Open Power AI Consortium Member Representative Committee Meeting

June 2025

Agenda

Thursday, August 21, 2025		
Time (EST)	Topic	Lead
11:00 am	Welcome • Meeting Overview • Work Groups • What's Coming?	Jeremy Renshaw, EPRI
11:10 am	AI @ Duke Energy	Brian Wilkerson, Duke Energy
11:30 am	Gen AI for Energy	Xing Wang and Kumar Lakshmipathi, AWS
11:50 am	Roundtable Discussion	All
12:00 pm	Adjourn	All

OPEN POWER AI CONSORTIUM

Uniting the Electric Sector with Advanced AI Solutions

MISSION STATEMENT

The Open Power AI Consortium aims to evolve the electric sector by leveraging advanced AI technologies to innovate the way electricity is made, moved, and used by customers. By fostering collaboration among industry leaders, researchers, and technology providers, the consortium will drive the development and deployment of cutting-edge AI solutions tailored to enhance operational efficiencies, deploy emerging and sustainable technologies, increase reliability and resiliency, and reduce costs while improving the customer experience.

OPAI Participants

AI and Technology Partners

Academia. Nat. Labs, & Strategic Partners

Energy Partners

OPAI Consortium Member Engagement

OPAI Leadership Council (LC)

Executive Advisory Group (EAG)

Member Representative Committee (MRC)

Electric DSM Work Group → Ben Sooter

Use Case Work Groups → Adrian Kelly

Electric DSM Work Group

Use Case Work Groups

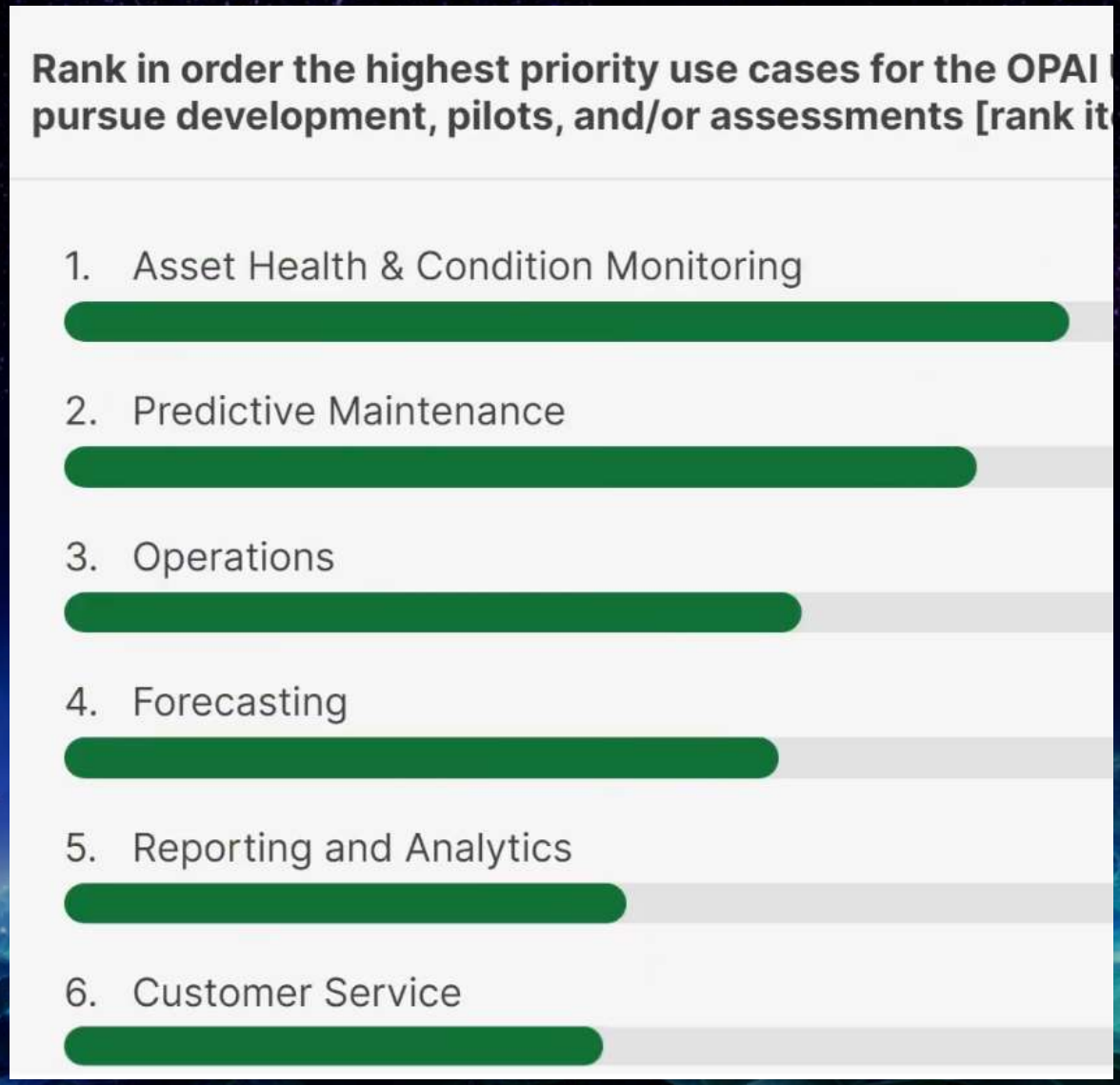
Deployment Work Group → Deployment Work Group → TBD

What's Coming?

