

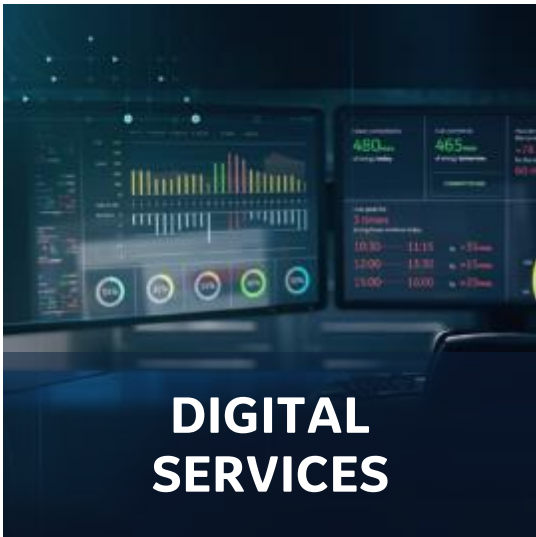


October 18, 2021

GE Renewable Energy Renewable Hybrids

GE Renewable Energy

\$15B revenue • 40,000 employees



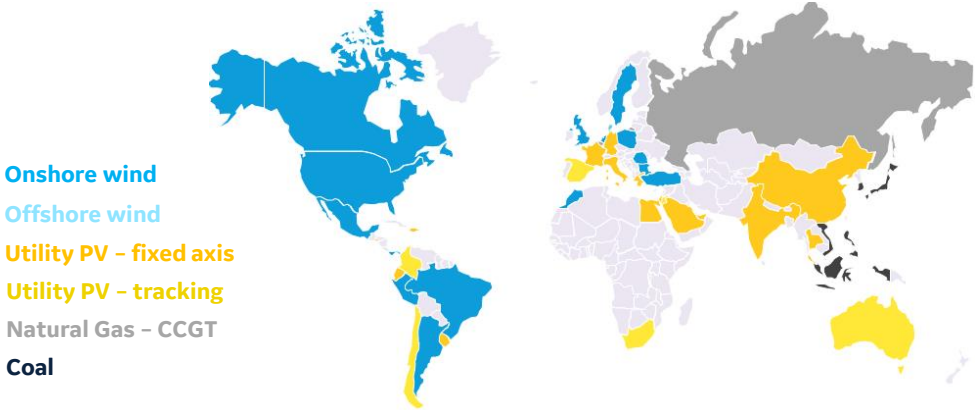
Broadest portfolio in the industry; gives us scale, scope and capability to fulfill our mission

