

NOVEMBER 2022

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# Accelerate your time to value with analytics and applications fueled by AVEVA™ Data Hub

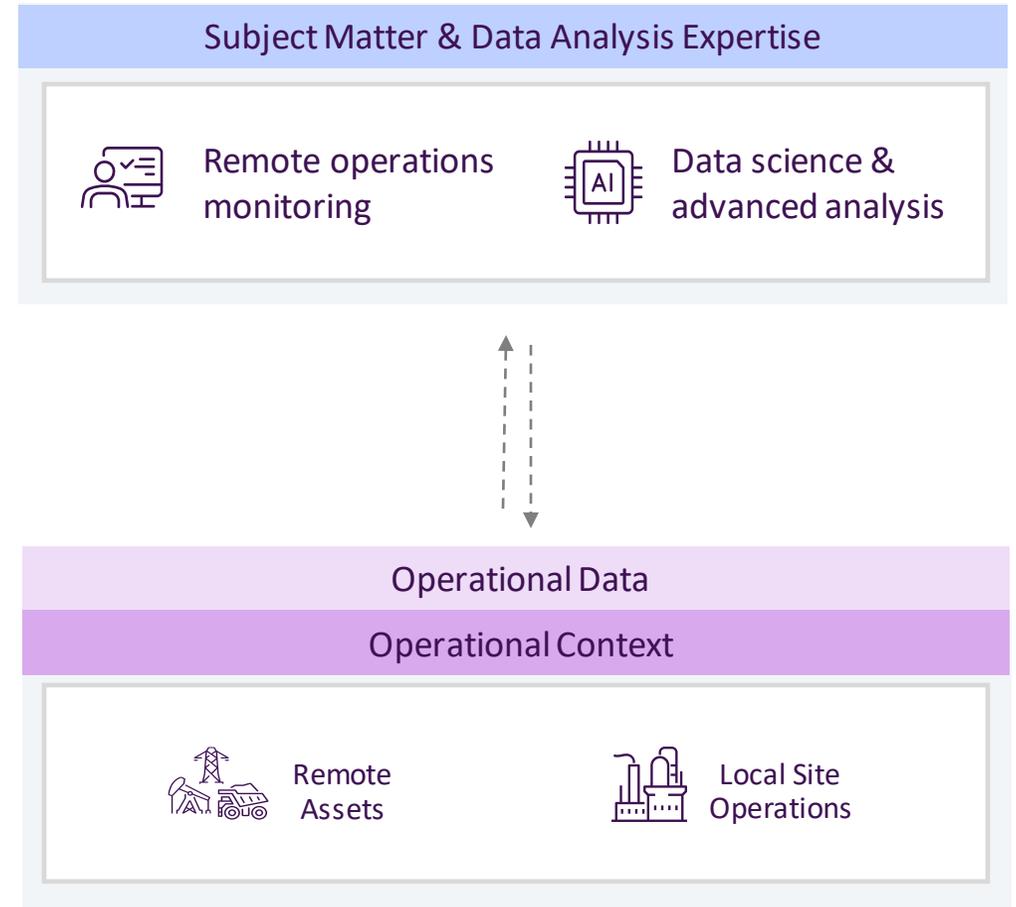
Alicia Coppock, AVEVA Sr. Technical Product Manager

Victor Zhang, AVEVA Technical Product Manager

**AVEVA**

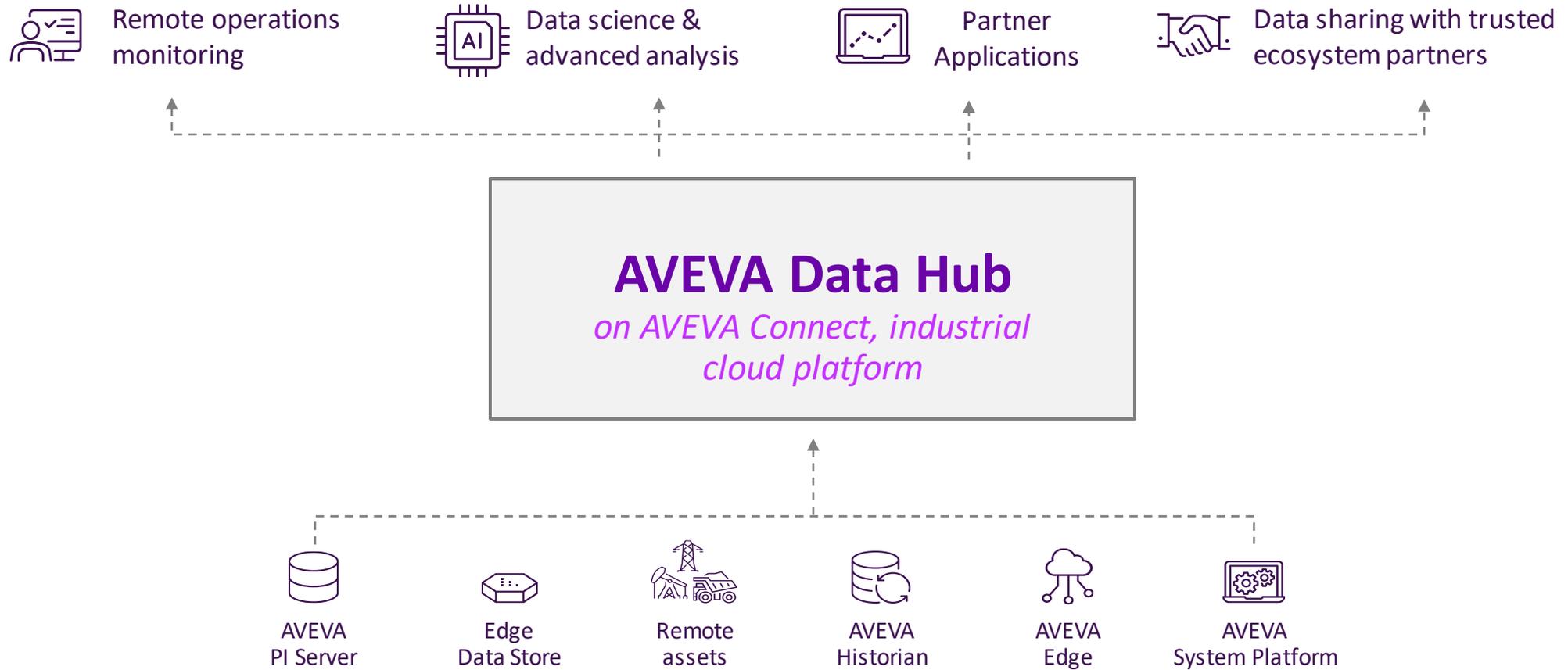
# Breaking down data silos

- Preserve operational context
- Enable secure access to a trusted system of record
- Provide a common surface for data access



