

HOFOR's Asset Management Transformation

[HOFOR](#) is the 'Greater Copenhagen Utility', a 1200-strong organisation with responsibility for supplying power, water, wastewater, town gas, district cooling and district heating utilities, to the city of Copenhagen. They own the Amagerværket combined heat and power station situated in Copenhagen and are also building wind turbines both within and outside the city.

HOFOR is organised into seven very diverse business units, with assets ranging from thermal and wind power generation to water treatment, district heating, gas and water pipeline networks and metering. They have various regulatory environments for the different business units – some are commercially competitive (thermal and wind power generation, district cooling), others are non-profit monopoly service providers (district heating, city gas, water and wastewater).



HOFOR is Denmark's largest utility company and it is facing a number of major changes. The population is growing and there is an increasing demand for services. At the same time, the climate is changing, and regional rainfall is increasing, so there is a growing need for sustainable ways to handle extremes of rainwater and wastewater, and benefit generations to come. HOFOR is also behind the Copenhagen municipality's ambitious [plan to be a carbon-neutral country by 2025](#), including turning the City of Copenhagen into the world's first carbon-neutral supplier of energy.

Asset Management Journey

The motivation to adopt asset management usually requires a pressing business need, a regulatory or other external obligation, or a passionate senior executive 'sponsor'. *HOFOR had none of these*: it achieves good service levels, has generally benign regulators, adequate financing and a collegiate leadership group. Nevertheless, and largely owing to the insight, influencing skills and tenacity of the programme manager, Lise Tarp-Johansen, the company has adopted a major transformation programme to introduce asset management concepts and business processes,

including new competencies, culture and tools, simply *'because it is the right thing to do.'*

Today HOFOR's asset management programme is strongly supported by senior management and a growing team of fast-learning champions. Lise and her team have guided HOFOR's business units to understand and agree that asset management is the way forward. This has already resulted in new methods for decision-making, risk management, asset renewal justifications and supply chain/spares strategies.

improvement opportunity. Using structured senior management workshops, these were turned into strategic asset management objectives on a 3-year horizon.

The delivery roadmap was developed and value-prioritised, including both strategic 'enablers' and 'quick win' activities (to test and demonstrate business benefits). The chosen high-value priorities included introduction and establishment of asset risk management processes, the revision of aging assets (for renewal/life extension needs)



Lise spent 3 years investigating good asset management practices and sources of expert support before mobilising gap analysis and road mapping activity. This ensured that existing (strong) perceptions of 'everything is already OK' were not threatened, but the scope for *further improvement* was recognised and accepted. [The Woodhouse Partnership](#) (TWPL) was chosen as a strategic advisor because of their track record and style of developing a bespoke 'home-owned' approach in each case.

A diagnostic phase, using [The Institute of Asset Management's](#) (IAM) Maturity Scale and the TWPL maturity assessment process, revealed existing strengths (often overlooked in pure 'gap' analyses), and several areas of significant

and supply chain/strategic spares optimization. Second and third 'waves' were also programmed to address and improve other aspects of asset life cycle management. In each area, a pilot/design phase ensured that the new processes were HOFOR-flavoured and home-owned, prior to systematic rollout.

Overall, a strategic theme for the initiative was adopted to introduce asset management as the method of ***'delivering and demonstrating value-for-money in the management of the asset portfolio'***.

This became HOFOR's acknowledged need for change, with three clear business drivers

1. 'HOFOR has a particular obligation to demonstrate financial responsibility',
2. 'HOFOR should be better at prioritising activities' and
3. 'HOFOR should strengthen its decision making'.

Governance and Strategic Objectives

A top management Steering Committee was established, setting strategic goals for the programme and authorising the first wave of cross-disciplinary workstreams. Initial scepticism was evident about the need for such changes, but patient coaching, consultation and 'inspiration visits' to several other organisations yielded full agreement of the main Board and the business unit heads about the importance, value, resourcing and committed outcomes for the project.



The People Factor

It was recognised, from the start, that the 'people factor' was to be critical to this transformation and that it would be very crucial to awakening the minds and lightening the hearts of HOFOR. An extensive communication and education plan was initiated early on to 'prepare the ground' for the changes and cultural shifts that are needed. Many of the asset management concepts were very new to the participants, so a strategy of '*learning while doing*' was adopted, with considerable success. Both top-down and bottom-up approaches were used, with awareness, consultation, coaching and formal training sessions.

