

Landscape architect Sven Stremke studies the energy management of Amsterdam. He sees unexpected possibilities in many places, including a city park heated by residual heat from a power plant.

Sven Stremke lives in Amsterdam, and shares his time between there and Wageningen. His work in the capital city is original: Stremke is the principal investigator for energy for the Amsterdam Institute for Advanced Metropolitan Solutions (AMS), a research institute established in 2014 that seeks new solutions to issues related to water, energy, waste, food and mobility. Within the Urban Pulse project, which is supported by AMS, Stremke and his colleagues have started collecting data on energy flows through the capital. Over the next few years, they aim to gather data about the 'metabolism' of the city, such as what comes in, what happens to it, where does it happen, and where do the residual products go. Databases for water, energy, food and building materials will be searched and cross-linked, and should together provide the most detailed picture of the city possible.

According to Stremke, a preliminary analysis of the data from these partners shows that Amsterdam mostly runs on coal – two thirds of the electricity produced in the city comes from coal plants. Much more coal arrives in the port as Amsterdam is one of the largest coal transshipment points in the Netherlands. Stremke hopes to receive data on power consumption in the city from the grid operator Alliander. "As well as knowing how much energy consumers use per year, Alliander can show how consumption changes over time."

Heated park

But what use are these figures for Amsterdam? "We don't know yet, exactly – but we're pretty sure that a better picture of the metabolism of the city will result in improved new plans." Stremke has asked one of his



students to do a feasibility study on a heated city park in the new district of IJburg. "I think that this could be interesting, and the power station in Diemen could supply the heat." The plant in Diemen, just outside the borders of the municipality of Amsterdam, has been supplying heat to the IJburg district and the city of Almere, but still discharges a lot of heated water into the IJsselmeer lake. "There are already pipes running from the plant to Amsterdam which we can make better use of," adds Stremke. "I don't know if a heated park would work, but the point is that you only see this type of opportunity when the data is readily available. Who knows what other ideas will surface if

we can make the relevant transversal connections.”

At one of the AMS meetings, a representative of the Port of Amsterdam ended up talking with the contact from Alliander about the opportunities for large-scale generation of solar energy in the port. “Although the port, the water supply company and power provision in the city are currently still worlds apart, bringing them together automatically gives rise to new ideas. I think Waternet and Alliander will both have more to offer each other once they have access to each other’s data.” In a similar manner, better understanding of other flows could provide new ideas related to food

and water, for example. “Food is an important factor in the ecological footprint of a city. If you are serious about making a city like Amsterdam climate neutral, you need to have information about it.”

Twitter

Amsterdam is not the first city to set up a research institute dedicated to urban issues. New York, for example, has a similar institution. The cities hope that scientists can help make the city more sustainable. They make use of big data: information from existing databases, but also from social media. “Twitter could be very useful in case of flooding or traffic incidents,”



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Stremke points out. "If there is a flooded street, someone will probably tweet a photograph. This can be more accurate than the rain radar. If you are creative about the way you search, there is a lot of data available – the trick is simply to find and interconnect the right data."

Stremke studied landscape architecture, and works for a research group that focuses on this field. A good landscape architect combines beauty and function, especially in these times of climate change and energy transition. But how does building databases and thinking about energy flows fit into this? "New times call for a new kind of landscape architect," Stremke says. "When times were good ten years ago, there were more than enough jobs for landscape architects. Those days are now gone and we need to develop new ideas, co-create, and find new opportunities. We used to primarily occupy the final segment of the process: someone else thought up a plan, and we made it pretty and ensured it would fit within the given environment. But if you develop plans yourself, you need to have a better understanding of what's behind the process."

Stremke and his colleagues designed sustainable energy landscapes for regions in Limburg and Zeeland, for instance. "This wasn't just about finding the best spot for a windmill. A big part of what we did was consid-

ering novel solutions. Where are bioenergy and other renewable resources available? Where can we save energy? We must now think along in a whole other way than before, and this makes the work much more challenging and fun."



Cooperation

The AMS is an initiative by the City of Amsterdam. The municipality issued a tender for this in 2013 and the contract was eventually awarded to a consortium comprising Delft University of Technology, the Massachusetts Institute of Technology and Wageningen UR. These three partners now deliver experts to AMS. One of their first tasks is to create databases about life in the city, with the resulting files being made available for research and for teaching at AMS. In 2017, Delft and Wageningen will together offer an MSc in Metropolitan Solutions within the framework of the institute. In addition to the universities and the municipality, several commercial and public or semi-public partners based in the city also took part in the study, including the Port of Amsterdam, grid operator Alliander and water supply company Waternet.