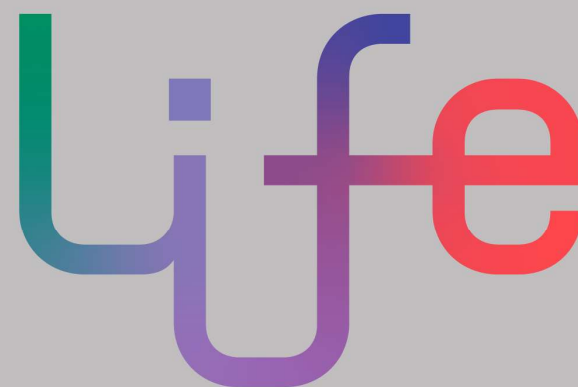


Annual public report

MOOI32019

Local Inclusive  
Future Energy (LIFE)  
City Platform project

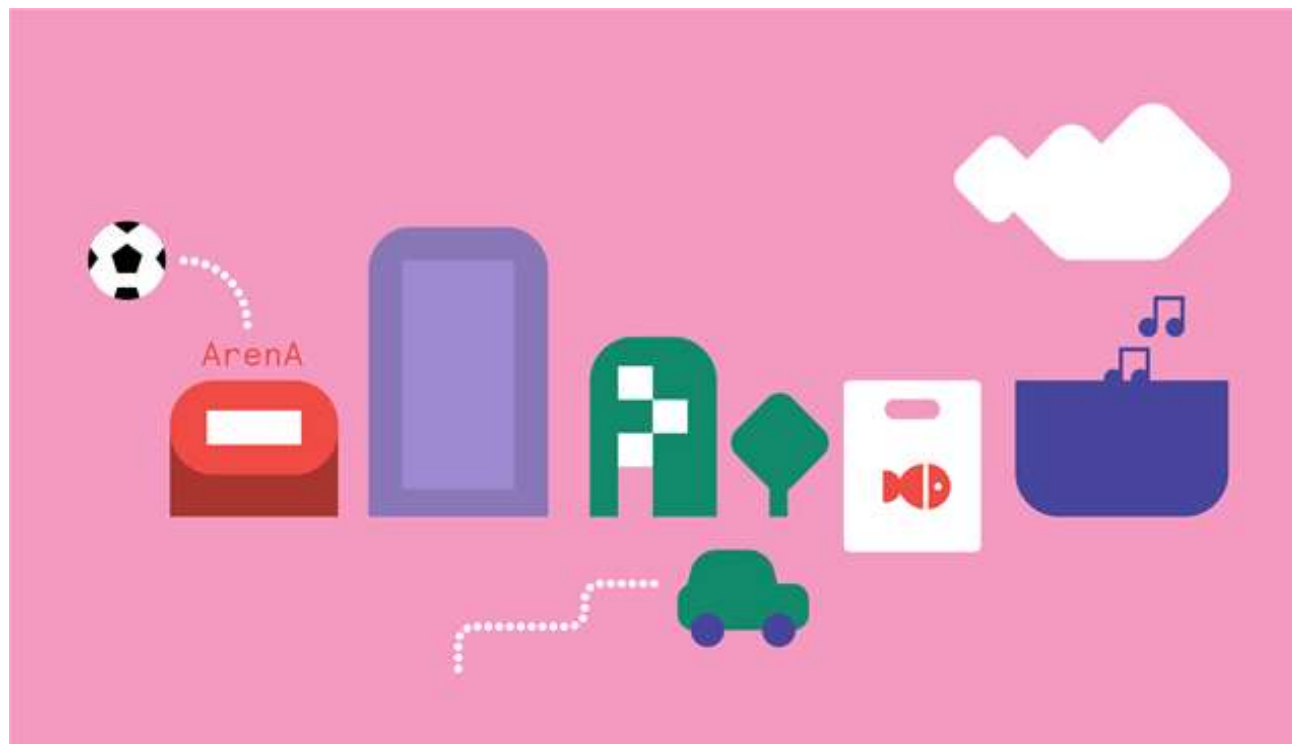
May 2023



Local  
Inclusive  
Future  
Energy

Publication date: 16<sup>th</sup> May 2023

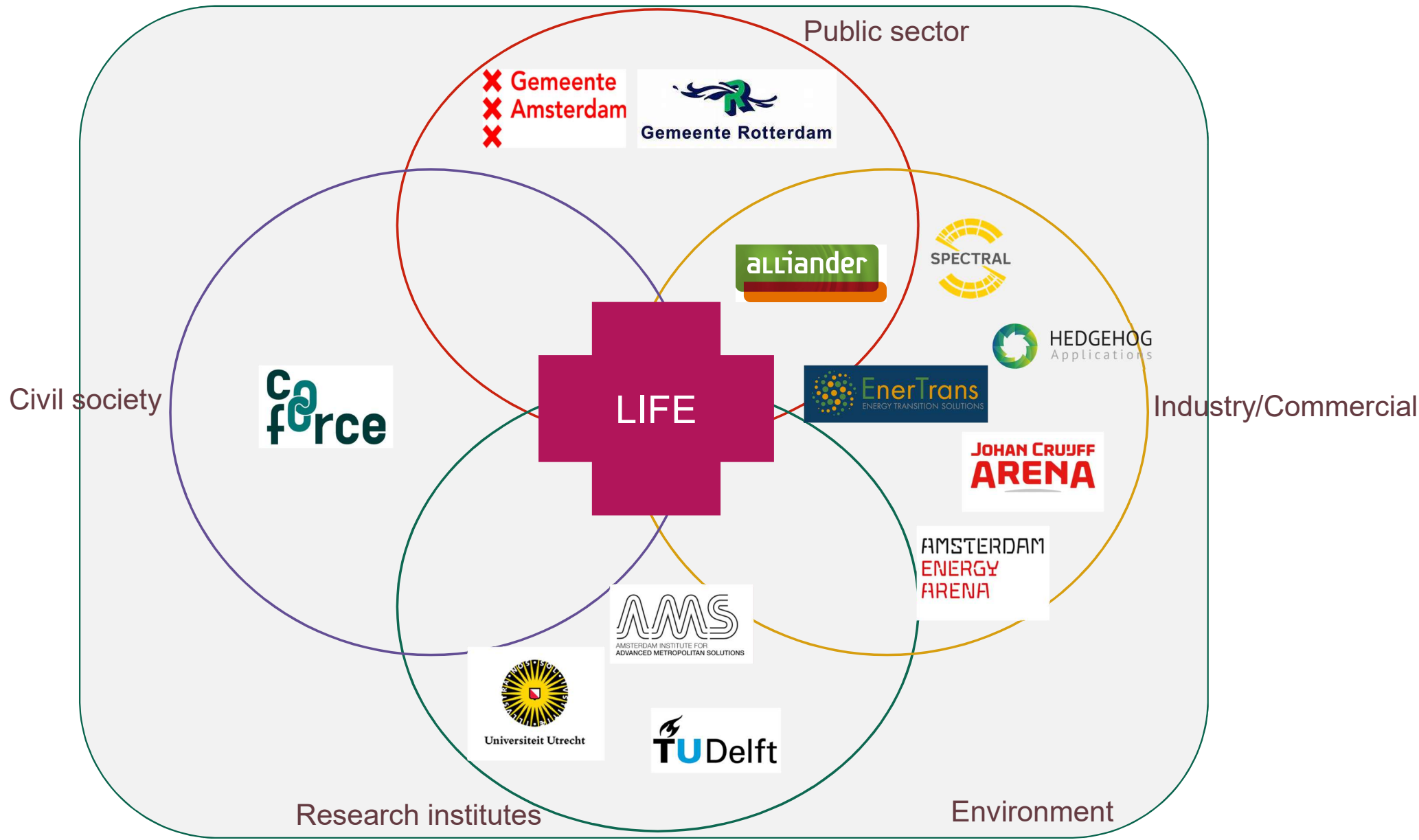
Publisher and author: Johan Crujff ArenA



# LIFE project at a glance

- Start and end date: 28 April 2021 – 31 March 2025
- Total project budget: €6,638,262
- Location: Arenapoort, Amsterdamse Poort, Venserpolder (Amsterdam); Schiebroek (Rotterdam)

# LIFE project partnership



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# Contributions to MOOI program objectives

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# Contributions to MOOI program

Topsector Energie/RVO MOOI subsidy program round 2020.

