



Island Finance Forum 2023

Quantitative Framework for Doubling the Energy Efficiency by
2030 on Small Island Nations

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Summary of CHENACT Findings

CHENACT is an energy and climate change project in the tourism sector that introduced many new concepts (e.g., EE/RE technologies, performance contracting, CDM) to its principal counterparts

There is considerable variation in the EE index among similar sized hotel properties, particularly for small hotels (<50 rooms)

Air-conditioning and lighting together account for approximately two-thirds of total electricity use in Caribbean hotels

EE projects would reduce electricity consumption by 20-30% and would yield net savings of \$280,000 to \$1 million over 7- year period for small hotels (<50 rooms) to large hotels (>200 rooms), respectively. ¹

IRR depends highly dependent on electricity tariff: 7% for 0.09 \$/kWh vs.232% for 0.40 \$/kWh

UN CCOOL

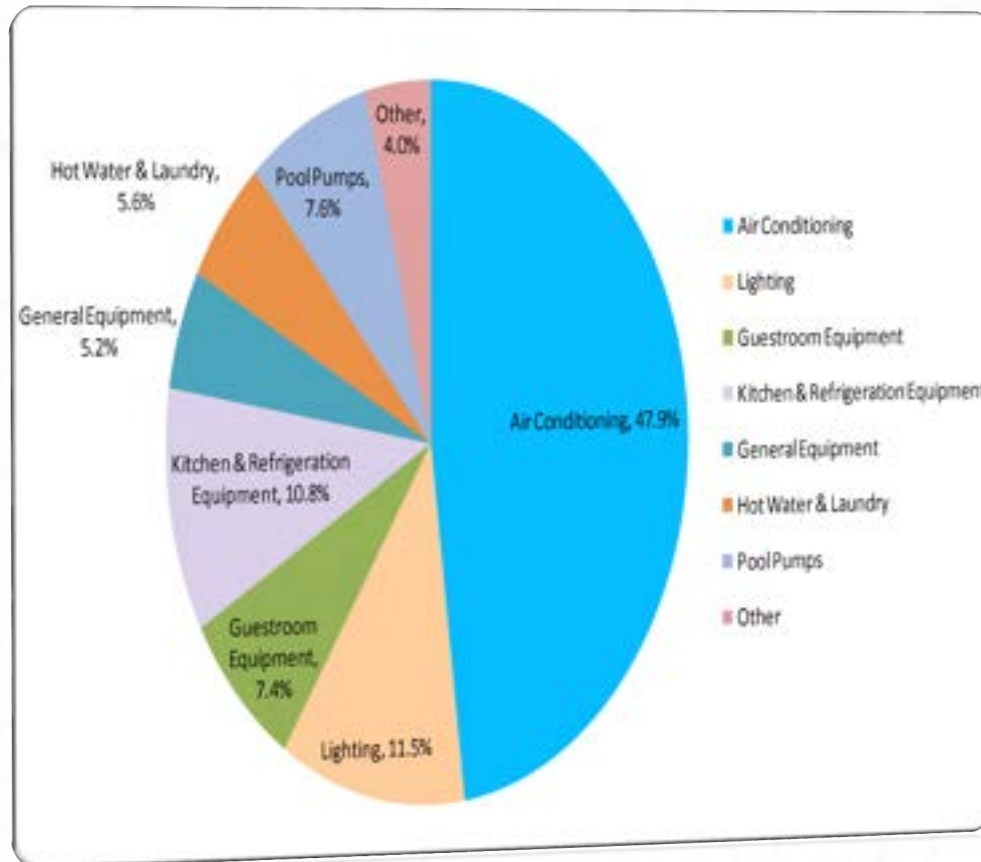
United Nations- Caribbean Cooling Initiative

Aim to assist governments to transition to more energy efficient cooling and refrigeration equipment.

Part of a larger Programme in 32 countries around the world – KCEP – The Kigali Cooling Efficiency Programme

Recognition that Cooling –for Humans, animals, food, medicines etc. is becoming the fastest growing energy requirement

Refrigerants currently used have high Global Warming Potential. In order to remain “well below” 1.5 degrees of warming we must replace those refrigerants currently being used with natural gases.



Electricity consumption in Caribbean Hotels by End use

Potential savings of 10-62% in Energy and up to 50% in water. Energy accounts for up to 60% of the operational costs in some hotels.

