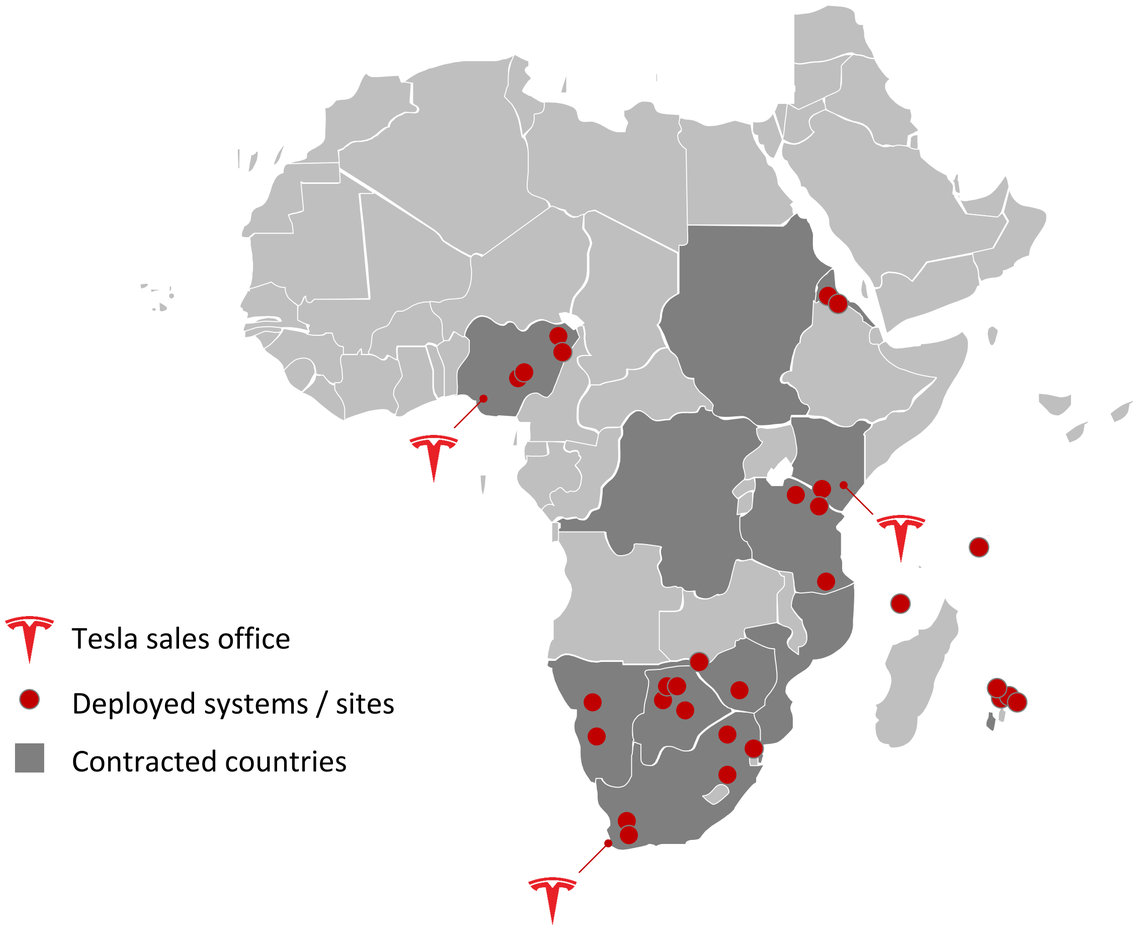
World Bank
Deploying Energy Storage Solutions - Microgrids
January 21, 2020

OUR MISSION

TESLA IN AFRICA

TESLA MICROGRIDS & PEOPLE SPAN THE REGION



AFRICA POWERPACK FOOTPRINT KEY FACTS

Deployed systems / sites	> 30
Total installed capacity	> 35 MWh
Contracted systems / sites	> 50
Reach (contracted countries)	12
System size range	100 kWh – 4 MWh
First system deployed	March 2017
Primary application	Microgrid diesel abatement & backup
Average diesel reduction	> 75%

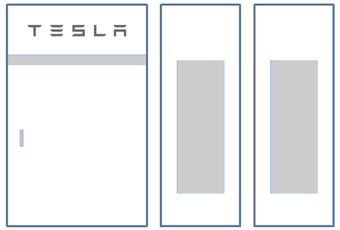
WHAT ARE THE GLOBAL TRENDS IN BESS?

