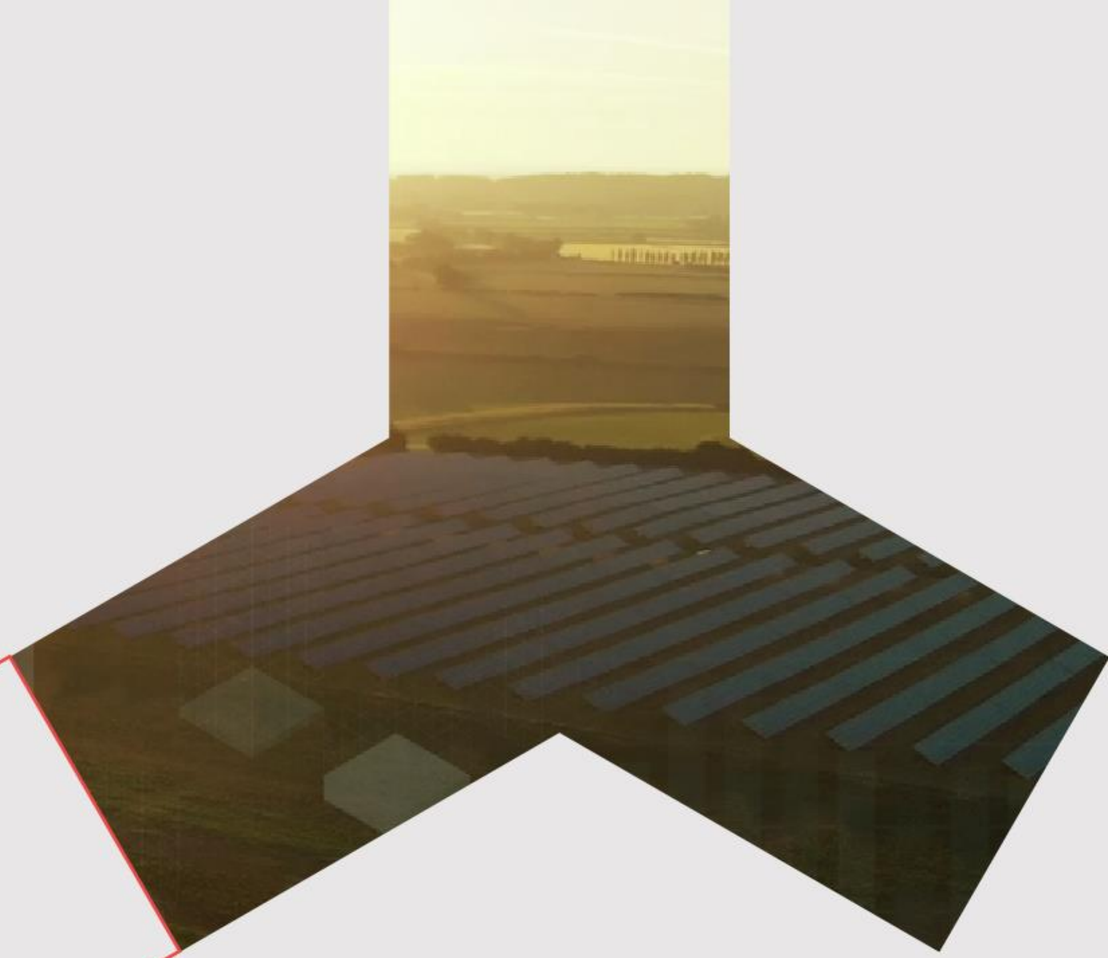
Hybrids, or hypes?



Hybrids, or hypes?

Energy communities #strongertogether

Ruben Baetens
PhD MSc Arch

Flux50

30/03/2021

100
experts

Engineers
Energy economists
Market strategists
Data scientists
Meteorologists

5
spin-offs

FLiDAR
XANT
Wattson
DUSS
DeltaQ

90+
Gigawatt

Solar PV
Wind onshore
Wind offshore
Storage
Grids & mini-grids

108
countries

Local knowledge
Onsite experience
Grid code expertise
Language spoken
Track record

Agenda

1

Buying electricity

The unbundled EU electricity sector

2

Energy communities

Collective and citizen-driven energy actions

3

P2P / Sharing energy / Collective self-consumption

But what if …

4

Key messages

1

Buying electricity

The unbundled EU electricity sector

Buying electricity

- **Unbundling** is the separation of the activities potentially subject to competition (generation, supply) from those where competition is not possible or allowed (transmission, distribution)

- The goal of unbundling is to guarantee **fair competition** among actors and **access** to the network at reasonable costs.

- Generation is part of an **emission trading system**, while also MS can add local levies to fund renewable energy or energy saving policies.

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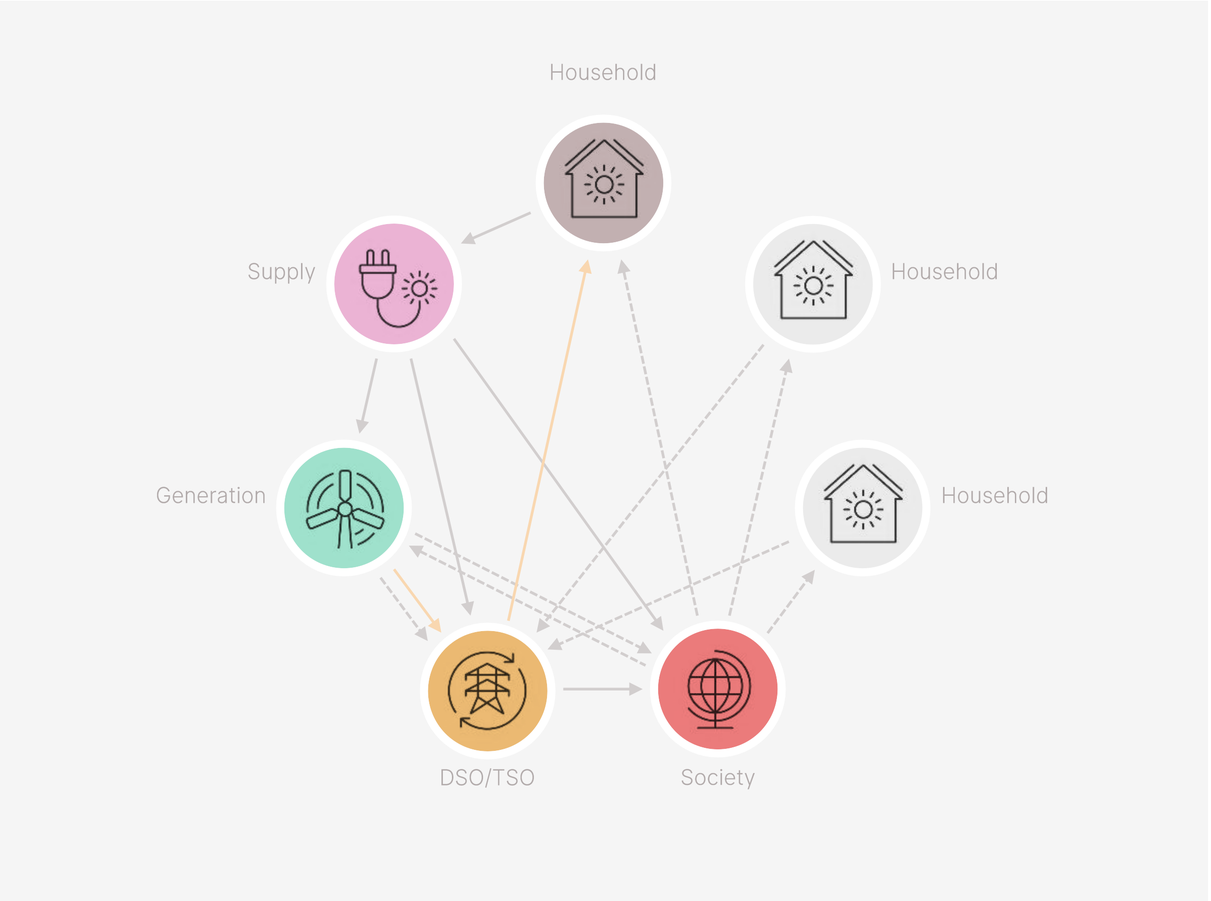

