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DEVELOPMENT BANK

The Bermuda Energy Summit 2017: Preparing the Future

From Policy to Practice: Barbados case study

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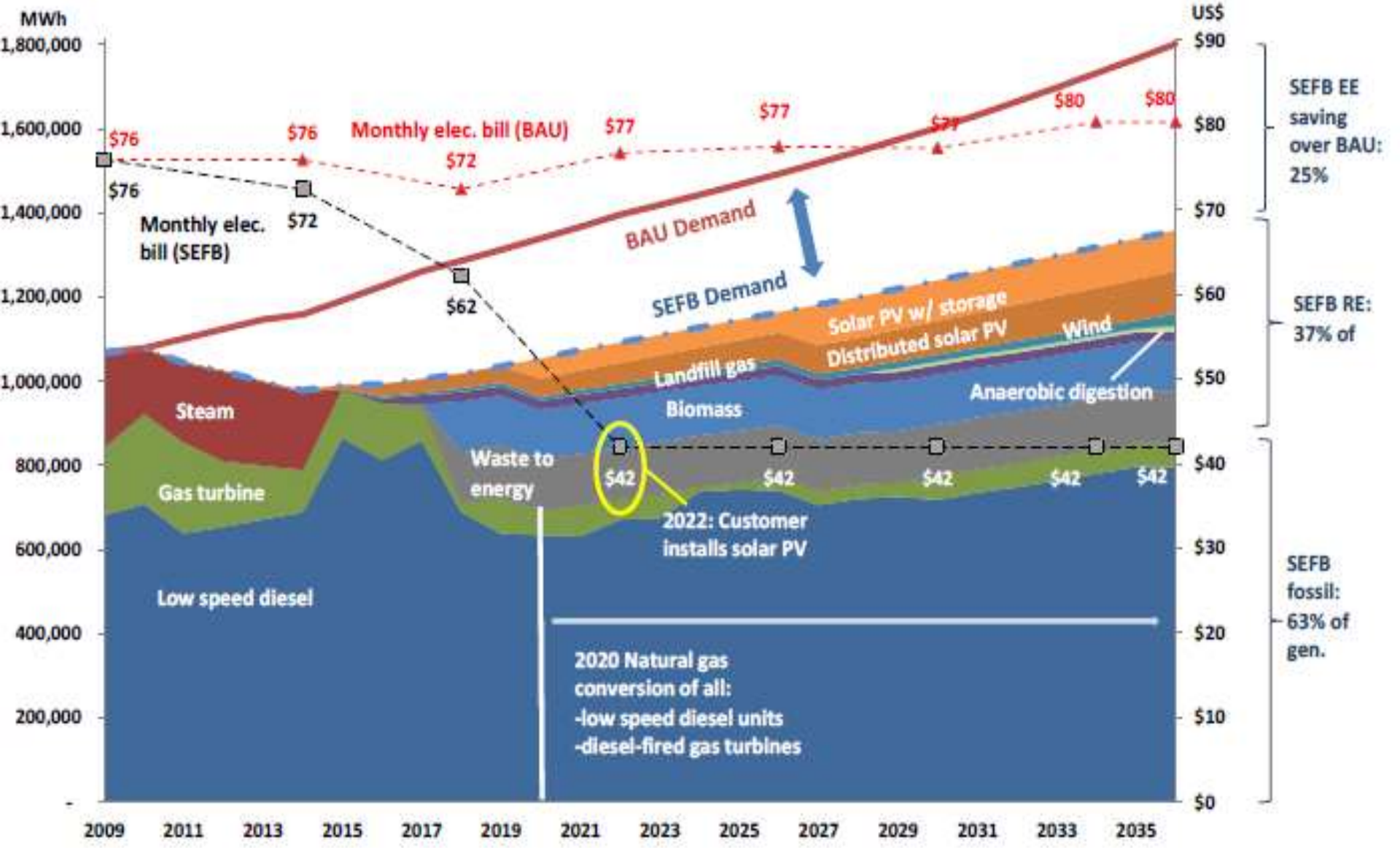
Case Study of Barbados
A mix of policies, regulations and programs

- In 2008 Barbados experienced high oil prices and in the 2009 financial crisis brought as a consequence less tourism.
- In 2008 Barbados requested the help of the IDB.
- 2009 the Sustainable Energy Framework was developed showing a clear strategy to promote RE and EE and setting targets of RE and EE.
- 2009 the Caribbean Hotel Renewable Energy and Energy Efficiency Action (CHENACT) Program more 60 hotels audited in Barbados
- 2010-2011 policy reforms were made, including banning of incandescent lamps, net billing (adopted by the utility)

Case Study of Barbados
A mix of policies, regulations and programs

- 2010 the Energy Smart Fund was developed to encourage RE and EE in SMEs. More 20 project funded over 2 MW of distributed solar PV
- 2012 the Public Sector Smart Energy (PSSE) program was developed to promote RE and EE in public sector. All public street lights will be LED, more than 5MW of solar distributed PV in public buildings, 6 e-vehicles (including 2 e-buses), more 21 electric chargers of e-vehicles.
- 2015 the New Electricity Law (ELPA) was enacted. RE licenses are provided by the Ministry.
- 2016 a program to promote cleaner fuels and RE was developed
- 2018 The energy Smart Fund II, more than 100 public buildings retrofitted.

