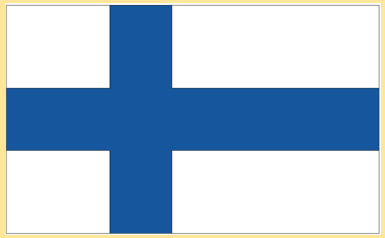
European Workshops on Demand Response 2022

DR4EU
DEMAND RESPONSE FOR EUROPE



Demand Response in Finland

State of play, evolutions and perspectives

55 min to be Fit for 55!

European workshops on DR: national implementation

Key features

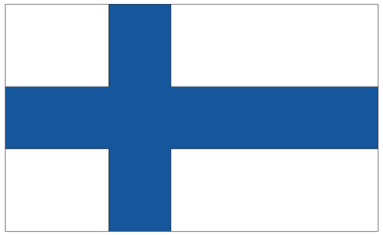
- DR today: MW? GWh?
- DR in all markets?
- Aggregation, independent?
- Balancing responsibilities
  - For DR aggregators
  - For impacted suppliers/BRPs
- Provisions for fair competition
- Technicalities: metering data and baseline

Key steps

- Any new legislation needed?
  - Which aspects
  - Adopted or yet to come
- Process to discuss and adapt regulation
- Timeframe
- Expected benefits and needs
- DR volumes needed to meet policy goals
  - Security of supply + climate targets
  - Mitigate costs for consumers

Agenda

- Sabine CROME, DGENER, EC
- Paolo BERTOLDI, JRC



- Petteri KUUVA, TEM
- Jukka RUUSUNEN, Fingrid
- Jori SÄNTTI, Energia Virasto

- Pasi KUOKKANEN, ELFI

- Q&A + questions on going => in the chat box please

Setting the scene

Sabine CROME, DG ENER, European Commission

Key provisions from the Clean Energy Package

Takeaways from 2021 workshops on DR

Pierre BIVAS, DR4EU

Clean energy package set the framework

DR to participate in all electricity markets, including through aggregation

- *Consumers should have access to electricity markets to trade their flexibility* (EMD, recital 39), and *bid to sell demand reduction or increase at a price in an organised market* (DR as per definition #20 in art.2)
- *Including [through] aggregation*, and *independently from their electricity supply contract* (art.13-1)
- *MS shall foster participation of DR through aggregation in all electricity markets* (art.17-1).
- Also *ancillary services* procured by TSOs (art.17-2) (+ see also existing network code on balancing).

CEP and fair competition

Fair competition with **generators**

- DR aggregators should *participate alongside producers*, without discrimination (art. 17-1 & 2)
- DR should also bear the same balancing responsibility as producers (art.17-3-d referring to the regulation art.5 and its recital 15 clarifying the *'allocated volume'* for DR aggregators)
- *MS should be free to choose the appropriate implementation model* and thus address the balancing responsibility of third parties, namely suppliers, *such as models where imbalances are settled or where perimeter correction are introduced*;
- MS may ensure a compensation be paid to affected third parties, namely supplier/BRPs depending on the 'model' + open issue to decide who would pay ('*electricity undertakings*') but they must ensure *not to create a barrier to demand response*. (art.17-4).

