



AVEVAWORLD
PARIS

OCTOBER 2024

Improving Sustainability by using AVEVA™ PI System™ Data for Enhanced Business Intelligence

How AI & Analytics is being used to take action in Devon Energy's operations.

Don Morrison - Real-time Systems Architect
Bryce Herbranson - Senior AI Software Developer

Devon Energy is a leading independent oil and gas producer



OPERATIONS ACROSS THE UNITED STATES

- Acreage resides in top U.S. resource plays
- Underpinned by world-class Delaware Basin position



DIVERSIFIED COMMODITY MIX

- Balanced exposure to oil & natural gas production
- Access to premium markets improves realized pricing



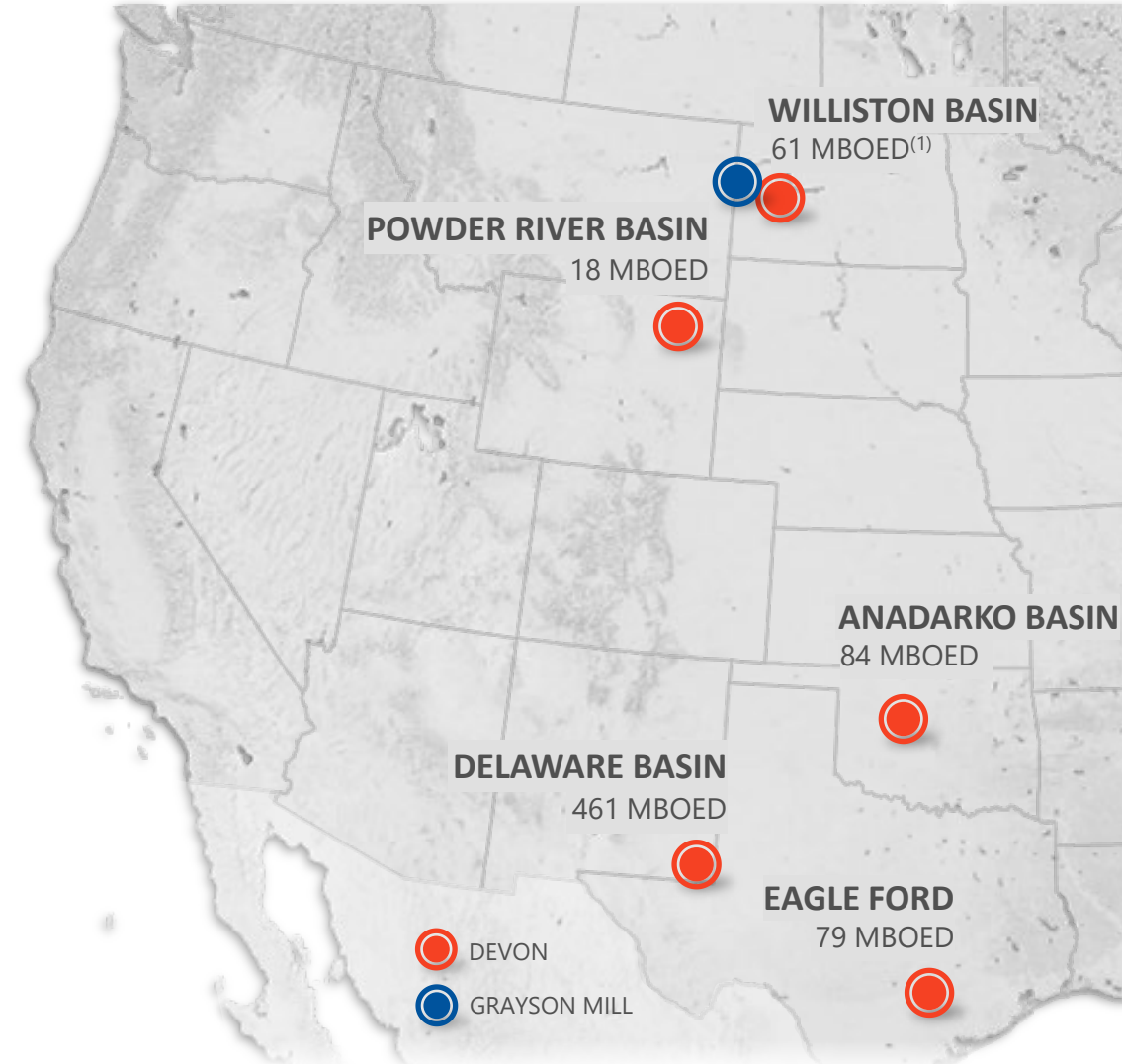
OPERATING SCALE ENHANCES PROFITABILITY

- Low-cost structure drives differentiated margins
- Track record of improving efficiencies & lowering cost of supply



DEEP INVENTORY OF REPEATABLE OPPORTUNITIES

- Possess >10 years of low-risk development inventory
- Resource upside from ongoing appraisal & exploration



Source: [Devon Energy Q2 Earnings Presentation](#)

(1) Q2 2024 Williston Basin production does not reflect Grayson Mill acquisition that is expected to close by the end of Q3 2024



Focused on Environmental Excellence



2024 SUSTAINABILITY REPORT HIGHLIGHTS

- Flared volume intensity was reduced by 82%⁽¹⁾
- Scope 1 & 2 GHG emissions intensity declined by 24%⁽¹⁾
- Recycled water usage increased by 15% vs. 2022
- Methane emissions intensity was reduced by 57%⁽¹⁾
- Oil & Gas Methane Partnership 2.0 Initiative Member



For more information, please refer to the **Sustainability** portion of Devon's website

Source: [Devon Energy Q2 Earnings Presentation](#)
(1) Measures reflect changes from 2019 to 2023.