The LIFE project contributes to a number of Innovation Themes within Mission B: Built Environment (Gebouwde Omgeving), including (in Dutch):

- Innovatiethema 4 – Slim energiegebruik in/tussen gebouwen door haar gebruikers
- Innovatiethema 6 – Flexibiliteit van/voor het energiesysteem (in de gebouwde omgeving)
- Innovatiethema 7 – Systeemontwerp voor het elektriciteitssysteem in de gebouwde omgeving
- Innovatiethema 8 – Lokale flexibiliteit ten behoeve van het totale elektriciteitssysteem

# Contributions to MOOI program

The activities in LIFE will further technical, social, financial and regulatory know-how of Dutch companies, knowledge institutions, social engagement groups and governments in supporting further electrification of the built environment (to cut-off from natural gas usage) by developing solutions for a reliable and affordable electricity system based on local renewables, smart storage and flexible energy use.

Specifically, LIFE will develop an adaptable, inclusive smart energy system to allow for 1) better matched supply and demand to allow for more local renewable energy installation; 2) manage and optimise energy demand (incl. heat-net) at a district scale between buildings; and 3) utilise aggregated flexibility to solve local grid issues to set an example for the future of urban energy systems.

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# Project principles & objectives

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# Project principles & objectives

The Local Inclusive Future Energy City Platform (LIFE) project aims to develop a district-scale energy management platform to resolve grid problems by optimizing local energy infrastructure, integrating renewable energy, and creating public support, focusing on the needs of end-users and local stakeholders in its design and implementation.

The key focus of this project is to lay the groundwork for the creation of a grid-integrated local energy market, and to do so in an inclusive manner. In short, can we avoid net congestion through flexible sharing of energy assets and provide an inclusive return, in a replicable and scalable way?

# Project principles & objectives

The proposed outcome of the project is to:

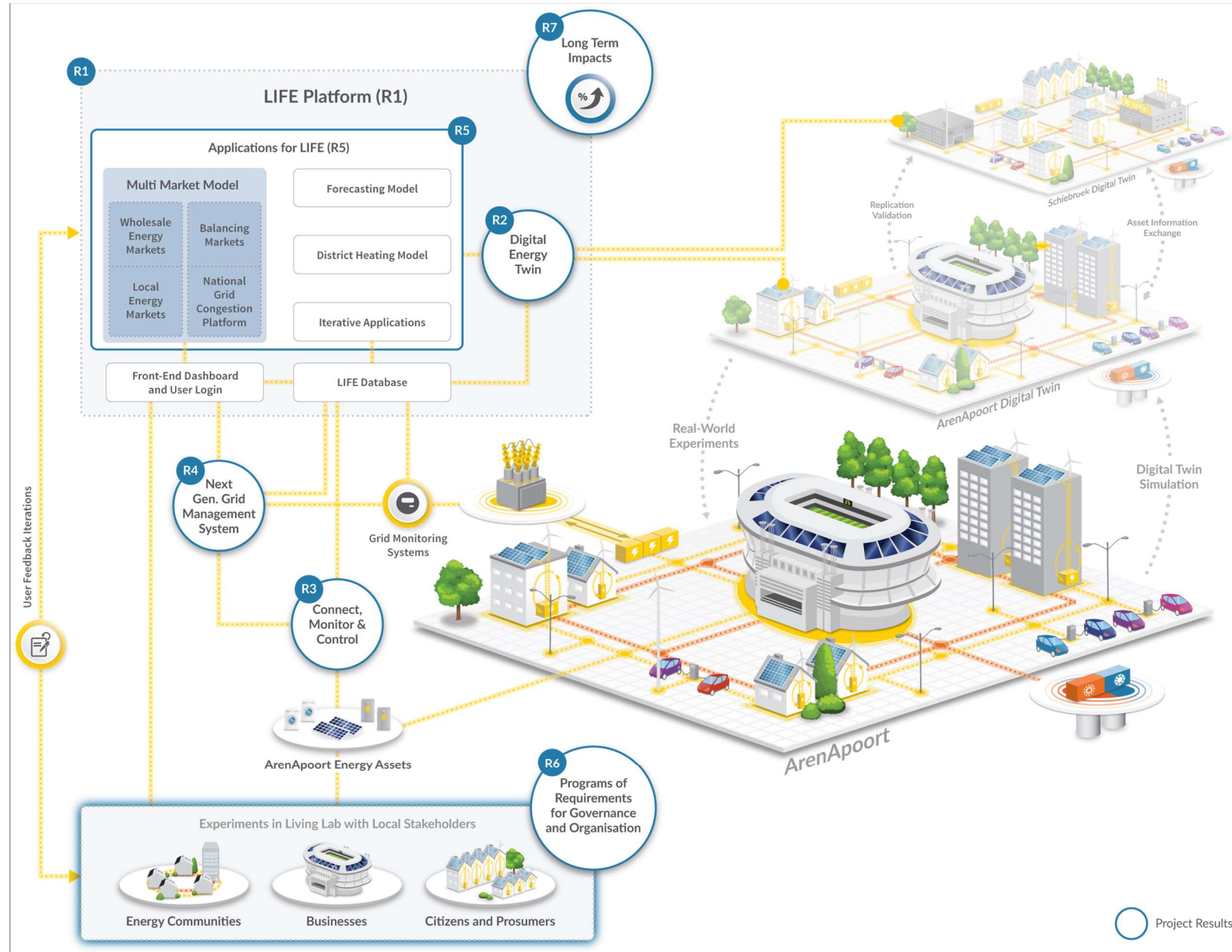
- **research the technical, economic and organizational possibilities** of creating such a platform, and
- **develop the necessary constituent parts** that will make up and connect to the platform, most notably the Digital Twin (result 2), MultiMarketModel and LIFE applications (result 5), the Next-Generation Grid Management System (result 4), and
- **demonstrate the successful control, operation and integration of certain asset submodules** within the platform (such as batteries and ATES systems), in some cases virtually, and
- **develop a strategy for the successful future demonstration of the whole LIFE platform** with various stakeholders involved, and
- **generate and spread knowledge and know-how** amongst both the consortium partners and end-users of the platform.

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# Activities in year 2

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# Overview of LIFE project results (R1-R7)