Energy Usage Profile

	JAMAICA	BAHAMAS	BARBADOS
RANGE	11-244 KW/GN	16-237 KW/GN	11.3- 103 KW/GN
AVERAGE	50.56	81.56	32.19
# HOTELS > 100KW/GN	3	5	1

Why the Differences?

Barbados/Eastern Caribbean

- Clientele- UK/Europe /other Caribbean
- Building Design-Open
- Temperature – fairly constant
- Use of SWH/Natural Gas
- Barbados Hotels have implemented may of the recommendations

Bahamas/Jamaica/ Northern Caribbean

- Clientele - North American
 - Building design - Enclosed
 - Temperature – Variable – gets cold!!
 - All Electricity
 - Bahamas- Electricity surcharge!
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Energy Saving opportunities in a 25-room hotel

Potential Energy savings cost of 60%!

EMO	Energy Management Opportunity	Initial Cost (US\$)	Annual Cost Savings (US\$)	Payback (years)	Annual Electrical Energy Savings (kWh)	Annual CO ₂ Savings (Tons/year)
1	Turning off of mini fridges once the room is vacant (i.e. not checked in)	-	954	-	1,578	1
2	Halogen Floodlights Retrofit	112	276	0.41	456	0
3	Replace Conventional Air conditioning Units with Inverter Units	13,160	12,496	1.05	21,037	17
4	Compact Fluorescent Lights retrofit to LED Lamps	1,750	1,272	1.38	2,103	2
5	PV Installation	13,000	4,636	2.80	7,666	6
TOTAL		28,022	19,633	1.43	32,839	26

Energy Saving opportunities in a 40-room hotel

ESO	Energy Management Opportunity	Initial Cost (US\$)	Annual Cost Savings (US\$)	Payback (years)	Annual Electrical Energy Savings (kWh)	Annual CO ₂ Savings (Tons/year)
1	Water Heater running unnecessarily	-	24,609	-	76,352	61
2	Underutilized Refrigerator	-	10,873	-	33,736	27
3	Pumps running unnecessarily	-	7,306	-	22,669	18
4	Lights turned on unnecessarily	-	3,582	-	11,114	9
5	Separating light switches in mini mart	2	1,800	-	5,585	4
6	Metal Halide retrofit with CFL	75	4,180	0.02	11,827	9
7	Heat Recovery from Refrigeration	6,475	54,074	0.12	167,770	134
8	Halogen Floodlights retrofit to CFL's	1,204	5,669	0.21	16,018	13
9	T12 replacement with LED tubes	505	2,296	0.22	6,787	5
10	Tungsten filament lamps retrofit to CFL's	658	2,812	0.23	7,959	6
TOTAL		8,919	117,202	0.08	359,816	286

Energy Saving opportunities identified in a 247-room hotel

EMO	Energy Management Opportunity	Initial Cost (US\$)	Annual Cost Savings (US\$)	Payback (years)	Annual Electrical Energy Savings (kWh)	Annual CO ₂ Savings (Tons/year)
1	Too many refrigerators underutilized (empty minibars in operation)	-	2,149	0.00	10,077	8
2	Lighting turned on unnecessarily	54	1,005	0.05	4,713	4
3	T12 Fluorescent Lamp Replacement	3,924	5,404	0.73	21,606	17
4	T8 Fluorescent Lamp Retrofit to T8 LED	3,310	3,386	0.98	13,692	11
5	Inefficient air conditioning units (<1.25 kW/ ton)	52,940	35,136	1.51	120,635	96
6	Corporate Utility Management Program	30,000	26,000	1.18	6,800	5
7	Food simulator energy saver (refrigeration system)	3,600	1,743	2.07	8,173	7
8	Limit Ice machine operation	4,500	2,145	2.10	10,058	8
9	Combine Heat and Power	2,775,000	678,927	4.09	1,164,303	927
10	ECM Motors in Ceiling Fans	29,500	5,463	5.40	12,807	10
TOTAL		2,950,828	751,556	3.93	1,415,872	1,127



Thanks for
listening!!

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Questions



Describe the projects CCOOL and CHENACT



What were the main findings?



What are the issues regarding the lack of implementation of recommendations by hotels?



Are there funding available and where?

We want to keep in contact with you. If you are interested in data, economic and investment indicators, energy efficiency and energy intensity, hotels and energy and internet of things devices, smart dashboards please click this link and we will keep in contact and send you some valuable resources

<https://bit.ly/energy-iff>

QR Code

