



# The age of renewables

With its asset base both growing and ageing, Landsvirkjun was outgrowing its existing management systems. **Unnur Thorvaldsdottir** and **Boudewijn Neijens** outline the company's next steps.

**L**andsvirkjun is Iceland's largest producer of electricity, and one of the 10 largest renewable energy companies in Europe. Our power infrastructure is ranked among the world's best and most reliable – an important competitive advantage that allows us to attract and retain industrial clients like Alcoa, Rio Tinto Alcan and others.

With 14 hydropower stations, two geothermal stations and two wind turbines, Landsvirkjun offers 100 percent renewable energy at the most competitive prices in Europe.

Of course, all of this depends on the company's ability to monitor, maintain and sustain existing assets while investing in new infrastructure to meet growth. With our oldest power station approaching 80 years of age and the rest of our power stations averaging 40 years old, we knew we needed to improve our asset management practices.

In 2012, Landsvirkjun established an Asset

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Management Group to develop both short-term (up to three-year) and long-term (up to 20-year) investment plans for equipment renewal.

Landsvirkjun had been using a computerised maintenance management system (CMMS) for operation and maintenance (O&M) planning, but we were outgrowing the homegrown system we had been relying on for short-term investment planning. With our assets ageing, we needed a more robust system to support our investment decision planning process – and a strategy to help us prioritise projects while managing risk.

The newly formed Asset Management Group

began by documenting our processes and structure – where we were versus where we wanted to be. We had been doing condition assessments on our assets but did not have any health index scores for their general condition. We needed a common working process to capture investment data, evaluate projects and document our decisions, but knew it would be a challenge to get buy-in from multiple stakeholders across the organisation and get everyone working toward the same goal.

Above all else, we knew we could no longer continue to invest in an internal system that was providing us with neither the visibility we needed to manage the risks of our critical assets, nor the ability to define and select measures to mitigate those risks. All of these factors combined led us to seek out external Asset Investment Planning and Management (AIPM) experts Copperleaf Technologies to guide us through the exercise and keep us on track.

It began with a workshop in 2012 where Copperleaf evaluated the company's current asset investment planning processes and mapped out where they wanted to go in the future. After taking some time to analyse the outcomes from those discussions, we decided to move forward with Copperleaf's C55 AIPM solution and created a plan to implement the system in two phases.

- **Phase 1:** replace the legacy in-house project tracking system with the AIPM platform and establish a new process to capture consistent business case information from project to project. With a more standard means to evaluate projects in place, the company then wanted to analyse how different levels of investment would affect future risk factors. To accomplish this, we implemented C55's Investment Decision Optimisation capability to help us select the optimal set of projects based on the available budget and overall value of each project to the company.
- **Phase 2:** implement C55's Predictive Analytics to provide a long-term view of the spending required to sustain the infrastructure and assist in the strategic and long-term financial planning of the company.

With this plan in mind, Landsvirkjun brought together a team of people with extensive experience running the company's power plants. We held three workshops with representatives from finance, operations, and other departments to ensure all stakeholders had their say in defining the new processes. Copperleaf's C55 solution was installed within four months and the company has been using the system ever since.

An AIPM solution like C55 brings both tangible and intangible benefits. For Landsvirkjun, the biggest benefit is that the company now has greater oversight on all investments under consideration than ever before.

Long-term investment needs are identified on the basis of risk, age and condition. Critical risks are clearly identified so they can be mitigated before an unplanned outage occurs, and the company can see the extent to which the investment plan will address those risks.

Short-term investment need proposals are collected in a database and assembled in portfolios which are then optimised based on risk assessments, the objectives of the company and the budgetary and resource constraints at any given time. Project owners can easily present their budget proposals to stakeholders in a transparent and well-structured way.

**The benefits include:**

**1. Better, faster decisions.** With more complete and accurate data (all types of spend are recorded in C55 and version control issues have been eliminated), Landsvirkjun can make better decisions on how to control spend for the entire Energy Division. The ability to compare different investment scenarios enables us to do sensitivity and what-if analysis easily for informed decision-making.

