Energy Technology and Governance Program

SOUTHEAST EUROPE DISTRIBUTION SYSTEM OPERATOR

SECURITY OF SUPPLY WORKING GROUP

Policy Changes Needed to Accelerate Distributed Generation in Southeast Europe

POSITION PAPER

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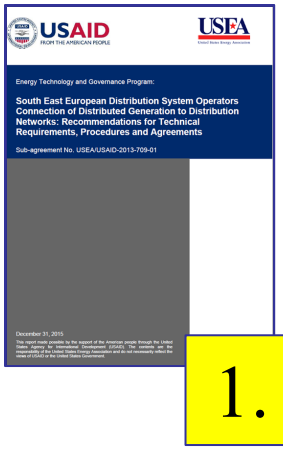
SEE DSO SoS WG

Distributed Generation Position Paper

Position paper

summarizes

- findings of 2 WG studies on DGs
- recommendations on the topic
- highlights some of the key data points



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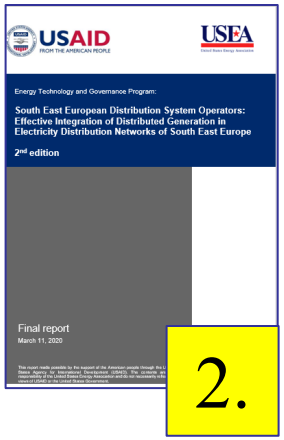

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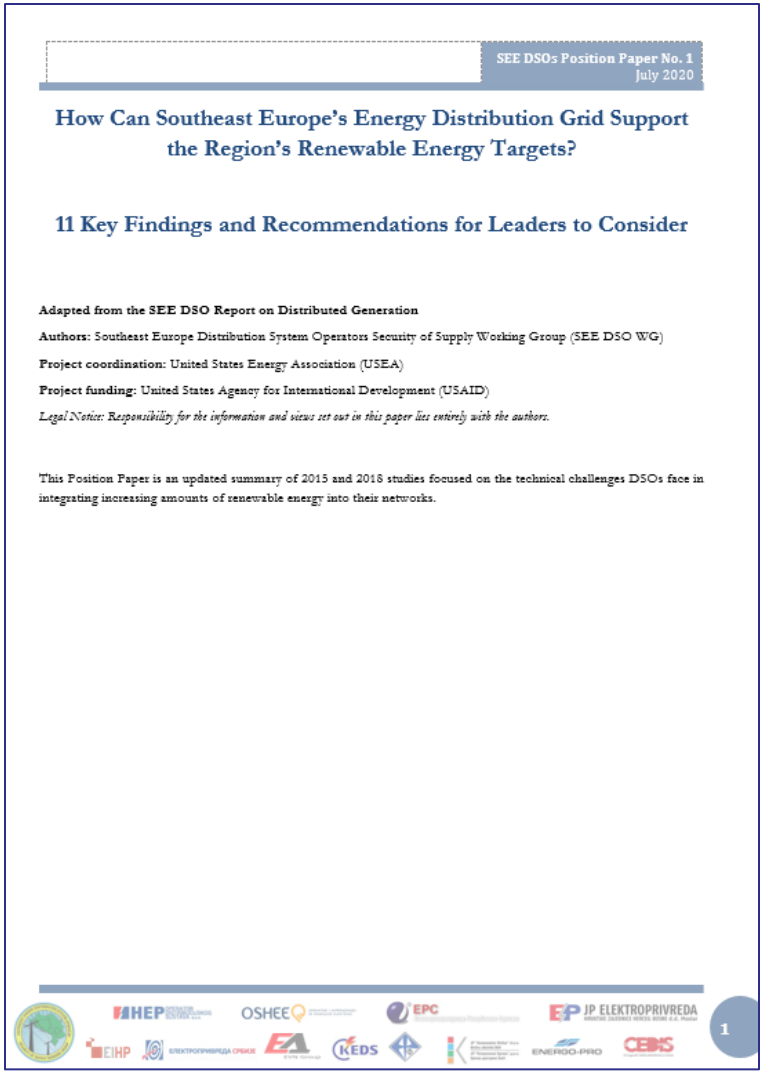
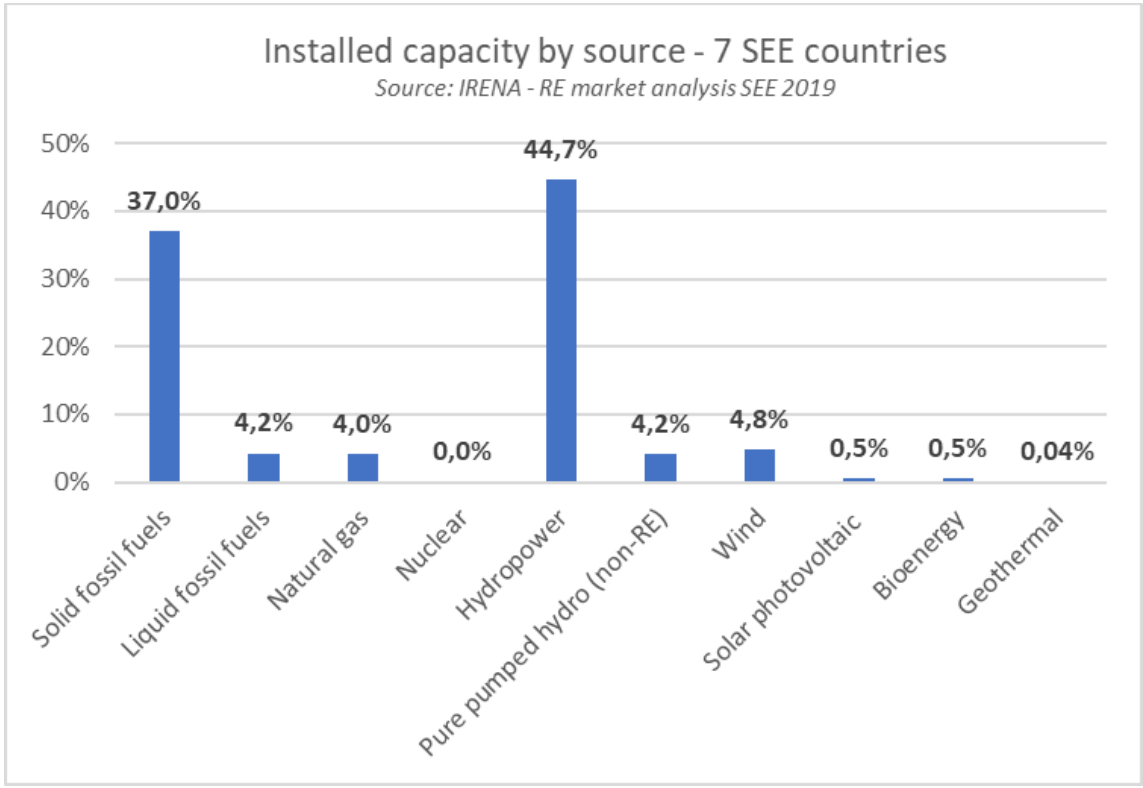