The IAM 'Big Picture' poster and video, translated into Danish, has also been very helpful. It became apparent, that it was possible to make good decisions without first starting up a data collecting project, that there are many 'tips' and methods (as part of the SALVO process) using tacit knowledge and that it adds true value to involve a cross-functional team collaborating in the search for the best solution. These types of findings are the most important for getting an acceptance and motivation for the change.

Lise was empowered to recruit a core team of 3 full time, and 20 part time 'champions' to lead and support the various workstreams. These included participants from all the business units. Each workstream also had TWPL subject matter experts to support them while designing, developing, testing and refining their solution, and planning the company-wide rollout (with adaption for Business Unit differences).

While the three initial workstreams (risk management, aging asset management, supply chain/spares management) are currently being rolled out across the whole company, next three (maintenance optimization, asset management performance monitoring and project/investment life cycle assessment/planning) are entering their 'design phase' (i.e. a task-force mobilised to develop and trial the most appropriate processes, tools, training and 'HOFOR-specific' styling).

The staff engagement in such a formal 'design phase' has ensured that there is a strong sense of ownership and commitment to the resulting processes/solutions. This is reinforced by Lise's personal style of team leadership and support – creating a multiplying effect in those engaged in developing solutions and spreading the good practices.

All the top management team are involved directly in the Steering Committee, meeting quarterly under leadership of the Technical Director. The 'Core team' (full time) and 20 part-time Champions are creating and rolling out the solutions, while all department heads, middle managers and field workforce are engaged

through the communications activities, consultation workshops and feedback sessions.

In all, over 100 persons (approximately 10 % of the total workforce) have already been directly involved in the asset management programme to date. All of HOFOR's 1200 employees have been informed on a monthly basis on the intranet about to the work in progress, cases, results and next steps. Asset management messages and updates now contribute to all the management briefing sessions. The volume of communication has led to many staff requesting to be involved more actively and to join in the asset management journey.

Asset management competency development is one of the strategic objectives for the roadmap, and a gap analysis (using a TWPL enhanced version of the IAM Competences Framework) has been used to reveal the learning needs for a cross-section of staff, including opportunities to refine job descriptions and responsibilities.

A proactive development programme is now underway, with transition to 'business as usual' incorporation within HR support (including embedding into induction processes for new staff, professional development reviews and the new Learner Management System).

The culture and behavioural change aspects were integrated into the programme from the beginning with the objective of establishing a 'how to' exemplar for other large culture change projects to come. HOFOR uses Prosci's ADKAR change management model that uses five milestones (Awareness, Desire, Knowledge, Ability and Reinforcement), in order to successful and sustainable change. Up to now, 50 persons in HOFOR have certification in this process, which supports the overall asset management transformation, as well as more discrete changes to business processes etc.

As programme lead, overseeing the development of both technical workstreams and establishment of the management system for asset management, Lise has been able to focus her team on delivering tangible improvements and benefits,

whilst also maintaining clear strategic alignment and integration. The improvements have already provided the business case for the next 'wave' of work and wider implementation of the (now proven) processes across the seven business units.

Significant Tangible Business Benefits

'Supply Chain and Critical Spares' Workstream

This stream conducted 19 criticality-targeted studies, ranging across the different business units, on both over- and understocked items. Based on the SALVO¹ process for optimal asset management decision-making, it created high level processes for:

- Establishing spares requirements,
- Strategic review of spares holding,
- Tactical review of spares holding.

In 10 of the 19 cases, some investment was proven to be justified in new/additional spares, yielding net service/risk benefits valued at **DKK 300 million NPV** for a *total* upfront investment of DKK 1 million.

The nine other cases concluded that reduced (or eliminated) stock was appropriate, represented a further net cost/risk benefit of **DKK 900,000 per year**.



¹ SALVO (Strategic Assets Lifecycle Value Optimisation) – a multi-industry collaboration to define best practices in asset management decision-making. See www.SALVOproject.org

On completion of the pilot phase, there is now an acceptance of the new methods introduced, in some cases confirming a gut feeling, in others revealing unexpected opportunities to improve costs or service levels; but in all cases establishing a new mind-set with respect to the risk implications of a good decision.

solutions, which showed a substantial saving whilst also calculating and demonstrating the true total Life Cycle Cost (LCC) of the options for water softening. But, much more importantly, the appetite for further asset management implementation was an outcome of the experience, along with a new approach for how to



Besides the big financial benefits, the stream has identified and established several situations (change in price, delivery time or supplier, change in risk profile, rebuilding of an asset or a plant etc.) and processes that will be used to trigger such studies or decisions in the future. These criteria and process ‘embedding’ activities will be rolled out from September 2018, and will make a significant change in HOFOR’s approach to managing the supply chain and spares inventory.

