
AWS
re:Invent
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SUS211

Water stewardship and renewable energy at scale

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AWS

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Agenda

AWS Water Stewardship programs

- Sustainable sources
- Water efficiency
- Reuse
- Replenishment

Using AWS to scale water impact

Generating renewable energy at scale

Renewable energy optimization

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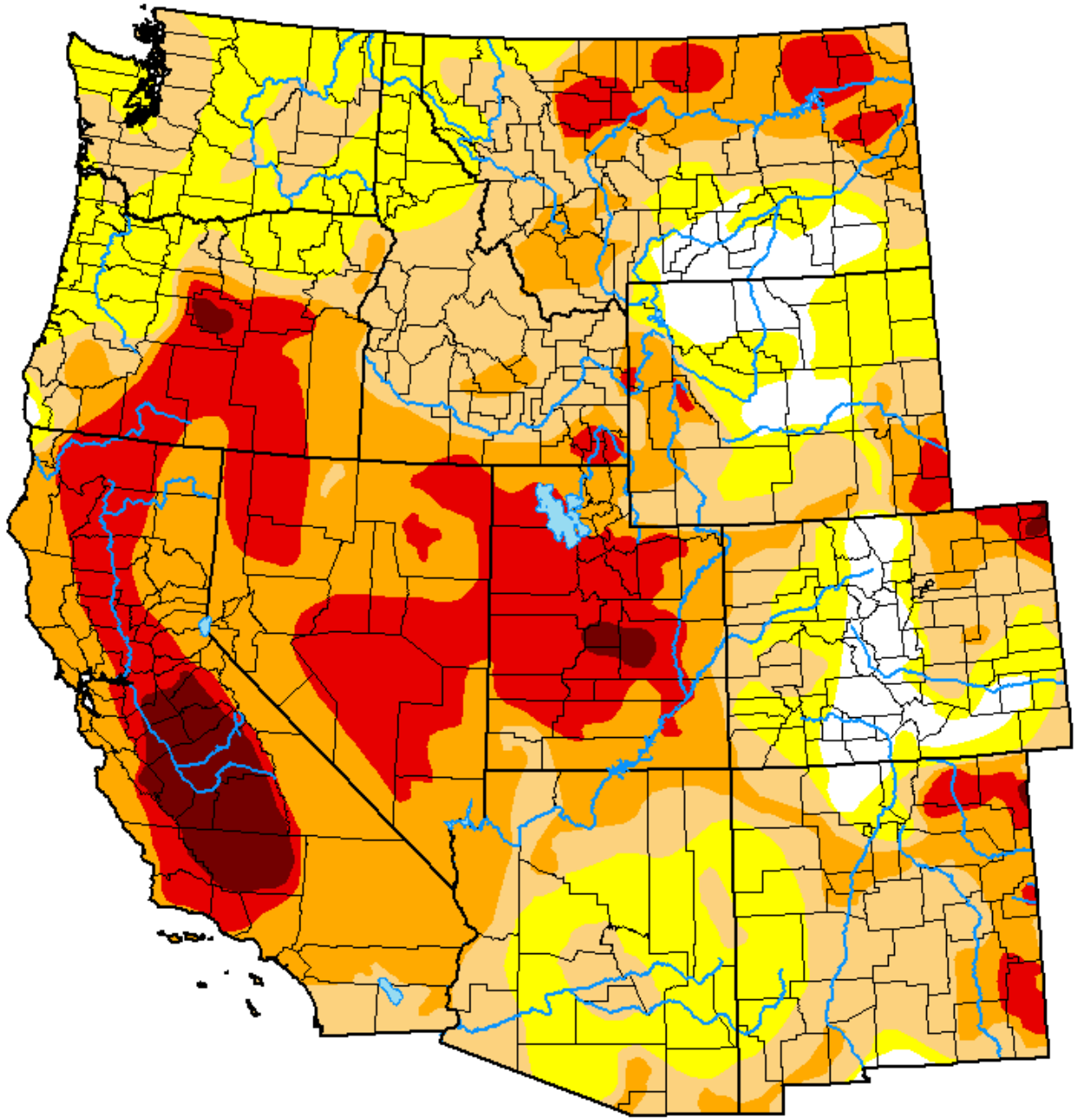
Water and climate change



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Water challenges

Water scarcity is becoming the new normal



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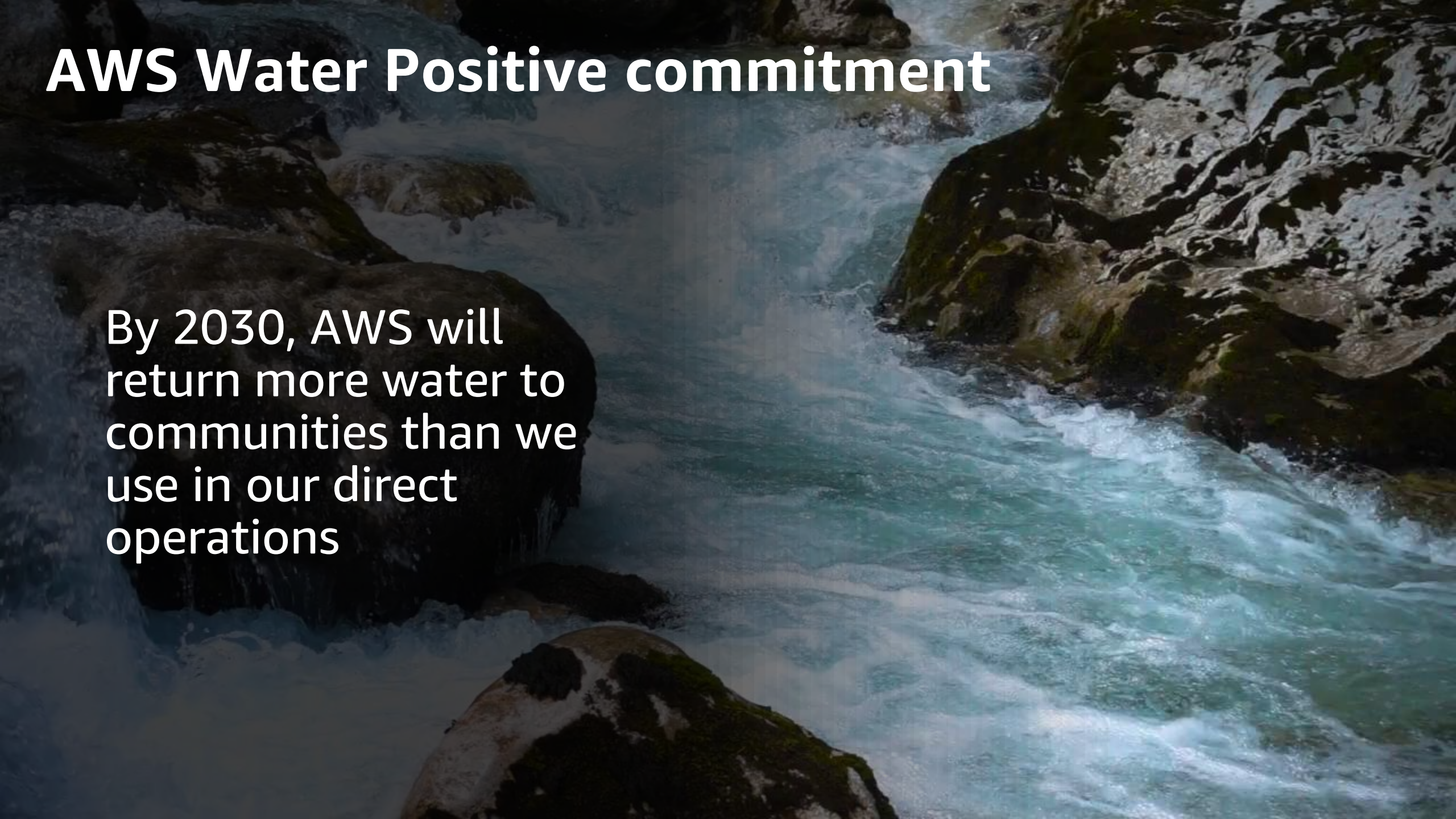
Using water efficiently

