

Our Services

Insight & Insight<sup>+</sup>



# Background to Green Highland

- Established in 2007 to utilise the technical expertise and knowledge of delivering energy projects to help unlock a new wave of hydropower projects.
- Initially developing small projects in the Highlands of Scotland, Green Highland grew into a business that can deliver at every step of a hydropower development.
- From the very first project, the Roroyere Hydro Scheme, to the River Leven Hydro Scheme, Green Highland have delivered 50 projects.
- Trusted with the operations, maintenance and management of a large portfolio of assets.
- Proud to be part of the Voith Group, a global technology company. Founded in 1867, with over 20,000 employees, sales of € 4.3 billion and locations in over 60 countries worldwide and is thus one of the larger family-owned companies in Europe.

*We are perfectly placed to take the years of experience and expertise to operate and maintain hydropower projects of every size, and at every stage, around the world.*

# Trusted Provider

## Green Highland is a trusted provider of operations, maintenance and management services

We work with a range of hydropower owners and investors to maximise the performance and return of hydropower projects. We are a trusted partner for many projects as we bring:

- Years of experience and expertise - which enables us to understand what is really happening on site and deliver real insight and value
- First-class team – we are proud to have some of the best people in the industry working for us. From the people in our control centre, collecting the data; our engineers, who are able to keep projects at optimum performance; our field engineers who are on call 24/7, to ensure the hydropower projects we manage are running as quickly as possible.
- Development of technology and infrastructure – We have been at the cutting of technology development that enables experience and knowledge to be applied, alongside the data. We believe that data without the people to understand doesn't add value and we believe people without the data are flying blind. By combing both people and data, we are able to provide you real Insight.
- Established a central control centre in Perth, Scotland and access to the remote control centre from anywhere in the world – Provides real-time monitoring, data collection and reporting and can be staffed 24/7 depending on requirements. We have VPNs and remote logins which allow all authorised persons to log in from any location. These enable remote access, which mirrors our control centre.

# Insight and Insight<sup>+</sup> Packages

## Remote monitoring, real-time data and industry experts to provide insight and value

We offer support for all maintenance, management and operations requirements. While we are able to help in every aspect of Hydropower we have streamlined our services into two packages

### Insight

Our insight package offers complete monitoring and reporting of real time data, supporting any hydropower project in the world to optimise performance, extend operating life and provide vital safety data and support.

### Insight<sup>+</sup>

Our Insight<sup>+</sup> package provides all the services of Insight but with the addition of physical support and delivery of service. This is the complete package that ensures that any hydropower project has the backing of leading experts, experience and technology.

# Insight Package

- Insight provides the data that, combined with experience and knowledge, provides true insight. Green Highland can install and integrate the INSIGHT platform into any hydropower project, small or large, anywhere in the world.
- Once installed, the team can quickly use the data to deliver safe, secure, and enhanced monitoring, analysis and optimisation for any hydropower project.
- The real benefit is that the people capturing, reading and interpreting the data are leading experts in the field who have lived and breathed hydropower projects and can see real insight in the data.



# Insight Package

## Insight provides both monitoring and maintenance data and reporting:

- Monitoring - project is connected into VHPE SCADA and monitored and checked daily. Any change in project status the control centre can contact the client or any necessary people or services to ensure status is quickly and safely returned to full operation.
- Maintenance - Maintenance plans can be uploaded onto the system so you can see if maintenance is being carried out on a live online platform. With the ability to optimise maintenance plans based on the data and knowledge of the team.



# Insight Package



- Efficient operation
- Increased availability
- Minimises downtime
- and ultimately Increased Yield

## Insight Delivers

Based on a data link to the SCADA system at the hydropower project, the control centre and reporting of on-site activities the O&M experts will perform the services:

- Live Monitoring
- Daily auditable online checks of plant status and performance
  - **Identifying trends to prevent/plan for plant failure in the future**
- Escalation and Intervention protocols + Alarm management
  - **Improving response time**
- Data logging + analysis
  - **Identifying trends to prevent/plan for plant failure and identify opportunities for optimisation**
- Ensuring the system is generating in line with design and forecast
  - **Actual v Theoretical Generation – The smaller the difference the greater the Yield**
- Monthly reports - Generation, Availability, Performance Analysis and Recommendations
- Annual Reports & Site Visit to address short, medium and long term considerations

