Flanders

Smart Energy Region

FLANDERS INNOVATION & ENTREPRENEURSHIP

flux50

Clusters for Growth

5 Years of Flux50

We are proud to take a look back at Flux50's many achievements over the past 5 years and invite you to join us as we look forward to 2025 and the impact we still want to accomplish. Our 2025 plans are an important intermediate step to a far-reaching energy transition in 2050.

In 2017, we launched the first projects within the 5 innovator zones. After 2 years of operation, we undertook a mid-term (re)evaluation of our strategic priorities. Due to technological evolutions and sharpened ambitions on the international, European, Belgian, and Flemish levels (including the EU Green Deal and recovery plans) it was necessary to determine a number of new accents within the defined innovator zones. A strategic roadmap was developed in 4 focus groups, each describing the ambitions, challenges, innovation priorities, and potential impact. In addition, the roadmaps contain a concrete action plan for the coming years to realise the envisaged impact.

The focus groups were organised according to 4 priority themes:

- Energy Communities and Positive Energy Districts (EC & PED)
- Renovation (REN)
- Sustainable Thermal Energy (STE)
- Large Scale Energy Storage and Security of Supply (SoS)

The basic outline of this vision for the future, theme by theme, can be found in the infographics in this brochure, along with details of the projects realised over the past 5 years.

ENERGY COMMUNITIES AND POSITIVE ENERGY DISTRICTS (EC & PED)

Flanders is a frontrunner in energy cooperatives, with many business park partnerships and extensive knowledge and expertise gained from its international and regional projects. Flux50 plans to convert this experience into 10 rolled-out energy communities and 5 positive energy districts by 2025, 10 positive energy districts by 2030, and 100 by 2050. This will be achieved by recognising best practices by market players and organising matchmaking. At the same time, there will be a continued focus on technological innovations, both focused on software applications and hardware realisations. Using gap analysis, 5 targeted innovation projects will be launched before 2025. In addition, synergies will be found between the market players and the regulated bodies to ensure these innovations are rolled-out in practice. To align these mutual ambitions, Flux50 aims to implement 2 validation projects.

RENOVATION (REN)

The renovation of the Flemish building stock has been high on the political agenda for years as an important part of the recovery plan. It is crucial that Flanders takes steps towards a substantial reduction in CO_2 emissions from the built environment. It is also essential that resources be used strategically in order to achieve a substantial increase in the renovation rate. Given the age and variety of the existing building stock, an acceleration in the renovation rate will depend primarily on the affordability of state-of-the-art technology and the capacity of the construction sector. Flux50 wants to focus on innovative renovation in order to obtain a robust and future-proof building stock in accordance with the European objectives of climate neutrality by 2050. Attention will be paid to integrated renovation concepts, the interaction between renovation concepts, the interaction between stakeholders (including construction teams), and the application of off-site techniques.

SUSTAINABLE THERMAL ENERGY

The Sustainable Thermal Energy roadmap focuses on the Flemish innovation priorities for improving the sustainability of demand for both heat and cooling, as well as general thermal comfort in the residential and tertiary built environment. This means making more than 85% of the energy demand in the built environment sustainable, of which fossil fuels currently provide more than 85%. Our starting point is technological neutrality. In terms of priorities, we align with the ambitions of the Flemish Energy and Climate Plan and focus on the innovation of heat pumps and heat networks. Through system integration, we believe that heat pumps will evolve from 'talk-of-the-town' to 'action-of-the-town'. In addition, we want to future-proof the large-scale heat network initiatives that are being set up in various cities. System integration remains one of the crucial challenges to which Flemish companies can apply their strength. In this way, we want to make 'innovation' tangible in the Flemish government's Heat Plan 2025.

LARGE SCALE ENERGY STORAGE AND SECURITY OF SUPPLY (SoS)

The roadmap focuses on grid- or generation-asset coupled (pre-meter) energy storage, which is typically large-scale (MWh or larger) and complementary to shorter-term (behind-the-meter) storage, which can be a solution for longer-term storage (days, week, or season). Power-to-X and large-scale battery storage are typical examples.

There are 3 main challenges here:

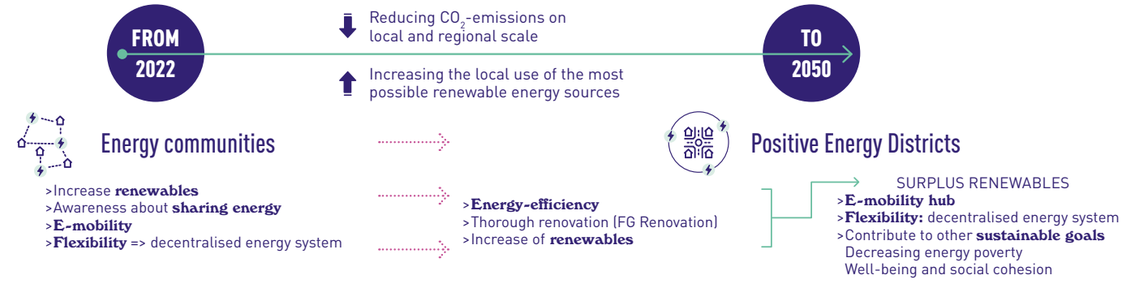
- The concretisation of a cross-sector energy plan that includes placing choices for sustainable energy and molecules in a system perspective.
- The transfer of innovative solutions to large-scale pilot projects with sustainable large-scale energy storage and security of supply.
- The facilitation of international value chains for the import of sustainable energy and molecules.

In this way, we want to contribute to the role of the Flemish ports as energy hubs of the future. Cooperation between different clusters and sectors is essential for us to achieve this goal.

Energy Communities and Positive Energy Districts (EC &PED)

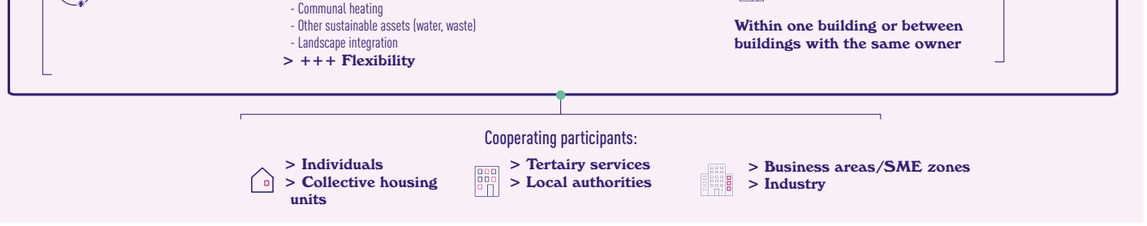
Ambition

Energy communities are a tool for supporting the energy transition. They can contribute to the goals of energy efficiency and renewable energy.



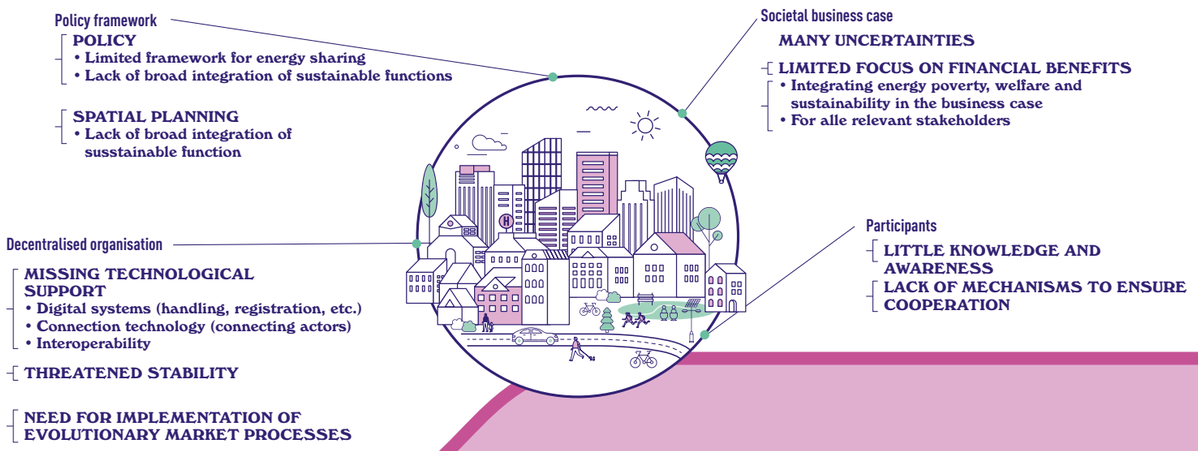
Flux50 scope

In the scope of this focus group, there is a special focus on positive energy districts (PED). They are energy-positive on an annual basis and use a lot of innovations to achieve a climate-neutral, urban infrastructure.



Points of interest in Flanders

The evolution to energy communities is not as clear as first expected. Technical innovations must go hand in hand with an adapted policy framework and a broad social vision.



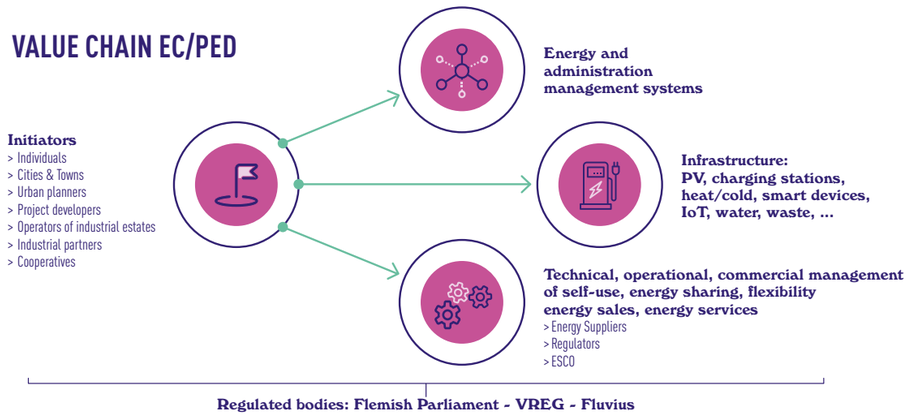
Energy Communities and Positive Energy Districts (EC &PED)

Flux50 action plan

A direct action plan has been established for the coming years that considers all stakeholders.

Impact

In addition to the intended climate ambitions, the evolution towards energy communities opens up economic opportunities.



Customer Energy Management Systems

Consortium: Volta together with the Eloya, FEE, Nelectra, and Techlink federations

Budget: € 809.584
Grant: 50 to 100 % of the total budget

In this Collective Research and Development and Collective Knowledge Dissemination (COOCK) project, the emphasis is on disseminating knowledge to the chosen target group. The guidance group plays an important role in determining the right knowledge dissemination.

Customer Energy Management Systems (CEMS) are applications that control the energy management of buildings for consumers and prosumers who want to use renewable energy sources such as photovoltaics (PVs), electric vehicles (EV), heat pumps, and smart appliances to achieve their climate objectives and lower energy costs.

Electrical installers (EI) are the appropriate target group to guide their customers through this energy transition. Through direct contact and the need for qualitative installations of these new products and systems, EIs are paving the way for new energy services. Use cases are helping to clarify the possibilities and applications in the new energy management systems market. This knowledge is conveyed by all possible modern educational channels including brochures, webinars, videos, technical articles, e-learnings, workshops, and the website **maakjemeterslim.be**.

The objective of the project is to encourage the entire EI sector to embrace this market. EIs and other stakeholders need to educate themselves to ensure a better customer relationship, continuity of service, and/or a reorientation of their business. COOCK CEMS will undoubtedly create new jobs. Flemish manufacturers will also develop products that respond to the energy data generated by sensors, the digital meter, and smart appliances.

Socially, COOCK CEMS contributes to making 'smart grids' possible: optimising the consumption of renewable energy, spreading consumption for minimum grid capacity, and creating flexibility.

During the lockdowns, several well-attended virtual webinars were organised, with the recordings accessible in the installers' section of the **maakjemeterslim.be** website. The basic brochure can also be viewed on this website. In the second part of the project, these new energy products and the CEMS will be introduced by a large number of companies.