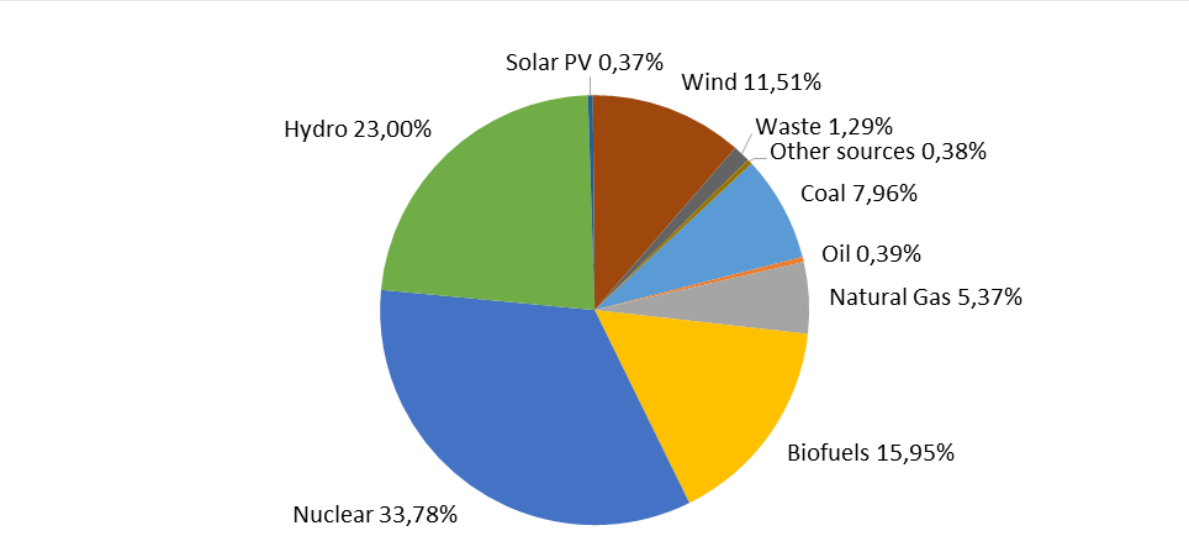
Fair competition with **suppliers**

- Allow independent aggregators (Recital 39) *without* need for any *consent* from other market participants (art.17-3-a)
- Same access to data: *ensure easy access to data on equal and non-discriminatory terms while fully protecting commercially sensitive information and customers' personal data (art. 17-3-c)*

JRC findings on DR in Finland

Paolo BERTOLDI, Joint Research Center of the European Commission

Finland's Electricity Generation mix in 2020. *Source*: IEA, 2020



DR & Independent Aggregators in Finland

- Finland has made progress towards decarbonization, mostly in power generation, thanks to large shares of nuclear, hydro and bioenergy. Nevertheless, the cold climate, long distances and energy-intensive industries could have delayed the country's carbon-neutral energy transition.

Players and context

- Fingrid Oyj is the sole national transmission operator in Finland. The Finnish state has held a controlling stake in Fingrid Oyj since 2011.
- In 2020 there were 77 distribution network operators in Finland, and the number of high-voltage DSOs has decreased to nine.
- Energiavirasto, the Finnish Energy Market Authority, regulates and promotes the operation of the electricity and gas markets, emission reductions, energy efficiency and the use of renewable energy.
- Finland joined the Nord Pool, a deregulated electricity market in 1998. Nordic countries (Norway, Finland, Sweden, and Denmark) have separate TSOs, though they share a single electricity market.

Transposition of EU Directive 2019/944

- Operating aggregated resources is possible in the current legislative framework in Finland.
- In general, power demand can and does participate actively in all electricity markets, and it's common that BRPs bid aggregated resources in different electricity markets. Independent aggregators are not yet recognized in legislation but will be in the very near future. However, also independent aggregation is already enabled in balancing and ancillary services markets.
- In the Finnish legislation, there is no separation of residential and non-residential customers when it comes to requirements set in Art 31. Customers are treated on a level playing field. In practice, residential customers do not participate in electricity wholesale markets directly but via their supplier. Thanks to hourly metering, spot-priced contracts are possible and actively benefited also by the residential customers.
- Residential customers cannot participate in multiple power markets directly since it is impractical, but they can and do participate indirectly through their provider. Residential consumers can react to spot-prices and profit from being flexible because smart hourly metering and spot-priced contracts are available.