# Engage new personas, enable new use cases

AVEVA Connect enables a hybrid data architecture through cloud offerings



# Assets give useful context to your data streams



## Assets

**AE01** ✔

Generated Windtopia Wind Turbine Asset

✎
⋮
✕

Asset Type: GE Wind Turbine

Metadata	Properties	Status
<b>Metadata</b>	<b>Value</b>	<b>UOM</b>
Altitude	1,000	m
Gearbox Serial Number	4800000-0000-0	
Latitude	44.563149	°
Longitude	-109.25416	°
Manufacturer	Truvale	
Model	T95-2MW	
Overheating delta limit	60	°C
Power Rated	1,500	kW
Region	NA	
Serial Number	M000000	

✔
▲
✕

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvale, ...)

# Assets give useful context to your data streams



## Assets

AE01 

Generated Windtopia Wind Turbine Asset

Metadata	Properties	Status	
Property	Last Value	UOM	Timestamp
<input type="checkbox"/> Auto Stop Reason	4.000		10/17/22, 7:10 AM
<input type="checkbox"/> Apparent Power	1,514.068		10/17/22, 11:14 AM
<input type="checkbox"/> Revenue - Daily	266.340		10/17/22, 11:03 AM
<input type="checkbox"/> Expected Power - 10 min rolling avg	1,500.011		10/17/22, 11:09 AM
<input type="checkbox"/> Energy Production - Monthly	266.981		10/17/22, 11:03 AM
<input type="checkbox"/> Revenue Rate	53.246		10/17/22, 11:14 AM
<input type="checkbox"/> Wind Deviation 1s	-27.461	°	10/17/22, 11:14 AM
<input type="checkbox"/> Wind Deviation 10s	-10.698	°	10/17/22, 11:13 AM
<input type="checkbox"/> Wind Speed	14.415	m/s <sup>2</sup>	10/17/22, 11:14 AM

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvalle, ...)
- **Stream reference properties** (Active power, expected power, operating state, etc.)



# Assets give useful context to your data streams



## Assets

Property		
T Auto Stop Reason   Value		
Value		Status
System OK	→	
Gear Box Vibration	→	
Pitch Motor	→	
High Gear Box Vibration	→	
High Generator Vibration	→	

- **Static metadata** (Region: North America, Wind farm: Big Buffalo Wind Farm, Asset Type: GE Wind Turbine, Manufacturer: Truvale, ...)
- **Stream reference properties** (Active power, expected power, operating state, etc.)
- **Asset status** (stream property values mapped to status: good, warning, bad)



# Asset status enables real-time monitoring



Assets

The screenshot shows the 'Assets' monitoring interface. At the top, there is a search bar 'Search for Assets' and a '+ Add Asset' button. Below the search bar, a filter facet is active for 'GE Wind Turbine'. The main area displays a grid of asset cards, each representing a wind turbine (AE01 to AE10) with its status indicated by a green checkmark or a red X. A red box highlights the filter facet and the asset grid.

Asset ID	Status
AE01	Good
AE02	Good
AE03	Good
AE04	Good
AE05	Good
AE06	Good
AE07	Bad
AE08	Good
AE09	Good
AE10	Bad

Filter facets:

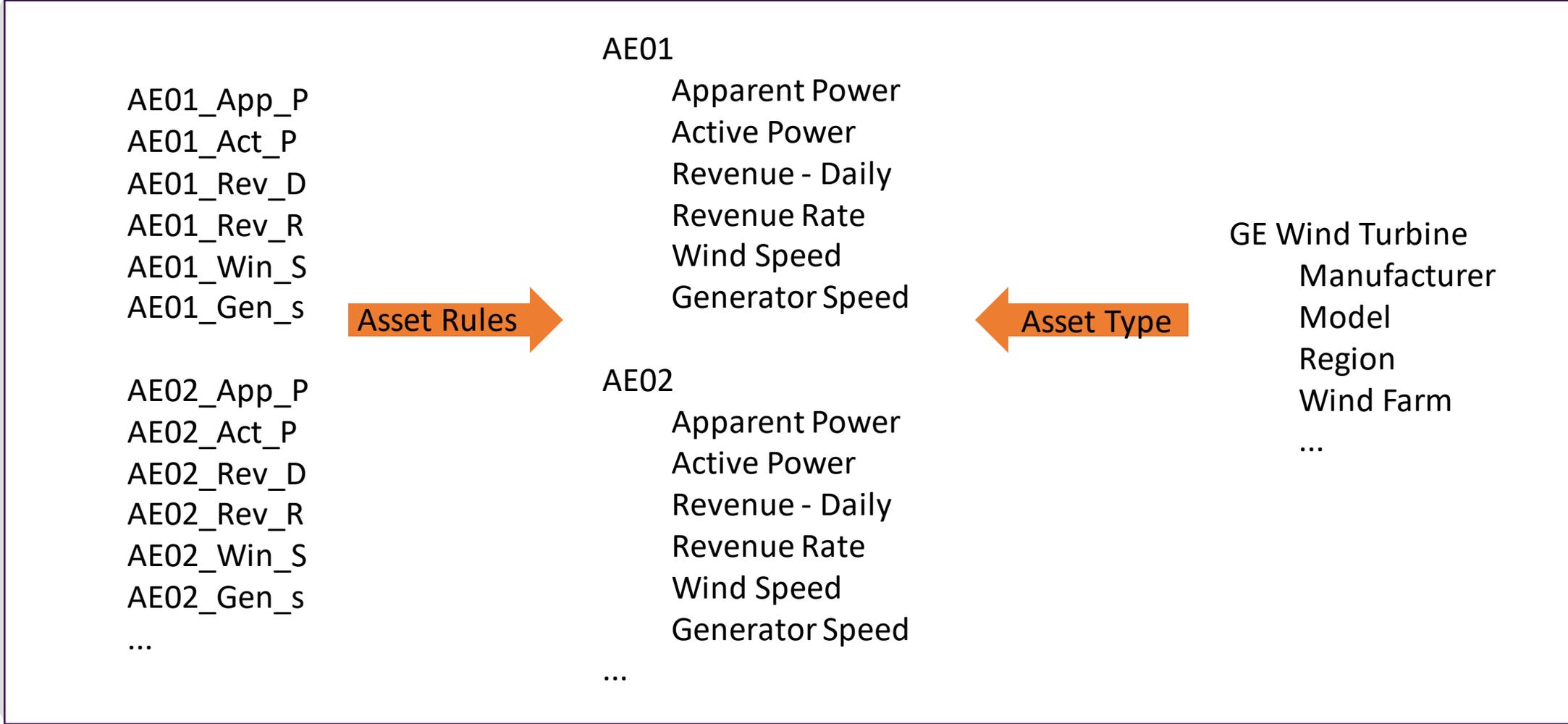
- Status
  - Good
  - Warning
  - Bad
  - Unknown
- Asset Type
  - VAVCO
  - VAVRH
  - EV Charging Station
  - VAVCO CO2
  - VAVRH CO2
  - Windtopia Wind Turbine
  - GE Wind Turbine
  - DataCollectorService
  - IDF
  - Emissions Intensity