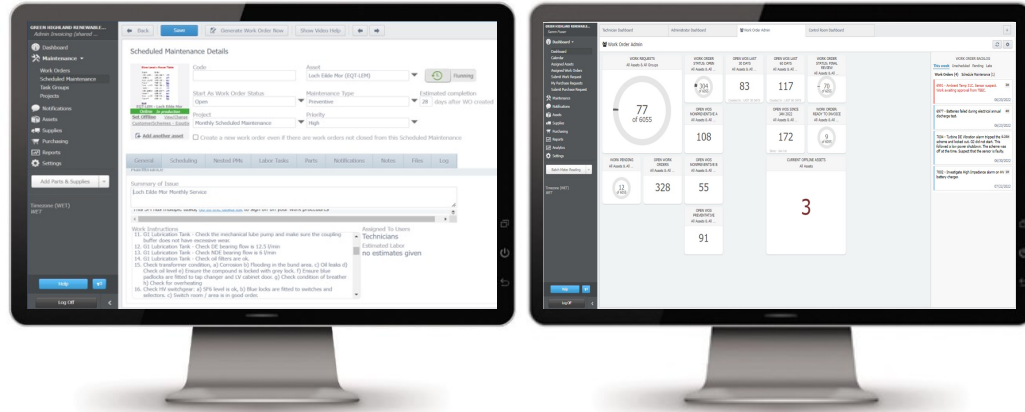
# Insight+ Package

- The Insight+ package takes all the data and knowledge gained from Insight and then adds hands-on support and physical delivery to ensure a fully optimised and high-performing hydropower project.
- Includes access to a network of in-the-field hydropower engineers and experts that can deliver 24/7 proactive measures as well as reactive (fault response) measures.
- Delivery of routine and non-routine Maintenance
- Can include in-depth performance analysis, where the team can really dig into the data to solve underlying issues and ensure improved performance



# Insight+ Package

Ensuring Maintenance is being performed effectively



- Delivers reliability
- Minimises downtime
- Increases availability



## Insight+ Delivers

Combines a monitoring and analysis system with a Maintenance Management System.

- This ensures operators can consistently deliver the recommended serving schedule with the information required to undertake the work on a compatible smartphone, tablet or laptop.
- The benefits include:
  - Having the support to know When and How to undertake servicing
  - Safety in the knowledge that maintenance data is being collected that can be audited and analysed and used proactively:
    - **Audited** to ensure compliance and high standards – **Materially helpful with warranties and Insurance events**
    - **Analysed** to identify trends to **prevent/plan for plant failure in the future**
- Keeping on top of the ongoing management of the plant - All issues that occur, however big or small, can be logged, analysed, prioritised and of course actioned.

# Green Highland and Voith

Coming together to deliver a full package of support



## Operation

- ✓ 24/7 Monitoring & Control Service
- ✓ Logging of events
- ✓ Performance analysis & support
- ✓ Coordination of routine and non routine Maintenance
- ✓ On-need checks



## Digital Power Plant

- ✓ Automation & Control System
- ✓ SCADA: Monitoring and analysis software
- ✓ Asset Management Software Package FIIX



