



Smart Otoniemi - Innovation ecosystem on smart energy

*Energy solutions for the block level -
Opportunities in Smart City business
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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 ~70 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.

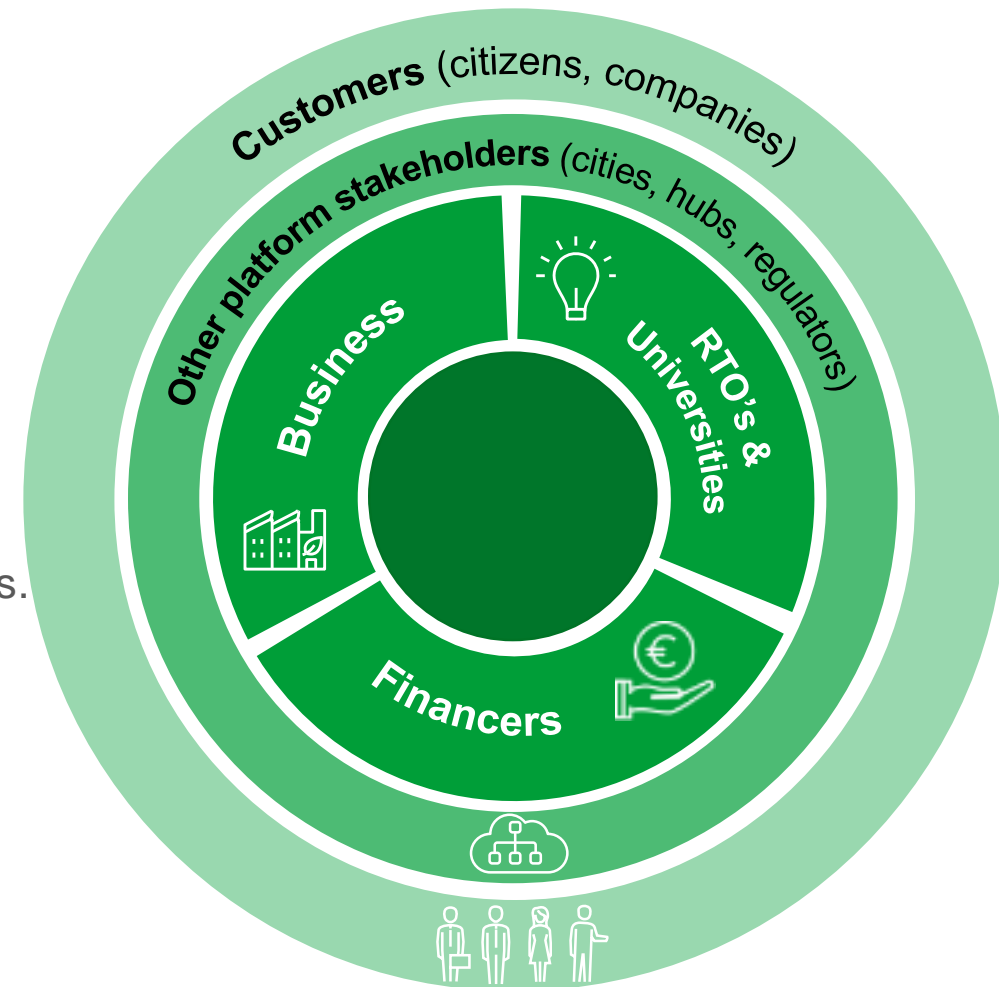
We invite companies and organizations from all sectors looking for new opportunities in the future energy business to join us.

➤ We turn bold ideas into action through piloting.

