



**IEEE NWESS**

# **How AI is Redefining Energy Delivery**

Shawntia McNeil- Global Energy Ecosystem Lead/Manager at NVIDIA

# Pioneering Accelerated Computing and AI



Full Stack, Data Center Scale  
 5.4 Million Developers  
 62 Million CUDA Downloads  
 4,000+ Accelerated Applications  
 2,000+ Inception Startups

# Energy Customer Business Drivers

What AI and Accelerated Computing Delivers



## More Production

While Reducing Environmental Impact



## Lower Cost

Improving Physical Systems at the Margin



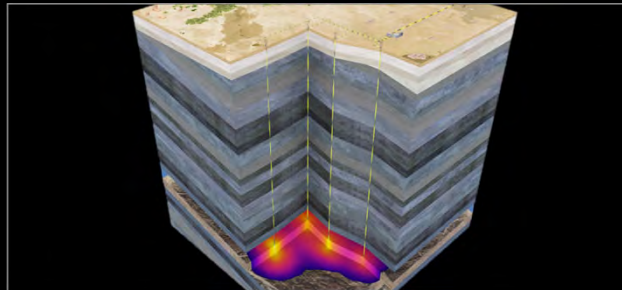
## Faster Time to Outcomes

Better Decisions Faster



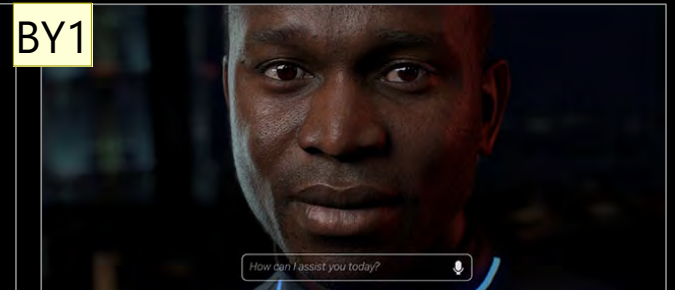
## Less Risk

Physical, Cybersecurity, and Safety



## Lower Carbon Footprint

Accelerate CCS



BY1

Better Employee and Customer Experience

Answers at Their Fingertips

### Slide 3

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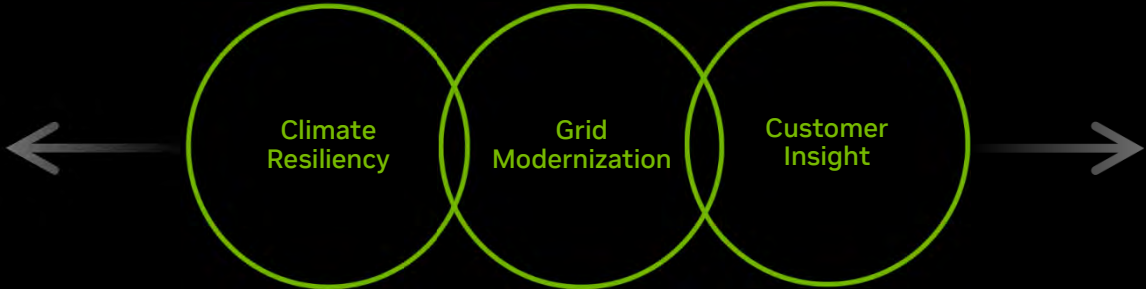
**BY1** [@Natalie Miller] looks like it's only blurry when viewing full-screen using PPT online. I downloaded and viewed in PPT app and images looked clearer.

Updated image #2, #5, and #6  
Brent Younger, 2025-01-16T19:43:20.387

**NM1 0** Thanks Brent  
Natalie Miller, 2025-01-18T01:38:26.111

# How AI is Being Leveraged Across Power and Utilities

Becoming a software defined energy provider



Generation



Predictive Maintenance & Inspection



Load Planning and Optimization



Grid Optimization



Cybersecurity

# AI-Powered Utilities Use Cases

## Powering Energy Transition

### Grid Planning

- Interconnection
- Rate Case
- Capacity Planning
- Demand Response
- Load Forecasting
- Renewable Generation

### Operations

- Power System Co-pilot
- Knowledge Management
- Drone Inspection
- Weather Forecasting
- Vegetation Management
- Switching orders (FLISR)
- Outage Validation

