



Options for the better integration of demand-side resources

[Written by RAP/Zsuzsanna Pató]
[November – 2022]



EUROPEAN COMMISSION

Directorate-General for Energy
Directorate ENER
Unit B2 — Energy Efficiency

Contact: Nikolaos Kontinakis

E-mail: Nikolaos.KONTINAKIS@ec.europa.eu

*European Commission
B-1049 Brussels*

Options for the better integration of demand-side resources

***Europe Direct is a service to help you find answers
to your questions about the European Union.***

Freephone number (*):

00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

LEGAL NOTICE

This document has been prepared for the European Commission however it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

More information on the European Union is available on the Internet (<http://www.europa.eu>).

Luxembourg: Publications Office of the European Union, 2022

© European Union, 2022

The **aim of this short report** is to identify options to further mobilise energy efficiency (EE) and demand-side flexibility (DSF) in European power markets. These options are clustered into:

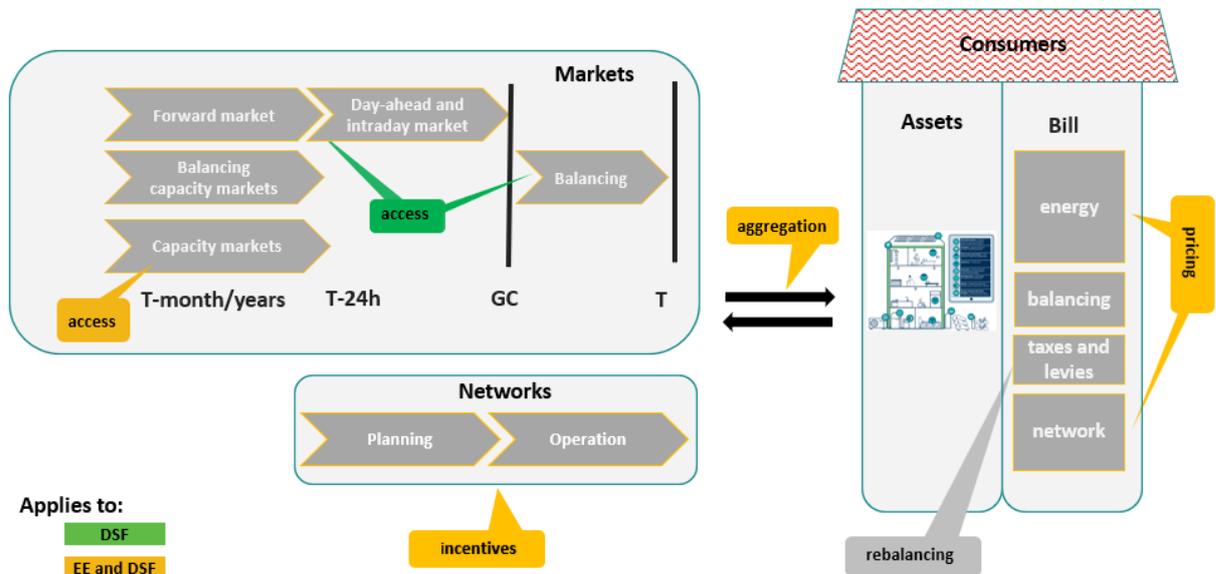
- Short-term actions: No need for legislative change but will help EE and DSF this winter and could be promoted as best practices.
- Solutions requiring legislative changes, including:
 - Limited edits or potential placeholders for further revisions that could be agreed on during the upcoming revision of the Electricity Directive (ED) and the Electricity Regulation (ER), and potentially the ongoing finalisation of the Energy Efficiency Directive (EED) and the Energy Performance of Buildings Directive (EPBD)
 - New ideas within the remit of these pieces of legislation that could be introduced in the next round of revisions.

Mobilising EE and DSF is key not only for reducing gas consumption in the short run – as recognised in [Regulation 2022/1854 on emergency interventions to address high energy prices](#) and in Art 3 of the [Renewable Energy Directive \(RED\) proposal by the Parliament](#) - but also in the future power system, which will be dominated by variable renewable generation. The use of these resources in the power sector needs to be considered in the following **context**:

- EE is a system resource and its value needs to be captured, instead of it merely being considered as a baseline. This justifies public investment and/or additional market revenues beyond what consumers would be willing to invest into it.
- Due to the electrification of heat and transport, the absolute change in electricity consumption is not a suitable proxy for measuring progress.
- 'Energy Efficiency First' is an overarching principle: supply (including networks) and demand-side resources (EE and DSF) must compete on an equal footing from a systemic perspective:
 - There's a need to aim not only at technology neutrality but at technology inclusivity.
 - Both need to be treated as power system resources.
- EE has standalone value, but it also boosts flexibility since efficient buildings have higher flexibility potential. EE is not just a 'buildings and products thing' and DSF is not just a 'market thing'.
- EE's costs and benefits depend on the perspective it's viewed from: consumer, local network, power system or the whole of society.
- Mobilising demand-side resources entails ongoing operational costs and upfront investment similar to generation and networks.
- Levels of regulatory leverage are different for market actors and regulated actors (network companies).
- Value-reflective wholesale pricing and network charges drive EE and DSF: market design is key in capturing their value.