	EMERGING MARKETS	DEVELOPED MARKETS
FRONT OF THE METER	▪ Large-scale batteries for renewables integration and/or peaker replacement ▪ Large microgrids - whole of region/islands ▪ Community microgrids for energy access	▪ Larger systems, > 1GWh ▪ Software optimizing between applications ▪ Markets adapting for storage capabilities
BEHIND THE METER	▪ Solar + Storage to reduce reliance on diesel ▪ Improved supply reliability for C&I customers	▪ Commercial storage participation in markets ▪ Virtual power plants using 1000's of residential batteries

HYBRID MICROGRIDS ENABLE A CLEAN, RELIABLE ENERGY FUTURE

ENABLING ENERGY SECURITY AND PRICE STABILITY

Local Renewable Energy
Reduced Dependency on Diesel



Intelligent Energy Storage
Low Maintenance Costs

Reliable and Affordable Energy
Sustainable Operations

POWERPACK FORMS THE BACKBONE OF MICROGRIDS

Island site from grid

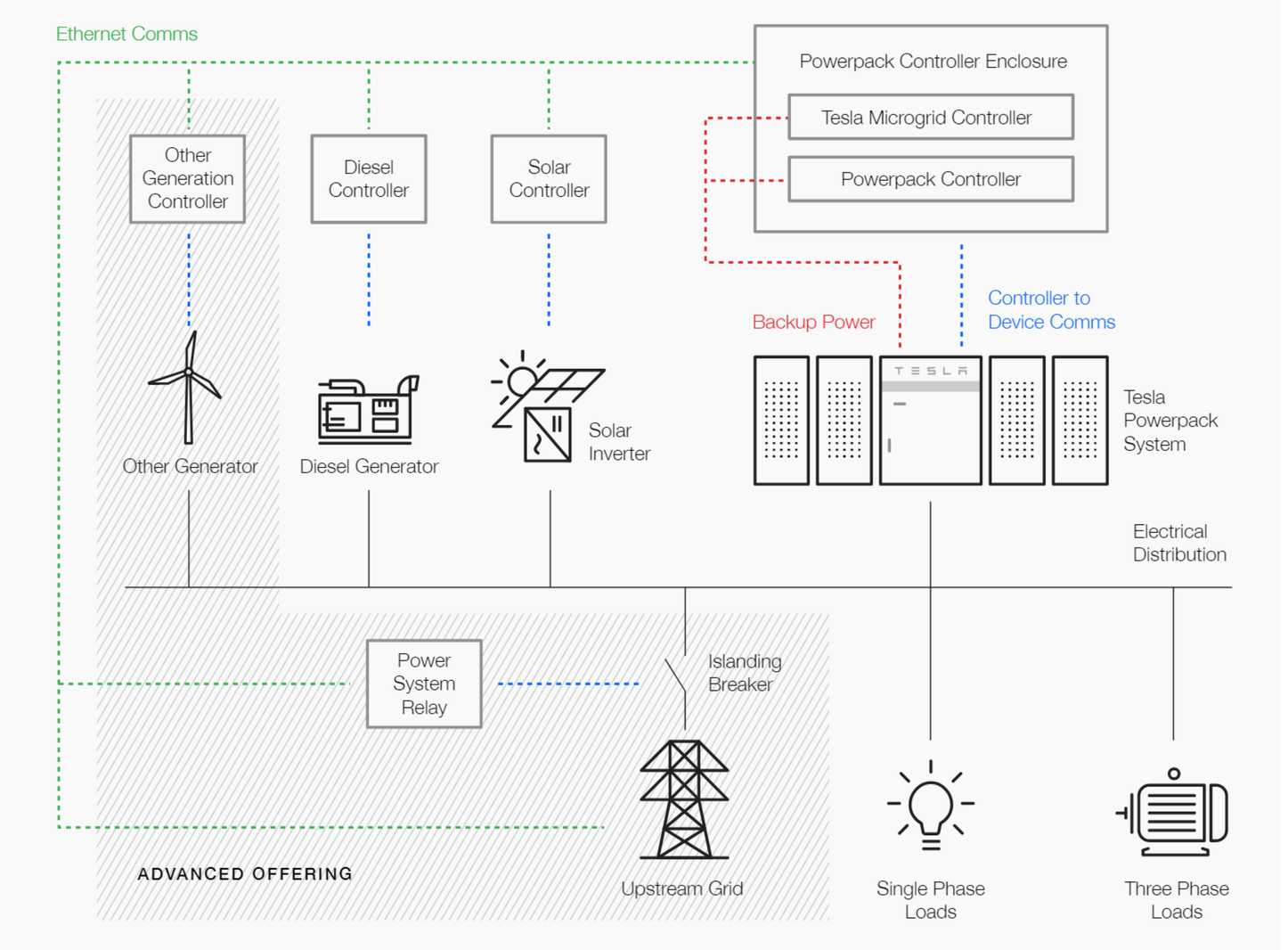
Keep renewables producing without a grid or generators

