



Elektro Ljubljana

# Active consumer in Slovenia

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*Technological Development Department*



# Elektro Ljubljana

—  
The largest  
electricity  
distribution  
company in Slovenia



**891 employees**

**17,520 km of power lines**

**5,720 transformer stations**

**356,102 end-users**

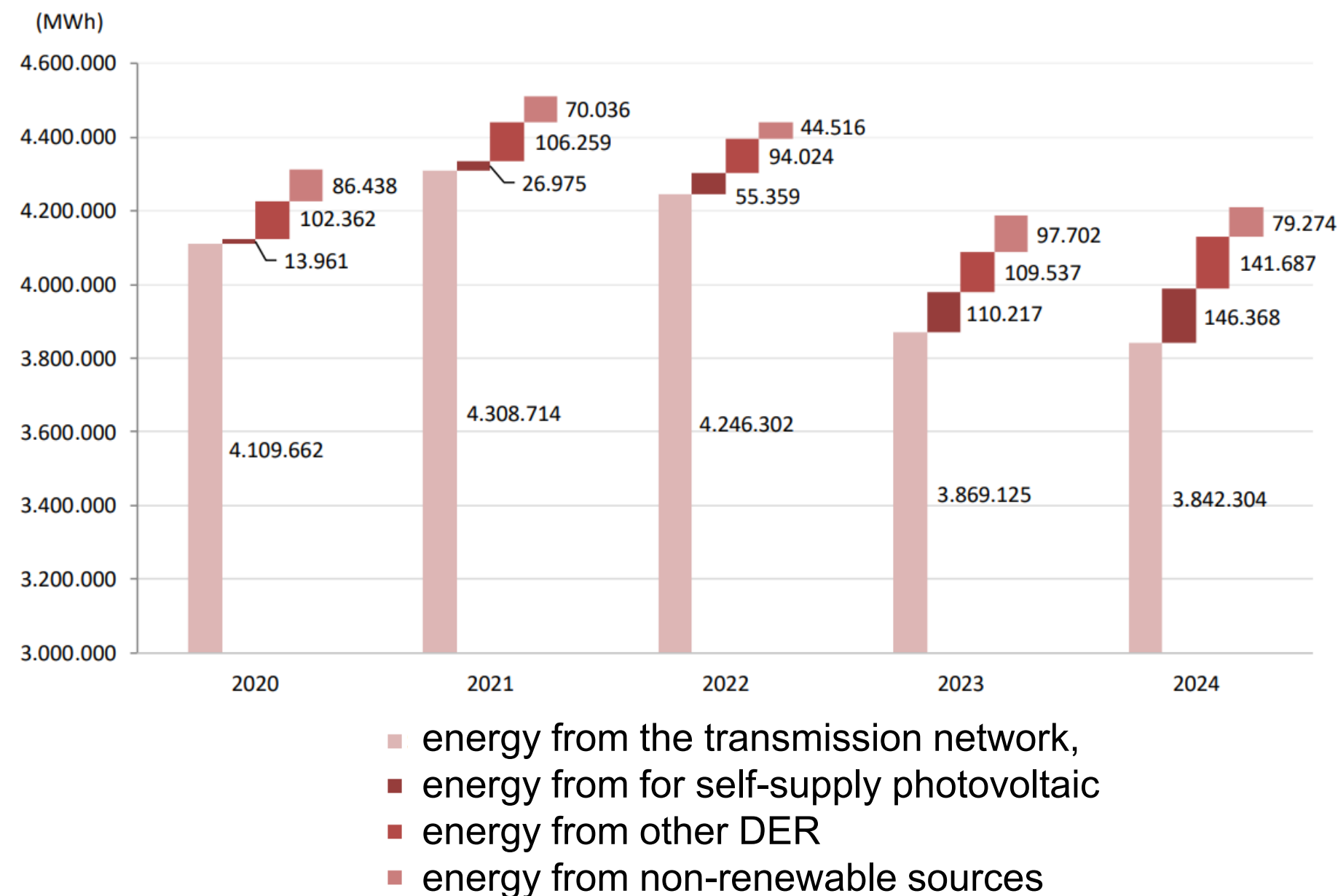
**3,910 GWh of distributed electricity in 2024**



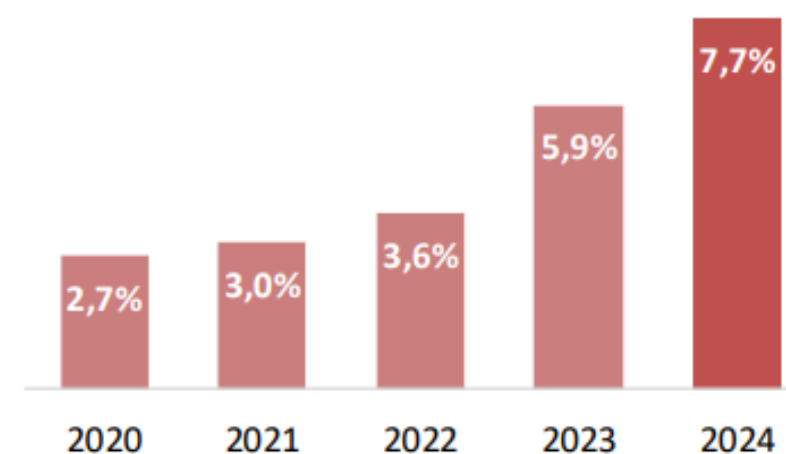
# Consumption of the electricity

In recent years there has been a decline in distributed energy, primarily because of electricity generation on the distribution network (solar power plants).

## Source of energy delivered to the distribution network



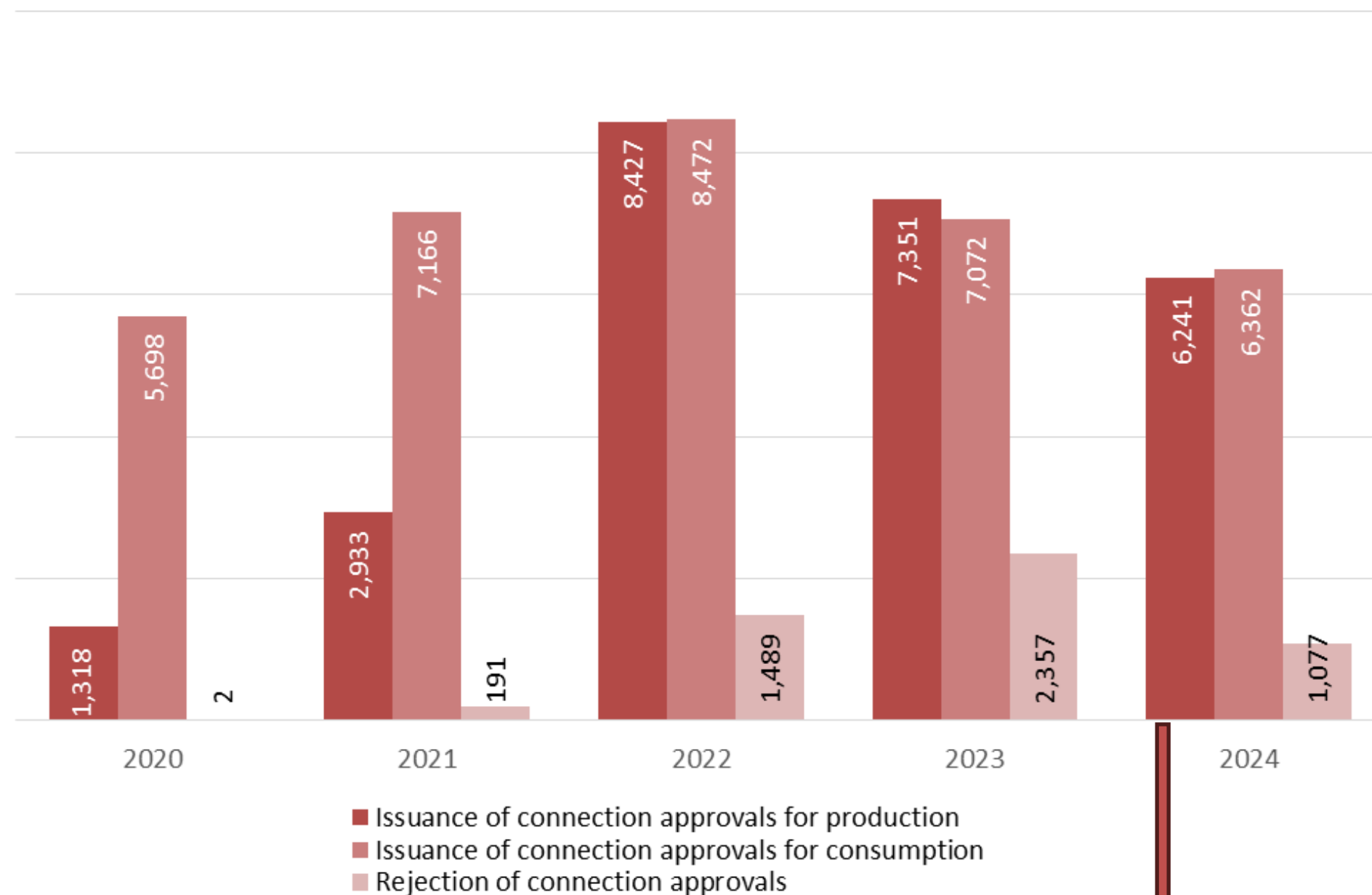
## Share of energy from DER delivered to the distribution network