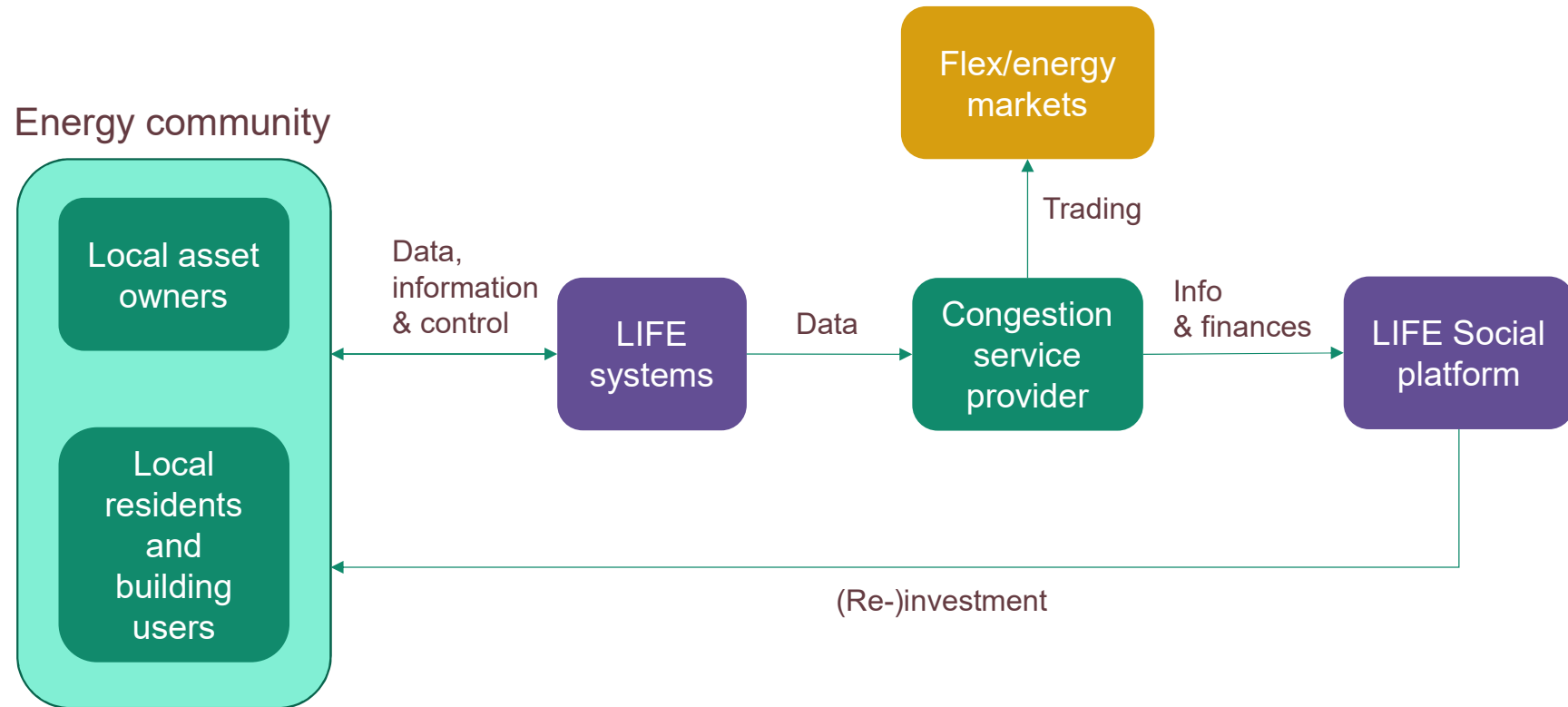
# Activities year 2 summary

2021-2022 (year 1) was a period of setting up and exploring the problems and possibilities in the project. 2022-2023 (year 2) was a period to design solutions on a system level with the consortium, to be tested and iterated in 2023-2025:

The LIFE system concept was developed collaboratively, linking together the techno-financial and social objectives of the project into a coherent narrative, driving the development of the component systems.

Data collection from the main stakeholders has progressed, with network data from Liander and consumption data from several major local building users connected to the LIFE platform.

# Local Inclusive Future Energy system concept



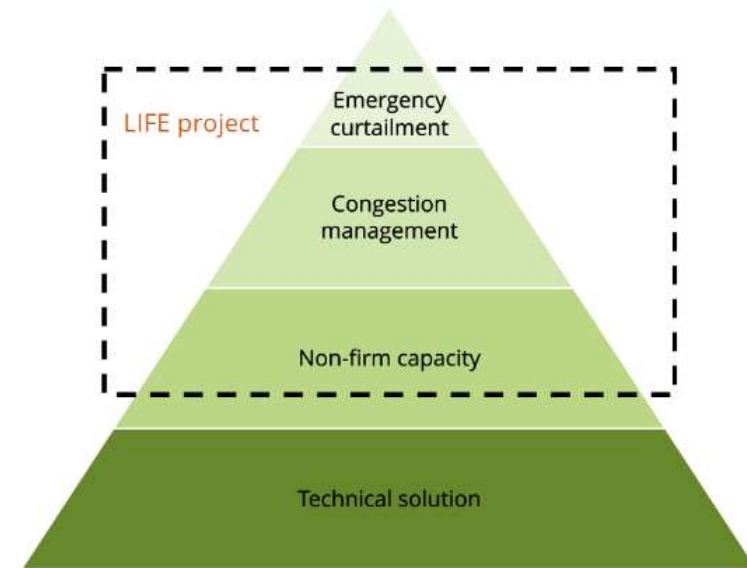
# Local Inclusive Future Energy system concept

## LIFE Technical Systems

- Consisting of Spectral's energy management platform, Alliander's next-gen grid management system and TU Delft's Digital Twin, supported by modules from EnerTrans and Hedgehog Systems
- For insight into network (non-firm) capacities, management of congestion and emergency curtailment

