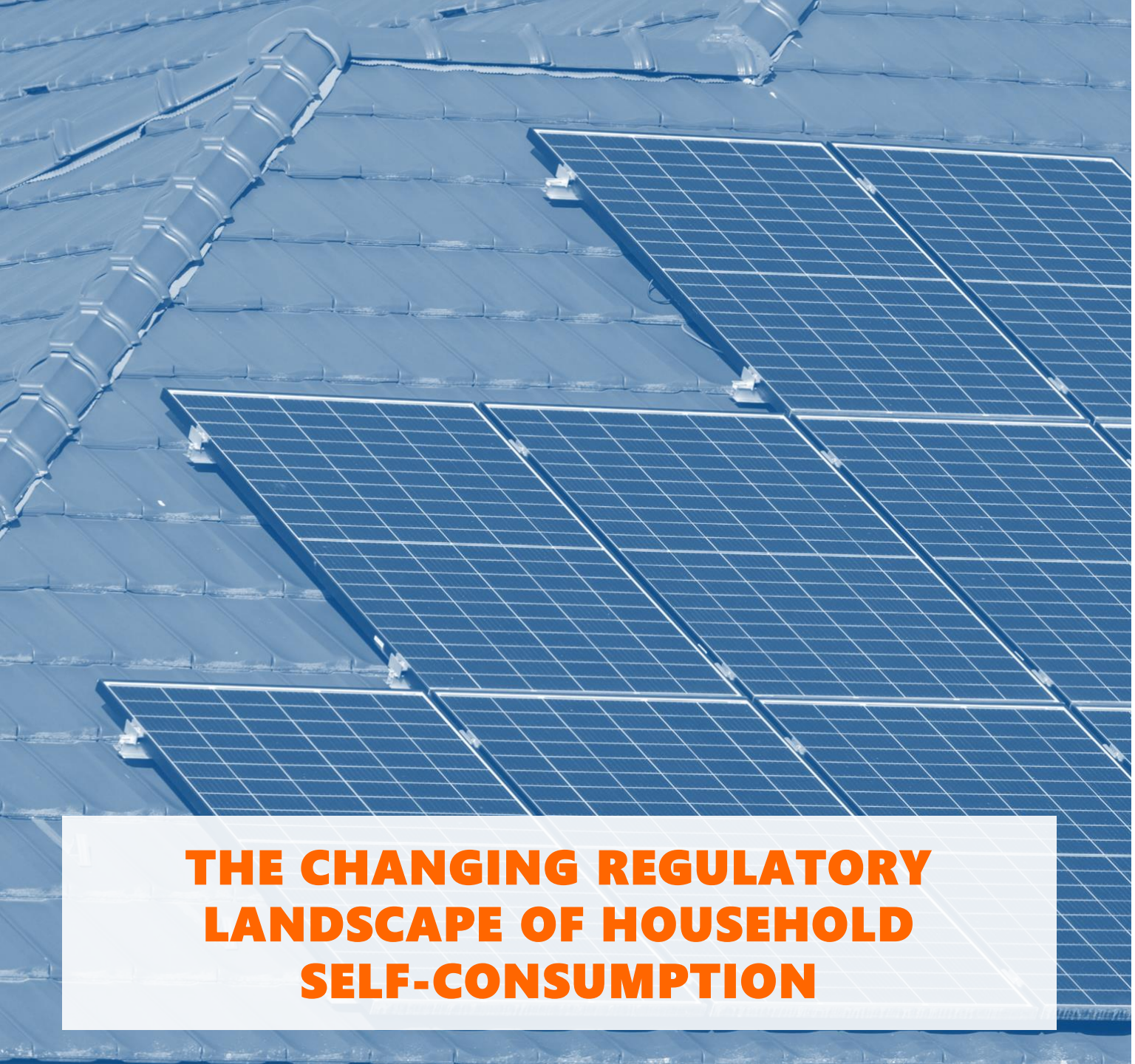


THE CHANGING REGULATORY LANDSCAPE OF HOUSEHOLD SELF-CONSUMPTION

REKK FOUNDATION

10 May, 2024
10.00 – 12.00 CET
online workshop

Supported by

European Climate Foundation

DIVERSITY OF SELF-CONSUMPTION SCHEMES FOR SOLAR PV IN THE EU

Katalin Varga, Senior Research Associate, REKK

Research questions

- What **changes and trends** can be observed in the *household* self-consumption schemes of EU countries to ensure compliance with EU regulations that require fair sharing of electricity system costs and the right to sell produced electricity at a price reflecting market value?
    - metering and billing arrangements
    - sell rate design
    - the retail price system
- What are the potential **challenges** and limitations under the different jurisdictions, what **barriers** might hinder renewable energy deployment?
- What kind of **other incentives** are available in the countries?
- How are **new prosumer business models** evolving (collective self-consumption, energy communities, virtual self-consumption, peer-to-peer trading, selling through aggregators)

EU regulation as laid down in the Internal Electricity Market Directive (EU) 2018/943

Prosumers need to contribute to grid maintanance and development

Article 15 Active customers

2. Member States shall ensure that active customers are: (e) **subject to cost-reflective, transparent and non-discriminatory network charges that account separately for the electricity fed into the grid and the electricity consumed from the grid (…)**

4. Member States that have **existing schemes that do not account separately for the electricity fed into the grid and the electricity consumed from the grid, shall not grant new rights under such schemes after 31 December 2023**.

