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# Grid Data Commons

NASPI Challenge Update, NASPI Work Group Meeting and Vendor Show

2026-04-15| Chicago, IL | Justin Gilmer

# Presentation Outline

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**01 Grid Data Growth**
Diverse and ever increasing

**02 Grid Data Commons**
Introduction and Vision

**03 Strategic Inspiration**
Foundations for the Commons

**04 Challenge Update**
Current State of the Initiative

**05 The Opportunity**
Value of a Global Data Commons

**06 Community Involvement**
Engagement and Collaboration

# Grid Data is Exploding – From Gigabytes to Exabytes

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## Annual Time Series Data Generated





| # of Streams | Smart Meter | SCADA | PQ | PMU | | DFR \| Point on Wave | | |
|---|---|---|---|---|---|---|---|---|
| 1,000,000 | 46 TB | 459 TB | 4.5 PB | 45 PB | 448 PB | 4.4 EB | 44 EB | 438 EB |
| 100,000 | 4.6 TB | 46 TB | 459 TB | 4.5 PB | 45 PB | 448 PB | 4.4 EB | 44 EB |
| 10,000 | 470 GB | 4.7 TB | 46 TB | 459 TB | 4.5 PB | 45 PB | 448 PB | 4.4 EB |
| 1,000 | 47 GB | 470 GB | 4.6 TB | 46 TB | 459 TB | 4.5 PB | 45 PB | 448 PB |
| 100 | 4.7 GB | 47 GB | 470 GB | 4.6 TB | 46 TB | 459 TB | 4.5 PB | 45 PB |
| 10 | 482 MB | 4.7 GB | 47 GB | 470 GB | 4.6 TB | 46 TB | 459 TB | 4.5 PB |
| | 0.1 Hz | 1 Hz | 10 Hz | 100 Hz | 1 KHz | 10 KHz | 100 KHz | 1 MHz |

Industry Trends

- Exabyte - $10^{18}$
- Petabyte - $10^{15}$
- Terabyte - $10^{12}$
- Gigabyte - $10^{9}$
- Megabyte - $10^{6}$

Additional Time-Series Data Sources: Vibration, seismic, temperature, humidity, acoustic, weather, etc.