ENVIRONMENTAL TARGETS

GHG EMISSIONS SCOPE 1 & 2

NET ZERO GHG EMISSIONS FOR SCOPE 1 & 2 BY 2050

GHG EMISSIONS INTENSITY SCOPE 1 & 2

50% REDUCTION BY 2030

METHANE EMISSIONS INTENSITY

65% REDUCTION BY 2030

FLARING INTENSITY

0.5% OF GROSS NATURAL GAS PRODUCED BY 2025 OR LOWER

ROUTINE FLARING

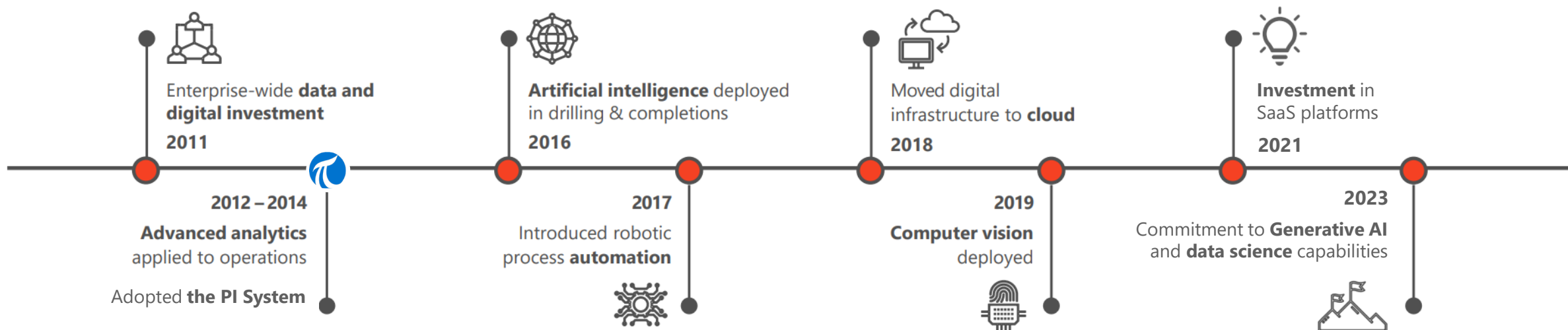
ELIMINATE AS DEFINED BY THE WORLD BANK BY 2030