The solutions proposed cover the various entry points for integrating EE and DSF into the power system (Figure 1). Rebalancing the taxes and levies on fossil fuels and electricity would encourage the electrification of heat and transport, and because of the superior efficiency reduce energy consumption but also boost the deployment of flexible assets.

Figure 1. Power system entry points for EE and DSF



1. SHORT-TERM ACTIONS

Speeding up internal energy market implementation and aligning state aid conditions

Goal:

- Accelerate implementation of, and compliance with, the Electricity Directive and Regulation on the internal energy market (IEM) to unlock demand-side resources.
- Minimise market interventions and supply-side subsidies that increase system costs and gas consumption, as well as those that do not effectively empower consumers through EE and DSF.

State of affairs:

Delayed IEM implementation is the main barrier to the integration of demand-side resources. The 'Clean Energy for all Europeans' package created an enabling framework for Member States (MS) to integrate demand-side resources as power system resources, but implementation has been uneven and lags behind overall, as is shown by [this report](#) from 2021 on the progress in 11 MS.

In addition to the usual infringement procedures, **specific conditions could be imposed on crisis-related state aid and other temporary derogations from EU IEM rules.** Indeed, compatibility with the internal market is already a precondition of state aid approval of MS measures under the [CEEAG](#).

The [Temporary Crisis Framework](#) communication currently states (paragraph 24) that "Member States are invited to consider" making crisis-related subsidies subject to "requirements related to environmental protection or security of supply". Examples given include requiring investments in EE; requiring reduced gas consumption via electrification and onsite renewables; and requiring "flexibilisation of investments" to facilitate better alignment of business processes to price signals on electricity markets.

Proposals:

- Emphasise, via a Communication, that MS are expected to prioritise implementation of the Clean Energy Package to unlock DSF resources and reduce

user costs, before resorting to market interventions such as generic price caps, regulated tariffs or rebates for all consumers. Given the urgency of the cost-of-living crisis, consider additional guidance setting out acceptable steps that can be taken now (e.g., MS committing to a timeframe and robust plan for implementation).

- Strengthen the Temporary Crisis Framework communication so that MS are required to impose appropriate efficiency or flexibility obligations on energy users and producers seeking crisis aid. Again, this could take the form of future commitments, or could be achieved by ringfencing a proportion of funds for efficiency and flexibility-enhancing measures.
- Increase public benchmarking of MS compliance with IEM legislation.
- Showcase national best practices and initiatives on an EU platform.

Examples of national initiatives for this winter

UK energy service operator's demand flexibility service

The UK's energy service operator, National Grid, has opened a [service](#) to enable access to demand flexibility this winter at times when demand is highest. Energy suppliers and aggregators can register to take part by incentivising their household and business customers to move their energy use out of peak hours. The regulator has confirmed a guaranteed price for providers of £3/kWh. Minimum service requirements include a minimum response time for assets of 30 minutes, a minimum unit size of 1MW and a maximum of 100MW, and half-hourly metering. (Reducing the minimum unit size to 100kW would facilitate more contributions by third-party aggregators – see 'Rebuilding markets and services around DSF', below, for more recommendations on DSF-friendly policy design.) Participation is limited to customers who have a smart meter – currently just under half of UK meters are smart meters. Twelve turn-down events have so far been planned for the coming winter, in which customers will be asked to reduce demand during peak hours (usually between 16:00 and 19:00). The scheme is based on an earlier [trial](#) carried out by National Grid and Octopus Energy with more than 100,000 customers, the [results](#) of which informed the design of the service. There is no risk involved for households who take part: individual customers who sign up will not be penalised for non-participation in any turn-down event; and, although payments to customers will vary between suppliers/aggregators (the average is expected to be around £100 for the winter), the focus is very much on incentives to turn down in 'upside only' offers.

Polish block tariff

Poland has introduced a block tariff for households: consumption up to a predetermined amount is fixed at the 2021 rate, while anything above that amount is charged at a higher – but still not fully cost-reflective – rate. In order to encourage reduced consumption, the [law](#) also introduced an energy-saving incentive. Households that reduce their energy use in 2023 by at least 10% compared to their average consumption between 2018 and 2022 will receive a discount on their 2024 bills amounting to 10% of the 2023 bill.

