Visionary power. Wherever you want.

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Advantage Digitalization

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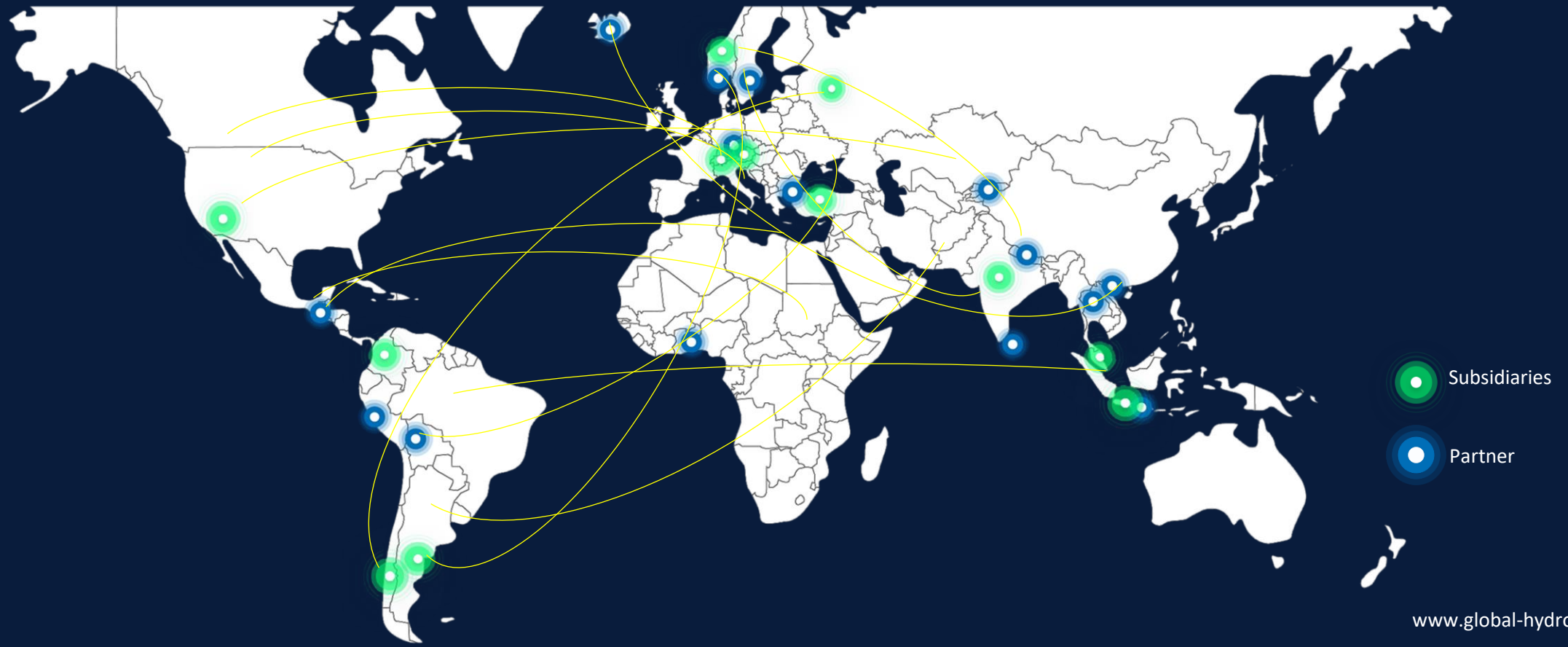
Focus on the customer

International structures for international business based on digital solutions

Digital products and services based on today's technology to ensure a smooth project execution and a high plant availability



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Digitalization meets conservative business

The development of digital technologies promises significant impacts in the (energy) industry.

