Innovarpel 2025

TECHNICAL DAYS

DIGITAL TRANSFORMATION
& INDUSTRIAL CYBERSECURITY
IN THE OIL&GAS INDUSTRY

arpel 60 YEARS

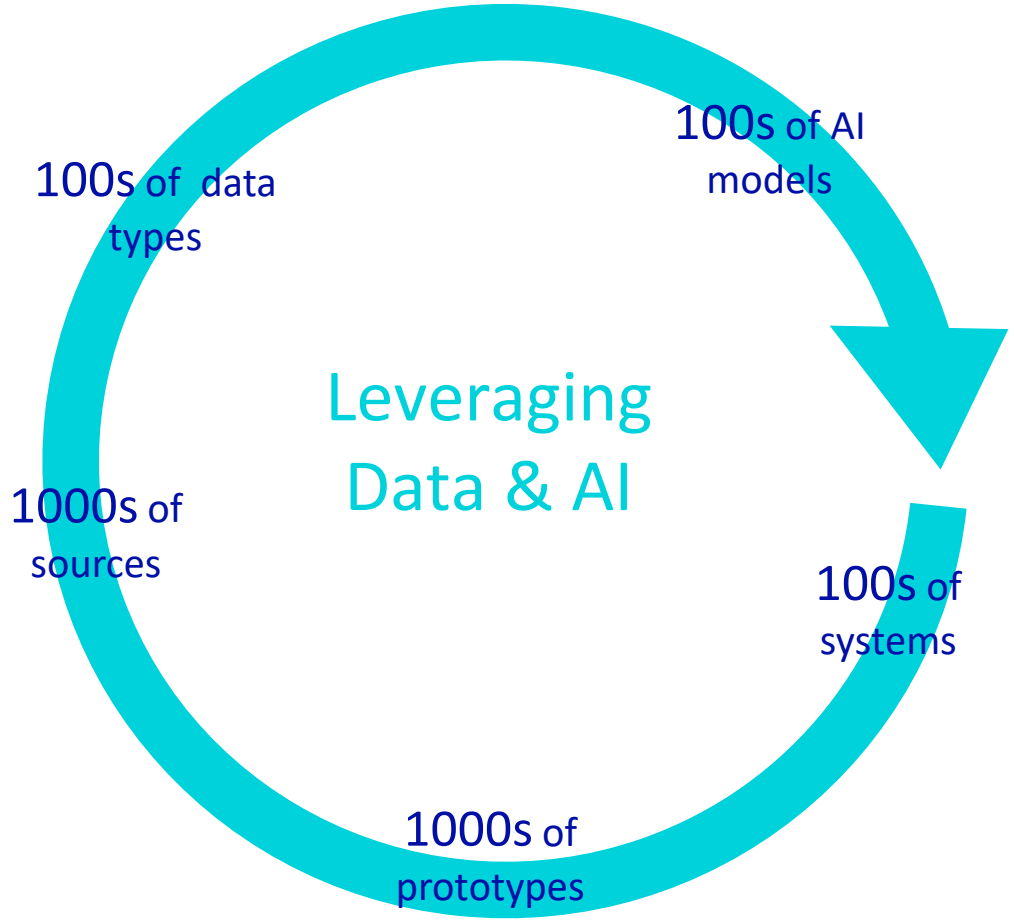
JUNE, 24 & 25
Rio de Janeiro, Brazil

# GenAI Use Cases in the E&P industry

**Giovanna Carneiro**

Rio INNOVATION FACTORI Manager

# Data & AI
# Opportunities for Energy

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# INNOVATION FACTORI

Create AI solutions together

