Eurelectric Input to EG3 on Demand Reduction Measures

A Eurelectric technical input paper

October 2022

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:

- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

Dépôt légal: /2022/12.105/39

DT Flexibility
WG Retail Market Design

Contact:
[Savannah ALTVATER, Officer – Retail Markets – saltvater@eurelectric.org]

Eurelectric Input to EG3 on Demand Reduction Measures

A Eurelectric technical input paper October 2022

With the recently adopted Council Regulation on An Emergency Intervention to Address High Energy Prices, the Council has set ambitious energy consumption reduction targets. This includes a recommended 10% reduction of Member States' monthly average gross electricity consumption and a binding 5% demand reduction target during identified peak hours. The challenge now is how to make these targets immediately operational for Member States. The power sector would like to provide recommended measures along with use cases from both inside the European Union and from around the globe with proven positive results. We have separated these recommendations into short-term (relatively, immediately implementable) measures and medium- to long-term solutions which should be incorporated in Member States' frameworks as prices are not foreseen to stabilise until 2025.

Short Term Recommendations & Use Cases

Recommendation: Behaviour-based awareness campaigns *(applies to household customers, SMEs, commercial & industrial customers, and energy intensive customers)*

For the upcoming winter, behaviour-based awareness campaigns, when effectively designed and implemented, can further drive down electricity consumption by household customers. Examples of successful state-run awareness campaigns can be found across the European Union including the Together, We Reduce Our Use campaign in Denmark, the Flip the Switch campaign in the Netherlands, the Reduce Your Use campaign in Ireland, the Mission 11 campaign in Austria, and the One Degree Lower campaign in Finland. Most notably, the Reduce Your Use campaign in Ireland has reached over 3.4 million listeners (approximately 68% of the Irish population), though we are waiting on final data of the effect of this reach and for the total energy savings in the household sector.

Use Case: PEAKApp – Austria, Estonia, Latvia, and Sweden *(applies to household customers and SMEs who have smart meters already installed)*

The PEAKapp[1] was a 3-year Research & Innovation project funded by Horizon2020 which deployed a smartphone application which connected with consumers' smart meters to help them reduce their consumption. The app was field tested in four Member States across over 3000 households. The main functionalities of the application which drove down electricity consumption was the benchmarking of a user's consumption based on their local peers and alerts to peak price periods with the encouragement to reduce or eliminate consumption in 15-minute intervals. Those households who were alerted to their inefficiency compared to neighbours were able to reduce their consumption by 7% the day after they saw the benchmark. Of those who received the request to reduce their use during a specific 15-minute period, 43% of users hit the requested target by doing small things like turning off their electronics, postponing the use of

[1] http://www.peakapp.eu/

household appliances, and postponing cooking with electric appliances. **The only monetary incentive for users was the reduced prices during periods of either high renewable generation or low system use. Most of the incentives were behaviour-based.** A similar system could be put in place in Member States which have a high deployment of Smart Meters and could be applied to both household and SME customers.

Use Case: Energy Cash Back Programme – South Korea *(applies to household customers and SMEs)*

Another example is the Energy Cash Back Programme which was launched in three major cities in South Korea. The programme used consumption data to compare individual households and apartment complexes and compensated those who had significantly lower consumption than their peers. The average energy reduction rate was 14.1%, and 779 MWh were saved in total. The prizes ranged from 200.000 – 3.000.000 won (€144,52 – €2.167,86). The project is expected to expand to a nation-wide scope this year.[2]

Use Case: Semi-Static Distribution Tariffs - Czech Republic *(applies to household customers, SMEs, and commercial & industrial customers)*

Another way to incentivise energy savings, especially during peak periods, is through semi-static distribution tariffs. Since the 1980s in the Czech Republic, tariffs have been implemented together with automatic management of energy resources via simple frequency signals going through the grid. Electric boilers or heat pumps are automatically switched on during the low tariff and switched off during the high tariff hours. Customers have the possibility to override the grid instruction, however this incurs a significantly higher cost.

