

# POWERING THE ENERGY TRANSITION: BUILDING A RESILIENT, INTELLIGENT GRID FOR THE FUTURE



Brent Brunell





[brent.brunell@gevernova.com](mailto:brent.brunell@gevernova.com)

*Technology Director Digital & Electrical Systems*

*GE Vernova's Advanced Research Center*









# GRID TRANSFORMATION

# THE GRID GROWTH

	% ELECTRICITY	GENERATION
<b>TODAY</b> ↓	 22%	 30 PWh/yr
<b>2050</b>	 50%	 70 PWh/yr

**BUILDING AS MUCH ELECTRICITY INFRASTRUCTURE IN THE NEXT 25 YEARS  
AS HUMANITY BUILT IN THE PREVIOUS 150 YEARS COMBINED.**

# THE GRID EVOLUTION

	FUEL	GENERATION	POWER FLOW	DEMAND
YESTERDAY	 Dispatchable on demand	 Centralized Provides inertia	 Predictable, one-way flow	 Stable & Predictable
TOMORROW	 Intermittent Limited dispatchability	 Distributed Limited natural inertia	 Bi-directional Meshed network	 Dynamic & Less predictable

THE ELECTRICAL GRID IS BECOMING MORE **DECENTRALIZED, DYNAMIC, AND COMPLEX ...**

**NEW SOLUTIONS REQUIRED**

# DATA CENTERS

# DATA CENTER POWER MARKET



# \$1T

ELECTRICITY IS ONE PART OF **\$7T** DATA CENTER BUILD OUT

# DATA CENTER POWER DEMAND



# 220 GW

FOR REFERENCE: ALL OF CANADA IS ~165 GW

# DATA CENTER RELIABILITY



99.999%

CONCURRENT MAINTAINABILITY AND **FULL FAULT TOLERANCE**



# GE VERNOVA RESPONSE

# 100 YEAR OLD STARTUP ACROSS ENERGY LANDSCAPE



# 80K

Global employees

# 130+

Countries

## POWER



Gas Power, Hydro Power, Nuclear, Steam Power

## WIND



Onshore Wind, Offshore Wind

## ELECTRIFICATION



Electrification Software, Grid Solutions, Power Conversion & Storage

## ACCELERATORS

Advanced Research, Consulting Services, Financial Services

# UNIQUELY POSITIONED LEADING ENERGY TRANSITION



## ENERGY SOURCE



Nuclear



Gas



Wind



Solar



Water

## ENERGY DESTINATION



Homes



Data Centers



Industry



### GENERATE

Generate approximately 25% of the world's electricity.

### TRANSFER

Grid and electrification solutions to transfer power more reliably and efficiently.

### ORCHESTRATE

Automated, digital power management systems.

### CONVERT

Science, systems and advanced technology to improve efficiencies in power conversion.

### STORE

Intelligent solar and storage solutions to address the variability of renewable energy supplies.

**~25%**

World's electricity generated with the help of our technology

**+95%**

of power transmission utilities rely on our Electrification Systems components

**90%**

Of companies across the sectors use our industrial software

**1st**

Small Modular Reactor commercial contract signed in North America

# DATA CENTER PRODUCTS AND BREAKTHROUGHS

## DISPATCHABLE POWER

- GAS Turbines
- Nuclear

## ELECTRIFICATION

- Electrification Systems
- Electrification Software
- Energy Management Systems
- Solid State Transformers
- Grid Beats and GRIDOS

## DATA CENTERS

## RENEWABLES

- Onshore Wind
- Batter Energy Storage Systems

## BREAKTHROUGH INNOVATIONS

- Small Modular Nuclear Reactor
- Carbon Capture
- Hydrogen Fuel
- Direct Air Capture



# PRODUCTS: STABILITY, SECURITY, RESILIENCE ...

3 areas creating more dependable system

1

## Grid Forming

From synchronous generation to an inverter dominated grid

Grid forming technologies pioneered and industrialized by GE Vernova



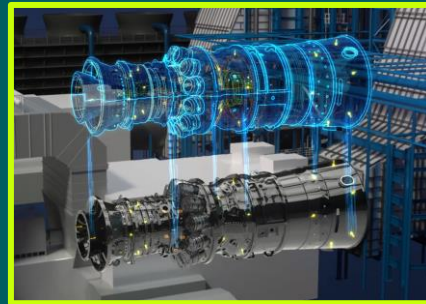
NREL GFM Solar Demo

Stability Solutions

2

## Cyber Security

Securing critical infrastructure through zero trust architectures, AI-driven threat detection, and quantum-resilient solutions



Cyber-Physical Security

3

## AI Grid Planning

ML model of grid behavior that can be used over multiple tasks for multiple grids: Planning, Operations, Markets



Grid Foundation Model

# RESILIENCE, REDUNDANCY, AND INTELLIGENCE ... EVERY NODE

# INTERNAL: CAPACITY, CAPABILITY ...

3 areas impacting productivity

1

## AI

**From:** Internal productivity

**To:** Process Transformation & Product Capabilities



Focused on growth

2

## Robotics

Higher-capacity operations, lean and increased safety



Capacity through Automation

3

## Operations Optimization

Planning and schedule optimization



Capacity without CAPEX

# GROWTH USING ADVANCED TECH **IN STANDARD PROCESS** ... SCALE

# SUPPLY CHAIN IMPACT

# GRID DISRUPTION & DATA CENTERS ...

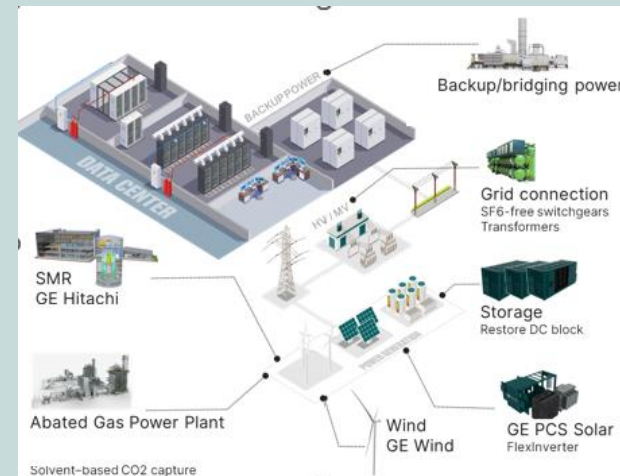
Multiple supply chain risks identified

## Grid Disruption

- Power quality degradation
- Rising outage risk
- Electrification of logistics
- Energy cost volatility

## Data Centers

- Unquenchable demand
- Equipment lead time increasing
- Data centers reshaping grid investment priorities



IDENTIFY POWER RELATED RISKS AND GEOGRAPHIES ... **ABATEMENT PLANS**

# STRATEGIC OPPORTUNITIES & TAKEAWAYS ...



## Strategic Opportunities

- Energy resilience as competitive advantage
- On-site generation and GFM-capable storage
- Securing priority grid access through utility partnerships

## Takeaways

- The grid is your silent Tier 1 supplier
- Data center growth is creating a power scarcity economy
- GE Vernova's integrated portfolio delivers proven, scalable pathways to resilience

EMBEDDING ENERGY AS A CORE STRATEGIC VARIABLE ... **COMPETITIVE ADVANTAGE**

# THE ENERGY TO CHANGE THE WORLD

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# MIT × GE Vernova

## Energy and Climate Alliance