smartEn
Smart Energy Europe

2nd EDITION

THE IMPLEMENTATION OF THE ELECTRICITY MARKET DESIGN TO DRIVE DEMAND-SIDE FLEXIBILITY

smartEn Monitoring Report March 2022

Index

FOREWORD

Demand side flexibility, meaning the flexibility provided by active customers in response to market signals, is both an extremely valuable resource to the European electricity system, and a remarkably untapped one.

The energy transition is bringing profound changes in the way we produce, transport and consume energy and the energy system of the future will look very different from today. Electricity demand is projected to increase significantly due to the accelerated electrification of transport, heating and cooling and industries sectors. At the same time, the electricity system of the future will be largely based on variable and distributed renewable electricity generation.

Increased flexibility will be key to adapt the electricity system to the future while keeping costs down and limiting costly grid expansions. As part of this, developing demand side flexibility provided by consumers across Europe can dramatically reduce total energy costs and contribute to a more cost-effective system management.

Technological progress in grid management and renewable generation has unlocked many opportunities for consumers.

The Clean Energy Package adopted in 2019 acknowledges the essential role that consumers will have to play in achieving the needed flexibility for the energy system of the future and puts the consumer at the heart of the energy transition – the "consumer centric electricity market design".

EU Electricity Directive 2019/944 contains a number of important provisions for the development of demand side flexibility, such as for example non-discriminatory access to all electricity markets and the full recognition of (independent) aggregators as market participants.

It is now key that Member States transpose these provisions into their national laws swiftly and set the regulatory framework that will effectively enable the participation of demand side flexibility in all electricity markets. The Commission is carefully analysing the transposition measures notified by Member States and will launch infringements proceedings where necessary.

Complementing the provisions of the EU Electricity Directive the Commission has started work on a new network code or amendments to existing network codes and guidelines to remove regulatory barriers on demand side flexibility.

With the 2nd edition of its monitoring report on the implementation of the Electricity Market Design to drive demand-side flexibility, smartEn presents its analysis on the progress made with the implementation in selected Member States. It is a rich and valuable source of information and I very much appreciate the work done by smartEn in collecting and analysing this information. By providing transparency on the status of the implementation in various Member States, the report serves as a useful tool to facilitate the sharing of best practices among Member States and to support Member States to learn from each other.

It is still a long path until we will have fully unlocked the potential of demand side flexibility and accomplished the right regulatory framework. Nevertheless, the smartEn report also highlights progress that has been made. Given the expected benefits of the participation of demand side flexibility in the electricity markets, I encourage everybody to continue their efforts.

Catharina Sikow-Magny
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Directorate-General for Energy, European Commission

INTRODUCTION

The Electricity Market Regulation and Directive are the two key building blocks of the EU Electricity Market Design. It forms the new 'rulebook' for electricity markets supporting the realisation of the European Green Deal.

The Electricity Market Design adopted in 2019 strongly recognises and addresses the increased need for demand-side flexibility in the electricity system in order to reach the EU's decarbonisation objectives in the most cost-effective way. It sets the enabling framework to empower consumers and communities to be active players in the clean energy transition and optimise system management.

As mentioned in the European Commission's toolbox of measures to tackle the exceptional situation of energy price hikes, consumers' flexibility is crucial to speeding up decarbonisation, while increasing system resiliency and efficiency.

However, as it stands now, more than 20 articles across the Electricity Regulation and Directive – all of them crucial for demand-side flexibility - are far from being fully implemented.

The provisions of the Electricity Regulation became applicable as of 1 January 2020 while the Electricity Directive had to be implemented and enacted into national regulations by 1 January 2021.

In the second half of 2021, with the support of its network of members companies, smartEn reviewed the progress made in 11 European Member States (France, Finland, Greece, Germany, Ireland, Italy, Poland, Portugal, Romania, Slovenia, Spain) with regards to the implementation of key articles for demand-side flexibility around:

- **Market-based procurement of all Decentralised Energy Resources (DER) by System Operators**
- **Non-discriminatory participation of all DERs to all markets and mechanisms**
- **Frameworks for innovative services**
- **Access to price signals for end-users**

The present report is the second time smartEn has embarked on such a monitoring exercise. The first edition, published in 2020, highlighted that implementation was limited and identified several barriers across the EU. By reiterating this exercise, smartEn aims to take stock of developments and hold Member States accountable in order to encourage EU institutions and Member States to accelerate the development of compliant national frameworks.