Renewable Energy is Mainstream



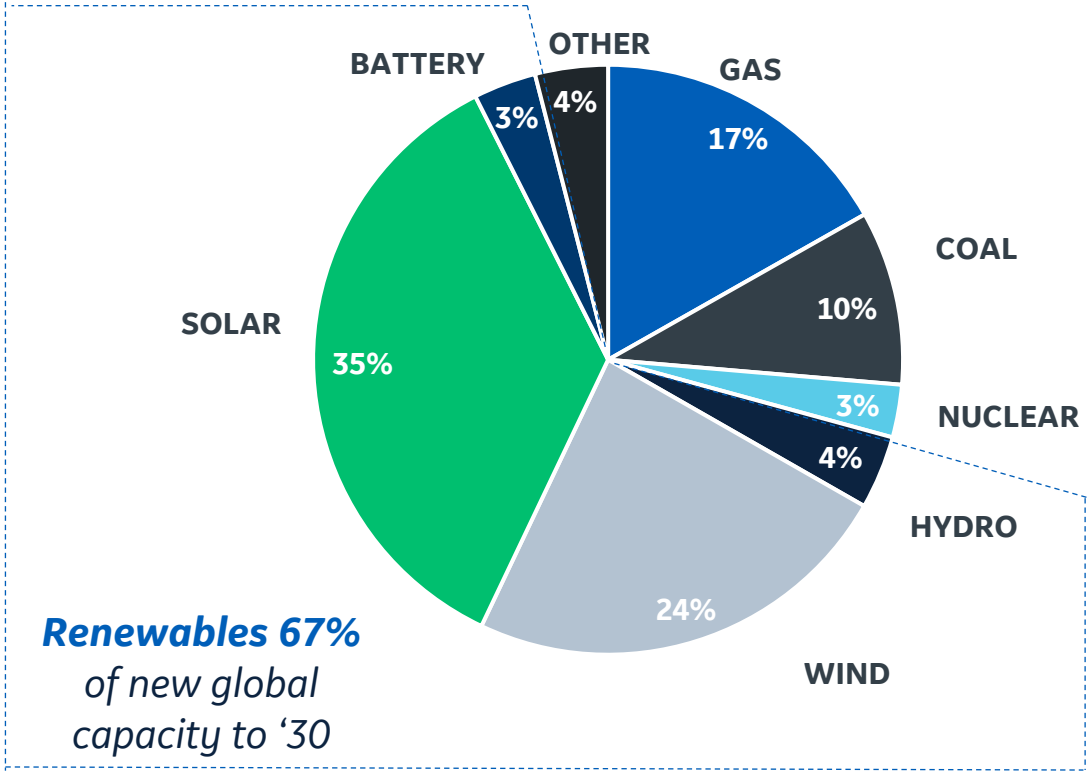
WIND & SOLAR CHEAPEST ENERGY SOURCES FOR 2/3 OF THE WORLD

Most competitive source of new bulk generation in 2020

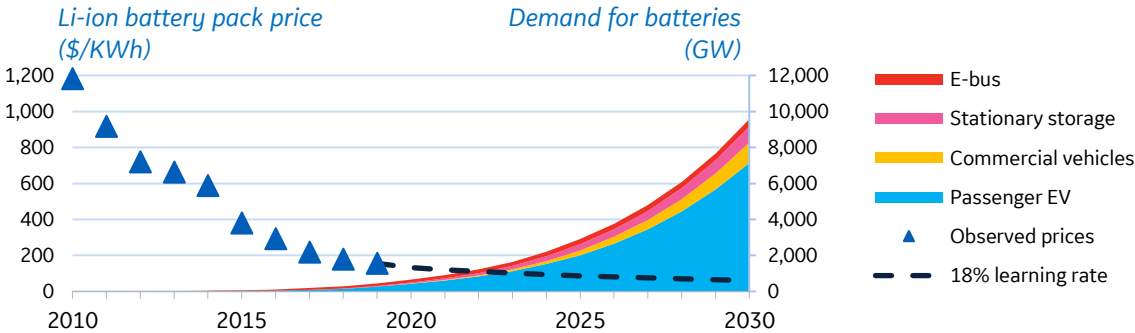


WIND, SOLAR & STORAGE INSTALLS CONTINUE TO GROW

Projected Capacity Additions 2020-2030



Battery costs have reached point of inflection

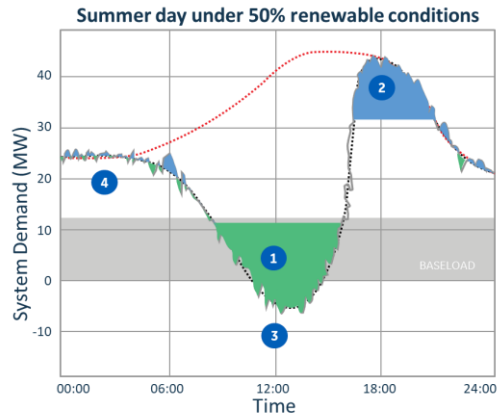


Source: BNEF 2020 New Energy Outlook, BNEF 2019 Li-ion Battery Survey

Increased RE penetration requires improved dispatchability, grid stability & efficiency/affordability that Hybrid Systems can provide

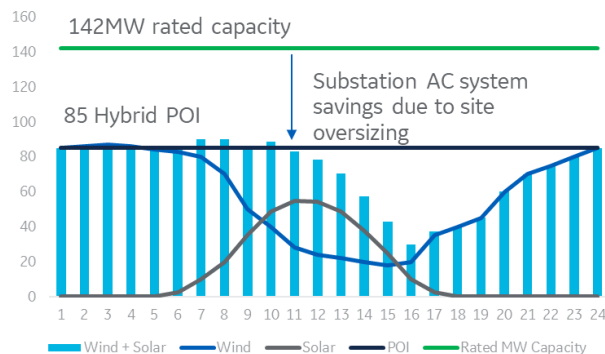


Integrating Storage



- 1 | Renewables curtailed** - ES charged with free or negative priced energy
- 2 | Peak Load** - ES discharged during peak demand
- 3 | Spinning Reserve** - ES discharged during dynamic events
- 4 | Frequency Regulation** - ES continuously charged and discharged to maintain grid stability

Integrating Wind and Solar



Leveraging complementarity of Wind and Solar to:

- Increase Capacity Factor
- Optimize EBOP and interconnection
- Optimize use of land
- Improve combined LCOE

Increased RE penetration requires improved dispatchability, grid stability & efficiency/affordability that Hybrid Systems can provide



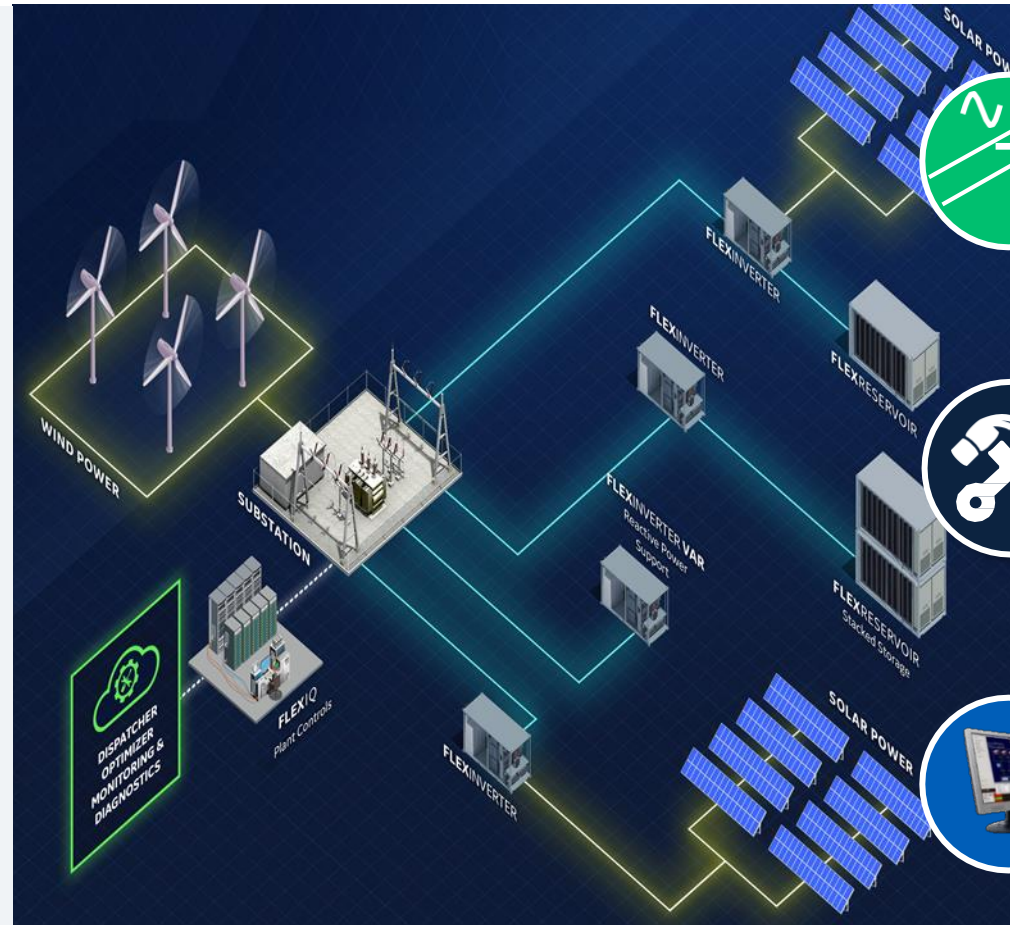
Who benefits?