## Customer gateway to create innovative digital solutions

### CUSTOMER CENTRICITY

**Understand client's pain points**

### FILL GAPS

**Complement portfolio**

### ACCELERATE

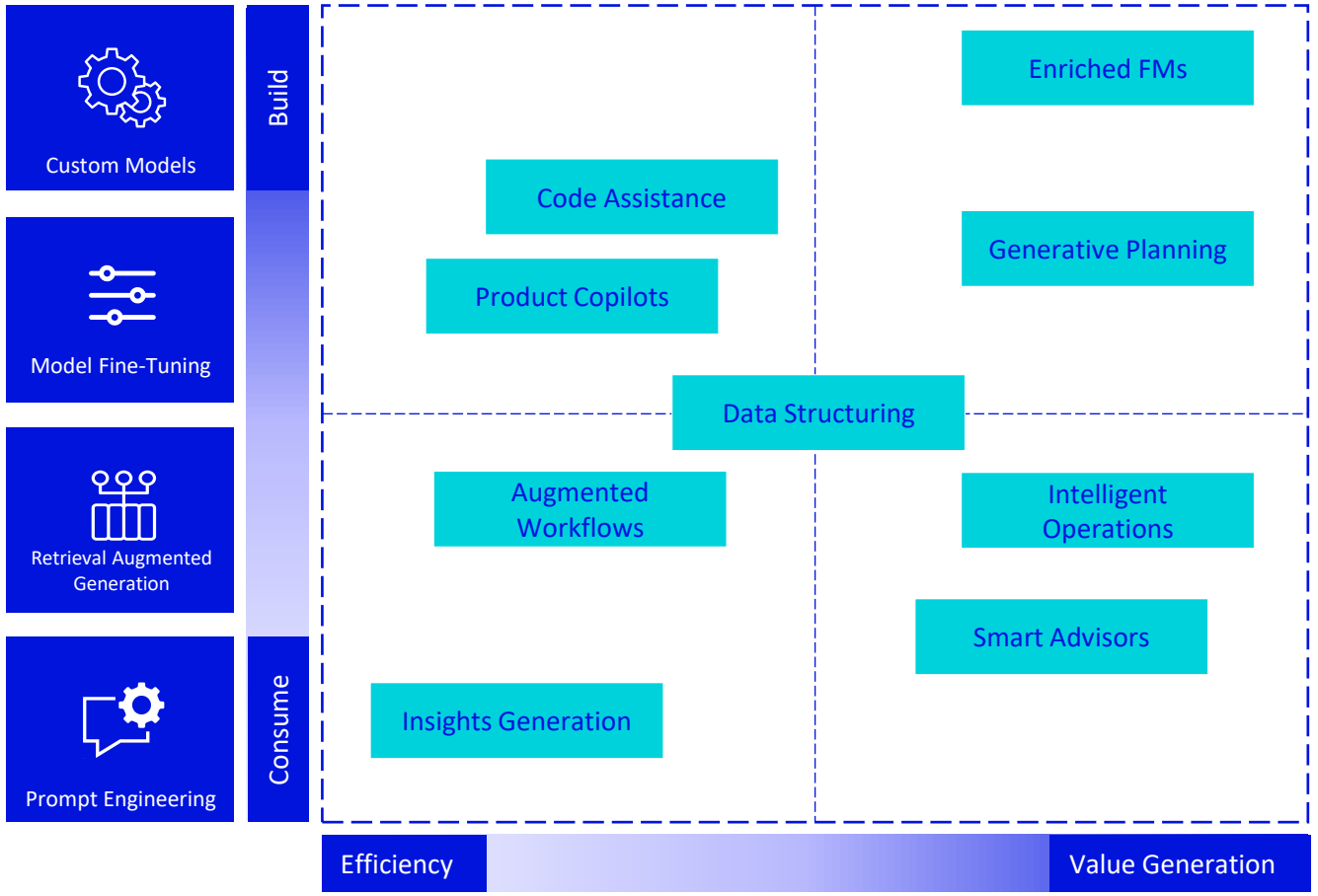
**Faster value creation**

### BOOST PERFORMANCE

**Supported by AI solutions**

# GenAI for Energy

- → **Transparent and Explainable**
- → **Sustainable**
- → **Governed and Secure**
- → **Ultimate low code/no code**