Efficient water-based cooling helps AWS minimize both energy and water use



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AWS Water Positive commitment



By 2030, AWS will return more water to communities than we use in our direct operations

Sustainable sources

Use sustainable sources like recycled water and rainwater harvesting wherever possible



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Water use efficiency

Maximize efficiency for any water used in data center cooling



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Water reuse

Reuse cooling water within communities



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Water replenishment

Support projects that increase water availability in communities where AWS operates



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Replenishment in action

Delivered clean water and sanitation to 290,000 people in India and Indonesia with Water.org and WaterAid



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Replenishment in action

Building wetlands in the Thames river basin that will recharge groundwater and improve water quality



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Progress to date

Recycled Water

20

Data centers using recycled water

Water Efficiency

0.25

Liters per kilowatt-hour in 2021

Water Reuse

96%

Of AWS's cooling water is reused in irrigation in US West (Oregon) Region

Water Replenishment

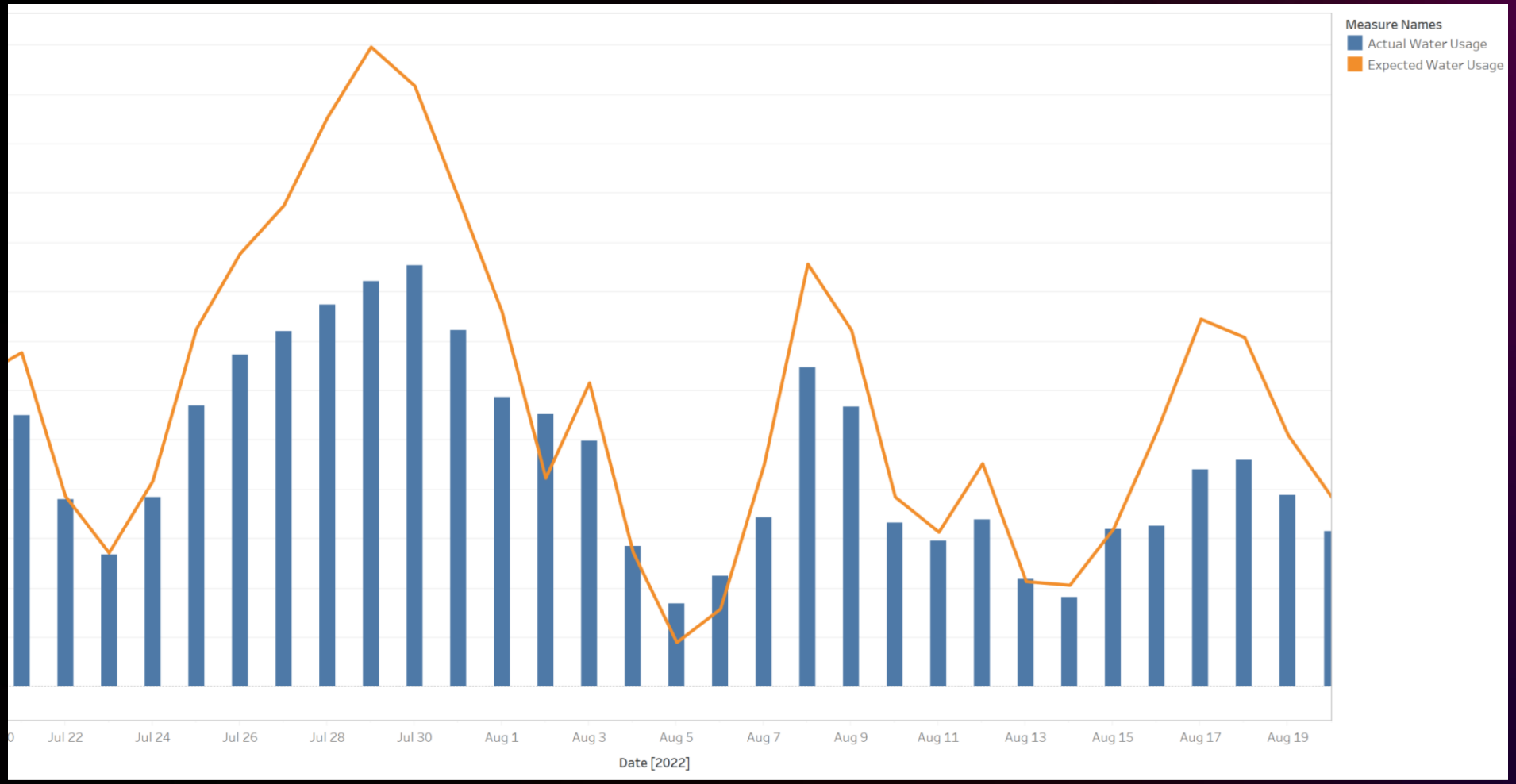
2.4 billion

Liters returned to communities through replenishment projects

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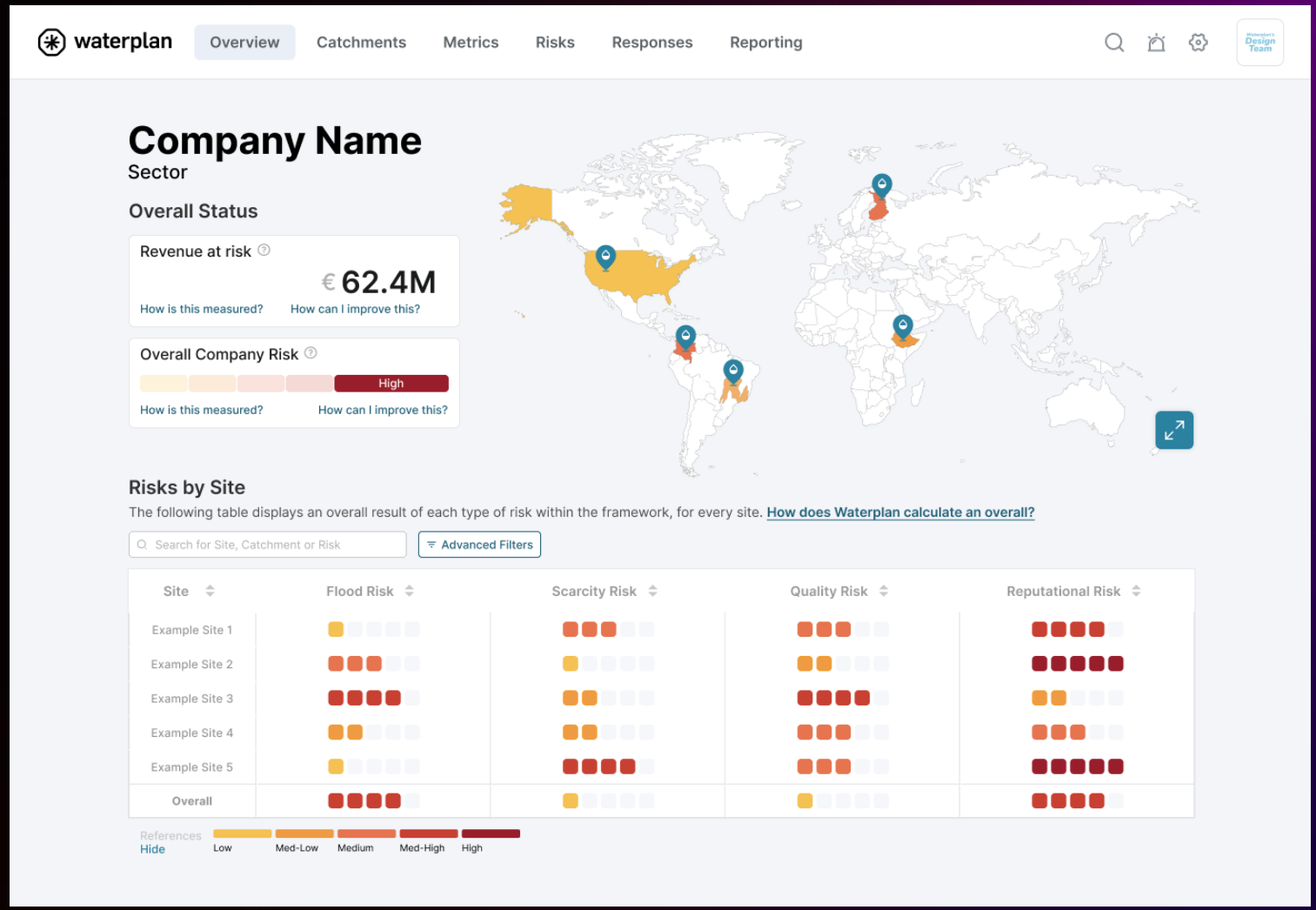
Using AWS services to scale impact