Currently there are various tariffs providing 8, 16 or 20 hours of low tariff rates based on the consumption pattern (whether it´s a heat pump, accumulation heating, simple boiler, etc.) of the customer. Hours of low tariff rates are typically published one week in advance. **Grid operators also have the chance to automatically switch off all the connected appliances where needed during a crisis period, although this is not often used.[3]**

Use Case: Critical peak pricing (CPP) - France *(applies to household customers)*

Since the 1980s, France has implemented time varying tariffs based on critical peak pricing through an option of the regulated tariff that can still be subscribed to by residential customers. This offer is designed to encourage households to reduce their electricity consumption during winter peak days corresponding to a situation of stress of the electricity system.
Based on a dynamic signal operated by the French TSO (available for all French suppliers), the principle consists in charging a significantly higher price for the consumption during selected peak periods throughout the winter, in exchange for a cheaper price during the rest of the year (the CPP is combined with a time of use pricing).

Finally, by subscribing such an offer, and without an exposition to market price volatility thanks to predictable fixed prices, the consumer is empowered for reducing its bill compared to a standard offer, by changing his behaviour and scheduling the use of his electrical equipment based on fixed peak/off-peak hours. The experience has shown that the reduction of the consumption of customers who have subscribed this offer is around 25% on peak days.

---

[2] https://www.iea.org/events/special-workshop-on-reducing-energy-demand-with-behaviour-and-awareness-campaigns

[3] More information available here, in CZ: https://www.predistribuce.cz/cs/potrebuji-zaridit/zakaznici/stav-hdo/?povel=492&den_od=11&mesic_od=10&rok_od=2022&den_do=24&mesic_do=10&rok_do=2022

In anticipation of stressful situations for the coming winters, French government has asked electricity suppliers for the development of incentive offers, such as critical peak pricing offers or peak time rebate (bonus/compensation for consumption reductions). Otherwise, such offers are encouraged by specific support mechanisms that are being put in place by French public authorities for implicit DR (see below).

Use Case: Enedis Explicit Automatic Water Heat Switch On/Off Example – France

(applies to household customers and SMEs, requires a smart meter for implementation)

As requested by the public authorities and to support the French TSO, Enedis will temporarily shift the automatic trigger of pilotable electric equipment - mainly electric water heater equipment – from lunch time off-peak hours (12:00 to 14:00) to overnight off-peak hours only (22:00 and 8:00). This temporary measure will apply from 15 October 2022 to 15 April 2023 to customers that subscribed to a specific peak/off-peak contract.

This measure concerns 4,3 million customers (including 238.000 professionals) which have chosen a peak/off-peak hours option contract (36 kVA or less), where off-peak hours are defined as between 12:00 and 14:00 and between 20:00 to 8:00. These customers represent 40% of all customers who benefit from peak/off-peak options.

This temporary measure aims at reducing tension over peak consumption during the lunch period. It would allow saving 2.5 GW, the equivalent of the total consumption of the city of Paris. The measure has no effect on the electricity bill or on comfort. Customers could still use the functionalities of their contract for other electric uses and could even manually start on the water boiler if they choose. The heating time would simply happen during off-peak hours at night, as it is already the case for 60% of clients.

Implementing such measure swiftly, as soon as this winter, is possible thanks to the functionalities of the Linky smart meter, which is, now more than ever, the facilitating tool for more responsible consumption habits. A tele-operation supervised by Enedis via the smart meters will allow sending the technical order of the automatic trigger during peak hours.

Use Case: Energy Savings Measures - France (applies to SMEs and commercial & industrial customers)

In France, several companies (Efficia, Datanumia, Energiency) proposed the following measures SMEs can take to reduce their consumption. As with household consumers, behaviour-based awareness campaigns can also be targeted at SMEs and recommend specific measures businesses can implement which significantly reduce consumption without limiting the comfort or productivity of their employees.[4]

For Businesses	For Employees	For Managers
Limit the heating to 19° or 18°	Turn off your computer and phone at night.	Concentrate employees who work in open spaces to free up areas that should not be heated or lit on slow days.
Control your heating according to the weather, activity times and the thermal inertia of the building.	Turn off the power supply of your workstation every evening when you leave.	Organize an energy saving contest between the different offices of the company.