# AI Solutions

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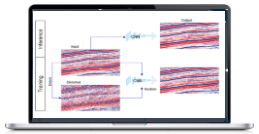
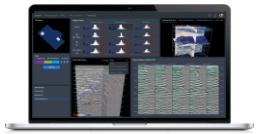
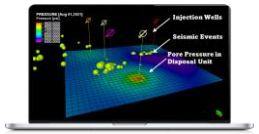
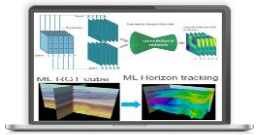
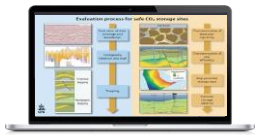
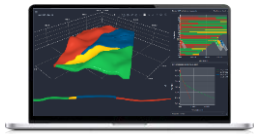
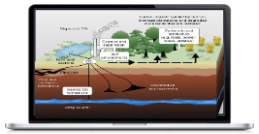
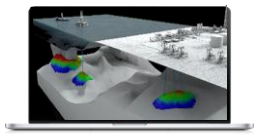
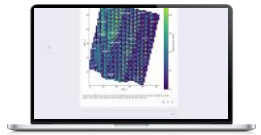
| Discovery | Planning | Development | Drilling | Production | New Energy |
|---|---|---|---|---|---|
|  ML Seismic Conditioning |  Prospect Analog Advice & Insights |  Permeability Log Estimation |  Ensemble Insights & Analytics |  Drilling Digital Geomechanics |  Autonomous Gas Lift Optimization |  Methane Monitoring & Alerting |
|  ML Seismic Stratigraphy |   Induced Seismicity From Water Disposal |  ML for Integrated Property Modelling |  AI Waterflood Insights |  Machine Learning-driven Well Placement |  Flow Estimation on Edge |  Digital Twins for CCS |
|  ML RGT Model & 3D Horizon Tracking |  Field Analog Identification |  Wellbore AI Interpretation |  Fasttrack Field Development |  AI Drilling Parameter Recommender |  ESP Optimization with Predictive AI at edge |  Exploring for CCS Prospects |
|  Machine Learning (ML) Assisted History Matching |  Planning for CCS Opportunities |  3D Visualization and Augmented Reality |  Field Development Scenario Generator |  Stuck Pipe Averter |  LNG Digital Journey |  Emission Reduction Well construction |
|  Gen AI-powered Well Report Extraction |  Geological Insights with Gen AI |  Gen AI for Field Development Planning |  Gen AI assisted model generation |  Gen AI for Operational Insights Retrieval |  Gen AI for Production Analytics |  Carbon Emission Life Cycle Analysis with Gen AI |

200+ Solutions

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ML Based Losses Severity Prediction

ESP Co-Pilot: Agentic Expert Systems

GenAI for Field Development Planning

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# ML Based Losses Severity Prediction

*"Predict severity of downhole losses in order to proactively plan mitigation measures and minimize NPT"*


Visualize & establish correlation of losses with fluid properties, curative actions, LCM formulation, etc.

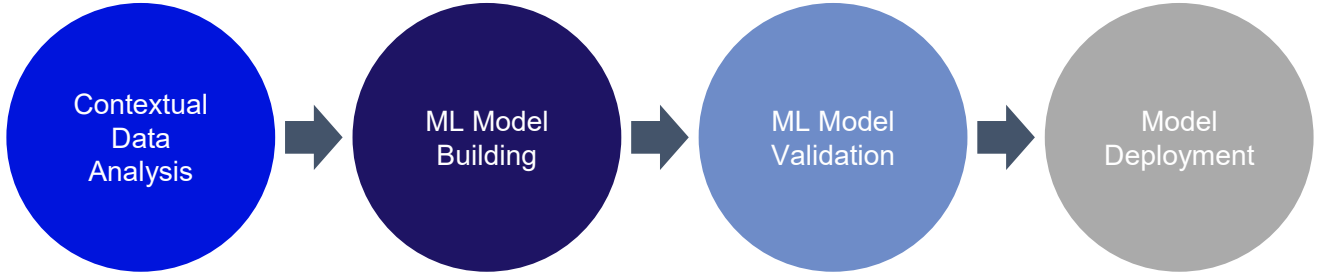
Outcomes to drive decisions

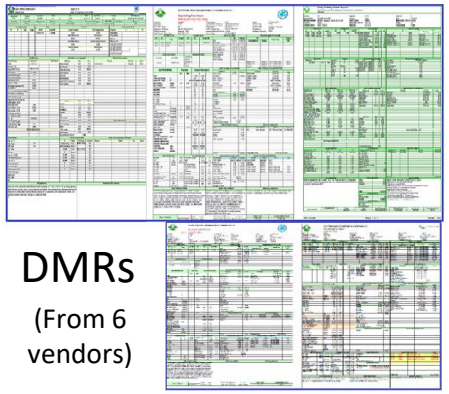
Value creation

Insights

- GenAI backed risk dashboards based on DDR & DMR event extraction
- Informed mitigation measures decision making

