Users TCP Academy

"How are energy communities/districts contributing to energy transition?"

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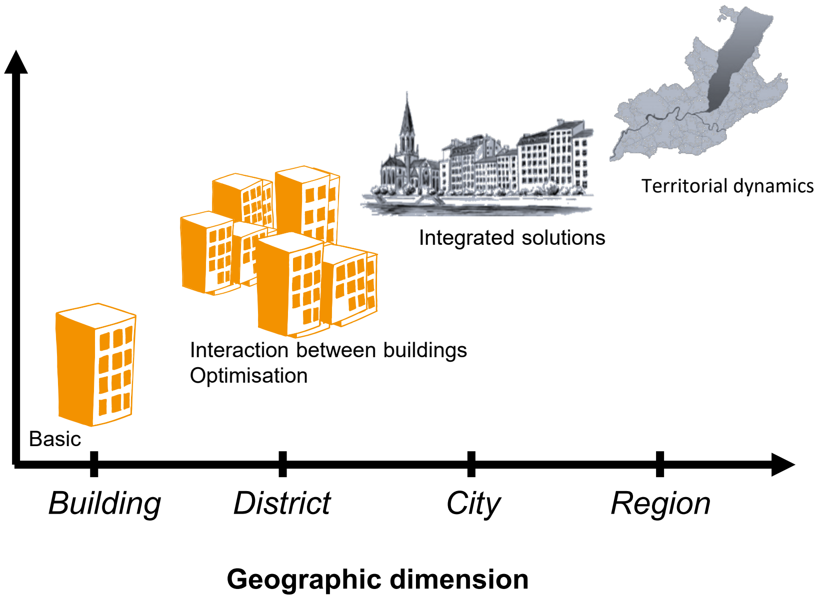
Agenda

- Technological and social innovation in different community energy typologies and their relationships with the socio-technical regimes
- Policy implications and recommendations for programme managers
- Moving towards Living Labs as a methodology and as intermediary

Changes in the landscape



- Transition to low-carbon supply
- Distributed energy resources
- Decentralisation
- Electrification of mobility & heating
- Intelligent and digital systems

Energy communities and districts

Energy communities and districts

EU: Clean Energy for all European Packages, 2016 (Electricity Directive, Art. 2, No.11)

“renewable energy communities”
“citizens energy communities”

Switzerland: Swiss provisions (the Energy Law (Lene), 2016 and Energy Ordinance (OEne), 2017)
“groupings of prosumers and consumers”, “community ownership”, “community energy”

PEDs (positive energy districts)
Smart Cities
So on and so on.

Learnings from case studies in Switzerland

Case studies

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Case study 1
Self-consumption community
(2 multi-family buildings in Boiron)

Case study 2
Self-consumption district
(4 multi-family buildings in Möriken-Wildegg)

Case study 3
Integrated energy community
(17 detached houses and school in Luggagia)

Case study 4
Virtual Power Plant
(A pool in Zurich for 15 buildings)

Case study 5
Peer to peer trading community
(Quartierstrom, 37 househods)

Case study 1: Self-sufficient community

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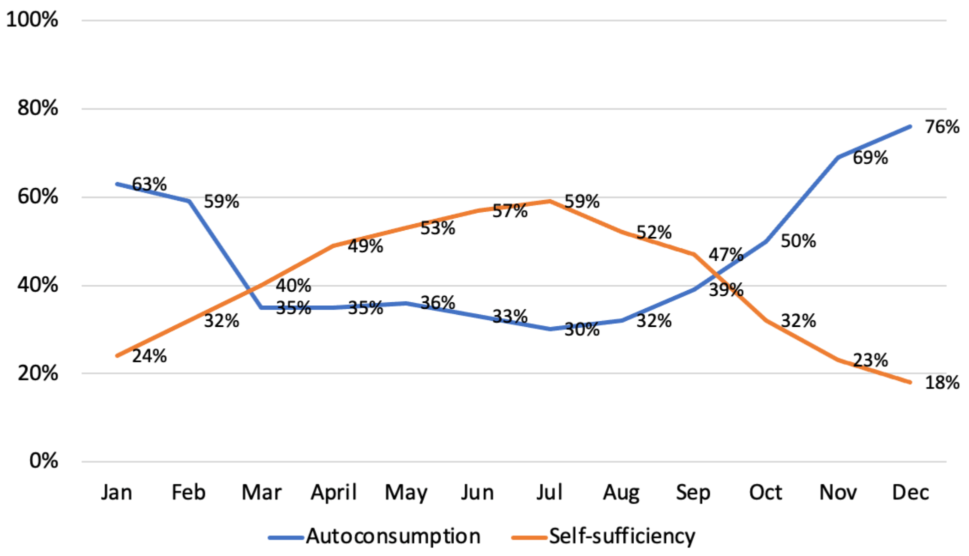
30 apartments
PV capacity 71.4 kW.