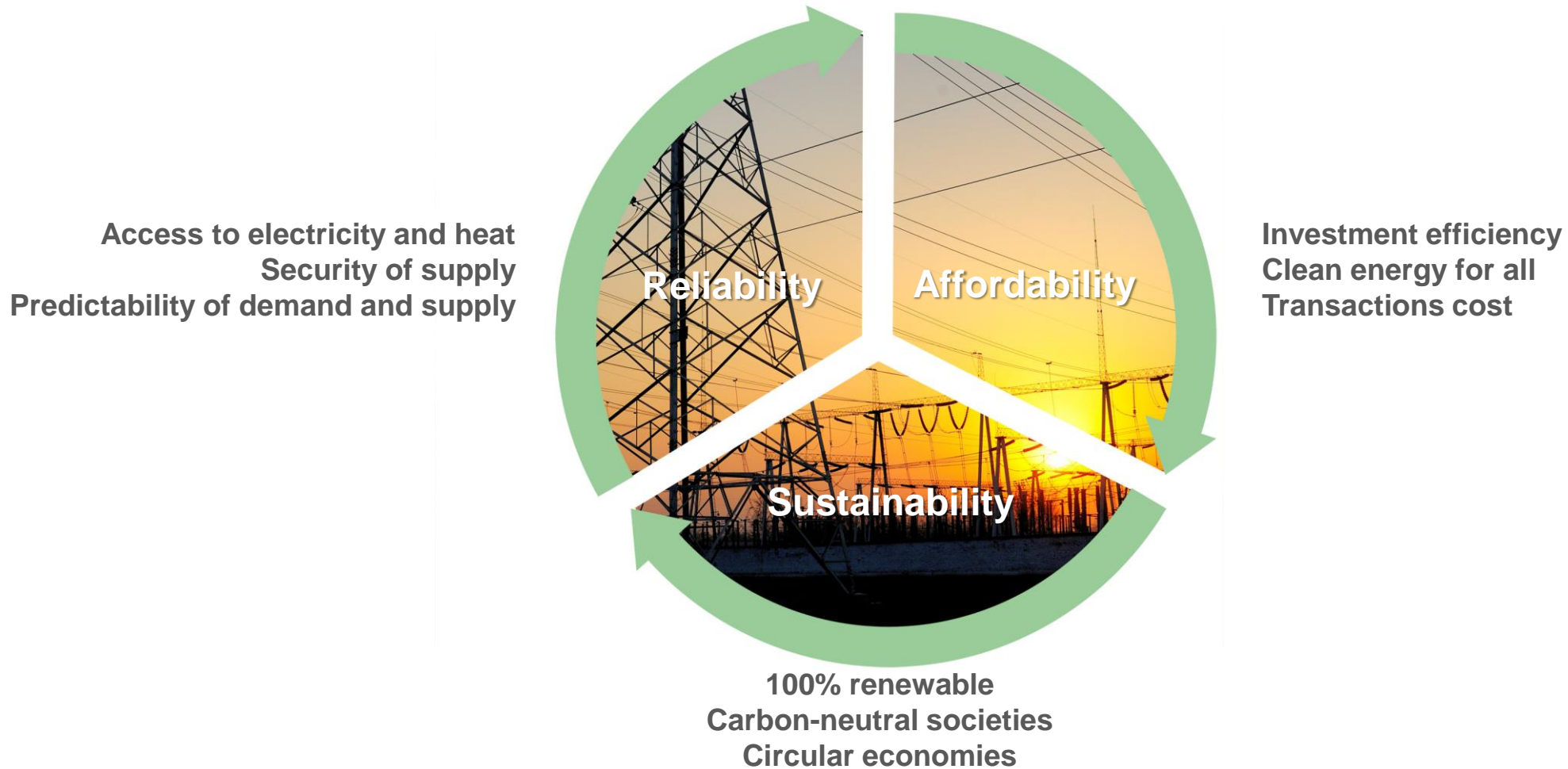
- 11 concrete pilots developing new ideas and creating new business.

➤ 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.