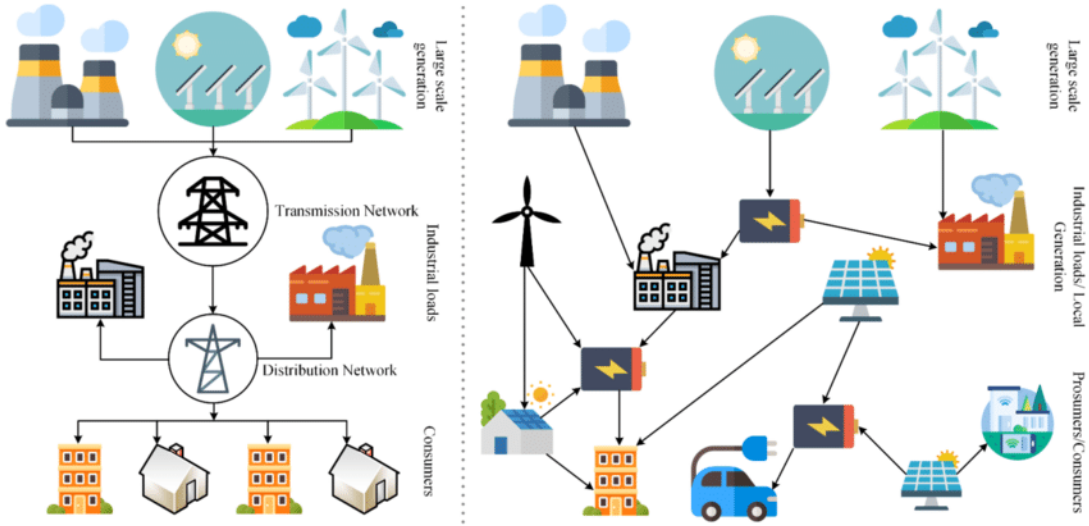
Optimal timing for PP

- apart from the large HPP (constructed several decades ago), other RETs have just started to take off
- deployment of **DGs** (RET) and **prosumers** is **still at an early stage in SEE**



Optimal timing for PP

- SEE aim to align with EU **commitments to achieve RE shares** → governments set new targets, formulate long-term strategies & define support schemes & shrinking cost of RET
- new EU directives promote **decentralized structures** → generation across many smaller plants & embedded generation on business sites and residential properties



Optimal timing for PP

- **DSOs are preparing for operation with increased integration of DGs (RES)** ← as in the rest of the EU, distribution networks were not originally designed with the intent to integrate DG and prosumers

- all DSOs share the **need for through modernization of networks** ← considerable assets due for retirement within a decade

- of utmost importance to **clarify all critical aspects** of DG integration

Integrated properly → DG will help make tomorrow's energy system more sustainable
Integrated badly → DG will increase the risk of outages and raise costs for final customers

Definitions

- **distributed generation (DG)**
  power generation units connected directly to the distribution network
  production and selling of electricity constitute DG's primary commercial or professional activity

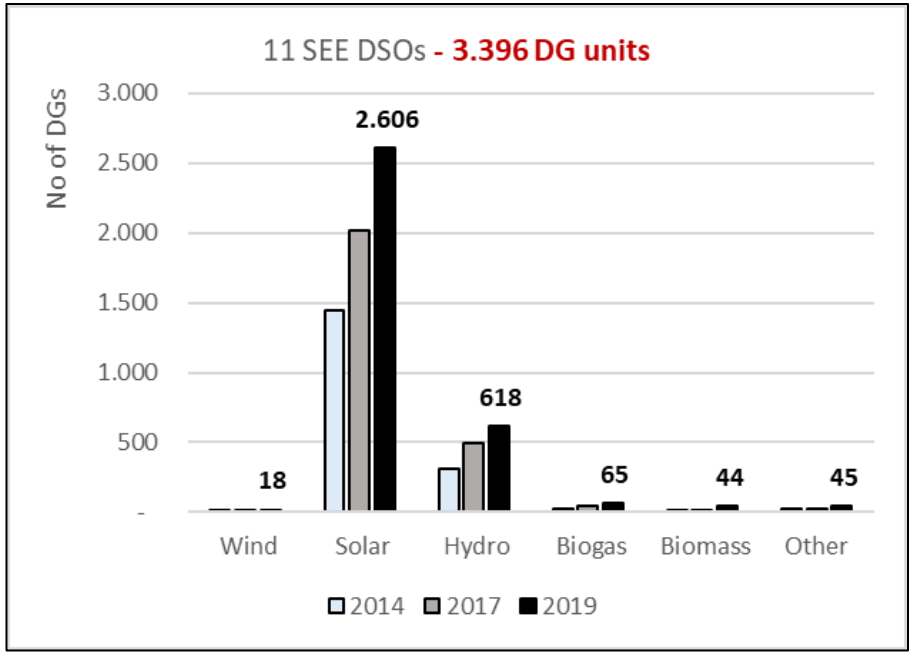
SPP Vis 3,5 MW

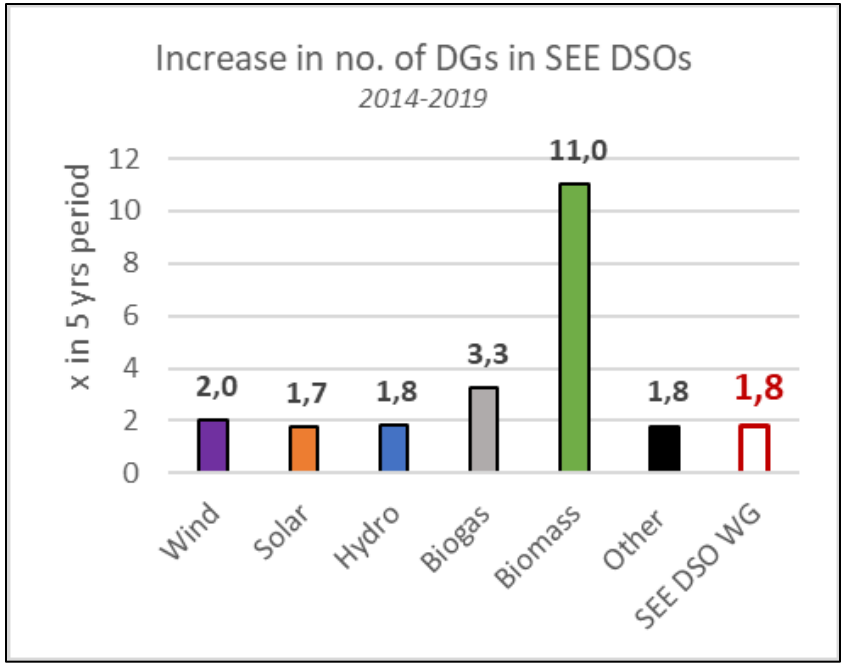
- **prosumers** – consumers
  produce and consume or store electricity within its premises
  sell self-generated electricity or participate in flexibility or energy efficiency schemes
  those activities do not constitute its primary commercial or professional activity (desire to cut costs & secure energy supply)