Grid Operator

- Lower Wind & Solar variability
- Increased flexibility
- Grid CAPEX deferral
- Peaker replacement
- Grid security/blackout avoidance

Asset Owner

- Increased Capacity Factor
- Hybrid DEVEX, CAPEX & OPEX optimization
- Optimized power forecasting & output
- Access to Energy, Capacity and Grid Services revenue streams



Improved Capacity Factor at Point of Interconnection

- Wind/Solar resource complementarity
- Lower Wind+Solar combined LCOE
- Curtailment avoidance

Synergies

- Common Electric Balance of Plant & interconnection
- DC-coupled *Solar+Storage* configuration
- Optimized use of land and civil works
- Common O&M
- Single permitting process

Integrated Controls & Software

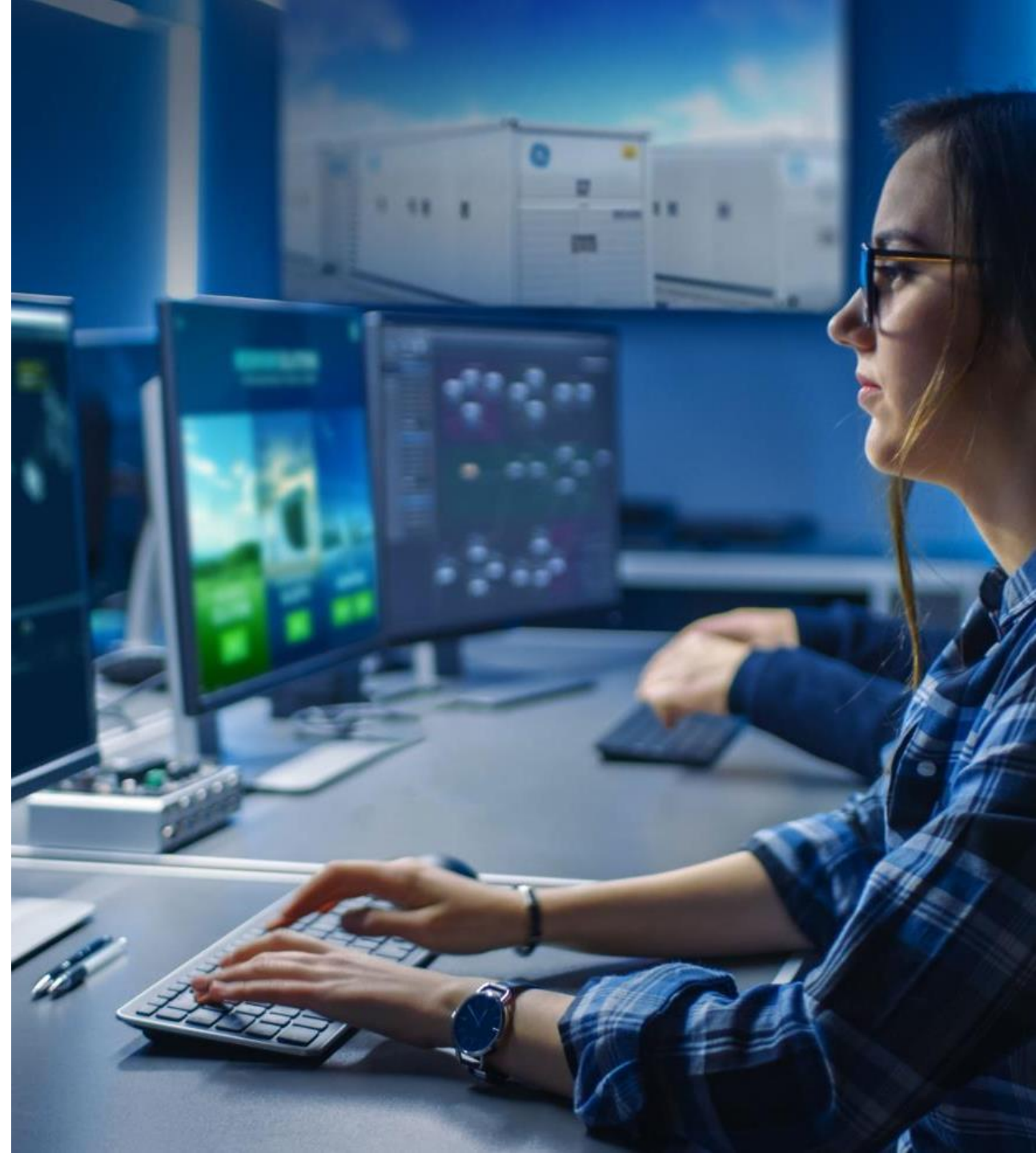
- Multi-asset coordinated plant control & grid compliance
- Dispatch optimization to maximize revenue or profit
- Hybrid plant monitoring & diagnostics

What are Hybrids in GE Renewable Energy?