## Number of approvals issued

In 2024 we issued 12,603 connection approvals, of which 6,362 were for consumption, 5,856 were for self-supply photovoltaic (PV) power plants and 385 were for generation.



All customers who applied for a PV connection by the end of 2023 were still included in the annual net metering. By the end of 2023, there were more than 6,000 applications for connection. These approvals were issued at the beginning of 2024. The number of rejected connection approvals is increasing.



## Regulated in Energy law (ZOOE)

### ➤ Article 4

- Indent 5: “**active customer**” means a final customer or a group of final customers who act together and consume or store electricity produced in their own facilities within limited locations, or self-produced electricity or electricity shared with other facilities, or who sell self-produced electricity or participate in flexibility schemes or energy efficiency schemes, provided that these activities are not their main economic or professional activity.
- Indent 77.a: participates in “electricity sharing”.





## Active consumer (Article 23 ZOEE)

- Active consumers have the right to operate on the market directly or through aggregation, the right to sell electricity from their own production, including on the basis of power purchase agreements, and the right to participate in flexibility programs and energy efficiency programs.
- Active consumers must be included in the balance scheme, except in the case of exchanges of electricity between active consumers belonging to the same balance scheme member, and in the case of an open contract with a supplier.
- Active clients may delegate the management of devices or the use of data to third parties (e.g. an aggregator).



## Active consumer (Article 23 ZOEE)

- Network charges shall be set for active customers that are cost-reflective, transparent and non-discriminatory.
- Active customers may provide multiple services at the same time, if technically feasible.
- Active customers who own energy storage devices shall not be charged network charges or other costs for energy delivered previously stored on their premises.
- When providing flexibility services to electricity operators, network charges or other costs shall not be charged for energy delivered or received stored on the premises of active customers.



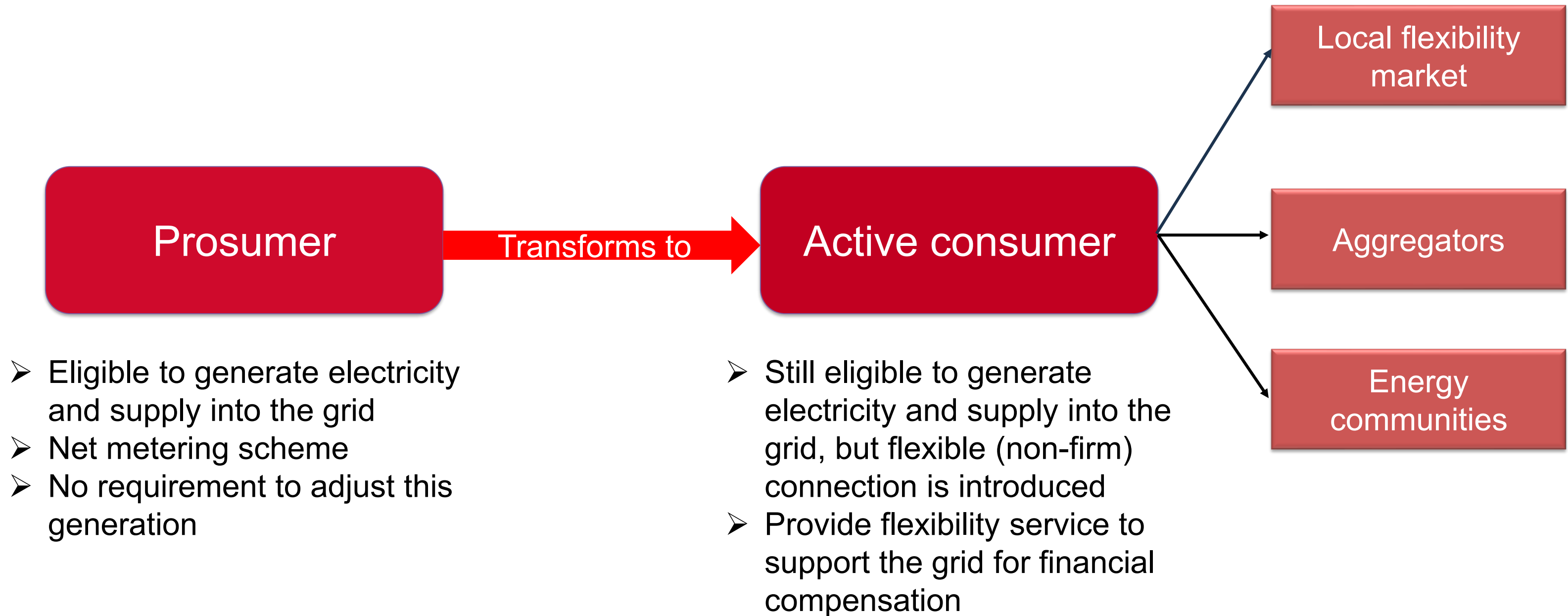
## Other articles in ZOEE

- Article 24 ZOEE:  
Energy communities are considered active consumers in relation to self-produced electricity
- Article 28 ZOEE  
At the request of a final customer wishing to become an active customer, or at the request of a third party authorised by the final customer, the distribution operator shall provide free and preferential installation of a smart meter with free or unrestricted physical access to a standardised interface.
- Article 139.a ZOEE  
Connection to a system with flexible operating restrictions (non-firm connections)





