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AIEQ Symposium - Montreal

The Case for Caribbean Microgrids

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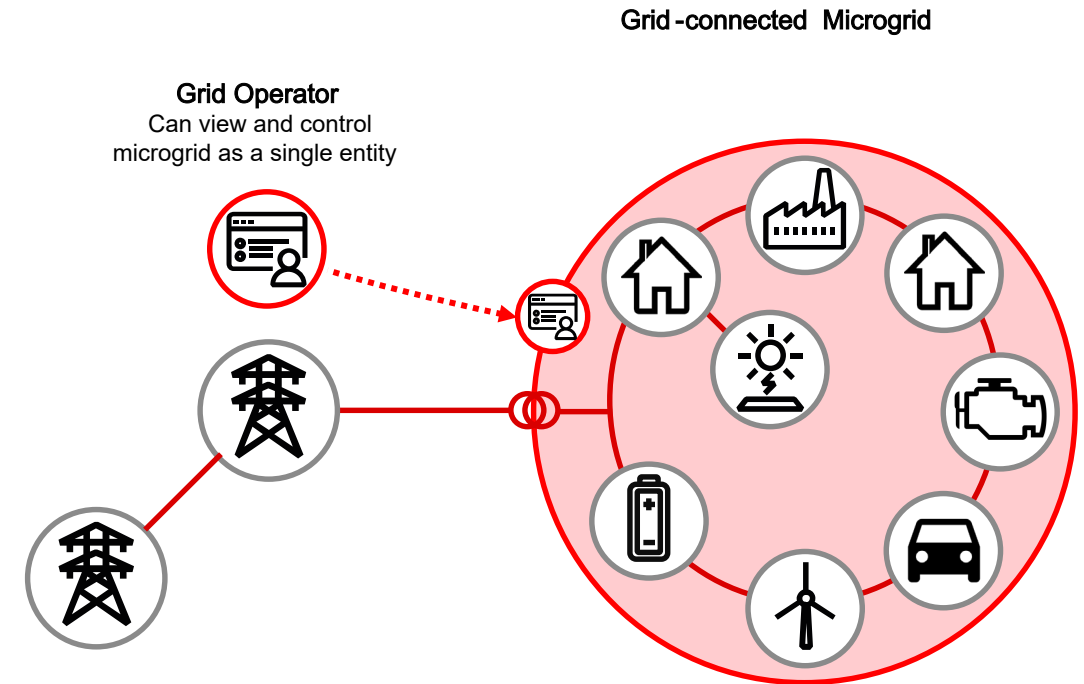
What is a microgrid?

Control is the key

Microgrid definition

Distributed energy resources and loads that can be operated in a controlled, coordinated way either connected to the main power grid or in “islanded”* mode.

Microgrids are low or medium voltage grids without power transmission capabilities and are typically not geographically spread out.



Market overview

Segments and drivers

			Main drivers				
			Social	Economic	Environmental	Operational	
			Access to electricity	Fuel & cost savings	Reduce CO ₂ footprint and pollution	Fuel independence	Uninterrupted supply
Off-grid	Weak grid	Island utilities		✓	✓	✓	(✓)
		Remote communities	✓	✓		✓	
	Grid-connected	Industrial and commercial		✓	(✓)	✓	✓
		Defense		(✓)	(✓)	✓	✓
		Urban communities			(✓)		✓
		Institutions and campuses		(✓)	✓		(✓)

* Independent Power Producer
 ✓: Main driver
 (✓): Secondary driver

Why are microgrids so popular in the Caribbean?

Isn't it obvious?



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Islands – Physical and Electrical



Image courtesy : Jamaica Public Service Company (JPS)