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Using AWS services to scale impact

waterplan



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Renewable energy at scale

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Further and faster together

September 19, 2019

Amazon and Global Optimism announced The Climate Pledge, a commitment to meet the goals of the Paris Agreement 10 years early and achieve net-zero carbon by 2040

Amazon is a co-founder and first signatory of The Climate Pledge

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Amazon is the largest corporate buyer of renewable energy globally

More than 380 projects around the world, on the path to power operations with 100% renewable energy by 2025

Once online, enough power for more than 4.8 million U.S. homes/year

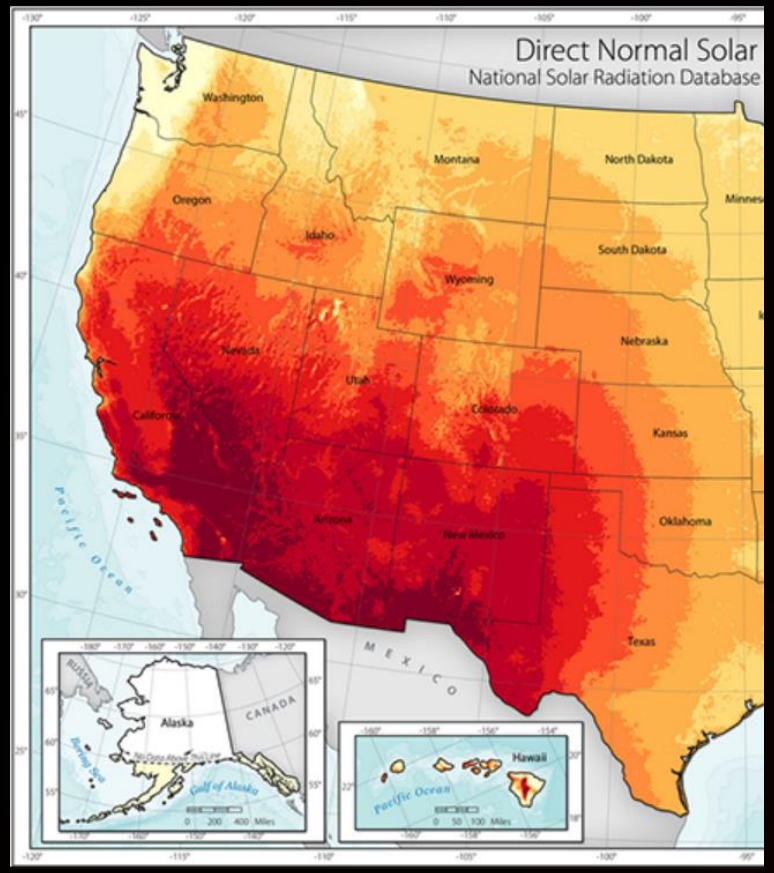
Optimizing renewable energy generation at scale



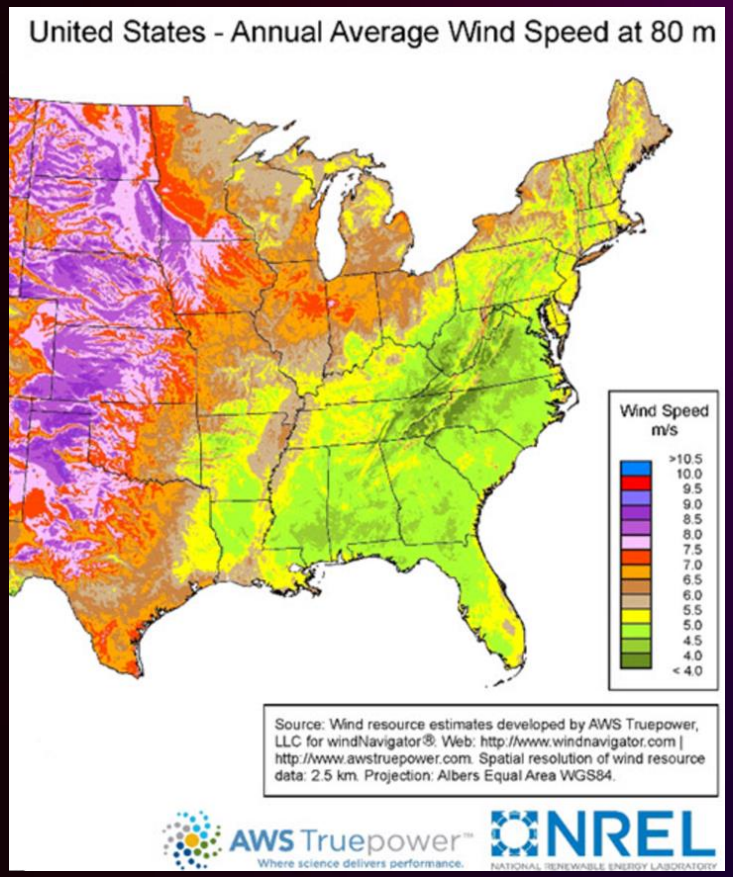
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Variable production from renewable sources