EU regulation as laid down in the Renewable Energy Directive, (EU) 2018/2001

Prosumers are entitled to fair remuneration for surplus electricity

Article 21 Renewables self-consumers

2. Member States shall ensure that renewables self-consumers, individually or through aggregators, are entitled:

(d) **to receive remuneration**, including, where applicable, through support schemes, for the self-generated renewable electricity that they feed into the grid, **which reflects the market value of that electricity** and which *may take into account its long-term value to the grid, the environment and society.*

3. Member States may apply **non-discriminatory and proportionate charges and fees** to renewables self-consumers, **in relation to their self-generated renewable electricity remaining within their premises** *(in certain cases)*

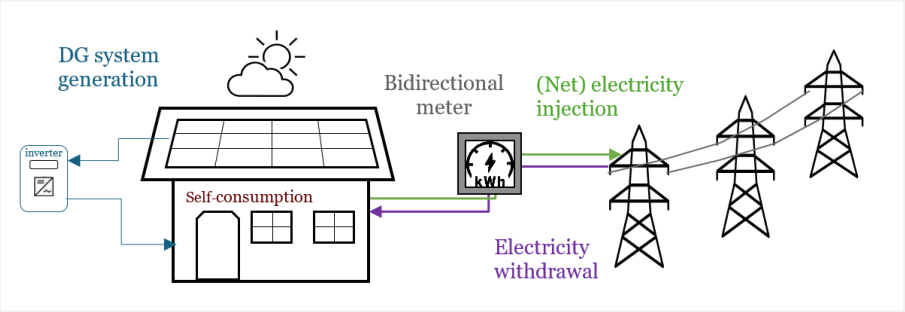
6. Member States shall put in place an **enabling framework** to promote and facilitate the development of renewables self-consumption based on an assessment of the existing unjustified barriers to

Metering and billing arrangements

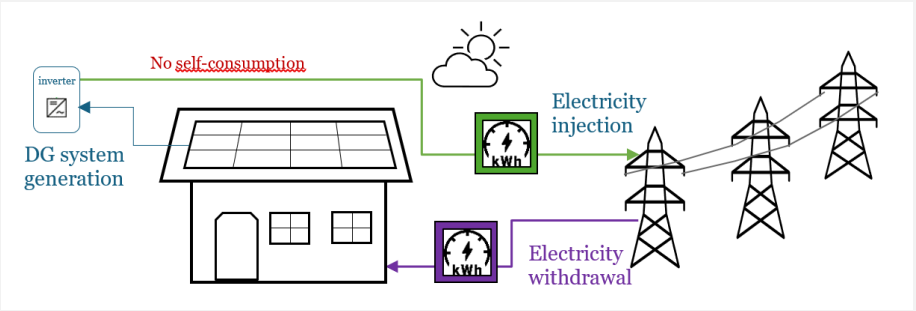
Often confusing nomenclature and difficulties in definition and distinghishing

3 concepts based on Zineman et al (2017)