Renewable Resource Rich

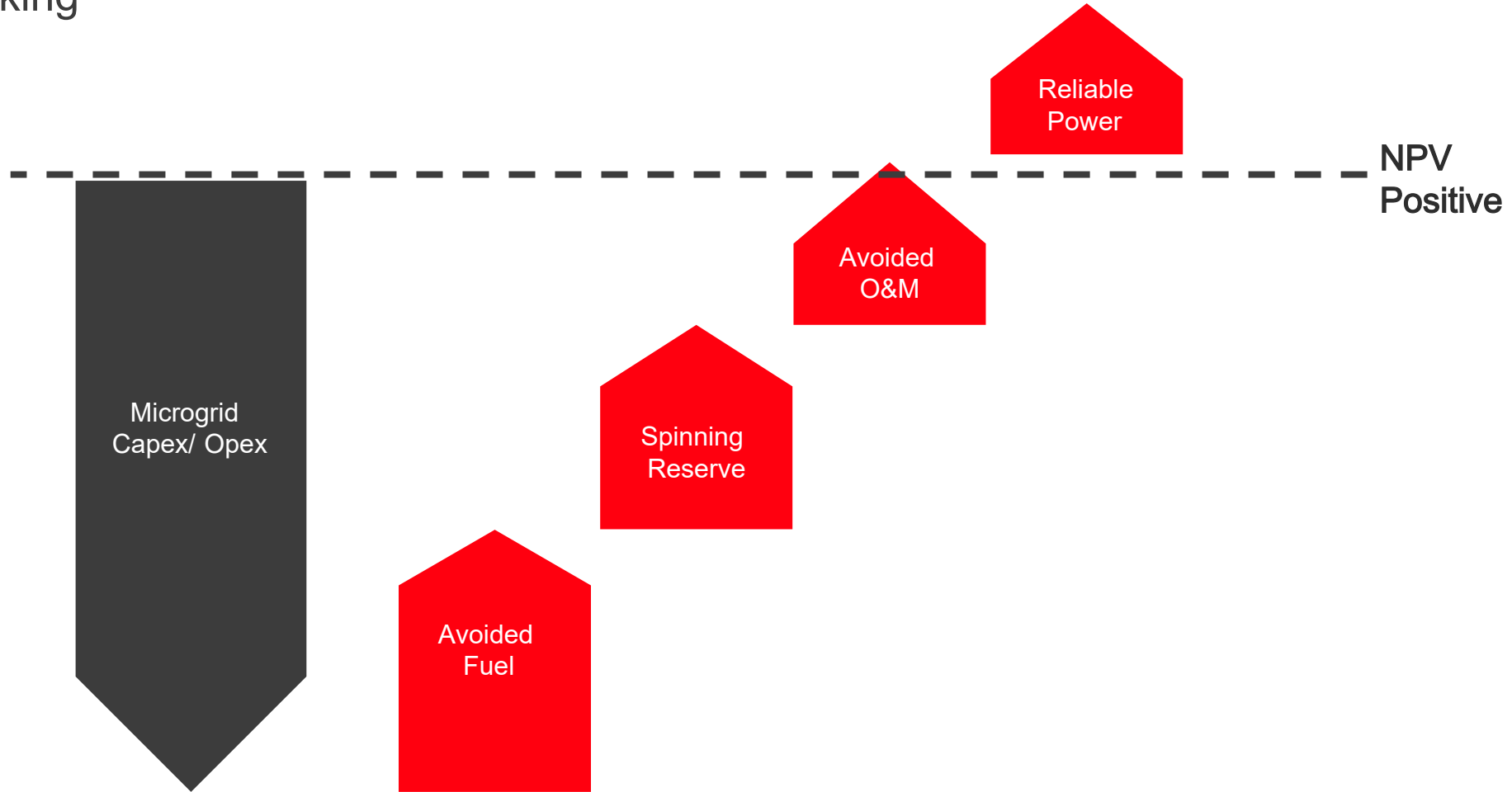
Ian Cumming/Getty Images



Diesel Dependent

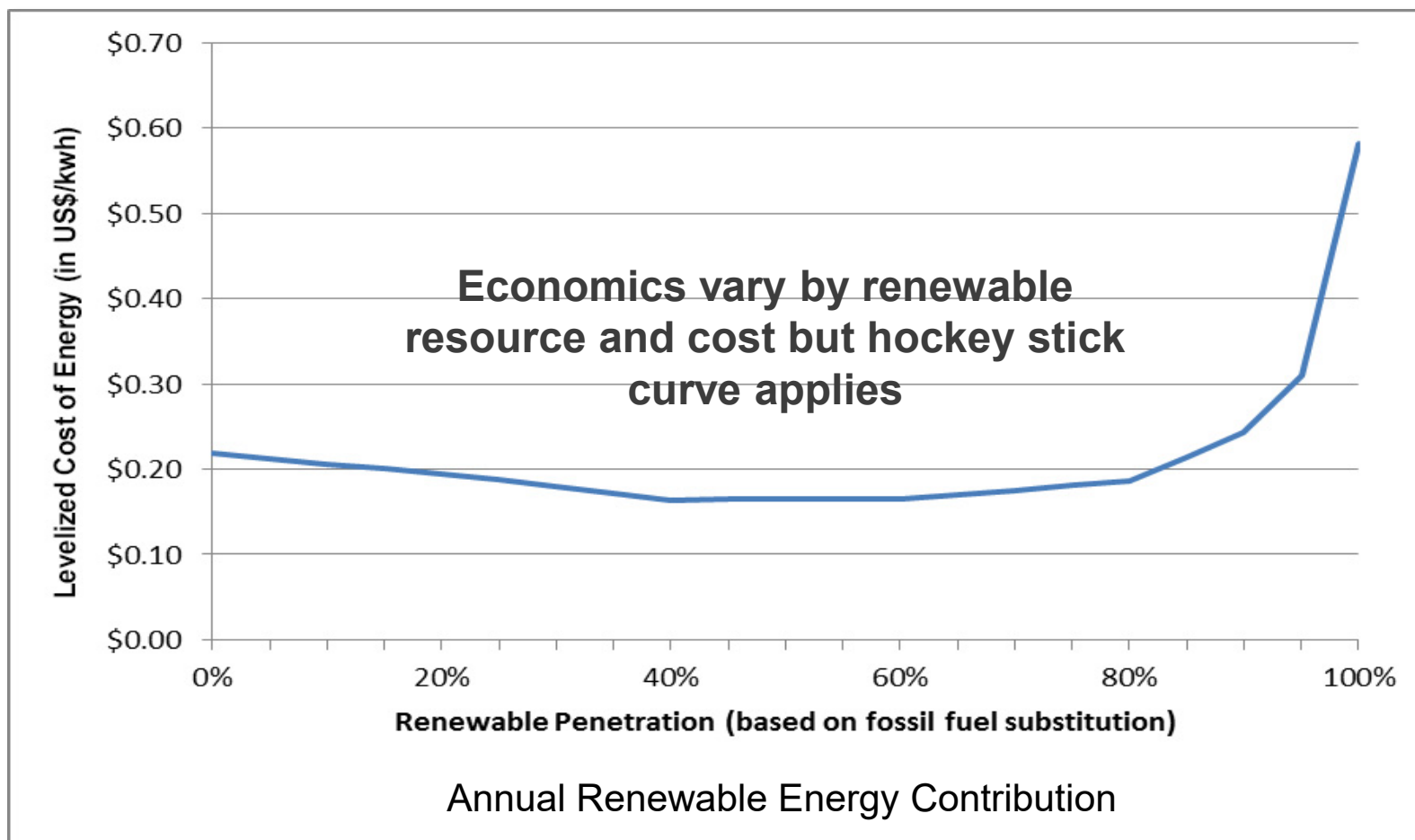
The Business Case

Value Stacking



Economic Optimization

What is the right solution?



Source: HOMER ENERGY Newsletter 06-2013