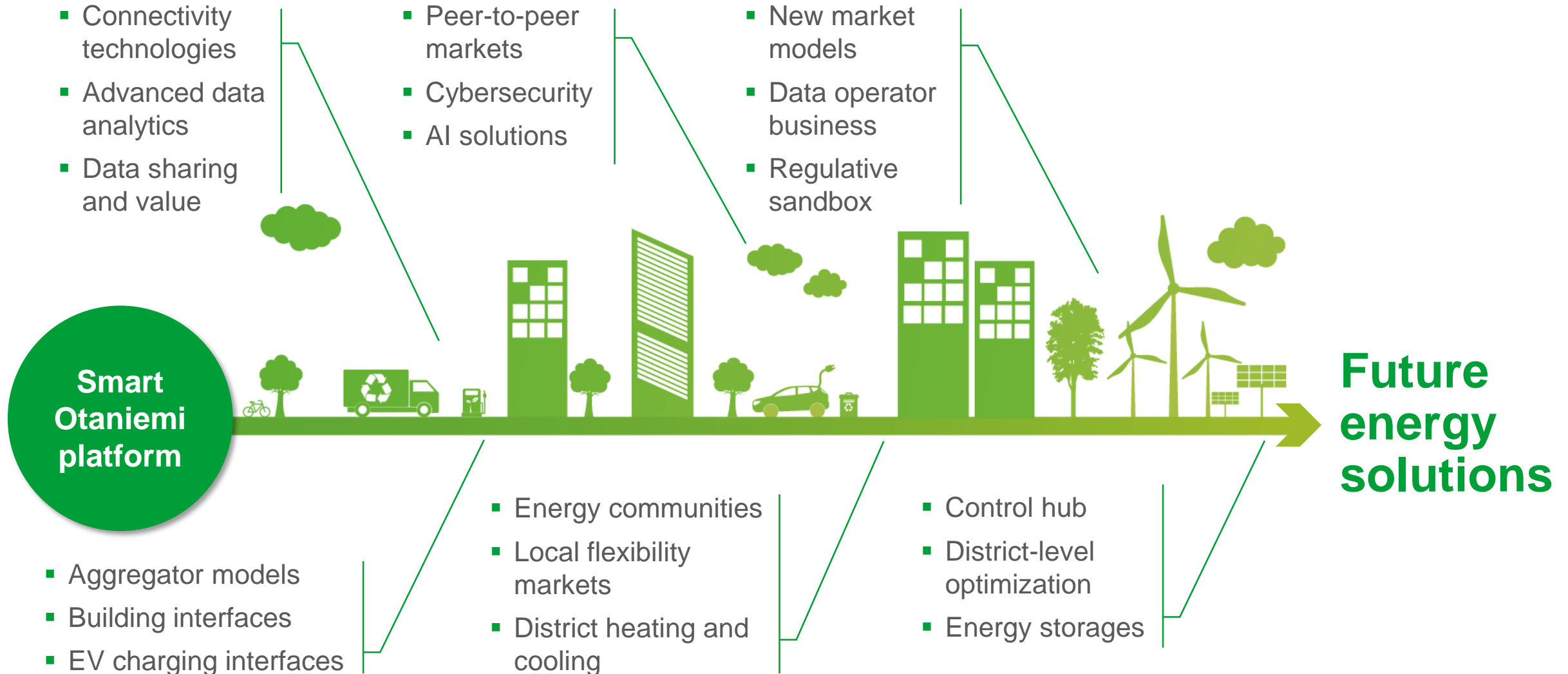


Vision and principles of smart energy



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

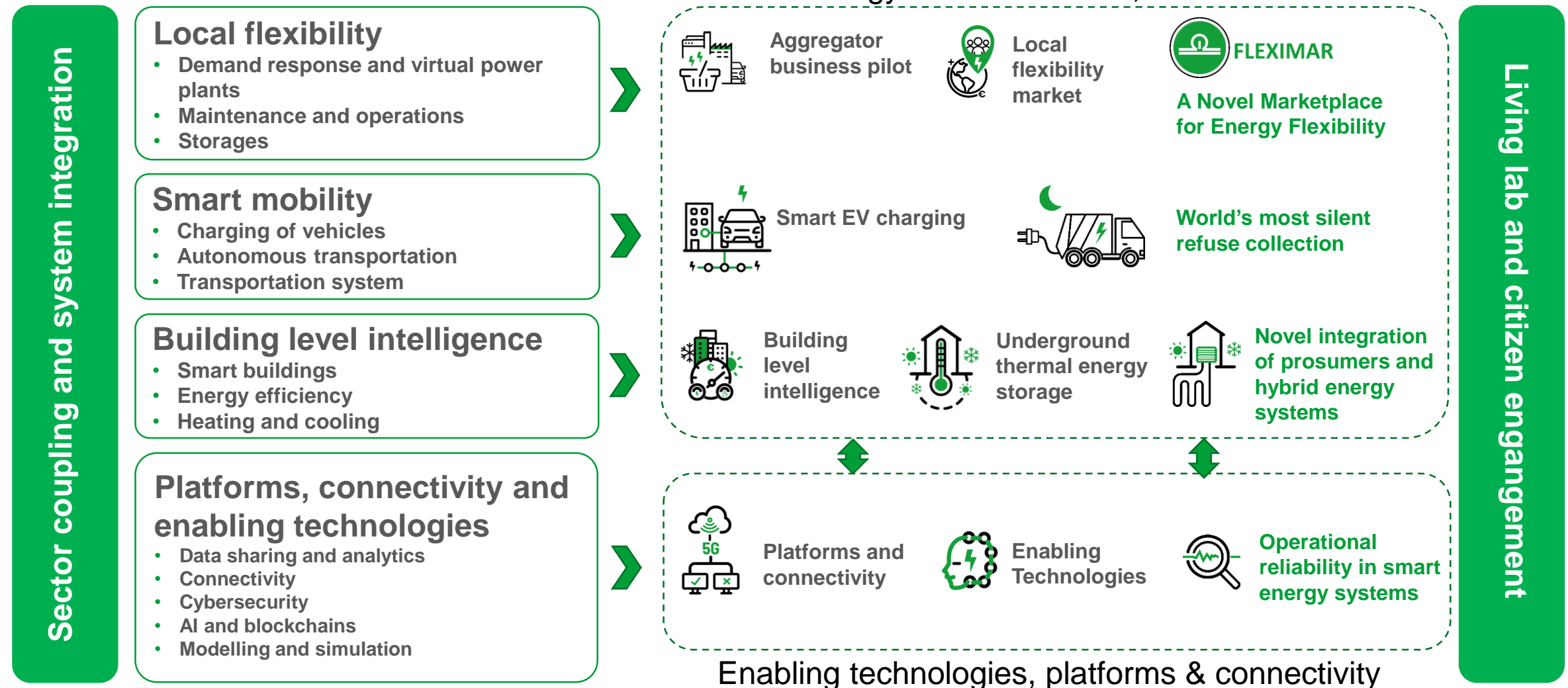
Smart Otaniemi vision and roadmap



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



Focus areas and pilots of Smart Otaniemi



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 globally.



Current pilot members in Smart Otaniemi



Novel integration of prosumers and hybrid energy systems

Aalto University, ACRE, GTK, VTT, Assemblin, Fortum, Halton, VÄRE, EQUA, Qheat, Salusfin, Elcogen, Basso, Tom Allen-Senera, Muovitech, Granlund ja K-liike