Companies in the electrical engineering sector have established business units that offer a range of products specifically for the EMS market. While most companies use their own resources for innovation, some apply for subsidies from VLAIO (mostly SME growth subsidiaries). As this was previously a rarity within the electrotechnical sector, this is an important step forward. Project partners will continue to ensure EIs and other stakeholders in the CEMS market are aware of its importance, after all, the efforts of a large number of businesses have already contributed to the success of the COOCK CEMS project.

Connected Buildings

Consortium: June Energy, Bagaar, Insaver, and Vito/ Energyville

Budget: € 1.444.160
Grant: € 588.583

This pilot-scale development project is a follow-up to the Connected Buildings feasibility study that showed market

demand for remote energy services that handle data obtained through various sensors in the home. Relevant energy audits that don't require home visits yet deliver continuous energy advice based on (near) real-time measurements are appreciated by residential customers. The consortium aims to offer remote energy advice via the June platform linked to VITO/Energyville Building Energy Calculation Service (EBECS).

The installation of additional sensors for data on indoor temperature, presence in the building, and humidity greatly improves the accuracy of the provided advice. This requires the optimal functionality of the entire chain with sensors, connectivity, integrality, data analytics, and customer approach with advice and investment offerings.

This advice will trigger consumers to make investments in their homes related to energy efficiency, renewable energy, flexibility, and storage.

The set of sensors and energy investments also ensure continuous monitoring, which collects sufficient data for the learning and improvement process required for artificial intelligence and machine learning. 100 households have been provided with the necessary sensors with sufficient stability and data quality from the Nb-IoT network. For customer friendliness, satellite data were used for building volume determination. 3 different types of advice were proposed:

- the most economic situation (fastest reimburse time);
- the most ecological situation (as cost-efficient as possible to reflect energy label A); and
- the legal minimum requirements.

To improve the algorithm and the advice, 3 different iterations were performed. Very accurate advice for PV/battery usage was worked out based on measurement data taken every 15 minutes. Due to corona, the recommended installations have not yet been implemented. However, the consortium will assist the customers to ensure a trouble-free installation.

After installation of the new energy infrastructure, the loop will be closed by measuring the data with the same sensors to objectively demonstrate the impact on comfort and cost savings, resulting in a quality stamp for future installations and enabling predictive maintenance modelling.
The project provides sufficient insights for further development of products and services both in the B2C and B2B segments.

Managing Uncertainty in Positive Energy District Design (MUPPED)

Consortium: Groep Van Roey, REBEL, DLA Piper, Stebo, Endeavour, VITO/Energyville, and KU Leuven

Budget: € 1.742.331
Grant: € 1.116.340

Managing Uncertainty in Positive Energy District Design (MUPPED) was established on October 1, 2021, to conduct fundamental research in the field of techno-economic and social uncertainties by bringing new data, innovative data analysis, and modelling techniques to the field of Positive Energy District development (PED). Furthermore, MUPPED will expand knowledge in the financial, legal, and organisational fields associated with the realisation of urban infill projects and PED developments in the broader urban area, with the aim of supporting the decision-making process of the relevant market players and maximising acceptance.

The 2 use case projects will generate at least 5 different personas and identify at least 5 key benefits for participation in PED projects with 80% approval of the proposed personalised benefits by the participants in the final phase of the PED project. Additionally, the project will define the optimal communication approach with at least 5 key parameters.

The 2 use case projects will generate at least 5 different personas and identify at least 5 key benefits for participation in PED projects with 80% approval of the proposed personalised benefits by the participants in the final phase of the PED project. Additionally, the project will define the optimal communication approach with at least 5 key parameters.

This approach will be approved by at least 70% of participants during the project via digital or offline contact. Site-specific uncertainties about building energy performance have been improved by at least 45% of participants when using open data rather than regional or national data. For robust design evaluation, the innovative simulation techniques investigated should reduce the calculation time compared to traditional Monte-Carlo approaches by at least a factor of 50. At least 3 sets of minimum data will be compiled to meet the

uncertainty requirements at key decision points during the PED development process. By including sociological and behavioural predictors on the individual level, the success rate will increase by 20-50%. Furthermore, with the inclusion of local data from the design phase, a success rate of approximately 60% can be achieved during the project based on historical project data.

Additionally, a valid protocol for lab testing and a convincing campaign element will be developed to improve the model's predictability to obtain a success rate of between 60-70% compared to historical data from reference projects from the consortium. Better management of uncertainties will increase the uptake of PED by +30% compared to similar baseline infill projects.

The increased uptake will ultimately lead to 20-30% lower energy consumption (in kWh), 10-20% higher renewable energy production (in kWh), >10% increased capital investment in renewable energy assets, and >10% lower operational (fixed and variable) costs. Optimal stakeholder inclusion scenarios, including communication strategies by stakeholder type, have been approved by at least 70% of participants.

Power Data Backbone for Digital City Poles

Consortium: Tres, Crescent, Imtech Belgium, Safety-Product, and Powerdale

Technology supporting partners: Nokia, Arco Information, Citymesh, Fluvius, and KBC

Budget: € 2.885.621
Grant: € 1.352.344

The Digital City Poles development project is a co-creation model that combines 4 social trends:

- electromobility with the need for charging points and V2G possibilities;
- the fibreoptic network necessary for the development of 5G and self-driving vehicles;
- the energy transition toward decentralised production and DC networks; and
- the digitalisation with the availability of Big Data to enable new business models and P2P transactions.

This co-creation vision is supported by Tres and the consortium partners: the E2E IoT integrator Crescent and Imtech Belgium for the management of the complex technical projects, Arco Information for the data capture in the digital workflows, Safety-Product for the mechanical aspects including the poles, and Powerdale for the EV charging points and platforms. These partners are supported by Nokia for the 5G input, Citymesh for the installation of 5G and applications, Fluvius as the grid operator, and KBC for the reliable financial transactions.

The powerful drivers for the digital city pole infrastructure include giving cities and towns the opportunity to generate recurring revenue for their public lighting (PL) poles which currently carry a heavy maintenance cost. Notwithstanding the transition towards public LED lighting, 40% of the maintenance costs will remain. Allowing services and applications to use the PL poles can generate revenues that exceed these maintenance costs. Many cities, including Leuven, Kortrijk, and Antwerp, strive to become smart cities where new applications that use big data can be tested and citizen participation can lead to an open network that supports the needs of citizens.

The development of 5G cells has been made possible by integration into the digital city poles. For example, the 5G strategy that was developed together with Nokia uses 'small cells' every 150m in the urban environment, requiring only a small radiation power. Another example impacts the 70% of city dwellers without a driveway or garage. By using charging stations connected and controlled by a digital city pole and disappear into the ground when not in use, it is possible to have inconspicuous charging points in the public domain for e-vehicles, e-bikes, and e-scooters.

This shows that the sustainable solution is to combine the digital city pole with an integrated electricity and fibre network. Together, this forms the Power-Data backbone. The use of energy and data is recorded per application and paid for by an energy and data usage package that considers the type and usage time of the application.

Due to the confidential data that the app handles and the asset management, the certification of hardware and applications is essential. This is also why payment transactions are carried out using blockchain technology through a financial institution. An energy ledger for all charging operators will help ensure standardisation and user-friendliness.

A growth path to rollout and commercialisation has been mapped out, starting with a demonstration at the Arenberg Science Park and the implementation of 24 digital smart poles, including 4 5G poles, at a business park. The next step will be the installation of 20 5G poles at the Arenberg Science Park. The project also aims to create a living lab encompassing the Gasthuisberg, Science Park Arenberg, Faculty of Computing and Engineering, and OHL area. The living lab will allow the testing of the applications of tomorrow, such as self-driving shuttles.

Green Energy Park in Zellik

Project MAMÛET
Consortium: VUB, SDM Projects, PowerPulse, Priva Building Intelligence, and ABB
Budget: € 4.985.984
Grant: € 3.470.471

Project OPTIBIDS
Consortium: VUB, Blueways International, Powerdale, Imtech, Scholt Energy Control, and VDL Bus Roeselare
Budget: € 4.503.404
Grant: € 3.000.608

Green Energy Park vzw is located in the Zellik Research Park and will become a strategic living lab for energy and mobility, smart regions, hospitals of the future, and bio-tech.
The business park will be developed into a local energy system including an electric microgrid and a heat grid fed by a data centre.

In the context of energy and mobility, VUB-MOBI's EVERGi team is a partner in 2 interdisciplinary and cooperative research projects that resulted from the intense feasibility study phase. Machine learning for real-time Advanced Multi Energy Trading (MAMÛET), the first ICON project, investigates the intelligent management of the local energy system (LES) with energy vectors such as electricity, thermal, HVAC, and mobility by the renewable energy community (REC).

The MAMÛET research themes are self-learning algorithms for status estimation and forecasting, optimal management and control strategies, and business and operation models. One of the first achievements is the smart digital tabletop. This is an interactive simulator that allows new energy models and algorithms to be tested and visualised in an interactive scale model of the research park. The partners for this project are SDM, PowerPulse, Priva Building Intelligence, ABB, and VUB.

Optimised bi-directional and smart vehicle charging in LES (Optibids), the second ICON project, aims to integrate electro-mobility into local energy systems. This involves designing strategies for smart and bi-directional charging as well as DC charging systems inside and outside the vehicle that combine with the local DC storage system.

These hardware concepts with V2G capacity that were developed within the project will be tested, together with the smart charging strategies, in 3 pilot sites, including at the Smart Village Lab of Green Energy Park vzw. The user and economic aspects are investigated through the analysis of charging data and the survey of EV drivers inside and outside the pilot sites. This living lab approach allows for the creation and validation of the technology and related services in real conditions and ensures natural valorisation. The partners for this project are Blueways International, Powerdale, Imtech, Scholt Energy Control, VDL Roeselare, and VUB. Green Energy Park vzw is also a partner in the ROLECS ICON project which studies the deployment of energy communities. The first large-scale living lab is in full development.

The Smart Village Lab where 'the smart home' in the 'smart residential area' is central, makes it possible to develop and test intelligent systems for the smart and sustainable management of various flexible homes.

In the Smart Home lab, communication between the digital meter and different smart home systems can be put into practice. Electrical and thermal energy can also be exchanged between different smart homes or with a smart energy grid with collective energy systems such as neighbourhood batteries and collective charging infrastructure for electric vehicles.

The RegEnergy Interreg project carries out the installation of the electrical storage infrastructure while the European Regional Development Fund Smart Multi Energy Lab (SMEL) takes care of the development of the electricity distribution network and the electrical installations of the homes (indoor installations, meters, control centre, and the installation components including heat pumps, SWW tank, thermal buffer tank, home batteries, ICT part, and security). Green Energy Park is also part of the Connect SME project where the unique living lab offers development and testing opportunities to companies, knowledge institutions, governments, and end users.

RE/SOURCED at Transfo in Zwevegem

Consortium: Leiedal, gemeente Zwevegem, de provincie West-Vlaanderen, Universiteit Gent, Flux50, VITO, and REScoop.eu

Budget: € 4.998.435
Grant: € 3.998.436

The Renewable Energy Solutions for Urban communities based on Circular Economy policies and DC backbones (RE/SOURCED) covers 3 current themes:

1. Renewable energy;
2. Circular economy; and
3. The conversion of heritage.

RE/SOURCED envisages the realisation of a medium-sized and self-sufficient energy system at Transfo, a 10-hectare multifunctional heritage site in Zwevegem (West-Flanders). Intercommunal Leiedal leads the project, which is supported by Urban Innovation Actions, an initiative of the European Union to face urban challenges with new and unproven solutions.

Transfo, the site chosen for RE/SOURCED, is a former power station from 1912 which has been protected as a monument for 20 years and is exceptional due to its scale, the state of the industrial heritage, and the opportunities it offers. The three structural partners – Zwevegem, the Province West-Flanders, and Leiedal – have worked together to repurpose the site, converting its industrial heritage with a regional, national, and even international look. Meanwhile, Transfo has been developed as a multifunctional site including (public) homes, offices, a microbrewery, leisure and sports facilities, and event spaces. Transfo is the perfect setting for RE/SOURCED due to the mix of energy profiles and the historical link with electricity production.