Buttons: Clear All, Show More

# Assets rules automatically create/update assets based on streams' naming conventions



## Asset Rules



# Visual trending enables asset root cause analysis & investigations

## Trending

- ✓ Stream & asset search
- ✓ Common trend interactions
- ✓ Stacked trends
- ✓ Trend summary calcs
- ✓ Min/max easy cursors
- ✓ Multiple cursor delta summary calcs
- ✓ Trend sharing
- ✓ URL parameters
- ✓ String & Enum trending
- ✓ Seamless contextual navigation from Asset Explorer
- ✓ Trending asset properties
- ✓ Asset swapping
- ✓ Trending shared streams

### Trending



### Sharing with URL Parameters

<https://datahub.connect.aveva.com/tenant/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/trend?origin=1;cee3a3fd-aeb2-4950-80f5-4b72c77322b1;uswe.datahub.conne.ct.aveva.com;ed809cce-0e64-446-f-a4c3-ada80bcf3367&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Expected%2520Power;Value;%25231A76D9&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Wind%2520Speed;Value;%2523008A00&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Active%2520Power;Value;%2523DC7300&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Operating%2520State;DigitalStateName&trace=a;1;d68f33a8-0bc8-43a6-a9b4-9aadd041ed1f;Bearing%2520B%2520Temperature;Value;%2523D28CD2&mode=stacked&cursor=2022-09-10T07:24:21.797Z&cursor=2022-09-11T13:05:27.127Z&selectedTrace=null;&startIndex=2022-09-07T11:03:02.714Z&endIndex=2022-09-14T11:03:02.715Z>

# Modern REST API to enable your applications



REST API

**AVEVA™ Data Hub API Console**

Full Path: v1 | uswe.datahub.connect.aveva.com/api/v1/Tenants/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z

URI: GET /Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z

Parameters:

- startIndex: 2022-09-15T04:00:00.000Z
- endIndex: 2022-09-15T04:00:00.000Z
- count:
- interval: 00:01:00.00
- continuationToken:
- cache:  Return tabular data (form=table)

GET

URI Path: GET uswe.datahub.connect.aveva.com/api/v1/Tenants/cee3a3fd-aeb2-4950-80f5-4b72c77322b1/Namespaces/ed809cce-0e64-446f-a4c3-ada80bcf3367/DataViews/Wind Turbine Analysis/Data/Interpolated?startIndex=2022-09-15T04:00:00.000Z&form=table&interval=00:01:00:00