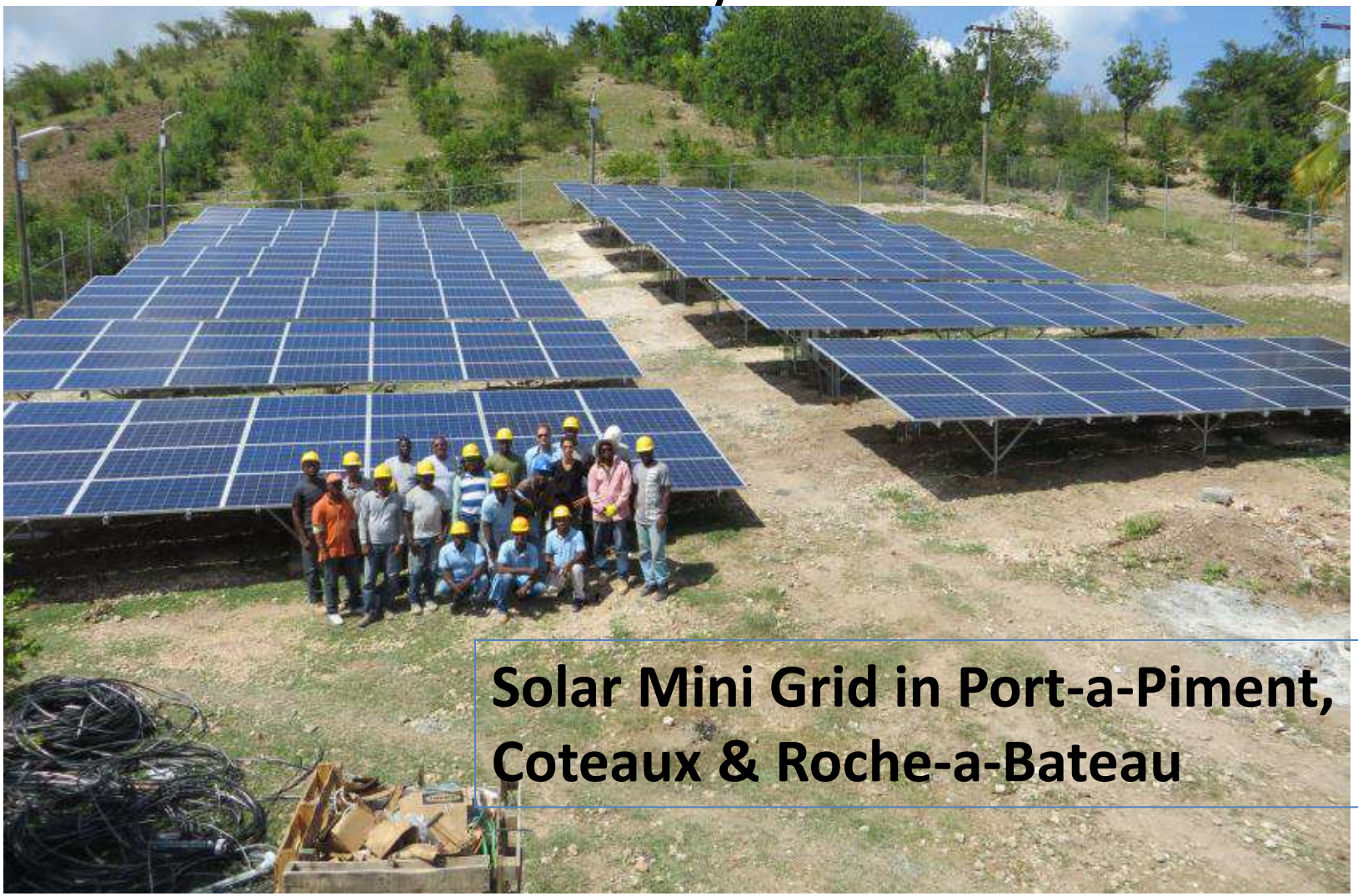
Using the example of Barbados



NEW TRENDS

RESILIENT ENERGY INFRASTRUCTURE

Opportunity combining solar energy and access: case study Haiti



Solar Mini Grid in Port-a-Piment, Coteaux & Roche-a-Bateau

After Matthew…

ENERGY EFFICIENCY

Effects of Energy Efficiency

Table 4. Implied Effects of Energy Efficiency Targets

Country	Effective Efficiency Target 1/	Implied Effects		
		Implied reduction in oil imports	Implied reduction in national electricity bill 2/	Implied impact on long-term GDP level
Dominica	1%	1%	1%	0%
St. Lucia	1%	1%	1%	0%
Barbados	12%	11%	9%	2%
St. Kitts and Nevis	12%	11%	8%	2%
St. Vincent and the Grens.	12%	10%	5%	2%
Antigua and Barbuda	20%	20%	13%	4%
Belize 3/	30%	20%	1%	6%
Jamaica	71%	69%	31%	14%

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RENEWABLE ENERGY & NATURAL GAS

Effects Renewable Energy Investments

Table 5. Implied Effects of Renewable Energy Targets

Country	Renewable Energy Target for Electricity	Implied Effects 1/		
		Implied reduction in oil imports	Implied reduction in the national electricity bill 2/	Implied impact on long-term GDP level
Antigua and Barbuda	20%	10%	6%	1%
Jamaica	20%	5%	4%	0%
Barbados	29%	13%	6%	1%
The Bahamas	30%	17%	11%	1%
St. Lucia	35%	22%	11%	1%
St. Kitts and Nevis 3/	40%	24%	9%	1%
Belize	89%	25%	10%	1%
Guyana	90%	28%	21%	2%
Dominica	100%	45%	16%	2%
Grenada	100%	49%	31%	3%