Prioritise generation assets and loads

Lower maintenance costs by reducing generator run hours

Power buffer management (spinning reserves)

Blackstart functionality



PROJECTS – INDIAN OCEAN AND CARRIBEAN

Location
Corsica, Martinique, Guadeloupe, La Reunion, Mayotte, French Guiana.

Project Size
From 500 kWh to 8 MWh (0,5C)
More than 95 MWh deployed or under deployment representing more than 50% of the total market.

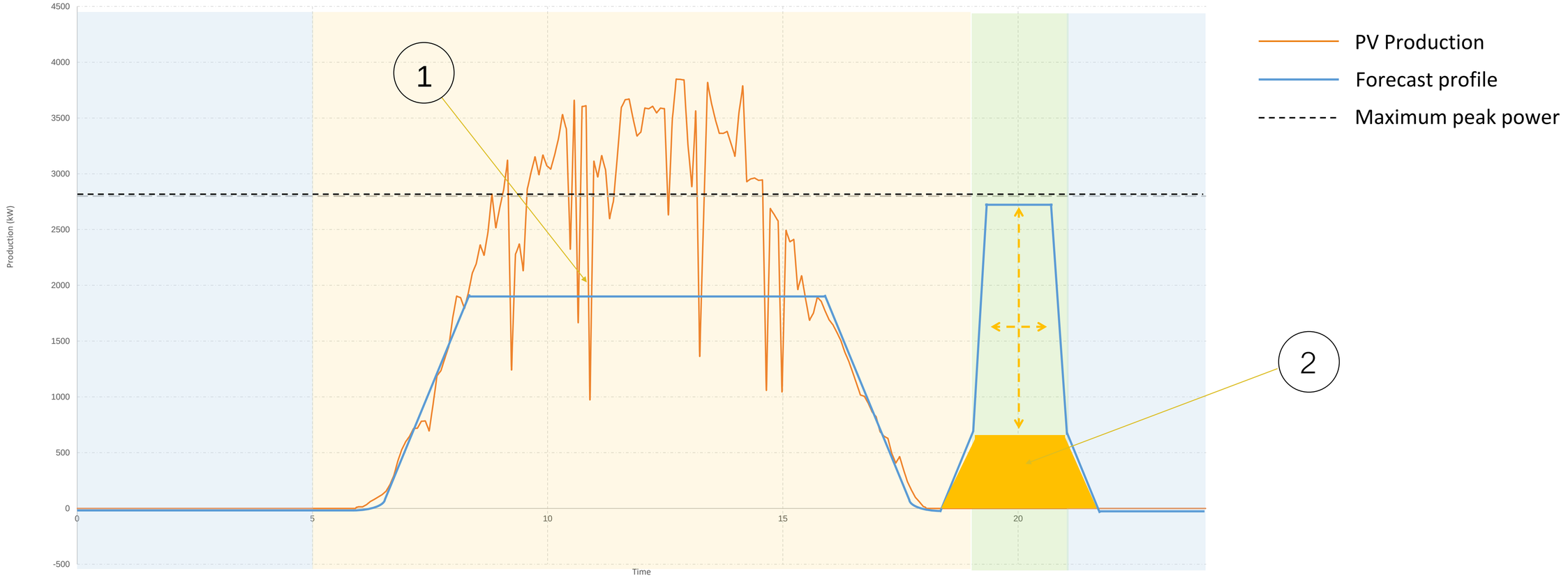
PPA (2017)
EUR 114/MWh and EUR 200/MWh bonus during peak hours
(vs 400 EUR/MWh for traditional fuel generation).

Primary Energy Resource
Solar PV

Applications
Load shifting / peak shaving
PV smoothing

Commissioned
2017 to 2020

SMOOTH DAY PRODUCTION AND PEAKER REPLACEMENT



The ESS owner will communicate a day ahead PV forecast to the utility (EDF):

1. Battery charges up to ~90% SoC in order to be ready to provide evening peak. Additional cycling is required to correct for forecast deviations.
2. Minimum output of 20% of kWp during peak hours.

2h ESS energy capacity maximizes revenues while remaining within throughput limits

Thank You