[4] https://eficia.com/le-plan-de-sobriete-energetique-pour-vos-batiments-tertiaires-en-3-etapes/

Example: early start and stop in the morning and stop at 5:00 p.m., on working days only.		
Condition the air renewal according to the air quality only and stop it during the closing hours.	Clean up your mailbox every month.	Raise employee awareness of energy efficiency issues through regular educational messages.
- Change any lighting that is not yet LED.	Reduce or turn off non-essential audio-visual systems, such as projectors or screens in reception areas or cafeterias during peak hours (8am-1pm & 5pm-8pm).	Organize work to facilitate employee commuting outside of peak traffic hours whenever possible.
- Install motion sensors to control lighting in reception, break and passage areas.	Favour soft mobility (by foot or bike) or public transport.	**Sourcing suppliers and partners locally to reduce the number of kilometres travelled by products, among other things.**
- Limit lighting between 8:00 a.m. and 1:00 p.m. in particular (which are the peak hours of the day) and until nightfall.	Do not charge your electric vehicle during peak hours (between 8:00 am and 1:00 pm and between 5:00 pm and 8:00 pm) and use off-peak hours (between 10:00 pm and 4:00 am or on weekends).	Give preference to reconditioned equipment (computers, telephones, etc.).
Turn off interior building lighting during closed periods and reduce exterior building lighting, especially for advertising.	Limit the use of the elevator when possible.	Raise employee awareness of eco-driving and offer courses and training.
Automatically turn off lights 3 hours after sunrise in naturally lit rooms.	Dress warmly in winter.	Pooling and limiting meal deliveries by opening a Canteen 2.0.
Install power strips with switches for all workstations and plug in devices that remain on standby (screens, chargers, individual ECLs, wifi relays, etc.).	Close doors to prevent heat loss or heat gain.	[redacted]
Turn off the wifi when the offices are closed.	[redacted]	

Limit the amount of equipment and avoid oversizing it (number of screens, size of these screens, power of the computer equipment compared to the need...)	[redacted]

Recommendation: Market-based flexibility procurement *(applies to SMEs, commercial & industrial customers, and energy intensive customers)*

Based on several studies and the experience of our suppliers, the best incentive to reduce consumption is through price signals. If the regulated retail price is well-designed, it may still provide an incentive for energy saving behaviour. For example, the Czech government implemented an emergency price regulation for SMEs while **keeping the original threshold for lower prices at 80% of consumption** (**based on their highest consumption between 2017 and 2022). Their remaining consumption is based on regular retail contracts, which are currently based on high-fixed or spot prices**. This way, SMEs will have a price incentive to limit their consumption, especially during the winter months when the spot price of electricity is higher.

Explicit Demand Response ("DR")

Another way to procure flexibility is for aggregators and suppliers to work with system operators to offer market-based solutions to customers (energy users) for **performing *Explicit DR***: changing their electricity consumption patterns when required by electricity system operators (such as during peak demand periods) and being financially compensated for it by directly participating (through aggregators or suppliers) in electricity market programmes such as capacity, ancillary services, balancing and wholesale market programmes.

Participation of customers performing Explicit DR is currently only possible in *some* electricity market programmes across Member States - mainly capacity market programmes, and often with rules that do not encourage DR customers' participation. As explained under the three Recommendation points outlined below (*Remove barriers to DR participation in existing markets*; *Launch emergency DR programmes that also highlight a clear path forward to long-term opportunities*; and *Open DR participation to all programmes across all EU electricity markets*), the Commission can stimulate the implementation of a number of improvements, both in the short and the long-term, to grow the Explicit DR market across Member States. Explicit DR will be instrumental as a way to provide the support that EU electricity grids need during these challenging times and in the future.