Ideal regions for solar generation



Ideal regions for wind generation



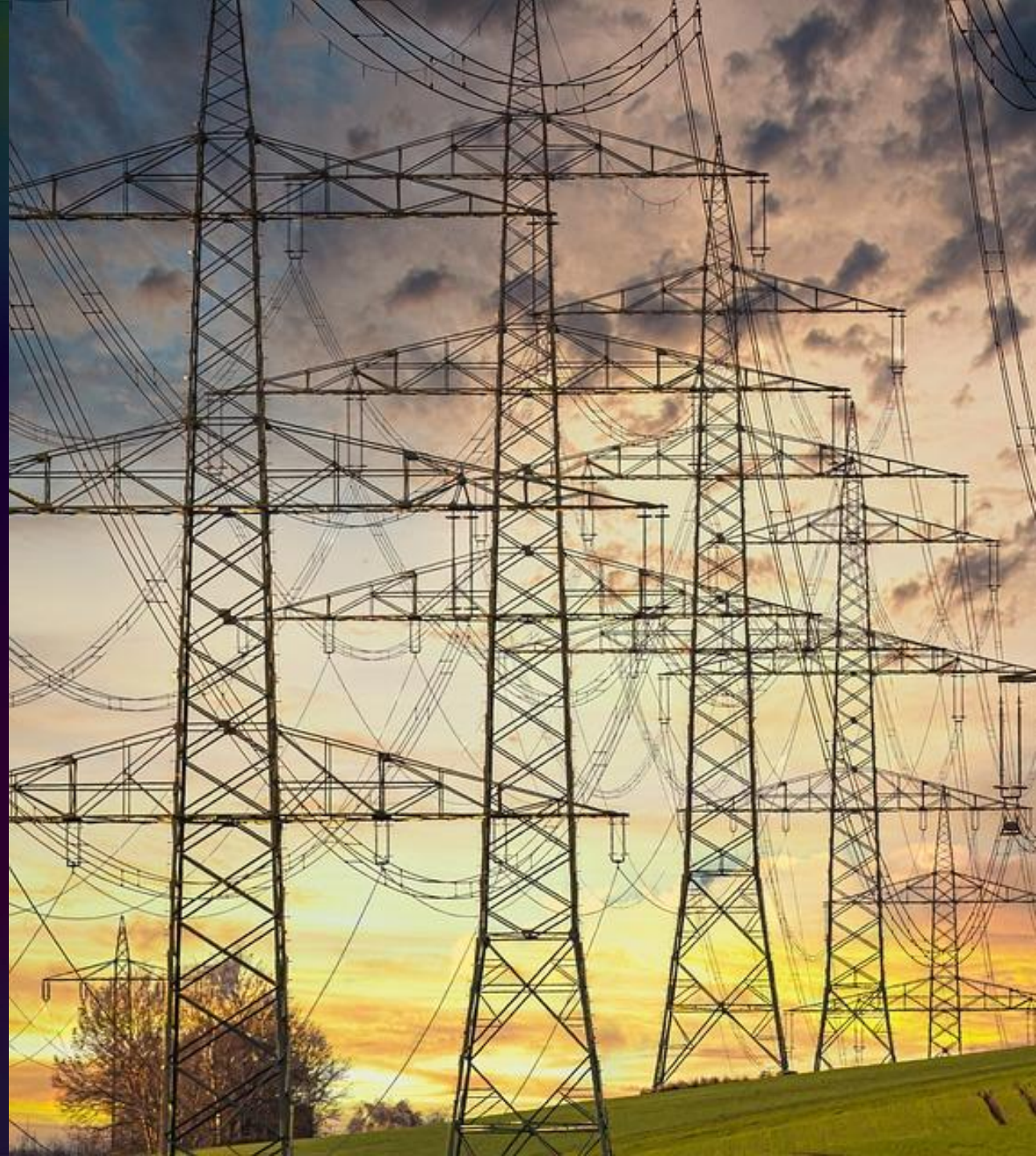
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Delivering renewable energy

Market fluctuations

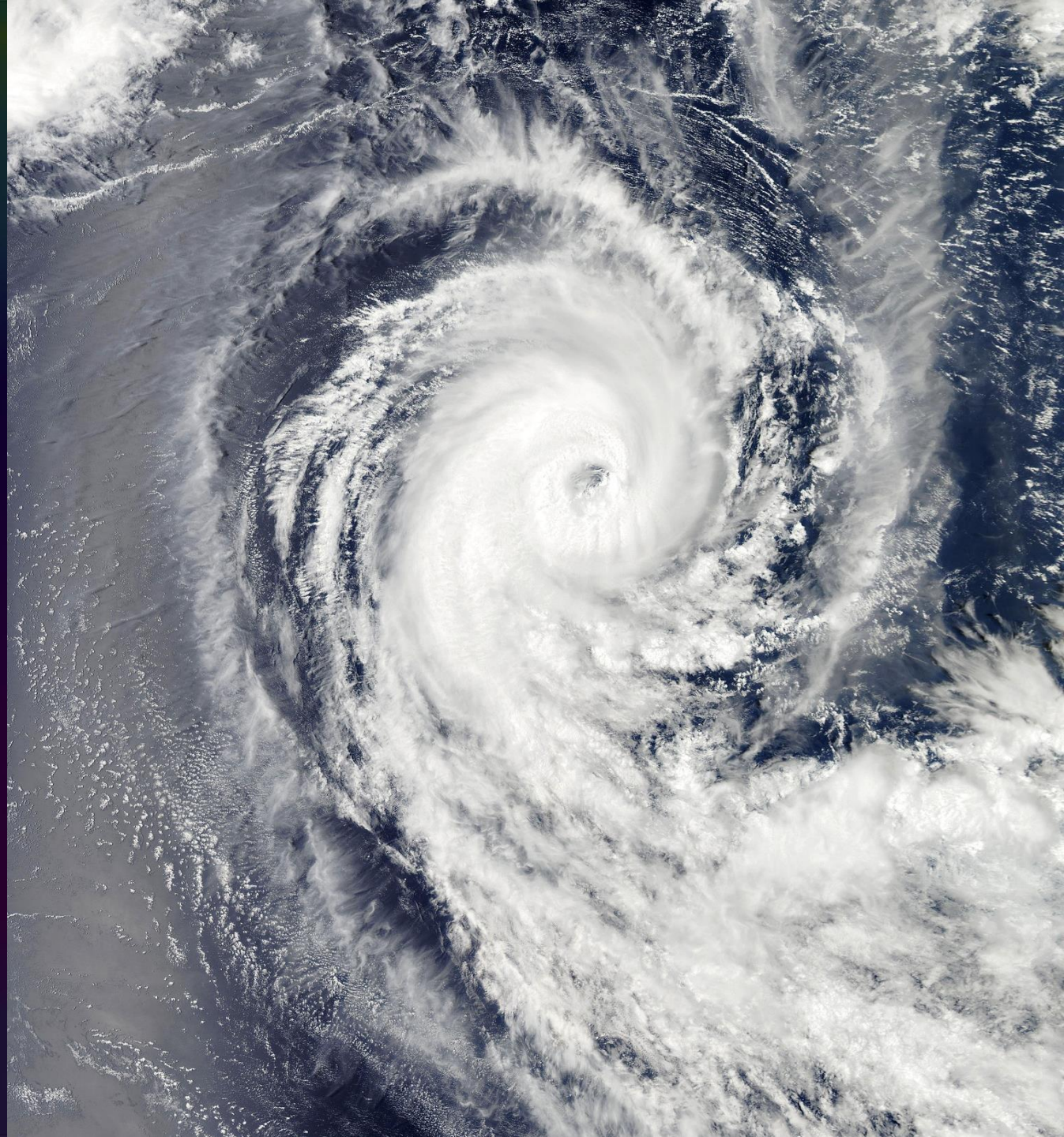
Renewable project performance

Grid congestion



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Extreme weather and natural disasters



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AWS renewable energy optimization (REO)

MACHINE LEARNING SOLUTION TO MAXIMIZE DELIVERY OF CLEAN ENERGY TO THE GRID



Data acquisition

Millions of datapoints from thousands of devices such as renewable energy assets, the grid, and external sources like weather