Covid 19 pandemic crises was accelerating the digitalization

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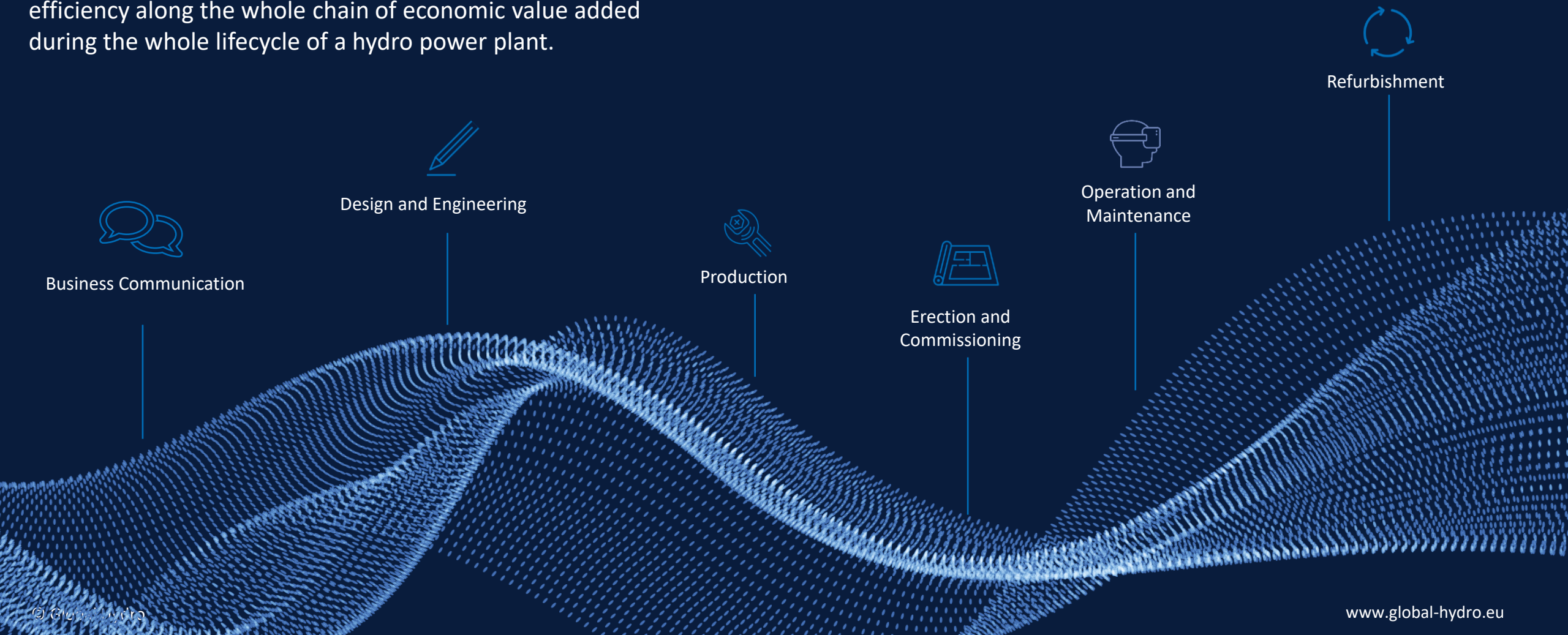
Digitalization meets conservative business

Digitization is becoming an integral part of the conservative hydro power business

The advantage of **digitalization** is the possible improve of efficiency along the whole chain of economic value added during the whole lifecycle of a hydro power plant.



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Digitalization of communication

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Global Hydro Headquarter

- Fully digitalized and automated processes
- Spread knowledge and share information
- Fully integrated ERP System
- Fully integrated software tools for the operating departments
- Virtual Meetings
- Dual commissioning’s
- Virtual FAT’s

Global Hydro worldwide subsidiaries

- Digitalized and fully automated processes
- Receive knowledge and share information
- Virtual Meetings, commissioning's and FAT’s

Customer

- Virtual customer platform
- E-Learning and training for operators
- Virtual Meetings, commissioning's and FAT’s

Power Plants

- Dual commissioning’s
- Monitoring and Operating assistance
- Digital Support Center
- Fully integrated web shop for wear parts

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Internal digitalization

getting ready for more

© Global Hydro

HEROS.

the beating heart of our customer-oriented digitalization

The future belongs to HEROS.