The report does not claim to extrapolate the information gathered from 11 countries to all EU Member States, but its balanced geographical representation gives an insight into both the challenges, as well as innovative developments.

The analysed countries are classified according to a simple traffic-light methodology: green for a satisfactory implementation of the relevant Market Design provisions, orange for weak progress and red for no or very scarce measures. The green ranking for a country does not necessarily constitute an ideal scenario, but highlights a satisfactory implementation compared to the other countries analysed.

OVERVIEW

Insufficient progress and slow-moving implementation of demand-side flexibility provisions

Both the Electricity Regulation and Directive set the right EU legislative framework to eliminate existing barriers to demand-side flexibility. However, based on a regular monitoring effort by smartEn, the second edition of this report highlights that there is still only limited progress towards the transposition of key provisions into national legislation.

• The market-based procurement of all Decentralised Energy Resources (DER) by System Operators is slowly progressing and remains in its infancy

In general, provisions on **market-based procurement** are more developed at the TSO level although progress on incentivising this at the DSO level should be noted in France, Finland and Ireland, provided that they consider some necessary clarifications to ensure that all DERs are included. Remunerations and incentives to procure flexibility exist for TSOs in most of the analysed countries.

Rules for the **ownership, development, management or operation of charging infrastructures for electric vehicles and energy storage facilities** by System Operators have now been set in several Member States but no National Regulatory Authority (NRA) in the monitored Member States has developed guidelines or procurement clauses to assist System Operators in ensuring a fair tendering procedure for energy storage facilities.

• Widespread and persisting limits to the non-discriminatory participation of all DER in all markets and mechanisms

1 year after the implementation date of the Electricity Directive, similar limitations to the ones identified back in 2020 continue to persist in some countries for the non-discriminatory participation of all DERs, both individually and aggregated, to **balancing markets.** As was the case in 2020, the same countries (France, Finland, Italy, Romania and Slovenia) tend to comply with non-discriminatory provisions for **day-ahead and intraday markets.** Unfortunately, they have not been joined by other countries. In addition, most of them, with the exception of France and Italy, still have a high bid size of 1 MW, which is double what was foreseen by the Regulation (500 kW or less).

Non-discriminatory and market-based rules for **redispatching** are only applied in Ireland and Portugal, who are now joining Finland as relatively good performers in that regard. While **resource adequacy mechanisms** have been already implemented for quite some time in several Member States, product design and prequalification requirements are rarely technology inclusive and often create implicit barriers to the participation of Decentralised Energy Resources.

• Uneven progress in setting frameworks for innovative services

One year after the implementation deadline of the Electricity Directive, a comprehensive **demand response aggregation framework** is still missing in most countries, with the exception of France and Slovenia. The issue of prior consent of suppliers has been addressed in a limited but growing number of countries. Only France, Italy, Romania and Slovenia have eliminated the possibility for suppliers to **discriminate against customers** that have a contract with an aggregator.

Free access to end-customer data by eligible parties, based on consumer's consent, would be a major enabler of innovative services, and only seven countries have set national rules allowing it. Nevertheless, this is an improvement compared to only 4 countries in 2020.

Over half of the analysed countries have now introduced provisions to ensure final customers are entitled to act as **active customers.** France, Italy, Poland and Spain are the only Member States compliant with the elimination of double network charges for **active customers owning an energy storage facility.** Finland has eliminated double taxation, but not double network charges.

The most progress can be observed in the development of national frameworks enabling **citizens energy communities.** While there were no such frameworks in 2020, they have now been established in France, Finland, Italy and Slovenia.

• Barely any progress to ensure access to price signals for end-users

Progress on smart meters roll-out is uneven across Europe. Either it has been completed or is close to completion, or it has been seriously delayed or stopped, such as in Romania or Germany.

Following the deployment of smart meters, suppliers in Finland, Italy and Spain already offer **dynamic electricity price contracts** linked to wholesale and spot market prices, in compliance with the obligation to provide at least one such commercial offer. With the exception of France that has now adopted compliant legislation which will apply from 2023, there has been no progress in this regard compared to the first monitoring in 2020.