- Work Group leads (utility and EPRI) will use LC direction and member survey results to identify top priorities (next slide)
- DSM and benchmarking results
- More opportunities to engage
- Top priorities will determine
  - Activities to be performed
  - Outcomes to be delivered
  - Datasets/resources needed

What Do We Need from You?

- Fill out the MRC Survey
- Assign people to Work Groups (if not already done)
- Share examples of work in these areas that can be shared with the group
  - Proposed
  - Ongoing
  - Completed
- Reach out to jrenshaw@epri.com to include in future meetings



AI @ Duke Energy – Brian Wilkerson
Gen AI

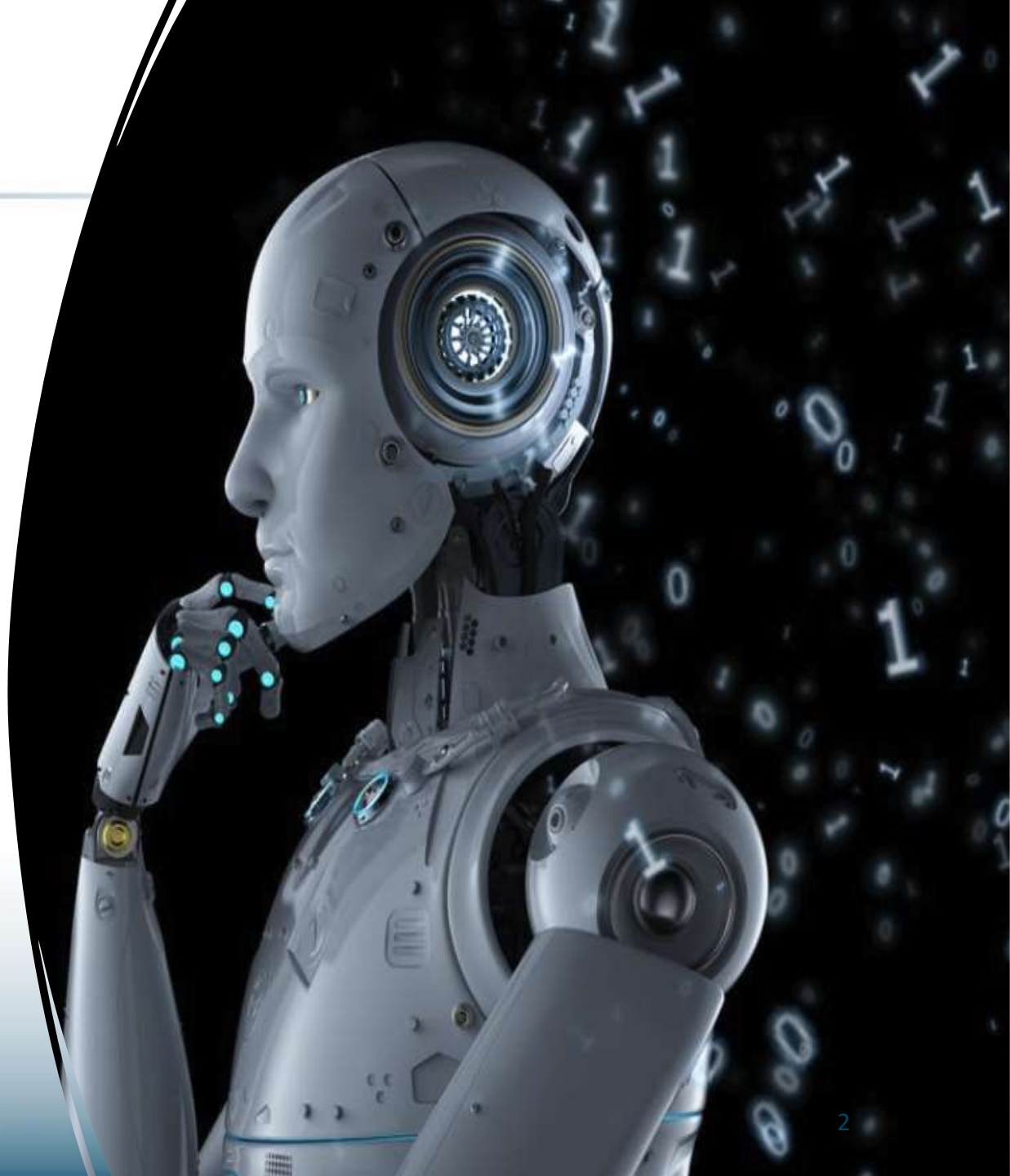
Open Discussion

AI @ Duke Energy

8/21/25

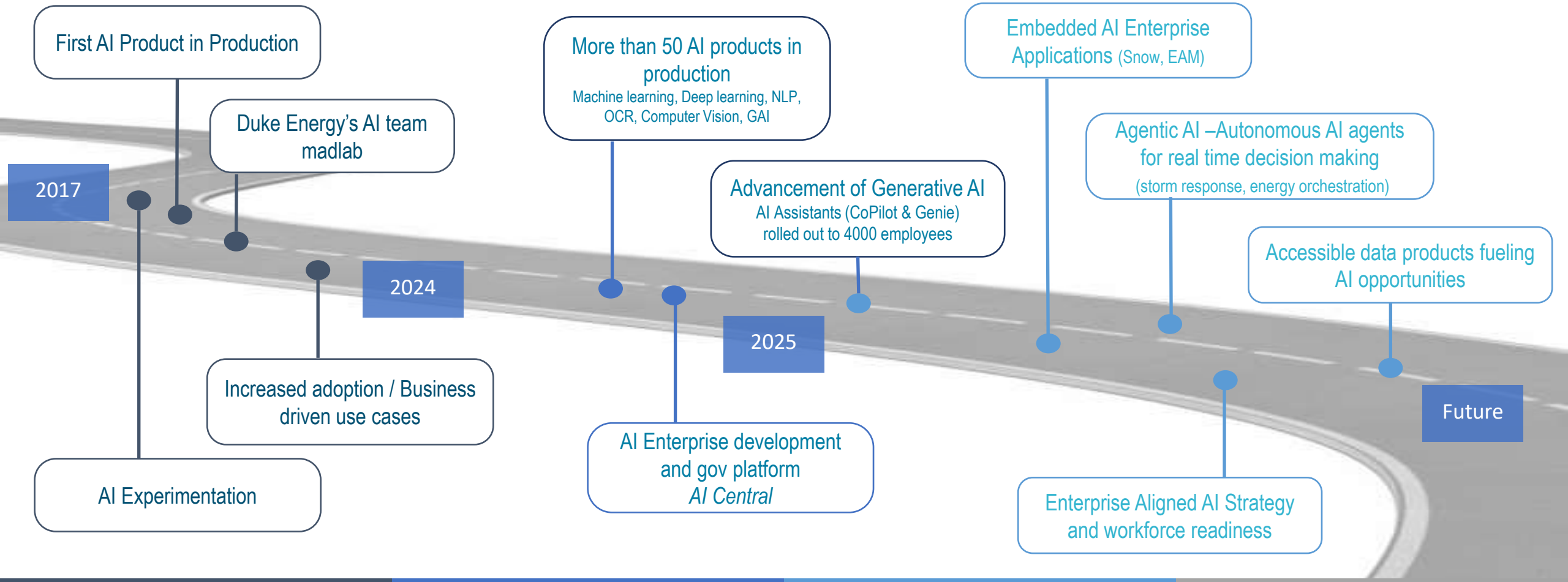
AI at Duke Energy. Did you know?

- We first adopted AI in 2017
- We were awarded a US AI patent for gas leak detection and flow rate for our NGBU
- We have a safety and innovation award from Edison Electric Institute for MOVEs
- We were awarded a DOE grant for our innovative solutions on the NGBU emissions platform
- We partner with AI leading companies & universities to deliver innovative solutions



Artificial Intelligence at Duke Energy

Where we have been → Where we are → Where we are headed



Building team & business partnership	Establishing technology & data safeguards	Creating structures for safe growth of AI & data	Execution of AI & data use cases

Accelerators

Duke Energy has established the foundations to accelerate AI adoption across the business.

DATA QUALITY & ACCESSIBILITY

- Data strategy - privacy, safeguards, protection, & ownership
- AI alignment to enterprise data strategy

TECHNICAL FRAMEWORK

- Deep pool of AI experts (~**100** Data Scientists)
- Proficient in cutting edge Generative AI cloud tools
- Valuable partnerships (AWS, Microsoft)
- **30+** products currently using AI across Duke Energy

VALUE & OVERSIGHT

- Cross-functional intake and prioritization
- Metered funding to manage spend and outcomes

GOVERNANCE & STANDARDS