GBPC Load Smoothing Project

Minimizing frequency deviation from industrial loads



Customer:

Grand Bahama Power Company

Solution:

9.5MW/7.3MWh BESS
Fast Response Controls

Project Drivers:

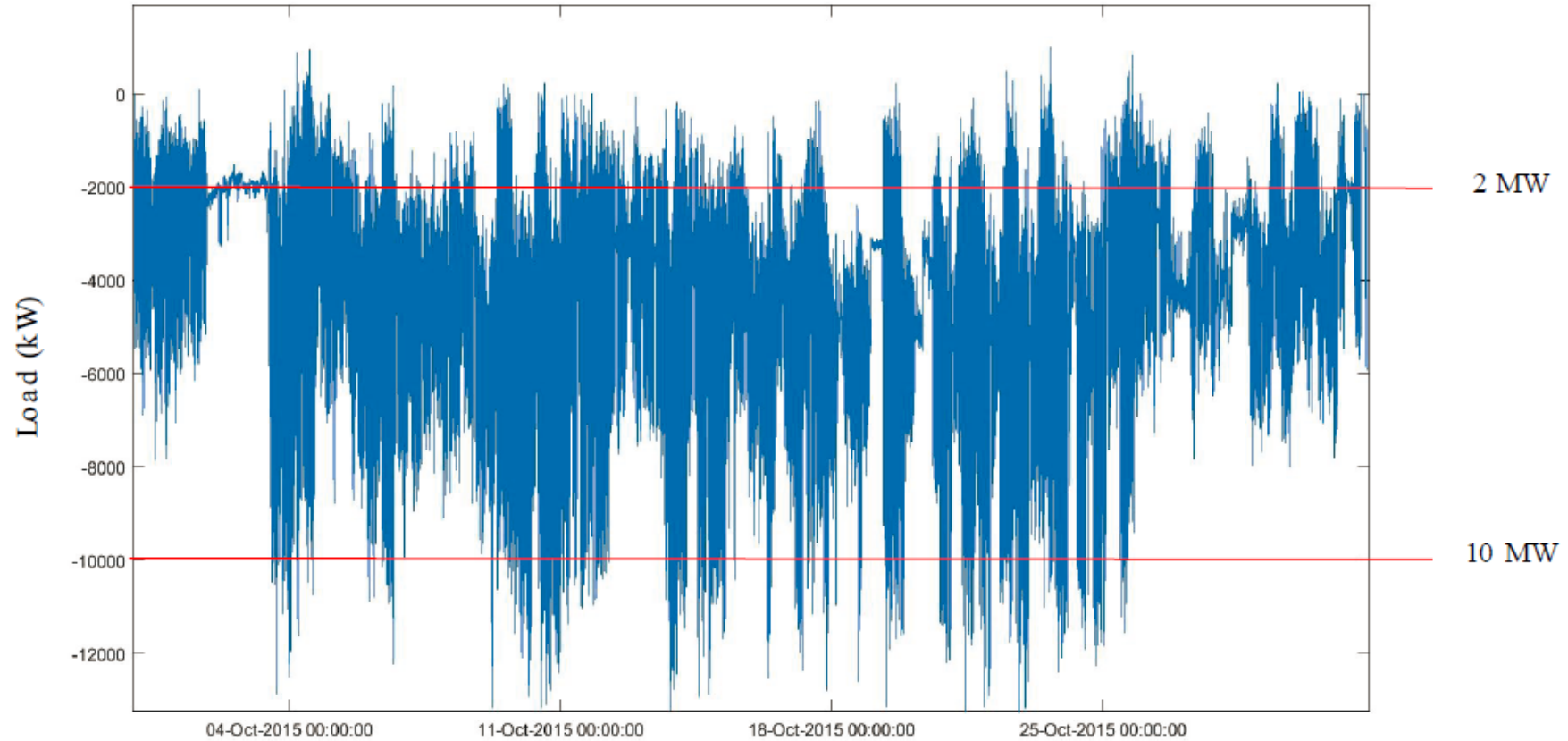
Uninterrupted Supply
Fuel and Cost Savings
CO₂ Reductions

