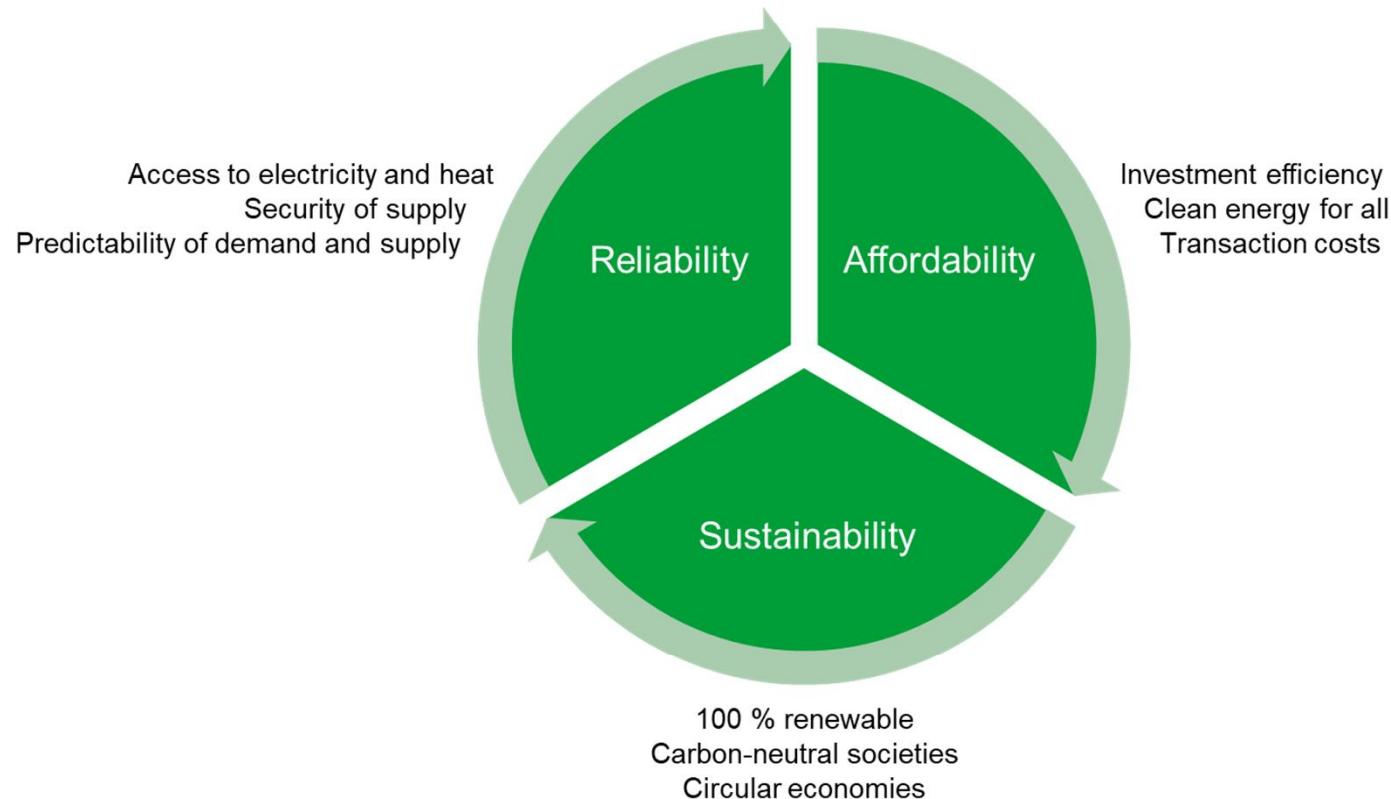




# Smart Otaniemi - Let's re-discover energy together.



# Vision and principles of smart energy



➤ Need for systemic changes in different sectors – Energy in the core.



# Finland opens the doors for re-discover energy



Cold climate, dark seasons, long distances and energy-intensive industry set demands and ambition levels for clean energy system in Finland.