SEE DSO
DISTRIBUTED GENERATION LANDSCAPE



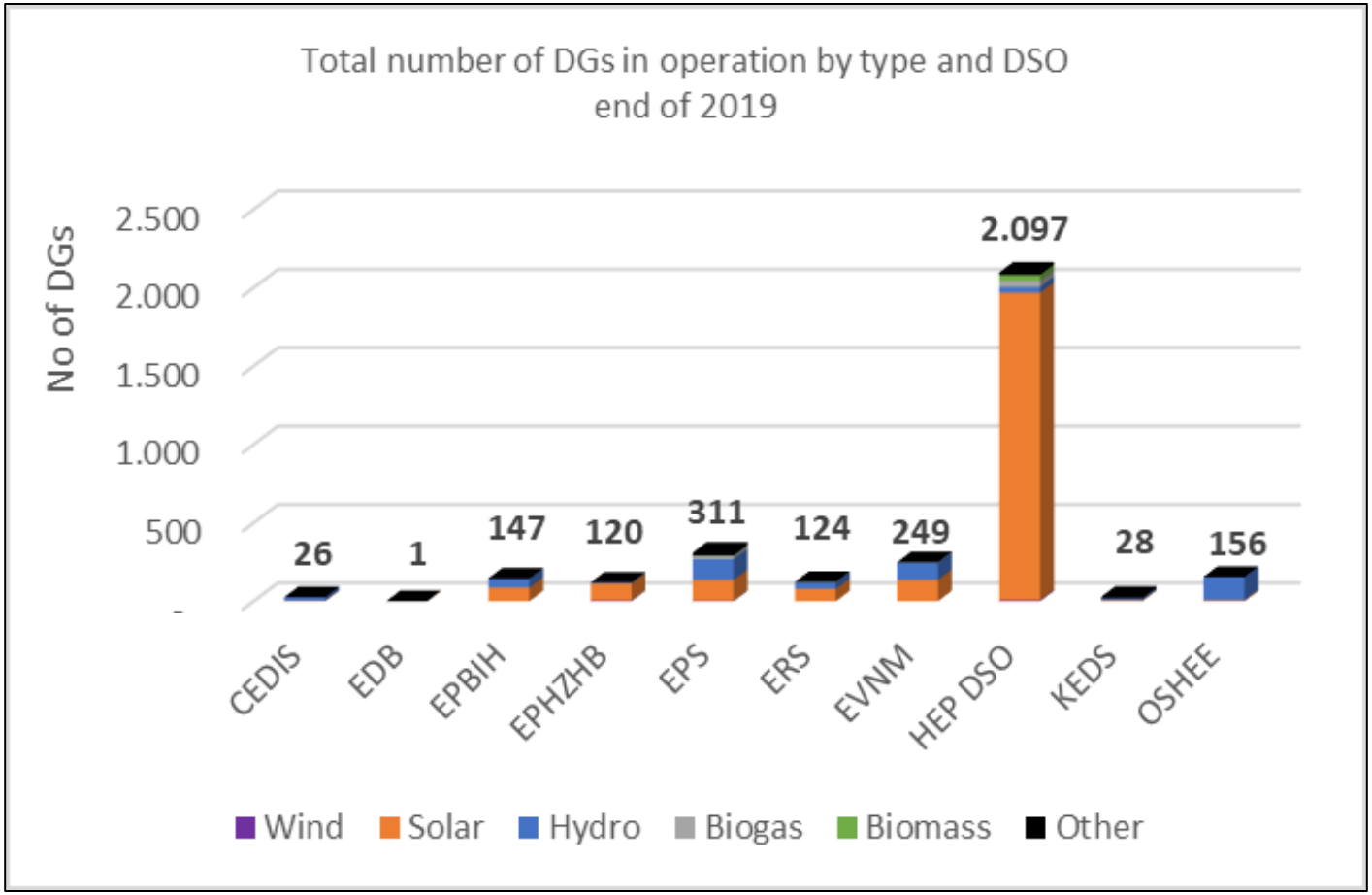
DG landscape – number



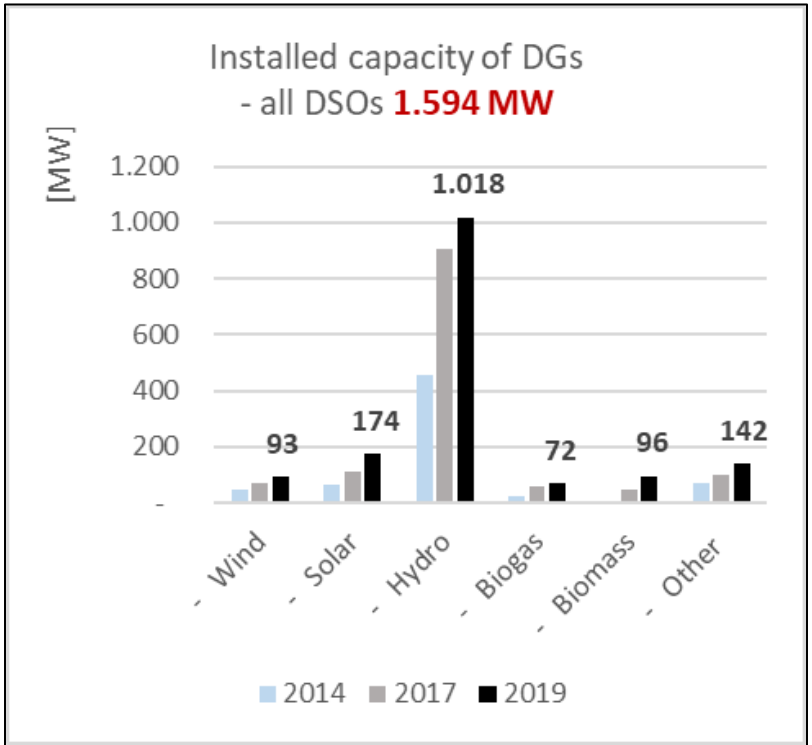


in 5 years period
avrg. annual increase 300 /yr DGs

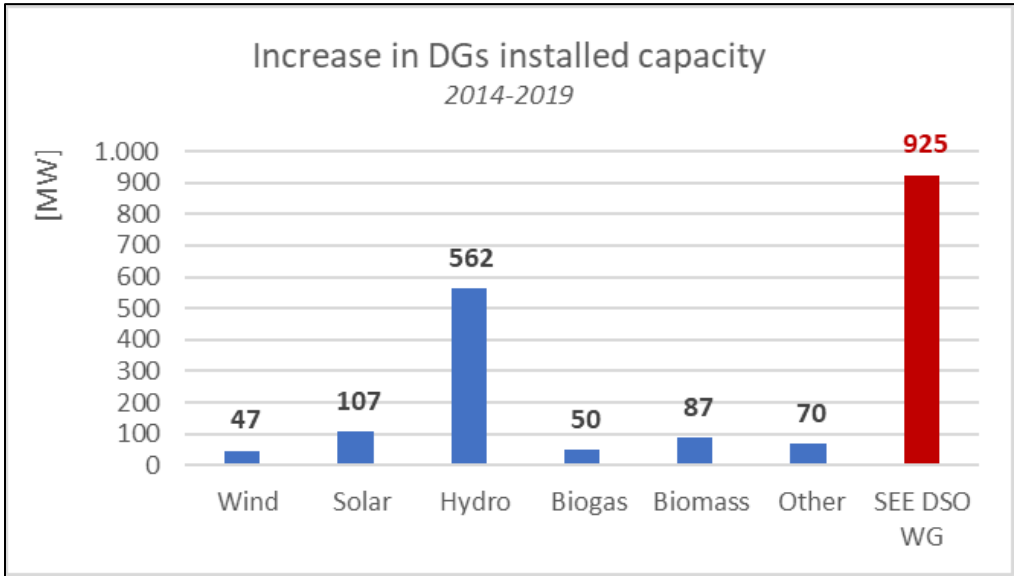
DG landscape – number (2019)