- A combination of multiple generation sources and/or energy storage (i.e., *Wind+Solar*, *Solar+Storage*)
- An integrated farm with a single controls system
- Energy storage in the form of Battery or Pumped Storage

OUR MISSION

Making renewable energy more affordable, reliable and dispatchable by integrating one of the industry's broadest portfolio of renewable technologies



Hybrids – GE's OEM fleet and innovation tradition to leverage



460 MWh+ BESS
Turnkeys ... All Grid Scale



1st Thermal Hybrid
3 x LM6000 + storage in operation since 2017



47,000+ WTG ...
90 GW Installed globally



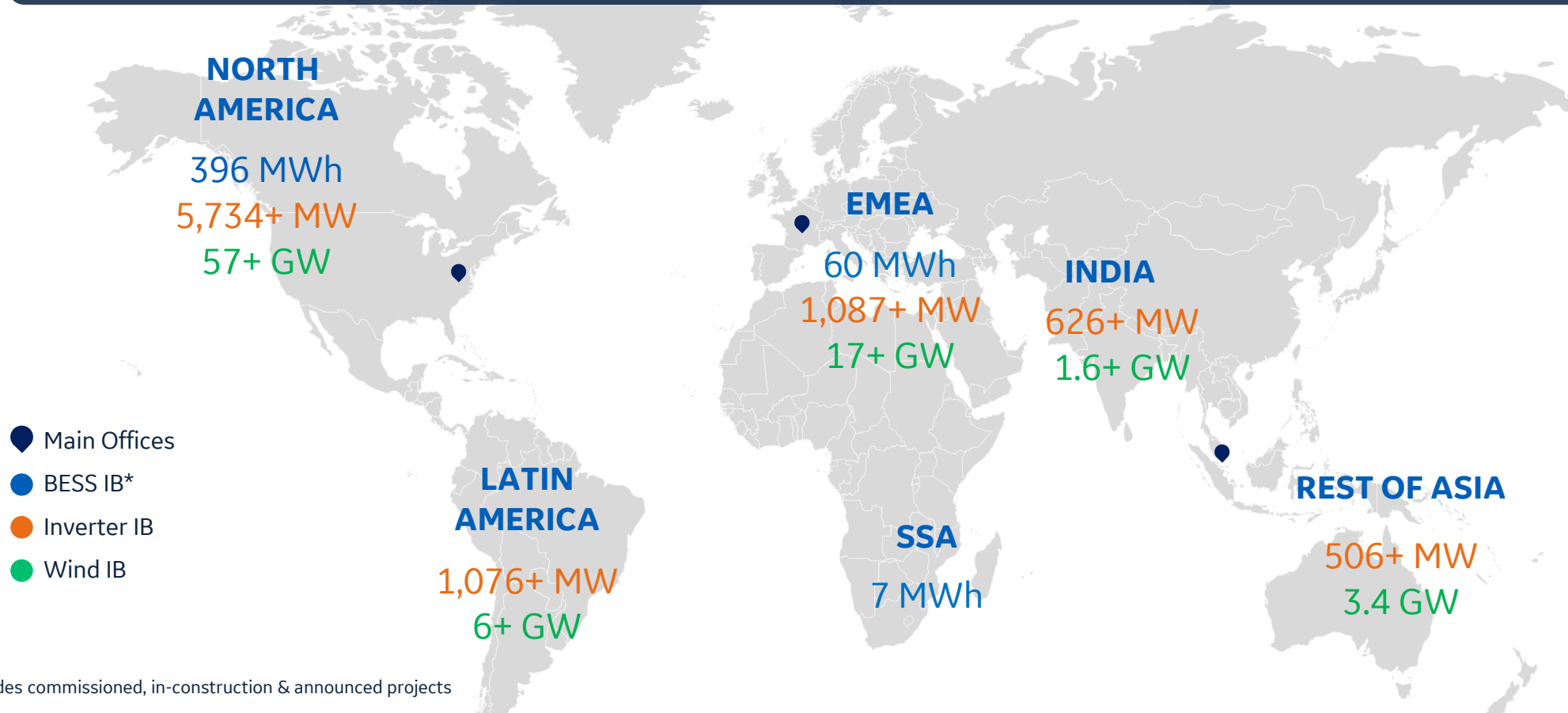
1st 12 MW WTG &
largest ON WTG Haliade-X & Cypress