Status: Code: 200 Text: OK

JSON Table

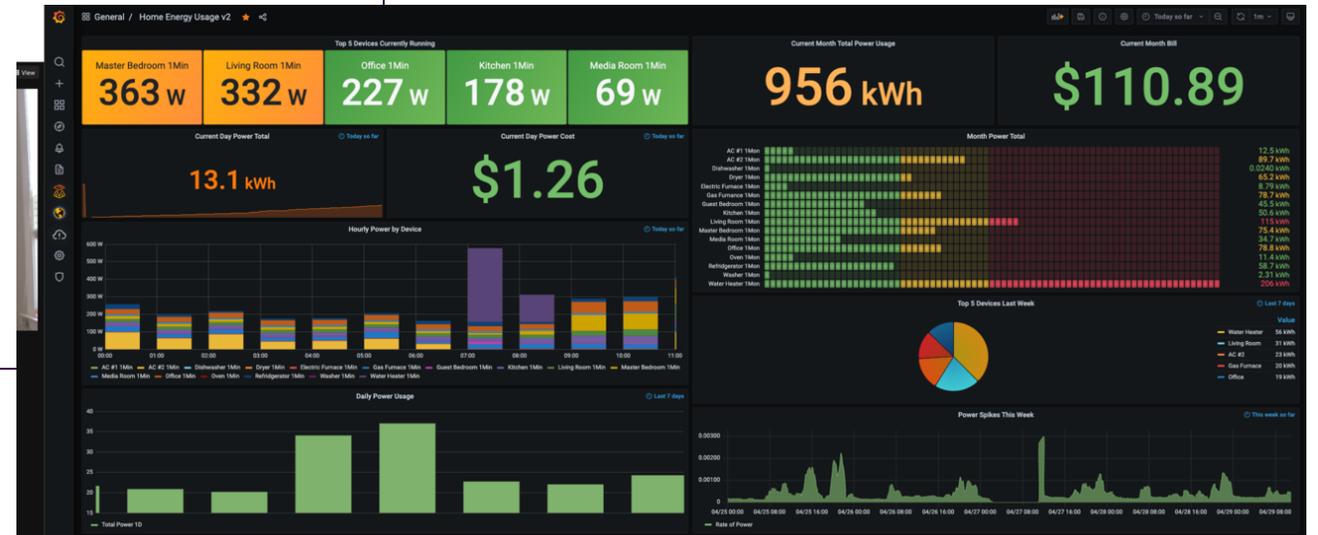
730 Total Response Values

Time	Name	Win...	Acti...	Man...	Rev...	Exp...	Rev...	Rev...	Pow...	Avail...
Sep 15, ...	GE01	Big Buff...	1520.4...	Truval...	26.085...	1470.5...	6754.1...	520.30...	1500	1
Sep 15, ...	GE02	Big Buff...	1446.1...	ACME	25.054...	1479.3...	6764.6...	533.47...	1500	1
Sep 15, ...	GE03	Big Buff...	1513.7...	ACME	26.361...	1500.2...	6480.9...	534.57...	1500	1
Sep 15, ...	GE04	Big Buff...	1507.8...	Truval...	26.519...	1498.3...	6544.2...	572.81...	1500	1
Sep 15, ...	GE05	Black M...	777.45...	Truval...	15.561...	1437.1...	4178.8...	454.24...	800	1
Sep 15, ...	GE06	Black M...	1500.8...	Truval...	27.083...	1488.9...	6394.6...	660.46...	1500	1
Sep 15, ...	GE07	Black M...	953.48...	ACME	20.621...	845.80...	6094.1...	629.93...	1500	1

C#  
Python  
Java  
NodeJS  
Angular



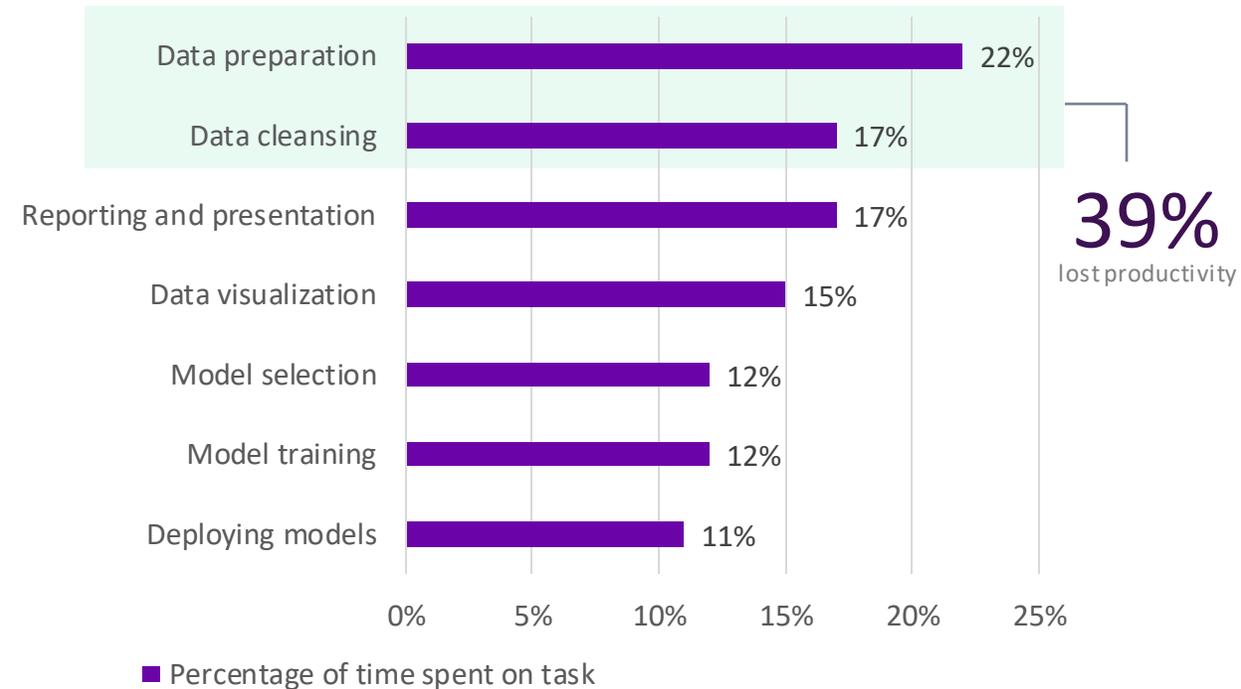
<https://github.com/osisoft>



# Preparing data for analytics

It's time consuming, even for data scientists

How do data scientists spend their time?



Source: [Anaconda's State of Data Science 2021 Survey](#)