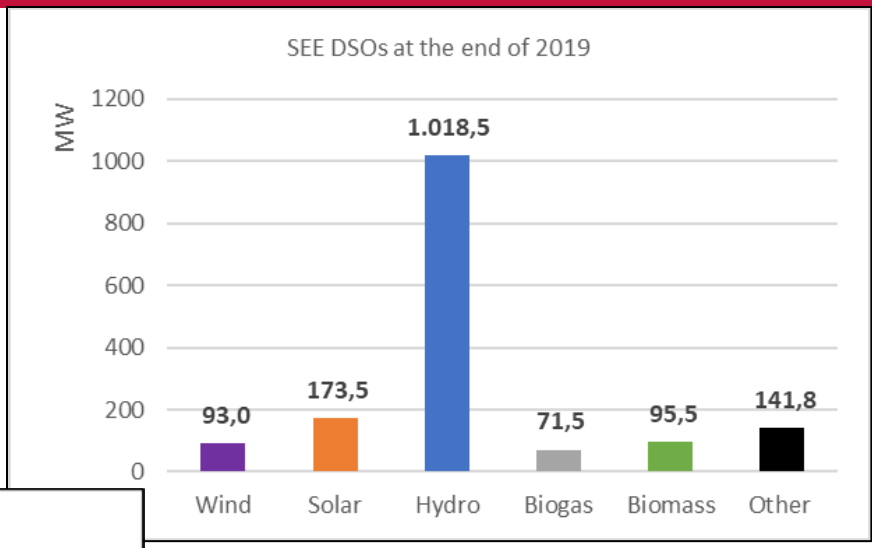
DG landscape – capacity additions

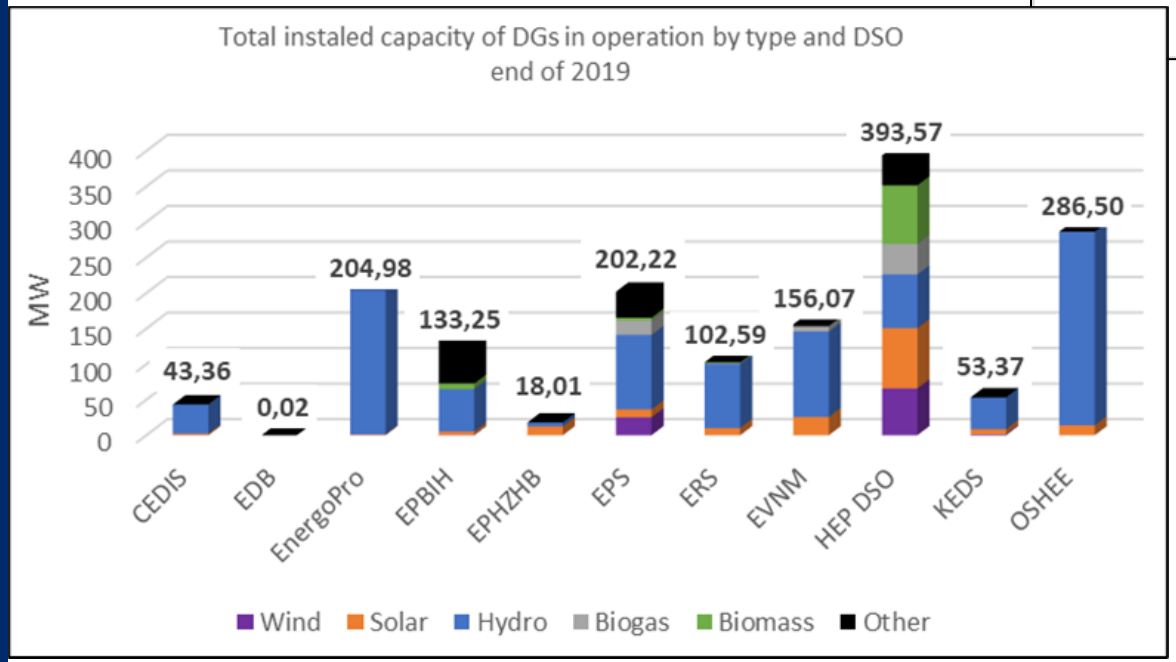


in 5 years period
avrg. annual increase
185 MW/yr



DG landscape – installed capacity 2019



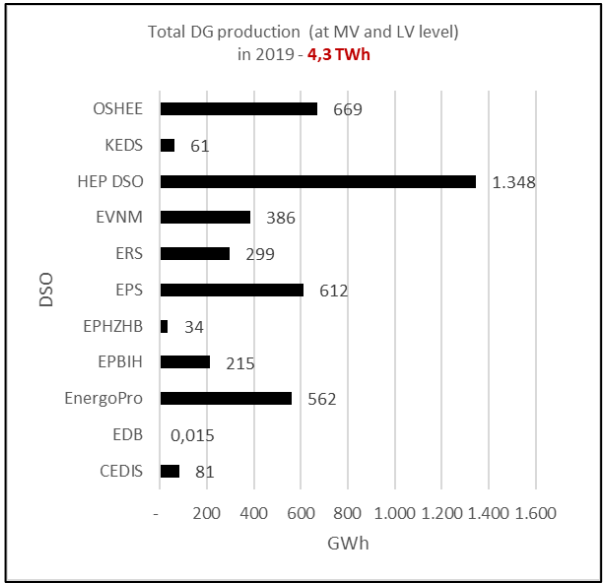


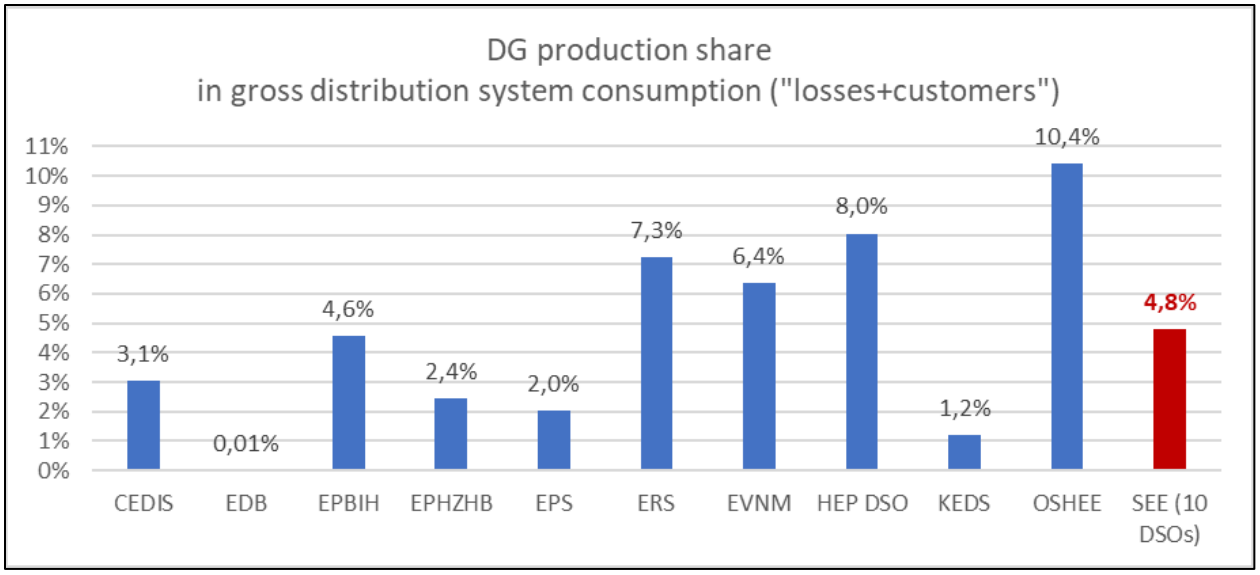
hydropower is the most deployed technology in terms of installed capacity

DG landscape – production

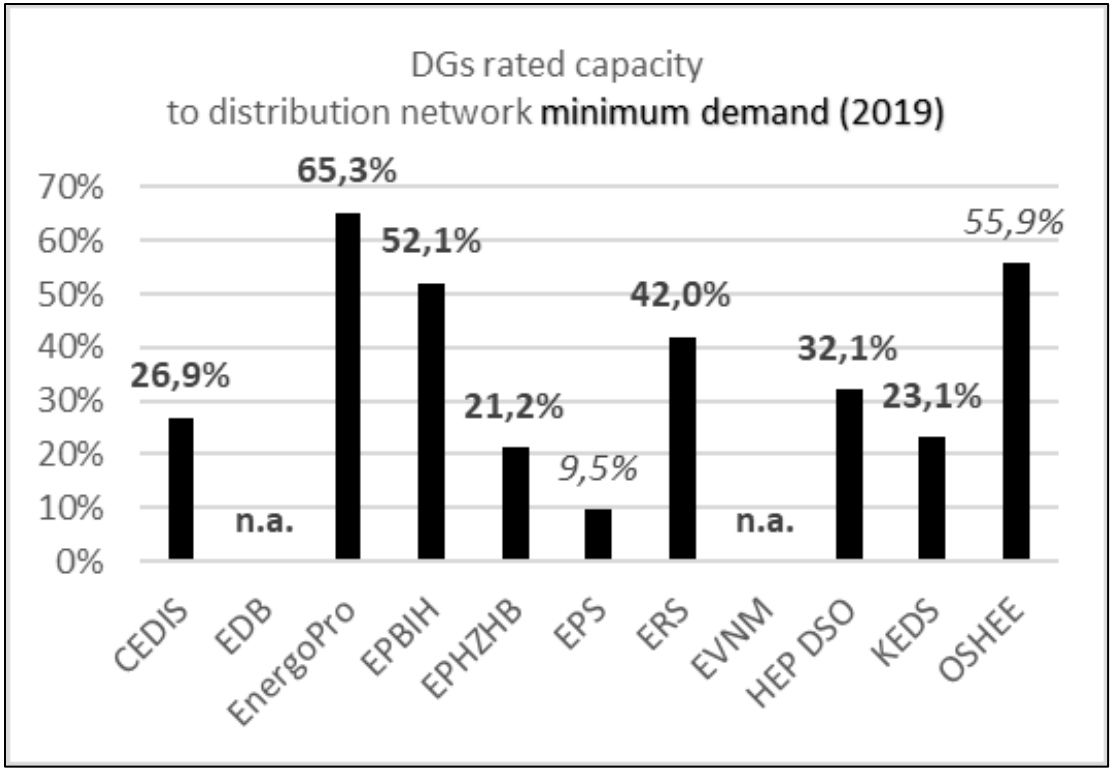
3,7 TWh in 2019