The goal of RE/SOURCED is the realisation of a circular and smart energy grid at Transfo. The basis is a self-sufficient energy system managed by an energy cooperative.

- The backbone of the system is a local power grid on direct current that saves both energy and material (i.e., more capacity with the same amount of metals and materials). The direct current network connects a set of renewable sources (solar panels and medium-sized wind turbines) and energy storage (batteries, hydroelectric storage, and vehicle-to-grid). The optimally integrated network is designed and developed with minimum losses and continuously matches demand and supply. The power, capacity and location of the cables are identified and the renewable energy sources and storage systems are selected and sized.

- An energy community of citizens, in which all users on Transfo will participate, will manage the shared infrastructure and cooperation. The establishment of a legal entity that fits into the definition of Europe's targeted energy communities is being supervised and the results will be spread to the network of energy communities and EU policymakers.

- Models have been developed in which circularity is also applied to the renewable energy sector. This sector is, after all, very material intensive.

RE/SOURCED has also realised an educational course for citizens, schools, and local authorities, along with a training package for professionals. And innovative companies will be able to test new products and services on the smart grid.

De Zaat in Temse, Cordeel Business Park 4.0

Consortium 'Usage Driven Power Station': Imtech, Eoluz, i.Leco, and Smart Software Development

Consortium 'Hydro Energy Power Station': Cordeel, Imtech, Ecosource, Eoluz, i.Leco, and Turbulent

Consortium 'Optibids': VUB, Blueways International, Powerdale, Imtech, Scholt Energy Control, and VDL Bus Roeselare

Budget: € 16.554.411
Grant: € 6.862.608

Cordeel's business premises De Zaat, Temse, is an integrated ecosystem built on 3 pillars.

The first pillar is the development project 'Usage Driven Power Station' (budget €3.152.002; grant €1.339.178) which identified and coordinated the needs of the users from different buildings and their energy production profiles. Data on building occupancy, production processes, energy needs, and sustainable generation systems are logged and processed using deep learning. Energy consumption is then predicted, visualised, and optimally tuned.

The second pillar is the development project 'Hydro Energy Power Station' (budget €8.899.005; grant €2.521.720) where innovative energy production processes and storage installations are designed, implemented, and tested for further application on other sites.

- A tidal power station has been placed at the beginning of the Schelde dock. An innovative 'robot vacuum cleaner' will soak up obstructions due to sand and sludge and return it to the Schelde. A large turbine that increases production by 20% compared to two small turbines (from 500 to 600 MWh) will be designed before being implemented and thoroughly tested in real conditions.

- The energy hill provides a higher water basin where water will be pumped using the surplus of renewable energy. In case of a shortage of renewable energy, it can be converted into electricity using a turbine.

- Awaiting the definitive design and installation, simulations have been carried out on a small-scale turbine to demonstrate its innovative aspect. A variable version of the turbine delivers maximum flexibility which is important for the economic valorisation and return.

- For interoperability, different building management systems were converted into a building management platform. To improve the system stability and the quality of the data, an intermediate communication layer was installed to transport data to the cloud.

- The floating solar panels on the dock have many applications worldwide. Innovative solutions for the floats, which are usually large in volume, and solutions for the anchorages, with which many incidents happen, will be demonstrated on the Zaat site.

The third pillar is the electro-mobility where the extended vehicle fleet, charging infrastructure, and renewable energy applications will serve as 1 of the 3 pilot sites of the Optibids ICON project (budget €4.503.404; grant €3.000.608).

The current results exceed all objectives:

- The self-consumption rate now stands at 68%. The tidal power plant will probably have a negative impact, but the energy hill largely compensates for this so that the objective of 65% is most certainly achievable.

- The reduction of the ecological footprint (predetermined 10%) already stands at 23.5% due to the integration of external renewable energy sources and storage opportunities.

- Energy costs have been greatly reduced by 14.6% compared to the expected 8%.

Moreover, the EU H2020 Creators project has started to roll out the concept with demonstrations at 10 different sites spread over 7 countries and involving 500 SMEs. The focus is on standardisation, forms of financing, setting up energy communities, and making the social context of the applications economically feasible. As one of its final objectives, De Zaat in Temse wants to achieve the CO_2 certification.

Smart Business Area of the Future

Consortium: Engie Electrabel, Quares, Intervest, and Continental

Budget: € 5.044.033
Grant: € 1.979.841

A feasibility study in 2018 positively answered 2 key questions:

- Can the consortium of 4 partners set up a renewable energy community (REC) in the Mechelen Noord business park and guarantee a more stable distribution network?
- Can the storage capacity of electric vehicles, in combination with local energy storage, be used as a reliable peak power plant?

In early December 2019, a living lab was launched to show that sharing and valorising green energy can increase the penetration of renewable energy sources and electrical storage at a lower social cost and that network congestion on the distribution network can be avoided. The 8.5-hectare Mechelen Noord business park has 20 medium voltage cabs, a peak power of 5.2 MW, an annual consumption of 23 GWh, and 3,200 parking spaces.

Within the project consortium, there is ample focus on establishing an energy community. The interest of the participating members from Mechelen Campus is very high, and the mapping of their user profiles in combination with the installation of charging infrastructure is still ongoing.
The connection of solar panels will happen in a follow-up phase.

Parallel to this, an industrial site in Herentals that is currently under construction by Intervest, has also shown interest in this project. Since specific assets, including solar panels, will be installed here more quickly, the possibility of establishing an energy community has also been mapped out, with special attention being paid to the legal interpretation of the energy community. To date, there are still a number of legal restrictions, but engagement with Fluvius and the regulators is essential to realise an appropriate working structure.

Currently, the installation of the hardware components (digital meters and sensors, solar panel installations, EV charging stations, etc.) is being finalised and data capture and processing have been started.

At a later stage, the energy management system, offset system, and business model will be tested and implemented.

Energytix

Consortium: IRC.be, Energytix BV, and SDM

Budget: € 1.690.267
Grant: € 845.134

This project focuses on designing a platform that can support the operation of full or parts of energy communities from start to finish. To achieve this, the project will develop and test the 'energytix.cloud' platform.

It brings together companies, individuals, politicians, and other actors in the initiation phase to conduct studies that contribute to the development of a sustainable energy network.
The project also enables the smart management of renewable energy throughout the operation of the energy community. Users can identify, activate, and then closely monitor their energy infrastructure on the platform.

The web platform has a number of unique features:

- The system is easily scalable and applicable to different sizes and types of energy eco-systems;
- The workflows are intuitive and easy to follow for all users;
- Bi-directional communication is possible on the platform for an infinite number of assets; and
- Other external services can be easily linked.

Energytix.cloud uses AI, machine-to-machine communication, and machine learning to create forecasts of energy production and consumption. These forecasts are based on historical data of the transmission and distribution grid, the energy market, own active installations, local weather stations, and more.

Self-learning algorithms predict the energy production and consumption every 15 seconds to minimise the imbalance on the grid and control the installations as efficiently as possible. If an imbalance does occur, it is added to the data set and taken into account in future calculations.

To make the model more tangible, it uses a simulator that works with a digital twin. Using hardware controllers, simulation of all existing installations in the energy community is possible. In this way, future energy production and consumption can be accurately simulated making this a valuable tool that increases accessibility and simplifies the study phase.

The project is unique in its existence due to the specific combination of state-of-the-art technology and its intended purpose. For example, it is possible to measure, analyse, predict, and control in one platform. In addition, the project is applicable both to industrial and private users, as well as to any set-up of energy community.

After a successful research phase, it appears to be possible to develop all the intended features for the platform. 'Energytix.cloud' is now ready to be further commercialised.

Privateflex

Consortium: Smappee, Centrica Business Solutions Belgium, AE, NXP Semiconductors Belgium, and KU Leuven

Budget: € 2.650.152
Grant: € 1.850.535

Flexibility (Flex) from household appliances or batteries must be aggregated across hundreds of households to achieve volumes that are tradable on energy markets or to provide ancillary services with it. A home controller determines the local available flexibility, but users aren't keen to share that raw data easily. Still, the aggregator needs to know the total amount of flex in the system in order to deploy it efficiently. Customers also need to know how much flex is deployed and when, and this must be verifiable.

A solution to this is to compute flex on encrypted data (COED). The project, therefore, aims to:

1. Design security, communication, and process architecture on the local e-management system;
2. Evaluate the COED algorithm for flex computation without releasing local data outside the household. Flexibility is determined via machine learning;
3. Maintain privacy via homomorphic encryption and secret sharing information ('shares');
4. Carry out demand management via specific coordination strategies;
5. Design efficient methods to activate flex, scalable to 1000+ clients; and
6. Define a mechanism that rewards households for their flex commitment, without releasing private data.

Privateflex is developing a scalable and privacy-friendly 'energy-flex-trading' methodology, which will increase customer acceptance of demand response (DR) programs and the evolution toward a smart and sustainable energy grid. For privacy protection mechanisms, implementation has shown promising results for both the non-disclosure of individual data and also the acceptable calculation times and communication costs that allow for sufficient scalability.

In the current proof of concept (PoC) phase, the project is implementing the solution in a series of households in Belgium. This PoC will demonstrate the effectiveness of the algorithms and encounter and mitigate the thresholds and barriers to maximise user participation. This knowledge and experience will lay the foundation for higher Technology Readinness Levels (TRL) solutions that will allow cross-sector developments for consumers other than residential consumers and prosumers. These solutions will be integrated into existing customer systems for cost-effective GDPR compliance to bring residential flex to market in higher volumes.

A privacy-friendly reward scheme has been developed, as well as a local verification method that uses data from the digital meter to determine whether the requested flexibility was really activated. The project will enable future energy communities to have a better understanding on reference architectures, more insights into customer behaviour, and increased opportunities for network optimisation. Specific questions from new or existing customers within the energy & utilities sector can be solved.

The new market processes (energy sharing, P2P sales, trading flexibility) need to go beyond GDPR rules in terms of privacy to trust the participants of these market processes, either as individuals or as members of an energy community. Thanks to Privateflex, we are working on inherently better solutions that include privacy-by-design and COED.

Realisation of the Sustainable "Vlaamse Staak" in Opwijk

Rolecs demonstration

This pilot project, supported by the Flemish Region, in collaboration with POM Vlaams-Brabant, the municipality of Opwijk, Haviland, Th!nk E, Powerdale, and Wattson, aims to realise a sustainable energy concept for the De Vlaamse Staak SME business park. Due to the high cost to extend the natural gas network to the business park, alternative sustainable energy concepts were sought.

The feasibility of various alternatives was studied by Wattson, Th!nk E, Boydens Engineering, and Fieldfisher. A geothermal-based grid was not eligible due to the excessive investment cost. Heating the buildings based on heat pumps and solar panels was the alternative put forward as a sustainable solution. Awaiting the possible establishment of a renewable energy community (REC), an ESCO-light approach will be provided that optimises the energy concept for each SME. It is important that Wattson gives advice on the realisation of the heat pumps and solar panels concept starting from the design phase of the building so the sizing of the concept elements can be based on the specific energy needs of each SME. Wattson finances and manages the heat pumps through monitoring, control of energy performance, and maintenance.

The monitoring system has been developed along with Powerdale and Th!nk E and aims to optimise the energy consumption of every SME. By monitoring, Wattson gets insights into the SME's effective energy profiles, which is an important element in transforming De Vlaamse Staak into a REC.

If this potential exists, combined with more clarity on the fare structures and modalities, the business case will be reviewed to finally decide or not to decide to transform De Vlaamse Staak into a REC.

As a result of Corona, the sign-up of De Vlaamse Staak has been slower than hoped for, with only 4 SMEs entering into a partnership with Wattson. In 2021 and early 2022 the energy concepts were implemented, and the heat pumps became operational in the SMEs.