### Digital Twins

- Substation Digital Twins
- Turbine Digital Twins
- Solar/PV
- Wind Farm Digital Twins
- Battery Storage And Power Line

### Customer Experience

- Virtual Assistants
- Proactive Notification
- Energy Usage Behavior
- Power Saving Recommendation

### Cyber and Physical Security

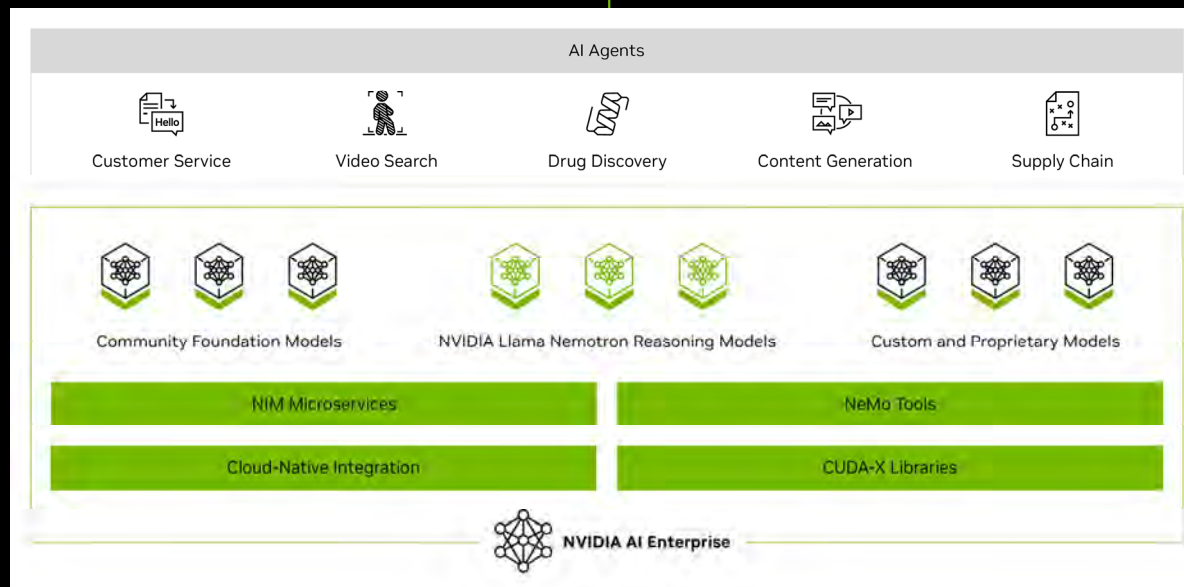
- Threat Detection
- Digital Fingerprinting
- OT Threat Detection
- Incident Response
- Compliance Management
- Intrusion Detection
- Video Surveillance and Summarization

### Capital Projects

- RFI/RFP/EOI Generator
- Engineering Co-Pilot
- Engineering Configurator
- Construction Site Management
- Compliance Management