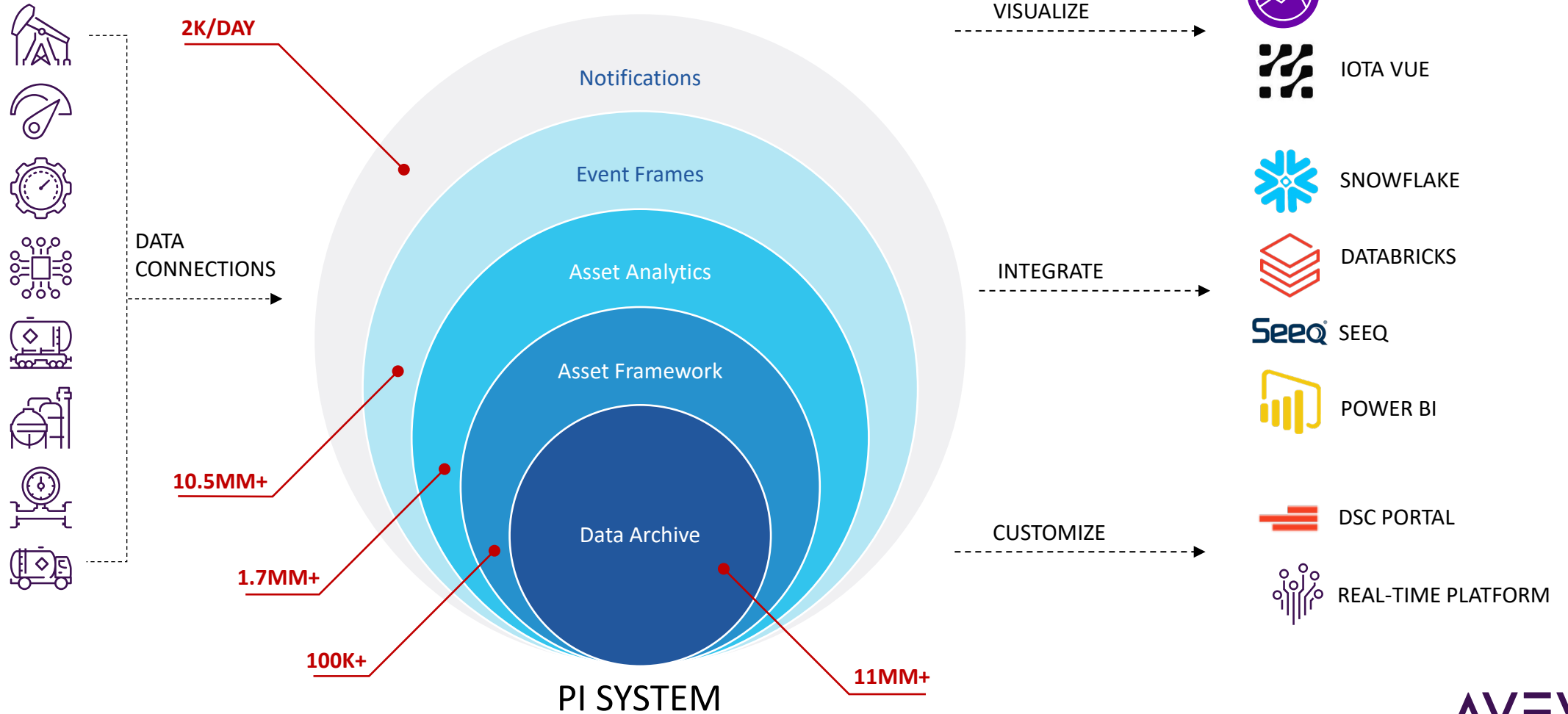
Devon Energy embraces innovation



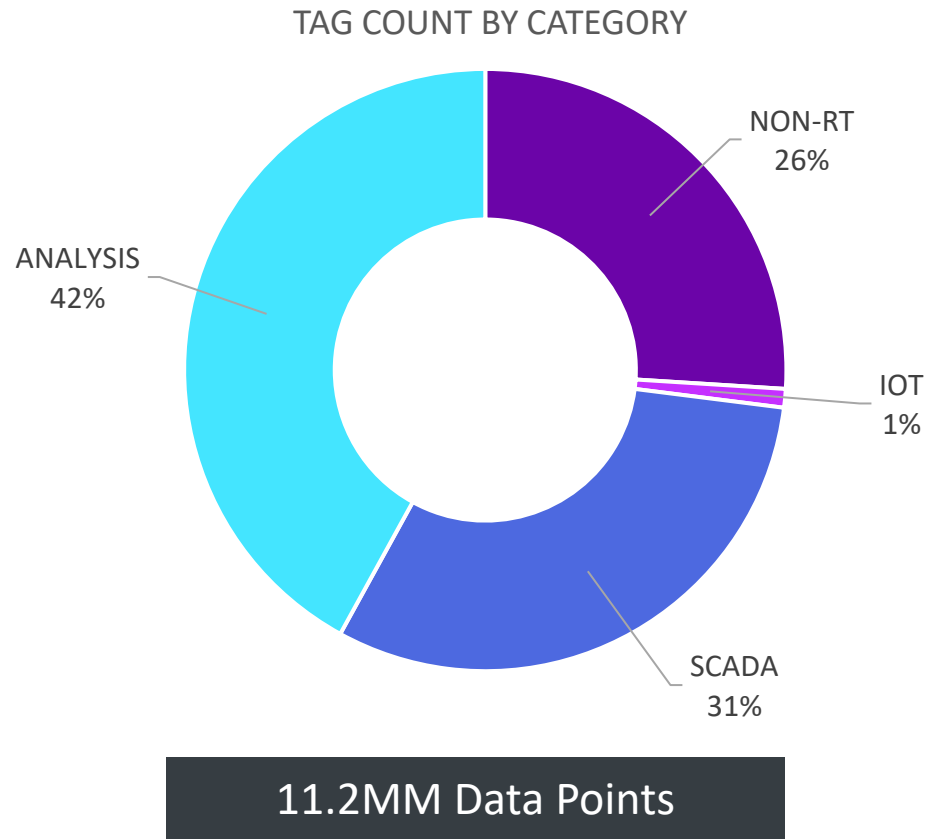
OUR TECHNOLOGY EVOLUTION



AVEVA PI System at Devon Energy



Data Driven Operations



EXECUTIVE DASHBOARDS

Operations Dashboard

Delaware North | Location Count: 413 | Well Count: 1398

Delaware South | Location Count: 322 | Well Count: 999

Inventory | Available Oil Hauls: 226 | Total Oil Tank Volume: 108,472.5 bbl

Inventory | Available Oil Hauls: 283 | Total Oil Tank Volume: 157,280.3 bbl

ENGINEERING/ANALYST DASHBOARDS

Gas Lift Detail - GEFPERT A 10H Gaslift Injection Meter 1

Description	Value	Units	Trend
Gas Rate Yesterday	1,2138		
SUR Yesterday	7.1977E+0	surface	
Oil Flow Time	243		
Oil Prod In Ratio	5.8284		

Wellbore Data

