

Grids of the Future

Sustainable, Digital, and Reliable

Paulo Tanarte

Business Leader, Power System
Schneider Electric Philippines



Electricity 4.0

is our **vision** to help our customers achieve their energy and sustainability goals **from strategy to execution**, globally and locally

Digital
For Efficiency

Electricity
4.0

Electric
For Decarbonization

Digital + **Electric** = **Sustainable**
For Efficiency For Decarbonization Green and Smart Energy

Microgrid: An Introduction

- **Integration of the Distribution of Energy Resources is a major trend of the new Energy landscape**
- Distributed Energy Resources (DER) include a variety of supply-side and demand-side resources connected to the distribution network
 - Distributed generators (renewable or back-up)
 - Controllable (or flexible) loads, used for Demand Response
 - Distributed energy storage (electrical and thermal)
- Microgrid relates to DER connected at Grid Level, i.e. a group of interconnected loads and distributed energy resources (DER) within clearly defined electrical boundaries that act as a single controllable entity with respect to the grid.

Benefits of a Microgrid:

- **Reliable Energy**
 - For utilities : reinforce the grid infrastructure with reliability “zones” across the grid
 - For End User : Leverage on site generation during grid power outage (islanding)
- **Efficiency and Optimization**
 - For utilities : Leveraging cheap energy flexibility of customers through DR and TOU
 - For End User : Optimize local production vs consumption vs grid consumption
- **Green Energy**
 - For utilities and End User : Better integration of intermittent renewable sources. Avoid starting polluting peak power plant

→ ● Sub-segment

→ ● Applications

→ ○ Reference architectures

→ ○ Solutions

→ ○ Reference cases

→ ○ Offerings

→ ○ Product descriptions

Microgrid use-cases for Utilities & Retailers

Utilities
(DSOs /
DNSPs)

Retailers
(MGSP)

Grid Mgmt.
+
EMS
+
PMS



Reduce asset maintenance costs

Replace 'long lines' with Stand Alone Power Systems to reduce operational costs
(some 'rural' utilities supply 20% of customers using 70% of the asset base)

SCADA
+
EMO/SAPS



Disaster Based Islanding

Support areas during blackout OR to prevent blackouts
(e.g. PG&E to prevent wildfires)

ADMS+DERMS
+
EMO



Workforce management

Reduce need for outage crews to respond to isolated areas & improve safety
(Microgrids for isolated flooding & fire management scenarios)

ADMS+DERMS
+
EMO



Increase Asset Utilization / New Revenue Generation

Utilize existing assets to provide additional services
(Community Batteries, DC EV Kiosks, AC Pole-mounted EV Chargers)

ADMS+DERMS
+
AutoGrid



Non-wires Alternatives

Relieve constrained areas of network
(E-bus Depots, Green Steel)

ADMS+DERMS
+
EMA/AutoGrid
+
EMO



Reduced customer churn

Microgrids and EaaS offers help retain customers

EMA/AutoGrid
+
EMO

ADMS - Advanced Distribution Management System

DERMS – Distributed Energy Resource Management System (a 'Grid DERMS')

'Grid Management' – Systems used by distribution utilities to plan, control & operate the network



Categories of Microgrid

Optimize your electrical bill & sustainability footprint

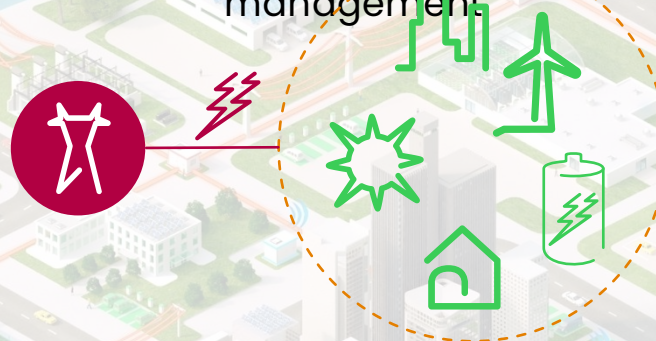
Hybrid system: Grid + local generation/storage + load management



Grid-tied

Manage blackouts while optimizing your electrical bill & sustainability footprint

