+11
			80%	26.02	3.9945E+11	2.9007E+12	3.3001E+12	1.4949E+11
			50%	26.02	3.9945E+11	2.9007E+12	3.3001E+12	1.4946E+11
		50%	99%	26.02	3.9945E+11	2.7512E+12	3.1507E+12	4.1700E+07
			80%	26.02	3.9945E+11	2.7512E+12	3.1507E+12	2.8300E+07
►			50%	26.02	3.9945E+11	2.7512E+12	3.1506E+12	0.0000E+00

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{u} (J)	W_{d} (J)	W (J)	OPL
49	99%	99%	99%	25.79	4.4394E+11	3.6281E+12	4.0720E+12	5.1936E+11
			80%	25.79	4.4394E+11	3.6281E+12	4.0720E+12	5.1935E+11
			50%	25.79	4.4394E+11	3.6280E+12	4.0720E+12	5.1932E+11
		80%	99%	25.79	4.4394E+11	3.2934E+12	3.7373E+12	1.8469E+11
			80%	25.79	4.4394E+11	3.2934E+12	3.7373E+12	1.8468E+11
			50%	25.79	4.4394E+11	3.2934E+12	3.7373E+12	1.8465E+11
		50%	99%	25.79	4.4394E+11	3.1088E+12	3.5527E+12	4.1700E+07
			80%	25.79	4.4394E+11	3.1087E+12	3.5527E+12	2.8100E+07
▶			50%	25.79	4.4394E+11	3.1087E+12	3.5526E+12	0.0000E+00
	80%	99%	99%	24.83	5.7465E+11	3.4743E+12	4.0490E+12	3.6561E+11
			80%	24.83	5.7465E+11	3.4743E+12	4.0490E+12	3.6559E+11
			50%	24.83	5.7465E+11	3.4743E+12	4.0489E+12	3.6557E+11
		80%	99%	24.83	5.7465E+11	3.1480E+12	3.7227E+12	3.9317E+10
			80%	24.83	5.7465E+11	3.1480E+12	3.7227E+12	3.9304E+10
			50%	24.83	5.7465E+11	3.1480E+12	3.7226E+12	3.9276E+10
		50%	99%	24.83	5.7465E+11	2.9675E+12	3.5421E+12	-1.4122E+11
			80%	24.83	5.7465E+11	2.9675E+12	3.5421E+12	-1.4123E+11
			50%	24.83	5.7465E+11	2.9674E+12	3.5421E+12	-1.4126E+11
	50%	99%	99%	24.15	7.1055E+11	3.4070E+12	4.1176E+12	2.9832E+11
			80%	24.15	7.1055E+11	3.4070E+12	4.1176E+12	2.9830E+11
			50%	24.15	7.1055E+11	3.4070E+12	4.1175E+12	2.9828E+11
		80%	99%	24.15	7.1055E+11	3.0795E+12	3.7901E+12	-2.9192E+10
			80%	24.15	7.1055E+11	3.0795E+12	3.7901E+12	-2.9206E+10
			50%	24.15	7.1055E+11	3.0795E+12	3.7900E+12	-2.9234E+10
		50%	99%	24.15	7.1055E+11	2.8999E+12	3.6105E+12	-2.0881E+11
			80%	24.15	7.1055E+11	2.8999E+12	3.6104E+12	-2.0882E+11
			50%	24.15	7.1055E+11	2.8999E+12	3.6104E+12	-2.0885E+11
51	99%	99%	99%	27.48	3.7423E+11	3.7306E+12	4.1048E+12	7.9974E+11
			80%	27.48	3.7423E+11	3.7306E+12	4.1048E+12	7.9973E+11
			50%	27.48	3.7423E+11	3.7305E+12	4.1048E+12	7.9970E+11
		80%	99%	27.48	3.7423E+11	3.3906E+12	3.7649E+12	4.5980E+11
			80%	27.48	3.7423E+11	3.3906E+12	3.7649E+12	4.5978E+11
			50%	27.48	3.7423E+11	3.3906E+12	3.7648E+12	4.5975E+11
		50%	99%	27.48	3.7423E+11	3.2032E+12	3.5774E+12	2.7232E+11
			80%	27.48	3.7423E+11	3.2032E+12	3.5774E+12	2.7230E+11
			50%	27.48	3.7423E+11	3.2031E+12	3.5774E+12	2.7227E+11
	80%	99%	99%	26.50	3.8114E+11	3.5436E+12	3.9247E+12	6.1271E+11
			80%	26.50	3.8114E+11	3.5435E+12	3.9247E+12	6.1270E+11
			50%	26.50	3.8114E+11	3.5435E+12	3.9247E+12	6.1267E+11
		80%	99%	26.50	3.8114E+11	3.2057E+12	3.5868E+12	2.7484E+11
			80%	26.50	3.8114E+11	3.2057E+12	3.5868E+12	2.7483E+11
			50%	26.50	3.8114E+11	3.2057E+12	3.5868E+12	2.7480E+11
		50%	99%	26.50	3.8114E+11	3.0225E+12	3.4037E+12	9.1681E+10
			80%	26.50	3.8114E+11	3.0225E+12	3.4037E+12	9.1667E+10
			50%	26.50	3.8114E+11	3.0225E+12	3.4036E+12	9.1639E+10
	50%	99%	99%	25.86	4.4038E+11	3.4467E+12	3.8870E+12	5.1581E+11
			80%	25.86	4.4038E+11	3.4466E+12	3.8870E+12	5.1580E+11
			50%	25.86	4.4038E+11	3.4466E+12	3.8870E+12	5.1577E+11
		80%	99%	25.86	4.4038E+11	3.1130E+12	3.5534E+12	1.8216E+11
			80%	25.86	4.4038E+11	3.1130E+12	3.5534E+12	1.8214E+11
			50%	25.86	4.4038E+11	3.1130E+12	3.5533E+12	1.8212E+11
		50%	99%	25.86	4.4038E+11	2.9309E+12	3.3713E+12	4.2200E+07
			80%	25.86	4.4038E+11	2.9309E+12	3.3713E+12	2.8300E+07
▶			50%	25.86	4.4038E+11	2.9308E+12	3.3712E+12	0.0000E+00