SELFIE

Interleuven, DCINERGY, De Watergroep, HoCoSto, i.Leco, Imtech, Matthys en Partners, and Powerdale

Budget: € 4.949.407
Grant: € 2.142.720

In order to achieve the EU climate objectives, buildings need to be highly efficiency and self-sufficient from an energy perspective. When using heat pumps, it is not possible to develop energy-self-sufficient buildings due to the high demand for energy when solar energy is scarce. The aim is to demonstrate that developing energy-self-sufficient buildings and low energy consuming sites and neighbourhoods relies on maximising the use of heat as a sustainable CO_2-neutral energy transition source while simultaneously maximising the energy efficiency of the buildings themselves by reducing electrical losses.

The key to achieving this goal is the integration of different energy components:

- Renewable energy sources, e.g., solar panels, solar collectors, and heat, to generate 100% of requirements;
- Heat storage that fills during the summer for use in the winter. One option here is to store residual heat from cooling buildings;
- Energy storage to increase the flexibility of the energy system by using the available network capacity more efficiently;
- An autonomous DC microgrid; and
- An energy management system to control thermal and electrical power, with the ability to convert energy forms when needed.

The 2 innovative technologies (heat and DC) will be integrated and used at the building and site level in combination with comprehensive energy management.

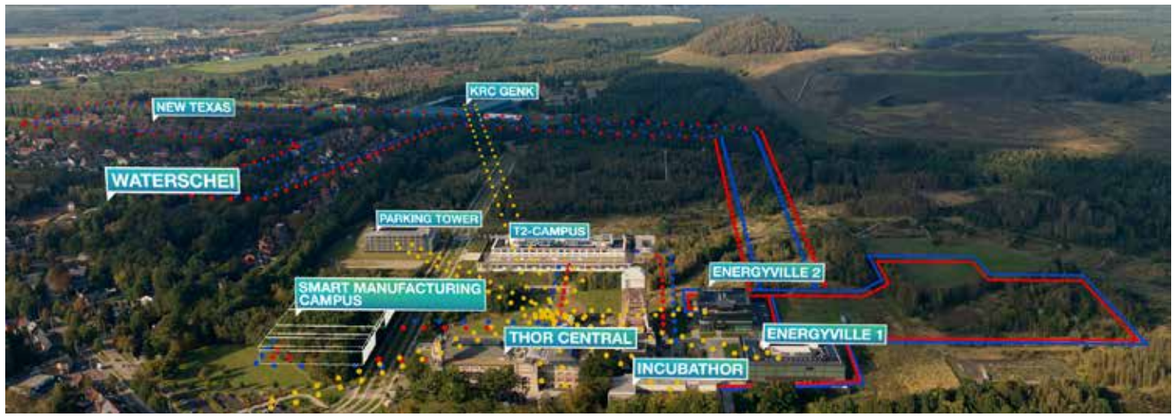
In order to demonstrate the set objectives, an energy-self-sufficient (office) building of 6,000m^2 will be realised, followed by the application of the concept in the new Keiberg-Vossem business park in Tervuren. To ensure thermal comfort, the building has adopted an innovative thermal system that converts heat to electricity and electricity to heat.

Thermal energy is captured in summer, buffered, and released in winter to achieve a comfortable indoor climate in all seasons. A system of active cooling and passive heating is established that operates, during the winter period, with a minimum of electrical power. The power generated in winter is mainly used to drive the circulation pumps, underfloor heating, lighting, and fans.

The main innovation lies in the adoption of a DC microgrid, which should provide the highest levels of energy efficiency and be able to operate autonomously. At the same time, a fundamentally new electrical architecture is proposed for the office spaces: a safe-to-touch DC nano grid. The overarching energy management system integrates all energy flows that occur on the thermal and electrical levels in a detailed simulation model. The energy management system is fundamental to operating all assets to achieve self-sufficiency and energy efficiency. After modelling, implementation, monitoring, and evidence-based tuning, the model will provide better valorisation and energy self-sufficiency.

The works are currently in progress.

oPEN Thor Living Lab



From a past full of coal to a unique living lab for the future

Based on the challenges of the future and with a clear focus on climate ambitions, Thor Park and its surroundings have become a unique living lab for technology, energy, and innovation.

The fertile ground for this living lab can be found at EnergyVille, a collaboration between research partners VITO, KU Leuven, imec, and UHasselt who are developing the technologies and knowledge to support public and private stakeholders in the transition to an energy-efficient, carbon-free, and sustainable built environment.

The home base of EnergyVille is Thor Park, which in 2020 was recognised as the first no-regulation zone in Flanders. That recognition was the starting shot for a large-scale living lab in which the energy concepts of the future can be extensively tested. Today that living lab extends across the Thor science and business park, the Texas social housing district, the adjacent garden Waterschei district, and the buildings and grounds of KRC Genk, making it a unique ecosystem of residential, scientific, and industrial stakeholders, which serves as a lever for large-scale innovation projects, both local and international.

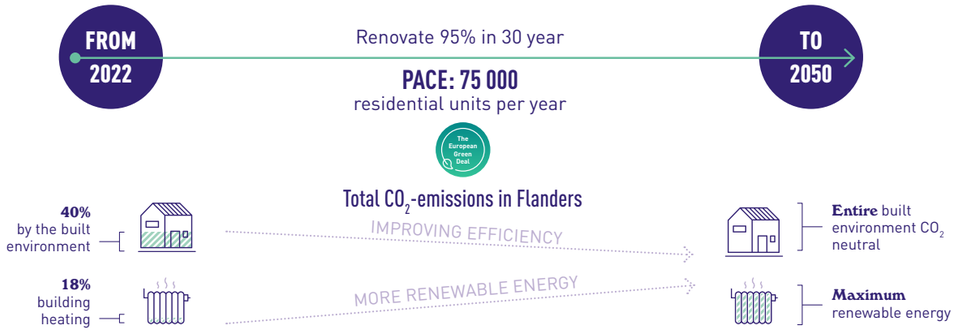
At EnergyVille in Thor Park, in addition to many (inter)national and European initiatives, various research projects are carried out with the support of Flux50. For each of these projects, there is intensive cooperation between the knowledge institutions and companies.

The focus is on different disciplines:

- Direct current (DC): projects with KU Leuven, VITO, Imtech, ABB, Th!nk E, Flanders Make, BASF, Blueways, and Bekaert.
- Solar energy: projects with imec, KU Leuven, UHasselt, UGent, VITO, Azteq, Borealis, Soltech, and Laborelec.
- Digital substation: projects with KU Leuven, VITO, BASF, Tractebel, ABB, and Siemens.
- Privacy and servitisation of energy data: projects with KU Leuven, Smappee, Centrica, AE, NXP, Calculus, WTCB, VITO, June, and BaoLiving.
- Energy communities and microgrids: projects with VITO, KU Leuven, imec, UGent, VUB, Th!nk E, ABB, Wattson, ThermoVault, KBC, Energent, 3E, Ducoop, Farys Solar, Ingenium, Electrabel, Quares, Laborelec, Openmotics, Metha Advocaten, Blixt, Magenta Tree, 70GigaWatt, Fieldfisher, Powerdale, Antea, Aspiravi, C-Valley, and Fluvius.
- Renovation: projects with VITO, imec, UGent, AGC Mirodan, Avineon, June Energy, and Zero Emission Solutions.
- Sustainable, smart buildings, and cities: projects with VVSG, Flux50, Agoria Smart Cities, Ahrend, EcoSource, Junovation, Camp C, Th!nk E, and VITO.
- Energy flexibility in the industry: projects with VITO, KU Leuven, and Ghent University.
- Electric mobility and smart charging: projects with KU Leuven, VITO, Blue Corner, Alfa Technical Installations, Multiobus, Nextensa, and MOVE.
- Advanced design and optimisation of heat exchangers with additive manufacturing: projects with VITO and KU Leuven.

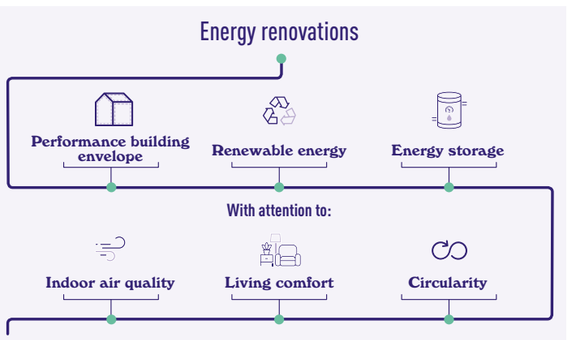
Ambition

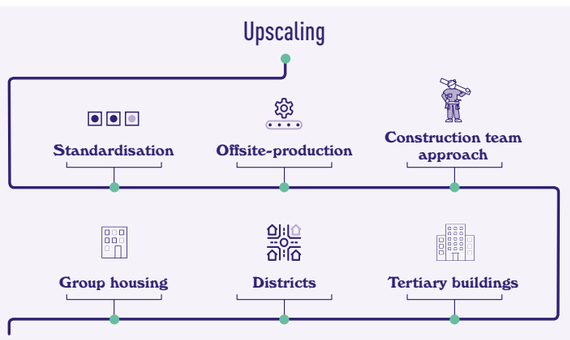
It is crucial that Flanders substantially reduces the CO_2-emissions from the built environment. This can only be done by accelerating and scaling up energy renovations.



Flux50 scope

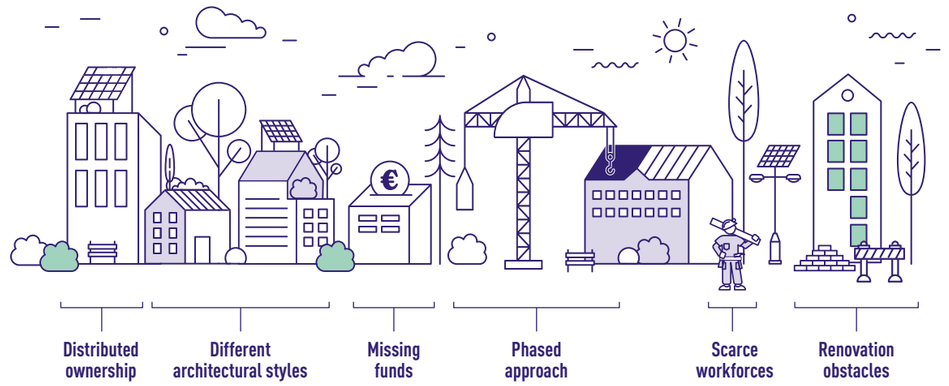
For a successful upscaling and acceleration of renovation there are several bottlenecks that need to be resolved.





Points of intrest in Flanders

Climate neutrality on the building or district level requires an integrated energy approach that pays attention to comfort and quality of life. This integrated approach for upscaling is both technical, organisational, and financial.



Flux50 ambition and actions

A direct action plan for the coming years was established to maximize upscaling of renovation from an innovation point-of-view.

ACTIONS 2022/3

- **Integration** of construction teams & systems
  - > Inspiration session with cases
- **Innovate** "One-stop shops for renovation"
  - > Co-creation event with players from the value chain
- **Facilitate** of collective pilot projects
  - > Lessons-learnt from ongoing pilots
  - > Overview of potential cases with decision makers and developers
  - > Apply innovation and integration concepts
- **Finance** Developing new models
  - > Workshop "financing innovative renovation"

GOAL 2025

- **Development of new renovation models**
- **Establishing living labs**
- **Policy supportive**

Impact

There is a huge economic potential for all parties in the value chain from these renonvation ambitions.

VALUE CHAIN

Economic Upscaling

1. **Decision and investment**
   - > Cities & towns
   - > Public housing companies
   - > Developers
2. **Financing**
   - > Banks
   - > Project developers
3. **Concept**
   - > Engineering consultancies
   - > Architects
4. **Execution and supply**
   - > Construction companies
   - > HVAC Techniques
   - > PV
   - > Building materials (sustainable & circular)
5. **Maintenance and "energy-as-a-service"**

At an average of **€ 50.000 per renovation** and **€ 600.000** collective **housing units** to renovate in **30 years**
= €30 BN.

Intellovate

Consortium: Creamo Sustainable Business Creation, Bast Architects & Engineers, E20, and Renotec

Budget: € 328.671
Grant: € 197.202

When offices are renovated, the main focus is on increased comfort, including ventilation, heating, and cooling. However, the installation of ventilation ducts in office spaces is often considered a waste of space.