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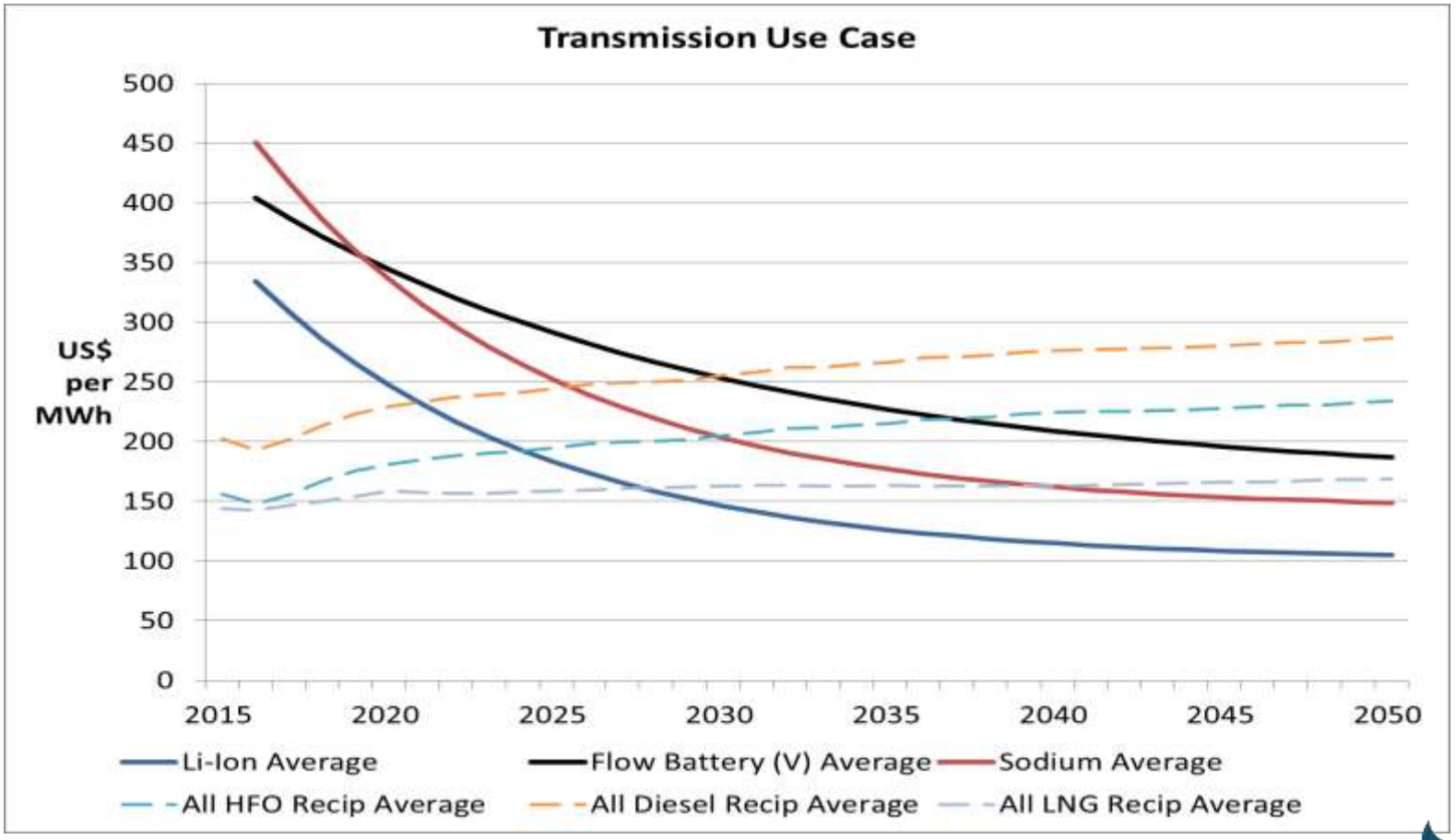
Fossil fuels vs PV+ Batteries



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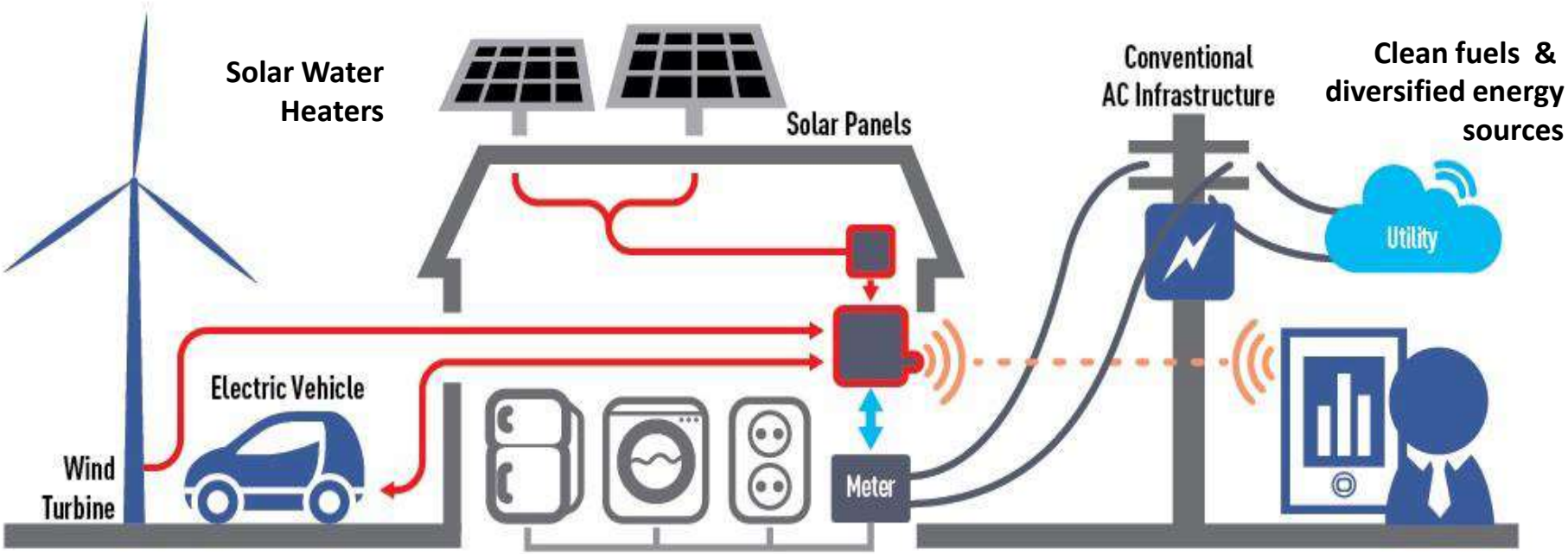
Source: Internal IDB st