Prosumers and flexibility services

- In Finland, consumers have the option of choosing a dynamic price contract. Customers who choose a dynamic price tariff structure pay the hourly price, retailer's premium, and a monthly fixed fee to the retailer with whom they opted to enter into a contract in the liberalized market (as opposed to regulated markets), and the price is determined based on the Nord Pool spot price for the price area of Finland; then the customer, who chooses a dynamic price tariff structure, pays the hourly price, retailer's premium, and a monthly fixed fee to the retailer with whom they opted.
- Markets open to flexibility services, the implicit use of flexibility, and incentives for self-consumption enable consumers in Finland to play a variety of roles. Consumers who also generate electricity typically use it for self-consumption to save money on their energy costs. This is usually simple because most suppliers have generator contracts in which the injections are paid at market price.
- Both explicit and implicit flexibility mechanisms are readily available in Finland. Implicit DR is widely used since metering infrastructure is very developed in the country. All suppliers offer dynamic pricing contracts, and 11% of customers have contracts with an hourly granularity and prices linked to the day-ahead market.

Flexibility Services

Implicit flexibility services

- Transmission and distribution tariffs in Finland are mostly energized. Transmission tariffs are flat or peak/off-peak tariffs (winter working day or other). Most DSOs only have peak/off-peak tariffs, but there are others also offering tariffs based on peak capacity. It is also possible to choose a 'night tariff' or 'night control.' The Active Customer pays a cheaper tariff and allows the DSO to control household electrical heating (using smart meters) at night. However, the control is similar every day and there are no other explicit control commands from the DSO.
- There are dynamic supply tariffs for industrial and residential customers. The roll-out of smart meters is complete (with second-generation now in roll-out), offering the possibility to make hourly energy prices available to the customers. In 2019, approximately 10% of domestic customers chose dynamic supply tariffs.

Explicit flexibility services

- Frequency containment reserve (FCR) is divided into two products: FCR-N, for normal operation, and FCR-D, for disturbances. In Finland, both are open to DR and (independent) aggregation.
- Manual frequency restoration reserve (mFRR) is open to DR and aggregation. Independent aggregation is in a pilot phase, and larger scale testing will start soon. Automatic frequency restoration reserve (aFRR) is also open to DR, and there are plans to open it to independent aggregation, in accordance with the result from the mFRR pilot.

Enablers and Barriers for DR and Independent Aggregators

- From a regulatory point of view, Finland is very advanced in implementing the 2019/944 EU Directive, establishing a legal framework for the independent aggregators. Having a complete regulatory framework and a track record of using it represents an enabler for independent aggregation and a benchmark for best practices among the EU Member States.
- Many elements of the flexibility requirements already exist in Finnish electricity market legislation, such as fully deregulated retail markets, balancing responsibility, and customers' ability to choose dynamic tariffs, among others. Each of these requirements is a functional enabler for engaging in Demand Response.
- The high share of wind in the energy mix could be considered as a further structural enabler, as it is related to the high flexibility needs of the local power system, and it could raise incentives to foster the deployment of DR as flexibility resource.
- Explicit use of DR, although available, is less extended than implicit DR. Technical requirements for most products are designed in a way that the demand side can participate without significant barriers.

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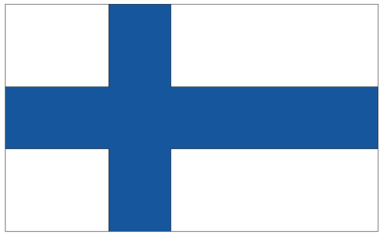

