Potential business models for Positive Energy Buildings

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Background: EXCESS-project

- EXCESS is about FleXible user-CEncric Energy poSitive houseS
- How nearly-zero energy buildings can be transformed into positive energy buildings (PEBs)?
- Five years, starting in 2019
- 21 partners from 8 countries
- 4 demos in 4 climate zones
EXCESS Demos

- Former industrial complex in **Graz**, Austria
- Apartment building in **Helsinki**, Finland
- Social housing complex in **Hasselt**, Belgium
- Multi-apartment block in **Granada**, Spain
Positive Energy Building:
- an energy efficient building
- produces more energy than it uses via renewable sources, over a time span of one year.
- high self-consumption rate
- high energy flexibility
- high quality indoor environment maintaining the comfort and well being of the building occupants.
- able to integrate the future technologies like electric vehicles to maximize the onsite consumption and share the surplus renewable energy.
EXCESS defines a positive energy building (PEB) as an energy efficient building that produces more energy than it uses via renewable sources, with high self-consumption rate and high energy flexibility, over a time span of one year.

A high quality indoor environment is an essential element in the PEB, maintaining the comfort and well-being of the building occupants. The PEB is also able to integrate the future technologies like electric vehicles with the motivation to maximize the onsite consumption and also share the surplus renewable energy.
PEB business models – why and what?

- Technologies exist
- Integrated concepts are emerging
- Well-designed business models:
  - recognized as a crucial element needed for a wider roll-out of PEBs
  - seem to be largely missing
- This presentation highlights potential business models & their contribution to the different PEB elements
Sources of information

- Literature review
- Discussions with stakeholders:
  - interviews and workshops during EXCESS project
  - co-operation in IEA Annex 83
Elements for value proposition in PEB BM

- Energy efficiency
- Renewable energy technologies integrated into the building or site
- Optimization of the energy demand and supply during the operational phase > flexibility towards the energy grids
- Ability to maintain the quality of the service (e.g. indoor environmental quality)
Business model approaches

- Renewable energy without investment costs
- Leasing of renewable energy technology
- Lifecycle contracting
- Energy communities
- Platform service
- Aggregator
- Energy management
- ESCO models*
- One-Stop-Shop
- Industrial building owners
- Commercial building owners
- Social building owners
- Housing companies
- Single-family building owners

- Avoidance of investment costs, stable price, service
- Holistic approach, one contractor
- Low cost, high power on decisions, optimizing infrastructure via sharing of assets
- Easy to find and compare service providers, full power to take decisions
- One point of contact towards the customer
- Stability and flexibility to the grid operator, lower energy cost for the building owner
- Optimised energy demand and supply
- Outsourcing of risks of energy efficiency improvement, one point of contact

*e.g. Energy Performance Contracting
Life-cycle phases of BMs

- Construction
  - Life-Cycle Contracting
- Operation
  - Energy Performance Contracting (EPC) model
  - Roof or land renting model
  - Leasing of renewable energy equipment
- Renovation
  - One-stop-shop
  - Energy cooperative
  - Energy management
  - Platform service
  - Aggregator

New models

- Pay-Per-Service business model, where the customer pays for the outcome rather than for the equipment or energy
- Community based model, where the energy services are handled by energy communities.
Business conditions vary by country

- Regulations
- Socioeconomic conditions
- Building traditions
- Climate
- Availability of renewable energy

FleXible user-CEntric Energy poSitive houseS
Challenges and new opportunities

- PEB is a complex system, requiring a lot of knowledge on different fields and companies with new skills.
- An integrator would be needed to take full advantage of the renewable potential and other benefits offered by the PEB concept.
- Current immaturity of the regulations
- More understanding needed about the real needs of the customers or their willingness to pay for the services.
- Affordable structures and the contractual arrangements for the provision of the service need to be developed.
- What could be gained by enlargement of the scope on district level?
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