MOVING FORWARD

Moving Forward: Smart grids, smart buildings and interconnectivity



THANKS

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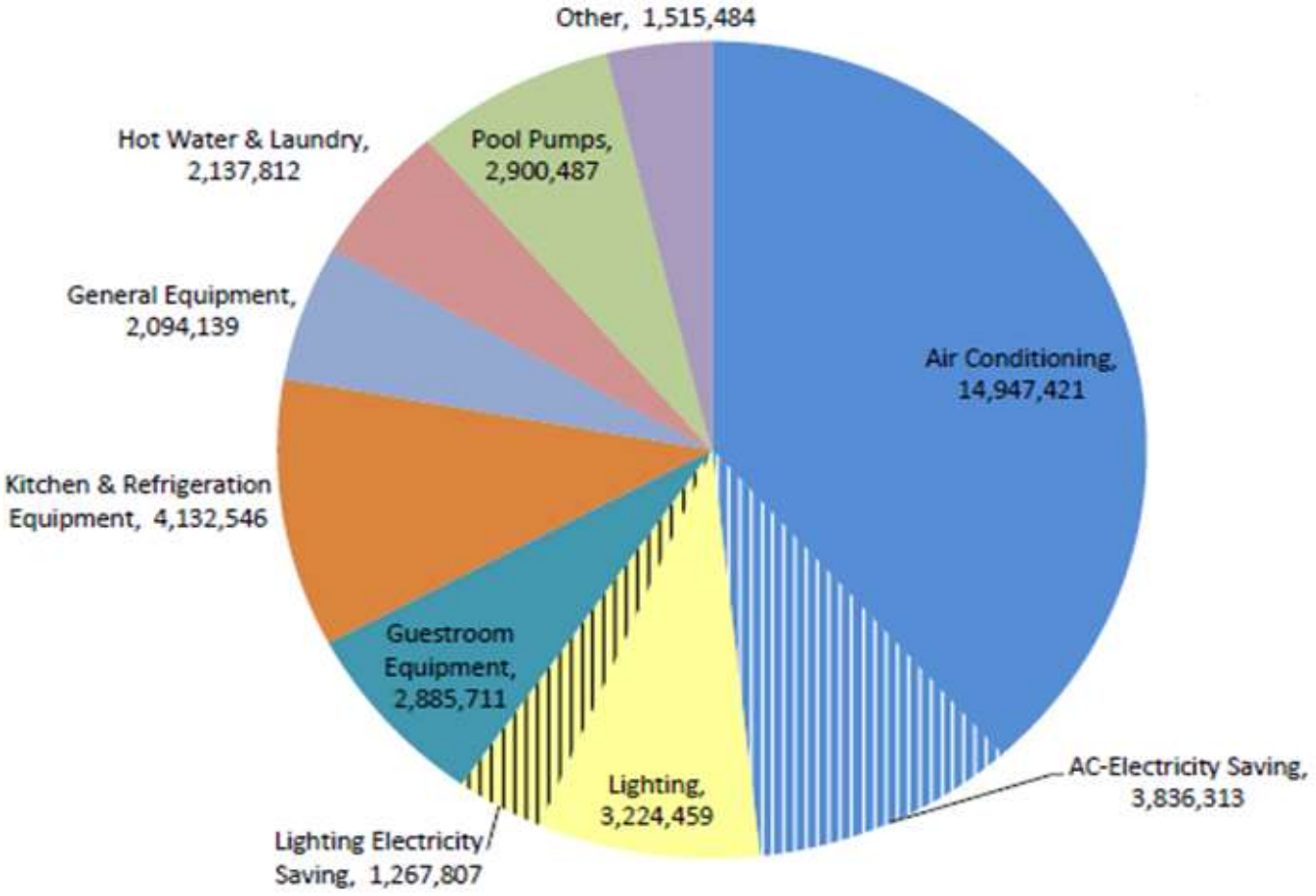
Energy Use in Hotels (*results from CHENACT*)

End-use electricity consumption and savings (kWh)

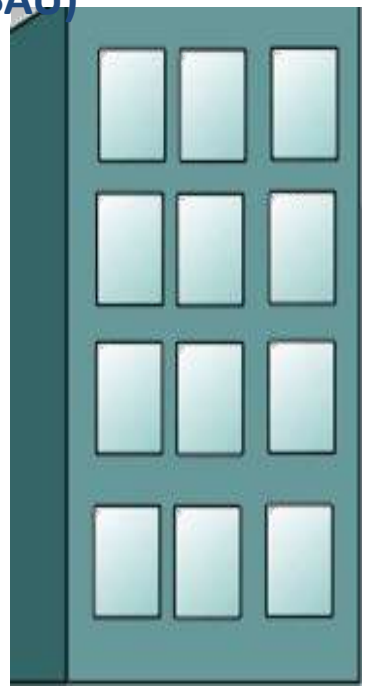


Air Conditioning and Lighting account for nearly 2/3 of all electricity consumed in Hotels.