# Automated workflow

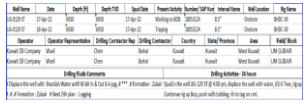


DMRs

(From 6 vendors)

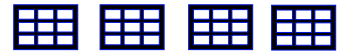
PDF to Digital (Python)



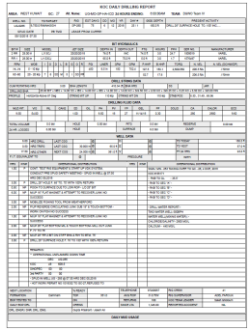
Harmonize (Manual + Python)

Splitting & merging appropriate columns

Data Modelling



Diff. data tables for diff. objects like Wells, Bit, Properties



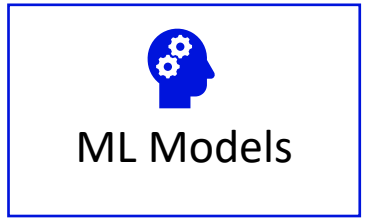
DDRs

PDF to Digital (Python)

Data Modelling

Losses Labelling

Diff. data tables for diff. objects like Wells, Bit, Operational Dist.

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ML Based Losses Severity Prediction

ESP Co-Pilot: Agentic Expert Systems

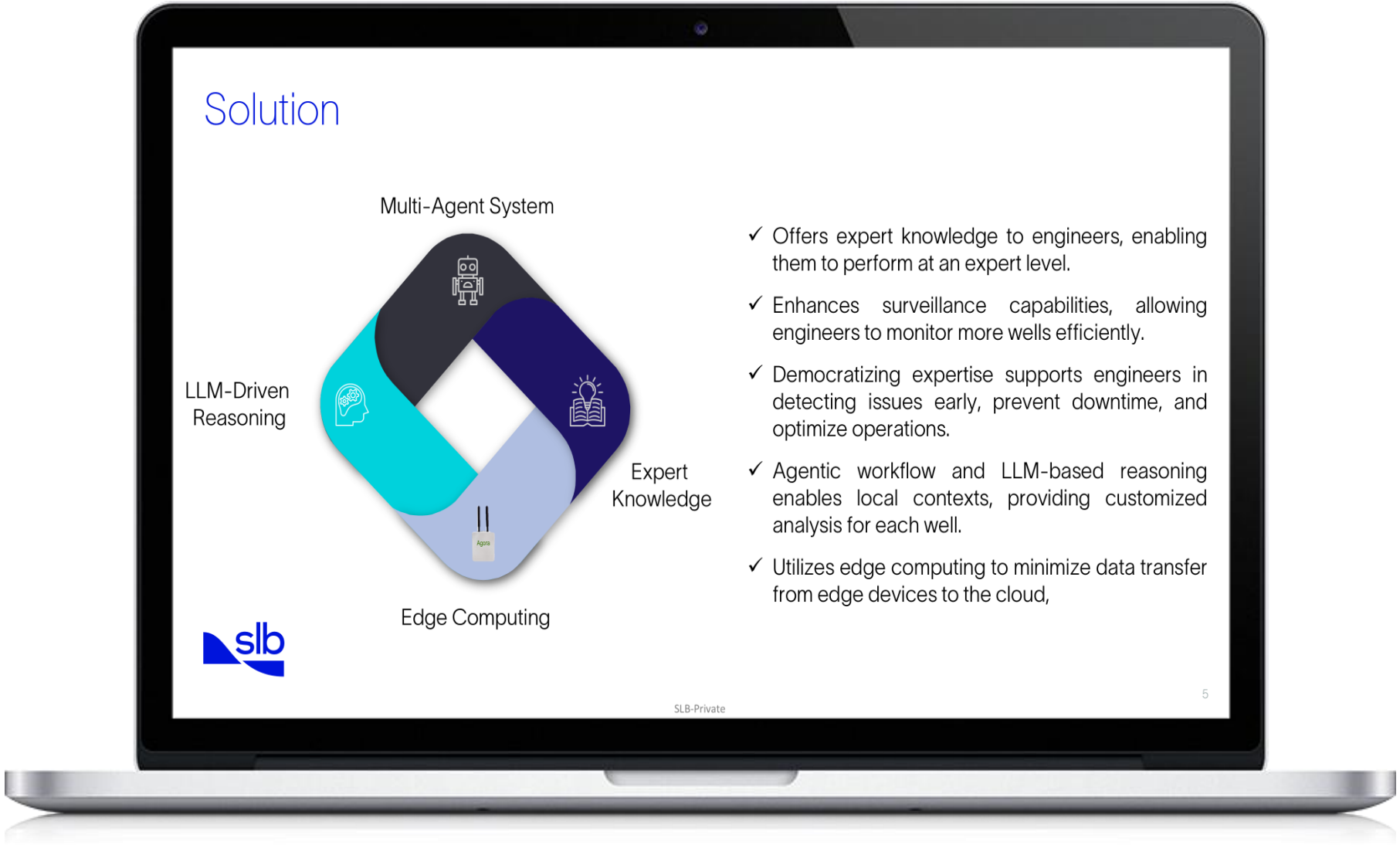
GenAI for Field Development Planning

# ESP Co-Pilot: Agentic Expert Systems

Detecting Problems Early

Preventing Downtime

Optimizing Operations



# Agentic Workflow: Analysis

Click to access the video







SLB-Private

# ESP Co-Pilot: Agentic Expert Systems

| Traditional Method | ESP Copilot: Power Analyzer |
| --- | --- |
| Engineers can monitor *10s of wells* | Engineers can monitor *100s to 1000s* of wells |
| Requires *specialized engineers* with deep training and experience to ensure expert level outcomes from the analysis | Acts as an advisor based on distilled knowledge, helping *engineers achieve expert-level outcomes* with ease |
| Depends on careful manual checks, *human errors possible* | Helps flag inconsistencies early, *supporting higher accuracy* |
| | *Handles repetitive tedious tasks*, such as generating reports, with ease, helping engineers focus on complex and strategic tasks |

*ESP Copilot (Power Analyzer) simplifies surveillance, empowering engineers to detect issues earlier, and optimize performance*

ML Based Losses Severity Prediction

ESP Co-Pilot: Agentic Expert Systems

GenAI for Field Development Planning

# GenAI for Field Development Planning

**Challenges:**

- → FDP analysis and optimization is labor-intensive and error-prone. Leads to suboptimal plans.
- → Advanced software features and scenario set up require deep expertise. Extends the FDP life cycle.
- → Poor implementation of best practices in modeling and simulation. Results in unrealistic, inaccurate models.

**Solution**

Generative AI can streamline field development planning by automating analysis, optimizing scenarios, and improving model accuracy to reduce labor, errors, and the need for deep expertise.