Use Case: Power Crunch - Japan *(applies to commercial & industrial customers and energy intensive customers)*

An example of an effective government programme which helped reduce demand during peak periods was the Power Crunch system. Japan had two periods of 6 GW capacity drops during periods of unseasonable weather which meant unprecedented levels of consumption. To reduce consumption among industrial customers, they employed an alert mechanism:

- When expected reserve margin was below 5% two days ahead, customers received a "power crunch **preparation notice**"
- When expected reserve margin was below 5% the day ahead, customers received a "power crunch **advisory**"
- When expected reserve margin was below 3% the day ahead, customers received a "power crunch **alert**"

Comparison Between March & June Crises (Industrial Users Response)

	March (Alert)	June (Advisory)
Be aware of crisis a day ahead	50%	↑ 60%
Prepared for crisis in advance	20%	↑ 60%
Took action to save power	80%	60%* 90% of those prepared
Saving ratio	▲7% (1 day)	▲2% (4 days)
Possible power saving of 0-5%	30%	↑ 40%
Possible power saving of 6-10%	10%	↑ 20%

The Japanese learned that if they give industry enough of a window to act, they can save significant amounts of power.[5]

Recommendation: Remove barriers to DR participation in existing markets

(applies to SMEs, commercial & industrial customers, and energy intensive customers)

The least costly, most immediate Explicit DR measure to help reduce energy prices in the current environment consists of removing regulatory barriers that limit the participation of DR resources in existing markets across EU Member States.

Although various markets allow DR participation in theory, it is not enough just to state that DR resources are eligible to participate. Programme rules must be conducive to their participation while ensuring a reasonabe level playing field with supply-side resources. While it is often thought that electricity programme rule changes can take time to be implemented, many rule changes simply require a change in philosophical approach by system operators and regulators, rather than technical changes in systems and processes which can take long time to be implemented. Below we highlight some barriers that can be overcome relatively swiftly through a change of approach/philosophy by system operators. In addition, Eurelectric's flexibility report also highlights other areas of potential interest when it comes to possible rule changes.[6]

Requiring telemetry for DR resources

To clarify: telemetry refers to the near real-time transfer of interval data from the customer site to the electricity system operator.

[5] https://www.iea.org/events/special-workshop-on-reducing-energy-demand-with-behaviour-and-awareness-campaigns

[6] https://cdn.eurelectric.org/media/5557/flexibility-final-report-2021-030-0531-01-e-h-9A846946.pdf

One of the common barriers to DR participation in electricity market programmes is the requirement for telemetry - a requirement that is often replicated from that placed on large central generators.

Telemetry requirements deter DR customers from participation because of the high costs that these systems entail, and because telemetry costs do not scale much with the size of the asset (while revenues do). Therefore, while it is relatively easy for a large generator to offset telemetry costs, it is much harder to do so for DR sites, which are usually much smaller. This does not contribute to creating a level-playing field for DR resources and, therefore, it dissuades many of them from participation.

System operators typically justify this requirement with the need to have insight into the impact that DR resources have on the overall system during an activation event, and to be able to verify that the DR event has taken place for the purpose of accurate settlements. However, neither of these justifications are often valid: if a 500 MW generator goes on a sudden outage, a grid operator needs to know about it immediately; if a 500kW DR site cannot respond to an event, the grid can easily absorb that lost capacity. As for settlements, system operators can verify the level of curtailment realised by DR through ex-post measurement and verification. For services that do not require high-speed response, the normal 15- or 30-minute interval data from the settlement meter will suffice. For high-speed services, such as balancing services, additional metering will be needed. But in neither case is it necessary to judge this in real time through the use of telemetry.

Technology/communication requirements for data transfers between DR assets and system operators should be implemented based on a clear and transparent national legal framework, mirroring the *Network Code on Requirements for Generators* and considering different possibilities of respective sources and needs of respective services.

Use case titled “Removing barriers to DR participation in existing markets: NOT requiring telemetry for DR resources” provides more details on best practice approaches to technology/communication requirements for data transfers between DR assets and system operators.[7]

Dubious approach to baseline methodologies

To clarify: a baseline is a counterfactual consumption estimate against which a customer’s load reductions are measured. Baselines are needed to measure performance and carry out settlements.

A common approach when it comes to baselines is to use data-driven methodologies, whereby a baseline is identified based on a DR site’s historical interval meter data (which may also include other variables such as weather/calendar day) and per aggregated unit. Across many markets, this has proved to be the most accurate and reliable approach to baselining.