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{u} (J)	W_{d} (J)	W (J)	OPL
50	99%	99%	99%	26.68	4.1438E+11	3.5540E+12	3.9684E+12	6.3179E+11
			80%	26.68	4.1438E+11	3.5540E+12	3.9683E+12	6.3178E+11
			50%	26.68	4.1438E+11	3.5539E+12	3.9683E+12	6.3175E+11
		80%	99%	26.68	4.1438E+11	3.2376E+12	3.6519E+12	3.1536E+11
			80%	26.68	4.1438E+11	3.2375E+12	3.6519E+12	3.1535E+11
			50%	26.68	4.1438E+11	3.2375E+12	3.6519E+12	3.1532E+11
		50%	99%	26.68	4.1438E+11	3.0616E+12	3.4760E+12	1.3939E+11
			80%	26.68	4.1438E+11	3.0616E+12	3.4759E+12	1.3938E+11
			50%	26.68	4.1438E+11	3.0615E+12	3.4759E+12	1.3935E+11
	80%	99%	99%	25.73	5.3317E+11	3.4081E+12	3.9413E+12	4.8595E+11
			80%	25.73	5.3317E+11	3.4081E+12	3.9413E+12	4.8594E+11
			50%	25.73	5.3317E+11	3.4081E+12	3.9413E+12	4.8591E+11
		80%	99%	25.73	5.3317E+11	3.0954E+12	3.6286E+12	1.7324E+11
			80%	25.73	5.3317E+11	3.0954E+12	3.6286E+12	1.7323E+11
			50%	25.73	5.3317E+11	3.0954E+12	3.6286E+12	1.7320E+11
		50%	99%	25.73	5.3317E+11	2.9222E+12	3.4554E+12	4.2200E+07
			80%	25.73	5.3317E+11	2.9222E+12	3.4554E+12	2.8600E+07
▶			50%	25.73	5.3317E+11	2.9222E+12	3.4554E+12	0.0000E+00
	50%	99%	99%	25.04	6.6270E+11	3.3415E+12	4.0042E+12	4.1935E+11
			80%	25.04	6.6270E+11	3.3415E+12	4.0042E+12	4.1933E+11
			50%	25.04	6.6270E+11	3.3415E+12	4.0042E+12	4.1931E+11
		80%	99%	25.04	6.6270E+11	3.0289E+12	3.6916E+12	1.0675E+11
			80%	25.04	6.6270E+11	3.0289E+12	3.6916E+12	1.0674E+11
			50%	25.04	6.6270E+11	3.0289E+12	3.6916E+12	1.0671E+11
		50%	99%	25.04	6.6270E+11	2.8577E+12	3.5204E+12	-6.4455E+10
			80%	25.04	6.6270E+11	2.8577E+12	3.5204E+12	-6.4468E+10
			50%	25.04	6.6270E+11	2.8577E+12	3.5204E+12	-6.4497E+10
52	99%	99%	99%	25.63	4.8191E+11	3.4289E+12	3.9108E+12	4.6070E+11
			80%	25.63	4.8191E+11	3.4289E+12	3.9108E+12	4.6069E+11
			50%	25.63	4.8191E+11	3.4288E+12	3.9107E+12	4.6066E+11
		80%	99%	25.63	4.8191E+11	3.1305E+12	3.6124E+12	1.6237E+11
			80%	25.63	4.8191E+11	3.1305E+12	3.6124E+12	1.6236E+11
			50%	25.63	4.8191E+11	3.1305E+12	3.6124E+12	1.6233E+11
		50%	99%	25.63	4.8191E+11	2.9682E+12	3.4501E+12	4.2000E+07
			80%	25.63	4.8191E+11	2.9682E+12	3.4501E+12	2.8600E+07
▶			50%	25.63	4.8191E+11	2.9682E+12	3.4501E+12	0.0000E+00
	80%	99%	99%	24.67	6.2547E+11	3.3047E+12	3.9302E+12	3.3657E+11
			80%	24.67	6.2547E+11	3.3047E+12	3.9302E+12	3.3656E+11
			50%	24.67	6.2547E+11	3.3047E+12	3.9302E+12	3.3653E+11
		80%	99%	24.67	6.2547E+11	3.0096E+12	3.6351E+12	4.1473E+10
			80%	24.67	6.2547E+11	3.0096E+12	3.6351E+12	4.1459E+10
			50%	24.67	6.2547E+11	3.0096E+12	3.6351E+12	4.1431E+10
		50%	99%	24.67	6.2547E+11	2.8494E+12	3.4749E+12	-1.1874E+11
			80%	24.67	6.2547E+11	2.8494E+12	3.4749E+12	-1.1876E+11
			50%	24.67	6.2547E+11	2.8494E+12	3.4748E+12	-1.1879E+11
	50%	99%	99%	24.01	7.6458E+11	3.2462E+12	4.0108E+12	2.7806E+11
			80%	24.01	7.6459E+11	3.2462E+12	4.0108E+12	2.7805E+11
			50%	24.01	7.6459E+11	3.2462E+12	4.0108E+12	2.7802E+11
		80%	99%	24.01	7.6458E+11	2.9543E+12	3.7189E+12	-1.3837E+10
			80%	24.01	7.6459E+11	2.9543E+12	3.7189E+12	-1.3851E+10
			50%	24.01	7.6459E+11	2.9543E+12	3.7189E+12	-1.3879E+10
		50%	99%	24.01	7.6458E+11	2.7951E+12	3.5597E+12	-1.7309E+11
			80%	24.01	7.6459E+11	2.7951E+12	3.5596E+12	-1.7310E+11
			50%	24.01	7.6459E+11	2.7950E+12	3.5596E+12	-1.7313E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
53	99%	99%	99%	26.76	3.7759E+11	3.4760E+12	3.8536E+12	6.1138E+11
			80%	26.76	3.7759E+11	3.4760E+12	3.8536E+12	6.1137E+11
			50%	26.76	3.7759E+11	3.4759E+12	3.8535E+12	6.1134E+11
		80%	99%	26.76	3.7759E+11	3.1731E+12	3.5507E+12	3.0851E+11
			80%	26.76	3.7759E+11	3.1731E+12	3.5507E+12	3.0850E+11
			50%	26.76	3.7759E+11	3.1731E+12	3.5507E+12	3.0847E+11
		50%	99%	26.76	3.7759E+11	3.0060E+12	3.3835E+12	1.4134E+11
			80%	26.76	3.7759E+11	3.0059E+12	3.3835E+12	1.4133E+11
			50%	26.76	3.7759E+11	3.0059E+12	3.3835E+12	1.4130E+11
	80%	99%	99%	25.75	4.2909E+11	3.3296E+12	3.7587E+12	4.6502E+11
			80%	25.75	4.2909E+11	3.3296E+12	3.7587E+12	4.6501E+11
			50%	25.75	4.2909E+11	3.3296E+12	3.7587E+12	4.6498E+11
		80%	99%	25.75	4.2909E+11	3.0283E+12	3.4574E+12	1.6366E+11
			80%	25.75	4.2909E+11	3.0283E+12	3.4573E+12	1.6364E+11
			50%	25.75	4.2909E+11	3.0282E+12	3.4573E+12	1.6362E+11
		50%	99%	25.75	4.2909E+11	2.8646E+12	3.2937E+12	4.2500E+07
			80%	25.75	4.2909E+11	2.8646E+12	3.2937E+12	2.8600E+07
▶			50%	25.75	4.2909E+11	2.8646E+12	3.2937E+12	0.0000E+00
	50%	99%	99%	25.14	5.3142E+11	3.2618E+12	3.7932E+12	3.9716E+11
			80%	25.14	5.3142E+11	3.2618E+12	3.7932E+12	3.9715E+11
			50%	25.14	5.3142E+11	3.2617E+12	3.7931E+12	3.9712E+11
		80%	99%	25.14	5.3142E+11	2.9625E+12	3.4939E+12	9.7881E+10
			80%	25.14	5.3142E+11	2.9625E+12	3.4939E+12	9.7868E+10
			50%	25.14	5.3142E+11	2.9624E+12	3.4939E+12	9.7839E+10
		50%	99%	25.14	5.3142E+11	2.8003E+12	3.3317E+12	-6.4337E+10
			80%	25.14	5.3142E+11	2.8003E+12	3.3317E+12	-6.4350E+10
			50%	25.14	5.3142E+11	2.8002E+12	3.3316E+12	-6.4379E+10
55	99%	99%	99%	25.74	1.4334E+12	7.7068E+12	9.1403E+12	5.9585E+11
			80%	25.74	1.4334E+12	7.7068E+12	9.1402E+12	5.9581E+11
			50%	25.74	1.4334E+12	7.7067E+12	9.1402E+12	5.9573E+11
		80%	99%	25.74	1.4334E+12	7.1111E+12	8.5445E+12	1.1640E+08
			80%	25.74	1.4334E+12	7.1111E+12	8.5445E+12	7.9200E+07
▶			50%	25.74	1.4334E+12	7.1110E+12	8.5444E+12	0.0000E+00
		50%	99%	25.74	1.4334E+12	6.7876E+12	8.2210E+12	-3.2339E+11
			80%	25.74	1.4334E+12	6.7876E+12	8.2210E+12	-3.2342E+11
			50%	25.74	1.4334E+12	6.7875E+12	8.2209E+12	-3.2350E+11
	80%	99%	99%	24.94	1.9024E+12	7.5187E+12	9.4212E+12	4.0775E+11
			80%	24.94	1.9024E+12	7.5187E+12	9.4211E+12	4.0771E+11
			50%	24.94	1.9024E+12	7.5186E+12	9.4210E+12	4.0764E+11
		80%	99%	24.94	1.9024E+12	6.9292E+12	8.8316E+12	-1.8178E+11
			80%	24.94	1.9024E+12	6.9292E+12	8.8316E+12	-1.8182E+11
			50%	24.94	1.9024E+12	6.9291E+12	8.8315E+12	-1.8189E+11
		50%	99%	24.94	1.9024E+12	6.6013E+12	8.5037E+12	-5.0969E+11
			80%	24.94	1.9024E+12	6.6013E+12	8.5037E+12	-5.0972E+11
			50%	24.94	1.9024E+12	6.6012E+12	8.5036E+12	-5.0980E+11
	50%	99%	99%	24.47	2.3236E+12	7.4411E+12	9.7647E+12	3.3011E+11
			80%	24.47	2.3236E+12	7.4411E+12	9.7647E+12	3.3007E+11
			50%	24.47	2.3236E+12	7.4410E+12	9.7646E+12	3.2999E+11
		80%	99%	24.47	2.3236E+12	6.8581E+12	9.1817E+12	-2.5290E+11
			80%	24.47	2.3236E+12	6.8580E+12	9.1817E+12	-2.5294E+11
			50%	24.47	2.3236E+12	6.8580E+12	9.1816E+12	-2.5302E+11
		50%	99%	24.47	2.3236E+12	6.5278E+12	8.8515E+12	-5.8315E+11
			80%	24.47	2.3236E+12	6.5278E+12	8.8514E+12	-5.8319E+11
			50%	24.47	2.3236E+12	6.5277E+12	8.8513E+12	-5.8327E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
54	99%	99%	99%	27.85	1.4147E+13	8.8986E+12	2.3046E+13	2.8391E+12
			80%	27.85	1.4147E+13	8.8986E+12	2.3046E+13	2.8391E+12
			50%	27.85	1.4147E+13	8.8986E+12	2.3045E+13	2.8390E+12
		80%	99%	27.85	1.4147E+13	8.3637E+12	2.2511E+13	2.3041E+12
			80%	27.85	1.4147E+13	8.3636E+12	2.2511E+13	2.3041E+12
			50%	27.85	1.4147E+13	8.3636E+12	2.2510E+13	2.3040E+12
		50%	99%	27.85	1.4147E+13	8.0786E+12	2.2226E+13	2.0190E+12
			80%	27.85	1.4147E+13	8.0786E+12	2.2225E+13	2.0190E+12
			50%	27.85	1.4147E+13	8.0786E+12	2.2225E+13	2.0190E+12
	80%	99%	99%	26.89	1.1053E+13	7.6178E+12	1.8671E+13	1.5583E+12
			80%	26.89	1.1053E+13	7.6178E+12	1.8671E+13	1.5583E+12
			50%	26.89	1.1053E+13	7.6178E+12	1.8671E+13	1.5582E+12
		80%	99%	26.89	1.1053E+13	7.0948E+12	1.8148E+13	1.0352E+12
			80%	26.89	1.1053E+13	7.0948E+12	1.8148E+13	1.0352E+12
			50%	26.89	1.1053E+13	7.0947E+12	1.8148E+13	1.0352E+12
		50%	99%	26.89	1.1053E+13	6.8172E+12	1.7871E+13	7.5763E+11
			80%	26.89	1.1053E+13	6.8172E+12	1.7871E+13	7.5761E+11
			50%	26.89	1.1053E+13	6.8172E+12	1.7871E+13	7.5759E+11
	50%	99%	99%	26.20	9.1513E+12	6.8257E+12	1.5977E+13	7.6617E+11
			80%	26.20	9.1513E+12	6.8257E+12	1.5977E+13	7.6616E+11
			50%	26.20	9.1513E+12	6.8257E+12	1.5977E+13	7.6613E+11
		80%	99%	26.20	9.1513E+12	6.3456E+12	1.5497E+13	2.8599E+11
			80%	26.20	9.1513E+12	6.3456E+12	1.5497E+13	2.8598E+11
			50%	26.20	9.1513E+12	6.3455E+12	1.5497E+13	2.8595E+11
		50%	99%	26.20	9.1513E+12	6.0596E+12	1.5211E+13	4.1400E+07
			80%	26.20	9.1513E+12	6.0596E+12	1.5211E+13	2.8300E+07
▶			50%	26.20	9.1513E+12	6.0596E+12	1.5211E+13	0.0000E+00
56	99%	99%	99%	26.77	1.1167E+12	7.7243E+12	8.8411E+12	8.2218E+11
			80%	26.77	1.1167E+12	7.7243E+12	8.8410E+12	8.2214E+11
			50%	26.77	1.1167E+12	7.7242E+12	8.8410E+12	8.2206E+11
		80%	99%	26.77	1.1167E+12	7.1191E+12	8.2358E+12	2.1695E+11
			80%	26.77	1.1167E+12	7.1191E+12	8.2358E+12	2.1691E+11
			50%	26.77	1.1167E+12	7.1190E+12	8.2357E+12	2.1683E+11
		50%	99%	26.77	1.1167E+12	6.7948E+12	7.9115E+12	-1.0740E+11
			80%	26.77	1.1167E+12	6.7947E+12	7.9115E+12	-1.0744E+11
			50%	26.77	1.1167E+12	6.7946E+12	7.9114E+12	-1.0751E+11
	80%	99%	99%	25.98	1.3951E+12	7.4927E+12	8.8878E+12	5.9053E+11
			80%	25.98	1.3951E+12	7.4927E+12	8.8878E+12	5.9050E+11
			50%	25.98	1.3951E+12	7.4926E+12	8.8877E+12	5.9042E+11
		80%	99%	25.98	1.3951E+12	6.9023E+12	8.2974E+12	1.1750E+08
			80%	25.98	1.3951E+12	6.9022E+12	8.2974E+12	8.0800E+07
▶			50%	25.98	1.3951E+12	6.9022E+12	8.2973E+12	0.0000E+00
		50%	99%	25.98	1.3951E+12	6.5766E+12	7.9717E+12	-3.2558E+11
			80%	25.98	1.3951E+12	6.5765E+12	7.9717E+12	-3.2562E+11
			50%	25.98	1.3951E+12	6.5765E+12	7.9716E+12	-3.2570E+11
	50%	99%	99%	25.50	1.7585E+12	7.4049E+12	9.1634E+12	5.0276E+11
			80%	25.50	1.7585E+12	7.4049E+12	9.1634E+12	5.0272E+11
			50%	25.50	1.7585E+12	7.4048E+12	9.1633E+12	5.0264E+11
		80%	99%	25.50	1.7585E+12	6.8152E+12	8.5737E+12	-8.6929E+10
			80%	25.50	1.7585E+12	6.8152E+12	8.5737E+12	-8.6967E+10
			50%	25.50	1.7585E+12	6.8151E+12	8.5736E+12	-8.7046E+10
		50%	99%	25.50	1.7585E+12	6.4855E+12	8.2439E+12	-4.1671E+11
			80%	25.50	1.7585E+12	6.4854E+12	8.2439E+12	-4.1674E+11
			50%	25.50	1.7585E+12	6.4853E+12	8.2438E+12	-4.1682E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_s (J)	W_d (J)	W (J)	OPL
57	99%	99%	99%	27.22	1.0669E+12	7.7564E+12	8.8233E+12	9.4600E+11
			80%	27.22	1.0669E+12	7.7564E+12	8.8233E+12	9.4596E+11
			50%	27.22	1.0669E+12	7.7563E+12	8.8232E+12	9.4588E+11
		80%	99%	27.22	1.0669E+12	7.1483E+12	8.2152E+12	3.3785E+11
			80%	27.22	1.0669E+12	7.1482E+12	8.2151E+12	3.3782E+11
			50%	27.22	1.0669E+12	7.1481E+12	8.2151E+12	3.3774E+11
		50%	99%	27.22	1.0669E+12	6.8248E+12	7.8917E+12	1.4400E+10
			80%	27.22	1.0669E+12	6.8248E+12	7.8917E+12	1.4362E+10
			50%	27.22	1.0669E+12	6.8247E+12	7.8916E+12	1.4284E+10
	80%	99%	99%	26.43	1.2456E+12	7.5037E+12	8.7493E+12	6.9328E+11
			80%	26.43	1.2456E+12	7.5036E+12	8.7493E+12	6.9324E+11
			50%	26.43	1.2456E+12	7.5036E+12	8.7492E+12	6.9316E+11
		80%	99%	26.43	1.2456E+12	6.9082E+12	8.1538E+12	9.7819E+10
			80%	26.43	1.2456E+12	6.9082E+12	8.1538E+12	9.7782E+10
			50%	26.43	1.2456E+12	6.9081E+12	8.1537E+12	9.7702E+10
		50%	99%	26.43	1.2456E+12	6.5815E+12	7.8271E+12	-2.2887E+11
			80%	26.43	1.2456E+12	6.5815E+12	7.8271E+12	-2.2891E+11
			50%	26.43	1.2456E+12	6.5814E+12	7.8270E+12	-2.2899E+11
	50%	99%	99%	25.95	1.5525E+12	7.4032E+12	8.9557E+12	5.9279E+11
			80%	25.95	1.5525E+12	7.4032E+12	8.9557E+12	5.9275E+11
			50%	25.95	1.5525E+12	7.4031E+12	8.9556E+12	5.9267E+11
		80%	99%	25.95	1.5525E+12	6.8105E+12	8.3630E+12	1.1530E+08
			80%	25.95	1.5525E+12	6.8105E+12	8.3630E+12	7.8100E+07
▶			50%	25.95	1.5525E+12	6.8104E+12	8.3629E+12	0.0000E+00
		50%	99%	25.95	1.5525E+12	6.4826E+12	8.0351E+12	-3.2781E+11
			80%	25.95	1.5525E+12	6.4826E+12	8.0351E+12	-3.2785E+11
			50%	25.95	1.5525E+12	6.4825E+12	8.0350E+12	-3.2793E+11
59	99%	99%	99%	26.72	1.1586E+12	8.1442E+12	9.3028E+12	9.4329E+11
			80%	26.72	1.1586E+12	8.1442E+12	9.3028E+12	9.4326E+11
			50%	26.72	1.1586E+12	8.1441E+12	9.3027E+12	9.4318E+11
		80%	99%	26.72	1.1586E+12	7.4268E+12	8.5854E+12	2.2590E+11
			80%	26.72	1.1586E+12	7.4268E+12	8.5854E+12	2.2587E+11
			50%	26.72	1.1586E+12	7.4267E+12	8.5853E+12	2.2579E+11
		50%	99%	26.72	1.1586E+12	7.0508E+12	8.2094E+12	-1.5015E+11
			80%	26.72	1.1586E+12	7.0507E+12	8.2093E+12	-1.5019E+11
			50%	26.72	1.1586E+12	7.0506E+12	8.2093E+12	-1.5027E+11
	80%	99%	99%	25.79	1.4802E+12	7.8900E+12	9.3701E+12	6.8907E+11
			80%	25.79	1.4802E+12	7.8899E+12	9.3701E+12	6.8903E+11
			50%	25.79	1.4802E+12	7.8899E+12	9.3700E+12	6.8895E+11
		80%	99%	25.79	1.4802E+12	7.2010E+12	8.6812E+12	1.1530E+08
			80%	25.79	1.4802E+12	7.2010E+12	8.6811E+12	7.8600E+07
▶			50%	25.79	1.4802E+12	7.2009E+12	8.6811E+12	0.0000E+00
		50%	99%	25.79	1.4802E+12	6.8252E+12	8.3054E+12	-3.7571E+11
			80%	25.79	1.4802E+12	6.8252E+12	8.3053E+12	-3.7575E+11
			50%	25.79	1.4802E+12	6.8251E+12	8.3052E+12	-3.7583E+11
	50%	99%	99%	25.32	1.8297E+12	7.7849E+12	9.6146E+12	5.8401E+11
			80%	25.32	1.8297E+12	7.7849E+12	9.6146E+12	5.8398E+11
			50%	25.32	1.8297E+12	7.7848E+12	9.6145E+12	5.8390E+11
		80%	99%	25.32	1.8297E+12	7.1104E+12	8.9401E+12	-9.0516E+10
			80%	25.32	1.8297E+12	7.1104E+12	8.9401E+12	-9.0554E+10
			50%	25.32	1.8297E+12	7.1103E+12	8.9400E+12	-9.0633E+10
		50%	99%	25.32	1.8297E+12	6.7288E+12	8.5585E+12	-4.7209E+11
			80%	25.32	1.8297E+12	6.7288E+12	8.5585E+12	-4.7213E+11
			50%	25.32	1.8297E+12	6.7287E+12	8.5584E+12	-4.7221E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_s (J)	W_d (J)	W (J)	OPL
58	99%	99%	99%	25.76	1.4590E+12	8.1357E+12	9.5947E+12	7.1138E+11
			80%	25.76	1.4590E+12	8.1357E+12	9.5947E+12	7.1135E+11
			50%	25.76	1.4590E+12	8.1356E+12	9.5946E+12	7.1127E+11
		80%	99%	25.76	1.4590E+12	7.4244E+12	8.8834E+12	1.1580E+08
			80%	25.76	1.4590E+12	7.4244E+12	8.8834E+12	7.8100E+07
▶			50%	25.76	1.4590E+12	7.4243E+12	8.8833E+12	0.0000E+00
		50%	99%	25.76	1.4590E+12	7.0459E+12	8.5049E+12	-3.7843E+11
			80%	25.76	1.4590E+12	7.0459E+12	8.5048E+12	-3.7847E+11
			50%	25.76	1.4590E+12	7.0458E+12	8.5048E+12	-3.7855E+11
	80%	99%	99%	24.88	1.8929E+12	7.9104E+12	9.8033E+12	4.8603E+11
			80%	24.88	1.8929E+12	7.9103E+12	9.8032E+12	4.8599E+11
			50%	24.88	1.8929E+12	7.9102E+12	9.8031E+12	4.8591E+11
		80%	99%	24.88	1.8929E+12	7.2284E+12	9.1213E+12	-1.9592E+11
			80%	24.88	1.8929E+12	7.2284E+12	9.1213E+12	-1.9596E+11
			50%	24.88	1.8929E+12	7.2283E+12	9.1212E+12	-1.9604E+11
		50%	99%	24.88	1.8929E+12	6.8522E+12	8.7451E+12	-5.7217E+11
			80%	24.88	1.8929E+12	6.8521E+12	8.7450E+12	-5.7221E+11
			50%	24.88	1.8929E+12	6.8520E+12	8.7449E+12	-5.7229E+11
	50%	99%	99%	24.41	2.3148E+12	7.8271E+12	1.0142E+13	4.0273E+11
			80%	24.41	2.3148E+12	7.8270E+12	1.0142E+13	4.0269E+11
			50%	24.41	2.3148E+12	7.8269E+12	1.0142E+13	4.0261E+11
		80%	99%	24.41	2.3148E+12	7.1572E+12	9.4720E+12	-2.6710E+11
			80%	24.41	2.3148E+12	7.1572E+12	9.4720E+12	-2.6714E+11
			50%	24.41	2.3148E+12	7.1571E+12	9.4719E+12	-2.6722E+11
		50%	99%	24.41	2.3148E+12	6.7730E+12	9.0878E+12	-6.5135E+11
			80%	24.41	2.3148E+12	6.7729E+12	9.0877E+12	-6.5138E+11
			50%	24.41	2.3148E+12	6.7729E+12	9.0877E+12	-6.5146E+11
60	99%	99%	99%	26.58	1.2736E+12	8.9801E+12	1.0254E+13	1.6168E+12
			80%	26.58	1.2736E+12	8.9800E+12	1.0254E+13	1.6167E+12
			50%	26.58	1.2736E+12	8.9799E+12	1.0254E+13	1.6167E+12
		80%	99%	26.58	1.2736E+12	8.2686E+12	9.5423E+12	9.0536E+11
			80%	26.58	1.2736E+12	8.2686E+12	9.5422E+12	9.0532E+11
			50%	26.58	1.2736E+12	8.2685E+12	9.5422E+12	9.0524E+11
		50%	99%	26.58	1.2736E+12	7.8695E+12	9.1431E+12	5.0620E+11
			80%	26.58	1.2736E+12	7.8694E+12	9.1431E+12	5.0616E+11
			50%	26.58	1.2736E+12	7.8676E+12	9.1412E+12	5.0427E+11
	80%	99%	99%	25.72	1.6530E+12	8.3829E+12	1.0036E+13	1.0196E+12
			80%	25.72	1.6530E+12	8.3828E+12	1.0036E+13	1.0196E+12
			50%	25.72	1.6530E+12	8.3828E+12	1.0036E+13	1.0195E+12
		80%	99%	25.72	1.6530E+12	7.6576E+12	9.3106E+12	2.9430E+11
			80%	25.72	1.6530E+12	7.6575E+12	9.3106E+12	2.9426E+11
			50%	25.72	1.6530E+12	7.6575E+12	9.3105E+12	2.9418E+11
		50%	99%	25.72	1.6530E+12	7.2793E+12	8.9323E+12	-8.4030E+10
			80%	25.72	1.6530E+12	7.2792E+12	8.9322E+12	-8.4068E+10
			50%	25.72	1.6530E+12	7.2791E+12	8.9322E+12	-8.4147E+10
	50%	99%	99%	25.24	2.0407E+12	8.0517E+12	1.0092E+13	6.8840E+11
			80%	25.24	2.0407E+12	8.0516E+12	1.0092E+13	6.8836E+11
			50%	25.24	2.0407E+12	8.0516E+12	1.0092E+13	6.8829E+11
		80%	99%	25.24	2.0407E+12	7.3634E+12	9.4041E+12	1.1690E+08
			80%	25.24	2.0407E+12	7.2634E+12	9.4041E+12	7.9200E+07
▶			50%	25.24	2.0407E+12	7.3633E+12	9.4040E+12	0.0000E+00
		50%	99%	25.24	2.0407E+12	6.9980E+12	9.0387E+12	-3.6525E+11
			80%	25.24	2.0407E+12	6.9980E+12	9.0387E+12	-3.6529E+11
			50%	25.24	2.0407E+12	6.9979E+12	9.0386E+12	-3.6537E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
61	99%	99%	99%	25.42	1.3978E+12	7.8128E+12	9.2106E+12	5.9714E+11
			80%	25.42	1.3978E+12	7.8128E+12	9.2106E+12	5.9710E+11
			50%	25.42	1.3978E+12	7.8127E+12	9.2105E+12	5.9700E+11
		80%	99%	25.42	1.3978E+12	7.2158E+12	8.6136E+12	1.1690E+08
			80%	25.42	1.3978E+12	7.2158E+12	8.6136E+12	7.9700E+07
▶			50%	25.42	1.3978E+12	7.2157E+12	8.6135E+12	0.0000E+00
		50%	99%	25.42	1.3978E+12	6.8717E+12	8.2695E+12	-3.4397E+11
			80%	25.42	1.3978E+12	6.8717E+12	8.2695E+12	-3.4400E+11
			50%	25.42	1.3978E+12	6.8716E+12	8.2694E+12	-3.4408E+11
	80%	99%	99%	24.62	1.8826E+12	7.5939E+12	9.4765E+12	3.7823E+11
			80%	24.62	1.8826E+12	7.5939E+12	9.4764E+12	3.7819E+11
			50%	24.62	1.8826E+12	7.5938E+12	9.4764E+12	3.7812E+11
		80%	99%	24.62	1.8826E+12	7.0032E+12	8.8857E+12	-2.1249E+11
			80%	24.62	1.8826E+12	7.0032E+12	8.8857E+12	-2.1253E+11
			50%	24.62	1.8826E+12	7.0031E+12	8.8856E+12	-2.1261E+11
		50%	99%	24.62	1.8826E+12	6.6610E+12	8.5435E+12	-5.5473E+11
			80%	24.62	1.8826E+12	6.6609E+12	8.5435E+12	-5.5476E+11
			50%	24.62	1.8826E+12	6.6608E+12	8.5434E+12	-5.5484E+11
	50%	99%	99%	24.14	2.3092E+12	7.4983E+12	9.8075E+12	2.8264E+11
			80%	24.14	2.3092E+12	7.4983E+12	9.8075E+12	2.8261E+11
			50%	24.14	2.3092E+12	7.4982E+12	9.8074E+12	2.8253E+11
		80%	99%	24.14	2.3092E+12	6.9055E+12	9.2147E+12	-3.1018E+11
			80%	24.14	2.3092E+12	6.9055E+12	9.2147E+12	-3.1021E+11
			50%	24.14	2.3092E+12	6.9054E+12	9.2146E+12	-3.1029E+11
		50%	99%	24.14	2.3092E+12	6.5608E+12	8.8700E+12	-6.5491E+11
			80%	24.14	2.2092E+12	6.5607E+12	8.8699E+12	-6.5495E+11
			50%	24.14	2.3092E+12	6.5607E+12	8.8699E+12	-6.5503E+11
63	99%	99%	99%	27.25	1.0462E+12	7.9852E+12	9.0314E+12	1.1106E+12
			80%	27.25	1.0462E+12	7.9851E+12	9.0314E+12	1.1106E+12
			50%	27.25	1.0462E+12	7.9850E+12	9.0313E+12	1.1105E+12
		80%	99%	27.25	1.0462E+12	7.3438E+12	8.3901E+12	4.6929E+11
			80%	27.25	1.0462E+12	7.3438E+12	8.3900E+12	4.6925E+11
			50%	27.25	1.0462E+12	7.3437E+12	8.3900E+12	4.6917E+11
		50%	99%	27.25	1.0462E+12	6.9891E+12	8.0354E+12	1.1458E+11
			80%	27.25	1.0462E+12	6.9891E+12	8.0353E+12	1.1454E+11
			50%	27.25	1.0462E+12	6.9890E+12	8.0353E+12	1.1446E+11
	80%	99%	99%	26.46	1.1200E+12	7.6484E+12	8.7684E+12	7.7383E+11
			80%	26.46	1.1200E+12	7.6483E+12	8.7683E+12	7.7379E+11
			50%	26.46	1.1200E+12	7.6483E+12	8.7682E+12	7.7371E+11
		80%	99%	26.46	1.1200E+12	7.0261E+12	8.1460E+12	1.5150E+11
			80%	26.46	1.1200E+12	7.0260E+12	8.1460E+12	1.5146E+11
			50%	26.46	1.1200E+12	7.0259E+12	8.1459E+12	1.5138E+11
		50%	99%	26.46	1.1200E+12	6.6826E+12	7.8026E+12	-1.9197E+11
			80%	26.46	1.1200E+12	6.6825E+12	7.8025E+12	-1.9201E+11
			50%	26.46	1.1200E+12	6.6825E+12	7.8024E+12	-1.9208E+11
	50%	99%	99%	25.99	1.3034E+12	7.4875E+12	8.7909E+12	6.1296E+11
			80%	25.99	1.3034E+12	7.4875E+12	8.7908E+12	6.1293E+11
			50%	25.99	1.3034E+12	7.4874E+12	8.7908E+12	6.1285E+11
		80%	99%	25.99	1.3034E+12	6.8747E+12	8.1780E+12	1.1640E+08
			80%	25.99	1.3034E+12	6.8746E+12	8.1780E+12	7.9200E+07
▶			50%	25.99	1.3034E+12	6.8746E+12	8.1779E+12	0.0000E+00
		50%	99%	25.99	1.3034E+12	6.5302E+12	7.8336E+12	-3.4435E+11
			80%	25.99	1.3034E+12	6.5302E+12	7.8335E+12	-3.4439E+11
			50%	25.99	1.3034E+12	6.5301E+12	7.8334E+12	-3.4446E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
62	99%	99%	99%	26.77	1.0773E+12	7.8736E+12	8.9508E+12	9.0158E+11
			80%	26.77	1.0773E+12	7.8735E+12	8.9508E+12	9.0154E+11
			50%	26.77	1.0773E+12	7.8735E+12	8.9507E+12	9.0147E+11
		80%	99%	26.77	1.0773E+12	7.2549E+12	8.3322E+12	2.8290E+11
			80%	26.77	1.0773E+12	7.2549E+12	8.3321E+12	2.8286E+11
			50%	26.77	1.0773E+12	7.2548E+12	8.3320E+12	2.8278E+11
		50%	99%	26.77	1.0773E+12	6.9121E+12	7.9894E+12	-5.9887E+10
			80%	26.77	1.0773E+12	6.9121E+12	7.9893E+12	-5.9925E+10
			50%	26.77	1.0773E+12	6.9120E+12	7.9893E+12	-6.0004E+10
	80%	99%	99%	25.98	1.2570E+12	7.5806E+12	8.8376E+12	6.0864E+11
			80%	25.98	1.2570E+12	7.5806E+12	8.8376E+12	6.0860E+11
			50%	25.98	1.2570E+12	7.5805E+12	8.8375E+12	6.0852E+11
		80%	99%	25.98	1.2570E+12	6.9721E+12	8.2291E+12	1.1700E+08
			80%	25.98	1.2570E+12	6.9721E+12	8.2291E+12	7.9200E+07
▶			50%	25.98	1.2570E+12	6.9720E+12	8.2290E+12	0.0000E+00
		50%	99%	25.98	1.2570E+12	6.6316E+12	7.8886E+12	-3.4042E+11
			80%	25.98	1.2570E+12	6.6316E+12	7.8885E+12	-3.4045E+11
			50%	25.98	1.2570E+12	6.6315E+12	7.8884E+12	-3.4053E+11
	50%	99%	99%	25.50	1.5646E+12	7.4557E+12	9.0203E+12	4.8365E+11
			80%	25.50	1.5646E+12	7.4556E+12	9.0203E+12	4.8362E+11
			50%	25.50	1.5646E+12	7.4555E+12	9.0202E+12	4.8354E+11
		80%	99%	25.50	1.5646E+12	6.8508E+12	8.4154E+12	-1.2122E+11
			80%	25.50	1.5646E+12	6.8507E+12	8.4154E+12	-1.2126E+11
			50%	25.50	1.5646E+12	6.8507E+12	8.4153E+12	-1.2134E+11
		50%	99%	25.50	1.5646E+12	6.5089E+12	8.0735E+12	-4.6313E+11
			80%	25.50	1.5646E+12	6.5088E+12	8.0735E+12	-4.6316E+11
			50%	25.50	1.5646E+12	6.5088E+12	8.0734E+12	-4.6324E+11
64	99%	99%	99%	25.89	1.8260E+12	7.8741E+12	9.7001E+12	6.1166E+11
			80%	25.89	1.8260E+12	7.8741E+12	9.7001E+12	6.1162E+11
			50%	25.89	1.8260E+12	7.8740E+12	9.7000E+12	6.1154E+11
		80%	99%	25.89	1.8260E+12	7.2626E+12	9.0886E+12	1.1580E+08
			80%	25.89	1.8260E+12	7.2626E+12	9.0886E+12	7.8600E+07
▶			50%	25.89	1.8260E+12	7.2625E+12	9.0885E+12	0.0000E+00
		50%	99%	25.89	1.8260E+12	6.9266E+12	8.7526E+12	-3.3587E+11
			80%	25.89	1.8260E+12	6.9266E+12	8.7526E+12	-3.3591E+11
			50%	25.89	1.8260E+12	6.9265E+12	8.7525E+12	-3.3599E+11
	80%	99%	99%	24.93	2.3181E+12	7.6625E+12	9.9807E+12	4.0005E+11
			80%	24.93	2.3181E+12	7.6625E+12	9.9806E+12	4.0002E+11
			50%	24.93	2.3181E+12	7.6624E+12	9.9805E+12	3.9994E+11
		80%	99%	24.93	2.3181E+12	7.0639E+12	9.3820E+12	-1.9856E+11
			80%	24.93	2.3181E+12	7.0639E+12	9.3820E+12	-1.9860E+11
			50%	24.93	2.3181E+12	7.0638E+12	9.3819E+12	-1.9868E+11
		50%	99%	24.93	2.3181E+12	6.7373E+12	9.0554E+12	-5.2522E+11
			80%	24.93	2.3181E+12	6.7372E+12	9.0554E+12	-5.2525E+11
			50%	24.93	2.3181E+12	6.7371E+12	9.0553E+12	-5.2533E+11
	50%	99%	99%	24.25	2.6722E+12	7.5533E+12	1.0225E+13	2.9079E+11
			80%	24.25	2.6722E+12	7.5532E+12	1.0225E+13	2.9075E+11
			50%	24.25	2.6722E+12	7.5531E+12	1.0225E+13	2.9067E+11
		80%	99%	24.25	2.6722E+12	6.9625E+12	9.6348E+12	-2.9992E+11
			80%	24.25	2.6722E+12	6.9625E+12	9.6347E+12	-2.9996E+11
			50%	24.25	2.6722E+12	6.9624E+12	9.6346E+12	-3.0004E+11
		50%	99%	24.25	2.6722E+12	6.6283E+12	9.3006E+12	-6.3414E+11
			80%	24.25	2.6722E+12	6.6283E+12	9.3005E+12	-6.3417E+11
			50%	24.25	2.6722E+12	6.6282E+12	9.3004E+12	-6.3425E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
65	99%	99%	99%	26.68	1.4809E+12	7.8563E+12	9.3372E+12	8.3189E+11
			80%	26.68	1.4809E+12	7.8562E+12	9.3372E+12	8.3185E+11
			50%	26.68	1.4809E+12	7.8561E+12	9.3371E+12	8.3177E+11
		80%	99%	26.68	1.4809E+12	7.2337E+12	8.7146E+12	2.0932E+11
			80%	26.68	1.4809E+12	7.2337E+12	8.7146E+12	2.0929E+11
			50%	26.68	1.4809E+12	7.2336E+12	8.7145E+12	2.0921E+11
		50%	99%	26.68	1.4809E+12	6.9056E+12	8.3865E+12	-1.1882E+11
			80%	26.68	1.4809E+12	6.9055E+12	8.3864E+12	-1.1886E+11
			50%	26.68	1.4809E+12	6.9054E+12	8.3864E+12	-1.1894E+11
	80%	99%	99%	25.73	1.9168E+12	7.6257E+12	9.5425E+12	6.0136E+11
			80%	25.73	1.9168E+12	7.6257E+12	9.5425E+12	6.0132E+11
			50%	25.73	1.9168E+12	7.6256E+12	9.5424E+12	6.0125E+11
		80%	99%	25.73	1.9168E+12	7.0245E+12	8.9413E+12	1.1640E+08
			80%	25.73	1.9168E+12	7.0245E+12	8.9412E+12	7.9200E+07
			50%	25.73	1.9168E+12	7.0244E+12	8.9412E+12	0.0000E+00
		50%	99%	25.73	1.9168E+12	6.6965E+12	8.6133E+12	-3.2783E+11
			80%	25.73	1.9168E+12	6.6965E+12	8.6133E+12	-3.2787E+11
			50%	25.73	1.9168E+12	6.6964E+12	8.6132E+12	-3.2794E+11
	50%	99%	99%	25.04	2.3201E+12	7.5199E+12	9.8400E+12	4.9550E+11
			80%	25.04	2.3201E+12	7.5198E+12	9.8399E+12	4.9546E+11
			50%	25.04	2.3201E+12	7.5198E+12	9.8398E+12	4.9538E+11
		80%	99%	25.04	2.3201E+12	6.9349E+12	9.2550E+12	-8.9441E+10
			80%	25.04	2.3201E+12	6.9349E+12	9.2550E+12	-8.9479E+10
			50%	25.04	2.3201E+12	6.9348E+12	9.2549E+12	-8.9558E+10
		50%	99%	25.04	2.3201E+12	6.6054E+12	8.9255E+12	-4.1897E+11
			80%	25.04	2.3201E+12	6.6054E+12	8.9255E+12	-4.1901E+11
			50%	25.04	2.3201E+12	6.6053E+12	8.9254E+12	-4.1909E+11
67	99%	99%	99%	25.94	1.6115E+12	8.3770E+12	9.9885E+12	7.2165E+11
			80%	25.94	1.6115E+12	8.3770E+12	9.9885E+12	7.2162E+11
			50%	25.94	1.6115E+12	8.3769E+12	9.9884E+12	7.2154E+11
		80%	99%	25.94	1.6115E+12	7.6555E+12	9.2670E+12	1.1640E+08
			80%	25.94	1.6115E+12	7.6554E+12	9.2669E+12	7.8100E+07
			50%	25.94	1.6115E+12	7.6553E+12	9.2668E+12	0.0000E+00
		50%	99%	25.94	1.6115E+12	7.2585E+12	8.8701E+12	-3.9679E+11
			80%	25.94	1.6115E+12	7.2585E+12	8.8700E+12	-3.9683E+11
			50%	25.94	1.6115E+12	7.2584E+12	8.8699E+12	-3.9691E+11
	80%	99%	99%	24.99	2.0765E+12	8.1074E+12	1.0184E+13	4.5210E+11
			80%	24.99	2.0765E+12	8.1074E+12	1.0184E+13	4.5206E+11
			50%	24.99	2.0765E+12	8.1073E+12	1.0184E+13	4.5198E+11
		80%	99%	24.99	2.0765E+12	7.3884E+12	9.4650E+12	-2.6690E+11
			80%	24.99	2.0765E+12	7.3884E+12	9.4649E+12	-2.6693E+11
			50%	24.99	2.0765E+12	7.3883E+12	9.4649E+12	-2.6701E+11
		50%	99%	24.99	2.0765E+12	7.0127E+12	9.0893E+12	-6.4262E+11
			80%	24.99	2.0765E+12	7.0127E+12	9.0892E+12	-6.4266E+11
			50%	24.99	2.0765E+12	7.0126E+12	9.0891E+12	-6.4274E+11
	50%	99%	99%	24.30	2.4719E+12	7.9678E+12	1.0440E+13	3.1244E+11
			80%	24.30	2.4719E+12	7.9677E+12	1.0440E+13	3.1240E+11
			50%	24.30	2.4719E+12	7.9677E+12	1.0440E+13	3.1232E+11
		80%	99%	24.30	2.4719E+12	7.2740E+12	9.7459E+12	-3.8133E+11
			80%	24.30	2.4719E+12	7.2740E+12	9.7459E+12	-3.8137E+11
			50%	24.30	2.4719E+12	7.2739E+12	9.7458E+12	-3.8145E+11
		50%	99%	24.30	2.4719E+12	6.9012E+12	9.3731E+12	-7.5414E+11
			80%	24.30	2.4719E+12	6.9012E+12	9.3731E+12	-7.5417E+11
			50%	24.30	2.4719E+12	6.9011E+12	9.3730E+12	-7.5425E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
66	99%	99%	99%	27.39	1.2450E+12	7.8340E+12	9.0790E+12	9.2077E+11
			80%	27.39	1.2450E+12	7.8340E+12	9.0790E+12	9.2073E+11
			50%	27.39	1.2450E+12	7.8339E+12	9.0789E+12	9.2065E+11
		80%	99%	27.39	1.2450E+12	7.2134E+12	8.4584E+12	3.0016E+11
			80%	27.39	1.2450E+12	7.2133E+12	8.4583E+12	3.0012E+11
			50%	27.39	1.2450E+12	7.2133E+12	8.4583E+12	3.0004E+11
		50%	99%	27.39	1.2450E+12	6.8848E+12	8.1298E+12	-2.8422E+10
			80%	27.39	1.2450E+12	6.8848E+12	8.1298E+12	-2.8459E+10
			50%	27.39	1.2450E+12	6.8847E+12	8.1297E+12	-2.8538E+10
	80%	99%	99%	26.43	1.6142E+12	7.6018E+12	9.2160E+12	6.8855E+11
			80%	26.43	1.6142E+12	7.6017E+12	9.2159E+12	6.8851E+11
			50%	26.43	1.6142E+12	7.6016E+12	9.2158E+12	6.8843E+11
		80%	99%	26.43	1.6142E+12	7.0030E+12	8.6171E+12	8.9735E+10
			80%	26.43	1.6142E+12	7.0029E+12	8.6171E+12	8.9698E+10
			50%	26.43	1.6142E+12	7.0028E+12	8.6170E+12	8.9619E+10
		50%	99%	26.43	1.6142E+12	6.6738E+12	8.2880E+12	-2.3939E+11
			80%	26.43	1.6142E+12	6.6738E+12	8.2880E+12	-2.3943E+11
			50%	26.43	1.6142E+12	6.6737E+12	8.2879E+12	-2.3950E+11
	50%	99%	99%	25.75	1.9905E+12	7.4995E+12	9.4900E+12	5.8627E+11
			80%	25.75	1.9905E+12	7.4994E+12	9.4900E+12	5.8623E+11
			50%	25.75	1.9905E+12	7.4994E+12	9.4899E+12	5.8615E+11
		80%	99%	25.75	1.9905E+12	6.9133E+12	8.9039E+12	1.1640E+08
			80%	25.75	1.9905E+12	6.9133E+12	8.9038E+12	8.0200E+07
			50%	25.75	1.9905E+12	6.9132E+12	8.9038E+12	0.0000E+00
		50%	99%	25.75	1.9905E+12	6.5827E+12	8.5732E+12	-3.3054E+11
			80%	25.75	1.9905E+12	6.5826E+12	8.5732E+12	-3.3057E+11
			50%	25.75	1.9905E+12	6.5826E+12	8.5731E+12	-3.3065E+11
68	99%	99%	99%	26.57	1.3195E+12	8.4326E+12	9.7521E+12	1.0486E+12
			80%	26.57	1.3195E+12	8.4325E+12	9.7521E+12	1.0486E+12
			50%	26.57	1.3195E+12	8.4324E+12	9.7520E+12	1.0485E+12
		80%	99%	26.57	1.3195E+12	7.6675E+12	8.9870E+12	2.8351E+11
			80%	26.57	1.3195E+12	7.6674E+12	8.9870E+12	2.8347E+11
			50%	26.57	1.3195E+12	7.6674E+12	8.9869E+12	2.8339E+11
		50%	99%	26.57	1.3195E+12	7.2634E+12	8.5830E+12	-1.2054E+11
			80%	26.57	1.3195E+12	7.2634E+12	8.5829E+12	-1.2057E+11
			50%	26.57	1.3195E+12	7.2633E+12	8.5829E+12	-1.2065E+11
	80%	99%	99%	25.61	1.7109E+12	8.1021E+12	9.8130E+12	7.1815E+11
			80%	25.61	1.7109E+12	8.1021E+12	9.8130E+12	7.1811E+11
			50%	25.61	1.7109E+12	8.1020E+12	9.8129E+12	7.1803E+11
		80%	99%	25.61	1.7109E+12	7.3841E+12	9.0950E+12	1.1640E+08
			80%	25.61	1.7109E+12	7.3840E+12	9.0950E+12	7.8700E+07
			50%	25.61	1.7109E+12	7.3840E+12	9.0949E+12	0.0000E+00
		50%	99%	25.61	1.7109E+12	6.9986E+12	8.7095E+12	-3.8542E+11
			80%	25.61	1.7109E+12	6.9985E+12	8.7094E+12	-3.8546E+11
			50%	25.61	1.7109E+12	6.9984E+12	8.7093E+12	-3.8553E+11
	50%	99%	99%	24.93	2.0988E+12	7.9773E+12	1.0076E+13	5.9336E+11
			80%	24.93	2.0988E+12	7.9773E+12	1.0076E+13	5.9333E+11
			50%	24.93	2.0988E+12	7.9772E+12	1.0076E+13	5.9325E+11
		80%	99%	24.93	2.0988E+12	7.2662E+12	9.3649E+12	-1.1780E+11
			80%	24.93	2.0988E+12	7.2661E+12	9.3649E+12	-1.1783E+11
			50%	24.93	2.0988E+12	7.2661E+12	9.3648E+12	-1.1791E+11
		50%	99%	24.93	2.0988E+12	6.8859E+12	8.9847E+12	-4.9806E+11
			80%	24.93	2.0988E+12	6.8859E+12	8.9846E+12	-4.9809E+11
			50%	24.93	2.0988E+12	6.8858E+12	8.9846E+12	-4.9817E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
69	99%	99%	99%	27.61	1.0764E+12	8.4861E+12	9.5624E+12	1.2241E+12
			80%	27.61	1.0764E+12	8.4860E+12	9.5624E+12	1.2240E+12
			50%	27.61	1.0764E+12	8.4860E+12	9.5623E+12	1.2239E+12
		80%	99%	27.61	1.0764E+12	7.7192E+12	8.7955E+12	4.5714E+11
			80%	27.61	1.0764E+12	7.7191E+12	8.7955E+12	4.5711E+11
			50%	27.61	1.0764E+12	7.7190E+12	8.7954E+12	4.5703E+11
		50%	99%	27.61	1.0764E+12	7.3218E+12	8.3981E+12	5.9756E+10
			80%	27.61	1.0764E+12	7.3217E+12	8.3981E+12	5.9718E+10
			50%	27.61	1.0764E+12	7.3216E+12	8.3980E+12	5.9639E+10
	80%	99%	99%	26.66	1.3084E+12	8.1269E+12	9.4353E+12	8.6494E+11
			80%	26.66	1.3084E+12	8.1269E+12	9.4353E+12	8.6490E+11
			50%	26.66	1.3084E+12	8.1268E+12	9.4352E+12	8.6482E+11
		80%	99%	26.66	1.3084E+12	7.3969E+12	8.7053E+12	1.3491E+11
			80%	26.66	1.3084E+12	7.3969E+12	8.7053E+12	1.3488E+11
			50%	26.66	1.3084E+12	7.3968E+12	8.7052E+12	1.3480E+11
		50%	99%	26.66	1.3084E+12	7.0074E+12	8.3158E+12	-2.5464E+11
			80%	26.66	1.3084E+12	7.0073E+12	8.3157E+12	-2.5468E+11
			50%	26.66	1.3084E+12	7.0072E+12	8.3156E+12	-2.5476E+11
	50%	99%	99%	25.97	1.6190E+12	7.9709E+12	9.5899E+12	7.0890E+11
			80%	25.97	1.6190E+12	7.9709E+12	9.5898E+12	7.0886E+11
			50%	25.97	1.6190E+12	7.9708E+12	9.5897E+12	7.0878E+11
		80%	99%	25.97	1.6190E+12	7.2621E+12	8.8811E+12	1.1740E+08
			80%	25.97	1.6190E+12	7.2621E+12	8.8810E+12	7.9700E+07
▶			50%	25.97	1.6190E+12	7.2620E+12	8.8810E+12	0.0000E+00
		50%	99%	25.97	1.6190E+12	6.8755E+12	8.4944E+12	-3.8652E+11
			80%	25.97	1.6190E+12	6.8755E+12	8.4944E+12	-3.8656E+11
			50%	25.97	1.6190E+12	6.8754E+12	8.4943E+12	-3.8664E+11
71	99%	99%	99%	26.65	1.2930E+12	8.0607E+12	9.3537E+12	9.0369E+11
			80%	26.65	1.2930E+12	8.0606E+12	9.3537E+12	9.0365E+11
			50%	26.65	1.2930E+12	8.0606E+12	9.3536E+12	9.0357E+11
		80%	99%	26.65	1.2930E+12	7.4081E+12	8.7012E+12	2.5115E+11
			80%	26.65	1.2930E+12	7.4081E+12	8.7011E+12	2.5111E+11
			50%	26.65	1.2930E+12	7.4080E+12	8.7010E+12	2.5103E+11
		50%	99%	26.65	1.2930E+12	7.0379E+12	8.3309E+12	-1.1908E+11
			80%	26.65	1.2930E+12	7.0379E+12	8.3309E+12	-1.1911E+11
			50%	26.65	1.2930E+12	7.0378E+12	8.3308E+12	-1.1919E+11
	80%	99%	99%	25.64	1.6776E+12	7.7936E+12	9.4711E+12	6.3657E+11
			80%	25.64	1.6776E+12	7.7935E+12	9.4711E+12	6.3653E+11
			50%	25.64	1.6776E+12	7.7934E+12	9.4710E+12	6.3645E+11
		80%	99%	25.64	1.6776E+12	7.1571E+12	8.8347E+12	1.1640E+08
			80%	25.64	1.6776E+12	7.1571E+12	8.8346E+12	7.9200E+07
▶			50%	25.64	1.6776E+12	7.1570E+12	8.8345E+12	0.0000E+00
		50%	99%	25.64	1.6776E+12	6.7999E+12	8.4774E+12	-3.5713E+11
			80%	25.64	1.6776E+12	6.7998E+12	8.4774E+12	-3.5717E+11
			50%	25.64	1.6776E+12	6.7997E+12	8.4773E+12	-3.5725E+11
	50%	99%	99%	25.04	2.0595E+12	7.6788E+12	9.7383E+12	5.2178E+11
			80%	25.04	2.0595E+12	7.6787E+12	9.7383E+12	5.2175E+11
			50%	25.04	2.0595E+12	7.6787E+12	9.7382E+12	5.2167E+11
		80%	99%	25.04	2.0595E+12	7.0530E+12	9.1125E+12	-1.0398E+11
			80%	25.04	2.0595E+12	7.0530E+12	9.1125E+12	-1.0402E+11
			50%	25.04	2.0595E+12	7.0529E+12	9.1124E+12	-1.0410E+11
		50%	99%	25.04	2.0595E+12	6.6950E+12	8.7546E+12	-4.6195E+11
			80%	25.04	2.0595E+12	6.6950E+12	8.7545E+12	-4.6199E+11
			50%	25.04	2.0595E+12	6.6949E+12	8.7545E+12	-4.6207E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
70	99%	99%	99%	25.85	1.5681E+12	8.0743E+12	9.6425E+12	6.5636E+11
			80%	25.85	1.5681E+12	8.0743E+12	9.6424E+12	6.5632E+11
			50%	25.85	1.5681E+12	8.0742E+12	9.6423E+12	6.5624E+11
		80%	99%	25.85	1.5681E+12	7.4181E+12	8.9862E+12	1.1690E+08
			80%	25.85	1.5681E+12	7.4180E+12	8.9862E+12	7.8700E+07
▶			50%	25.85	1.5681E+12	7.4180E+12	8.9861E+12	0.0000E+00
		50%	99%	25.85	1.5681E+12	7.0530E+12	8.6212E+12	-3.6491E+11
			80%	25.85	1.5681E+12	7.0530E+12	8.6211E+12	-3.6495E+11
			50%	25.85	1.5681E+12	7.0529E+12	8.6211E+12	-3.6503E+11
	80%	99%	99%	24.87	2.0253E+12	7.8238E+12	9.8492E+12	4.0589E+11
			80%	24.87	2.0253E+12	7.8238E+12	9.8491E+12	4.0586E+11
			50%	24.87	2.0253E+12	7.8237E+12	9.8491E+12	4.0578E+11
		80%	99%	24.87	2.0253E+12	7.1816E+12	9.2069E+12	-2.3639E+11
			80%	24.87	2.0253E+12	7.1815E+12	9.2069E+12	-2.3643E+11
			50%	24.87	2.0253E+12	7.1814E+12	9.2068E+12	-2.3651E+11
		50%	99%	24.87	2.0253E+12	6.8280E+12	8.8533E+12	-5.8995E+11
			80%	24.87	2.0253E+12	6.8280E+12	8.8533E+12	-5.8999E+11
			50%	24.87	2.0253E+12	6.8279E+12	8.8532E+12	-5.9007E+11
	50%	99%	99%	24.23	2.4225E+12	7.7104E+12	1.0133E+13	2.9246E+11
			80%	24.23	2.4225E+12	7.7104E+12	1.0133E+13	2.9242E+11
			50%	24.23	2.4225E+12	7.7103E+12	1.0133E+13	2.9234E+11
		80%	99%	24.23	2.4225E+12	7.0814E+12	9.5040E+12	-3.3651E+11
			80%	24.23	2.4225E+12	7.0814E+12	9.5040E+12	-3.3655E+11
			50%	24.23	2.4225E+12	7.0813E+12	9.5039E+12	-3.3663E+11
		50%	99%	24.23	2.4225E+12	6.7254E+12	9.1480E+12	-6.9251E+11
			80%	24.23	2.4225E+12	6.7254E+12	9.1480E+12	-6.9255E+11
			50%	24.23	2.4225E+12	6.7253E+12	9.1479E+12	-6.9263E+11
72	99%	99%	99%	26.94	1.1790E+12	8.0719E+12	9.2509E+12	1.0190E+12
			80%	26.94	1.1790E+12	8.0718E+12	9.2508E+12	1.0189E+12
			50%	26.94	1.1790E+12	8.0717E+12	9.2508E+12	1.0189E+12
		80%	99%	26.94	1.1790E+12	7.4105E+12	8.5896E+12	3.5765E+11
			80%	26.94	1.1790E+12	7.4105E+12	8.5895E+12	3.5762E+11
			50%	26.94	1.1790E+12	7.4104E+12	8.5894E+12	3.5754E+11
		50%	99%	26.94	1.1790E+12	7.0313E+12	8.2103E+12	-2.1571E+10
			80%	26.94	1.1790E+12	7.0313E+12	8.2103E+12	-2.1609E+10
			50%	26.94	1.1790E+12	7.0312E+12	8.2102E+12	-2.1688E+10
	80%	99%	99%	25.92	1.5173E+12	7.7905E+12	9.3077E+12	7.3757E+11
			80%	25.92	1.5173E+12	7.7904E+12	9.3077E+12	7.3753E+11
			50%	25.92	1.5173E+12	7.7903E+12	9.3076E+12	7.3745E+11
		80%	99%	25.92	1.5173E+12	7.1539E+12	8.6712E+12	1.0103E+11
			80%	25.92	1.5173E+12	7.1539E+12	8.6711E+12	1.0099E+11
			50%	25.92	1.5173E+12	7.1538E+12	8.6711E+12	1.0091E+11
		50%	99%	25.92	1.5173E+12	6.7959E+12	8.3131E+12	-2.5701E+11
			80%	25.92	1.5173E+12	6.7958E+12	8.3131E+12	-2.5705E+11
			50%	25.92	1.5173E+12	6.7958E+12	8.3130E+12	-2.5713E+11
	50%	99%	99%	25.32	1.8816E+12	7.6854E+12	9.5669E+12	6.3247E+11
			80%	25.32	1.8816E+12	7.6853E+12	9.5669E+12	6.3243E+11
			50%	25.32	1.8816E+12	7.6852E+12	9.5668E+12	6.3235E+11
		80%	99%	25.32	1.8816E+12	7.0530E+12	8.9346E+12	1.1690E+08
			80%	25.32	1.8816E+12	7.0530E+12	8.9345E+12	7.9700E+07
▶			50%	25.32	1.8816E+12	7.0529E+12	8.9345E+12	0.0000E+00
		50%	99%	25.32	1.8816E+12	6.6888E+12	8.5704E+12	-3.6409E+11
			80%	25.32	1.8816E+12	6.6888E+12	8.5703E+12	-3.6413E+11
			50%	25.32	1.8816E+12	6.6887E+12	8.5702E+12	-3.6421E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
73	99%	99%	99%	25.75	9.5728E+12	2.8198E+13	3.7771E+13	1.8370E+12
			80%	25.75	9.5728E+12	2.8198E+13	3.7771E+13	1.8369E+12
			50%	25.75	9.5728E+12	2.8198E+13	3.7770E+13	1.8365E+12
		80%	99%	25.75	9.5728E+12	2.6363E+13	3.5936E+13	2.2160E+09
			80%	25.75	9.5728E+12	2.6361E+13	3.5934E+13	3.1600E+08
►			50%	25.75	9.5728E+12	2.6361E+13	3.5934E+13	0.0000E+00
		50%	99%	25.75	9.5728E+12	2.5362E+13	3.4934E+13	-9.9945E+11
			80%	25.75	9.5728E+12	2.5361E+13	3.4934E+13	-9.9960E+11
			50%	25.75	9.5728E+12	2.5361E+13	3.4934E+13	-9.9992E+11
	80%	99%	99%	24.95	1.1275E+13	2.7657E+13	3.8933E+13	1.2964E+12
			80%	24.95	1.1275E+13	2.7657E+13	3.8933E+13	1.2963E+12
			50%	24.95	1.1275E+13	2.7657E+13	3.8932E+13	1.2960E+12
		80%	99%	24.95	1.1275E+13	2.5823E+13	3.7098E+13	-5.3811E+11
			80%	24.95	1.1275E+13	2.5823E+13	3.7098E+13	-5.3826E+11
			50%	24.95	1.1275E+13	2.5822E+13	3.7098E+13	-5.3858E+11
		50%	99%	24.95	1.1275E+13	2.4836E+13	3.6112E+13	-1.5248E+12
			80%	24.95	1.1275E+13	2.4836E+13	3.6112E+13	-1.5249E+12
			50%	24.95	1.1275E+13	2.4836E+13	3.6111E+13	-1.5252E+12
	50%	99%	99%	24.47	1.2305E+13	2.7357E+13	3.9663E+13	9.9643E+11
			80%	24.47	1.2305E+13	2.7357E+13	3.9662E+13	9.9629E+11
			50%	24.47	1.2305E+13	2.7357E+13	3.9662E+13	9.9597E+11
		80%	99%	24.47	1.2305E+13	2.5531E+13	3.7836E+13	-8.3047E+11
			80%	24.47	1.2305E+13	2.5530E+13	3.7836E+13	-8.3062E+11
			50%	24.47	1.2305E+13	2.5530E+13	3.7835E+13	-8.3093E+11
		50%	99%	24.47	1.2305E+13	2.4536E+13	3.6841E+13	-1.8252E+12
			80%	24.47	1.2305E+13	2.4536E+13	3.6841E+13	-1.8254E+12
			50%	24.47	1.2305E+13	2.4535E+13	3.6841E+13	-1.8257E+12
75	99%	99%	99%	27.00	7.1401E+12	2.7945E+13	3.5085E+13	2.5427E+12
			80%	27.00	7.1401E+12	2.7945E+13	3.5085E+13	2.5426E+12
			50%	27.00	7.1401E+12	2.7945E+13	3.5085E+13	2.5422E+12
		80%	99%	27.00	7.1401E+12	2.6100E+13	3.3240E+13	6.9806E+11
			80%	27.00	7.1401E+12	2.6100E+13	3.3240E+13	6.9791E+11
			50%	27.00	7.1401E+12	2.6100E+13	3.3240E+13	6.9759E+11
		50%	99%	27.00	7.1401E+12	2.5114E+13	3.2255E+13	-2.8783E+11
			80%	27.00	7.1401E+12	2.5114E+13	3.2254E+13	-2.8799E+11
			50%	27.00	7.1401E+12	2.5114E+13	3.2254E+13	-2.8830E+11
	80%	99%	99%	26.20	9.2381E+12	2.7465E+13	3.6703E+13	2.0623E+12
			80%	26.20	9.2381E+12	2.7464E+13	3.6703E+13	2.0621E+12
			50%	26.20	9.2381E+12	2.7462E+13	3.6700E+13	2.0600E+12
		80%	99%	26.20	9.2381E+12	2.5631E+13	3.4870E+13	2.2909E+11
			80%	26.20	9.2381E+12	2.5631E+13	3.4869E+13	2.2894E+11
			50%	26.20	9.2381E+12	2.5631E+13	3.4869E+13	2.2862E+11
		50%	99%	26.20	9.2381E+12	2.4641E+13	3.3879E+13	-7.6133E+11
			80%	26.20	9.2381E+12	2.4641E+13	3.3879E+13	-7.6148E+11
			50%	26.20	9.2381E+12	2.4641E+13	3.3879E+13	-7.6179E+11
	50%	99%	99%	25.72	1.0676E+13	2.7223E+13	3.7899E+13	1.8211E+12
			80%	25.72	1.0676E+13	2.7223E+13	3.7899E+13	1.8209E+12
			50%	25.72	1.0676E+13	2.7223E+13	3.7899E+13	1.8206E+12
		80%	99%	25.72	1.0676E+13	2.5403E+13	3.6079E+13	4.6600E+08
			80%	25.72	1.0676E+13	2.5403E+13	3.6079E+13	3.1900E+08
►			50%	25.72	1.0676E+13	2.5402E+13	3.6078E+13	0.0000E+00
		50%	99%	25.72	1.0676E+13	2.4400E+13	3.5076E+13	-1.0023E+12
			80%	25.72	1.0676E+13	2.4400E+13	3.5076E+13	-1.0024E+12
			50%	25.72	1.0676E+13	2.4400E+13	3.5076E+13	-1.0028E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
74	99%	99%	99%	26.89	7.6078E+12	2.7881E+13	3.5488E+13	2.2790E+12
			80%	26.89	7.6078E+12	2.7880E+13	3.5488E+13	2.2788E+12
			50%	26.89	7.6078E+12	2.7880E+13	3.5488E+13	2.2785E+12
		80%	99%	26.89	7.6078E+12	2.6055E+13	3.3663E+13	4.5360E+11
			80%	26.89	7.6078E+12	2.6055E+13	3.3663E+13	4.5345E+11
			50%	26.89	7.6078E+12	2.6055E+13	3.3663E+13	4.5313E+11
		50%	99%	26.89	7.6078E+12	2.5082E+13	3.2690E+13	-5.1952E+11
			80%	26.89	7.6078E+12	2.5082E+13	3.2690E+13	-5.1967E+11
			50%	26.89	7.6078E+12	2.5080E+13	3.2688E+13	-5.2162E+11
	80%	99%	99%	26.00	9.7090E+12	2.7413E+13	3.7122E+13	1.8115E+12
			80%	26.00	9.7090E+12	2.7413E+13	3.7122E+13	1.8113E+12
			50%	26.00	9.7090E+12	2.7413E+13	3.7122E+13	1.8110E+12
		80%	99%	26.00	9.7090E+12	2.5602E+13	3.5311E+13	4.6300E+08
			80%	26.00	9.7090E+12	2.5602E+13	3.5311E+13	3.1700E+08
►			50%	26.00	9.7090E+12	2.5602E+13	3.5311E+13	0.0000E+00
		50%	99%	26.00	9.7090E+12	2.4614E+13	3.4323E+13	-9.8779E+11
			80%	26.00	9.7090E+12	2.4614E+13	3.4323E+13	-9.8795E+11
			50%	26.00	9.7090E+12	2.4613E+13	3.4322E+13	-9.8826E+11
	50%	99%	99%	25.53	1.1052E+13	2.7165E+13	3.8218E+13	1.5636E+12
			80%	25.53	1.1052E+13	2.7165E+13	3.8218E+13	1.5635E+12
			50%	25.53	1.1052E+13	2.7165E+13	3.8217E+13	1.5632E+12
		80%	99%	25.53	1.1052E+13	2.5354E+13	3.6407E+13	-2.4751E+11
			80%	25.53	1.1052E+13	2.5354E+13	3.6406E+13	-2.4767E+11
			50%	25.53	1.1052E+13	2.5354E+13	3.6406E+13	-2.4798E+11
		50%	99%	25.53	1.1052E+13	2.4371E+13	3.5423E+13	-1.2310E+12
			80%	25.53	1.1052E+13	2.4371E+13	3.5423E+13	-1.2312E+12
			50%	25.53	1.1052E+13	2.4370E+13	3.5423E+13	-1.2315E+12
76	99%	99%	99%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8646E+12
			80%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8644E+12
			50%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8641E+12
		80%	99%	25.39	1.1071E+13	2.6893E+13	3.7964E+13	2.1030E+09
			80%	25.39	1.1071E+13	2.6891E+13	3.7962E+13	3.1900E+08
►			50%	25.39	1.1071E+13	2.6891E+13	3.7962E+13	0.0000E+00
		50%	99%	25.39	1.1071E+13	2.5867E+13	3.6938E+13	-1.0240E+12
			80%	25.39	1.1071E+13	2.5866E+13	3.6937E+13	-1.0242E+12
			50%	25.39	1.1071E+13	2.5866E+13	3.6937E+13	-1.0245E+12
	80%	99%	99%	24.59	1.2403E+13	2.8068E+13	4.0472E+13	1.1778E+12
			80%	24.59	1.2403E+13	2.8068E+13	4.0472E+13	1.1776E+12
			50%	24.59	1.2403E+13	2.8068E+13	4.0471E+13	1.1773E+12
		80%	99%	24.59	1.3403E+13	2.6202E+13	3.8606E+13	-6.8812E+11
			80%	24.59	1.2403E+13	2.6202E+13	3.8606E+13	-6.8827E+11
			50%	24.59	1.2403E+13	2.6202E+13	3.8605E+13	-6.8859E+11
		50%	99%	24.59	1.2403E+13	2.5190E+13	3.7593E+13	-1.7009E+12
			80%	24.59	1.3403E+13	2.5190E+13	3.7593E+13	-1.7011E+12
			50%	24.59	1.2403E+13	2.5189E+13	3.7593E+13	-1.7014E+12
	50%	99%	99%	24.11	1.3207E+13	2.7667E+13	4.0874E+13	7.7662E+11
			80%	24.11	1.3207E+13	2.7667E+13	4.0874E+13	7.7647E+11
			50%	24.11	1.3207E+13	2.7667E+13	4.0873E+13	7.7615E+11
		80%	99%	24.11	1.3207E+13	2.5806E+13	3.9013E+13	-1.0848E+12
			80%	24.11	1.3207E+13	2.5806E+13	3.9012E+13	-1.0849E+12
			50%	24.11	1.3207E+13	2.5804E+13	3.9010E+13	-1.0871E+12
		50%	99%	24.11	1.3207E+13	2.4799E+13	3.8006E+13	-2.0917E+12
			80%	24.11	1.3207E+13	2.4799E+13	3.8005E+13	-2.0919E+12
			50%	24.11	1.3207E+13	2.4798E+13	3.8005E+13	-2.0922E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{a} (J)	W_{d} (J)	W (J)	OPL
77	99%	99%	99%	26.92	6.3032E+12	2.8350E+13	3.4653E+13	2.4891E+12
			80%	26.92	6.3032E+12	2.8350E+13	3.4653E+13	2.4890E+12
			50%	26.92	6.3032E+12	2.8349E+13	3.4652E+13	2.4887E+12
		80%	99%	26.92	6.3032E+12	2.6440E+13	3.2744E+13	5.7986E+11
			80%	26.92	6.3032E+12	2.6440E+13	3.2744E+13	5.7971E+11
			50%	26.92	6.3032E+12	2.6440E+13	3.2743E+13	5.7939E+11
		50%	99%	26.92	6.3032E+12	2.5415E+13	3.1718E+13	-4.4573E+11
			80%	26.92	6.3032E+12	2.5415E+13	3.1718E+13	-4.4587E+11
			50%	26.92	6.3032E+12	2.5414E+13	3.1718E+13	-4.4619E+11
	80%	99%	99%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8918E+12
			80%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8917E+12
			50%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8914E+12
		80%	99%	25.97	8.3828E+12	2.5861E+13	3.4244E+13	4.6700E+08
			80%	25.97	8.3828E+12	2.5861E+13	3.4244E+13	3.1900E+08
▶			50%	25.97	8.3828E+12	2.5861E+13	3.4243E+13	0.0000E+00
		50%	99%	25.97	8.3828E+12	2.4830E+13	3.3212E+13	-1.0310E+12
			80%	25.97	8.3828E+12	2.4829E+13	3.3212E+13	-1.0311E+12
			50%	25.97	8.3828E+12	2.4829E+13	3.3212E+13	-1.0314E+12
	50%	99%	99%	25.49	9.9826E+12	2.7481E+13	3.7464E+13	1.6203E+12
			80%	25.49	9.9826E+12	2.7481E+13	3.7463E+13	1.6202E+12
			50%	25.49	9.9826E+12	2.7480E+13	3.7463E+13	1.6199E+12
		80%	99%	25.49	9.9826E+12	2.5589E+13	3.5571E+13	-2.7200E+11
			80%	25.49	9.9826E+12	2.5588E+13	3.5571E+13	-2.7215E+11
			50%	25.49	9.9826E+12	2.5588E+13	3.5571E+13	-2.7247E+11
		50%	99%	25.49	9.9826E+12	2.4566E+13	3.4548E+13	-1.2947E+12
			80%	25.49	9.9826E+12	2.4566E+13	3.4548E+13	-1.2949E+12
			50%	25.49	9.9826E+12	2.4565E+13	3.4548E+13	-1.2952E+12
79	99%	99%	99%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8646E+12
			80%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8644E+12
			50%	25.39	1.1071E+13	2.8755E+13	3.9826E+13	1.8641E+12
		80%	99%	25.39	1.1071E+13	2.6893E+13	3.7964E+13	2.1030E+09
			80%	25.39	1.1071E+13	2.6891E+13	3.7962E+13	3.1900E+08
▶			50%	25.39	1.1071E+13	2.6891E+13	3.7962E+13	0.0000E+00
		50%	99%	25.39	1.1071E+13	2.5867E+13	3.6938E+13	-1.0240E+12
			80%	25.39	1.1071E+13	2.5866E+13	3.6937E+13	-1.0242E+12
			50%	25.39	1.1071E+13	2.5866E+13	3.6937E+13	-1.0245E+12
	80%	99%	99%	24.59	1.2403E+13	2.8068E+13	4.0472E+13	1.1778E+12
			80%	24.59	1.2403E+13	2.8068E+13	4.0472E+13	1.1776E+12
			50%	24.59	1.2403E+13	2.8068E+13	4.0471E+13	1.1773E+12
		80%	99%	24.59	1.2403E+13	2.6202E+13	3.8606E+13	-6.8812E+11
			80%	24.59	1.2403E+13	2.6202E+13	3.8606E+13	-6.8827E+11
			50%	24.59	1.2403E+13	2.6202E+13	3.8605E+13	-6.8859E+11
		50%	99%	24.59	1.2403E+13	2.5190E+13	3.7593E+13	-1.7009E+12
			80%	24.59	1.2403E+13	2.5190E+13	3.7593E+13	-1.7011E+12
			50%	24.59	1.2403E+13	2.5189E+13	3.7593E+13	-1.7014E+12
	50%	99%	99%	24.11	1.3207E+13	2.7667E+13	4.0874E+13	7.7662E+11
			80%	24.11	1.3207E+13	2.7667E+13	4.0874E+13	7.7647E+11
			50%	24.11	1.3207E+13	2.7667E+13	4.0873E+13	7.7615E+11
		80%	99%	24.11	1.3207E+13	2.5806E+13	3.9013E+13	-1.0848E+12
			80%	24.11	1.3207E+13	2.5806E+13	3.9012E+13	-1.0849E+12
			50%	24.11	1.3207E+13	2.5804E+13	3.9010E+13	-1.0871E+12
		50%	99%	24.11	1.3207E+13	2.4799E+13	3.8006E+13	-2.0917E+12
			80%	24.11	1.3207E+13	2.4799E+13	3.8005E+13	-2.0919E+12
			50%	24.11	1.3207E+13	2.4798E+13	3.8005E+13	-2.0922E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{a} (J)	W_{d} (J)	W (J)	OPL
78	99%	99%	99%	26.94	4.8772E+12	2.8423E+13	3.3300E+13	2.9140E+12
			80%	26.94	4.8772E+12	2.8423E+13	3.3300E+13	2.9138E+12
			50%	26.94	4.8772E+12	2.8422E+13	3.3299E+13	2.9135E+12
		80%	99%	26.94	4.8772E+12	2.6461E+13	3.1339E+13	9.5273E+11
			80%	26.94	4.8772E+12	2.6461E+13	3.1338E+13	9.5258E+11
			50%	26.94	4.8772E+12	2.6461E+13	3.1338E+13	9.5226E+11
		50%	99%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.5609E+10
			80%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.5758E+10
			50%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.6074E+10
	80%	99%	99%	26.15	6.4255E+12	2.7715E+13	3.4140E+13	2.2059E+12
			80%	26.15	6.4255E+12	2.7714E+13	3.4140E+13	2.2058E+12
			50%	26.15	6.4255E+12	2.7714E+13	3.4140E+13	2.2054E+12
		80%	99%	26.15	6.4255E+12	2.5780E+13	3.2206E+13	2.7121E+11
			80%	26.15	6.4255E+12	2.5780E+13	3.2206E+13	2.7106E+11
			50%	26.15	6.4255E+12	2.5779E+13	3.2206E+13	2.7074E+11
		50%	99%	26.15	6.4255E+12	2.4716E+13	3.1141E+13	-7.9318E+11
			80%	26.15	6.4255E+12	2.4715E+13	3.1141E+13	-7.9333E+11
			50%	26.15	6.4255E+12	2.4715E+13	3.1141E+13	-7.9365E+11
	50%	99%	99%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9433E+12
			80%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9432E+12
			50%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9428E+12
		80%	99%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	4.7000E+08
			80%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	3.1700E+08
▶			50%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	0.0000E+00
		50%	99%	25.67	8.0793E+12	2.4455E+13	3.2534E+13	-1.0540E+12
			80%	25.67	8.0793E+12	2.4455E+13	3.2534E+13	-1.0541E+12
			50%	25.67	8.0793E+12	2.4454E+13	3.2534E+13	-1.0545E+12
80	99%	99%	99%	26.92	6.3032E+12	2.8350E+13	3.4653E+13	2.4891E+12
			80%	26.92	6.3032E+12	2.8350E+13	3.4653E+13	2.4890E+12
			50%	26.92	6.3032E+12	2.8349E+13	3.4652E+13	2.4887E+12
		80%	99%	26.92	6.3032E+12	2.6440E+13	3.2744E+13	5.7986E+11
			80%	26.92	6.3032E+12	2.6440E+13	3.2744E+13	5.7971E+11
			50%	26.92	6.3032E+12	2.6440E+13	3.2743E+13	5.7939E+11
		50%	99%	26.92	6.3032E+12	2.5415E+13	3.1718E+13	-4.4573E+11
			80%	26.92	6.3032E+12	2.5415E+13	3.1718E+13	-4.4587E+11
			50%	26.92	6.3032E+12	2.5414E+13	3.1718E+13	-4.4619E+11
	80%	99%	99%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8918E+12
			80%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8917E+12
			50%	25.97	8.3828E+12	2.7752E+13	3.6135E+13	1.8914E+12
		80%	99%	25.97	8.3828E+12	2.5861E+13	3.4244E+13	4.6700E+08
			80%	25.97	8.3828E+12	2.5861E+13	3.4244E+13	3.1900E+08
▶			50%	25.97	8.3828E+12	2.5861E+13	3.4243E+13	0.0000E+00
		50%	99%	25.97	8.3828E+12	2.4830E+13	3.3212E+13	-1.0310E+12
			80%	25.97	8.3828E+12	2.4829E+13	3.3212E+13	-1.0311E+12
			50%	25.97	8.3828E+12	2.4829E+13	3.3212E+13	-1.0314E+12
	50%	99%	99%	25.49	9.9826E+12	2.7481E+13	3.7464E+13	1.6203E+12
			80%	25.49	9.9826E+12	2.7481E+13	3.7463E+13	1.6202E+12
			50%	25.49	9.9826E+12	2.7480E+13	3.7463E+13	1.6199E+12
		80%	99%	25.49	9.9826E+12	2.5589E+13	3.5571E+13	-2.7200E+11
			80%	25.49	9.9826E+12	2.5588E+13	3.5571E+13	-2.7215E+11
			50%	25.49	9.9826E+12	2.5588E+13	3.5571E+13	-2.7247E+11
		50%	99%	25.49	9.9826E+12	2.4566E+13	3.4548E+13	-1.2947E+12
			80%	25.49	9.9826E+12	2.4566E+13	3.4548E+13	-1.2949E+12
			50%	25.49	9.9826E+12	2.4565E+13	3.4548E+13	-1.2952E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
S1	99%	99%	99%	26.94	4.8772E+12	2.8423E+13	3.3300E+13	2.9140E+12
			80%	26.94	4.8772E+12	2.8423E+13	3.3300E+13	2.9138E+12
			50%	26.94	4.8772E+12	2.8422E+13	3.3299E+13	2.9135E+12
		80%	99%	26.94	4.8772E+12	2.6461E+13	3.1339E+13	9.5273E+11
			80%	26.94	4.8772E+12	2.6461E+13	3.1338E+13	9.5258E+11
			50%	26.94	4.8772E+12	2.6461E+13	3.1338E+13	9.5226E+11
		50%	99%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.5609E+10
			80%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.5758E+10
			50%	26.94	4.8772E+12	2.5413E+13	3.0290E+13	-9.6074E+10
	80%	99%	99%	26.15	6.4255E+12	2.7715E+13	3.4140E+13	2.2059E+12
			80%	26.15	6.4255E+12	2.7714E+13	3.4140E+13	2.2058E+12
			50%	26.15	6.4255E+12	2.7714E+13	3.4140E+13	2.2054E+12
		80%	99%	26.15	6.4255E+12	2.5780E+13	3.2205E+13	2.7121E+11
			80%	26.15	6.4255E+12	2.5780E+13	3.2205E+13	2.7106E+11
			50%	26.15	6.4255E+12	2.5779E+13	3.2205E+13	2.7074E+11
		50%	99%	26.15	6.4255E+12	2.4716E+13	3.1141E+13	-7.9318E+11
			80%	26.15	6.4255E+12	2.4715E+13	3.1141E+13	-7.9333E+11
			50%	26.15	6.4255E+12	2.4715E+13	3.1141E+13	-7.9365E+11
	50%	99%	99%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9433E+12
			80%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9432E+12
			50%	25.67	8.0793E+12	2.7452E+13	3.5531E+13	1.9428E+12
		80%	99%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	4.7000E+08
			80%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	3.1700E+08
►			50%	25.67	8.0793E+12	2.5509E+13	3.3588E+13	0.0000E+00
		50%	99%	25.67	8.0793E+12	2.4455E+13	3.2534E+13	-1.0540E+12
			80%	25.67	8.0793E+12	2.4455E+13	3.2534E+13	-1.0541E+12
			50%	25.67	8.0793E+12	2.4454E+13	3.2534E+13	-1.0545E+12
S3	99%	99%	99%	26.91	9.5148E+12	2.8373E+13	3.7887E+13	2.4168E+12
			80%	26.91	9.5148E+12	2.8373E+13	3.7887E+13	2.4167E+12
			50%	26.91	9.5148E+12	2.8372E+13	3.7887E+13	2.4164E+12
		80%	99%	26.91	9.5148E+12	2.6515E+13	3.6030E+13	5.5951E+11
			80%	26.91	9.5148E+12	2.6515E+13	3.6030E+13	5.5936E+11
			50%	26.91	9.5148E+12	2.6515E+13	3.6030E+13	5.5905E+11
		50%	99%	26.91	9.5148E+12	2.5520E+13	3.5035E+13	-4.3580E+11
			80%	26.91	9.5148E+12	2.5520E+13	3.5035E+13	-4.3595E+11
			50%	26.91	9.5148E+12	2.5520E+13	3.5034E+13	-4.3627E+11
	80%	99%	99%	25.96	1.1198E+13	2.7790E+13	3.8988E+13	1.8342E+12
			80%	25.96	1.1198E+13	2.7790E+13	3.8988E+13	1.8341E+12
			50%	25.96	1.1198E+13	2.7790E+13	3.8988E+13	1.8338E+12
		80%	99%	25.96	1.1198E+13	2.5956E+13	3.7154E+13	4.6600E+08
			80%	25.96	1.1198E+13	2.5956E+13	3.7154E+13	3.2100E+08
►			50%	25.96	1.1198E+13	2.5956E+13	3.7154E+13	0.0000E+00
		50%	99%	25.96	1.1198E+13	2.4960E+13	3.6158E+13	-9.9601E+11
			80%	25.96	1.1198E+13	2.4960E+13	3.6158E+13	-9.9616E+11
			50%	25.96	1.1198E+13	2.4959E+13	3.6158E+13	-9.9647E+11
	50%	99%	99%	25.27	1.2232E+13	2.7469E+13	3.9701E+13	1.5130E+12
			80%	25.27	1.2232E+13	2.7469E+13	3.9701E+13	1.5128E+12
			50%	25.27	1.2232E+13	2.7468E+13	3.9701E+13	1.5125E+12
		80%	99%	25.27	1.2232E+13	2.5648E+13	3.7881E+13	-3.0739E+11
			80%	25.27	1.2232E+13	2.5648E+13	3.7881E+13	-3.0754E+11
			50%	25.27	1.2232E+13	2.5646E+13	3.7879E+13	-3.0967E+11
		50%	99%	25.27	1.2232E+13	2.4646E+13	3.6879E+13	-1.3095E+12
			80%	25.27	1.2232E+13	2.4646E+13	3.6878E+13	-1.3097E+12
			50%	25.27	1.2232E+13	2.4646E+13	3.6878E+13	-1.3100E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
S2	99%	99%	99%	25.90	1.1155E+13	2.8478E+13	3.9633E+13	1.8393E+12
			80%	25.90	1.1155E+13	2.8478E+13	3.9633E+13	1.8391E+12
			50%	25.90	1.1155E+13	2.8478E+13	3.9632E+13	1.8388E+12
		80%	99%	25.90	1.1155E+13	2.6639E+13	3.7794E+13	4.6800E+08
			80%	25.90	1.1155E+13	2.6639E+13	3.7794E+13	3.1700E+08
►			50%	25.90	1.1155E+13	2.6639E+13	3.7793E+13	0.0000E+00
		50%	99%	25.90	1.1155E+13	2.5641E+13	3.6795E+13	-9.9823E+11
			80%	25.90	1.1155E+13	2.5640E+13	3.6795E+13	-9.9838E+11
			50%	25.90	1.1155E+13	2.5640E+13	3.6795E+13	-9.9870E+11
	80%	99%	99%	24.95	1.2438E+13	2.7865E+13	4.0303E+13	1.2266E+12
			80%	24.95	1.2438E+13	2.7865E+13	4.0303E+13	1.2264E+12
			50%	24.95	1.2438E+13	2.7865E+13	4.0303E+13	1.2261E+12
		80%	99%	24.95	1.2438E+13	2.6015E+13	3.8453E+13	-6.2406E+11
			80%	24.95	1.2438E+13	2.6015E+13	3.8453E+13	-6.2421E+11
			50%	24.95	1.2438E+13	2.6014E+13	3.8452E+13	-6.2452E+11
		50%	99%	24.95	1.2438E+13	2.5027E+13	3.7464E+13	-1.6123E+12
			80%	24.95	1.2438E+13	2.5026E+13	3.7464E+13	-1.6125E+12
			50%	24.95	1.2438E+13	2.5026E+13	3.7464E+13	-1.6128E+12
	50%	99%	99%	24.26	1.3226E+13	2.7511E+13	4.0738E+13	8.7249E+11
			80%	24.26	1.3226E+13	2.7511E+13	4.0737E+13	8.7234E+11
			50%	24.26	1.3226E+13	2.7511E+13	4.0737E+13	8.7202E+11
		80%	99%	24.26	1.3226E+13	2.5673E+13	3.8899E+13	-9.6602E+11
			80%	24.26	1.3226E+13	2.5673E+13	3.8899E+13	-9.6617E+11
			50%	24.26	1.3226E+13	2.5672E+13	3.8899E+13	-9.6649E+11
		50%	99%	24.26	1.3226E+13	2.4680E+13	3.7907E+13	-1.9585E+12
			80%	24.26	1.3226E+13	2.4680E+13	3.7906E+13	-1.9587E+12
			50%	24.26	1.3226E+13	2.4680E+13	3.7906E+13	-1.9590E+12
S4	99%	99%	99%	26.68	9.9600E+12	2.8431E+13	3.8391E+13	2.7787E+12
			80%	26.68	9.9600E+12	2.8431E+13	3.8391E+13	2.7785E+12
			50%	26.68	9.9600E+12	2.8431E+13	3.8391E+13	2.7782E+12
		80%	99%	26.68	9.9600E+12	2.6574E+13	3.6534E+13	9.2114E+11
			80%	26.68	9.9600E+12	2.6574E+13	3.6534E+13	9.2100E+11
			50%	26.68	9.9600E+12	2.6573E+13	3.6533E+13	9.2068E+11
		50%	99%	26.68	9.9600E+12	2.5583E+13	3.5543E+13	-6.9330E+10
			80%	26.68	9.9600E+12	2.5583E+13	3.5543E+13	-6.9481E+10
			50%	26.68	9.9600E+12	2.5583E+13	3.5543E+13	-6.9798E+10
	80%	99%	99%	25.72	1.1535E+13	2.7822E+13	3.9357E+13	2.1696E+12
			80%	25.72	1.1535E+13	2.7822E+13	3.9357E+13	2.1695E+12
			50%	25.72	1.1535E+13	2.7822E+13	3.9357E+13	2.1692E+12
		80%	99%	25.72	1.1535E+13	2.5984E+13	3.7519E+13	3.3160E+11
			80%	25.72	1.1535E+13	2.5984E+13	3.7519E+13	3.3145E+11
			50%	25.72	1.1535E+13	2.5984E+13	3.7519E+13	3.3113E+11
		50%	99%	25.72	1.1535E+13	2.4988E+13	3.6522E+13	-6.6501E+11
			80%	25.72	1.1535E+13	2.4987E+13	3.6522E+13	-6.6515E+11
			50%	25.72	1.1535E+13	2.4987E+13	3.6522E+13	-6.6547E+11
	50%	99%	99%	25.04	1.2502E+13	2.7477E+13	3.9980E+13	1.8246E+12
			80%	25.04	1.2502E+13	2.7477E+13	3.9980E+13	1.8244E+12
			50%	25.04	1.2502E+13	2.7477E+13	3.9979E+13	1.8241E+12
		80%	99%	25.04	1.2502E+13	2.5653E+13	3.8156E+13	4.6100E+08
			80%	25.04	1.2502E+13	2.5653E+13	3.8155E+13	3.1400E+08
►			50%	25.04	1.2502E+13	2.5653E+13	3.8155E+13	0.0000E+00
		50%	99%	25.04	1.2502E+13	2.4656E+13	3.7159E+13	-9.9635E+11
			80%	25.04	1.2502E+13	2.4656E+13	3.7159E+13	-9.9650E+11
			50%	25.04	1.2502E+13	2.4656E+13	3.7158E+13	-9.9681E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{st}(J)	W_d(J)	W (J)	OPL
85	99%	99%	99%	25.93	1.2131E+13	2.9257E+13	4.1388E+13	1.9194E+12
			80%	25.93	1.2131E+13	2.9257E+13	4.1388E+13	1.9192E+12
			50%	25.93	1.2131E+13	2.9257E+13	4.1387E+13	1.9189E+12
		80%	99%	25.93	1.2131E+13	2.7338E+13	3.9469E+13	4.6500E+08
			80%	25.93	1.2131E+13	2.7338E+13	3.9469E+13	3.2000E+08
▶			50%	25.93	1.2131E+13	2.7338E+13	3.9468E+13	0.0000E+00
		50%	99%	25.93	1.2131E+13	2.6261E+13	3.8392E+13	-1.0768E+12
			80%	25.93	1.2131E+13	2.6261E+13	3.8391E+13	-1.0770E+12
			50%	25.93	1.2131E+13	2.6261E+13	3.8391E+13	-1.0773E+12
	80%	99%	99%	24.98	1.3176E+13	2.8520E+13	4.1696E+13	1.1818E+12
			80%	24.98	1.3176E+13	2.8520E+13	4.1695E+13	1.1817E+12
			50%	24.98	1.3176E+13	2.8519E+13	4.1695E+13	1.1814E+12
		80%	99%	24.98	1.3176E+13	2.6599E+13	3.9775E+13	-7.3889E+11
			80%	24.98	1.3176E+13	2.6599E+13	3.9775E+13	-7.3904E+11
			50%	24.98	1.3176E+13	2.6598E+13	3.9774E+13	-7.3936E+11
		50%	99%	24.98	1.3176E+13	2.5544E+13	3.8720E+13	-1.7942E+12
			80%	24.98	1.3176E+13	2.5544E+13	3.8719E+13	-1.7943E+12
			50%	24.98	1.3176E+13	2.5543E+13	3.8719E+13	-1.7947E+12
	50%	99%	99%	24.30	1.3819E+13	2.8105E+13	4.1923E+13	7.6693E+11
			80%	24.30	1.3819E+13	2.8105E+13	4.1923E+13	7.6678E+11
			50%	24.30	1.3819E+13	2.8104E+13	4.1923E+13	7.6646E+11
		80%	99%	24.30	1.3819E+13	2.6185E+13	4.0004E+13	-1.1528E+12
			80%	24.30	1.3819E+13	2.6185E+13	4.0003E+13	-1.1529E+12
			50%	24.30	1.3819E+13	2.6185E+13	4.0003E+13	-1.1533E+12
		50%	99%	24.30	1.3819E+13	2.5145E+13	3.8963E+13	-2.1932E+12
			80%	24.30	1.3819E+13	2.5143E+13	3.8961E+13	-2.1950E+12
			50%	24.30	1.3819E+13	2.5143E+13	3.8961E+13	-2.1953E+12
87	99%	99%	99%	27.24	9.7677E+12	2.9148E+13	3.8915E+13	2.9625E+12
			80%	27.24	9.7677E+12	2.9147E+13	3.8915E+13	2.9623E+12
			50%	27.34	9.7677E+12	2.9147E+13	3.8915E+13	2.9620E+12
		80%	99%	27.24	9.7677E+12	2.7173E+13	3.6941E+13	9.8814E+11
			80%	27.24	9.7677E+12	2.7173E+13	3.6941E+13	9.8799E+11
			50%	27.24	9.7677E+12	2.7173E+13	3.6940E+13	9.8767E+11
		50%	99%	27.24	9.7677E+12	2.6118E+13	3.5886E+13	-6.6855E+10
			80%	27.24	9.7677E+12	2.6118E+13	3.5886E+13	-6.7002E+10
			50%	27.34	9.7677E+12	2.6118E+13	3.5886E+13	-6.7321E+10
	80%	99%	99%	26.29	1.1390E+13	2.8486E+13	3.9876E+13	2.3009E+12
			80%	26.29	1.1390E+13	2.8486E+13	3.9876E+13	2.3008E+12
			50%	26.29	1.1390E+13	2.8486E+13	3.9875E+13	2.3005E+12
		80%	99%	26.29	1.1390E+13	2.6540E+13	3.7930E+13	3.5536E+11
			80%	26.29	1.1390E+13	2.6540E+13	3.7930E+13	3.5521E+11
			50%	26.29	1.1390E+13	2.6540E+13	3.7930E+13	3.5489E+11
		50%	99%	26.29	1.1390E+13	2.5483E+13	3.6873E+13	-7.0179E+11
			80%	26.29	1.1390E+13	2.5483E+13	3.6873E+13	-7.0194E+11
			50%	26.29	1.1390E+13	2.5483E+13	3.6873E+13	-7.0226E+11
	50%	99%	99%	25.60	1.2387E+13	2.8128E+13	4.0516E+13	1.9434E+12
			80%	25.60	1.2387E+13	2.8128E+13	4.0516E+13	1.9432E+12
			50%	25.60	1.2387E+13	2.8128E+13	4.0515E+13	1.9429E+12
		80%	99%	25.60	1.2387E+13	2.6186E+13	3.8573E+13	4.6300E+08
			80%	25.60	1.2387E+13	2.6185E+13	3.8573E+13	3.1500E+08
▶			50%	25.60	1.2387E+13	2.6185E+13	3.8572E+13	0.0000E+00
		50%	99%	25.60	1.2387E+13	2.5122E+13	3.7510E+13	-1.0628E+12
			80%	25.60	1.2387E+13	2.5122E+13	3.7509E+13	-1.0630E+12
			50%	25.60	1.2387E+13	2.5122E+13	3.7509E+13	-1.0633E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{st}(J)	W_d(J)	W (J)	OPL
86	99%	99%	99%	26.75	1.0412E+13	2.9269E+13	3.9681E+13	2.6490E+12
			80%	26.75	1.0412E+13	2.9268E+13	3.9681E+13	2.6488E+12
			50%	26.75	1.0412E+13	2.9268E+13	3.9680E+13	2.6485E+12
		80%	99%	26.75	1.0412E+13	2.7298E+13	3.7710E+13	6.7786E+11
			80%	26.75	1.0412E+13	2.7297E+13	3.7709E+13	6.7771E+11
			50%	26.75	1.0412E+13	2.7297E+13	3.7709E+13	6.7739E+11
		50%	99%	26.75	1.0412E+13	2.6218E+13	3.6630E+13	-4.0180E+11
			80%	26.75	1.0412E+13	2.6218E+13	3.6630E+13	-4.0196E+11
			50%	26.75	1.0412E+13	2.6217E+13	3.6629E+13	-4.0227E+11
	80%	99%	99%	25.80	1.1877E+13	2.8586E+13	4.0463E+13	1.9662E+12
			80%	25.80	1.1877E+13	2.8586E+13	4.0462E+13	1.9660E+12
			50%	25.80	1.1877E+13	2.8585E+13	4.0462E+13	1.9657E+12
		80%	99%	25.80	1.1877E+13	2.6620E+13	3.8497E+13	4.6900E+08
			80%	25.80	1.1877E+13	2.6620E+13	3.8497E+13	3.1600E+08
▶			50%	25.80	1.1877E+13	2.6620E+13	3.8496E+13	0.0000E+00
		50%	99%	25.80	1.1877E+13	2.5547E+13	3.7424E+13	-1.0724E+12
			80%	25.80	1.1877E+13	2.5547E+13	3.7424E+13	-1.0726E+12
			50%	25.80	1.1877E+13	2.5547E+13	3.7424E+13	-1.0729E+12
	50%	99%	99%	25.11	1.2777E+13	2.8194E+13	4.0972E+13	1.5746E+12
			80%	25.11	1.2777E+13	2.8194E+13	4.0972E+13	1.5745E+12
			50%	25.11	1.2777E+13	2.8194E+13	4.0971E+13	1.5742E+12
		80%	99%	25.11	1.2777E+13	2.6238E+13	3.9016E+13	-3.8150E+11
			80%	25.11	1.2777E+13	2.6238E+13	3.9015E+13	-3.8164E+11
			50%	25.11	1.2777E+13	2.6238E+13	3.9015E+13	-3.8196E+11
		50%	99%	25.11	1.2777E+13	2.5178E+13	3.7955E+13	-1.4421E+12
			80%	25.11	1.2777E+13	2.5177E+13	3.7955E+13	-1.4423E+12
			50%	25.11	1.2777E+13	2.5177E+13	3.7955E+13	-1.4426E+12
88	99%	99%	99%	25.71	1.1381E+13	2.8870E+13	4.0251E+13	1.9088E+12
			80%	25.71	1.1381E+13	2.8870E+13	4.0251E+13	1.9087E+12
			50%	25.71	1.1381E+13	2.8870E+13	4.0251E+13	1.9084E+12
		80%	99%	25.71	1.1381E+13	2.6962E+13	3.8343E+13	4.6400E+08
			80%	25.71	1.1381E+13	2.6962E+13	3.8343E+13	3.1500E+08
▶			50%	25.71	1.1381E+13	2.6961E+13	3.8342E+13	0.0000E+00
		50%	99%	25.71	1.1381E+13	2.5916E+13	3.7297E+13	-1.0450E+12
			80%	25.71	1.1381E+13	2.5916E+13	3.7297E+13	-1.0451E+12
			50%	25.71	1.1381E+13	2.5916E+13	3.7297E+13	-1.0455E+12
	80%	99%	99%	24.76	1.2609E+13	2.8207E+13	4.0816E+13	1.2453E+12
			80%	24.76	1.2609E+13	2.8207E+13	4.0815E+13	1.2452E+12
			50%	24.76	1.2609E+13	2.8206E+13	4.0815E+13	1.2448E+12
		80%	99%	24.76	1.2609E+13	2.6292E+13	3.8900E+13	-6.6998E+11
			80%	24.76	1.2609E+13	2.6291E+13	3.8900E+13	-6.7013E+11
			50%	24.76	1.2609E+13	2.6291E+13	3.8900E+13	-6.7045E+11
		50%	99%	24.76	1.2609E+13	2.5257E+13	3.7866E+13	-1.7044E+12
			80%	24.76	1.2609E+13	2.5257E+13	3.7866E+13	-1.7045E+12
			50%	24.76	1.2609E+13	2.5257E+13	3.7865E+13	-1.7048E+12
	50%	99%	99%	24.07	1.3362E+13	2.7837E+13	4.1199E+13	8.7513E+11
			80%	24.07	1.3362E+13	2.7836E+13	4.1199E+13	8.7498E+11
			50%	24.07	1.3362E+13	2.7836E+13	4.1199E+13	8.7466E+11
		80%	99%	24.07	1.3362E+13	2.5914E+13	3.9276E+13	-1.0478E+12
			80%	24.07	1.3362E+13	2.5914E+13	3.9276E+13	-1.0479E+12
			50%	24.07	1.3362E+13	2.5913E+13	3.9276E+13	-1.0482E+12
		50%	99%	24.07	1.3362E+13	2.4881E+13	3.8244E+13	-2.0800E+12
			80%	24.07	1.3362E+13	2.4881E+13	3.8244E+13	-2.0802E+12
			50%	24.07	1.3362E+13	2.4881E+13	3.8243E+13	-2.0805E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
89	99%	99%	99%	26.75	1.0765E+13	2.8736E+13	3.9501E+13	2.5266E+12
			80%	26.75	1.0765E+13	2.8736E+13	3.9501E+13	2.5265E+12
			50%	26.75	1.0765E+13	2.8735E+13	3.9500E+13	2.5262E+12
		80%	99%	26.75	1.0765E+13	2.6862E+13	3.7627E+13	6.5230E+11
			80%	26.75	1.0765E+13	2.6861E+13	3.7626E+13	6.5216E+11
			50%	26.75	1.0765E+13	2.6861E+13	3.7626E+13	6.5184E+11
		50%	99%	26.75	1.0765E+13	2.5833E+13	3.6598E+13	-3.7669E+11
			80%	26.75	1.0765E+13	2.5832E+13	3.6597E+13	-3.7684E+11
			50%	26.75	1.0765E+13	2.5832E+13	3.6597E+13	-3.7716E+11
	80%	99%	99%	25.80	1.2143E+13	2.8103E+13	4.0246E+13	1.8932E+12
			80%	25.80	1.2143E+13	2.8102E+13	4.0246E+13	1.8930E+12
			50%	25.80	1.2143E+13	2.8102E+13	4.0245E+13	1.8927E+12
		80%	99%	25.80	1.2143E+13	2.6210E+13	3.8353E+13	4.6700E+08
			80%	25.80	1.2143E+13	2.6210E+13	3.8353E+13	3.1900E+08
▶			50%	25.80	1.2143E+13	2.6209E+13	3.8353E+13	0.0000E+00
		50%	99%	25.80	1.2143E+13	2.5192E+13	3.7335E+13	-1.0173E+12
			80%	25.80	1.2143E+13	2.5192E+13	3.7335E+13	-1.0174E+12
			50%	25.80	1.2143E+13	2.5192E+13	3.7335E+13	-1.0178E+12
	50%	99%	99%	25.11	1.2989E+13	2.7730E+13	4.0719E+13	1.5203E+12
			80%	25.11	1.2989E+13	2.7730E+13	4.0719E+13	1.5202E+12
			50%	25.11	1.2989E+13	2.7729E+13	4.0718E+13	1.5199E+12
		80%	99%	25.11	1.2989E+13	2.5854E+13	3.8843E+13	-3.5531E+11
			80%	25.11	1.2989E+13	2.5854E+13	3.8843E+13	-3.5546E+11
			50%	25.11	1.2989E+13	2.5854E+13	3.8843E+13	-3.5577E+11
		50%	99%	25.11	1.2989E+13	2.4831E+13	3.7820E+13	-1.3786E+12
			80%	25.11	1.2989E+13	2.4831E+13	3.7820E+13	-1.3788E+12
			50%	25.11	1.2989E+13	2.4830E+13	3.7819E+13	-1.3791E+12
91	99%	99%	99%	25.97	3.9944E+11	3.2420E+12	3.6415E+12	2.6364E+11
			80%	25.97	3.9944E+11	3.2420E+12	3.6415E+12	2.6363E+11
			50%	25.97	3.9944E+11	3.2420E+12	3.6414E+12	2.6360E+11
		80%	99%	25.97	3.9944E+11	2.9784E+12	3.3779E+12	4.1700E+07
			80%	25.97	3.9944E+11	2.9784E+12	3.3779E+12	2.8300E+07
▶			50%	25.97	3.9944E+11	2.9784E+12	3.3778E+12	0.0000E+00
		50%	99%	25.97	3.9944E+11	2.8346E+12	3.2340E+12	-1.4381E+11
			80%	25.97	3.9944E+11	2.8346E+12	3.2340E+12	-1.4382E+11
			50%	25.97	3.9944E+11	2.8346E+12	3.2340E+12	-1.4385E+11
	80%	99%	99%	25.19	4.9439E+11	3.1298E+12	3.6241E+12	1.5135E+11
			80%	25.19	4.9439E+11	3.1297E+12	3.6241E+12	1.5134E+11
			50%	25.19	4.9439E+11	3.1297E+12	3.6241E+12	1.5131E+11
		80%	99%	25.19	4.9439E+11	2.8692E+12	3.3636E+12	-1.0918E+11
			80%	25.19	4.9439E+11	2.8692E+12	3.3636E+12	-1.0919E+11
			50%	25.19	4.9439E+11	2.8692E+12	3.3636E+12	-1.0922E+11
		50%	99%	25.19	4.9439E+11	2.7279E+12	3.2223E+12	-2.5046E+11
			80%	25.19	4.9439E+11	2.7279E+12	3.2223E+12	-2.5047E+11
			50%	25.19	4.9439E+11	2.7279E+12	3.2223E+12	-2.5050E+11
	50%	99%	99%	24.71	6.2430E+11	3.0827E+12	3.7070E+12	1.0427E+11
			80%	24.71	6.2430E+11	3.0827E+12	3.7070E+12	1.0426E+11
			50%	24.71	6.2430E+11	3.0826E+12	3.7069E+12	1.0423E+11
		80%	99%	24.71	6.2430E+11	2.8231E+12	3.4474E+12	-1.5532E+11
			80%	24.71	6.2430E+11	2.8231E+12	3.4474E+12	-1.5534E+11
			50%	24.71	6.2430E+11	2.8230E+12	3.4473E+12	-1.5537E+11
		50%	99%	24.71	6.2430E+11	2.6830E+12	3.3073E+12	-2.9541E+11
			80%	24.71	6.2430E+11	2.6830E+12	3.3073E+12	-2.9542E+11
			50%	24.71	6.2430E+11	2.6830E+12	3.3073E+12	-2.9545E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
90	99%	99%	99%	27.28	1.0065E+13	2.8670E+13	3.8735E+13	2.8381E+12
			80%	27.28	1.0065E+13	2.8670E+13	3.8735E+13	2.8380E+12
			50%	27.28	1.0065E+13	2.8669E+13	3.8735E+13	2.8377E+12
		80%	99%	27.28	1.0065E+13	2.6792E+13	3.6857E+13	9.6013E+11
			80%	27.28	1.0065E+13	2.6792E+13	3.6857E+13	9.5998E+11
			50%	27.28	1.0065E+13	2.6791E+13	3.6857E+13	9.5966E+11
		50%	99%	27.28	1.0065E+13	2.5768E+13	3.5833E+13	-6.3448E+10
			80%	27.28	1.0065E+13	2.5768E+13	3.5833E+13	-6.3599E+10
			50%	27.28	1.0065E+13	2.5768E+13	3.5833E+13	-6.3917E+10
	80%	99%	99%	26.33	1.1614E+13	2.8057E+13	3.9671E+13	2.2251E+12
			80%	26.33	1.1614E+13	2.8057E+13	3.9671E+13	2.2249E+12
			50%	26.33	1.1614E+13	2.8056E+13	3.9671E+13	2.2246E+12
		80%	99%	26.33	1.1614E+13	2.6177E+13	3.7792E+13	3.4569E+11
			80%	26.33	1.1614E+13	2.6177E+13	3.7792E+13	3.4554E+11
			50%	26.33	1.1614E+13	2.6177E+13	3.7791E+13	3.4522E+11
		50%	99%	26.33	1.1614E+13	2.5157E+13	3.6771E+13	-6.7509E+11
			80%	26.33	1.1614E+13	2.5157E+13	3.6771E+13	-6.7524E+11
			50%	26.33	1.1614E+13	2.5156E+13	3.6770E+13	-6.7556E+11
	50%	99%	99%	25.64	1.2565E+13	2.7708E+13	4.0273E+13	1.8759E+12
			80%	25.64	1.2565E+13	2.7707E+13	4.0273E+13	1.8757E+12
			50%	25.64	1.2565E+13	2.7707E+13	4.0272E+13	1.8754E+12
		80%	99%	25.64	1.2565E+13	2.5832E+13	3.8397E+13	4.6700E+08
			80%	25.64	1.2565E+13	2.5832E+13	3.8397E+13	3.2100E+08
▶			50%	25.64	1.2565E+13	2.5832E+13	3.8397E+13	0.0000E+00
		50%	99%	25.64	1.2565E+13	2.4810E+13	3.7375E+13	-1.0216E+12
			80%	25.64	1.2565E+13	2.4810E+13	3.7375E+13	-1.0218E+12
			50%	25.64	1.2565E+13	2.4810E+13	3.7375E+13	-1.0221E+12
92	99%	99%	99%	26.83	3.8168E+11	3.2265E+12	3.6082E+12	3.7393E+11
			80%	26.83	3.8168E+11	3.2265E+12	3.6082E+12	3.7392E+11
			50%	26.83	3.8168E+11	3.2265E+12	3.6082E+12	3.7389E+11
		80%	99%	26.83	3.8168E+11	2.9700E+12	3.3517E+12	1.1738E+11
			80%	26.83	3.8168E+11	2.9700E+12	3.3517E+12	1.1737E+11
			50%	26.83	3.8168E+11	2.9700E+12	3.3516E+12	1.1734E+11
		50%	99%	26.83	3.8168E+11	2.8291E+12	3.2108E+12	-2.3522E+10
			80%	26.83	3.8168E+11	2.8291E+12	3.2108E+12	-2.3536E+10
			50%	26.83	3.8168E+11	2.8290E+12	3.2107E+12	-2.3564E+10
	80%	99%	99%	25.98	4.3175E+11	3.1078E+12	3.5396E+12	2.5524E+11
			80%	25.98	4.3175E+11	3.1078E+12	3.5396E+12	2.5522E+11
			50%	25.98	4.3175E+11	3.1078E+12	3.5396E+12	2.5519E+11
		80%	99%	25.98	4.3175E+11	2.8527E+12	3.2844E+12	4.1900E+07
			80%	25.98	4.3175E+11	2.8526E+12	3.2844E+12	2.8800E+07
▶			50%	25.98	4.3175E+11	2.8526E+12	3.2844E+12	0.0000E+00
		50%	99%	25.98	4.3175E+11	2.7147E+12	3.1464E+12	-1.3796E+11
			80%	25.98	4.3175E+11	2.7146E+12	3.1464E+12	-1.3797E+11
			50%	25.98	4.3175E+11	2.7146E+12	3.1464E+12	-1.3800E+11
	50%	99%	99%	25.50	5.3020E+11	3.0544E+12	3.5846E+12	2.0176E+11
			80%	25.50	5.3020E+11	3.0544E+12	3.5846E+12	2.0175E+11
			50%	25.50	5.3020E+11	3.0543E+12	3.5845E+12	2.0172E+11
		80%	99%	25.50	5.3020E+11	2.8003E+12	3.3305E+12	-5.2291E+10
			80%	25.50	5.3020E+11	2.8003E+12	3.3305E+12	-5.2306E+10
			50%	25.50	5.3020E+11	2.8003E+12	3.3305E+12	-5.2333E+10
		50%	99%	25.50	5.3020E+11	2.6631E+12	3.1933E+12	-1.8948E+11
			80%	25.50	5.3020E+11	2.6631E+12	3.1933E+12	-1.8949E+11
			50%	25.50	5.3020E+11	2.6631E+12	3.1933E+12	-1.8952E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_e (J)	W_d (J)	W (J)	OPL
93	99%	99%	99%	27.50	3.7528E+11	3.2517E+12	3.6270E+12	4.4123E+11
			80%	27.50	3.7528E+11	3.2517E+12	3.6270E+12	4.4122E+11
			50%	27.50	3.7528E+11	3.2517E+12	3.6269E+12	4.4119E+11
		80%	99%	27.50	3.7528E+11	2.9936E+12	3.3689E+12	1.8316E+11
			80%	27.50	3.7528E+11	2.9936E+12	3.3689E+12	1.8314E+11
			50%	27.50	3.7528E+11	2.9936E+12	3.3689E+12	1.8311E+11
		50%	99%	27.50	3.7528E+11	2.8513E+12	3.2266E+12	4.0825E+10
			80%	27.50	3.7528E+11	2.8513E+12	3.2266E+12	4.0812E+10
			50%	27.50	3.7528E+11	2.8513E+12	3.2265E+12	4.0783E+10
	80%	99%	99%	26.61	3.9361E+11	3.1267E+12	3.5203E+12	3.1622E+11
			80%	26.61	3.9361E+11	3.1267E+12	3.5203E+12	3.1620E+11
			50%	26.61	3.9361E+11	3.1266E+12	3.5203E+12	3.1617E+11
		80%	99%	26.61	3.9361E+11	2.8702E+12	3.2638E+12	5.9757E+10
			80%	26.61	3.9361E+11	2.8702E+12	3.2638E+12	5.9743E+10
			50%	26.61	3.9361E+11	2.8702E+12	3.3638E+12	5.9715E+10
		50%	99%	26.61	3.9361E+11	2.7310E+12	3.1246E+12	-7.9507E+10
			80%	26.61	3.9361E+11	2.7310E+12	3.1246E+12	-7.9520E+10
			50%	26.61	3.9361E+11	2.7309E+12	3.1245E+12	-7.9549E+10
	50%	99%	99%	26.00	4.5365E+11	3.0660E+12	3.5196E+12	2.5551E+11
			80%	26.00	4.5365E+11	3.0660E+12	3.5196E+12	2.5550E+11
			50%	26.00	4.5365E+11	3.0659E+12	3.5196E+12	2.5547E+11
		80%	99%	26.00	4.5365E+11	2.8105E+12	3.3642E+12	4.2000E+07
			80%	26.00	4.5365E+11	2.8105E+12	3.2642E+12	2.8300E+07
▶			50%	26.00	4.5365E+11	2.8105E+12	3.2641E+12	0.0000E+00
		50%	99%	26.00	4.5365E+11	2.6718E+12	3.1254E+12	-1.3871E+11
			80%	26.00	4.5365E+11	2.6717E+12	3.1254E+12	-1.3873E+11
			50%	26.00	4.5365E+11	2.6717E+12	3.1254E+12	-1.3875E+11
95	99%	99%	99%	26.47	3.8731E+11	3.4586E+12	3.8459E+12	4.3985E+11
			80%	26.47	3.8731E+11	3.4586E+12	3.8459E+12	4.3984E+11
			50%	26.47	3.8731E+11	3.4585E+12	3.8458E+12	4.3981E+11
		80%	99%	26.47	3.8731E+11	3.1409E+12	3.5282E+12	1.2216E+11
			80%	26.47	3.8731E+11	3.1409E+12	3.5282E+12	1.2215E+11
			50%	26.47	3.8731E+11	3.1408E+12	3.5281E+12	1.2212E+11
		50%	99%	26.47	3.8731E+11	2.9682E+12	3.3555E+12	-5.0504E+10
			80%	26.47	3.8731E+11	2.9682E+12	3.3555E+12	-5.0518E+10
			50%	26.47	3.8731E+11	2.9682E+12	3.3555E+12	-5.0547E+10
	80%	99%	99%	25.64	4.6823E+11	3.3306E+12	3.7988E+12	3.1187E+11
			80%	25.64	4.6823E+11	3.3306E+12	3.7988E+12	3.1185E+11
			50%	25.64	4.6823E+11	3.3305E+12	3.7988E+12	3.1182E+11
		80%	99%	25.64	4.6823E+11	3.0188E+12	3.4870E+12	4.2300E+07
			80%	25.64	4.6823E+11	3.0187E+12	3.4870E+12	2.8600E+07
▶			50%	25.64	4.6823E+11	3.0187E+12	3.4869E+12	0.0000E+00
		50%	99%	25.64	4.6823E+11	2.8482E+12	3.3164E+12	-1.7056E+11
			80%	25.64	4.6823E+11	2.8481E+12	3.3164E+12	-1.7058E+11
			50%	25.64	4.6823E+11	2.8481E+12	3.3163E+12	-1.7061E+11
	50%	99%	99%	25.16	5.8259E+11	3.2762E+12	3.8588E+12	2.5749E+11
			80%	25.16	5.8259E+11	3.2762E+12	3.8588E+12	2.5748E+11
			50%	25.16	5.8259E+11	3.2762E+12	3.8588E+12	2.5745E+11
		80%	99%	25.16	5.8259E+11	2.9649E+12	3.5474E+12	-5.3860E+10
			80%	25.16	5.8259E+11	2.9648E+12	3.5474E+12	-5.3873E+10
			50%	25.16	5.8259E+11	2.9648E+12	3.5474E+12	-5.3901E+10
		50%	99%	25.16	5.8259E+11	2.7964E+12	3.3790E+12	-2.2228E+11
			80%	25.16	5.8259E+11	2.7964E+12	3.3790E+12	-2.2230E+11
			50%	25.16	5.8259E+11	2.7964E+12	3.3790E+12	-2.2232E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_e (J)	W_d (J)	W (J)	OPL
94	99%	99%	99%	26.00	4.1749E+11	3.4455E+12	3.8630E+12	3.1296E+11
			80%	26.00	4.1749E+11	3.4455E+12	3.8630E+12	3.1294E+11
			50%	26.00	4.1749E+11	3.4454E+12	3.8629E+12	3.1292E+11
		80%	99%	26.00	4.1749E+11	3.1326E+12	3.5500E+12	4.1900E+07
			80%	26.00	4.1749E+11	3.1325E+12	3.5500E+12	2.8300E+07
			50%	26.00	4.1749E+11	3.1325E+12	3.5500E+12	0.0000E+00
		50%	99%	26.00	4.1749E+11	2.9606E+12	3.3781E+12	-1.7188E+11
			80%	26.00	4.1749E+11	2.9606E+12	3.3781E+12	-1.7190E+11
			50%	26.00	4.1749E+11	2.9606E+12	3.3781E+12	-1.7193E+11
	80%	99%	99%	25.09	5.3501E+11	3.3265E+12	3.8615E+12	1.9400E+11
			80%	25.09	5.3501E+11	3.3265E+12	3.8615E+12	1.9398E+11
			50%	25.09	5.3501E+11	3.3265E+12	3.8615E+12	1.9396E+11
		80%	99%	25.09	5.3501E+11	3.0197E+12	3.5547E+12	-1.1284E+11
			80%	25.09	5.3501E+11	3.0197E+12	3.5547E+12	-1.1286E+11
			50%	25.09	5.3501E+11	3.0196E+12	3.5546E+12	-1.1288E+11
		50%	99%	25.09	5.3501E+11	2.8496E+12	3.3846E+12	-2.8290E+11
			80%	25.09	5.3501E+11	2.8496E+12	3.3846E+12	-2.8291E+11
			50%	25.09	5.3501E+11	2.8496E+12	3.3846E+12	-2.8294E+11
	50%	99%	99%	24.61	6.6781E+11	3.2756E+12	3.9434E+12	1.4311E+11
			80%	24.61	6.6781E+11	3.2756E+12	3.9434E+12	1.4310E+11
			50%	24.61	6.6781E+11	3.2756E+12	3.9434E+12	1.4307E+11
		80%	99%	24.61	6.6781E+11	2.9704E+12	3.6382E+12	-1.6210E+11
			80%	24.61	6.6781E+11	2.9704E+12	3.6382E+12	-1.6212E+11
			50%	24.61	6.6781E+11	2.9704E+12	3.6382E+12	-1.6214E+11
		50%	99%	24.61	6.6781E+11	2.8021E+12	3.4699E+12	-3.3037E+11
			80%	24.61	6.6781E+11	2.8021E+12	3.4699E+12	-3.3039E+11
			50%	24.61	6.6781E+11	2.8021E+12	3.4699E+12	-3.3041E+11
96	99%	99%	99%	26.90	3.7264E+11	3.6138E+12	3.9864E+12	5.7007E+11
			80%	26.90	3.7264E+11	3.6137E+12	3.9864E+12	5.7005E+11
			50%	26.90	3.7264E+11	3.6137E+12	3.9863E+12	5.7002E+11
		80%	99%	26.90	3.7264E+11	3.2733E+12	3.6459E+12	2.2959E+11
			80%	26.90	3.7264E+11	3.2733E+12	3.6459E+12	2.2957E+11
			50%	26.90	3.7264E+11	3.2732E+12	3.6459E+12	2.2954E+11
		50%	99%	26.90	3.7264E+11	3.0874E+12	3.4601E+12	4.3728E+10
			80%	26.90	3.7264E+11	3.0874E+12	3.4600E+12	4.3714E+10
			50%	26.90	3.7264E+11	3.0874E+12	3.4600E+12	4.3686E+10
	80%	99%	99%	25.97	3.7704E+11	3.4587E+12	3.8357E+12	4.1497E+11
			80%	25.97	3.7704E+11	3.4586E+12	3.8357E+12	4.1496E+11
			50%	25.97	3.7704E+11	3.4586E+12	3.8357E+12	4.1493E+11
		80%	99%	25.97	3.7704E+11	3.1226E+12	3.4997E+12	7.8924E+10
			80%	25.97	3.7704E+11	3.1226E+12	3.4996E+12	7.8910E+10
			50%	25.97	3.7704E+11	3.1226E+12	3.4996E+12	7.8882E+10
		50%	99%	25.97	3.7704E+11	2.9389E+12	3.3159E+12	-1.0483E+11
			80%	25.97	3.7704E+11	2.9388E+12	3.3159E+12	-1.0484E+11
			50%	25.97	3.7704E+11	2.9388E+12	3.3159E+12	-1.0487E+11
	50%	99%	99%	25.49	4.0944E+11	3.3786E+12	3.7880E+12	3.3489E+11
			80%	25.49	4.0944E+11	3.3786E+12	3.7880E+12	3.3488E+11
			50%	25.49	4.0944E+11	3.3785E+12	3.7880E+12	3.3485E+11
		80%	99%	25.49	4.0944E+11	3.0437E+12	3.4532E+12	4.2200E+07
			80%	25.49	4.0944E+11	3.0437E+12	3.4531E+12	2.8600E+07
▶			50%	25.49	4.0944E+11	3.0437E+12	3.4531E+12	0.0000E+00
		50%	99%	25.49	4.0944E+11	2.8619E+12	3.2713E+12	-1.8181E+11
			80%	25.49	4.0944E+11	2.8619E+12	3.2713E+12	-1.8182E+11
			50%	25.49	4.0944E+11	2.8618E+12	3.2713E+12	-1.8185E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
97	99%	99%	99%	25.47	4.5643E+11	3.2631E+12	3.7196E+12	2.6103E+11
			80%	25.47	4.5643E+11	3.2631E+12	3.7196E+12	2.6101E+11
			50%	25.47	4.5643E+11	3.2631E+12	3.7195E+12	2.6098E+11
		80%	99%	25.47	4.5643E+11	3.0022E+12	3.4586E+12	4.2200E+07
			80%	25.47	4.5643E+11	3.0021E+12	3.4586E+12	2.9400E+07
▶			50%	25.47	4.5643E+11	3.0021E+12	3.4585E+12	0.0000E+00
		50%	99%	25.47	4.5643E+11	2.8595E+12	3.3159E+12	-1.4262E+11
			80%	25.47	4.5643E+11	2.8595E+12	3.3159E+12	-1.4263E+11
			50%	25.47	4.5643E+11	2.8595E+12	3.3159E+12	-1.4266E+11
	80%	99%	99%	24.69	6.0734E+11	3.1472E+12	3.7546E+12	1.4514E+11
			80%	24.69	6.0734E+11	3.1472E+12	3.7546E+12	1.4512E+11
			50%	24.69	6.0734E+11	3.1472E+12	3.7545E+12	1.4509E+11
		80%	99%	24.69	6.0734E+11	2.8903E+12	3.4976E+12	-1.1185E+11
			80%	24.69	6.0734E+11	2.8902E+12	3.4976E+12	-1.1187E+11
			50%	24.69	6.0734E+11	2.8902E+12	3.4976E+12	-1.1190E+11
		50%	99%	24.69	6.0734E+11	2.7500E+12	3.3574E+12	-2.5209E+11
			80%	24.69	6.0734E+11	2.7500E+12	3.3574E+12	-2.5210E+11
			50%	24.69	6.0734E+11	2.7500E+12	3.3573E+12	-2.5213E+11
	50%	99%	99%	24.21	7.6190E+11	3.0974E+12	3.8593E+12	9.5246E+10
			80%	24.21	7.6190E+11	3.0973E+12	3.8592E+12	9.5233E+10
			50%	24.21	7.6190E+11	3.0973E+12	3.8592E+12	9.5204E+10
		80%	99%	24.21	7.6190E+11	2.8409E+12	3.6028E+12	-1.6125E+11
			80%	24.21	7.6190E+11	2.8409E+12	3.6027E+12	-1.6126E+11
			50%	24.21	7.6190E+11	2.8408E+12	3.6027E+12	-1.6129E+11
		50%	99%	24.21	7.6190E+11	2.7013E+12	3.4632E+12	-3.0083E+11
			80%	24.21	7.6190E+11	2.7013E+12	3.4632E+12	-3.0084E+11
			50%	24.21	7.6190E+11	2.7012E+12	3.4631E+12	-3.0087E+11
99	99%	99%	99%	27.24	3.7446E+11	3.3465E+12	3.7209E+12	5.1676E+11
			80%	27.24	3.7446E+11	3.3465E+12	3.7209E+12	5.1674E+11
			50%	27.24	3.7446E+11	3.3464E+12	3.7209E+12	5.1671E+11
		80%	99%	27.24	3.7446E+11	3.0826E+12	3.4571E+12	2.5290E+11
			80%	27.24	3.7446E+11	3.0826E+12	3.4571E+12	2.5289E+11
			50%	27.24	3.7446E+11	3.0826E+12	3.4570E+12	2.5286E+11
		50%	99%	27.24	3.7446E+11	2.9388E+12	3.3133E+12	1.0909E+11
			80%	27.24	3.7446E+11	2.9388E+12	3.3132E+12	1.0907E+11
			50%	27.24	3.7446E+11	2.9388E+12	3.3132E+12	1.0905E+11
	80%	99%	99%	26.45	3.9851E+11	3.1729E+12	3.5714E+12	3.4317E+11
			80%	26.45	3.9851E+11	3.1729E+12	3.5714E+12	3.4315E+11
			50%	26.45	3.9851E+11	3.1728E+12	3.5713E+12	3.4312E+11
		80%	99%	26.45	3.9851E+11	2.9155E+12	3.3140E+12	8.5808E+10
			80%	26.45	3.9851E+11	2.9155E+12	3.3140E+12	8.5795E+10
			50%	26.45	3.9851E+11	2.9155E+12	3.3140E+12	8.5766E+10
		50%	99%	26.45	3.9851E+11	2.7749E+12	3.1734E+12	-5.4807E+10
			80%	26.45	3.9851E+11	2.7749E+12	3.1734E+12	-5.4820E+10
			50%	26.45	3.9851E+11	2.7749E+12	3.1734E+12	-5.4849E+10
	50%	99%	99%	25.98	4.5794E+11	3.0848E+12	3.5427E+12	2.5507E+11
			80%	25.98	4.5794E+11	3.0848E+12	3.5427E+12	2.5506E+11
			50%	25.98	4.5794E+11	3.0847E+12	3.5427E+12	2.5503E+11
		80%	99%	25.98	4.5794E+11	2.8298E+12	3.2877E+12	4.1900E+07
			80%	25.98	4.5794E+11	2.8297E+12	3.2877E+12	2.8600E+07
▶			50%	25.98	4.5794E+11	2.8297E+12	3.2877E+12	0.0000E+00
		50%	99%	25.98	4.5794E+11	2.6910E+12	3.1489E+12	-1.3875E+11
			80%	25.98	4.5794E+11	2.6909E+12	3.1489E+12	-1.3877E+11
			50%	25.98	4.5794E+11	2.6909E+12	3.1489E+12	-1.3880E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
98	99%	99%	99%	25.45	4.2191E+11	3.3093E+12	3.7312E+12	3.9643E+11
			80%	25.45	4.2191E+11	3.3093E+12	3.7312E+12	3.9641E+11
			50%	25.45	4.2191E+11	3.3093E+12	3.7312E+12	3.9639E+11
		80%	99%	25.45	4.2191E+11	3.0404E+12	3.4623E+12	1.2748E+11
			80%	25.45	4.2191E+11	3.0404E+12	3.4623E+12	1.2747E+11
			50%	25.45	4.2191E+11	3.0403E+12	3.4622E+12	1.2744E+11
		50%	99%	25.45	4.2191E+11	2.8929E+12	3.3148E+12	-1.9991E+10
			80%	25.45	4.2191E+11	2.8929E+12	3.3148E+12	-2.0005E+10
			50%	25.45	4.2191E+11	2.8929E+12	3.3148E+12	-2.0034E+10
	80%	99%	99%	24.67	5.3951E+11	3.1749E+12	3.7144E+12	2.6203E+11
			80%	24.67	5.3951E+11	3.1749E+12	3.7144E+12	2.6202E+11
			50%	24.67	5.3951E+11	3.1749E+12	3.7144E+12	2.6199E+11
		80%	99%	24.67	5.3951E+11	2.9129E+12	3.4524E+12	4.2200E+07
			80%	24.67	5.3951E+11	2.9129E+12	3.4524E+12	2.8300E+07
▶			50%	24.67	5.3951E+11	2.9129E+12	3.4524E+12	0.0000E+00
		50%	99%	24.67	5.3951E+11	2.7684E+12	3.3079E+12	-1.4451E+11
			80%	24.67	5.3951E+11	2.7684E+12	3.3079E+12	-1.4452E+11
			50%	24.67	5.3951E+11	2.7683E+12	3.3078E+12	-1.4455E+11
	50%	99%	99%	24.19	6.8599E+11	3.1218E+12	3.8078E+12	2.0896E+11
			80%	24.19	6.8599E+11	3.1218E+12	3.8078E+12	2.0895E+11
			50%	24.19	6.8599E+11	3.1218E+12	3.8078E+12	2.0892E+11
		80%	99%	24.19	6.8599E+11	2.8571E+12	3.5431E+12	-5.5740E+10
			80%	24.19	6.8599E+11	2.8571E+12	3.5431E+12	-5.5753E+10
			50%	24.19	6.8599E+11	2.8571E+12	3.5431E+12	-5.5782E+10
		50%	99%	24.19	6.8599E+11	2.7137E+12	3.3997E+12	-1.9922E+11
			80%	24.19	6.8599E+11	2.7137E+12	3.3996E+12	-1.9923E+11
			50%	24.19	6.8599E+11	2.7136E+12	3.3996E+12	-1.9926E+11
100	99%	99%	99%	25.69	4.9822E+11	3.3335E+12	3.8317E+12	2.7066E+11
			80%	25.69	4.9822E+11	3.3335E+12	3.8317E+12	2.7065E+11
			50%	25.69	4.9822E+11	3.3335E+12	3.8317E+12	2.7062E+11
		80%	99%	25.69	4.9822E+11	3.0629E+12	3.5611E+12	4.2200E+07
			80%	25.69	4.9822E+11	3.0629E+12	3.5611E+12	2.8800E+07
▶			50%	25.69	4.9822E+11	3.0629E+12	3.5611E+12	0.0000E+00
		50%	99%	25.69	4.9822E+11	2.9108E+12	3.4090E+12	-1.5205E+11
			80%	25.69	4.9822E+11	2.9108E+12	3.4090E+12	-1.5206E+11
			50%	25.69	4.9822E+11	2.9108E+12	3.4090E+12	-1.5209E+11
	80%	99%	99%	24.74	6.4770E+11	3.2272E+12	3.8749E+12	1.6432E+11
			80%	24.74	6.4770E+11	3.2272E+12	3.8749E+12	1.6431E+11
			50%	24.74	6.4770E+11	3.2271E+12	3.8748E+12	1.6428E+11
		80%	99%	24.74	6.4770E+11	2.9536E+12	3.6013E+12	-1.0926E+11
			80%	24.74	6.4770E+11	2.9536E+12	3.6013E+12	-1.0927E+11
			50%	24.74	6.4770E+11	2.9536E+12	3.6013E+12	-1.0930E+11
		50%	99%	24.74	6.4770E+11	2.8040E+12	3.4517E+12	-2.5881E+11
			80%	24.74	6.4770E+11	2.8040E+12	3.4517E+12	-2.5883E+11
			50%	24.74	6.4770E+11	2.8040E+12	3.4517E+12	-2.5885E+11
	50%	99%	99%	24.05	7.8977E+11	3.1731E+12	3.9628E+12	1.1022E+11
			80%	24.05	7.8977E+11	3.1731E+12	3.9628E+12	1.1020E+11
			50%	24.05	7.8977E+11	3.1730E+12	3.9628E+12	1.1017E+11
		80%	99%	24.05	7.8977E+11	2.9034E+12	3.6932E+12	-1.5942E+11
			80%	24.05	7.8977E+11	2.9034E+12	3.6932E+12	-1.5943E+11
			50%	24.05	7.8977E+11	2.9034E+12	3.6932E+12	-1.5946E+11
		50%	99%	24.05	7.8977E+11	2.7551E+12	3.5449E+12	-3.0775E+11
			80%	24.05	7.8977E+11	2.7551E+12	3.5449E+12	-3.0776E+11
			50%	24.05	7.8977E+11	2.7551E+12	3.5448E+12	-3.0779E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
101	99%	99%	99%	26.94	3.8393E+11	3.3462E+12	3.7301E+12	3.9992E+11
			80%	26.94	3.8393E+11	3.3462E+12	3.7301E+12	3.9991E+11
			50%	26.94	3.8393E+11	3.3461E+12	3.7300E+12	3.9988E+11
		80%	99%	26.94	3.8393E+11	3.0695E+12	3.4534E+12	1.2323E+11
			80%	26.94	3.8393E+11	3.0695E+12	3.4534E+12	1.2321E+11
			50%	26.94	3.8393E+11	3.0694E+12	3.4534E+12	1.2318E+11
		50%	99%	26.94	3.8393E+11	2.9188E+12	3.3028E+12	-2.7412E+10
			80%	26.94	3.8393E+11	2.9188E+12	3.3027E+12	-2.7425E+10
			50%	26.94	3.8393E+11	2.9188E+12	3.3027E+12	-2.7454E+10
	80%	99%	99%	25.99	4.6790E+11	3.2130E+12	3.6809E+12	2.6672E+11
			80%	25.99	4.6790E+11	3.2130E+12	3.6809E+12	2.6671E+11
			50%	25.99	4.6790E+11	3.2129E+12	3.6808E+12	2.6668E+11
		80%	99%	25.99	4.6790E+11	2.9463E+12	3.4142E+12	4.2200E+07
			80%	25.99	4.6790E+11	2.9463E+12	3.4142E+12	2.8600E+07
▶			50%	25.99	4.6790E+11	2.9462E+12	3.4141E+12	0.0000E+00
		50%	99%	25.99	4.6790E+11	2.7972E+12	3.2651E+12	-1.4900E+11
			80%	25.99	4.6790E+11	2.7972E+12	3.2651E+12	-1.4901E+11
			50%	25.99	4.6790E+11	2.7972E+12	3.2651E+12	-1.4904E+11
	50%	99%	99%	25.30	5.8045E+11	3.1597E+12	3.7402E+12	2.1348E+11
			80%	25.30	5.8045E+11	3.1597E+12	3.7402E+12	2.1347E+11
			50%	25.30	5.8045E+11	3.1597E+12	3.7401E+12	2.1344E+11
		80%	99%	25.30	5.8045E+11	2.8895E+12	3.4699E+12	-5.6744E+10
			80%	25.30	5.8045E+11	2.8895E+12	3.4699E+12	-5.6758E+10
			50%	25.30	5.8045E+11	2.8895E+12	3.4699E+12	-5.6786E+10
		50%	99%	25.30	5.8045E+11	2.7420E+12	3.3225E+12	-2.0424E+11
			80%	25.30	5.8045E+11	2.7420E+12	3.3224E+12	-2.0425E+11
			50%	25.30	5.8045E+11	2.7420E+12	3.3224E+12	-2.0428E+11
103	99%	99%	99%	25.99	4.8609E+11	3.5576E+12	4.0437E+12	3.1999E+11
			80%	25.99	4.8609E+11	3.5576E+12	4.0437E+12	3.1998E+11
			50%	25.99	4.8609E+11	3.5576E+12	4.0437E+12	3.1995E+11
		80%	99%	25.99	4.8609E+11	3.2377E+12	3.7238E+12	4.2200E+07
			80%	25.99	4.8609E+11	3.2377E+12	3.7238E+12	2.8800E+07
▶			50%	25.99	4.8609E+11	3.2377E+12	3.7237E+12	0.0000E+00
		50%	99%	25.99	4.8609E+11	3.0618E+12	3.5479E+12	-1.7585E+11
			80%	25.99	4.8609E+11	3.0618E+12	3.5479E+12	-1.7587E+11
			50%	25.99	4.8609E+11	3.0618E+12	3.5479E+12	-1.7590E+11
	80%	99%	99%	25.04	6.3505E+11	3.4206E+12	4.0556E+12	1.8291E+11
			80%	25.04	6.3505E+11	3.4206E+12	4.0556E+12	1.8290E+11
			50%	25.04	6.3505E+11	3.4205E+12	4.0556E+12	1.8287E+11
		80%	99%	25.04	6.3505E+11	3.1038E+12	3.7389E+12	-1.3383E+11
			80%	25.04	6.3505E+11	3.1038E+12	3.7389E+12	-1.3384E+11
			50%	25.04	6.3505E+11	3.1038E+12	3.7388E+12	-1.3387E+11
		50%	99%	25.04	6.3505E+11	2.9304E+12	3.5655E+12	-3.0722E+11
			80%	25.04	6.3505E+11	2.9304E+12	3.5655E+12	-3.0724E+11
			50%	25.04	6.3505E+11	2.9304E+12	3.5654E+12	-3.0727E+11
	50%	99%	99%	24.35	7.7937E+11	3.3554E+12	4.1347E+12	1.1770E+11
			80%	24.35	7.7937E+11	3.3553E+12	4.1347E+12	1.1768E+11
			50%	24.35	7.7937E+11	3.3553E+12	4.1347E+12	1.1766E+11
		80%	99%	24.35	7.7937E+11	3.0415E+12	3.8208E+12	-1.9618E+11
			80%	24.35	7.7937E+11	3.0415E+12	3.8208E+12	-1.9619E+11
			50%	24.35	7.7937E+11	3.0414E+12	3.8208E+12	-1.9622E+11
		50%	99%	24.35	7.7937E+11	2.8696E+12	3.6490E+12	-3.6807E+11
			80%	24.35	7.7937E+11	2.8696E+12	3.6489E+12	-3.6809E+11
			50%	24.35	7.7937E+11	2.8695E+12	3.6489E+12	-3.6811E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d (J)	W_d (J)	W (J)	OPL
102	99%	99%	99%	27.63	3.7568E+11	3.3975E+12	3.7732E+12	4.8897E+11
			80%	27.63	3.7568E+11	3.3975E+12	3.7732E+12	4.8896E+11
			50%	27.63	3.7568E+11	3.3974E+12	3.7731E+12	4.8893E+11
		80%	99%	27.63	3.7568E+11	3.1183E+12	3.4939E+12	2.0974E+11
			80%	27.63	3.7568E+11	3.1182E+12	3.4939E+12	2.0973E+11
			50%	27.63	3.7568E+11	3.1182E+12	3.4939E+12	2.0970E+11
		50%	99%	27.63	3.7568E+11	2.9649E+12	3.3406E+12	5.6370E+10
			80%	27.63	3.7568E+11	2.9649E+12	3.3406E+12	5.6357E+10
			50%	27.63	3.7568E+11	2.9648E+12	3.3405E+12	5.6328E+10
	80%	99%	99%	26.68	3.9582E+11	3.2496E+12	3.6454E+12	3.4106E+11
			80%	26.68	3.9582E+11	3.2496E+12	3.6454E+12	3.4105E+11
			50%	26.68	3.9582E+11	3.2495E+12	3.6454E+12	3.4102E+11
		80%	99%	26.68	3.9582E+11	2.9746E+12	3.3704E+12	6.6044E+10
			80%	26.68	3.9582E+11	2.9745E+12	3.3704E+12	6.6030E+10
			50%	26.68	3.9582E+11	2.9745E+12	3.3703E+12	6.6002E+10
		50%	99%	26.68	3.9582E+11	2.8234E+12	3.2193E+12	-8.5084E+10
			80%	26.68	3.9582E+11	2.8234E+12	3.2192E+12	-8.5098E+10
			50%	26.68	3.9582E+11	2.8234E+12	3.2192E+12	-8.5126E+10
	50%	99%	99%	25.99	4.8210E+11	3.1816E+12	3.6637E+12	2.7311E+11
			80%	25.99	4.8210E+11	3.1816E+12	3.6637E+12	2.7310E+11
			50%	25.99	4.8210E+11	3.1816E+12	3.6637E+12	2.7307E+11
		80%	99%	25.99	4.8210E+11	2.9086E+12	3.3907E+12	4.2200E+07
			80%	25.99	4.8210E+11	2.9085E+12	3.3907E+12	2.8500E+07
▶			50%	25.99	4.8210E+11	2.9085E+12	3.3906E+12	0.0000E+00
		50%	99%	25.99	4.8210E+11	2.7591E+12	3.2412E+12	-1.4942E+11
			80%	25.99	4.8210E+11	2.7591E+12	3.2412E+12	-1.4944E+11
			50%	25.99	4.8210E+11	2.7591E+12	3.2412E+12	-1.4946E+11
104	99%	99%	99%	26.96	3.8761E+11	3.5828E+12	3.9704E+12	4.7400E+11
			80%	26.96	3.8761E+11	3.5828E+12	3.9704E+12	4.7399E+11
			50%	26.96	3.8761E+11	3.5828E+12	3.9704E+12	4.7396E+11
		80%	99%	26.96	3.8761E+11	3.2587E+12	3.6463E+12	1.4988E+11
			80%	26.96	3.8761E+11	3.2587E+12	3.6463E+12	1.4987E+11
			50%	26.96	3.8761E+11	3.2586E+12	3.6463E+12	1.4984E+11
		50%	99%	26.96	3.8761E+11	3.0820E+12	3.4696E+12	-2.6826E+10
			80%	26.96	3.8761E+11	3.0820E+12	3.4696E+12	-2.6839E+10
			50%	26.96	3.8761E+11	3.0819E+12	3.4696E+12	-2.6867E+10
	80%	99%	99%	26.00	4.7629E+11	3.4262E+12	3.9025E+12	3.1741E+11
			80%	26.00	4.7629E+11	3.4262E+12	3.9025E+12	3.1740E+11
			50%	26.00	4.7629E+11	3.4262E+12	3.9025E+12	3.1737E+11
		80%	99%	26.00	4.7629E+11	3.1088E+12	3.5851E+12	4.1700E+07
			80%	26.00	4.7629E+11	3.1088E+12	3.5851E+12	2.8300E+07
▶			50%	26.00	4.7629E+11	3.1088E+12	3.5851E+12	0.0000E+00
		50%	99%	26.00	4.7629E+11	2.9351E+12	3.4114E+12	-1.7367E+11
			80%	26.00	4.7629E+11	2.9351E+12	3.4114E+12	-1.7368E+11
			50%	26.00	4.7629E+11	2.9351E+12	3.4114E+12	-1.7371E+11
	50%	99%	99%	25.31	5.9219E+11	3.3546E+12	3.9467E+12	2.4575E+11
			80%	25.31	5.9219E+11	3.3545E+12	3.9467E+12	2.4573E+11
			50%	25.31	5.9219E+11	3.3545E+12	3.9467E+12	2.4571E+11
		80%	99%	25.31	5.9219E+11	3.0387E+12	3.6309E+12	-7.0069E+10
			80%	25.31	5.9219E+11	3.0387E+12	3.6309E+12	-7.0083E+10
			50%	25.31	5.9219E+11	3.0387E+12	3.6309E+12	-7.0111E+10
		50%	99%	25.31	5.9219E+11	2.8661E+12	3.4583E+12	-2.4267E+11
			80%	25.31	5.9219E+11	2.8661E+12	3.4583E+12	-2.4268E+11
			50%	25.31	5.9219E+11	2.8661E+12	3.4583E+12	-2.4271E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a(J)	W_d(J)	W (J)	OPL
105	99%	99%	99%	27.52	3.7549E+11	3.6338E+12	4.0093E+12	5.7482E+11
			80%	27.52	3.7549E+11	3.6338E+12	4.0093E+12	5.7480E+11
			50%	27.52	3.7549E+11	3.6338E+12	4.0092E+12	5.7477E+11
		80%	99%	27.52	3.7549E+11	3.3078E+12	3.6833E+12	2.4881E+11
			80%	27.52	3.7549E+11	3.3078E+12	3.6833E+12	2.4879E+11
			50%	27.52	3.7549E+11	3.3077E+12	3.6832E+12	2.4877E+11
		50%	99%	27.52	3.7549E+11	3.1266E+12	3.5021E+12	6.7599E+10
			80%	27.52	3.7549E+11	3.1266E+12	3.5021E+12	6.7586E+10
			50%	27.52	3.7549E+11	3.1265E+12	3.5020E+12	6.7557E+10
	80%	99%	99%	26.56	3.9859E+11	3.4607E+12	3.8593E+12	4.0170E+11
			80%	26.56	3.9859E+11	3.4607E+12	3.8593E+12	4.0168E+11
			50%	26.56	3.9859E+11	3.4606E+12	3.8592E+12	4.0165E+11
		80%	99%	26.56	3.9859E+11	3.1379E+12	3.5365E+12	7.8950E+10
			80%	26.56	3.9859E+11	3.1379E+12	3.5365E+12	7.8937E+10
			50%	26.56	3.9859E+11	3.1379E+12	3.5365E+12	7.8909E+10
		50%	99%	26.56	3.9859E+11	2.9606E+12	3.3592E+12	-9.8348E+10
			80%	26.56	3.9859E+11	2.9606E+12	3.3592E+12	-9.8361E+10
			50%	26.56	3.9859E+11	2.9606E+12	3.3592E+12	-9.8398E+10
	50%	99%	99%	25.87	4.8573E+11	3.3804E+12	3.8661E+12	3.2141E+11
			80%	25.87	4.8573E+11	3.3804E+12	3.8661E+12	3.2140E+11
			50%	25.87	4.8573E+11	3.3803E+12	3.8661E+12	3.2137E+11
		80%	99%	25.87	4.8573E+11	3.0590E+12	3.3447E+12	4.1900E+07
			80%	25.87	4.8573E+11	3.0590E+12	3.5447E+12	2.8300E+07
			50%	25.87	4.8573E+11	3.0590E+12	3.5447E+12	0.0000E+00
		50%	99%	25.87	4.8573E+11	2.8830E+12	3.3688E+12	-1.7593E+11
			80%	25.87	4.8573E+11	2.8830E+12	3.3688E+12	-1.7594E+11
			50%	25.87	4.8573E+11	2.8830E+12	3.3687E+12	-1.7597E+11
107	99%	99%	99%	26.92	3.7676E+11	3.4864E+12	3.8631E+12	4.5340E+11
			80%	26.92	3.7676E+11	3.4864E+12	3.8631E+12	4.5338E+11
			50%	26.92	3.7676E+11	3.4863E+12	3.8631E+12	4.5335E+11
		80%	99%	26.92	3.7676E+11	3.1786E+12	3.5554E+12	1.4564E+11
			80%	26.92	3.7676E+11	3.1786E+12	3.5554E+12	1.4562E+11
			50%	26.92	3.7676E+11	3.1786E+12	3.5553E+12	1.4559E+11
		50%	99%	26.92	3.7676E+11	3.0136E+12	3.3903E+12	-1.9431E+10
			80%	26.92	3.7676E+11	3.0135E+12	3.3903E+12	-1.9445E+10
			50%	26.92	3.7676E+11	3.0135E+12	3.3903E+12	-1.9474E+10
	80%	99%	99%	25.91	4.1998E+11	3.3372E+12	3.7572E+12	3.0423E+11
			80%	25.91	4.1998E+11	3.3372E+12	3.7572E+12	3.0422E+11
			50%	25.91	4.1998E+11	3.3372E+12	3.7572E+12	3.0419E+11
		80%	99%	25.91	4.1998E+11	3.0330E+12	3.4530E+12	4.2200E+07
			80%	25.91	4.1998E+11	3.0330E+12	3.4530E+12	2.8600E+07
			50%	25.91	4.1998E+11	3.0330E+12	3.4530E+12	0.0000E+00
		50%	99%	25.91	4.1998E+11	2.8695E+12	3.2895E+12	-1.6348E+11
			80%	25.91	4.1998E+11	2.8695E+12	3.2895E+12	-1.6349E+11
			50%	25.91	4.1998E+11	2.8695E+12	3.2894E+12	-1.6352E+11
	50%	99%	99%	25.30	5.1882E+11	3.2653E+12	3.7841E+12	2.3231E+11
			80%	25.30	5.1882E+11	3.2653E+12	3.7841E+12	2.3229E+11
			50%	25.30	5.1882E+11	3.2653E+12	3.7841E+12	2.3226E+11
		80%	99%	25.30	5.1882E+11	2.9663E+12	3.4851E+12	-6.6697E+10
			80%	25.30	5.1882E+11	2.9663E+12	3.4851E+12	-6.6711E+10
			50%	25.30	5.1882E+11	2.9662E+12	3.4851E+12	-6.6739E+10
		50%	99%	25.30	5.1882E+11	2.8026E+12	3.3214E+12	-2.3039E+11
			80%	25.30	5.1882E+11	2.8026E+12	3.3214E+12	-2.3040E+11
			50%	25.30	5.1882E+11	2.8026E+12	3.3214E+12	-2.3043E+11
106	99%	99%	99%	25.75	4.4700E+11	3.4547E+12	3.9017E+12	3.0163E+11
			80%	25.75	4.4700E+11	3.4547E+12	3.9017E+12	3.0162E+11
			50%	25.75	4.4700E+11	3.4547E+12	3.9017E+12	3.0159E+11
		80%	99%	25.75	4.4700E+11	3.1531E+12	3.6001E+12	4.2000E+07
			80%	25.75	4.4700E+11	3.1531E+12	3.6001E+12	2.8900E+07
			50%	25.75	4.4700E+11	3.1531E+12	3.6001E+12	0.0000E+00
		50%	99%	25.75	4.4700E+11	2.9880E+12	3.4350E+12	-1.6505E+11
			80%	25.75	4.4700E+11	2.9880E+12	3.4350E+12	-1.6506E+11
			50%	25.75	4.4700E+11	2.9880E+12	3.4350E+12	-1.6509E+11
	80%	99%	99%	24.73	5.7936E+11	3.3284E+12	3.9078E+12	1.7534E+11
			80%	24.73	5.7936E+11	3.3284E+12	3.9078E+12	1.7533E+11
			50%	24.73	5.7936E+11	3.3284E+12	3.9077E+12	1.7530E+11
		80%	99%	24.73	5.7936E+11	3.0277E+12	3.6071E+12	-1.2535E+11
			80%	24.73	5.7936E+11	3.0277E+12	3.6071E+12	-1.2536E+11
			50%	24.73	5.7936E+11	3.0277E+12	3.6070E+12	-1.2539E+11
		50%	99%	24.73	5.7936E+11	2.8638E+12	3.4432E+12	-2.8925E+11
			80%	24.73	5.7936E+11	2.8638E+12	3.4432E+12	-2.8926E+11
			50%	24.73	5.7936E+11	2.8638E+12	3.4431E+12	-2.8929E+11
	50%	99%	99%	24.13	7.1420E+11	3.2706E+12	3.9848E+12	1.1748E+11
			80%	24.13	7.1420E+11	3.2705E+12	3.9847E+12	1.1747E+11
			50%	24.13	7.1420E+11	3.2705E+12	3.9847E+12	1.1744E+11
		80%	99%	24.13	7.1420E+11	2.9694E+12	3.6836E+12	-1.8369E+11
			80%	24.13	7.1420E+11	2.9694E+12	3.6836E+12	-1.8370E+11
			50%	24.13	7.1420E+11	2.9693E+12	3.6835E+12	-1.8373E+11
		50%	99%	24.13	7.1420E+11	2.8064E+12	3.5206E+12	-3.4670E+11
			80%	24.13	7.1420E+11	2.8064E+12	3.5206E+12	-3.4671E+11
			50%	24.13	7.1420E+11	2.8063E+12	3.5205E+12	-3.4674E+11
108	99%	99%	99%	27.64	3.7293E+11	3.3863E+12	3.7593E+12	3.8851E+11
			80%	27.64	3.7293E+11	3.3863E+12	3.7593E+12	3.8851E+11
			50%	27.64	3.7293E+11	3.3863E+12	3.7593E+12	3.8851E+11
		80%	99%	27.64	3.7293E+11	3.2957E+12	3.6686E+12	2.9786E+11
			80%	27.64	3.7293E+11	3.2957E+12	3.6686E+12	2.9784E+11
			50%	27.64	3.7293E+11	3.2956E+12	3.6686E+12	2.9781E+11
		50%	99%	27.64	3.7293E+11	3.1287E+12	3.5017E+12	1.3091E+11
			80%	27.64	3.7293E+11	3.1287E+12	3.5017E+12	1.3089E+11
			50%	27.64	3.7293E+11	3.1287E+12	3.5016E+12	1.3087E+11
	80%	99%	99%	26.69	3.7933E+11	3.3998E+12	3.7792E+12	4.0202E+11
			80%	26.69	3.7933E+11	3.3998E+12	3.7792E+12	4.0200E+11
			50%	26.69	3.7933E+11	3.3998E+12	3.7791E+12	4.0198E+11
		80%	99%	26.69	3.7933E+11	3.0987E+12	3.4780E+12	1.0088E+11
			80%	26.69	3.7933E+11	3.0987E+12	3.4780E+12	1.0086E+11
			50%	26.69	3.7933E+11	3.0987E+12	3.4780E+12	1.0083E+11
		50%	99%	26.69	3.7933E+11	2.9345E+12	3.3138E+12	-6.3358E+10
			80%	26.69	3.7933E+11	2.9345E+12	3.3138E+12	-6.3372E+10
			50%	26.69	3.7933E+11	2.9344E+12	3.3138E+12	-6.3400E+10
	50%	99%	99%	26.00	4.3051E+11	3.2966E+12	3.7271E+12	2.9873E+11
			80%	26.00	4.3051E+11	3.2965E+12	3.7271E+12	2.9871E+11
			50%	26.00	4.3051E+11	3.2965E+12	3.7270E+12	2.9869E+11
		80%	99%	26.00	4.3051E+11	2.9979E+12	3.4284E+12	4.1900E+07
			80%	26.00	4.3051E+11	2.9979E+12	3.4284E+12	2.8500E+07
			50%	26.00	4.3051E+11	2.9978E+12	3.4283E+12	0.0000E+00
		50%	99%	26.00	4.3051E+11	2.8357E+12	3.2662E+12	-1.6213E+11
			80%	26.00	4.3051E+11	2.8357E+12	3.2662E+12	-1.6214E+11
			50%	26.00	4.3051E+11	2.8357E+12	3.2662E+12	-1.6217E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
109	99%	99%	99%	25.74	1.3924E+12	7.7241E+12	9.1165E+12	1.1640E+08
			80%	25.74	1.3924E+12	7.7241E+12	9.1165E+12	7.9100E+07
▶			50%	25.74	1.3924E+12	7.7240E+12	9.1164E+12	0.0000E+00
		80%	99%	25.74	1.3924E+12	7.1335E+12	8.5259E+12	-5.9052E+11
			80%	25.74	1.3924E+12	7.1334E+12	8.5258E+12	-5.9056E+11
			50%	25.74	1.3924E+12	7.1333E+12	8.5257E+12	-5.9064E+11
		50%	99%	25.74	1.3924E+12	6.8033E+12	8.1957E+12	-9.2071E+11
			80%	25.74	1.3924E+12	6.8032E+12	8.1956E+12	-9.2074E+11
			50%	25.74	1.3924E+12	6.8031E+12	8.1956E+12	-9.2082E+11
	80%	99%	99%	24.94	1.8477E+12	7.5342E+12	9.3819E+12	-1.8975E+11
			80%	24.94	1.8477E+12	7.5342E+12	9.3819E+12	-1.8978E+11
			50%	24.94	1.8477E+12	7.5341E+12	9.3818E+12	-1.8986E+11
		80%	99%	24.94	1.8477E+12	6.9440E+12	8.7917E+12	-7.7999E+11
			80%	24.94	1.8477E+12	6.9439E+12	8.7916E+12	-7.8003E+11
			50%	24.94	1.8477E+12	6.9439E+12	8.7916E+12	-7.8011E+11
		50%	99%	24.94	1.8477E+12	6.6138E+12	8.4615E+12	-1.1102E+12
			80%	24.94	1.8477E+12	6.6137E+12	8.4614E+12	-1.1102E+12
			50%	24.94	1.8477E+12	6.6137E+12	8.4614E+12	-1.1103E+12
	50%	99%	99%	24.46	2.2702E+12	7.4536E+12	9.7238E+12	-2.7038E+11
			80%	24.46	2.2702E+12	7.4536E+12	9.7238E+12	-2.7042E+11
			50%	24.46	2.2702E+12	7.4535E+12	9.7237E+12	-2.7049E+11
		80%	99%	24.46	2.2702E+12	6.8683E+12	9.1385E+12	-8.5570E+11
			80%	24.46	2.2702E+12	6.8682E+12	9.1385E+12	-8.5574E+11
			50%	24.46	2.2702E+12	6.8682E+12	9.1384E+12	-8.5582E+11
		50%	99%	24.46	2.2702E+12	6.5354E+12	8.8056E+12	-1.1886E+12
			80%	24.46	2.2702E+12	6.5354E+12	8.8056E+12	-1.1886E+12
			50%	24.46	2.2702E+12	6.5353E+12	8.8055E+12	-1.1887E+12
111	99%	99%	99%	27.23	1.0673E+12	7.7563E+12	8.8235E+12	3.5185E+11
			80%	27.23	1.0673E+12	7.7562E+12	8.8235E+12	3.5181E+11
			50%	27.23	1.0673E+12	7.7562E+12	8.8234E+12	3.5174E+11
		80%	99%	27.23	1.0673E+12	7.1475E+12	8.2147E+12	-2.5697E+11
			80%	27.23	1.0673E+12	7.1474E+12	8.2147E+12	-2.5700E+11
			50%	27.23	1.0673E+12	7.1473E+12	8.2146E+12	-2.5708E+11
		50%	99%	27.23	1.0673E+12	6.8237E+12	7.8909E+12	-5.8076E+11
			80%	27.23	1.0673E+12	6.8236E+12	7.8909E+12	-5.8080E+11
			50%	27.23	1.0673E+12	6.8236E+12	7.8908E+12	-5.8088E+11
	80%	99%	99%	26.44	1.2469E+12	7.5011E+12	8.7481E+12	9.6707E+10
			80%	26.44	1.2469E+12	7.5011E+12	8.7480E+12	9.6669E+10
			50%	26.44	1.2469E+12	7.5010E+12	8.7479E+12	9.6591E+10
		80%	99%	26.44	1.2469E+12	6.9083E+12	8.1552E+12	-4.9613E+11
			80%	26.44	1.2469E+12	6.9083E+12	8.1552E+12	-4.9616E+11
			50%	26.44	1.2469E+12	6.9082E+12	8.1551E+12	-4.9624E+11
		50%	99%	26.44	1.2469E+12	6.5783E+12	7.8253E+12	-8.2608E+11
			80%	26.44	1.2469E+12	6.5783E+12	7.8252E+12	-8.2612E+11
			50%	26.44	1.2469E+12	6.5782E+12	7.8252E+12	-8.2620E+11
	50%	99%	99%	25.96	1.5546E+12	7.4045E+12	8.9592E+12	1.1690E+08
			80%	25.96	1.5546E+12	7.4045E+12	8.9592E+12	7.9200E+07
▶			50%	25.96	1.5546E+12	7.4044E+12	8.9591E+12	0.0000E+00
		80%	99%	25.96	1.5546E+12	6.8111E+12	8.3657E+12	-5.9338E+11
			80%	25.96	1.5546E+12	6.8110E+12	8.3657E+12	-5.9342E+11
			50%	25.96	1.5546E+12	6.8109E+12	8.3656E+12	-5.9350E+11
		50%	99%	25.96	1.5546E+12	6.4831E+12	8.0377E+12	-9.2135E+11
			80%	25.96	1.5546E+12	6.4830E+12	8.0377E+12	-9.2138E+11
			50%	25.96	1.5546E+12	6.4830E+12	8.0376E+12	-9.2146E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
110	99%	99%	99%	25.73	1.3880E+12	7.7393E+12	9.1273E+12	1.9924E+11
			80%	25.73	1.3880E+12	7.7393E+12	9.1273E+12	1.9920E+11
			50%	25.73	1.3880E+12	7.7392E+12	9.1272E+12	1.9912E+11
		80%	99%	25.73	1.3880E+12	7.1359E+12	8.5239E+12	-4.0417E+11
			80%	25.73	1.3880E+12	7.1359E+12	8.5239E+12	-4.0420E+11
			50%	25.73	1.3880E+12	7.1358E+12	8.5238E+12	-4.0428E+11
		50%	99%	25.73	1.3880E+12	6.8060E+12	8.1940E+12	-7.3409E+11
			80%	25.73	1.3880E+12	6.8060E+12	8.1940E+12	-7.3413E+11
			50%	25.73	1.3880E+12	6.8059E+12	8.1939E+12	-7.3421E+11
	80%	99%	99%	24.94	1.8416E+12	7.5402E+12	9.3818E+12	1.1640E+08
			80%	24.94	1.8416E+12	7.5402E+12	9.3817E+12	7.9200E+07
▶			50%	24.94	1.8416E+12	7.5401E+12	9.3816E+12	0.0000E+00
		80%	99%	24.94	1.8416E+12	6.9468E+12	8.7884E+12	-5.9330E+11
			80%	24.94	1.8416E+12	6.9467E+12	8.7883E+12	-5.9334E+11
			50%	24.94	1.8416E+12	6.9467E+12	8.7882E+12	-5.9341E+11
		50%	99%	24.94	1.8416E+12	6.6159E+12	8.4574E+12	-9.2420E+11
			80%	24.94	1.8416E+12	6.6158E+12	8.4574E+12	-9.2424E+11
			50%	24.94	1.8416E+12	6.6158E+12	8.4573E+12	-9.2432E+11
	50%	99%	99%	24.46	2.2642E+12	7.4597E+12	9.7239E+12	-8.0413E+10
			80%	24.46	2.2642E+12	7.4596E+12	9.7238E+12	-8.0449E+10
			50%	24.46	2.2642E+12	7.4596E+12	9.7237E+12	-8.0529E+10
		80%	99%	24.46	2.2642E+12	6.8706E+12	9.1348E+12	-6.6946E+11
			80%	24.46	2.2642E+12	6.8706E+12	9.1348E+12	-6.6949E+11
			50%	24.46	2.2642E+12	6.8705E+12	9.1347E+12	-6.6957E+11
		50%	99%	24.46	2.2642E+12	6.5384E+12	8.8025E+12	-1.0017E+12
			80%	24.46	2.2642E+12	6.5383E+12	8.8025E+12	-1.0018E+12
			50%	24.46	2.2642E+12	6.5382E+12	8.8024E+12	-1.0018E+12
112	99%	99%	99%	25.78	1.5278E+12	8.0933E+12	9.6211E+12	1.1640E+08
			80%	25.78	1.5278E+12	8.0933E+12	9.6210E+12	8.0200E+07
▶			50%	25.78	1.5278E+12	8.0932E+12	9.6210E+12	0.0000E+00
		80%	99%	25.78	1.5278E+12	7.3925E+12	8.9203E+12	-7.0064E+11
			80%	25.78	1.5278E+12	7.3925E+12	8.9203E+12	-7.0067E+11
			50%	25.78	1.5278E+12	7.3924E+12	8.9202E+12	-7.0075E+11
		50%	99%	25.78	1.5278E+12	7.0145E+12	8.5423E+12	-1.0787E+12
			80%	25.78	1.5278E+12	7.0145E+12	8.5423E+12	-1.0787E+12
			50%	25.78	1.5278E+12	7.0144E+12	8.5422E+12	-1.0788E+12
	80%	99%	99%	24.91	1.9906E+12	7.8774E+12	9.8680E+12	-2.1580E+11
			80%	24.91	1.9906E+12	7.8773E+12	9.8679E+12	-2.1584E+11
			50%	24.91	1.9906E+12	7.8773E+12	9.8679E+12	-2.1592E+11
		80%	99%	24.91	1.9906E+12	7.2056E+12	9.1962E+12	-8.8758E+11
			80%	24.91	1.9906E+12	7.2056E+12	9.1962E+12	-8.8762E+11
			50%	24.91	1.9906E+12	7.2055E+12	9.1961E+12	-8.8770E+11
		50%	99%	24.91	1.9906E+12	6.8324E+12	8.8229E+12	-1.2608E+12
			80%	24.91	1.9906E+12	6.8323E+12	8.8229E+12	-1.2609E+12
			50%	24.91	1.9906E+12	6.8322E+12	8.8228E+12	-1.2609E+12
	50%	99%	99%	24.43	2.4075E+12	7.7895E+12	1.0197E+13	-3.0373E+11
			80%	24.43	2.4075E+12	7.7894E+12	1.0197E+13	-3.0376E+11
			50%	24.43	2.4075E+12	7.7893E+12	1.0197E+13	-3.0384E+11
		80%	99%	24.43	2.4075E+12	7.1325E+12	9.5400E+12	-9.6067E+11
			80%	24.43	2.4075E+12	7.1325E+12	9.5400E+12	-9.6070E+11
			50%	24.43	2.4075E+12	7.1324E+12	9.5399E+12	-9.6078E+11
		50%	99%	24.43	2.4075E+12	6.7562E+12	9.1637E+12	-1.3370E+12
			80%	24.43	2.4075E+12	6.7561E+12	9.1637E+12	-1.3370E+12
			50%	24.43	2.4075E+12	6.7561E+12	9.1636E+12	-1.3371E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
113	99%	99%	99%	25.96	1.4027E+12	8.1109E+12	9.5136E+12	2.3040E+11
			80%	25.96	1.4027E+12	8.1109E+12	9.5136E+12	2.3036E+11
			50%	25.96	1.4027E+12	8.1108E+12	9.5135E+12	2.3028E+11
		80%	99%	25.96	1.4027E+12	7.4075E+12	8.8102E+12	-4.7304E+11
			80%	25.96	1.4027E+12	7.4074E+12	8.8102E+12	-4.7308E+11
			50%	25.96	1.4027E+12	7.4074E+12	8.8101E+12	-4.7316E+11
		50%	99%	25.96	1.4027E+12	7.0271E+12	8.4298E+12	-8.5343E+11
			80%	25.96	1.4027E+12	7.0271E+12	8.4298E+12	-8.5346E+11
			50%	25.96	1.4027E+12	7.0270E+12	8.4297E+12	-8.5354E+11
	80%	99%	99%	25.09	1.8251E+12	7.8806E+12	9.7057E+12	1.1480E+08
			80%	25.09	1.8251E+12	7.8806E+12	9.7057E+12	7.7500E+07
▶			50%	25.09	1.8251E+12	7.8805E+12	9.7056E+12	0.0000E+00
		80%	99%	25.09	1.8251E+12	7.2093E+12	9.0344E+12	-6.7121E+11
			80%	25.09	1.8251E+12	7.2093E+12	9.0344E+12	-6.7125E+11
			50%	25.09	1.8251E+12	7.2092E+12	9.0343E+12	-6.7133E+11
		50%	99%	25.09	1.8251E+12	6.8355E+12	8.6606E+12	-1.0450E+12
			80%	25.09	1.8251E+12	6.8354E+12	8.6605E+12	-1.0451E+12
			50%	25.09	1.8251E+12	6.8354E+12	8.6605E+12	-1.0452E+12
	50%	99%	99%	24.62	2.2434E+12	7.8013E+12	1.0045E+13	-7.9233E+10
			80%	24.62	2.2434E+12	7.8012E+12	1.0045E+13	-7.9270E+10
			50%	24.62	2.2434E+12	7.8012E+12	1.0045E+13	-7.9348E+10
		80%	99%	24.62	2.2434E+12	7.1312E+12	9.3746E+12	-7.4932E+11
			80%	24.62	2.2434E+12	7.1312E+12	9.3746E+12	-7.4935E+11
			50%	24.62	2.2434E+12	7.1311E+12	9.3745E+12	-7.4942E+11
		50%	99%	24.62	2.2434E+12	6.7563E+12	8.9997E+12	-1.1242E+12
			80%	24.62	2.2434E+12	6.7563E+12	8.9997E+12	-1.1242E+12
			50%	24.62	2.2434E+12	6.7562E+12	8.9996E+12	-1.1243E+12
115	99%	99%	99%	25.79	1.2956E+12	7.7444E+12	9.0400E+12	1.1590E+08
			80%	25.79	1.2956E+12	7.7443E+12	9.0400E+12	7.8700E+07
▶			50%	25.79	1.2956E+12	7.7443E+12	9.0399E+12	0.0000E+00
		80%	99%	25.79	1.2956E+12	7.1677E+12	8.4634E+12	-5.7651E+11
			80%	25.79	1.2956E+12	7.1677E+12	8.4633E+12	-5.7654E+11
			50%	25.79	1.2956E+12	7.1676E+12	8.4633E+12	-5.7662E+11
		50%	99%	25.79	1.2956E+12	6.8207E+12	8.1163E+12	-9.2358E+11
			80%	25.79	1.2956E+12	6.8206E+12	8.1163E+12	-9.2362E+11
			50%	25.79	1.2956E+12	6.8206E+12	8.1162E+12	-9.2370E+11
	80%	99%	99%	25.00	1.7400E+12	7.5304E+12	9.2703E+12	-2.1387E+11
			80%	25.00	1.7400E+12	7.5303E+12	9.2703E+12	-2.1391E+11
			50%	25.00	1.7400E+12	7.5303E+12	9.2702E+12	-2.1399E+11
		80%	99%	25.00	1.7400E+12	6.9487E+12	8.6887E+12	-7.9554E+11
			80%	25.00	1.7400E+12	6.9487E+12	8.6886E+12	-7.9558E+11
			50%	25.00	1.7400E+12	6.9486E+12	8.6886E+12	-7.9566E+11
		50%	99%	25.00	1.7400E+12	6.6053E+12	8.3453E+12	-1.1390E+12
			80%	25.00	1.7400E+12	6.6053E+12	8.3452E+12	-1.1390E+12
			50%	25.00	1.7400E+12	6.6052E+12	8.3451E+12	-1.1391E+12
	50%	99%	99%	24.52	2.1684E+12	7.4392E+12	9.6077E+12	-3.0503E+11
			80%	24.52	2.1684E+12	7.4392E+12	9.6076E+12	-3.0506E+11
			50%	24.52	2.1684E+12	7.4391E+12	9.6076E+12	-3.0514E+11
		80%	99%	24.52	2.1684E+12	6.8564E+12	9.0249E+12	-8.8782E+11
			80%	24.52	2.1684E+12	6.8564E+12	9.0248E+12	-8.8786E+11
			50%	24.52	2.1684E+12	6.8563E+12	9.0248E+12	-8.8794E+11
		50%	99%	24.52	2.1684E+12	6.5187E+12	8.6872E+12	-1.2255E+12
			80%	24.52	2.1684E+12	6.5187E+12	8.6871E+12	-1.2256E+12
			50%	24.52	2.1684E+12	6.5186E+12	8.6870E+12	-1.2256E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
114	99%	99%	99%	26.55	1.1607E+12	8.1792E+12	9.3399E+12	3.6750E+11
			80%	26.55	1.1607E+12	8.1792E+12	9.3399E+12	3.6746E+11
			50%	26.55	1.1607E+12	8.1791E+12	9.3398E+12	3.6738E+11
		80%	99%	26.55	1.1607E+12	7.4453E+12	8.6061E+12	-3.6636E+11
			80%	26.55	1.1607E+12	7.4453E+12	8.6060E+12	-3.6640E+11
			50%	26.55	1.1607E+12	7.4452E+12	8.6060E+12	-3.6648E+11
		50%	99%	26.55	1.1607E+12	7.0638E+12	8.2246E+12	-7.4785E+11
			80%	26.55	1.1607E+12	7.0638E+12	8.2246E+12	-7.4789E+11
			50%	26.55	1.1607E+12	7.0637E+12	8.2245E+12	-7.4797E+11
	80%	99%	99%	25.65	1.4833E+12	7.9148E+12	9.3981E+12	1.0316E+11
			80%	25.65	1.4833E+12	7.9148E+12	9.3981E+12	1.0312E+11
			50%	25.65	1.4833E+12	7.9147E+12	9.3980E+12	1.0304E+11
		80%	99%	25.65	1.4833E+12	7.2213E+12	8.7045E+12	-5.9043E+11
			80%	25.65	1.4833E+12	7.2212E+12	8.7045E+12	-5.9047E+11
			50%	25.65	1.4833E+12	7.2211E+12	8.7044E+12	-5.9055E+11
		50%	99%	25.65	1.4833E+12	6.8381E+12	8.3214E+12	-9.7356E+11
			80%	25.65	1.4833E+12	6.8381E+12	8.3214E+12	-9.7359E+11
			50%	25.65	1.4833E+12	6.8380E+12	8.3213E+12	-9.7367E+11
	50%	99%	99%	25.17	1.8324E+12	7.8118E+12	9.6442E+12	1.1640E+08
			80%	25.17	1.8324E+12	7.8118E+12	9.6442E+12	7.9200E+07
▶			50%	25.17	1.8324E+12	7.8117E+12	9.6441E+12	0.0000E+00
		80%	99%	25.17	1.8324E+12	7.1275E+12	8.9599E+12	-6.8420E+11
			80%	25.17	1.8324E+12	7.1274E+12	8.9599E+12	-6.8424E+11
			50%	25.17	1.8324E+12	7.1274E+12	8.9598E+12	-6.8432E+11
		50%	99%	25.17	1.8324E+12	6.7465E+12	8.5789E+12	-1.0651E+12
			80%	25.17	1.8324E+12	6.7465E+12	8.5789E+12	-1.0652E+12
			50%	25.17	1.8324E+12	6.7464E+12	8.5788E+12	-1.0653E+12
116	99%	99%	99%	26.79	1.0846E+12	7.8628E+12	8.9474E+12	3.0853E+11
			80%	26.79	1.0846E+12	7.8627E+12	8.9473E+12	3.0849E+11
			50%	26.79	1.0846E+12	7.8626E+12	8.9473E+12	3.0841E+11
		80%	99%	26.79	1.0846E+12	7.2482E+12	8.3328E+12	-3.0606E+11
			80%	26.79	1.0846E+12	7.2481E+12	8.3328E+12	-3.0610E+11
			50%	26.79	1.0846E+12	7.2481E+12	8.3327E+12	-3.0618E+11
		50%	99%	26.79	1.0846E+12	6.8973E+12	7.9819E+12	-6.5691E+11
			80%	26.79	1.0846E+12	6.8973E+12	7.9819E+12	-6.5695E+11
			50%	26.79	1.0846E+12	6.8972E+12	7.9818E+12	-6.5703E+11
	80%	99%	99%	26.00	1.2774E+12	7.5544E+12	8.8318E+12	1.1690E+08
			80%	26.00	1.2774E+12	7.5543E+12	8.8317E+12	7.8600E+07
▶			50%	26.00	1.2774E+12	7.5542E+12	8.8316E+12	0.0000E+00
		80%	99%	26.00	1.2774E+12	6.9564E+12	8.2338E+12	-5.9781E+11
			80%	26.00	1.2774E+12	6.9564E+12	8.2338E+12	-5.9785E+11
			50%	26.00	1.2774E+12	6.9563E+12	8.2337E+12	-5.9793E+11
		50%	99%	26.00	1.2774E+12	6.6139E+12	7.8913E+12	-9.4037E+11
			80%	26.00	1.2774E+12	6.6138E+12	7.8912E+12	-9.4040E+11
			50%	26.00	1.2774E+12	6.6138E+12	7.8912E+12	-9.4048E+11
	50%	99%	99%	25.52	1.5996E+12	7.4376E+12	9.0372E+12	-1.1669E+11
			80%	25.52	1.5996E+12	7.4375E+12	9.0371E+12	-1.1672E+11
			50%	25.52	1.5996E+12	7.4374E+12	9.0371E+12	-1.1680E+11
		80%	99%	25.52	1.5996E+12	6.8360E+12	8.4356E+12	-7.1824E+11
			80%	25.52	1.5996E+12	6.8360E+12	8.4356E+12	-7.1828E+11
			50%	25.52	1.5996E+12	6.8359E+12	8.4355E+12	-7.1836E+11
		50%	99%	25.52	1.5996E+12	6.4959E+12	8.0956E+12	-1.0583E+12
			80%	25.52	1.5996E+12	6.4959E+12	8.0955E+12	-1.0583E+12
			50%	25.52	1.5996E+12	6.4958E+12	8.0954E+12	-1.0584E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{st}(J)	W_{d}(J)	W (J)	OPL
117	99%	99%	99%	27.24	1.0508E+12	7.9261E+12	8.9769E+12	4.7276E+11
			80%	27.24	1.0508E+12	7.9261E+12	8.9769E+12	4.7272E+11
			50%	27.24	1.0508E+12	7.9260E+12	8.9768E+12	4.7265E+11
		80%	99%	27.24	1.0508E+12	7.2947E+12	8.3455E+12	-1.5864E+11
			80%	27.24	1.0508E+12	7.2947E+12	8.3455E+12	-1.5868E+11
			50%	27.24	1.0508E+12	7.2946E+12	8.3454E+12	-1.5876E+11
		50%	99%	27.34	1.0508E+12	6.9500E+12	8.0008E+12	-5.0338E+11
			80%	27.24	1.0508E+12	6.9499E+12	8.0007E+12	-5.0342E+11
			50%	27.24	1.0508E+12	6.9499E+12	8.0007E+12	-5.0350E+11
	80%	99%	99%	26.45	1.1449E+12	7.6017E+12	8.7467E+12	1.4838E+11
			80%	26.45	1.1449E+12	7.6017E+12	8.7466E+12	1.4834E+11
			50%	26.45	1.1449E+12	7.6016E+12	8.7466E+12	1.4826E+11
		80%	99%	26.45	1.1449E+12	6.9893E+12	8.1342E+12	-4.6409E+11
			80%	26.45	1.1449E+12	6.9892E+12	8.1342E+12	-4.6412E+11
			50%	26.45	1.1449E+12	6.9892E+12	8.1341E+12	-4.6420E+11
		50%	99%	26.45	1.1449E+12	6.6499E+12	7.7948E+12	-8.0350E+11
			80%	26.45	1.1449E+12	6.6498E+12	7.7948E+12	-8.0354E+11
			50%	26.45	1.1449E+12	6.6497E+12	7.7947E+12	-8.0362E+11
	50%	99%	99%	25.97	1.3515E+12	7.4535E+12	8.8050E+12	1.1590E+08
			80%	25.97	1.3515E+12	7.4534E+12	8.8049E+12	7.9200E+07
▶			50%	25.97	1.3515E+12	7.4534E+12	8.8049E+12	0.0000E+00
		80%	99%	25.97	1.3515E+12	6.8488E+12	8.2003E+12	-6.0454E+11
			80%	25.97	1.3515E+12	6.8488E+12	8.2003E+12	-6.0457E+11
			50%	25.97	1.3515E+12	6.8487E+12	8.2002E+12	-6.0465E+11
		50%	99%	25.97	1.3515E+12	6.5052E+12	7.8567E+12	-9.4816E+11
			80%	25.97	1.3515E+12	6.5052E+12	7.8567E+12	-9.4819E+11
			50%	25.97	1.3515E+12	6.5051E+12	7.8566E+12	-9.4827E+11
119	99%	99%	99%	26.23	1.6883E+12	7.8395E+12	9.5278E+12	2.1187E+11
			80%	26.23	1.6883E+12	7.8395E+12	9.5277E+12	2.1183E+11
			50%	26.23	1.6883E+12	7.8394E+12	9.5277E+12	2.1175E+11
		80%	99%	26.23	1.6883E+12	7.2300E+12	8.9182E+12	-3.9768E+11
			80%	26.23	1.6883E+12	7.2299E+12	8.9182E+12	-3.9772E+11
			50%	26.23	1.6883E+12	7.2299E+12	8.9181E+12	-3.9780E+11
		50%	99%	26.23	1.6883E+12	6.8960E+12	8.5843E+12	-7.3162E+11
			80%	26.23	1.6883E+12	6.8960E+12	8.5843E+12	-7.3166E+11
			50%	26.23	1.6883E+12	6.8959E+12	8.5842E+12	-7.3174E+11
	80%	99%	99%	25.28	2.1643E+12	7.6278E+12	9.7921E+12	1.1590E+08
			80%	25.28	2.1643E+12	7.6277E+12	9.7921E+12	7.9200E+07
▶			50%	25.28	2.1643E+12	7.6277E+12	9.7920E+12	0.0000E+00
		80%	99%	25.28	2.1643E+12	7.0337E+12	9.1980E+12	-5.9398E+11
			80%	25.28	2.1643E+12	7.0336E+12	9.1980E+12	-5.9402E+11
			50%	25.28	2.1643E+12	7.0336E+12	9.1979E+12	-5.9410E+11
		50%	99%	25.28	2.1643E+12	6.7062E+12	8.8705E+12	-9.2150E+11
			80%	25.28	2.1643E+12	6.7061E+12	8.8705E+12	-9.2154E+11
			50%	25.28	2.1643E+12	6.7060E+12	8.8704E+12	-9.2162E+11
	50%	99%	99%	24.59	2.5474E+12	7.5332E+12	1.0081E+13	-9.4463E+10
			80%	24.59	2.5474E+12	7.5332E+12	1.0081E+13	-9.4502E+10
			50%	24.59	2.5474E+12	7.5331E+12	1.0080E+13	-9.4581E+10
		80%	99%	24.59	2.5474E+12	6.9451E+12	9.4925E+12	-6.8256E+11
			80%	24.59	2.5474E+12	6.9451E+12	9.4925E+12	-6.8259E+11
			50%	24.59	2.5474E+12	6.9450E+12	9.4924E+12	-6.8267E+11
		50%	99%	24.59	2.5474E+12	6.6111E+12	9.1586E+12	-1.0165E+12
			80%	24.59	2.5474E+12	6.6111E+12	9.1585E+12	-1.0166E+12
			50%	24.59	2.5474E+12	6.6110E+12	9.1584E+12	-1.0166E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_{st}(J)	W_{d}(J)	W (J)	OPL
118	99%	99%	99%	25.88	1.8453E+12	7.8432E+12	9.6885E+12	1.1640E+08
			80%	25.88	1.8453E+12	7.8432E+12	9.6885E+12	7.9200E+07
▶			50%	25.88	1.8453E+12	7.8431E+12	9.6884E+12	0.0000E+00
		80%	99%	25.88	1.8453E+12	7.2453E+12	9.0906E+12	-5.9780E+11
			80%	25.88	1.8453E+12	7.2453E+12	9.0905E+12	-5.9784E+11
			50%	25.88	1.8453E+12	7.2452E+12	9.0905E+12	-5.9792E+11
		50%	99%	25.88	1.8453E+12	6.9127E+12	8.7580E+12	-9.3039E+11
			80%	25.88	1.8453E+12	6.9127E+12	8.7580E+12	-9.3043E+11
			50%	25.88	1.8453E+12	6.9126E+12	8.7579E+12	-9.3051E+11
	80%	99%	99%	24.93	2.3388E+12	7.6477E+12	9.9865E+12	-1.9540E+11
			80%	24.93	2.3388E+12	7.6477E+12	9.9865E+12	-1.9544E+11
			50%	24.93	2.3388E+12	7.6476E+12	9.9864E+12	-1.9552E+11
		80%	99%	24.93	2.3388E+12	7.0552E+12	9.3941E+12	-7.8788E+11
			80%	24.93	2.3388E+12	7.0552E+12	9.3940E+12	-7.8792E+11
			50%	24.93	2.3388E+12	7.0551E+12	9.3939E+12	-7.8800E+11
		50%	99%	24.93	2.3388E+12	6.7282E+12	9.0670E+12	-1.1149E+12
			80%	24.93	2.3388E+12	6.7282E+12	9.0670E+12	-1.1149E+12
			50%	24.93	2.3388E+12	6.7281E+12	9.0669E+12	-1.1150E+12
	50%	99%	99%	24.24	2.6888E+12	7.5501E+12	1.0239E+13	-2.9302E+11
			80%	24.24	2.6888E+12	7.5501E+12	1.0239E+13	-2.9306E+11
			50%	24.24	2.6888E+12	7.5500E+12	1.0239E+13	-2.9314E+11
		80%	99%	24.24	2.6888E+12	6.9575E+12	9.6463E+12	-8.8565E+11
			80%	24.24	2.6888E+12	6.9574E+12	9.6462E+12	-8.8569E+11
			50%	24.24	2.6888E+12	6.9573E+12	9.6461E+12	-8.8577E+11
		50%	99%	24.24	2.6888E+12	6.6247E+12	9.3135E+12	-1.2184E+12
			80%	24.24	2.6888E+12	6.6247E+12	9.3135E+12	-1.2184E+12
			50%	24.24	2.6888E+12	6.6246E+12	9.3134E+12	-1.2185E+12
120	99%	99%	99%	27.05	1.3577E+12	7.8377E+12	9.1954E+12	3.3336E+11
			80%	27.05	1.3577E+12	7.8377E+12	9.1953E+12	3.3332E+11
			50%	27.05	1.3577E+12	7.8376E+12	9.1952E+12	3.3324E+11
		80%	99%	27.05	1.3577E+12	7.2076E+12	8.5653E+12	-2.9671E+11
			80%	27.05	1.3577E+12	7.2076E+12	8.5652E+12	-2.9675E+11
			50%	27.05	1.3577E+12	7.2075E+12	8.5652E+12	-2.9683E+11
		50%	99%	27.05	1.3577E+12	6.8796E+12	8.2373E+12	-6.2474E+11
			80%	27.05	1.3577E+12	6.8796E+12	8.2372E+12	-6.2478E+11
			50%	27.05	1.3577E+12	6.8795E+12	8.2371E+12	-6.2486E+11
	80%	99%	99%	26.10	1.7653E+12	7.6006E+12	9.3659E+12	9.6210E+10
			80%	26.10	1.7653E+12	7.6005E+12	9.3658E+12	9.6173E+10
			50%	26.10	1.7653E+12	7.6004E+12	9.3657E+12	9.6094E+10
		80%	99%	26.10	1.7653E+12	7.0076E+12	8.7729E+12	-4.9676E+11
			80%	26.10	1.7653E+12	7.0075E+12	8.7728E+12	-4.9680E+11
			50%	26.10	1.7653E+12	7.0075E+12	8.7728E+12	-4.9688E+11
		50%	99%	26.10	1.7653E+12	6.6760E+12	8.4413E+12	-8.2838E+11
			80%	26.10	1.7653E+12	6.6759E+12	8.4412E+12	-8.2841E+11
			50%	26.10	1.7653E+12	6.6758E+12	8.4412E+12	-8.2849E+11
	50%	99%	99%	25.41	2.1560E+12	7.5045E+12	9.6605E+12	1.1700E+08
			80%	25.41	2.1560E+12	7.5044E+12	9.6604E+12	7.8700E+07
▶			50%	25.41	2.1560E+12	7.5043E+12	9.6603E+12	0.0000E+00
		80%	99%	25.41	2.1560E+12	6.9203E+12	9.0763E+12	-5.8409E+11
			80%	25.41	2.1560E+12	6.9202E+12	9.0762E+12	-5.8412E+11
			50%	25.41	2.1560E+12	6.9201E+12	9.0761E+12	-5.8420E+11
		50%	99%	25.41	2.1560E+12	6.5869E+12	8.7429E+12	-9.1744E+11
			80%	25.41	2.1560E+12	6.5869E+12	8.7429E+12	-9.1748E+11
			50%	25.41	2.1560E+12	6.5868E+12	8.7428E+12	-9.1756E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
121	99%	99%	99%	25.94	1.5777E+12	8.4113E+12	9.9890E+12	1.1690E+08
			80%	25.94	1.5777E+12	8.4113E+12	9.9889E+12	7.9100E+07
			50%	25.94	1.5777E+12	8.4112E+12	9.9889E+12	0.0000E+00
		80%	99%	25.94	1.5777E+12	7.6729E+12	9.2505E+12	-7.3832E+11
			80%	25.94	1.5777E+12	7.6729E+12	9.2505E+12	-7.3836E+11
			50%	25.94	1.5777E+12	7.6728E+12	9.2504E+12	-7.3844E+11
		50%	99%	25.94	1.5777E+12	7.2769E+12	8.8545E+12	-1.1343E+12
			80%	25.94	1.5777E+12	7.2768E+12	8.8545E+12	-1.1344E+12
			50%	25.94	1.5777E+12	7.2768E+12	8.8544E+12	-1.1345E+12
	80%	99%	99%	24.99	2.0357E+12	8.1292E+12	1.0165E+13	-2.8206E+11
			80%	24.99	2.0357E+12	8.1291E+12	1.0165E+13	-2.8210E+11
			50%	24.99	2.0357E+12	8.1290E+12	1.0165E+13	-2.8218E+11
		80%	99%	24.99	2.0357E+12	7.4013E+12	9.4370E+12	-1.0099E+12
			80%	24.99	2.0357E+12	7.4013E+12	9.4370E+12	-1.0099E+12
			50%	24.99	2.0357E+12	7.4012E+12	9.4369E+12	-1.0100E+12
		50%	99%	24.99	2.0357E+12	7.0219E+12	9.0576E+12	-1.3893E+12
			80%	24.99	2.0357E+12	7.0218E+12	9.0575E+12	-1.3894E+12
			50%	24.99	2.0357E+12	7.0218E+12	9.0575E+12	-1.3895E+12
	50%	99%	99%	24.30	2.4340E+12	7.9942E+12	1.0428E+13	-4.1700E+11
			80%	24.30	2.4340E+12	7.9942E+12	1.0428E+13	-4.1704E+11
			50%	24.30	2.4340E+12	7.9941E+12	1.0428E+13	-4.1712E+11
		80%	99%	24.30	2.4340E+12	7.2847E+12	9.7187E+12	-1.1265E+12
			80%	24.30	2.4340E+12	7.2847E+12	9.7187E+12	-1.1266E+12
			50%	24.30	2.4340E+12	7.2846E+12	9.7186E+12	-1.1266E+12
		50%	99%	24.30	2.4340E+12	6.9090E+12	9.3431E+12	-1.5022E+12
			80%	24.30	2.4340E+12	6.9090E+12	9.3430E+12	-1.5022E+12
			50%	24.30	2.4340E+12	6.9089E+12	9.3430E+12	-1.5023E+12
123	99%	99%	99%	27.21	1.3603E+12	8.2581E+12	9.6184E+12	4.0661E+11
			80%	27.21	1.3603E+12	8.2580E+12	9.6184E+12	4.0657E+11
			50%	27.21	1.3603E+12	8.2580E+12	9.6183E+12	4.0649E+11
		80%	99%	27.21	1.3603E+12	7.5509E+12	8.9113E+12	-3.0053E+11
			80%	27.21	1.3603E+12	7.5509E+12	8.9113E+12	-3.0057E+11
			50%	27.21	1.3603E+12	7.5508E+12	8.9112E+12	-3.0065E+11
		50%	99%	27.21	1.3603E+12	7.1646E+12	8.5250E+12	-6.8683E+11
			80%	27.21	1.3603E+12	7.1646E+12	8.5250E+12	-6.8686E+11
			50%	27.21	1.3603E+12	7.1645E+12	8.5249E+12	-6.8694E+11
	80%	99%	99%	26.26	1.7686E+12	7.9784E+12	9.7470E+12	1.2693E+11
			80%	26.26	1.7686E+12	7.9784E+12	9.7470E+12	1.2689E+11
			50%	26.26	1.7686E+12	7.9783E+12	9.7469E+12	1.2681E+11
		80%	99%	26.26	1.7686E+12	7.2930E+12	9.0616E+12	-5.5848E+11
			80%	26.26	1.7686E+12	7.2930E+12	9.0616E+12	-5.5852E+11
			50%	26.26	1.7686E+12	7.2929E+12	9.0615E+12	-5.5860E+11
		50%	99%	26.26	1.7686E+12	6.9238E+12	8.6924E+12	-9.2766E+11
			80%	26.26	1.7686E+12	6.9238E+12	8.6924E+12	-9.2770E+11
			50%	26.26	1.7686E+12	6.9237E+12	8.6923E+12	-9.2778E+11
	50%	99%	99%	25.57	2.1644E+12	7.8516E+12	1.0016E+13	1.1690E+08
			80%	25.57	2.1644E+12	7.8516E+12	1.0016E+13	7.9200E+07
			50%	25.57	2.1644E+12	7.8515E+12	1.0016E+13	0.0000E+00
		80%	99%	25.57	2.1644E+12	7.1852E+12	9.3496E+12	-6.6627E+11
			80%	25.57	2.1644E+12	7.1852E+12	9.3496E+12	-6.6630E+11
			50%	25.57	2.1644E+12	7.1851E+12	9.3495E+12	-6.6638E+11
		50%	99%	25.57	2.1644E+12	6.8186E+12	8.9830E+12	-1.0329E+12
			80%	25.57	2.1644E+12	6.8186E+12	8.9830E+12	-1.0329E+12
			50%	25.57	2.1644E+12	6.8185E+12	8.9829E+12	-1.0330E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
122	99%	99%	99%	26.46	1.3796E+12	8.4208E+12	9.8004E+12	3.1838E+11
			80%	26.46	1.3796E+12	8.4208E+12	9.8004E+12	3.1835E+11
			50%	26.46	1.3796E+12	8.4207E+12	9.8003E+12	3.1827E+11
		80%	99%	26.46	1.3796E+12	7.6574E+12	9.0371E+12	-4.4499E+11
			80%	26.46	1.3796E+12	7.6574E+12	9.0370E+12	-4.4503E+11
			50%	26.46	1.3796E+12	7.6573E+12	9.0369E+12	-4.4510E+11
		50%	99%	26.46	1.3796E+12	7.2576E+12	8.6372E+12	-8.4480E+11
			80%	26.46	1.3796E+12	7.2576E+12	8.6372E+12	-8.4484E+11
			50%	26.46	1.3796E+12	7.2575E+12	8.6371E+12	-8.4492E+11
	80%	99%	99%	25.51	1.7891E+12	8.1025E+12	9.8916E+12	1.1700E+08
			80%	25.51	1.7891E+12	8.1025E+12	9.8916E+12	7.9200E+07
			50%	25.51	1.7891E+12	8.1024E+12	9.8915E+12	0.0000E+00
		80%	99%	25.51	1.7891E+12	7.3800E+12	9.1692E+12	-7.2236E+11
			80%	25.51	1.7891E+12	7.3800E+12	9.1691E+12	-7.2239E+11
			50%	25.51	1.7891E+12	7.3799E+12	9.1691E+12	-7.2247E+11
		50%	99%	25.51	1.7891E+12	6.9960E+12	8.7851E+12	-1.1064E+12
			80%	25.51	1.7891E+12	6.9960E+12	8.7851E+12	-1.1064E+12
			50%	25.51	1.7891E+12	6.9959E+12	8.7850E+12	-1.1065E+12
	50%	99%	99%	24.82	2.1844E+12	7.9709E+12	1.0155E+13	-1.3150E+11
			80%	24.82	2.1844E+12	7.9709E+12	1.0155E+13	-1.3154E+11
			50%	24.82	2.1844E+12	7.9708E+12	1.0155E+13	-1.3161E+11
		80%	99%	24.82	2.1844E+12	7.2643E+12	9.4487E+12	-8.3808E+11
			80%	24.82	2.1844E+12	7.2643E+12	9.4487E+12	-8.3812E+11
			50%	24.82	2.1844E+12	7.2642E+12	9.4486E+12	-8.3820E+11
		50%	99%	24.82	2.1844E+12	6.8860E+12	9.0704E+12	-1.2164E+12
			80%	24.82	2.1844E+12	6.8859E+12	9.0704E+12	-1.2165E+12
			50%	24.82	2.1844E+12	6.8859E+12	9.0703E+12	-1.2165E+12
124	99%	99%	99%	25.67	1.6275E+12	8.0757E+12	9.7031E+12	1.1640E+08
			80%	25.67	1.6275E+12	8.0757E+12	9.7031E+12	7.9200E+07
			50%	25.67	1.6275E+12	8.0756E+12	9.7030E+12	0.0000E+00
		80%	99%	25.67	1.6275E+12	7.4228E+12	9.0503E+12	-6.5273E+11
			80%	25.67	1.6275E+12	7.4228E+12	9.0503E+12	-6.5277E+11
			50%	25.67	1.6275E+12	7.4227E+12	9.0502E+12	-6.5285E+11
		50%	99%	25.67	1.6275E+12	7.0605E+12	8.6879E+12	-1.0151E+12
			80%	25.67	1.6275E+12	7.0604E+12	8.6879E+12	-1.0151E+12
			50%	25.67	1.6275E+12	7.0604E+12	8.6878E+12	-1.0152E+12
	80%	99%	99%	24.69	2.0935E+12	7.8357E+12	9.9292E+12	-2.3987E+11
			80%	24.69	2.0935E+12	7.8357E+12	9.9292E+12	-2.2991E+11
			50%	24.69	2.0935E+12	7.8356E+12	9.9291E+12	-2.3999E+11
		80%	99%	24.69	2.0935E+12	7.1939E+12	9.2874E+12	-8.8168E+11
			80%	24.69	2.0935E+12	7.1939E+12	9.2874E+12	-8.8172E+11
			50%	24.69	2.0935E+12	7.1938E+12	9.2873E+12	-8.8180E+11
		50%	99%	24.69	2.0935E+12	6.8364E+12	8.9299E+12	-1.2391E+12
			80%	24.69	2.0935E+12	6.8364E+12	8.9299E+12	-1.2392E+12
			50%	24.69	2.0935E+12	6.8363E+12	8.9298E+12	-1.2392E+12
	50%	99%	99%	24.06	2.4846E+12	7.7282E+12	1.0213E+13	-3.4734E+11
			80%	24.06	2.4846E+12	7.7282E+12	1.0213E+13	-3.4737E+11
			50%	24.06	2.4846E+12	7.7281E+12	1.0213E+13	-3.4746E+11
		80%	99%	24.06	2.4846E+12	7.0954E+12	9.5800E+12	-9.8017E+11
			80%	24.06	2.4846E+12	7.0954E+12	9.5800E+12	-9.8021E+11
			50%	24.06	2.4846E+12	7.0953E+12	9.5799E+12	-9.8029E+11
		50%	99%	24.06	2.4846E+12	6.7383E+12	9.2229E+12	-1.3373E+12
			80%	24.06	2.4846E+12	6.7383E+12	9.2229E+12	-1.3373E+12
			50%	24.06	2.4846E+12	6.7382E+12	9.2228E+12	-1.3374E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
125	99%	99%	99%	26.05	1.4668E+12	8.0722E+12	9.5390E+12	2.5109E+11
			80%	26.05	1.4668E+12	8.0722E+12	9.5390E+12	2.5105E+11
			50%	26.05	1.4668E+12	8.0721E+12	9.5389E+12	2.5098E+11
		80%	99%	26.05	1.4668E+12	7.4108E+12	8.8775E+12	-4.1039E+11
			80%	26.05	1.4668E+12	7.4107E+12	8.8775E+12	-4.1042E+11
			50%	26.05	1.4668E+12	7.4106E+12	8.8774E+12	-4.1050E+11
		50%	99%	26.05	1.4668E+12	7.0472E+12	8.5139E+12	-7.7398E+11
			80%	26.05	1.4668E+12	7.0471E+12	8.5139E+12	-7.7402E+11
			50%	26.05	1.4668E+12	7.0470E+12	8.5138E+12	-7.7410E+11
	80%	99%	99%	25.05	1.9024E+12	7.8213E+12	9.7236E+12	1.1700E+08
			80%	25.05	1.9024E+12	7.8212E+12	9.7236E+12	7.9700E+07
▶			50%	25.05	1.9024E+12	7.8211E+12	9.7235E+12	0.0000E+00
		80%	99%	25.05	1.9024E+12	7.1767E+12	9.0791E+12	-6.4440E+11
			80%	25.05	1.9024E+12	7.1767E+12	9.0791E+12	-6.4443E+11
			50%	25.05	1.9024E+12	7.1766E+12	9.0790E+12	-6.4451E+11
		50%	99%	25.05	1.9024E+12	6.8198E+12	8.7221E+12	-1.0014E+12
			80%	25.05	1.9024E+12	6.8197E+12	8.7221E+12	-1.0014E+12
			50%	25.05	1.9024E+12	6.8196E+12	8.7220E+12	-1.0015E+12
	50%	99%	99%	24.44	2.3025E+12	7.7116E+12	1.0014E+13	-1.0955E+11
			80%	24.44	2.3025E+12	7.7116E+12	1.0014E+13	-1.0959E+11
			50%	24.44	2.3025E+12	7.7115E+12	1.0014E+13	-1.0967E+11
		80%	99%	24.44	2.3025E+12	7.0795E+12	9.3819E+12	-7.4168E+11
			80%	24.44	2.3025E+12	7.0794E+12	9.3819E+12	-7.4172E+11
			50%	24.44	2.3025E+12	7.0793E+12	9.3818E+12	-7.4180E+11
		50%	99%	24.44	2.3025E+12	6.7222E+12	9.0247E+12	-1.0989E+12
			80%	24.44	2.3025E+12	6.7222E+12	9.0246E+12	-1.0990E+12
			50%	24.44	2.3025E+12	6.7221E+12	9.0246E+12	-1.0991E+12
127	99%	99%	99%	25.75	9.5477E+12	2.8225E+13	3.7773E+13	4.6700E+08
			80%	25.75	9.5477E+12	2.8225E+13	3.7773E+13	3.1800E+08
▶			50%	25.75	9.5477E+12	2.8225E+13	3.7772E+13	0.0000E+00
		80%	99%	25.75	9.5477E+12	2.6395E+13	3.5942E+13	-1.8299E+12
			80%	25.75	9.5477E+12	2.6395E+13	3.5942E+13	-1.8301E+12
			50%	25.75	9.5477E+12	2.6394E+13	3.5942E+13	-1.8304E+12
		50%	99%	25.75	9.5477E+12	2.5370E+13	3.4917E+13	-2.8550E+12
			80%	25.75	9.5477E+12	2.5370E+13	3.4917E+13	-2.8551E+12
			50%	25.75	9.5477E+12	2.5369E+13	3.4917E+13	-2.8555E+12
	80%	99%	99%	24.95	1.1257E+13	2.7670E+13	3.8927E+13	-5.5448E+11
			80%	24.95	1.1257E+13	2.7670E+13	3.8927E+13	-5.5462E+11
			50%	24.95	1.1257E+13	2.7670E+13	3.8926E+13	-5.5494E+11
		80%	99%	24.95	1.1257E+13	2.5834E+13	3.7091E+13	-2.3904E+12
			80%	24.95	1.1257E+13	2.5834E+13	3.7091E+13	-2.3905E+12
			50%	24.95	1.1257E+13	2.5834E+13	3.7090E+13	-2.3908E+12
		50%	99%	24.95	1.1257E+13	2.4840E+13	3.6097E+13	-3.3845E+12
			80%	24.95	1.1257E+13	2.4840E+13	3.6097E+13	-3.3846E+12
			50%	24.95	1.1257E+13	2.4840E+13	3.6096E+13	-3.3850E+12
	50%	99%	99%	24.47	1.2290E+13	2.7359E+13	3.9649E+13	-8.6597E+11
			80%	24.47	1.2290E+13	2.7359E+13	3.9649E+13	-8.6612E+11
			50%	24.47	1.2290E+13	2.7358E+13	3.9648E+13	-8.6643E+11
		80%	99%	24.47	1.2290E+13	2.5530E+13	3.7820E+13	-2.6947E+12
			80%	24.47	1.2290E+13	2.5530E+13	3.7820E+13	-2.6948E+12
			50%	24.47	1.2290E+13	2.5530E+13	3.7820E+13	-2.6952E+12
		50%	99%	24.47	1.2290E+13	2.4535E+13	3.6825E+13	-3.6902E+12
			80%	24.47	1.2290E+13	2.4534E+13	3.6824E+13	-3.6904E+12
			50%	24.47	1.2290E+13	2.4534E+13	3.6824E+13	-3.6907E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
126	99%	99%	99%	27.59	1.0899E+12	8.0673E+12	9.1573E+12	4.0517E+11
			80%	27.59	1.0899E+12	8.0673E+12	9.1572E+12	4.0513E+11
			50%	27.59	1.0899E+12	8.0672E+12	9.1571E+12	4.0505E+11
		80%	99%	27.59	1.0899E+12	7.4163E+12	8.5062E+12	-2.4585E+11
			80%	27.59	1.0899E+12	7.4163E+12	8.5062E+12	-2.4589E+11
			50%	27.59	1.0899E+12	7.4162E+12	8.5061E+12	-2.4597E+11
		50%	99%	27.59	1.0899E+12	7.0399E+12	8.1298E+12	-6.2225E+11
			80%	27.59	1.0899E+12	7.0399E+12	8.1298E+12	-6.2229E+11
			50%	27.59	1.0899E+12	7.0398E+12	8.1297E+12	-6.2237E+11
	80%	99%	99%	26.57	1.3629E+12	7.7783E+12	9.1412E+12	1.1611E+11
			80%	26.57	1.3629E+12	7.7782E+12	9.1412E+12	1.1608E+11
			50%	26.57	1.3629E+12	7.7781E+12	9.1411E+12	1.1600E+11
		80%	99%	26.57	1.3629E+12	7.1481E+12	8.5110E+12	-5.1405E+11
			80%	26.57	1.3629E+12	7.1481E+12	8.5110E+12	-5.1408E+11
			50%	26.57	1.3629E+12	7.1480E+12	8.5109E+12	-5.1416E+11
		50%	99%	26.57	1.3629E+12	6.7837E+12	8.1466E+12	-8.7849E+11
			80%	26.57	1.3629E+12	6.7836E+12	8.1466E+12	-8.7853E+11
			50%	26.57	1.3629E+12	6.7835E+12	8.1465E+12	-8.7861E+11
	50%	99%	99%	25.97	1.6920E+12	7.6623E+12	9.3542E+12	1.1590E+08
			80%	25.97	1.6920E+12	7.6622E+12	9.3542E+12	7.9700E+07
▶			50%	25.97	1.6920E+12	7.6622E+12	9.3541E+12	0.0000E+00
		80%	99%	25.97	1.6920E+12	7.0341E+12	8.7261E+12	-6.2805E+11
			80%	25.97	1.6920E+12	7.0341E+12	8.7260E+12	-6.2809E+11
			50%	25.97	1.6920E+12	7.0340E+12	8.7260E+12	-6.2817E+11
		50%	99%	25.97	1.6920E+12	6.6735E+12	8.3654E+12	-9.8868E+11
			80%	25.97	1.6920E+12	6.6734E+12	8.3654E+12	-9.8872E+11
			50%	25.97	1.6920E+12	6.6734E+12	8.3653E+12	-9.8880E+11
128	99%	99%	99%	26.89	7.5922E+12	2.7879E+13	3.5471E+13	4.6461E+11
			80%	26.89	7.5922E+12	2.7879E+13	3.5471E+13	4.6446E+11
			50%	26.89	7.5922E+12	2.7879E+13	3.5471E+13	4.6414E+11
		80%	99%	26.89	7.5922E+12	2.6057E+13	3.3649E+13	-1.3580E+12
			80%	26.89	7.5922E+12	2.6056E+13	3.3649E+13	-1.3581E+12
			50%	26.89	7.5922E+12	2.6056E+13	3.3648E+13	-1.3584E+12
		50%	99%	26.89	7.5922E+12	2.5083E+13	3.2675E+13	-2.3318E+12
			80%	26.89	7.5922E+12	2.5083E+13	3.2675E+13	-2.3320E+12
			50%	26.89	7.5922E+12	2.5082E+13	3.2674E+13	-2.3323E+12
	80%	99%	99%	26.00	9.6947E+12	2.7415E+13	3.7110E+13	4.6300E+08
			80%	26.00	9.6947E+12	2.7415E+13	3.7110E+13	3.1400E+08
▶			50%	26.00	9.6947E+12	2.7415E+13	3.7109E+13	0.0000E+00
		80%	99%	26.00	9.6947E+12	2.5603E+13	3.5298E+13	-1.8116E+12
			80%	26.00	9.6947E+12	2.5603E+13	3.5297E+13	-1.8118E+12
			50%	26.00	9.6947E+12	2.5602E+13	3.5297E+13	-1.8121E+12
		50%	99%	26.00	9.6947E+12	2.4615E+13	3.4310E+13	-2.7997E+12
			80%	26.00	9.6947E+12	2.4615E+13	3.4309E+13	-2.7998E+12
			50%	26.00	9.6947E+12	2.4614E+13	3.4309E+13	-2.8002E+12
	50%	99%	99%	25.53	1.1041E+13	2.7169E+13	3.8210E+13	-2.4600E+11
			80%	25.53	1.1041E+13	2.7168E+13	3.8209E+13	-2.4615E+11
			50%	25.53	1.1041E+13	2.7168E+13	3.8209E+13	-2.4647E+11
		80%	99%	25.53	1.1041E+13	2.5356E+13	3.6397E+13	-2.0590E+12
			80%	25.53	1.1041E+13	2.5355E+13	3.6396E+13	-2.0591E+12
			50%	25.53	1.1041E+13	2.5355E+13	3.6396E+13	-2.0594E+12
		50%	99%	25.53	1.1041E+13	2.4372E+13	3.5413E+13	-3.0428E+12
			80%	25.53	1.1041E+13	2.4372E+13	3.5413E+13	-3.0430E+12
			50%	25.53	1.1041E+13	2.4371E+13	3.5412E+13	-3.0433E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
129	99%	99%	99%	26.52	7.9883E+12	2.8031E+13	3.6020E+13	7.5874E+11
			80%	26.52	7.9883E+12	2.8031E+13	3.6020E+13	7.5859E+11
			50%	26.52	7.9883E+12	2.8031E+13	3.6019E+13	7.5827E+11
		80%	99%	26.52	7.9883E+12	2.6206E+13	3.4194E+13	-1.0668E+12
			80%	26.52	7.9883E+12	2.6206E+13	3.4194E+13	-1.0669E+12
			50%	26.52	7.9883E+12	2.6206E+13	3.4194E+13	-1.0672E+12
		50%	99%	26.52	7.9883E+12	2.5204E+13	3.3192E+13	-2.0692E+12
			80%	26.52	7.9883E+12	2.5203E+13	3.3192E+13	-2.0693E+12
			50%	26.52	7.9883E+12	2.5203E+13	3.3191E+13	-2.0697E+12
	80%	99%	99%	25.72	1.0043E+13	2.7540E+13	3.7583E+13	2.6770E+11
			80%	25.72	1.0043E+13	2.7540E+13	3.7583E+13	2.6755E+11
			50%	25.72	1.0043E+13	2.7540E+13	3.7583E+13	2.6724E+11
		80%	99%	25.72	1.0043E+13	2.5709E+13	3.5752E+13	-1.5637E+12
			80%	25.72	1.0043E+13	2.5709E+13	3.5752E+13	-1.5639E+12
			50%	25.72	1.0043E+13	2.5709E+13	3.5751E+13	-1.5642E+12
		50%	99%	25.72	1.0043E+13	2.4712E+13	3.4755E+13	-2.5611E+12
			80%	25.72	1.0043E+13	2.4712E+13	3.4754E+13	-2.5612E+12
			50%	25.72	1.0043E+13	2.4711E+13	3.4754E+13	-2.5615E+12
	50%	99%	99%	25.24	1.1320E+13	2.7273E+13	3.8593E+13	4.6800E+08
			80%	25.24	1.1320E+13	2.7273E+13	3.8593E+13	3.1700E+08
►			50%	25.24	1.1320E+13	2.7273E+13	3.8592E+13	0.0000E+00
		80%	99%	25.24	1.1320E+13	2.5450E+13	3.6769E+13	-1.8232E+12
			80%	25.24	1.1320E+13	2.5449E+13	3.6769E+13	-1.8234E+12
			50%	25.24	1.1320E+13	2.5449E+13	3.6769E+13	-1.8237E+12
		50%	99%	25.24	1.1320E+13	2.4444E+13	3.5764E+13	-2.8283E+12
			80%	25.24	1.1320E+13	2.4444E+13	3.5764E+13	-2.8285E+12
			50%	25.24	1.1320E+13	2.4444E+13	3.5764E+13	-2.8288E+12
131	99%	99%	99%	26.78	2.1451E+13	3.1904E+13	5.3356E+13	1.2362E+12
			80%	26.78	2.1451E+13	3.1904E+13	5.3356E+13	1.2361E+12
			50%	26.78	2.1451E+13	3.1904E+13	5.3355E+13	1.2358E+12
		80%	99%	26.78	2.1451E+13	2.9792E+13	5.1244E+13	-8.7594E+11
			80%	26.78	2.1451E+13	2.9792E+13	5.1243E+13	-8.7609E+11
			50%	26.78	2.1451E+13	2.9792E+13	5.1243E+13	-8.7641E+11
		50%	99%	26.78	2.1451E+13	2.8630E+13	5.0081E+13	-2.0384E+12
			80%	26.78	2.1451E+13	2.8630E+13	5.0081E+13	-2.0386E+12
			50%	26.78	2.1451E+13	2.8629E+13	5.0081E+13	-2.0389E+12
	80%	99%	99%	25.93	2.0199E+13	3.0669E+13	5.0868E+13	4.7000E+08
			80%	25.93	2.0199E+13	3.0669E+13	5.0867E+13	3.1900E+08
►			50%	25.93	2.0199E+13	3.0668E+13	5.0867E+13	0.0000E+00
		80%	99%	25.93	2.0199E+13	2.8579E+13	4.8778E+13	-2.0890E+12
			80%	25.93	2.0199E+13	2.8579E+13	4.8778E+13	-2.0892E+12
			50%	25.93	2.0199E+13	2.8579E+13	4.8778E+13	-2.0895E+12
		50%	99%	25.93	2.0199E+13	2.7427E+13	4.7626E+13	-3.2416E+12
			80%	25.93	2.0199E+13	2.7427E+13	4.7625E+13	-3.2417E+12
			50%	25.93	2.0199E+13	2.7426E+13	4.7625E+13	-3.2421E+12
	50%	99%	99%	25.45	1.9438E+13	2.9962E+13	4.9400E+13	-7.0629E+11
			80%	25.45	1.9438E+13	2.9962E+13	4.9400E+13	-7.0644E+11
			50%	25.45	1.9438E+13	2.9962E+13	4.9400E+13	-7.0675E+11
		80%	99%	25.45	1.9438E+13	2.7872E+13	4.7311E+13	-2.7960E+12
			80%	25.45	1.9438E+13	2.7872E+13	4.7311E+13	-2.7961E+12
			50%	25.45	1.9438E+13	2.7872E+13	4.7310E+13	-2.7965E+12
		50%	99%	25.45	1.9438E+13	2.6732E+13	4.6171E+13	-3.9359E+12
			80%	25.45	1.9438E+13	2.6732E+13	4.6171E+13	-3.9361E+12
			50%	25.45	1.9438E+13	2.6732E+13	4.6170E+13	-3.9364E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
130	99%	99%	99%	25.98	1.3956E+13	2.9823E+13	4.3779E+13	4.7000E+08
			80%	25.98	1.3956E+13	2.9823E+13	4.3779E+13	3.1900E+08
►			50%	25.98	1.3956E+13	2.9822E+13	4.3779E+13	0.0000E+00
		80%	99%	25.98	1.3956E+13	2.7857E+13	4.1813E+13	-1.9655E+12
			80%	25.98	1.3956E+13	2.7857E+13	4.1813E+13	-1.9656E+12
			50%	25.98	1.3956E+13	2.7855E+13	4.1811E+13	-1.9677E+12
		50%	99%	25.98	1.3956E+13	2.6760E+13	4.0716E+13	-3.0622E+12
			80%	25.98	1.3956E+13	2.6760E+13	4.0716E+13	-3.0624E+12
			50%	25.98	1.3956E+13	2.6760E+13	4.0716E+13	-3.0627E+12
	80%	99%	99%	25.14	1.4567E+13	2.8963E+13	4.3530E+13	-8.5925E+11
			80%	25.14	1.4567E+13	2.8963E+13	4.3530E+13	-8.5940E+11
			50%	25.14	1.4567E+13	2.8963E+13	4.3529E+13	-8.5972E+11
		80%	99%	25.14	1.4567E+13	2.7001E+13	4.1568E+13	-2.8211E+12
			80%	25.14	1.4567E+13	2.7001E+13	4.1568E+13	-2.8212E+12
			50%	25.14	1.4567E+13	2.7001E+13	4.1568E+13	-2.8216E+12
		50%	99%	25.14	1.4567E+13	2.5933E+13	4.0499E+13	-3.8896E+12
			80%	25.14	1.4567E+13	2.5933E+13	4.0499E+13	-3.8897E+12
			50%	25.14	1.4567E+13	2.5932E+13	4.0499E+13	-3.8901E+12
	50%	99%	99%	24.67	1.4937E+13	2.8471E+13	4.3408E+13	-1.3512E+12
			80%	24.67	1.4937E+13	2.8471E+13	4.3408E+13	-1.3514E+12
			50%	24.67	1.4937E+13	2.8471E+13	4.3408E+13	-1.3517E+12
		80%	99%	24.67	1.4937E+13	2.6521E+13	4.1458E+13	-3.3009E+12
			80%	24.67	1.4937E+13	2.6521E+13	4.1458E+13	-3.3011E+12
			50%	24.67	1.4937E+13	2.6521E+13	4.1458E+13	-3.3014E+12
		50%	99%	24.67	1.4937E+13	2.5454E+13	4.0391E+13	-4.3683E+12
			80%	24.67	1.4937E+13	2.5454E+13	4.0391E+13	-4.3685E+12
			50%	24.67	1.4937E+13	2.5453E+13	4.0391E+13	-4.3688E+12
132	99%	99%	99%	27.34	1.3866E+13	2.9971E+13	4.3837E+13	1.3554E+12
			80%	27.34	1.3866E+13	2.9971E+13	4.3837E+13	1.3553E+12
			50%	27.34	1.3866E+13	2.9971E+13	4.3837E+13	1.3550E+12
		80%	99%	27.34	1.3866E+13	2.7994E+13	4.1860E+13	-6.2124E+11
			80%	27.34	1.3866E+13	2.7994E+13	4.1860E+13	-6.2139E+11
			50%	27.34	1.3866E+13	2.7994E+13	4.1860E+13	-6.2170E+11
		50%	99%	27.34	1.3866E+13	2.6896E+13	4.0762E+13	-1.7196E+12
			80%	27.34	1.3866E+13	2.6896E+13	4.0762E+13	-1.7198E+12
			50%	27.34	1.3866E+13	2.6896E+13	4.0762E+13	-1.7201E+12
	80%	99%	99%	26.37	1.4499E+13	2.9115E+13	4.3614E+13	4.9939E+11
			80%	26.37	1.4499E+13	2.9115E+13	4.3614E+13	4.9924E+11
			50%	26.37	1.4499E+13	2.9115E+13	4.3614E+13	4.9893E+11
		80%	99%	26.37	1.4499E+13	2.7152E+13	4.1651E+13	-1.4632E+12
			80%	26.37	1.4499E+13	2.7152E+13	4.1651E+13	-1.4633E+12
			50%	26.37	1.4499E+13	2.7152E+13	4.1651E+13	-1.4636E+12
		50%	99%	26.37	1.4499E+13	2.6069E+13	4.0568E+13	-2.5466E+12
			80%	26.37	1.4499E+13	2.6069E+13	4.0568E+13	-2.5468E+12
			50%	26.37	1.4499E+13	2.6069E+13	4.0567E+13	-2.5471E+12
	50%	99%	99%	25.85	1.4883E+13	2.8616E+13	4.3499E+13	4.6800E+08
			80%	25.85	1.4883E+13	2.8616E+13	4.3499E+13	3.1900E+08
►			50%	25.85	1.4883E+13	2.8616E+13	4.3499E+13	0.0000E+00
		80%	99%	25.85	1.4883E+13	2.6662E+13	4.1545E+13	-1.9534E+12
			80%	25.85	1.4883E+13	2.6662E+13	4.1545E+13	-1.9536E+12
			50%	25.85	1.4883E+13	2.6662E+13	4.1545E+13	-1.9539E+12
		50%	99%	25.85	1.4883E+13	2.5593E+13	4.0476E+13	-3.0228E+12
			80%	25.85	1.4883E+13	2.5593E+13	4.0476E+13	-3.0230E+12
			50%	25.85	1.4883E+13	2.5592E+13	4.0475E+13	-3.0233E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
133	99%	99%	99%	25.37	8.1431E+12	2.8699E+13	3.6842E+13	4.6600E+08
			80%	25.37	8.1431E+12	2.8699E+13	3.6842E+13	3.1500E+08
▶			50%	25.37	8.1431E+12	2.8699E+13	3.6842E+13	0.0000E+00
		80%	99%	25.37	8.1431E+12	2.6745E+13	3.4888E+13	-1.9540E+12
			80%	25.37	8.1431E+12	2.6745E+13	3.4888E+13	-1.9542E+12
			50%	25.37	8.1431E+12	2.6744E+13	3.4887E+13	-1.9545E+12
		50%	99%	25.37	8.1431E+12	2.5677E+13	3.3820E+13	-3.0217E+12
			80%	25.37	8.1431E+12	2.5677E+13	3.3820E+13	-3.0218E+12
			50%	25.37	8.1431E+12	2.5677E+13	3.3820E+13	-3.0221E+12
	80%	99%	99%	24.57	1.0178E+13	2.8101E+13	3.8279E+13	-5.9824E+11
			80%	24.57	1.0178E+13	2.8100E+13	3.8278E+13	-5.9839E+11
			50%	24.57	1.0178E+13	2.8100E+13	3.8278E+13	-5.9870E+11
		80%	99%	24.57	1.0178E+13	2.6158E+13	3.6336E+13	-2.5407E+12
			80%	24.57	1.0178E+13	2.6158E+13	3.6336E+13	-2.5408E+12
			50%	24.57	1.0178E+13	2.6158E+13	3.6336E+13	-2.5411E+12
		50%	99%	24.57	1.0178E+13	2.5100E+13	3.5278E+13	-3.5985E+12
			80%	24.57	1.0178E+13	2.5100E+13	3.5278E+13	-3.5986E+12
			50%	24.57	1.0178E+13	2.5100E+13	3.5278E+13	-3.5989E+12
	50%	99%	99%	24.09	1.1427E+13	2.7774E+13	3.9201E+13	-9.2471E+11
			80%	24.09	1.1427E+13	2.7774E+13	3.9200E+13	-9.2486E+11
			50%	24.09	1.1427E+13	2.7774E+13	3.9200E+13	-9.2518E+11
		80%	99%	24.09	1.1427E+13	2.5815E+13	3.7241E+13	-2.8841E+12
			80%	24.09	1.1427E+13	2.5815E+13	3.7241E+13	-2.8843E+12
			50%	24.09	1.1427E+13	2.5814E+13	3.7241E+13	-2.8846E+12
		50%	99%	24.09	1.1427E+13	2.4776E+13	3.6203E+13	-3.9223E+12
			80%	24.09	1.1427E+13	2.4776E+13	3.6203E+13	-3.9225E+12
			50%	24.09	1.1427E+13	2.4776E+13	3.6203E+13	-3.9228E+12
135	99%	99%	99%	26.94	4.8451E+12	2.8413E+13	3.3258E+13	9.7938E+11
			80%	26.94	4.8451E+12	2.8412E+13	3.3258E+13	9.7923E+11
			50%	26.94	4.8451E+12	2.8412E+13	3.3257E+13	9.7891E+11
		80%	99%	26.94	4.8451E+12	2.6452E+13	3.1297E+13	-9.8140E+11
			80%	26.94	4.8451E+12	2.6452E+13	3.1297E+13	-9.8155E+11
			50%	26.94	4.8451E+12	2.6451E+13	3.1296E+13	-9.8186E+11
		50%	99%	26.94	4.8451E+12	2.5404E+13	3.0249E+13	-2.0291E+12
			80%	26.94	4.8451E+12	2.5404E+13	3.0249E+13	-2.0292E+12
			50%	26.94	4.8451E+12	2.5404E+13	3.0249E+13	-2.0296E+12
	80%	99%	99%	26.14	6.3599E+12	2.7699E+13	3.4059E+13	2.6553E+11
			80%	26.14	6.3599E+12	2.7699E+13	3.4058E+13	2.6538E+11
			50%	26.14	6.3599E+12	2.7698E+13	3.4058E+13	2.6506E+11
		80%	99%	26.14	6.3599E+12	2.5767E+13	3.2127E+13	-1.6658E+12
			80%	26.14	6.3599E+12	2.5767E+13	3.2127E+13	-1.6660E+12
			50%	26.14	6.3599E+12	2.5767E+13	3.2127E+13	-1.6663E+12
		50%	99%	26.14	6.3599E+12	2.4699E+13	3.1059E+13	-2.7343E+12
			80%	26.14	6.3599E+12	2.4699E+13	3.1059E+13	-2.7345E+12
			50%	26.14	6.3599E+12	2.4698E+13	3.1058E+13	-2.7348E+12
	50%	99%	99%	25.67	8.0082E+12	2.7435E+13	3.5444E+13	2.2760E+09
			80%	25.67	8.0082E+12	2.7435E+13	3.5443E+13	2.1270E+09
▶			50%	25.67	8.0082E+12	2.7433E+13	3.5441E+13	0.0000E+00
		80%	99%	25.67	8.0082E+12	2.5496E+13	3.3504E+13	-1.9375E+12
			80%	25.67	8.0082E+12	2.5496E+13	3.3504E+13	-1.9376E+12
			50%	25.67	8.0082E+12	2.5495E+13	3.3503E+13	-1.9379E+12
		50%	99%	25.67	8.0082E+12	2.4439E+13	3.2447E+13	-2.9941E+12
			80%	25.67	8.0082E+12	2.4439E+13	3.2447E+13	-2.9943E+12
			50%	25.67	8.0082E+12	2.4439E+13	3.2447E+13	-2.9946E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
134	99%	99%	99%	26.82	6.8755E+12	2.8359E+13	3.5234E+13	5.8016E+11
			80%	26.82	6.8755E+12	2.8359E+13	3.5234E+13	5.8001E+11
			50%	26.82	6.8755E+12	2.8358E+13	3.5234E+13	5.7969E+11
		80%	99%	26.82	6.8755E+12	2.6470E+13	3.3346E+13	-1.3085E+12
			80%	26.82	6.8755E+12	2.6470E+13	3.3345E+13	-1.3087E+12
			50%	26.82	6.8755E+12	2.6470E+13	3.3345E+13	-1.3090E+12
		50%	99%	26.82	6.8755E+12	2.5435E+13	3.2311E+13	-2.3435E+12
			80%	26.82	6.8755E+12	2.5435E+13	3.2310E+13	-2.3437E+12
			50%	26.82	6.8755E+12	2.5435E+13	3.2310E+13	-2.3440E+12
	80%	99%	99%	25.99	9.0023E+12	2.7779E+13	3.6781E+13	4.6600E+08
			80%	25.99	9.0023E+12	2.7779E+13	3.6781E+13	3.1700E+08
▶			50%	25.99	9.0023E+12	2.7779E+13	3.6781E+13	0.0000E+00
		80%	99%	25.99	9.0023E+12	2.5900E+13	3.4902E+13	-1.8786E+12
			80%	25.99	9.0023E+12	2.5900E+13	3.4902E+13	-1.8788E+12
			50%	25.99	9.0023E+12	2.5899E+13	3.4902E+13	-1.8791E+12
		50%	99%	25.99	9.0023E+12	2.4870E+13	3.3872E+13	-2.9089E+12
			80%	25.99	9.0023E+12	2.4870E+13	3.3872E+13	-2.9090E+12
			50%	25.99	9.0023E+12	2.4869E+13	3.3872E+13	-2.9093E+12
	50%	99%	99%	25.51	1.0487E+13	2.7492E+13	3.7979E+13	-2.8672E+11
			80%	25.51	1.0487E+13	2.7492E+13	3.7979E+13	-2.8687E+11
			50%	25.51	1.0487E+13	2.7491E+13	3.7979E+13	-2.8719E+11
		80%	99%	25.51	1.0487E+13	2.5608E+13	3.6096E+13	-2.1703E+12
			80%	25.51	1.0487E+13	2.5608E+13	3.6095E+13	-2.1705E+12
			50%	25.51	1.0487E+13	2.5608E+13	3.6095E+13	-2.1708E+12
		50%	99%	25.51	1.0487E+13	2.4589E+13	3.5076E+13	-3.1895E+12
			80%	25.51	1.0487E+13	2.4589E+13	3.5076E+13	-3.1897E+12
			50%	25.51	1.0487E+13	2.4589E+13	3.5076E+13	-3.1900E+12
136	99%	99%	99%	25.89	1.1346E+13	2.8466E+13	3.9812E+13	4.6500E+08
			80%	25.89	1.1346E+13	2.8466E+13	3.9812E+13	3.1400E+08
▶			50%	25.89	1.1346E+13	2.8465E+13	3.9811E+13	0.0000E+00
		80%	99%	25.89	1.1346E+13	2.6633E+13	3.7979E+13	-1.8321E+12
			80%	25.89	1.1346E+13	2.6633E+13	3.7979E+13	-1.8323E+12
			50%	25.89	1.1346E+13	2.6633E+13	3.7979E+13	-1.8326E+12
		50%	99%	25.89	1.1346E+13	2.5636E+13	3.6983E+13	-2.8288E+12
			80%	25.89	1.1346E+13	2.5636E+13	3.6983E+13	-2.8289E+12
			50%	25.89	1.1346E+13	2.5636E+13	3.6982E+13	-2.8292E+12
	80%	99%	99%	24.94	1.2583E+13	2.7840E+13	4.0423E+13	-6.2518E+11
			80%	24.94	1.2583E+13	2.7840E+13	4.0423E+13	-6.2533E+11
			50%	24.94	1.2583E+13	2.7840E+13	4.0422E+13	-6.2565E+11
		80%	99%	24.94	1.2583E+13	2.5997E+13	3.8580E+13	-2.4680E+12
			80%	24.94	1.2583E+13	2.5997E+13	3.8580E+13	-2.4682E+12
			50%	24.94	1.2583E+13	2.5997E+13	3.8580E+13	-2.4685E+12
		50%	99%	24.94	1.2583E+13	2.5020E+13	3.7603E+13	-3.4449E+12
			80%	24.94	1.2583E+13	2.5020E+13	3.7603E+13	-3.4450E+12
			50%	24.94	1.2583E+13	2.5020E+13	3.7603E+13	-3.4453E+12
	50%	99%	99%	24.26	1.3342E+13	2.7473E+13	4.0816E+13	-9.9182E+11
			80%	24.26	1.3342E+13	2.7473E+13	4.0816E+13	-9.9197E+11
			50%	24.26	1.3342E+13	2.7473E+13	4.0815E+13	-9.9229E+11
		80%	99%	24.26	1.3342E+13	2.5656E+13	3.8999E+13	-2.8089E+12
			80%	24.26	1.3342E+13	2.5656E+13	3.8999E+13	-2.8090E+12
			50%	24.26	1.3342E+13	2.5656E+13	3.8998E+13	-2.8093E+12
		50%	99%	24.26	1.3342E+13	2.4667E+13	3.8009E+13	-3.7985E+12
			80%	24.26	1.3342E+13	2.4667E+13	3.8009E+13	-3.7987E+12
			50%	24.26	1.3342E+13	2.4666E+13	3.8009E+13	-3.7990E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
137	99%	99%	99%	26.93	9.4508E+12	2.8362E+13	3.7813E+13	5.7946E+11
			80%	26.93	9.4508E+12	2.8362E+13	3.7812E+13	5.7931E+11
			50%	26.93	9.4508E+12	2.8361E+13	3.7812E+13	5.7900E+11
		80%	99%	26.93	9.4508E+12	2.6507E+13	3.5958E+13	-1.2749E+12
			80%	26.93	9.4508E+12	2.6507E+13	3.5958E+13	-1.2751E+12
			50%	26.93	9.4508E+12	2.6507E+13	3.5958E+13	-1.2754E+12
		50%	99%	26.93	9.4508E+12	2.5508E+13	3.4959E+13	-2.2744E+12
			80%	26.93	9.4508E+12	2.5508E+13	3.4959E+13	-2.2745E+12
			50%	26.93	9.4508E+12	2.5507E+13	3.4958E+13	-2.2749E+12
	80%	99%	99%	25.98	1.1150E+13	2.7783E+13	3.8933E+13	4.7000E+08
			80%	25.98	1.1150E+13	2.7783E+13	3.8933E+13	3.1900E+08
▶			50%	25.98	1.1150E+13	2.7782E+13	3.8932E+13	0.0000E+00
		80%	99%	25.98	1.1150E+13	2.5949E+13	3.7099E+13	-1.8330E+12
			80%	25.98	1.1150E+13	2.5949E+13	3.7099E+13	-1.8331E+12
			50%	25.98	1.1150E+13	2.5949E+13	3.7099E+13	-1.8335E+12
		50%	99%	25.98	1.1150E+13	2.4951E+13	3.6101E+13	-2.8308E+12
			80%	25.98	1.1150E+13	2.4951E+13	3.6101E+13	-2.8309E+12
			50%	25.98	1.1150E+13	2.4951E+13	3.6101E+13	-2.8313E+12
	50%	99%	99%	25.29	1.2194E+13	2.7464E+13	3.9657E+13	-3.1862E+11
			80%	25.29	1.2194E+13	2.7464E+13	3.9657E+13	-3.1877E+11
			50%	25.29	1.2194E+13	2.7463E+13	3.9657E+13	-3.1908E+11
		80%	99%	25.29	1.2194E+13	2.5638E+13	3.7832E+13	-2.1444E+12
			80%	25.29	1.2194E+13	2.5638E+13	3.7832E+13	-2.1445E+12
			50%	25.29	1.2194E+13	2.5637E+13	3.7831E+13	-2.1448E+12
		50%	99%	25.29	1.2194E+13	2.4641E+13	3.6835E+13	-3.1410E+12
			80%	25.29	1.2194E+13	2.4641E+13	3.6835E+13	-3.1411E+12
			50%	25.29	1.2194E+13	2.4641E+13	3.6835E+13	-3.1415E+12
139	99%	99%	99%	25.78	1.2245E+13	2.9329E+13	4.1575E+13	4.6700E+08
			80%	25.78	1.2245E+13	2.9329E+13	4.1575E+13	3.1900E+08
▶			50%	25.78	1.2245E+13	2.9329E+13	4.1574E+13	0.0000E+00
		80%	99%	25.78	1.2245E+13	2.7400E+13	3.9646E+13	-1.9285E+12
			80%	25.78	1.2245E+13	2.7400E+13	3.9646E+13	-1.9287E+12
			50%	25.78	1.2245E+13	2.7400E+13	3.9645E+13	-1.9290E+12
		50%	99%	25.78	1.2245E+13	2.6325E+13	3.8571E+13	-3.0037E+12
			80%	25.78	1.2245E+13	2.6325E+13	3.8571E+13	-3.0039E+12
			50%	25.78	1.2245E+13	2.6325E+13	3.8570E+13	-3.0042E+12
	80%	99%	99%	24.82	1.3263E+13	2.8586E+13	4.1848E+13	-7.4320E+11
			80%	24.82	1.3263E+13	2.8586E+13	4.1848E+13	-7.4335E+11
			50%	24.82	1.3263E+13	2.8585E+13	4.1848E+13	-7.4367E+11
		80%	99%	24.82	1.3263E+13	2.6644E+13	3.9906E+13	-2.6854E+12
			80%	24.82	1.3263E+13	2.6643E+13	3.9906E+13	-2.6856E+12
			50%	24.82	1.3263E+13	2.6643E+13	3.9906E+13	-2.6859E+12
		50%	99%	24.82	1.3263E+13	2.5590E+13	3.8852E+13	-3.7393E+12
			80%	24.82	1.3263E+13	2.5590E+13	3.8852E+13	-3.7394E+12
			50%	24.82	1.3263E+13	2.5589E+13	3.8852E+13	-3.7398E+12
	50%	99%	99%	24.14	1.3888E+13	2.8155E+13	4.2043E+13	-1.1741E+12
			80%	24.14	1.3888E+13	2.8155E+13	4.2043E+13	-1.1743E+12
			50%	24.14	1.3888E+13	2.8154E+13	4.2042E+13	-1.1746E+12
		80%	99%	24.14	1.3888E+13	2.6226E+13	4.0114E+13	-3.1034E+12
			80%	24.14	1.3888E+13	2.6225E+13	4.0113E+13	-3.1035E+12
			50%	24.14	1.3888E+13	2.6225E+13	4.0113E+13	-3.1039E+12
		50%	99%	24.14	1.3888E+13	2.5178E+13	3.9067E+13	-4.1505E+12
			80%	24.14	1.3888E+13	2.5178E+13	3.9066E+13	-4.1507E+12
			50%	24.14	1.3888E+13	2.5178E+13	3.9066E+13	-4.1510E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
138	99%	99%	99%	27.58	8.2250E+12	2.8268E+13	3.6493E+13	8.2586E+11
			80%	27.58	8.2250E+12	2.8267E+13	3.6492E+13	8.2571E+11
			50%	27.58	8.2250E+12	2.8267E+13	3.6492E+13	8.2540E+11
		80%	99%	27.58	8.2250E+12	2.6408E+13	3.4633E+13	-1.0333E+12
			80%	27.58	8.2250E+12	2.6408E+13	3.4633E+13	-1.0335E+12
			50%	27.58	8.2250E+12	2.6408E+13	3.4633E+13	-1.0338E+12
		50%	99%	27.58	8.2250E+12	2.5417E+13	3.3642E+13	-2.0244E+12
			80%	27.58	8.2250E+12	2.5417E+13	3.3642E+13	-2.0245E+12
			50%	27.58	8.2250E+12	2.5417E+13	3.3642E+13	-2.0248E+12
	80%	99%	99%	26.63	1.0165E+13	2.7736E+13	3.7901E+13	2.9433E+11
			80%	26.63	1.0165E+13	2.7736E+13	3.7901E+13	2.9418E+11
			50%	26.63	1.0165E+13	2.7736E+13	3.7901E+13	2.9386E+11
		80%	99%	26.63	1.0165E+13	2.5889E+13	3.6054E+13	-1.5523E+12
			80%	26.63	1.0165E+13	2.5889E+13	3.6054E+13	-1.5525E+12
			50%	26.63	1.0165E+13	2.5889E+13	3.6054E+13	-1.5528E+12
		50%	99%	26.63	1.0165E+13	2.4900E+13	3.5065E+13	-2.5420E+12
			80%	26.63	1.0165E+13	2.4900E+13	3.5065E+13	-2.5422E+12
			50%	26.63	1.0165E+13	2.4899E+13	3.5064E+13	-2.5425E+12
	50%	99%	99%	25.94	1.1404E+13	2.7442E+13	3.8847E+13	4.6800E+08
			80%	25.94	1.1404E+13	2.7442E+13	3.8846E+13	3.1900E+08
▶			50%	25.94	1.1404E+13	2.7442E+13	3.8846E+13	0.0000E+00
		80%	99%	25.94	1.1404E+13	2.5614E+13	3.7018E+13	-1.8281E+12
			80%	25.94	1.1404E+13	2.5614E+13	3.7018E+13	-1.8282E+12
			50%	25.94	1.1404E+13	2.5613E+13	3.7018E+13	-1.8285E+12
		50%	99%	25.94	1.1404E+13	2.4617E+13	3.6022E+13	-2.8243E+12
			80%	25.94	1.1404E+13	2.4617E+13	3.6022E+13	-2.8244E+12
			50%	25.94	1.1404E+13	2.4617E+13	3.6021E+13	-2.8247E+12
140	99%	99%	99%	26.72	8.6645E+12	2.9501E+13	3.8165E+13	6.3535E+11
			80%	26.72	8.6645E+12	2.9500E+13	3.8165E+13	6.3520E+11
			50%	26.72	8.6645E+12	2.9500E+13	3.8164E+13	6.3489E+11
		80%	99%	26.72	8.6645E+12	2.7446E+13	3.6111E+13	-1.4189E+12
			80%	26.72	8.6645E+12	2.7446E+13	3.6111E+13	-1.4191E+12
			50%	26.72	8.6645E+12	2.7444E+13	3.6108E+13	-1.4212E+12
		50%	99%	26.72	8.6645E+12	2.6306E+13	3.4971E+13	-2.5590E+12
			80%	26.72	8.6645E+12	2.6306E+13	3.4970E+13	-2.5591E+12
			50%	26.72	8.6645E+12	2.6306E+13	3.4970E+13	-2.5595E+12
	80%	99%	99%	25.77	1.0542E+13	2.8866E+13	3.9408E+13	4.6800E+08
			80%	25.77	1.0542E+13	2.8865E+13	3.9408E+13	3.1700E+08
▶			50%	25.77	1.0542E+13	2.8865E+13	3.9408E+13	0.0000E+00
		80%	99%	25.77	1.0542E+13	2.6794E+13	3.7336E+13	-2.0714E+12
			80%	25.77	1.0542E+13	2.6794E+13	3.7336E+13	-2.0716E+12
			50%	25.77	1.0542E+13	2.6793E+13	3.7336E+13	-2.0719E+12
		50%	99%	25.77	1.0542E+13	2.5676E+13	3.6218E+13	-3.1896E+12
			80%	25.77	1.0542E+13	2.5675E+13	3.6218E+13	-3.1898E+12
			50%	25.77	1.0542E+13	2.5675E+13	3.6218E+13	-3.1901E+12
	50%	99%	99%	25.08	1.1708E+13	2.8501E+13	4.0209E+13	-3.6434E+11
			80%	25.08	1.1708E+13	2.8501E+13	4.0209E+13	-3.6449E+11
			50%	25.08	1.1708E+13	2.8500E+13	4.0209E+13	-3.6480E+11
		80%	99%	25.08	1.1708E+13	2.6445E+13	3.8153E+13	-2.4201E+12
			80%	25.08	1.1708E+13	2.6445E+13	3.8153E+13	-2.4203E+12
			50%	25.08	1.1708E+13	2.6445E+13	3.8153E+13	-2.4206E+12
		50%	99%	25.08	1.1708E+13	2.5330E+13	3.7039E+13	-3.5348E+12
			80%	25.08	1.1708E+13	2.5330E+13	3.7039E+13	-3.5350E+12
			50%	25.08	1.1708E+13	2.5330E+13	3.7038E+13	-3.5353E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
141	99%	99%	99%	27.63	9.4885E+12	2.9043E+13	3.8532E+13	9.9312E+11
			80%	27.63	9.4885E+12	2.9041E+13	3.8530E+13	9.9116E+11
			50%	27.63	9.4885E+12	2.9041E+13	3.8529E+13	9.9085E+11
		80%	99%	27.63	9.4885E+12	2.7095E+13	3.6583E+13	-9.5519E+11
			80%	27.63	9.4885E+12	2.7095E+13	3.6583E+13	-9.5534E+11
			50%	27.63	9.4885E+12	2.7094E+13	3.6583E+13	-9.5566E+11
		50%	99%	27.63	9.4885E+12	2.6048E+13	3.5536E+13	-2.0022E+12
			80%	27.63	9.4885E+12	2.6048E+13	3.5536E+13	-2.0024E+12
			50%	27.63	9.4885E+12	2.6047E+13	3.5536E+13	-2.0027E+12
	80%	99%	99%	26.66	1.1179E+13	2.8409E+13	3.9588E+13	3.5893E+11
			80%	26.66	1.1179E+13	2.8409E+13	3.9588E+13	3.5879E+11
			50%	26.66	1.1179E+13	2.8409E+13	3.9587E+13	3.5847E+11
		80%	99%	26.66	1.1179E+13	2.6481E+13	3.7659E+13	-1.5695E+12
			80%	26.66	1.1179E+13	2.6480E+13	3.7659E+13	-1.5696E+12
			50%	26.66	1.1179E+13	2.6480E+13	3.7659E+13	-1.5699E+12
		50%	99%	26.66	1.1179E+13	2.5427E+13	3.6606E+13	-2.6226E+12
			80%	26.66	1.1179E+13	2.5427E+13	3.6606E+13	-2.6227E+12
			50%	26.66	1.1179E+13	2.5427E+13	3.6606E+13	-2.6230E+12
	50%	99%	99%	26.00	1.2218E+13	2.8052E+13	4.0270E+13	2.2170E+09
			80%	26.00	1.2218E+13	2.8052E+13	4.0270E+13	2.0720E+09
▶			50%	26.00	1.2218E+13	2.8050E+13	4.0268E+13	0.0000E+00
		80%	99%	26.00	1.2218E+13	2.6134E+13	3.8352E+13	-1.9157E+12
			80%	26.00	1.2218E+13	2.6134E+13	3.8352E+13	-1.9159E+12
			50%	26.00	1.2218E+13	2.6134E+13	3.8352E+13	-1.9162E+12
		50%	99%	26.00	1.2218E+13	2.5079E+13	3.7297E+13	-2.9709E+12
			80%	26.00	1.2218E+13	2.5079E+13	3.7297E+13	-2.9711E+12
			50%	26.00	1.2218E+13	2.5079E+13	3.7297E+13	-2.9714E+12
143	99%	99%	99%	26.62	8.6349E+12	2.8742E+13	3.7377E+13	5.7018E+11
			80%	26.62	8.6349E+12	2.8742E+13	3.7377E+13	5.7003E+11
			50%	26.62	8.6349E+12	2.8741E+13	3.7376E+13	5.6971E+11
		80%	99%	26.62	8.6349E+12	2.6798E+13	3.5433E+13	-1.3737E+12
			80%	26.62	8.6349E+12	2.6798E+13	3.5433E+13	-1.3738E+12
			50%	26.62	8.6349E+12	2.6798E+13	3.5432E+13	-1.3742E+12
		50%	99%	26.62	8.6349E+12	2.5740E+13	3.4375E+13	-2.4320E+12
			80%	26.62	8.6349E+12	2.5739E+13	3.4374E+13	-2.4322E+12
			50%	26.62	8.6349E+12	2.5739E+13	3.4374E+13	-2.4325E+12
	80%	99%	99%	25.67	1.0517E+13	2.8172E+13	3.8689E+13	4.6700E+08
			80%	25.67	1.0517E+13	2.8172E+13	3.8689E+13	3.1800E+08
▶			50%	25.67	1.0517E+13	2.8172E+13	3.8688E+13	0.0000E+00
		80%	99%	25.67	1.0517E+13	2.6216E+13	3.6733E+13	-1.9556E+12
			80%	25.67	1.0517E+13	2.6216E+13	3.6732E+13	-1.9557E+12
			50%	25.67	1.0517E+13	2.6216E+13	3.6732E+13	-1.9561E+12
		50%	99%	25.67	1.0517E+13	2.5159E+13	3.5676E+13	-3.0122E+12
			80%	25.67	1.0517E+13	2.5159E+13	3.5676E+13	-3.0124E+12
			50%	25.67	1.0517E+13	2.5159E+13	3.5676E+13	-3.0127E+12
	50%	99%	99%	24.99	1.1685E+13	2.7859E+13	3.9544E+13	-3.1238E+11
			80%	24.99	1.1685E+13	2.7859E+13	3.9544E+13	-3.1253E+11
			50%	24.99	1.1685E+13	2.7859E+13	3.9543E+13	-3.1284E+11
		80%	99%	24.99	1.1685E+13	2.5903E+13	3.7588E+13	-2.2686E+12
			80%	24.99	1.1685E+13	2.5903E+13	3.7587E+13	-2.2688E+12
			50%	24.99	1.1685E+13	2.5903E+13	3.7587E+13	-2.2691E+12
		50%	99%	24.99	1.1685E+13	2.4847E+13	3.6531E+13	-3.3249E+12
			80%	24.99	1.1685E+13	2.4847E+13	3.6531E+13	-3.3251E+12
			50%	24.99	1.1685E+13	2.4846E+13	3.6531E+13	-3.3254E+12