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April 19th, 2022

European workshop on DR in Finland – TSO view

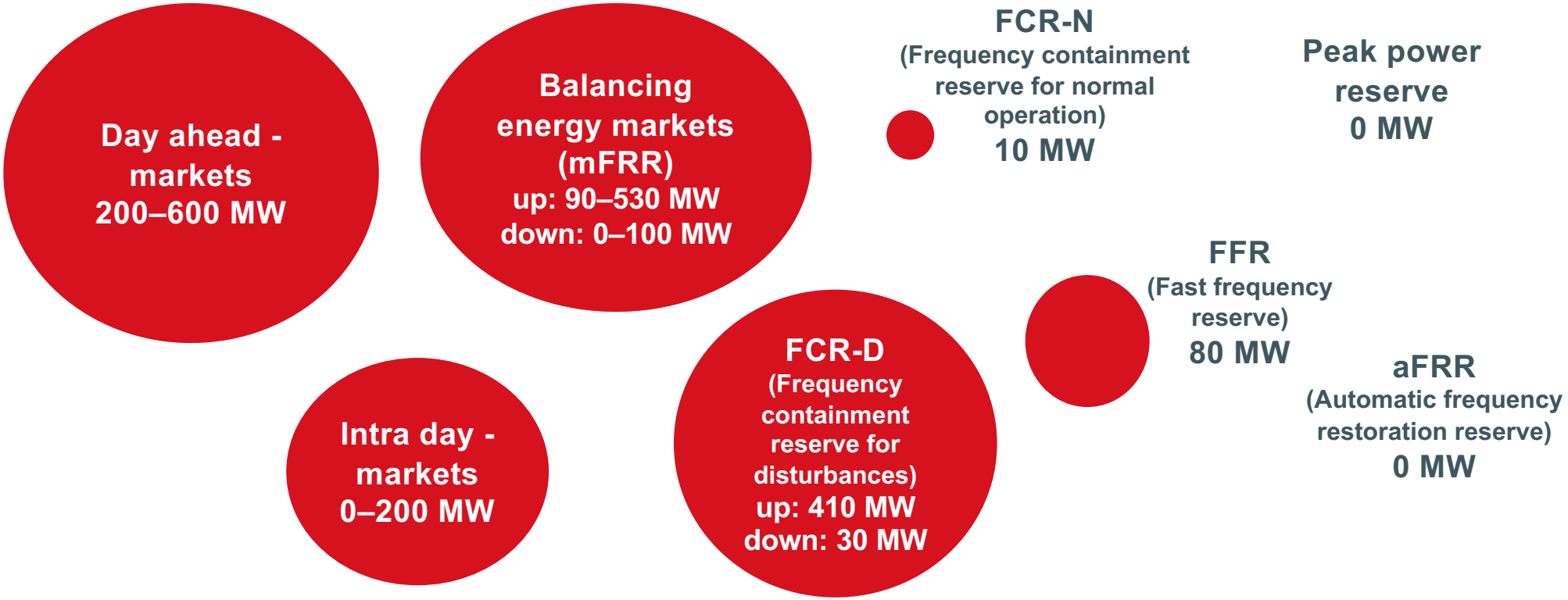
Jukka Ruusunen

President and CEO, Fingrid Oyj

FINGRID

Participation of demand response in electricity markets in Finland

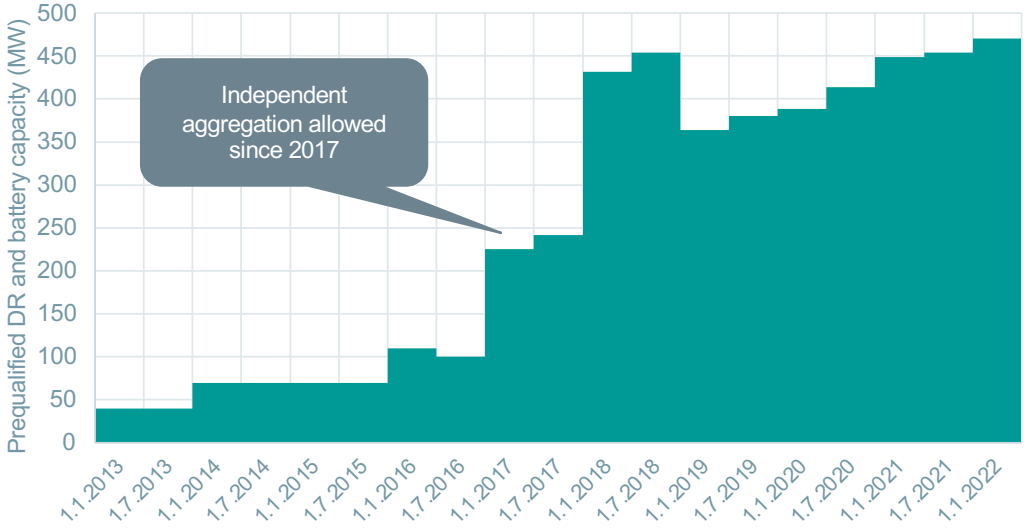
status: February, 2022



* Day ahead and intraday: based on estimations of implicit participation (reaction to price signals)