2. SOLUTIONS REQUIRING LEGISLATIVE CHANGES

Need for general reframing of DSF and EE

Goal:

- Reframe EU legislation to prioritise DSF and EE as power system resources like other fundamental energy infrastructure.

State of affairs:

The EU regulatory landscape focuses on the individual right to participate in DSF, rather than on DSF's vital role as a system resource for efficient, affordable decarbonisation and reliability. It therefore fails to provide coherent, mutually supportive objectives and incentives to deliver customer flexibility at scale, for the benefit of the whole system. Meanwhile, although supplier EE obligations do exist in the majority of MS, the full power system and societal value of EE – both alone and as an enabler of DSF – is not reflected in IEM legislation. The measures outlined below would help to unlock the potential of EE and DSF, while continuing to uphold consumer-centric principles such as agency, consumer protection and user experience.

Proposals:

- Explicitly reframe EE and DSF as system resources, as well as being tools for consumer empowerment. This could be part of the recitals of future recasts of IEM legislation.
- Ensure dedicated regulatory oversight of the customer transition to smart energy solutions, to provide focus and accountability. This could be ACER or CEER based but should cover the heat, transport and buildings sectors as part of an integrated strategy.

Need for coherent definition of DSF across the various pieces of legislation (IMD, RED, EED, EPBD)

Goal:

- Common understanding of types, roles and values of DSF across all markets and uses and by all actors.
- It is fundamental that the scope/definition remains stable to reduce regulatory risks to actors.

State of affairs:

Although several pieces of legislation provide definitions of DSF, **EU regulation still lacks a consistent approach**. EE contributes to DSF predominantly in the form of heat storage – efficient buildings can store heat for longer and allow heating schedules to be flexed. As such, the definition of DSF needs to link to a definition of storage that goes beyond supply-side storage such as batteries or EVs. The DSF [definition](#) used by the EU Smart Grid Task Force specifies that demand-side actions must be “in response to price signals or market incentives,” and thus excludes non-paid requests from system operators. The Art 2(20) Electricity Directive definition of demand response does not mention the role of EE, onsite generation or storage. The [Guidance on Energy Efficiency First](#) refers to demand-response only, not including distributed generation. The [draft RED](#)

recast defines system efficiency without making reference to storage.¹ The upcoming [network code on demand response](#) plans to cover load, storage and distributed generation – but it’s not clear if the definition of storage will include heat storage, and thus EE.

Proposals:

- Create a definition of DSF that is technology-agnostic. It should encompass the capacity of a customer to react to an implicit or explicit price signal by shifting controllable loads, or utilising onsite storage such as batteries, onsite generation and EE.
- The definition put forward by [SmartEn](#) is a good starting point and could be complemented with a reference to the EE of the building being a heat storage asset: *“Demand-side flexibility means the capability of any active customer to react to external signals and adjust their energy generation and consumption in a dynamic, time-dependent way, individually as well as through aggregation. Demand-side flexibility can be provided by smart decentralised energy resources, including demand management, energy storage, and distributed renewable generation to support a more reliable, sustainable and efficient energy system.”*
- Update existing legislation – including IEM – with a common definition that clarifies the status of voluntary versus mandated and paid versus uncompensated actions. → ED Art 2

Access/aggregation

Rebuilding markets and services around the needs of DSF

Goal:

Ensure that DSF and EE can participate in all markets that are designed to be technology-inclusive, and facilitate value-stacking across these markets.

State of affairs:

Detailed ‘all-inclusive design’ requirements are not included in the IEM legislation, except from the minimum bid size of 500kW for day-ahead and intraday markets in the ER Art 8(3). It is the [proposed Framework Guideline on Demand Response](#) (FG) that sets out common principles for balancing markets, wholesale markets and ancillary services. However, this does not extend to:

- Capacity remuneration mechanisms (CRMs), the eligibility criteria and product specifications for which remain out of reach to most forms of DSF.
- EE, as the Framework Guideline “is developed in order to set out clear and objective principles for the development of harmonised rules regarding demand response, including rules on aggregation, energy storage and demand curtailment.”