Description	Value	Units	Trend
Drilling Oil	1.893	in	
Flowline Depth	12,460	ft	
End of Tubing Depth	12,460	ft	
End of Tubing Installation	0	ft	
10 Perforated Depth	12,582	ft	
Total Gas Lift Valves	10		

Wellbore Data

Description	Value	Units	Trend
Prod Gas Yesterday	485.5	scf	
Oil Gas Volume Yesterday	602.3	scf	
Prod Fluid Yesterday	0.1	scf	
Prod Oil Yesterday	85.556	scf	
Prod Water Yesterday	0	scf	
TOW Allocated Gas Production	79.87	scf	
TOW Allocated Oil Production	35.88	scf	
TOW Allocated Water Production	0.14	scf	

Wellbore Data

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Drilling Oil	1.893	in	
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Control Output 37.6 %

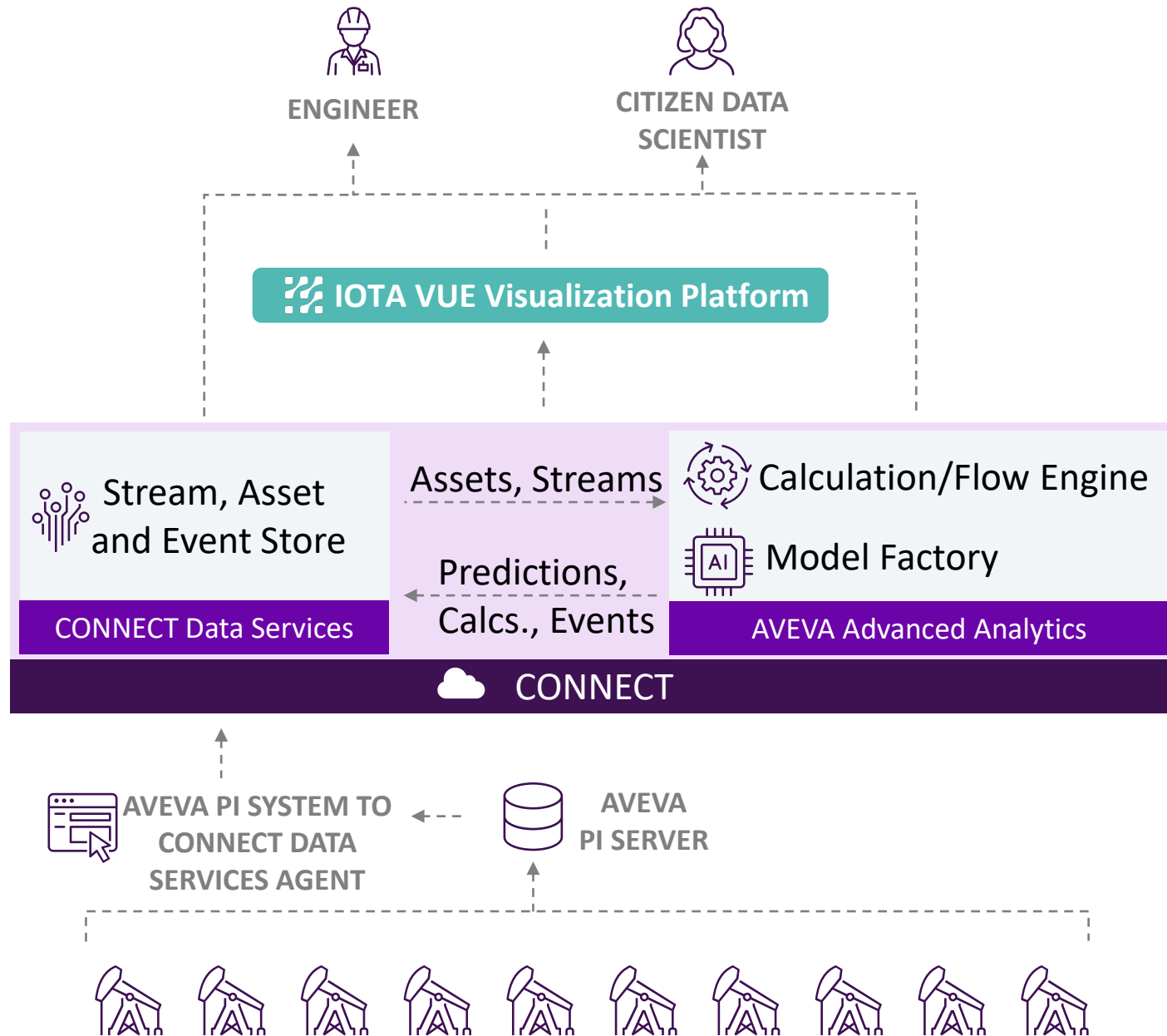
Alarm Event Thermal Treatment Encountered