Data storage

REO Data Lake is a securely curated energy data lake



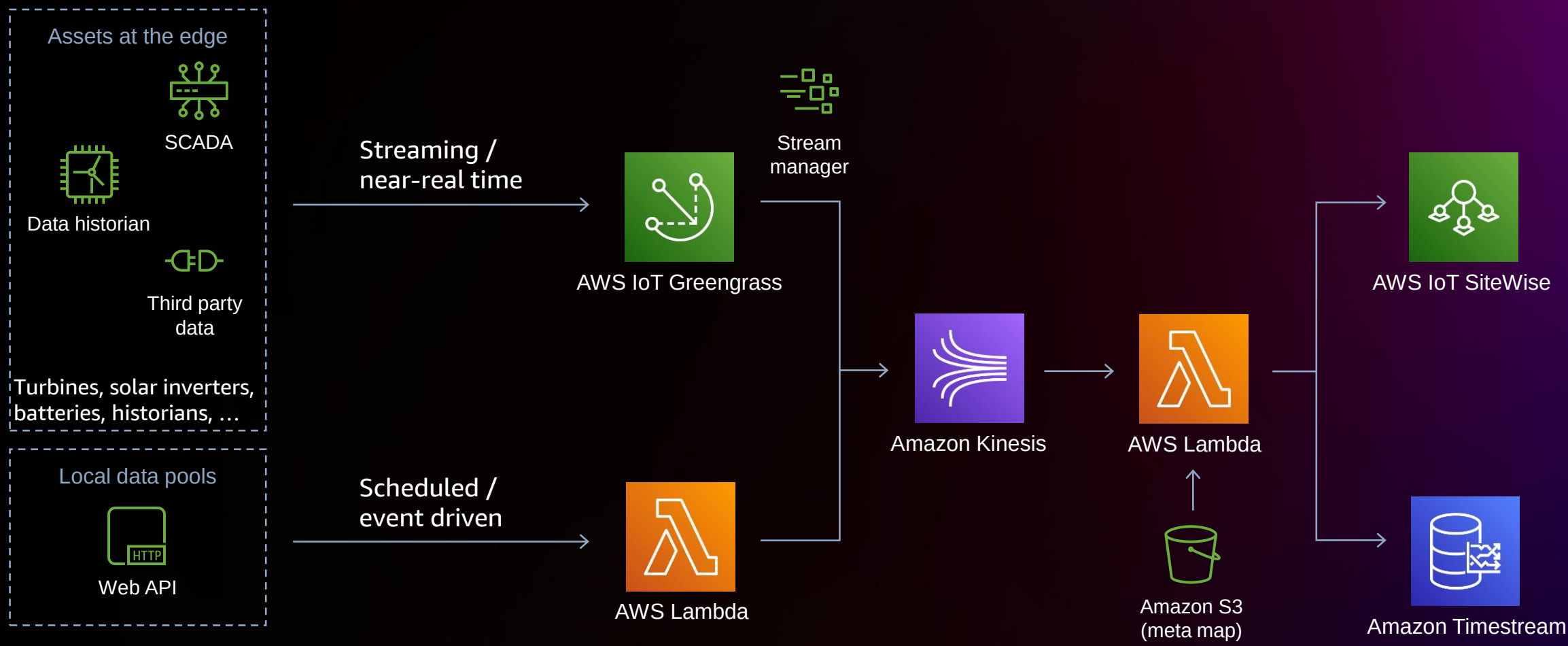
Data insights

Dashboards, forecasting, and operational guidance built on Amazon Machine Learning (Amazon ML)

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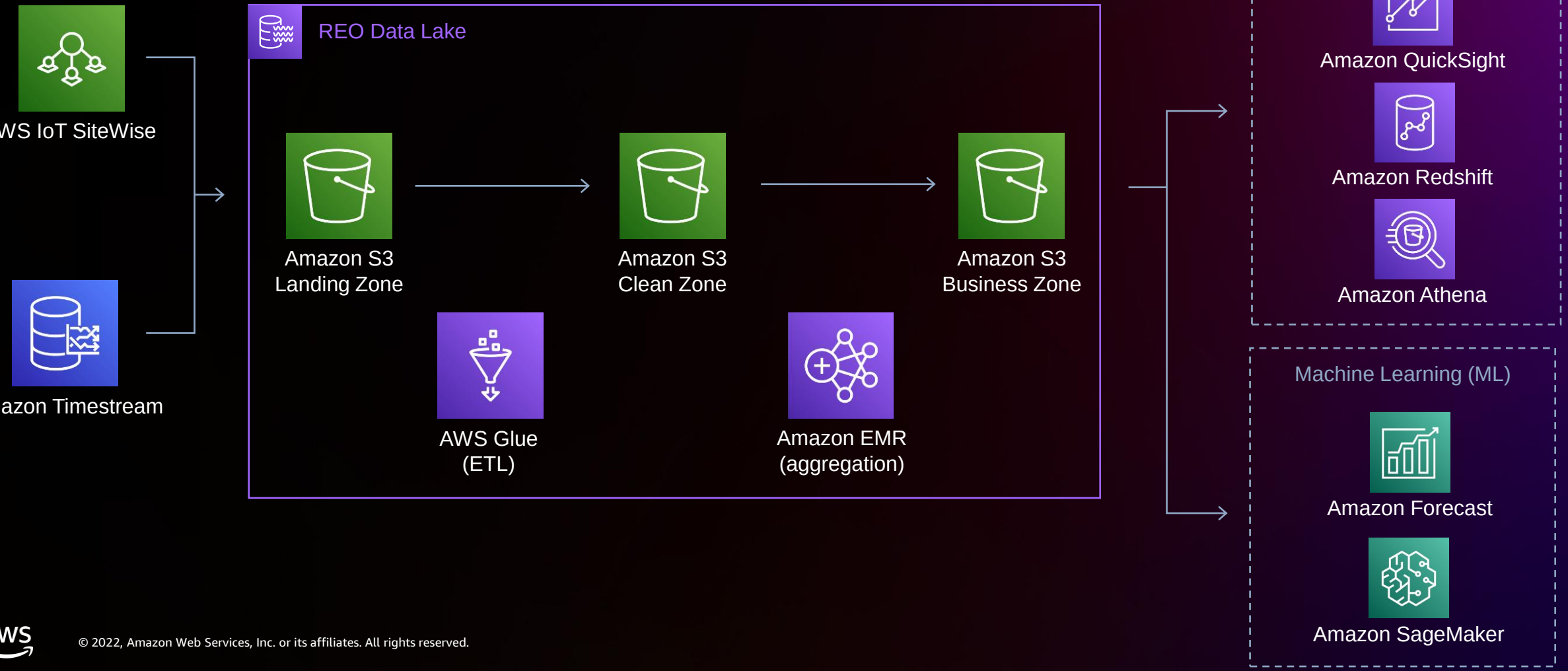
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REO data acquisition



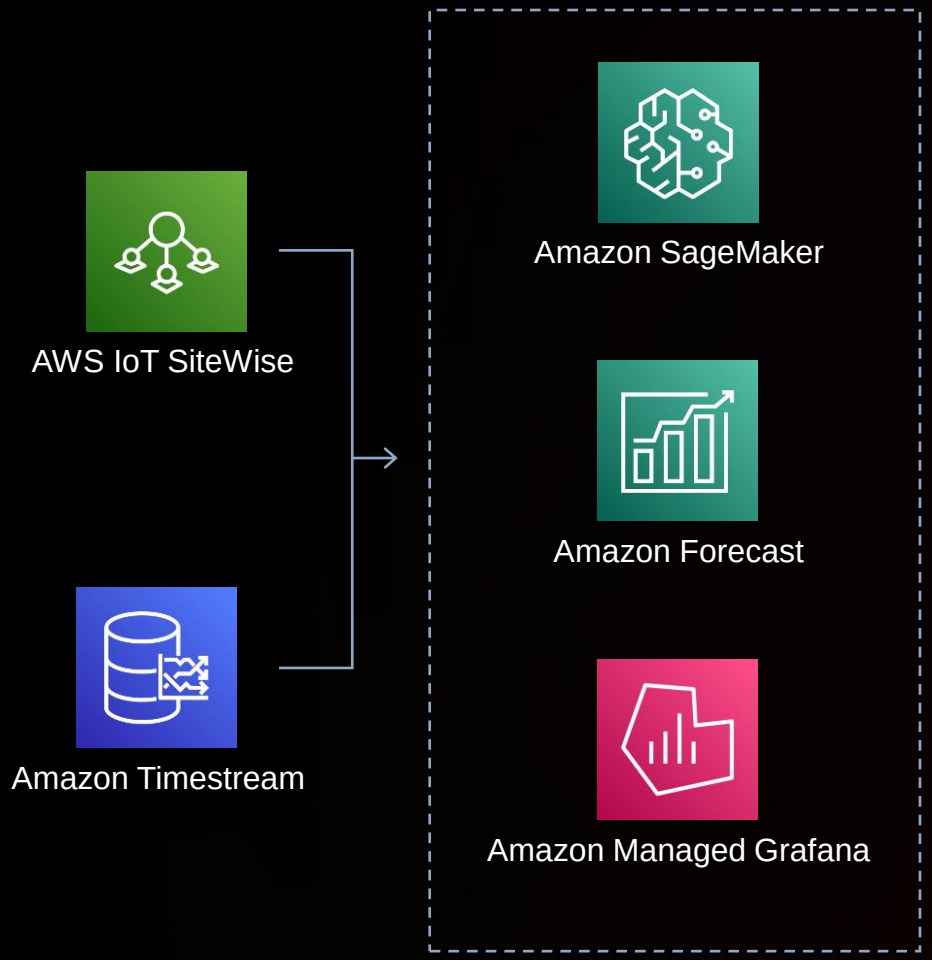
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REO data storage