Proposals:

- Extend the remit of the DSF Network Code so that all-inclusive policy design requirements also apply to new and existing CRMs, to facilitate market access and

¹ ‘System efficiency’ means an energy system which integrates variable renewables cost-effectively and maximises the value of DSF to optimise the transition to climate neutrality, measured in reductions of system investment and operational costs, greenhouse gas emissions and fossil fuel uses in each national energy mix.

value-stacking for the explicit DSF that should theoretically be able to access these markets. → FG 1.1.4

- Include EE among the resources that can participate in CRMs, and require contract length to be based on TOTEX in CRMs (CAPEX-based contract length favours more expensive technologies). → ER Art 22(1)(h)
- Reduce minimum bid size to 100kW or under for all markets (not only day-ahead and intraday but also balancing, ancillary services, forward and CRMs), as low bid sizes are key for third parties who build up their portfolios from scratch. → ER Art 8(3)

Developing a standard methodology for DSF potential and value

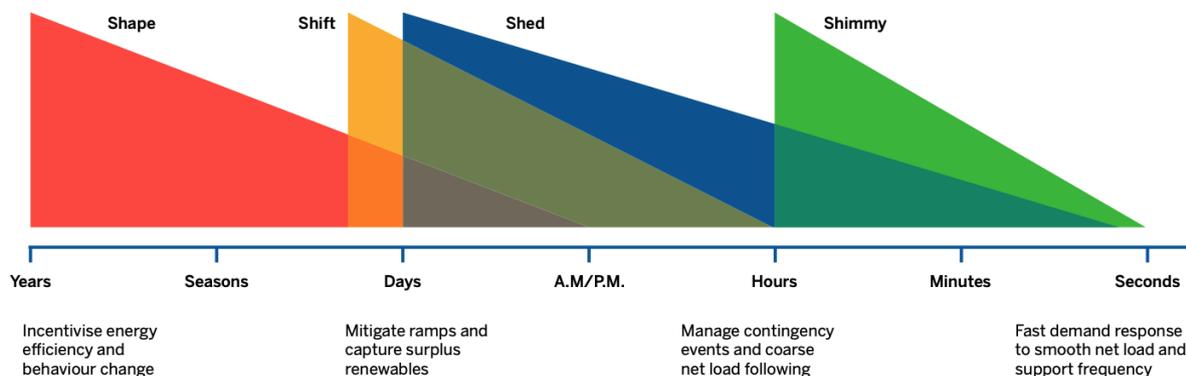
Goal:

- Learn about the 'all-system value' of DSF across all timescales for technology-inclusive optimisation (static and dynamic) across supply and demand options.

State of affairs:

The EU legislative framework is, in general, **preoccupied with the role of DSF in critical-peak shaving** and security of supply, most notably in the European Resource Assessment. The reality is that, where properly facilitated, **DSF delivers a range of valuable services across all timeframes** (Figure 2).

Figure 2. Demand-response contributions across different time frames



Source: Alstone, P., et al. (Lawrence Berkeley National Laboratory, 2017). 2025 California demand response potential study—charting California's demand response future: Final report on phase 2 results³

Having a standardised estimation (similar to the [one](#) prepared recently by SmartEn) on the potential and value of DSF would assist MS in complying with the current [peak reduction EU target](#) and reporting on the implementation of the Efficiency First principle, including the use of flexibility in the NECPs. It is essential for potential future DSF deployment targets and supplier obligations.

Proposals:

- Develop robust common metrics for estimating and valuing contributions of households and other implicit flexibility by ACER → ACER regulation

Inclusive and robust consultation

Goal:

- Ensure DSF and EE providers and other minority stakeholders can input meaningfully on key IEM decisions by MS.
- Avoid unnecessary market interventions or interventions with implicit biases towards incumbents or supply-side resources.
- Improve transparency, independence and quality of decision-making.

State of affairs:

National consultation requirements were introduced to certain parts of the state aid rules in 2022 (CEEAG sections 4.1 (reduction and removal of greenhouse gas emissions) and 4.8 (security of supply)). However, by the time a MS has decided to notify state aid – for example a capacity remuneration mechanism – vital decisions may have been made at the expense of energy-only market options, which could be better placed to incentivise EE and DSF. **The consultation requirements therefore come too late in the process.** Even in the limited state aid areas where consultation requirements exist, there are exceptions that limit their effectiveness. **Implicit biases** arise in flawed policy design, which hinder DSF and EE deployment and value streams. Such harm is not removed by lower aid amounts, the mere presence of a competitive process or the absence of fossil subsidies, so consultation requirements should apply in these situations.

Proposals:

- Extend MS consultation requirements to IEM implementation and compliance, not just state aid. As part of this, require the introduction of a legally-binding code of conduct on consultations, such as the [one](#) in place in the UK.
- Require MS and key decision-makers, such as system operators, to publish – with enough time for scrutiny – the data and underlying assumptions behind the policy positions being consulted on, especially for decisions related to resource adequacy and electricity market design reform.
- Introduce transparency requirements for industry personnel secondments to policy teams, including reporting requirements for governments and system operators on steps taken to avoid conflicts of interest. Require MS to ensure meaningful representation of demand-side services and active consumers in policy working groups and policy placements.
- Bolster CEEAG consultation obligations to include all categories of aid where EE and DSF are at risk of being undervalued or excluded, with current derogations and exemptions removed.

