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BM for energy communities from the perspective of a DSO

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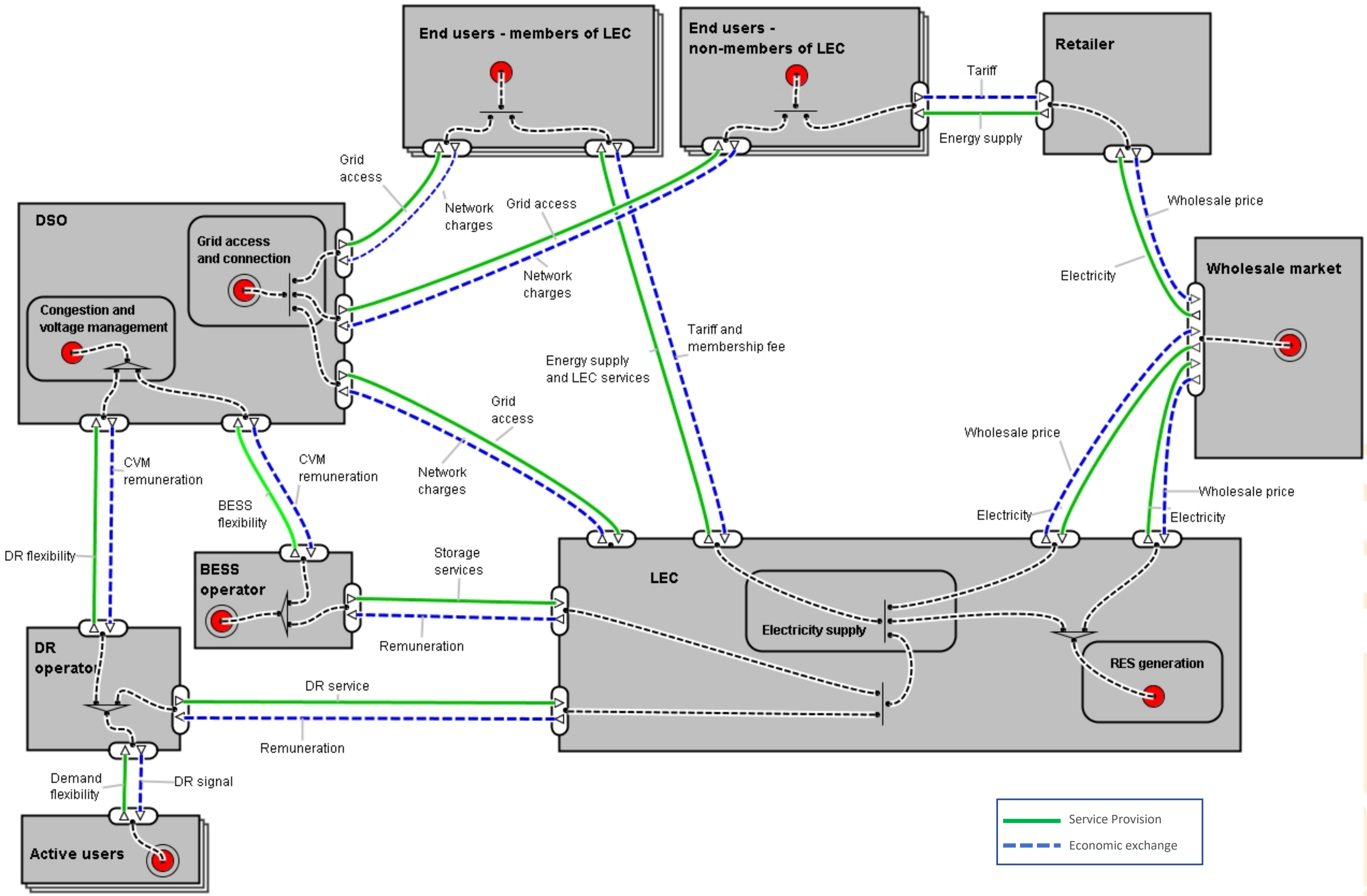
June 7, 2022