**Accurate and rapid FDP optimization insights**

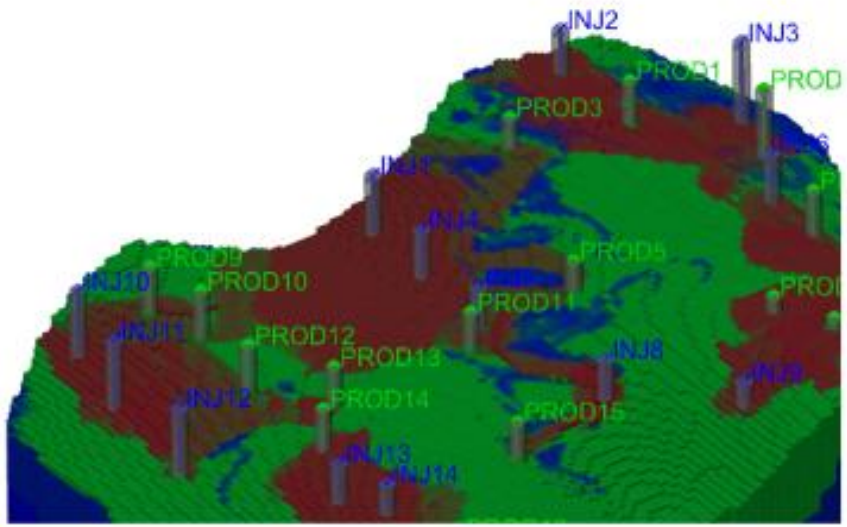
**50%**

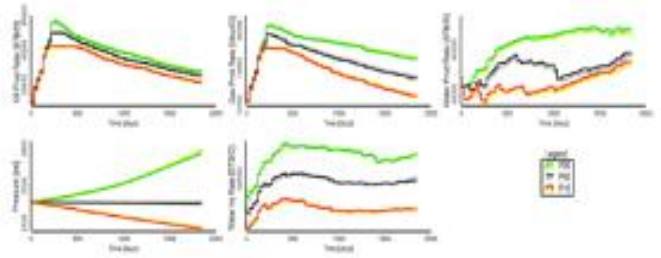
**Faster model generation to fast-track FDP**

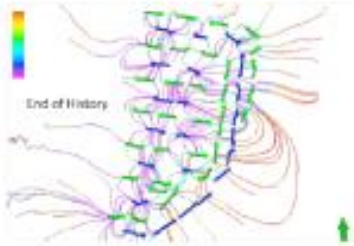
**Boost production and reduce development costs**

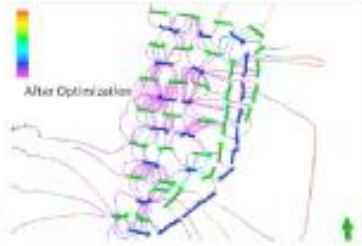
FDP analysis and optimization
is labor-intensive and error-prone.

Leads to suboptimal plans.