10 TWh losses & 67 TWh customers consumption



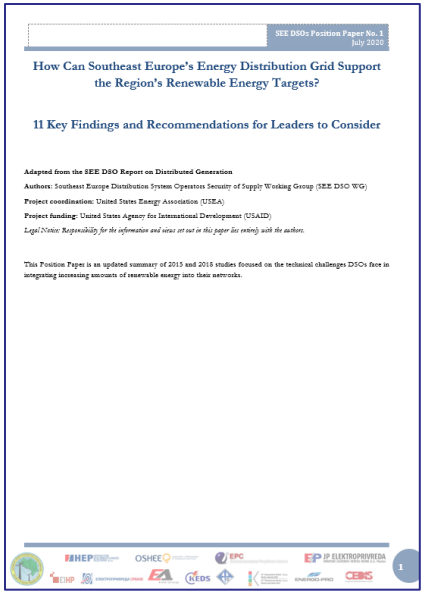


DG landscape –
penetration in distribution network



- likelihood for DG to be curtailed in periods of min. demand
- DSOs have to make substantial investments to support the momentum of DG deployment

SEE DSO DISTRIBUTED GENERATION POSITION PAPER



SEE DSOs Position Paper No. 1
July 2020

How Can Southeast Europe's Energy Distribution Grid Support the Region's Renewable Energy Targets?