- **We have to rethink and re-discover energy systems.**  
Smartness in systems is an unwritten rule.
- **Finland has excellence in energy field research as well as 5G and IoT studies. 5G connectivity, artificial intelligence and IoT applications are already used in Finland's energy systems.**  
Innovative transmission and distribution system operators, advanced regulation and market frameworks.
- **Possibilities to test new business models and services in real circumstances.**  
Digitalization in energy is easily said than done.
- **More sandboxes and playgrounds needed where energy utilities, ICT sector, building and transportation operators and service providers can co-create and test new services together with the citizens.**



## Why Smart Otaniemi?



- Energy challenge is global - **solutions need to be implemented locally.**  
Energy will be produced and consumed in different regions - **unique features.**  
**No one-size-fit-all solutions in energy transition.**
  - § Smart Otaniemi is a place where you have possibility to design, test and tune the most suitable toolbox for your systemic change.
  - § Smart Otaniemi is not based on specific technology, energy source or solution.
  - § Smart Otaniemi aims to solve systemic challenge - the biggest question of smart energy. The working method is bringing together experts, companies, investors and public sector to pilot novel solutions.
- Smart Otaniemi is like a mosaic book of energy that is build piece by piece the big picture in mind.

# Smart Otaniemi innovation ecosystem today



## ➤ Mission is to make energy future smarter.

- § Currently 50 partners: ICT and energy utilities, service providers, technology vendors and real estate owners.
- § Research and development organizations and universities have a significant role.
- § Companies varies from startups to big corporations.

We invite companies and organizations from all sectors looking for new opportunities in the future energy business to join us.

## ➤ We turn bold ideas into action through piloting.

- § 7 concrete pilots developing new ideas and creating new business.

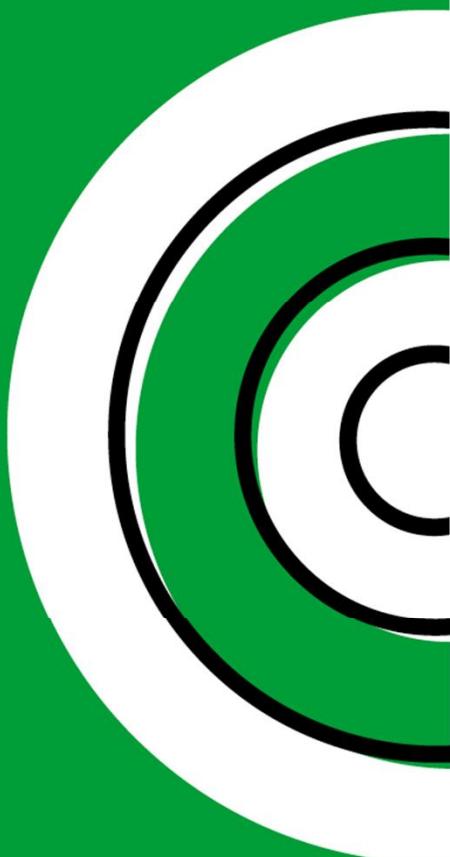
## ➤ To experiment and create smart solutions of the future in a living-lab setting with the customers.

- § Otaniemi combines one of the world's smartest transmission and distribution systems and markets with the latest developments in digital technologies.
- § Brings together the latest developments in the smart buildings and mobility.





Focus areas and pilots –  
Turning ideas into action.



# Focus areas of Smart Otaniemi

How to build sustainable, reliable and affordable smart energy system in local context?



Sector coupling and system integration

## Local flexibility

- Demand response and virtual power plants
- Maintenance and operations
- Storages



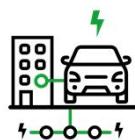
Pilot:  
Aggregator business models



Pilot:  
Flexibility market study  
in Otaniemi

## Smart mobility

- Charging of vehicles
- Autonomous transportation
- Transportation system



Pilot:  
Smart EV charging

## Building level intelligence

- Smart buildings
- Energy efficiency
- Heating and cooling



Pilot:  
Integral use of data  
in buildings



Pilot:  
Optimised underground  
thermal storage

## Platforms, connectivity and enabling technologies

- Data sharing and analytics
- Connectivity
- Cybersecurity
- AI and blockchains
- Modelling and simulation