In some markets, however, the approach adopted regarding baselines is such that the customer is forced to effectively schedule all its consumption as a condition for participation in a DR programme, i.e., to be able to offer any flexibility to the system, they are required to give up their normal freedom to consume as much or as little as they need. This loss of freedom is too high a cost for almost all consumers and may also be read as in contradiction with the Clean Energy Package, as it contrasts with the messages of consumer empowerment and freedom of choice. If

[7] Sent as an attachment to the Commission

a consumer is forced to schedule all their consumption as a condition of participation in a DR programme, they will remain inflexible or likely decide not to participate in the programme. An example of this approach can be found in the Italian Capacity Market. Here, providing accurate forecasts – by nominating baseline figures – is a condition of participation in the market and it involves penalties for inaccuracy. This means that customers whose demand fluctuates (pretty much all other customers except those like aluminium smelters) cannot really participate. Other examples of dubious approaches to baseline methodologies can be found in markets where system operators compare last generation/consumption schedule (which is a mere forecast) with real data to settle redispatching, which leads to imprecise results and thus costs for redispatching providers.

Use case titled "Removing barriers to DR participation in existing markets: allow a variety of different baseline methodologies or focus on data-driven methodologies" provides more details on best practice approaches to baseline methodologies.[8]

Having tight performance tolerances

Any electricity market programmes will entail tolerances and related penalties for DR under-performance (i.e., delivering a lesser consumption reduction than agreed). However, while penalties for under-delivering are usually justified, DR resources need to be able to manage uncertainty by sometimes over-delivering for two main reasons:

- A prudent DR provider (an aggregator in this case) will make sure that its market offers are lower than its actual capabilities. It will include a buffer in its portfolio's capabilities to make sure that it is always able to deliver at least the amount it is dispatched for. It is not in the interest of the DR provider to over-deliver, particularly as they are generally not paid for it, but the only way it will be able to ensure it meets its dispatch target is by aiming to over-deliver by a certain amount.
- Unlike most generators, DR resources will typically not seek to be dispatched very often. They are most likely dispatched during tight or contingency conditions. In times like this, the power system security risks of under-delivery vs. over-delivery are different. That is, over-delivery of DR resources is unlikely to cause a problem during these times, as it will alleviate power system security and reliability issues, not exacerbate them.

Therefore, having over-delivery tolerances (and related penalties) in some cases can be a needless deterrent to DR participation. Therefore, if over-delivery performances are applied, these need to be carefully considered.

Use case titled "Removing barriers to DR participation in existing markets: removing tight performance tolerances for over-delivering" provides more details on best practice approaches to over-delivery tolerances. [9]

Proposal to the EC:

- Mandate Member States to remove potential barriers for DR participation in their existing electricity market programmes by consulting with industry/aggregators on best practices and lessons learned. Member States shall ensure that current practices regarding DR participation in the market are compliant with the regulatory framework for DR by implementing the principles defined in Articles 17 and 31 of the Electricity Directive.

[8] Sent as an attachment to the Commission
[9] Sent as an attachment to the Commission

Recommendation: Launch emergency DR programmes that also highlight a clear path forward to long-term opportunities *(applies to household customers, SMEs, commercial & industrial customers, and energy intensive customers)*

Another potential measure for Member States to consider is the creation of "emergency" DR programmes, to access additional flexibility this winter. This is an approach adopted by the GB market, through the *GB Demand Flexibility Service* Programme, and Irish Market, through the *SEM Beat the Peak* Programme.

Please note: as further elaborated below in section "Key considerations regarding emergency programme measures", in order for there to be participation in short-term programmes such as these, it is important that a clear route to long-term opportunities is also highlighted by regulators and system operators. Without the existence of long-term opportunities, these short-term programmes will not get the levels of participation they need and will therefore not contribute to strengthening security of supply at this time of emergency.

Some details about the GB and SEM programmes are provided below for information.

GB Demand Flexibility Service

A programme meant to run from the 1st of November to the 31st of March 2023, aimed at allowing National Grid, the GB system operator, to access new flexibility that is not currently accessible through existing services and market incentives, if insufficient upwards flexibility is forecast at the day ahead stage.