Data Driven Engineering



CONNECT



Devon Energy proactively identifies gas compression performance issues

Challenge

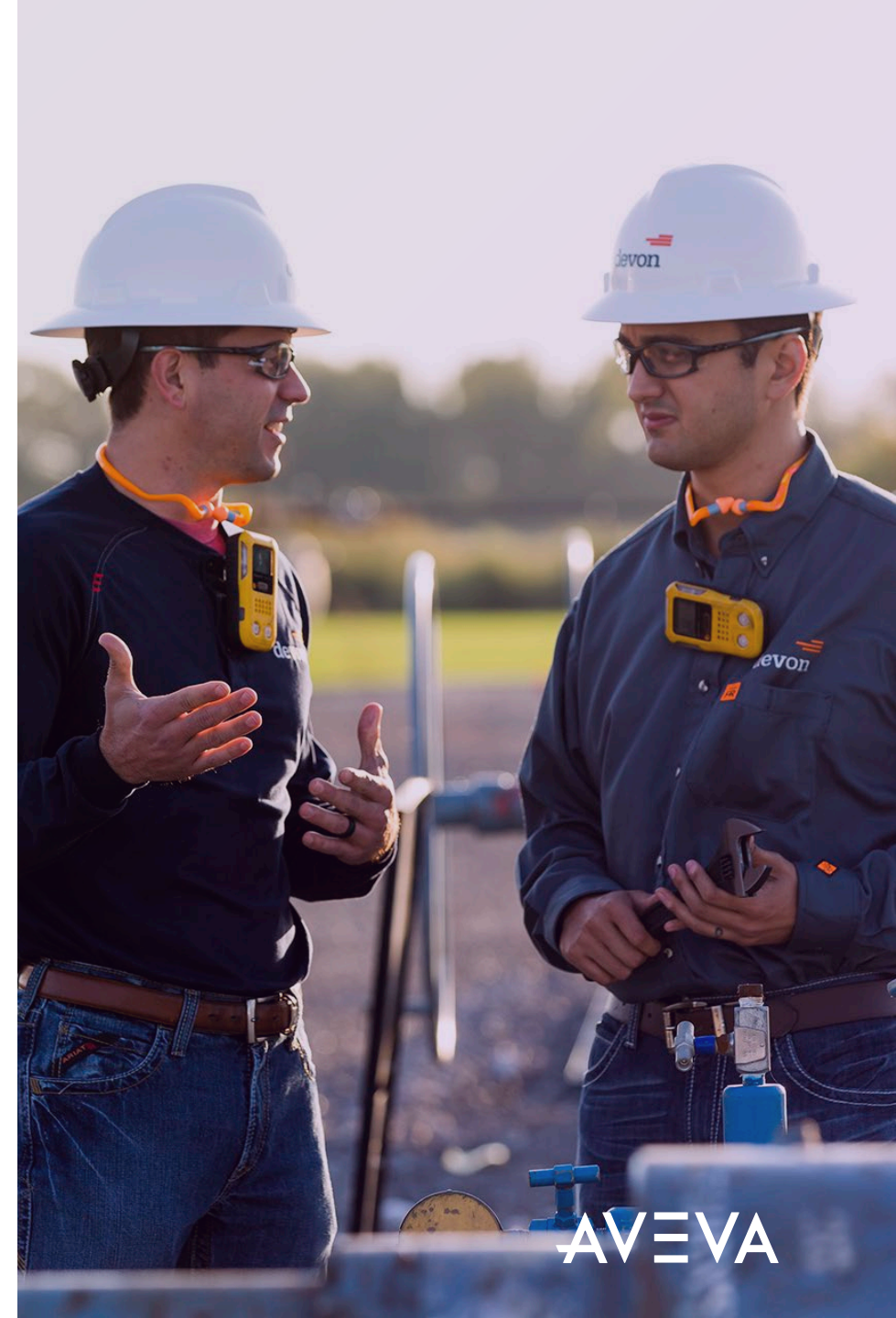
- Faulted compressors cause operational downtime and potential emissions sources
- Downtime due to faulted/inefficient compression is a **\$50MM+** opportunity
- Monitoring leased compression units is complicated – multiple portals/dashboards
- Data science and reporting for equipment requires centralized/standardized data

Solution

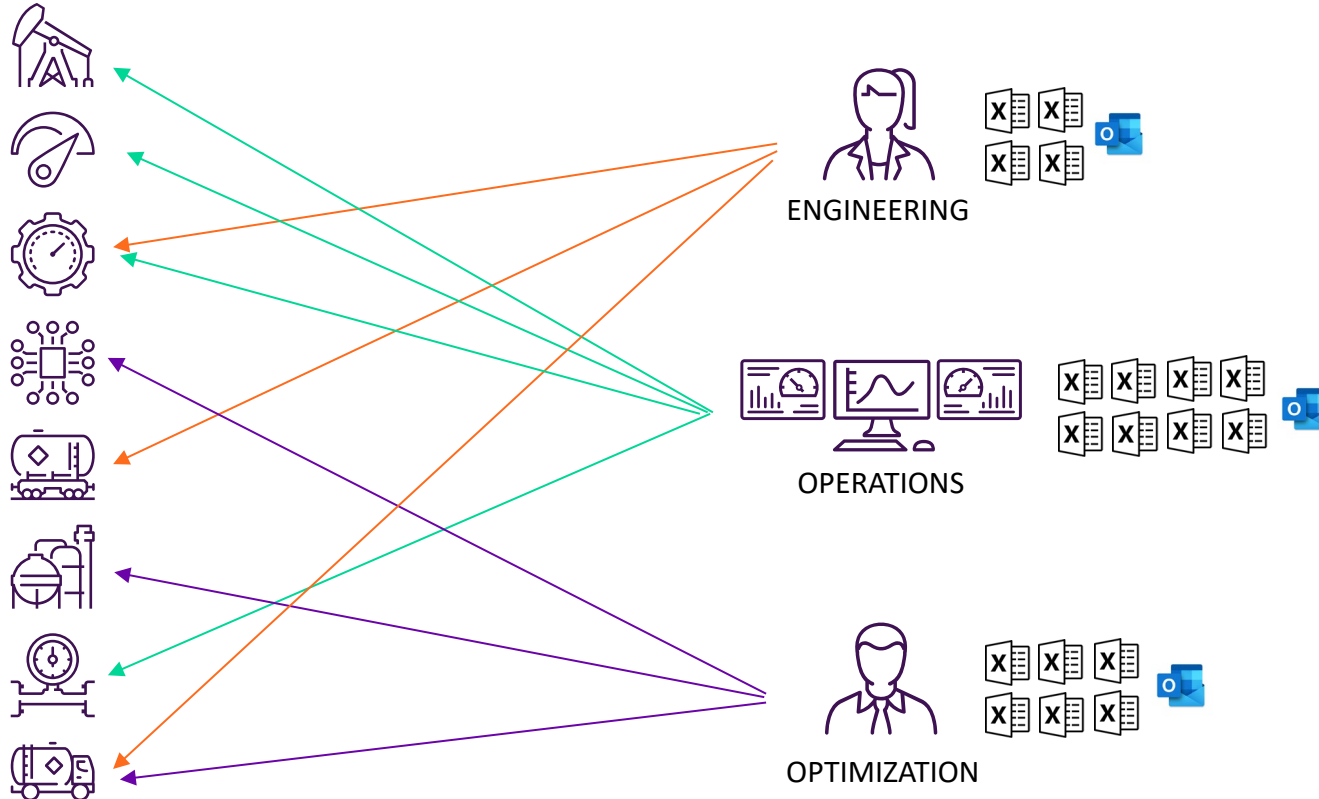
- AVEVA PI System used to centralize compression unit data from multiple vendors
- AVEVA Partner ecosystem leveraged for advanced analytics and model inference
- Integration of AVEVA PI System to Snowflake to enable reporting and data science