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
142	99%	99%	99%	25.70	1.0734E+13	2.8931E+13	3.9665E+13	4.6800E+08
			80%	25.70	1.0734E+13	2.8931E+13	3.9665E+13	3.1500E+08
▶			50%	25.70	1.0734E+13	2.8931E+13	3.9665E+13	0.0000E+00
		80%	99%	25.70	1.0734E+13	2.6995E+13	3.7729E+13	-1.9356E+12
			80%	25.70	1.0734E+13	2.6993E+13	3.7727E+13	-1.9376E+12
			50%	25.70	1.0734E+13	2.6993E+13	3.7727E+13	-1.9379E+12
		50%	99%	25.70	1.0734E+13	2.5932E+13	3.6666E+13	-2.9989E+12
			80%	25.70	1.0734E+13	2.5932E+13	3.6666E+13	-2.9991E+12
			50%	25.70	1.0734E+13	2.5931E+13	3.6665E+13	-2.9994E+12
	80%	99%	99%	24.74	1.2120E+13	2.8268E+13	4.0388E+13	-6.6264E+11
			80%	24.74	1.2120E+13	2.8268E+13	4.0388E+13	-6.6278E+11
			50%	24.74	1.2120E+13	2.8268E+13	4.0387E+13	-6.6310E+11
		80%	99%	24.74	1.2120E+13	2.6334E+13	3.8453E+13	-2.5971E+12
			80%	24.74	1.2120E+13	2.6333E+13	3.8453E+13	-2.5972E+12
			50%	24.74	1.2120E+13	2.6333E+13	3.8453E+13	-2.5976E+12
		50%	99%	24.74	1.2120E+13	2.5284E+13	3.7404E+13	-3.6469E+12
			80%	24.74	1.2120E+13	2.5284E+13	3.7403E+13	-3.6470E+12
			50%	24.74	1.2120E+13	2.5283E+13	3.7403E+13	-3.6473E+12
	50%	99%	99%	24.06	1.2970E+13	2.7902E+13	4.0872E+13	-1.0292E+12
			80%	24.06	1.2970E+13	2.7901E+13	4.0872E+13	-1.0293E+12
			50%	24.06	1.2970E+13	2.7901E+13	4.0871E+13	-1.0296E+12
		80%	99%	24.06	1.2970E+13	2.5959E+13	3.8929E+13	-2.9719E+12
			80%	24.06	1.2970E+13	2.5959E+13	3.8929E+13	-2.9720E+12
			50%	24.06	1.2970E+13	2.5957E+13	3.8927E+13	-2.9741E+12
		50%	99%	24.06	1.2970E+13	2.4918E+13	3.7888E+13	-4.0129E+12
			80%	24.06	1.2970E+13	2.4918E+13	3.7888E+13	-4.0131E+12
			50%	24.06	1.2970E+13	2.4917E+13	3.7888E+13	-4.0134E+12
144	99%	99%	99%	27.13	7.0492E+12	2.8581E+13	3.5630E+13	8.3781E+11
			80%	27.13	7.0492E+12	2.8581E+13	3.5630E+13	8.3766E+11
			50%	27.13	7.0492E+12	2.8580E+13	3.5630E+13	8.3734E+11
		80%	99%	27.13	7.0492E+12	2.6621E+13	3.3670E+13	-1.1219E+12
			80%	27.13	7.0492E+12	2.6621E+13	3.3670E+13	-1.1221E+12
			50%	27.13	7.0492E+12	2.6621E+13	3.3670E+13	-1.1224E+12
		50%	99%	27.13	7.0492E+12	2.5567E+13	3.2616E+13	-2.1757E+12
			80%	27.13	7.0492E+12	2.5567E+13	3.2616E+13	-2.1758E+12
			50%	27.13	7.0492E+12	2.5567E+13	3.2616E+13	-2.1761E+12
	80%	99%	99%	26.16	8.9867E+12	2.8019E+13	3.7006E+13	2.7627E+11
			80%	26.16	8.9867E+12	2.8019E+13	3.7006E+13	2.7612E+11
			50%	26.16	8.9867E+12	2.8019E+13	3.7006E+13	2.7581E+11
		80%	99%	26.16	8.9867E+12	2.6066E+13	3.5052E+13	-1.6774E+12
			80%	26.16	8.9867E+12	2.6065E+13	3.5052E+13	-1.6775E+12
			50%	26.16	8.9867E+12	2.6065E+13	3.5052E+13	-1.6779E+12
		50%	99%	26.16	8.9867E+12	2.5004E+13	3.3990E+13	-2.7395E+12
			80%	26.16	8.9867E+12	2.5003E+13	3.3990E+13	-2.7397E+12
			50%	26.16	8.9867E+12	2.5003E+13	3.3990E+13	-2.7400E+12
	50%	99%	99%	25.51	1.0458E+13	2.7743E+13	3.8202E+13	4.6800E+08
			80%	25.51	1.0458E+13	2.7743E+13	3.8201E+13	3.1700E+08
▶			50%	25.51	1.0458E+13	2.7743E+13	3.8201E+13	0.0000E+00
		80%	99%	25.51	1.0458E+13	2.5799E+13	3.6258E+13	-1.9435E+12
			80%	25.51	1.0458E+13	2.5799E+13	3.6257E+13	-1.9437E+12
			50%	25.51	1.0458E+13	2.5799E+13	3.6257E+13	-1.9440E+12
		50%	99%	25.51	1.0458E+13	2.4748E+13	3.5206E+13	-2.9946E+12
			80%	25.51	1.0458E+13	2.4748E+13	3.5206E+13	-2.9948E+12
			50%	25.51	1.0458E+13	2.4748E+13	3.5206E+13	-2.9951E+12