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REO data insights



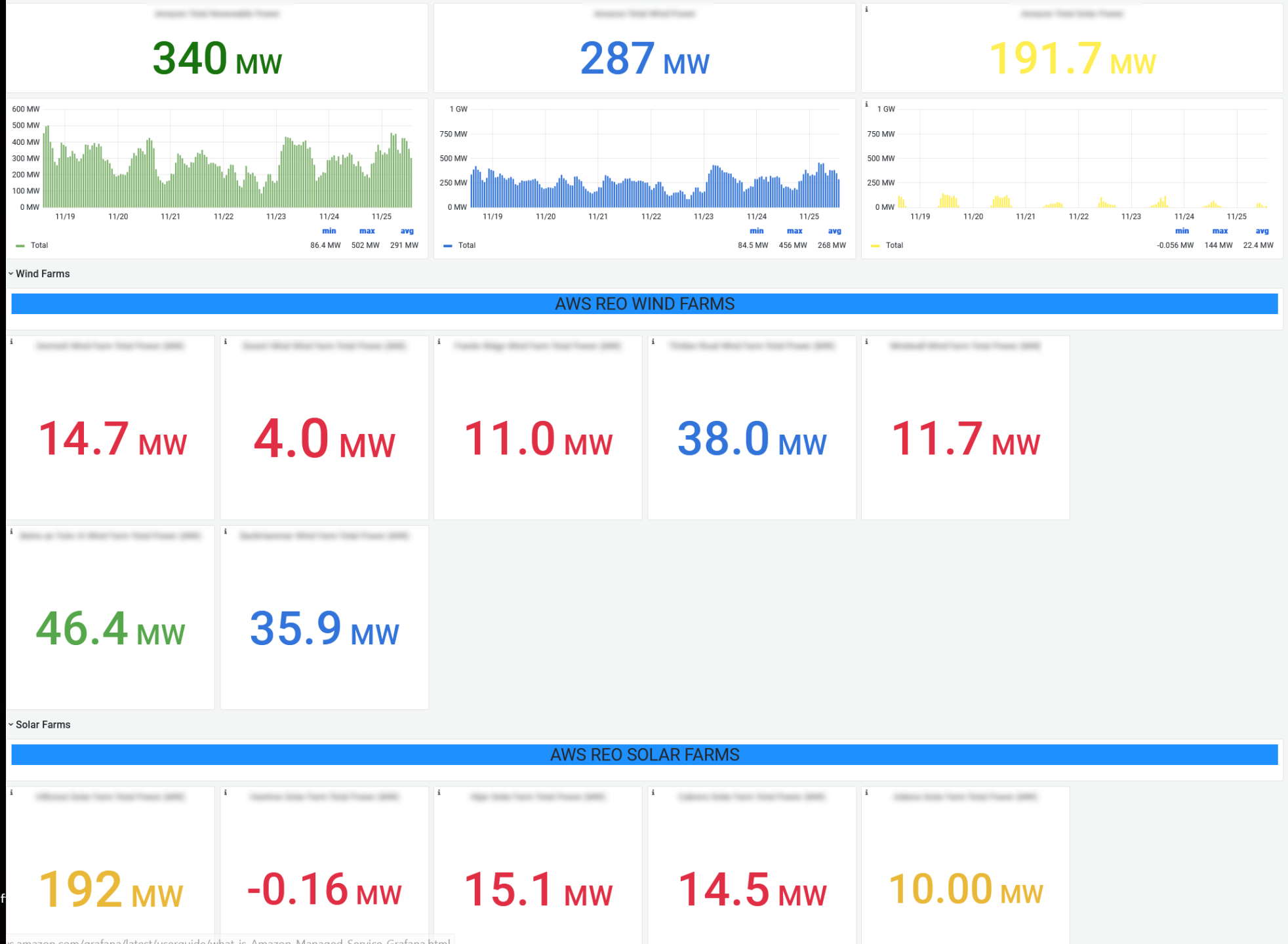
Machine learning models forecast generation, production, and grid conditions to improve output

Dispatch optimization to maximize delivery of clean power to the grid

Dashboards to provide real-time operational insights

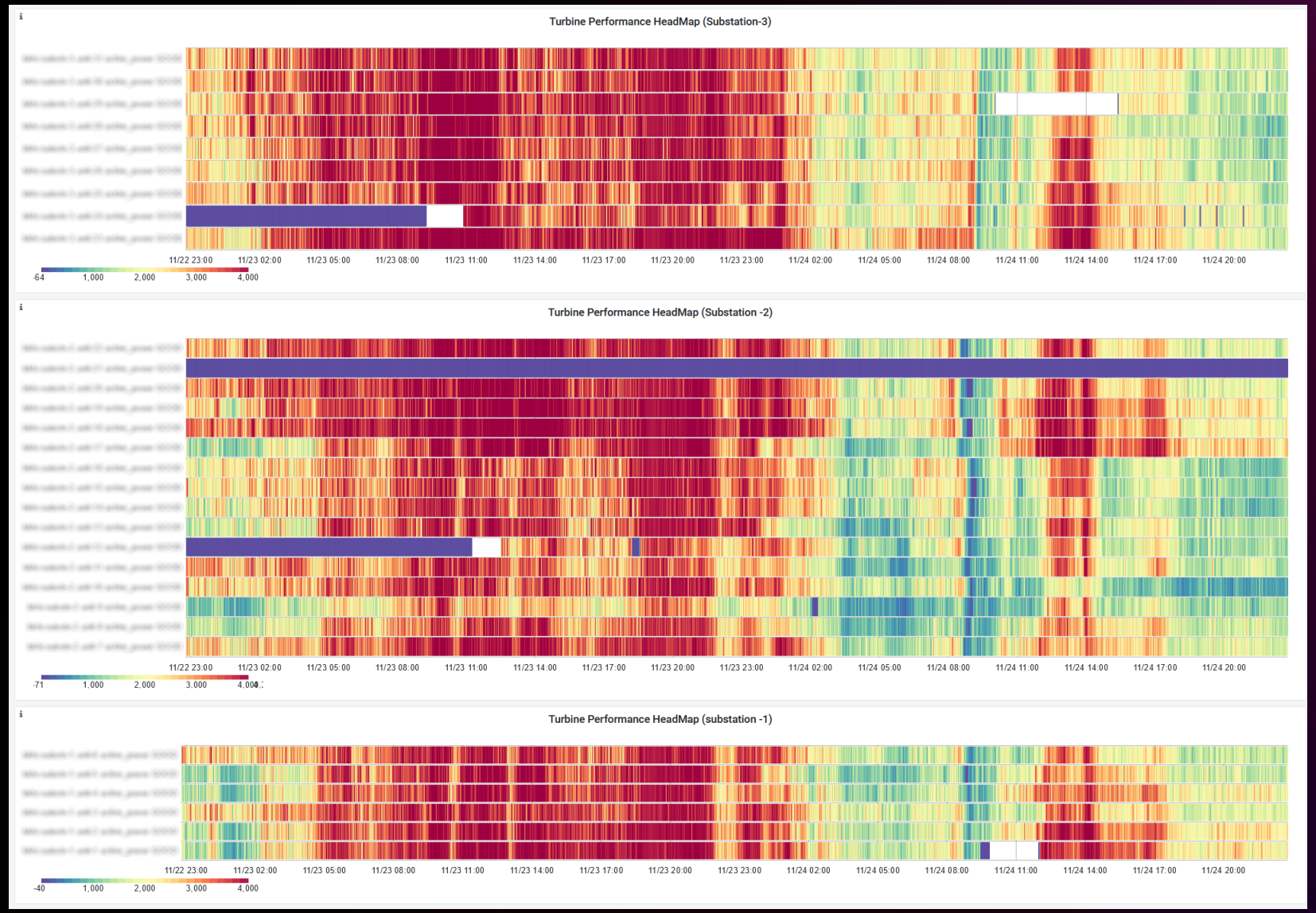
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Global visibility