Key features include:

- Any consumers with half-hourly meters who do not already participate in any other DR programmes are eligible to participate.
- There are no real systems for settlements – these are done manually ex-post, relying on performance data submitted by the participating customer to the system operator.
- Demand reductions must be sustained for a minimum of 30 minutes.
- Aggregators can participate representing a range of loads (min 1MW - max 100MW).

SEM Beat the Peak

The proposed Irish *Beat the Peak* programme involves several different activities, including behaviour change campaigns, Implicit DR and Explicit DR, for both residential and commercial consumers.

The Explicit DR part of the programme targets large and multi-site commercial customers to reduce demand during peak events, in return for financial incentives in the form of direct payments. Key details of the proposed programme:

- Aggregators are the key point of contact for peak event communication and payment issuing for participants. They play a central role in the enrolment of and communication with customers.
- Participating customers are required to have quarter hourly interval metering.
- 10–24-hour notice is provided to participants to reduce their demand.

- Customers' response is measured based on their profile metering data. Customers who deliver a demand reduction relative to their agreed baseline demand (set using customer load data from winter 2021 and winter 2019) receive payment per kWh of load reduction achieved.
- Unlike most other structural programmes in any markets, customers are not penalised for failure to participate in a given peak event. Instead, there are processes to engage with non-participating customers to understand the reasons for lack of participation.
- Customers participating in other DR initiatives may potentially participate in *Beat the Peak* to the extent that they are not funded twice by similar schemes or other market mechanisms (i.e., capacity market or ancillary services).

Key considerations regarding emergency programme measures

The need for long-term opportunities:
Although short-term programmes like the ones outlined above can contribute to providing a safety net for system operators in times of emergency, it is necessary to highlight that, just because of their short-term nature, they are unlikely to spur much investment and may therefore not attract as much participation as might be hoped.

Aggregators and other service providers need a clear path to long-term participation to decide to invest in any programmes/markets. Many of them will not be willing to sign up for a 4-month programme because that requires considerable initial efforts in recruiting customers, developing their flexibility (which are the major costs) and persuading them that they will not regret the effort of getting involved. Without the guarantee that there is a future beyond those 4 months, it is unlikely that there will be a high level of participation.

Therefore, if short-term emergency programmes are adopted, there needs to be a clear path forward to some long-term opportunity for the same customers providing broadly similar flexibility, without the risk of a long gap where the temporary programme stops and the permanent one has not yet started. This is the most effective way to encourage aggregators and other service providers to choose to invest to deliver the needed flexibility in the short and long-term. Otherwise, there may be too little interest to provide these services or the cost of providing such service would be too high.

An alternative (or additional measure) to launching emergency programmes is to open all wholesale markets up to DR resources from now. Although the mechanics of doing so in a short space of time would not look elegant and full market integration could not be ensured from the start, this is one of the only actions that would fuel short and long-term investments in flexibility. The same "rough and ready" approach adopted for emergency programmes like the ones mentioned above can be adopted for wholesale market participation as well. Rules and system integration can then be improved over time.

DR programmes with non-demanding rules are possible:
In times of non-emergency, many DR programmes (or programmes involving DR participation) are typically put together with sophisticated/demanding/costly rules for DR resources which, as described in section "Removing barriers to DR participation in existing markets" above, often produce the opposite effect: they deter DR resources from participation.

However, the fact that the GB and Ireland emergency programmes outlined were put together with "rough and ready" rules (for example, there is no requirement of specific systems for

settlements in the GB programme, there are loose underperformance penalties in the Irish programme and a wide participation pool is enabled in both programmes) demonstrates that it is indeed possible for system operators and regulators to launch DR programmes with less demanding rules than they have typically done so far. These rules can then be improved over time, as more knowledge of material system operator needs are identified.

Proposal to the EC:

Encourage Member States to:

- "In addition to launching emergency programmes (which are short-term measures only), DR access to all EU electricity markets (including wholesale, capacity, balancing and ancillary services programmes) should also be implemented as a short-term action, if the same approach adopted to putting together emergency programmes is also adopted for wholesale market access to DR: less formal rules for performance measurement and verification can be used in the short term. Systems and processes can then be improved over time
- Open all wholesale markets up to DR resources from now. Less formal rules that ensure rigorous performance measurement and verification can be used in the short term, but these should be transitional, and the involved terms should be clearly stated. Systems and processes can then be improved over time.