# Transition from prosumer to active consumer

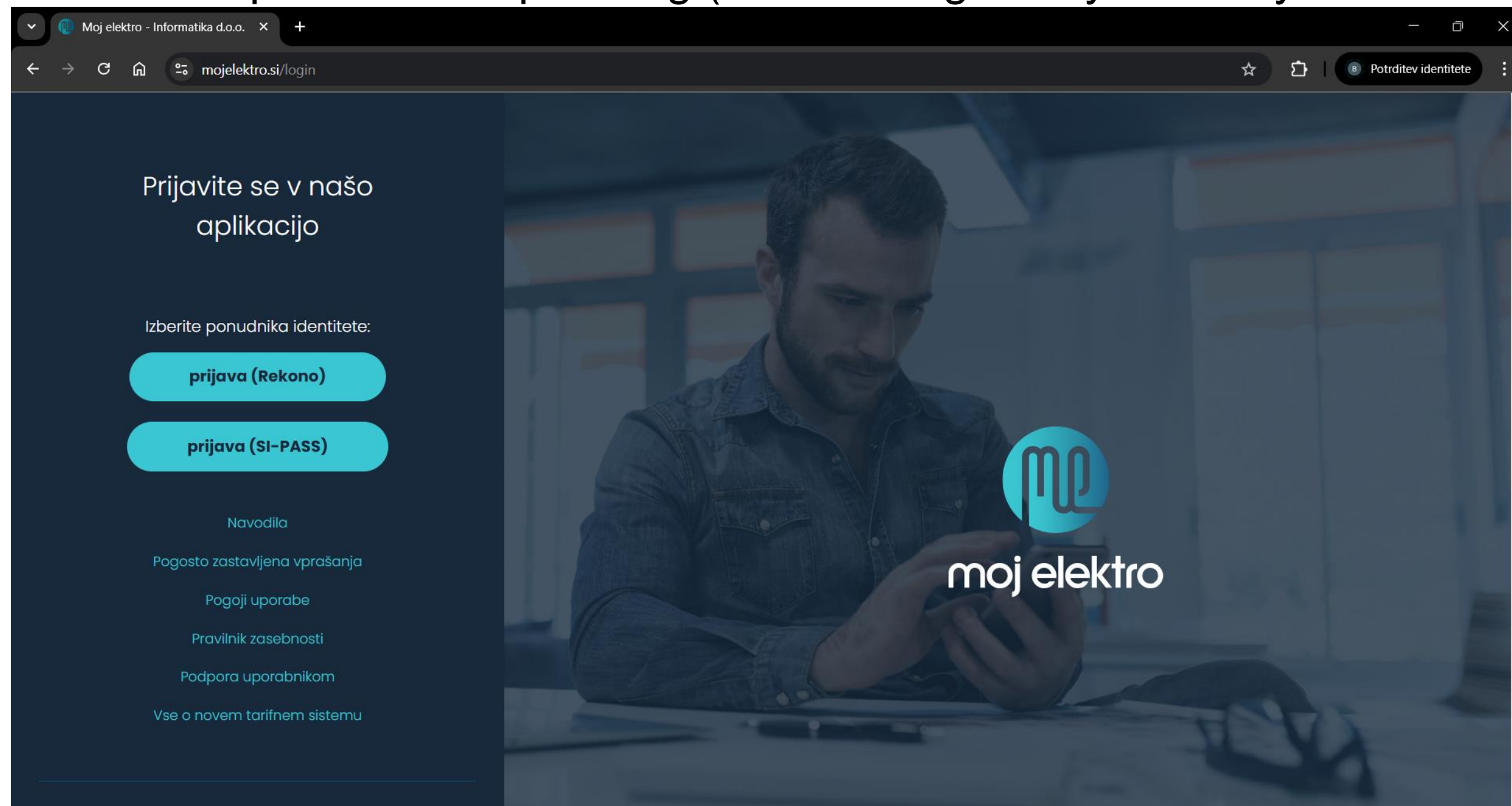




# EVT as national data hub

example as a local market with flexibility and digitalization

Introducing flexibility services into operation and planning (National regulatory authority requirements)





# Procedure for applying to DSO's flexibility tender

Consumer  
prosumer



Register  
flexibility



Authorise  
aggregator



# Registering Flexibility of consumers

- consumer inserts power of flexibility and contact details about new tenders
- Consumer can authorize aggregator to apply on DSO's tender, by selecting aggregator

The screenshot shows a web interface for registering flexibility power. The header includes logos for Elektro Celje, elektro gorenjska, Elektro Ljubljana, ELEKTRO MARIBOR, Elektro Primorska, and moj elektro. The navigation bar contains links: Moj profil, Merilna mesta / merilne točke, Pooblastila, and Izvozi. The main section is titled 'Merilno mesto 3-' and has a 'Flexibility' label. Below the title are tabs: Podrobnosti MM, Obračunski podatki, Dnevna stanja, Dnevna poraba, Odbirki - 15 minutni, Odbirki - urni, and Prožnost. A 'Registracija prožnosti' button is present, with a red annotation 'Register Flexibility'. The form fields include: 'Moč prožnosti' (Flexibility power in kW) with a value of 2,5; 'E-mail za obvestilo o razpisih' (E-mail for notifications about new tenders) with the value User.email@mail.com; 'Mobilna številka za SMS obvestila o razpisih' (GSM number for SMS notifications about new tenders) with a checked checkbox and the value +3860123456789; 'Agregator' (Aggregator selection) with a checked checkbox and a dropdown menu showing 'GEN-I D.O.O.'; and a 'Strinjam se s posredovanjem podatkov agregatorju' (Consensus with terms and conditions) section with a checked checkbox and a paragraph of terms. A 'Registriraj prožnost' button is at the bottom.

Elektro Celje elektro gorenjska Elektro Ljubljana ELEKTRO MARIBOR Elektro Primorska moj elektro

Moj profil Merilna mesta / merilne točke Pooblastila Izvozi

Merilno mesto 3- Flexibility

Podrobnosti MM Obračunski podatki Dnevna stanja Dnevna poraba Odbirki - 15 minutni Odbirki - urni Prožnost

Registracija prožnosti Register Flexibility

Moč prožnosti Flexibility power in kW

2,5 kW

E-mail za obvestilo o razpisih E-mail for notifications about new tenders

User.email@mail.com

Mobilna številka za SMS obvestila o razpisih GSM number for SMS notifications about new tenders

☒ +3860123456789

Agregator Aggregator selection

☒ GEN-I D.O.O. ▼

Strinjam se s posredovanjem podatkov agregatorju Consensus with terms and conditions

Jamčim za resničnost in pravilnost vnesenih podatkov in da sem seznanjen s Splošnimi pogoji razbremenjevanja omrežja z zagotavljanjem prožnosti (Splošni pogoji) ter z njimi v celoti soglašam. Elektro Ljubljana dovoljujem, da obdeluje moje osebne podatke za namen sodelovanja na razpisu in izvajanja storitve prožnosti v skladu s Splošnimi pogoji.

Registriraj prožnost



# Procedure for applying to DSO's flexibility tender

Consumer  
prosumer



Register  
flexibility



Authorise  
aggregator

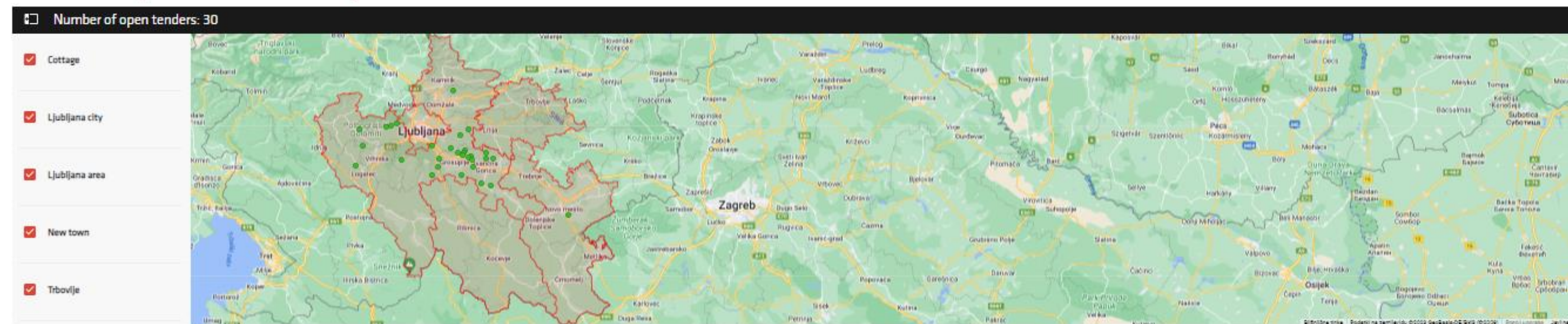
DSO  
publish a  
tender for  
flexibility





# DSO publish tender for flexibility

## Interactive map of tenders for flexibility



DSO publishes tender where overloads of the network could be solved with flexibility, based on historian load analysis of the grid with parameters:

## Current tenders for flexibility

Select area/unit:  Search by address:

SHELF-OVEN (2069225) 2023 | Grosuplje | until 01.09.2023 00:00

The network for which the call for tender is issued: POLICA-PEČ (2069225) 2023  
Area code: 2069225  
Type of service: Reducing consumption at metering points  
Service provision: from 1/11/2023 00:00:00 to 31/03/2024 22:00:00  
Total tendered power: 50 kW  
Minimum offered power: 1 kW  
Deadline for submission of bids: 01/09/2023 00:00:00  
Service during weekdays: 17:00-22:00  
Service during weekends and holidays: 10:00 -22:00  
Response time from activation announcement: 15 minutes  
Maximum duration of individual activation: 75 minutes  
Maximum daily number of activations: 2

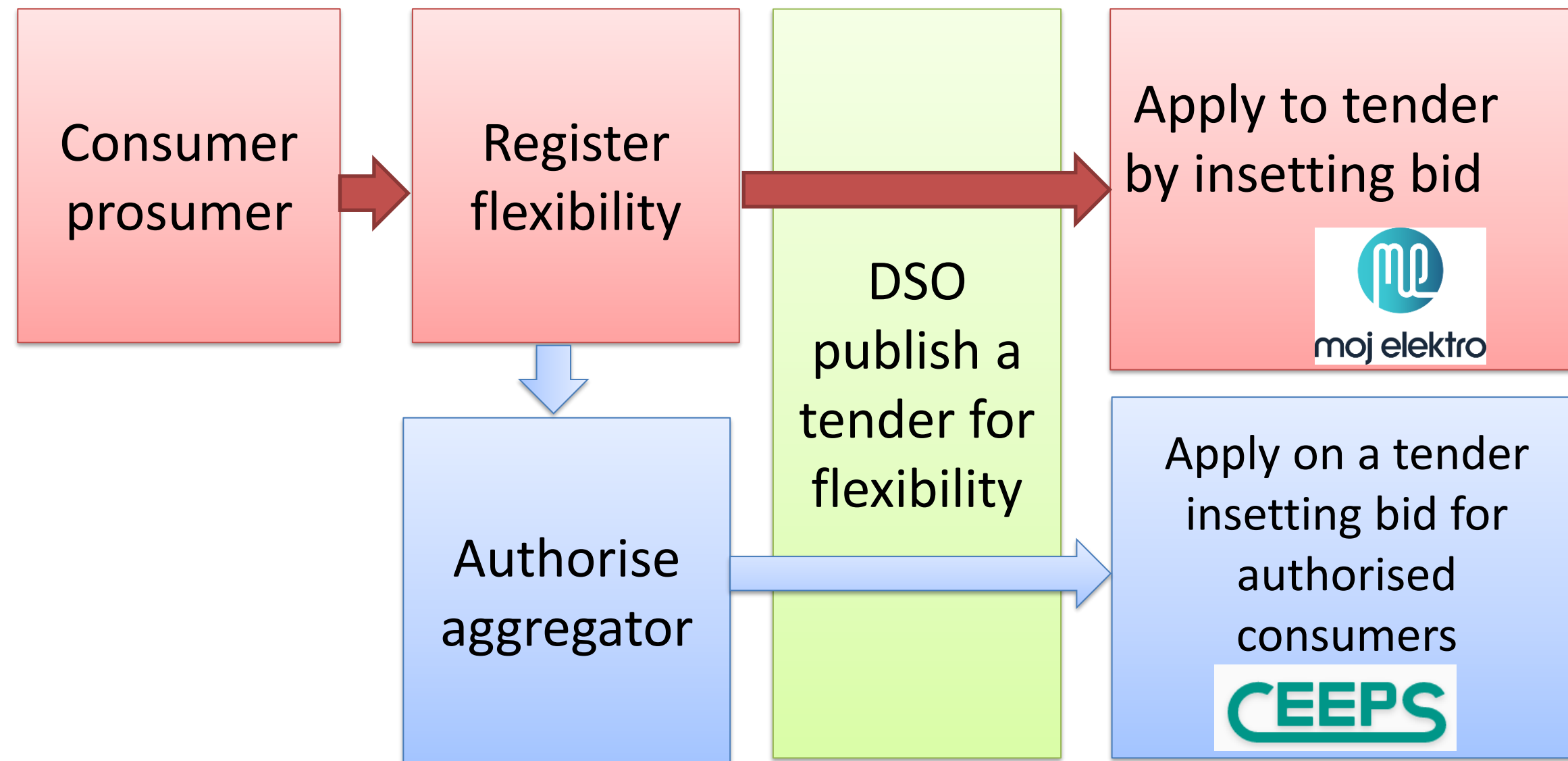
TITLES ▲  
POLICE 109 (GROSUPLJE)  
POLICE 109 A (GROSUPLJE)  
POLICE 109 B (GROSUPLJE)

- Area of the grid (**MV/LV substation**)
- Time period of flexibility need (November – March)
- Total flexible power of tender and minimum power of consumer's offer
- DUE date of tender
- Other parameters of activations (daily schedule of activations for weekdays and weekends, reaction-ramp time, max duration of single activation, maximum daily activations)





# Procedure for applying to DSO's flexibility tender





# Application to a tender (consumer)

- Consumers which are in tender area and have already registered their flexibility, receive e-mail and (SMS) so that they can insert their bids.
- Consumer inserts bid (price -offer) for its flexibility energy (EUR per kWh)
- In case consumer authorize aggregator, aggregator will insert bid for consumer

Elektro Celje elektro gorenjska Elektro Ljubljana ELEKTRO RARIŠOR Elektro Primorska moj elektro

Moj profil Merilna mesta / merilne točke Pooblastila Izvozi

Merilno mesto 3-

Podrobnosti MM Obračunski podatki Dnevna stanja Dnevna poraba Odbirki - 15 minutni Odbirki - urni Prožnost

Registracija prožnosti Prijava na razpis Application to a tender

Razpis  
TP Kerniskova feb2023 Tender selection

Moč prožnosti  
3 Flexibility power in kW kW

E-mail za obvestila o previsoki ceni in obvestila aktivacij  
user.email@mail.com E-mail for notifications of the auction

Mobilna številka za prejemanje SMS obvestil o previsoki ceni in za aktivacije  
+386123456789 GSM number for SMS notifications about auction

Ponudbena cena v EUR za kWh  
0,5 Bid/price for activated (reduced) energy (€/kWh)

Rok za prijavo  
10. 2. 2023 Due date of tender

Strinjam se s pogoji, objavljenimi v razpisni dokumentaciji  
☒ Consensus with terms and conditions

www.elektro-ljubljana.si/razpisi

Jamčim za resničnost in pravilnost vnesenih podatkov ter izjavljam, da sem prebral in sem seznanjen z razpisno dokumentacijo in Splošnimi pogoji razbremenjevanja omrežja z zagotavljanjem prožnosti (Splošni pogoji) ter z njimi v celoti soglašam. Elektro Ljubljana dovoljujem, da obdeluje moje osebne podatke za namen sodelovanja na razpisu in izvajanja storitve prožnosti v skladu s Splošnimi pogoji.

Prijava na razpis

# Application of an aggregator

- Aggregator inserts bids for the consumers who authorised it in central electro-energy portal (CEEPS)

The screenshot shows the CEEPS portal interface for an aggregator. The top navigation bar includes the CEEPS logo, the user's role (Skupina: GEN-I D.O.O. - AGREGATOR), and links for help (Pomoč), profile (Profil), and logout (Odlog). The main menu on the left shows 'Moj menu' and 'Prožnost'. The 'Prožnost' section contains three tabs: 'Prijava na razpis' (selected), 'Pregled aktivacij', and 'Mesečni obračun storitve'. The 'Prijava na razpis' tab displays the following information:

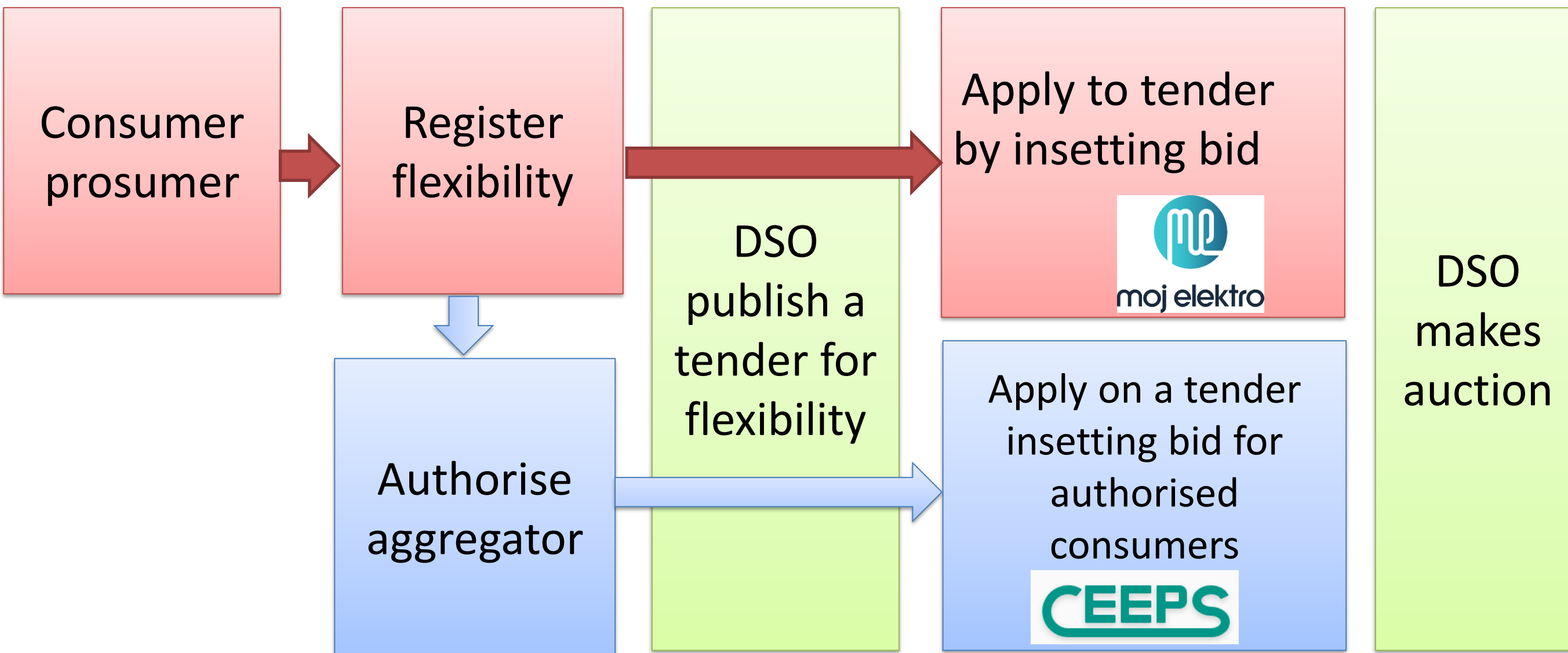
- Razpis:** 4-28NovTest
- Naziv:** 28NovTest
- Rok za prijavo:** 28.11.2022
- Razpisna dokumentacija:** www.elektro-ljubljana.si/razpisi
- Moč skupna (kW):** 20
- Moč minimalna (kW):** 1
- Distribucija:** ELEKTRO LJUBLJANA, d.d.
- Območje:** GRADIŠČE 20/0.4 G-071
- Cena:** 0,90
- ☒ Prikaži samo nepotrjene
- Določí ceno vsem** (button)

Below this information, it states 'Najdenih 11 rezultatov.' and displays a table of results. The table has the following columns: Id prijave, Enotni identifikator MM, Moč, Enota moči, Cena, and Razveljavi ceno. The first three rows of the table are shown:

Id prijave	Enotni identifikator MM	Moč	Enota moči	Cena	Razveljavi ceno
53	3-414652	1000	W	0,90	<input type="button" value="X"/>
50	3-340849	2000	W	0,90	<input type="button" value="X"/>
47	3-340848	3000	W	0,90	<input type="button" value="X"/>



# Procedure for applying to DSO's flexibility tender



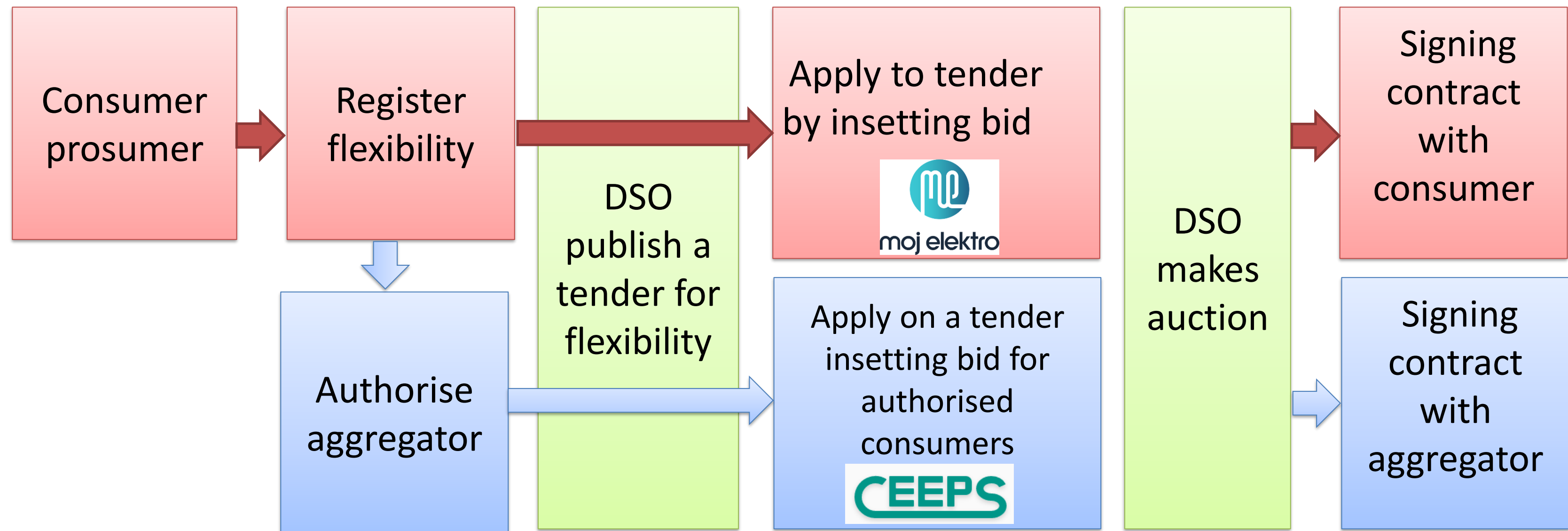
# Daily and final auction

- Once a day system makes price comparison and consumers or aggregators with too high price are noticed with e-mail or SMS, so they can lower their price
- After due date final auction is made and all bidders are informed about results