Consider flexibility (supplier) obligation

Goal:

- Introduce an obligation on electricity suppliers to meet a share of peak demand through clean resources, including demand-side flexibility and reduction.

State of affairs:

[Regulation 2022/1854](#) introduces an obligation on MS to reduce gross electricity consumption during peak hours by at least 5% on average per hour. MS are responsible for identifying peak hours corresponding to 10% of the overall hours of the period between 1 December 2022 and 31 March 2023. MS are free to choose the appropriate measures to reduce peak consumption. This raises the question of how MS will

implement this provision. The European Parliament [agreed](#) to amend the draft revised Renewable Energy Directive to introduce a DSF target corresponding to 5% of peak demand. Massachusetts (USA) operates a [Clean Peak Standard](#) to meet peak demand with clean resources, which is intended to incentivise renewables and battery storage. Obligations on energy suppliers to meet a share of the demand they serve during peak times with clean resources are being considered or introduced: schemes are in development in the UK (a clean peak standard as part of the government's [Reform of the Electricity Market Arrangements](#) Consultation), Ireland and Luxemburg.

The EU could consider applying broader obligations on market actors related to peak reduction and clean peak resources. One option would be to broaden the scope of Energy Efficiency Obligation Schemes (EEOS). Care should be taken to avoid **market power** exercised by suppliers on access to and control over flexibility resources. The full implementation of the CE4ALL package should require competition, and give access to aggregators and independent service providers along with suppliers to guarantee best value for customers and minimise cost deployment. It may therefore be advisable to also consider other possible obligated parties besides suppliers, especially as the regulation of aggregators and other energy service providers evolves. SmartEn [identified](#) four complementary implementation methods that comply with the peak reduction obligation in the Council Regulation. The obligated parties – according to SmartEn - could be MS, TSOs, DSOs, NRAs, suppliers or aggregators. The scheme will need to lay out how participating consumers will receive signals to change their consumption, and whether financial compensation is foreseen. Equally important will be to put in place guardrails to avoid consumers being forced to under-consume, and to ensure consumers are guaranteed access to **basic energy services** to meet their needs. Generally, any scheme will need to be designed with the consumer/participant in mind and guarantee access for all, including low-income and vulnerable consumers. Finally, when **considering a broader scope for EEOS, regulators must avoid any actions which reduce or undermine incentives for EE, as that is the primary objective of EEOS.**

Proposals:

- Establish boundary conditions for the introduction of peak saving obligations, pertaining to competition, equity, consumer access and EE. Identify optimal implementation options pertaining to obligated parties, communication and remuneration.
- Consider introduction of peak demand obligations in the IEM. Make sure these are aligned with requirements in RED, if retained there.

Extend the mandate of NRAs

Goal:

- Align the mandate of NRAs more closely with European decarbonisation ambitions and its essential policy tools, including the use of DSF to minimise the cost of the energy transition.

State of affairs:

With regard to demand-side resource the IMD requires NRAs to “take all reasonable measures” to help achieve EE and the integration of renewable and distributed generation (among others). In reality, **many NRA mandates exclude any reference to decarbonisation or the energy transition** (e.g., [MEKH](#) – Hungary, [ARERA](#) – Italy or [ACM](#) – the Netherlands). Reference to the need to regulate the transition at the lowest cost to consumers (e.g., [OFGEM](#)) is a good anchor to emphasise the role of demand-side resources.

Proposals:

- Integrate the implementation of the Energy Efficiency First principle into the general objectives of NRAs → ED Art 58(h)

Networks/incentives

Better utilisation of non-wire solutions

Goal:

- Ensure network companies use the portfolio of supply (capacity extension) and demand resources that brings the highest net benefit to society.
- Ensure transparent data-sharing on distribution network condition (timing and location of congestions and voltage issues).

State of affairs:

ED Art 32(3) requires DSOs to publish and submit their network development plan to the NRA every two years. These plans “shall provide transparency on the medium- and long-term flexibility services needed ... (and also) **include** the use of demand response, energy efficiency, energy storage facilities or other resources that distribution system operator is using as an alternative to system expansion” (ED Art 32(2)).

Hence the current regulation does not require the use of demand-side resources whenever they provide higher net benefit to society, and the information requirements fall short of meeting the information need – in terms of update frequency and granularity – of third-party actors and consumers. [European regulators](#) cited the need for visualisation and coherent data provisions in these network development plans.