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
145	99%	99%	99%	26.00	4.5681E+11	3.1648E+12	3.6216E+12	4.1900E+07
			80%	26.00	4.5681E+11	3.1648E+12	3.6216E+12	2.8600E+07
▶			50%	26.00	4.5681E+11	3.1647E+12	3.6215E+12	0.0000E+00
		80%	99%	26.00	4.5681E+11	2.9194E+12	3.3762E+12	-2.4535E+11
			80%	26.00	4.5681E+11	2.9194E+12	3.3762E+12	-2.4537E+11
			50%	26.00	4.5681E+11	2.9193E+12	3.3761E+12	-2.4540E+11
		50%	99%	26.00	4.5681E+11	2.7850E+12	3.2418E+12	-3.7976E+11
			80%	26.00	4.5681E+11	2.7850E+12	3.2418E+12	-3.7978E+11
			50%	26.00	4.5681E+11	2.7849E+12	3.2417E+12	-3.7980E+11
	80%	99%	99%	25.22	6.0845E+11	3.0757E+12	3.6842E+12	-8.8997E+10
			80%	25.22	6.0845E+11	3.0757E+12	3.6842E+12	-8.9011E+10
			50%	25.22	6.0845E+11	3.0757E+12	3.6841E+12	-8.9039E+10
		80%	99%	25.22	6.0845E+11	2.8298E+12	3.4383E+12	-3.3490E+11
			80%	25.22	6.0845E+11	2.8298E+12	3.4383E+12	-3.3491E+11
			50%	25.22	6.0845E+11	2.8298E+12	3.4382E+12	-3.3494E+11
		50%	99%	25.22	6.0845E+11	2.6960E+12	3.3044E+12	-4.6875E+11
			80%	25.22	6.0845E+11	2.6960E+12	3.3044E+12	-4.6876E+11
			50%	25.22	6.0845E+11	2.6959E+12	3.3044E+12	-4.6879E+11
	50%	99%	99%	24.75	7.6112E+11	3.0379E+12	3.7991E+12	-1.2678E+11
			80%	24.75	7.6112E+11	3.0379E+12	3.7991E+12	-1.2680E+11
			50%	24.75	7.6112E+11	3.0379E+12	3.7990E+12	-1.2683E+11
		80%	99%	24.75	7.6112E+11	2.7924E+12	3.5535E+12	-3.7235E+11
			80%	24.75	7.6112E+11	2.7924E+12	3.5535E+12	-3.7237E+11
			50%	24.75	7.6112E+11	2.7923E+12	3.5535E+12	-3.7240E+11
		50%	99%	24.75	7.6112E+11	2.6593E+12	3.4205E+12	-5.0538E+11
			80%	24.75	7.6112E+11	2.6593E+12	3.4205E+12	-5.0539E+11
			50%	24.75	7.6112E+11	2.6593E+12	3.4204E+12	-5.0542E+11
147	99%	99%	99%	27.33	3.7767E+11	3.2292E+12	3.6069E+12	1.8016E+11
			80%	27.33	3.7767E+11	3.2292E+12	3.6069E+12	1.8015E+11
			50%	27.33	3.7767E+11	3.2292E+12	3.6068E+12	1.8012E-11
		80%	99%	27.33	3.7767E+11	2.9725E+12	3.3501E+12	-7.6601E+10
			80%	27.33	3.7767E+11	2.9724E+12	3.3501E+12	-7.6614E+10
			50%	27.33	3.7767E+11	2.9724E+12	3.3501E+12	-7.6643E+10
		50%	99%	27.33	3.7767E+11	2.8319E+12	3.2096E+12	-2.1713E+11
			80%	27.33	3.7767E+11	2.8319E+12	3.2096E+12	-2.1715E+11
			50%	27.33	3.7767E+11	2.8319E+12	3.2096E+12	-2.1718E+11
	80%	99%	99%	26.43	4.0780E+11	3.1077E+12	3.5155E+12	5.8614E+10
			80%	26.43	4.0780E+11	3.1077E+12	3.5155E+12	5.8601E+10
			50%	26.43	4.0780E+11	3.1076E+12	3.5154E+12	5.8572E+10
		80%	99%	26.43	4.0780E+11	2.8531E+12	3.2609E+12	-1.9594E+11
			80%	26.43	4.0780E+11	2.8531E+12	3.2609E+12	-1.9596E+11
			50%	26.43	4.0780E+11	2.8531E+12	3.2609E+12	-1.9599E+11
		50%	99%	26.43	4.0780E+11	2.7149E+12	3.1227E+12	-3.3413E+11
			80%	26.43	4.0780E+11	2.7149E+12	3.1227E+12	-3.3415E+11
			50%	26.43	4.0780E+11	2.7149E+12	3.1227E+12	-3.3418E+11
	50%	99%	99%	25.93	4.8167E+11	3.0491E+12	3.5308E+12	4.2000E+07
			80%	25.93	4.8167E+11	3.0491E+12	3.5308E+12	2.8600E+07
▶			50%	25.93	4.8167E+11	3.0491E+12	3.5307E+12	0.0000E+00
		80%	99%	25.93	4.8167E+11	2.7963E+12	3.2780E+12	-2.5275E+11
			80%	25.93	4.8167E+11	2.7963E+12	3.2780E+12	-2.5277E+11
			50%	25.93	4.8167E+11	2.7963E+12	3.2779E+12	-2.5279E+11
		50%	99%	25.93	4.8167E+11	2.6599E+12	3.1416E+12	-3.8913E+11
			80%	25.93	4.8167E+11	2.6599E+12	3.1416E+12	-3.8914E+11
			50%	25.93	4.8167E+11	2.6599E+12	3.1416E+12	-3.8917E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
146	99%	99%	99%	26.27	3.8625E+11	3.2472E+12	3.6334E+12	1.1778E+11
			80%	26.27	3.8625E+11	3.2471E+12	3.6334E+12	1.1776E+11
			50%	26.27	3.8625E+11	3.2471E+12	3.6334E+12	1.1774E+11
		80%	99%	26.27	3.8625E+11	2.9822E+12	3.3685E+12	-1.4716E+11
			80%	26.27	3.8625E+11	2.9822E+12	3.3685E+12	-1.4717E+11
			50%	26.27	3.8625E+11	2.9822E+12	3.3684E+12	-1.4720E+11
		50%	99%	26.27	3.8625E+11	2.8392E+12	3.2254E+12	-2.9022E+11
			80%	26.27	3.8625E+11	2.8391E+12	3.2254E+12	-2.9024E+11
			50%	26.27	3.8625E+11	2.8391E+12	3.2254E+12	-2.9026E+11
	80%	99%	99%	25.49	4.5371E+11	3.1294E+12	3.5831E+12	4.2000E+07
			80%	25.49	4.5371E+11	3.1294E+12	3.5831E+12	2.8100E+07
▶			50%	25.49	4.5371E+11	3.1294E+12	3.5831E+12	0.0000E+00
		80%	99%	25.49	4.5371E+11	2.8675E+12	3.3212E+12	-2.6191E+11
			80%	25.49	4.5371E+11	2.8675E+12	3.3212E+12	-2.6193E+11
			50%	25.49	4.5371E+11	2.8674E+12	3.3211E+12	-2.6195E+11
		50%	99%	25.49	4.5371E+11	2.7258E+12	3.1795E+12	-4.0358E+11
			80%	25.49	4.5371E+11	2.7258E+12	3.1795E+12	-4.0359E+11
			50%	25.49	4.5371E+11	2.7258E+12	3.1795E+12	-4.0362E+11
	50%	99%	99%	25.01	5.6792E+11	3.0783E+12	3.6463E+12	-5.1044E+10
			80%	25.01	5.6792E+11	3.0783E+12	3.6462E+12	-5.1057E+10
			50%	25.01	5.6792E+11	3.0783E+12	3.6462E+12	-5.1086E+10
		80%	99%	25.01	5.6792E+11	2.8177E+12	3.3856E+12	-3.1168E+11
			80%	25.01	5.6792E+11	2.8177E+12	3.3856E+12	-3.1170E+11
			50%	25.01	5.6792E+11	2.8177E+12	3.3856E+12	-3.1173E+11
		50%	99%	25.01	5.6792E+11	2.6770E+12	3.2449E+12	-4.5237E+11
			80%	25.01	5.6792E+11	2.6770E+12	3.2449E+12	-4.5238E+11
			50%	25.01	5.6792E+11	2.6770E+12	3.2449E+12	-4.5241E+11
148	99%	99%	99%	26.01	4.3499E+11	3.4234E+12	3.8584E+12	4.1700E+07
			80%	26.01	4.3499E+11	3.4234E+12	3.8584E+12	2.8000E+07
▶			50%	26.01	4.3499E+11	3.4234E+12	3.8584E+12	0.0000E+00
		80%	99%	26.01	4.3499E+11	3.1153E+12	3.5503E+12	-3.0807E+11
			80%	26.01	4.3499E+11	3.1153E+12	3.5503E+12	-3.0808E+11
			50%	26.01	4.3499E+11	3.1153E+12	3.5503E+12	-3.0811E+11
		50%	99%	26.01	4.3499E+11	2.9463E+12	3.3813E+12	-4.7708E+11
			80%	26.01	4.3499E+11	2.9463E+12	3.3813E+12	-4.7710E+11
			50%	26.01	4.3499E+11	2.9462E+12	3.3812E+12	-4.7712E+11
	80%	99%	99%	25.10	5.6458E+11	3.3083E+12	3.8729E+12	-1.1510E+11
			80%	25.10	5.6458E+11	3.3083E+12	3.8728E+12	-1.1511E+11
			50%	25.10	5.6458E+11	3.3082E+12	3.8728E+12	-1.1514E+11
		80%	99%	25.10	5.6458E+11	3.0072E+12	3.5718E+12	-4.1614E+11
			80%	25.10	5.6458E+11	3.0072E+12	3.5718E+12	-4.1615E+11
			50%	25.10	5.6458E+11	3.0072E+12	3.5718E+12	-4.1618E+11
		50%	99%	25.10	5.6458E+11	2.8404E+12	3.4050E+12	-5.8298E+11
			80%	25.10	5.6458E+11	2.8404E+12	3.4050E+12	-5.8300E+11
			50%	25.10	5.6458E+11	2.8403E+12	3.4049E+12	-5.8303E+11
	50%	99%	99%	24.62	7.0396E+11	3.2674E+12	3.9713E+12	-1.5602E+11
			80%	24.62	7.0396E+11	3.2673E+12	3.9713E+12	-1.5603E+11
			50%	24.62	7.0396E+11	3.2673E+12	3.9713E+12	-1.5606E+11
		80%	99%	24.62	7.0396E+11	2.9608E+12	3.6647E+12	-4.6261E+11
			80%	24.62	7.0396E+11	2.9608E+12	3.6647E+12	-4.6262E+11
			50%	24.62	7.0396E+11	2.9607E+12	3.6647E+12	-4.6265E+11
		50%	99%	24.62	7.0396E+11	2.7947E+12	3.4986E+12	-6.2870E+11
			80%	24.62	7.0396E+11	2.7947E+12	3.4986E+12	-6.2871E+11
			50%	24.62	7.0396E+11	2.7946E+12	3.4986E+12	-6.2874E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d(J)	W_d(J)	W (J)	OPL
149	99%	99%	99%	26.63	3.9252E+11	3.4236E+12	3.8162E+12	1.1955E+11
			80%	26.63	3.9252E+11	3.4236E+12	3.8162E+12	1.1954E+11
			50%	26.63	3.9252E+11	3.4236E+12	3.8161E+12	1.1951E+11
		80%	99%	26.63	3.9252E+11	3.1168E+12	3.5093E+12	-1.8726E+11
			80%	26.63	3.9252E+11	3.1168E+12	3.5093E+12	-1.8728E+11
			50%	26.63	3.9252E+11	3.1168E+12	3.5093E+12	-1.8730E+11
		50%	99%	26.63	3.9252E+11	2.9488E+12	3.3413E+12	-3.5528E+11
			80%	26.63	3.9252E+11	2.9488E+12	3.3413E+12	-3.5529E+11
			50%	26.63	3.9252E+11	2.9488E+12	3.3413E+12	-3.5532E+11
	80%	99%	99%	25.82	4.8278E+11	3.3041E+12	3.7869E+12	4.2500E+07
			80%	25.82	4.8278E+11	3.3041E+12	3.7869E+12	2.8900E+07
▶			50%	25.82	4.8278E+11	3.3041E+12	3.7869E+12	0.0000E+00
		80%	99%	25.82	4.8278E+11	2.9987E+12	3.4815E+12	-3.0537E+11
			80%	25.82	4.8278E+11	2.9987E+12	3.4815E+12	-3.0539E+11
			50%	25.82	4.8278E+11	2.9987E+12	3.4815E+12	-3.0541E+11
		50%	99%	25.82	4.8278E+11	2.8320E+12	3.3147E+12	-4.7214E+11
			80%	25.82	4.8278E+11	2.8319E+12	3.3147E+12	-4.7215E+11
			50%	25.82	4.8278E+11	2.8319E+12	3.3147E+12	-4.7218E+11
	50%	99%	99%	25.34	6.0303E+11	3.2522E+12	3.8552E+12	-5.1905E+10
			80%	25.34	6.0303E+11	3.2522E+12	3.8552E+12	-5.1918E+10
			50%	25.34	6.0303E+11	3.2521E+12	3.8552E+12	-5.1946E+10
		80%	99%	25.34	6.0303E+11	2.9471E+12	3.5501E+12	-3.5698E+11
			80%	25.34	6.0303E+11	2.9471E+12	3.5501E+12	-3.5699E+11
			50%	25.34	6.0303E+11	2.9471E+12	3.5501E+12	-3.5702E+11
		50%	99%	25.34	6.0303E+11	2.7824E+12	3.3854E+12	-5.2168E+11
			80%	25.34	6.0303E+11	2.7824E+12	3.3854E+12	-5.2170E+11
			50%	25.34	6.0303E+11	2.7824E+12	3.3854E+12	-5.2173E+11
151	99%	99%	99%	25.95	4.1065E+11	3.2626E+12	3.6732E+12	4.1900E+07
			80%	25.95	4.1065E+11	3.2625E+12	3.6732E+12	2.8600E+07
			50%	25.95	4.1065E+11	3.2625E+12	3.6732E+12	0.0000E+00
		80%	99%	25.95	4.1065E+11	3.0014E+12	3.4121E+12	-2.6108E+11
			80%	25.95	4.1065E+11	3.0014E+12	3.4121E+12	-2.6110E+11
			50%	25.95	4.1065E+11	3.0014E+12	3.4120E+12	-2.6113E+11
		50%	99%	25.95	4.1065E+11	2.8581E+12	3.2687E+12	-4.0445E+11
			80%	25.95	4.1065E+11	2.8581E+12	3.2687E+12	-4.0446E+11
			50%	25.95	4.1065E+11	2.8580E+12	3.2687E+12	-4.0449E+11
	80%	99%	99%	25.16	5.1013E+11	3.1397E+12	3.6498E+12	-1.2286E+11
			80%	25.16	5.1013E+11	3.1397E+12	3.6498E+12	-1.2287E+11
			50%	25.16	5.1013E+11	3.1396E+12	3.6498E+12	-1.2290E+11
		80%	99%	25.16	5.1013E+11	2.8792E+12	3.3893E+12	-3.8337E+11
			80%	25.16	5.1013E+11	2.8791E+12	3.3893E+12	-3.8338E+11
			50%	25.16	5.1013E+11	2.8791E+12	3.3892E+12	-3.8341E+11
		50%	99%	25.16	5.1013E+11	2.7385E+12	3.2487E+12	-5.2397E+11
			80%	25.16	5.1013E+11	2.7385E+12	3.2487E+12	-5.2399E+11
			50%	25.16	5.1013E+11	2.7385E+12	3.2486E+12	-5.2401E+11
	50%	99%	99%	24.69	6.4981E+11	3.0857E+12	3.7356E+12	-1.7678E+11
			80%	24.69	6.4981E+11	3.0857E+12	3.7355E+12	-1.7679E+11
			50%	24.69	6.4981E+11	3.0857E+12	3.7355E+12	-1.7682E+11
		80%	99%	24.69	6.4981E+11	2.8268E+12	3.4767E+12	-4.3569E+11
			80%	24.69	6.4981E+11	2.8268E+12	3.4766E+12	-4.3570E+11
			50%	24.69	6.4981E+11	2.8268E+12	3.4766E+12	-4.3573E+11
		50%	99%	24.69	6.4981E+11	2.6875E+12	3.3373E+12	-5.7501E+11
			80%	24.69	6.4981E+11	2.6875E+12	3.3373E+12	-5.7503E+11
			50%	24.69	6.4981E+11	2.6875E+12	3.3373E+12	-5.7506E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_d(J)	W_d(J)	W (J)	OPL
150	99%	99%	99%	27.00	3.7877E+11	3.4738E+12	3.8526E+12	1.9694E+11
			80%	27.00	3.7877E+11	3.4738E+12	3.8526E+12	1.9693E+11
			50%	27.00	3.7877E+11	3.4738E+12	3.8526E+12	1.9690E+11
		80%	99%	27.00	3.7877E+11	3.1585E+12	3.5372E+12	-1.1841E+11
			80%	27.00	3.7877E+11	3.1585E+12	3.5372E+12	-1.1842E+11
			50%	27.00	3.7877E+11	3.1584E+12	3.5372E+12	-1.1845E+11
		50%	99%	27.00	3.7877E+11	2.9862E+12	3.3650E+12	-2.9069E+11
			80%	27.00	3.7877E+11	2.9862E+12	3.3650E+12	-2.9070E+11
			50%	27.00	3.7877E+11	2.9862E+12	3.3649E+12	-2.9073E+11
	80%	99%	99%	26.21	4.1408E+11	3.3331E+12	3.7472E+12	5.6189E+10
			80%	26.21	4.1408E+11	3.3331E+12	3.7471E+12	5.6175E+10
			50%	26.31	4.1408E+11	3.3330E+12	3.7471E+12	5.6147E+10
		80%	99%	26.21	4.1408E+11	3.0236E+12	3.4377E+12	-2.5326E+11
			80%	26.21	4.1408E+11	3.0236E+12	3.4377E+12	-2.5327E+11
			50%	26.21	4.1408E+11	3.0236E+12	3.4377E+12	-2.5330E+11
		50%	99%	26.21	4.1408E+11	2.8532E+12	3.2673E+12	-4.2366E+11
			80%	26.21	4.1408E+11	2.8532E+12	3.2673E+12	-4.2367E+11
			50%	26.21	4.1408E+11	2.8532E+12	3.2673E+12	-4.2370E+11
	50%	99%	99%	25.73	5.0459E+11	3.2769E+12	3.7815E+12	4.2200E+07
			80%	25.73	5.0459E+11	3.2769E+12	3.7815E+12	2.8600E+07
▶			50%	25.73	5.0459E+11	3.2769E+12	3.7815E+12	0.0000E+00
		80%	99%	25.73	5.0459E+11	2.9638E+12	3.4684E+12	-3.1305E+11
			80%	25.73	5.0459E+11	2.9638E+12	3.4684E+12	-3.1307E+11
			50%	25.73	5.0459E+11	2.9638E+12	3.4684E+12	-3.1309E+11
		50%	99%	25.73	5.0459E+11	2.7952E+12	3.2998E+12	-4.8172E+11
			80%	25.73	5.0459E+11	2.7952E+12	3.2997E+12	-4.8173E+11
			50%	25.73	5.0459E+11	2.7951E+12	3.2997E+12	-4.8176E+11
152	99%	99%	99%	25.92	3.9575E+11	3.3469E+12	3.7426E+12	1.5193E+11
			80%	25.92	3.9575E+11	3.3469E+12	3.7426E+12	1.5192E+11
			50%	25.92	3.9575E+11	3.3468E+12	3.7426E+12	1.5189E+11
		80%	99%	25.92	3.9575E+11	3.0747E+12	3.4704E+12	-1.2026E+11
			80%	25.92	3.9575E+11	3.0747E+12	3.4704E+12	-1.2027E+11
			50%	25.92	3.9575E+11	3.0747E+12	3.4704E+12	-1.2030E+11
		50%	99%	25.92	3.9575E+11	2.9259E+12	3.3216E+12	-2.6909E+11
			80%	25.92	3.9575E+11	2.9259E+12	3.3216E+12	-2.6910E+11
			50%	25.92	3.9575E+11	2.9258E+12	3.3216E+12	-2.6913E+11
	80%	99%	99%	25.13	4.7349E+11	3.1950E+12	3.6685E+12	4.1700E+07
			80%	25.13	4.7349E+11	3.1950E+12	3.6685E+12	2.8300E+07
▶			50%	25.13	4.7349E+11	3.1950E+12	3.6684E+12	0.0000E+00
		80%	99%	25.13	4.7349E+11	2.9267E+12	3.4002E+12	-2.6823E+11
			80%	25.13	4.7349E+11	2.9267E+12	3.4002E+12	-2.6824E+11
			50%	25.13	4.7349E+11	2.9267E+12	3.4002E+12	-2.6827E+11
		50%	99%	25.13	4.7349E+11	2.7806E+12	3.2541E+12	-4.1437E+11
			80%	25.13	4.7349E+11	2.7806E+12	3.2541E+12	-4.1439E+11
			50%	25.13	4.7349E+11	2.7805E+12	3.2540E+12	-4.1441E+11
	50%	99%	99%	24.66	5.9686E+11	3.1271E+12	3.7240E+12	-6.7810E+10
			80%	24.66	5.9686E+11	3.1271E+12	3.7240E+12	-6.7824E+10
			50%	24.66	5.9686E+11	3.1271E+12	3.7240E+12	-6.7852E+10
		80%	99%	24.66	5.9686E+11	2.8594E+12	3.4563E+12	-3.3551E+11
			80%	24.66	5.9686E+11	2.8594E+12	3.4563E+12	-3.3552E+11
			50%	24.66	5.9686E+11	2.8594E+12	3.4563E+12	-3.3555E+11
		50%	99%	24.66	5.9686E+11	2.7147E+12	3.3116E+12	-4.8023E+11
			80%	24.66	5.9686E+11	2.7147E+12	3.3116E+12	-4.8024E+11
			50%	24.66	5.9686E+11	2.7147E+12	3.3115E+12	-4.8027E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
153	99%	99%	99%	27.26	3.7352E+11	3.3633E+12	3.7368E+12	2.4768E+11
			80%	27.26	3.7352E+11	3.3633E+12	3.7368E+12	2.4766E+11
			50%	27.26	3.7352E+11	3.3633E+12	3.7368E+12	2.4764E+11
		80%	99%	27.26	3.7352E+11	3.0941E+12	3.4676E+12	-2.1555E+10
			80%	27.26	3.7352E+11	3.0941E+12	3.4676E+12	-2.1569E+10
			50%	27.26	3.7352E+11	3.0940E+12	3.4676E+12	-2.1597E+10
		50%	99%	27.26	3.7352E+11	2.9459E+12	3.3194E+12	-1.6972E+11
			80%	27.26	3.7352E+11	2.9459E+12	3.3194E+12	-1.6973E+11
			50%	27.26	3.7352E+11	2.9459E+12	3.3194E+12	-1.6976E+11
	80%	99%	99%	26.47	3.9186E+11	3.2004E+12	3.5922E+12	8.4749E+10
			80%	26.47	3.9186E+11	3.2004E+12	3.5922E+12	8.4735E+10
			50%	26.47	3.9186E+11	3.2004E+12	3.5922E+12	8.4707E+10
		80%	99%	26.47	3.9186E+11	2.9333E+12	3.3252E+12	-1.8233E+11
			80%	26.47	3.9186E+11	2.9333E+12	3.3252E+12	-1.8234E+11
			50%	26.47	3.9186E+11	2.9333E+12	3.3251E+12	-1.8237E+11
		50%	99%	26.47	3.9186E+11	2.7877E+12	3.1795E+12	-3.2795E+11
			80%	26.47	3.9186E+11	2.7877E+12	3.1795E+12	-3.2797E+11
			50%	26.47	3.9186E+11	2.7876E+12	3.1795E+12	-3.2800E+11
	50%	99%	99%	26.00	4.4585E+11	3.1157E+12	3.5615E+12	4.1700E+07
			80%	26.00	4.4585E+11	3.1157E+12	3.5615E+12	2.8300E+07
►			50%	26.00	4.4585E+11	3.1156E+12	3.5615E+12	0.0000E+00
		80%	99%	26.00	4.4585E+11	2.8507E+12	3.2966E+12	-2.6494E+11
			80%	26.00	4.4585E+11	2.8507E+12	3.2966E+12	-2.6495E+11
			50%	26.00	4.4585E+11	2.8507E+12	3.2965E+12	-2.6498E+11
		50%	99%	26.00	4.4585E+11	2.7069E+12	3.1528E+12	-4.0875E+11
			80%	26.00	4.4585E+11	2.7069E+12	3.1527E+12	-4.0876E+11
			50%	26.00	4.4585E+11	2.7069E+12	3.1527E+12	-4.0879E+11
155	99%	99%	99%	26.95	3.8773E+11	3.3359E+12	3.7237E+12	1.3127E+11
			80%	26.95	3.8773E+11	3.3359E+12	3.7237E+12	1.3125E+11
			50%	26.95	3.8773E+11	3.3359E+12	3.7236E+12	1.3123E+11
		80%	99%	26.95	3.8773E+11	3.0597E+12	3.4474E+12	-1.4502E+11
			80%	26.95	3.8773E+11	3.0596E+12	3.4474E+12	-1.4504E+11
			50%	26.95	3.8773E+11	3.0596E+12	3.4473E+12	-1.4507E+11
		50%	99%	26.95	3.8773E+11	2.9100E+12	3.2977E+12	-2.9472E+11
			80%	26.95	3.8773E+11	2.9099E+12	3.2977E+12	-2.9474E+11
			50%	26.95	3.8773E+11	2.9099E+12	3.2976E+12	-2.9477E+11
	80%	99%	99%	26.00	4.8162E+11	3.2047E+12	3.6863E+12	4.2000E+07
			80%	26.00	4.8162E+11	3.2047E+12	3.6863E+12	2.8300E+07
►			50%	26.00	4.8162E+11	3.2047E+12	3.6863E+12	0.0000E+00
		80%	99%	26.00	4.8162E+11	2.9393E+12	3.4210E+12	-2.6534E+11
			80%	26.00	4.8162E+11	2.9393E+12	3.4209E+12	-2.6535E+11
			50%	26.00	4.8162E+11	2.9393E+12	3.4209E+12	-2.6538E+11
		50%	99%	26.00	4.8162E+11	2.7913E+12	3.2730E+12	-4.1334E+11
			80%	26.00	4.8162E+11	2.7913E+12	3.2729E+12	-4.1335E+11
			50%	26.00	4.8162E+11	2.7913E+12	3.2729E+12	-4.1338E+11
	50%	99%	99%	25.31	5.9720E+11	3.1531E+12	3.7503E+12	-5.1580E+10
			80%	25.31	5.9720E+11	3.1531E+12	3.7503E+12	-5.1593E+10
			50%	25.31	5.9720E+11	3.1531E+12	3.7503E+12	-5.1621E+10
		80%	99%	25.31	5.9720E+11	2.8838E+12	3.4810E+12	-3.2089E+11
			80%	25.31	5.9720E+11	2.8838E+12	3.4810E+12	-3.2090E+11
			50%	25.31	5.9720E+11	2.8837E+12	3.4809E+12	-3.2093E+11
		50%	99%	25.31	5.9720E+11	2.7369E+12	3.3341E+12	-4.6775E+11
			80%	25.31	5.9720E+11	2.7369E+12	3.3341E+12	-4.6776E+11
			50%	25.31	5.9720E+11	2.7369E+12	3.3341E+12	-4.6779E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
154	99%	99%	99%	25.73	5.8509E+11	3.2816E+12	3.8667E+12	4.1400E+07
			80%	25.73	5.8509E+11	3.2816E+12	3.8667E+12	2.8300E+07
►			50%	25.73	5.8509E+11	3.2816E+12	3.8667E+12	0.0000E+00
		80%	99%	25.73	5.8509E+11	3.0242E+12	3.6093E+12	-2.5736E+11
			80%	25.73	5.8509E+11	3.0242E+12	3.6093E+12	-2.5737E+11
			50%	25.73	5.8509E+11	3.0242E+12	3.6093E+12	-2.5740E+11
		50%	99%	25.73	5.8509E+11	2.8789E+12	3.4640E+12	-4.0267E+11
			80%	25.73	5.8509E+11	2.8789E+12	3.4640E+12	-4.0269E+11
			50%	25.73	5.8509E+11	2.8789E+12	3.4639E+12	-4.0271E+11
	80%	99%	99%	24.78	7.5499E+11	3.1894E+12	3.9444E+12	-9.2205E+10
			80%	24.78	7.5499E+11	3.1894E+12	3.9443E+12	-9.2218E+10
			50%	24.78	7.5499E+11	3.1893E+12	3.9443E+12	-9.2247E+10
		80%	99%	24.78	7.5499E+11	2.9255E+12	3.6805E+12	-3.5604E+11
			80%	24.78	7.5499E+11	2.9255E+12	3.6805E+12	-3.5606E+11
			50%	24.78	7.5499E+11	2.9255E+12	3.6805E+12	-3.5609E+11
		50%	99%	24.78	7.5499E+11	2.7826E+12	3.5376E+12	-4.9897E+11
			80%	24.78	7.5499E+11	2.7826E+12	3.5376E+12	-4.9898E+11
			50%	24.78	7.5499E+11	2.7826E+12	3.5375E+12	-4.9901E+11
	50%	99%	99%	24.09	8.9686E+11	3.1399E+12	4.0367E+12	-1.4171E+11
			80%	24.09	8.9686E+11	3.1398E+12	4.0367E+12	-1.4172E+11
			50%	24.09	8.9686E+11	3.1398E+12	4.0367E+12	-1.4175E+11
		80%	99%	24.09	8.9686E+11	2.8790E+12	3.7759E+12	-4.0253E+11
			80%	24.09	8.9686E+11	2.8790E+12	3.7759E+12	-4.0254E+11
			50%	24.09	8.9686E+11	2.8790E+12	3.7759E+12	-4.0257E+11
		50%	99%	24.09	8.9686E+11	2.7368E+12	3.6337E+12	-5.4473E+11
			80%	24.09	8.9686E+11	2.7368E+12	3.6337E+12	-5.4474E+11
			50%	24.09	8.9686E+11	2.7368E+12	3.6337E+12	-5.4477E+11
156	99%	99%	99%	27.67	3.7269E+11	3.3983E+12	3.7710E+12	2.2242E+11
			80%	27.67	3.7269E+11	3.3983E+12	3.7710E+12	2.2241E+11
			50%	27.67	3.7269E+11	3.3983E+12	3.7710E+12	2.2238E+11
		80%	99%	27.67	3.7269E+11	3.1171E+12	3.4898E+12	-5.8781E+10
			80%	27.67	3.7269E+11	3.1171E+12	3.4898E+12	-5.8795E+10
			50%	27.67	3.7269E+11	3.1171E+12	3.4898E+12	-5.8824E+10
		50%	99%	27.67	3.7269E+11	2.9633E+12	3.3360E+12	-2.1260E+11
			80%	27.67	3.7269E+11	2.9633E+12	3.3360E+12	-2.1261E+11
			50%	27.67	3.7269E+11	2.9633E+12	3.3360E+12	-2.1264E+11
	80%	99%	99%	26.71	3.7456E+11	3.2522E+12	3.6268E+12	7.6279E+10
			80%	26.71	3.7456E+11	3.2522E+12	3.6267E+12	7.6266E+10
			50%	26.71	3.7456E+11	3.2522E+12	3.6267E+12	7.6238E+10
		80%	99%	26.71	3.7456E+11	2.9741E+12	3.3486E+12	-2.0185E+11
			80%	26.71	3.7456E+11	2.9741E+12	3.3486E+12	-2.0186E+11
			50%	26.71	3.7456E+11	2.9740E+12	3.3486E+12	-2.0189E+11
		50%	99%	26.71	3.7456E+11	2.8230E+12	3.1976E+12	-3.5288E+11
			80%	26.71	3.7456E+11	2.8230E+12	3.1976E+12	-3.5289E+11
			50%	26.71	3.7456E+11	2.8230E+12	3.1976E+12	-3.5292E+11
	50%	99%	99%	26.02	4.0680E+11	3.1760E+12	3.5828E+12	4.2300E+07
			80%	26.02	4.0680E+11	3.1759E+12	3.5827E+12	2.8400E+07
►			50%	26.02	4.0680E+11	3.1759E+12	3.5827E+12	0.0000E+00
		80%	99%	26.02	4.0680E+11	2.8989E+12	3.3057E+12	-2.7705E+11
			80%	26.02	4.0680E+11	2.8989E+12	3.3057E+12	-2.7707E+11
			50%	26.02	4.0680E+11	2.8988E+12	3.3056E+12	-2.7710E+11
		50%	99%	26.02	4.0680E+11	2.7501E+12	3.1569E+12	-4.2587E+11
			80%	26.02	4.0680E+11	2.7500E+12	3.1568E+12	-4.2588E+11
			50%	26.02	4.0680E+11	2.7500E+12	3.1568E+12	-4.2591E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
157	99%	99%	99%	25.99	4.7057E+11	3.5763E+12	4.0469E+12	4.1900E+07
			80%	25.99	4.7057E+11	3.5763E+12	4.0469E+12	2.8600E+07
▶			50%	25.99	4.7057E+11	3.5763E+12	4.0468E+12	0.0000E+00
		80%	99%	25.99	4.7057E+11	3.2511E+12	3.7217E+12	-3.2517E+11
			80%	25.99	4.7057E+11	3.2511E+12	3.7217E+12	-3.2518E+11
			50%	25.99	4.7057E+11	3.2511E+12	3.7216E+12	-3.2521E+11
		50%	99%	25.99	4.7057E+11	3.0738E+12	3.5444E+12	-5.0243E+11
			80%	25.99	4.7057E+11	3.0738E+12	3.5444E+12	-5.0245E+11
			50%	25.99	4.7057E+11	3.0738E+12	3.5444E+12	-5.0247E+11
	80%	99%	99%	25.03	6.1402E+11	3.4315E+12	4.0455E+12	-1.4477E+11
			80%	25.03	6.1402E+11	3.4315E+12	4.0455E+12	-1.4478E+11
			50%	25.03	6.1402E+11	3.4315E+12	4.0455E+12	-1.4481E+11
		80%	99%	25.03	6.1402E+11	3.1145E+12	3.7285E+12	-4.6178E+11
			80%	25.03	6.1402E+11	3.1145E+12	3.7285E+12	-4.6179E+11
			50%	25.03	6.1402E+11	3.1144E+12	3.7285E+12	-4.6182E+11
		50%	99%	25.03	6.1402E+11	2.9404E+12	3.5545E+12	-6.3582E+11
			80%	25.03	6.1402E+11	2.9404E+12	3.5545E+12	-6.3583E+11
			50%	25.03	6.1402E+11	2.9404E+12	3.5544E+12	-6.3586E+11
	50%	99%	99%	24.34	7.5523E+11	3.3670E+12	4.1222E+12	-2.0929E+11
			80%	24.34	7.5523E+11	3.3670E+12	4.1222E+12	-2.0930E+11
			50%	24.34	7.5523E+11	3.3669E+12	4.1222E+12	-2.0933E+11
		80%	99%	24.34	7.5523E+11	3.0508E+12	3.8060E+12	-5.2549E+11
			80%	24.34	7.5523E+11	3.0508E+12	3.8060E+12	-5.2550E+11
			50%	24.34	7.5523E+11	3.0507E+12	3.8060E+12	-5.2553E+11
		50%	99%	24.34	7.5523E+11	2.8770E+12	3.6322E+12	-6.9929E+11
			80%	24.34	7.5523E+11	2.8770E+12	3.6322E+12	-6.9930E+11
			50%	24.34	7.5523E+11	2.8769E+12	3.6322E+12	-6.9933E+11
159	99%	99%	99%	27.20	3.7852E+11	3.6107E+12	3.9892E+12	2.4001E+11
			80%	27.20	3.7852E+11	3.6107E+12	3.9892E+12	2.4000E+11
			50%	27.20	3.7852E+11	3.6107E+12	3.9892E+12	2.3997E+11
		80%	99%	27.20	3.7852E+11	3.2822E+12	3.6607E+12	-8.8498E+10
			80%	27.20	3.7852E+11	3.2822E+12	3.6607E+12	-8.8511E+10
			50%	27.20	3.7852E+11	3.2822E+12	3.6607E+12	-8.8540E+10
		50%	99%	27.20	3.7852E+11	3.1038E+12	3.4824E+12	-2.6687E+11
			80%	27.20	3.7852E+11	3.1038E+12	3.4823E+12	-2.6689E+11
			50%	27.20	3.7852E+11	3.1038E+12	3.4823E+12	-2.6691E+11
	80%	99%	99%	26.24	4.3345E+11	3.4469E+12	3.8803E+12	7.6162E+10
			80%	26.24	4.3345E+11	3.4468E+12	3.8803E+12	7.6149E+10
			50%	26.24	4.3345E+11	3.4468E+12	3.8803E+12	7.6120E+10
		80%	99%	26.24	4.3345E+11	3.1229E+12	3.5563E+12	-2.4784E+11
			80%	26.24	4.3345E+11	3.1228E+12	3.5563E+12	-2.4786E+11
			50%	26.24	4.3345E+11	3.1228E+12	3.5563E+12	-2.4788E+11
		50%	99%	26.24	4.3345E+11	2.9466E+12	3.3800E+12	-4.2412E+11
			80%	26.24	4.3345E+11	2.9466E+12	3.3800E+12	-4.2414E+11
			50%	26.24	4.3345E+11	2.9465E+12	3.3800E+12	-4.2417E+11
	50%	99%	99%	25.55	5.3871E+11	3.3707E+12	3.9095E+12	4.2200E+07
			80%	25.55	5.3871E+11	3.3707E+12	3.9094E+12	2.8900E+07
▶			50%	25.55	5.3871E+11	3.3707E+12	3.9094E+12	0.0000E+00
		80%	99%	25.55	5.3871E+11	3.0489E+12	3.5877E+12	-3.2175E+11
			80%	25.55	5.3871E+11	3.0489E+12	3.5876E+12	-3.2177E+11
			50%	25.55	5.3871E+11	3.0489E+12	3.5876E+12	-3.2180E+11
		50%	99%	25.55	5.3871E+11	2.8741E+12	3.4128E+12	-4.9658E+11
			80%	25.55	5.3871E+11	2.8741E+12	3.4128E+12	-4.9660E+11
			50%	25.55	5.3871E+11	2.8741E+12	3.4128E+12	-4.9662E+11

