

**Sustainability**  
**Case Studies**

Q3

1 January – 30 September 2022



# Case Study

## Curtin University.

### Maintenance at Curtin University is now upgraded to support its recognition for world-class innovation and high sustainability standards

For Curtin University and one of its campuses extending over 116 hectares in Perth, SWG has delivered an integrated, mobile-enabled facilities and asset management solution to streamline and automate end-to-end business processes for the operations and maintenance portfolio. Looking forward, the university plans to expand Perth into a 'City of Innovation': a vibrant urban hub of economic vitality, world-class knowledge, sustainable living, creative spirit, and cultural diversity.

In 2020, the university was awarded a 6-star 'Green Star-Communities' rating from the Green Building Council of Australia (GBCA), a certification for showcasing world leadership in highly efficient buildings. This requires Curtin to continually develop a community that provides a culturally rich, safe, and productive environment that seeks to reduce its ecological footprint.



**Service Works Global (SWG)** is an Addnode Group company specialising in providing facilities, property, and workplace management software.

For Curtin University, Perth, Australia, SWG has provided its computerised maintenance management system QFM. An estate as huge as Curtin, 116 ha and 55,000 students, requires a system that meet comprehensive requirements regarding communication, data and accuracy.

QFM, with over 250 built-in reports as standard, provides the customer with access to a wealth of data at the touch of a button, including:

- Work nearing the deadline or overdue
- Who the job is assigned to
- Asset maintenance history and performance
- Budgetary information

### NEED.



Curtin averages over 25,000 reactive jobs raised per year, so routing all requests through a help desk then manually allocating and tracking each one is not an option. Instead, an integrated, flexible, easy-to-use, feature-rich, and scalable digital maintenance and workflow management system was needed. Additionally, the previous system needed extensive customisation, so the client favoured an off-the-shelf solution that required little to no customisation.

### SOLUTION.



Because of SWG's extensive experience in the education sector, its local support team, and its partnership approach to collaborating with clients, it could meet the university team's needs. A fully integrated solution was implemented, which provided the team at Curtin University with easy access to vast amounts of data. Including jobs in progress, work nearing the deadline or overdue - as well as whom each job was assigned to, asset maintenance history and performance, and budgetary information.

### SUSTAINABLE BENEFITS.



The software manages assets across their whole lifecycle, reducing asset downtime, improving performance, extending asset life, and lowering maintenance costs. Additional benefits include operational efficiencies, improved resource utilisation, and a scalable solution directly supporting the University's 'Greater Curtin' strategy to be the educator of choice renowned for global academic and research excellence. Well-maintained assets also draw less energy; replacing paper job sheets and creating 60 digital maintenance forms on the mobile app has enabled the team to go paper free.

# Case Study

## Nottingham Trent University.

Claytex, a TECHNIA company, supported NTU on a project to improve the energy efficiency of buildings' thermal management to reduce their climate impact

Energy efficiency in buildings is important, as it has a strong impact on greenhouse gas emissions. Today, the building sector accounts for roughly 40% of the energy demand in the European Union. Improving the energy efficiency of buildings' thermal management systems can help achieve a reduction in energy consumption. Thus, reducing the impact on climate change.

Nottingham Trent University (NTU) is one of the most sustainable universities in the world, ranked third in the UK by the People and Planet University League, and fifth globally in the UI GreenMetric. With NTU, the TECHNIA company Claytex has supported a sustainability project that involved the modelling of buildings' thermal management systems.



TECHNIA is an Addnode Group company, a global provider of solutions for digitalizing products or facility's entire lifecycle - from idea, design, simulation and manufacturing to sale, aftermarket, and recycling. For our customers this entails shorter lead times, greater innovation, and increased efficiency and traceability, Making Product Creation Sustainable.

With NTU, Claytex, a TECHNIA company, support sustainability projects that involve modelling of buildings' thermal management systems. The main objective was to improve the energy efficiency of buildings thermal management, primarily to meet targets on CO2 emissions to reduce the impact on climate change.

### NEED.

The main objective of the project was to improve the energy efficiency of buildings' thermal management, primarily to meet targets on CO2 emissions to reduce the impact on climate change. To understand the impact of applying certain energy-saving technologies or control strategies, different scenarios were simulated. The alternative, to create a 1:1 scale integrated prototype of the systems involved, was unfeasible considering both cost and time.

### SOLUTION.

Co-simulation modelling was utilized to assess a decentralized full electric heating system that would serve 39 UK homes. The system made use of renewable energy sources such as solar PV (photo-voltaic) panels to generate electricity and ground source heat pumps that utilize boreholes as the heat source.