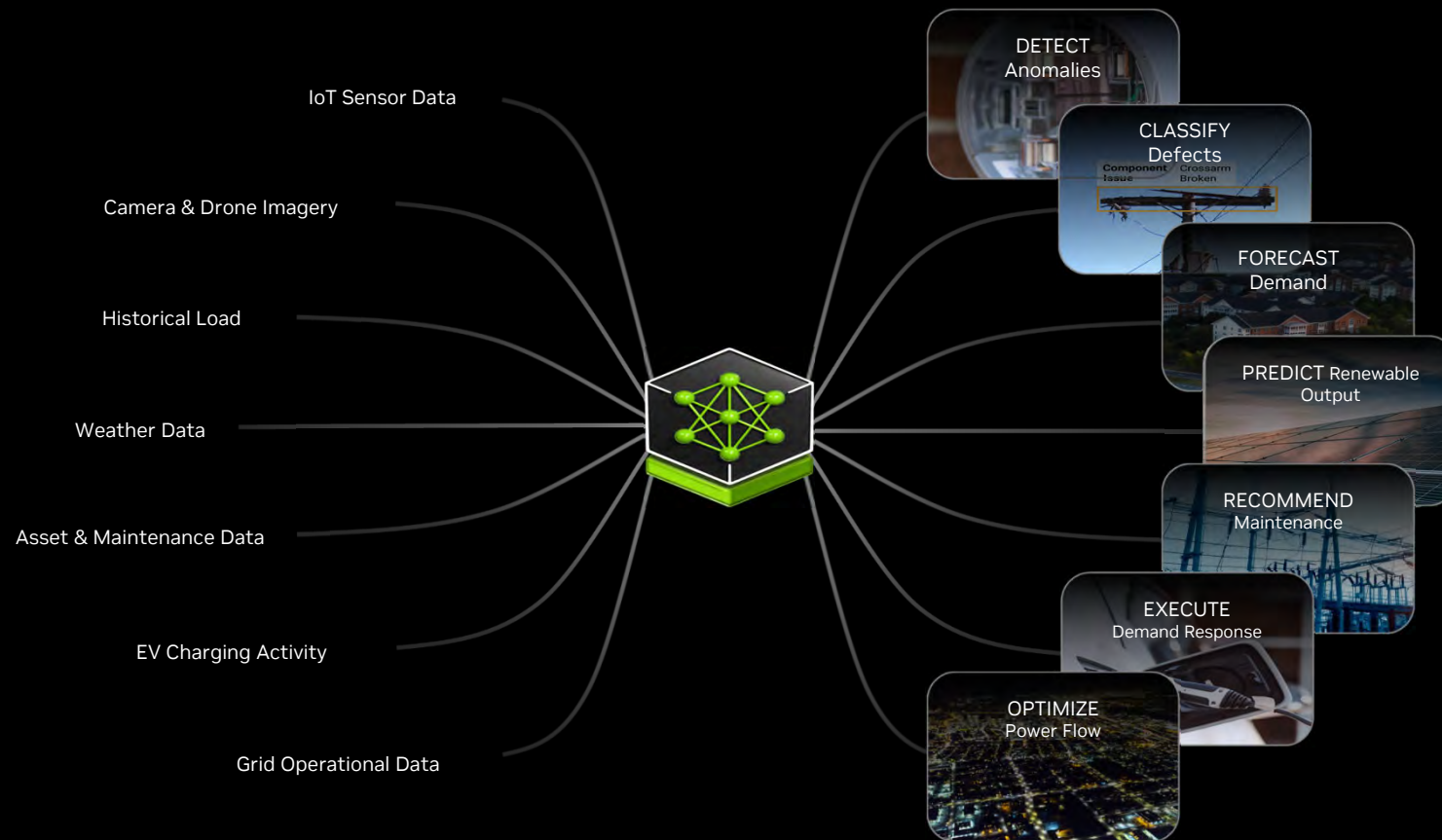
### Power Trading

- Price Forecasting
- Load Generation Forecasting
- Market Simulation
- Trading Strategies
- Trading Agents/Bots



# The Power of Domain-Specific AI Models

Transform vast amounts of energy data into actionable intelligence

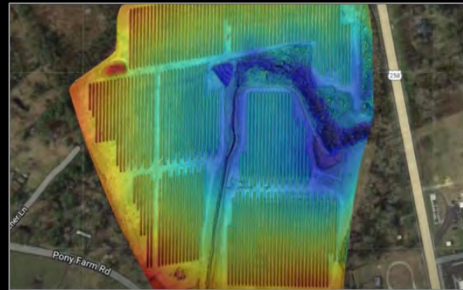


# How Energy Companies Are Leveraging AI

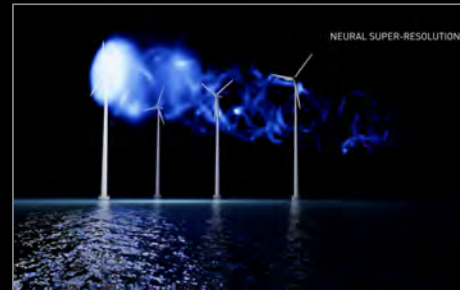
## Becoming a Software Defined Energy Provider