- Cross-functional team to establish governance program, policy
- AI model and data safeguard

AI Capabilities

Computer Vision

Derives meaningful information from digital images, videos and other visual inputs (ex. Asset Classification)

Anomaly Detection

Identification of unexpected events, observations, or items that differ significantly from the norm (ex. Faulty Sensors)

Optimization

Determining the most effective use of a situation or resource subject to constraints (e.g., Route Optimization)

Natural Language Processing

Derives meaningful information from text (ex. Classification, Q&A, Summarization)

Forecasting

Making predictions based on past and present data (ex. Load Forecasting)

Generative AI

Creating new content such as images, text, video, that mimics human-created content (ex. ChatGPT, Document Interrogation)

Data Readiness

Is your data appropriately positioned to support your need?

Relevant	• Data is appropriate and aligned with the need
Permitted	• Data use complies with legal, ethical, and policy requirements
Available	• Data exists and is present where it is expected to reside for the need
Accessible	• The right people or systems can locate and obtain the data
Timely	• Data is up-to-date and available at the moment of need
Understood	• Users can interpret and apply the data correctly
Actionable	• Data is in a format and state to support the need
Connected	• Data is or can be related to other relevant data
Trustworthy	• Data is reliable, accurate, and credible

Detailed Data Readiness Checklist

MOVES

MOBILE OBSERVATION VEHICLE & EQUIPMENT SOLUTIONS

What is **MOVES?**

MOVES is a suite of web-based tools that enable large image dataset collection, processing, analysis, archiving and actionable reporting.

What are the benefits?

Save time:
Improves efficiency by keeping all inspection data in one place.

Increase safety:
Use drones to go into areas that may be a safety risk for teammates.

Optimize work:
Discover faults in equipment using AI.

What can drones inspect?