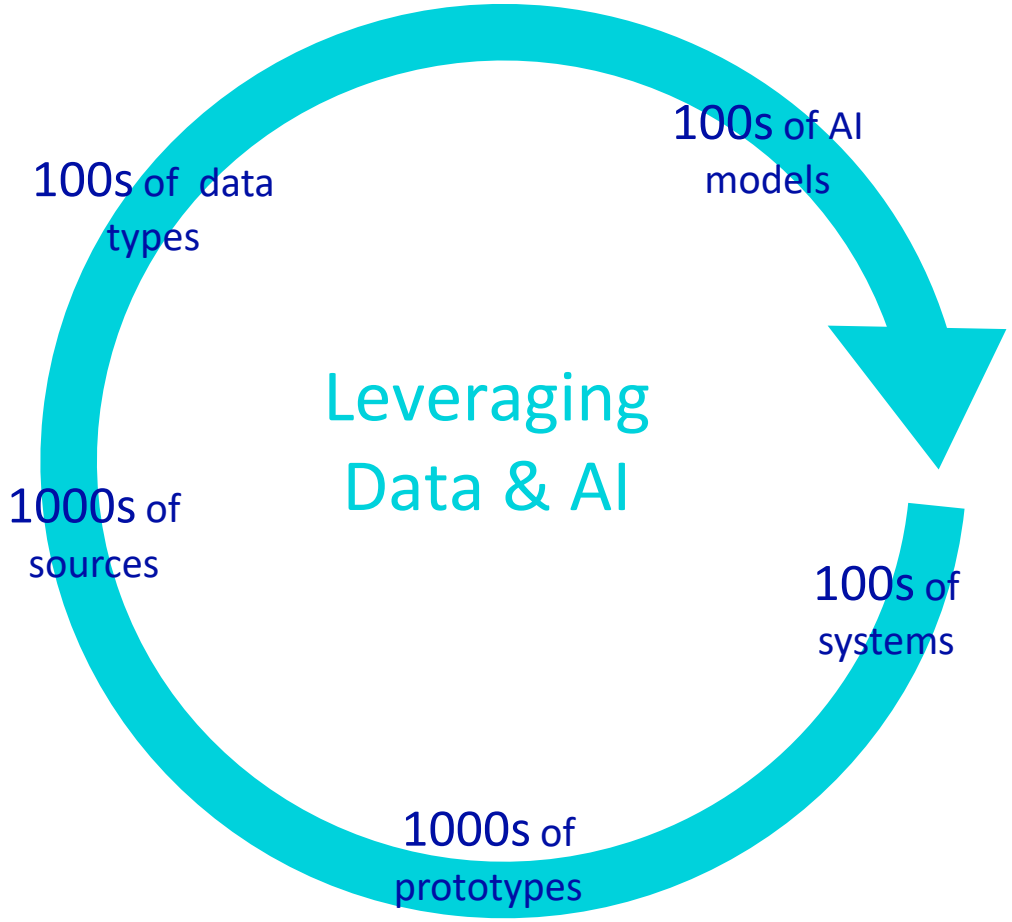


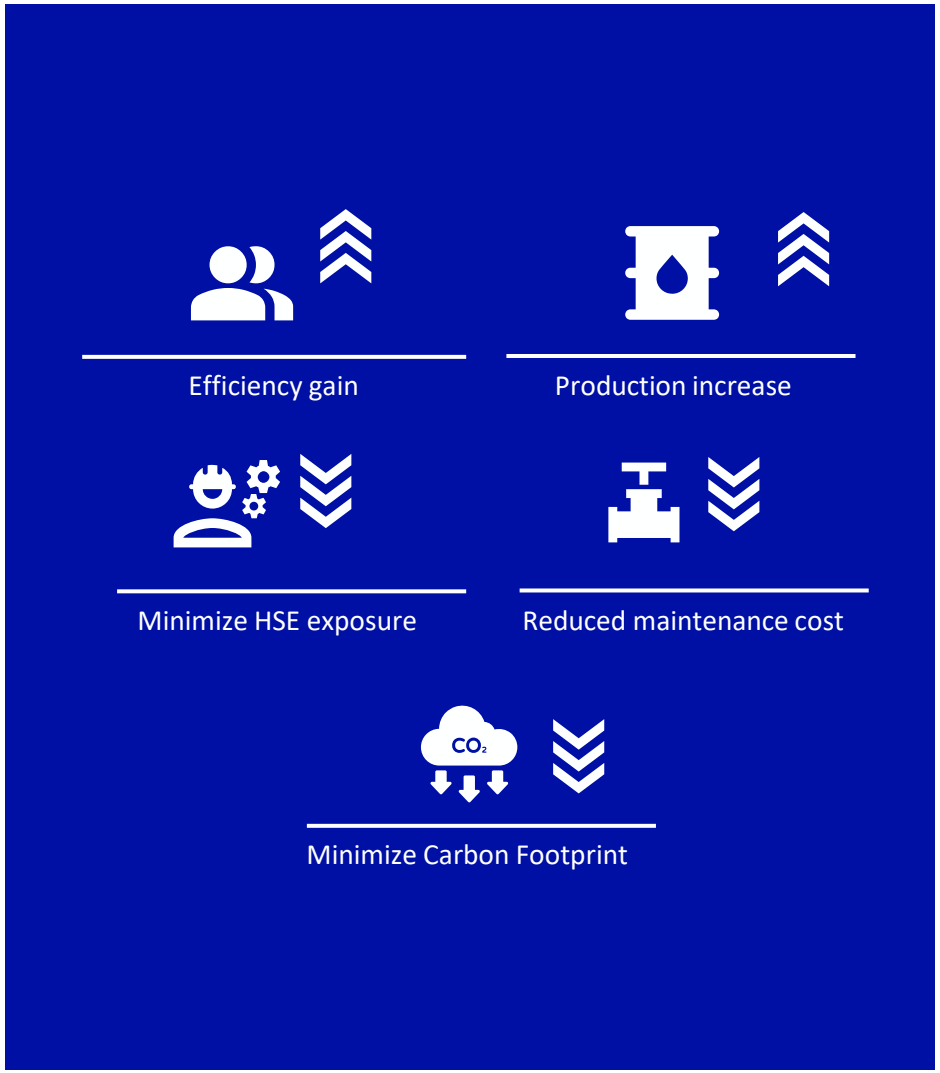





# Data & AI
# Opportunities for Energy



Obrigada!

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