‘Aging Assets’ Workstream

This workstream revolutionised the way HOFOR approaches the planning of investment in aging assets. For example, HOFOR faces the challenge of whether to upgrade or replace existing water treatment systems to meet new stringent requirements for water softness. The two primary treatment works were therefore studied, using cross-functional teams and risk-based life cycle analysis. These teams were able to develop new

handle ‘intangibles’ within investment justifications. The benefit of a growing ‘pull’ for more asset management initiatives, through bottom-up motivation, reduces the need for continued management ‘push’.

So, a ‘soft’ but very real benefit from the developed business processes included the gathering and stimulation of relevant people across functions, with a common, systematic approach to resolving a complex problem and achieving a consensus. This including documenting of assumptions, sensitivities, dependencies and rationale for their conclusions in an auditable form. These benefits mean that many additional colleagues have recognised and supported the process - a prerequisite for wider, sustained success.

‘Risk Management’ Workstream

The risk team discovered many different existing approaches and maturities in risk management across HOFOR. The workstream therefore developed a common risk register template that has aligned the various business units and given HOFOR a common language and methodology in terms of risk management. This incorporates a sophisticated ruleset for combining consequence types, so that the resulting rankings directly reflect corporate strategic priorities and accountabilities.

A risk management policy was also developed and communicated HOFOR-wide. And the transition towards a consistent and proportionate treatment of different risks is underway, including the use of risk within prioritisation of work and resources across the different utilities. This also includes incorporation of such risks within the decision-making processes, and asset life cycle interventions (both Capex and Opex activities).

Culture Change

In the absence of a ‘burning platform’ or other imperative, it was important for the business unit managers to communicate that this was not a project ‘with the objective of cutting cost’ but rather that asset management enables much better identification and demonstration of *why* things are worthwhile and *when (or how much)*. In some situations, this might involve cutting cost but in others it can reveal the need to spend more. This has been demonstrated clearly in the spares cases (10 examples of increased investment, 9 where savings could be made). This was expressed in the adopted theme of the asset management project: *seeking and demonstrating best value-for-money*. This phrase has become the foundation for the growing understanding and buy-in to asset management in HOFOR. Other symptoms of the desired cultural transformation include:

- A risk- and reliability-based mindset is evident and growing.
- Knowledge sharing is improving.
- Teamwork is becoming more common, including active collaborations between

functional departments and different utilities.

- The demand for more asset management initiatives has exploded.

HOFOR anticipated some resistance when launching the programme, but the opposite has so far shown to be the case. The HOFOR Technical Director, Bjarne Korshøj, observes that asset management is a ***‘common sense initiative that is effectively engaging employees of HOFOR in a positive manner’***.

Critical to the success of the ‘technical’ workstreams, and the acceptance of the process and results, was the continuous involvement of key stakeholders. Lise and her team’s ability to manage the diverse groups (financial, technical, regulatory, operational, customer service etc), ensured good buy-in from the start and helped with acceptance of the conclusions and resulting benefits. Importantly, these stakeholders were extensively consulted in the planning process, providing expectations, concerns and priorities in a transparent way.



Validation and Robustness

[TWPL](#) provided expert subject guidance and support, and was able to challenge robustness at each stage. For example, this included developing a robust audit trail for the ‘aging assets’ workstream, from initial targeting of candidate cases and scoping criteria, through to problem definition, root cause analysis, solution options development, costs and risks estimation, business case appraisal (using asset life cycle costing and

optimisation of asset renewal timing) and the consolidation of a 50- year total investment programme with final validation.

An indicator of the true success and justification of the work was that the HOFOR water planning team were able to reapply the process autonomously. A prerequisite for the robustness is the anchoring of the implementation into the different business units. These business units are now the owners of the implementation programme, supported by the central asset management team, who is responsible for the tools, concepts etc. This became the solid basis for broadening engagement and responsibility widely and rapidly.