[Hosting capacity analysis](#) underpinning maps available for stakeholders are analytical tools facilitating the integration of distributed energy resources (DERs). They can reduce the queues for grid connection, can improve the utilisation of the existing grid by directing new resources such as EV chargers and other DERs to available network capacities and by facilitating the offering of non-firm connection. These analyses are mandated in several US states. Utilities are required to publish their hosting capacity maps in [various US states](#) after they were first mandated for in [California](#) in 2018. [Use cases](#) include DER interconnection, distribution system planning, and defining DER locational value. New York went further and adopted a new [framework](#) in 2021 on access to energy data to enable energy service entities to more easily develop new clean energy resources, products and technologies. The framework covers both customer usage data – that can be accessed only with permission from the customer – and utility system data (both anonymised and aggregated), and includes hosting capacity maps.

[Some](#) European states have taken steps to introduce such tools, and DSOs have improved their data transparency. OFGEM, for example, requested each network company in 2019 to develop its digitalisation strategy, and since 2021 they have complied with the [Data Best Practice Guidance](#) as part of the RIIIO-2 price control framework.

Proposals

- Require DSOs to “demonstrate” the use of demand-side resources (as in the original Commission proposal). → ED Art 32(2)
- Mandate or incentivise DSOs to publish hosting capacity maps. → ED Art 32

Aligning DSOs with policy objectives

Goal:

- Use DSF/EE to secure network services whenever they can efficiently substitute network investment.

State of affairs:

Even though Article 32 of the Electricity Directive requires regulatory frameworks to incentivise DSOs to procure DSF “*when such services cost effectively*” supplant the need to upgrade capacity, it remains a [niche practice](#): only France, the UK and the Netherlands have business-as-usual flex markets to enhance network operation. Network companies, however, most often have incentives to solve congestion by building new network capacity, as they earn a rate of return on CAPEX.

Despite Article 18(8) of the Electricity Regulation recognising the potential role of performance-based network regulation in encouraging the cost-efficient development of their networks, it is only offered as a possible tool to NRAs.

Proposals:

- Require the development of a [network regulation](#) that makes the network company indifferent of the type of solution it employs (building of DSF/EE) with reference to the TOTEX approach.
- Urge NRAs to develop and test in regulatory sandboxes performance-based regulation to offer least-cost network services in a net-zero electricity system. A potential policy target could be the rollout of advanced metering infrastructure. → ER Art 18(8)

Pricing/tariffs

Mandate for smartness enabled by automation for new flexible electric load

Goal:

- Facilitate smart integration of electrified heating and transport to minimise system cost.

State of affairs:

Today a consumer installing potentially flexible assets such as a heat pump or an EV can easily stay on a retail tariff that does not incentivise DSF. If the consumer has no smart meter or has a contract with a smaller supplier, they do not even have the right to smarter tariffs (ED Art 11(1)). The result is that the impact of electrification, so critical for generation and network requirements, depends on consumers who might or might not have the right to switch to smarter tariffs and might or might not have the information on the benefits of such a switch. In this context, when we refer to ‘smart tariffs’ we mean not only real-time tariffs but all retail offers and services designed to capture both the cost of providing the energy and consumer preferences on risk, predictability and simplicity. This includes energy as a service and fixed prices offers with flexibility agreements built in, as well as cash-back and other ‘upside only’ offers that reward flexible actions (which may be automated), such as critical peak rebates.

Proposals:

- Require newly electrified flexible loads for heating and transport to run on smart tariffs as the default, with an opt-out option.
- Assist social groups on low incomes or otherwise at risk of exclusion to switch to smart tariffs by providing them with flexible assets and support for EE. The capability for flexibility needs to be tied to electrification. For example, a heat pump may require EE and a storage heater to be used flexibly.
- All new public/fast charging points should offer smart tariffs by default by Q2 2023, and existing ones by 2024. →ED Art 11

Facilitate existing loads switching to smart tariffs

Goal:

- Help consumers to switch to smart tariffs to reduce their bills and system costs.

State of affairs:

Enabling consumers who would benefit from switching to smart tariffs to do so has value for the system as well. However, supplier switching rates in general [vary widely](#) across MS, between 25% and 5% by number of eligible meter points. Retail competition is hindered by [various factors](#), including the non-comparability of offers and burdensome processes. [Access to a comparison tool](#) that meets the requirements of ED Article 14, for example, is available only to a small fraction of European consumers. Much of the proposal rests on the non-discriminatory and transparent access-to-data provisions of the forthcoming implementing act announced in the [Digitalisation Action Plan](#). The Fitness Check of EU consumer law on digital fairness can ensure that consumers' rights are protected with regards to tariff choices and contract changes.