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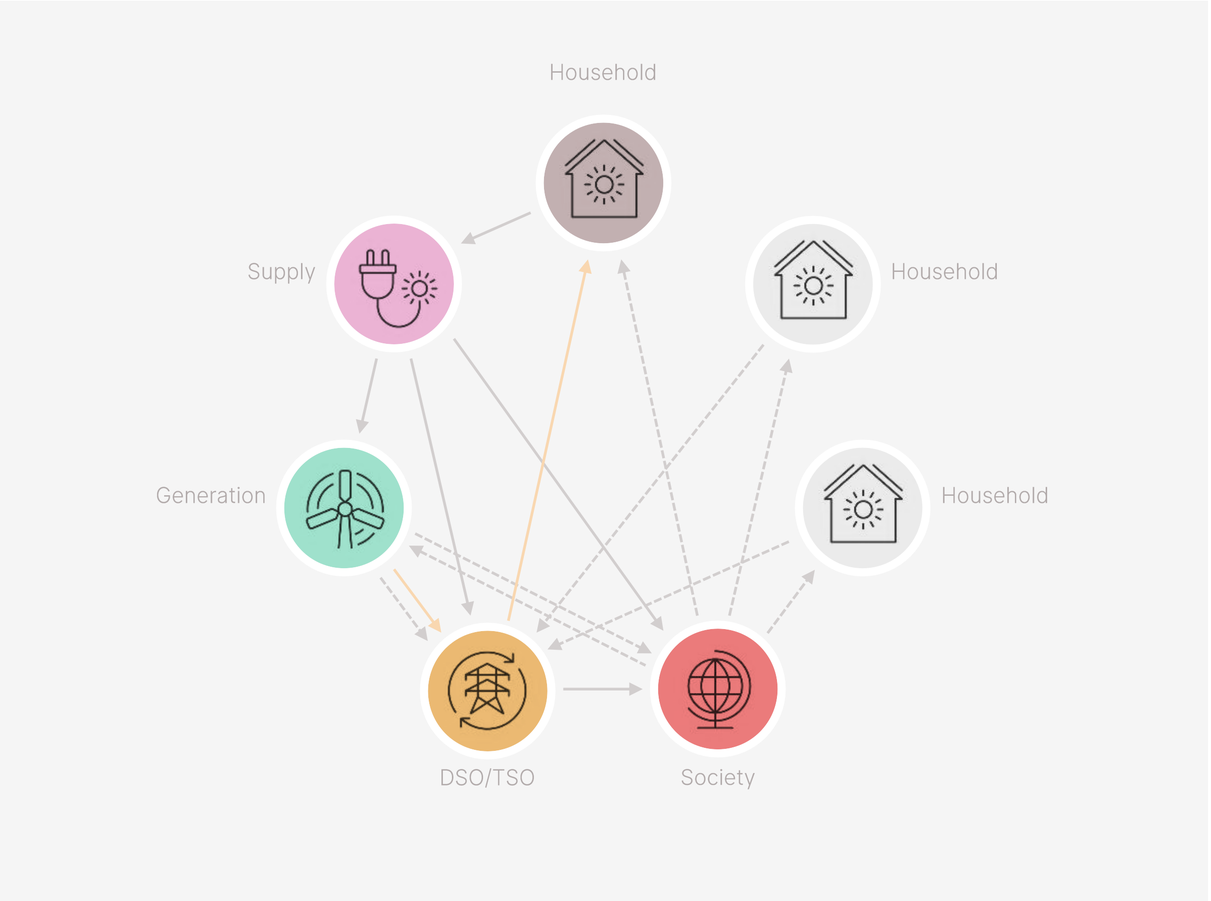

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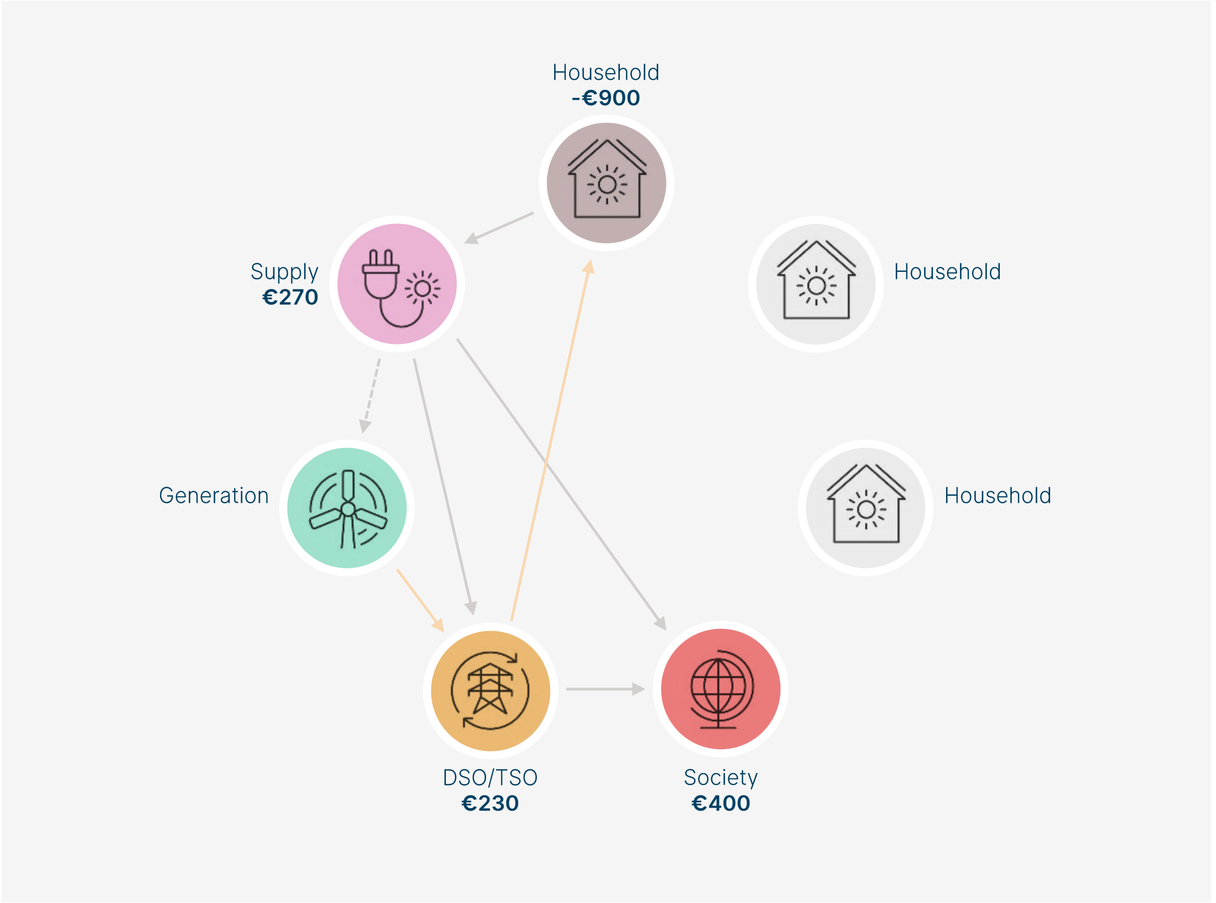
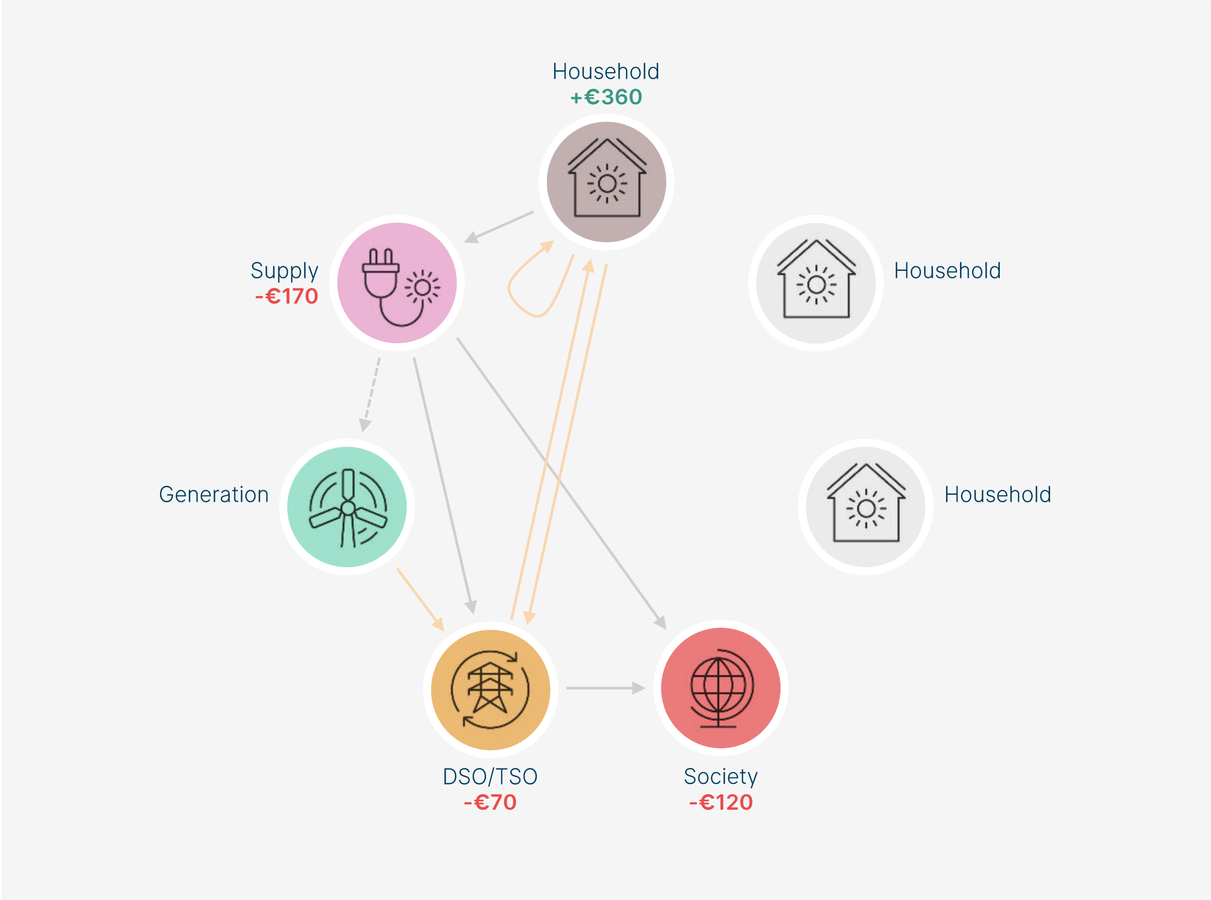
FIG_ Implicit *Financial beneficiaries* ● and *Power flows* ● for the electricity consumption of an average Belgian household *without* PV (Feb'21)



Buying electricity

- Installing **behind-the-meter** photovoltaics saves the end-consumer on supply & generation, grid and energy taxes - through self-consumption and grid injection.
- However, as a large share of the energy bill is **zero-sum**, around half of the gains created by installing PV are compensated by increased electricity bills for the other households.