# Data Views curate operational data for external consumption



## Data Views

### Enabling data exploration, integration, & data science

#### DATA VIEW

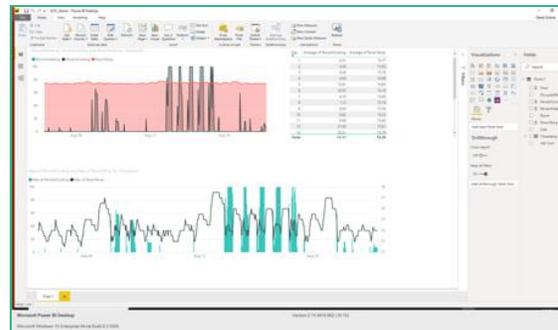
Timestamp	Name	Wind Farm	Manufacturer	Active Power Value kW	Wind Speed
Oct 10, 2022, 12:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1111.974	11.2518015
Oct 10, 2022, 1:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1101.3666	11.011856
Oct 10, 2022, 2:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1344.1127	10.481206
Oct 10, 2022, 3:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1083.0879	10.267265
Oct 10, 2022, 4:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1014.003	8.934044
Oct 10, 2022, 5:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1490.9729	11.637246
Oct 10, 2022, 6:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	484.01773	7.505134
Oct 10, 2022, 7:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	769.05817	7.385011
Oct 10, 2022, 8:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	733.9142	9.447613
Oct 10, 2022, 9:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	379.49713	7.02852
Oct 10, 2022, 10:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1523.0479	13.044865
Oct 10, 2022, 11:00:00 AM	AE01	Big Buffalo Wind Farm	Truvalle	1526.3428	13.379772
Oct 10, 2022, 12:00:00 PM	AE01	Big Buffalo Wind Farm	Truvalle	-0.64833814	14.5167
Oct 10, 2022, 1:00:00 PM	AE01	Big Buffalo Wind Farm	Truvalle	1521.683	13.470598

Data Science Tools & Data Exploration

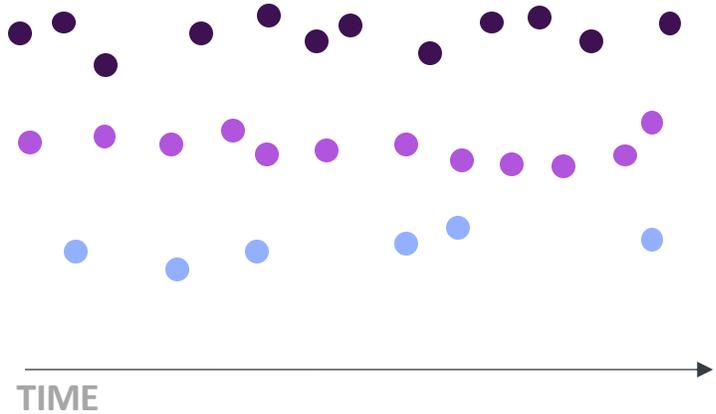
Data Science via Code

Partners & Apps

Cloud Platforms



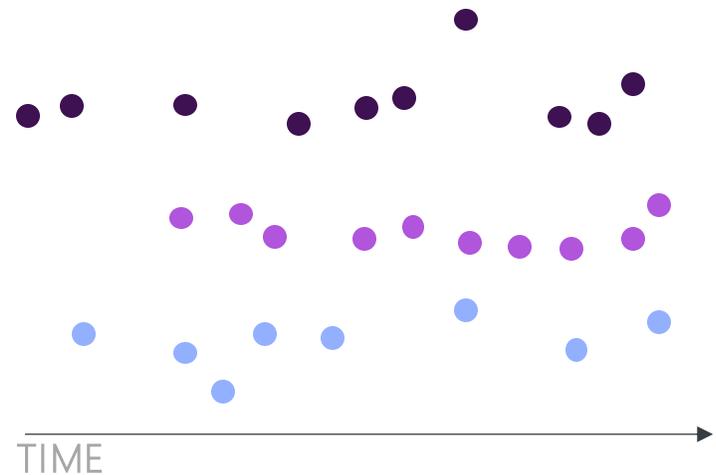
# Data is aggregated and context-aware



 STREAMS

 ASSETS + METADATA

GE01_BL1.ACT_PV	<i>Turbine Measurement</i>	<b>GE01 Blade 1, Actual</b>
GE01_BL2.ACT_PV	<i>Turbine Measurement</i>	<b>GE01 Blade 2, Actual</b>
GE01_P.ACT_PV	<i>Turbine Measurement</i>	<b>GE01 Active Power</b>