Proposals:

- Create a tailor-made tariff comparison tool that can reflect the ownership of flexible assets and compare completely different types of tariffs. →ED Art 14(1)
- Request that suppliers inform consumers of better tariff options at non-prohibitive cost and based on transparent consumption data.
- [Produce a shadow bill](#) after switching, and possibly compensate the difference for the first year if the bill increases. →ED Art 12
- Give consumers the right to switch back to previous tariffs, as a lack of offers of time-differentiated tariffs could lock in consumers and discourage future switches. The 'right to switch' should cover situations in which customers convert from deemed settlements to settlements against actual consumption, when there are still limited household retail options to serve this market (in some cases perhaps only one provider). →ED Art 12
- Find the right balance between easy retail market entry (accompanied by hedging and other risk management tools) and the socialized cost of exit. Include ACER guidance on what reasonable supplier of last resort costs might entail.

Volumetric network tariff

Goal:

- Incentivise consumers to use the network according to available capacity, and minimise long-term network cost.

State of affairs:

Probably the biggest shortcoming of the IMD is that it keeps the reference to fixed costs, suggesting that "[t]ariff methodologies shall ... reflect fixed costs of transmission and

distribution system operators" (ED, Art 18). Even though fixed costs are not equal to fixed charges, this reference is easily interpreted as justifying a fixed tariff element. For example, in [Germany](#) the average fixed fee in network tariffs for household customers has been increased by 60% in the last five years, while in some places the volumetric fees have actually been lowered. This reference in the EU legislation contradicts the general requirement for network tariffs that "*shall neutrally support overall system efficiency in the long run through price signals to consumers and producers*" and "*shall not create disincentives for the participation of demand response*" among others (Art 18 (1)). Unfortunately, the Regulation does not provide clear guidance on the introduction of dynamic tariffs; it only asks national regulators to consider the time-of-use distribution tariffs that may be introduced in a "foreseeable way" to the consumer. These tariffs link the price of network use to the cost of network use in a given moment and provide an incentive to shift use to less congested periods, hence avoiding or reducing network expansion needs and lowering system costs.

An average consumer is hardly interested in the intricacies of network management; they will modify their consumption pattern only if and to the extent by which they can reduce their bill. **Tariffs with a large fixed element make consumers indifferent to energy consumption levels and patterns.** This leads to higher future network costs for all consumers, as there is no incentive to use the existing network capacity efficiently. Having investment costs does not have to translate into a fixed tariff element; grid companies can recover costs [independently](#) of the tariff structure.

Proposals:

- NRAs should set a clear, forward-looking methodology for network tariff design featuring mandatory annually fixed volumetric time-of-use fees for DSOs. The methodology should be backed up by evidence through the impact study of existing regulation and transparent data collection on networks. →ER Art 18
- NRAs should announce tariff reforms years in advance to have an impact on investment decisions. The structure of price signals and spreads should be clear, transparent and predictable. →ER Art 18

Expedited rollout of advanced metering infrastructure

Goal:

- Enable the integration of all types of consumer flexibility into the power system.
- Fully roll out advanced meter infrastructures: these are essential for consumers to monitor and control their energy consumption, as well as for energy suppliers and aggregators to offer time-varying tariffs and to bill based on real consumption.

State of affairs:

Smart meter rollout is very [uneven](#) in Europe. Some MS have rolled them out fully (e.g., Scandinavia, Spain, Italy) while others have not started at all (e.g., Germany, Belgium, Czechia). Annex II of the ED requires MS to reach the 80 per cent deployment target within seven years of the conclusion of a positive cost-benefit analysis. In countries where the rollout has already started, this deadline is 2024. Consumers are entitled to a smart meter at their own cost even in the absence of a national rollout (Art 21). The need for a full-scale rollout has also been emphasised by the EC in its [Digitalisation Action Plan](#), which asks MS to re-run their cost-benefit analysis in the light of REPowerEU.

Proposals:

- Ringfence EU funds to roll out smart meters at no upfront cost to consumers.
- NRAs should consider allowing the use of aggregators' (sub)metering infrastructure but continue the enrolment of advanced metering infrastructure so

that DSF remains inclusive and does not leave out low-income consumers and other groups at risk of being excluded (e.g., the elderly, dwellers in rural areas with no internet).

Rebalancing taxes and levies across fuels

Goal:

- Scale up the electrification of heat and transport to achieve a net-zero economy by 2050.