9 GW+ Inverters for
PV and BESS installed



1st 1500 V solar technology integrated
solution





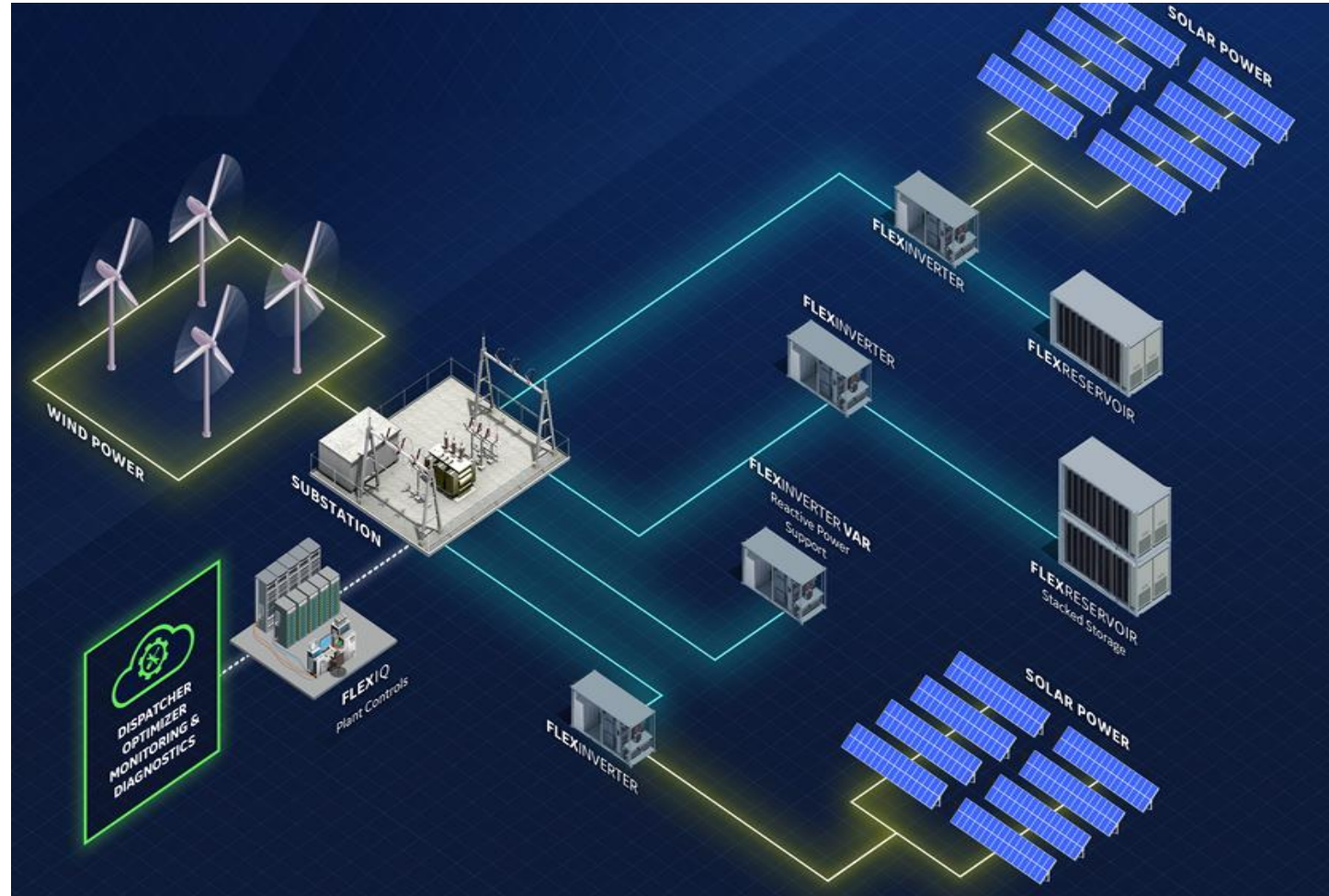
— Our Solution Set

Our FLEX solution set

Flexible. Reliable. intelligent

As we navigate the energy transition, our customers require flexible, reliable and intelligent solutions that can solve for complex challenges while maximizing value. The FLEX portfolio solves for multiple applications to enable dispatchable, green MWhs.

- **FLEXIQ** – digital platform that provides design, operations and fleet management solutions to enable grid compliance and maximize lifetime customer value
- **FLEXRESERVOIR** – systems integrated battery energy storage & power electronics solution, for multiple configurations and market applications
- **FLEXINVERTER*** – containerized solution that delivers a reliable, cost-effective, plug & play, factory integrated power conversion platform for utility scale solar and storage applications



From **origination** to **operation**, GE's **FLEXIQ*** digital platform provides design, operations, and fleet management solutions to optimize a Hybrid project's customer value.



Hybrid Architect

Techno-economic evaluation and plant configuration tool to maximize project value.



Plant Control

Multi-asset plant controls for coordinated control of active and reactive power, voltage, and PF.



Dispatcher

Dispatch schedule optimization software to maximize revenue or profit.



MD

App for monitoring and reporting asset alerts, performance, and issue identification.