FIG_ Implicit *changes* (+/-) in financial beneficiaries for the electricity consumption if an average Belgian household installs a PV installation (Feb'21)



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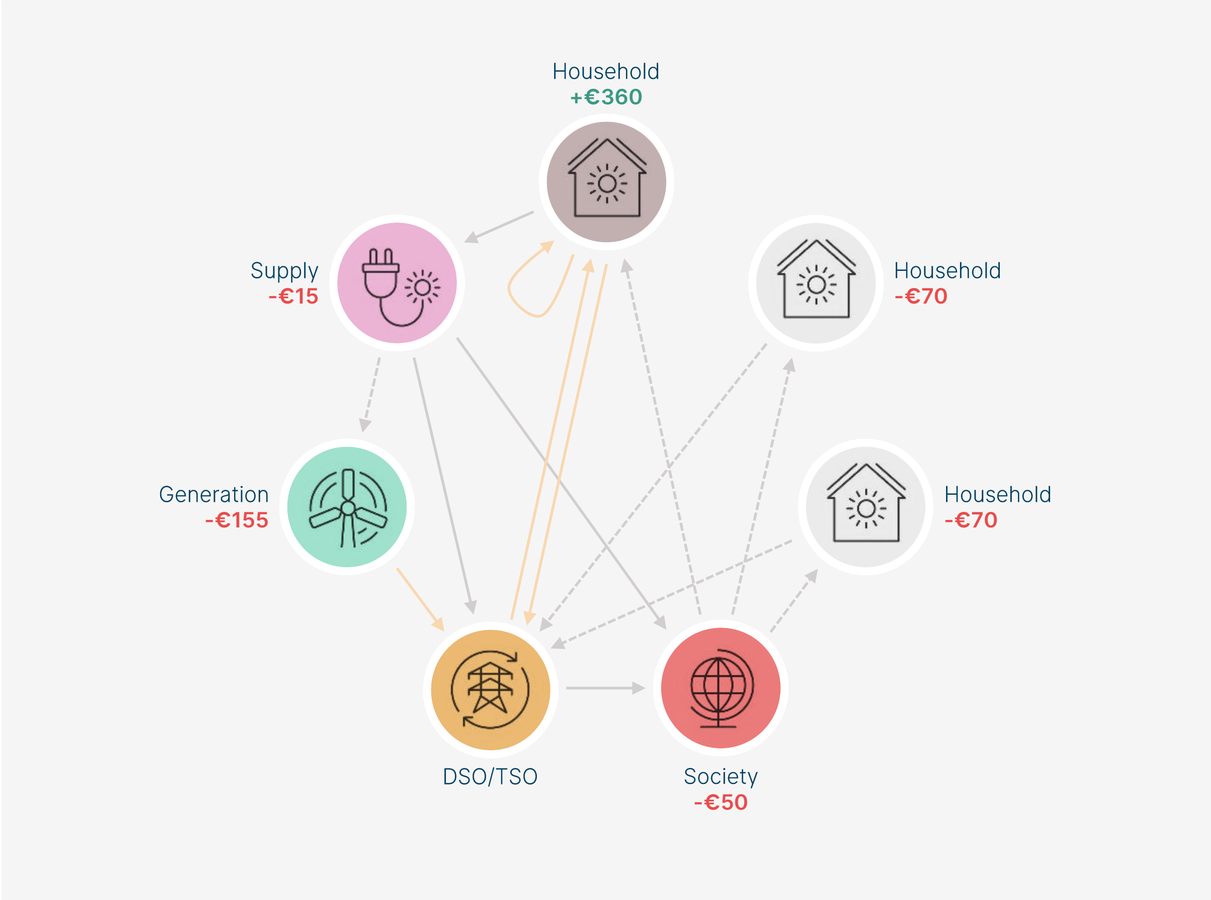

2

Energy communities

Collective and citizen-driven energy actions

Energy communities

- Energy communities organize **collective and citizen-driven energy actions** that will help pave the way for a clean energy transition.

- New rules enable active consumer participation in all markets, either by **generating**, **consuming**, **sharing** or **selling** electricity, or by providing **flexibility services** through demand-response and storage.

- Empowering renewable energy communities to produce, consume, store and sell renewable energy will also help advance energy efficiency in households, support the use of renewable energy and at the same time contribute to **fighting poverty** through reduced energy consumption and lower supply tariffs.

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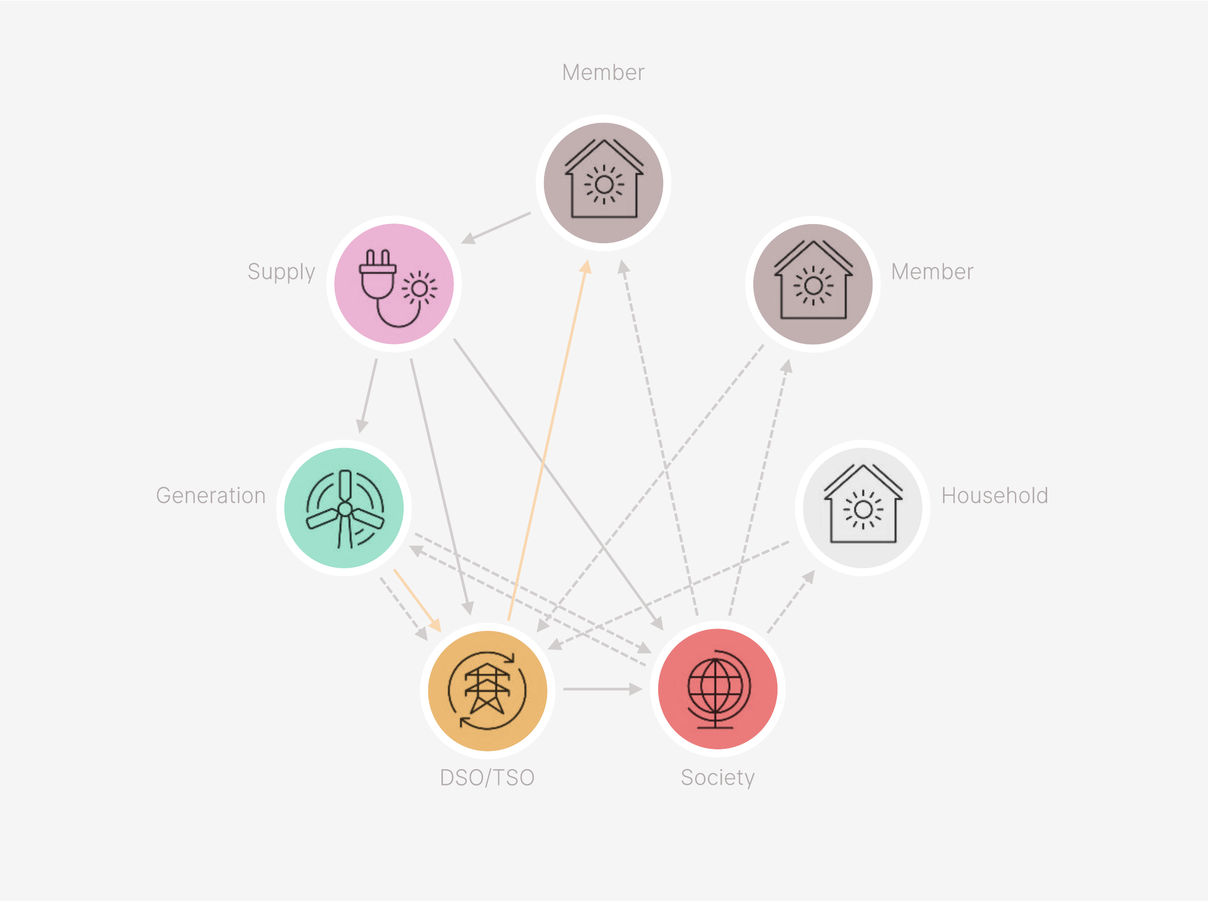