Incorporating them into an insulated facade would be an asset as it has a minimal impact on space utilisation (and therefore rental income). In fact, it adds value which can justify the increased cost of implementation. The offsite prefabrication process of the facade elements also ensures a shorter construction time and optimal planning can even avoid complete rental vacancies.

The Intellovate building concept successfully demonstrated these objectives with a mock-up. The prefabricated panel with joinery and the necessary ventilation ducts caused no loss of insulation value. The placement of the ventilation ducts on the outside requires special attention to connections and mounting techniques and the removal of the facade's external cavity wall is necessary, which causes minimal disruption at the outset. On the other hand, on site only limited time is required and work can be carried out without scaffolding. The rapid renovation, limited disruption, and high-quality facade finish allow building owners to make significant profits when renting or selling.

The concept is ideal for flat and uniform facades with central ventilation. Office buildings from 1975 to 2006 that meet these criteria are the most eligible for the Intellovate concept.

The mock-up has since been assembled at Renotec's subcontractor, Jonckheere Projects.

The annual increased renovation potential of large office buildings is estimated at approximately 10%, or 100 office buildings per year. The market share captured by the consortium of 10% led to approximately 10 renovation projects. In the period from 2025 to 2050, a total of 272 buildings could be realised with Intellovate. This means a total turnover of

€544m over a period of 25 years, or €22m on an annual basis over a period of 25 years, accounting for 11 renovations per year.

The next step is to validate the concept on a demonstration building. A pilot-scale demonstration is an appropriate project type to take this next step.

The Social Energy Jump (SEJ)

Consortium: Enervalis, BAM Interbuild bv, VEB, Cordium cvba, and Energinvest bvba

Budget: € 1.506.992
Grant: € 763.764

The "Social Energy Jump" (SEJ) project aims to tackle the large backlog of renovations in public housing in Flanders in accordance with the 2050 climate objectives. Specific to this approach are the speed of renovation and the limited impact on the residents during the process.

There were 3 central research questions:

1. Can a thorough and climate-neutral renovation model be developed for public housing estates in Flanders in order to achieve the short and long-term climate objectives?
2. What are the technical and operational characteristics of such a performance-based energetic renovation compared to the conventional renovation approach?
3. What alternative and innovative financing possibilities are available that offer solutions to the global budgetary challenges of the housing companies, the Flemish Agency for Social Housing (VMSW), and the Flemish Government?

The Social Energy Jump (SEJ) model
The SEJ model offers an integrated one-step renovation that leads to climate neutrality, with an optimal business case compared to a conventional renovation path that requires a second renovation after 20 to 25 years. The technical renovation model is based on 'off-site' prefabricated wall and roof panels (including windows, doors, and solar panels) and an energy module with a heat pump and control software. Operationally, a set of 2 to 4 houses can be renovated in about 10 days instead of the several months required by the conventional renovation process.

A great deal of attention is paid to the needs and the comfort of the residents during and after the renovation. This requires extremely detailed preparation and very good (almost daily) communication with them.

Financing possibilities
The financing solutions will be further analysed, with attention to the specific needs of the social housing companies, the VMSW, and the Flemish Government. Here, specific attention is paid to non-balance sheet results that could be realised by performance-based models like energy performance contracting (EPC) which works with a bonus system. KPIs are set in advanced and monitored after the renovation, resulting in the contractor being awarded when KPIs are met or fined if they're not.

Also linked to the project is the renovation of SHM Cordium's 4 public housing units in Hoeselt. This pilot project is already showing a positive impact by reducing energy consumption for heating by an average of 85% and visibly increasing user comfort. This, together with good communication and cooperation, has resulted in a high level of satisfaction among the residents. Based on the project in Hoeselt, policy recommendations will be formulated for the Flemish Government so that the SEJ can make up for the lost time. The next step within this project is to scale up the 4-house pilot project in Hoeselt to the district level. In time, this project could potentially be expanded to all public housing in Flanders (end of 2020: +/- 173.000 homes).

Monumentmeter

Consortium: Gadgeon Europe, Ingenium, Itho Daalderop, Zerofriction, and Option (Crescent NV)

Budget: € 327.819
Grant: € 196.691

Historic buildings, because of their heritage value, can rarely undergo a thorough renovation and even the implementation of small energy-saving measures is subject to conditions.

With this in mind, the Monumentmeter project wanted to investigate the following questions:

1. Is it technically and financially feasible to reduce CO_2 in a historic building by using modern IoT products while respecting the requirements of the Monuments and Sites Department?
2. Is the billing of energy costs according to usage possible for very limited rental periods (days or weeks)?
3. Can a CO_2 calculator be built based on the results of the answers to the first 2 questions? This would estimate the reduced CO_2 emissions of a historic building so this potential could be replicated for 3 other historic buildings.

In the first phase, the consortium successfully worked out a number of theoretical concepts and translated them into the first version of the calculator. However, when implementing the IoT technology, a number of technical problems emerged:

- The complexity of placing calorimeters during the winter period without depressurising the installation.
- The installation of smart thermostatic valves that are not suitable for temperatures of 90°. These temperatures are still frequently found in the central heating installations of historic buildings.
- The integration of new technologies into existing installations of different manufacturers.

The required components and important preconditions to achieve a valid business case were investigated. Several alternative uses with corresponding energy optimisations were compared, with the selected scenarios applied in the real-life context of the National Bank building.

The initial aim of the project was to achieve a 10-20% reduction in CO_2 emissions through reducing energy consumption within the context of historical heritage. However, in the pilot building, the cost of implementing the techniques was much higher than the savings achieved. The technical difficulties in installing thermostatic valves, the compatibility of the components, and the complexity of implementing wireless technology were at the root of this less favourable financial business case.

However, Gadgeon's Building Management Software (Delpheon) was paired with Option Cloudgate to manage electricity, heat, and air quality sensors during implementation. Thanks to this project, Gadgeon Europe and Option commercialised this linkage into the Gadgeon Air solution. The Covid19 issue accelerated the demand for this sensor to measure and manage CO_2, temperature, humidity, and air pressure. Gadgeon Air is now being used outside the context of historic buildings. The project provided a significant acceleration in the development of this technology.

Digital Twins For Upscaled Retrofits (DITUR)

Consortium: AGC, Avineon, June, Zero Emission Solutions, EnergyVille/Vito, imec/SMIT, UGent – IDLab, and imec-mict-UGent

Budget: € 3.808.874
Grant: € 2.626.016

The objectives for the construction industry are clear: CO_2 emissions must be reduced. Energy consumption has to fall, which can be achieved through more efficient techniques and installation in combination with better-insulated buildings. The EU states that the biggest challenge for reducing energy consumption in buildings lies in increasing the rate, quality, and efficiency of building renovation.

The Digital Twins for Upscaled Retrofits (DITUR) project explores the potential of data analysis, using digital twins, to support the renovation challenge of today's housing stock, throughout the renovation process from identification to realisation, including optimisation of process efficiency for the actors involved in the building process. To achieve this, it is necessary to investigate how detailed the data models should be and what the costs and benefits are of such intensive data acquisition and analysis.

Initially, the digital twin would serve 2 purposes. It should be a tool to provide tailored insights to residential owners regarding the energy savings potential for specific and clustered buildings. In doing so, the digital twin can be a digital marketplace for energy-related inventory data and data analysis. As well as the development of the digital twin itself, applications will be examined and insights built up to the involvement of citizens (building owners) in the process.

Part of the DITUR project is the investigation of possible valorisation approaches of the digital twin model to support the renovation, as well as the possibilities of scaling up to more cities and regions, involving market players, and internationalisation.

Building Service Platform BSP4ESCO

Consortium: Calculus, Beneens, Benetech, and Solutes

Budget: € 523.961
Grant: € 258.528

The development of a Building Service Platform (BSP) aims to support the accelerated renovation of the Flemish building stock and to stimulate the more efficient use of energy. This can be done by providing stakeholders with more insights and

tools and by using the EU building sector's declining workforce more efficiently. Following a successful feasibility study, this pilot project also explores whether the BSP is also key to new business models for building ownership and sales.

The BSP enables energy savings by combining AI and the data generated by closely monitoring comfort, air quality, building occupancy, user behaviour, and external weather indicators. It also enables reducing the sizing of HVAC systems without the loss of comfort.

BSP realises the possibility of financially tracking building management through an energy service company (ESCO) model. The feasibility and profitability of the ESCO contract can be monitored and controlled in real-time. In an ESCO model or a full Design Build Finance Maintain and Operate (DBFMO) contract, the one-time fixed-price sale is replaced with a fixed price throughout the building's lifecycle for both construction, maintenance, and energy consumption.

During the project, the project partners also successfully deployed some sustainable building trends such as cross laminated timber (CLT) and borehole energy storage (BES).

Buildings can be built faster, cheaper, and more sustainably thanks to BSP. Energy consumption can be reduced by up to 15%, as can operating costs over the entire life of the building without loss of comfort. In addition, the lifetime of the HVAC installations can be extended by up to 20%.

BSP creates new business opportunities in the form of ESCO contracts. This model can be a financial lever for the installation of renewable energy sources and energy-saving techniques.

The BSP concept opens up commercial opportunities for each of the project partners in their area of expertise.

DAPPER Developing Applied Building Photovoltaics for Performance and Reliability (DAPPER)

Consortium: KU Leuven, imec, UHasselt, and UGent

Budget: € 2.144.216
Grant: 100%

The Developing Applies Building Photovoltaics for Performance and Reliability (DAPPER) project started on June 1, 2021, and seeks an answer to the following questions:

- How can we increase the reliability of photovoltaic systems integrated into buildings, the so-called Building Integrated Photovoltaics (BIPV)?
- How can we improve predictions of the energy generated by solar panels in or on top of buildings?
- How can we facilitate smart monitoring, predictive maintenance, and energy management?

Here we look for new designs of facade-integrated PV panels and their power converters and new concepts for optimal integration in building facades, as well as searching for the right choice of components and design rules. We develop data-driven models and digital twins that enable constant monitoring and performance prediction, detect deviations early, and better predict mutual interactions. A physical model with PV panels in the building will enable better designs of buildings with BIPV and better performance predictions, including lifetime effects. We are looking for data analysis procedures that can be implemented in building energy management systems in combination with advanced sensors.

DAPPER is also connected to related projects such as SolSThore (SALK/EFRO), PV OpMaat (Interreg Flanders/NL). Thanks to the results of DAPPER, Flemish companies in the building sector will be able to make better predictions about the performance of PV systems provided in buildings, making their concepts less risky. By gaining more insight into the factors that influence the reliability of such systems, smarter component choices can be made, which will result in better designs. Monitoring energy output to reduce operational losses is standard for large-scale PV installations but is so far too expensive to be applied in smaller systems, e.g., on buildings.

The results from DAPPER will help to lower this threshold by enabling integration into energy management systems, which are being implemented in more and more buildings.
The construction of new BEN buildings and the comprehensive renovation of existing buildings has a huge leverage effect on energy consumption, as buildings today consume about 40% of our energy. The application of photovoltaic technology plays an important role in these works. By making them more efficient, DAPPER significantly supports job creation in the construction sector.

A partner company is planning a new production site in Thor Park in Genk, where BIPV modules will be produced locally, especially for the construction sector, and we are supporting them by sharing the project's results.

Mobile Green Energy system

Consortium: S2ENSO, Creamo, ACT Research, Karybel, Cast4all, and KBC (without aid)

Budget: € 293.120
Grant: € 146.561

A green energy system could offer a more sustainable alternative to the use of noisy and smelly diesel generator groups for events. It could also support municipalities in their pursuit of the electrification of their urban fleet and the storage of renewable energy. Cities and municipalities need support and solutions for their energy transition. A mobile battery system can be used by the city for different applications such as temporary charging stations, energy supply at festivals, energy storage of solar energy surplus, and the supply of network support services.