Role of energy communities



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Role of energy communities

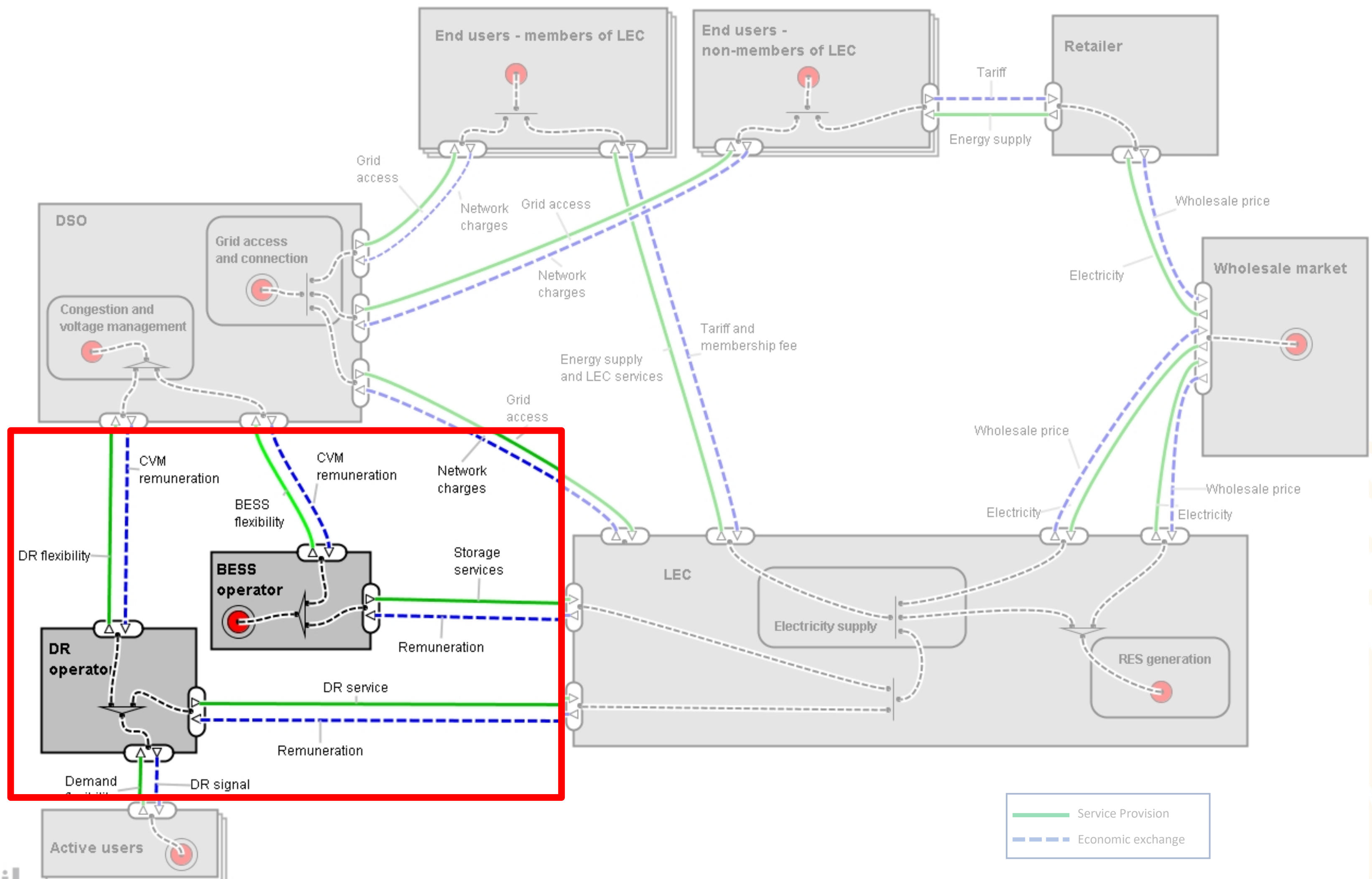
Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
- Equipment suppliers - End-users, LEC members - Software Provider and IT integrator - Data service provider (forecasting, others)	- Optimal design of generation equipment and facilities - Local energy management to maximize local self-consumption. Includes forecasting, energy optimization, trading and supply	- Supply locally produced renewable electricity - Reduced electricity bill - Enhance self-sufficiency - End-user empowerement	- Open webpage information, FAQs, etc. - Intranet platform for personalized feedback and energy data - On-line assistant and social media interactions - Direct relationship through representative at	- Local end-users, particularly those connected at LV, including residential and commercial - Local community at large (brand presence, educational, etc.)