Savings potential of 30-40% in energy and 40-50% in water

Estimated impact of the intervention on a single building/hotel

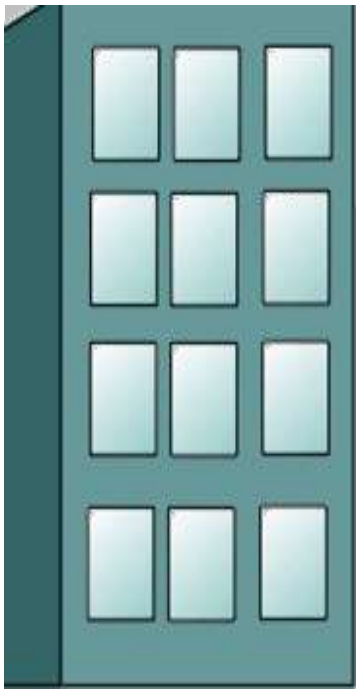
Business As Usual (BAU)



- *Efficient LED lights*
- *Intelligent lighting*
- *Efficient computers & electronics*
- *Energy Efficient Condensers*
- *≈85kW roof mounted solar PV*
- *Training to bldg. users*

Est. US$475,000

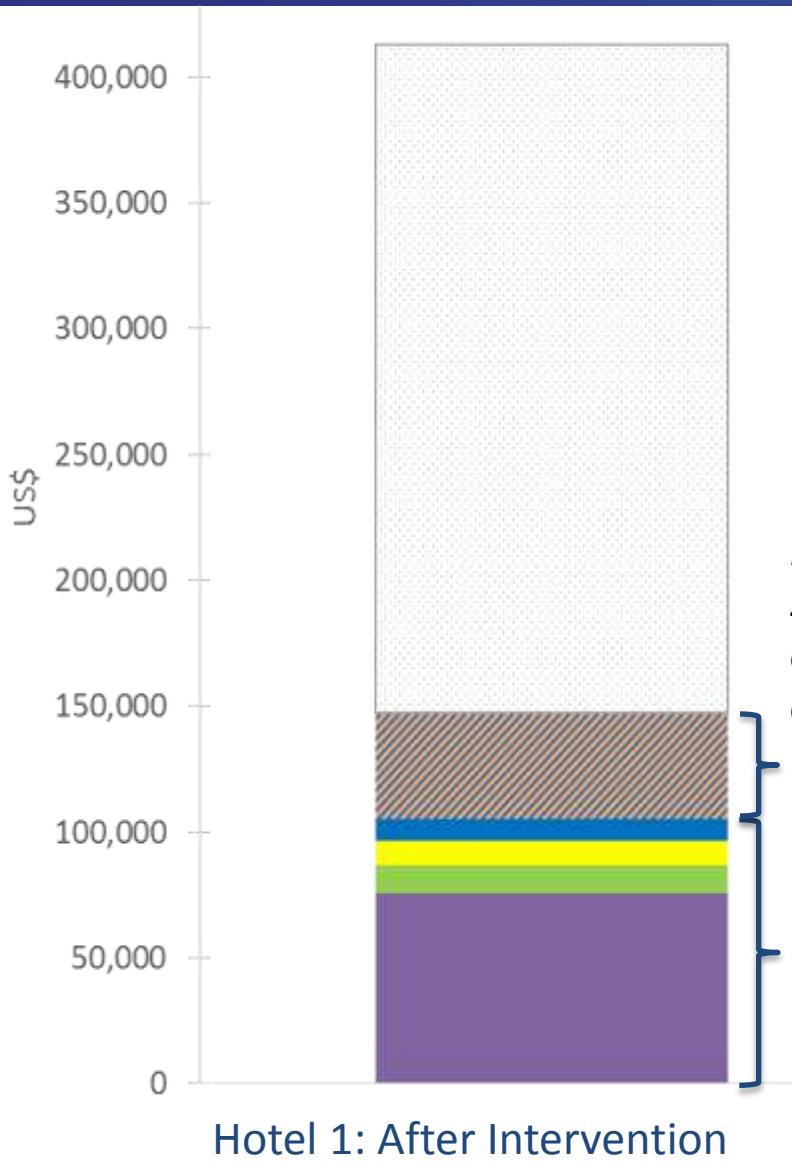
After Intervention



Electricity consumption= **1.5 GWh/yr**
Tariff= 0.27 US$/kWh
Electricity savings over BAU=0%
Annual Savings=**US$0**
Electricity bill=US$420,000

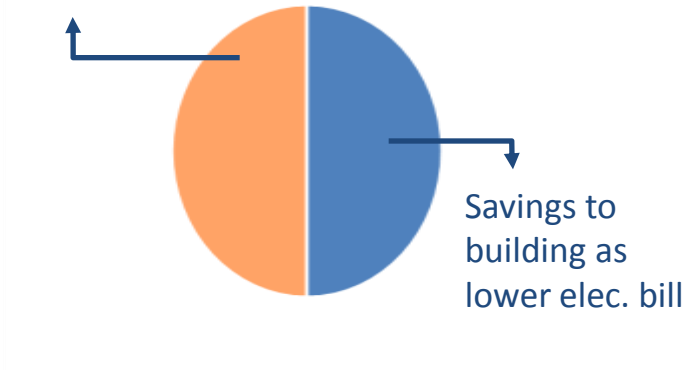
Electricity consumption= **1.1 GWh/yr**
Tariff= 0.27 US$/kWh
Mandated electricity savings over BAU=25%
Annual Savings=**US$105,000**
Electricity bill=US$315,000
Simple payback=4.5 years

Allocate savings $ in the following way….