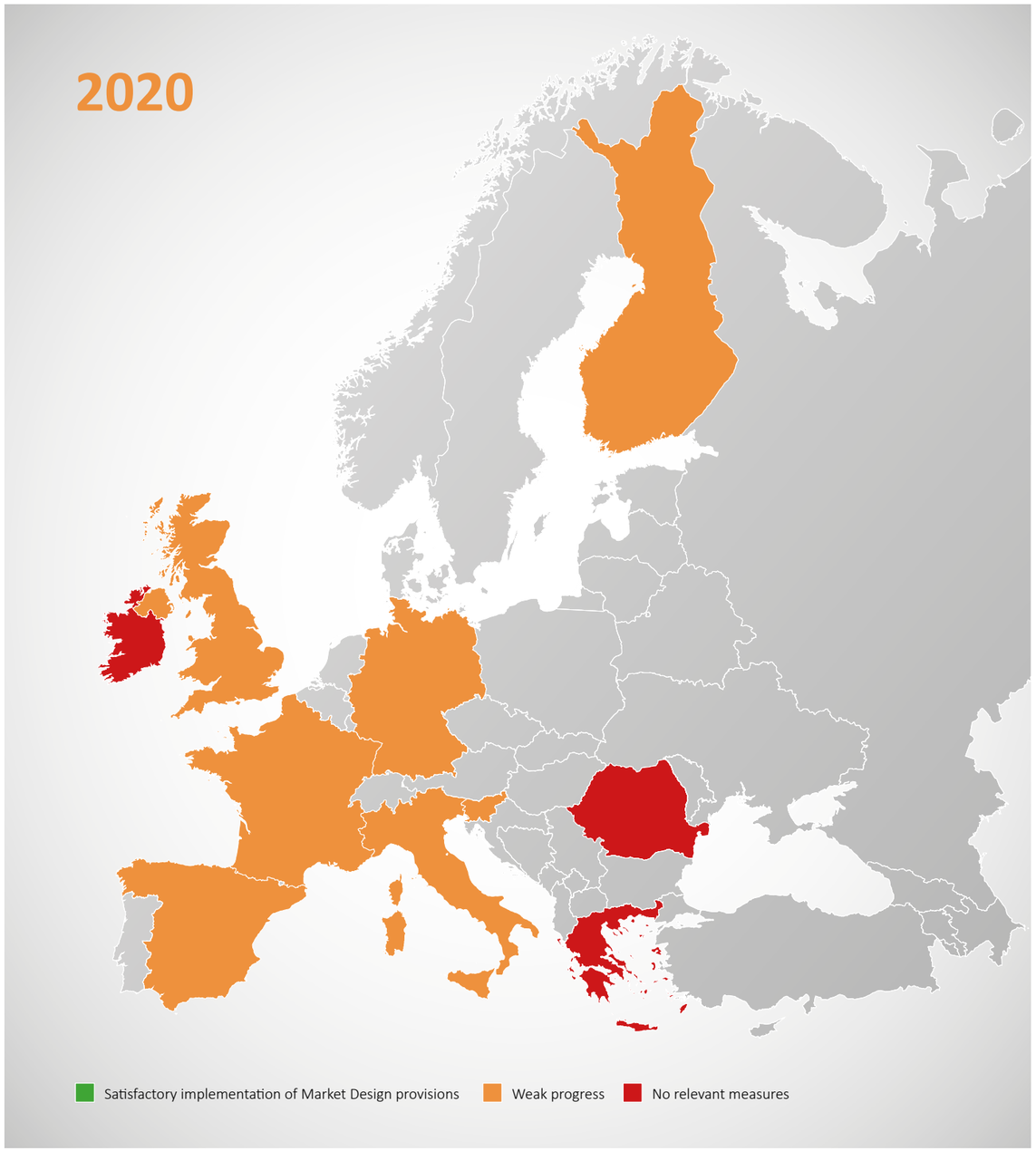
Similar to 2020, the development towards **time-differentiated network tariffs** is a reality only in France and Finland, where the NRAs have approved cost-reflective, transparent network charges that also take into account the need for flexibility.