# Procedure for applying to DSO's flexibility tender





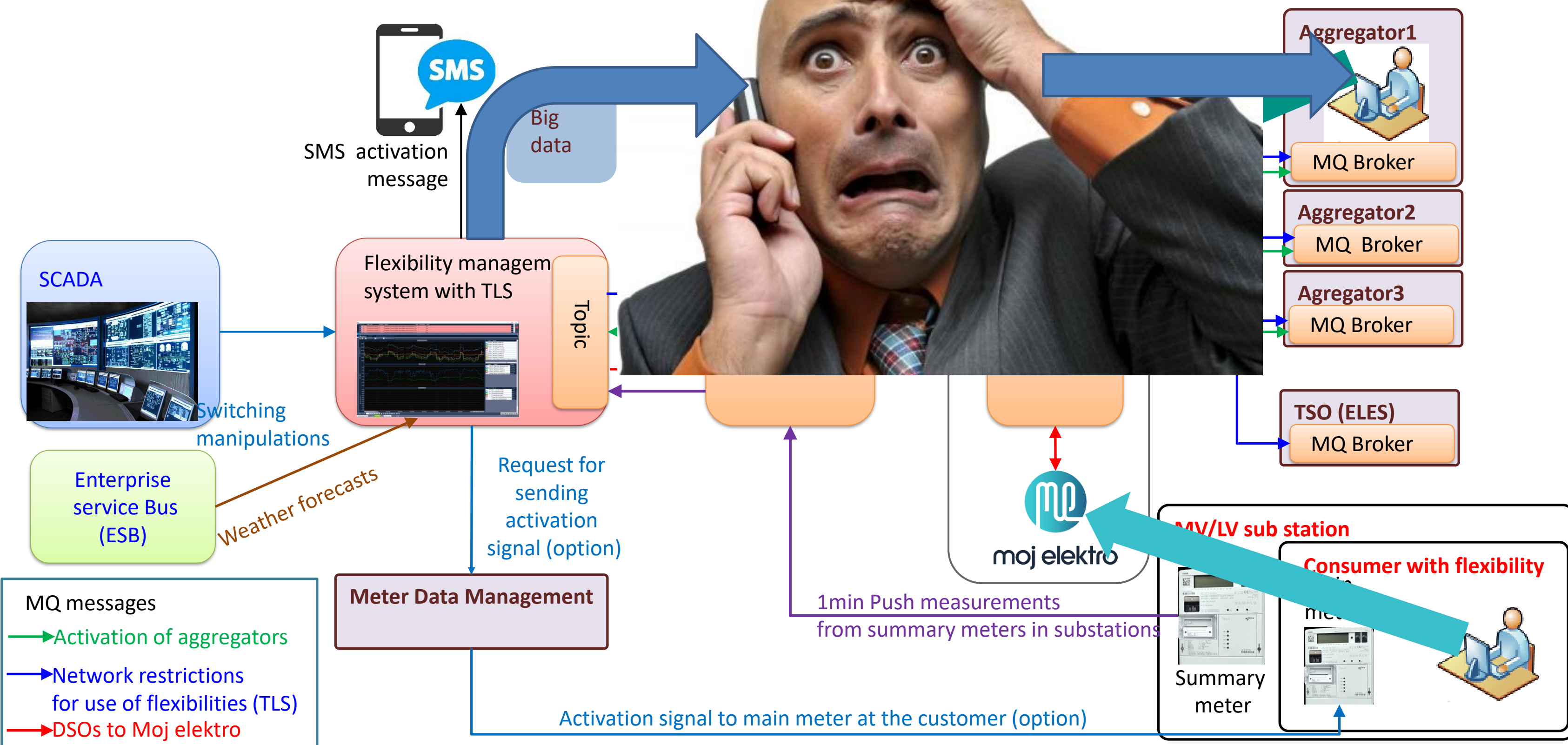
# Signing the contract

- DSO sends contracts to consumers or aggregators which were successful on auction.  
With signing contract consumers or aggregators become flexible service providers (FSP).
- Before start date of contract DSO checks if consumer have smart meter, which enables reading 15 min measurements, and replaces if necessary.
- If consumer wants, that their appliances (heating pumps for example) receive dry contact for activation, DSO enables that activation signal is send by relay output on billing meter.

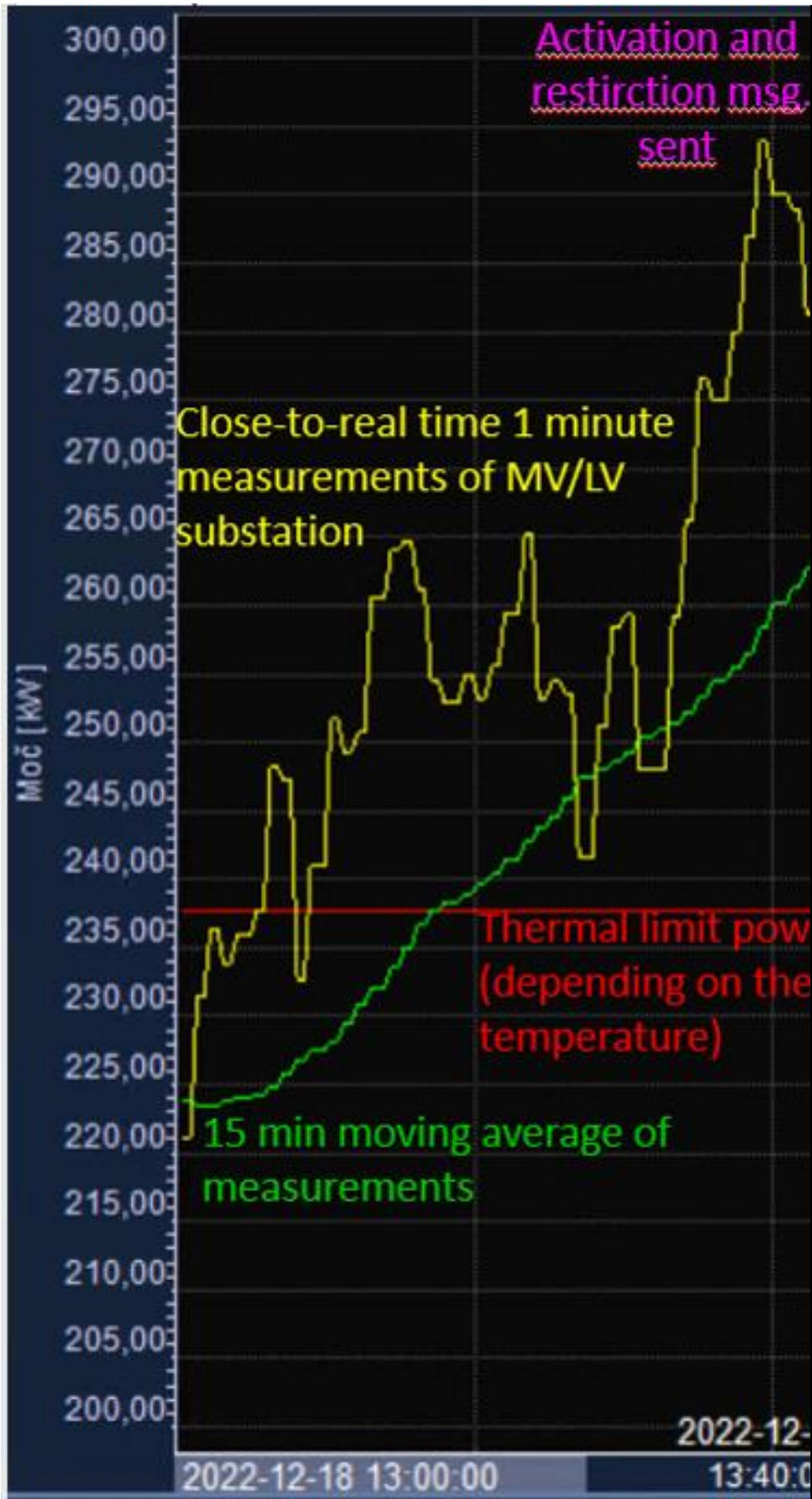




# Activation of flexibility



# Activation of flexibility because of transformer overload





# Activation results for consumer in Moj elektro portal

- Households: payment of the reward into a bank account every 3 months
- Legal entities: every 3 months, create an invoice based on the data from Moj elektro and send it to the DSO

The screenshot displays the 'Moj elektro' portal interface. At the top, there is a navigation bar with logos for Elektro Celje, elektro gorenjska, Elektro Ljubljana, ELEKTRO RARIBOR, Elektro Primorska, and moj elektro. Below the navigation bar, the main content area shows the 'Merilno mesto 3-376999 TESTNO MERILNO MESTO (GSRNMT: 383111589999999988)'. A tab labeled 'Pregled aktivacij' is selected. The page displays a table of activation results for the period from 1. 9. 2022 to 30. 9. 2022. The table has four columns: 'Začetek aktivacije' (Activation start time), 'Konec aktivacije' (Activation end time), 'Priznana energija' (Activated energy), and 'Znesek' (Amount in EUR). The data shows three activation periods, each lasting 15 minutes, with increasing energy consumption and amounts over time.