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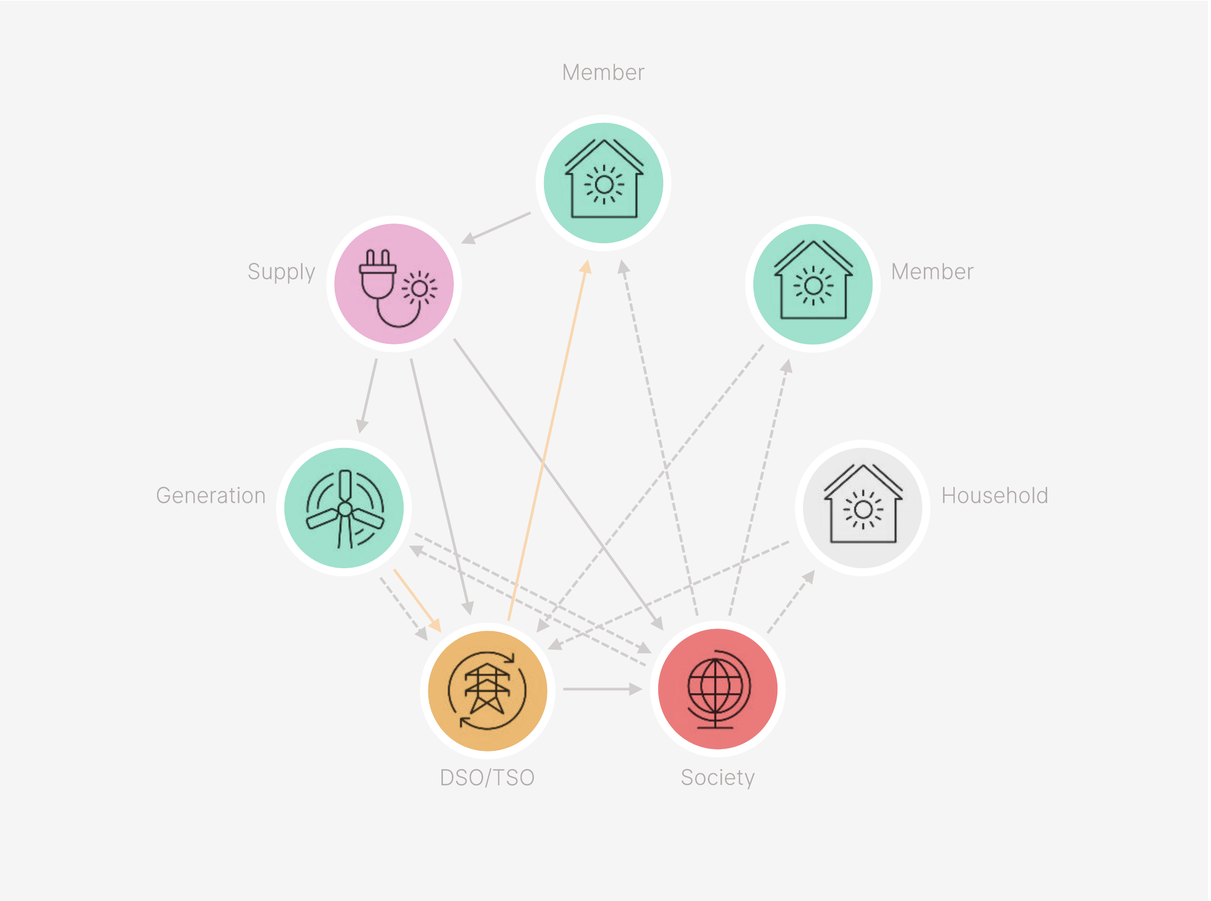

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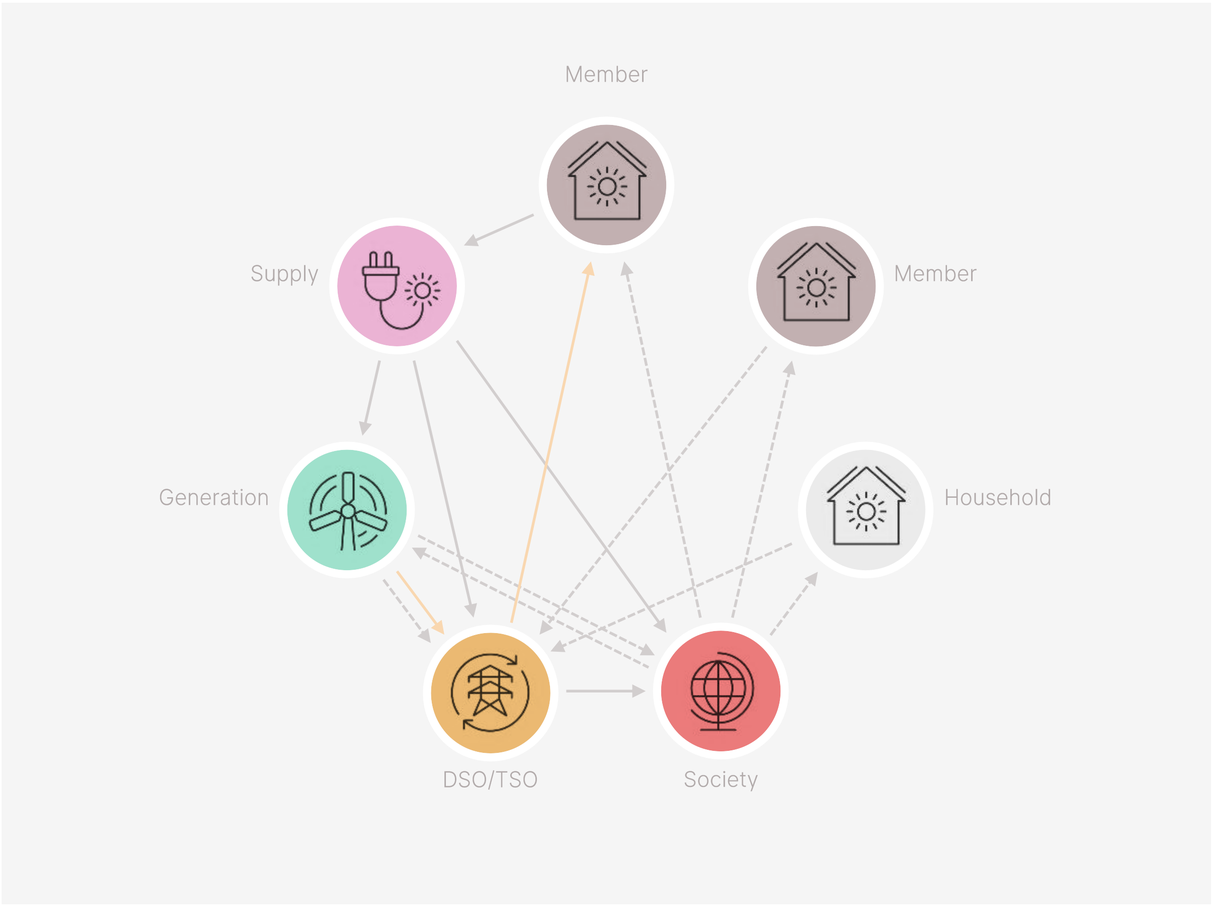

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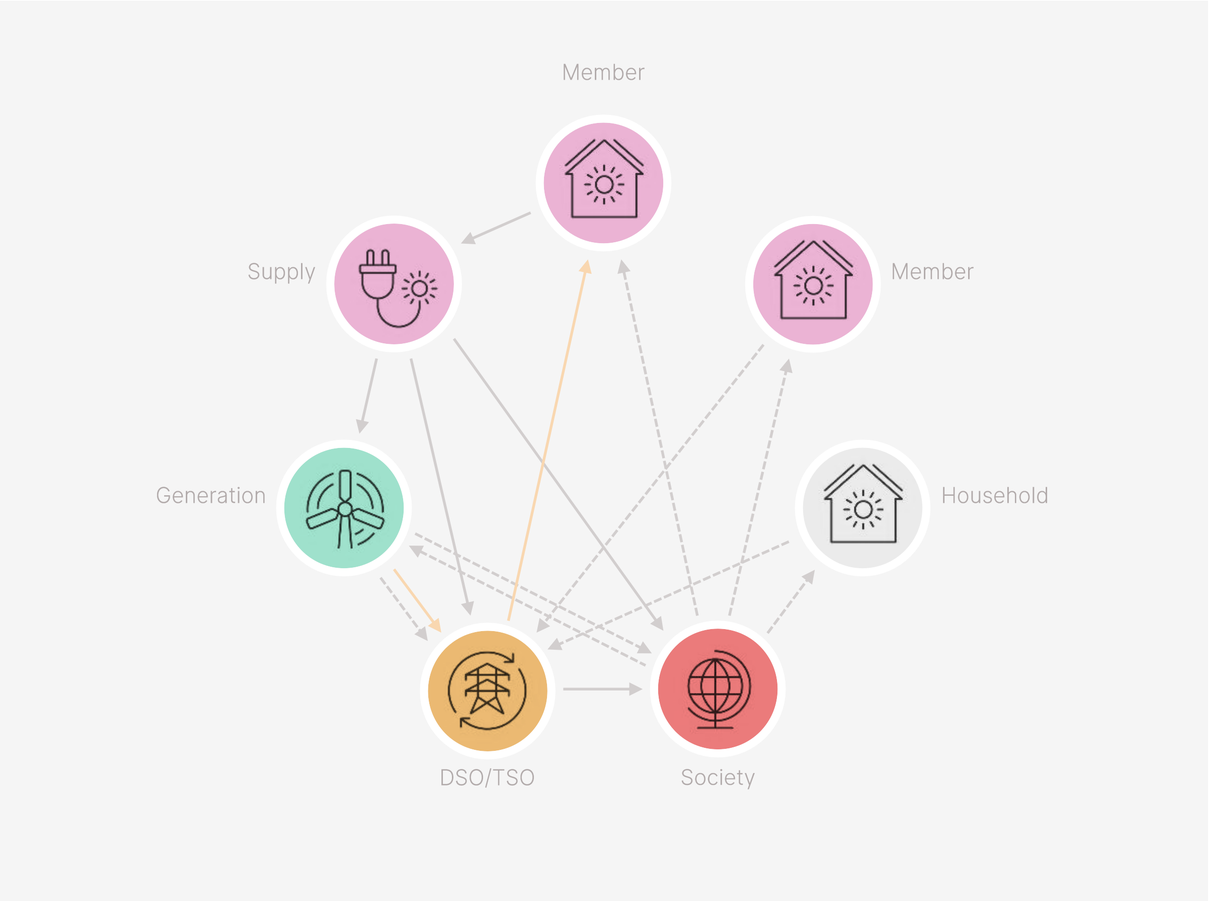