11 Key Findings and Recommendations for Leaders to Consider

Adapted from the SEE DSO Report on Distributed Generation

Authors: Southeast Europe Distribution System Operators Security of Supply Working Group (SEE DSO WG)

Project coordination: United States Energy Association (USEA)

Project funding: United States Agency for International Development (USAID)

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This Position Paper is an updated summary of 2015 and 2018 studies focused on the technical challenges DSOs face in integrating increasing amounts of renewable energy into their networks.

1

How Can Southeast Europe's Energy Distribution Grid Support the Region's Renewable Energy Targets?

11 Key Findings and Recommendations for Leaders to Consider

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Distributed Generation Position Paper

USEA United States Energy Association

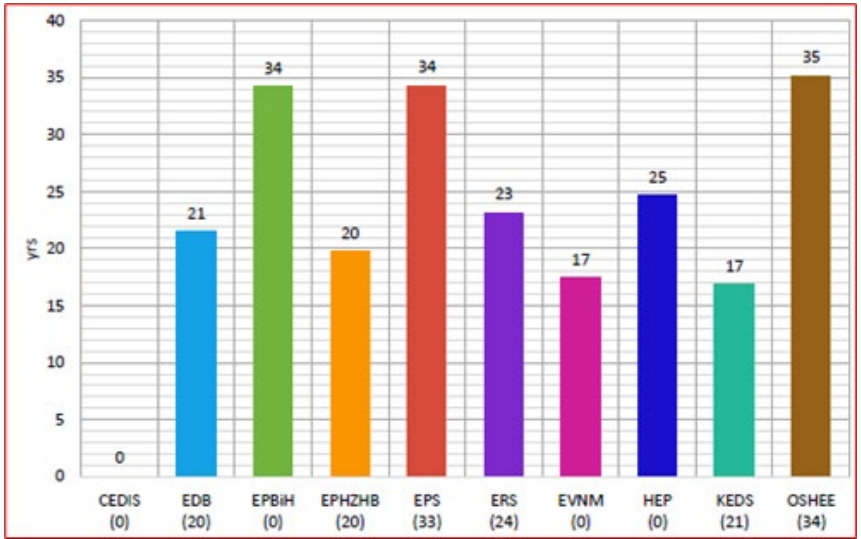
1. Findings

- networks not originally designed to handle significant amount of generation
- ageing distribution infrastructure
- realization of the RE targets may fail due to insufficient distribution grid capacities
- development needs driven by DGs installation, uneven consumption trends & strict regulation of SoS → pressing DSOs to undertake costly investment cycle

average age of transformers 29 yrs

Recommendation

- key determinants of distribution network development sustainability: predictable, stable and transparent regulatory framework
- full cost recovery and access to credit and capital markets needed to fund DSO investmens



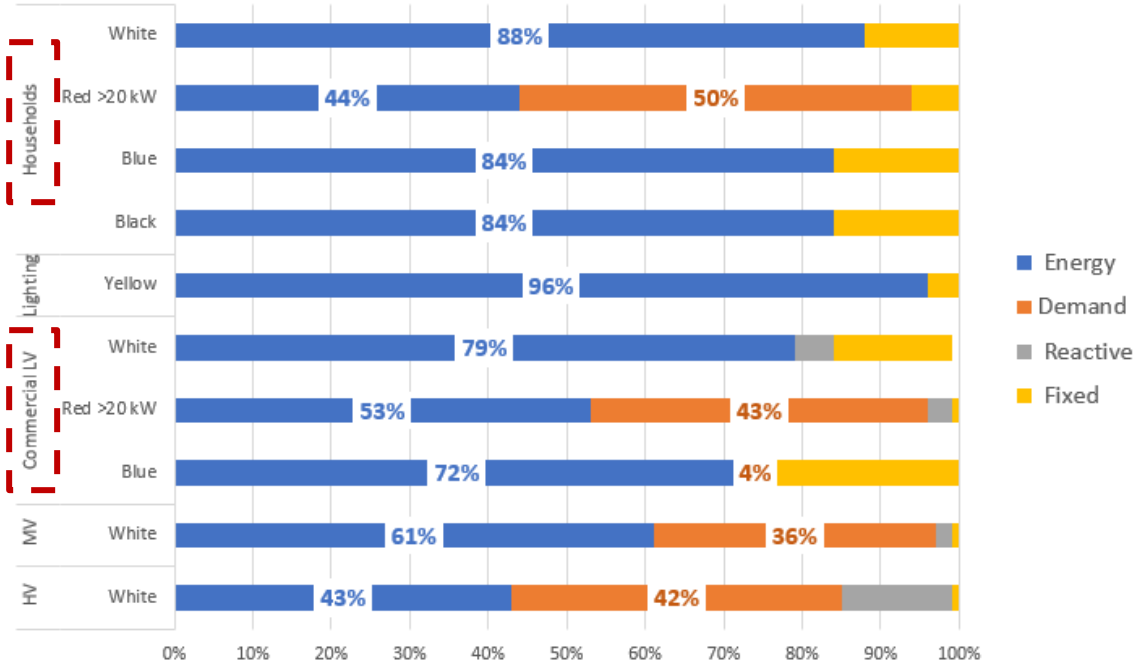
2. Finding

- network costs → capacity driven (peak demand)
- fixed costs in DSOs total regulatory approved revenues ~ 80%

- distribution tariffs are primarily based on the volume of electricity that is passed through the network
- fixed & capacity components under 35%

Recommendation

- network tariffs should be redesigned → gradual transition toward capacity tariffs or two-part tariffs
- better suited to account for the impact of the prosumers



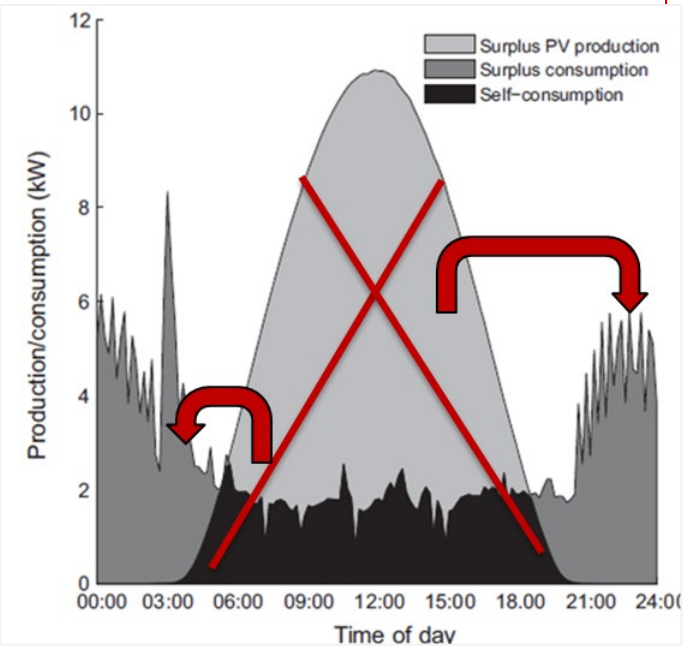
Case: Croatia

3. Finding

- low retail electricity prices ⟶ incentives for self-consumption in SEE are limited ⟶ net metering / billing
- arrangement that allows consumers who also generate to 'virtually' consume their self-generated electricity at any time
- detrimental to DSO revenue