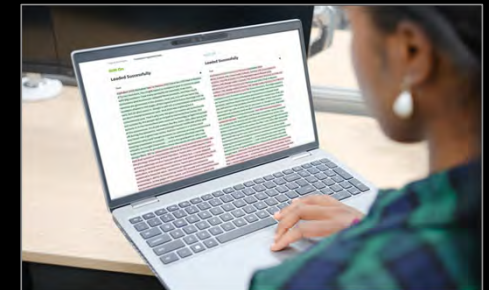
Data Science and Predictive AI



Computer Vision



Physics ML



Generative AI



Robotics



Digital Twins



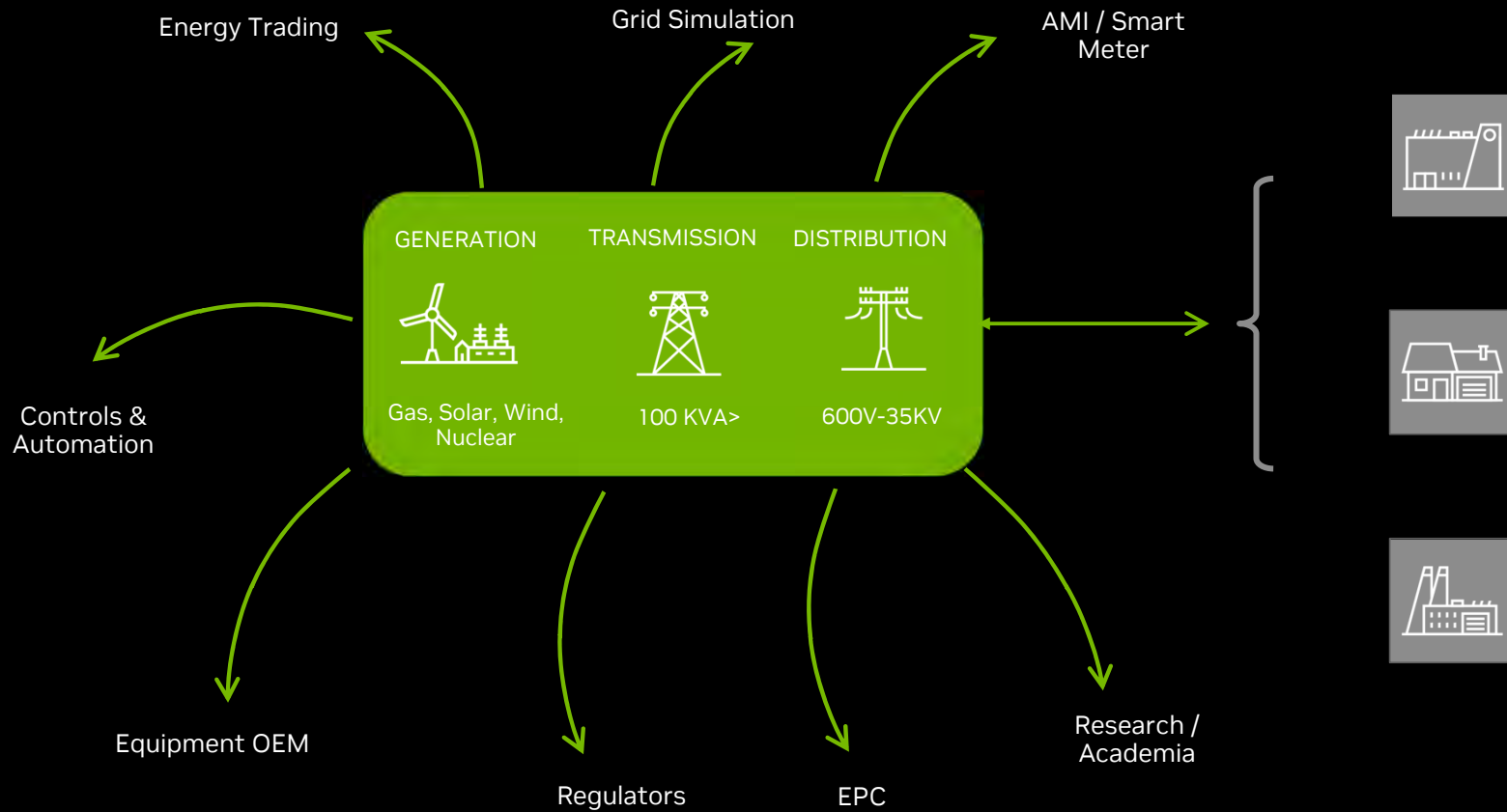
OT Security



Distributed Edge AI

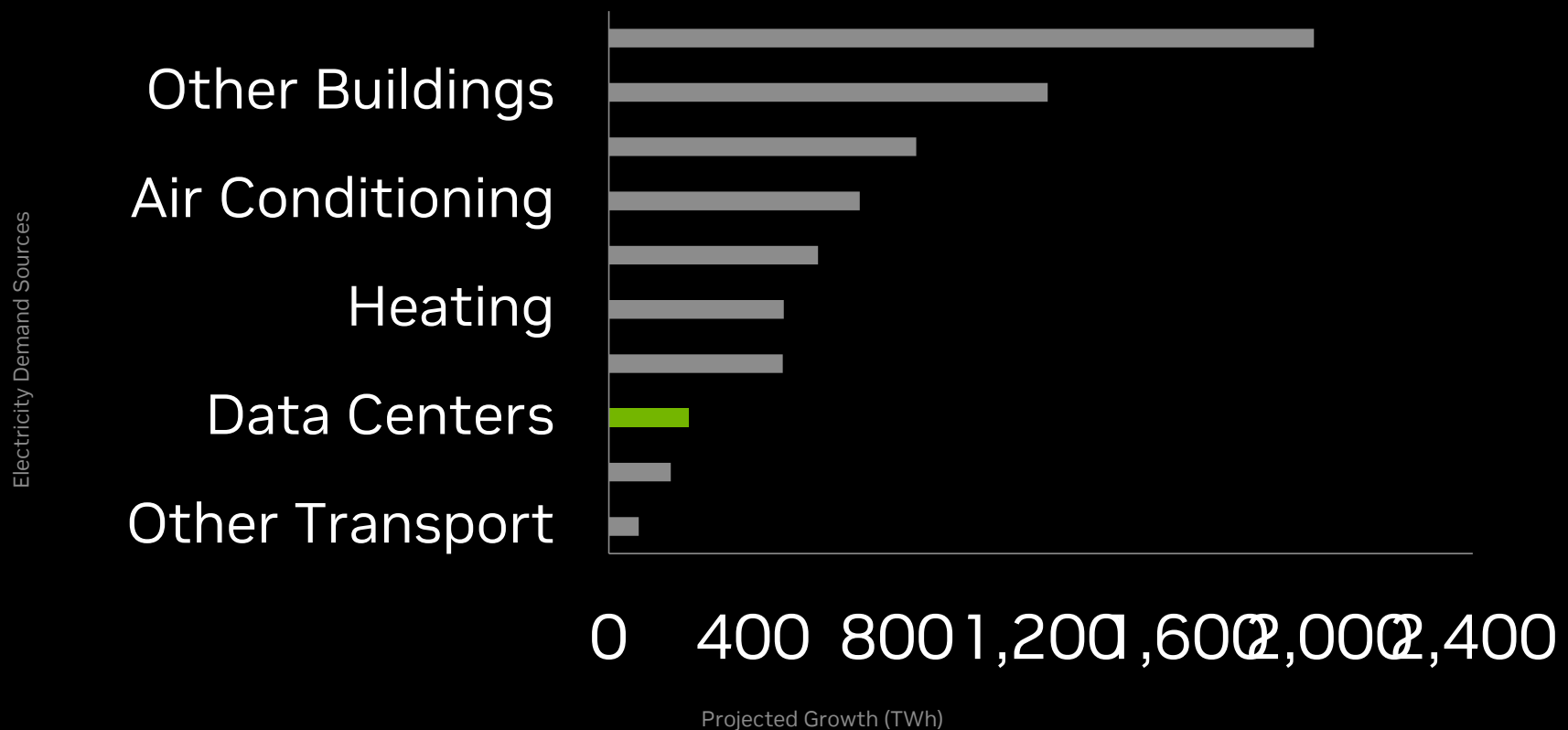
# NVIDIA Enabling Chip-2-Grid Ecosystem

## Data Center as Flexible Resource



# Rising Energy Demand Goes Beyond Data Centers and AI

Projected Growth in Global Electricity Demand from 2023 to 2030



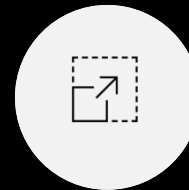
Source: International Energy Agency (IEA). World Energy Outlook 2024.