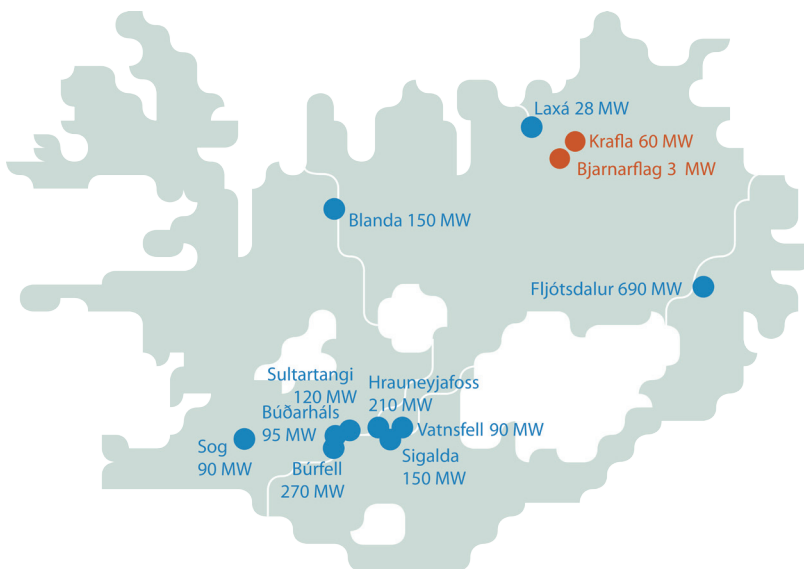
**2. Process efficiencies.** Moving from multiple spreadsheets to a single, centralised, multi-user system has enabled more interaction between departments than ever before. Having one source of the truth ensures employees are using the correct information without wasting time searching for data. The result is that our investment planning process is much more efficient and effective.

**3. Improved visibility and management of risk.** Overall, there is more risk awareness within Landsvirkjun. Documentation has improved considerably because all project owners have to provide data to support their arguments for the need and timing of each investment.

**4. Employee engagement and satisfaction.** By taking a big focus on change management and taking extra measures such as translating the system into Icelandic, the roll-out and adoption of C55 has been a success.

Preparation and change management are key to a successful implementation. It was important to get experienced consultants to help us map our processes before any decisions were made. To have someone outside our own organisation ask questions and guide us through the process mapping was extremely valuable. It helped us see where we were starting from and where we wanted to be in the future, and was a concept that worked very well for us.

It is very important to keep on developing, and continuously improve and review the processes and tools we work with.



**Figure 1: Map of Iceland showing the locations of the hydropower infrastructure**

“Quantifying the benefits in terms of hard numbers isn’t an easy task. How exactly can you measure how much risk has been avoided? What we do know is this: we’ve aligned our procedures with best practices outlined in the ISO55000 asset management standard. We now have a transparent picture of all of our major asset classes, and can compare different investment scenarios for both short-term and long-term planning to help us make the best use of our resources. Overall, it’s given us greater confidence in our decision-making and our ability to plan for the future.”

Einar Mathieson, Executive Vice President, Landsvirkjun Energy Division

## Powerful drivers for Asset Investment Planning and Management (AIPM)

Landsvirkjun’s experiences with AIPM are not unique. Some of the most commonly stated benefits include:

### Better decisions

Comparing dozens or hundreds of candidate projects and options can be daunting. Programmatic optimisation generally leads to higher value portfolios, unlocking up to 30 percent in extra value.

### Improved execution

Most plans and budgets are out of date the moment they are approved. The ability to quickly adjust project portfolios based on external or internal changes has allowed utilities to improve their overall project execution rate up to 10 percent.

### Compelling business cases

Building well documented, bottom-up, transparent investment plans improves the probability of acceptance by regulators and other stakeholders. Being able to demonstrate the cost of not investing has rewarded some utilities with budget increases in the order of 20 percent.

### Higher productivity

Much time is wasted searching for information and updating spreadsheets. Productivity gains of up to 20 percent have been reported by users of enterprise class AIPM solutions.

## About Landsvirkjun

- 1965: company established
- 16: hydro & geothermal power stations
- 13,250 GWh: electricity generation
- 1,987 MW: installed capacity
- 250: staff

## Authors’ biographies

Unnur M. Thorvaldsdottir joined Landsvirkjun in 2007. She has extensive experience in business development, quality and project management in the IT, finance and energy sectors. Unnur holds a degree in Electrical Engineering from the Royal School of Technology in Stockholm and a Master’s Degree in E-Commerce.

Boudewijn Neijens holds a degree in Mechanical Engineering from the University of Brussels, an MBA from INSEAD in France, and CMRP and CRL certifications. As Chief Marketing Officer at Copperleaf Technologies, he helps large asset-intensive corporations refine their AIPM, decision support and risk-based planning. He is the Vice-Chair of the Canadian chapter of the IAM.)