To conclude, the slow pace of progress and the lack of proper legal frameworks at national level mean that much of the demand-side flexibility potential will remain untapped and that the market for demand-side flexibility will remain fragmented. It also indicates that if nothing is done to address this stagnation, the full implementation of the Electricity Market Design will not be met within a reasonable timeframe. Despite the fact that it is critical to achieving the EU's decarbonisation objectives and to increasing system efficiency in a cost-effective way, while also tackling the pressing issues of high energy prices, EU energy security and independence.

Addressing this would ensure that the 'Fit for 55' package is built on a solid foundation, in order to effectively work towards an energy system where all electrified demand-side sectors such as buildings, transport and industries are integrated and can unleash their demand-side flexibility. Both the Commission and the Member States should address these obstacles to the EU Green Deal without further delay.

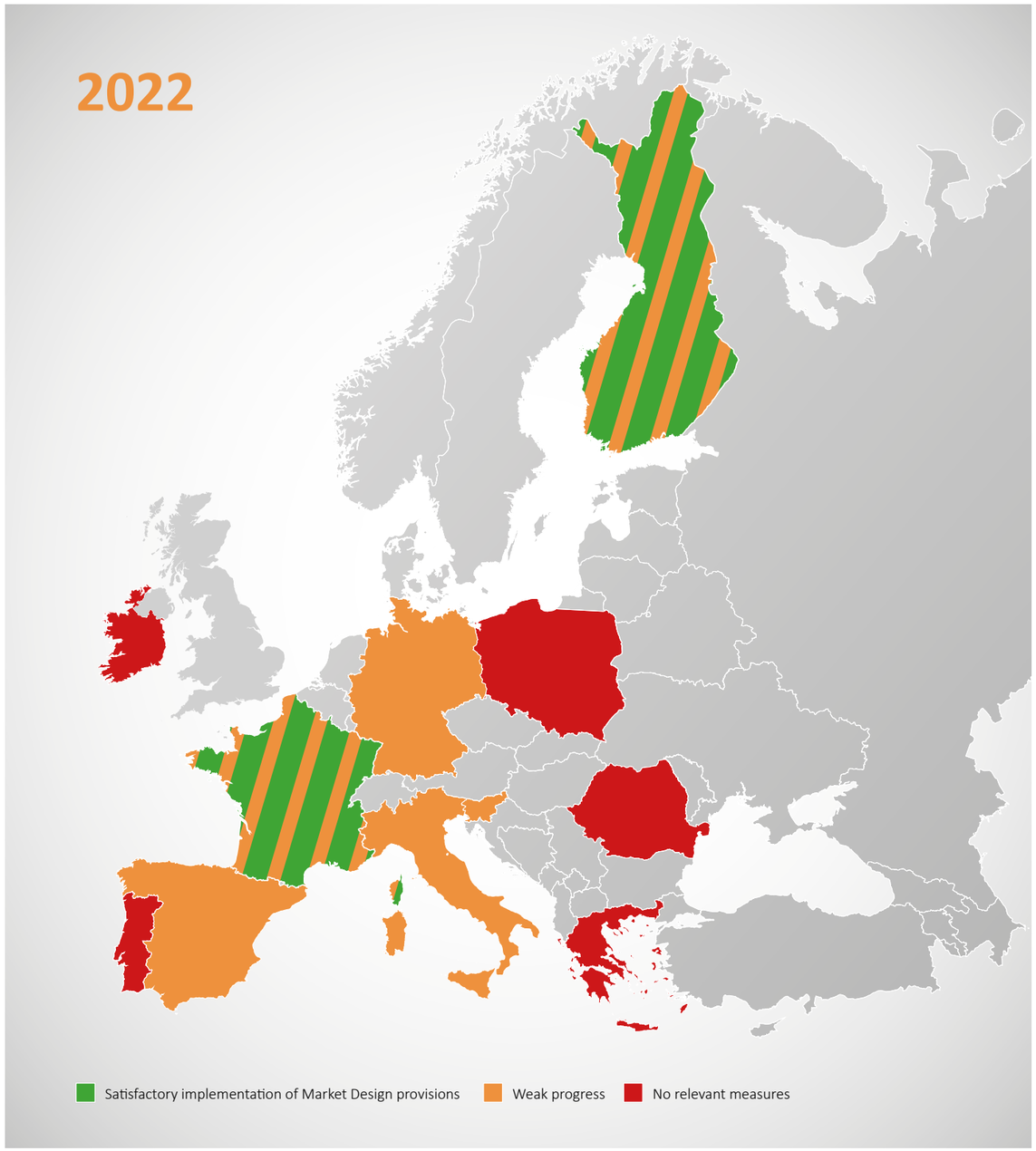
OVERVIEW

2020



Provisions covered by this mapping:
Articles 5, 11-13, 15-17, 19, 23, 32-34, 36, 40, 51, 54, 71 of the Electricity Directive and articles 6-8, 13, 18, 20-22 of the Electricity Regulation.

2022



Provisions covered by this mapping:
Articles 11, 13, 15-17, 19, 23, 32, 33, 36, 40, 51, 54 of the Electricity Directive and articles 6-8, 13, 18, 20-22 of the Electricity Regulation.

MAP 1

Market-based procurement of all Decentralised Energy Resources by System Operators

The clean energy transition is bringing profound changes to the way we produce, transport and consume energy. This has major implications for TSOs and DSOs who have to take appropriate measures in order to make their network more resilient and flexible to accommodate the growing share of variable renewable energy.

The Electricity Directive has established specific rules that incentivise system operators to become neutral market facilitators and procure flexibility services through market-based procedures in order to optimise the operation of their grids and delay or postpone investments in new infrastructure or grid reinforcements.