If PV consumed: 17 ct/kWh
If bought from the grid: 21 ct/kWh
Sell PV excess: 10 ct/kWh

No energy management systems

Case study 1: Self-sufficient community



5% decrease in the bills
4,500 CHF per year → 20 years

Case study 2: Self-sufficient innovative district in Möriken-Wildegg with EMS

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Möriken-Wildegg with 4 apartment buildings (source: Setz Architektur AG)

Energy community / district (RCP):
4 neighbour residential buildings

+

PV installation

+

Energy management system
(Heating -> full-automation
Electric vehicle → semi-automation
Dishwasher & washing machine → semi-automation)

co-invest

Local utility (retailer)

Case study 2: Self-sufficient innovative district in Möriken-Wildegg with EMS

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- The optimization tool prioritizes PV production first, if there is no production, the optimization is done based on real-time prices.
- 50% of people have moved their washing machines and dishwashers.
- Average self-consumption was 46% and self-sufficiency 52%.
- 7.8% bill savings for end users.

- Community interest first!
- Constant support with information (interface)

Case study 3: Luggagia Innovation Community

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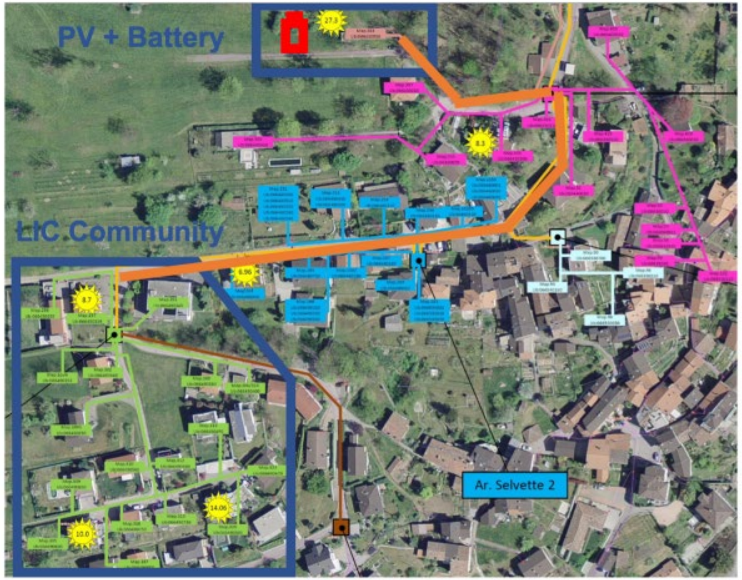
Problem & Motivation:
Too much PV supply (grid problem)
Local congestion (EV & heat pump)
Network reinforcement + voltage



Source: Supsi

Energy community (RCP):

14 house (75 residents),
3 house prosumers (33 kWp)

+

One kindergarten (30 kWp)

+

EMS
(Heating +
A decentralised battery)

Municipality

owner

Local utility
DSO

co-invested &
co-owner

Case study 3: Luggagia Innovation Community

Case study 3: Luggagia Innovation Community

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- 89% of the additional photovoltaic energy that was fed into the grid before was used in the community.
- Increased local self-sufficiency by 16%.
- 5% peak decrease only with domestic hot water. heat pumps → peak shaving of at least 15%
- Techno-economic analysis: 15-18% cost reduction for the DSO.

- Community interest first!
- Clear and transparent communication with people (workshops, surveys)

Key findings

- Technological innovation: know-how on PV technologies, energy management of distributed resources in communities and districts.
- Social innovation: Developing new practices is not observed strongly after joining.
- Constant support is needed by developers.
- Collaborative & symbiotic niche innovation
- DSOs, retailers closely working with SMEs, technology companies for more granular management of communities.

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(Living lAbs iNTerfaces for the Energy tRansitioN