The consortium has joined forces to prepare a feasibility study to develop the necessary knowledge and insights. Technological exploration gives the design conditions for electric and mechanical plans. A market survey shows who the customers are, how these customers can be reached, what their needs and requirements are, and which business model and business case can be identified. A first system design of the Mobile Green Energy System (MGES) shows that it is technically possible to meet the requirements identified in the market exploration. It is also important to include research of the regulatory framework: what standards and rules should be complied? Are there any regulatory restrictions that makes it impossible to release this into the market?

Discussions with the cities of Ghent and Antwerp clarify that no positive business case is possible due to the small number of times the MGES would be used. The priority is given to the use of the distribution network.

Based on the climate and environmental objectives, low emission zones, and the need to avoid odour and noise pollution from using diesel, the consortium sought alternative sectors. Construction companies and event organisers were interested in reports on the carbon footprint, the cost of electricity supply, the submetering for irregularities, and the permanent alarms for temperature, water flow, and diesel consumption. Since knowledge about electricity proved to be insufficient for further

analysis, measurement campaigns on construction sites and events were carried out by implementing a specific MGES visualisation platform.

The acquired knowledge showed that a tower crane on a construction site would be an ideal testing ground for the MGES battery. Near Grid Solutions was founded in order to commercialize the MGES. The Green Box is more than a battery, it's an energy solution for the contractor. Near Grid Solutions develops energy solutions to connect electrical systems to the distribution network on locations where the distribution network does not have the necessary capacity.

The first mobile city battery was presented to the press and public at the Vandenbussche yard in Stekene on September 10, 2020.

Proeftuin XMPL / Snowball

Consortium: Smappee, Amplifino, and Yuso

Budget: € 2.897.729
Grant: € 1.291.492

Today, buildings are responsible for approximately 40% of energy consumption and 36% of CO_2 emissions in the European Union.

Today, buildings are responsible for approximately 40% of energy consumption and 36% of CO_2 emissions in the European Union. At the XMPL Living Lab at Snowball, a consortium is working to structurally reduce these figures. The consortium is a collaboration between software developer Amplifino, Home Energy Management System developer Smappee and energy supplier Yuso, assisted by UGent and Howest and with the support of the Spearhead Cluster Flux50 and VLAIO (Agency Flanders Innovation & Entrepreneurship).

The consortium is building a brand new and future-oriented energy management system based on artificial intelligence at Snowball. On the site, different types of new energy techniques have been installed, including cooling and heating the site with a 300.000-litre ice buffer, a 180kWp solar park, a 2.5 MWh battery to store surplus solar energy, and an AC/DC charging station for 50 electric vehicles. Furthermore, Snowball is equipped with a series of IoT sensors, from which 12 million data points are collected daily. These data are used to build forecasting models and algorithms.

Based on these models and algorithms, the entire site is monitored and controlled without any loss of comfort, resulting in significant savings in energy costs. The new energy management system goes even further: it is also a source of revenue by using its flexibility on the energy market. This is an additional benefit for the end-user from implementing the state-of-the-art energy management system.

Today, the consortium is working hard to validate and optimise the models. A duplicable product must be ready by September 2021. As a brand new Cleantech hub, Snowball wants to facilitate and promote sustainable entrepreneurship. 'Lead by example' is Snowball's slogan. The XMPL Living Lab fits perfectly in this picture.

Sustainable Thermal Energy

Ambition

The Sustainable Thermal Energy focus group investigates how the sustainability of thermal energy in the built environment can be accelerated. Heat pumps and heat networks are receiving special attention.

FROM 2022 → 100% sustainability **OF THERMAL BUILDING ENERGY** → **TO 2050**

85%
energy demand in the residential and tertiary buildings sector **for heating + sanitary warm water**

Growing demand for **cooling**

85%
energy demand supplied by **fossil fuels**

< 1%
applications are for **heat pumps + heat grids**

Heat pumps
Talk of town → **Action of the town**

Heat grids
Large-scale heat network initiatives
→ **making them future proof**

Flux50 scope

The scope includes thermal comfort as a whole with focus on existing buildings for various sectors.

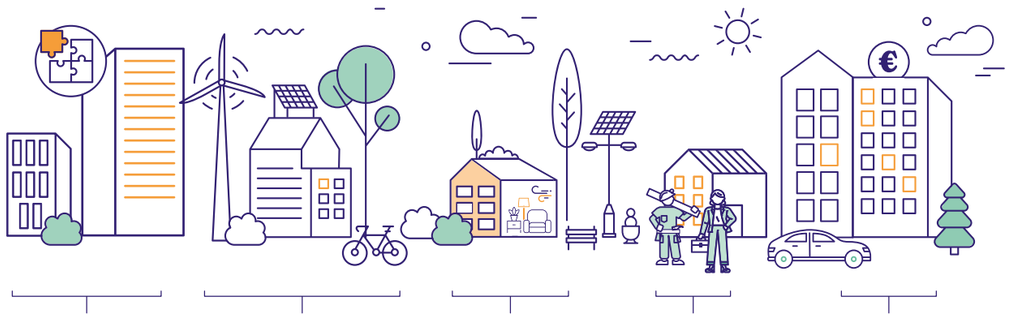
Thermal comfort
- Heat
- Cooling
- Airconditioning

Type
- 3,5 million existing buildings

Application
- Residential
- Small business areas
- Tertiary

Points of intrests in Flanders

For the transition to sustainable thermal energy, it is important to pay attention to several technical, financial, and societal needs.



Lack of systems integration
- Selection tools and dimensioning
- Intelligent steering
- Hybrid combinations without lock-in
- Integration in renovation concepts (low T)

Need to focus on sustainability
- Materials
- Refrigerants

End-user expectations
COMFORT:
- Healthy indoor climate
- Comfort-as-a-service
- No noise pollution
- Compactness

Need for training and motivation
- Customised training for installers
- Targeted motivation of project developer

Affordability & inclusiveness

Sustainable Thermal Energy

Flux50 action plan

To realise the intended ambitions towards 2050, a direct action plan for the coming years has been established.

ACTIONS 2022/3 → **GOAL 2025**

HEAT PUMPS

Inspire
> Deep dive "heat pumps in a one-stop shop for renovation"
> Inspiration session "hybrid heat pumps in an integrated approach

Facilitate
> Event: "Innovation meets market" (lessons-learnt from pilot projects)

Reliable investment
> In existing (Flemish) buildings
> For residents /project developers

Quality installers
> First pole
-> Enable full breakthrough

HEAT GRIDS

Positioning
> Roadmap meetings with large-scale heat grid initiatives

Consultations
> Input Heat Plan Flanders 2025

5 projects for 2025-2030
5 different cities with innovative heat grid breakthroughs in progress

Impact

A transition to "thermal energy" includes economic opportunities for all suppliers in the value chain.

VALUE CHAIN HEAT GRID & HEAT PUMP

Design
> Consultancies
> Architects

Supply of components
> HVAC
> Controllers
> Energy Storage
> Pipes
> PV
> Floor heating

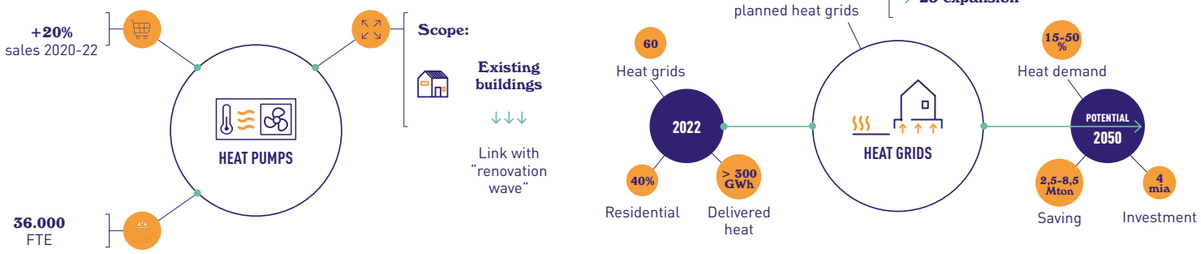
Service providers
> Energy suppliers
> Comfort as a service

Investment
> Property developers
> Public housing companies
> Cities and towns
> Energy-as-a-service

Distribution

Installation and maintenance
> Installers
> Maintenance technicians

The economic opportunities are reflected in investments to replace installations for both heat grids and heat pumps as well as in the need for a significant workforce for the installation and renovation sector.



Sailing Heat

Consortium: Shipit Multimodal Logistics, Fluviant, and Scheldewerf Rupelmonde; project preparation with Luminus

Budget: € 722.477
Grant: € 409.668

Total budget for project preparation >€10m
Expected support from VLAIO, and the Flemish Climate Fund €6m

With complementary feasibility studies, the sailing heat consortium addressed the following questions:

- Is connecting an industrial source of waste heat by ship to an urban network with an operating temperature <100°C environmentally, technically, and economically feasible and desirable?
- Is the connection of an industrial source of waste heat by ship to an industrial heat user with an operating temperature of 100 to 550°C environmentally, technically, and economically feasible, desirable, and safe?
- How can transport by ship be as energy-efficient and sustainable as possible?

Both feasibility studies yielded the result that the transport of heat by ship is environmentally, technically, and economically feasible due to the absent CO_2 avoidance cost, the high flexibility of application, and the speed and simplicity of implementation. The transport at higher temperatures is also interesting for industrial heat users who want a fast greening of their heat demand with a very low CO_2 avoidance cost.

The applications have been tested and validated at different cities and network operators (<100°C) and industrial companies (100-550°C). Transport by ship is very energy efficient due to the high energy density in the ship and the very low energy loss during transport. Also, the propulsion of the ship can be CO_2-neutral by using green electricity or hydrogen.

As a result, the consortium has a logistics concept, including a barge and loading/unloading infrastructure, ready for an application that loads, transports, and unloads heat up to 100°C for the city network. For the higher temperature range, there is a safe logistics concept, including transport solutions via road and inland navigation and loading/unloading infrastructure that loads, transports, and unloads heat up to 550°C at the desired temperature between 60 and 550°C at the industrial customer.

These solutions aim to have a significant impact on sustainable thermal energy, specifically in the field of energy ports, by making urban networks sustainable to accelerate urban climate plans and as an affordable and sustainable alternative to natural gas for industrial customers.

The consortium has also recently entered into a partnership with Luminus to green Flanders' largest city network with an expected 5% CO_2 reduction as of 2023 as part of the City of Ghent's 2030 climate plan. It is the project's ambition, with the support of the city of Ghent and the Flemish government, including resources from the Flemish Climate Fund, to establish the start-up in Ghent in the short term. In addition, sailing heat is also included as a cornerstone of the heat map for the city of Antwerp. At the same time, the consortium is investigating how the development of city networks can be accelerated through the flexible use of inland navigation for other cities.

Finally, various industrial sectors such as construction, food, and chemicals show great interest in this multimodal approach. The highly developed infrastructure for inland navigation and the high concentration of industry along this infrastructure are very favourable factors.

Community Hybrinator

Consortium: EnergieID, EnerGent, Efika Engineering, and Ecopower
Budget: € 330.872
Grant: € 161.260

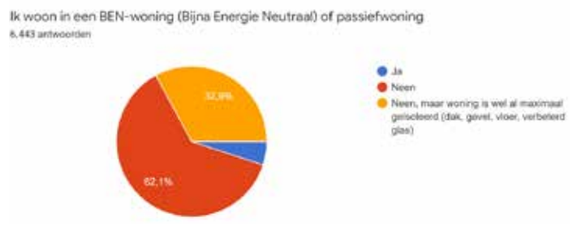
EU climate targets and current political events demand achievable and fast solutions to ensure we all become independent from fossil fuels. Residential customers are not carrying out extensive renovations and commercial heat pump solutions are often very expensive and have little compatibility with other brands' solutions. A more open and less expensive solution is required.

This led to the following objectives being set:

1. Calculation via analysis of the Flemish housing market, data analysis of EnergieID, and a survey of 60.000+ co-operators, Ecopower, and Energent, to determine the market potential of hybrid heat pumps;
2. Testing of 3 different hydraulic integrations of the hybrid heat pump. The hybrid heat pump with buffering as a thermal battery increases self-consumption and substantially replaces the share of fossil gas in existing homes; and
3. Research on smart control and aggregation to integrate hybrid heat pumps into a controllable energy community.