Results

- Compression unit data is now centralized in PI System and available in Snowflake
- Data science projects detect optimization opportunities for operations improvements
- **Operational efficiency improvement of 1% for GL assets can capture \$46MM uplift**
- **Minimize potential emissions by enhancing our assets' energy efficiency.**

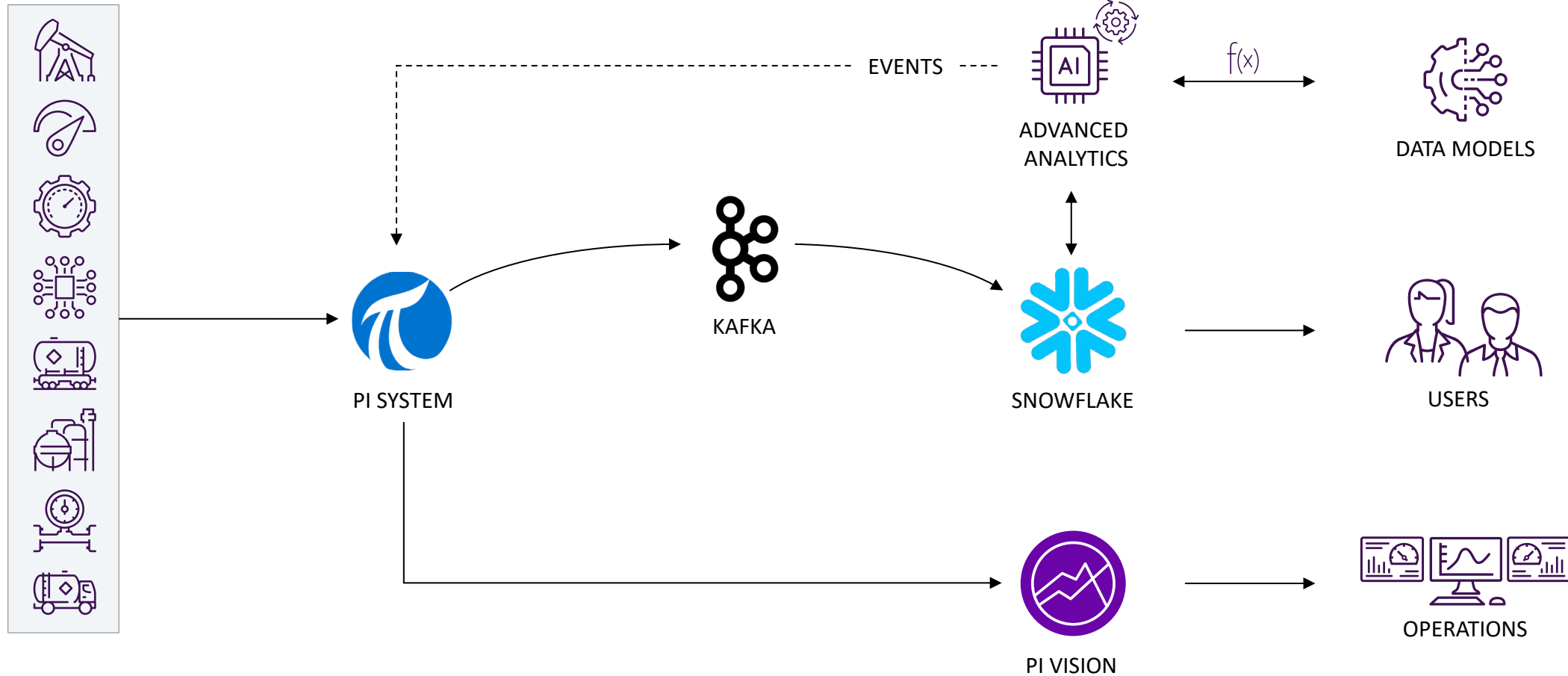


Service company dashboard overload

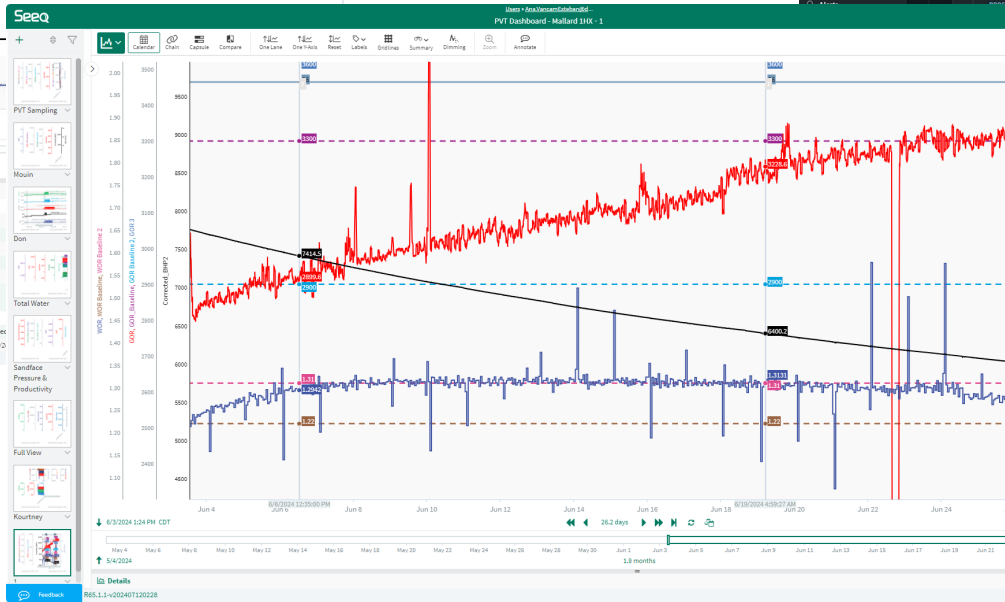


- Each service company provided a dashboard
- Each dashboard is slightly different
- Operators have to open multiple dashboards and keep track of what units are in which dashboard
- EVERYONE is working out of Excel to keep things straight

Delivering data to our business users



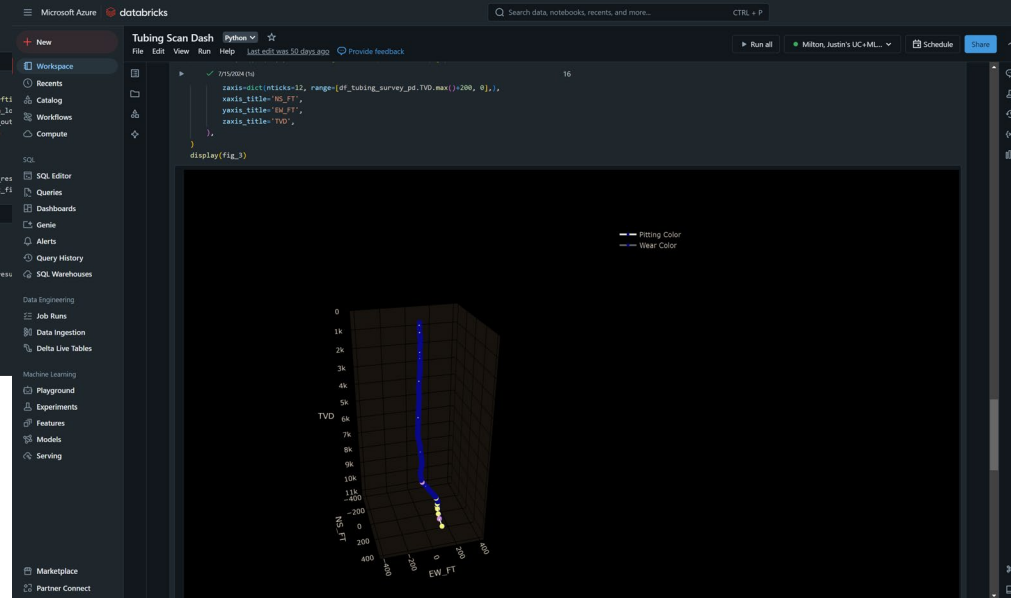
Data science for efficient compression



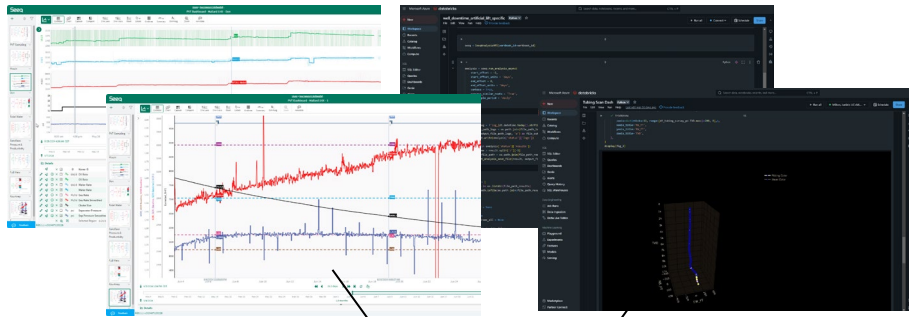
```
well_downtime_artificial_lift_specific Python
```

```
seqq = SeqqAnalysisAPI(workbook_id=workbook_id)
```

```
analysis = seqq.run_analysis_async(  
    start_offset = -3,  
    start_offset_units = 'days',  
    end_offset = 0,  
    end_offset_units = 'days',  
    verbose = True,  
    remove_sililar_roots = 'True',  
    lift_period = 'daily')
```

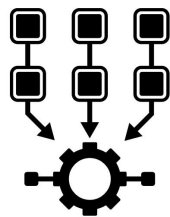


From data science to actionable insights



REAL-TIME PLATFORM EVENT ARCHITECTURE

- PI EVENT FRAMES
- SEEQ CAPSULES
- DATABRICKS OUTPUTS



2024.09.03 15:03:40	In Progress	Rod Pump Fault from PI- AF Analytics	ART-99a9f0d5-6a2f- 11ef-a85b- 000d3a6115c0	New
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“ Improving our compressor efficiency gives us *more reliable uptime* for our wells being produced on gas lift. This allows us to *maximize sustainability* and *minimize GHG emissions* by keeping wells running and reducing flaring while *using energy efficiently*.