Optimised underground thermal storage

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

World's most silent refuse collector

HSY, NTM, Motiomax, VTT

Integral use of data in buildings

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

Aggregator business models

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



A Novel Marketplace for Energy Flexibility

Flexibility market study in Otaniemi

Empower, Fingrid, Caruna, e2m

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Smart EV charging

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

Operational reliability in smart energy systems

VTT, Softability, Elenia, Vincit, Agiler, Arisense

BUSINESS FINLAND



Maximizing PV integration capacity in energy and power systems

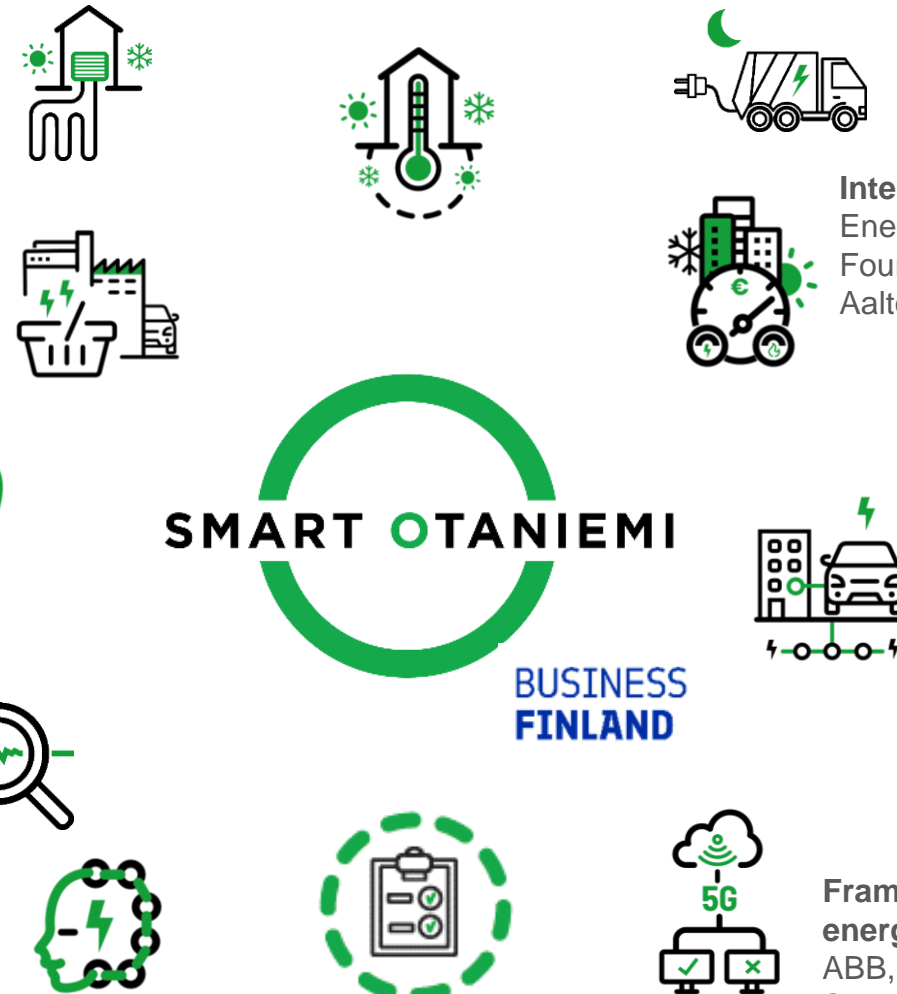
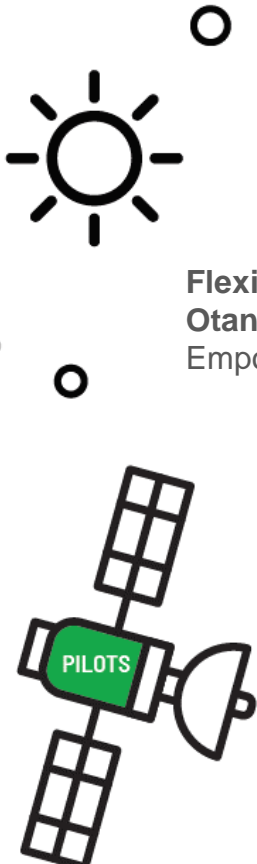
Use cases in AI and blockchains in energy domain

VTT, Aalto University, Streamr

Your pilot?

Frameworks and platform for data-driven energy solutions in Otaniemi

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



Smart Otaniemi pilots feeding the technology innovations for the sustainable low carbon smart city portfolio and other ecosystems!



Smart City Performance measurement system



Making City
Oulu Lighthouse City



Tampere Lighthouse City



Smart City cultural heritage



Kerava Follower City



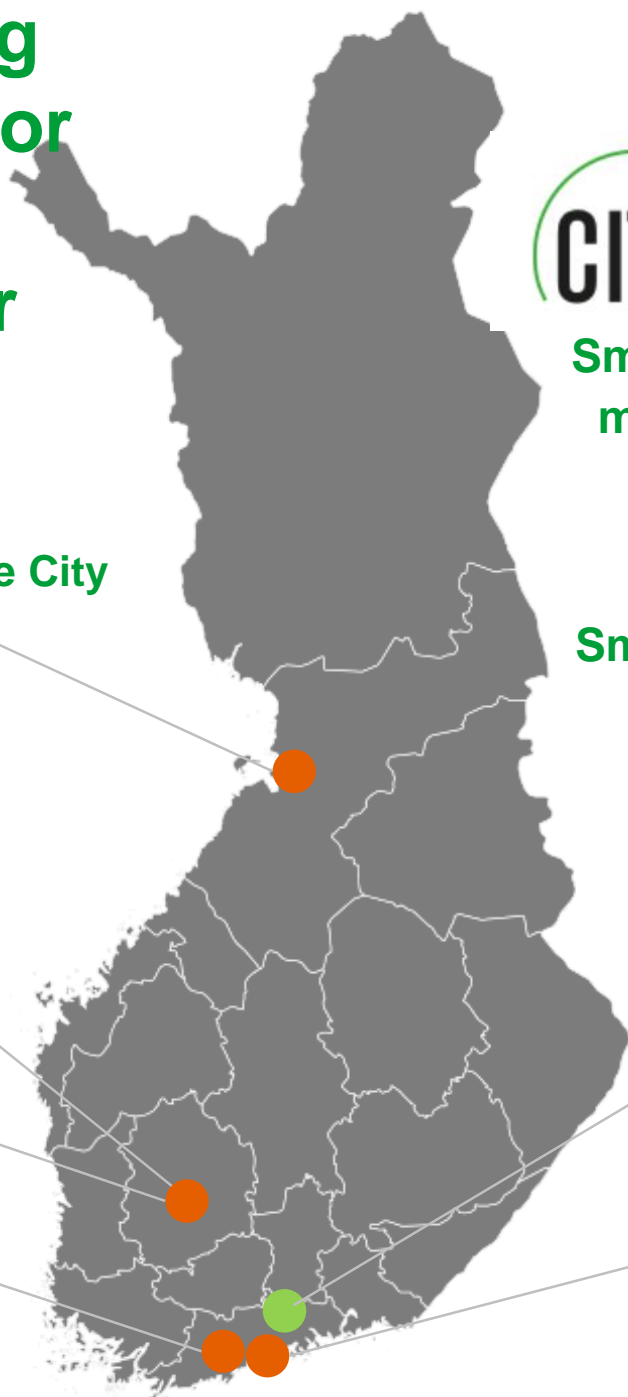
Tampere Nature-Based Solutions Living Lab