Medium- and Long-Term Recommendations (for beyond this winter)

Energy efficiency upgrade awareness campaigns and state-sponsored energy audit programmes *(applies to household customers, SMEs, and commercial & industrial customers)*

Incentivising low-cost, high reward technology upgrades in European homes and businesses is a simple and effective measure Member States can apply to reduce electricity consumption in homes across Europe. Targeted awareness campaigns and subsidies and grants to encourage the switching out of inefficient appliances and fixtures can have a significant impact on demand reduction by increasing the efficiency of the products used. For example, the European Commission estimates that switching to highly efficient washing machines which meet the new ecodesign requirements could help save up to 5 TWh of electricity by 2030.[10]

Further efficiency gains can be leveraged with the introduction of smart appliances, which use AI and machine learning to optimise energy use in the home based on a resident's routines and comforts. Smart thermostats that are linked to electric climate control appliances are a great source for optimisation. On average, European consumers who implement smart thermostats in their homes see an energy savings of 10%[11].

Businesses should take the current price crisis as an opportunity to conduct deep energy efficiency audits (including ensuring they are compliant with ecodesign regulations) of their practices and processes and invest in more efficient appliances and fixtures and in renovations to ensure the appropriate levels of insulation for their premises.

[10] https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/energy-efficient-products/washing-machines_en

[11] https://en.grenoble-em.com/news-smart-thermostats-how-convince-future-users

The Commission should encourage Member States to facilitate awareness campaigns and provide consumers with access to trusted professionals to conduct free-to-them energy audits, either of their home or their business, and provide recommendations for both short- and long-term solutions to achieve the highest efficiency gains.

Framework of well-designed PPAs which encourage energy use optimisation

(applies to SMEs, commercial & industrial customers, and energy intensive customers)

We recommend the development of a framework for long-term Power Purchase Agreements (PPAs) and other long-term contracts which incorporate incentives for flexible consumption (ensuring excess consumption is charged at a market-based rate) while providing these customers with long-term price stability. These contracts should be based in part on the highest previous historical consumption, while also factoring in the increase in demand required for electrifying their processes.

Open DR participation to all programmes across all EU electricity markets *(applies to household customers, SMEs, commercial & industrial customers, and energy intensive customers)*

Opening DR participation to *all* markets is a requirement of the EU Electricity Directive.

Article 17.1 of the EU Electricity Directive states: "*Member States shall ensure that national regulatory authorities encourage final customers, including those offering demand response through aggregators, to participate alongside generators in a non-discriminatory manner in all organised markets*".

However, at present, only very few electricity markets in Europe enable full DR access to all their programmes. One of the most exemplary cases of a country that has integrated DR resources effectively into its electricity market is France, where DR resources can participate in:

- The balancing mechanism: industrial DR has been allowed in France on the balancing mechanism since 2003 (in 2020, around 10.7GWh of DR capacity was activated using the balancing mechanism)
- Ancillary services, including primary, secondary, and tertiary frequency control: the French system operator RTE has been contracting DR that can be activated on very short notice for the mFRR (manual frequency restoration reserves) since 2011. In 2020, DR capacity made up 45% of the mFRR.
- The wholesale market via the NEBEF mechanism (Demand Response Block Exchange Notification): as of 2020, 22 DR providers have contracts with RTE to participate in the mechanism. In 2021, DR volumes selected in the NEBEF mechanism reached 67 GWh
- The capacity mechanism: the 2021 DR call for tenders contracted around 1.5 GW of DR capacity, which is almost double the volume contracted in 2020. The overall DR capacity reached 3GW on the capacity mechanism for 2021.
- A specific support mechanism has been put in place by French public authorities for DR (originally for explicit DR and recently for implicit / tariff-based DR). It consists of the organization of tenders dedicated to DR which have been notified to the European Commission within the framework of the State Aid procedure. This capacity-based DR mechanism allows an entity to be remunerated for electric power made available over a specific period, which can be activated by the grid operator. In principal, this consists of giving the awarded DR capacities the opportunity to get additional compensation. This compensation is a fixed premium which corresponds to €/MWh capacity available annually. The framework dedicated to this mechanism provides for different conditions

to participate.