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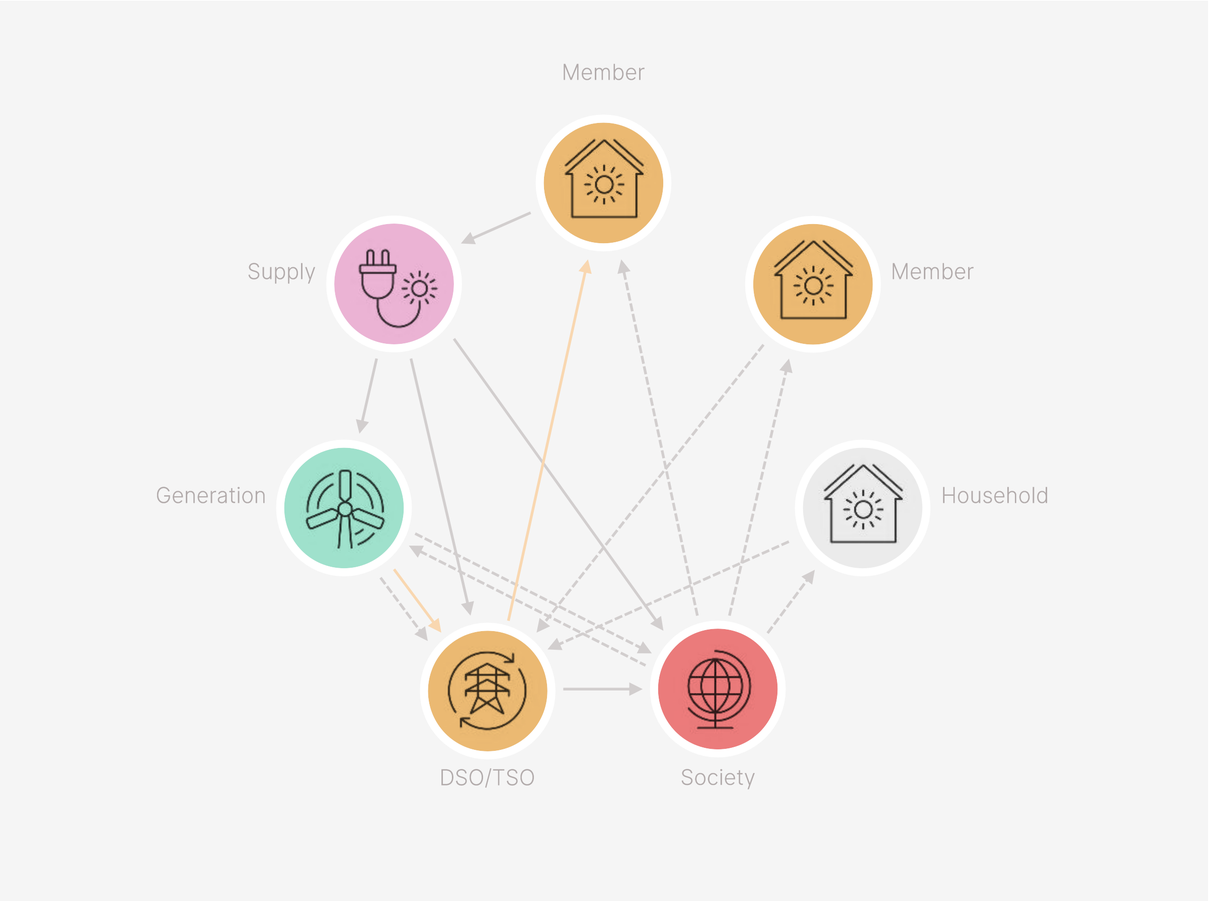


3

Sharing energy

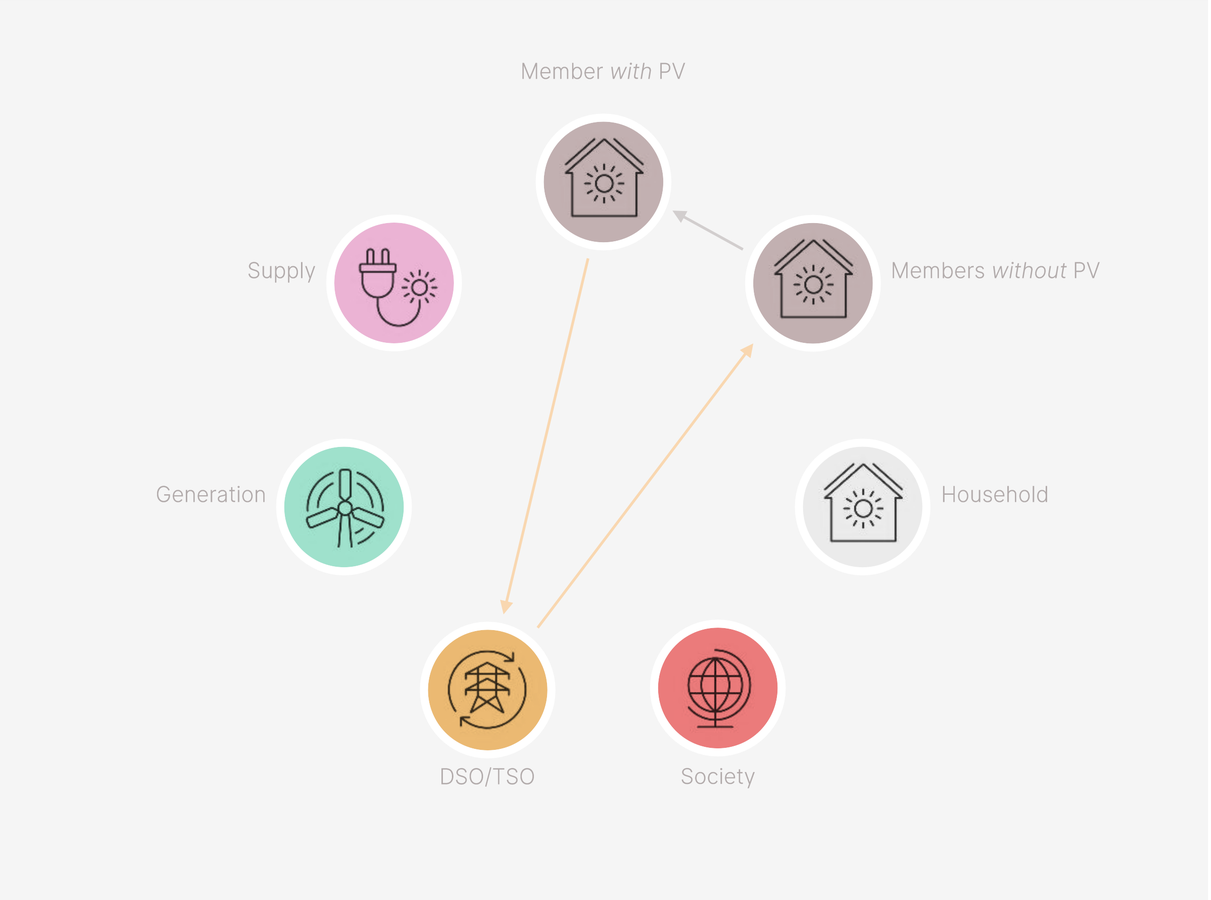
Peer-to-peer / Collective self-consumption

Sharing energy

Conceptually:
Transfer-of-energy ?

- ‘Energy sharing’ is a model where citizens can exchange locally produced power with one another (peer-to-peer) — or external markets.

FIG_ Implicit *Financial* ● and *Power* ● transactions for shared energy between two households within a community, i.e. one member with PV and multiple members without PV



Sharing energy

Recovering *all* energy bill components

- Eating the margin of suppliers
- Recovering grid tariffs *“because sharing energy reduces the use of and costs at the distribution and transmission grid”*
- Recovering energy taxes *“to support community energy”*
- … but remember the **zero-sum** game.