ORIGINATION



OPERATION

*Trademark of General Electric

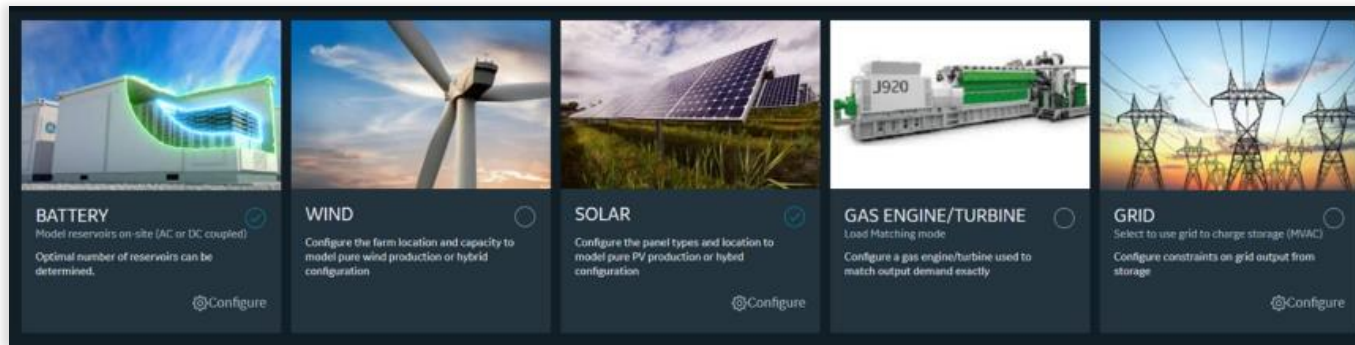


Hybrid Architect



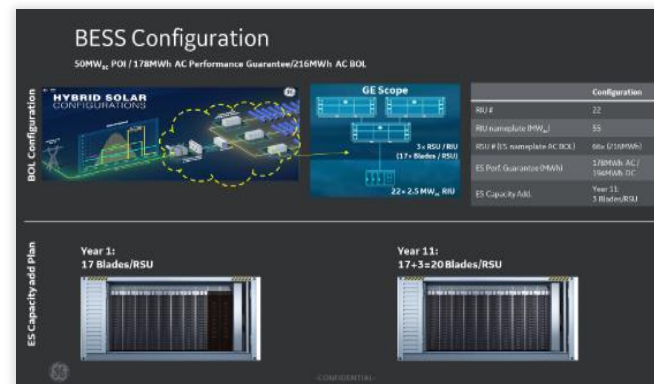
User Input:

- Basic user: location, generation equipment, revenue and power output
- Expert level: allows adjustment of 70 variables finance, Capex, Opex, Equipment efficiency and degradation



Output:

- Optimized hybrid system design configuration
- Multi-year proforma w/LCOE, NPV, IRR
- Curtailment Analysis
- Battery Capacity Addition Strategy for local incentives
- Power point summary



Battery



Wind



PV



Grid



Gas

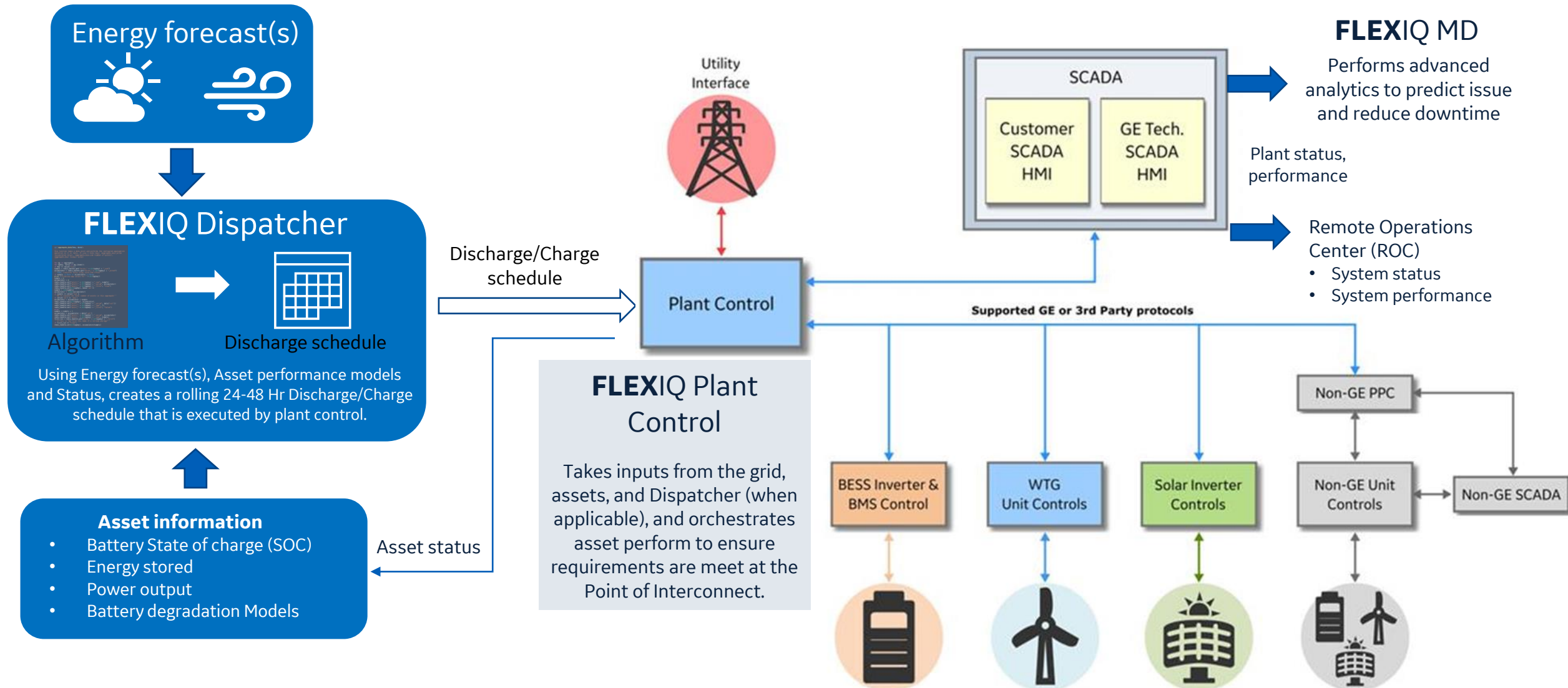
APPLICATIONS/ USE CASES

- Energy Shifting
 - Merchant/Structured PPA
- Load Following/Firming
- Capacity Payments
- REC for Revenue
- Curtailment
- Frequency Response
- Additional applications/use cases as market demands change