The right conditions need to exist for DR participation in electricity market programmes. A major one is the full recognition of *independent aggregators* as essential market actors for the success of any DR programmes. The need for full recognition of independent aggregators is expressed multiple times and in multiple different ways in the EU Electricity Directive. Yet, in Member States like Portugal and Spain, the participation of independent aggregators is still not allowed at all, while in others the EU Electricity Directive has been transposed into local laws, but the transpositions contain some fundamental flaws.

One of the most striking examples of a flawed implementation can be observed in Romania, where the aggregator framework (as per Chapter III of the EU Electricity Directive) has been completely misinterpreted. While the EU Electricity Directive states that aggregators must be allowed to participate in all markets, including independent aggregators (which are defined as aggregators that are "*not affiliated to a supplier or any other market participant*"), Romania has interpreted this as meaning that only independent aggregators (an aggregator that is a completely separate entity from a supplier) should be allowed, by defining an independent aggregator as a "*market participant involved in the aggregation and not related to its customer's supplier*".

Another example of interventions not sufficient to involve concrete DR participation is the example of the Italian Capacity Market, which envisaged no participation by DR units as a result of the auctions. In the Italian Capacity Market, aggregators are not paid for capacity. Instead, participating customers' suppliers receive a rebate on capacity payments which they may pass on to customers. Therefore, to participate, aggregators have to strike deals with the suppliers, which contributes to making the aggregator business model unviable. Participation of DR units could be encouraged by removing some features of the mechanism, specifically i) demand units should be allowed to participated when they share a site with generation, ii) removing the faculty for the TSO to disconnect each participating customer, and iii) participants should be allowed to nominate customers even after the auction.

Also in the Italian market, the possibility of aggregation of consumption units does not really exist in any markets other than the tertiary reserves UVAM Pilot Programme (Unità Virtuali Abilitate Miste). Even in this programme, however, the possibility of aggregation did not occur without initial barriers due to administrative challenges in managing commercial relationships between aggregators and suppliers[12].

These contractual models are currently dealt with differently by every Member State but, in some cases, perfect is the enemy of good – it is entirely possible to spend several years debating the nuances of different contractual models. But just like it is being done with emergency DR programmes, as mentioned above, it is far better to get something "rough and ready" in place quickly and improve any material aspects of it at a later stage.

[12] As per the programme rules, UVAMs (virtually aggregated units) have to be operated by a BSP (balancing service provider) which participates in the programme on behalf of its clients. However, in order to participate in other markets (e.g. day-ahead and intraday markets), individual consumption units within the virtual aggregate continue to belong to BRPs, therefore BRP and BSP may not coincide for a virtually aggregated unit because, while only one BSP will operate each such virtual unit for the purpose of the UVAM Programme, potentially multiple BRPs might manage the operation of individual load or generation units belonging to the aggregate in other programmes. This led to a number of difficulties regarding UVAMs' management and remuneration. Initially, BSPs needed the permission of every BRP for individual units joining the virtual aggregate. However, this has now been overturned by the regulator to BSPs simply notifying BRPs about individual units' participation.

Proposal to the EC:

- Ensure that the EU Electricity Directive is correctly implemented across all Member States.
- Open DR participation to all programmes across all EU electricity markets. As mentioned above, this does not have to necessarily be a mid/long-term action. DR participation to all programmes across all EU electricity markets can also be done as a short-term action if the same approach adopted for emergency programmes (which are put together with "rough and ready" rules, to be improved as time goes by) is adopted for DR participation to any other programmes in EU electricity markets.

eurelectric
powering people

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

Union of the Electricity Industry - Eurelectric aisbl
Boulevard de l'Impératrice, 66 – bte 2 - 1000 Brussels, Belgium
Tel: + 32 2 515 10 00 - VAT: BE 0462 679 112 • www.eurelectric.org
EU Transparency Register number: 4271427696-87