HEROS 1 & 2
Simple turbine governor
(Focus on the basic functions)

HEROS 3
Powerplant Management System
(Integration of all relevant systems in one system)

HEROS 4
IoT Scada System, HEROS connect
(Cloud based visualization and operation of several powerplant)

HEROS 5 (2023)
Focus on the available DATA stream of the powerplant
Machine Learning, AI
Fully integrated communication platform

© Global Hydro

Keep the overview – HEROS Connect

Poor visibility

Different control systems of different HPPs at multiple locations worldwide

→ One unified and central view consolidates all information to one dashboard

Limited mobile accessibility

Due to complex remote accessibility or lack of capability to use it on a variety of device types

→ With better mobile accessibility, operators stay up to date on performance and potential issues

Poor data storage and analysis

Different control system are currently limited in storage and scalability of collected data and analysis

→ Data collection and analysis enables to detect potential to increase the efficiency in the operation and maintenance of hydropower plants

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Keep the overview – HEROS Connect

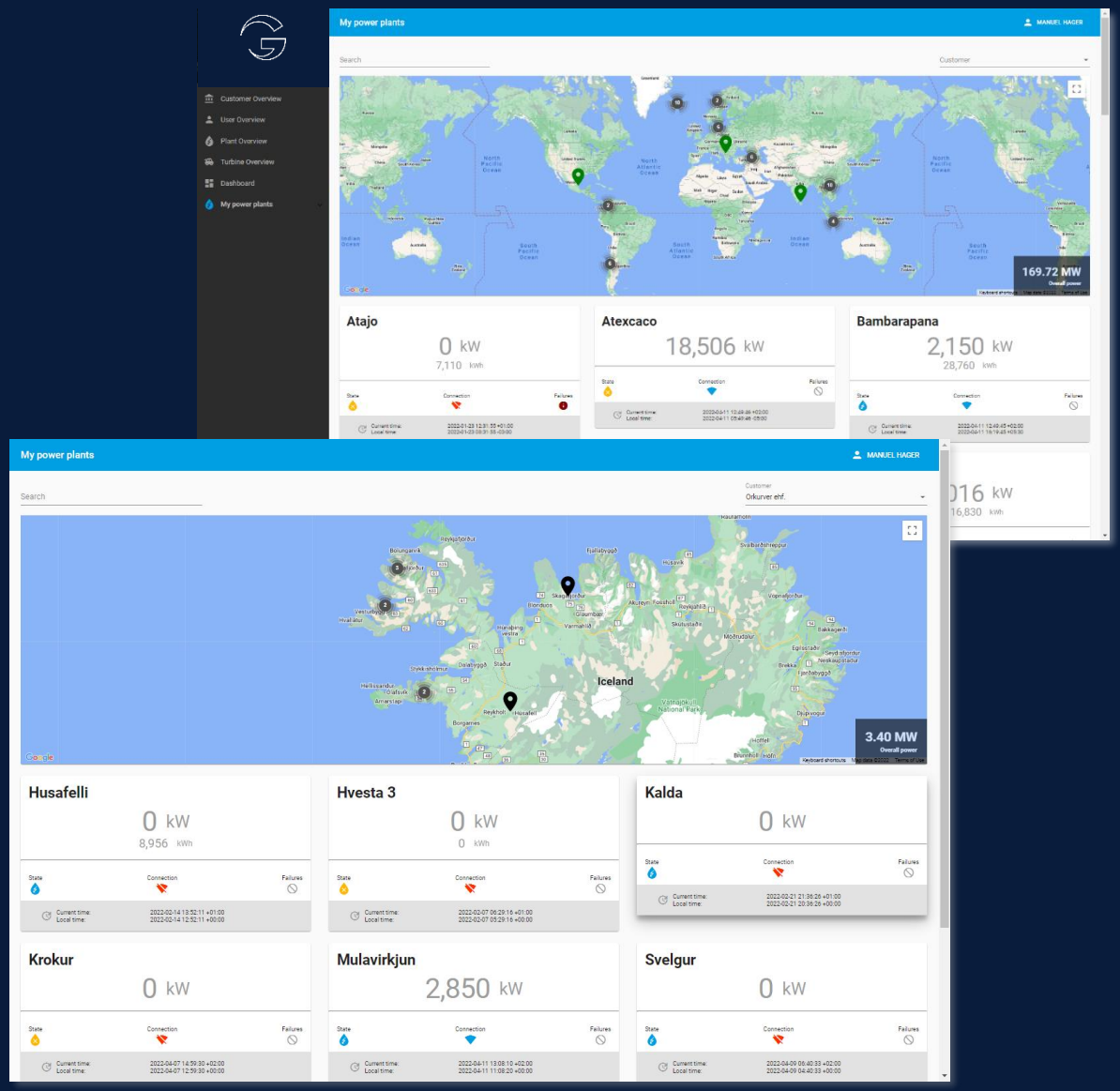
Unified and centralized view

Costumer in Island

Taking care of several HPPs

Past: Needed to connect to each HPP separately

Now: One click and overview



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Keep the overview – HEROS Connect

Unified and centralized view

HEROS Connect gives you a unified and centralized view of all your plants, simplifying analyzation and unlocking the potential to detect operational improvements.

Enables cross–comparisons between different plants and turbines

Integrates any control system, helping you control multiple plants.

Provides the same visualization for all plants, simplifying control and analyzation of data.

Eliminates the need for multiple power plant operators to establish a costly SCADA system and communication infrastructure