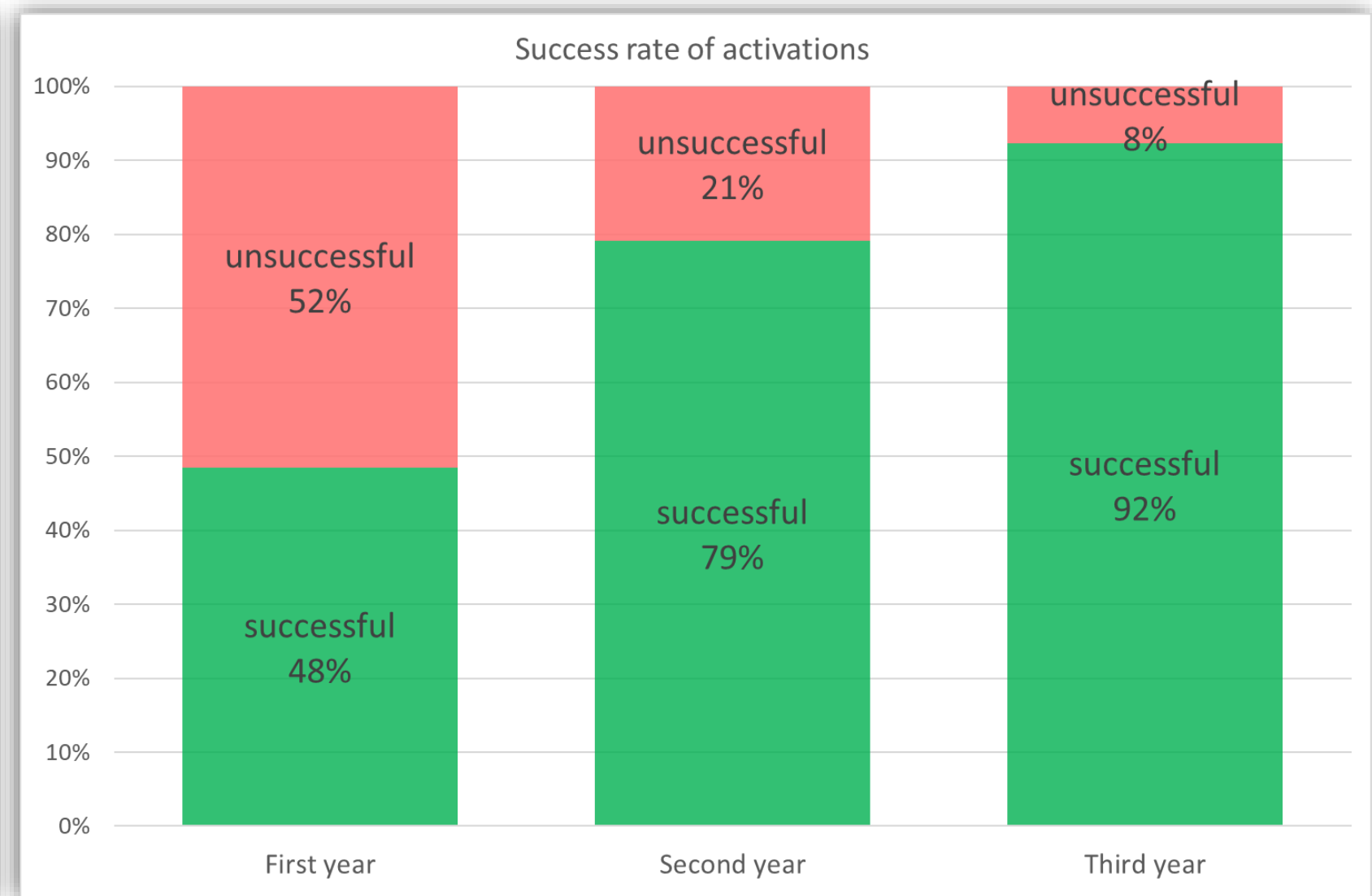
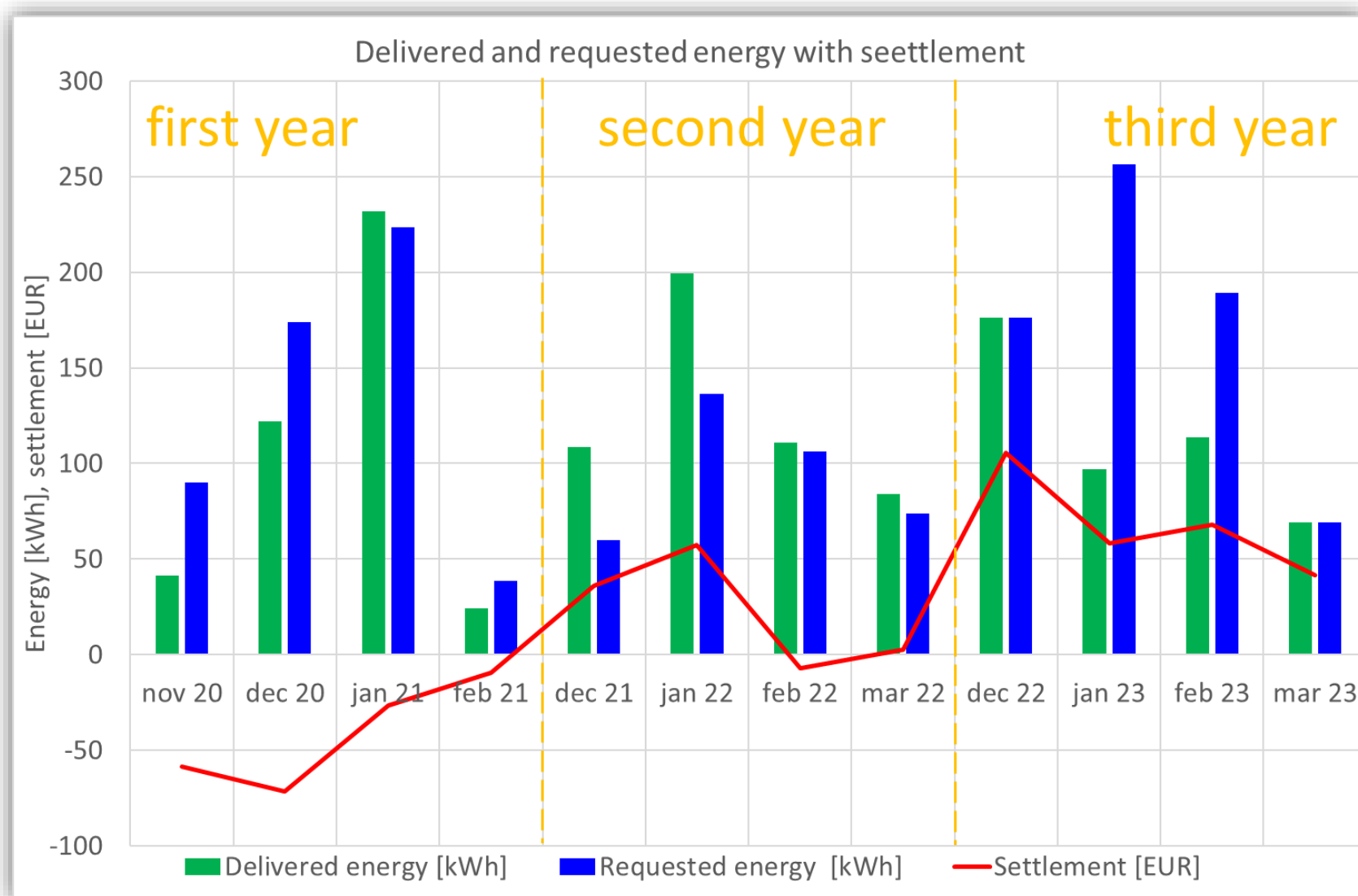
<u>Začetek aktivacije</u>	<u>Konec aktivacije</u>	<u>Priznana energija</u>	<u>Znesek</u>
20.05.2021 11:30:00	20.05.2021 11:45:00	24,3849	7,8
21.05.2021 11:30:00	21.05.2021 11:45:00	12,3849	3,9
22.05.2021 11:30:00	22.05.2021 11:45:00	48,3849	15,6



The Aggregator periodically issue an invoice on the basis of the billing available in CEEPS.