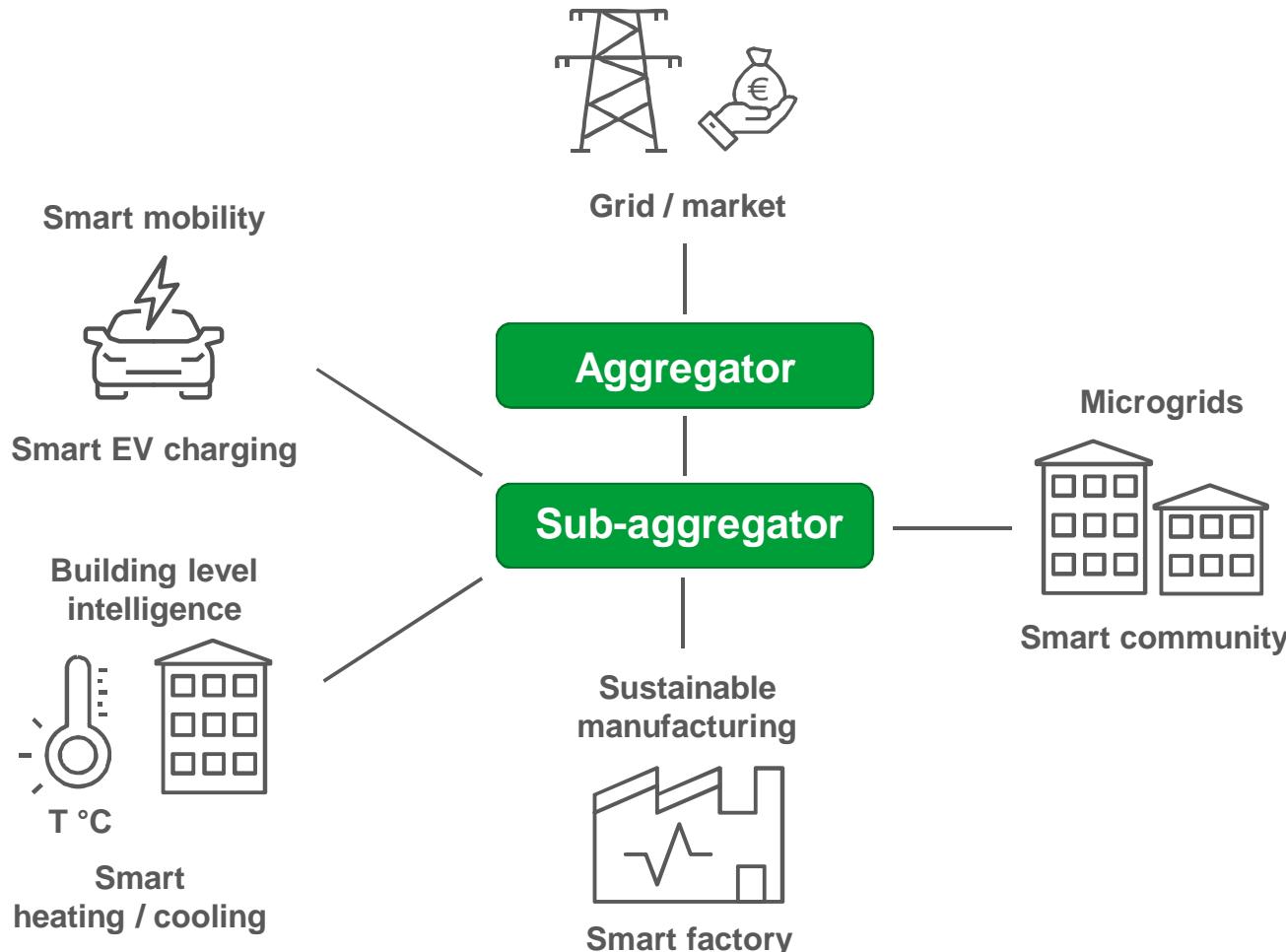
Pilot:  
Frameworks and  
platform for data-driven  
energy solutions in  
Otaniemi



Pilot:  
Use cases in AI and  
blockchains in  
energy domain

Living lab and citizen engagement

# Aggregator business models



## Challenge

To get the flexible potential to electricity markets in the most efficient and suitable way as possible.

## Goal

To study how flexible potential could be harnessed e.g. from buildings and electric vehicles through sub-aggregators who have the ability to monitor and control their equipment.

# Smart EV charging



## Challenge

Electric car charging can have a significant impact on the electric grid load without smart charging.

## Goals

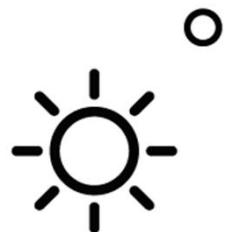
1. To develop charging (slow, normal, fast and wireless) technologies.
2. Learn to use EV charging stations as providers of flexibility for the energy market in collaboration with the aggregator pilot.



Creating smarter world together -  
Get innovative. Get involved.