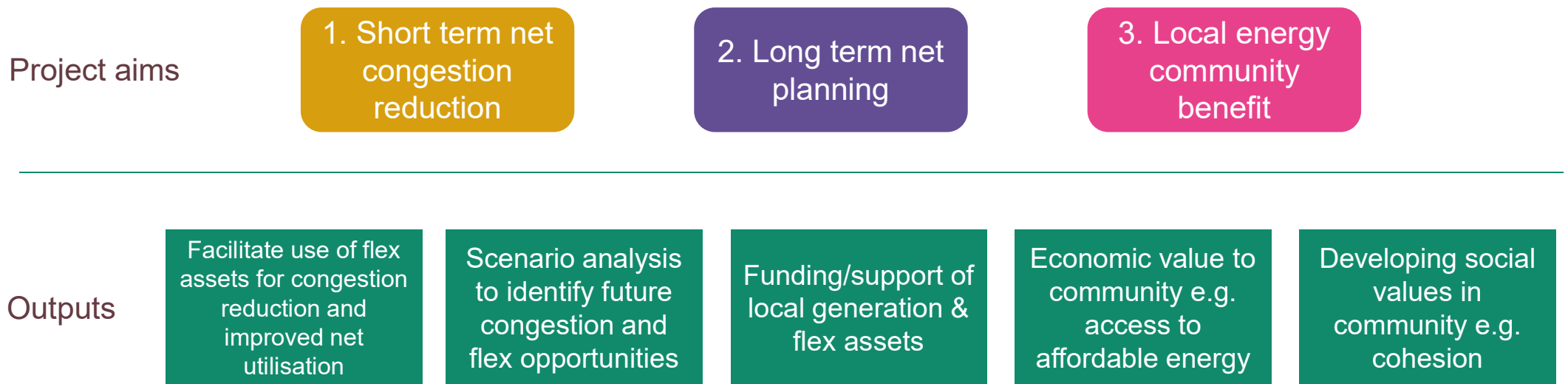
## LIFE Social Platform

- A local institution to govern the generation, (re)distribution and exchange of social, economic and informational value
- Enables collective activities of local businesses and residents to reduce net congestion, reduce costs and improve sustainability



# LIFE use cases

The conceptual LIFE system high-level use cases are taking shape as the following:





# LIFE use cases – highlights

## **Intraday use of flex assets to reduce grid congestion and improve net utilisation**

- Short-term (day-ahead, hourly) forecasting of grid status and use of flex assets (via LIFE Technical platform) to reduce grid congestion and generate value from DSO and markets.
- Reduction of peak grid congestion in some cases enables reduction of existing contracted net connection capacities, freeing up capacity for new connections or for existing large users to expand operations.

## **Scenario analysis to support network planning, development plans and stakeholder engagement**

- Using the Digital Twin to simulate future scenarios for e.g. Venserpolder area to assess impacts of growth in local generation, heat or flex assets on the power and heat networks.

## **Funding of local generation/flex assets**

- Investing a share of the generated value from short-term net congestion reduction (via LIFE Social platform) into local generation and storage/flex assets.

## **Access to stable, affordable energy prices**

- Offer participants in the LIFE Social platform cost-plus pricing of energy via a Direct PPA model from local renewable energy generation assets. This may be fixed for 10-15 years and include both electricity and heat prices (if excess electricity is stored as heat). Refer to parallel activities section below.

# Results (Work Packages)

**R1 LIFE Platform** – Spectral’s online platform is up and running, receiving and visualising data from several local large users.

**R2 Digital Twin** – TU Delft has built a digital twin of Liander’s network connected to substation Bijlmer Noord, and is improving it with data from the large users.

**R3 Connection of Assets** – Several large users have already signed mandates to allow LIFE to access their electricity data. A campaign is under way to recruit more large users.

**R4 Grid Management System** – A ‘metro-kaart’ style format was developed to share Liander’s network congestion status data. Data communications with R1 and R2 have been setup and current focus is enabling use of flex assets (e.g. battery) to avoid congestion at different timescales.