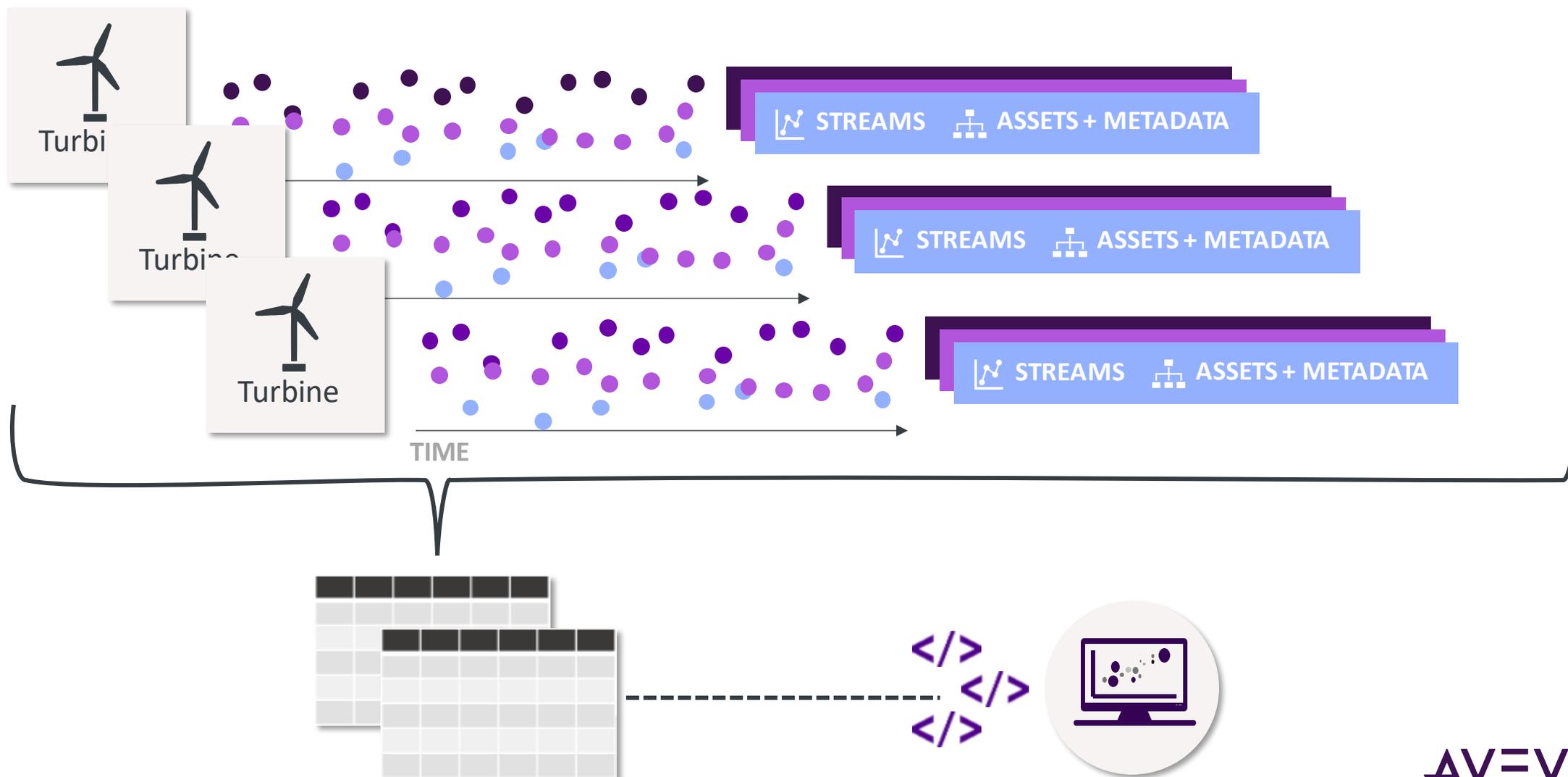


 STREAMS

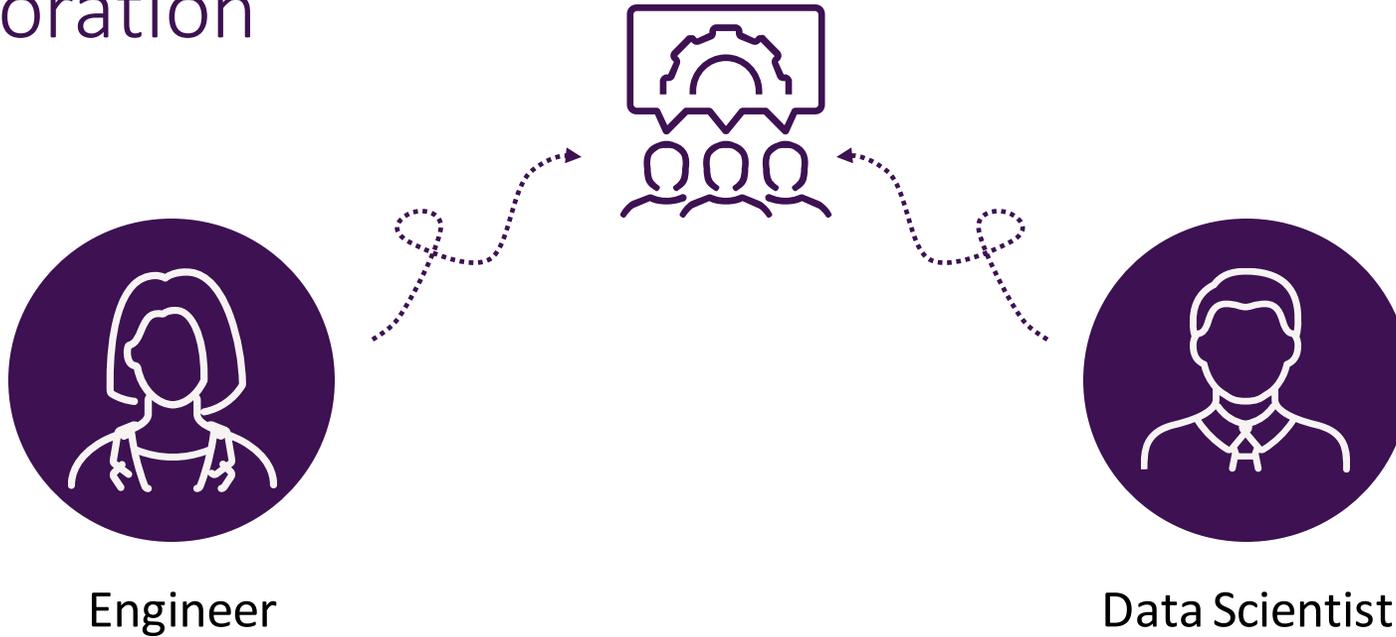
 ASSETS + METADATA

GE02_BL1.ACT_PV	<i>Turbine Measurement</i>	<b>GE02 Blade 1, Actual</b>
GE02_BL2.ACT_PV	<i>Turbine Measurement</i>	<b>GE02 Blade 2, Actual</b>
GE02_P.ACT_PV	<i>Turbine Measurement</i>	<b>GE02 Active Power</b>

# Data is shaped for consumption



# OT/IT Collaboration



- Organize and shape data for analysis
- Add meaningful context to data

- Use AI / ML and visual analytics to enable new insights

# Easily slice & dice your AVEVA Data Hub data in Power BI



## AVEVA Data Hub Power BI Connector

**AVEVA Data Hub Power BI Connector**

**Windtopia**

Active Power Value by Wind Farm

Wind Farm	Value	Percentage
Atlantic Ocean Wind Farm	0.34M	(0.95%)
Big Buffalo Wind Farm	0.71M	(1.95%)
Sirocco Sands Wind Farm	1.19M	(3.30%)
Foehn Alps Wind Farm	1.21M	(3.35%)
Black Wolf Wind Farm	1.25M	(3.45%)
Black Mesa Wind Farm	1.26M	(3.48%)
Levanter Iberia Wind Farm	1.26M	(3.48%)
Nordic Sea Wind Farm	1.25M	(3.45%)
Pacific Ocean Wind Farm	1.26M	(3.48%)
Other	1.97M	(5.45%)