State of affairs:

While EVs today already deliver cost savings over their lifetime compared to petrol and diesel cars, the economics of switching away from fossil fuel heating may simply not yet stack up. This is because the price ratio of electricity versus fossil gas was unfavourable in most European countries before the price crunch, and it may run the risk of becoming so again once markets find their new equilibrium. Regardless of the evolution of prices, it is no longer appropriate to [put most of the costs of decarbonising the economy on electricity](#) as in many countries it is now cleaner than gas and will become even more so in the future. Electric end-uses such as heat pumps and EVs are significantly more efficient than combustion technologies and save energy. To encourage the uptake of electrification several MS have started to [reform](#) their taxes and levies regulation.

Proposals:

- MS should remove barriers to electrification from their tax regimes.

Assets (in the remit of the [recast EPBD](#))

Goal

- Convert the building stock to 'smart and [low flow temperature ready](#)', as:
 - Efficient buildings not only save on energy bills but are prerequisites for flexibility;
 - Efficient buildings are one of the most sustainable solutions for supporting low-income consumers; and
 - The fast and full integration of flexible assets depends on building design.

State of affairs

- The current building stock is inefficient. Seventy-five per cent of buildings are considered [inefficient](#), and almost all buildings – 97% – will [need to have some kind of renovation](#) to reach the 2050 vision of a decarbonised building stock.
- The pace of renovation is slow. The annual renovation rate is only around only 1%, and many of the improvements that contribute to this figure achieve very low or negligible energy savings. The average energy savings achieved by renovations from 2012 to 2016 were only 9% in domestic and 17% in non-domestic buildings. Deep renovations that save more than 60% of primary energy, and take buildings closer to decarbonisation, are only being carried out in [0.2% to 0.3% of the stock each year](#).
- A major part of the EU's existing building stock will still be in use by 2050 at the current low renovation rate. The EPBD could be better utilised to build the capacity of all buildings to interact with the grid and provide flexibility services. To date, the measures in the Directive contributing to this aim have been geared

mainly to larger non-domestic buildings – through, for example, the smart readiness indicator as of 2026 (Art 13), and providing access to buildings data.

Proposals

- The total primary energy use of a zero-energy building must be delivered by onsite renewables, through an energy community or through a district system on a net annual basis. This net calculation should be more granular than annual to avoid high seasonal demand on the grid. → draft EPBD Art 7
- Minimum energy performance standards can guarantee a minimum level of EE in all buildings, reducing energy use overall and providing a gateway for electrified heat to be operated more flexibly. In a proposal more ambitious than the original Directive, REPowerEU proposed that targeted homes should meet a minimum Energy Performance Certificate standard 'D' for the first compliance deadline in around 2030. This would not only reduce the exposure of households in the worst performing homes to pricing shocks, but would also contribute to ready homes to be heated more efficiently with a heat pump or through a low temperature district heating system → draft EPBD Art 9
- Other opportunities exist in the Directive to support the take-up of flexible assets in buildings. There should be information (included in Energy Performance Certificate recommendations [Art 16], Building Renovation Passport [Art 10] etc.) at trigger points (renovation, sale, rent), and support programmes that combine EE and DSF to guide consumers: 'smart and low-flow ready'.
- All new and major renovated residential and non-residential buildings should be equipped with pre-cabling for charging points as a minimum. This allows for quicker and cheaper installation of charging points. We recommend:
 - Extending the scope of requirements in Art. 12 (1) for equipping new and renovated non-residential buildings to buildings with one parking space (and not five as in the current draft), to include, for example, smaller commercial buildings.
 - Extending the scope of requirements in Art. 12 (4) for equipping new and renovated residential buildings to buildings with one parking space (and not three as in the current draft), to include, for example, single-family homes.
- Include depot [charging for heavy-duty vehicles](#) as a use case in the requirements for equipping new and major renovated non-residential buildings in Art. 12 (1), and change the definition of non-residential buildings from "adjacent car parks" to "adjacent vehicle parking".
- Keep requirements outlined in Art. 12 (6) and 12(7) on charging points to be digitally connected and smart charging capable, and bidirectional if desired.
- Keep the 'right to plug' outlined in Art. 12(8) which facilitates and accelerates deployment of charging infrastructure according to citizens' needs.
→ draft EPBD Art 12

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
via EU Bookshop (<http://bookshop.europa.eu>);
- more than one copy or posters/maps:
from the European Union's representations (http://ec.europa.eu/represent_en.htm);
from the delegations in non-EU countries
(http://eeas.europa.eu/delegations/index_en.htm);
by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm)
or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (<http://bookshop.europa.eu>).

Priced subscriptions:

- via one of the sales agents of the Publications Office of the European Union
(http://publications.europa.eu/others/agents/index_en.htm).