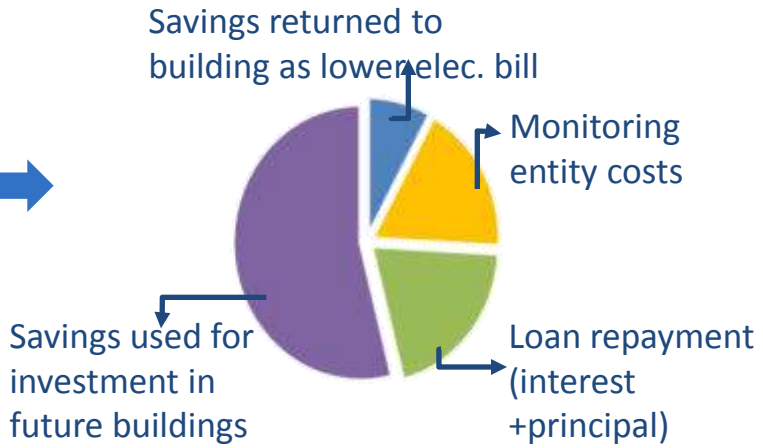


Hotel 1: After Intervention

If more than 25% savings over BAU achieved…

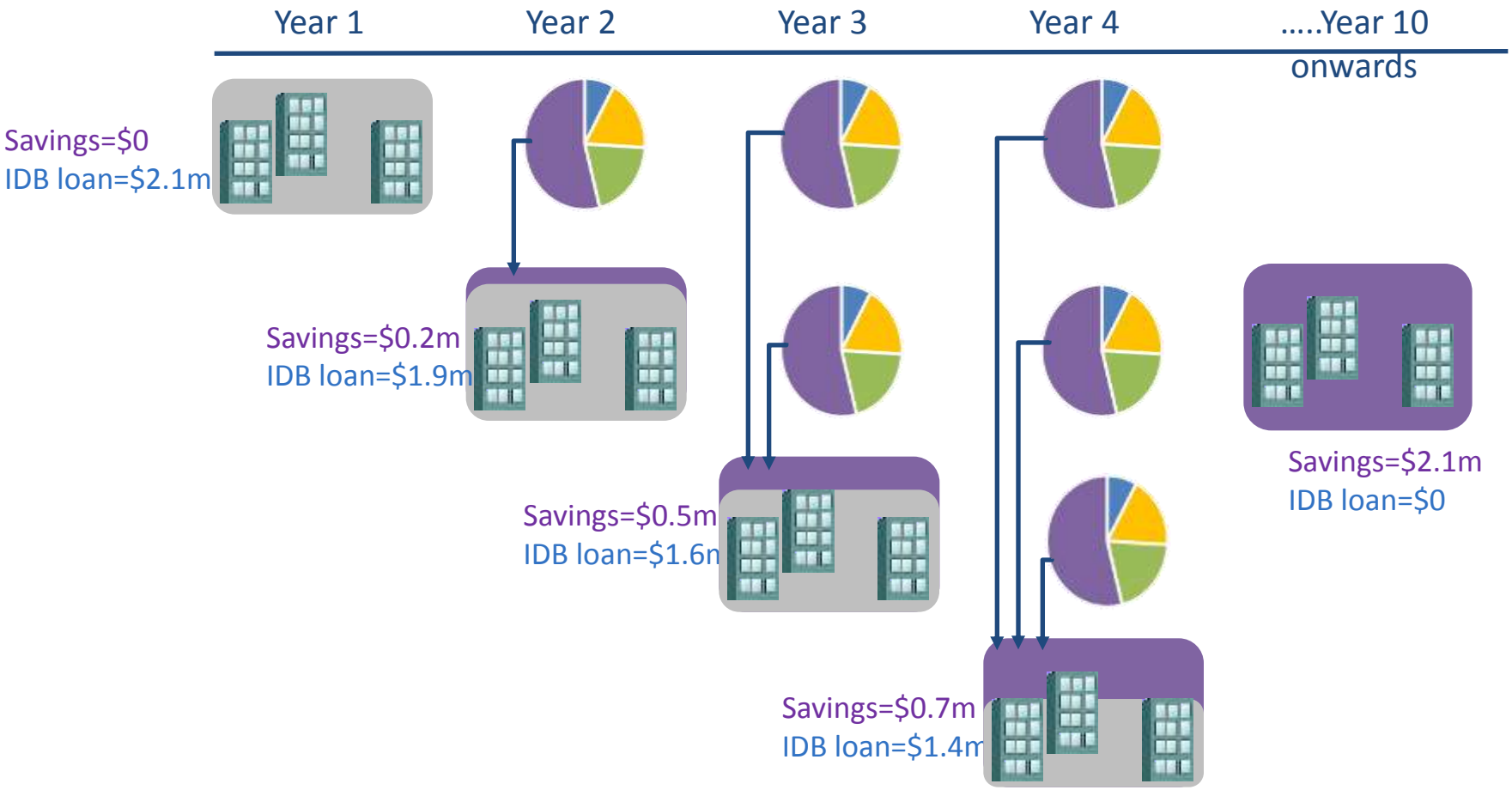


Mandated 25% savings (US$105,000) over BAU allocated as…



Use savings $ and IIC/IDB funding draw-downs to ramp up # buildings/hotels retrofitted