Active Power Value and Expected Power Value by Timestamp

Energy Production - Daily Value and Operating Efficiency Value by Day

Active Power Value by Wind Farm and Name

Wind Farm	Value
Atlantic Ocean Wind Farm	WT08
Sirocco Sands Wind Farm	GE08
Black Wolf Wind Farm	WT04
Levanter Iberia Wind Farm	WT05
Big Buffalo Wind Farm	WT09
Foehn Alps Wind Farm	WT07
Black Mesa Wind Farm	GE10
Nordic Sea Wind Farm	WT06
Pacific Ocean Wind Farm	WT11
Other	WT03, WT02, WT01, GE02, GE01, GE03, GE04, GE05, GE06, GE07

**\$157.41K**  
Current Month Revenue

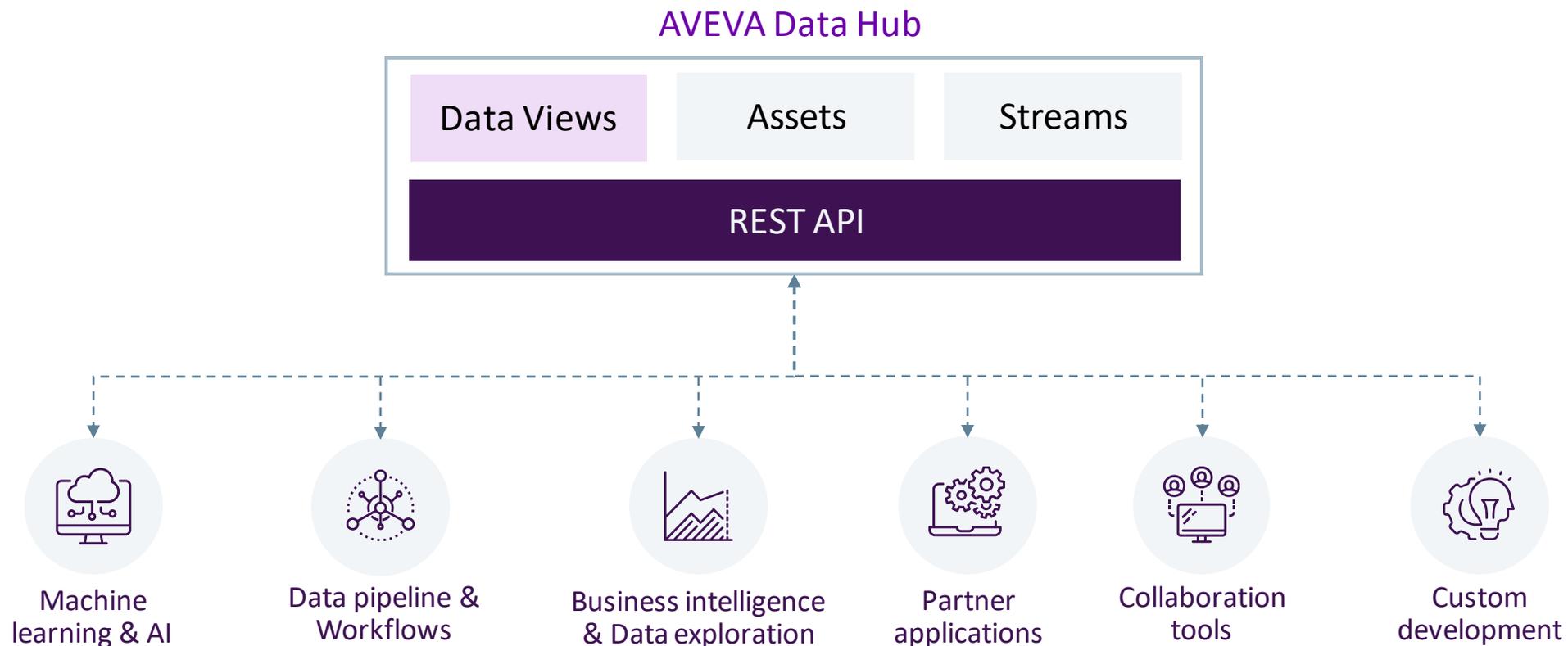
**4.20K**  
Energy Production - Monthly Value

**(\$32.25)**  
Auto Stop Aggregation\_RevenueLoss Va...

**28**  
Turbine Count

- ✓ Import Data Views into Power BI
- ✓ Stored & Interpolated retrieval modes
- ✓ No coding required
- ✓ Power BI Desktop and Power BI Service (through On-Premises Data Gateway)

# Integration through REST API for many use cases



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# Accelerate your time to value with AVEVA Data Hub

- Preserve operational data context with **Assets**
- Monitor and visualize assets and data with **Asset Explorer** and **Trending**
- Curate data for analytics with **Data Views**
- Modern **REST API** for analytics, integrations and custom applications

# Learn more about AVEVA Connect & AVEVA Data Hub

## Industrial Cloud Platform @ AVEVA PI World 2022 – San Francisco

### • Day 1: Industrial Cloud Platform

- AVEVA: AVEVA Connect, Industrial Cloud Platform – Vision, roadmap, and starting your operations and engineering digital twin journey [14:00]
- AVEVA: Power your secure industrial ecosystem of data, applications, and partners with AVEVA Data Hub connected communities [14:40]
- AVEVA: Accelerate Your Time to Value with Analytics and Applications Fueled by AVEVA Data Hub [15:40] [\[this talk\]](#)
- AVEVA: On your marks, get set, Unleash your Operational Data in the Cloud! [16:20]
- AVEVA: Aggregating Engineering Content, Data and Documents and Real-Time Data into a Common User Experience [17:00]