Solar panels | Boilers | Coal ash basins | Exhaust stacks | HRSGs | L-0 blades | And more!

MOVES allows you to:

- Identify issues by using AI to detect faults from drone images
- Plan your work effectively from inspection reports generated by the MOVES application

Solar Inspection Example

Old way:
9,100 hours
hours to perform inspections

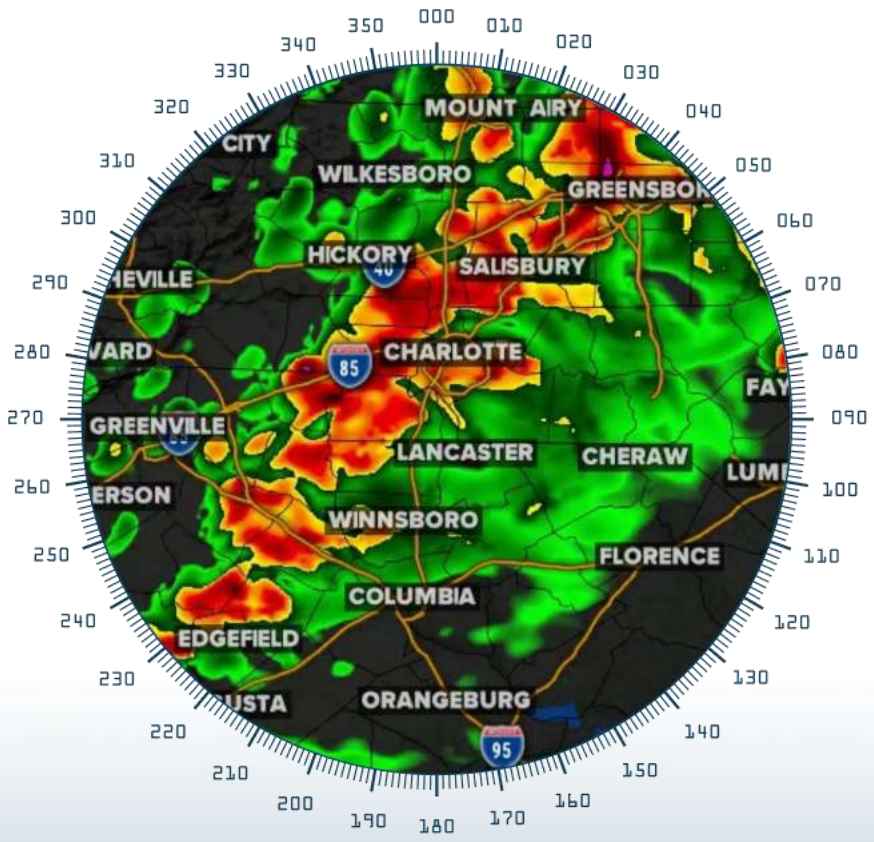
New way:
<350 hours
using drones to inspect solar fields and provide infrared images to identify faults

Results:

- Enhanced performance & reliability diagnosis
- 5% gain in solar yield
- Increased worker productivity