GENERAL IMPACT OF ARCHITECT

- Reduces design cycle time from weeks to hours
- optimized configurations with up to 10% additional value

FLEXIQ Control System (Plant Control, Dispatcher, and MD)



FLEXRESERVOIR BESS Solution

Cell to system integration, extracting maximum reliability and performance with safety at its core

- GE's integrated, Energy Storage System & Power Electronics for AC and DC coupled solutions
- Scalable in duration from 1 – 4h+
- 3MW – 500MW+
- Adaptive to different markets and application spaces through modular configuration of the FLEXRESERVOIR
- Future proved design to accommodate flexible augmentation & changes in battery supply chain



FLEXRESERVOIR – Cell to system integration, extracting maximum reliability and performance with safety at its core



*Adaptive to different markets and application spaces through modular configuration of the **FLEXRESERVOIR***

Power Electronics

3MW+ **FLEXINVERTER**

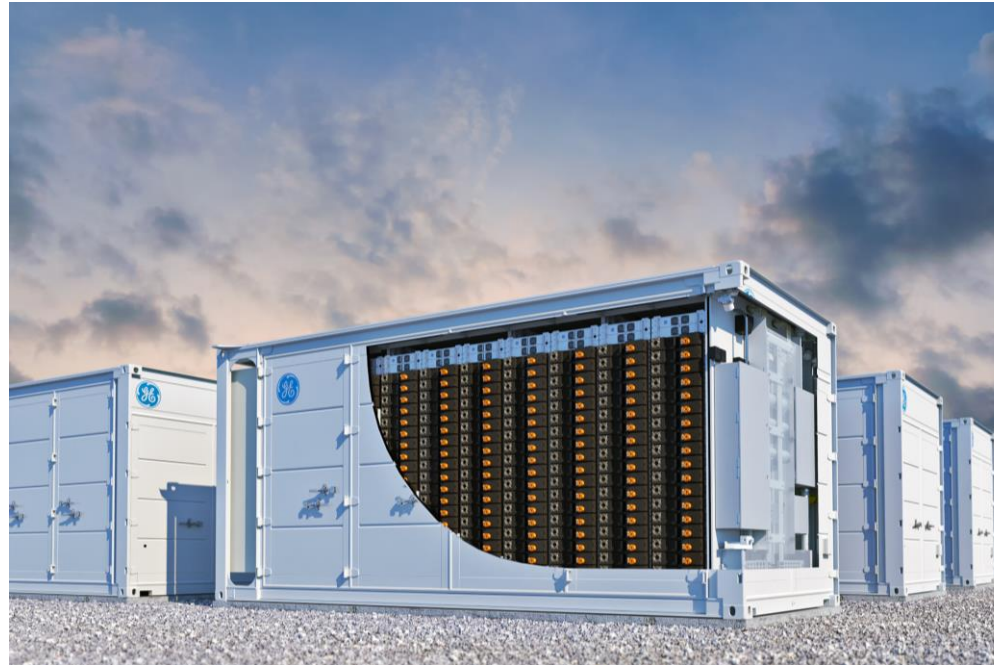
- Standalone or as integrated power station
- AC & DC coupled applications
- Grid following or forming capabilities

Enclosure Flexibility

- Battery agnostic, able to accommodate multiple form factors & OEMs
- Duration flexible 1-4hr +
- Flexible PV expansion capability (increase DC/AC ratio)
- Optional self derived aux power. No need for AC aux power distribution

Blade Protection Unit

- Maximize system utilization (fewer inverter stations)
- Eliminate potential of high short circuit currents and damage to batteries
- Easily mix and match batteries on the same inverter during augmentation (different capacities, cell/stack voltages, etc)
- Simplified DC coupling for Solar + BESS



System optimization

- Option for all connections to be above ground & less EPC costs
- Stackable for increased power density
- System integrated solution for maximum flexibility

Safety & Compliance

- Deflagration
- Manual venting
- UL 9540 & 9540A
- NFPA 855
- Fire suppression
- Active short circuit protection*

Scalable Configuration

- Power 3-500MVA+
- Duration 1-4hr +
- Expandable duration architecture

Multiple Applications

- DC coupled
- AC coupled
- Black start/grid forming

*For systems 2hr + in duration

FLEXINVERTER - Power conversion platform for utility scale solar and storage applications



FLEXINVERTER* Solar/BESS Power Station

INVERTER + TRANSFORMER + RMU

- 3.0 – 3.9 MW, high power density
- DC-coupling configuration option
- High efficiency
- Plug & play with Night-time/Idle-time Disconnect option
- Outdoor UL / IEC installation options
- ISO high cube 20ft container
- Inverter system configurations up to 20 MVA+
- Plant controller agnostic

FLEXINVERTER Stand-alone

- 3.0-3.9 MW, high power density
- DC-coupling configuration option
- Advanced grid features and reactive power control, day and night for grid stabilization
- IEC and UL compliance
- ISO Tricon container for optimized logistics
- Plant controller agnostic



*The solar inverter range **FLEXINVERTER** was originally named "**LV5+**". For marketing purposes, the product name for the GE Renewable Energy solar inverter was changed