### • Day 2: Customer Presentations

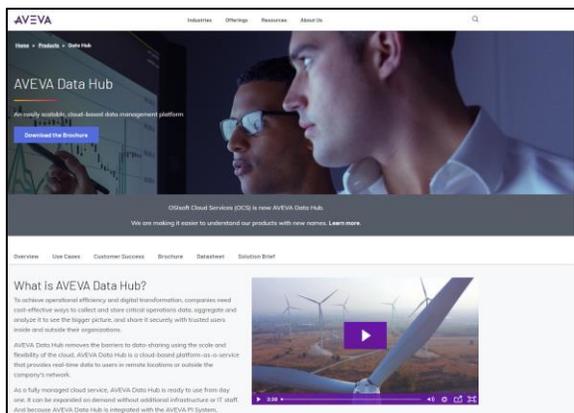
- IGI: The International Group: Lityx, use AVEVA™ Data Hub (ADH) to implement AI-based analytics, improving yields and generating millions in additional profit at a 20x ROI [10:55]
- First Quantum Minerals: Mixed Mobile Machinery Fleet Streaming Data to AVEVA Data Hub at First Quantum Minerals [14:00]
- Industrial Parts Depot: Real-Time Fleet Monitoring with OCS at Industrial Parts Depot [14:00]

### • Day 3: Industrial Cloud Platform

- AVEVA: Four Imperatives of a Trusted Information Infrastructure [10:45]
- AVEVA: Deploy Edge Data Store and Adapters in minutes with AVEVA Edge Management [11:25]
- AVEVA: Visualizing the Digital Twin, an Independent Service on the Industrial Cloud Platform [13:30]
- AVEVA: Uniting the connected community through secure and transparent industrial data sharing [14:25]
- AVEVA: Harnessing the power of Sequential Data Store (Sds) and Assets for developers and partners [15:30]
- AVEVA: Aggregating data with Data Hub asset rules and data views for analytics and applications [16:25]

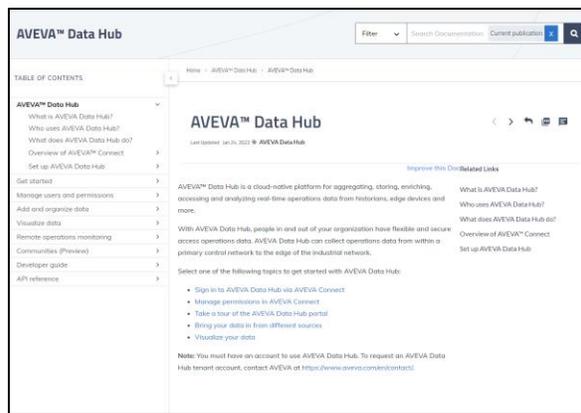
# Where to find more information on AVEVA Data Hub

## Overview & Resources



<https://www.aveva.com/en/products/data-hub/>

## Documentation



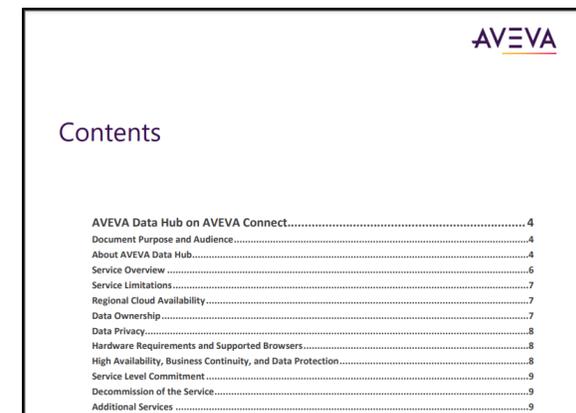
<https://docs.osisoft.com/bundle/data-hub/page/adh-content-portal-overview.html>

## Security & Trust Center



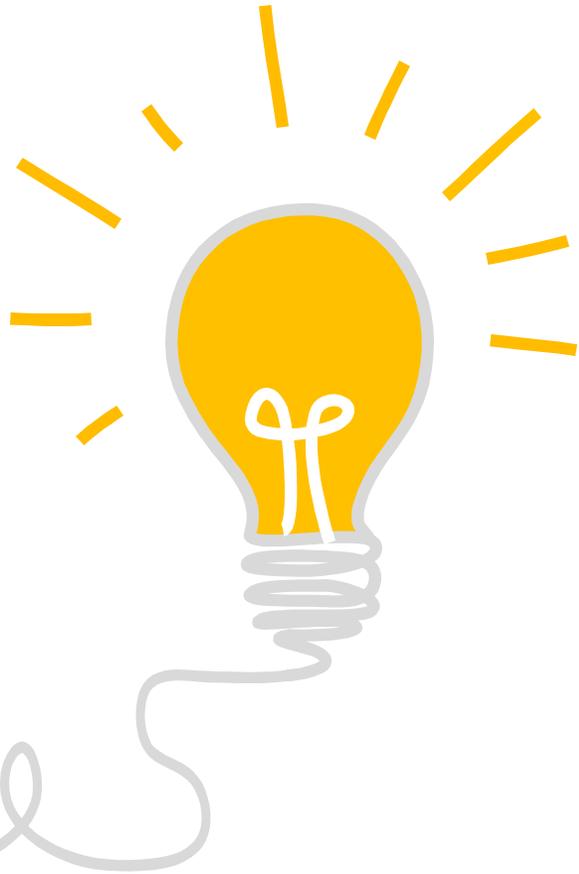
<https://www.aveva.com/en/legal/trust/>

## Service Description



[https://www.aveva.com/content/dam/aveva/documents/legal/service-documents/AVEVA-Data-Hub-on-AVEVA-Connect\\_v1-0.pdf](https://www.aveva.com/content/dam/aveva/documents/legal/service-documents/AVEVA-Data-Hub-on-AVEVA-Connect_v1-0.pdf)

How can you influence the AVEVA Data Hub roadmap?



<https://feedback.aveva.com>

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Let us know your product feedback!



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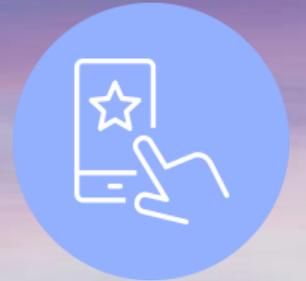
# Questions?

Please wait for the microphone.  
State your name and company.



# Please remember to...

Navigate to this session in the mobile app to complete the survey.



# Thank you!

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The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

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 [@avevagroup](https://twitter.com/avevagroup)

#### ABOUT AVEVA

AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at [www.aveva.com](https://www.aveva.com)