กรณีศึกษา	%SP	%TP	%HP	DGI	W_u (J)	W_d (J)	W (J)	OPL
158	99%	99%	99%	26.94	3.8902E+11	3.5782E+12	3.9672E+12	1.5341E+11
			80%	26.94	3.8902E+11	3.5782E+12	3.9672E+12	1.5339E+11
			50%	26.94	3.8902E+11	3.5782E+12	3.9672E+12	1.5336E+11
		80%	99%	26.94	3.8902E+11	3.2546E+12	3.6436E+12	-1.7023E+11
			80%	26.94	3.8902E+11	3.2546E+12	3.6436E+12	-1.7024E+11
			50%	26.94	3.8902E+11	3.2545E+12	3.6435E+12	-1.7027E+11
		50%	99%	26.94	3.8902E+11	3.0773E+12	3.4664E+12	-3.4745E+11
			80%	26.94	3.8902E+11	3.0773E+12	3.4664E+12	-3.4746E+11
			50%	26.94	3.8902E+11	3.0773E+12	3.4663E+12	-3.4749E+11
	80%	99%	99%	25.99	4.8211E+11	3.4248E+12	3.9070E+12	4.1700E+07
			80%	25.99	4.8211E+11	3.4248E+12	3.9069E+12	2.8400E+07
▶			50%	25.99	4.8211E+11	3.4248E+12	3.9069E+12	0.0000E+00
		80%	99%	25.99	4.8211E+11	3.1053E+12	3.5874E+12	-3.1951E+11
			80%	25.99	4.8211E+11	3.1053E+12	3.5874E+12	-3.1953E+11
			50%	25.99	4.8211E+11	3.1052E+12	3.5874E+12	-3.1956E+11
		50%	99%	25.99	4.8211E+11	2.9316E+12	3.4137E+12	-4.9321E+11
			80%	25.99	4.8211E+11	2.9316E+12	3.4137E+12	-4.9322E+11
			50%	25.99	4.8211E+11	2.9315E+12	3.4137E+12	-4.9325E+11
	50%	99%	99%	25.30	6.0011E+11	3.3501E+12	3.9502E+12	-7.4727E+10
			80%	25.30	6.0011E+11	3.3501E+12	3.9502E+12	-7.4740E+10
			50%	25.30	6.0011E+11	3.3500E+12	3.9501E+12	-7.4768E+10
		80%	99%	25.30	6.0011E+11	3.0356E+12	3.6357E+12	-3.8915E+11
			80%	25.30	6.0011E+11	3.0356E+12	3.6357E+12	-3.8917E+11
			50%	25.30	6.0011E+11	3.0356E+12	3.6357E+12	-3.8920E+11
		50%	99%	25.30	6.0011E+11	2.8633E+12	3.4635E+12	-5.6145E+11
			80%	25.30	6.0011E+11	2.8633E+12	3.4634E+12	-5.6146E+11
			50%	25.30	6.0011E+11	2.8633E+12	3.4634E+12	-5.6149E+11
160	99%	99%	99%	25.98	4.5457E+11	3.4244E+12	3.8790E+12	4.2200E+07
			80%	25.98	4.5457E+11	3.4244E+12	3.8790E+12	2.8600E+07
▶			50%	25.98	4.5457E+11	3.4244E+12	3.8790E+12	0.0000E+00
		80%	99%	25.98	4.5457E+11	3.1323E+12	3.5869E+12	-2.9206E+11
			80%	25.98	4.5457E+11	3.1323E+12	3.5869E+12	-2.9207E+11
			50%	25.98	4.5457E+11	3.1323E+12	3.5869E+12	-2.9210E+11
		50%	99%	25.98	4.5457E+11	2.9703E+12	3.4249E+12	-4.5410E+11
			80%	25.98	4.5457E+11	2.9703E+12	3.4249E+12	-4.5411E+11
			50%	25.98	4.5457E+11	2.9703E+12	3.4248E+12	-4.5414E+11
	80%	99%	99%	24.96	5.8870E+11	3.3009E+12	3.8896E+12	-1.2348E+11
			80%	24.96	5.8870E+11	3.3009E+12	3.8896E+12	-1.2349E+11
			50%	24.96	5.8870E+11	3.3009E+12	3.8896E+12	-1.2352E+11
		80%	99%	24.96	5.8870E+11	3.0103E+12	3.5990E+12	-4.1413E+11
			80%	24.96	5.8870E+11	3.0103E+12	3.5990E+12	-4.1415E+11
			50%	24.96	5.8870E+11	3.0102E+12	3.5989E+12	-4.1418E+11
		50%	99%	24.96	5.8870E+11	2.8501E+12	3.4388E+12	-5.7432E+11
			80%	24.96	5.8870E+11	2.8501E+12	3.4388E+12	-5.7433E+11
			50%	24.96	5.8870E+11	2.8500E+12	3.4388E+12	-5.7436E+11
	50%	99%	99%	24.36	7.2440E+11	3.2487E+12	3.9731E+12	-1.7572E+11
			80%	24.36	7.2440E+11	3.2487E+12	3.9731E+12	-1.7574E+11
			50%	24.36	7.2440E+11	3.2486E+12	3.9730E+12	-1.7577E+11
		80%	99%	24.36	7.2440E+11	2.9536E+12	3.6780E+12	-4.7078E+11
			80%	24.36	7.2440E+11	2.9536E+12	3.6780E+12	-4.7080E+11
			50%	24.36	7.2440E+11	2.9536E+12	3.6780E+12	-4.7082E+11
		50%	99%	24.36	7.2440E+11	2.7946E+12	3.5190E+12	-6.2977E+11
			80%	24.36	7.3440E+11	2.7946E+12	3.5190E+12	-6.2979E+11
			50%	24.36	7.2440E+11	2.7946E+12	3.5190E+12	-6.2982E+11

ตารางที่ ค.1 การสูญเสียโอกาสของการประหยัดพลังงาน (ต่อ)

กาญีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
161	99%	99%	99%	26.94	3.8028E+11	3.4516E+12	3.8319E+12	1.4053E+11
			80%	26.94	3.8028E+11	3.4516E+12	3.8319E+12	1.4051E+11
			50%	26.94	3.8028E+11	3.4516E+12	3.8318E+12	1.4048E+11
		80%	99%	26.94	3.8028E+11	3.1501E+12	3.5304E+12	-1.6098E+11
			80%	26.94	3.8028E+11	3.1501E+12	3.5303E+12	-1.6100E+11
			50%	26.94	3.8028E+11	3.1500E+12	3.5303E+12	-1.6102E+11
		50%	99%	26.94	3.8028E+11	2.9877E+12	3.3679E+12	-3.2342E+11
			80%	26.94	3.8028E+11	2.9876E+12	3.3679E+12	-3.2343E+11
			50%	26.94	3.8028E+11	2.9876E+12	3.3679E+12	-3.2346E+11
	80%	99%	99%	25.93	4.4953E+11	3.3111E+12	3.7606E+12	4.2200E+07
			80%	25.93	4.4953E+11	3.3111E+12	3.7606E+12	2.9100E+07
▶			50%	25.93	4.4953E+11	3.3111E+12	3.7606E+12	0.0000E+00
		80%	99%	25.93	4.4953E+11	3.0129E+12	3.4624E+12	-2.9815E+11
			80%	25.93	4.4953E+11	3.0129E+12	3.4624E+12	-2.9817E+11
			50%	25.93	4.4953E+11	3.0129E+12	3.4624E+12	-2.9819E+11
		50%	99%	25.93	4.4953E+11	2.8520E+12	3.3015E+12	-4.5907E+11
			80%	25.93	4.4953E+11	2.8520E+12	3.3015E+12	-4.5908E+11
			50%	25.93	4.4953E+11	2.8520E+12	3.3015E+12	-4.5911E+11
	50%	99%	99%	25.32	5.5802E+11	3.2456E+12	3.8036E+12	-6.5488E+10
			80%	25.32	5.5802E+11	3.2456E+12	3.8036E+12	-6.5501E+10
			50%	25.32	5.5802E+11	3.2455E+12	3.8036E+12	-6.5529E+10
		80%	99%	25.32	5.5802E+11	2.9497E+12	3.5077E+12	-3.6137E+11
			80%	25.32	5.5802E+11	2.9497E+12	3.5077E+12	-3.6139E+11
			50%	25.32	5.5802E+11	2.9497E+12	3.5077E+12	-3.6141E+11
		50%	99%	25.32	5.5802E+11	2.7897E+12	3.3477E+12	-5.2138E+11
			80%	25.32	5.5802E+11	2.7897E+12	3.3477E+12	-5.2139E+11
			50%	25.32	5.5802E+11	2.7896E+12	3.3477E+12	-5.2142E+11

กาญีศึกษา	%SP	%TP	%HP	DGI	W_a (J)	W_d (J)	W (J)	OPL
162	99%	99%	99%	27.47	3.7327E+11	3.5237E+12	3.8969E+12	2.4025E+11
			80%	27.47	3.7327E+11	3.5237E+12	3.8969E+12	2.4024E+11
			50%	27.47	3.7327E+11	3.5236E+12	3.8969E+12	2.4021E+11
		80%	99%	27.47	3.7327E+11	3.2148E+12	3.5880E+12	-6.8666E+10
			80%	27.47	3.7327E+11	3.2147E+12	3.5880E+12	-6.8679E+10
			50%	27.47	3.7327E+11	3.2147E+12	3.5880E+12	-6.8707E+10
		50%	99%	27.47	3.7327E+11	3.0448E+12	3.4181E+12	-2.3862E+11
			80%	27.47	3.7327E+11	3.0448E+12	3.4181E+12	-2.3864E+11
			50%	27.47	3.7327E+11	3.0448E+12	3.4180E+12	-2.3867E+11
	80%	99%	99%	26.46	3.8122E+11	3.3651E+12	3.7463E+12	8.1652E+10
			80%	26.46	3.8122E+11	3.3651E+12	3.7463E+12	8.1639E+10
			50%	26.46	3.8122E+11	3.3650E+12	3.7463E+12	8.1610E+10
		80%	99%	26.46	3.8122E+11	3.0594E+12	3.4407E+12	-2.2398E+11
			80%	26.46	3.8122E+11	3.0594E+12	3.4407E+12	-2.2399E+11
			50%	26.46	3.8122E+11	3.0594E+12	3.4406E+12	-2.2402E+11
		50%	99%	26.46	3.8122E+11	2.8933E+12	3.2746E+12	-3.9007E+11
			80%	26.46	3.8122E+11	2.8933E+12	3.2746E+12	-3.9008E+11
			50%	26.46	3.8122E+11	2.8933E+12	3.2745E+12	-3.9011E+11
	50%	99%	99%	25.86	4.3740E+11	3.2835E+12	3.7209E+12	4.1700E+07
			80%	25.86	4.3740E+11	3.2834E+12	3.7208E+12	2.8000E+07
▶			50%	25.86	4.3740E+11	3.2834E+12	3.7208E+12	0.0000E+00
		80%	99%	25.86	4.3740E+11	2.9825E+12	3.4199E+12	-3.0091E+11
			80%	25.86	4.3740E+11	2.9825E+12	3.4199E+12	-3.0092E+11
			50%	25.86	4.3740E+11	2.9825E+12	3.4199E+12	-3.0095E+11
		50%	99%	25.86	4.3740E+11	2.8175E+12	3.2549E+12	-4.6596E+11
			80%	25.86	4.3740E+11	2.8174E+12	3.2548E+12	-4.6598E+11
			50%	25.86	4.3740E+11	2.8174E+12	3.2548E+12	-4.6601E+11

ภาคผนวก ง

โปรแกรม

เพื่อให้บรรลุตามวัตถุประสงค์ของการศึกษาวิจัย ผู้วิจัยจึงได้ทำการประดิษฐ์โปรแกรมคอมพิวเตอร์ด้วยภาษาฟอร์แทรน 90 ขึ้นจากหลักการที่ได้กล่าวไว้อย่างละเอียดในบทที่ 3. โปรแกรมที่ประดิษฐ์ขึ้นประกอบด้วย 1 โปรแกรมหลัก และ 6 โมดูล ดังนี้

1. โปรแกรม SYS_OPT
2. โมดูล DATATRANSFR
3. โมดูล RESPONSE
4. โมดูล SOLAR
5. โมดูล VISIBLE
6. โมดูล ENERGY

โปรแกรมหลัก SYS_OPT

โปรแกรมนี้เป็นโปรแกรมหลักสำหรับเรียกโปรแกรมย่อย(Subroutine) จากโมดูลต่างๆ มาใช้งาน สำหรับการคำนวณพลังงานที่อาคารใช้และการออพติไมเซชั่น ขั้นตอนการทำงานของโปรแกรมนี้เริ่มจากเรียกโปรแกรมย่อย READDATA ซึ่งอยู่ในโมดูล DATATRANSFR เพื่อรับรู้ข้อมูลจากไฟล์(File) ข้อมูลจำนวน 2 ไฟล์คือ INPUTDATA.TXT และ WEATHERDATA.TXT โดยข้อมูลทั้งหมดของอาคารจะบรรจุอยู่ในไฟล์ INPUTDATA.TXT และ ข้อมูลสภาวะแวดล้อมประกอบด้วย อุณหภูมิ ความชื้นจำเพาะ รังสีดวงอาทิตย์ และทิศทางแลความเร็วลม จะถูกบรรจุอยู่ใน WEATHERDATA.TXT หลังจากโปรแกรมทำการรับรู้ข้อมูลทั้งหมดแล้ว โปรแกรมจะเรียกโปรแกรมย่อย R_FACTOR จากโมดูลRESPONSE เพื่อทำการคำนวณสัมประสิทธิ์ฟังก์ชั่นถ่ายโอนการนำความร้อน ได้แก่ X_n, Y_n, Z_n และ สัมประสิทธิ์การถ่ายโอนฟลักซ์ Φ_n ของผนังและกระจกของอาคารทั้งหมด จากนั้นโปรแกรมจะให้ผู้ใช้เลือกการใช้งานซึ่งจะมี 2 ทางเลือกคือ 1. คำนวณพลังงานที่อาคารใช้ จากข้อมูลของสิ่งแวดล้อมและข้อมูลของอาคารที่โปรแกรมได้รับรู้ไว้ในตอนต้น 2. ทำการออพติไมเซชั่น

ทางเลือกที่ 1. การคำนวณพลังงาน โปรแกรมจะเรียกโปรแกรมย่อย ENEGY_CAL ซึ่งอยู่ในโมดูล ENERGY มาใช้ในการคำนวณพลังงาน ผลลัพธ์ที่ได้จากโปรแกรมย่อย ENEGY_CAL ทั้งหมดจะแสดงในไฟล์ REPORT.ENG ซึ่งประกอบด้วย

1. ผลลัพธ์รายชั่วโมงได้แก่ ภาระการทำความเย็น ปริมาณแสงสว่างที่ต้องใช้สำหรับระบบไฟส่องสว่าง และ ดัชนีความจ้าภายใน
2. ผลลัพธ์รายปีของ พลังงานที่ใช้ในการส่องสว่าง พลังงานที่ใช้ในการทำความเย็น และ ดัชนีความจ้าสูงสุดของอาคารในปีที่พิจารณา

ทางเลือกที่ 2. การออพติไมเซชั่น โปรแกรมจะเรียกโปรแกรมย่อย HOOKE_JEEVES โดยโปรแกรมย่อย HOOKE_JEEVES จะมีขั้นตอนการทำงานตามลำดับดังนี้

1. สร้างฟังก์ชั่นพีนัลตี้โดยเรียกใช้โปรแกรมย่อย FUNC โปรแกรมย่อยฟังก์ชั่นจะเรียกโปรแกรมย่อย ENERGY_CAL ซึ่งอยู่ในโมดูล ENEGY เพื่อคำนวณพลังงานทั้งหมดที่อาคารใช้ และเรียกโปรแกรมย่อย GLARE ซึ่งอยู่ในโมดูล SOLAR เพื่อคำนวณดัชนีความจ้าภายในอาคาร รวมไปถึงคำนวณผลลัพธ์จากฟังก์ชั่นเงื่อนไขต่างๆ ซึ่งได้กล่าวไว้ในหัวข้อที่ 3.9 และหัวข้อที่ 4.3
2. ทำหาจุดต่ำสุดของฟังก์ชั่นพีนัลตี้ด้วยวิธีการเซอร์ท
3. คืนค่าตัวแปรอิสระซึ่งในที่นี้คือค่าของปัจจัยควบคุมได้ทั้งหมด และค่าของฟังก์ชั่นพีนัลตี้ที่ต่ำที่สุด ซึ่งได้มาจากวิธีการเซอร์ทในข้อที่ 2. แก่โปรแกรมหลัก

เมื่อโปรแกรมได้รับค่าปัจจัยควบคุมได้ทั้งหมดจากโปรแกรมย่อย HOOKE_JEEVES ดังที่ได้กล่าวในขั้นตอนที่ 3 ข้างต้นแล้ว จากนั้นโปรแกรมจะทำการตรวจสอบผลการลู่เข้าสู่ผลเฉลยและตรวจสอบความสอดคล้องของปัจจัยควบคุมได้ทั้งหมดต่อสมการเงื่อนไข เมื่อพบว่าผลคำตอบยังไม่ลู่เข้าสู่ผลเฉลยหรือยังมีความไม่สอดคล้องต่อสมการเงื่อนไขเกิดขึ้นโปรแกรมจะทำการเพิ่มค่าพีนัลตี้พารามิเตอร์ (r_k) และทำการคืนค่าปัจจัยควบคุมได้ทั้งหมดไปยังโปรแกรมย่อย HOOKE_JEEVES และทำตามขั้นตอนที่ 1 ถึง ขั้นตอนที่ 3 ใหม่จนกว่าผลการตรวจสอบการลู่เข้าสู่ผลเฉลยเป็นที่น่าพอใจ และปัจจัยควบคุมได้ทั้งหมดมีความสอดคล้องต่อสมการเงื่อนไข โปรแกรมจึงทำการแสดงผลลัพธ์ทั้งหมดจากการออพติไมเซชั่นซึ่งประกอบด้วย

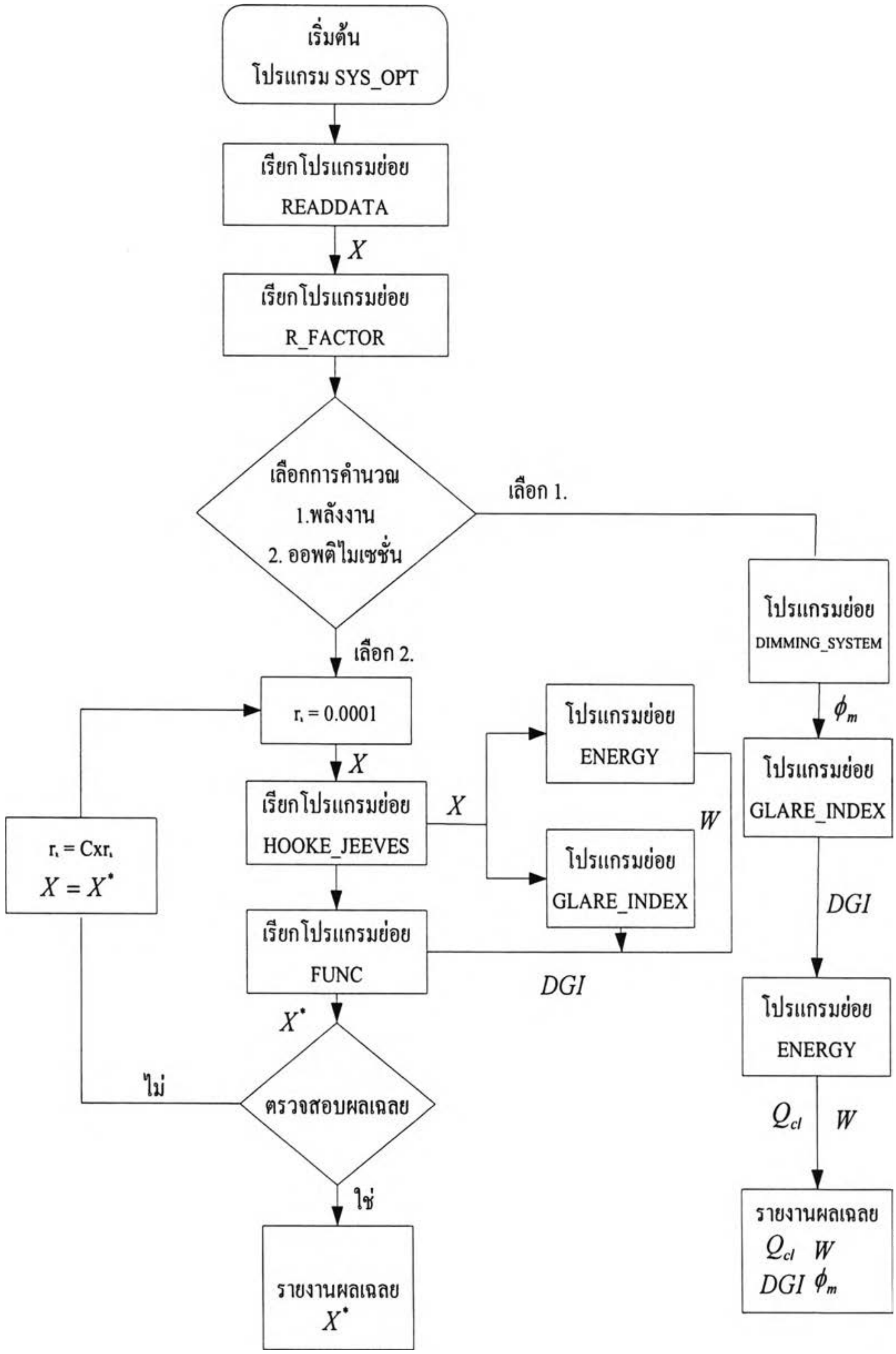
1. ปัจจัยควบคุมได้ทั้งหมด
2. พลังงานจากระบบไฟส่องสว่าง พลังงานจากระบบการทำความเย็น และ ดัชนีความจ้าสูงสุดของปี

แผนภูมิภาพรวมของการปฏิบัติการทั้งหมดของโปรแกรมจะแสดงในรูปที่ ง.1

โมดูล DATATRANSFR

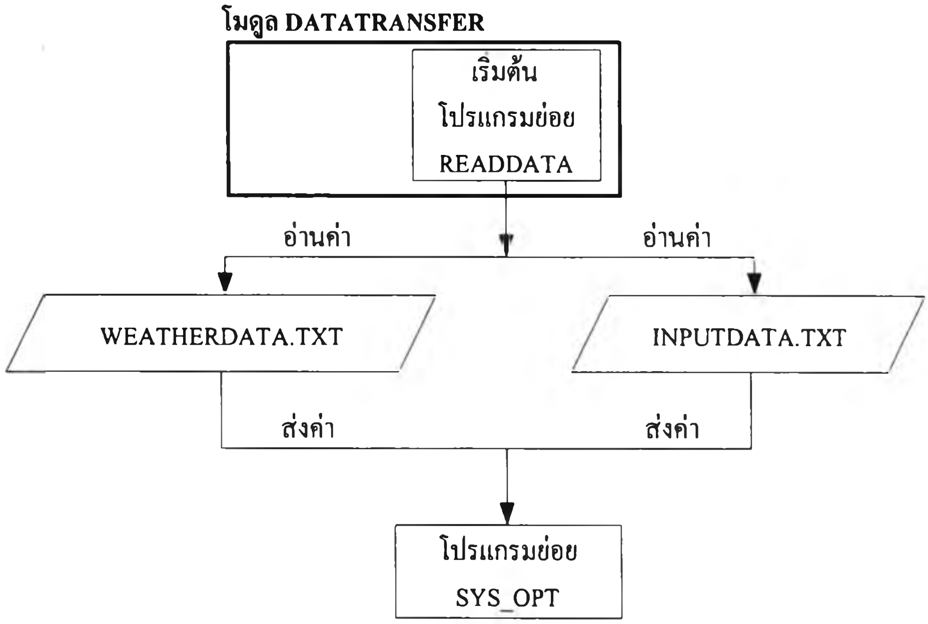
โมดูล DATATRANSFER เป็นโมดูลสำหรับการรับรู้ข้อมูลและส่งข้อมูลทั้งหมดให้กับโปรแกรม SYS_OPT โดยอาศัยโปรแกรมย่อย READDATA สำหรับการอ่านข้อมูลจากไฟล์ข้อมูลจำนวน 2 ไฟล์ คือ

1. *ไฟล์ข้อมูล INPUTDATA.TXT* ข้อมูลภายในไฟล์ข้อมูลนี้เป็นข้อมูลเกี่ยวกับอาคารที่พิจารณา ซึ่งประกอบด้วย ตำแหน่งที่ตั้งของอาคาร มิติของอาคาร ทิศการวางตัวของอาคาร คุณสมบัติเชิงประสิทธิภาพของเครื่องทำความเย็นและระบบแสงสว่าง คุณสมบัติของผนังและกระจก ความหนาแน่นของผู้อาศัยภายในอาคาร อัตราการไหลเชิงปริมาตรของการระบายอากาศ อัตราการความร้อนจากเครื่องมือเครื่องใช้ต่อหน่วยพื้นที่
2. *ไฟล์ข้อมูล WEATHERDATA.TXT* ข้อมูลภายในไฟล์ข้อมูลนี้เป็นข้อมูลรายชั่วโมงของสิ่งแวดล้อมของอาคาร ซึ่งประกอบด้วย อุณหภูมิ รังสีดวงอาทิตย์ ความชื้นจำเพาะ ความเร็วและทิศทางลม



C แทน ค่าคงที่มากกว่า 1 สำหรับการศึกษาวิจัยนี้ใช้ C = 10

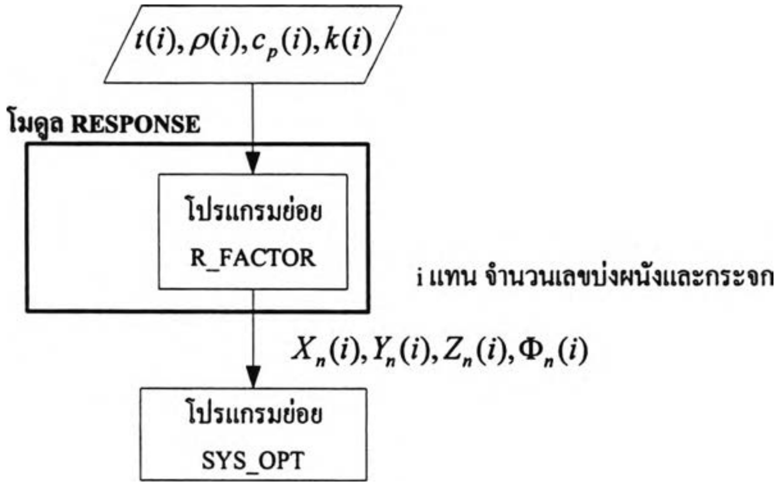
รูปที่ ง.1 แผนภูมิภาพรวมการปฏิบัติการทั้งหมดของโปรแกรม



รูปที่ ง.2 แสดงแผนภูมิการทำงานของโปรแกรมย่อย READDATA

โมดูล RESPONSE

โมดูลนี้มีวัตถุประสงค์เพื่อทำการคำนวณ สัมประสิทธิ์ฟังก์ชันถ่ายโอนการนำความร้อนของผนังภายนอก (X_n) สัมประสิทธิ์ฟังก์ชันถ่ายโอนการนำความร้อนระหว่างผนังภายนอกและภายใน (Y_n) สัมประสิทธิ์ฟังก์ชันถ่ายโอนการนำความร้อนของผนังภายใน (Z_n) และสัมประสิทธิ์การถ่ายโอนฟลักซ์ (Φ_n) ของผนังทั้ง 6 ด้านและกระจกทั้ง 4 ด้านของอาคาร โดยใช้โปรแกรมย่อย R_FACTOR เป็นโปรแกรมหลักในการคำนวณ โดยโปรแกรมจะรับค่า ความหนา (t) ความจุความร้อนจำเพาะ (c_p) สัมประสิทธิ์การนำความร้อน (k) และ ความหนาแน่น (ρ) ของผนังและกระจกทั้งหมดของอาคาร