The large-scale data analysis provided a unique insight into Flemish living rooms about existing technologies and willingness to invest. It showed that gas boilers make up just under 70% of heating appliances, high-temperature emission with radiators or convectors are used more than 95% of the time, and that, even for motivated co-operators, it is not obvious that a comprehensive renovation is necessary.

A relatively limited intervention such as a hybrid heat pump, therefore, appears to be one of the best alternatives for quickly reducing CO_2 in existing homes. A heat pump can be coupled to an existing gas heating system to create a hybrid heat pump with flexible heat storage.



3 installations were successfully carried out and brought into operation. Depending on the chosen solution, 51% to 97% of gas was replaced by green electricity during the project. This result has since been further improved. In all homes, a self-consumption rate of more than 33% was achieved, with solar panel installations covering the entire consumption including heat pumps. With the current gas prices, the cost-benefit analysis has become positive for the end user.

The systems are controlled by an open-source smart home controller (COmmunity FlexibilitY box or COFYbox) to increase the self-consumption of renewable energy and to enable price-related demand management. This energy management system is being further developed in one of the largest community-driven developments in Europe. These developments should also enable a user to join a community-driven virtual power plant (cVPP) that enables civilian energy communities to offer collective flexibility services.

Finally, the project provided insights to support the evolution toward real-time energy delivery (Ecopower) and use in larger renovation projects (Efika).

Transition to Sustainable Heat

Consortium: Kelvin Solutions, Umicore, and Warmte Verzilverd
Budget: € 252.375
Grant: € 151.425

This project aims to develop a replicable methodology for moving from high-temperature steam-based heat to lower-temperature, renewable energy-based heat for industry. This transition strategy needs to meet technical and financial challenges and risks, resistance to change, and many other obstacles.

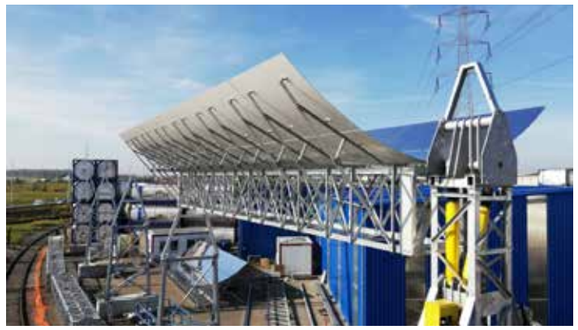
In the first phase, a study was conducted on the typical processes and temperature regimes in 5 different industries. This is in order to refine existing insights and expertise. Flemish and international best practices were screened on their technical solutions and financial model, as well as on critical (non-technical) preconditions for the approval process. In the second phase, together with industrial process experts, we focused on those critical decision criteria and possible solutions in transition strategies. The outcome was translated into a standard methodology, which was applied in the third phase of a practical study.

The application and testing at Umicore and a large pharmaceutical company in Puurs were extremely positive and created the necessary impact. It provided the pharmaceutical company with a clear and well-founded vision of the future for the realisation of its internal sustainability objectives in combination with its expansion plans in Puurs. At Umicore, it provided the necessary buy-in from management and the corporate level and also freed up the necessary budgets and even increased internal sustainability ambitions.

The impact of the projects is estimated at €20-40m and €10-20m respectively. The ambition is a CO_2 reduction of more than 30%.

The developed methodology is currently being actively applied in other industrial companies including imec, Kaneka, Aurubis in Olen, and Metallo (Aurubis) in Beerse. For Kelvin Solutions, the developed methodology is an innovative asset that supports their further economic development. Socially, this project contributes to the transition to sustainable industrial heat.

The Concentrated Solar Power (CSP) Installation



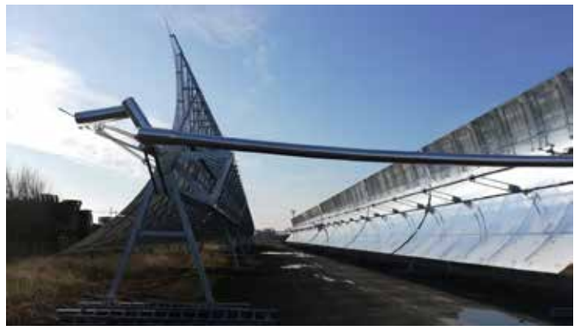
Feasibility study
Consortium: Azteq, Tractebel, and Port of Antwerp
Budget: € 112.491
Grant: € 49.996

ICON Project
Consortium: imec, EnergyVille (KULeuven and VITO), Borealis, Soltech, and Laborelec
Budget: € 1.656.408
Grant: € 1.219.506

Concentrated Solar Power (CSP) installations that produce industrial process heat up to 400°C, seem to make little sense at first sight in Flanders. Azteq, in collaboration with Tractebel and Port of Antwerp, has refuted this assumption in a feasibility study facilitated by Flux50. There are sufficient full load hours in Flanders (950 hours) to potentially offer this technology.

Azteq's solar thermal installation bundles the sunlight in the focal point of parabolic mirrors where oil is heated. Through a heat exchanger, this heat is transferred to industrial processes or temporarily stored in a buffer vessel. To absorb as much sunlight as possible, the mirrors follow the sun during the day.

Thanks to the feasibility study, which was carried out with the support of Flux50, 3 pilot installations were mapped out and financially supported by the Flemish government.



These 3 installations are now operational. In Kallo at ADPO, the installation ensures the storage of heated liquids at temperatures above 140°C. In Ostend, it provides heat at 180°C for the chemical company Proviron. Later the EnergyVille test facility in Genk will follow for further research into heat networks and ORC installations.

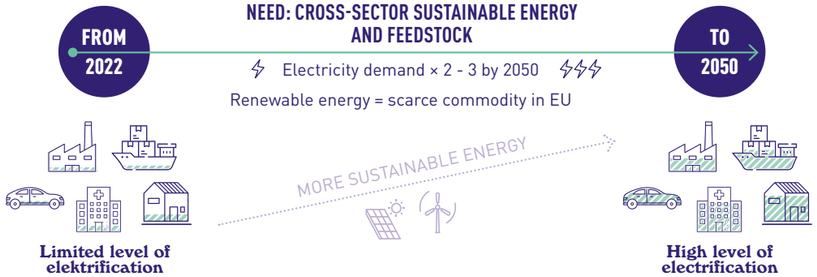
Technology is constantly evolving. Together with imec (EnergyVille), further thought was given to taking full advantage of the used surface. Due to the combination of the solar thermal mirrors with solar cells, both heat and electricity can be generated. This is currently being investigated by both parties in cooperation with Borealis, Soltech, Laborelec and VITO (EnergyVille) in an interdisciplinary cooperative research project supported by Flux50 and Catalisti (the cluster organisation for the chemical sector in Flanders). This research will provide expertise to the companies which they can also apply in other domains such as glass-free or building-integrated solar panels.

In case of a successful test phase of the prototype setup, further development of the production device, in particular of the coating line on an industrial scale, will be required. Preferably for this purpose, a new production unit is targeted in Flanders. The potential market for the integrated CSP+ mirrors is mainly in Spain, but also increasingly in the Middle East, North Africa, and South America.

Large-scale Energy Storage & Security of Supply

Ambition

In orrder to make the growing electricity demand sustainable, a major increase in renewable energy is needed. This focus group examines how we should innovate large-scale energy storage and security of supply.

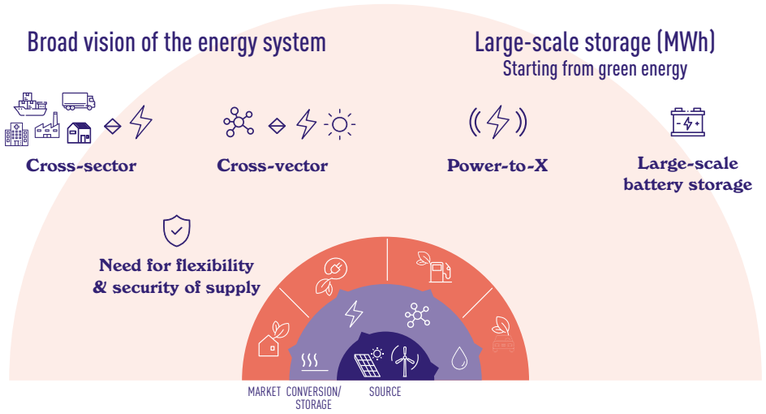


AMBITION

- Optimal mix energy flexibility, adequacy, import of molecules
- International competitiveness of Flemish harbors
- Sustainable Security of Supply

Flux50 scope

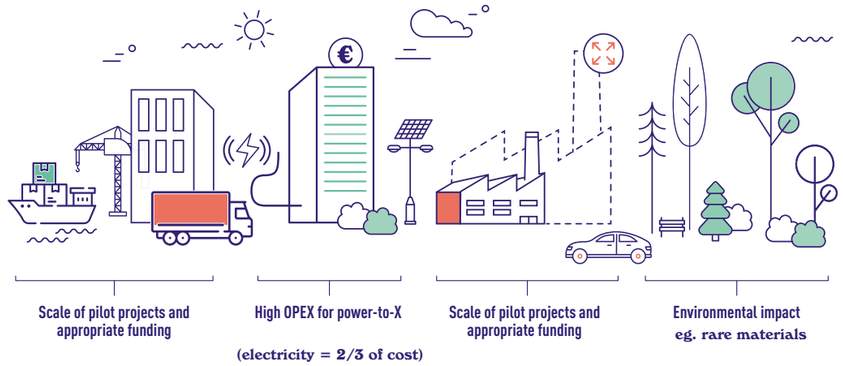
The scope focuses on a broad vision, of the energy system and storage, and elaborates on the role of various energy storage options in this broader framework.



Large-scale Energy Storage & Security of Supply

Points of interest in Flanders

A broad vision calls for cross-sector and cross-vector energy plans and related (large-scale) investments.



Flux50 action plan

Overarching cooperation (also with other spearhead clusters) is central in the established action plan for the coming years.

ACTIONS 2022/3

- **Positioning overarching energy plan**
- **Innovation flow through to pilot projects**
  (e.g., Power-to-X, battery storage)
- **Co-organisation of a stakeholder event**
  > International energy import value chain
  > Role of energy and molecules

GOAL 2025

- **Innovation in concrete cross-sectoral energy plan**
  > Phased approach
  > International context
- **Energy import value chain**
  > Minimum 1 being carried out
  > International

Cooperation between clusters

Impact

Investment projects in this domain are typically large-scale infrastructure projects that may even have an international dimension. They are crucial for our harbors as a whole.

VALUE CHAIN

Concept
> Study, engineering agencies

Transport & conversion
> Harbour companies
> Network operators for energy/molecules
> Shipping
> Producers of storage/conversion technologies

End use
> Energy suppliers, BRPs, aggregators
> Flemish industry (ETS-non-ETS)

Investment projects
(€5m up to > €50m)

IImport sustainable molecules:
H_2 import study
> 2035 110 TWh
> 2050 750 TWh

Coordinated Development of Hybrid Offshore Assets (CORDOBA)

Consortium: Elicio, Marlinks, Yuso, Enersynt, and KU Leuven; in partnership with De Blauwe Cluster

Budget: € 1.476.433
Grant: € 1.041.521

With a wind capacity of 4.890MWp, Belgium is one of the world leaders in terms of installed megawatts per capita of wind energy. Various Belgian and Flemish companies have developed unique knowledge over the past decades regarding the planning, installation, and operation of wind turbines, especially offshore wind turbines. It is even assumed that offshore wind capacity will increase by 5.000MWp by the end of the decade.

In the media, Tinne Van der Straeten, Federal Minister of Energy, also mentioned a possible additional cable connection or interconnector to Denmark, for which a study is now underway.