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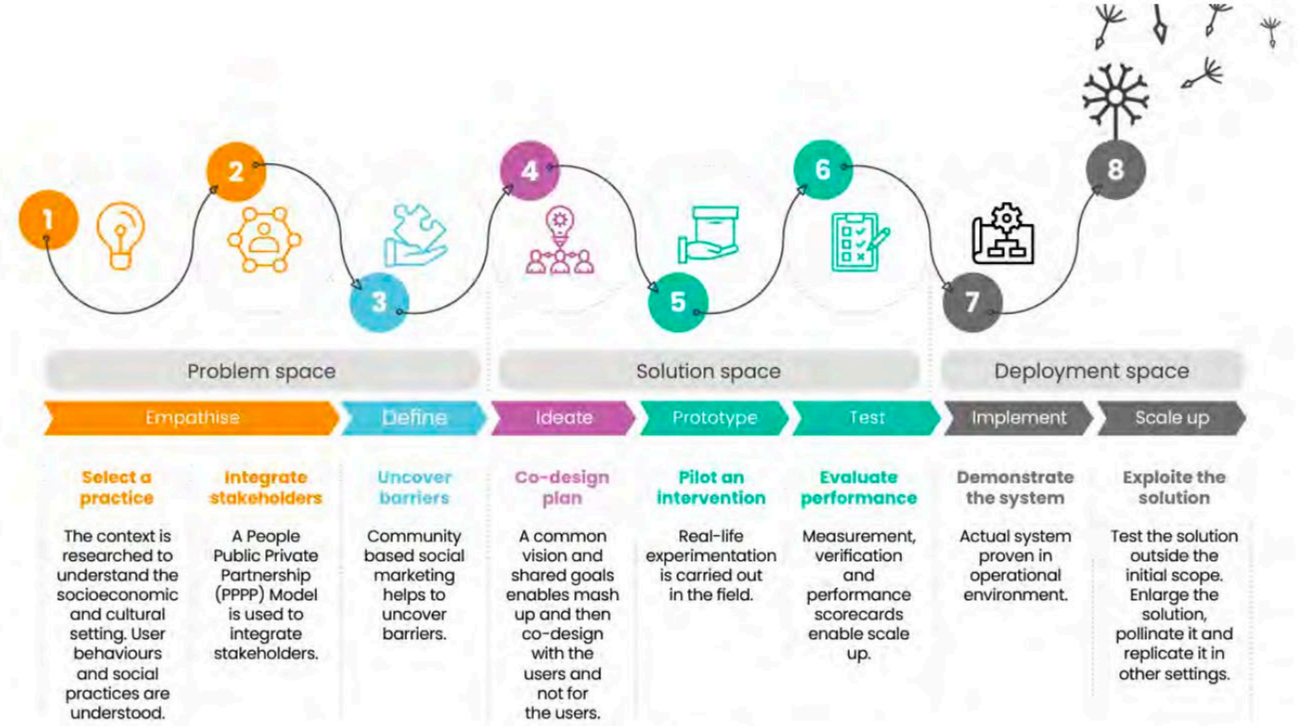

*Adapted from Mastelic, 2019

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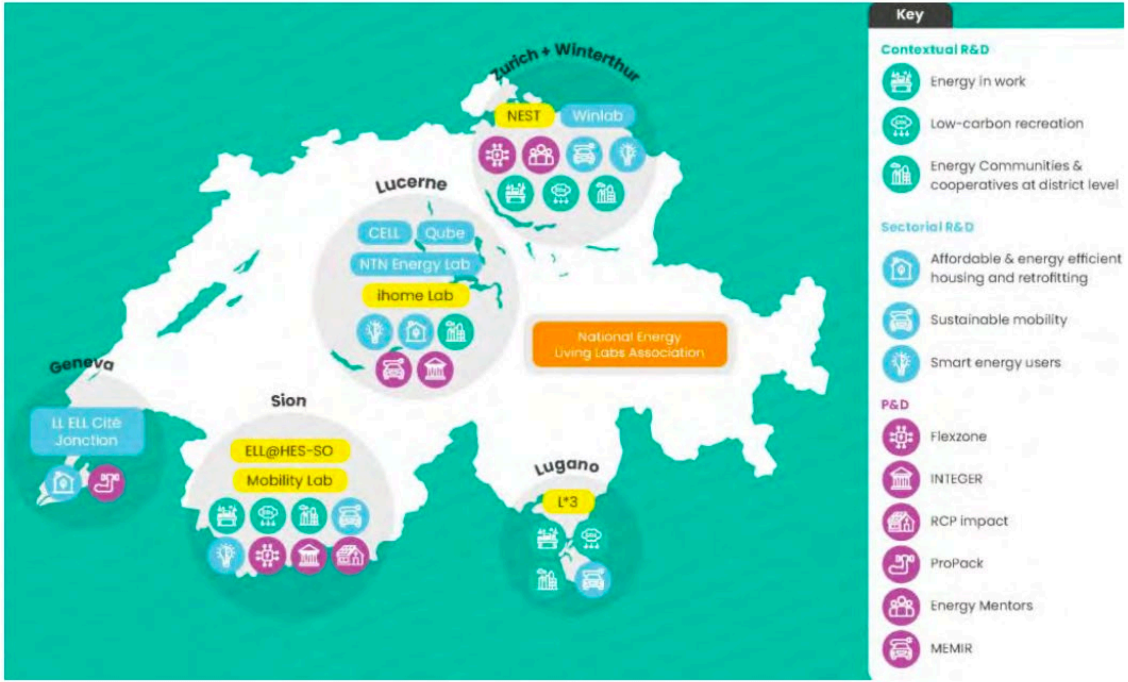

Figure 9 : Living Labs as territorial interfaces

Thank you very much!
Merci beaucoup!

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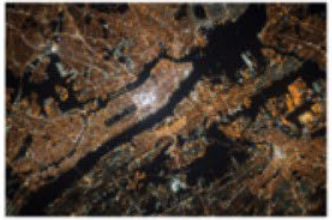
User-Centred Energy Systems



The User-Centred Energy Systems mission is to provide evidence from socio-technical research on the design, social acceptance and usability of clean energy technologies to inform policy making for clean, efficient and secure energy transitions.

Webinars

User-Centred Energy Systems Academy

Annexes

- UsersTCP | Business Models and Systems
- UsersTCP | Peer-to-Peer Energy Trading
- UsersTCP | Social License to Automate
- UsersTCP | Hard-to-Reach Energy Users
- UsersTCP | Behavioural Insights Platform
- UsersTCP | Gender and Energy