# Utility Data is Exploding

## From Gigabytes to Exabytes

### Grid Timeseries Data

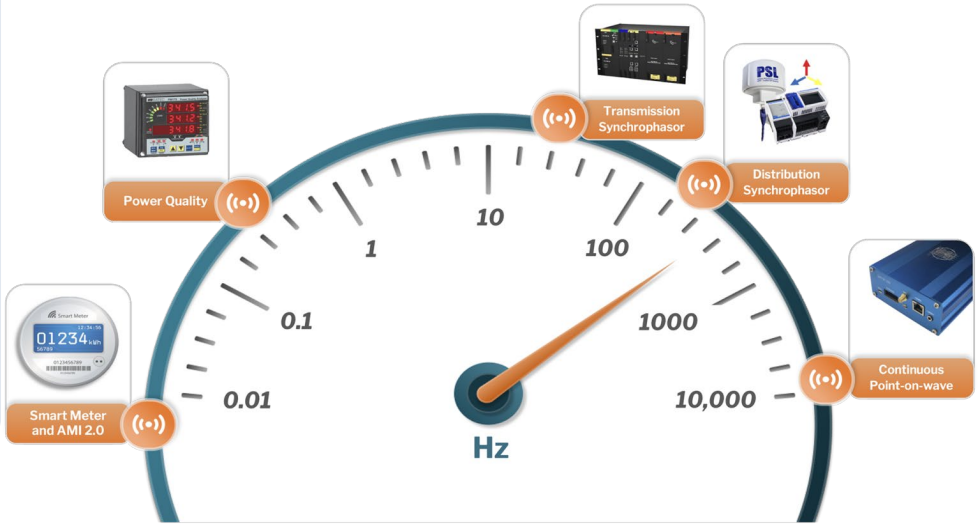
0.001Hz ↔ MHz

### Many Devices and Manufacturers

AMI ↔ SCADA ↔ PMU/DFR ↔ CPOW

### Events

Specialized Timeseries



# Utility Data is Exploding

## From Gigabytes to Exabytes

### Assets

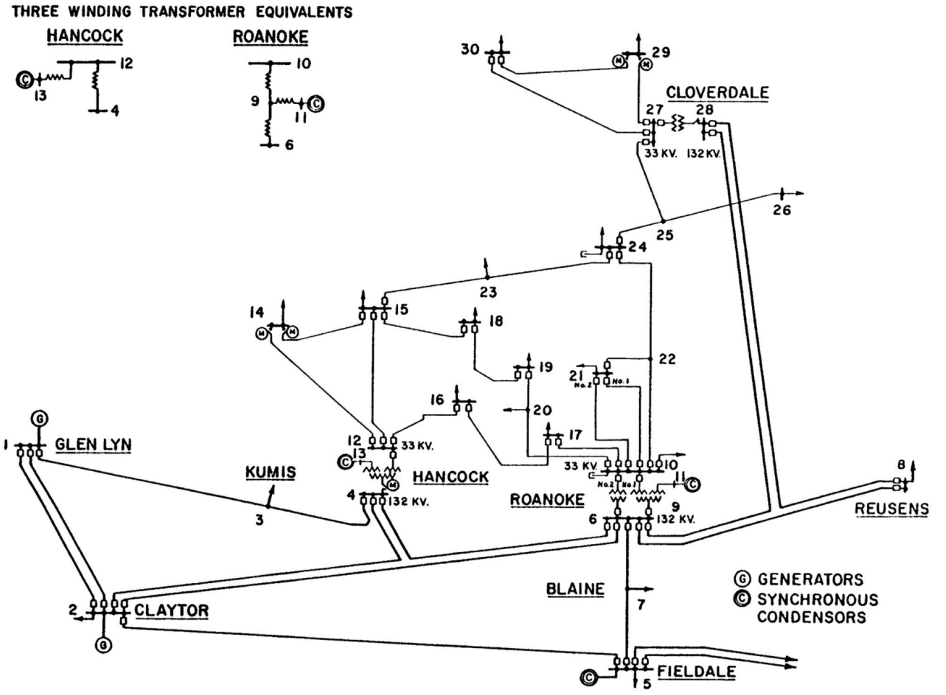
Device Type, Manufacturer, Location

### Internal Metadata

Stream Mappings, Location

### Topology

Electrical Connectivity, Location




http://www.ee.washington.edu/research/pstca/pf30/pg_tca30bus.htm

# Utility Data is Exploding

## From Gigabytes to Exabytes

### External Data Sources

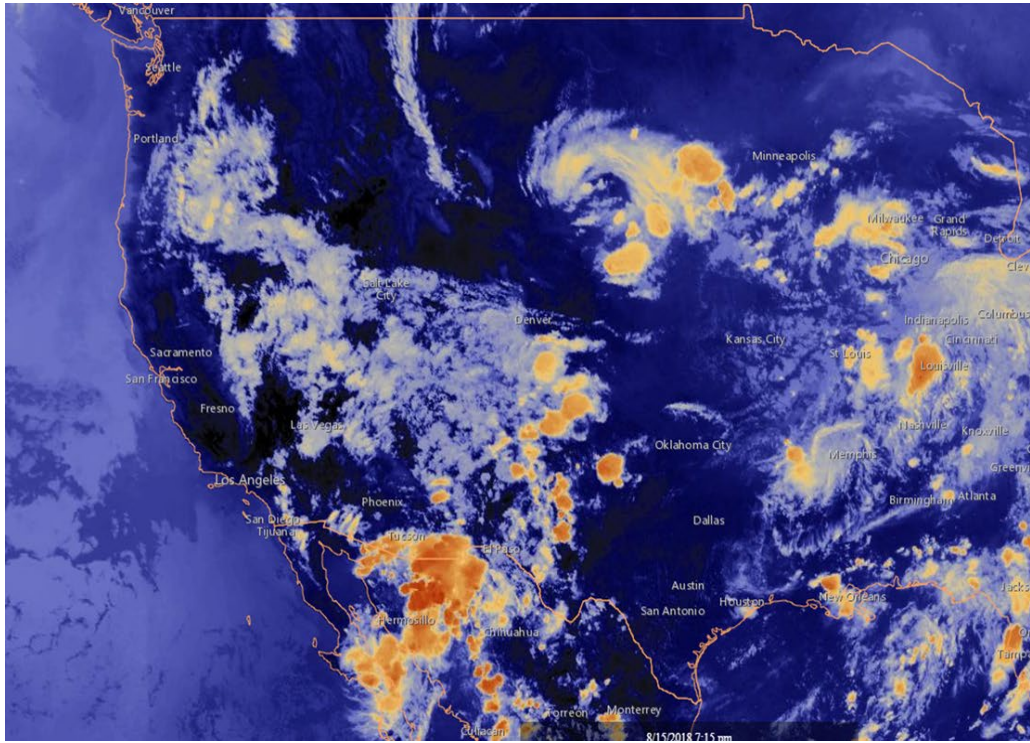
Not Utility Owned

### Weather

Meterological, Space Weather

### Simulation Engines

State Estimation, Power Flows




A screenshot of GOES East Infrared Satellite Image - Latest 24 Hours Western Hemisphere over North America from 8/16/18. (Image credit: NOAA National Environmental Satellite, Data, and Information Service)

# The Grid Data Commons

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Community Vision

## A Shared Resource for Real Solutions

The Grid Data Commons is an attempt to solve the critical data access bottleneck.