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Keep the overview – HEROS Connect

Unified and centralized view

HEROS Connect allows you to control all connected plants on one platform and offers personalized visualization of many different data on one dashboard

Keeps you up-to-date about connectivity, operational and failure status, and powerplant output as well as single turbine output.

Allows you customize views to fit to your needs.

Displays different current turbine values like openings, winding and bearing temperatures and control modes.

Uses advanced evaluation and analysis capabilities to provide comparisons of different kinds of measurements.

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Remote Commissioning

Professional team in headquarter and subsidiaries

Cameras
VR-glasses
Process
Digital documentation
…

Local team on site

Inspection — Dry test — Wet test — Trial operation

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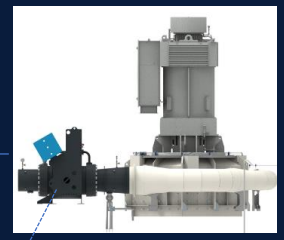
From Remote Commissioning to Dual Commissioning

Global Hydro Offices

- Lead is always in our commissioning centres
- Higher flexibility and parallel commissioning of more projects
- Improvement of documentation
- Secure same commissioning standards

Powerplant

EM equipment

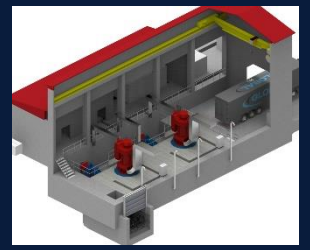


Powerplant management system

HEROS 4.0

IO Link Sensors

Powerplant facility



Local Technician guided by mixed reality

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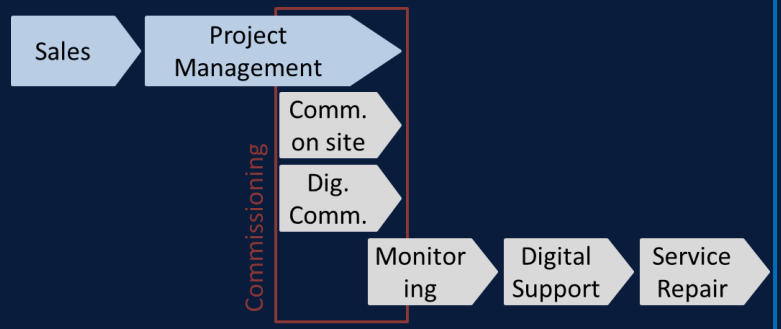
From Remote Commissioning to Dual Commissioning

Global Hydro Offices

- Defined processes with regulation which steps needs to be done in powerplant and which can be done remotely
- Documents archived centrally and retrievable
- Live status/progress overview evaluations and dashboards



Powerplant

- Increase safety and quality
- Only relevant steps are available
- Approvals for operations - interface to HEROS
- End devices independently in connection with VR/AR