This project helps us *minimize costs* due to fewer restarts and *improves maintenance* plans that come from greater visibility into our gas lift data. ”

Lorenzo Wilborn
Advising Production Engineer

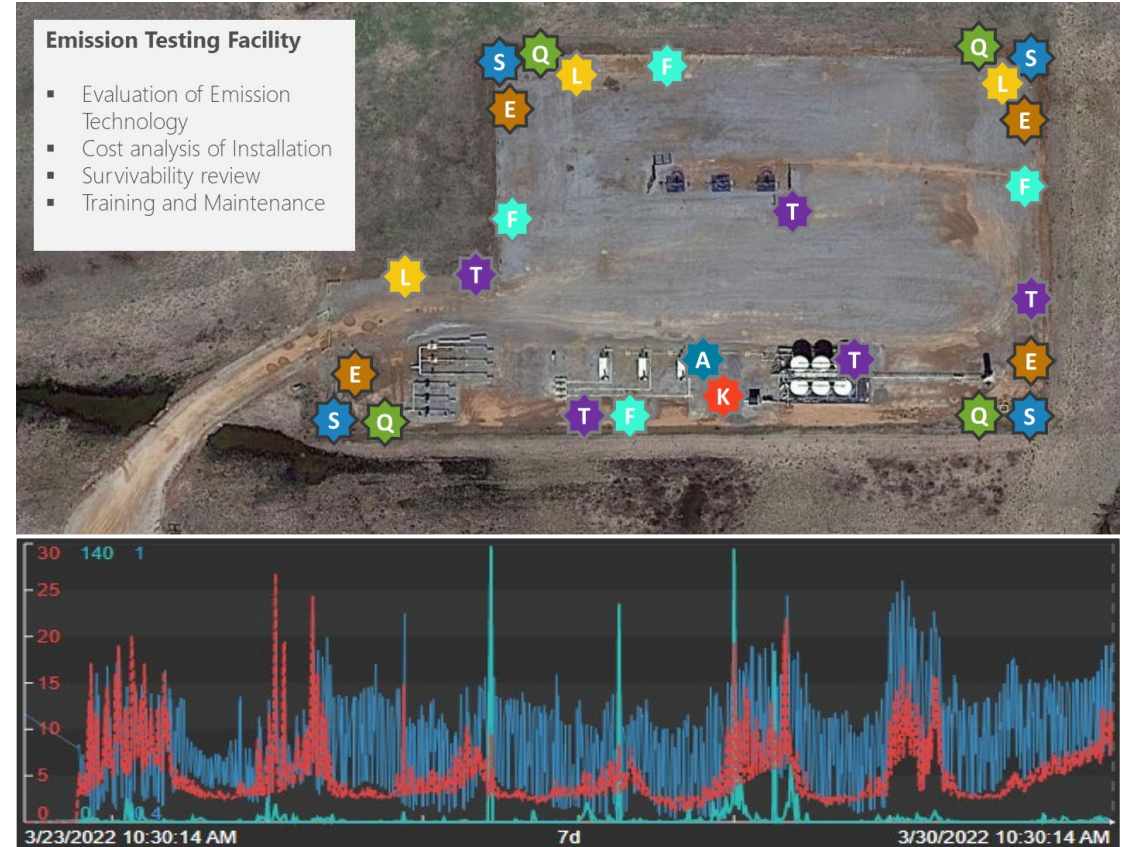
Continuous Emissions Monitoring



Using **methane detection** technology to measure and **continually improve**

What We've Learned

- New level of insight into our emissions performance
- Driving new operational efficiencies
- Emissions data in PI Vision raises awareness



Using Generative AI to further improve sustainability efforts



- In the Oil and Gas industry, **safety** and **sustainability** are intrinsically linked, each reinforcing the other in the pursuit of long-term viability and responsible operations.
- Safety in this context involves not only the physical **well-being** of employees and the **integrity** of operational processes, but also environmental protection against potential hazards such as spills and emissions.
- Preemptively identifying potential safety hazards averts environmental incidents that could degrade ecosystems and jeopardize **community trust**.



Using Generative AI to further improve sustainability efforts



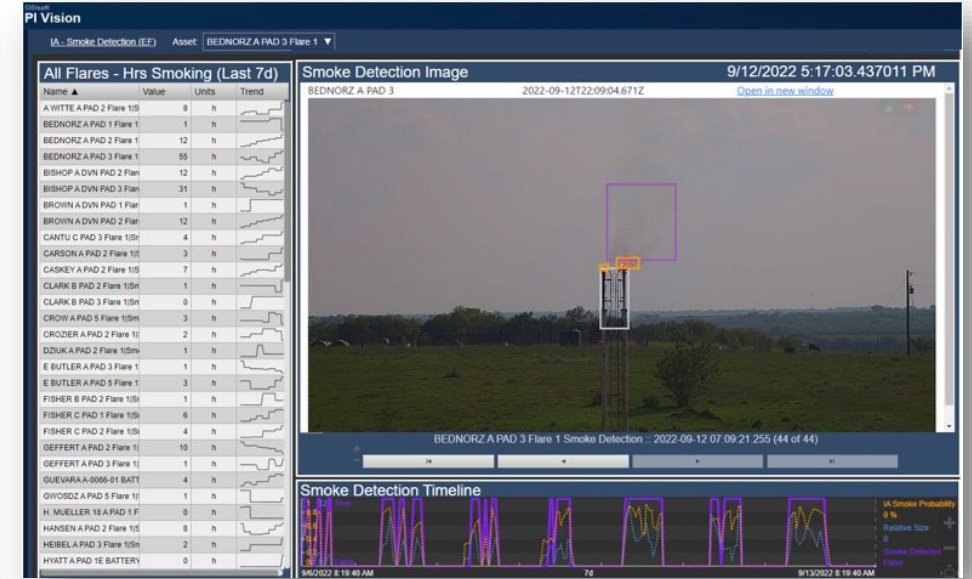
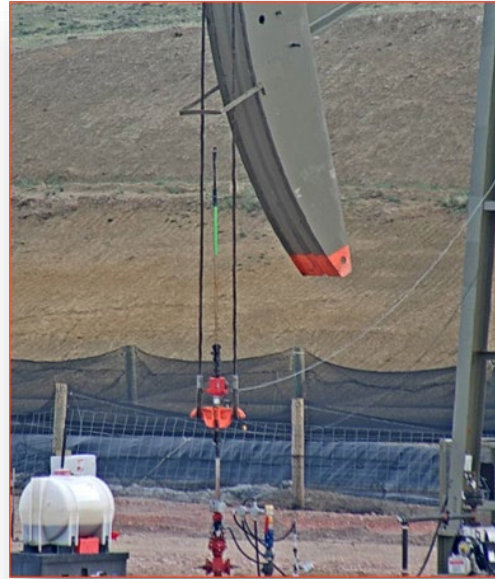
- Devon is utilizing AI to analyze and structure all historical hazards and potential future **safety** concerns, so anyone who is about to start work is prepared and well-informed, no matter the language!
- Before starting work in a new location, AI brings engineers up to speed on all prior sub-surface challenges and anything else notable, empowering them to reduce their planning phase by **90%**.



Using Generative AI to further improve sustainability efforts



- Frontier LLMs are now capable of performing **visual analysis**, work previously done by classically trained models.
- By using AI to analyze images from field cameras and drones, we're able to quickly create **actionable insights** on what matters most.