BM#	Main actor	Customer segments	Value propositions	Revenue streams
BM1	LEC	- Local end-users, particularly LV ones - Local community	- Supply locally produced renewable electricity - Reduced electricity bill - Enhance self-sufficiency - End-user empowerement - Feeling of community membership - Enable end-users to become an active part of the energy transition - Locally-oriented alternative to conventional incumbent suppliers - Energy feedback and advice	- Revenues from selling electricity to LEC members - Revenues from selling electricity in wholesale markets - Lower RES curtailment - Specific remuneration for RES electricity (if elligible) - LEC membership fees

- DSO network charges
- Market participation fees
- Energy procurement from wholesale markets
- Maintenance and replacement of equipment
- BESS investment and maintenance costs (if applicable)
- DR or BESS service remuneration (if applicable)

- LEC membership fees

Additional roles of energy communities?



Additional roles of energy communities?

BESS operator:

- Besides optimizing its own processes (e.g. maximizing RES self-consumption) → act as an FSP to **provide services to DSOs (CVM, islanding)**
- Bilateral contracts or local flexibility markets
- Key challenge: design, install, **operate and maintain BESS**

Main actor	Customer segments	Value propositions	Revenue streams
BESS Operator	- LEC - DSOs	- Improved grid planning and operation thanks to BESS support - Availability of BESS flexibility while complying with regulatory unbundling limitations - No need to care about BESS maintenance or transport (if mobile BESS)	- Revenues for providing flexibility services - Revenues for provision of islanding services

Additional roles of energy communities?

DR operator:

- Besides optimizing its own processes (e.g. maximizing RES self-consumption) → act as an FSP to **provide services to DSOs (CVM, islanding)**
- Bilateral contracts or local flexibility markets
- Key challenge: recruit, engage and **activate consumers when/where needed**
  - Open issue: **economic or behavioral nudges** (peer comparisons, gamification)?

Main actor	Customer segments	Value propositions	Revenue streams	Key activities
DR Operator	- LEC - DSOs - Active consumers	Vis-à-vis DSOs and LECs: - Improved grid planning and operation thanks to DR support - No need for DSO or LEC to perform recruitment and engagement activities - Improved information on the current and future behaviour of local grid users 'Vis-à-vis end-users: - End-user empowerement through enhanced consumption data and controllability - Enhanced energy efficiency - Lower energy bills and/or additional revenue streams - Maximize the consumption of locally produced energy	- Revenues for providing flexibility services - Income from energy service contracts signed with active users	- Design and deployment of communications infrastructure - Recruitment of active users and contracting DR services - Procurement and deployment of smart home devices - Estimation of flexibility availability - Determine flexibility costs and profit-sharing mechanisms with active users - Sales of flexibility services through the means set by the DSO - Design energy feedback and behavioural signals/nudges to achieve changes in end-users' consumption profiles - Monitoring and assessing end user response to DR signals

Gaps and challenges

- Slow progress **LEC regulation** (CEC/REC) at national scale
  - **Collective self-generation** enables LEC (even if not legally recognized as such)
  - However, often limited to supply points within the same building → limits scalability
- **Low smart metering deployment in some MS limits replicability**
  - Needed for DR ex-ante (forecast, recruitment) and ex-post(verification, settlement)
- **DSO BESS ownership** model?
- **Provision of flexibility services to the DSO:**
  - **DSO regulation** generally does not incentivize flexibility over grid reinforcement
  - Lack of mechanisms for **flex. procurement**: connection agreements, local markets
  - Flex. trading platforms emerging as a new business model itself.
    - Open issue: operated by DSO (à la TSO in AASS) or independent operator (à la PEX)?

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Thank you!

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