VALUE | Safety | Speed

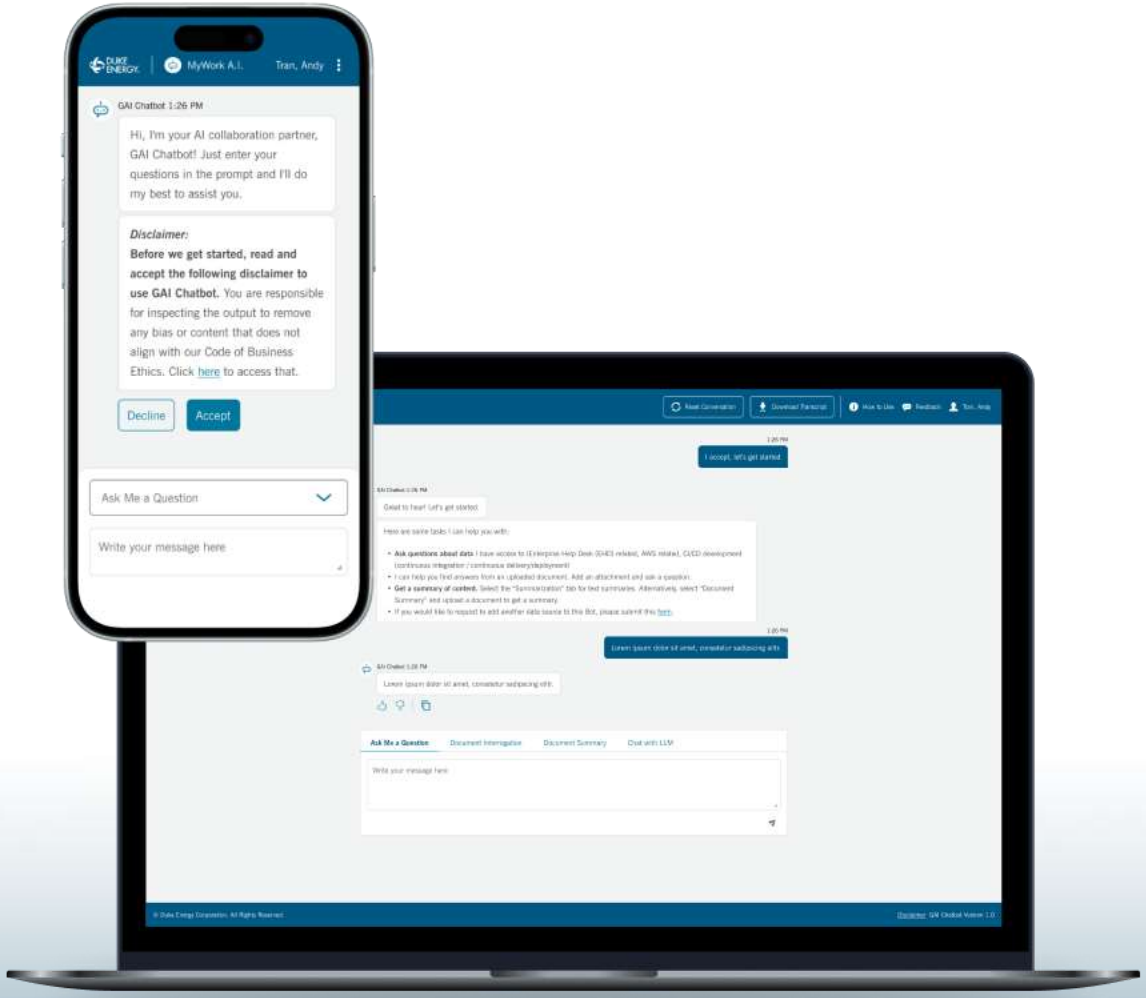
Storm Preparedness



AI-powered Storm Damage Prediction

- **Pre**-landfall model that estimates the number and location of storm outages, crew types needed, and duration of restoration efforts - *Prediction*
- **Post**-landfall model that produces accurate restoration times and resource allocation forecasts through analyzing weather and outage data, crew availability, and damage assessments - *Validity of Prediction*
- Right number of crews getting to the right places at the right time

Enterprise Chatbot - Genie



Duke's Version of ChatGPT

- Provides faster answers to FAQs and quick access to data sources such as SharePoint, OneDrive, and Teams
- Summarization of large documents delivering quick insights
- Co-developed by Duke with Amazon Web Services for speed and security
  - Require legal disclosure to enforce responsible use

Agentic Agents- Inventory Management

User prompts

- What are current inventory levels for item DEF456?
- How likely am I to run out of materials in the next 6 months for item DEF456?
- Can you craft me an email alerting the supplier that I need to cancel an order?
- Are there any slots that I no longer need to hold onto?

The Orchestrator agent determines which specialized agent to direct question to based on topics

Orchestrator Agent

Orchestrator agent invokes Inventory and Forecasts Agent

The inventory agent works with the forecast agent and predicts that part DEF456 will run out in approx. 3 to 5 months.

Agents inform the requester that the part won't be available in 6 months and suggests an alternative. If the alternative isn't acceptable, a purchase order will be created for additional stock, pending approval

Inventory Agent | Contracts Agent | Forecasts Agent | Lead Times Agent




Data Sources

Agents are trained using specific datasets and work together to provide the most precise responses possible.


DUKE
ENERGY®

aws FOR ENERGY AND UTILITIES

GenAI for Energy

XING WANG
Global Lead, Grid Modernization, AWS

KUMAR LAKSHMIPATHI
GenAI Lead for Energy, AWS

GenAI is Transforming Energy!

UPSTREAM

Well Construction
Distill key information for large repositories of past well construction operations. Enrich documents intelligently and provide rapid search and lineage.

Production Operations
Analyze historic well document archives, extract information and create well chronologies for use in field management.

Exploration
Sift exploration data and generate proposals for well placements.

Talk to and explore OSDU in natural language

Reservoir Management
Mine historic production data and completion failures to optimize completion life.

MIDSTREAM

Pipelines, Logistics & Infrastructure
Analyze pipeline contracts for potentially missed opportunities to enhance revenue through better operations management.

DOWNSTREAM

Refining & Chemicals Operations
Integrate generative agents into plant data to generate real time reporting

Worker Safety
Intelligently search and analyze past incidents. Generate recommendations to enhance the safety of future operations

Analyze incident reports and highlight leading indicators of larger concern

POWER & UTILITIES

Trading & Risk
Optimize commodity trades and gain visibility across your entire portfolio.

Customer Care
Enhance customer experiences with automated agents that know everything about your customers.

Competitor Tariff Analysis
Analyze competitor tariff strategies and trends. Create recommendations to enhance profitability.