25

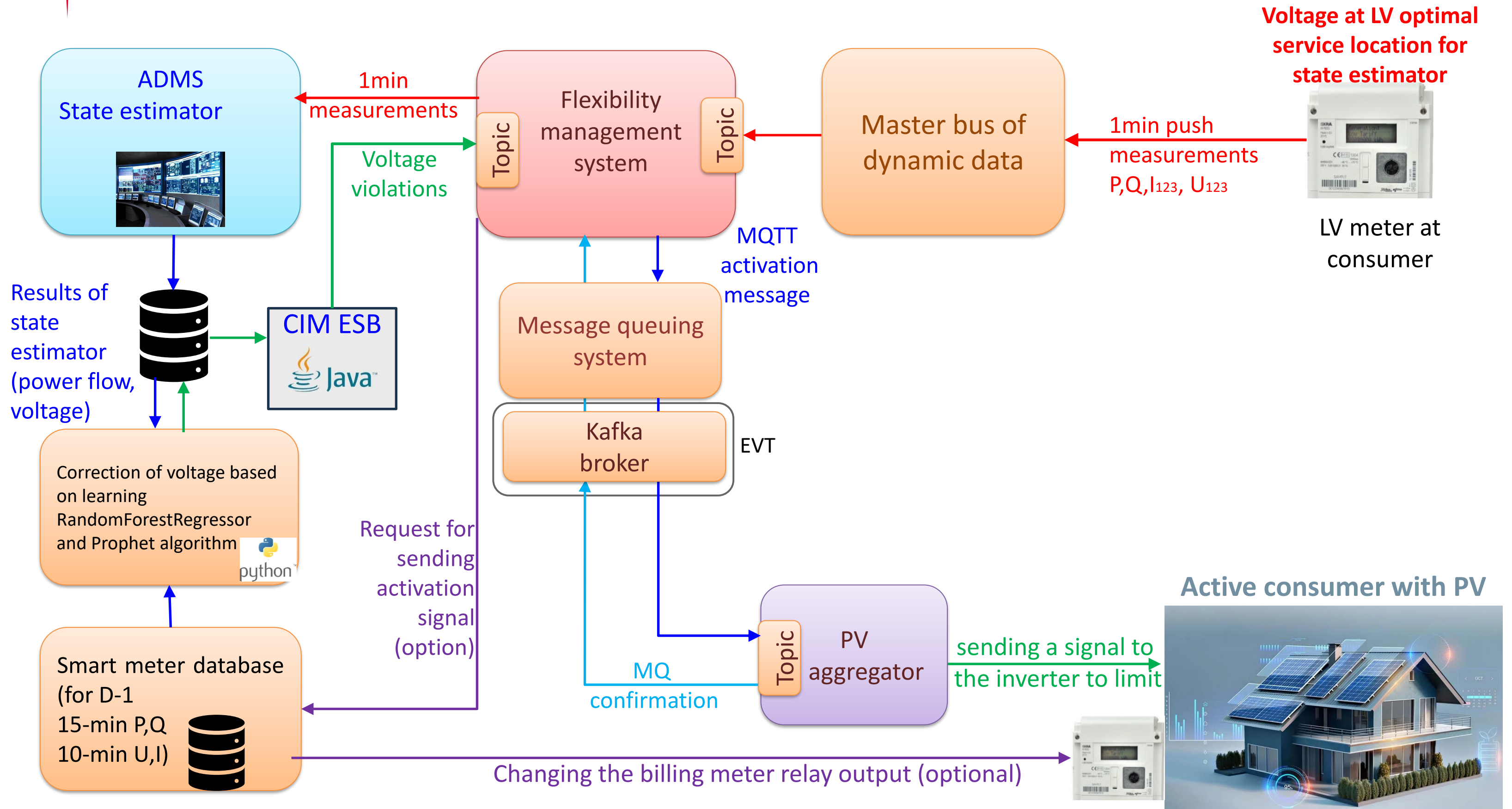
# Delivered / requested energy with settlement amount and success rate of activations







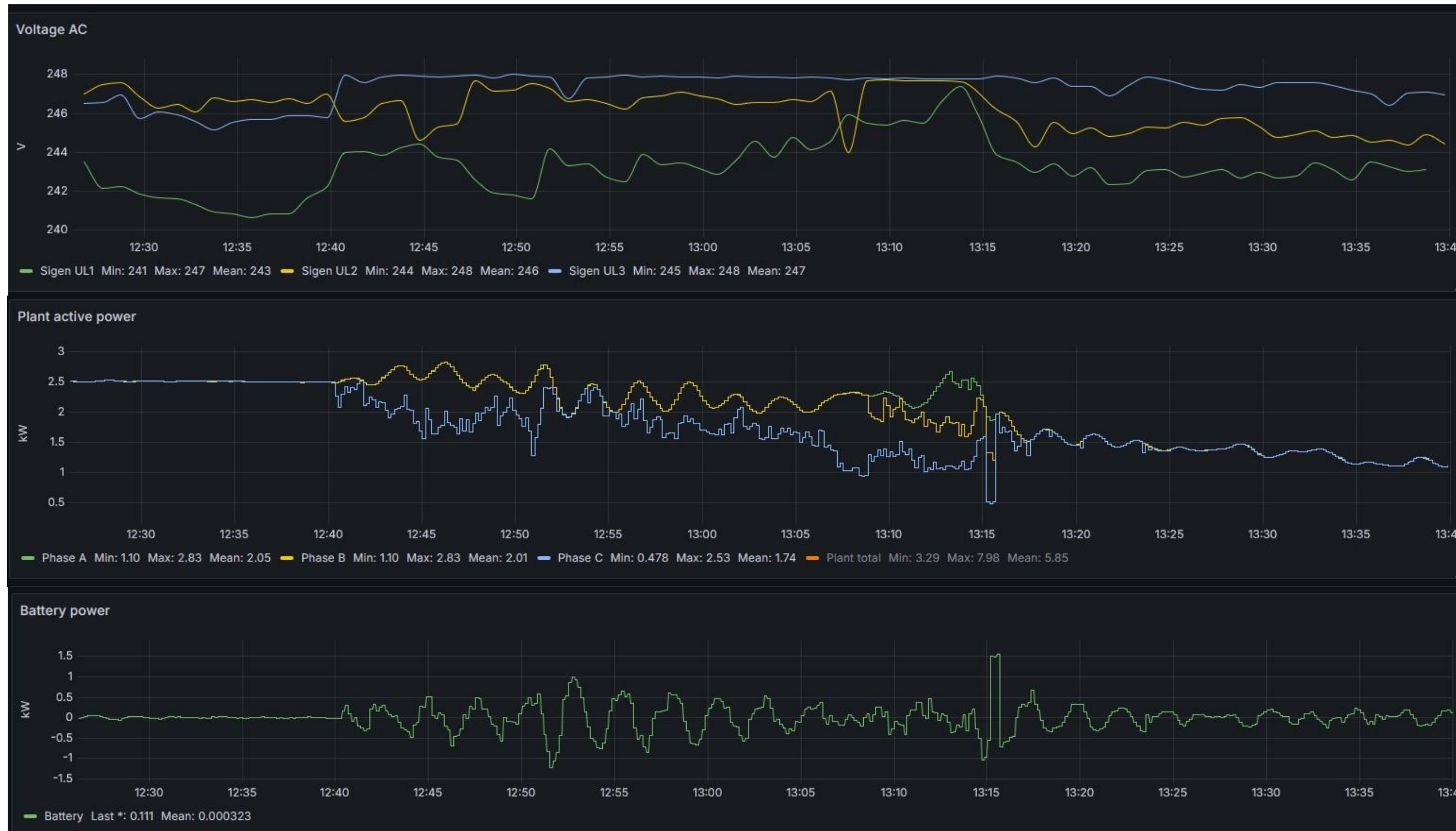
# Flexibility of generation: flexible connection







# Example of reduction (smart inverter)







Elektro Ljubljana

[www.elektro-ljubljana.si](http://www.elektro-ljubljana.si)

Thank you for your attention

Bright networking future



Elektro Ljubljana

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