รูปที่ ง.3 แสดงแผนภูมิการทำงานของโปรแกรมย่อย R_FACTOR

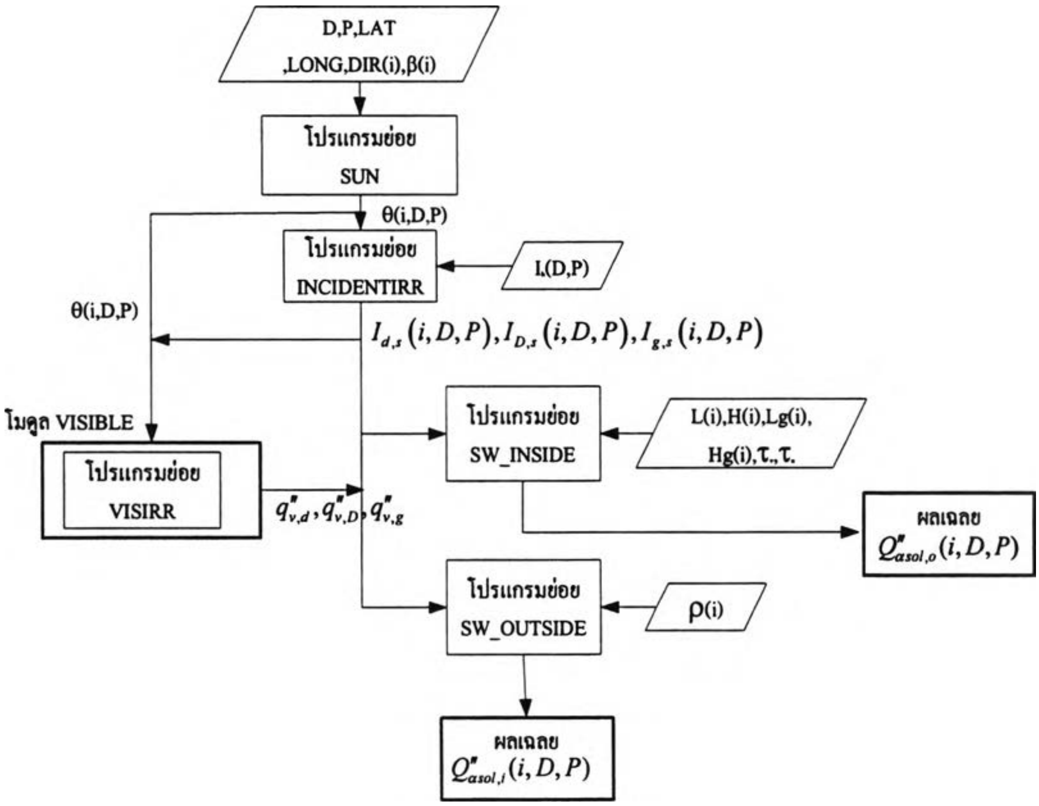
โมดูล SOLAR

โมดูลนี้มีวัตถุประสงค์เพื่อคำนวณอิทธิพลของแสงอาทิตย์ทั้งหมดที่มีต่อความต้องการพลังงานของอาคารซึ่งประกอบด้วย $Q''_{asol,i}$ $Q''_{asol,o}$ $\dot{Q}_{al}$ และ *DGI* โปรแกรมย่อยที่สำคัญมีดังต่อไปนี้

1. *โปรแกรมย่อย SUN* เป็นโปรแกรมสำหรับการคำนวณมุมตกกระทบของผนังด้านต่างๆ ของอาคาร
2. *โปรแกรมย่อย SW_INSIDE* เป็นโปรแกรมย่อยสำหรับการคำนวณฟลักซ์รังสีดวงอาทิตย์ที่ตกกระทบพื้นผิวภายในอาคาร
3. *โปรแกรมย่อย SW_OUTSIDE* เป็นโปรแกรมย่อยสำหรับการคำนวณฟลักซ์รังสีดวงอาทิตย์ที่ตกกระทบพื้นผิวภายนอกอาคาร
4. *โปรแกรมย่อย INCIDENTIRR* เป็นโปรแกรมย่อยสำหรับการคำนวณฟลักซ์รังสีดวงอาทิตย์ตกกระทบผนังภายนอกอาคาร
5. *โปรแกรมย่อย EXTERIOR_IRR_ILL* เป็น โปรแกรมย่อยสำหรับการคำนวณความส่องสว่างจากธรรมชาติตกกระทบพื้นผิวภายนอกของกระจก
6. *โปรแกรมย่อย AVERAGE_DAYLIGHT* เป็นโปรแกรมย่อยสำหรับการคำนวณความส่องสว่างจากธรรมชาติบนระนาบทำงานของอาคาร

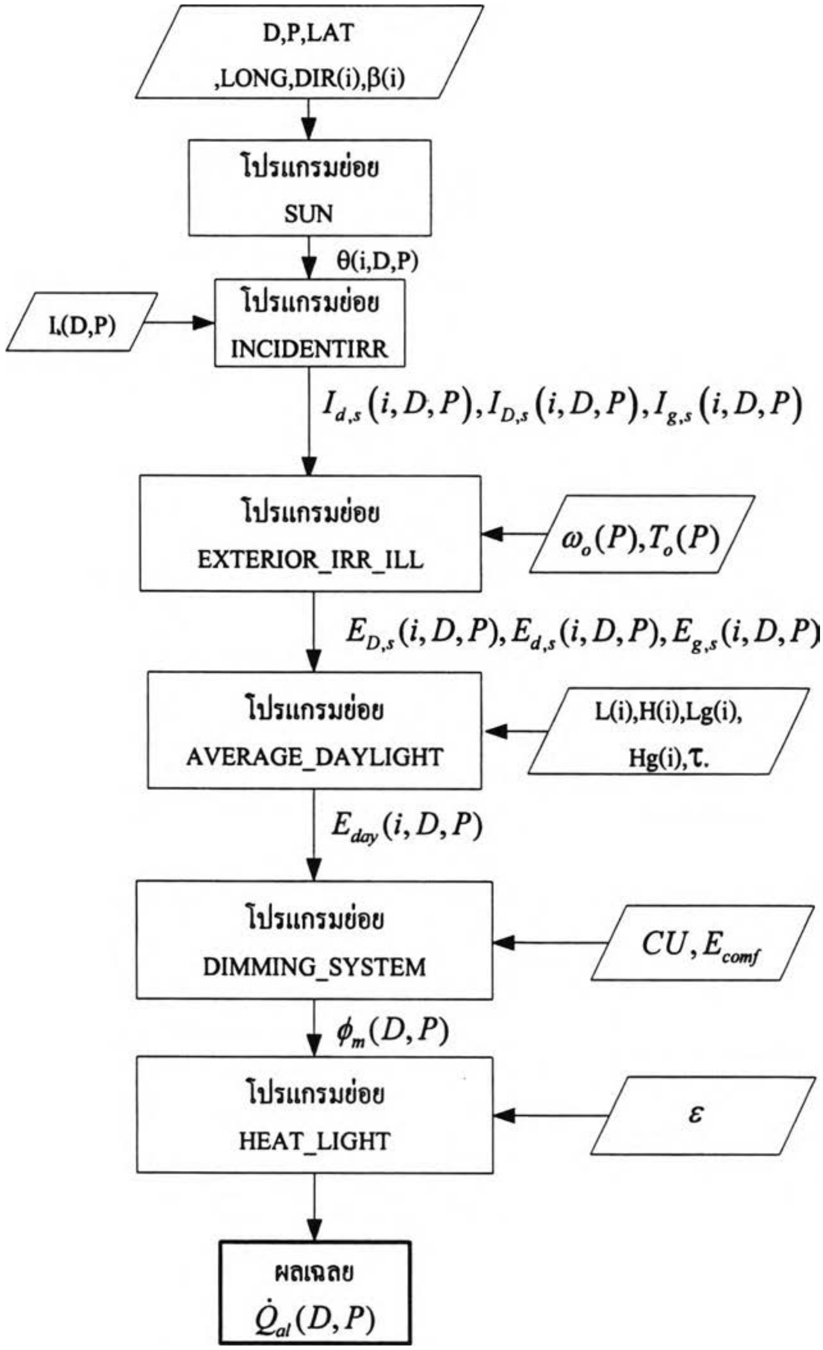
7. *โปรแกรมย่อย DIMMING_SYSTEM* เป็นโปรแกรมย่อยสำหรับการคำนวณปริมาณแสงจากระบบไฟส่องสว่างสำหรับกรณีพิจารณาความส่องสว่างจากธรรมชาติเข้าช่วยในการให้ความสว่างภายในอาคาร
8. *โปรแกรมย่อย HEAT_LIGHT* เป็นโปรแกรมย่อยสำหรับการคำนวณความร้อนจากระบบไฟส่องสว่าง
9. *โปรแกรมย่อย GLARE_INDEX* เป็นโปรแกรมย่อยสำหรับการคำนวณดัชนีความจ้าภายในอาคาร

เพื่อให้เกิดความเข้าใจที่ชัดเจนของการทำงานของโปรแกรมย่อยต่างๆ ในโมดูล SOLAR ดังนั้นแผนภูมิการทำงานของโมดูลนี้ เพื่อให้ได้มาซึ่งผลเฉลยต่างๆ จึงแบ่งย่อยออกเป็น 3 แผนภูมิ ดังแสดงในรูปที่ ง.4 รูปที่ ง.5 และ รูปที่ ง.6 ต่อไปนี้



i แทน จำนวนเลขบ่งผนัง, D แทน จำนวนเลขบ่งวัน, P แทน จำนวนเลขบ่งคาบเวลา

รูปที่ ง.4 แสดงแผนภูมิการทำงานของโปรแกรม
สำหรับการคำนวณ $Q''_{\alpha sol,i}$ และ $Q''_{\alpha sol,o}$



i แทน จำนวนเลขบ่งผนัง, D แทน จำนวนเลขบ่งวัน, P แทน จำนวนเลขบ่งคาบเวลา

รูปที่ ง.5 แสดงแผนภูมิการทำงานของโปรแกรม

สำหรับการคำนวณ $\dot{Q}_{al}$

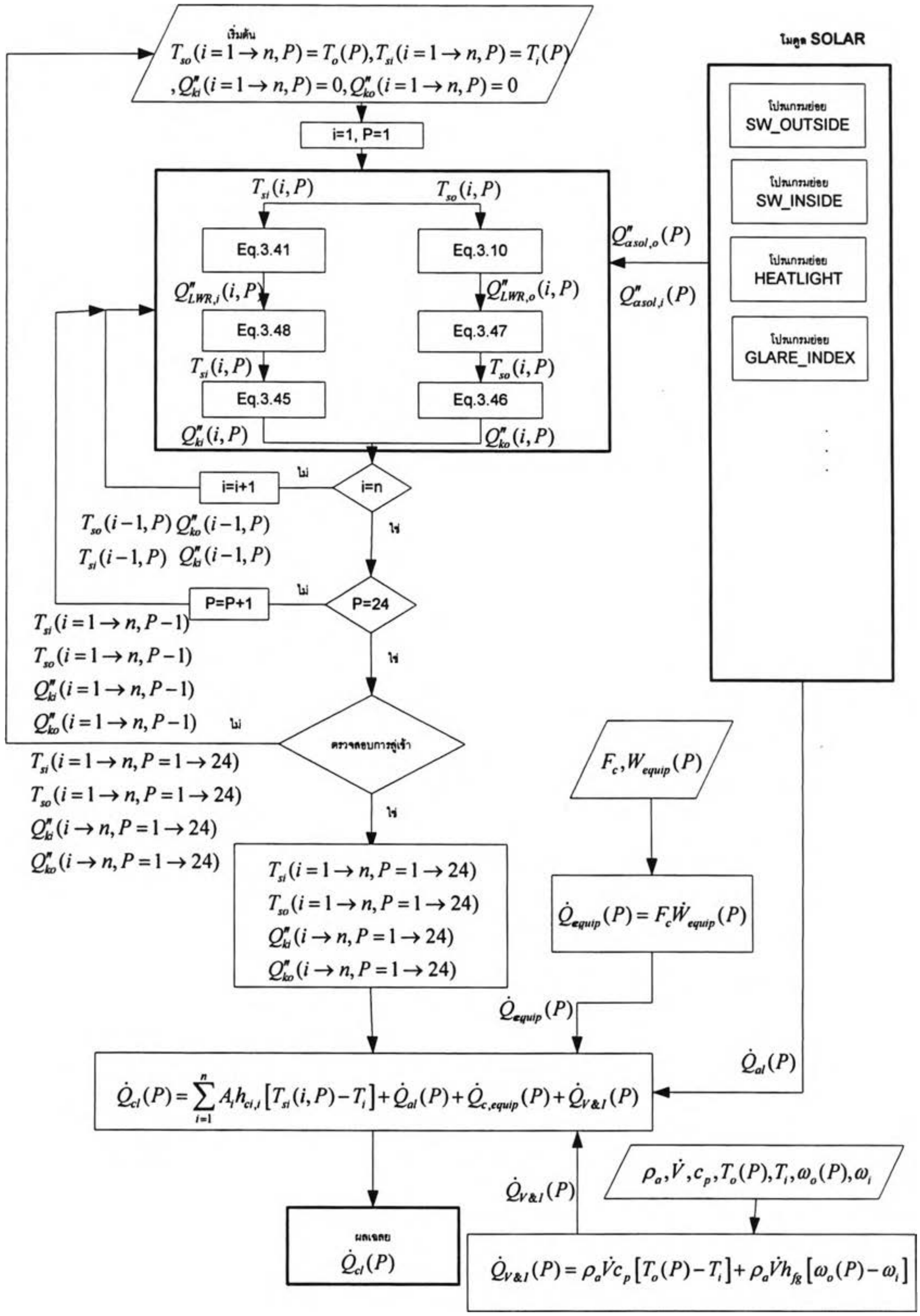
โมดูล ENERGY

เป็นโมดูลที่ใช้ในการคำนวณพลังงานที่อาคารใช้สุทธิรายปี โดยเริ่มต้นจากการเรียกโปรแกรมย่อยทั้งหมดในโมดูล SOLAR จากนั้นคำนวณความร้อนจากผู้อาศัยและเครื่องมือเครื่องใช้ คำนวณภาระความร้อนจากการระบายอากาศ คำนวณหาภาระการทำความเย็นโดยวิธีสมดุลทางความร้อน คำนวณกำลังงานที่ใช้ในการทำความเย็นและการส่องสว่างรายชั่วโมง และพลังงานที่อาคารใช้รายปีสำหรับการทำความเย็น พลังงานการส่องสว่าง และพลังงานสุทธิรายปี ผลลัพธ์ทั้งหมดของการคำนวณจะถูกบันทึกลงในไฟล์ REPORT.ENG ซึ่งประกอบด้วย

1. ภาระการทำความเย็นรายชั่วโมงของอาคาร
2. ปริมาณแสงสว่างรายชั่วโมงของระบบไฟส่องสว่าง
3. ดัชนีความจ้ารายชั่วโมง
4. พลังงานที่ใช้ในการส่องสว่างรายปี
5. พลังงานที่ใช้ในการทำความเย็นรายปี
6. พลังงานสุทธิที่อาคารใช้รายปี

โปรแกรมย่อยในโมดูลนี้จะประกอบด้วย

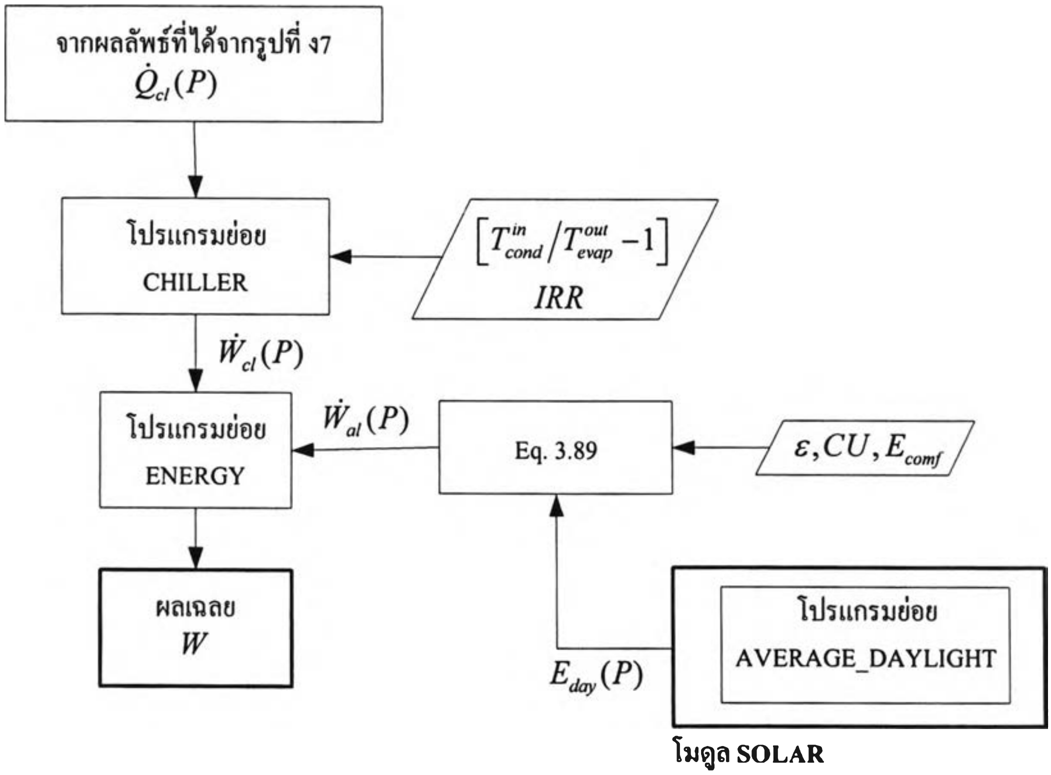
1. *โปรแกรมย่อย ENERGY_CAL* ใช้ในการคำนวณภาระการทำความเย็น พลังงานสุทธิรายปีสำหรับการส่องสว่าง และการทำความเย็น
2. *โปรแกรมย่อย CHILLER* เป็นโปรแกรมย่อยในการคำนวณกำลังงานที่เครื่องทำความเย็นใช้



P แทน เวลา (ในที่นี้เป็นชั่วโมง), i แทน จำนวนเลขบ่งผนัง

n แทน จำนวนผนังทั้งหมด

รูปที่ ง.7 แสดงแผนภูมิการทำงานบางส่วนของโปรแกรมย่อย ENERGY สำหรับการคำนวณ $\dot{Q}_{cl}(P)$ ของวันที่พิจารณา



รูปที่ ง.8 แสดงแผนภูมิการคำนวณพลังงานสุทธิรายปี
จากการทำความเย็นและกำลังงานการส่องสว่างของอาคาร

โปรแกรม SYSTEM_OPT

```
PROGRAM SYSTEM_OPT

USE DATATRANSFER
USE RESPONSE_FACTOR
USE ENERGY
USE SOLAR_FLUX
USE VISIBLE

        REAL :: TINY,PFR,PFC
        INTEGER :: NX
        INTEGER :: ITERP
        REAL,ALLOCATABLE,DIMENSION(:) :: X
        REAL,ALLOCATABLE,DIMENSION(:) :: Xstar
        REAL :: Fstar
        REAL :: Fold
        INTEGER :: CONSTRAINT
        REAL :: CPUTIME
        INTEGER :: REPORT,SELECT,JJ
        REAL :: LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10,VIS_TRAN
        REAL ::VIS_REFLECT,NON_TRAN,NON_ABSORB
        REAL,ALLOCATABLE,DIMENSION(:) :: DEL
        REAL,ALLOCATABLE,DIMENSION(:,:) :: XCP,XCM
        REAL :: FCM,FCP
        INTEGER :: CONST_M, CONST_P,CON
        REAL :: MAXDGly

        CALL OPT_VAR(NX,LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10,VIS_TRAN,VIS_REFLECT &
                ,NON_TRAN,NON_ABSORB,X)
        PFR = 0.1
        PFC = 10
        REPORT = 0
        ITERP = 0
        WRITE(*,*) '******************************'
        WRITE(*,197) NFLOOR
        197 FORMAT (' *',I3,'   STOREY BUILDING      *')
        WRITE(*,*) '******************************'
        WRITE(*,*) ' ENERGY CALCULATION AND OPTIMIZATION PROGRAM '
        WRITE(*,*) 'SELECT FOR CALCULATION PRESS :: '
        WRITE(*,*) ' 1 FOR ENERGY CALCULATION '
        WRITE(*,*) ' 2 FOR OPTIMIZATION '
        READ(*,*) SELECT
        IF (SELECT==1) THEN
                GOTO 225
        ELSE IF (SELECT==2) THEN
                GOTO 15
        ELSE
        WRITE(*,*) 'PRESS 1 OR 2 '
        GOTO 230
        END IF
        15 CONTINUE
       OPEN(UNIT=111,FILE='RESULT.OPT',STATUS='REPLACE',ACTION='WRITE')
```

```
WRITE(111,*)
WRITE(111,*) 'OPTIMIZATION REPORT '
WRITE(111,*) '=================='
WRITE(111,*) 'FILE INPUT AND OUTPUT '
WRITE(111,*) 'INPUT FILES ARE INPUTDATA.TXT,WEATHERDATA.TXT'
WRITE(111,*) 'OUTPUT FILES ARE RESULT.OPT, AND RESULT.ENG '
WRITE(111,*) 'PENALTY PARAMETER'
WRITE(111,*) 'THE EXTERIOR PENALTY PARAMETER :', PFR
WRITE(111,*) 'THE INCREASING FACTOR FOR NEXT ITERATION : ',PFC
WRITE(111,*) 'NUMBER OF VARIABLE :: ',NX
WRITE(111,*) 'CALCULATED VARIABLE X(1), X(2), X(3), ...,X(N) :: '
WRITE(111,*) TEXTX(:)
Fold = 0
    DO
                ITERP = ITERP + 1
                WRITE(111,*) '================================'
                WRITE(111,*) '| PENALTY ITERATION ' ,ITERP,'|'
                WRITE(111,*) '================================'

                CALL HOOKE_JEEVES(NX,PFR,REPORT,X(:),Xstar,Fstar,CONSTRAINT)
                WRITE(111,*) 'HOOK METHOD RESULT '
                WRITE(111,*) 'X OPTIMUM VALUE X(1),X(2),X(3),...,X(N) :: '
                WRITE(111,*) Xstar(:)
                WRITE(111,*)  ' PENALTY FUNCTION OPTIMUM VALUE Fstar : ',Fstar
                WRITE(111,*) ' NUMBER OF INVALID CONSTRAINT : ', CONSTRAINT

                IF (ITERP == 1) THEN
                        GOTO 221
                END IF
                CON = 0
                XCP(:,:) = 0
                XCM(:,:) = 0
                DO I=1, NX
                DEL(:) = 0
                FCP = 0
                FCM = 0
                CONST_P = 0
                CONST_M = 0
    DO J=1, NX
                IF (I==J) THEN
                        IF (I <=8) THEN
                                DEL(I) = 0.1
                        ELSE IF (I > 8) THEN
                                DEL(I) = 0.01
                        END IF
                END IF
    END DO
                XCP(I,:) = Xstar(:)+DEL(:)
                XCM(I,:) = Xstar(:)-DEL(:)
                CALL FUNC(NX,PFR,REPORT,XCP(I,:),FCP,CONST_P,MAXDGIy)
                IF (MINVAL(XCM(I,:))<= 0) THEN
                        XCM(I,:) = 0.001
                ELSE
                        XCM(I,:) = XCM(I,:)
                END IF
                CALL FUNC(NX,PFR,REPORT,XCM(I,:),FCM,CONST_M,MAXDGIy)
```

```
                IF ((FCP < Fstar) .OR. (FCM < Fstar) .OR. (CONST_P > 0) .OR. (CONST_M > 0)) THEN
                        CON=CON + 1
                ELSE
                        CON = CON
                END IF
    END DO
                IF (CON > 0) THEN
                    PFR = PFC*PFR
                    X(:) = Xstar(:)
                    Fold = Fstar
                ELSE
                    GOTO 220
                END IF

                221 CONTINUE
                IF (ITERP == 1) THEN
                        Fold = Fstar
                        X(:) = Xstar(:)
                        PFR = PFC*PFR
                END IF

        END DO
        220 CONTINUE
        WRITE(111,*) 'FINAL RESULT FOR PENALTY OPTIMUIZATION '
        WRITE(111,*) '-------------------------------------- '
        WRITE(111,*) 'VALUE OF THE OPTIMUM VARIABLES X(1),X(2),X(3),...,X(N) :: '
        WRITE(111,*) X(:)
        WRITE(111,*) 'VALUE OF PENALTY FUNCTION : ',Fstar
        WRITE(111,*) 'VALUE OF INVALID CONSTRAINT : ',CONSTRAINT
        WRITE(111,*) 'THE FINAL VALUE OF EXTERNAL PENALTY PARAMETER : ', PFR
        CALL CPU_TIME(CPUTIME)
        WRITE(*,*) 'TOTAL CALCULATION TIME IN SECONDS : ',CPUTIME
        WRITE(111,*) 'TOTAL CALCULATION TIME IN SECONDS : ',CPUTIME
        WRITE(111,*)
        WRITE(111,*) 'END OF OPTIMIZATION REPORT '
        WRITE(111,*) '========================== '
        225 CONTINUE
        REPORT = 1
        CALL ENERGY_CAL(NX,PFR,REPORT,X(:),F)
        CLOSE(111)
        230 CONTINUE
END PROGRAM

SUBROUTINE HOOKE_JEEVES(N,PFR,REPORT,X0,XSTAR,FSTAR,CONSTRAINT)
USE DATATRANSFER

!       PURPOSE
!               HOOKE AND JEEVES METHOD IS ONE OF PATTERN SEARCH METHOD.
!       A SEQUENTIAL THENIQUE EACH STEP CONSISTS OF TWO KIND OF MOVE :
!               1. EXPLORATORY MOVE IS TO EXPLORE THE LOCAL BEHAVIOR OF THE OBJECTIVE
!               FUNCTION.
!               2. PATTERN MOVE IS TO TAKE ADVANTAGE OF THE PATTERN DIRECTION.

        INTEGER,INTENT(IN) :: N         ! NUMBER OF THE PARAMETERS
        REAL,INTENT(IN) :: PFR          ! PENALTY PARAMETER
        REAL,DIMENSION(N),INTENT(IN) :: X0  ! INITIAL VALUE OF THE BASE POINT
```

```
          REAL,DIMENSION(N),INTENT(OUT) :: XSTAR
          REAL,INTENT(OUT) :: FSTAR
          INTEGER,INTENT(IN) :: REPORT
          INTEGER,INTENT(OUT) :: CONSTRAINT
          REAL :: MAXDGIy
          INTEGER,PARAMETER :: DP = 8
          REAL,DIMENSION(N) :: X      ! POINT OF THE OPTIMIZATION CONTAINED VALUE
                                  ! OF THE PARAMETERS
          REAL,DIMENSION(N) :: DX,DXi         ! STEP LENGTH OF THE MOVING PARAMETER(DX)
                      !, AND INITIAL STEP LENGTH (DXi)
          REAL,DIMENSION(N) :: SMALL
          REAL,DIMENSION(N) :: XSTART
          REAL,PARAMETER :: REDUC = 0.5       ! REDUCTION FACTOR IS RECOMMANDED
          REAL :: F,FP,FM,FSTART
          REAL,DIMENSION(N,0:N) :: Y
          REAL,DIMENSION(N,N) :: U
          INTEGER :: K,EQ,EQ1
          INTEGER :: AJ,TESTS,II
!         GENERATE UNIT VECTOR
                  DO I=1, N
                          DO J=1, N
                                  IF (I==J) THEN
                                          U(I,J) = 1
                                  ELSE
                                          U(I,J) = 0
                                  END IF
                          END DO
                  END DO
!         INITIAL SETTING
                  K = 1
                  X(:) = X0(:)
                  DXi(1:8) = 1
                  SMALL(1:8) = 0.1
                  DXi(9:12) = 0.2
                  SMALL(9:12) = 0.01
                  DX(:) = DXi(:)
                  CONSTRAINT = 0
          WRITE(111,*) 'HOOKE AND JEEVES METHOD RESULT '
          WRITE(111,*) '------------------------------ '
          WRITE(111,*)
          WRITE(111,*) 'THE INITIAL VALUE OF PATTERN MOVE FOR EACH VARIABLE DX(1),DX(2),...,DX(N) :: '
          WRITE(111,198) DXi(:)
          WRITE(111,*) 'THE REDUCTION FACTOR : ', REDUC
          WRITE(111,*) 'THE INITIAL VALUE OF BASE POINT X0(1),X0(2),X0(3),...,X0(N) :: '
          WRITE(111,198) X0(:)
          WRITE(111,*)
          198 FORMAT (3E11.4)
          CALL FUNC(N,PFR,REPORT,X,F,CONSTRAINT,MAXDGIy)
          XSTART(:) = X(:)
          FSTART = F
                  DO !(DO UNIT 11)
                          CALL FUNC(N,PFR,REPORT,X,F,CONSTRAINT,MAXDGIy)
                          I = 1
                          Y(:,0) = X(:)
                          DO          !(DO UNIT 10)
                          WRITE(*,*) 'ITERATION : ',K
```

```
WRITE(111,*) 'ITERATION : ',K
AJ = 0
DO
        CALL FUNC(N,PFR,REPORT,Y(:,I-1)+DX(:)*U(I,:),FP,CONSTRAINT,MAXDGIy)
          IF (FP < F) THEN
                Y(:,I) = Y(:,I-1)+DX(:)*U(I,:)
                  AJ = 1
                  IF (I == N) THEN
                       FY = FP
                  END IF
          ELSE
                  IF (Y(I,I-1)-DX(I)*U(I,I) > 0) THEN

                  CALL FUNC(N,PFR,REPORT,Y(:,I-1)-DX(:)*U(I,:) &
                          ,FM,CONSTRAINT,MAXDGIy)
                   IF (FM < F) THEN
                        Y(:,I) = Y(:,I-1)-DX(:)*U(I,:)
                              AJ = 2
                        IF (I == N) THEN
                              FY = FM
                       END IF
                    ELSE
                         Y(:,I) = Y(:,I-1)
                         AJ = 3
                         IF (I == N) THEN
                              FY = F
                         END IF
                   END IF
                  ELSE
                        Y(:,I) = Y(:,I-1)
                              AJ = -3
                   IF (I==N) THEN
                              FY = F
                   END IF
                   END IF
           END IF
           IF (I == N) THEN
           WRITE(111,*) 'Y(:,I) :: '
                              WRITE(111,*) Y(:,I)
                              IF (AJ == 1) THEN
                                        WRITE(111,*) ' FP :: '
                                        WRITE(111,*) FP
                              ELSE IF (AJ == 2) THEN
                                        WRITE(111,*) ' FM :: '
                                        WRITE(111,*) FM
                              ELSE IF (AJ == 3) THEN
                                        WRITE(111,*) ' F :: '
                                        WRITE(111,*) F
                              END IF
                              EQ = 0
                              DO J =1, N
                                        IF (Y(J,N) /= X(J)) THEN
                                                  EQ = EQ + 1
                                        ELSE
                                                  EQ = EQ
                                        END IF
```

```
                                END DO
                                IF ((EQ > 0) .AND. (K==1)) THEN
                                        GOTO 10
                                ELSE IF ((EQ > 0) .AND. (K>1)) THEN
                                        IF (FY < F)  THEN    ! FY<F
                                                WRITE(111,*) ' FY<F '
                                                X(:) = Y(:,N)
                                                I = 1
                                                GOTO 10
                                        ELSE IF (FY >= F) THEN
                                                WRITE(111,*) 'FY >= F'
                                                DX(:) = REDUC*DX(:)
                                                K = K + 1
                                                X(:) = Y(:,0)
                                             CALL CHECK_EQ(N,DX,SMALL,EQ1)
                                                IF (EQ1 == 0) THEN
                                                        I = 1
                                                        GOTO 10
                                                ELSE
                                                        GOTO 11
                                                END IF
                                        END IF
                                ELSE IF (EQ == 0 ) THEN
                                        DX(:) = REDUC*DX(:)
                                        X(:) = Y(:,0)
                                        I = 1
                                        CALL CHECK_EQ(N,DX,SMALL,EQ1)
                                        IF (EQ1 == 0) THEN
                                                I = 1
                                                GOTO 10
                                        ELSE
                                                I = 1
                                                GOTO 9
                                        END IF
                                END IF
                        ELSE    ! IN CASE OF I < N
                                I = I + 1
                        END IF
9 CONTINUE
                END DO

10 CONTINUE
                K = K + 1
                CALL CHECK_EQ(N,DX,SMALL,EQ1)
                IF (EQ1 > 0) THEN
                        Y(:,0) = Y(:,N) + Y(:,N)-X(:)
                        DO JJ=1, N
                                IF (Y(JJ,0) < 0) THEN
                                        Y(JJ,0) = 0
                                END IF
                        END DO
                        X(:) = Y(:,0)
                        I = 1
                     CALL FUNC(N,PFR,REPORT,X(:),F,CONSTRAINT,MAXDGIy)
                ELSE IF (FSTART > FY) THEN
                        Xstar(:) = X(:)
                        Fstar = FY
```

```
                                        GOTO 12 !(EXIT ALL LOOP)
                                ELSE IF (FSTART <= FY) THEN
                                        Xstar(:) = XSTART(:)
                                        Fstar = FSTART
                                        GOTO 12 !(EXIT ALL LOOP)
                                END IF
                                WRITE(111,*) 'ITERATION RESULT X(:) :: '
                                WRITE(111,*) X(:)
                                WRITE(111,*) 'VALUE OF PENALTY FUNCTION , F :',F
                                WRITE(111,*) 'NUMBER OF INVALID CONSTRAINT : ', CONSTRAINT
                                WRITE(111,*) 'MAX. DGI : ', MAXDGIy

                        END DO
11 CONTINUE
                END DO
12 CONTINUE

                CALL FUNC(N,PFR,REPORT,Xstar(:),Fstar,CONSTRAINT,MAXDGIy)

END SUBROUTINE HOOKE_JEEVES

!-----------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE FUNC(NX,PFR,REPORT,X,F,CONSTRAINT,MAXDGIy)

USE DATATRANSFER
USE SOLAR_FLUX
USE PEOPLE
USE OUTSIDE_SHORTWAVE
USE AIR_PROPERTIES
USE RESPONSE_FACTOR
USE ENERGY

        INTEGER,INTENT(IN) :: NX
        REAL,INTENT(IN) :: PFR
        REAL,DIMENSION(NX),INTENT(IN) :: X
        REAL,INTENT(OUT) :: F
        INTEGER :: PR
        INTEGER,INTENT(IN) :: REPORT
        INTEGER,INTENT(OUT) :: CONSTRAINT
!       DECLARE PARAMETER FOR GLARE CALCULATION
        REAL,DIMENSION(NWALL,NDAY,PERIOD) :: DGI
        REAL,DIMENSION(NDAY,PERIOD) :: Eday
!       DECLARE INTERNAL VARIABLE
        INTEGER :: DATE
        REAL :: SUM,SUM1
        INTEGER :: IFLAG,IFSUM
        INTEGER,PARAMETER :: MAX_ITER=100
        REAL :: G
        REAL,DIMENSION(NX) :: LX,UX,UPPER,LOWER
        REAL,DIMENSION(NWALL,2) :: REFLECT
        REAL,DIMENSION(NDAY,PERIOD) :: WALLconv
        REAL,DIMENSION(NWALL) :: SUMDIF,SUMADIF
        REAL :: LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10
        REAL :: VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB
        REAL,INTENT(OUT) :: MAXDGIy
```

```
        REAL,DIMENSION(7:10) :: LOWABS,UPABS,LOWREF,UPREF
        REAL :: UA,LA,UR,LR
        F = 0

        CALL ENERGY_CAL(NX,PFR,REPORT,X,F)

        CALL CONVERT_VAR(NX,X,LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10&
       ,VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB)

!       GLARE CALCULATE SECTION
        Eday(:,:) = 0
        DGI(:,:,:) = 0
        MAXDGIy = 0

        CALL GLARE_INDEX(Eday,DGI)
        MAXDGIy = MAXVAL(DGI(:,:,:))

!       SET INNITIAL NUMBER OF CONSTRAINT
        CONSTRAINT = 0
        LIGHT_INVALID = 0

        G = 0
        G = MAXDGIy/DGImax - 1
        IF (G > 0) THEN
                F = F + PFR*ABS(G*G)
                CONSTRAINT = CONSTRAINT + 1
        ELSE
                F = F
                CONSTRAINT = CONSTRAINT
        END IF

        DO I=7, NWALL
                ABSORBv(I,IN) = 1 - (REFLECTv(I,IN) + VTRAN(I))
                ABSORBv(I,OUT)= 1 - (REFLECTv(I,OUT) + VTRAN(I))
        END DO

        DO I=7, NWALL
                REFLECT(I,IN)      = 1 - (ABSORB(I,IN) + TRAN(I))
                REFLECT(I,OUT)     = 1 - (ABSORB(I,OUT) + TRAN(I))
        END DO

        ! LIMITTING VALUE
                UA = 0.82
                LA = 0.23

                DO I=7, NWALL

                        LOWABS(I) = (ABSORBv(I,IN)/LA) - 1
                        IF (LOWABS(I) < 0) THEN
                                CONSTRAINT = CONSTRAINT + 1
                                F = F + PFR*ABS(LOWABS(I)*LOWABS(I))
                        ELSE
                                CONSTRAINT = CONSTRAINT
                        END IF
                        LOWABS(I) = (ABSORBv(I,OUT)/LA) - 1
                        IF (LOWABS(I) < 0) THEN
```

```
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(LOWABS(I)*LOWABS(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF
          UPABS(I) = (ABSORBv(I,IN)/UA) - 1
          IF (UPABS(I) > 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(UPABS(I)*UPABS(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF
          UPABS(I) = (ABSORBv(I,OUT)/UA) - 1
          IF (UPABS(I) > 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(UPABS(I)*UPABS(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF
END DO

UR = 0.885
LR = 0.042
DO I=7, NWALL

          LOWREF(I) = (REFLECT(I,IN)/LR) - 1
          IF (LOWREF(I) < 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(LOWREF(I)*LOWREF(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF
          LOWREF(I) = (REFLECT(I,OUT)/LR) - 1
          IF (LOWREF(I) < 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(LOWREF(I)*LOWREF(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF

          UPREF(I) = (REFLECT(I,IN)/UR) - 1
          IF (UPREF(I) > 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(UPREF(I)*UPREF(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF

          UPREF(I) = (REFLECT(I,OUT)/UR) - 1
          IF (UPREF(I) > 0) THEN
                    CONSTRAINT = CONSTRAINT + 1
                    F = F + PFR*ABS(UPREF(I)*UPREF(I))
          ELSE
                    CONSTRAINT = CONSTRAINT
          END IF
END DO
```

```
        DO I=1, NWALL
                DO J=1, NWALL
           IF ((VTRAN(I) > 0) .AND. (VTRAN(J) == 0 ) .AND. (DIR(I)==DIR(J))) THEN
                                UX(I-6) = 0.9*LENGTH(J)
                                LX(I-6) = 0.1*LENGTH(J)
                                UX(I-2) = 0.9*WIDTH(J)
                                LX(I-2) = 0.1*WIDTH(J)
                        END IF
                END DO
        END DO
        UX(9) = 0.5
        UX(10) = 0.6
        UX(11) = 1.0
        UX(12) = 0.78
        LX(9) = 0.001
        LX(10) = 0.033
        LX(11) = 0.001
        LX(12) = 0.001
        LOWER(:) = 0
        DO I=1, NX
                LOWER(I) = X(I)/LX(I) - 1
                IF (LOWER(I) < 0) THEN
                        CONSTRAINT = CONSTRAINT + 1
                        F = F + PFR*ABS(LOWER(I)*LOWER(I))
                ELSE
                        F = F
                END IF
        END DO

        UPPER(:) = 0
        DO I=1, NX
                UPPER(I) = X(I)/UX(I) - 1
                IF (UPPER(I) > 0) THEN
                        CONSTRAINT = CONSTRAINT + 1
                        F = F + PFR*ABS(UPPER(I)*UPPER(I))
                ELSE
                        F = F
                END IF
        END DO


END SUBROUTINE FUNC
!-----------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE OPT_VAR(NX,LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10 &
        ,VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB,X)
        INTEGER,INTENT(IN) :: NX
        REAL,INTENT(IN) :: LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10
        REAL,INTENT(IN) :: VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB
        REAL,DIMENSION(NX),INTENT(OUT) :: X
                X(1) = LEN7
                X(2) = LEN8
                X(3) = LEN9
                X(4) = LEN10
                X(5) = WID7
```

```
                    X(6) = WID8
                    X(7) = WID9
                    X(8) = WID10
                    X(9) = VIS_TRAN
                    X(10) = VIS_REFLECT
                    X(11) = NON_TRAN
                    X(12) = NON_ABSORB
END SUBROUTINE OPT_VAR

!-----------------------------------------------------------------------------------------------------------------------

 SUBROUTINE CONVERT_VAR(NX,X,LEN7,LEN8,LEN9,LEN10,WID7&
,WID8,WID9,WID10,VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB)

 INTEGER,INTENT(IN) :: NX
         REAL,DIMENSION(NX),INTENT(IN) :: X
         REAL,INTENT(OUT) :: LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10
         REAL,INTENT(OUT) :: VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB

                    LEN7 = X(1)
                    LEN8 = X(2)
                    LEN9 = X(3)
                    LEN10 = X(4)
                    WID7 = X(5)
                    WID8 = X(6)
                    WID9 = X(7)
                    WID10 = X(8)
                    VIS_TRAN = X(9)
                    VIS_REFLECT = X(10)
                    NON_TRAN = X(11)
                    NON_ABSORB = X(12)

 END SUBROUTINE CONVERT_VAR

!-----------------------------------------------------------------------------------------------------------------------

SUBROUTINE CHECK_EQ(N,DX,SMALL,EQ)

INTEGER :: N
REAL,DIMENSION(N),INTENT(IN) :: DX,SMALL
INTEGER,INTENT(OUT) :: EQ
!        EQ = 0 MEAN ALL OF METRIX DX <= SMALL
         EQ= 0
         DO I=1, N
                  IF (DX(I) >= SMALL(I)) THEN
                           EQ = EQ + 1
                  ELSE
                           EQ = EQ
                  END IF
         END DO
END SUBROUTINE CHECK_EQ
```

โมดูล DATATRANSFER

```
MODULE DATATRANSFER

!         BUILDING DATA
          REAL :: LAT,LONG,LONGstd,FLOORHIGH
          INTEGER :: NFLOOR
          INTEGER,PARAMETER :: NDAY = 12
          INTEGER,DIMENSION(NDAY) :: DAY     = (/21,52,80,111,141,172,202,233,264,294,325,355/)
          REAL :: VCOMFORT,CU,EFFICACY,Hwp,DGImax,EQUIP
          REAL :: Tz,RHz,ACHinf,Vvent
          INTEGER :: COOLSYS
          REAL :: CL,Tce,IRR
          INTEGER :: ART_INDEX
          INTEGER :: DLIGHT
          REAL :: PERSON_AREA,SENSIBLEpeo,LATENTpeo
          REAL :: Gref,TERRAIN,Zo
          INTEGER :: NWALL
          INTEGER,ALLOCATABLE,DIMENSION(:) :: NL
          REAL,ALLOCATABLE,DIMENSION(:,:) :: THICK,DENSITY,CONDUCTIVITY,SPEC_HEAT
          INTEGER,PARAMETER :: MAXLAYER = 6
          INTEGER,PARAMETER :: IN=1
          INTEGER,PARAMETER :: OUT=2
          INTEGER :: TEMP
          INTEGER :: STATUS
          REAL,ALLOCATABLE,DIMENSION(:,:) :: ABSORB,REFLECTv,ABSORBv,ROUGHTNESS,EMISSION
          REAL,ALLOCATABLE,DIMENSION(:) :: TRAN,VTRAN,DIR,LENGTH,WIDTH,WANGLE
          REAL :: OPENOFFICE,CLOSEOFFICE
          REAL :: DIV_OPEN,DIV_CLOSE
          REAL :: FTOC  !FLOOR TO CEILING HIGH
          REAL,DIMENSION(24) :: PERSON
          INTEGER,PARAMETER :: PERIOD=24
          CHARACTER(LEN=20),ALLOCATABLE,DIMENSION(:) :: TEXTX
          INTEGER :: NVAR
!         WEATHER DATA
          REAL :: Psur
```

```
          REAL,DIMENSION(NDAY,24) :: Tsur
          REAL,DIMENSION(NDAY,24) :: Wsur
          REAL,DIMENSION(NDAY,24) :: TSOLAR
          REAL,DIMENSION(NDAY,24) :: Vwind,DIRwind

CONTAINS
SUBROUTINE READDATA
          CHARACTER(LEN=20) :: TEXT,COOLSYS
          INTEGER :: NLINE
          REAL :: THICK1,THICK2
!         OPEN DATA FILE INPUTDATA.TXT
                    OPEN (UNIT= 1, FILE ='INPUTDATA.TXT',ACTION='READ')
!         READ DATA FROM INPUTDATA.TXT
!         BUILDING CHARACTHERIC DATA
                    CALL READLINE(1,3)
                    READ(1,*) LAT,LONG,LONGstd,FLOORHIGH
                    CALL READLINE(1,2)
                    READ(1,*) VCOMFORT,CU,EFFICACY,Hwp,DGImax,EQUIP
                    CALL READLINE(1,2)
                    READ(1,*) Tz,RHz,ACHinf,Vvent
                    CALL READLINE(1,3)
                    READ(1,*) ART_INDEX
                    CALL READLINE(1,2)
                    READ(1,*) CL,COOLSYS,Tce,IRR
                    CALL READLINE(1,2)
                    READ(1,*) DLIGHT
                    CALL READLINE(1,2)
                    READ(1,*) PERSON_AREA,SENSIBLEpeo,LATENTpeo
                    CALL READLINE(1,2)
                    READ(1,*) Gref,TERRAIN,Zo
!         WALL/LAYER TYPE AND PROPERTIES
                    CALL READLINE(1,4)
                    READ(1,*) NWALL
                    ALLOCATE(NL(NWALL),THICK(NWALL,MAXLAYER),DENSITY(NWALL,MAXLAYER), &
                    CONDUCTIVITY(NWALL,MAXLAYER))
                    ALLOCATE(SPEC_HEAT(NWALL,MAXLAYER))
                    CALL READLINE(1,2)
!                   READ LAYER PROPERTIES FOR EACH WALL
                    DO I=1, NWALL
                    READ(1,*) TEXT,TEXT,NL(I)
                              DO J=1, NL(I)
                                   READ(1,*) TEXT,THICK(I,J),DENSITY(I,J),CONDUCTIVITY(I,J),SPEC_HEAT(I,J)
                              END DO
                    CALL READLINE(1,1)
                    END DO
                    CALL READLINE(1,1)
                    ALLOCATE(ABSORB(NWALL,2),ABSORBv(NWALL,2) &
                    ,REFLECTv(NWALL,2) ,ROUGHTNESS(NWALL,2),EMISSION(NWALL,2))
          DO I=1, NWALL
             CALL READLINE(1,1)
              READ(1,*) TEXT,ABSORB(I,IN),REFLECTv(I,IN),ROUGHTNESS(I,IN),EMISSION(I,IN)
             READ(1,*) TEXT,ABSORB(I,OUT),REFLECTv(I,OUT),ROUGHTNESS(I,OUT) & ,EMISSION(I,OUT)
          END DO
          CALL READLINE(1,3)
          ALLOCATE(TRAN(NWALL),VTRAN(NWALL),DIR(NWALL),&
          LENGTH(NWALL),WIDTH(NWALL),WANGLE(NWALL))
```

```
        DO I= 1, NWALL
        READ(1,*) TEXT,TRAN(I),VTRAN(I),DIR(I),LENGTH(I),WIDTH(I),WANGLE(I)
        ABSORBv(I,OUT) = 1 - VTRAN(I) - REFLECTv(I,OUT)
        ABSORBv(I,IN) = 1 - VTRAN(I) - REFLECTv(I,IN)
        END DO
                CALL READLINE(1,3)
                READ(1,*) OPENOFFICE,CLOSEOFFICE,DIV_OPEN,DIV_CLOSE
                THICK1 = 0
                THICK2 = 0
                DO I=1, NL(1)
                        THICK1 = THICK1 + THICK(1,I)
                END DO
                DO I=1, NL(2)
                        THICK2 = THICK2 + THICK(2,I)
                END DO
                CALL TOTALFLOOR(WIDTH(3),FLOORHIGH,THICK1,THICK2,NFLOOR,FTOC)
                CALL NUM_PEO(NFLOOR,PERSON_AREA,WIDTH(1), & LENGTH(1) &
                ,OPENOFFICE,CLOSEOFFICE,DIV_OPEN ,DIV_CLOSE,PERSON)
                        READ(1,*)
                        READ(1,*) NVAR
                        READ(1,*)
                        ALLOCATE(TEXTX(NVAR))

                        DO I= 1, NVAR
                                READ(1,*) TEXTX(I)
                        END DO
        OPEN (UNIT=2,FILE ='WEATHERDATA.TXT',ACTION = 'READ')
        CALL READLINE(2,3)
        READ(2,*) TEXT,TEXT,Psur
        CALL READLINE(2,3)
!       READ HOURLY DRY BULB TEMPERATURE (CELCIUS)
        DO I=1, NDAY
            READ(2,*)  TEXT &  ,Tsur(I,1),Tsur(I,2),Tsur(I,3),Tsur(I,4),Tsur(I,5),Tsur(I,6),Tsur(I,7) ,Tsur(I,8) &
                    ,Tsur(I,9),Tsur(I,10),Tsur(I,11),Tsur(I,12),Tsur(I,13),Tsur(I,14),Tsur(I,15),Tsur(I,16) &
                    ,Tsur(I,17),Tsur(I,18),Tsur(I,19),Tsur(I,20),Tsur(I,21),Tsur(I,22),Tsur(I,23),Tsur(I,24)
        END DO
        CALL READLINE(2,3)
!       READ HOURLY RELATIVE HUMIDITY (%)
        DO I=1, NDAY
              READ(2,*) TEXT &,Wsur(I,1),Wsur(I,2),Wsur(I,3),Wsur(I,4),Wsur(I,5),Wsur(I,6),Wsur(I,7),Wsur(I,8) &
                      ,Wsur(I,9),Wsur(I,10),Wsur(I,11),Wsur(I,12),Wsur(I,13),Wsur(I,14),Wsur(I,15) &
                      ,Wsur(I,16),Wsur(I,17),Wsur(I,18),Wsur(I,19),Wsur(I,20),Wsur(I,21),Wsur(I,22), &
                     Wsur(I,23),Wsur(I,24)
        END DO
        CALL READLINE(2,3)
!       READ HOURLY TOTAL SOLAR RADIATION (W/m^2)
        DO I=1, NDAY
             READ(2,*)  TEXT, &TSOLAR(I,1),TSOLAR(I,2),TSOLAR(I,3),TSOLAR(I,4),TSOLAR(I,5) &
                     ,TSOLAR(I,6),TSOLAR(I,7),TSOLAR(I,8),TSOLAR(I,9),TSOLAR(I,10) &
                     ,TSOLAR(I,11),TSOLAR(I,12),TSOLAR(I,13),TSOLAR(I,14) &
                     ,TSOLAR(I,15),TSOLAR(I,16),TSOLAR(I,17),TSOLAR(I,18) &
                     ,TSOLAR(I,19),TSOLAR(I,20),TSOLAR(I,21),TSOLAR(I,22) &
                     ,TSOLAR(I,23) ,TSOLAR(I,24)
        END DO
        CALL READLINE(2,4)
        DO I=1, NDAY
```

```
          READ(2,*)  TEXT &,DIRwind(I,1),Vwind(I,1),DIRwind(I,2),Vwind(I,2),DIRwind(I,3) &
                     ,Vwind(I,3),DIRwind(I,4),Vwind(I,4),DIRwind(I,5),Vwind(I,5) &
                     ,DIRwind(I,6),Vwind(I,6),DIRwind(I,7),Vwind(I,7),DIRwind(I,8) &
                     ,Vwind(I,8),DIRwind(I,9),Vwind(I,9),DIRwind(I,10),Vwind(I,10)&
                     ,DIRwind(I,11),Vwind(I,11),DIRwind(I,12),Vwind(I,12),DIRwind(I,13) &
                     ,Vwind(I,13),DIRwind(I,14),Vwind(I,14),DIRwind(I,15),Vwind(I,15) &
                     ,DIRwind(I,16),Vwind(I,16),DIRwind(I,17),Vwind(I,17),DIRwind(I,18) &
                     ,Vwind(I,18),DIRwind(I,19),Vwind(I,19),DIRwind(I,20),Vwind(I,20) &
                     ,DIRwind(I,21),Vwind(I,21),DIRwind(I,22),Vwind(I,22),DIRwind(I,23) &
                     ,Vwind(I,23),DIRwind(I,24),Vwind(I,24)
      END DO
      CLOSE(1)
      CLOSE(2)
      END SUBROUTINE READDATA
!------------------------------------------------------------------------------------------------
    SUBROUTINE READLINE(UNIT,NLINE)

      INTEGER,INTENT(IN) :: NLINE
      INTEGER,INTENT(IN) :: UNIT
      DO I=1, NLINE
              READ(UNIT,*)
      END DO
      END SUBROUTINE READLINE
!------------------------------------------------------------------------------------------------

   SUBROUTINE LINE_COUNT(NLINE)
      INTEGER,INTENT(INOUT) :: NLINE
      NLINE = 0
      DO
         READ(1,*,IOSTAT=STATUS) TEMP
         IF (STATUS /= 0) EXIT
         NLINE = NLINE + 1
      END DO
   END SUBROUTINE LINE_COUNT
!------------------------------------------------------------------------------------------------
END MODULE DATATRANSFER
==================================================================================================
```