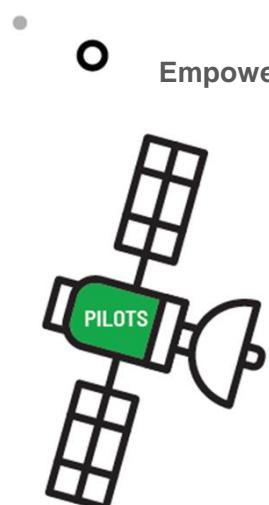
# Current pilot members in Smart Otaniemi



e2m, Savon Voima,  
Granlund, Ensto, Parking  
Energy, Merus Power, Green  
Energy Finland



Eneron, Green Energy  
Finland, Fourdeg, Savon  
voima Oy, ACRE Aalto  
University, VTT



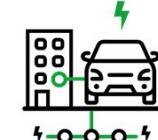
Empower, Fingrid, Caruna, e2m



VTT, Aalto University,  
Streamr



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Ensto, Energy Storage Futures,  
Parking Energy, e2m, Aalto  
University, VTT



ABB, Caruna, Nokia, Eneron, Fourdeg,  
GEF, Seneqo, Tieto, Gravito, VTT, Aalto  
University

Your pilot?

# Why the global company joins Smart Otaniemi? – Nokia as an example



Jarno Halme  
Head of Data Strategy,  
Nokia Mobile Networks

Nokia's vision is to create smart, safe and sustainable world – as part of the community.

**Nokia is active in connectivity and platforms – 5G in the core.**

- § Nokia wants to create systems from the beginning together with the actual users and experts on the different applications.
- § Nokia builds together different use cases and optimizes the connectivity and platform layers and then standardize and create the systems that are available worldwide.

**Nokia is interested in innovations.**

- § Innovations include commercialization and market acceptance.
- § Nokia could create a catalog of the innovations, and take them worldwide together, with the potential customers.

➤ Smart Otaniemi enables to build smarter world together.

# What do businesses get from innovation ecosystems?



## R&D efficiency

Faster time - to - market. Radical innovation with diverse ecosystem. Efficient resource use and access to infrastructure. Shared risk and courage to take more risks.



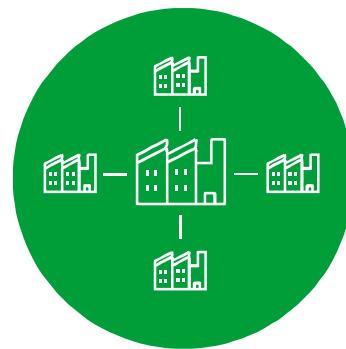
## New revenues

The company creates new revenue streams (with new business models and radical innovation) that increase growth & profitability.



## Momentum

The agile culture and “attitude” within the innovation ecosystem impacts positively the company’s momentum. Skill exchange within the ecosystem works as a talent magnet.



## Attractiveness increase

Partnering and co-branding with the good reputation key companies within the innovation ecosystem increases the profile, position and brand value of a company in the market. Reversed, the large key companies also benefit from being involved with the agile start-ups and other innovators.

# International co-operation through Smart Otaniemi

Smart Otaniemi offers a way to exchange ideas and knowledge and increase research collaboration:

Companies, research and development organisations and universities are welcome to join Smart Otaniemi.

Finnish Smart Otaniemi members from different sectors are interested to take part in future pilots in global locations.



# Smart Otaniemi – how to collaborate?



## Let's...

**1.** gather your local stakeholders (eg. government, research, funders, 2-3 key companies) around the same table

**2.** take a look at your local conditions and assess what is really needed in energy transformation

**4.** take a look at what is already available in Otaniemi to avoid re-inventing the wheel.

**5.** put the pilot area together with the best forces from your local stakeholders and Smart Otaniemi

**3.** decide focus areas that would best support your country and companies. We start from small and grow from there.

**6.** re-discover energy!



Join to make energy smarter.





## Join the movement

Visit Smart Otaniemi webpage: [www.smartotaniemi.fi](http://www.smartotaniemi.fi)

Order a newsletter: <https://subscription.smartotaniemi.fi/>

Contact: [smartotaniemi@vtt.fi](mailto:smartotaniemi@vtt.fi)

Follow the discussion: #smartotaniemi

Business Finland's Smart Energy Program:

<https://www.businessfinland.fi/suomalaisille-asiakkaille/palvelut/verkostot/biotalous-ja-cleantech/alykas-energia/>



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