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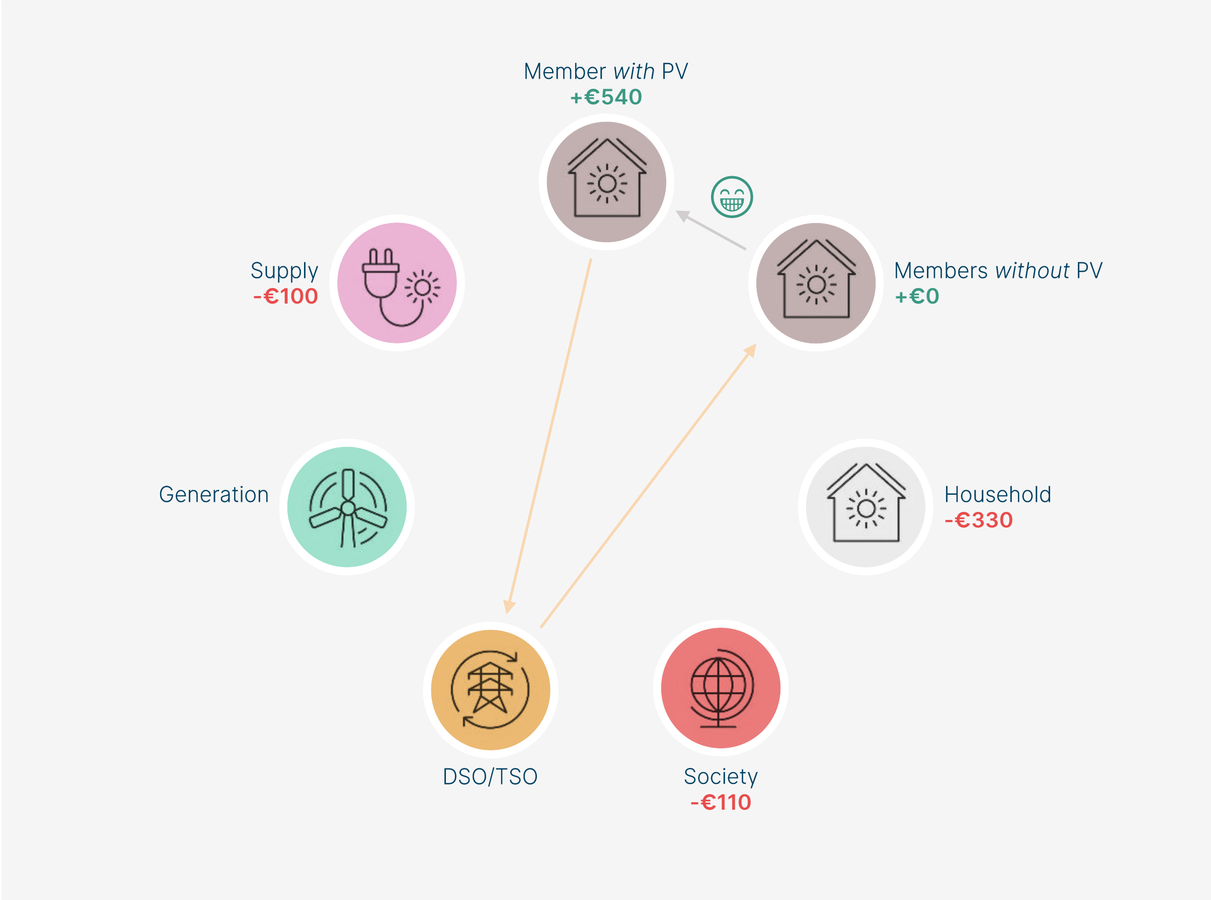
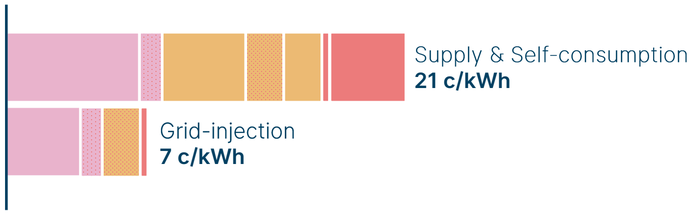


Sharing energy

But what if all energy levies are reformed to a CO_2-tax ?

- *If* the energy levies are reformed to a single CO_2-tax, such tax would also be 'recovered' by just injection power in the grid **without** setting up an energy sharing scheme.
- Which reduces the value of energy sharing with ~1/3rd, but also relieves non-member household.



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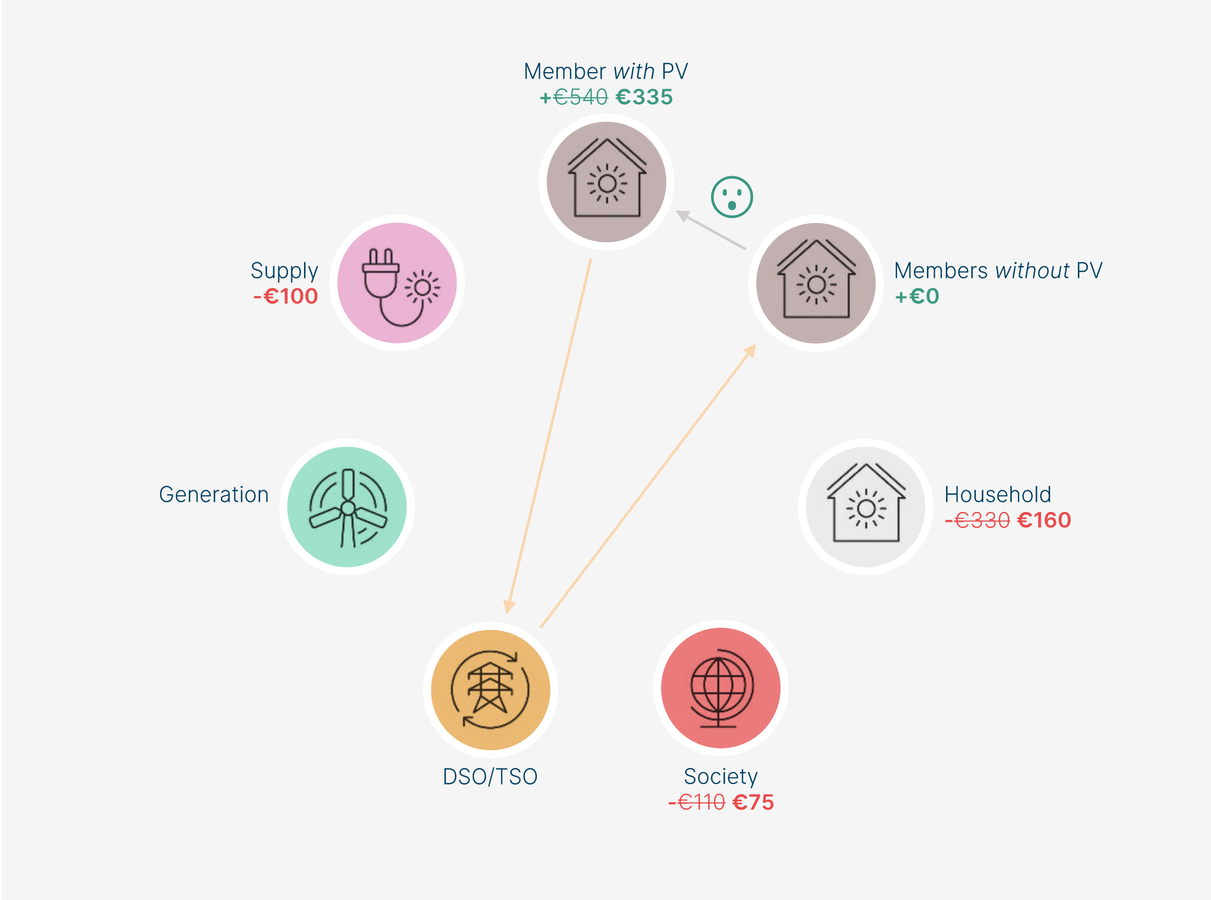

Sharing energy

… and what if (also) dynamic, hourly prices are introduced for all?

- If dynamic market prices are introduced to the end-consumer, grid offtake and grid injection will be **valued equally** –but counterfeited by a lump-sum handling fee.
- Which reduces the value of energy sharing with another ~1/3rd.