โมดูล RESPONSE_FACTOR

```
MODULE RESPONSE_FACTOR

      USE DATATRANSFER
!     Porpose
!             This module is to calculate CTF factor by using z-transform method.

      INTEGER, PARAMETER :: DP = 8
      REAL(KIND = DP),ALLOCATABLE,DIMENSION(:,:) :: Xr,Yr,Zr,Fr

      CONTAINS

SUBROUTINE R_CAL
```

```
        REAL(KIND = DP),ALLOCATABLE,DIMENSION(:,:,:) :: Xtf,Ytf,Ztf
        INTEGER,ALLOCATABLE,DIMENSION(:) :: ORDER,TM

        !CALCULATE WALL RESPONSE FACTOR
        ALLOCATE(Xtf(NWALL,0:5,PERIOD),Ytf(NWALL,0:5,PERIOD),Ztf(NWALL,0:5,PERIOD))
        ALLOCATE(Xr(NWALL,PERIOD),Yr(NWALL,PERIOD),Zr(NWALL,PERIOD))
        ALLOCATE(Fr(NWALL,0:5))
        ALLOCATE(ORDER(NWALL),TM(NWALL))

        DO I=1, NWALL
           CALL R_FACTOR(NL(I),THICK(I,:),DENSITY(I,:),CONDUCTIVITY(I,:) &
          ,SPEC_HEAT(I,:),PERIOD,Xtf(I,:,:),Ytf(I,:,:),Ztf(I,:,:),Fr(I,:) ,ORDER(I),TM(I))
        END DO

        DO I=1, NWALL
                DO K =1, PERIOD
                        Xr(I,K) = Xtf(I,ORDER(I),K)
                        Yr(I,K) = Ytf(I,ORDER(I),K)
                        Zr(I,K) = Ztf(I,ORDER(I),K)
                END DO
        END DO
END SUBROUTINE R_CAL
!------------------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE R_FACTOR(NL,THICKNESS,DENSITY,CONDUCTIVITY,SPEC_HEAT &
                ,PERIOD,Xtf,Ytf,Ztf,F,ORDER, TM)

        IMPLICIT NONE
        INTEGER,INTENT(IN):: NL
        REAL, DIMENSION(NL),INTENT(IN) :: THICKNESS,DENSITY,CONDUCTIVITY,SPEC_HEAT
        INTEGER, INTENT(IN) :: PERIOD
        REAL(KIND = DP),DIMENSION(0:5,PERIOD),INTENT(OUT) :: Xtf, Ytf, Ztf
        REAL(KIND = DP), DIMENSION(0:5),INTENT(OUT) :: F
        INTEGER, INTENT(OUT) :: ORDER, TM
        REAL,DIMENSION(NL) :: R, C
        REAL(KIND = DP), DIMENSION(PERIOD) :: bn
        REAL(KIND = DP),ALLOCATABLE, DIMENSION(:,:) :: X, Y, Z
        REAL(KIND = DP), ALLOCATABLE,DIMENSION(:) :: Atf, Btf, Ctf, Dtf
        REAL(KIND = DP), ALLOCATABLE,DIMENSION(:) :: dAtf, dBtf, dCtf, dDtf
        REAL(KIND = DP), DIMENSION(1:5) :: Lamda
        REAL(KIND = DP),PARAMETER :: Tiny = 1.E-15
        REAL, PARAMETER :: Err = 1.E-3
        REAL(KIND = DP) :: U, Err1, Err2, Err3, Err4, Err5, Err6
        REAL(KIND = DP) :: TERM1, TERM2, TERM3, TERM4, TERM5, TERMU
        REAL(KIND = DP) :: SUMX, SUMY, SUMZ
        INTEGER :: I, J, ORD, K
        INTEGER :: Nroot
        REAL(KIND = DP) :: DEL
                DEL = 3600
                DO I =1, NL
                   CALL RandC(THICKNESS(I),DENSITY(I),CONDUCTIVITY(I) &
                        ,SPEC_HEAT(I),R(I),C(I))
                END DO
                ALLOCATE (X(0:5,PERIOD),Y(0:5,PERIOD),Z(0:5,PERIOD))
                CALL Searching(Nl,R,C,PERIOD,bn,Nroot)
                ALLOCATE (Atf(0:Nroot),Btf(0:Nroot),Ctf(0:Nroot),Dtf(0:Nroot))
```

```
            ALLOCATE (dAtf(0:Nroot),dBtf(0:Nroot),dCtf(0:Nroot),dDtf(0:Nroot))

! Initial set of computation values
            Atf  = 0.
            Btf  = 0.
            Ctf  = 0.
            Dtf  = 0.
            dAtf = 0.
            dBtf = 0.
            dCtf = 0.
            dDtf = 0.
            Lamda = 0.
            X    = 0.
            Y    = 0.
            Z    = 0.
! CALCULATE VALUE OF Lamda,AND OVERALL HEAT TRANSFER COEFFICIENT
            Lamda(1:5) = EXP(-DEL*bn(1:5))
            U  = 1/SUM(R(:))

! DETERMINE TRANSMISSION MATRIX AND
! DERIVATIVE TRANSMISSION MATRIX ELEMENT
CALL Trans_Matrix(Tiny,Nl,R,C,Atf(0),Btf(0),Ctf(0),Dtf(0))
CALL Dev_Matrix(Tiny,Nl,R,C,dAtf(0),dBtf(0),dCtf(0),dDtf(0))
            DO J =1, Nroot
                  CALL Trans_Matrix(bn(J),Nl,R,C,Atf(J),Btf(J),Ctf(J),Dtf(J))
                  CALL Dev_Matrix(bn(J),Nl,R,C,dAtf(J),dBtf(J),dCtf(J),dDtf(J))
            END DO
! DETERMINE THE FIRST TERM ZERO ORDER OF
!  CONDUCTION TRANFER COEFFICIENT
            TERM1 = DEL*Btf(0)
            TERM2 = TERM1*Btf(0)
            X(0,1) = Dtf(0)/Btf(0) + dDtf(0)/TERM1 - Dtf(0)*dBtf(0)/TERM2
            Y(0,1) = 1./Btf(0) + 1./TERM1 - dBtf(0)/TERM2
            Z(0,1) = Atf(0)/Btf(0) + dAtf(0)/TERM1 - Atf(0)*dBtf(0)/TERM2
            SUMX = 0.
            SUMY = 0.
            SUMZ = 0.
            DO J =1, Nroot
                        TERM3 = EXP(-DEL*bn(J))
                        TERM4 = DEL * bn(J)*bn(J) * dBtf(J)
                        TERM5 = TERM3/TERM4
                        SUMX = SUMX + TERM5*Dtf(J)
                        SUMY = SUMY + TERM5
                        SUMZ = SUMZ + TERM5*Atf(J)
            END DO
                        X(0,1) = X(0,1) + SUMX
                        Y(0,1) = Y(0,1) + SUMY
                        Z(0,1) = Z(0,1) + SUMZ
! DETERMINE THE SECOND TERM ZERO ORDER
! OF CONDUCTION TRANFER COEFFICIEN
                        X(0,2) = - dDtf(0)/TERM1 + Dtf(0)*dBtf(0)/TERM2
                        Y(0,2) = - 1./TERM1 + dBtf(0)/TERM2
                        Z(0,2) = - dAtf(0)/TERM1 + Atf(0)*dBtf(0)/TERM2
                        SUMX = 0.
                        SUMY = 0.
                        SUMZ = 0.
```

```
        DO J =1, Nroot
                TERM3 = EXP(-2.*DEL*bn(J))*(1.-2.*EXP(DEL*bn(J)))
                TERM4 = DEL*bn(J)*bn(J)*dBtf(J)
                TERM5 = TERM3/TERM4
                SUMX = SUMX + TERM5*Dtf(J)
                SUMY = SUMY + TERM5
                SUMZ = SUMZ + TERM5*Atf(J)
        END DO
                X(0,2) = X(0,2) + SUMX
                Y(0,2) = Y(0,2) + SUMY
                Z(0,2) = Z(0,2) + SUMZ
! DETERMINE THE m'th TERM ZERO ORDER  OF CONDUCTION TRANFER COEFFICIENT
        DO TM =3, PERIOD
                SUMX = 0.
                SUMY = 0.
                SUMZ = 0.
        DO J =1, Nroot
                TERM1 = EXP(-REAL(TM)*DEL*bn(J))
                TERM2 = (1.-EXP(DEL*bn(J)))**2
                TERM3 = DEL*bn(J)*bn(J)*dBtf(J)
                TERM4 = TERM1*TERM2/TERM3
                SUMX = SUMX + TERM4 * Dtf(J)
                SUMY = SUMY + TERM4
                SUMZ = SUMZ + TERM4*Atf(J)
        END DO
                X(0,TM) = SUMX
                Y(0,TM) = SUMY
                Z(0,TM) = SUMZ
        END DO
! DECLARE 1st to 5th ORDER OF THE CONDUCTION
! TERANSFER COEFFICIENT
! DECLARE ORDER 1st to 5th OF THE FIRST TERM OF
! THE CONDUCTION TERANSFER COEFFICIENT
        DO ORD =1, 5
                X(ORD,1) = X(ORD-1,1)
                Y(ORD,1) = Y(ORD-1,1)
                Z(ORD,1) = Z(ORD-1,1)
        ! DECLARE ORDER 1st to 5th FROM THE SECOND TERM TO m'th
        ! TERM OF THE CONDUCTION TERANSFER COEFFICIENT
        DO TM =2, Nroot
                X(ORD,TM) = X(ORD-1,TM) - Lamda(ORD)*X(ORD-1,TM-1)
                Y(ORD,TM) = Y(ORD-1,TM) - Lamda(ORD)*Y(ORD-1,TM-1)
                Z(ORD,TM) = Z(ORD-1,TM) - Lamda(ORD)*Z(ORD-1,TM-1)
        END DO
        END DO
! DETERMINE THE APPROPRIATE COMPUTATIONAL NUMBER OF ORDER
DO ORD =0, 5
        TERM1 = SUM(X(ORD,:))
        TERM2 = SUM(Y(ORD,:))
        TERM3 = SUM(Z(ORD,:))
        TERMU = PRODUCT(1.-Lamda(1:ORD))*U
        Err1 = (TERM1-TERM2)*100./TERM1
        Err2 = (TERM1-TERM3)*100./TERM1
        Err3 = (TERM1-TERMU)*100./TERM1
        Err4 = (TERM2-TERM3)*100./TERM2
        Err5 = (TERM2-TERMU)*100./TERM2
```

```
                Err6 = (TERM3-TERMU)*100./TERM3
                IF ((DABS(Err1) <= Err) .AND. (DABS(Err2) <= Err) .AND. &
                   (DABS(Err3) <= Err) .AND. (DABS(Err4) <= Err) .AND. &
         (DABS(Err5) <= Err) .AND. (DABS(Err6) <= Err)) EXIT
        END DO
        IF (ORD <= 5) THEN
                ORDER = ORD
        ELSE
                ORDER = 5
        END IF
        ! DETERMINE FLUX HISTORY COEFFICIENT
                F = 0.
                IF (ORDER == 0)  GOTO 10
                        F(1) = SUM(Lamda(1:ORDER))
                DO I =1, ORDER-1
                DO J =I+1, ORDER
                        F(2) = F(2) - Lamda(I)*Lamda(J)
                END DO
                END DO
                DO I =1, ORDER-2
                DO J =I+1, ORDER-1
                DO K =I+2, ORDER
                        F(3) = F(3) + Lamda(I)*Lamda(J)*Lamda(K)
                END DO
                END DO
                END DO

                DO I = 4, ORDER
                        F(I) = (-1)**I+1* PRODUCT(Lamda(1:ORDER))
                END DO
        10 CONTINUE
                Xtf(ORDER,:) = X(ORDER,:)
                Ytf(ORDER,:) = Y(ORDER,:)
                Ztf(ORDER,:) = Z(ORDER,:)
                DEALLOCATE (X,Y,Z)
                DEALLOCATE (Atf,Btf,Ctf,Dtf)
                DEALLOCATE (dAtf,dBtf,dCtf,dDtf)
        END SUBROUTINE R_FACTOR
!------------------------------------------------------------------------------------------------------------------

SUBROUTINE RandC(THICKNESS,DENSITY,CONDUCTIVITY,SPEC_HEAT,R,C)

REAL,INTENT(IN) :: THICKNESS,DENSITY,CONDUCTIVITY,SPEC_HEAT
REAL, INTENT(OUT) :: R, C
     R = THICKNESS/CONDUCTIVITY
     C = THICKNESS*DENSITY*SPEC_HEAT
END SUBROUTINE RandC
!------------------------------------------------------------------------------------------------------------------

SUBROUTINE Searching(Nl,R,C,PERIOD,bn,Nroot)

        INTEGER,INTENT(IN) :: NL, PERIOD
        REAL,DIMENSION(Nl),INTENT(IN) :: R, C
        REAL (KIND = DP),DIMENSION(PERIOD),INTENT(OUT) :: bn
        INTEGER, INTENT(OUT) :: Nroot
        INTEGER :: I, N
```

```
INTEGER :: SignA, SignAnew, SignB, SignBnew, SignAs, SignBs
REAL,PARAMETER :: Tiny = 1.E-15, bmax = 0.095
REAL (KIND = DP), PARAMETER :: Step = 1.E-6
REAL (KIND = DP):: bx, br, br1, br2
REAL (KIND = DP):: As, Bs, As1, Bs1, As2, Bs2, Y1
REAL (KIND = DP):: Cs, Ds
!Initial subroutine calculation
        N = 0
        bx = Step
        I = 0
CALL Trans_Matrix(bx,Nl,R,C,As, Bs,Cs,Ds)
        IF ( As > 0. ) THEN
                SignA = 1
        ELSE
                SignA = -1
        END IF
        IF (Bs > 0.) THEN
                SignB = 1
        ELSE
                SignB = -1
        END IF
        IF (ABS(Bs) <= Tiny) THEN
                I = I + 1
                bn(I) = bx
        END IF
!Searching Roots of A along bn's axis
DO WHILE ((bx <= bmax).AND.(I < SIZE(bn)))
        bx = bx + Step

        CALL Trans_Matrix(bx,Nl,R,C,As, Bs,Cs,Ds)
        IF (As > 0.) THEN
                SignAnew = 1
        ELSE
                SignAnew = -1
        END IF
        IF (Bs > 0.) THEN
                SignBnew = 1
        ELSE
                SignBnew = -1
        END IF
CALL Trans_Matrix (bx+Step,Nl,R,C,As2,Bs2,Cs,Ds)
                IF (As2 > 0.) THEN
                        SignA = 1
                ELSE
                        SignA = -1
                END IF
                IF (Bs2 > 0.) THEN
                        SignB = 1
                ELSE
                        SignB = -1
                END IF
IF (SignA /= SignAnew) THEN
                N = N + 1
                IF (SignB /= SignBnew) THEN
                        CALL SecantB (bx,bx + Step,NL,R,C,Y1,SignAs,SignBs)
                        SignA = SignAs
```

```
                        N = 0
                        I = I + 1
                        bn(I) = Y1
                END IF
        ELSE
                IF (SignB /= SignBnew) THEN
                        CALL SecantB (bx,bx + Step,NL,R,C,Y1,SignAs,SignBs)
                        IF (SignAs == SignA) THEN
                                SignA = SignAs
                                N = 0
                                I = I + 1
                                bn(I) = Y1
                        END IF
                IF ((SignAs /= SignA) .AND. (SignAnew /= SignAs)) THEN
                                N = 1
                                bn(I) = Y1
                END IF
                IF ((SignAs /= SignA) .AND. (SignAnew == SignAs)) THEN
                                N = 1
                                I = I + 1
                                bn(I) = Y1
                        END IF
                END IF
        END IF
        END DO
            Nroot = I
END SUBROUTINE Searching

!-----------------------------------------------------------------------------------------------------------


SUBROUTINE Trans_Matrix (bn,Nl,R,C,Actf,Bctf,Cctf,Dctf)

            REAL(KIND = DP),INTENT(IN) :: bn
            INTEGER,INTENT(IN) :: Nl
            REAL,DIMENSION(NL),INTENT(IN) :: R, C
            REAL(KIND = DP),INTENT(OUT) :: Actf,Bctf,Cctf,Dctf
            INTEGER :: I
            REAL,PARAMETER :: Tiny = 1.E-6
            REAL (KIND = DP) :: TERM1
            REAL (KIND = DP),DIMENSION(Nl,2,2) :: M
            REAL (KIND = DP),DIMENSION(2,2) :: STORE

            DO I = 1, NL
                    IF (C(I)<Tiny) THEN
            ! For light weighted slab
                            M(I,1,1) = 1.  ! Actf(bn)
                            M(I,1,2) = R(I) ! Bctf(bn)
                            M(I,2,1) = 0   ! Cctf(bn)
                            M(I,2,2) = 1.  ! Dctf(bn)
                    ELSE
            ! For general slub
                            TERM1 = DSQRT(bn*R(I)*C(I))
                            M(I,1,1) = DCOS(TERM1)              !  Actf(bn)
                            M(I,1,2) = (R(I)/TERM1) * DSIN(TERM1) !  Bctf(bn)
                            M(I,2,1) = -(TERM1/R(I)) * DSIN(TERM1)  ! Cctf(bn)
```

```
                    M(I,2,2) = DCOS(TERM1)          !  Dctf(bn)
               END IF
          END DO

          ! Crack value from matrix [M] to value of Actf(bn), Bctf(bn), Cctf(bn), Dctf(bn)
          ! and Determine transmission matrix for all layer.
               STORE = M(1,:,:)
          DO I =2, NL
               STORE = MATMUL(STORE,M(I,:,:))
          END DO
          Actf = STORE(1,1)
          Bctf = STORE(1,2)
          Cctf = STORE(2,1)
          Dctf = STORE(2,2)

END SUBROUTINE Trans_Matrix

!-----------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE Dev_Matrix(bn,NI,R,C,dActf,dBctf,dCctf,dDctf)

     REAL (KIND = DP), INTENT(IN) :: bn
     REAL,DIMENSION(NI), INTENT(IN) ::R, C
     INTEGER, INTENT(IN):: NI
     REAL (KIND = DP), INTENT(OUT) :: dActf, dBctf, dCctf, dDctf
     INTEGER :: I, J
     REAL, PARAMETER :: Tiny = 1.E-6
     REAL(KIND = DP) :: U , TERM1
     REAL(KIND = DP), DIMENSION(NI) :: MA, MB, MC, MD
     REAL(KIND = DP), DIMENSION(NI) :: Ad, Bd, Cd, Dd
     REAL(KIND = DP), DIMENSION(NI,NI,2,2) :: M
     REAL(KIND = DP), DIMENSION(2,2) :: SUM, STORE

     ! CREATE THE MENBER OF TRANSMISSION MATRIX AND DERIVATIVE TRANSMISSION MATRIX
          DO I = 1, NI
               IF (C(I) < Tiny) THEN
                    MA(I) = 1.
                    MB(I) = R(I)
                    MC(I) = 0.
                    MD(I) = 1.
                    Ad(I) = 0.
                    Bd(I) = 0.
                    Cd(I) = 0.
                    Dd(I) = 0.
               ELSE
                    U = DSQRT (R(I) * C(I)/bn)/2.
                    TERM1 = DSQRT(R(I)*C(I)*bn)
                    MA(I) = DCOS(TERM1)
                    MB(I) = R(I)/TERM1 * DSIN(TERM1)
                    MC(I) = -TERM1/R(I) * DSIN(TERM1)
                    MD(I) = MA(I)
                    Ad(I) = U * DSIN(TERM1)
                    Bd(I) = U * DSIN(TERM1)/(bn * C(I)) - 0.5*R(I)/bn* DCOS(TERM1)
                    Cd(I) = U * DSIN(TERM1)/R(I) + 0.5*DCOS(TERM1)*C(I)
                    Dd(I) = Ad(I)
```

```
                    END IF
                END DO
        ! CREATE THE TRANSMISSION MATRIX AND DERIVATIVE TRANSMISSION MATRIX
                DO I = 1, NL
                DO J = 1, NL
                IF (I == J) THEN
                    M(I,I,1,1) = Ad(I)
                    M(I,I,1,2) = Bd(I)
                    M(I,I,2,1) = Cd(I)
                    M(I,I,2,2) = Dd(I)
                ELSE
                    M(I,J,1,1) = MA(J)
                    M(I,J,1,2) = MB(J)
                    M(I,J,2,1) = MC(J)
                    M(I,J,2,2) = MD(J)
                END IF
                END DO
                END DO
        ! DETERMINE THE DERIVATIVE TRANSMISSION MATRIX
                SUM = 0.
                DO I=1, Nl
                    STORE = M(I,1,:,:)
                DO J =2, Nl
                    STORE = MATMUL(STORE,M(I,J,:,:))
                END DO
                    SUM = SUM + STORE
                END DO
        ! DECLARE A MEMBER OF THE DERIVATIVE TRANSMISSION MATRIX
                dActf = SUM(1,1)
                dBctf = SUM(1,2)
                dCctf = SUM(2,1)
                dDctf = SUM(2,2)

END SUBROUTINE Dev_Matrix

!-------------------------------------------------------------------------------------------------------------

SUBROUTINE SecantB (X0,X1,NL,R,C,Y1,SignAs,SignBs)

        ! Subroutine for computing root of nonlinear equation using the SECANT
        ! METHOD defined the following given value :
        !       X0 = First value of initial guess of bn
        !       X1 = Second value of initial guess of bn
        !       ES = Stopping criterion tolerance (%)

                REAL (KIND = DP) , INTENT(IN) :: X0
                REAL (KIND = DP) , INTENT(IN) :: X1
                REAL,DIMENSION(NL),INTENT(IN) :: R, C
                INTEGER, INTENT(IN) :: NL
                REAL (KIND = DP) , INTENT(OUT) ::  Y1
                INTEGER,INTENT(OUT) :: SignAs, SignBs
                REAL (KIND = DP) :: A0, A1
                INTEGER :: ITER
                REAL, PARAMETER :: ES = 0.00001
                REAL (KIND = DP) :: F0, F1, DF, DX, TOL
                REAL (KIND = DP) :: Y0
```

```
                REAL (KIND = DP) :: Bs1, Bs2
                REAL (KIND = DP) :: Cs, Ds
                Y0 = X0
                Y1 = X1
                DO ITER = 1, 1500
                CALL Trans_Matrix (Y0,NL,R,C,A0,Bs1,Cs,Ds)
                CALL Trans_Matrix (Y1,NL,R,C,A1,Bs2,Cs,Ds)
                F0 = Bs1
                F1 = Bs2
                DF = (F0-F1)/(Y0-Y1)
                DX = -F1/DF
                Y0 = Y1
                Y1 = Y1 + DX
                TOL = ABS(DX*100./Y1)
                IF (TOL < ES) EXIT
                END DO
                CALL Trans_Matrix (Y1,NL,R,C,A1,Bs1,Cs,Ds)
                IF (A1 > 0)  THEN
                        SignAs = 1
                ELSE
                        SignAs = -1
                END IF
                IF (Bs1 > 0) THEN
                        SignBs = 1
                ELSE
                        SignBs = -1
                END IF

END SUBROUTINE SecantB

!----------------------------------------------------------------------------------------------------
END MODULE Response_factor
```

โมดูล SOLAR_FLUX

```
MODULE SOLAR_FLUX

USE DATATRANSFER
USE VISIBLE

! PURPOSE :[MODULE FUNCTION]

! MODULE IS TO CALCULATE DIRECT, DIFFUSE, AND TOTAL SHORT WAVE SOLAR
!  FLUX  AND DAYLIGHT ILLUMINANCE ON THE WORKING PLANE
!  AND ALSO TO CALCULATE DAYLIGHT GLARE INDEX.

REAL,PARAMETER :: PI = 3.141592654
REAL,PARAMETER :: DR= PI/180
```

```
REAL,PARAMETER :: RD= 180/PI

! DECLARE VARIABLES
!  DR       = Degree to radian multiplier
!  RD       = Radian to degree multiplier

CONTAINS

SUBROUTINE GLARE_INDEX(Eday,DGI)

    REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: DGI
    REAL,DIMENSION(NWALL) :: GWIDTH
    REAL,DIMENSION(NWALL,NDAY,PERIOD) :: Eo,Edir,Edif,EG,Ev1,Ev2,Ev3,RADIO
    REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: Eday
    INTEGER,DIMENSION(NWALL) :: GLASS
    REAL,DIMENSION(NWALL) :: TEMPF,TEMPAREA,EWH,OSPOINT
   REAL :: Fv23

! DETERMINE GLASS HIGH WHICH ARE REDUCED FOR EACH FLOOR
          DO IS =1, NWALL
                    IF (VTRAN(IS) > 0) THEN
                              GWIDTH(IS) = WIDTH(IS)/REAL(NFLOOR)
                    ELSE
                              GWIDTH(IS) = 0
                    END IF
          END DO
!         DETERMINE EXTERIOR ILLUMINANCE COMPONENTS
          CALL EXTERIOR_IRR_ILL(Eo,Edir,Edif,EG)
          CALL  AVERAGE_DAYLIGHT(RADIO,Eday,GLASS)

!         EFFECTIVE WINDOW HIGH (EWH)
          DO IS=1, NWALL
                    DO IS2=1, NWALL
                              IF ((DIR(IS)==DIR(IS2)) .AND. (VTRAN(IS2)==0) &
                      .AND. (GLASS(IS)>0)) THEN
                                        TEMPF(IS) = LENGTH(IS2)
                                        TEMPAREA(IS) = LENGTH(IS)*GWIDTH(IS)/(LENGTH(IS2)*FTOC)
                              END IF
                    END DO
          END DO
!         DETERMINE WINDOW ILLUMINANCE(Ewin), OUTDOOR ILLUMINANCE(Eod)
!         , AND INTERNAL REFLECTED ILLUMINANCE(Ein)

          DO IS=1, NWALL
                    IF (GLASS(IS) > 0) THEN
                              EWH(IS) = LENGTH(IS)*GWIDTH(IS)*VTRAN(IS)/TEMPF(IS)
                              OSPOINT(IS) = 3.5*EWH(IS)
                              Fv23 = 0
                              CALL SURFACE_PARALLEL(GWIDTH(IS),LENGTH(IS),OSPOINT(IS),Fv23)
                              DO D=1, NDAY
                                        DO PR=1, PERIOD
                                                  ! DAYLIGHT ILLUMINANCE FROM WINDOWS
                                                  Ev1(IS,D,PR) = VTRAN(IS)*(Edir(IS,D,PR)  &
                                      + Edif(IS,D,PR) + EG(IS,D,PR)*TEMPAREA(IS)&
                                      *(1-COSD(WANGLE(IS)))/2)
                                                  SUM = 0
```

```
                                        DO I=1, NWALL
                                             IF (I /= IS) THEN
                                                  SUM = SUM + RADIO(I,D,PR)
                                             ELSE
                                                  SUM = SUM
                                             END IF
                                        END DO
     ! UNSHIELDED ILLUMINANCE AT OBSERVATION POINT
                                        Ev2(IS,D,PR) = Fv23*Ev1(IS,D,PR) + SUM
     ! SHIELDED ILLUMINANCE AT OBSERVATION POINT
                                        Ev3(IS,D,PR) = Fv23*Ev1(IS,D,PR)

                                   END DO
                              END DO
                    ELSE
                              Ev1(IS,:,:) = 0
                              Ev2(IS,:,:) = 0
                              Ev3(IS,:,:) = 0
                    END IF
          END DO
!         DETERMINE DAYLIGHT GLARE INDEX(DGI) FOR EACH GLASS
          DO IS=1, NWALL
                              DO D=1, NDAY
                                   DO PR=1, PERIOD
                                        IF (GLASS(IS) /= 0) THEN
                                             IF ((Ev1(IS,D,PR)>0) .AND. &
                                        (Ev2(IS,D,PR)>0) .AND. &
                                   (Ev3(IS,D,PR)>0)) THEN

                              CALL GLARE_CONST(LENGTH(IS),GWIDTH(IS),OSPOINT(IS) &
                                   ,Ev3(IS,D,PR),Ev2(IS,D,PR) &
                              ,Ev1(IS,D,PR),DGI(IS,D,PR))
                                             ELSE
                                                  DGI(IS,D,PR) = 0
                                             END IF
                                        ELSE
                                             DGI(IS,:,:) = 0
                                        END IF
                                   END DO
                              END DO
          END DO
END SUBROUTINE GLARE_INDEX
!-----------------------------------------------------------------------------------------------------------------------------------------

! THE FOLLOWING SUBROUTINE ARE DETERMINE LIGHTING ILLUMINANCE
! CONSUMPTION AND HEAT FROM ART. LIGHT

SUBROUTINE HEAT_LIGHT(ART_SW_FLUX,ART_CONV_RATE,LUMENart)

     REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: ART_SW_FLUX
     REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: ART_CONV_RATE
     REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: LUMENart
     REAL,DIMENSION(NWALL) :: GWIDTH,A,F
     REAL :: SUM
     INTEGER :: IS
```

```
! DETERMINE GLASS HIGH WHICH ARE REDUCED FOR EACH FLOOR
        DO IS =1, NWALL
                IF (VTRAN(IS) > 0) THEN
                        GWIDTH(IS) = WIDTH(IS)/REAL(NFLOOR)
                ELSE
                        GWIDTH(IS) = 0
                END IF
        END DO
                IF (DLIGHT == 1) THEN
                        CALL ONOFF_SYSTEM(LUMENart)
                ELSE
                        CALL DIMMING_SYSTEM(LUMENart)
                END IF
        IF (ART_INDEX == 1) THEN
                Fr = 0.67
        ELSE IF (ART_INDEX == 2) THEN
                Fr = 0.59
        ELSE IF (ART_INDEX == 3) THEN
                Fr = 0.19
        ELSE IF (ART_INDEX == 4) THEN
                Fr = 0.71
        ELSE
                WRITE(*,*) 'LIGHTING INSTALLATION TYPE ERROR CHECK INPUTDATA.TXT'
        END IF
        Fconv = 1 - Fr
        DO I=1, NWALL
                DO J=1, NWALL
                        IF (I <= 2 ) THEN
                                A(I) = LENGTH(I)*WIDTH(I)
                        ELSE IF((VTRAN(I) == 0) .AND. (DIR(I) == DIR(J)) .AND. (VTRAN(J) > 0)) THEN
                                A(I) = ABS(LENGTH(I)*FTOC - LENGTH(J)*GWIDTH(J))
                        ELSE IF ((VTRAN(I) == 0) .AND. (I > 2)) THEN
                                A(I) = LENGTH(I) * FTOC
                        ELSE IF (VTRAN(I) > 0) THEN
                                A(I) = LENGTH(I) * GWIDTH(I)
                        END IF
                END DO
        END DO
        SUM = 0
        DO I=1, NWALL
                SUM = SUM + A(I)
        END DO




        DO D=1, NDAY
                DO PR=1, PERIOD
                        DO I=1, NWALL
                                F(I) = A(I)/SUM
                                ART_SW_FLUX(I,D,PR) = F(I)*Fr*LUMENart(D,PR)/(EFFICACY*A(I))
                        END DO
                END DO
        END DO
        DO D=1, NDAY
                DO PR=1, PERIOD
```

```
                ART_CONV_RATE(D,PR) = Fconv*(LUMENart(D,PR)/EFFICACY)
            END DO
        END DO

END SUBROUTINE HEAT_LIGHT

!-----------------------------------------------------------------------------------------------------------------

SUBROUTINE ONOFF_SYSTEM(LUMENocc)

REAL,DIMENSION(NDAY,PERIOD) :: LUMENocc
REAL :: PER
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: RADIO
REAL,DIMENSION(NDAY,PERIOD) :: Eday,Eart_occ
INTEGER,DIMENSION(NWALL) :: GLASS

        CALL AVERAGE_DAYLIGHT(RADIO,Eday,GLASS)

        DO D=1, NDAY
            DO PR=1, PERIOD
                IF ((PR >= OPENOFFICE) .AND. (PR < CLOSEOFFICE)) THEN
                    PER = DIV_OPEN
                ELSE
                    PER = DIV_CLOSE
                END IF

                    Eart_occ(D,PR) = VCOMFORT
                    LUMENocc(D,PR) = (REAL(NFLOOR)*Eart_occ(D,PR) &
           *PER/100*(LENGTH(1)*WIDTH(1)))/CU
            END DO
        END DO

END SUBROUTINE ONOFF_SYSTEM

!-----------------------------------------------------------------------------------------------------------------

SUBROUTINE DIMMING_SYSTEM(LUMENdim)

REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: LUMENdim
REAL :: PER
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: RADIO
REAL,DIMENSION(NDAY,PERIOD) :: Eday,Eart_dim
INTEGER,DIMENSION(NWALL) :: GLASS

!       THIS SUBROUTINE ESTIMATES ARTIFICIAL LIGHT ILLUMINANCE FOR INTGRATING DAYLIGHT,
!       THE MINIMUM ARTIFICIAL LIGHT ILLUMINANCE IS .


        CALL AVERAGE_DAYLIGHT(RADIO,Eday,GLASS)
        DO D=1, NDAY
            DO PR=1, PERIOD
                IF ((PR >= OPENOFFICE) .AND. (PR < CLOSEOFFICE)) THEN
                    PER = DIV_OPEN
                ELSE
                    PER = DIV_CLOSE
                END IF
```

```
                                IF (VCOMFORT < Eday(D,PR)) THEN
                                        Eart_dim(D,PR) = 0
                                ELSE
                                        Eart_dim(D,PR) = VCOMFORT - Eday(D,PR)
                                END IF
                                LUMENdim(D,PR) = REAL(NFLOOR)*Eart_dim(D,PR)*PER/100 &
                                                * LENGTH(1)*WIDTH(1)/CU
                END DO
        END DO

END SUBROUTINE DIMMING_SYSTEM

!-------------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE AVERAGE_DAYLIGHT(RADIO,Eday,GLASS)

!       THIS SUBROUTINE EVAUATES PERIOD AVERAGE DAYLIGHT ILLUMINANCE(Eday) WHICH INCIDENTS
!       ON WORKING PLANE BY AVERAGE FLUX TRANSFER METHOD. THIS METHOD CAN BE CONSIDERED
!        IN TWO IMPORTANT STEPS. THE FIRST STEP IS TO DETERMINE VIEW FACTOR FOR EACH PLANE
!        EFFECTING ON OTHER SURFACES. THE SECOND STEP IS TO DETERMINE AVERAGE DAYLIGHT
!        ILLUMINANCE BY USEING
!       GAUSSIAN ELIMINATION METHOD IN ORDER TO SLOVE MULTI-LINEAR EQUATIONS. THESE LINEAR
!       EQUATIONS  ARE CREATED BY SURFACE DAYLIGHT FLUX EXCHANGE REATIONSHIP.

REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: RADIO
REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: Eday
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: LUMENin
INTEGER,DIMENSION(NWALL),INTENT(OUT) :: GLASS
REAL,DIMENSION(NWALL,NWALL) :: Frl,Fj
REAL,DIMENSION(NWALL) :: FGJ,FGg,Fw,Fwj,VIEW,SUMW,GWIDTH,GWALL,A
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: Eo,Edir,Edif,EG
REAL,DIMENSION(PERIOD) :: SUMPR
REAL,DIMENSION(NWALL,NWALL,PERIOD) :: MAT_R
REAL,DIMENSION(NWALL,NWALL,PERIOD) :: GRADIO
REAL,DIMENSION(NWALL,NWALL,NWALL,PERIOD) :: MAT_C
REAL,DIMENSION(NWALL) :: AG,AO,EWH,Fwos
REAL :: Fu,Fd,INC,SUM,TEMPF,SUMVIEW
INTEGER :: IS,IS2

! DETERMINE GLASS HIGH FOR EACH FLOOR WHICH ARE REDUCED FORM HIGHT OF THE BUILDING
        DO IS =1, NWALL
                IF (VTRAN(IS) > 0) THEN
                        GWIDTH(IS) = WIDTH(IS)/REAL(NFLOOR)
                ELSE
                        GWIDTH(IS) = 0
                END IF
        END DO

! DETERMINE VIEW FACTOR FOR EACH SURFACE

!       SETTING INITIAL VALUE
        Frl(:,:) = 0
        Fj(:,:) = 0
        FGJ(:) = 0
        FGg(:) = 0
        Fw(:) = 0
```

```
        Fwj(:) = 0
        VIEW(:) = 0
        SUMW(:) = 0
!       DETERMINE VIEW FACTOR FROM BUILDING GEOMETRY
!       BECAUSE THE BUILDING SURFACE IS FLAT, THE VIEW FACTOR OF THE ANY SURFACE AT
! THE SAME DIRECTION AND Fii VANISH.
        DO IS =1, NWALL
                Frl(IS,IS) = 0
                IF (VTRAN(IS) /= 0) THEN
                        GLASS(IS) = IS
                ELSE
                        GLASS(IS) = 0
                END IF
        END DO
!       THE VIEW FACTOR OF THE WALL WHICH IS SAME DIRECTION AS GLESS DIRECTION IS ZERO.
        DO IS =1, NWALL
                IF (VTRAN(IS) == 0)  THEN
                        DO IS2=1, NWALL
                                IF (VTRAN(IS2) > 0)  THEN
                                        IF (DIR(IS) == DIR(IS2)) THEN
                                                GWALL(IS) = IS
                                                Frl(GWALL(IS),GLASS(IS2)) = 0
                                                Frl(GLASS(IS2),GWALL(IS)) = 0
                                        END IF
                                ELSE
                                        GWALL(IS) = 0
                                END IF
                        END DO
                END IF
        END DO
!       GROUND TO GLASS VIEW FACTOR
        DO IS=1, NWALL
                IF (GWALL(IS) > 0) THEN
                        FGJ(IS) = (1-COS(WANGLE(IS)*DR))/2
                END IF
        END DO

        DO IS2=1, NWALL
        DO IS=1, NWALL
                IF ((DIR(IS2)==DIR(IS)) .AND. (VTRAN(IS)>0) .AND. (GWALL(IS2)>0)) THEN
                        FGg(IS) = (LENGTH(IS)*WIDTH(IS))/(LENGTH(IS2)*WIDTH(IS2)) * FGJ(IS2)
                ELSE
                        FGg(IS) = 0
                END IF
        END DO
        END DO
!       DETERMINE VIEW FACTOR FROM VIEW FACTOR FORMULAS
!       SURFACE TO SURFACE VIEW FACTOR
        CALL SURFACE_PARALLEL(WIDTH(1),LENGTH(1),FTOC,Frl(1,2))
        CALL SURFACE_PARALLEL(WIDTH(1),LENGTH(1),Hwp,Fw(1))
        CALL SURFACE_PARALLEL(WIDTH(2),LENGTH(2),ABS(FTOC-Hwp),Fw(2))

        DO IS=1, NWALL
                IF (IS > 2) THEN
                        A(IS) = LENGTH(IS)*FTOC
                ELSE
```

```
                    A(IS) = LENGTH(IS)*WIDTH(IS)
            END IF
    END DO

!   DETERMINE VIEW FACTOR FROM EACH VERTICAL SURFACE TO WORKING PLANE
    DO IS=3, NWALL
      IF ((VTRAN(IS)==0) .AND. (GWALL(IS)==0) .AND. (LENGTH(IS)==LENGTH(1))) THEN
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),ABS(FTOC-Hwp),WIDTH(1),Fu)
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),Hwp,WIDTH(1),Fd)
                    Fw(IS) = Fu + Fd
      ELSE IF ((VTRAN(IS)==0) .AND. (GWALL(IS)==0) .AND. (LENGTH(IS)==WIDTH(1))) THEN
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),ABS(FTOC-Hwp),LENGTH(1),Fu)
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),Hwp,LENGTH(1),Fd)
                    Fw(IS) = Fu + Fd
      ELSE IF ((VTRAN(IS)==0) .AND. (GWALL(IS)/=0) .AND. (LENGTH(IS)==LENGTH(1))) THEN
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),ABS(FTOC-Hwp),WIDTH(1),Fu)
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),Hwp,WIDTH(1),Fd)
                    Fwj(IS) = Fu + Fd
      ELSE IF ((VTRAN(IS)==0) .AND. (GWALL(IS)/=0) .AND. (LENGTH(IS)==WIDTH(1))) THEN
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),ABS(FTOC-Hwp),LENGTH(1),Fu)
                    CALL SURFACE_PERPENDICULAR(LENGTH(IS),Hwp,LENGTH(1),Fd)
                    Fwj(IS) = Fu + Fd
            END IF
    END DO

!   DETERMINE VIEW FACTOR OF THE HORIZONTAL WALL (FLOOR AND CEILING)
    DO IS2=1, 2
    DO IS=3, NWALL
            IF (IS2 < IS)  THEN
                IF ((VTRAN(IS) == 0) .AND. (WIDTH(IS2)==LENGTH(IS)) .AND. (GWALL(IS)==0))  THEN
                CALL SURFACE_PERPENDICULAR(WIDTH(IS2),LENGTH(IS2),FTOC,Frl(IS2,IS))
            ELSE IF ((VTRAN(IS) == 0) .AND. (LENGTH(IS2)==LENGTH(IS)).AND. (GWALL(IS)==0)) THEN
                CALL SURFACE_PERPENDICULAR(LENGTH(IS2),WIDTH(IS2),FTOC,Frl(IS2,IS))
            ELSE IF ((VTRAN(IS) == 0) .AND. (LENGTH(IS2)==LENGTH(IS)) .AND. (GWALL(IS)/=0)) THEN
                CALL SURFACE_PERPENDICULAR(LENGTH(IS2),WIDTH(IS2),FTOC,Fj(IS2,IS))
            ELSE IF ((VTRAN(IS) == 0) .AND. (WIDTH(IS2)==LENGTH(IS)) .AND. (GWALL(IS)/=0))  THEN
                CALL SURFACE_PERPENDICULAR(WIDTH(IS2),LENGTH(IS2),FTOC,Fj(IS2,IS))
            END IF
            END IF
    END DO
    END DO
! DETERMINE VIEW FACTOR OF THE VERTICAL WALL (OPAQUE)
!  VIEW FACTOR FOR SURFACE PARALLEL
    DO IS2=3, NWALL
            DO IS=3, NWALL
                    IF (((DIR(IS2)==(DIR(IS)+180)).OR. (DIR(IS2)==(DIR(IS)-180)))) THEN
                            IF ((IS2 < IS) .AND.(VTRAN(IS) == 0) .AND. (LENGTH(IS2)==LENGTH(1)) &
                            .AND.(GWALL(IS2)==0))  THEN
                                CALL SURFACE_PARALLEL(FTOC,LENGTH(IS2),WIDTH(1),Frl(IS2,IS))
                            ELSE IF ((IS2 < IS).AND.(VTRAN(IS) == 0).AND.(LENGTH(IS2)==WIDTH(1))
                            .AND.(GWALL(IS2)==0)) THEN
                                CALL SURFACE_PARALLEL(LENGTH(IS2),FTOC,LENGTH(1),Frl(IS2,IS))
                            END IF

            IF ((VTRAN(IS) == 0) .AND.  (LENGTH(IS2)==LENGTH(1)) .AND. (IS==GWALL(IS)/=0))  THEN
                    CALL SURFACE_PARALLEL(LENGTH(IS2),FTOC,WIDTH(1),Fj(IS2,IS))
```

```
                    ELSE IF ((VTRAN(IS) == 0) .AND. (LENGTH(IS2)==WIDTH(1)) .AND. (IS==GWALL(IS)/=0)) THEN
                    CALL SURFACE_PARALLEL(FTOC,LENGTH(IS2),LENGTH(1),Fj(IS2,IS))
                    END IF
                    END IF
                    END DO
        END DO
!       VIEW FACTOR FOR SURFACE PERPENDICULAR
        DO IS2=3, NWALL
                    DO IS=3, NWALL
                      IF (((ABS(DIR(IS2)-DIR(IS))==90) .OR. (ABS(DIR(IS2)-DIR(IS))==270))) THEN
                         IF ((IS2 < IS) .AND. (VTRAN(IS) == 0) .AND. (WIDTH(IS2)==WIDTH(IS)) &
                        .AND. (IS /= GWALL(IS)).AND. (GWALL(IS2) == 0)) THEN
                        CALL SURFACE_PERPENDICULAR(FTOC,LENGTH(IS2),FTOC,Frl(IS2,IS))
                     END IF
                     IF ((VTRAN(IS) == 0) .AND. (WIDTH(IS2)==WIDTH(IS)) .AND. (IS == GWALL(IS))) THEN
                        CALL SURFACE_PERPENDICULAR(FTOC,LENGTH(IS2),FTOC,Fj(IS2,IS))
                     END IF
                     END IF
                    END DO
        END DO
!       RECIPOCATING LAW
        DO IS2=1, NWALL
                    DO IS=1, NWALL
                            IF ((IS2 > IS) .AND. (IS/=GWALL(IS))) THEN
                                    Frl(IS2,IS) = A(IS)*Frl(IS,IS2)/A(IS2)
                            END IF
                    END DO
        END DO
!       DETERMINE VIEW FACTOR OF GLASS SURFACE AND THE OPAQUE
!       SURFACE INSTALLED GLASS
!       BY VIEW FACTOR ALGEBRA AND SUMMATION RULE TECHNIQUE.
        DO IS2=1, NWALL
                    IF ((GWALL(IS2) > 0) .AND. (VTRAN(IS2)==0)) THEN
!       FIND GLASS IN THE CONSIDERED WALL
                    DO I=1, NWALL
                            IF ((DIR(IS2)==DIR(I)) .AND. (VTRAN(I)>0)) THEN
                                    GLASS(I) = I
                                    AG(I) = LENGTH(I)*GWIDTH(I)
                                    AO(IS2)= A(IS2)-AG(I)
                                    Fw(GLASS(I)) = (AG(I)/A(IS2)) * Fwj(IS2)
                                    Fw(IS2) = (AO(IS2)/A(IS2))*Fw(GLASS(I))
                            END IF
                    END DO
                            DO IS=1, NWALL
                                    IF ((GWALL(IS)==0) .AND. (VTRAN(IS)==0)) THEN
                                            Frl(IS,IS2) = (AO(IS2)/A(IS2)) * Fj(IS,IS2)
                                            Frl(IS2,IS) = A(IS)*Frl(IS,IS2)/AO(IS2)
                                    DO I=1, NWALL
                                            IF ((DIR(IS2)==DIR(I)) .AND.  &
                                  (VTRAN(I)>0)) THEN
                                                    Frl(IS,GLASS(I)) = Fj(IS,IS2)-Frl(IS,IS2)
                                                    Frl(GLASS(I),IS) = &
                                      A(IS)*Frl(IS,GLASS(I))/AG(I)
                                            END IF
                                    END DO
```

```
                        END IF
                END DO
        END IF
END DO

!       DETERMINE AVERAGE DAYLIGHT ILLUMINANCE INCIDENT ON WORKING PLANE
        CALL EXTERIOR_IRR_ILL(Eo,Edir,Edif,EG)

!       CREATE DAYLIGHT FLUX TRANSFER MATRIX

!       CREATE RIGHT HAND SIDE MATRIX
                DO D=1, NDAY
                        MAT_R(:,:,:) = 0
                        MAT_C(:,:,:,:) = 0
                        GRADIO(:,:,:) = 0
                        SUMW(:) = 0
                        SUMPR(:) = 0
                        DO IS2=1, NWALL
                                DO PR=1, PERIOD
                                        IF (VTRAN(IS2)>0) THEN
                                           LUMENin(IS2,D,PR) = VTRAN(IS2)*(Edif(IS2,D,PR) + &
                                                        EG(IS2,D,PR)*FGg(IS2))*(LENGTH(IS2) &
                                                        *GWIDTH(IS2))
                                        ELSE
                                                LUMENin(IS2,D,PR) = 0
                                        END IF
                                        DO IS=1, NWALL
                                                IF (IS <= 2) THEN
                                                        MAT_R(IS2,IS,PR) = REFLECTv(IS,IN) &
                                                        *Frl(IS2,IS)*LUMENin(IS2,D,PR) &
                                                        /(LENGTH(IS)*WIDTH(IS))
                                                ELSE
                                                        MAT_R(IS2,IS,PR) = REFLECTv(IS,IN) &
                                                              *Frl(IS2,IS)*LUMENin(IS2,D,PR) &
                                                              /(LENGTH(IS)*FTOC)
                                                END IF
                                        END DO
                                END DO
                        END DO

!       CREATE COEFFICIENT MATRIX
                        DO IS2=1, NWALL
                                DO PR=1, PERIOD
                                        IF (VTRAN(IS2)>0) THEN
                                                DO I=1, NWALL
                                                        DO J=1, NWALL
                                                                IF (I==J) THEN
                                                                MAT_C(IS2,I,J,PR) = 1 - &
                                                                        REFLECTv(I,IN)*Frl(I,J)
                                                                ELSE
                                                                MAT_C(IS2,I,J,PR) = (-1)*&
                                                                        REFLECTv(I,IN)*Frl(I,J)
                                                                END IF
                                                        END DO
                                                END DO
                                        ELSE
```

```
                                        MAT_C(IS2,:,:,PR) = 0
                                END IF
                        END DO
                END DO

!       DETERMINE RADIOSITY FOR EACH SURFACE WHICH EFFECTS ON EACH GLASS
                DO IS2=1, NWALL
                        DO PR=1, PERIOD
                                IF (VTRAN(IS2)>0) THEN
                                        CALL GAUSS(NWALL,MAT_C(IS2,:,:,PR) &
                                                ,MAT_R(IS2,:,PR),GRADIO(IS2,:,PR))
                                ELSE
                                        GRADIO(IS2,:,PR) = 0
                                END IF
                        END DO
                END DO
                DO PR=1, PERIOD
                        DO I=1, NWALL
                                SUMW(I) = 0
                                DO IS2=1, NWALL
                                        SUMW(I) = SUMW(I) + GRADIO(IS2,I,PR)
                                END DO
                        RADIO(I,D,PR) = SUMW(I)
                        END DO
                END DO
                DO PR=1, PERIOD
                        SUMPR(PR) = 0
                        DO IS=1, NWALL
                                SUMPR(PR) = SUMPR(PR) +  Fw(IS)*RADIO(IS,D,PR)
                        END DO
                        Eday(D,PR) = SUMPR(PR)
                END DO
        END DO !NDAY

END SUBROUTINE AVERAGE_DAYLIGHT

!---------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE EXTERIOR_IRR_ILL(Eo,Edir,Edif,EG)

!       THIS SUBROUTINE IS TO CALCULATE HORIZONTAL GLOBAL
! ILLUMINANCE FROM GLOBAL SOLAR RADIATION
!, HORIZONTAL DIFFUSE ILLUMINANCE FROM HORIZONTAL DIFFUSE SOLAR
! RADIATION, AND HORIZONTAL DIRECT ILLUMINANCE FROM HORIZONTAL
! DIRECT SOLAR RADIATION. MODEL FORMULATION ARE PRESENTED
! BY RICHARD PEREZ, PIERRE INEICHEN,ROBERT SEALS (SOLAR ENERGY JOURNAL 1990).


        REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: Eo,Edir,Edif,EG
        REAL,DIMENSION(NDAY,PERIOD):: EHG,EHDIF,EHDIR
        INTEGER :: INDEX
        REAL,DIMENSION(NWALL,NDAY,PERIOD) :: INCIDENT
        REAL,DIMENSION(NDAY,PERIOD) :: IHDIF,IHDIR,CLEAR,BRIGHT
        REAL,DIMENSION(NDAY,PERIOD) :: Pv,Tdew,WH,Psat
        REAL :: AIR_MASS,KT
        REAL,PARAMETER :: Ra = 0.287
```

```
REAL,PARAMETER :: Rv = 0.4615
REAL :: TEST
REAL,DIMENSION(NDAY) :: C = (/0.058,0.06,0.071,0.097,0.121,0.134 &
                        ,0.136,0.122,0.092,0.073,0.063,0.057/)
REAL,DIMENSION(PERIOD) :: F1,F2
REAL,DIMENSION(8) :: aG = (/96.63,107.54,98.73,92.72,86.73,88.34,78.63,99.65/)
REAL,DIMENSION(8) :: bG = (/-0.47,0.79,0.7,0.56,0.98,1.39,1.47,1.86/)
REAL,DIMENSION(8) :: cG = (/11.50,1.79,4.4,8.36,7.1,6.06,4.93,-4.46/)
REAL,DIMENSION(8) :: dG = (/-9.16,-1.19,-6.95,-8.31,-10.94,-7.6,-11.37,-3.15/)
REAL,DIMENSION(8) :: aDIF = (/97.24,107.22,104.97,102.39,100.71,106.42,141.88,152.23/)
REAL,DIMENSION(8) :: bDIF = (/-0.46,1.15,2.96,5.59,5.94,3.83,1.9,0.35/)
REAL,DIMENSION(8) :: cDIF = (/12.,0.59,-5.53,-13.95,-22.75,-36.15,-53.24,-45.27/)
REAL,DIMENSION(8) :: dDIF = (/-8.91,-3.95,-8.77,-13.90,-23.74,-28.83,-14.03,-7.98/)
REAL,DIMENSION(8) :: aDIR = (/57.2,98.99,109.83,110.34,106.36,107.19,105.75,101.18/)
REAL,DIMENSION(8) :: bDIR = (/-4.55,-3.46,-4.9,-5.84,-3.97,-1.25,0.77,1.58/)
REAL,DIMENSION(8) :: cDIR = (/-2.98,-1.21,-1.71,-1.99,-1.75,-1.51,-1.26,-1.1/)
REAL,DIMENSION(8) :: dDIR = (/117.12,12.38,-8.81,-4.56,-6.16,-26.73,-34.44,-8.29/)
REAL,DIMENSION(8) :: F11 = (/0.11,0.429,0.809,1.014,1.282,1.426,1.485,1.17/)
REAL,DIMENSION(8) :: F12 = (/0.57,0.363,-0.054,-0.252,-0.42,-0.653,-1.214,-0.3/)
REAL,DIMENSION(8) :: F13 = (/-0.081,-0.307,-0.442,-0.531,-0.689,-0.779, &
                        -0.784,-0.615/)
REAL,DIMENSION(8) :: F21 = (/-0.095,0.05,0.181,0.275,0.38,0.425,0.411,0.518/)
REAL,DIMENSION(8) :: F22 = (/0.158,0.008,-0.169,-0.35,-0.559,-0.785,-0.629,-1.892/)
REAL,DIMENSION(8) :: F23 = (/-0.018,-0.065,-0.092,-0.096,-0.114,-0.097 &
                        ,-0.082,-0.055/)

CALL SUN(NDAY,NWALL,DAY,PERIOD,LAT,LONG ,LONGstd,DIR,WANGLE,INCIDENT)
DO D=1, NDAY
        DO PR=1, PERIOD
                IF (COSD(INCIDENT(2,D,PR)) > 0) THEN
                        IHDIR(D,PR) = TSOLAR(D,PR)* &
                COSD(INCIDENT(2,D,PR)) &
                /(COSD(INCIDENT(2,D,PR)) + C(D))
                        IHDIF(D,PR) = TSOLAR(D,PR) - IHDIR(D,PR)
                ELSE
                        IHDIR(D,PR) = 0
                        IHDIF(D,PR) = 0
                END IF
        END DO
END DO
DO D=1, NDAY
        DO PR =1, PERIOD
                Psat(D,PR) = (7E-5)*(Tsur(D,PR)**3) - 0.0002*(Tsur(D,PR)**2) &
                         + 0.0621*Tsur(D,PR) + 0.5839
                Pv(D,PR) = (Rv/Ra)*Psur*Wsur(D,PR)/(1+(Rv*Wsur(D,PR)/Ra))
                Tdew(D,PR) = 6.54 + 14.256*LOG(Pv(D,PR)) + 0.7389*(LOG(Pv(D,PR)))**2 &
                         + 0.09486*(LOG(Pv(D,PR)))**3 + 0.4569*(Pv(D,PR)**0.1984)
                WH(D,PR) = EXP(0.07*Tdew(D,PR) - 0.075)
        END DO
END DO
DO D=1, NDAY
        Iextra = ( 1 + 0.033*COSD(360*DAY(D)/365.25))*1373
        DO PR=1, PERIOD
                AIR_MASS = 1/COSD(INCIDENT(2,D,PR))
                IF (IHDIF(D,PR) > 0) THEN
                        BRIGHT(D,PR) = IHDIF(D,PR)*AIR_MASS/Iextra
```

```
                    CLEAR(D,PR) = ((IHDIF(D,PR)+IHDIR(D,PR))/IHDIF(D,PR)  &
                                + 1.041*(INCIDENT(2,D,PR)*DR)**3) &
                                /(1 + 1.041*(INCIDENT(2,D,PR)*DR)**3)
                ELSE
                    BRIGHT(D,PR) = 0
                    CLEAR(D,PR) = 0
                END IF
        END DO
END DO

DO D=1, NDAY
        DO PR=1, PERIOD
                IF (BRIGHT(D,PR) > 0) THEN
                    IF ((CLEAR(D,PR) >= 1) .AND. (CLEAR(D,PR) < 1.065)) THEN
                        INDEX = 1
                    ELSE IF ((CLEAR(D,PR) >= 1.065) .AND. (CLEAR(D,PR) < 1.23)) THEN
                        INDEX = 2
                    ELSE IF ((CLEAR(D,PR) >= 1.23) .AND. (CLEAR(D,PR) < 1.5)) THEN
                        INDEX = 3
                    ELSE IF ((CLEAR(D,PR) >= 1.5) .AND. (CLEAR(D,PR) < 1.95)) THEN
                        INDEX = 4
                    ELSE IF ((CLEAR(D,PR) >= 1.95) .AND. (CLEAR(D,PR) < 2.8)) THEN
                        INDEX = 5
                    ELSE IF ((CLEAR(D,PR) >= 2.8) .AND. (CLEAR(D,PR) < 4.5)) THEN
                        INDEX = 6
                    ELSE IF ((CLEAR(D,PR) >= 4.5) .AND. (CLEAR(D,PR) < 6.2)) THEN
                      INDEX = 7
                    ELSE IF (CLEAR(D,PR) >= 6.2) THEN
                        INDEX = 8
                    ELSE
                        INDEX = 0
                    END IF

                    IF (INDEX > 0) THEN
                        EHG(D,PR) = TSOLAR(D,PR) * &
                                (aG(INDEX) + bG(INDEX)*Wsur(D,PR) &
                                + cG(INDEX)*COSD(INCIDENT(2,D,PR)) +  &
                                dG(INDEX)*LOG(BRIGHT(D,PR)))
                        EHDIF(D,PR) = IHDIF(D,PR) * (aDIF(INDEX) &
                        + bDIF(INDEX)*Wsur(D,PR) &
                        + cDIF(INDEX)*COSD(INCIDENT(2,D,PR)) &
                        + dDIF(INDEX)*LOG(BRIGHT(D,PR)))
                        TEST = IHDIR(D,PR) * (aDIR(INDEX) &
                        + bDIR(INDEX)*Wsur(D,PR) + cDIR(INDEX)*&
                        EXP(5.73*INCIDENT(2,D,PR)*DR - 5) &
                        + dDIR(INDEX)*BRIGHT(D,PR))
                    ELSE
                        EHG(D,PR) = 0
                        EHDIF(D,PR) = 0
                        TEST = 0
                    END IF
                    IF (TEST > 0) THEN
                        EHDIR(D,PR) = TEST
                    ELSE
                        EHDIR(D,PR) = 0
                    END IF
```

```
                ELSE
                        EHG(D,PR) = 0
                        EHDIF(D,PR) = 0
                        EHDIR(D,PR) = 0
                END IF
        END DO
END DO

DO D=1, NDAY
        F1(:) = 0
        F2(:) = 0
        DO PR=1, PERIOD
                IF (INDEX > 0 ) THEN
                        F1(PR) = F11(INDEX) + F12(INDEX)*BRIGHT(D,PR) &
                                + F13(INDEX)*INCIDENT(1,D,PR)*DR
                        F2(PR) = F21(INDEX) + F22(INDEX)*BRIGHT(D,PR) &
                                + F23(INDEX)*INCIDENT(1,D,PR)*DR
                ELSE
                        F1(PR) = 0
                        F2(PR) = 0
                END IF
                DO I =1, NWALL
                        IF (VTRAN(I) > 0) THEN
                                IF (COSD(INCIDENT(I,D,PR)) > 0) THEN
                                        a = COSD(INCIDENT(I,D,PR))
                                ELSE
                                        a = 0
                                END IF

                                IF (COSD(INCIDENT(2,D,PR)) > 0.087) THEN
                                        b = COSD(INCIDENT(2,D,PR))
                                ELSE
                                        b = 0.087
                                END IF
                                IF (COSD(INCIDENT(I,D,PR)) > 0) THEN
                                        Edir(I,D,PR) = EHDIR(D,PR)*COSD(INCIDENT(I,D,PR))
                                ELSE
                                        Edir(I,D,PR) = 0
                                END IF
                                EG(I,D,PR) = Gref*EHG(D,PR)
                                Edif(I,D,PR) = EHDIF(D,PR)* ((1-  &
                                F1(PR))*(1+COS(WANGLE(I)*DR))/2 &
                                 + F1(PR)*a/b + F2(PR)*SIN(WANGLE(I)*DR))
                                IF (Edif(I,D,PR) < 0) THEN
                                        Edif(I,D,PR) = 0
                                END IF
                                Eo(I,D,PR) = Edir(I,D,PR) + EG(I,D,PR) + Edif(I,D,PR)
                        ELSE
                                Eo(I,D,PR) = 0
                                Edir(I,D,PR) = 0
                                EG(I,D,PR) = 0
                                Edif(I,D,PR) = 0
                        END IF
                END DO
        END DO
END DO
```

```
END SUBROUTINE EXTERIOR_IRR_ILL

!-----------------------------------------------------------------------------------------------------------------------------------------
!****** ALL OF THE FOLLOWING SUBROUTINE CALCULATE HEAT FORM SOLAR




SUBROUTINE SW_OUTSIDE(OSW_FLUX)

REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: OSW_FLUX
REAL,DIMENSION(NWALL,NDAY,PERIOD) ::IDIR,IDIF,IT,SUMADIR
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: Vdir,Vsky,Vg
REAL,DIMENSION(NDAY,PERIOD) :: IHDIR,IHDIF
REAL,DIMENSION(NWALL) :: SUMADIF

        CALL INCIDENTIRR(IHDIR,IHDIF,IDIR,IDIF,IT)
        CALL VISIRR(Vdir,Vsky,Vg)

        DO D=1, NDAY
                DO PR=1, PERIOD
                        DO I=1, NWALL
                                IF ((I > 1) .AND. (VTRAN(I) > 0)) THEN
                                        OSW_FLUX(I,D,PR) = (IDIR(I,D,PR) - &
                                                        Vdir(I,D,PR))*ABSORB(I,OUT)  &
                                                        + Vdir(I,D,PR)*ABSORBv(I,OUT) &
                                                        + (IDIF(I,D,PR) - Vsky(I,D,PR)) &
                                                        *ABSORB(I,OUT) &
                                                        + (Vsky(I,D,PR))*ABSORBv(I,OUT)
                                ELSE IF  ((I > 1) .AND. (VTRAN(I) == 0)) THEN
                                        OSW_FLUX(I,D,PR) = IT(I,D,PR)*ABSORB(I,OUT)
                                ELSE
                                        OSW_FLUX(I,D,PR) =  0
                                END IF
                        END DO
                END DO
        END DO

END SUBROUTINE SW_OUTSIDE

!-----------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE SW_INSIDE (TRANsol,ISW_FLUX)

!         THIS SUBROUTINE IS TO CALCULATE DIRECT AND DIFFUSE RADIATION RATE TRANSMITTED INTO
THE ROOM
! THROUGH WINDOW OR GLASSES. DIRECT RADIATION RATE THROUGH THE WINDOW CAN BE CALCULATED
BY
! QDIR = (AREA)*(SC)*Idir*SUM(tj*COS(INCIDENT ANGLE)^j) AND DIFFUSE RADIATION RATE CAN BE
CLECULATED
! BY QDIF = (AREA)*(SC)*2*Idif*SUM(tj/(j+2)).
!         THE SOLAR FLUX STRIKES EACH ROOM SURFACE, WE CAN ASSUME
! THAT ALL TRAMSMITTED DIRECT RADIATION IS ABSORBED BY THE FLOOR AND ALL TRENSMISSTED
```

```
DIFFUSE
! RADIATION IS UNIFORMLY ABSORBED BY THE ZONE SURFACES EXCEPT FOR GLASS OR WINDOW.

REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: ISW_FLUX
REAL,INTENT(OUT) :: TRANsol
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: Vdir,Vsky,Vg
REAL,DIMENSION(NDAY,PERIOD) :: IHDIR,IHDIF
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: QDIR,QDIF
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: INCIDENT,SUMTDIR,IDIR,IDIF,IT,SUMADIR
REAL,DIMENSION(NWALL) :: SUMTDIF,SUMADIF
REAL :: SUM
REAL,DIMENSION(NDAY,PERIOD) :: SUMDIFRATE,SUMDIRRATE
CALL SUN(NDAY,NWALL,DAY,PERIOD,LAT,LONG,LONGstd,DIR,WANGLE,INCIDENT)
CALL INCIDENTIRR(IHDIR,IHDIF,IDIR,IDIF,IT)
CALL VISIRR(Vdir,Vsky,Vg)

            DO D=1, NDAY
                  DO PR=1, PERIOD
                        DO I=1, NWALL
                              IF ((TRAN(I) > 0) .OR. (VTRAN(I) > 0)) THEN
                              IF (COSD(INCIDENT(I,D,PR)) > 0) THEN
                                    QDIR(I,D,PR) = &
                              (LENGTH(I)*WIDTH(I))*(TRAN(I) &
                              *(IDIR(I,D,PR)-Vdir(I,D,PR)) + &
                               VTRAN(I)*Vdir(I,D,PR))
                              ELSE
                                    QDIR(I,D,PR) = 0
                              END IF
                                    QDIF(I,D,PR) = (LENGTH(I)*WIDTH(I))*(TRAN(I) &
                                                *(IDIF(I,D,PR)-Vsky(I,D,PR)) &
                                                + VTRAN(I)*(Vsky(I,D,PR)))
                              ELSE
                                    QDIR(I,D,PR) = 0
                                    QDIF(I,D,PR) = 0
                              END IF
                        END DO
                  END DO
            END DO
      SUMDIFRATE(:,:) = 0
      SUMDIRRATE(:,:) = 0
      DO D=1, NDAY
            DO PR=1, PERIOD
                  SUM = 0
                  DO I=1, NWALL
                        IF ((TRAN(I) == 0) .AND. (VTRAN(I) == 0))  THEN
                          SUM = SUM + LENGTH(I)*WIDTH(I)
                        ELSE
                          SUM = SUM
                        END IF
                              SUMDIFRATE(D,PR)  = SUMDIFRATE(D,PR) &
                               + QDIF(I,D,PR)
                              SUMDIRRATE(D,PR)  = SUMDIRRATE(D,PR) &
                               + QDIR(I,D,PR)
                  END DO
            END DO
            DO PR=1, PERIOD
```

```
                              DO I=1, NWALL
                                        IF (I == 1) THEN
                                                  ISW_FLUX(I,D,PR) = SUMDIFRATE(D,PR)/SUM &
                      + SUMDIRRATE(D,PR)/(LENGTH(1)*WIDTH(1))
                                        ELSE
                                                  ISW_FLUX(I,D,PR) = SUMDIFRATE(D,PR)/SUM
                                        END IF
                              END DO
                    END DO
          END DO

END SUBROUTINE SW_INSIDE

!-----------------------------------------------------------------------------------------------------------------------

SUBROUTINE INCIDENTIRR(IHDIR,IHDIF,IDIR,IDIF,IT)

REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT):: IDIR,IDIF,IT
REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: IHDIF,IHDIR
REAL,DIMENSION(NDAY,PERIOD) :: INDIR
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: INCIDENT
REAL :: Iextra
REAL,DIMENSION(NDAY,PERIOD) :: KT
REAL,DIMENSION(NDAY) :: C = (/0.058,0.06,0.071,0.097,0.121,0.134,0.136,0.122,0.092,0.073,0.063,0.057/)

! DECLARE VARIABLES
!         IDIR = Plane or outside surface direct irradiance, W/m^2
!         IDIF = Outside surface diffuse irradiance, W/m^2
!         IT   = Total outside irradiance on the outside surface, W/m^2
!         Gref = Ground reflection

CALL SUN(NDAY,NWALL,DAY,PERIOD,LAT,LONG, &
LONGstd,DIR,WANGLE,INCIDENT)

          DO D=1, NDAY
                    DO PR=1, PERIOD
                              IF (COSD(INCIDENT(2,D,PR)) > 0) THEN
                                        INDIR(D,PR) = TSOLAR(D,PR)&
                                        /(COSD(INCIDENT(2,D,PR)) + C(D))
                                        IHDIR(D,PR) = INDIR(D,PR)*COSD(INCIDENT(2,D,PR))
                                        IHDIF(D,PR) = TSOLAR(D,PR) - IHDIR(D,PR)
                              ELSE
                                        IHDIR(D,PR) = 0
                                        IHDIF(D,PR) = 0
                              END IF
                    END DO
          END DO

          DO D=1, NDAY
                    DO PR=1, PERIOD
                              DO I=1, NWALL
                                        IDIF(I,D,PR) = IHDIF(D,PR)*(1+COSD(WANGLE(I)))/2 &
                                                      + TSOLAR(D,PR)*Gref*(1-COSD(WANGLE(I)))/2
                                        IF (COSD(INCIDENT(I,D,PR)) > 0)   THEN
                                                  IDIR(I,D,PR) = INDIR(D,PR)*COSD(INCIDENT(I,D,PR))
                                        ELSE
```

```
                                        IDIR(I,D,PR) = 0
                                END IF
                                IT(I,D,PR) = IDIR(I,D,PR) + IDIF(I,D,PR)
                        END DO
                END DO
        END DO

END SUBROUTINE INCIDENTIRR

!-----------------------------------------------------------------------------------------------------------------------------------

! THE FOLLOWING SUBROUTINES ARE THE SUBROUTINE TOOL
! USED TO CALCULATE BY UPPERED SUBROUTINES.



SUBROUTINE SURFACE_PARALLEL(X,Y,L,F)

!       THIS SUBROUTINE EVALUATES VIEW FACTOR OF THE TWO RECTANGULAR SURFACES WHICH ARE
!       PARALLEL AND DIRECTLY OPPOSITE EACH OTHER.

        REAL,INTENT(IN) :: X,Y,L
        REAL,INTENT(OUT) :: F
        REAL :: Xb,Yb,TERMX,TERMY,TERMXY
        REAL :: TERM,TERM1,TERM2,TERM3,TERM4
        REAL,PARAMETER :: PI = 3.141592654

        Xb = X/L
        Yb = Y/L
        TERMX = 1 + Xb**2
        TERMY = 1 + Yb**2
        TERMXY = 1+ Xb**2 + Yb**2
        TERM = 2/(PI*Xb*Yb)
        TERM1 = LOG((TERMX*TERMY/TERMXY)**0.5)
        TERM2 = Xb*(TERMY**0.5)*ATAN(Xb/TERMY**0.5)
        TERM3 = Yb*(TERMX**0.5)*ATAN(Yb/TERMX**0.5)
        TERM4 = -Xb*ATAN(Xb)-Yb*ATAN(Yb)
        F = TERM*(TERM1+TERM2+TERM3+TERM4)

END SUBROUTINE SURFACE_PARALLEL

!-----------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE SURFACE_PERPENDICULAR(X,Y,Z,F)

!       THIS SUBROUTINE EVALUATES VIEW FACTOR OF THE TWO RECTANGULAR SURFACES WHICH ARE
!       ADJACENT AND PERPENDICULAR EACH OTHER.

        REAL,INTENT(IN) :: X,Y,Z
        REAL,INTENT(OUT) :: F
        REAL :: H, W
        REAL,PARAMETER :: PI = 3.141592654
        REAL :: TERMW, TERMH,TERMWH,TERMHW,TERMHWR
        REAL :: TERM,TERM1,TERM2,TERM3

        H = Z/X
```

```
        W = Y/X

        TERMH = 1+H**2
        TERMW = 1+W**2
        TERMWH = 1 + W**2 + H**2
        TERMHW = H**2 + W**2
        TERMHWR = (H**2 + W**2)**0.5
        TERM = 1/(PI*W)
        TERM1 = W*ATAN(1/W)+H*ATAN(1/H)
        TERM2 = TERMHWR*ATAN(1/TERMHWR)
        TERM3 = 0.25* LOG((TERMW*TERMH/TERMWH)*(W**2*TERMWH/(TERMW*TERMHW))**(W**2) &
            * (H**2*TERMWH/(TERMH*TERMHW))**(H**2))
        F = TERM*( TERM1 - TERM2 + TERM3)

END SUBROUTINE SURFACE_PERPENDICULAR

!-------------------------------------------------------------------------------------------------------------------


SUBROUTINE GLARE_CONST(LENGTH,WIDTH,OSP,Ewin,Ein,Eod,DGI)

        REAL :: X,Y,A,B,C,D,APP_SOLID_A,SOLID_A,Lwin,Lin,Lod,CON_F
        REAL,PARAMETER :: PI = 3.141592654
        REAL,INTENT(IN) :: LENGTH,WIDTH,OSP,Ewin,Ein,Eod
        REAL,INTENT(OUT) :: DGI

        X = LENGTH/(2*OSP)
        Y = WIDTH/(2*OSP)
        A = X/(1+X**2)**0.5
        B = Y/(1+X**2)**0.5
        C = Y/(1+Y**2)**0.5
        D = X/(1+Y**2)**0.5
        CON_F = (A*ATAN(B) + C*ATAN(D))/PI
        APP_SOLID_A = LENGTH*WIDTH*COS(ATAN(X))*COS(ATAN(Y))/OSP**2
        SOLID_A = 2*PI*CON_F
        Lwin = Ewin/(CON_F*PI)
        Lin = Ein/PI
        Lod = Eod/(2*(PI-1))
        DGI = (0.478*Lod**1.6*SOLID_A**0.8)/(Lin + (0.07*APP_SOLID_A**0.5*Lwin))

END SUBROUTINE GLARE_CONST

!-------------------------------------------------------------------------------------------------------------------
END MODULE SOLAR_FLUX
```