Strengthening Our Environmental Performance



COMMITTED TO **AGGRESSIVE** EMISSIONS TARGETS

- Received “Gold Standard Pathway” within the OGMP 2.0 program for our implementation plan for methane emissions reporting
- Achieved our standalone emissions reduction goal for 2023

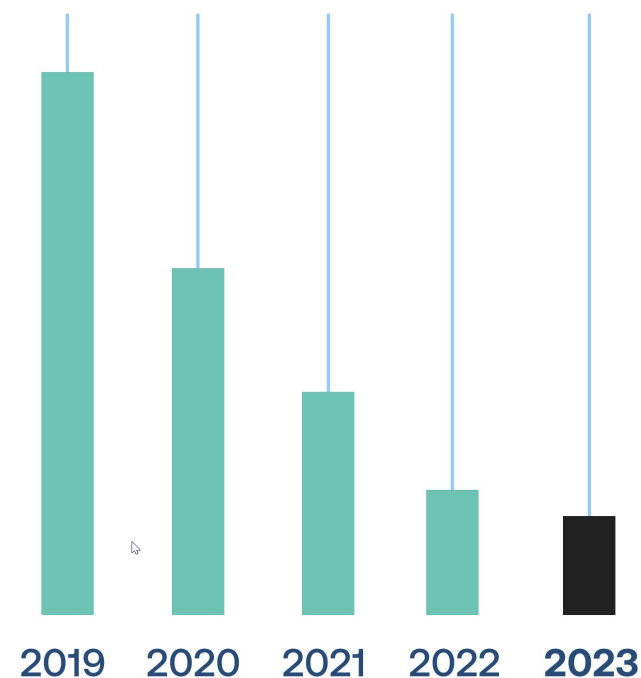
TAKING ACTION & **DELIVERING RESULTS**

- Scope 1 & 2 GHG emissions reduced by 30%⁽¹⁾
- Methane emissions were reduced 57%⁽¹⁾
- Flared volume intensity declined by 82%⁽¹⁾

FLARING INTENSITY

(% of natural gas produced)

2.2% 1.4% 0.9% 0.5% 0.4%



Since 2019
82%

Source: [Devon Energy 2024 Sustainability Report](https://devonener.gy/2024SR) - <https://devonener.gy/2024SR>
(1) Reductions against baseline metrics established in 2019 when Net Zero targets were announced



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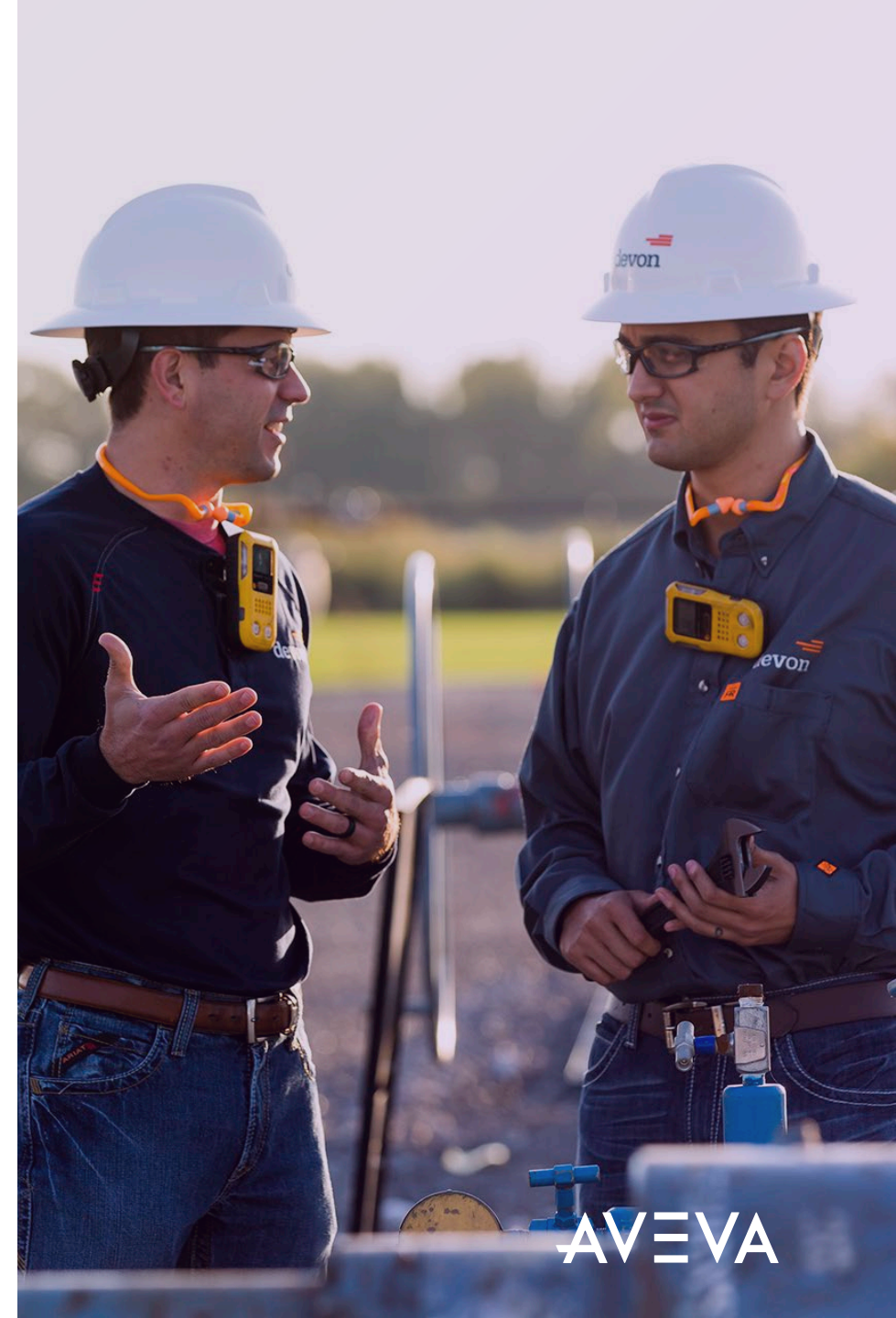
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Thank you - Let's Connect



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SPECIAL THANKS TO...

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- Craig Harclerode
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radix

- Samuel Miranda
- Nikolas Moreira
- Leonardo Fabregat

❏ IOTA

- Sasha Jones
- Alex "3D" Drozdov

AVEVA

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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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.

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