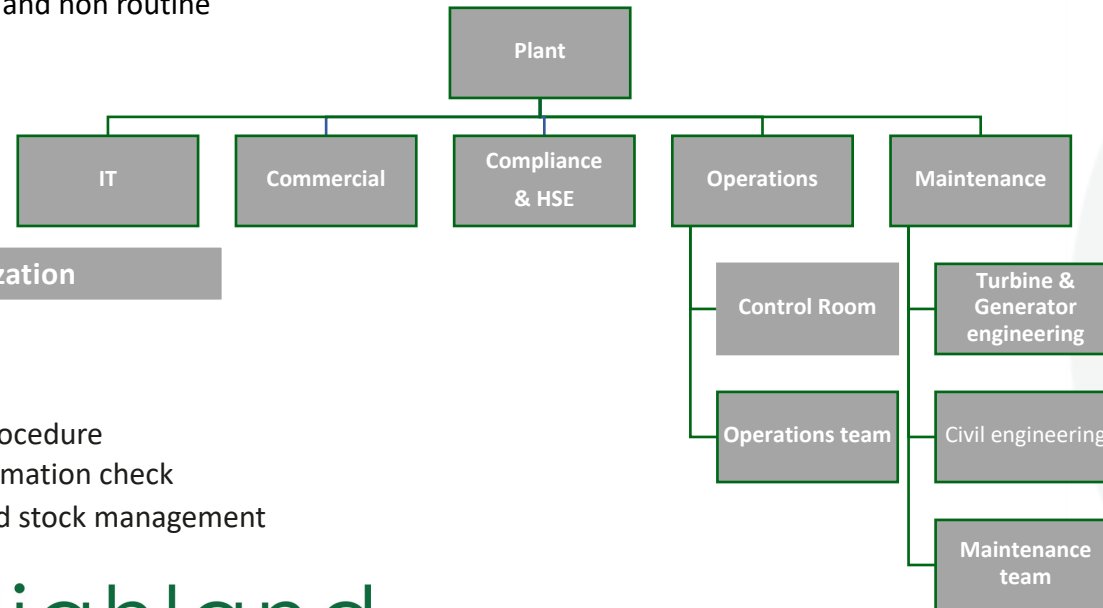
## Experts & Know-How

- ✓ Remote expert support
- ✓ Daily reporting
- ✓ Expert asset management
- ✓ Data protection



## Assessment & Optimization

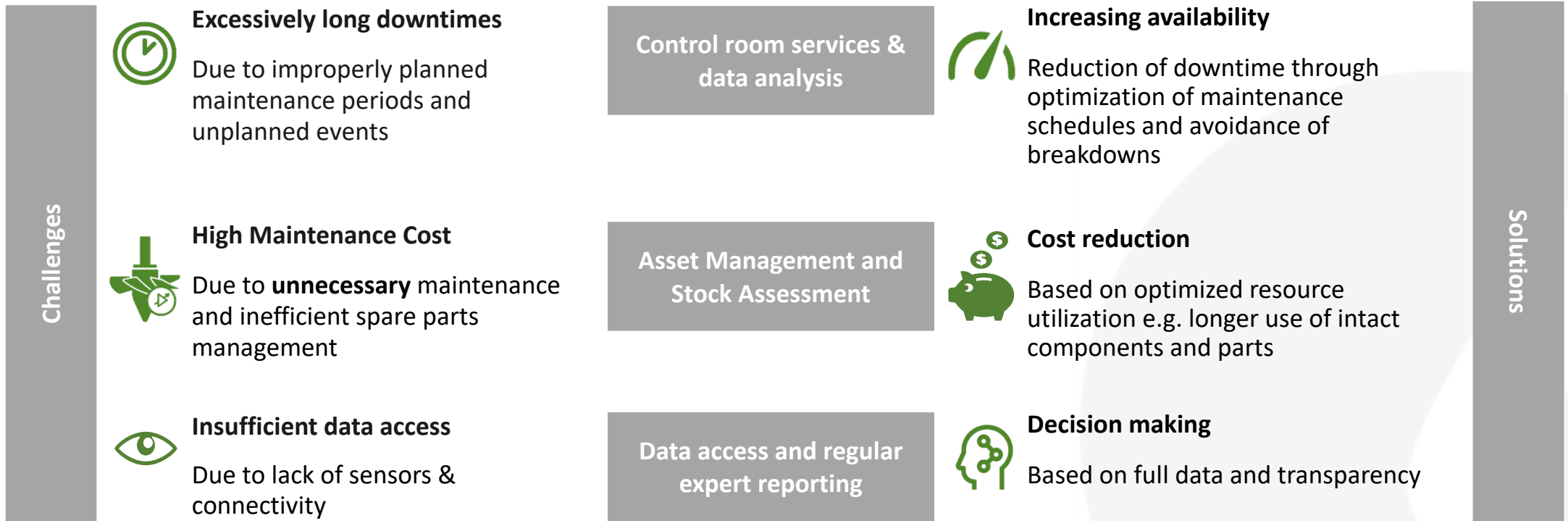
- ✓ O&M Consulting
- ✓ Remote health check
- ✓ Optimized escalation procedure
- ✓ Continuous critical information check
- ✓ On-need spare parts and stock management



## Maintenance Expert Support

- ✓ O&M Strategy development
- ✓ Schedule of reports generation
- ✓ Spare parts management
- ✓ Management inventory

# Delivering a solution to every challenge



“Data is King but experience builds *Insight*”