Given the importance of this branch of industry for Flanders, in 2021 De Blauwe Cluster, together with the companies Elicio, Marlinks, Yuso, and Enersynt, launched the coordinated development of hybrid offshore assets (CORDOBA), a research project on hybrid offshore wind farms. This project is being carried out in close cooperation with the Catholic University of Leuven and Flux50. Hybrid offshore wind farms provide direct coupling of production from offshore wind with interconnectors, markets, and integrated flexibility. The timing of this project is of great importance, as regulations are being drafted today at different levels that will apply to these hybrid offshore wind farms within 5-10 years.

Due to the decreased installation costs for wind energy combined with the rising prices of electricity, most of these new parks will be installed without grants.

For investment security, it is therefore important that the design, planning, and revenue streams from these wind farms are properly identified so that the most cost-effective choices can be made. The future hybrid offshore wind farms in Belgium will have to produce energy as well as increasingly balancing their production in order not to overburden the high-voltage grid in the event of extreme wind or abnormal forecasts. In this way, an optimal balance can be pursued within the energy triad of security of supply, affordability, and environmentally friendliness, which is essential in such long-term decisions.

The CORDOBA research project aims to support Flemish companies such as Elicio, Marlinks, Yuso, and Enersynt that wish to develop further unique knowledge. VLAIO has allocated a total of €1.042m to all partners out of a total budget of €1.476m. The consortium itself expects to eventually employ 26 full-time employees based on the developed knowledge and also to attract investments of €23m to our country.

Digital Substations (DIGSUB)

Consortium: KU Leuven, VITO, BASF Antwerp, ENGIELaborelec, ENGIE-Tractebel, Hitachi Energie, and Siemens

Budget: € 1.282.208
Grant: € 896.991

The transition to digital substations requires the secondary equipment in today's substations from traditionally wired, copper analogue cables to digitally connected components, for example using fibreoptics. This has clear advantages in terms of complexity, size, configuration time, and cost. In terms of standards, IEC61850 is being promoted internationally to allow all components, with different functionalities and from different suppliers, to work together seamlessly. Even with the obvious benefits of digital substations, adaptation is too slow due to uncertain reliability, lack of staff knowledge (in-depth knowledge of both power systems and ICT are required), and the reliability level of legacy systems.

The project's goal is to make the concept of digital substations more acceptable to the end user through a robust reliability assessment with methodologies and tools for faster testing, better fault management, and faster deployment.

A detailed analysis of digital substations and their potential failure behaviour, including a risk assessment, has been developed in the form of a failure mode and effect analysis (FMEA). Furthermore, a lab-scale digital substation and semi-automatic test procedures for IEC61850 have been established.

2 use cases are being worked out: the integration of BASF's network into the SCADA system and Engie-Laborelec, a study on the reliability of digital substation technology in a future hybrid power plant.

Both the test procedures and the guidelines will lead to reduced engineering time when setting up a digital substation. Although the project is not yet finished, the estimated benefits appear to be realisable. The digitalisation of the High Voltage (HV), Medium Voltage (MV) and Low Voltage (LV) grids are necessity for the energy transition. Short installation times, more cost-efficient operation through better fault detection, and preventive maintenance are favourable factors for smart grid management.

The knowledge institutes will set up a competence centre for digital substations where users and manufacturers meet to test integration without compromising their system operations. In the future, there is the possibility of offshore digital substations due to the growth of offshore wind farms. From feasibility studies on icon to demonstration-scale development projects, these digital substations could be a pathway to an application that ensures the cost-effective operation of wind farms.

Hydrogen Imports in Flanders

Consortium: DEME, Engie, Exmar, Fluxys, Port of Antwerp, Port of Zeebrugge, and WaterstofNet

Budget: € 359.801
Grant: € 179.902

Achieving a climate-neutral economy by 2050 is unfeasible if it is solely based on the local potential of renewable energy. The import of renewable energy in the form of molecules will also be necessary to achieve this goal and to ensure the preservation of the current competitiveness and prosperity. The analysis of multiple scenarios shows that Europe will have to import a significant amount of energy, including from overseas territories. A large part of this energy import will be in molecule form (including a number of hydrogen-based energy carriers). The international context also evolves very quickly. The EU Commission and several member states, such as Germany and the Netherlands, are strongly committed to hydrogen and the cross-border approach.

The consortium consists of partners that want to actively focus on the future supply chain to establish renewable energy carriers in Flanders. The partners – DEME, Engie, Exmar, Fluxys, Port of Antwerp, Port of Zeebrugge, and WaterstofNet – have the skills and business strength to implement the whole supply chain and have joined forces within a hydrogen-import coalition.

This joint study focused on acquiring the necessary insights to start designing concrete projects that produce, transport, and use hydrogen or alternative carriers. The collaboration with Procura investigates further integration into the entire energy system and defines policy recommendations.

The consortium is building up knowledge and integrating this new knowledge across the entire value chain, including renewable energy production based on hybrid wind and solar installations, electrolysis, and hydrogen conversion installations, storage facilities, terminal facilities, specialised vessels, and pipeline installations for transport from carrier molecules to industrial end-user.

The main focus is on the integration of the various components, the industrial feasibility, and the economic implications. The analysis also detects any barriers to technological or regulatory nature.

Possible components for innovation are generation facilities such as wind and (hybrid) solar installations including electrolysis and hydrogen conversion plants, mobile and fixed storage facilities, terminal facilities, special ship design for the transportation of carrier molecules, and pipeline installations.

In January 2021, the results were presented in a public report. In the following phase, the coalition will work on expanding hydrogen import to Belgium.

Hydrogen Panels

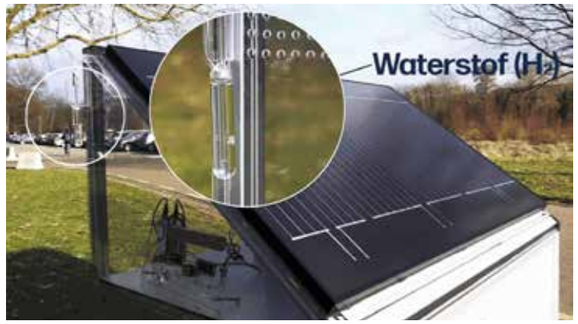
Rolecs Demonstration Oud-Heverlee

In 2019, Professor Johan Martens of the KU Leuven and his fellow researchers Tom Bosserez and Jan Rongé made headlines all over the world with their hydrogen panel that converts sunlight and water vapour from the air directly into hydrogen gas.

Hydrogen gas is considered one of the sustainable energy carriers of the future, especially if it is produced from green energy sources. It can be stored and transported. Green hydrogen will, without a doubt, be intensively used in industrial processes to significantly reduce CO_2 emissions.

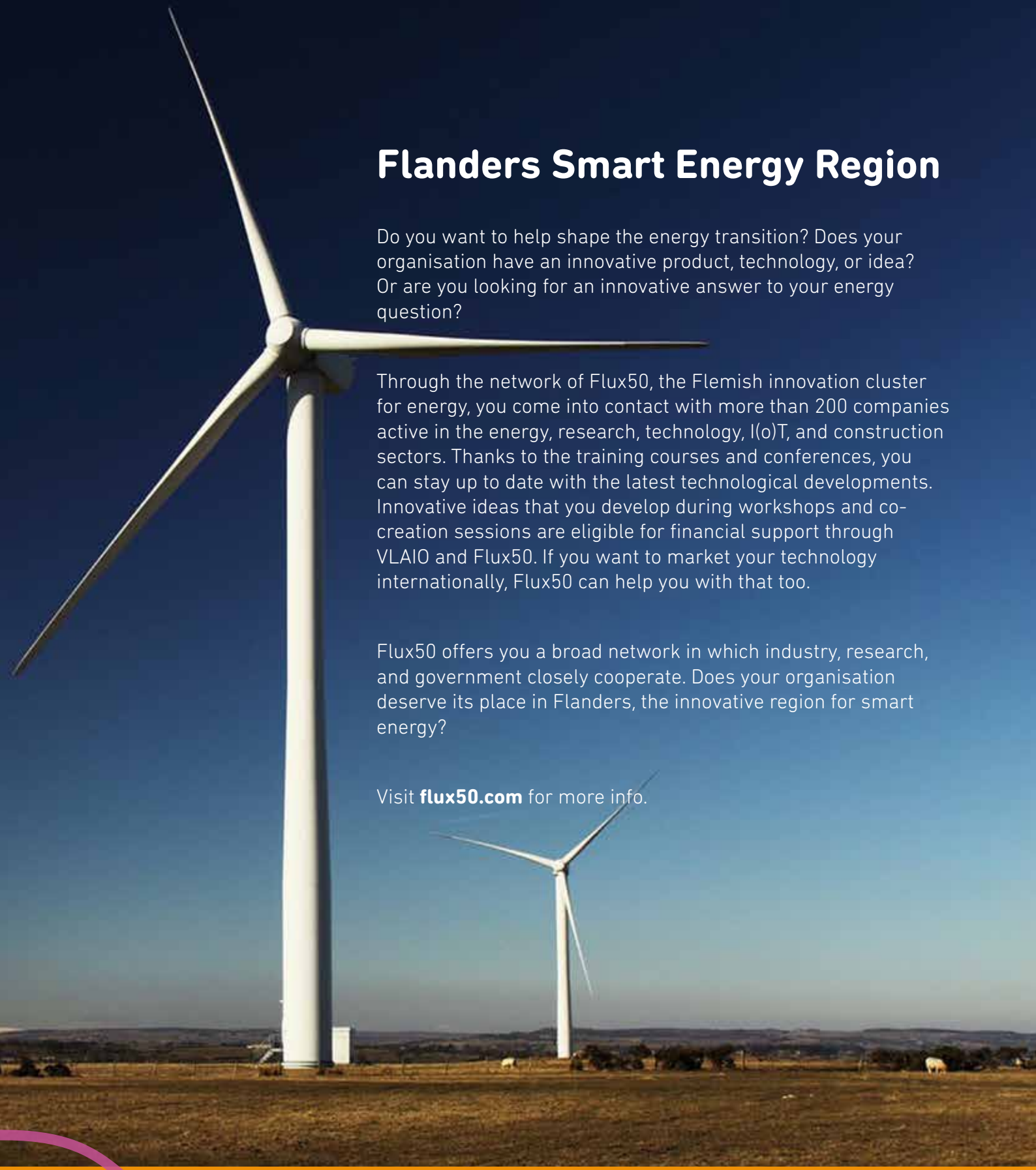
The researchers do not use a normal electrolyser for their hydrogen panel, instead they compactly combine the absorption of the water from the air, splitting water and capturing sunlight with electricity production. So, while it looks like a solar panel, it produces green hydrogen and is, therefore, called a hydrogen panel.

'We get a return of up to 15 percent which means that 15 percent of the solar energy that the panel receives, is converted into chemical energy stored in hydrogen gas', explains Professor Martens.



Flux50 played a role in the further development of the hydrogen panel by supporting the first demonstration in a home as part of the ROLECS interdisciplinary cooperative research project. A panel measuring 1.6x1m was installed to produce hydrogen gas during the summer that could then be used for heating and electricity production in the winter. The house also has solar panels to generate electricity and a solar water heater to produce hot water. In theory, together the three techniques should be sufficient to provide sufficient energy all year round.

Flux50, alongside Catalisti, is also following the next steps towards industrialisation in the later stage innovation project HyPPr in the context of the Moonshot innovation program. The HyPPr project aims to create a pilot line and living lab that supports the design, upscaling of production, and integration of innovative hydrogen panels. Both projects are financially supported by VLAIO.



Flanders Smart Energy Region

Do you want to help shape the energy transition? Does your organisation have an innovative product, technology, or idea? Or are you looking for an innovative answer to your energy question?

Through the network of Flux50, the Flemish innovation cluster for energy, you come into contact with more than 200 companies active in the energy, research, technology, I(o)T, and construction sectors. Thanks to the training courses and conferences, you can stay up to date with the latest technological developments. Innovative ideas that you develop during workshops and co-creation sessions are eligible for financial support through VLAIO and Flux50. If you want to market your technology internationally, Flux50 can help you with that too.

Flux50 offers you a broad network in which industry, research, and government closely cooperate. Does your organisation deserve its place in Flanders, the innovative region for smart energy?

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