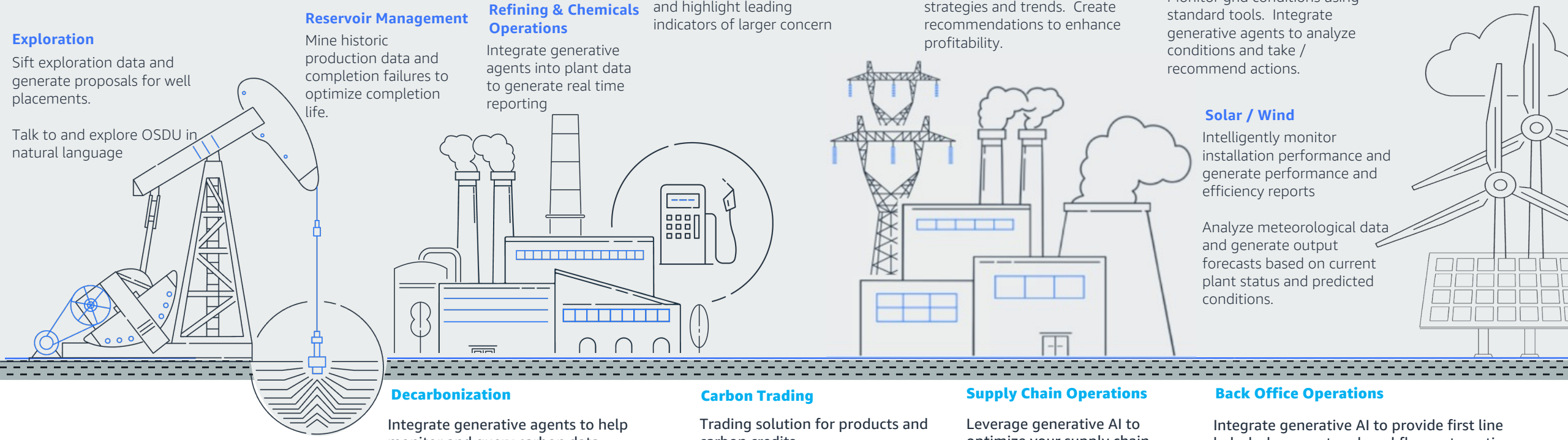
Transmission/Distribution
Monitor grid conditions using standard tools. Integrate generative agents to analyze conditions and take / recommend actions.

Solar / Wind
Intelligently monitor installation performance and generate performance and efficiency reports

Analyze meteorological data and generate output forecasts based on current plant status and predicted conditions.

NEW ENERGIES

Novel Material Discovery
Leverage generative AI to analyze and recommend novel chemistries such as battery make up.



Decarbonization
Integrate generative agents to help monitor and query carbon data.

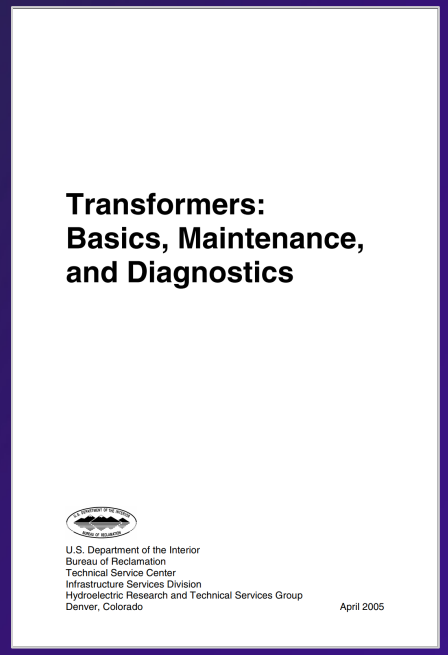
Carbon Trading
Trading solution for products and carbon credits

Supply Chain Operations
Leverage generative AI to optimize your supply chain

Back Office Operations
Integrate generative AI to provide first line helpdesk support and workflow automation.

AI Use Cases are Evolving

Gen AI for Maintenance - Chatbot



256 Page PDF guide

I've found some burned paper near a transformer. Is this a problem?

How do I perform a DP test?

It is unclear whether the burned paper outside the transformer is a problem without further information and testing. The document provides information on how to perform a DP test…

See: pages 138, 162, 197, 216

To perform a DP test, remove a sample of the paper insulation from a convenient location near the top of the center phase

See: page 243

Gen AI for Maintenance - IoT

256 Page PDF guide

```
sensorData: {
  timestamp: 1632578627
  motorId: im323
  rpm: 2500
  temperature: 150
  voltage: 12.5
  amperage: 25
 }
```

RPM of 2500 is higher than the rated speed of 1445 rpm

See: page 343

Gen AI for Maintenance - Vision

KL do you see any rust or cracks or freeze on the pipes in the image?

Yes, upon closer inspection, there appears to be a crack or fracture visible on one of the pipe segments or valve components in the image.

Copy Retry

Gen AI for Maintenance - Video

What time did the maintenance trucks arrive?

The trucks arrived late and only got here at 6:45 PM

Gen AI – Domain Models

Maintenance FM

Sustainability FM

Grid FM

Regulatory Compliance FM

Material Discovery FM

Gen AI for Maintenance - Agents

Monitor my RS Pro 3 Motor and text the on-call person if there is a problem. Get their confirmation before ordering parts, scheduling maintenance or announcing downtime

OK

Instructions: Your task is to detect anomalies in…

ASSISTANT ACTIONS	UTILITY ACTIONS
Find Motor Specs **in**: equipment Id **out**: PDFs	Send Email **in**: names **out**: email
Find On-Call Team **in:** time **out:** names	Order Part **in**: partID **out**: status

Agentic AI

Reason & decompose request into steps

Execute action or search knowledge

Observe results

Think about next step

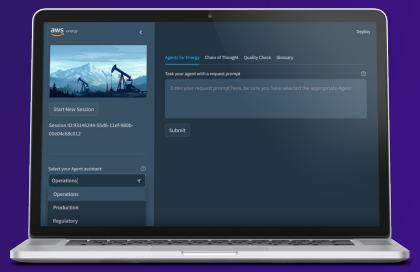
Until final answer

Explore Prism data...

Ask a question...

Explorer is powered by AI, so mistakes are possible. This is an Alpha version, do not use for critical or sensitive tasks.

