

# The City as a Testbed

– testing green ideas in Linköping

# What's a testbed?

Vinnova, the Swedish Innovation Agency, defines a testbed as a physical or virtual environment where companies, academia, or other organizations can work for change, testing, and implementing of new products, services, or processes within selected areas.

As a part of the project Climate Neutral City 2030, Linköping municipality offers small to medium-sized enterprises the opportunity to apply for testbed vouchers.

The goal of testbed vouchers is to make it possible for companies within the climate and energy sector to test their solutions in a real-world environment. Whether it's in the living testbed in the city district of Ebbepark with local property owners or another part of Linköping municipality.

With the city as a testbed, the possibilities are endless.



*"The testbed vouchers provide several benefits: they encourage initiatives that lead societal development in the right direction. They demonstrate that good ideas are taken seriously, and at the same time, they improve the municipality's contact with the business community," says Ulrika Johansson, Linköping Science Park.*



*"The solutions could range from technical services and products reducing energy use and greenhouse gas emissions to social innovations promoting awareness and well-being, fostering climate-friendly behavior and societal transformation," says Sandra Viktor, Process leader of Climate Neutral City 2030.*



## Partial repairs instead of tearing out entire bathrooms with InviSense

InviSense was the first company to be approved for testbed vouchers. They aimed to see how small leakages in bathrooms could be detected by their sensors. What they could see is that detecting leakages in time enables partial reparations, instead of replacing entire bathroom units. By detecting and pinpointing leaks early, these sensors save time, money, and resources, offering a more sustainable solution. The test showed that more than 1000 kilograms of CO2 equivalents can be saved. This could not only help property owners save money on renovations but also help protect the environment by reducing waste.



# Fresh Air With Devair: Smart ventilation solutions tested in Ebbepark

Devair's smart ventilation solutions have been tested in Ebbepark to promote fresh air circulation. The system is designed to enhance indoor air quality while optimizing energy efficiency.

As the testing progressed, they were able to explore more functionality in line with the simultaneous development of their product and software. Devair has now gathered a significant amount of data that will be evaluated to provide further value for the product and its customers, showing that testing its products in real environments has been crucial to understanding its performance.



# SeaPattern and Tekniska verken test the performance of new hydrokinetic turbines



Seapattern and Tekniska verken teamed up to test the installation of new hydrokinetic turbines at the Svartåfors hydropower plant. The turbines, designed to harness energy from flowing water, underwent performance tests with promising results. The collaboration shows advancements in renewable energy technology and highlights the potential for hydrokinetic turbines to contribute to sustainable energy production.





## Analyzing and visualizing electricity flow in Stångåstaden's properties with Envista

Envista and Stångåstaden collaborated on a project to understand electricity usage in Stångåstaden's properties. This project built upon Envista's energy consumption analysis, visualizing electricity flow to enhance the platform and its visualization tools.

The learnings included understanding how electricity flows within the properties, identifying areas for improvement, and enhancing the platform's visualization tools to facilitate more efficient energy management.



# More tests

## Smart signs by Signostium

Signostium has created energy-autonomous digital signs for residential buildings, powered by indoor light through solar cells, delivering resident information and facility updates.

The first pilot will be running in Ebbepark in Linköping on two addresses including 40 apartments.

## DAZOQ in an energy-efficient collaboration with Stångåstaden and Ebbepark

DAZOQ, along with Ebbepark and Stångåstaden, is measuring how energy in real-time can help save energy in buildings and apartments. This will help property owners figure out how to use less power during busy times, and it will let tenants keep track of how much energy they're using.

## Together Tech's light-harvesting sensors tested in Ebbepark with Sankt Kors

Together Tech is trying out light-harvesting sensors in Ebbepark with Sankt Kors, aiming to use ambient light to power IoT devices and reduce battery replacements. The solution of harvesting light and monitoring energy consumption is a relevant topic in today's society, with a need to reduce the use of batteries and eliminate dangerous substances.



## Linköping's draknäste - where brave ideas take off!

In 2023, Linköping's draknäste premiered, where entrepreneurs pitch innovative ideas to a panel, also called "dragons". Linköping's draknäste connects entrepreneurial innovations with municipal companies for potential collaboration, and selected companies can partner with a municipal company to apply for test bed vouchers afterwards.

During the event, entrepreneurs can showcase their concepts to representatives from municipal property companies like Sankt Kors, Stångåstaden, and Lejonfastigheter, as well as experts from Tekniska verken and RISE. The event will be held annually from now on.



**Viable Cities** is a strategic innovation program with support from Energimyndigheten, Vinnova, and Formas, aiming at creating climate-neutral cities by 2030. Linköping is one of 23 Swedish cities working towards this goal. By signing the Climate Contract, Linköping has agreed to reduce greenhouse gas emissions, facilitate innovation, and make the citizens contribute to the change, where the testbed voucher is one of several enabling tools. The goal of the project is to enhance and facilitate the conversion to a sustainable city.

*Read more at [viablecities.se](https://viablecities.se) & [linkopingsciencepark.se](https://linkopingsciencepark.se)*



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