โมดูล ENERGY

```
MODULE ENERGY

USE DATATRANSFER
USE SOLAR_FLUX
USE PEOPLE
```

```
USE AIR_PROPERTIES
USE RESPONSE_FACTOR

CONTAINS

SUBROUTINE ENERGY_CAL(NX,PFR,REPORT,X,OF)


          INTEGER,PARAMETER :: DP = 8
          INTEGER,INTENT(IN) :: REPORT ! ENERGY REPORT (0 = NO REPORT,1 = REPORT)


          INTEGER,INTENT(IN) :: NX
          REAL,INTENT(IN) :: PFR
          REAL,DIMENSION(NVAR),INTENT(IN) :: X
          REAL,INTENT(OUT) :: OF
          INTEGER :: PR


!         DECLARE PARAMETER FOR GLARE CALCULATION
          REAL,DIMENSION(NWALL,NDAY,PERIOD) :: DGI,QDIF,QDIR

!         DECLARE SOLAR_FLUX MODULE
          REAL,ALLOCATABLE,DIMENSION(:,:,:) :: ISW_FLUX
          REAL,ALLOCATABLE,DIMENSION(:,:,:) :: ART_SW_FLUX
          REAL,ALLOCATABLE,DIMENSION(:,:) :: LUMENart,ART_CONV_RATE
          REAL,ALLOCATABLE,DIMENSION(:,:,:) :: OSW_FLUX

!         DECLARE PEOPLE MODULE
          REAL,ALLOCATABLE,DIMENSION(:) :: CONV_PEOPLE_RATE,PEOlat
          REAL,ALLOCATABLE,DIMENSION(:,:) :: RAD_PEOPLE_FLUX

!         DECLARE INTERNAL VARIABLE
          INTEGER :: DATE
          REAL :: SUMAREA
          REAL,DIMENSION(NWALL) :: AREA,Aos,Fos,EMITo
          REAL,DIMENSION(NWALL,PERIOD) :: FLUXki,FLUXko,OLDTso,OLDTsi,NEWTso,NEWTsi
          INTEGER :: ITER_DATE,ITER_HB
          REAL,DIMENSION(NWALL,PERIOD) :: OLDo,OLDi
          REAL :: SUM,SUM1
          REAL,DIMENSION(NWALL,PERIOD) :: FLUXbal,To,hrad
          REAL,PARAMETER :: STEFAN = 5.6697E-8
          REAL,DIMENSION(NWALL,PERIOD) :: hrsky,hrg,Tsky,Tg
          REAL,DIMENSION(NWALL,PERIOD) :: FLUXout_conv
          REAL,DIMENSION(NWALL,PERIOD) ::  CONV_FLUX
          REAL,DIMENSION(NWALL,NDAY,PERIOD) :: hi,ho
          REAL(KIND=DP),DIMENSION(NWALL,PERIOD) ::SUMYO,SUMZO,SUMFLUXO,SUMXI,SUMYI,SUMFLUXI
          REAL,DIMENSION(NWALL,PERIOD) ::  Hout,Hin
          REAL,DIMENSION(NWALL,PERIOD) ::  ERRi,ERRo
          REAL,DIMENSION(NWALL,PERIOD) :: OLDFi,OLDFo
          INTEGER :: IFLAG,IFSUM
          REAL,DIMENSION(NWALL,NDAY,PERIOD) :: Tso,Tsi
          REAL,DIMENSION(NDAY,PERIOD) :: Qsen,Qlat
          REAL,PARAMETER :: vsur = 0.814         !(m^3/kg)
          REAL,PARAMETER :: cpa = 1006           !(J/kg K)
          REAL,DIMENSION(NDAY,PERIOD) :: INFsen,VENTsen
```

```
        REAL,DIMENSION(NDAY,PERIOD) :: INFlat,VENTlat
        REAL :: hfg
        REAL :: Wz
        REAL,DIMENSION(NDAY,PERIOD) :: COOLINGrate,Eday
        REAL,DIMENSION(NDAY,PERIOD) :: HOURcool,HOURlight,luxART,luxDLIGHT
        REAL :: YEARcool,YEARlight
        INTEGER,PARAMETER :: MAX_ITER=100
        REAL,DIMENSION(NX) :: LX,UX,UPPER,LOWER
        REAL :: WALLHEAT,QEQUIP
        REAL :: RCR
        REAL,DIMENSION(NDAY,PERIOD) :: WALLconv,LIGHT_HEAT
        REAL,DIMENSION(NDAY) :: TOTAL_DATE_WALLconv,GLASStran,PEOPLEsen ,PEOPLElat,DDGImax
        REAL,DIMENSION(12) :: NDATE = (/31.0,28.0,31.0,30.0,31.0,30.0,31.0 ,31.0,30.0,31.0,30.0,31.0/)
        REAL,DIMENSION(NWALL) :: SUMADIF
        REAL :: LEN7,LEN8,LEN9,LEN10,WID7,WID8,WID9,WID10 &
                ,VIS_TRAN,VIS_REFLECT,NON_TRAN,NON_ABSORB
        REAL :: TRANsol
        REAL,DIMENSION(NWALL,2) :: REFLECT
        F = 0



!       ***CONVERT MINIMIZE VARIABLES TO BUILDING PARAMETER***
        CALL CONVERT_VAR(NX,X,LEN7,LEN8,LEN9,LEN10,WID7 &
                         ,WID8,WID9,WID10,VIS_TRAN )
!       CALCULATE INSIDE SHORT WAVE FLUX
        ALLOCATE(ISW_FLUX(NWALL,NDAY,PERIOD))
        CALL  SW_INSIDE(TRANsol,ISW_FLUX)
!       CALCULATE ARTIFICIAL LIGHT
        ALLOCATE(ART_SW_FLUX(NWALL,NDAY,PERIOD))
        ALLOCATE(ART_CONV_RATE(NDAY,PERIOD))
        ALLOCATE(LUMENart(NDAY,PERIOD))
        CALL HEAT_LIGHT(ART_SW_FLUX,ART_CONV_RATE,LUMENart)
!       CALCULATE HEAT TRANSFER FROM PEOPLE
        ALLOCATE(CONV_PEOPLE_RATE(PERIOD), &
       RAD_PEOPLE_FLUX(NWALL,PERIOD),PEOlat(PERIOD))
      CALL HEAT_PEOPLE(NWALL,PERIOD,PERSON,SENSIBLEpeo  &
      ,LATENTpeo,LENGTH,WIDTH ,CONV_PEOPLE_RATE,RAD_PEOPLE_FLUX,PEOlat)
!       CALCULATE OUTSIDE SHORTWAVE FLUX INCIDENT ON OUTSIDE SURFACE
        ALLOCATE(OSW_FLUX(NWALL,NDAY,PERIOD))
        CALL SW_OUTSIDE(OSW_FLUX)

        DO DATE =1, NDAY ! CALCULATE DAY HEAT BALANCE LOOP.
!       INITIAL GAUSSING FOR THE FIRST ITERATION
                                FLUXki(:,:) = 0
                                FLUXko(:,:) = 0
                                OLDFo(:,:) = 0
                                OLDFi(:,:) = 0
                                OLDTso(:,:) = 30
                                OLDTsi(:,:) = 30
                                NEWTso(:,:) = 0
                                NEWTsi(:,:) = 0
                                ITER_DATE = 0

                        DO      !          DATE ITERATION
                                ITER_DATE = ITER_DATE + 1
```

```
                    DO PR =1, PERIOD
                        ITER_HB = 0
                        DO        ! HOURLY(PERIOD) ITERATION
                            ITER_HB = ITER_HB + 1
                            DO I=1, NWALL
                                SUM = 0
                                SUM1 = 0
                                DO J=1, NWALL
                                IF (J/=I) THEN   SUM = SUM +  &
                               AREA(J)*EMISSION(J,IN) &
                                      *(OLDTsi(J,PR)+273)
                                SUM1 = SUM1 + AREA(J)*EMISSION(J,IN)
                               ELSE
                                SUM = SUM
                                        SUM1 = SUM1
                                END IF
                                END DO
                    DO J=1, NWALL
                          To(J,PR) = (SUM/SUM1) - 273
                          hrad(J,PR) = 4*STEFAN*Fw(J)*((OLDTsi(J,PR)+273 + Tw(J,PR))/2)**3
                    END DO
                    SUM = 0
                    DO J=1, NWALL
                           SUM = SUM + AREA(J)*hrad(J,PR)*(OLDTsi(J,PR)-Tw(J,PR))
                    END DO
                    FLUXbal(I,PR) = SUM/SUMAREA
          IF (I>1) THEN ! CEILING(I=2) AND VERTICAL WALLS(I>2)
             CALL OUTSIDE_LONG(WANGLE(I),EMISSION(I,OUT),OLDTso(I,PR) &
                        ,Tsur(DATE,PR),hrsky(I,PR),hrg(I,PR),Tsky(I,PR),Tg(I,PR))
             CALL OUTSIDE_CONV(TERRAIN,BUHIGHT,Zo,DIRwind(DATE,PR) &
                          ,Vwind(DATE,PR),Tsur(DATE,PR),DIR(I),WIDTH(I),WANGLE(I) &
                          ,LENGTH(I),ROUGHTNESS(I,OUT),OLDTso(I,PR),ho(I,DATE,PR) &
                          ,FLUXout_conv(I,PR))
          ELSE
              FLUXout_conv(I,PR) = 0
              ho(I,DATE,PR) = 500
               hrsky(I,PR) = 0
               hrg(I,PR) = 0
                Tsky(I,PR) = 0
                Tg(I,PR) = 0
          END IF
        CALL INSIDE_CONVEC(WANGLE(I),Tz,OLDTsi(I,PR),hi(I,DATE,PR),CONV_FLUX(I,PR))
        CALL SUMFLUX(PR,PERIOD,OLDTsi(I,:),OLDTso(I,:),Xr(I,:),Yr(I,:) &
                  ,Zr(I,:),Fr(I,:),FLUXki(I,:),FLUXko(I,:),SUMYO(I,PR),SUMZO(I,PR) &
                  ,SUMFLUXO(I,PR),SUMXI(I,PR),SUMYI(I,PR),SUMFLUXI(I,PR))
Hout(I,PR) = -SUMYO(I,PR) + SUMZO(I,PR) + SUMFLUXO(I,PR)
Hin(I,PR) = -SUMXI(I,PR) + SUMYI(I,PR) + SUMFLUXI(I,PR)
NEWTso(I,PR) = (Yr(I,1)*(OLDTsi(I,PR)+273)-Hout(I,PR) &
          +OSW_FLUX(I,DATE,PR)+ho(I,DATE,PR)*(Tsur(DATE,PR)+273) &
          +hrg(I,PR)*Tg(I,PR)+hrsky(I,PR)*Tsky(I,PR)) &
          /(Zr(I,1)+ho(I,DATE,PR)+hrg(I,PR)+hrsky(I,PR)) - 273
NEWTsi(I,PR) = (ISW_FLUX(I,DATE,PR)+Yr(I,1)*(NEWTso(I,PR)+273) &
          +Hin(I,PR)+hi(I,DATE,PR)*(Tz+273)+hrad(I,PR) &
          *(Tw(I,PR)+273)+ FLUXbal(I,PR) &
          +RAD_PEOPLE_FLUX(I,PR)+ART_SW_FLUX(I,DATE,PR)) &
```

```
                    /(Xr(I,1)+hi(I,DATE,PR)+hrad(I,PR)) - 273
        FLUXko(I,PR) = -Yr(I,1)*(NEWTsi(I,PR)+273)+Zr(I,1)*(NEWTso(I,PR)+273)+Hout(I,PR)
        FLUXki(I,PR) = Yr(I,1)*(NEWTso(I,PR)+273)-Xr(I,1)*(NEWTsi(I,PR)+273)+Hin(I,PR)
        OLDTsi(I,PR) = NEWTsi(I,PR)
        OLDTso(I,PR) = NEWTso(I,PR)

END DO ! NWALL LOOP
!       CHECK ITERATION CONVERT FOR SURFACE
!       TEMPERATURE AT THE CONSIDERING DATE
        IFLAG = 0
        IFSUM = 0
        ERRi(:,:) = 0
        ERRo(:,:) = 0
        IF (ITER_HB > 1) THEN
          DO I =1, NWALL
             ERRo(I,PR) = ABS(OLDTso(I,PR)-OLDo(I,PR))/OLDo(I,PR)
             ERRi(I,PR) = ABS(OLDTsi(I,PR)-OLDi(I,PR))/OLDi(I,PR)
            IF ((ERRo(I,PR) > 0.01) .OR. (ERRi(I,PR) > 0.01)) THEN
                IFLAG = 1
            ELSE
                IFLAG = 0
             END IF
               IFSUM = IFSUM + IFLAG
        END DO
     ELSE
                IFSUM = 1
     END IF

!       RECORD OLD VALUE OF THE INSIDE AND
!       OUTSIDE SURFACE TEMPERATURE DURING ITERATION
        DO I=1, NWALL
                OLDo(I,PR) = OLDTso(I,PR)
                OLDi(I,PR) = OLDTsi(I,PR)
        END DO
                IF (IFSUM == 0) EXIT

        END DO ! HOURLY(PERIOD) ITERATION LOOP
END DO ! PERIOD LOOP
!       CHECK ITERATION CONVERT FOR INSIDE AND OUTSIDE SURFACE
!       HEAT FLUX AT THE CALCULATION DATE
                                IFLAG = 0
                                IFSUM = 0
                                ERRi(:,:) = 0
                                ERRo(:,:) = 0
                                IF (ITER_HB > 1) THEN
                DO I =1, NWALL
                 DO PR=1, PERIOD
                        ERRo(I,PR) = ABS(FLUXko(I,PR)-OLDFo(I,PR))/OLDFo(I,PR)
                        ERRi(I,PR) = ABS(FLUXki(I,PR)-OLDFi(I,PR))/OLDFi(I,PR)
                        IF ((ERRo(I,PR) > 0.05) .OR. (ERRi(I,PR) > 0.05)) THEN
                                        IFLAG = 1
                                ELSE
                                        IFLAG = 0
                                END IF
                                        IFSUM = IFSUM + IFLAG
                        END DO
```

```
                    END DO
                                        ELSE
                                                            IFSUM = 1
                                        END IF

                                        IF ((IFSUM == 0) .OR. (ITER_DATE==MAX_ITER)) EXIT

!          RECORD OLD VALUE OF INSIDE AND OUTSIDE SURFACE HEAT FLUX
                              OLDFi(:,:) = FLUXki(:,:)
                              OLDFo(:,:) = FLUXko(:,:)

                    END DO ! ITERATION DATE

                              DO I=1, NWALL
                                        DO PR=1, PERIOD
                                                  Tso(I,DATE,PR) = NEWTso(I,PR)
                                                  Tsi(I,DATE,PR) = NEWTsi(I,PR)
                                        END DO
                              END DO

          END DO ! DAY HEAT BALANCE CALCULATION LOOP

!          CALCULATE TOTAL RATE CONVECTIVE WALL SENSIBLE HEAT(J/s)
                    WALLconv(:,:) = 0
                    DO DATE=1, NDAY
                              DO PR=1, PERIOD
                                        DO I=1, NWALL
                                                  WALLconv(DATE,PR) = WALLconv(DATE,PR) &
                                                   + hi(I,DATE,PR)*AREA(I)*(Tsi(I,DATE,PR)-Tz)
                                        END DO
                              END DO
                    END DO

!                   DO PR=1, PERIOD
!                   END DO

! TOTAL ENERGY FROM WALL CONVECTION (J/DATE) FOR EACH DAY

                    TOTAL_DATE_WALLconv(:) = 0
                    DO DATE=1, NDAY
                              DO PR=1, PERIOD
                                    TOTAL_DATE_WALLconv(DATE) = TOTAL_DATE_WALLconv(DATE) &
                                                          + 3600*WALLconv(DATE,PR)          ! J
                              END DO
                    END DO

! HEAT FROM ARTIFICIAL LIGHT (J/s)

          LIGHT_HEAT(:,:) = 0
          DO DATE=1, NDAY
                    DO PR=1, PERIOD
                              DO I=1, NWALL
                               LIGHT_HEAT(DATE,PR) = LIGHT_HEAT(DATE,PR) + &
                                    ART_SW_FLUX(NWALL,DATE,PR)*AREA(I) &
                                   + ART_CONV_RATE(DATE,PR)
                              END DO
```

```
                END DO
        END DO
!       CALCULATE TOTAL HOURLY SENSIBLE HEAT RATE (J/s)
                DO DATE=1, NDAY
                        Qsen(DATE,:) = 0
                        DO PR=1, PERIOD
                         Qsen(DATE,PR) = Qsen(DATE,PR) +  WALLconv(DATE,PR) &
                   + CONV_PEOPLE_RATE(PR)
                        END DO
                END DO
!       CALCULATE HOURLY INFILTRATION AND VENTILATION HEAT RATE (J/s)
                CALL SPEC_HUMID (Tz,RHz,Psur,Wz)
                DO DATE=1, NDAY
                        hfg = 0
                DO PR=1, PERIOD
               INFsen(DATE,PR) = (ACHinf*(AREA(1)*WIDTH(3))/3600)*1200*ABS(Tsur(DATE,PR)-Tz)
              VENTsen(DATE,PR) = 1.23*Vvent*PERSON(PR)*0.47*ABS(Tsur(DATE,PR)-Tz)
              INFlat(DATE,PR) = (ACHinf*(AREA(1)*WIDTH(3))/3600)*  (Wsur(DATE,PR) &
                              -Wz)*(4775+1.998*(Tsur(DATE,PR)-Tz))
        VENTlat(DATE,PR) = 3010*Vvent*PERSON(PR)*0.47*(Wsur(DATE,PR)-Wz)
                END DO
                END DO
!       CALCULATE HOURLY TOTAL INTERNAL LATENT HEAT RATE (J/s)
                DO DATE=1, NDAY
                Qlat(DATE,:) = 0
                        DO PR=1, PERIOD
                                Qlat(DATE,PR) = PEOlat(PR) + VENTlat(DATE,PR)
                        END DO
                END DO
        QEQUIP = EQUIP*(WIDTH(1)*LENGTH(1)*NFLOOR)
!       CALCULATE HOURLY TOTAL HEAT RATE(J/s)
                DO DATE=1, NDAY
                        DO PR=1, PERIOD
                            COOLINGrate(DATE,PR) = Qsen(DATE,PR)+ Qlat(DATE,PR)+ INFsen(DATE,PR) &
                                + VENTsen(DATE,PR) + ART_CONV_RATE(DATE,PR) &
                                + QEQUIP
                        END DO
                END DO

!       CALCULATE AVERAGE HOURLY ENERGY USEAGE,
!       AND YEAR ENERGY USEAGE FOR COOLING MACHINE(J)
                CALL CHILLER(NDAY,PERIOD,CL,Tce,IRR,COOLINGrate,HOURcool,YEARcool)
!       END OF VARIABLE LOAD SYSTEM COOLING CONTROL
        END IF
!       CALCULATE AVERAGE HOURLY ENERGY USEAGE
!       , AND YEAR ENERGY USEAGE FOR LIGHTING MACHINE(J)
                YEARlight = 0
                DO DATE=1, NDAY
                        DO PR=1, PERIOD
                        HOURlight(DATE,PR) = (LUMENart(DATE,PR)/EFFICACY)*3600
                        YEARlight = YEARlight + NDATE(DATE)*HOURlight(DATE,PR)
                        END DO
                END DO
!       CALCULATE TOTAL ENERGY CONSUMPTION (10^13 J)
        OF = (YEARcool + YEARlight)*1E-12
!       GLARE CALCULATE SECTION
```

```
          CALL GLARE_INDEX(Eday,DGI)
IF (REPORT /= 0) THEN
!         CALCULATE DAILY MAXIMUM DAYLIGHT INDEX
          DDGImax(:) = 0
          DO DATE =1, NDAY
                    DDGImax(DATE) = MAXVAL(DGI(:,DATE,:))
          END DO
OPEN(UNIT=106,FILE='RESULT.ENG',STATUS='REPLACE',ACTION='WRITE')
WRITE(106,*) 'REPORT FOR OPTIMIZATION BUILDING ENERGY RESULT '
WRITE(106,*) '=============================================='
WRITE(106,*)
WRITE(106,*) 'YEARLY LIGHTING CONSUMPTION (J) : ',';',YEARlight !*1E-6 ,' MJ '
WRITE(106,*) 'YEARLY COOLING CONSUMPTION (J) : ',';',YEARcool !*1E-6 ,' MJ '
WRITE(106,*) 'TOTAL YEARLY CONSUMPTION (J) :',';',(YEARlight+YEARcool) !*1E-6,' MJ '
WRITE(106,*) 'OVERALL SOLAR TRANSMISSTION (J) :',';', TRANSol
WRITE(106,*) 'MAXIMUM DAYLIGHT GLARE INDEX (DGIN): ',';',MAXVAL(DGI)
DO DATE =1, NDAY
          DO PR=1, PERIOD
                    IF (MAXVAL(COOLINGrate)==COOLINGrate(DATE,PR)) THEN
                              WRITE(106,*) 'MAXIMUM COOLING LOAD : MONTH/ HOUR:',';',DATE,'/',PR
                              WRITE(106,*) 'MAX COOLING RATE (W): ',';',COOLINGrate(DATE,PR)
                    END IF
                    IF (MAXVAL(LUMENart)==LUMENart(DATE,PR)) THEN
                              WRITE(106,*) 'MAXIMUM ARTIFICIAL LIGHT USED (lm): MONTH/
HOUR:',';',DATE,'/',PR
                              WRITE(106,*) 'MAX ART LUMENANCE (lm):',';',LUMENart(DATE,PR)
                    END IF
          END DO
END DO
WRITE(106,*)
WRITE(106,*) 'ENERGY REPORT (W)'
WRITE(106,*) '====================='
WRITE(106,*) 'SENSIBLE HEAT (W) REPORT :: '
WRITE(106,*) 'HOURLY EQUIPMENT LOAD :: ', QEQUIP
WRITE(106,*) 'WALL CONVECTION,CONVECTION FROM LIGHT,TOTAL HEAT FROM LIGHT &
       ,PEOPLE CONVECTION,SEN. HEAT FROM VENT ::'
          DO DATE =1, NDAY
                    WRITE(106,*) ' MONTH : ' ,';',DATE
          DO PR=1, PERIOD
                    WRITE(106,*)  PR,';',WALLconv(DATE,PR),';',ART_CONV_RATE(DATE,PR) &
                ,';',CONV_PEOPLE_RATE(PR),';',VENTsen(DATE,PR)
          END DO
          END DO
WRITE(106,*) 'LATENT HEAT (W) REPORT :: '
WRITE(106,*) 'LATENT HEAT FROM PEO,VENTILATION ::'
          DO DATE =1, NDAY
                    WRITE(106,*)  ' MONTH : ' ,';',DATE
          DO PR=1, PERIOD
                    WRITE(106,*)  PR,';',PEOlat(PR),';',VENTlat(DATE,PR)
          END DO
          END DO
WRITE(106,*) 'COOLING RATE HEAT REPORT :: '
          DO DATE =1, NDAY
                    WRITE(106,*)  ' MONTH : ' ,';',DATE
          DO PR=1, PERIOD
                    WRITE(106,*)  PR,';',COOLINGrate(DATE,PR)
```

```
        END DO
        END DO

WRITE(106,*)
WRITE(106,*)  'UASED LUMINATION(lm), AND  MAXIMUM DAILY DGI REPORT'
WRITE(106,*) 'MONTH , ART. LIGHT'
        DO DATE=1, NDAY
                WRITE(106,*) 'MONTH : ',';', DATE
                DO PR=1, PERIOD
                        WRITE(106,*) PR,';', LUMENart(DATE,PR), ';' ,Eday(DATE,PR)
                END DO
        END DO
WRITE(106,*)
WRITE(106,*) 'MAX. GLARE INDEX OF THE MONTH :: DGIN '
        DO DATE=1, NDAY
                WRITE(106,*) 'MONTH : ',';',DATE,';',DDGImax(DATE)
        END DO
        201 FORMAT (I4,3ES14.3)
        WRITE(106,*)
        WRITE(106,*)
        RCR = 5*(FTOC-Hwp)*(LENGTH(1)+WIDTH(1))/(LENGTH(1)*WIDTH(1))
        WRITE(106,*)  ' ROOM CAVITY RATIO :: ', ';',RCR
        WRITE(106,*)
        WRITE(106,*) 'END REPORT'
END IF
DEALLOCATE(ISW_FLUX)
DEALLOCATE(ART_SW_FLUX)
DEALLOCATE(ART_CONV_RATE)
DEALLOCATE(LUMENart)
DEALLOCATE(CONV_PEOPLE_RATE,RAD_PEOPLE_FLUX,PEOlat)
DEALLOCATE(OSW_FLUX)
! DEALLOCATE(Xtf,Ytf,Ztf,Xr,Yr,Zr,Fr,ORDER,TM)
CLOSE(106)
END SUBROUTINE ENERGY_CAL

!------------------------------------------------------------------------------------------------------------------------------------------------

SUBROUTINE CHILLER(NDAY,PERIOD,CL,Tce,IRR,COOLINGrate,HOURcool,YEARcool)

        INTEGER,INTENT(IN) :: PERIOD,NDAY
        REAL,INTENT(IN) :: CL,Tce,IRR
        REAL,DIMENSION(NDAY,PERIOD),INTENT(IN) :: COOLINGrate
        REAL,INTENT(OUT) :: YEARcool
        REAL,DIMENSION(NDAY,PERIOD),INTENT(OUT) :: HOURcool
        INTEGER :: NUM
        REAL,PARAMETER :: dt = 3600
        REAL,DIMENSION(12) :: NDATE = (/31.0,28.0,31.0,30.0,31.0,30.0,31.0,31.0,30.0,31.0,30.0,31.0/)
        REAL :: COPrev,COPmax,Qmax,EDAY
        REAL,DIMENSION(NDAY,PERIOD) :: COPpart,Qpart
        INTEGER :: n

        COPpart(:,:) = 0
        Qpart(:,:) = 0
        Qmax = CL*1E3/0.284   ! W
        COPrev = 1/(Tce - 1)
        COPmax = COPrev*Qmax/(Qmax + IRR*1E3*COPrev)
```

```
        DO DATE=1, NDAY
                DO PR=1, PERIOD
                        n = INT(COOLINGrate(DATE,PR)/Qmax)
                        IF (n > 1) THEN
                                Qpart(DATE,PR) = COOLINGrate(DATE,PR) &
                        - REAL(n)*Qmax
                        ELSE
                                Qpart(DATE,PR) = COOLINGrate(DATE,PR)                ! W
                        END IF
                        COPpart(DATE,PR) = COPrev*Qpart(DATE,PR) &
                                        /(Qpart(DATE,PR) + IRR*1E3*COPrev)
                        IF (n > 1) THEN
                                HOURcool(DATE,PR)=REAL(n)*Qmax/COPmax + &
                                        Qpart(DATE,PR)/COPpart(DATE,PR)
                        ELSE
                        HOURcool(DATE,PR) = Qpart(DATE,PR)/COPpart(DATE,PR)
                        END IF
                        n = 0
                END DO
        END DO
        YEARcool = 0
        DO DATE=1, NDAY
                        EDAY = 0
                DO PR=1, PERIOD
                        EDAY = EDAY + dt*NDATE(DATE)*HOURcool(DATE,PR)
                END DO
                        YEARCOOL = YEARCOOL + EDAY
        END DO

END SUBROUTINE CHILLER

!------------------------------------------------------------------------------------------------------------------------
END MODULE
==========================================================================
```

โมดูล VISIBLE

```
MODULE VISIBLE

USE DATATRANSFER
REAL,DIMENSION(370:770) :: E0nlam,Awlam,Aglam,A0lam,Anlam
INTEGER :: LAMNANO

CONTAINS
SUBROUTINE READVIS
CHARACTER(LEN=20) :: TEXT1
OPEN (UNIT= 1000, FILE ='VISUAL.TXT',ACTION='READ')
CALL READLINE(1000,2)
```

```
    DO LAMNANO=370, 770
        READ(1000,*)TEXT1,E0nlam(LAMNANO),Awlam(LAMNANO),Aglam(LAMNANO)&
                    ,A0lam(LAMNANO),Anlam(LAMNANO)
    END DO
CLOSE(1000)
END SUBROUTINE READVIS
!-----------------------------------------------------------------------------------------------------------


SUBROUTINE VISIRR( Vdir,Vsky,Vg)

REAL,DIMENSION(NWALL,NDAY,PERIOD),INTENT(OUT) :: Vdir,Vsky,Vg
REAL,DIMENSION(370:770,NDAY,PERIOD):: TR,TOZ,TN,TG,Tw,TAS
REAL,DIMENSION(NDAY,PERIOD) :: mR,mO,mN,mM,mW,mAS
REAL,DIMENSION(NWALL,NDAY,PERIOD) :: INCIDENT
REAL,DIMENSION(370:770,NDAY,PERIOD) :: Ebh,EdRh,EdAh,Edbh
REAL,DIMENSION(370:770) :: TSOZ
REAL,DIMENSION(370:770,NDAY,PERIOD) :: TAREO
REAL :: FR1,FR2,FR,G1,G2,G3,G4,SR,TSR,TRM,LAM
REAL,DIMENSION(370:770,NDAY,PERIOD) :: SSOZ,Taa,TASS
REAL,DIMENSION(0:4) :: k = (/6.6851E-1,-2.0657E-1,1.4680E-1,-4.0565E-2,3.8811E-3/)
REAL :: SUM,TERM0,TEMP,g,Fg,as0,as1,Fa1,Fa2,Fa,Y,Sa,Tassc,Ed0
REAL :: Rb,Rd,Rs,Rb0,Rz,Tasscu,Rdi
REAL,DIMENSION(370:770,NDAY,PERIOD) :: Taau
REAL,DIMENSION(370:770,NWALL,NDAY,PERIOD) :: SVdir
REAL :: TERM1,TERM2,TERM3,TERM4,REd,REb0,REb,REg
REAL :: B,Et,STIME,HOUR,DECLINATION,ALTITUDE,AZIMUTH
CALL READVIS
CALL OPTICMASS(mR,mO,mN,mM,mW,mAS)
CALL TRANSMITTANCE(mR,mO,mN,mM,mW,mAS,TR,TOZ,TN,TG,Tw,TAS,INCIDENT,TAREO,TSOZ)
!       DETERMINE HORIZENTRAL SPECTRAL DIRECT COMPONENT
        DO LAMNANO=370, 770
                DO D=1, NDAY
                        DO PR=1, PERIOD
                                IF (COSD(INCIDENT(2,D,PR)) > 0) THEN
                                        Ebh(LAMNANO,D,PR) =
                                  COSD(INCIDENT(2,D,PR))*E0nlam(LAMNANO)*TR(LAMNANO,D,PR)   &
                                  *TOZ(LAMNANO,D,PR)*TN(LAMNANO,D,PR)*TG(LAMNANO,D,PR) &
                                  *Tw(LAMNANO,D,PR)*TAS(LAMNANO,D,PR)
                                ELSE
                                        Ebh(LAMNANO,D,PR) = 0
                                END IF
                        END DO
```

```
            END DO
      END DO
!     DETERMINE HORIZONTAL DIFFUSE COMPONENTS
!           1. RAYLEIGH DIFF. COMPONENT
            FR1 = 0.5
            DO LAMNANO=370, 770
                  LAM = REAL(LAMNANO)*1E-3
                  DO D=1, NDAY
                        DO PR=1, PERIOD
                              IF (COSD(INCIDENT(2,D,PR))>0) THEN
                                    TRM = 0.17*(1-EXP(-8*COSD(INCIDENT(2,D,PR))))
                                    SR = 3.65 - 2.3*EXP(-4*COSD(INCIDENT(2,D,PR)))
                                    TSR = 1/(117.2594*(LAM**4) - 1.3215*(LAM**2) &
                                     + 3.2073E-4 - 7.6842E-5/(LAM**2))
                                    IF (TSR < TRM) THEN
                                          FR2 = 1
                                    ELSE
                                          FR2=EXP(-((TSR-TRM)/SR)&
                                          **(0.72+COSD(INCIDENT(2,D,PR))))
                                    END IF
                                    FR=FR1*FR2
                                    TASS(LAMNANO,D,PR)=(0.8569+ 0.0436*LAM)&
                                    *TAREO(LAMNANO,D,PR)
                                    Taa(LAMNANO,D,PR)=EXP(-mAS(D,PR)*&
                                     (TAREO(LAMNANO,D,PR) - TASS(LAMNANO,D,PR)))
                                    G1= (-11.012 + 12.392*mO(D,PR))/(1 + 0.23644*mO(D,PR))
                                    G2 = 3.2656*(1 - EXP(-0.46464*(mO(D,PR)**1.25)))-&
                                     0.965936*G1
                                    G3 = 1.93187*G1 + 2*G2
                                    G4=EXP(0.31045+0.001684*mO(D,PR)- &
                                    0.28549/(mO(D,PR)**4))
                                    IF (TSOZ(LAMNANO) <= 2) THEN &
                                    SSOZ(LAMNANO,D,PR)=EXP(-G1*TSOZ(LAMNANO) &
                                    **0.95 - G2*TSOZ(LAMNANO))
                                    ELSE
                                    SSOZ(LAMNANO,D,PR)=EXP(-G3- &
                                     G4*(TSOZ(LAMNANO)-2))
                                    END IF
                                    EdRh(LAMNANO,D,PR)= FR*E0nlam(LAMNANO)* &
                                  (1-(TR(LAMNANO,D,PR)**0.9))*SSOZ(LAMNANO,D,PR) &
                                    *TN(LAMNANO,D,PR)*TG(LAMNANO,D,PR)* &
                                    Tw(LAMNANO,D,PR)*Taa(LAMNANO,D,PR) &
```

```
                                        *COSD(INCIDENT(2,D,PR))
                                ELSE
                                        EdRh(LAMNANO,D,PR) = 0
                                END IF
                        END DO
                END DO
        END DO
!       2. AEROSOL DIFF. COMPONENT
                DO LAMNANO=370, 770
                        LAM = REAL(LAMNANO)*1E-3
                        SUM = 0
                        DO I=0, 4
                                SUM = SUM + k(I)*(LAM**I)
                        END DO
                        IF (SUM < 0.99) THEN
                                g = SUM
                        ELSE
                                g = 0.99
                        END IF

                        Fg = LOG(1-g)
                        as0 = (1.459 + (0.1595 + 0.4129*Fg)*Fg)*Fg
                        as1 = (0.0783 - (0.3824 + 0.5874*Fg)*Fg)*Fg
                        DO D=1, NDAY
                                DO PR=1, PERIOD
                                        IF (COSD(INCIDENT(2,D,PR)) > 0) THEN
                                        Fa1=1-0.5*EXP((as0+ as1*COSD(INCIDENT(2,D,PR)))&
                                         *COSD(INCIDENT(2,D,PR)))
                                        IF (COSD(INCIDENT(2,D,PR))>0.05) THEN
                                                TERM0 = COSD(INCIDENT(2,D,PR))
                                        ELSE
                                                TERM0 = 0.05
                                                END IF
                                                Y = -0.5 + EXP(0.24*(TERM0**-1.24))
                                                TEMP=3.5-(4.53- &
                                                 0.82*TASS(LAMNANO,D,PR))&
                                                 *COSD(INCIDENT(2,D,PR)) + &
                                                (8.26-6.02*TASS(LAMNANO,D,PR)) &
                                                *(COSD(INCIDENT(2,D,PR))**2)
                                                IF (TEMP > 1) THEN
                                                        Sa = TEMP
                                                ELSE
```

```
                                                Sa = 1
                                        END IF
                                        IF (TASS(LAMNANO,D,PR) <= 2) THEN
                                                Fa2 = 1
                                        ELSE
                                                Fa2=EXP(- &
                                                ((TASS(LAMNANO,D,PR)-2)/Sa)**Y)
                                        END IF
                                                Fa = Fa1*Fa2
                                        Tassc = 0.0005*REAL(LAMNANO)+ 0.411
                                    Tassc=TAS(LAMNANO,D,PR)/Taa(LAMNANO,D,PR)
                                        EdAh(LAMNANO,D,PR)= &
                                        Fa*E0nlam(LAMNANO) &
                                       *(1 - Tassc)*SSOZ(LAMNANO,D,PR)&
                                       *TR(LAMNANO,D,PR) &
                                       *TN(LAMNANO,D,PR)*TG(LAMNANO,D,PR)&
                                       *Tw(LAMNANO,D,PR)*Taa(LAMNANO,D,PR)&
                                       *COSD(INCIDENT(2,D,PR))&
                                        *COSD(INCIDENT(2,D,PR))

                                ELSE
                                        EdAh(LAMNANO,D,PR) = 0
                                END IF
                        END DO
                END DO
        END DO
!       3. BACKSCATTERED DIFF. COMPONENT
        CALL TRANSMITTANCE(mR,mO,mN,mM,mW &
            ,mAS,TR,TOZ,TN,TG,Tw,TAS,INCIDENT,TAREO,TSOZ)
            DO LAMNANO=370, 770
                LAM = REAL(LAMNANO)*1E-3
                SUM = 0
                DO I=0, 4
                        SUM = SUM + k(I)*(LAM**I)
                END DO
                IF (SUM < 0.99) THEN
                        g = SUM
                ELSE
                        g = 0.99
                END IF
                Fg = LOG(1-g)
                as0 = (1.459 + (0.1595 + 0.4129*Fg)*Fg)*Fg
```

```
as1 = (0.0783 - (0.3824 + 0.5874*Fg)*Fg)*Fg
DO D=1, NDAY
        DO PR=1, PERIOD
                IF (COSD(INCIDENT(2,D,PR)) > 0) THEN
                        Fa1=1-0.5*EXP((as0+  &
                        as1*COSD(INCIDENT(2,D,PR)))&
                        *COSD(INCIDENT(2,D,PR)))&
                        Y = -0.5 + EXP(0.24*(TERM0**-1.24))
                        TEMP=3.5-(4.53- &
                        0.82*TASS(LAMNANO,D,PR))
                        *COSD(INCIDENT(2,D,PR)) + &
                        (8.26-6.02*TASS(LAMNANO,D,PR)) &
                        *(COSD(INCIDENT(2,D,PR)))**2
                        IF (TEMP > 1) THEN
                                Sa = TEMP
                        ELSE
                                Sa = 1
                        END IF
                        IF (TASS(LAMNANO,D,PR) <= 2) THEN
                                Fa2 = 1
                        ELSE
                                Fa2=EXP(- &
                               ((TASS(LAMNANO,D,PR)-2)/Sa)**Y)
                        END IF
                        Fa =Fa1*Fa2
                        TRM=0.17*(1-EXP(- &
                        8*COSD(INCIDENT(2,D,PR))))
                        SR=3.65-2.3*EXP(- &
                        4*COSD(INCIDENT(2,D,PR)))
                        TSR=1/(117.2594*(LAM**4)- 1.3215 &
                      *(LAM**2) + 3.2073E-4 - 7.6842E-5/(LAM**2))
                        IF (TSR < TRM) THEN
                                FR2 = 1
                        ELSE
                                FR2=EXP(-((TSR- &
                        TRM)/SR)**(0.72+COSD(INCIDENT(2,D,PR))))
                        END IF
                        FR=FR1*FR2
                        Taau(LAMNANO,D,PR)=EXP(-&
                         mAS(D,PR)*(TAREO(LAMNANO,D,PR)&
                         - TASS(LAMNANO,D,PR)))
                          Tasscu=TAS(LAMNANO,D,PR) &
```

```
                                        /Taau(LAMNANO,D,PR)
                                        Rz =(1 - COSD(INCIDENT(2,D,PR))&
                                        *LOG(1 + 1/COSD(INCIDENT(2,D,PR))))/0.307
                                        Rb0=0.039063-0.010104*LAM+ &
                                         \0.0077394*(LAM**2) - 0.0021669*(LAM**3)
                                        Rb=(1+(0.001209- &
                                        0.00010748*LAM)*EXP((0.11087 &
                                         +0.0017729*LAM)*INCIDENT(2,D,PR)))&
                                           *Rb0
                                        Rd = 0.0803 - 0.00365*LAM
                                        Rs= TG(LAMNANO,D,PR)*&
                                        TW(LAMNANO,D,PR)*Taau(LAMNANO,D,PR)&
                                        *TN(LAMNANO,D,PR) &
                                        *((1-FR)*(1-TR(LAMNANO,D,PR))*&
                                        S0*(Tasscu**0.5) + (1 - Fa)**0.9&
                                        *(1 - Tasscu**2))
                                         Ed0=EdRh(LAMNANO,D,PR)+&
                                        EdAh(LAMNANO,D,PR)
                                         Edbh(LAMNANO,D,PR)=  &
                                         RS*(Rb*Ebh(LAMNANO,D,PR) &
                                         *COSD(INCIDENT(2,D,PR)) &
                                          + Rd*Ed0)/(1-Rd*Rs)
                                ELSE
                                         Edbh(LAMNANO,D,PR) = 0
                                END IF

                        END DO
                END DO
        END DO

!       IRRADIANT ON HORIZONTAL SURFACE
!               1. DIRECT COMPONENT       : Vdir(I,D,PR) W/m^2
                DO I=1, NWALL
                        DO D=1, NDAY
                                DO PR=1, PERIOD
                                        IF (COSD(INCIDENT(I,D,PR)) > 0) THEN
                                                SUM = 0
                                                DO LAMNANO=370, 770
                                                    SUM=SUM+ &
                                                      SVdir(LAMNANO,I,D,PR)
                                                END DO
                                                Vdir(I,D,PR) = SUM
```

```
                        ELSE
                            Vdir(I,D,PR) = 0
                        END IF
                    END DO
                END DO
            END DO
!       2. DIFFUSE COMPONENT; Vdif W/m^2
!       2.1     SKY DIFFUSE COMPONENT :: Vsky(I,D,PR) W/m^2
        Rdi = 0
        DO I=1, NWALL
                DO D=1, NDAY
                    DO PR=1, PERIOD
                        IF (VTRAN(I) > 0) THEN
                            Rdi=(1+COSD(WANGLE(I)))/2
                        IF(COSD(INCIDENT(2,D,PR))>0) THEN
                            SUM=0
                        DO LAMNANO=370, 770
                          TEMP=Rdi*(EdAh(LAMNANO,D,PR)&
                         +Edbh(LAMNANO,D,PR)+&
                          EdRh(LAMNANO,D,PR))
                              SUM = SUM + TEMP
                        END DO
                            Vsky(I,D,PR) = SUM

                    ELSE
                        Vsky(I,D,PR) = 0
                                    END IF
                        ELSE
                            Vsky(I,D,PR) = 0
                        END IF
                    END DO
                END DO
            END DO
!       2.2     GROUND DIFFUSE COMPONENT :: Vg(I,D,PR) W/m^2
            DO I=1, NWALL
                DO D=1, NDAY
                    DO PR=1, PERIOD
                        IF (VTRAN(I) > 0) THEN
                              B = 360*(DAY(D)-81)/364
                              Et = 9.87*SIND(2*B)-7.53*&
                                COSD(B)-1.5*SIND(B)
                        IF ((LONGstd-LONG)/15+ Et/60 > 60) THEN
```

```
STIME = PR + 1 + ((LONGstd-
LONG)/15&
+ Et/60-60)
ELSE
STIME = PR + (LONGstd-LONG)&
/15+ Et/60
END IF
HOUR = 15*(STIME-12)
DECLINATION=ASIND(-&
SIND(23.45)*COSD(360*&
(DAY(D)+10)/365.25))
ALTITUDE= ASIND(COSD(LAT)&
*COSD(DECLINATION)&
*COSD(HOUR)+SIND(LAT)&
*SIND(DECLINATION))
AZIMUTH=   &
ACOSD((SIND(ALTITUDE)&
*SIND(LAT)-SIND(DECLINATION)
/(COSD(ALTITUDE)*COSD(LAT)))
Rri = 1 - (1 + COSD(WANGLE(I)))/2
IF (COSD(INCIDENT(2,D,PR)) >= 0) THEN
SUM = 0
TERM1 = 0
TERM2 = 0
TERM3 = 0
TERM4 = 0
DO LAMNANO=370, 770
LAM=REAL(LAMNANO)*1E-3
REd = 0.0803 - 0.00365*LAM
REb0 = 0.039063 - 0.010104*LAM &
+ 0.0077394*(LAM**2) -&
0.0021669*(LAM**3)
REb=1+(0.001209- &
0.00010748*LAM)*&
EXP((0.11087 + 0.0017729*LAM)&
*INCIDENT(2,D,PR))
TERM1 = REd*(EdAh(LAMNANO,D,PR)
+ Edbh(LAMNANO,D,PR))
TERM2 = REb0 + (REb - REb0)*&
ABS(COSD(AZIMUTH-DIR(I)))
TERM3 = Ebh(LAMNANO,D,PR)&
*COSD(INCIDENT(2,D,PR))
```

```
TERM4=
Ebh(LAMNANO,D,PR)&
*COSD(INCIDENT(2,D,PR))&
+ EdAh(LAMNANO,D,PR) +&
Edbh(LAMNANO,D,PR) &
+ EdRh(LAMNANO,D,PR)
REg = (TERM1 + TERM2&
*TERM3)/TERM4
SUM = SUM + Gref*Rri&
*TERM4    REg
END DO
Vg(I,D,PR) = SUM
ELSE
Vg(I,D,PR) = 0
END IF
END DO
END DO
END DO
END SUBROUTINE VISIRR
!-------------------------------------------------------------------------------------------------------------
END MODULE VISIBLE
```

ภาคผนวก จ

ตัวอย่างการคำนวณจากโปแกรมคอมพิวเตอร์ที่ประดิษฐ์ขึ้น

เพื่อให้เกิดความชัดเจนในการแสดงตัวอย่างการคำนวณจากโปแกรมคอมพิวเตอร์ที่ได้อธิบายไว้ในภาคผนวก ง จึงได้แบ่งขั้นตอนการแสดงตัวอย่างการคำนวณออกเป็น 2 ขั้นตอนคือ

1. ตัวอย่างการคำนวณสำหรับการวิเคราะห์กำลังงานที่อาคารใช้
2. ตัวอย่างการคำนวณสำหรับการออพติไมเซชั่นและการสูญเสียโอกาสของการประหยัดพลังงาน

ข้อมูลอาคารสำหรับกรณีตัวอย่าง

- *ขนาดอาคาร* ความกว้าง 30 เมตร ความยาว 30 เมตร ความสูง 40 เมตร จำนวนชั้นทั้งหมด 12 ชั้น พื้นที่ทำความเย็นและการส่องสว่าง 10800 ตารางเมตร
- *สถานที่ตั้งและการวางตัว* กรุงเทพมหานคร (lat. 13.4N, long 100.3E) วางตัวในทิศหลัก
- *ระบบไฟส่องสว่าง* ใช้หลอดฟลูออเรสเซนต์ สัมประสิทธิ์การใช้ประโยชน์ 0.88 ประสิทธิภาพหลอดไฟ 0.7 lm/W
- *เครื่องทำความเย็น* ขนาด 200 ตัน T_{cond}/T_{evap}=1.1647 K/K , IRR = 16.204 kW
- *สภาวะออกแบบภายใน* อุณหภูมิภายใน 24.5°C 50%RH ความส่องสว่างบนระนาบทำงาน 500lux ดัชนีความจ้าสูงสุดเท่ากับ 26 การระบายอากาศ 10cfm/คน
- *ผู้อาศัย* ความหนาแน่นของผู้อาศัย 0.1คน/m^2 กิจกรรมทำงานในสำนักงาน ความร้อนสัมผัส 73 W/คน ความร้อนแฝง 59 W/คน
- *สิ่งแวดล้อมอาคาร* สัมประสิทธิ์การสะท้อนของพื้น 0.2 ค่าความน่าจะเป็นของรูปแบบรังสีดวงอาทิตย์ 99%SP ค่าความน่าจะเป็นของรูปแบบความชื้นจำเพาะ 50%HP ค่าความน่าจะเป็นของรูปแบบอุณหภูมิ 50%TP

- *คุณสมบัติของผนังสำหรับการนำความร้อน*

ชั้นของผนัง	ความหนา(m)	ความหนาแน่น (kg/m3)	สัมประสิทธิ์การนำความร้อน (W/m k)	ความจุความร้อนจำเพาะ (J/kg K)
ปูนฉาบ	0.02	2110	0.74	837.36
อิฐมอญ	0.096	2000	1.32	840
ปูนฉาบ	0.02	2110	0.74	837.36

- *คุณสมบัติของกระจกสำหรับการนำความร้อน*

	ความหนา(m)	ความหนาแน่น (kg/m3)	สัมประสิทธิ์การนำความร้อน (W/m k)	ความจุความร้อนจำเพาะ (J/kg K)
กระจก	0.003	2700	0.78	840

- *คุณสมบัติพื้นผิวของผนังและกระจก*

ผนัง	สัมประสิทธิ์การดูดกลืน	สัมประสิทธิ์การสะท้อน	สัมประสิทธิ์การแผ่รังสี
พื้นผิวภายนอก	0.25	0.5	0.925
พื้นผิวภายใน	0.25	0.5	0.925
กระจก	**สัมประสิทธิ์การดูดกลืน**	**สัมประสิทธิ์การสะท้อน**	**สัมประสิทธิ์การแผ่รังสี**
พื้นผิวภายนอก	0.2	0.2	0.84
พื้นผิวภายใน	0.2	0.2	0.84

สัมประสิทธิ์การส่งผ่าน :: $\tau_v(0) = 0.7$, $\tau_n(0) = 0.3$

- *มิติอาคาร/ทิศ*

ผนัง/กระจก	**Surface Azimuth Angle(degree)**	**ความยาว (m)**	**ความกว้าง/สูง (m)**	**Tilt Angle (degree)**
พื้น	-	30	30	180
เพดาน	-	30	30	0
ผนังแนวระดับ	0	30	40	90
ผนังแนวระดับ	90	30	40	90
ผนังแนวระดับ	180	30	40	90
ผนังแนวระดับ	270	30	40	90
กระจก	0	15	20	90
กระจก	90	15	20	90
กระจก	180	15	20	90
กระจก	270	15	20	90

ตัวอย่างการคำนวณสำหรับการวิเคราะห์กำลังงานที่ใช้

ในหัวข้อนี้จะแสดงตัวอย่างการคำนวณจากข้อมูลอาคารข้างต้น ประกอบด้วย สัมประสิทธิ์ฟังก์ชั่นถ่ายโอน ภาระการทำความเย็น ความส่องสว่างจากรังสีดวงอาทิตย์บนระนาบทำงาน ความจ้าภายในอาคาร ตลอดจนกำลังงานที่ใช้สำหรับการทำความเย็น การส่องสว่าง และกำลังงานสุทธิของอาคาร การแสดงผลการคำนวณทั้งหมดจะอ้างอิงที่เวลา 13.00 น ของวันที่ 21 พฤษภาคม

การคำนวณฟังก์ชั่นถ่ายโอนผ่านโปรแกรมย่อย R_FACTOR
(แผนภูมิรูปที่ 3ง)

<u>การแทนค่า</u>

พิจารณาผนัง :

ชั้นที่1 ปูนฉาบ $t = 0.02\,\text{m}$, $\rho = 2110\ \text{kg/m}^3$, $k = 0.74\ \text{W/m K}$, $c_p = 837.36\ \text{J/kg K}$

ชั้นที่2 อิฐมอญ $t = 0.096\,\text{m}$, $\rho = 2000\ \text{kg/m}^3$, $k = 1.32\ \text{W/m K}$, $c_p = 840\ \text{J/kg K}$

ชั้นที่3 ปูนฉาบ $t = 0.02\,\text{m}$, $\rho = 2110$ kg/m^3 , $k = 0.74$ W/m K, $c_p = 837.36$ J/kg K

ตารางที่ จ.1 แสดงผลการคำนวณสัมประสิทธิ์ฟังก์ชั่นถ่ายโอนของผนัง

n	X_n	Y_n	Z_n	Φ_n
1	23.49095	0.9168399	23.49095	5E-3
2	-12.452667	3.8710656	-12.452667	0
3	-2.0516758	2.0011882	-2.0516758	0
4	-0.7127039	0.7122024	-0.7127039	0
5	-0.2504885	0.2504835	-0.2504885	0
6	-8.81E-02	8.81E-02	-8.81E-02	-
7	-3.10E-02	3.10E-02	-3.10E-02	-
8	-1.09E-02	1.09E-02	-1.09E-02	-
9	-3.83E-03	3.83E-03	-3.83E-03	-
10	-1.35E-03	1.35E-03	-1.35E-03	-
11	-4.73E-04	4.73E-04	-4.73E-04	-
12	-1.66E-04	1.66E-04	-1.66E-04	-
13	-5.85E-05	5.85E-05	-5.85E-05	-
14	-2.06E-05	2.06E-05	-2.06E-05	-
15	-7.23E-06	7.23E-06	-7.23E-06	-
16	-2.54E-06	2.54E-06	-2.54E-06	-
17	-8.94E-07	8.94E-07	-8.94E-07	-
18	-3.14E-07	3.14E-07	-3.14E-07	-
19	-1.10E-07	1.10E-07	-1.10E-07	-
20	-3.88E-08	3.88E-08	-3.88E-08	-
21	-1.37E-08	1.37E-08	-1.37E-08	-
22	-4.80E-09	4.80E-09	-4.80E-09	-
23	-1.69E-09	1.69E-09	-1.69E-09	-
24	-5.93E-10	5.93E-10	-5.93E-10	-

การคำนวณมุมตกกระทบของผนังด้านต่างๆ ของอาคาร ผ่านโปรแกรมย่อย SUN
(แผนภูมิรูปที่ 4ง)

<u>การแทนค่า</u>

D=5, P=13, LAT=13.4, LONG=100.3
หลังคา :: DIR(HOR)= -1, $\beta = 0$
ผนังทิศใต้ :: DIR(S)= 0 , $\beta = 90$
ผนังทิศตะวันตก :: DIR(W) = 90, $\beta = 90$
ผนังทิศเหนือ :: DIR(N) = 180, $\beta = 90$
ผนังทิศตะวันออก :: DIR(E) = 270 , $\beta = 90$

ตารางที่ จ.2 แสดงผลการคำนวณมุมตกกระทบ (θ) ของผนังอาคารด้านต่างๆ

P	DIR(HOR)	DIR(S)	DIR(W)	DIR(N)	DIR(E)
13	16.54058	96.98743	75.0845	83.01257	104.9155

การคำนวณฟลักซ์รังสีดวงอาทิตย์ตกกระทบผนังอาคาร ผ่านโปรแกรมย่อย INCIDENTIRR
(แผนภูมิรูปที่ 4ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^o$, $I_h(5,13) = 1303.93$ W/m^2

<u>ผลการคำนวณ</u> (i = S)

$I_{D,s}(S,5,13)$ =0 W/m^2 $I_{d,s}(S,5,13) + I_{g,s}(S,5,13)$ = 203.4631 W/m^2

การคำนวณฟลักซ์รังสีดวงอาทิตย์ช่วงความยาวคลื่นมองเห็นได้ตกกระทบพื้นผิวอาคารผ่านโปรแกรมย่อย VISIRR
(แผนภูมิรูปที่ 4ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^{o}$, $I_{h}(5,13) = 1303.93$ W/m^2

<u>ผลการคำนวณ</u>

$$q''_{v,D}(S,5,13) = 0 \text{ W/m}^2, \quad q''_{v,d}(S,5,13) + q''_{v,g}(S,5,13) = 87.75758 \text{ W/m}^2$$

การคำนวณฟลักซ์รังสีดวงอาทิตย์ตกกระทบและดูดกลืนที่พื้นผิวภายในผ่านโปรแกรมย่อย SW_INSIDE

(แผนภูมิรูปที่ 4ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^{o}$, $I_{D,s}(S,5,13)$ =0 W/m^2

$$I_{d,s}(S,5,13) + I_{g,s}(S,5,13) = 203.4631 \text{ W/m}^2$$

$$q''_{v,D}(S,5,13) = 0 \text{ W/m}^2$$

$$q''_{v,d}(S,5,13) + q''_{v,g}(S,5,13) = 87.75758 \text{ W/m}^2$$

<u>ผลการคำนวณ</u>

$$Q''_{\alpha sol,i}(S,5,13) = 21.90787 \text{ W/m}^2$$

การคำนวณฟลักซ์รังสีดวงอาทิตย์ตกกระทบและดูดกลืนที่พื้นผิวภายนอกผ่านโปรแกรมย่อย SW_OUTSIDE

(แผนภูมิรูปที่ 4ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^{o}$, $I_{D,s}(S,5,13)$ =0 W/m^2

$$I_{d,s}(S,5,13) + I_{g,s}(S,5,13) = 203.4631 \text{ W/m}^2$$

<u>ผลการคำนวณ</u>

$$Q''_{asol,o}(S,5,13) = 50.86577 \text{ W/m}^2$$

การคำนวณความส่องสว่างจากธรรมชาติตกกระทบพื้นผิวภายนอกอาคารผ่านโปรแกรมย่อย EXTERIOR_IRR_ILL
(แผนภูมิรูปที่ 5ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^o$, $I_{D,s}(S,5,13) = 0 \text{ W/m}^2$

$$I_{d,s}(S,5,13) + I_{g,s}(S,5,13) = 203.4631 \text{ W/m}^2$$

$$\omega_o(5,13) = 0.019825538 \text{ kgw/kga}$$

$$T_o(5,13) = 33.24\ ^\circ\text{C}$$

<u>ผลการคำนวณ</u>

$$E_{D,s}(S,5,13) = 0 \text{ lux} \quad E_{d,s}(S,5,13) + E_{g,s} = 40053.88 \text{ lux}$$

การคำนวณความส่องสว่างจากธรรมชาติบนระนาบทำงานผ่านโปรแกรมย่อย AVERAGE_DAYLIGHT
(แผนภูมิรูปที่ 5ง)

<u>การแทนค่า</u>

$$E_{D,s}(S,5,13) = 0, \quad E_{d,s}(S,5,13) + E_{g,s} = 40053.88 \text{ lux}$$

$$E_{D,s}(W,5,13) = 29868.80, \quad E_{d,s}(W,5,13) + E_{g,s}(W,5,13) = 37431.81 \text{ lux}$$

$$E_{D,s}(N,5,13) = 14116.81, \quad E_{d,s}(N,5,13) + E_{g,s}(N,5,13) = 38814.62 \text{ lux}$$

$$E_{D,s}(E,5,13) = 0, \quad E_{d,s}(E,5,13) + E_{g,s}(E,5,13) = 40053.88 \text{ lux}$$

$$L(HOR) = L(S) = L(W) = L(N) = L(E) = 30 \text{ m}$$

$$H(HOR) = H(S) = H(W) = H(N) = H(E) = 40 \text{ m}$$

$$L_g(S) = L_g(W) = L_g(N) = L_g(E) = 15 \text{ m}$$
$$H_g(S) = H_g(W) = H_g(N) = H_g(E) = 20 \text{ m}$$
$$\tau_v(0) = 0.7$$

<u>ผลการคำนวณ</u>

$$E_{day}(5,13) = 1454.669 \text{ lux}$$

การคำนวณปริมาณแสงที่ระบบไฟส่องสว่างใช้ผ่านโปรแกรมย่อย DIM_SYSTEM (แผนภูมิรูปที่ 5ง)

<u>การแทนค่า</u>

CU = 0.88, $\varepsilon = 70$ lm/W, $E_{comf} = 500$ lux, $E_{day}(5,13) = 1454.669$ lux

<u>ผลการคำนวณ</u>

$$\phi_m(5,13) = 0 \text{ lm}$$

การคำนวณความร้อนจากระบบไฟส่องสว่างผ่านโปรแกรมย่อย HEAT_LIGHT (แผนภูมิรูปที่ 5ง)

<u>การแทนค่า</u>

$\varepsilon = 70$ lm/W, $\phi_m(5,13) = 0$ lm

<u>ผลการคำนวณ</u>

$$\dot{Q}_{al}(5,13) = 0 \text{ W/m}^2$$

การคำนวณความจ้าจากกระจก ผ่านโปรแกรมย่อย GLARE_INDEX
(แผนภูมิรูปที่ 6ง)

<u>การแทนค่า</u>

ผนังทิศใต้ $\theta = 75.0845^o$

$E_{D,s}(S,5,13) = 0$ lux $E_{d,s}(S,5,13) + E_{g,s}$ =40053.88 lux

$L(HOR) = L(S) = L(W) = L(N) = L(E) = 30$ m

$H(HOR) = H(S) = H(W) = H(N) = H(E) = 40$ m

$L_g(S) = L_g(W) = L_g(N) = L_g(E) = 15$ m

$H_g(S) = H_g(W) = H_g(N) = H_g(E) = 20$ m

$\tau_v(0)$ =0.7 $\rho_v(0)$ =0.2

<u>ผลการคำนวณ</u>

$DGI(S,5,13)$ = 21.16998

การคำนวณภาระการทำความเย็นผ่านโปรแกรมย่อย ENERGY
(แผนภูมิรูปที่ 7ง)

<u>การแทนค่า</u>

เวลา 13.00 น 21 พฤษภาคม จำนวนผู้อาศัย 972 คน

T_i=24.5°C ω_i=0.008 kgw/kga $\dot{V}$ = 9720cfm = 0.000162 m^3/s

F_c =0.3

<u>ผลการคำนวณ</u>

$\dot{Q}_{cl}(5,13)$ = 1,069,198 W

การคำนวณกำลังงานการทำความเย็นผ่านโปรแกรมย่อย CHILLER
(แผนภูมิรูปที่ 8ง)

<u>การแทนค่า</u>

เวลา 13.00 น 21 พฤษภาคม

$\dot{Q}_{cl}(5,13) =$ 1,069,198 W $\frac{T_{cond}}{T_{evap}} - 1 =$ 0.1647 K/K , IRR = 16.204 kW

<u>ผลการคำนวณ</u>

$\dot{W}_{cl}(5,13) =$ 192,301 W

การคำนวณกำลังงานการส่องสว่างและกำลังงานสุทธิผ่านโปรแกรมย่อย ENERGY
(แผนภูมิรูปที่ 8ง)

<u>การแทนค่า</u>

เวลา 13.00 น 21 พฤษภาคม

$\dot{W}_{cl}(5,13) =$ 192,301 W

CU = 0.88, $\varepsilon = 70$ lm/W, $E_{comf} = 500$ lux

<u>ผลการคำนวณ</u>

$\dot{W}_{al}(5,13) = 0$ W

$\dot{W}(5,13) = 192{,}301$ W

ตารางที่ จ.3 อุณหภูมิพื้นผิวอาคาร เวลา 13.00 น 21 พฤษภาคม

พื้นผิวอาคาร	Tso(5,13)	Tsi(5,13)
พื้น	33.33	39.52
หลังคา	42.60	37.21
ผนังทิศใต้	32.93	29.46
ผนังทิศตะวันตก	34.64	29.54
ผนังทิศเหนือ	34.26	30.10
ผนังทิศตะวันออก	33.94	31.05
กระจกทิศใต้	32.58	32.45
กระจกทิศตะวันตก	34.04	33.87
กระจกทิศเหนือ	33.31	33.16
กระจกทิศตะวันออก	32.59	32.46

ตัวอย่างการคำนวณสำหรับการออพติไมเซชั่นและการสูญเสียโอกาสของการประหยัดพลังงาน

แผนภูมิของการออพติไมเซชั่นแสดงในรูปที่ 1ง จากข้อมูลสำหรับอาคารตัวอย่างข้างต้น ตัวแปรอิสระของปัจจัยควบคุมได้สำหรับการศึกษาวิจัยนี้สามารถแสดงได้ดังนี้

$$X = \big[L_g(S), L_g(W), L_g(N), L_g(E)$$
$$,\mathrm{H}_g(S), H_g(W), H_g(N), H_g(E)$$
$$,\tau_v(0), \rho_v(0), \tau_n(0), \alpha_n(0)\big]^T$$

กำหนดค่าเริ่มต้นปัจจัยควบคุมได้และพีนัลตี้พารามิเตอร์

$\mathrm{X}=\big[20,20,20,20,20,20,20,20,0.5,0.2,0.5,0.2\big]^T$ และ $r_k = 0.0001$

ผลจากการเซอร์ทฟังก์ชั่นพีนัลตี้ครั้งที่ 1 จะได้

$r_k = 0.0001$

$$\mathrm{X}^{*}=\big[18.625,18.625, 25.625, 25.625, 25.625$$
$$,24.875, 23.125, 25.625, 0.475, 0.225$$
$$,0.025,0.025\big]^T$$

$PF = 3.158622 \times 10^{12}$

ผลจากการเซอร์ทฟังก์ชั่นพีนัลตี้ครั้งที่ 2 จะได้

$r_k = 0.001$

$$X^{*} = [16.562, 16.5625, 27.8125, 27.5625, 27.81250$$
$$26.8125, 21.0625, 27.8125, 0.4625, 0.2375$$
$$0.0625, \ 0.0375]^{T}$$

$PF = 3.181 \times 10^{12}$

ผลจากการเซอร์ทฟังก์ชั่นพีนัลตี้ครั้งที่ 3 จะได้

$r_k = 0.01$

$$X^{*} = [17.375, 15.875, 25.1875, 27.125, 29.0, \ 30.0$$
$$22.5, 31.75, 0.35, 0.3625, 0.025, 0.1]^{T}$$

$PF = 3.217589 \times 10^{12}$

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ทำการเซอร์ทฟังก์ชั่นพีนัลตี้ครั้งที่ 20 จะได้ผลลัพธ์ที่ลู่เข้าสู่ผลเฉลยและสอดคล้องกับสมการเงื่อนไขทั้งหมดคือ

$r_k = 10^{16}$

$$X^{*} = [20.6875, 15.9375, 26.5, 26.4375, 35.3125, 34.3125$$
$$, 34.8125, 35.0625, 0.213, 0.538, 0.113, 0.013]^{T}$$

DGI สูงสุดของปีคือ 25.99

$W^{*} = 3.237 \times 10^{12}$ J

$W_{al} = 4.174 \times 10^{11}$ J

$W_{cl} = 2.82 \times 10^{12}$ J

หาเราพิจารณาการสูญเสียโอกาสของการประหยัดพลังงานโดยมีความน่าจะเป็นของรูปแบบรังสีดวงอาทิตย์ผันแปรไปเป็นที่ความน่าจะเป็น 80%SP พลังงานที่อาคารใช้ในการทำความเย็นและการส่องสว่างจะเท่ากับ $3.25736317 \times 10^{12}$ J ดังนั้นการสูญเสียโอกาสของการประหยัดพลังงานจะเท่ากับ

$$\begin{aligned} OPL(99\%SP \rightarrow 80\%SP, 50\%TP, 50\%HP) &= W(80\%SP, 50\%TP, 50\%HP) \\ &\quad - W^{*}(80\%SP, 50\%TP, 50\%HP) \end{aligned}$$

$$\begin{aligned} OPL(99\%SP \rightarrow 80\%SP, 50\%TP, 50\%HP) &= (3.25736317\text{-}3.237) \times 10^{12} \\ &= 2.0363 \times 10^{10} J \end{aligned}$$

ประวัติผู้เขียนวิทยานิพนธ์

นายธีระชาติ พรพิบูลย์ เกิดวันที่ 6 ตุลาคม 2513 ที่ จังหวัดกรุงเทพมหานคร สำเร็จการศึกษาปริญญาวิศวกรรมศาสตรบัณฑิต สาขาวิชาวิศวกรรมเครื่องกล ภาควิชาวิศวกรรมเครื่องกล คณะวิศวกรรมศาสตร์ มหาวิทยาลัยรังสิต ในปีการศึกษา 2535 และจบการศึกษาวิศวกรรมศาสตรมหาบัณฑิต สาขาวิชาวิศวกรรมเครื่องกล ภาควิชาวิศวกรรมเครื่องกล คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ในปีการศึกษา 2539 ในปีการศึกษา 2540 จนถึงปัจจุบัน รับราชการ ในตำแหน่งอาจารย์ประจำ สาขาวิชาวิศวกรรมเครื่องกล สำนักวิชาวิศวกรรมศาสตร์ มหาวิทยาลัยเทคโนโลยีสุรนารี