Solar Scalable Solutions

Solar – Performance Guarantee

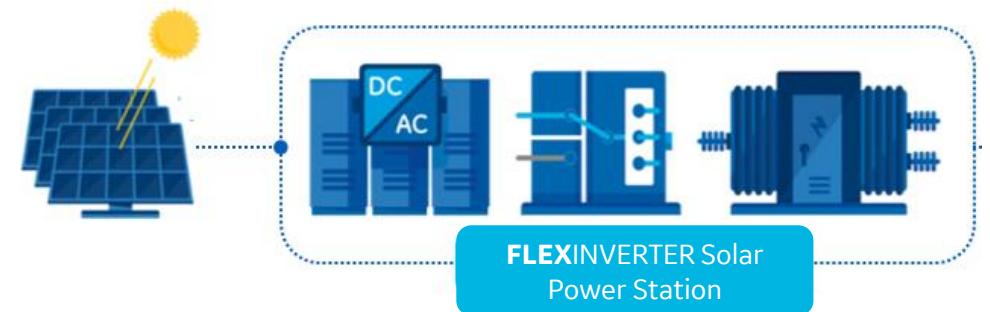
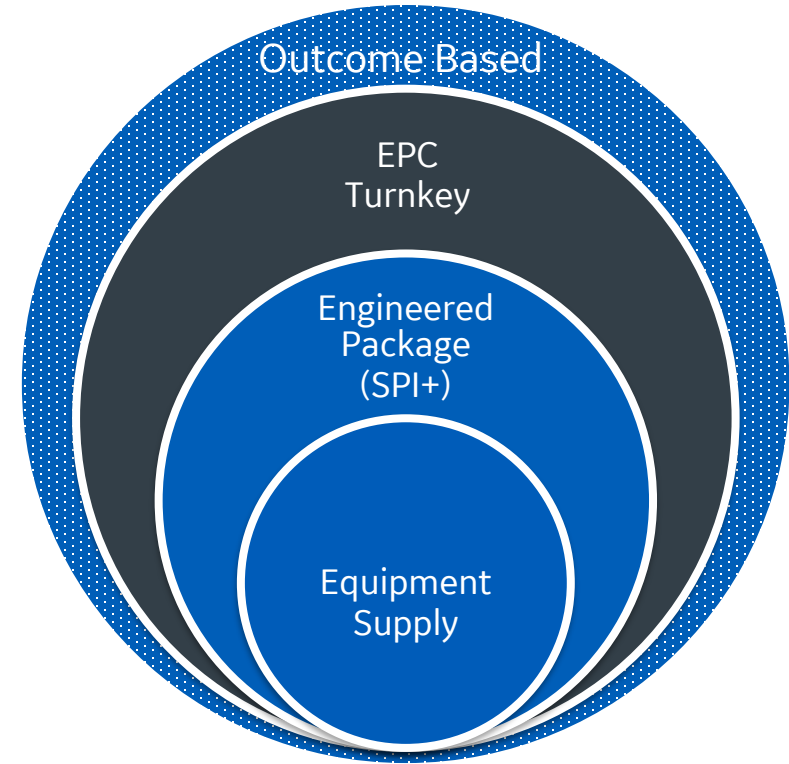
- PR Guarantee

Solar Power Island + (Selective)

- Engineered Equipment Package
- GE Solar Digital
- *Combiner boxes, Cables, Racking and Structures*

GE Technology (Inverter Station)

- 1500V Inverter
- SCADA Plant control
- Digital Ready
- Cyber secured Remote connection





— Case Studies



- The innovative DC-coupled solution **improves solar yield and overall efficiency of the system** while enabling dispatchable renewable energy into the grid
- This will help improve the overall energy output of the solar-storage hybrid system while helping to reduce costs and increasing the overall system reliability and flexibility
- Project aligns with UK Government push to use energy storage to take full advantage of wind and solar power in combating climate change



- 25MW multiple hour duration Energy Storage System to be integrated with Wykes' plant at the Chelveston Renewable Energy Park
- The site currently operates with 60 MW of solar energy and 26 MW of wind energy, featuring GE's 2.85 MW onshore wind turbines
- GE's Reservoir Energy Storage

technology integrated to add another 60 MW of solar capacity

- The Storage system will be the UK's first direct-DC-coupled Solar deployment where the Solar Panels and Batteries will share a common set of power conversion equipment



- The innovative DC-coupled solution **improves solar yield and overall efficiency of the system** while enabling dispatchable renewable energy into the grid
- DC-coupling enables **higher RTE** with one less conversion round
- **Less CAPEX** as PV arrays connect to Inverter unit of battery – replaces need for standalone Solar inverter
- NYSERDA subsidy scheme to offset uncertainty of revenues streams – NY state to deploy 1.5GWh of storage until 2025



- Integration of two solar PV arrays built by Helios Energy with two energy storage systems, comprised of GE's Reservoir technology, Reservoir Inverter units, control systems and combiner boxes.
- Two **3 MW / 12 MWh** and **2 MW / 8 MWh** storage systems
- **Direct DC coupled** configuration with a **single inverter and single point of interconnection** shared by the solar array and the storage system



Building a world that works



SOLAR INVERTER FLEXINVERTER

STATEMENT ON SOLAR INVERTER PRODUCT NAME

This information is about product naming of GE Renewable Energy solar inverter range **FLEXINVERTER**.

It explains the renaming of the solar inverter product.

The solar inverter range **FLEXINVERTER** was originally named "**LV5+**".

For marketing purposes, the product name for the GE Renewable Energy solar inverter was changed.

The data sheets and every marketing collaterals were changed to reflect the revised product name accordingly.

There has been no design change linked to the product renaming.

A blue ink signature of Mike Bowman, written in a cursive style.

Mike Bowman

Renewable Hybrids Chief Technology Officer
GE Renewable Energy