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Digital Trouble Shooting & Support

- Local team or customer can be guided with VR glasses or also with mobile phone/tablets
- Communication, pictures, … are stored for each case/project on server
- Exchange of data or pictures
- Visualization of additional information on other devices

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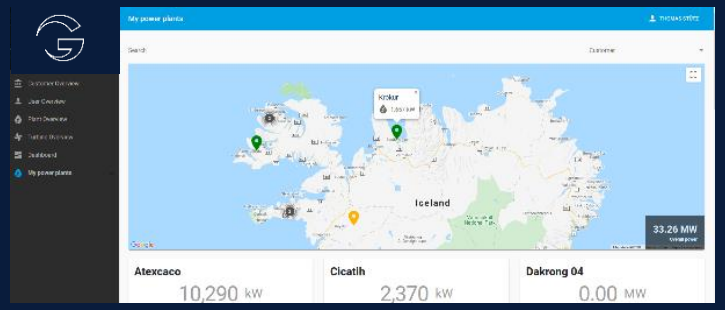
Digital Products and Services

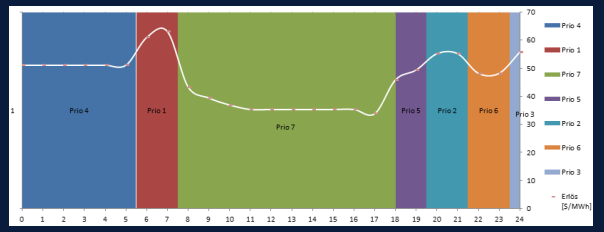
Optimize Production
- Produce power at the right time
- Optimize efficiency

Reduce Maintenance costs
- Machine Learning
- Powerplant KPI's
- Monitoring expert reports

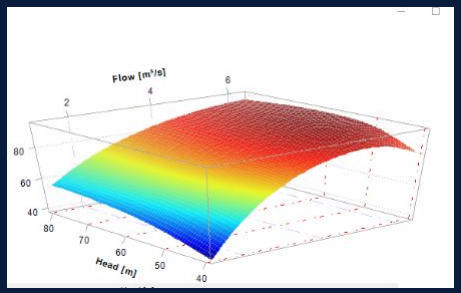
Keep an Overview on your plants
- HEROS Connect