Agents*4Energy*



PRE-BUILT AGENTS

- Maintenance
- Crew Dispatch
- Rate Case
- Grid Modeling
- Grid Planning
- Add your own agent

YOUR DATA & TOOLS

Assets		GIS/EAM	
Meter Data		MDM/MDA	
Grid Model		Powerflow	

Amazon Bedrock
Access to FMs to AI infrastructure

Claude · stability.ai · MISTRAL AI_ · cohere · amazon · LLaMA by Meta · AI21labs

Reasoning-first models are rising: Many providers are clearly moving toward models optimized for reasoning—fueling the surge of Agentic AI architectures.

Case Study: Avangrid

AVANGRID'S FIRST TIME RIGHT AUTOPILOT TRANSFORMS FIELD OPERATIONS WITH GENERATIVE AI

Generative AI solution built with Amazon Bedrock helps technicians quickly find and resolve challenges at operating wind facilities

Results in faster troubleshooting, reduced downtime, and optimized operational efficiency

Pictured: Technicians working on a turbine

ORANGE, Conn. — March 24, 2025 — Avangrid, Inc., a leading energy company and member of the Iberdrola Group, today announced that it has deployed a new solution built to transform field operations, resulting in faster troubleshooting and optimized operational efficiency. The solution, called First Time Right Autopilot (patent pending), puts the power of generative artificial intelligence (AI) into the hands of Avangrid field technicians to help them efficiently identify and resolve issues on wind turbines, putting the turbines back into service more quickly and ensuring these facilities continue to generate electricity for homes, businesses, and industry across the country.

The process begins when a field technician encounters an issue. They immediately engage the AI-powered autopilot integrated into their mobile device through voice or text. First Time Right Autopilot gathers pertinent information to narrow down the problem's nature and scope before providing the technician with detailed, step-by-step instructions, often supplemented with relevant documentation or instructional videos. It effectively puts a seasoned engineer next to the technician who can guide them through the diagnostic process.