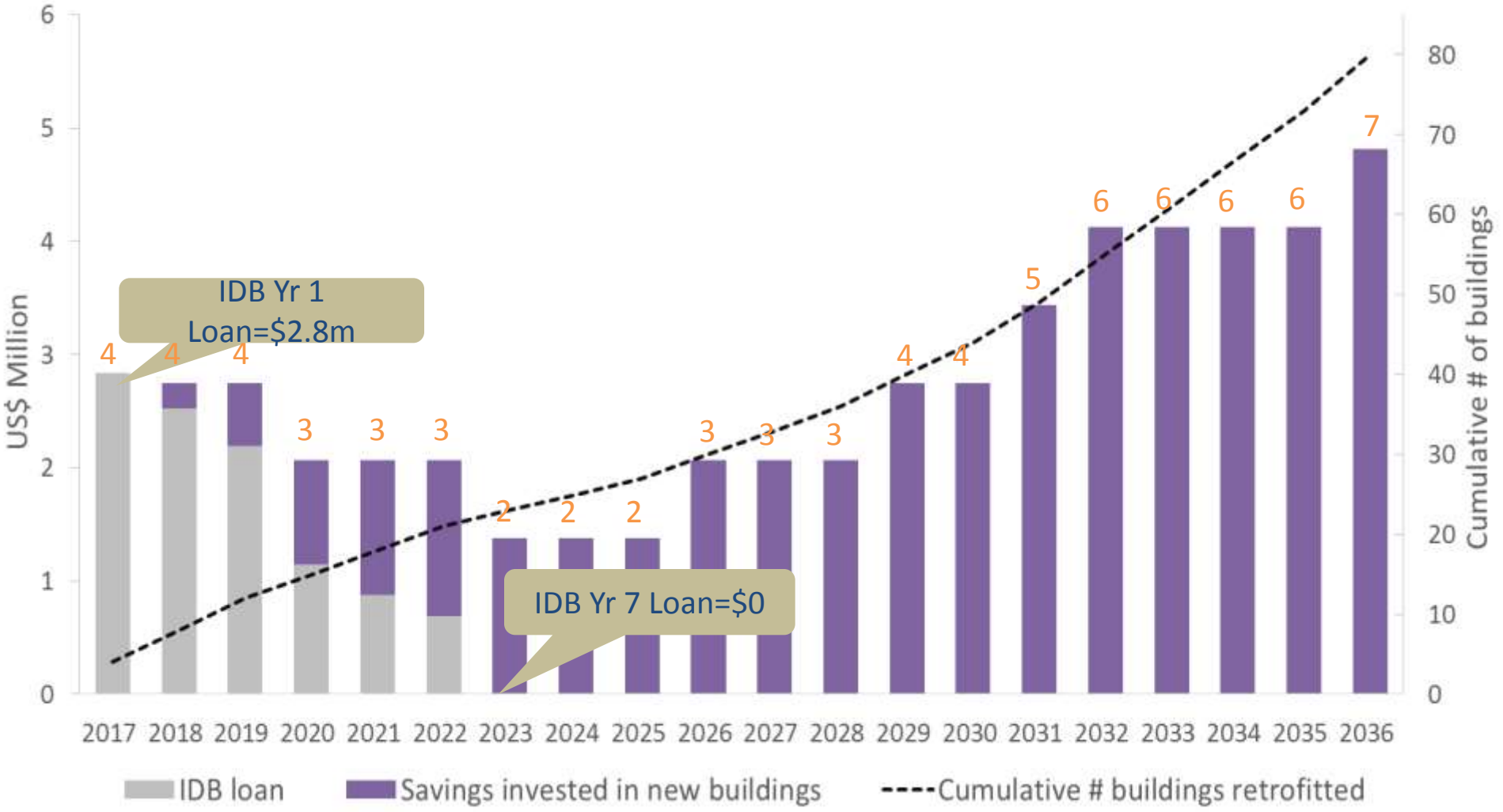
3 buildings retrofitted every year…



Model assumptions:

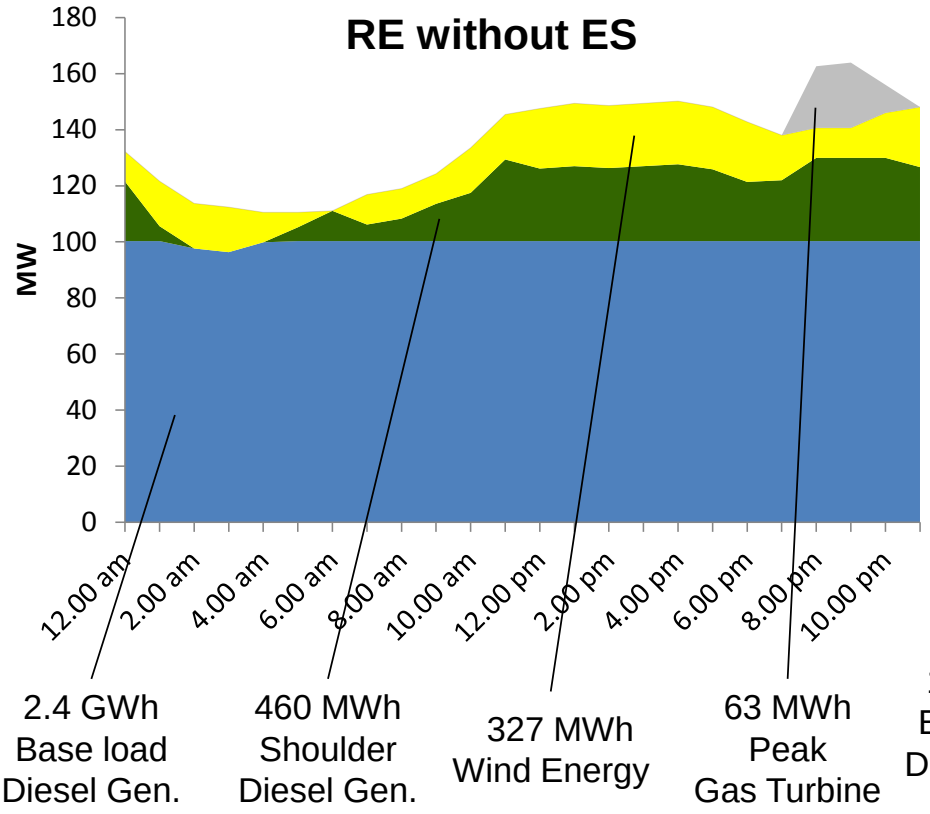
- Bldgs similar profile
- IDB loan conditions
- US$0.27/kWh avg tariff
- Tariff growth 1% p.a.