IoT Scada system HEROS Connect

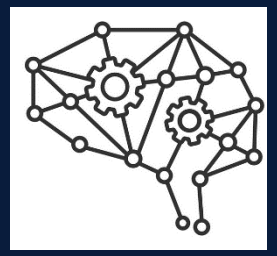


Feed in Tariff oriented control

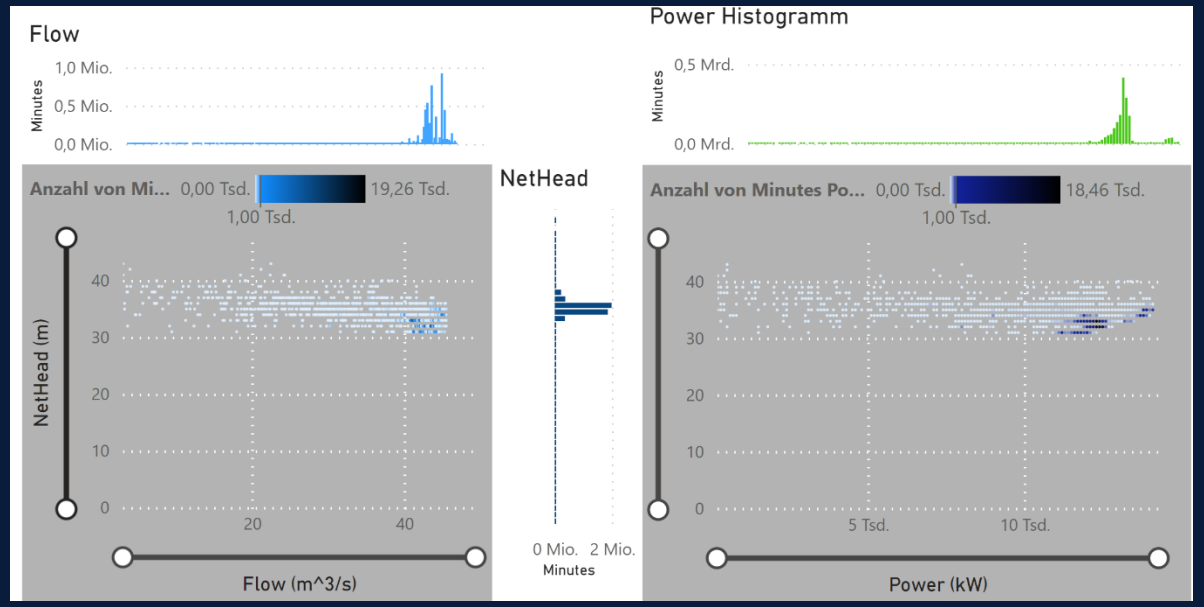


Efficiency optimized Water split up

Powerplant KPI's



Predictive Maintenance



Expert report and advises

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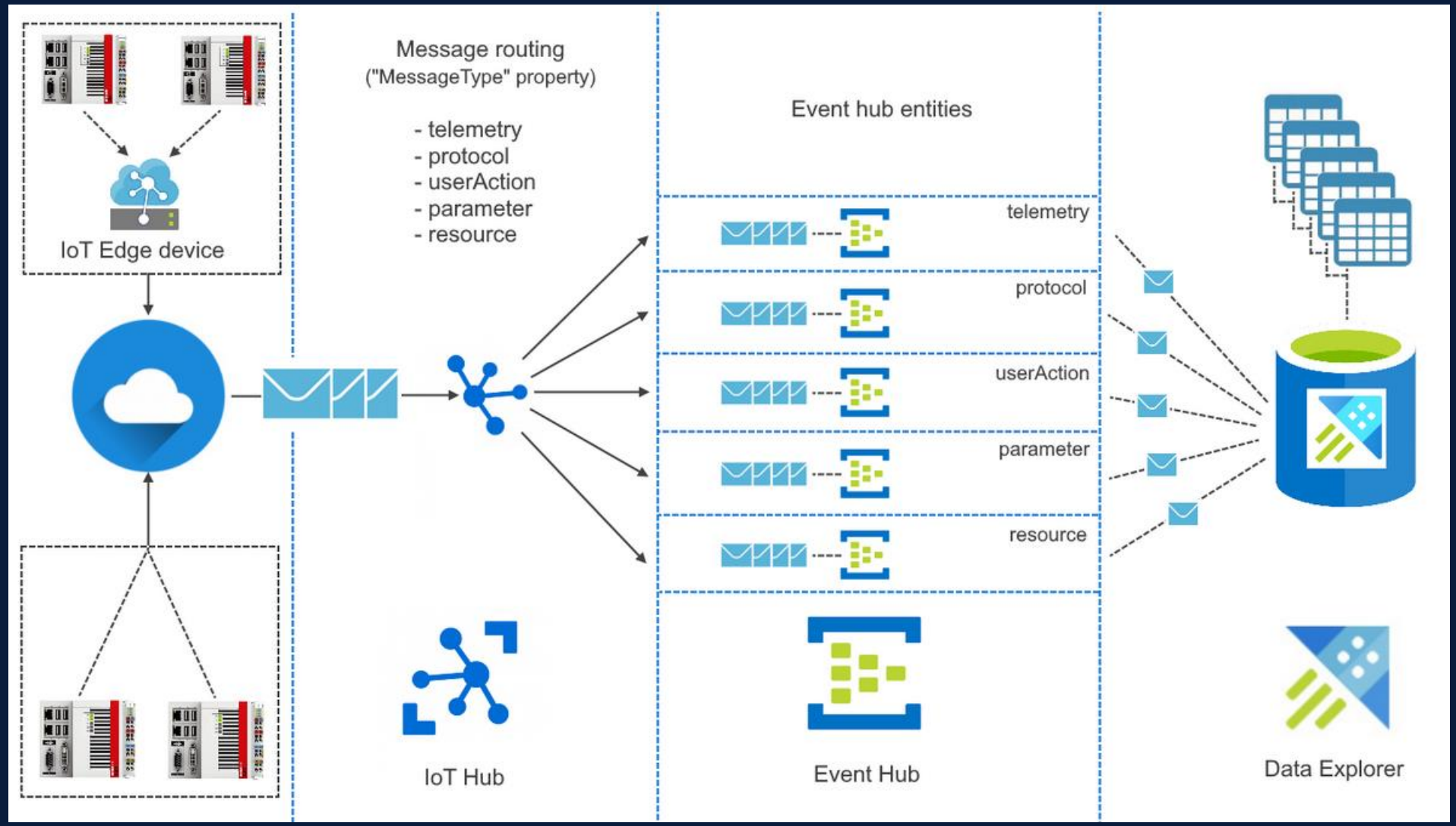
Machine Learning