Hybrid system: Grid + local generation/storage + load management



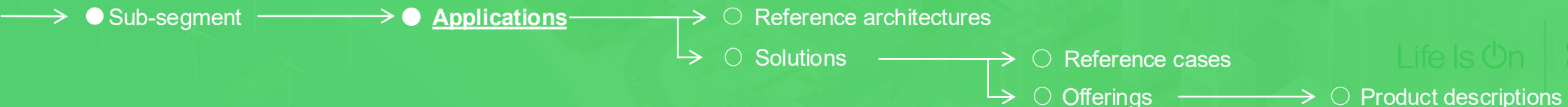
Island-able

"Power on" with efficient and future proof power systems

Hybrid system: Diesel/Gas &/or renewable generation + storage + load management



Off-grid



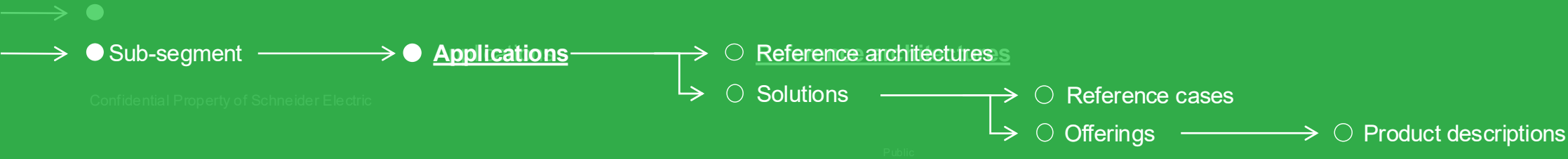
Life Is On

Schneider
Electric

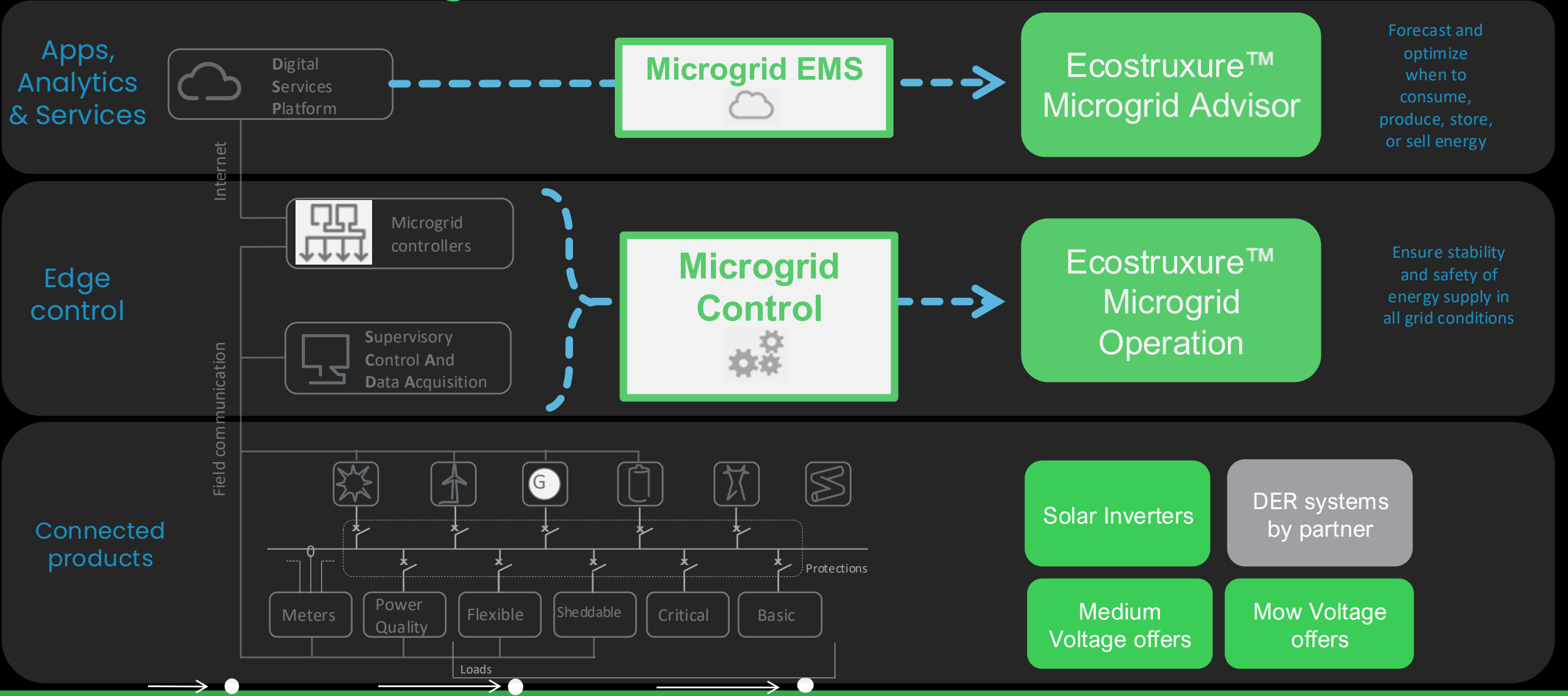
Microgrid Segmentation

Utility Microgrid
District (urban/ city)
End-user

	XS < 10kW	S / M 10 to 500kW	L 500kW to 10MW	XL > 10MW
Grid-tied Always connected to utility-grid	Smart Homes without islanding 	Small & Medium Buildings 	CIB wo islanding 	Eco district 
Islandable Able to switch from grid-tied to off-grid	with islanding		CIB, Campus 	
Off grid Works independently from any grid	Access to Energy 	Rural electrification 	Remote sites & Islands 	Large islands (utility grid)



EcoStruxure Microgrid Architecture



Leading companies follow an **integrated** approach

Strategize

MEASURE enterprise baseline
CREATE decarbonization roadmap
STRUCTURE program & governance
ENGAGE ecosystem
COMMUNICATE commitment



Digitize

MONITOR resource usage & emissions
IDENTIFY saving opportunities
REPORT and benchmark progress

Decarbonize

REPLACE energy source
ELECTRIFY operations
REDUCE energy use

Life Is On

Schneider
Electric

The moment is now