Recommendation

- net-metering should be avoided in the current volumetric tariff construct
- net metering may be used in a transitional phase & limited to very small-scale installations, with yearly system quotas
- allow only real time netting of withdrawals and injections (hourly)
- investment aids preferable

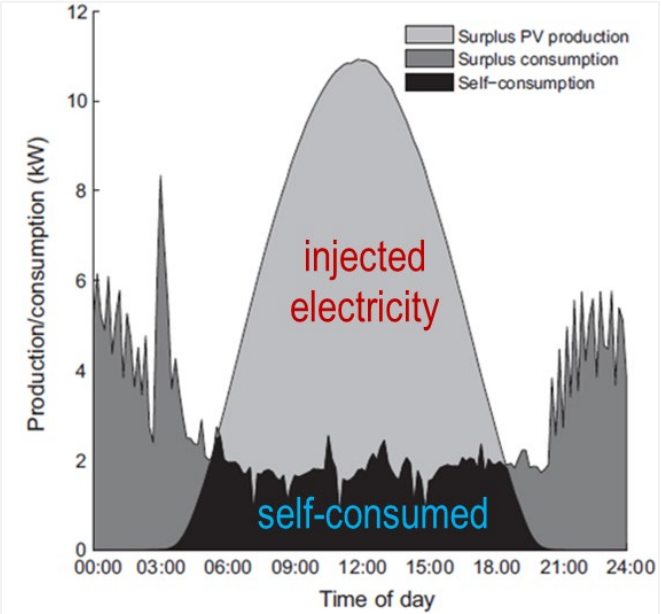


4. Finding

- prosumers contribute less to the grid cost recovery → self-consumed & injected electricity exempted from paying grid tariffs
- prosumers remain connected to the network for back-up service in case their generator fails

Recommendation

- prevent that a virtual storage capacity of distribution networks is available to prosumers free of charge
- prosumers should pay their share of the network and other system costs
- prosumers network costs should not be shifted to other customers



5.

Finding

- SEE DSOs do not charge DGs for network usage
- DGs only pay for connection & do not participate in covering network costs: network losses, services, maintenance, metering costs,...
- not likely that fixed network costs will decrease with DG integration
- variable RES require new grid investments - grid monitoring & automation

Recommendation

- understanding that it is difficult to allocate the additional operating costs to each DG

  use of system costs should be:
  1) socialized to all network users or
  2) (partly) allocated to the generators

- in favour of the second approach designed to provide clear price signals to the DGs for efficient system use

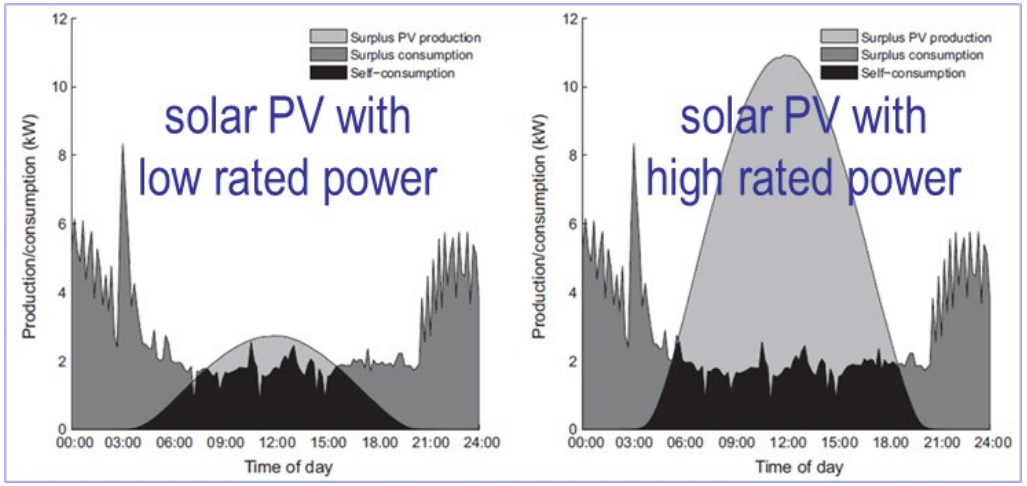
Montenegro introduced of distribution system charges for producers in 2020

6. Finding

- DGs and prosumers not incentivised to use the grid in the most economically efficient way
- schemes (net-metering) lead to the over-dimensioning of on-site generation
- if electricity produced is not consumed in the neighbourhood (locally) → contributes to network losses & network congestions or excessive investment in the network

Recommendation

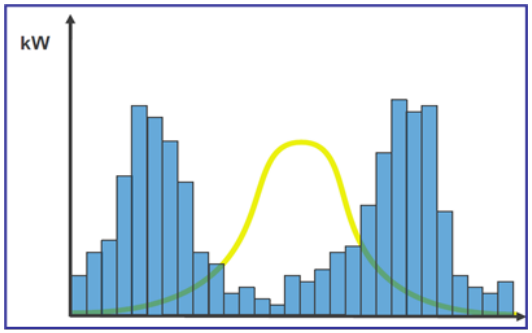
- network tariffs should be designed to encourage the most technically & economically efficient use of the existing infrastructure (reducing peak power flows)

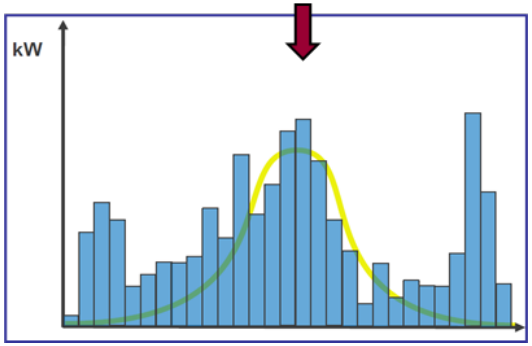


7.

Finding

- widespread deployment of DG (especially variable RES) will lead to operational challenges
- voltage control, protection settings and higher network losses,..