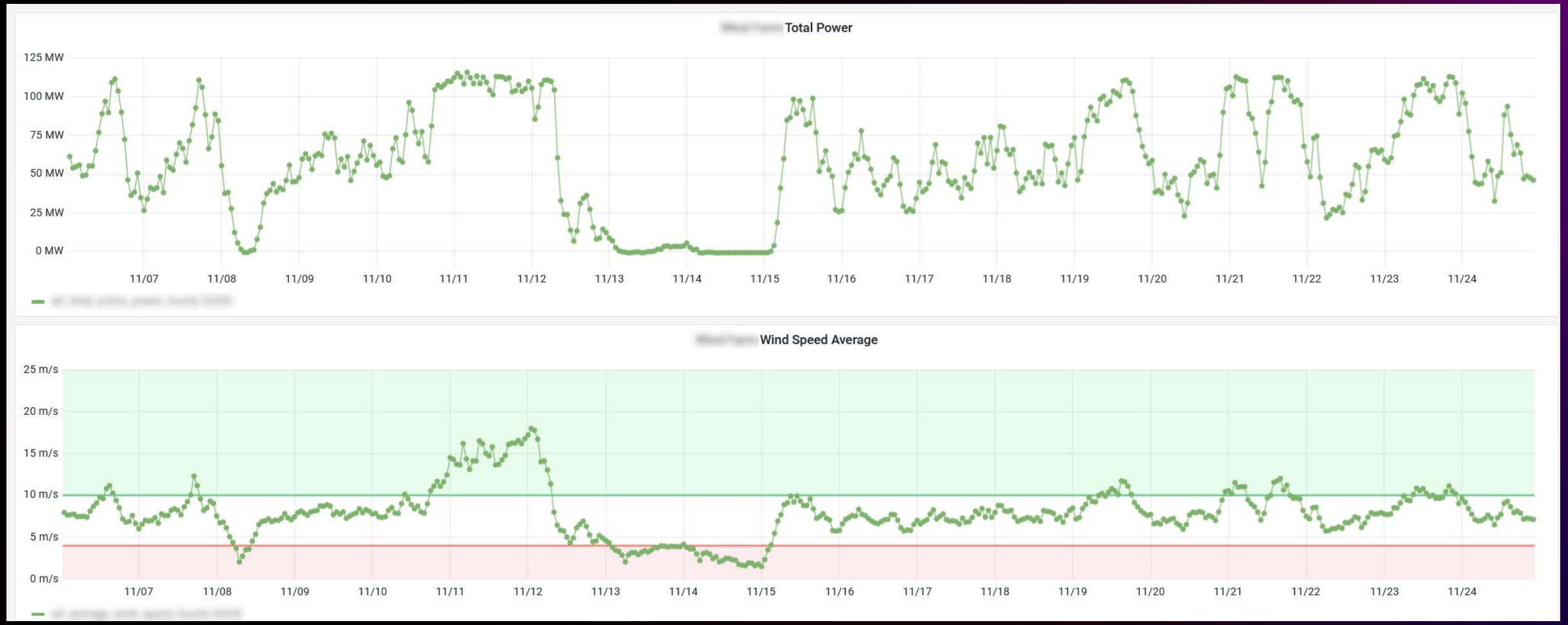
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Operational dashboards – turbine performance



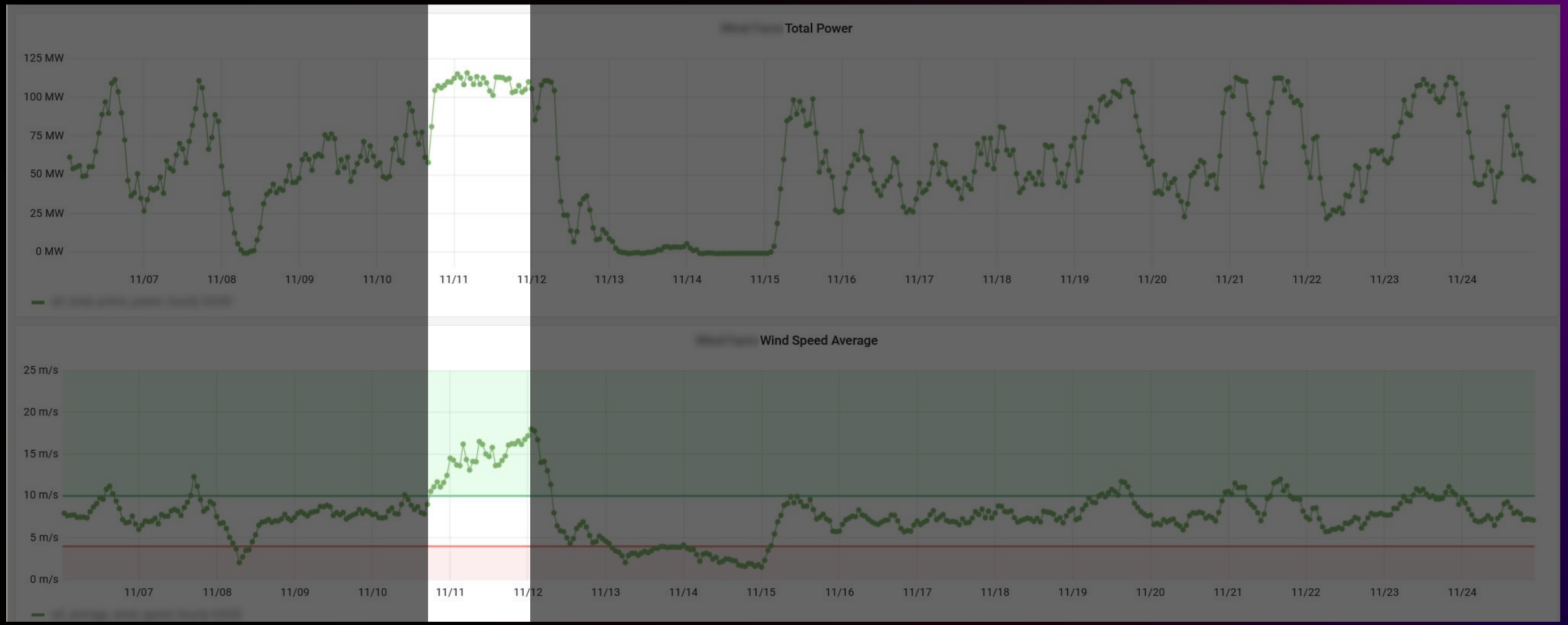
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Operational dashboards – wind and power