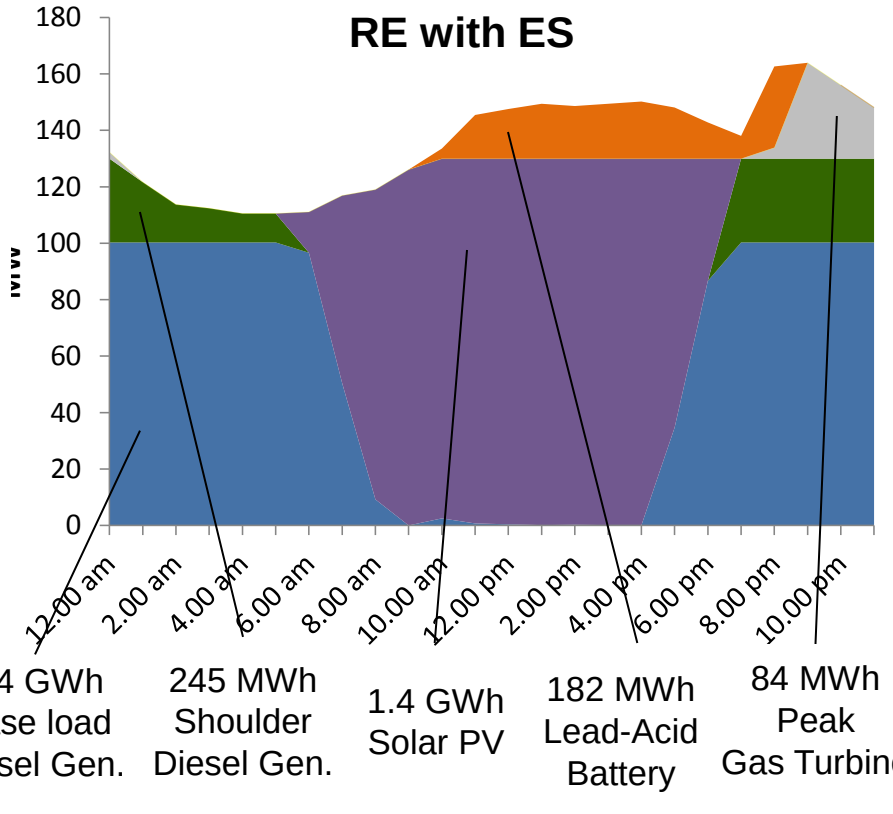
Increasing savings + decreasing loans : more # of buildings/hotels retrofitted with less initial capital



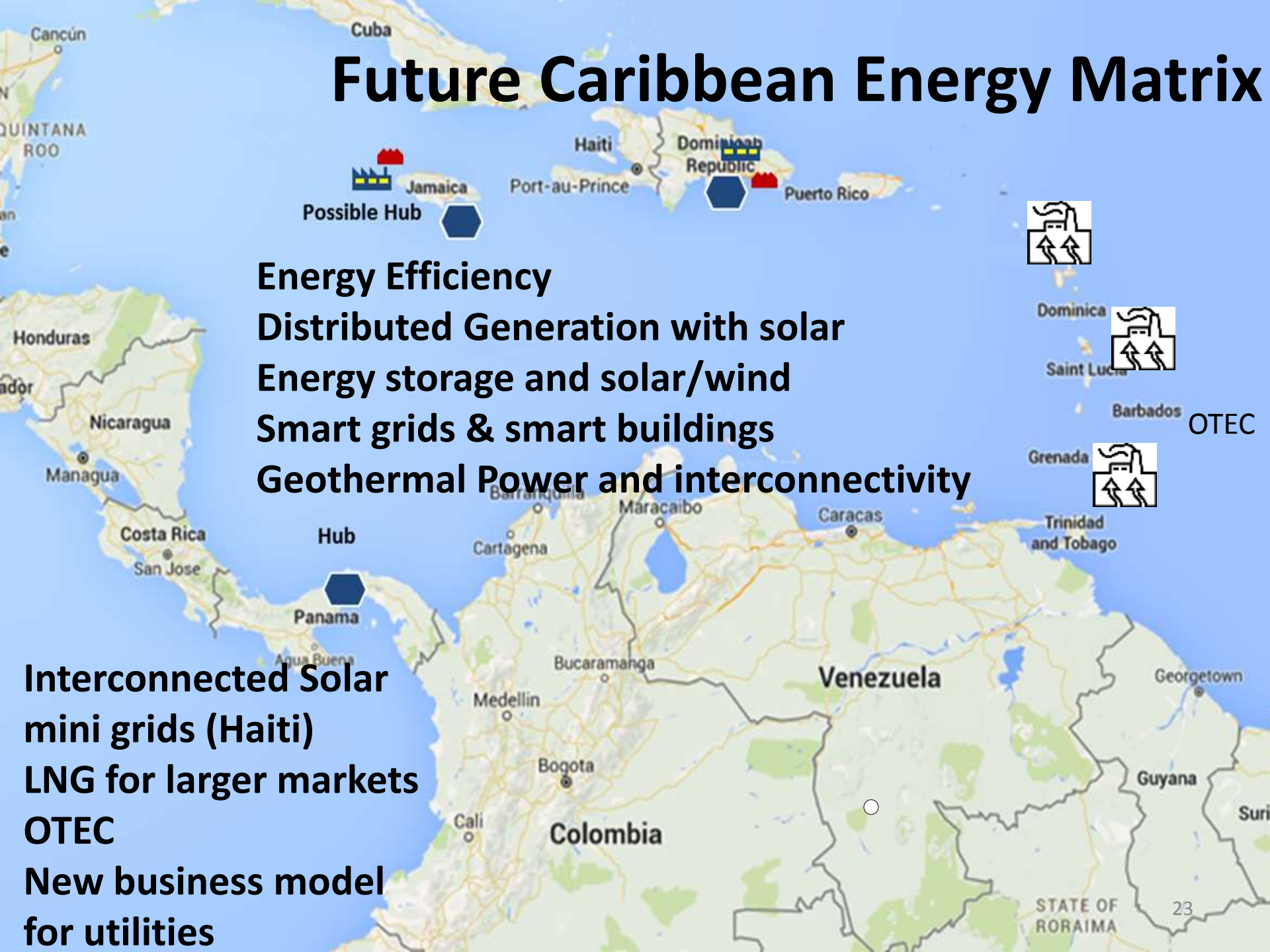
By how much can Solar PV increase the share of RE in total generation if viable?

Small Island Country





Future Caribbean Energy Matrix



Energy Efficiency
Distributed Generation with solar
Energy storage and solar/wind
Smart grids & smart buildings
Geothermal Power and interconnectivity

Interconnected Solar mini grids (Haiti)
LNG for larger markets
OTEC
New business model for utilities