

Table S1. Annual energy consumption in Abu Dhabi, Hanoi and Seoul (folding type, MWh).

		Ref	0 step	1 step	2 step	3 step	4 step	5 step	6 Step	7 step	8 step	9 step
Abu Dhabi	east	heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		cooling	28.5	20.0	20.3	20.8	21.5	22.2	22.9	23.6	24.4	25.1
		lighting	1.1	3.4	3.4	3.3	3.1	2.9	2.7	2.5	2.3	2.1
		total	29.7	23.4	23.7	24.1	24.6	25.1	25.6	26.1	26.7	27.2
	south	heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		cooling	31.2	19.9	20.2	20.8	21.4	22.2	23.1	24.0	25.0	25.8
		lighting	0.9	3.4	3.4	3.2	2.9	2.5	2.2	1.9	1.7	1.4
		total	32.1	23.3	23.5	24.0	24.4	24.8	25.3	25.9	26.7	27.2
	west	heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		cooling	28.9	20.0	20.3	20.7	21.3	22.0	22.8	23.6	24.5	25.1
		lighting	1.0	3.4	3.4	3.0	2.6	2.3	2.1	2.0	1.8	1.6
		total	29.8	23.3	23.7	23.7	23.9	24.3	24.9	25.6	26.3	26.8
Hanoi	east	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
		cooling	18.5	12.4	12.6	13.0	13.4	13.9	14.4	14.9	15.5	15.9
		lighting	2.4	3.4	3.4	3.4	3.3	3.2	3.2	3.1	3.0	2.9
		total	20.9	15.9	16.0	16.4	16.8	17.2	17.6	18.1	18.5	18.9
	south	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
		cooling	19.5	12.2	12.4	12.8	13.3	13.8	14.4	15.0	15.7	16.2
		lighting	2.1	3.4	3.4	3.3	3.2	3.1	3.0	2.8	2.7	2.6
		total	21.6	15.7	15.8	16.2	16.6	17.0	17.5	17.9	18.4	18.9
	west	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
		cooling	19.2	12.4	12.6	13.0	13.4	14.0	14.5	15.1	15.7	16.2
		lighting	2.0	3.4	3.4	3.3	3.0	2.9	2.7	2.6	2.5	2.4
		total	21.3	15.9	16.0	16.4	16.5	16.9	17.3	17.8	18.3	18.8
Seoul	east	heating	3.5	7.9	7.9	7.8	7.7	7.7	7.6	7.5	7.4	7.2
		cooling	7.7	3.7	3.7	3.9	3.9	4.0	4.1	4.3	4.4	4.6
		lighting	1.1	3.4	3.4	3.3	3.0	2.7	2.3	2.0	1.7	1.5
		total	12.3	15.0	15.0	15.0	14.7	14.4	14.0	13.7	13.5	13.3
	south	heating	2.9	8.0	7.9	7.7	7.6	7.3	7.0	6.6	6.2	5.9
		cooling	10.4	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.5	4.7
		lighting	1.0	3.4	3.4	3.1	2.6	2.1	1.7	1.4	1.3	1.2
		total	14.3	15.0	14.9	14.6	14.1	13.3	12.8	12.3	12.0	11.8
	west	heating	3.7	7.9	7.9	7.8	7.7	7.6	7.6	7.4	7.3	7.2
		cooling	9.3	3.7	3.8	3.9	4.0	4.1	4.3	4.5	4.8	5.0
		lighting	1.0	3.4	3.4	3.1	2.7	2.3	1.9	1.7	1.4	1.2
		total	13.9	15.0	15.1	14.8	14.4	14.1	13.8	13.6	13.5	13.4

Table S2. Annual energy consumption in Abu Dhabi, Hanoi and Seoul (rotating type, MWh).

		Ref	0 step	1 step	2 step	3 step	4 step	5 step	6 Step	7 step	8 step	9 step
Abu Dhabi	east	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
		cooling	28.5	21.5	20.9	20.9	20.8	20.7	20.7	20.8	21.1	21.7
		lighting	1.1	3.2	3.4	3.4	3.3	3.2	3.0	2.8	2.5	2.0
		total	29.7	24.9	24.4	24.3	24.2	24.1	23.8	23.6	23.4	23.7
	south	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
		cooling	31.2	21.9	21.0	21.0	20.9	20.8	20.7	20.5	20.7	21.9
		lighting	0.9	3.2	3.3	3.3	3.3	3.2	2.9	2.6	2.2	1.8
		total	32.1	25.2	24.5	24.4	24.3	24.0	23.7	23.2	22.7	23.3
	west	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		cooling	28.9	21.6	21.0	20.9	20.8	20.6	20.6	20.9	21.4	22.6
		lighting	1.0	3.1	3.3	3.3	3.1	2.9	2.6	2.3	2.0	1.8
		total	29.8	24.7	24.3	24.2	24.0	23.6	23.3	22.9	23.3	24.4
Hanoi	east	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		cooling	18.5	14.2	13.8	13.7	13.8	13.9	14.1	14.3	14.7	15.2
		lighting	2.4	3.3	3.4	3.4	3.4	3.3	3.2	3.1	3.0	2.9
		total	20.9	17.6	17.3	17.2	17.2	17.3	17.5	17.6	17.8	18.2
	south	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		cooling	19.5	14.1	13.6	13.6	13.6	13.7	13.9	14.1	14.4	15.2
		lighting	2.1	3.3	3.4	3.4	3.4	3.2	3.1	3.0	2.9	2.6
		total	21.6	17.6	17.1	17.1	17.1	17.1	17.1	17.2	17.4	17.9
	west	heating	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		cooling	19.2	14.3	13.8	13.8	13.8	13.9	14.1	14.4	14.8	15.7
		lighting	2.0	3.3	3.4	3.3	3.3	3.1	2.9	2.7	2.6	2.5
		total	21.3	17.8	17.3	17.2	17.2	17.2	17.1	17.2	17.5	18.3
Seoul	east	heating	3.5	4.6	4.7	4.8	4.8	4.8	4.8	4.8	4.7	4.5
		cooling	7.7	5.4	5.2	5.0	5.1	5.0	4.9	5.0	5.1	5.2
		lighting	1.1	3.3	3.3	3.1	3.0	2.8	2.5	2.2	1.9	1.4
		total	12.3	13.3	13.3	13.0	12.9	12.6	12.2	12.0	11.7	11.2
	south	heating	2.9	4.2	4.5	4.8	4.6	4.7	4.7	4.4	4.1	3.8
		cooling	10.4	6.0	5.7	5.0	5.5	5.4	5.2	5.2	5.4	5.4
		lighting	1.0	3.3	3.3	3.2	3.0	2.6	2.2	1.8	1.5	1.2
		total	14.3	13.5	13.5	13.1	13.1	12.7	12.2	11.7	11.2	10.9
	west	heating	3.7	4.6	4.7	4.8	4.8	4.8	4.7	4.7	4.6	4.4
		cooling	9.3	5.5	5.2	5.1	5.1	5.0	4.9	4.4	5.1	5.8
		lighting	1.0	3.2	3.3	3.2	3.0	2.6	2.3	1.9	1.6	1.3
		total	13.9	13.4	13.3	13.1	12.8	12.4	12.0	11.4	11.4	11.5