The system model consisted of a Functional Mock-up Unit (FMU), coupling the two software platforms EnergyPlus and Dymola. EnergyPlus simulated the energy demand of the buildings while Dymola was utilized to create a detailed model of the energy system. The heat source technologies that were modelled with the Dymola application were photovoltaic cells and ground source heat pumps. The storage devices were electrical batteries and water tanks. The two software platforms communicated to assess and optimize energy consumption.

One of the main objectives of the control strategy in addition to maximising the use of renewables was to avoid the high electricity price in the afternoon in the following ways:

- Use all the photovoltaic production in powering the heat pumps
- Store any surplus electrical energy generated by the PVs in the battery
- Switch off the heat pumps in the hours in which the electricity is more expensive and store the PV production in those hours
- Use the stored energy to run the heat pumps after 4 pm

### SUSTAINABLE BENEFITS.

The co-simulation of these energy solutions allows studying the system in a very precise and accurate way. The simulation shows that the solar PV system is capable to provide almost 50% of the electricity needed by the heating system. Furthermore, considering the UK's energy mix, the share of renewable energy goes up to 66%, and 76% of the electricity is carbon-free. The model allows for the development of different control strategies aiming to reduce the energy consumption from the grid, maximize the self-consumption of photovoltaic energy and ultimately, move away from fossil fuel to sustainable energy resources.

# Case Study

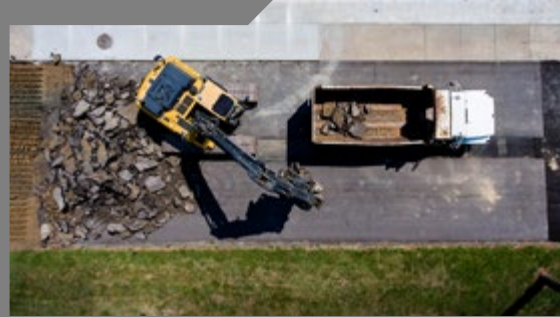
## Ledningskollen.

Ledningskollen extends the life of critical Swedish infrastructure, while also reducing waste, emissions and saving costs

PTS strives to ensure that everyone in Sweden shall have access to good telephone, broadband, and postal services. To ensure that established infrastructure is not accidentally damaged, PTS launched the project Ledningskollen to reduce the number of accidents caused by excavating.

Ledningskollen plays an important part in creating sustainable societies by securing critical infrastructure. Today, over 1,100 companies, associations, municipalities, and authorities have chosen to use the service. Every year over 200,000 cases are made.

Over the years, Ledningskollen has evolved to also be used by municipalities to plan and coordinate excavations. This results in higher efficiency of resources as, for example, the ground can be excavated once for multiple projects, rather than multiple times for different projects.



Decerno is an Addnode Group company specializing in tailored digital solutions that create new opportunities, simplify lives for people, and strengthen the customer's competitiveness.

For the **Swedish Post and Telecom Authority (PTS)**, Decerno has provided the web service Ledningskollen, used by groundworkers for the identification of subterranean cables and pipes.

The implementations of Ledningskollen have led to fewer accidents by excavation, which in turn has led to sustainable benefits such as:

- Reduction in emissions due to fewer repairs
- Less waste of economic resources
- Increased efficiency by cooperating and planning work together

### NEED.



The accidental destruction of cables and pipes through excavation is unsustainable. The risk of destroying critical infrastructure could potentially lead to devastating consequences. Before the launch of Ledningskollen, determining the location of pipes and cables was a serious problem for groundworkers, which required a solution.

### SOLUTION.



Initially, the idea was that anyone requiring information regarding the location of subterranean cables and pipes could get in contact with the infrastructure owner based on a specified excavation area. Today, Ledningskollen enables the communication between the infrastructure owners and the people who want to know where these are located.

Furthermore, as the exact location of infrastructure can be sensitive information, the exact location of the infrastructure is not stored. Instead, the infrastructure owner can map out if they have infrastructure within a kilometer wide area. If excavation is planned within that area, they are notified and then send the exact location of their infrastructure directly to the groundworker.

### SUSTAINABLE BENEFITS.



Ledningskollen reduces the risk of excavation damage and strengthens critical infrastructure and enhances crisis management capabilities. Our estimations show that the risk of accidentally excavating cables and pipes is four times higher when not using the Ledningskollen service. In economic terms, disrupted cables and pipes are estimated to cost 400 MSEK in direct repair costs annually. Additionally, when replacement or repairment of infrastructure is avoided, CO2 emissions are saved in the form of non-existent waste and emissions from machines that had been used in repairs