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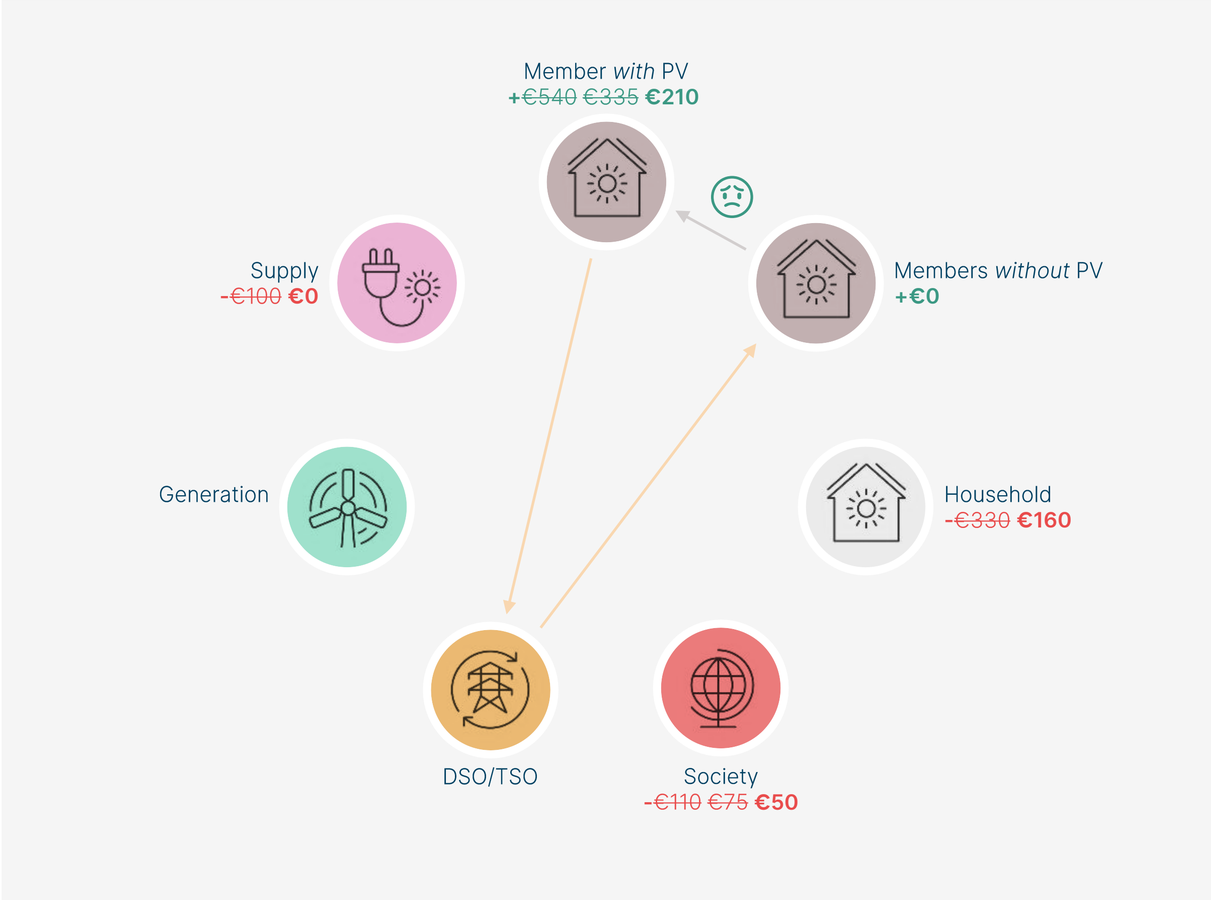
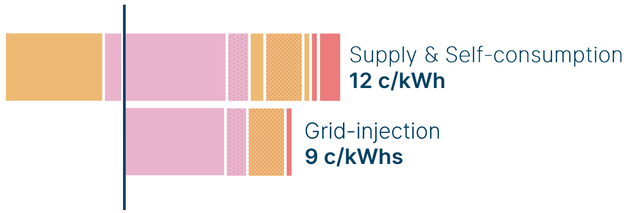


Sharing energy

… and what if (also) grid tariffs become cost-representative ?

- Over 80% of grid tariffs is **recuperation of historical costs**, and do not reflect current and/or local grid impact and grid costs.
- Grid tariffs are, hence, being transformed to a capacity tariffs which cannot be recovered by trading kWh's.
- Including CO_2-tax and dynamic prices, 90% of the value of sharing energy disappeared.



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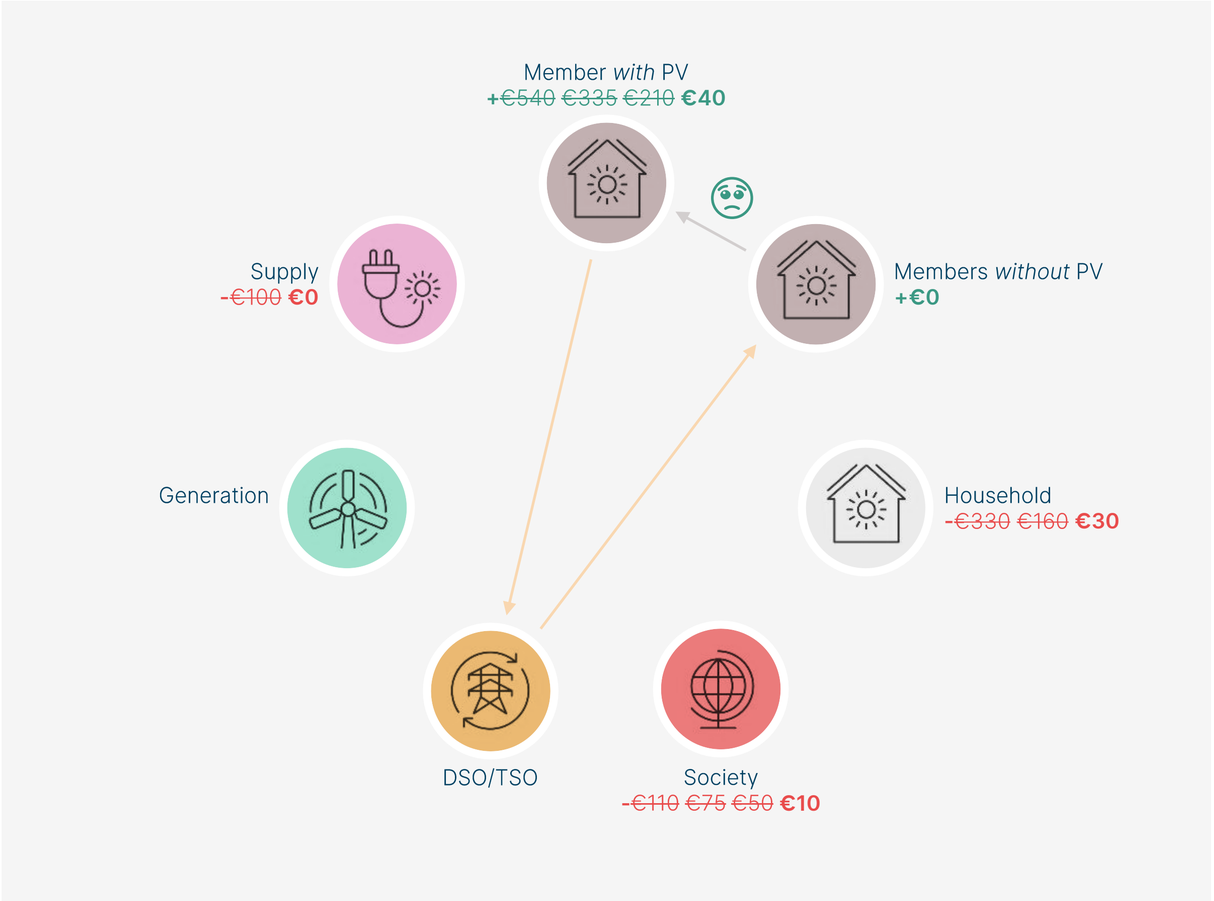


4

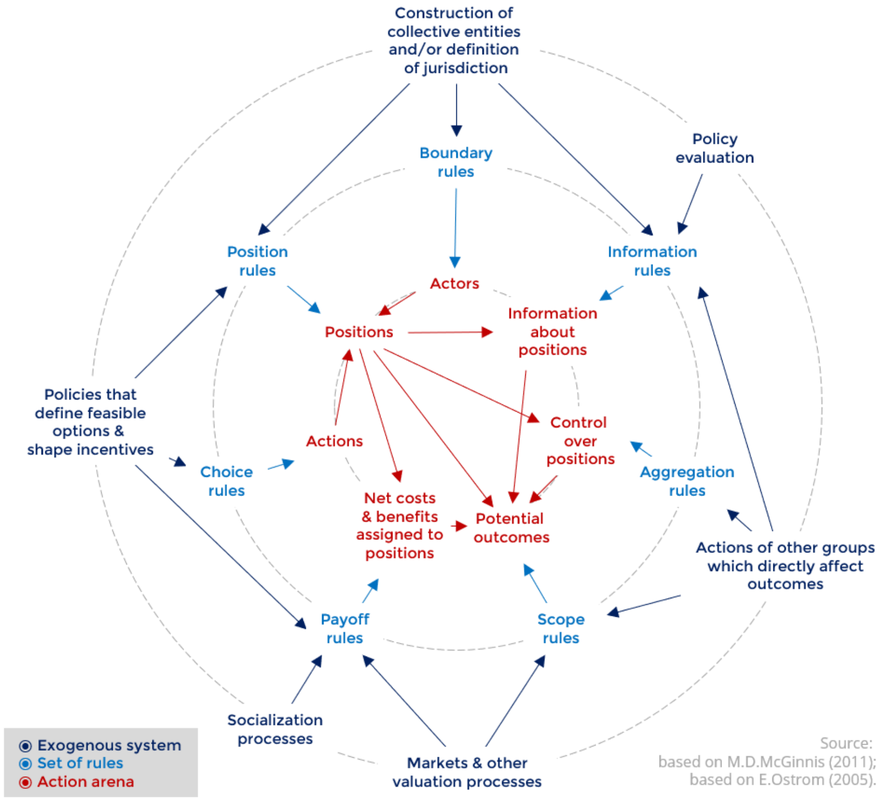
Key messages

Transfer-of-energy between prosumers within a community

Key messages

1. **Don’t forget an energy community is part of a bigger system.**
   Internal community rules can be strongly impacted by this ‘exogenous’ system.