Applications:

Frequency Management
Renewable Integration

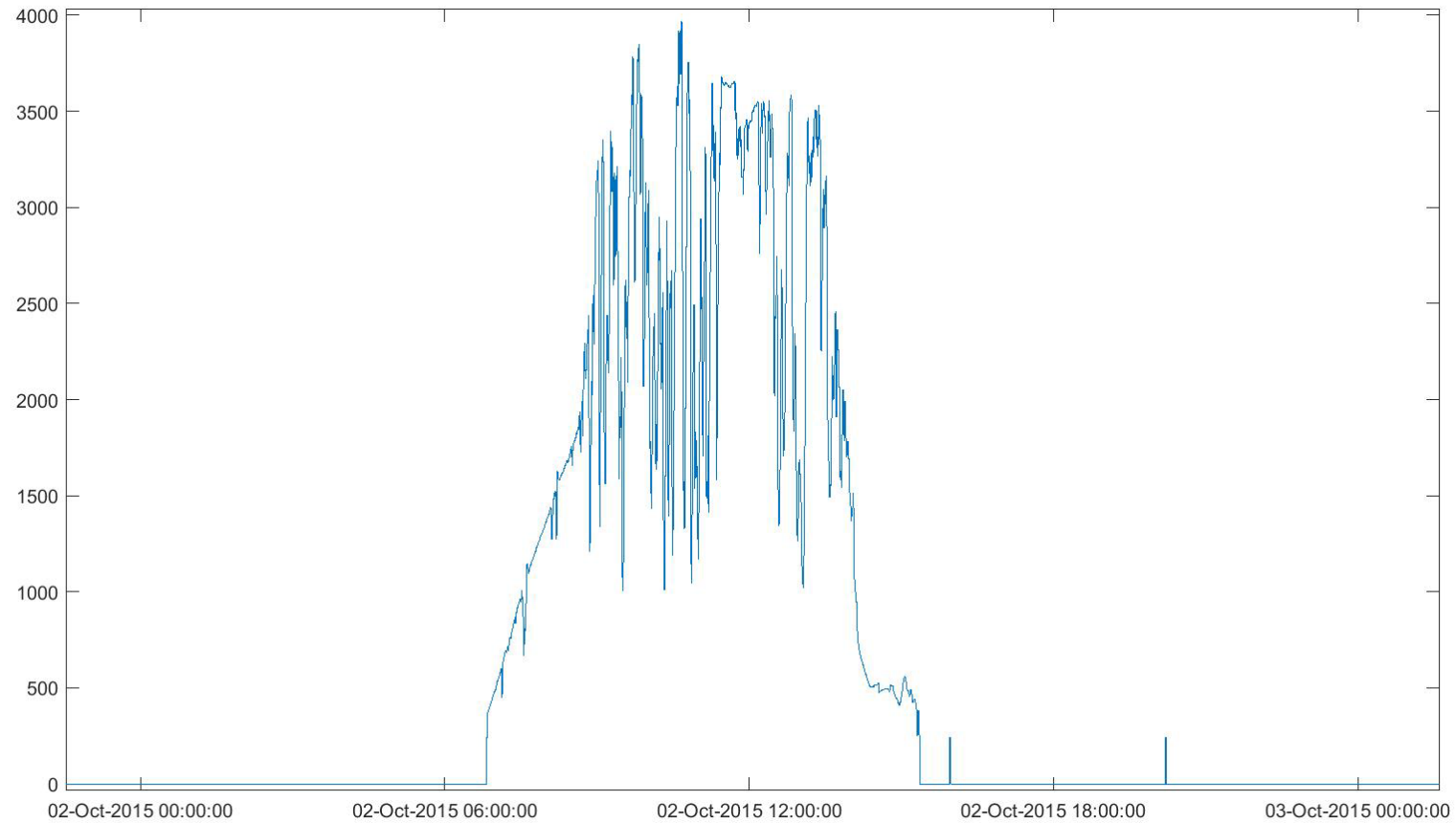
GBPC Load Smoothing Project

Highly volatile load



GBPC Load Smoothing Project

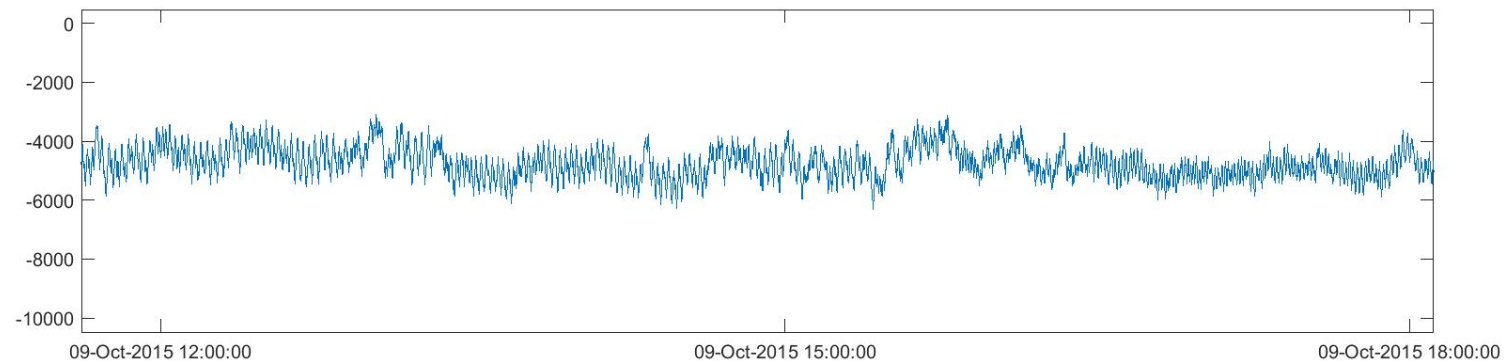
Projected daily solar shape



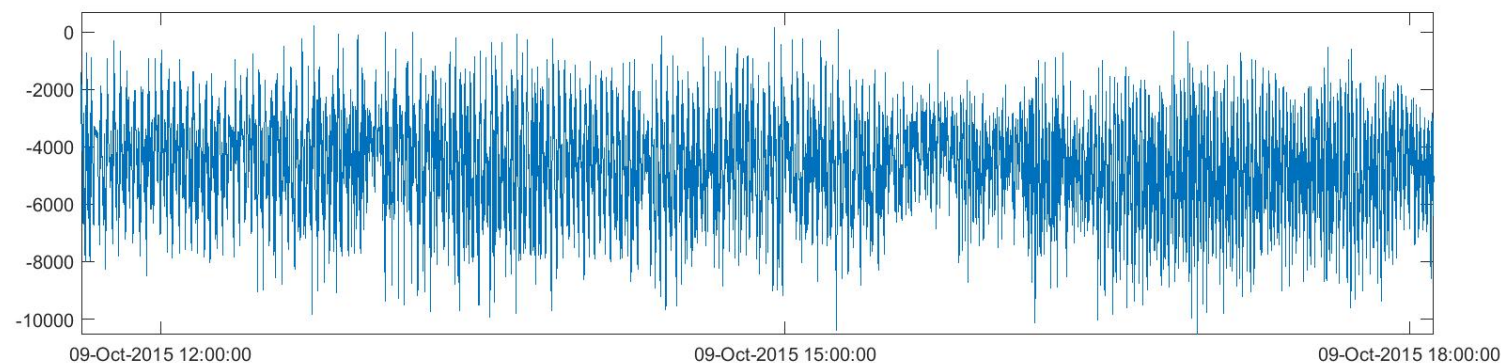
GBPC Load Smoothing Project

Applying storage with desired control parameters