Core Objectives

## Enabling Shared Intelligence

- Enable shared datasets for industry-wide use
- Encourage cross-industry learning
- Accelerate model development and collaboration

# NI4AI: Original Inspiration

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Project Genesis

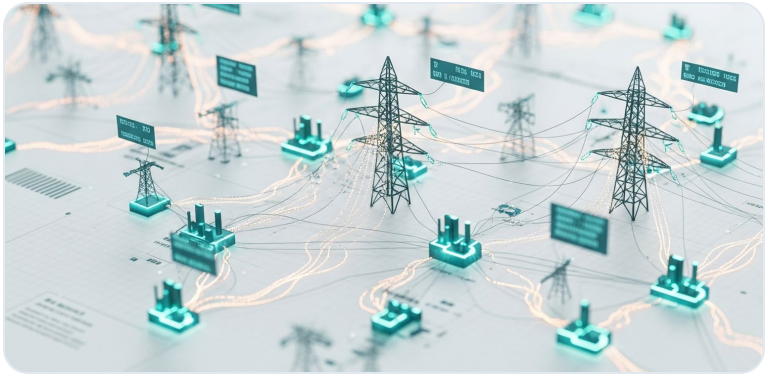
## ARPA-E Open Innovation

A multi-year initiative (2018) between **PingThings** and **UC Berkeley** to eliminate barriers to AI adoption on the grid.

Data Ecosystem

## Dual-Tier Data Access

- **Public:** Open access datasets available to any registered user.
- **Proprietary:** Controlled access for utility-owned pilot data.



> *The overarching objective is to remove any and all obstacles to the rapid development, adoption, and deployment of new use cases based on analytics, machine learning (ML), and artificial intelligence (AI) for sensor data measuring the electric grid.*

# NASPI Challenge: Project Update

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## Current Status

Initial outreach introduced the concept, but broad participation has yet to take off.

## Why This Still Matters

High-resolution grid data continues to grow in scale and importance.

# PingThings and NI4AI

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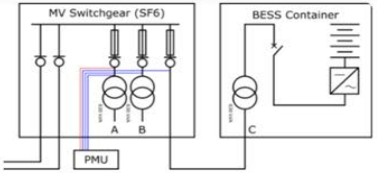
events

Anonymized transmission PMU data for wide-area events

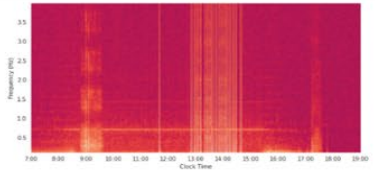
sunshine

PMU data archives from a distribution grid with community solar




POW/EPFL

Point on wave data for battery charging and discharging events



monitoring

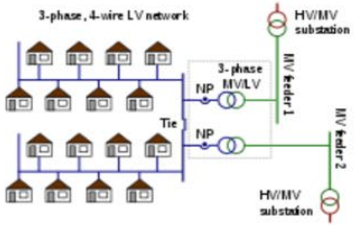
Anonymized continuous monitoring data for four generators

POW/underground

Continuous point on wave data for an underground cable

POW/signatures

EPRI/DOE library of 200+ fault event signatures including three-phase voltage and current waveforms




golden

3 months of PMU data from 10 sensors deployed on a


ni4ai

Streaming data from PMUs in wall outlets with wide-area grid coverage

# PingThings and NI4AI

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**Example Dataset**
PowerSide µPMU, 60Hz

**Installed in Local Homes**
Streaming into the PredictiveGrid platform

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# Advancing the Grid Data Commons

Initiative Status

## Grid Data Commons Momentum

We are committed to moving the Grid Data Commons forward as a centralized repository.

Community Focus

## Assisting the Community

Proactive support with open-access datasets, collaborative tools.

Data Scope

## Multi-Resolution Data Types

Full support for waveform, synchrophasor, and other fast and slow report-rate data streams, geospatial, etc.

Collaboration

## Community Driven

Drive forward use-cases, collaborate, data contributions

# Grid Data Commons: Invitation

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### Data Contribution
Share your datasets to enrich the commons and enable broader research.

### Use-Case Development
Test and develop algorithms where data access is not a bottleneck.

### Collaboration
How can we unblock others to use and leverage this resource?