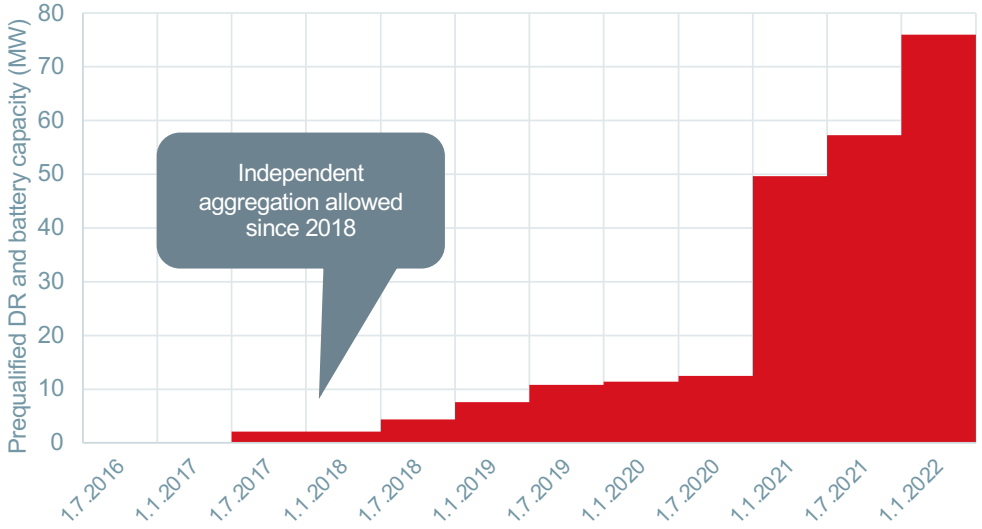
Prequalified capacity of demand response and battery energy storage systems in FCR-D and FCR-N

Demand response and battery volumes in Frequency Containment Reserve for Disturbances (FCR-D)



→ **Volumes of demand response and batteries in FCR-D increased significantly during the last 5 years, independent aggregation had a significant impact.**

Demand response and battery volumes in Frequency Containment Reserve for Normal Operation (FCR-N)



→ **Volumes of demand response and batteries in FCR-N increased significantly during the last years, independent aggregation had a clear impact.**

FINGRID

Thank you!

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FINGRID

energiavirasto

DR4EU Workshop: Demand Response in Finland

19.4.2022

Jori Säntti

Reilua energiaa

What is Energiavirasto's Role in the Process

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- Promoting the operations and development of electricity markets
- Following and participating in the European discussion on DR for years
- Facilitating discussions among stakeholders, other NRAs, etc.
- One of our roles in this is Giving Recommendations concerning new legislation
  - Clean energy package contained provisions on how to enable DR
  - EV has given input to the legislator as the new legislation is being drafted
- When the new legislation is in place, EV will handle the Implementation of the measures

Background for Energiavirasto's Recommendations for the Legislator

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- Energiavirasto was tasked to support in the implementation of the CEP provisions

- Smart Grid Forum was established
  - Wide range of participants from ministry, stakeholders, researchers, TSO etc.
  - One of the key tasks of the Forum: Promoting the adoption and market entry of demand response

- Wide range of discussions, which Energiavirasto used as input when giving their own recommendations for legislative changes

- The following is based on what kind of recommendations EV gave to the legislator
  - The actual legal changes have not yet been made

Energiavirasto's Recommendations on Settlement and Balance Responsibility

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- The provided flexibility is the difference between the consumed electricity and what would have been consumed without DR.
- This means that we need to somehow verify the Demand Response provided by an IA
  - Needed to allocate the financial reimbursements and energy balances between IA and the supplier
  - The calculated value defines payment to the aggregator
- How to know what the level of consumption would have been without flexibility as it never happened?
  - EV Recommendation to use a baseline
    - An estimated level of "normal" energy consumption without flexibility
    - Defined in a methodology. NRA to approve.

