

Transforming Amsterdam's smart energy mix



Screen shot of the Decision Support Tool, showing the gas usage of individual buildings in the city centre of Amsterdam

Nestled in the southwest of Amsterdam, sits one of the most advanced stadiums in the world. The ArenA stadium, when opened in 1996, was placed bang in the middle of one of the city's most disadvantaged areas—Amsterdam Zuid-Oost. Through a huge urban renewal programme that began in the 1990s and 2000s the area now features a successful mix of office, retail, residential and industry. The district at large has further developed its smart city status and skills by becoming a smart urban lab where it is helping transform the city into a low-carbon and smart energy city.

Amsterdam is one of six cities that form the European Commission backed TRANSFORM project. Copenhagen, Genoa, Hamburg, Lyon, Vienna and knowledge institutions have, since the start of 2013, worked alongside 13 private sector partners that make up the consortium, to help the cities achieve their energy and climate targets—in particular the EU 2020 energy targets of lowering carbon emissions by 20

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percent, increasing renewable energy sources by 20 percent and increasing energy efficiency by 20 percent.

“During the last decades the city of Amsterdam and its economy grew dramatically,” explains Ronald van Warmerdam, Senior Project Manager and Coordinator of the TRANSFORM project at the City of Amsterdam. “The number of inhabitants will grow by more than 10,000 each year in the coming years. These people need houses and jobs and energy to live and prosper.”

Just the ICT sector alone in Amsterdam has grown so quickly that electricity use has surged by 18 percent,

further straining the city's desire to reduce electricity consumption.

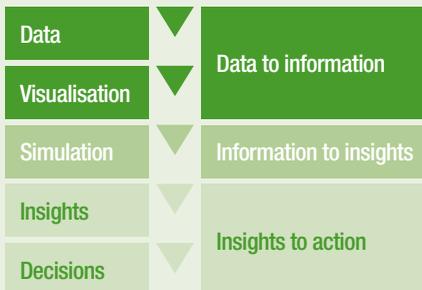
Consulting and ICT company, Accenture, and research body, the Austrian Institute of Technology (AIT), are two of the consortiums that have worked with Amsterdam through the TRANSFORM project to help the city achieve its broader 20-20-20 energy goals. Accenture, no stranger to Amsterdam's smart city aspirations, having already worked intensively with the city's Amsterdam Smart City programme, began by gathering city-specific geospatial and energy-related data on a granular level from different data owners. This was then aggregated and

'cleaned-up' to produce an enriched energy consumption data by using statistical analysis, and uploaded into a database and visualized via a web-interface.

This 'Data to information' phase led to the web-based open data energy planning and simulation tool, integrated with geographic information system (GIS) visualisation and big-data energy input.

"The Tool, or Decision Support Environment, enables users to visualise the usage and renewable potential of energy", says Joost Brinkman, Lead Sustainability Services Accenture. "Next to visualisation, it can simulate future scenarios and calculate the impact of measures that cities or stakeholders can take. This is done on a building level (400,000 buildings for Amsterdam) which makes it one of a kind. The DSE is set up as open source, so there is no 'black box', all aspects can be adapted and new measures can be added."

A key reason why Amsterdam Zuid-Oost was chosen as the smart urban lab was the major challenge of closing the gap between current CO₂ emissions (390 kt/year) and the ambitious targets set forth to reduce these. To achieve this the district aims to become a self-sufficient neighbourhood where energy is produced locally from



renewable sources and from waste, and where energy losses are minimised.

"TRANSFORM gave us the opportunity to dive deep into typical constraints concerning the energy transition of our city," says van Warmerdam. "The tool is one of the big successes of the project and I am convinced that with the tool we will be able to support discussions on energy transition issues with stakeholders and citizens."

Despite the programme due to formally expire towards mid 2015 both Accenture, AIT and Amsterdam see the project continuing in some form. Accenture has already partnered with the Amsterdam Institute for Advanced Metropolitan Solutions to develop the tool further and use it for educational and research purposes.

"Due to its open source approach the tool is also available for other cities and stakeholders," says Brinkman. "Our plan is to initiate an 'expert community' around the tool to ensure continuous improvement of its useability and functionality as well as sharing of knowledge between the users and developers."

Similarly the city of Amsterdam is working on creating new business with the tool with the aim to develop it further to use in other cities. Plans are underway to meet again with partners of the TRANSFORM project to discuss progress in 2016.

"We are only beginning to understand the new sustainable energy systems and related infrastructure of cities and all other things related," explains van Warmerdam. "Energy was simple in the old days: on one side of the line it was produced and on the other side energy was consumed. The big challenge nowadays is to overcome not just technical things but trust, contracting, citizens involvement, partnership, and legal ways. I hope we have added some good tools with our TRANSFORM project for the public and private sector to collaborate and involve citizens too." ■



Testing of the Transform Serious Game in Lyon, September 2014

Key outcomes of the TRANSFORM project

Serious Game

A Serious Game was developed and tested to engage stakeholders to experience the importance of cooperation and communication on energy planning.

Atlas

TRANSFORM has built the Amsterdam energy atlas where all energy related information is gathered in which all data is open source and citizens are free to use www.maps.amsterdam.nl

Tool

The tool, or Decision Support Environment, is able to model different energy solutions on a district and whole city level, based on the atlas. The tool helps stakeholders in the energy transition to discuss the different energy solutions of districts.

Smart Urban Lab

This is a platform on a district level where stakeholders, citizens and the municipality discuss sustainable energy solutions. The tool supports the dialogue and the discussion about the needed investments.