# AI Factories Power the Next Industrial Revolution

The manufacture of "intelligence" - now the essential engine of every enterprise

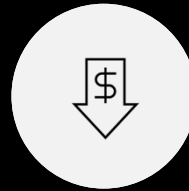
## Drive Innovation

Analyze vast amounts of data to identify market trends and consumer preferences

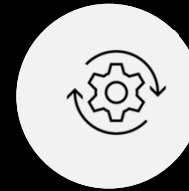


## Foster Agility

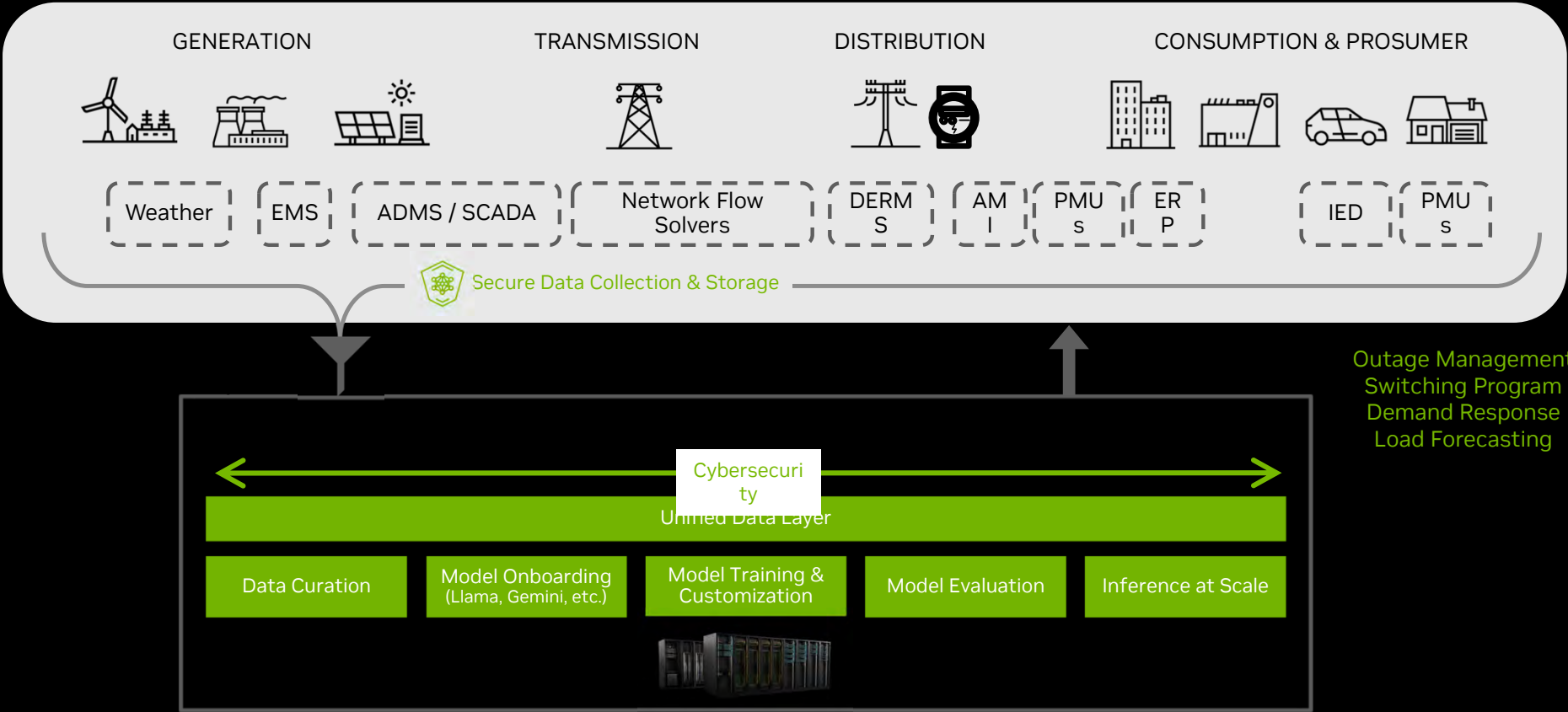
Scale AI solutions quickly across functions and tasks, easily adapt to market changes



Reduce operational costs by automating processes and optimizing resource usage



# AI Factories Transform Energy Data into Actionable Intelligence



# AI Center of Excellence (CoE)

HR for AI onboarding



## Identified Use Cases

Business Need, Internal Alignment



## Quality Data

Understand Data Sources, Format



## AI Skills & Expertise

IT, Data Scientists, MLOps



## AI Infrastructure

Consider Agility & Energy Efficiency



## AI Governance

Responsible AI, Data Privacy

Successful AI Deployments Start with an AI Strategy



Thank You