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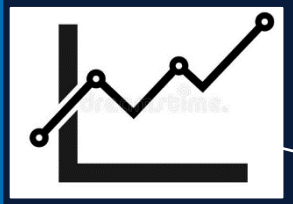
Machine Learning Use Case – Detect Abrasion



Historical data

Sensors

KPI's as basis for decision

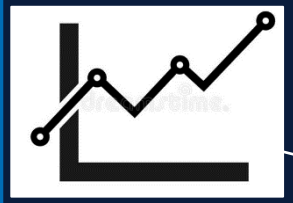
OCA expert

Recommendations

Plant Manager

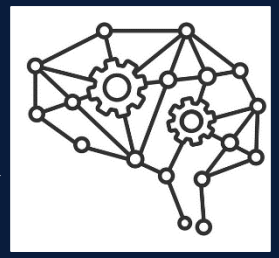
Finding the decision if the plant shall stay in operation or not

Detecting abrasion before a turbine breakdown occurs, gain time for spare part ordering and scheduling repair

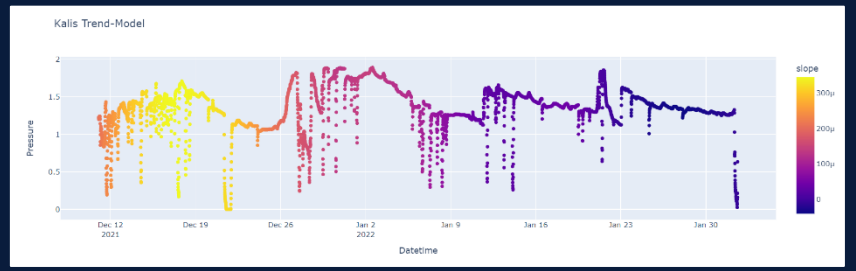


Historical data

Sensors



Machine learning Model



Machine learning Model

OCA expert

Recommendations

Plant Manager

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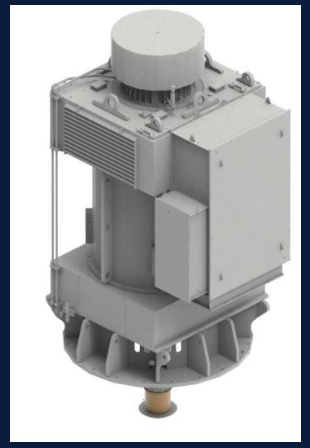
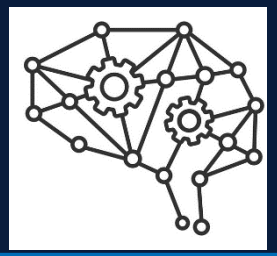
Machine Learning Use Case –Adaptive Temperature monitoring

Detection of wear; changing values?

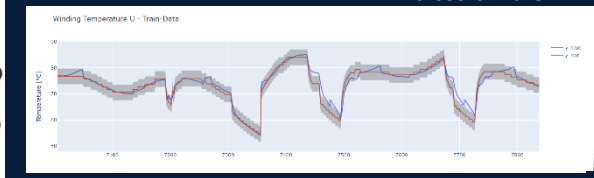
React on problems

Detect problems before they occur





Microsoft Azure



OCA expert

Recommendations

Plant Manager

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