Recommendation

- to reduce the amount of investment required, all network users (consumers, producers, prosumers) shall be motivated to shift their peak energy use to non-peak hours
- customers should be motived to load shifting activities for improved self-consumption & provision of flexibility services

energy management systems, home-automation, energy storage

8. Finding

- SEE DSOs do not rely on services provided by networks users as a feasible alternative to network investments
- result in a large amount of the total network capacity added & required only for a few hours per year
- DG (RES) integration requires the provision of new services & more advanced distribution management strategy

Recommendation

- SEE DSOs should embrace an active role in the implementation of new network management strategies
- DSO require confidence and incentives to deploy new technologies (smart meters, widespread SCADA, IT and communication infrastructure, sensors,..)

9.

Finding

- connection charge is a one-time payment

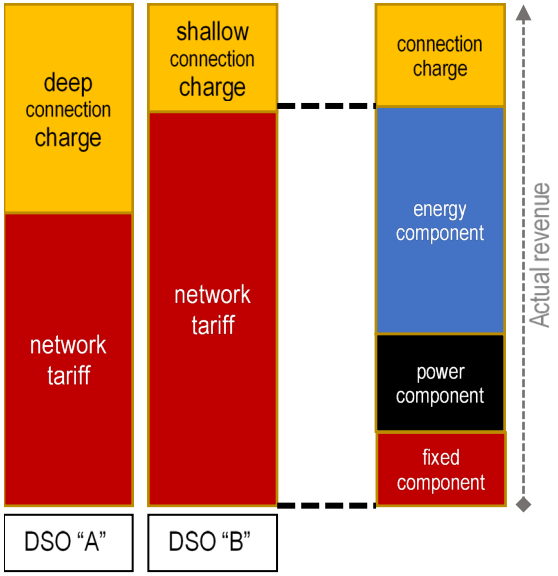
  primarily based on hosting capactiy of the existing network

- in SEE DSOs “deep” approach prevails

- in SEE, DGs do not pay for their use of the network (system charges)

Recommendation

- socialization of connection costs should not be permitted
- adequately designed „deep” connection charging provides appropriate and harmonized locational signals (close to the to load centres)



10.

Finding

- DSOs must authorise & conduct a grid connection study to determine the optimal connection point & necessary reinforcements
- can be cumbersome and time consuming → there is potential for connection procedure improvements

Recommendation

- focus on simplified methodologies for smaller DGs, transparency and public notice practices
- cluster grid connection requests to reduce the overall number of studies required

(rounds) group processing of connection requests

approximately simultaneous & closely located DG requests

submitted for an aggregated grid connection analysis

→ all DGs to share necessary reinforcements

11. Finding

- once approved, the DSO is certifying that it is able to accommodate the DG onto its network
- no requirement for the applicant to build the DG in a timely manner (if at all)
- can result in unnecessary grid investments & backlogs in connection requests

Recommendation

- to impose enforceable deadlines to ensure applicants build their DG faciliites in a timely manner (prevent „virtual saturations”)

Albanian proposal of deadlines
0-500 kW 12 months
500-2000 kW 18 months
>2000 kW 24 months

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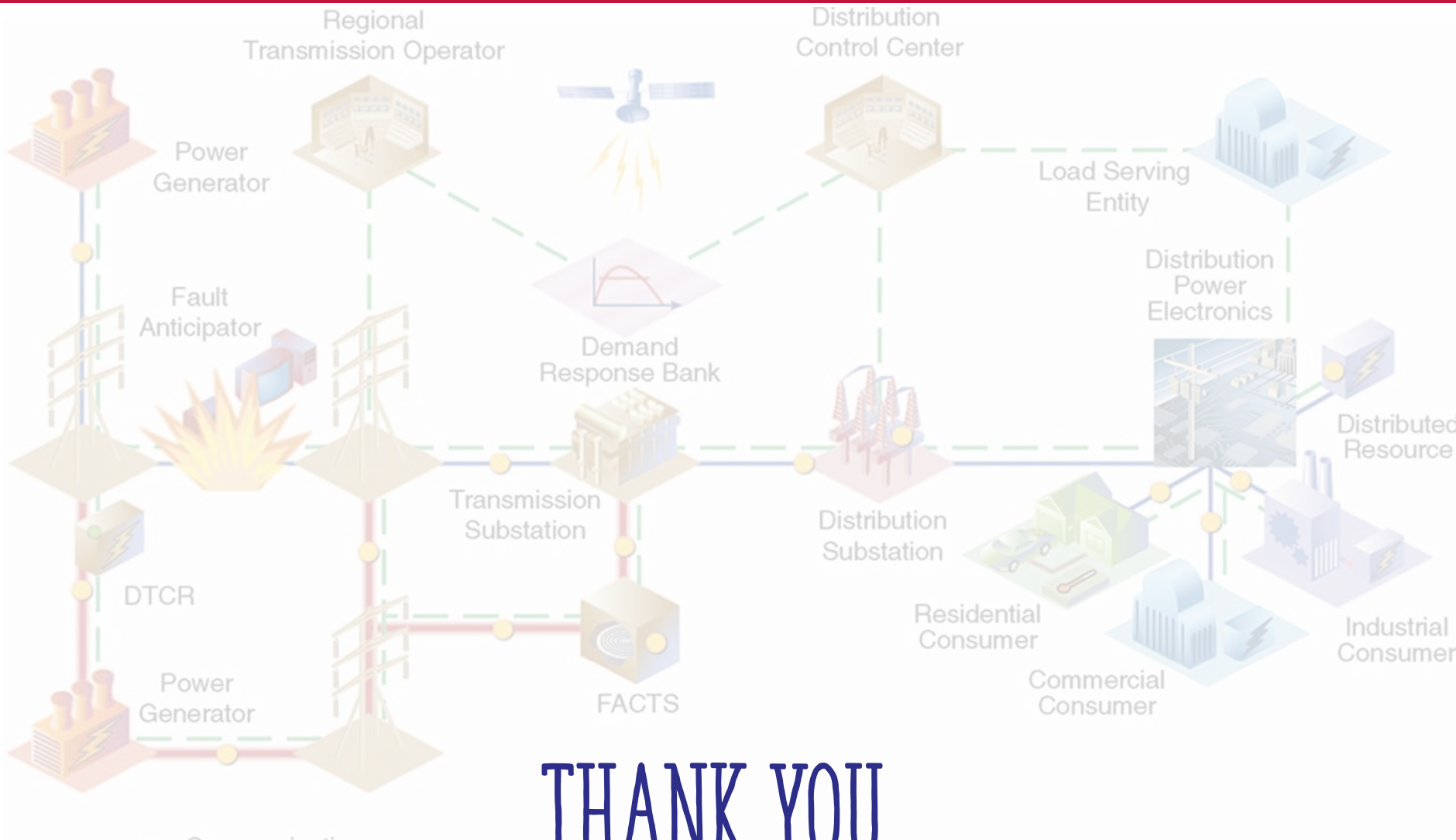

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