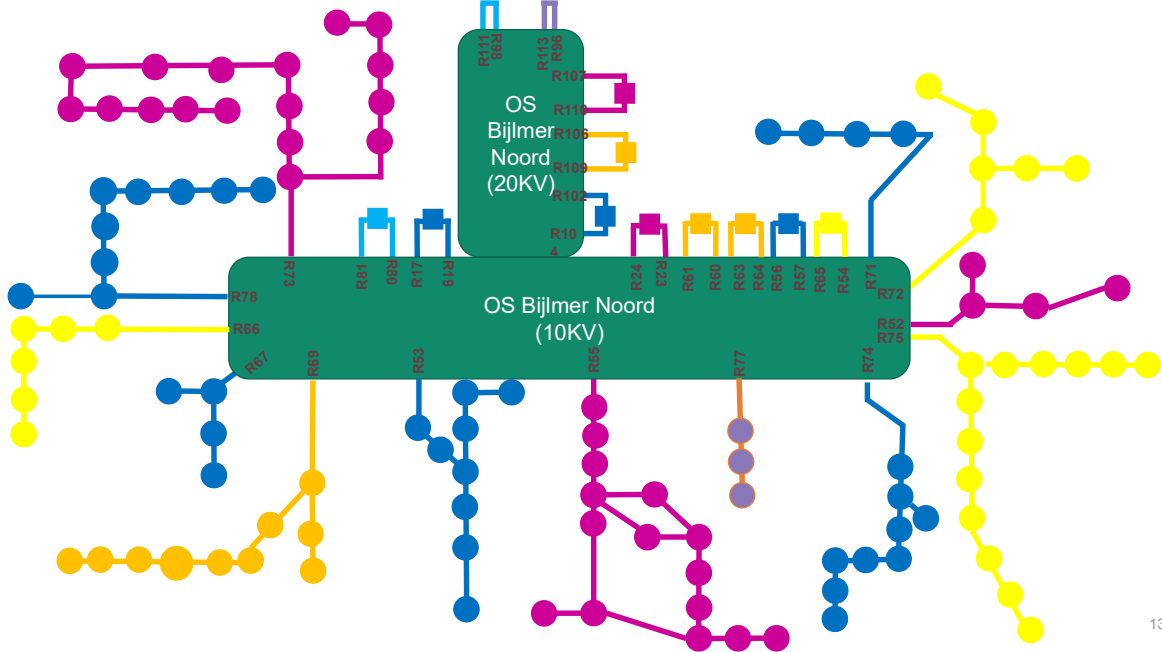
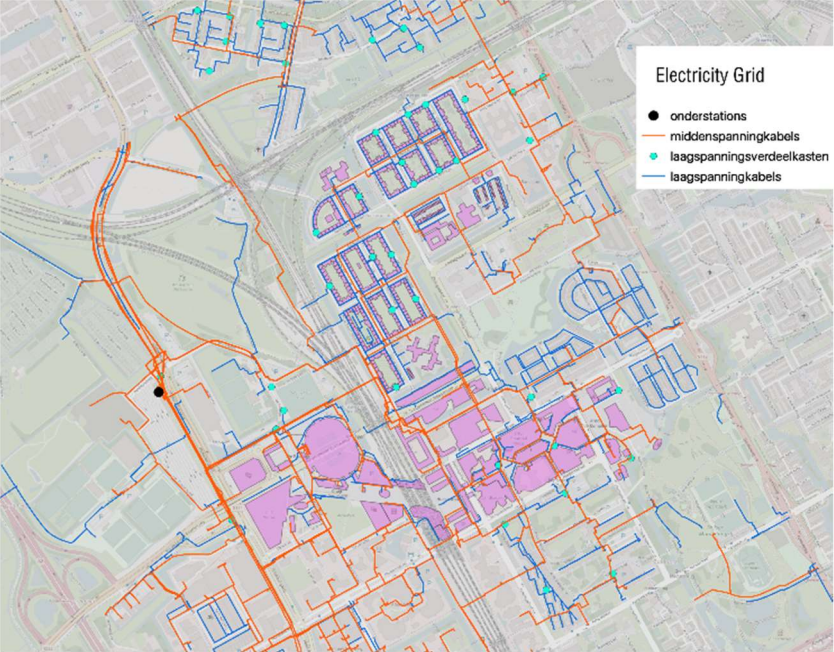
**R5 Applications of LIFE** – The Multi-Market Model is in demo phase and being tested. A heat network model for Venserpolder is under development to integrate with R2 for scenario analysis.