FIG_ Action arena of (energy) communities,
drafted based on MD MCGinnis (2011), based in E Ostrom (2005)



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   Exceptions never last forever, and generally transfer costs to households outside the community.

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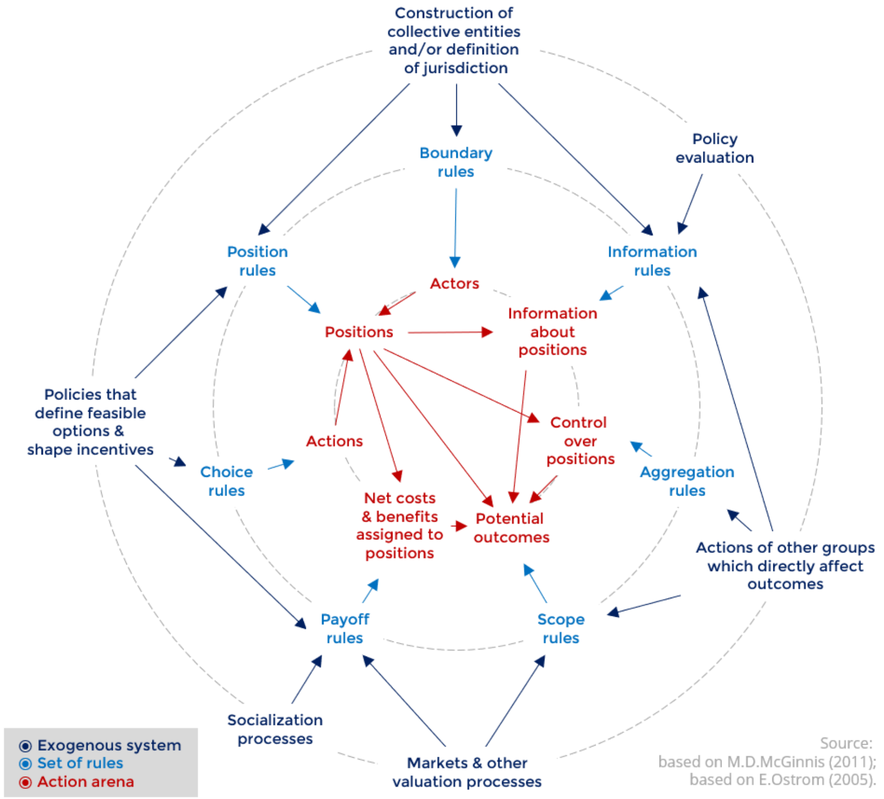

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   The energy sector is fast-moving with short contracts, making it hard to secure investments. Long-term agreements based on community trust and willingness-to-pay create *stability* and *certainty* for actions.

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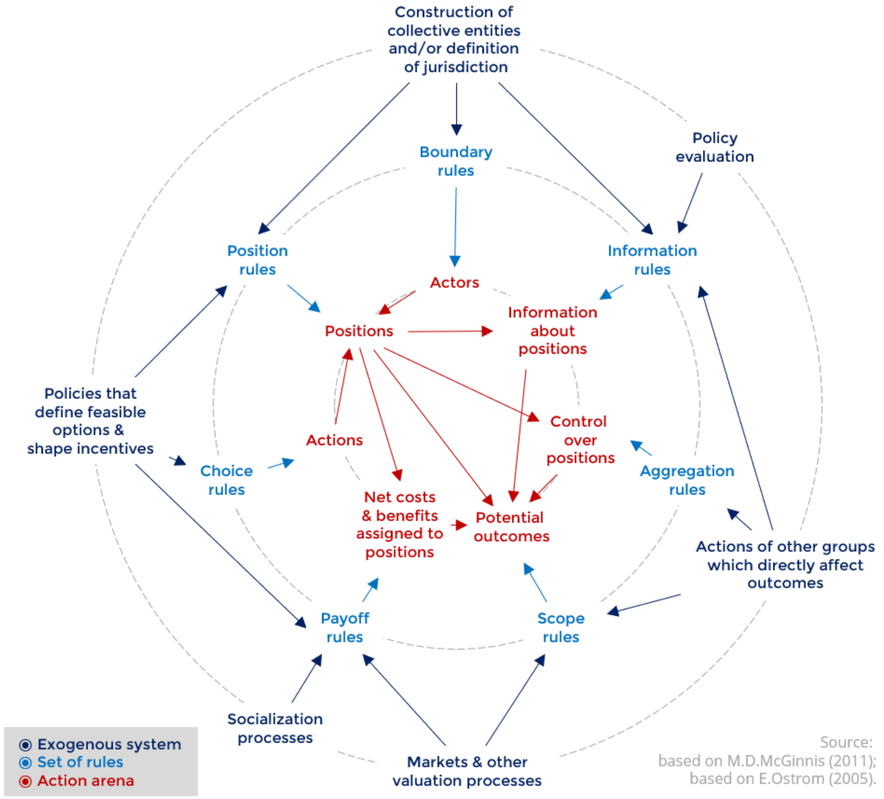

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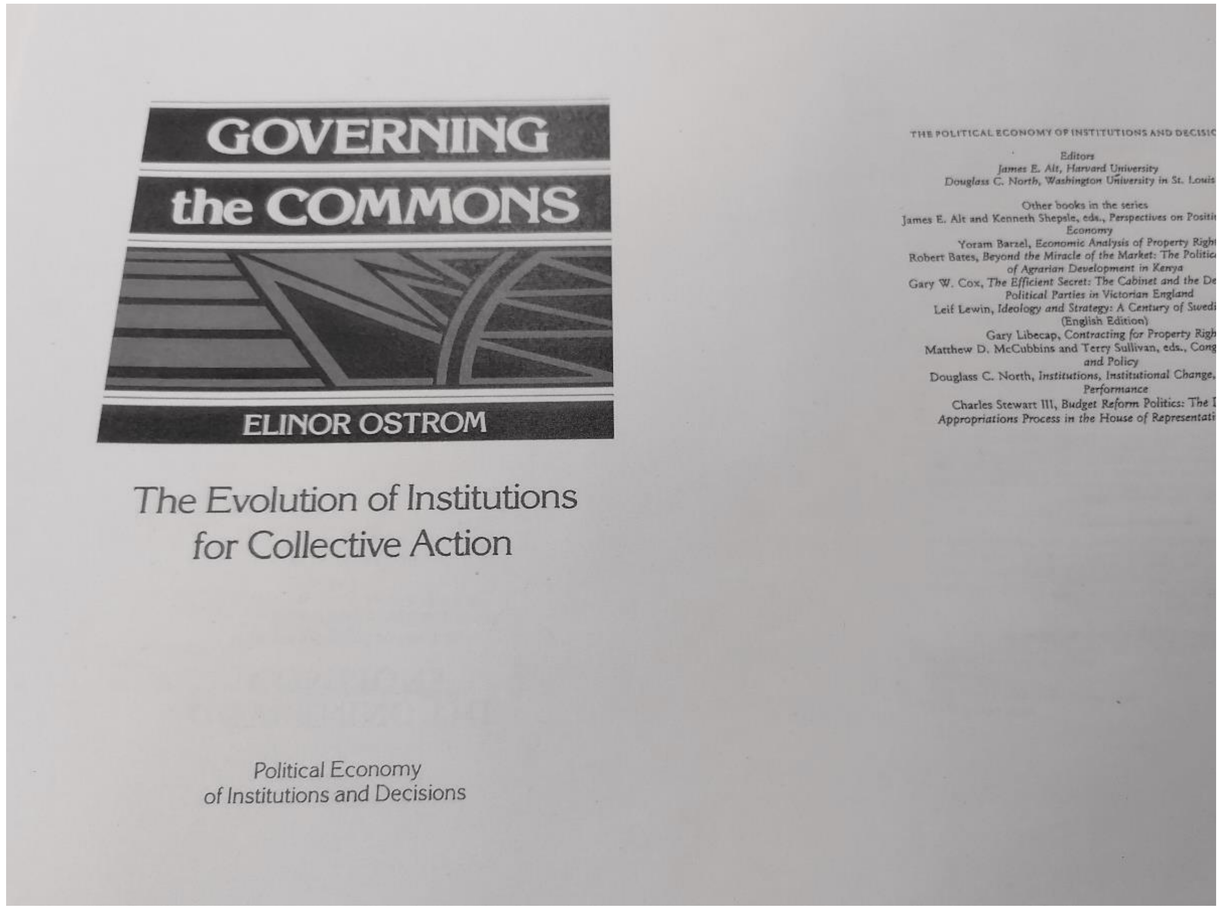
4. **Back to the basics.**

FIG_ Elinor Ostrom (1990), “Governing the Commons: The Evolution of Institutions for Collective Action”, *Political Economy of Institutions and Decisions - Canto Classics*, 298p



Thank you

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