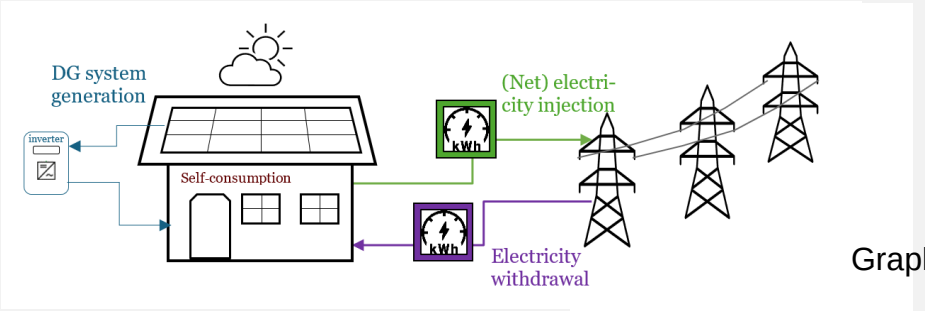
Net-metering



Buy all – sell all



Net-billing



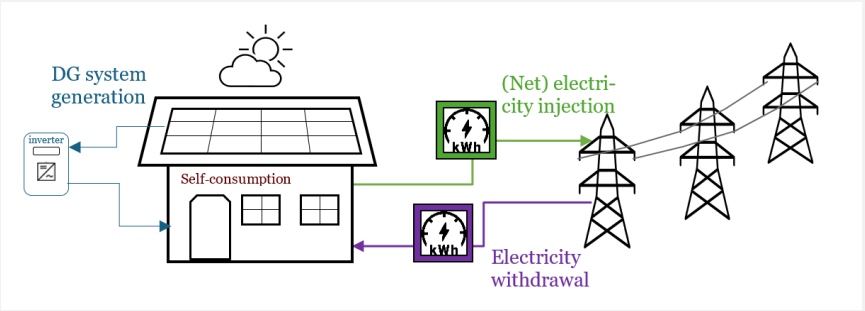
Graphs by REKK

Another arrangement: Separate metering and billing

As witnessed in several countries

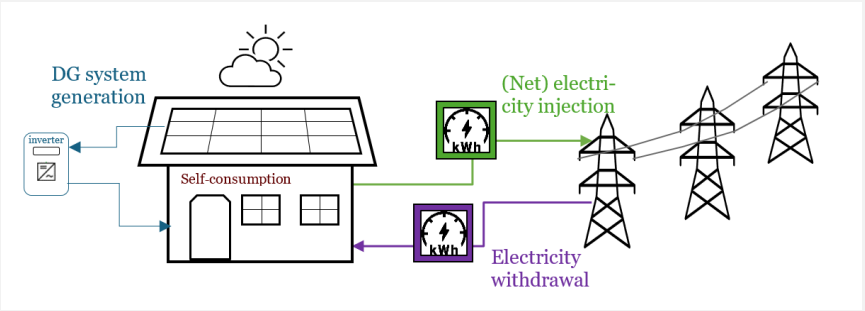
Separate metering and billing

- No netting of bills
- 2 separate contractual relationships for electricity exported and withdrawn



Net-billing

- Netting of the bills
- 1 or 2 contractual relationships for electricity exported and withdrawn



Graphs by REKK

Case study countries

Monitoring the evolution of self-consumption schemes in 10 EU member states

Previous system	New system	Country
Net-metering	Not yet in place	Netherlands, Greece
	Net-billing	Poland
	Separate metering and billing	Hungary
Net-billing	Separate metering and billing	Italy
Separate metering and billing	-	Austria, Portugal, Germany, Denmark
Other: no scheme	-	Slovakia

Sell rate design

Determines the value of surplus electricity fed into the grid

- Set by regulation - Static
  - Feed-in tariff (DE, GR), feed-in premium (above 10 kW in AT)
  - Fix amount based on the energy component of the retail tariff (HU)
- Set by regulation - Linked to market prices:
  - Spot pricing (DK), hourly pricing (IT, PL), or average of hourly prices (AT, PT)
  - May include upper and/or lower caps (AT, IT)
- Market price - as agreed with the supplier / aggregator
  - No pre-set criteria, households and suppliers agree on the sell rate (in HU from 2025, SK, NL for surplus after netmetering)
  - Aggregator: PT
- Charges on surplus electricity: only one of the analysed countries applies grid tariffs and VAT to exported electricity (DK), income taxes may apply above a certain threshold.

Retail rate design

Often there is limited motivation to adjust consumption

- Energy fees:
  - Only static and ToU available for households: SK, HU
  - In other analysed countries also options for variable and increasingly dynamic contracts
- Grid tariffs:
  - On distribution and/or transmission, mostly capacity and power based
  - Static in GR, HU, IT, static and TOU in other analysed countries
  - Locational differences in DE
  - Cost-reflective charges: grid users are charged only for the use of those electricity grid segments which they use in PT
- Other fees:
  - VAT, RES / CHP / nuclear energy surcharge, community duty, social tariff, etc.
- Total retail prices vary significantly across countries (in 2022 between 9 cent/kWh in NL and 52 cent/kWh in DK)
- Grid tariffs and other fees account from 25% (PT) to 74 % (PL) in retail prices

Summary of findings

- Two countries have not yet transited from net-metering to a new compensation scheme (NL, GR)
- All countries, even those that still have net-metering, comply with the requirement of fair sharing of system costs
- The main goal of the compensation schemes is to encourage self-consumption, although in AT and DE selling the total amount of electricity is also possible
- Prosumers have contracts with their suppliers or with different entities – in some countries the selling is also a market-based activity (e.g. DK, PT, SK)
- No system fees for injection in any of the countries (except Denmark) – as opposed to what is said in the EMD.
- Countries were making efforts to ease administration for new investments in the size categories for residential prosumers

Summary of findings 2

- Scarce grid connection capacity and grid congestion is a problem in almost all countries
- Smart-meters are required to be installed in almost all analysed countries helping to measure instantaneous electricity flows, which is a prerequisite for separate measurement and also demand response
  - however, the sell rate and retail rate design does not encourage adjusting to market prices in all cases
- Investment subsidies (grants, tax reductions) are available in all analysed countries (except DK) to alleviate the burden of high initial investment costs
- PV+storage investments are also encouraged in many countries – it is a question whether this is the most efficient way of subsidising flexibility
- Legislation related to new business models is in place in the countries - there are good examples of their operation

Thank you for your attention!

katalin.varga@rekk.hu