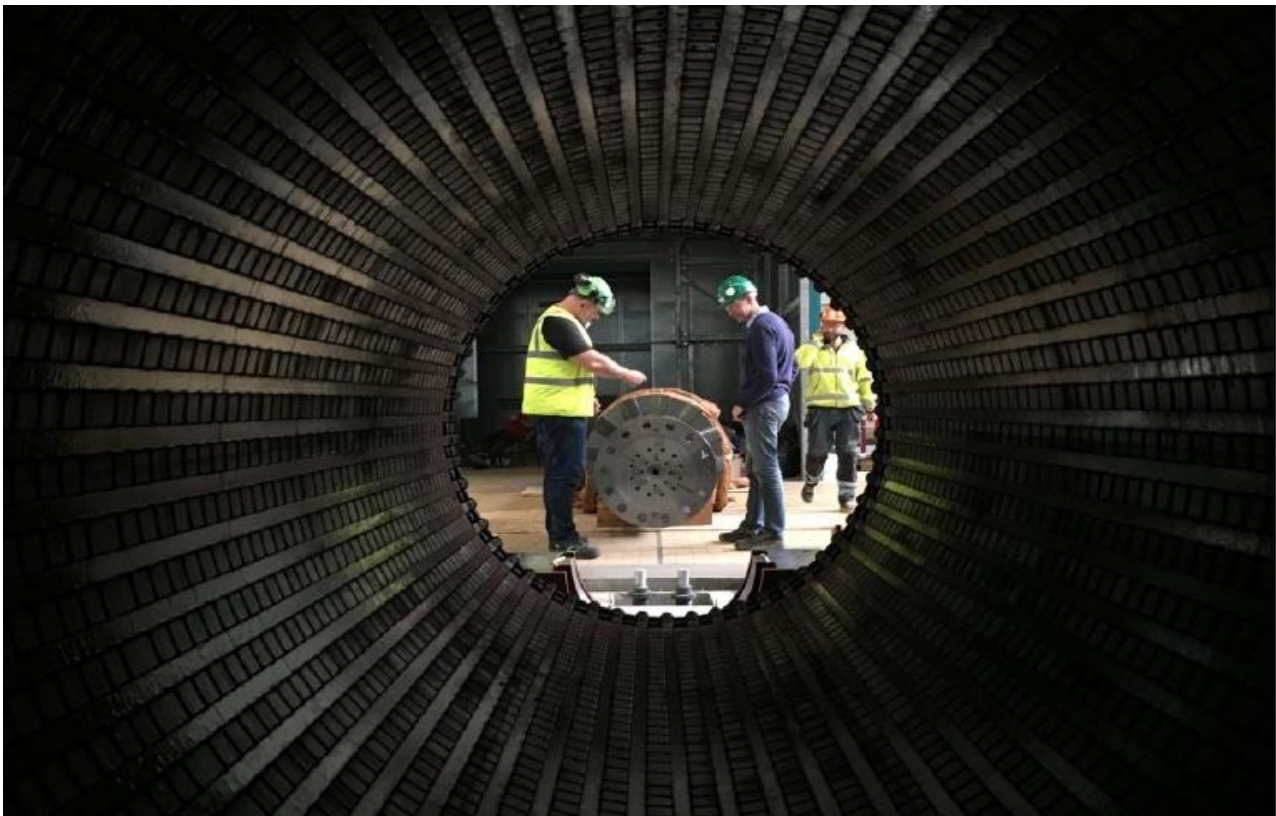
Conclusions

HOFOR has embraced better asset management practices because they are indeed the *'right things to do'* if you are responsible for complex critical infrastructure. The critical success factors, however, have included the style of people-centric introduction, Lise's project management and team energy, the 'home-owned' workstreams and the

collaboration with widely-experienced subject-matter experts in TWPL.

With the lack of a burning platform or other external imperative, there has been a lot of focus on 'making asset management make sense' in HOFOR; and establishing the necessary sponsorship at leadership levels. This has yielded the necessary sense of importance and determination – the HOFOR imperative for Asset Management.

A large part of HOFOR's employees recognise that the 'asset management journey' has only just begun, and there is widespread optimism, determination and energy to be involved and make the transformation into a sustainable success. So, raising asset management maturity can be a consensus-based process, provided that the right teams are established, supported and empowered to drive it.



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