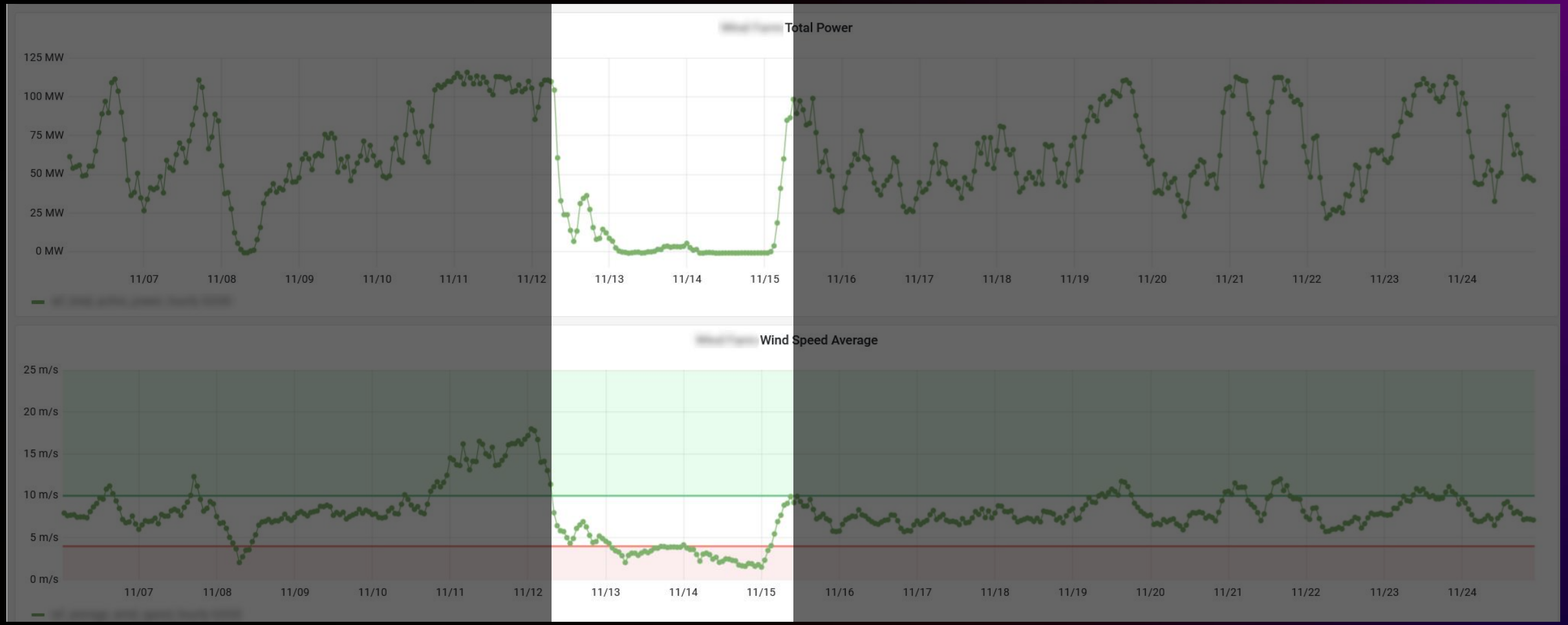
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Operational dashboards – wind and power



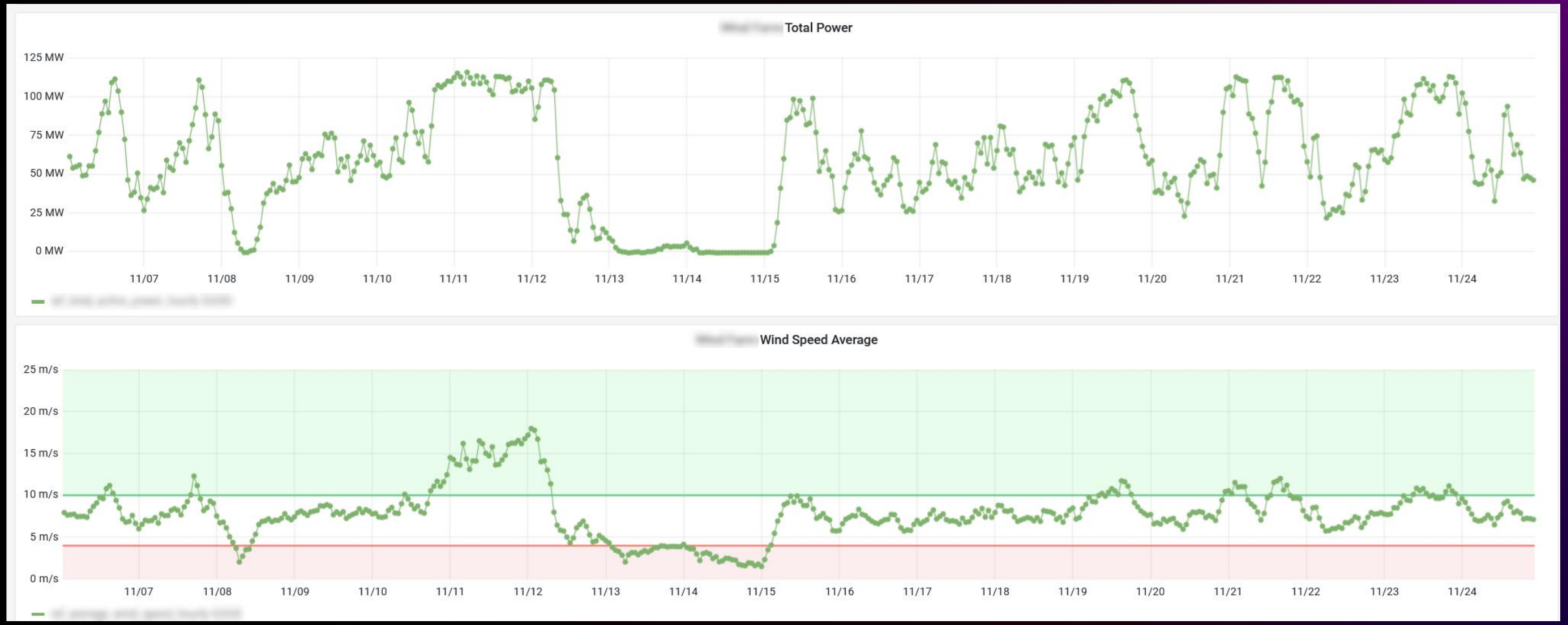
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Operational dashboards – wind and power



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Operational dashboards – wind and power



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Renewable energy at scale



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Courtesy of The SOLA Group

Sustainability breakout sessions

SUS204: Sustainability in AWS global infrastructure

SUS205: Architecting sustainably and reducing your AWS carbon footprint

SUS206: Sustainability and AWS silicon

SUS208: Utilizing sustainability data at scale

SUS210: Modeling climate change impacts and risks at scale

SUS211: Water stewardship and renewable energy at scale

SUS212: Accelerating decarbonization and sustainability transformation

SUS301: Sustainable machine learning for protecting natural resources

SUS303: Delivering sustainable, high-performing architectures

SUS312: How innovators are driving more sustainable manufacturing

STP213: Scaling global carbon footprint management

AWS re:Invent 2022 Sustainability

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Sustainability workshops and chalk talks

SUS201: Detecting deforestation with geospatial images and Amazon SageMaker

SUS202: Using Amazon SageMaker, AutoGluon, and ASDI to predict air quality

SUS203: Carbon emissions reporting using modern data architecture on AWS

SUS207: Patterns for obtaining insights from sustainability data

SUS302: Optimizing architectures for sustainability

AWS re:Invent 2022 Sustainability

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Thank you!

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