While in 2020 no country had fully transposed provisions **to incentivise DSOs to procure flexibility through market-based procedures,** France, Finland and Ireland have now adopted such a framework. However, clarifications are still needed in France and Ireland to ensure that such these procurement procedures include all DERs. Pilot projects are currently being tested in the remaining countries, with the exception of Germany, where new regulations pushing for non-market based solutions have halted all progress in this area. Overall, it can be said that across Europe, local flexibility markets are still in their infancy.

Regarding the **prohibition of ownership, development, management or operation of charging infrastructures for electric vehicles by DSOs,** France, Finland, Italy and Slovenia have now joined Greece and Spain in entering this principle into legislation to enable market players to invest in recharging infrastructure deployment in a competitive way. In other countries, this provision has either not yet been transposed into national legislation or charging stations are currently mainly being managed by DSOs. In the case of Poland, DSOs are mandated to build such charging infrastructure and to recover costs through network tariffs, in case the number of installed charging stations is not sufficient on the basis of a set deployment timeline. This constitutes an important deviation from the EU framework.

Progress in the **prohibition of ownership, development, management, operation of energy storage facilities by DSOs** also has to be noted, with this principles set in legislation in France, Finland, Germany, Italy, Spain and Slovenia. Other countries such as Ireland and Romania have not yet transposed the provisions of article 36 of the Electricity Directive, while Poland is actually allowing the TSO and DSO to build and operate energy storage and recover the construction costs along with the return on capital involved in the network tariff, clearly deviating from the EU framework.