Storage affected
load profile



Current load
profile

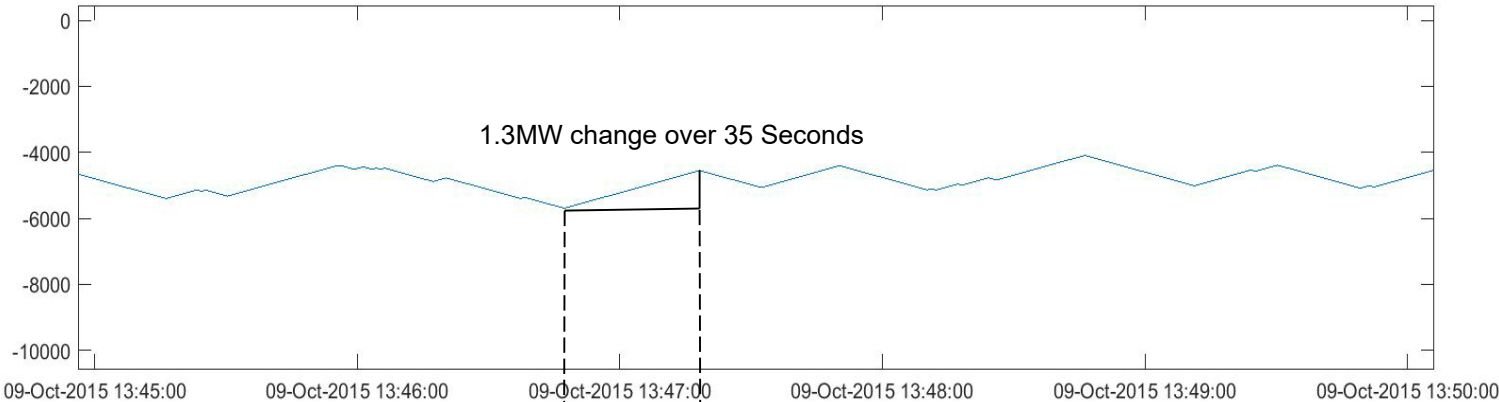




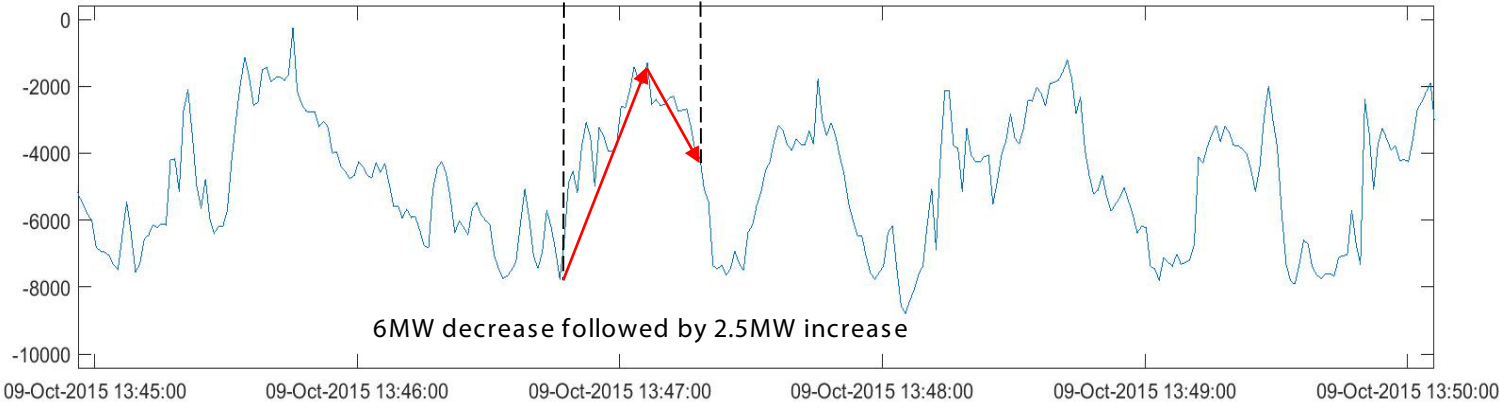
GBPC Load Smoothing Project

Ramp rate differential

Storage affected load profile



Current load profile



WEB Aruba IGMS Project

Building a foundation for increased renewables

Customer:

WEB Aruba

Project Drivers:

Uninterrupted Supply
Fuel and Cost Savings
CO₂ Reductions

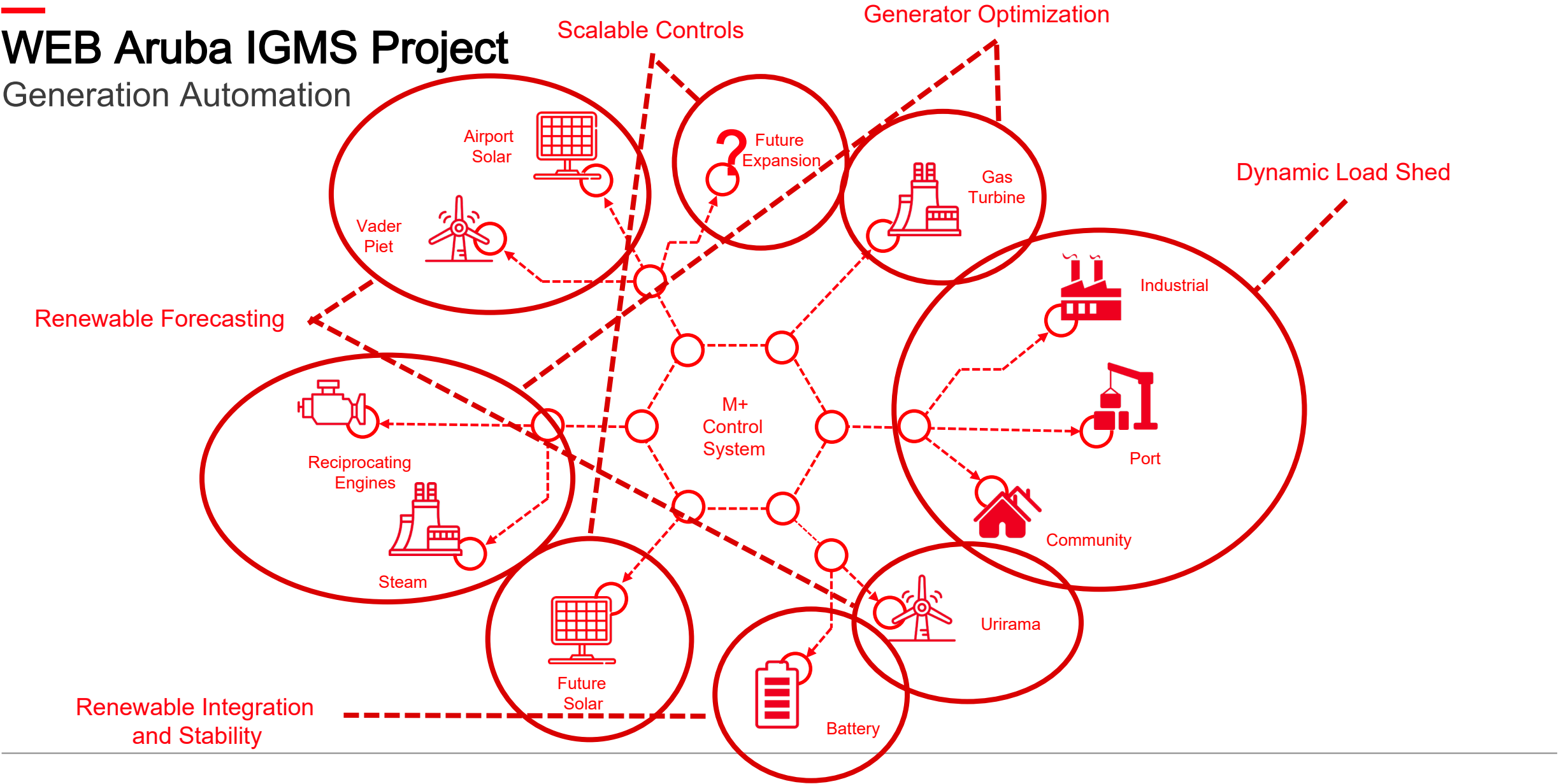
Applications:

Renewable Integration
Frequency Management
Intelligent Load Shedding
Load and Generation Forecasting
Generation Optimization