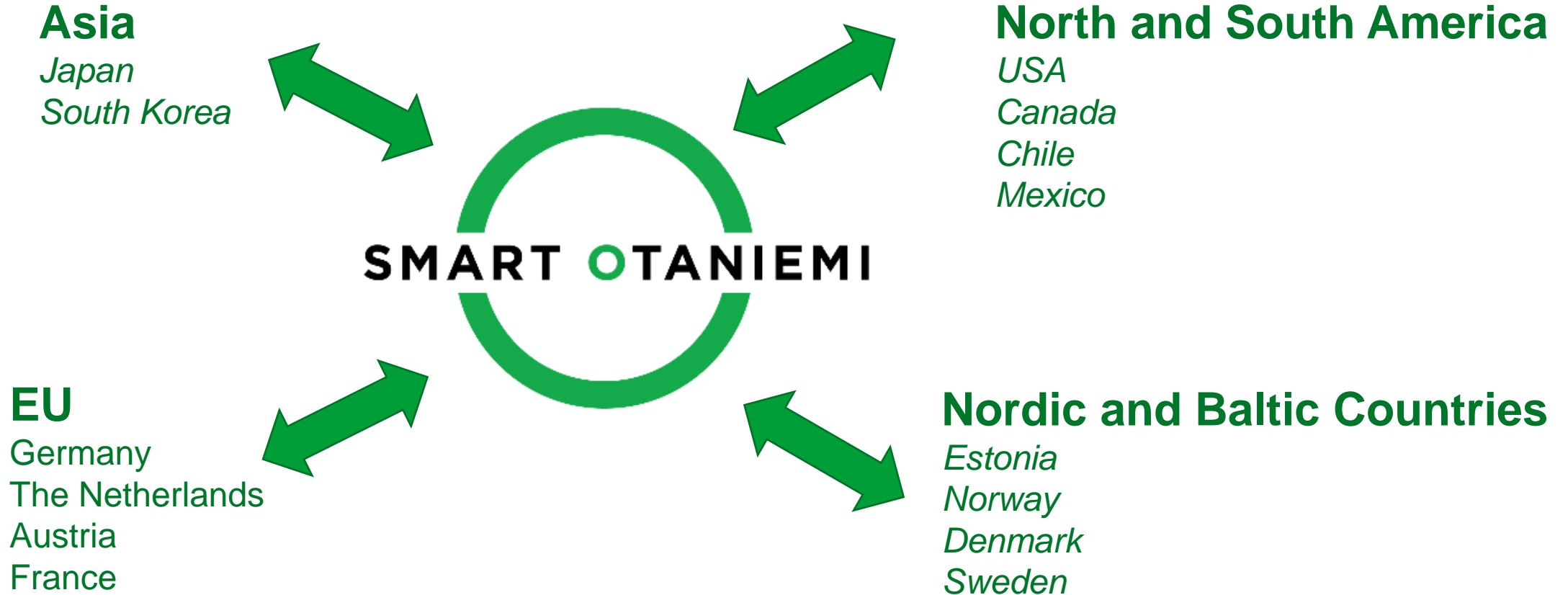
Helsinki Lighthouse City



Espoo Lighthouse City



Towards Global Collaboration!



Join the movement

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

Contact: smartotaniemi@vtt.fi

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Business Finland's Smart Energy Program:

<https://www.businessfinland.fi/en/for-finnish-customers/services/build-your-network/bioeconomy-and-cleantech/smart-energy/>



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