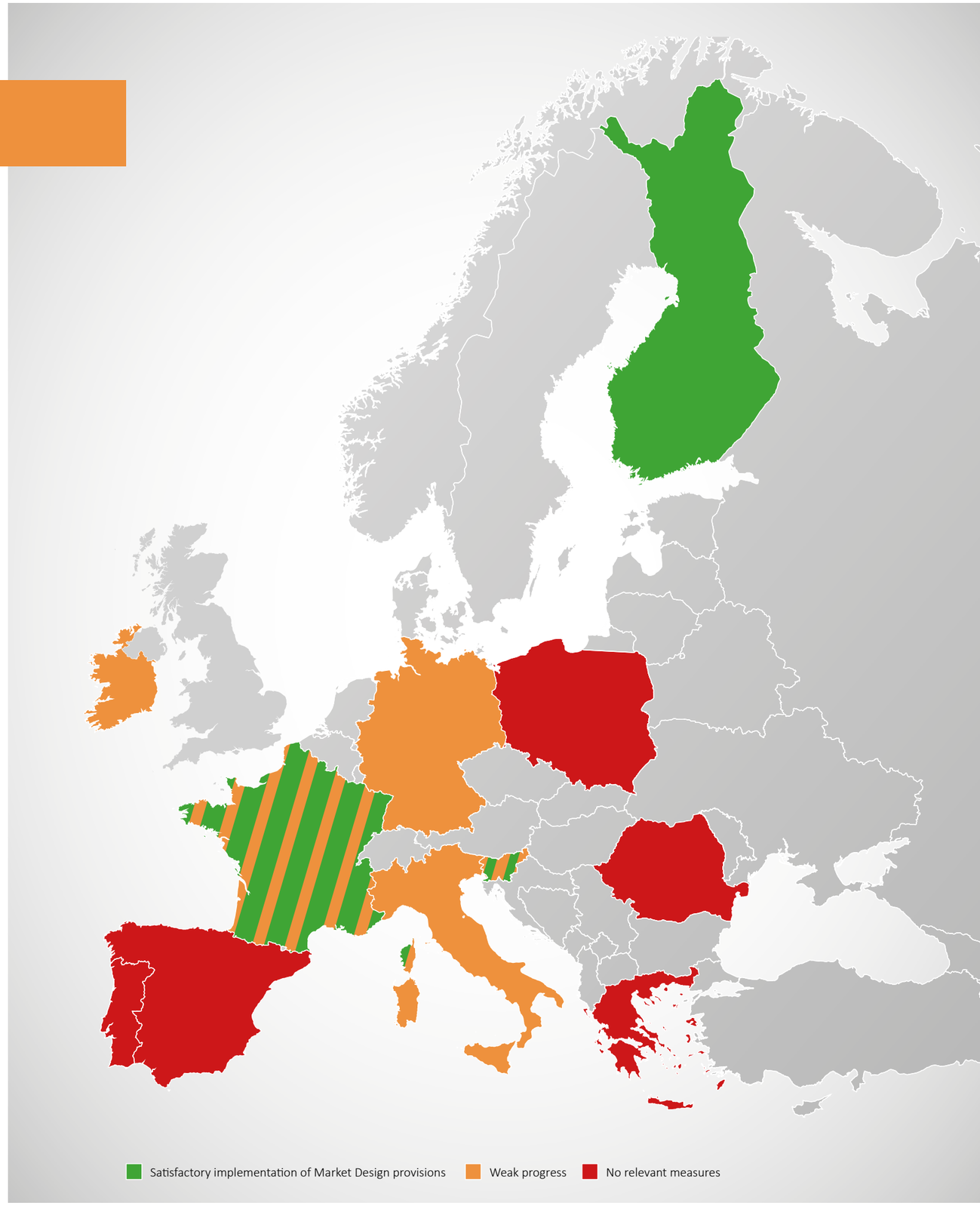
No NRAs have intervened until now to develop specific **guidelines or procurement clauses** to help DSOs ensure a fair tendering procedure for energy storage facilities. The only exemption is Italy where the NRA has adopted high level guidelines which will need to be accompanied by detailed rules at the end of an ongoing pilot project regarding DSOs owning and managing storage facilities.

Eight of the analysed countries (France, Finland, Germany, Poland, Portugal, Romania, Slovenia and Spain) have already set clear rules to ensure that all eligible parties have **non-discriminatory access to data managed by DSOs,** an important condition for the development of innovative services. This is double the number of countries compared to the situation in 2020.

Compared to DSOs, the **framework on market-based procurement of all DERs by TSOs** is more advanced, although still not ideal. Finland, Italy and Romania have now joined France, Greece, Ireland, Slovenia and Spain in setting clear rules for the market-based procurement of ancillary services. Poland and Portugal still have to adapt or further detail their framework in accordance with the provisions of article 40 of the Electricity Directive. Most of the national frameworks already adequately remunerate TSOs for the procurement of flexibility services, with the exception of Greece, Portugal and Romania.

As with the DSO provisions on the principle of **prohibiting ownership, development, management, operation of energy storage facilities,** countries have progressed in defining clear rules for TSOs, notably in France, Finland, Slovenia as well as in Germany. Although for the latter there are still conflicting provisions that allow storage assets financed by grid tariffs to participate in the market, resulting in considerable market distortion. Concrete cases showed that the tendering procedure done in Germany did not make it profitable for other market participants to invest in storage because participation was limited to only meet the TSO's needs, thus prohibiting the participation of storage operators in all electricity markets. The NRAs have still not developed **guidelines or procurement clauses** to assist TSOs in ensuring a fair tendering procedure for energy storage facilities.