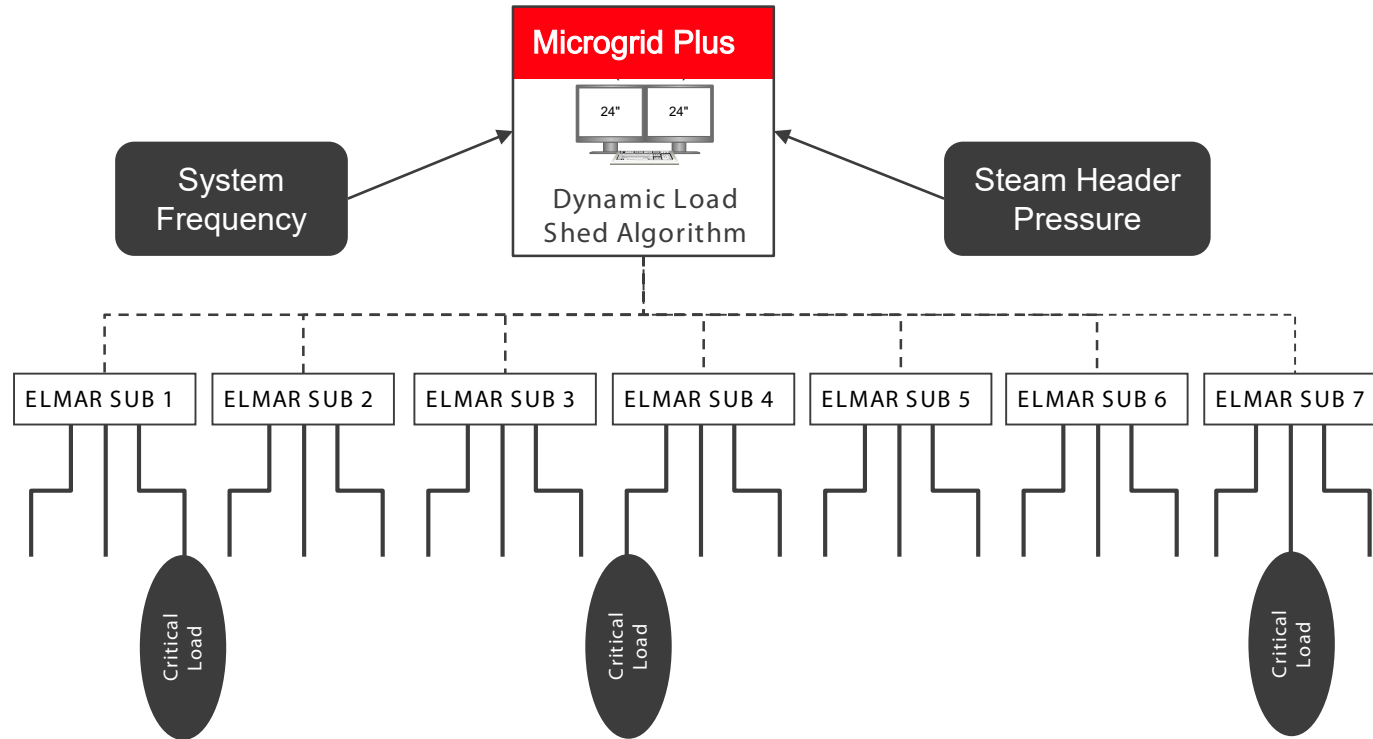
WEB Aruba IGMS Project

Generation Automation

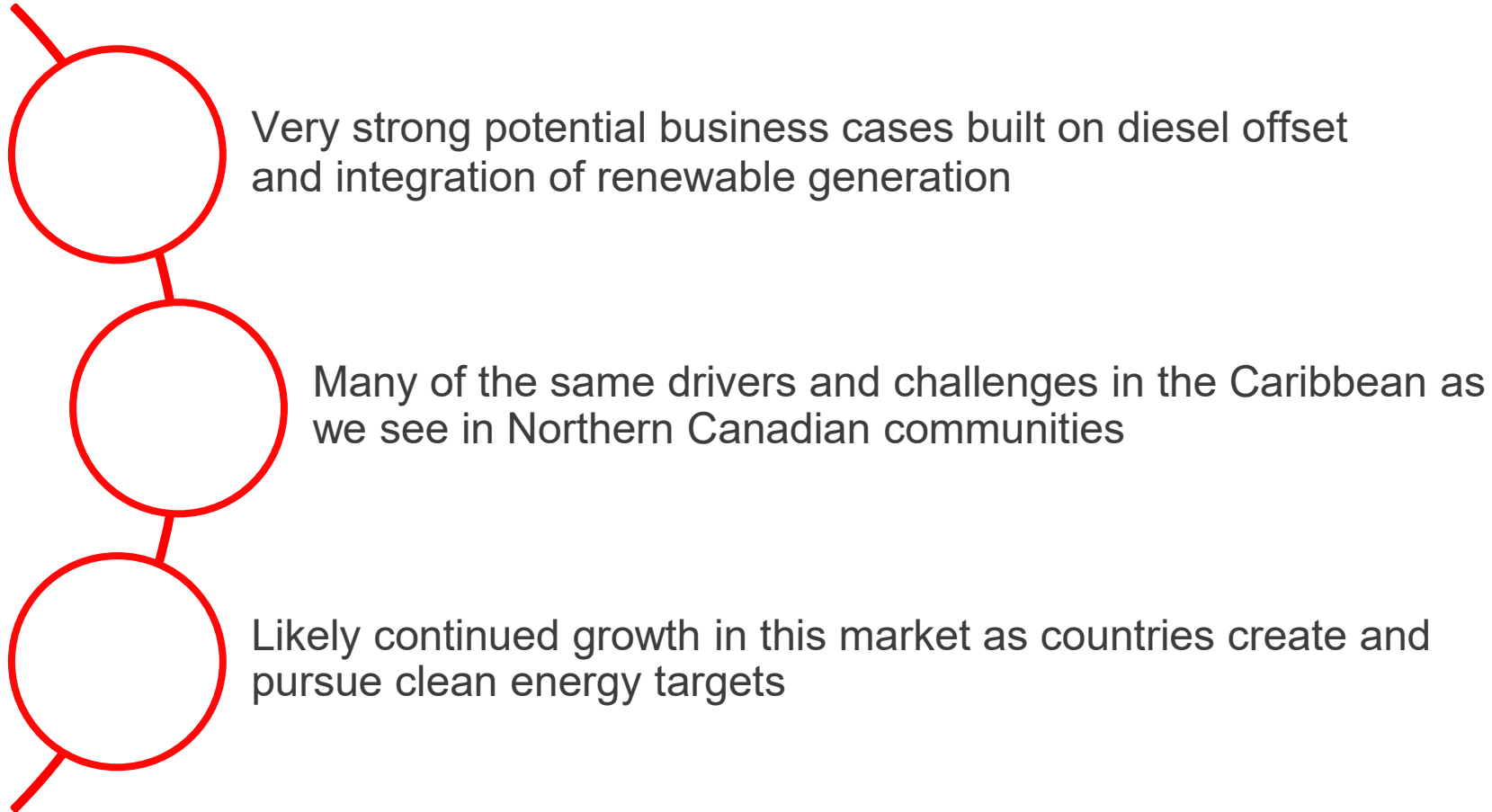


WEB Aruba IGMS Project

Distribution load shedding – granular and dynamic



Key Takeaways





Questions?

Do not hesitate to contact me...

Contact Info

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