Avangrid A member of the Iberdrola Group

Company: Avangrid

Website: https://www.avangrid.com/

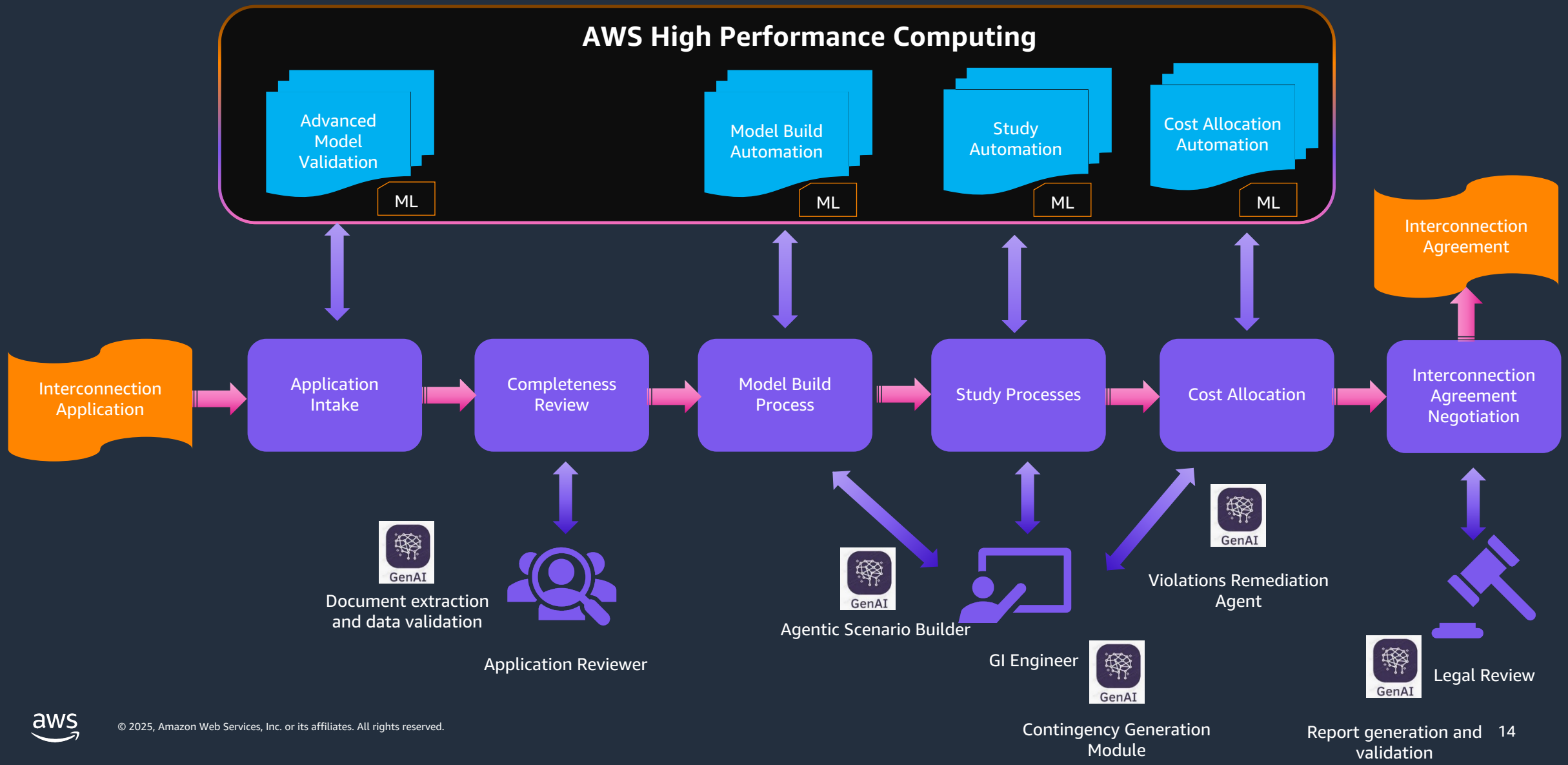
Profile

Avangrid, Inc., is an energy services and delivery company. Avangrid serves about 3.1 million customers throughout New England, Pennsylvania and New York in the United States.

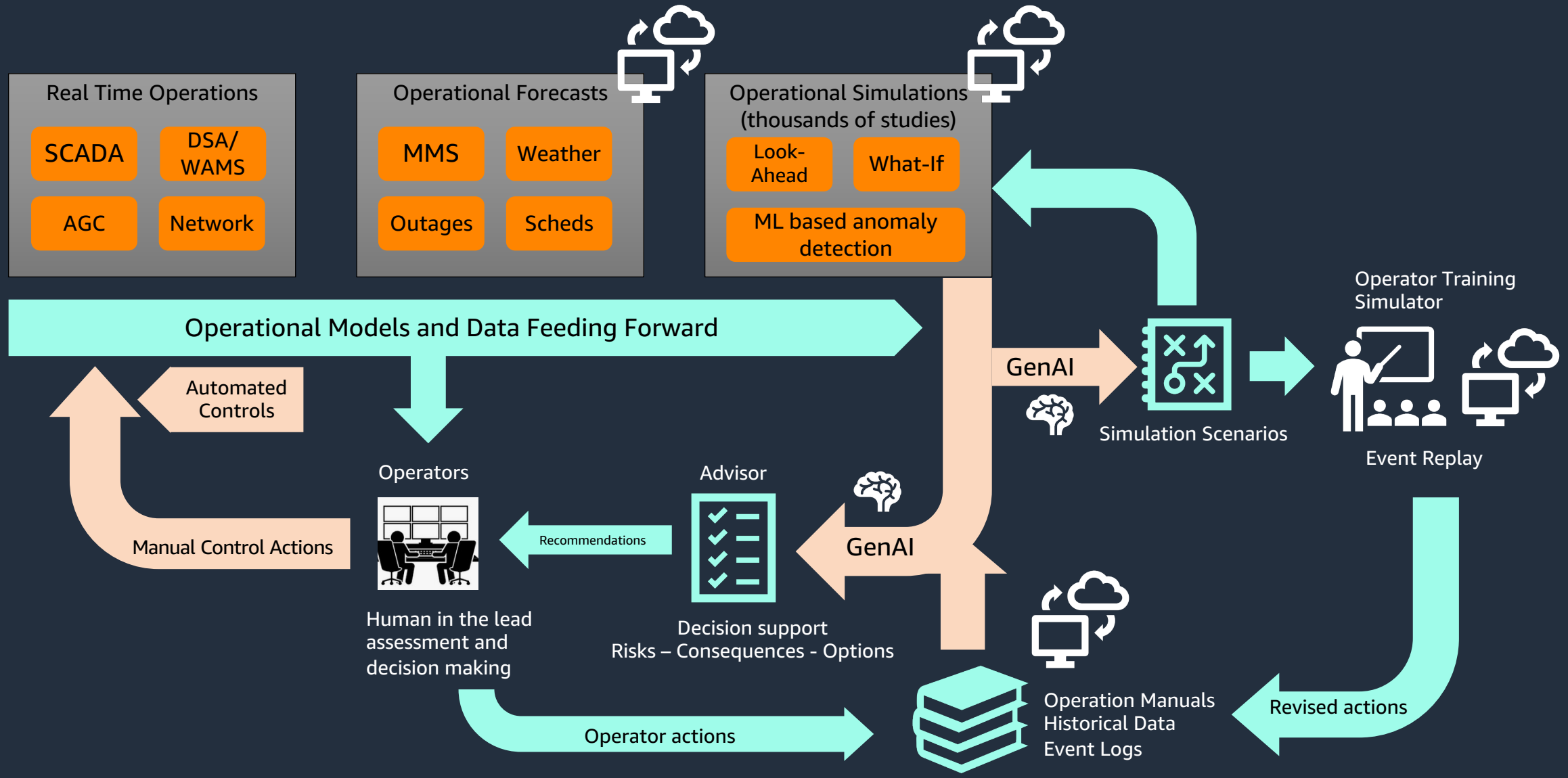
The First Time Right Autopilot is the perfect example of Avangrid and Iberdrola leading the way when it comes to innovation in our sector," **said Pedro Azagra, Avangrid CEO**. "By leveraging generative AI to provide real-time, expert-level support, we are empowering our technicians with the tools they need to improve reliability and efficiency within our fleet. This is a testament to our commitment to shaping the future of energy through continuous innovation and technological advancement.

Pedro Azagra, Avangrid CEO

Generation Interconnection Automation with Gen AI/ML



GenAI Co-Operator for Grid Control Room



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Thank you!

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