Energiavirasto's Recommendations on Settlement and Balance Responsibility

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- How should the balancing responsibility be organized? Two main options:
  - Splitting the consumption unit into separate balancing units?
    - Costly? Would require major changes in the balancing scheme
  - IA to operate under a BRP?

- EV recommends a balancing scheme where IA offers balancing services independently under a BRP
  - When an IA offers flexibility, the energy is actually owned by the supplier. Also, the flexibility will create a balancing error for the BRP.
  - Some kind of a compensation mechanism is required to avoid market distortions

Energiavirasto's Recommendation on Compensation

- EV´s view is that all market participants, inclucing IA, should bear financial responsibility for their actions
  - Compensation to the BRP for the energy
  - Correction/compensation for the balancing error

- How to calculate the financial compensation/correction?
  - Additional studies likely needed?
  - Balancing between maximizing the amount of flexibility and avoiding distortion to the markets?
    - Without compensation, we will likely see a lot of flexibility, but we likely also distort the markets.
    - Will we see enough IA if we use a full compensation -model?
  - Should the level of compensation change over time as the market participants learn to anticipate the level of demand response and take this into account in their energy procurement and balancing?

- EV supports the possibility for exceptions for compensation for capacity products where the energy amounts are very low (FCR)

Energiavirasto's Recommendation on Compensation

- Who will pay for the compensation?
  - CEP does not define who should pay
  - Covering the compensation by a tariff from market participants?
  - EV´s view is that the compensation should be paid by the IA. Otherwise there is a risk of distorting the markets

- Is the compensation a barrier to entry for IAs?
  - No. Instead, it should be seen as a measure to protect the markets to avoid distortions
    - Ensuring that an aggregator will not get excessive profits at the expense of others
  - Without these measures proposed by EV (compensation, settlement etc.), IA would need to cooperate with a supplier.
    - In practice a supplier could block the entry of an IA
  - The proposed measures actually instead remove a barrier for entry, allowing for true independent aggregation

Next Steps

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- EV is waiting for the legislative package to be adopted
  - The plan is to have the government proposal sent to the Parliament during spring.
  - As the legislative changes are made, tasks are likely given to EV
- Is everything ready once CEP provisions have been put in place? Need to make adjustments?
  - DR is a new scheme and will likely need some kind of revisions?
  - Talks of a Network Code on DR? This might also entail further adjustments or changes to the scheme
- Demand Response is very much needed in the system
  - EV will further promote the adoption and development of this important resource

Jori Säntti
Adviser, Markets

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European workshop on DR - the Finnish experience

Pasi Kuokkanen

Managing Director

Association of Energy Users in Finland

Large end-users' active role in the electricity markets. Why?

1. **We (all) are balance responsible parties:**
   - Each market player has to take care of own balances (often via service providers)
2. **Understand value of your assets and value of your DR:**
   - Often more than one supply source. Large end-users portfolios can own several contracts, PPAs and production facilities
3. **Active TSO (role of the facilitator)**
   - has direct contact to end users
   - has open reserve markets for competition
   - develop actively market rules and transparency

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SUOMEN SÄHKÖNKÄYTTÄJÄT

Market shares of the end users

(Source: Fingrid)

mFFR, up
10% activations
40% bids

FFR
70 %

FCR-D ,up
40-60 %

mFFR, down
5% activations
1% bids

aFFR
0 %

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3 steps forward for small users DR

1. **Ownership of the electricity**:

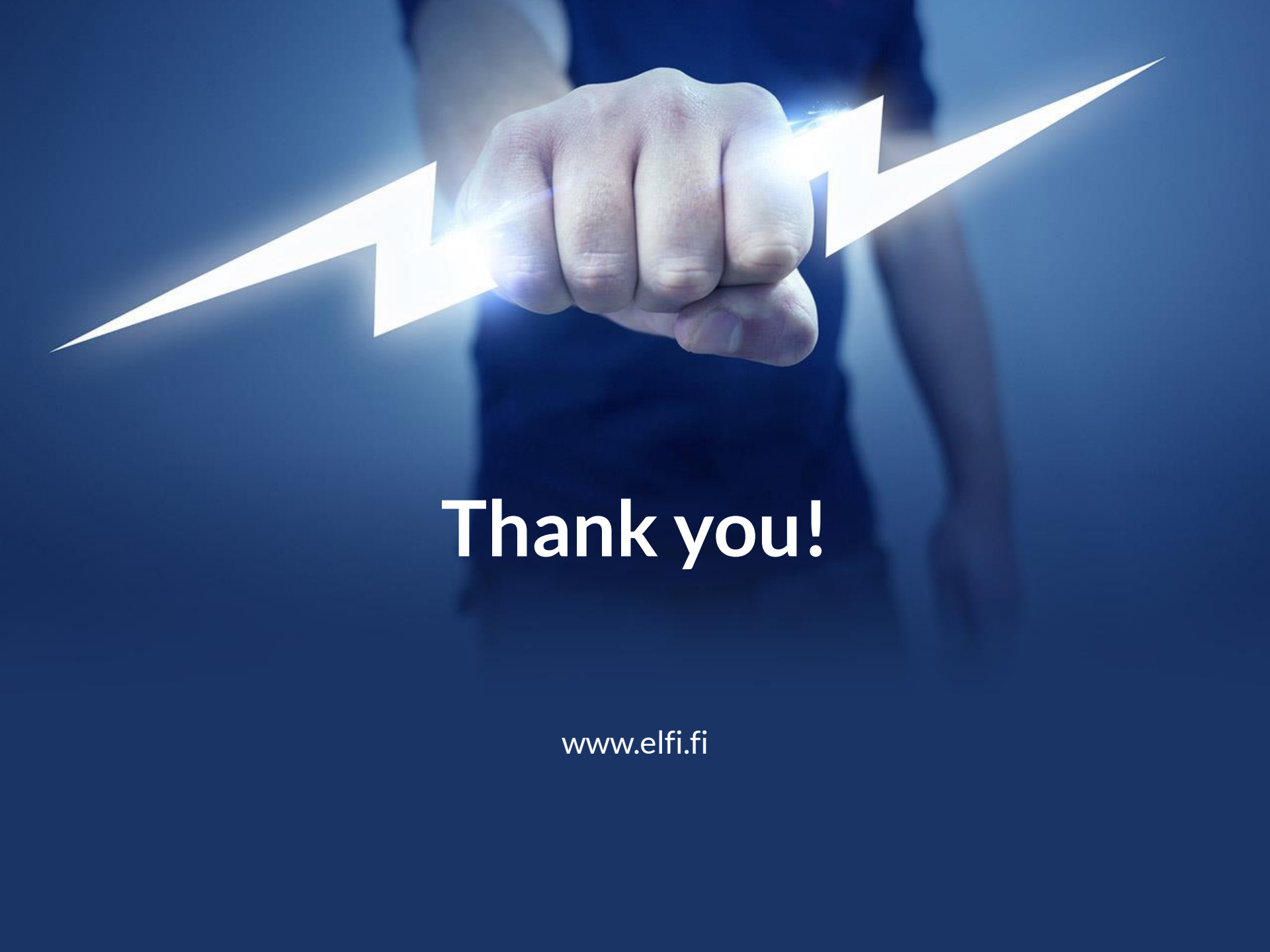
The purchaser of electricity must be the owner of the electricity it has acquired on a contractual basis.

2. **No financial barriers:**

No financial compensation shall be given by the electricity user to the open supplier for the activation of demand response. Open supplier's balance should be corrected.

3. **Keep it simple** (Each market has own rules):

Service providers (aggregators) shall be liable for its own error in accordance with the balance sheet rule and they may operate in marketplaces in accordance with the rules of the marketplaces.



Thank you!

www.elfi.fi

Thank you for your interest in DR!

Next session on Denmark to take place on 3rd May 2022

Register by e-mail to: **info@dr4eu.org**