**R6 Governance, Inclusion and Engagement** – The Engagement and Inclusion Plan as well as the Assessment of Regulatory Principles report have been completed. The LIFE Social Platform concept is being further developed for upcoming co-creation sessions with the local residents.

**R7 Long-Term Impacts** – Value flows between stakeholders in several LIFE use case scenarios have been defined and current focus is on quantifying the values in order to develop detailed value propositions.

# Metro-kaart

Alliander developed a 'metro-kaart' map format for sharing network data and congestion expectations in a location-specific visualisation while protecting commercially- or privacy-sensitive data. This format is being further developed within Alliander as a product for supporting planning and congestion reduction solutions.



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# Spin-offs

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# Learning from other projects and organisations

Contact has been made with several related projects & organisations to learn from their experiences, among others:

- Community Virtual Power Plant (cVPP) project, led by TU Eindhoven
- CleanMobilEnergy (CME) project, led by Gemeente Arnhem
- COBEN (Civic Energy) project, led by University of Oldenburg
- Om|Nieuwe Energie, an energy supplier that has launched a 'direct PPA' model in 2022 for energy cooperatives to sell energy directly to Gemeente's at cost-plus pricing. CEO André is on LIFE's Advisory Board.
- De Groene Hub, a donut-deal style community initiative in Holendrecht (zuid-oost)
- Energie Samen, the umbrella organisation for Dutch energy cooperatives
- Local4Local, a MOOI project led by Energie Samen which began in 2023 to develop the direct PPA model to serve households with cost-plus energy prices.
- RESCHOOL, a Horizon Europe project which began in late 2022 with a pilot in Amsterdam to setup a local energy community in the Eastern Harbour Area.
- GO-e, a MOOI project led by TNO developing ways how energy flexibility can replace network upgrades.

# Parallel projects

- VVE programme – lead Gemeente Amsterdam
  - To make use of budget in VVE programme for improving energy efficiency of Venserpolder apartment blocks and installation of solar PV
- Circular Solar Panels – lead AMS Institute
  - To allow for 2nd-life PV panels (e.g. panels from JCA) to be installed on local buildings in the project area
- Socio-Economic Emulator – lead AMS Institute
  - An amalgamation of tools to engage local stakeholders in energy issues and the LIFE project and enable co-creative processes
  - NWO funding application submitted; waiting on acceptance
- Investigation on setting up/joining local energy cooperative – lead CoForce
  - CoForce has begun assessing possibilities of setting up a local energy cooperative to engage locals and provide tangible benefits

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# Publications

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# Publications

- Date: 17-Feb-22
- Title: Inclusive and sustainable design of the ArenAPoort energy system
- <https://www.ams-institute.org/events/scientific-conference-reinventing-city/>
  
- Date: 15-Sep-22
- Title: Openresearch: Local smart energy systems
- <https://openresearch.amsterdam/en/page/71786/lab-1-local-smart-energy-systems>

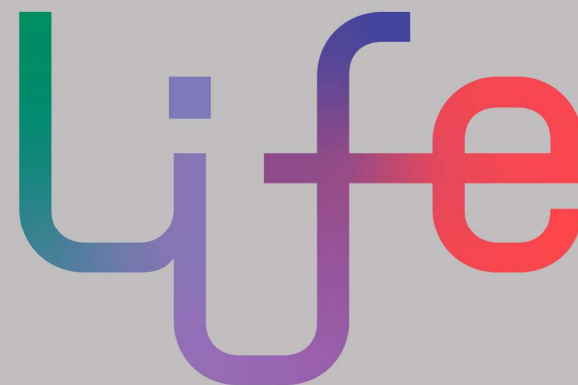


*Het project is uitgevoerd met Topsector Energie subsidie van het Ministerie van Economische Zaken en Klimaat, uitgevoerd door Rijksdienst voor Ondernemend Nederland. De specifieke subsidie voor dit project betreft MOOI-subsidie ronde 2020.*

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