With regards to the long term perspective, France, Finland, Germany and Slovenia are still the only analysed countries to have fully considered the potential of using all DERs as alternatives to system expansion in their **10-year network development plans.** While in Italy the rules require the consideration of all DERs, it does not provide sufficient indications to support this objective. TSOs in Greece, Ireland, Poland, Portugal and Spain are still lagging behind in meeting the network development requirements set out in article 51 of the Electricity Directive.



Provisions covered by this mapping:
Articles 32, 36, 40, 51 and 54 of the Electricity Directive.

MAP 2

Non-discriminatory participation of all Decentralised Energy Resources in all markets and mechanisms

The Electricity Regulation has established clear rules to ensure the non-discriminatory participation of all DERs, both individual and aggregated, in balancing, intraday and day-ahead markets, redispatching, capacity mechanisms and strategic reserves.

At the time of writing, similar limitations to the ones identified back in 2020 persist in most countries in relation to **balancing markets.** For example, Finland still applies limitations to independent aggregation, while Spain has not yet defined the independent aggregators framework and participation in balancing markets for demand-response aggregation is only possible through a supplier. In Poland, participation is only possible through the supplier and aggregation is not feasible. In Portugal, only customers connected to the medium and high voltage networks can provide flexibility services in the balancing markets, creating a barrier to the participation of DERs connected at low voltage levels. As in 2020, only France, Romania and Slovenia allow for the participation of all DERs to balancing markets.

Greece only allows individual and aggregated participation for dispatchable production, while some DERs, such as residential and PV with a capacity below 400kW, are not yet allowed to participate. In Italy, the UVAM project is an attempt to open balancing to all DERs, both individual and aggregated, provided they meet the minimum bid size of 1 MW which is still too high, as in most countries.

For **day-ahead and intraday markets,** there is barely no improvement. France, Finland, Italy, Romania and Slovenia are still the only ones that mostly comply with non-discriminatory provisions for all DERs. Among these countries, only France and Italy have modified the minimum bid size in order to meet the requirements foreseen by the Regulation (500 kW or less). Limits to the participation of independent aggregators are still a major issue in Germany, Poland, Portugal, and Spain.

While in 2020 derogations and exceptions for reducing the imbalance settlement period to at least 15 minutes have been granted in almost all countries, the situation is changing in Germany, Portugal, Romania and Slovenia where such a timeframe is being used in the day-ahead and intra-day markets. Finland and Poland have also announced regulatory developments in order to comply with this requirement.

Article 13 of the Electricity Regulation also requires the non-discriminatory participation of all DERs according to market-based rules for **redispatching.** Ireland and Portugal have now joined the ranks of Finland, as the only countries so far that seem to be fully compliant, ensuring financial compensation based on market prices and not providing for derogations from market-based redispatching. In Italy, redispatching is operated by the TSO through the balancing or ancillary services markets and no separate accounting is provided. In France, the market is only at TSO-level, based on market prices, and only in case of insufficient bids can the system operator request a non-market-based redispatching.

Other countries are not yet compliant. In particular Poland, where the largest power plants are managed by a Central Dispatching System, as well as in Germany, which has set a cost-based mandatory redispatch for all resources larger than 100 kW with the intention to avoid gaming. Spain has not yet transposed these provisions but the expected regulatory changes are leaning towards allowing the participation of DERs following market-based redispatching.

Similar rules on the non-discriminatory participation of all DERs, both individual and aggregated, have been introduced for **capacity mechanisms and strategic reserves** in articles 20-22 of the Electricity Regulation.

At present, resource adequacy mechanisms are implemented in the following countries[1]:

- **France's** capacity mechanisms are based on technology-neutral participation requirements. The participation of DERs is advanced compared to other countries but is still quite limited compared to traditional generation.

- **Italy** had introduced a capacity mechanism before the Electricity Regulation entered into force and this mechanism is in theory open to all DERs. However, in practice no demand response and only very limited storage capacity have been contracted in the first two auctions that have been held, due to limiting participation requirements.

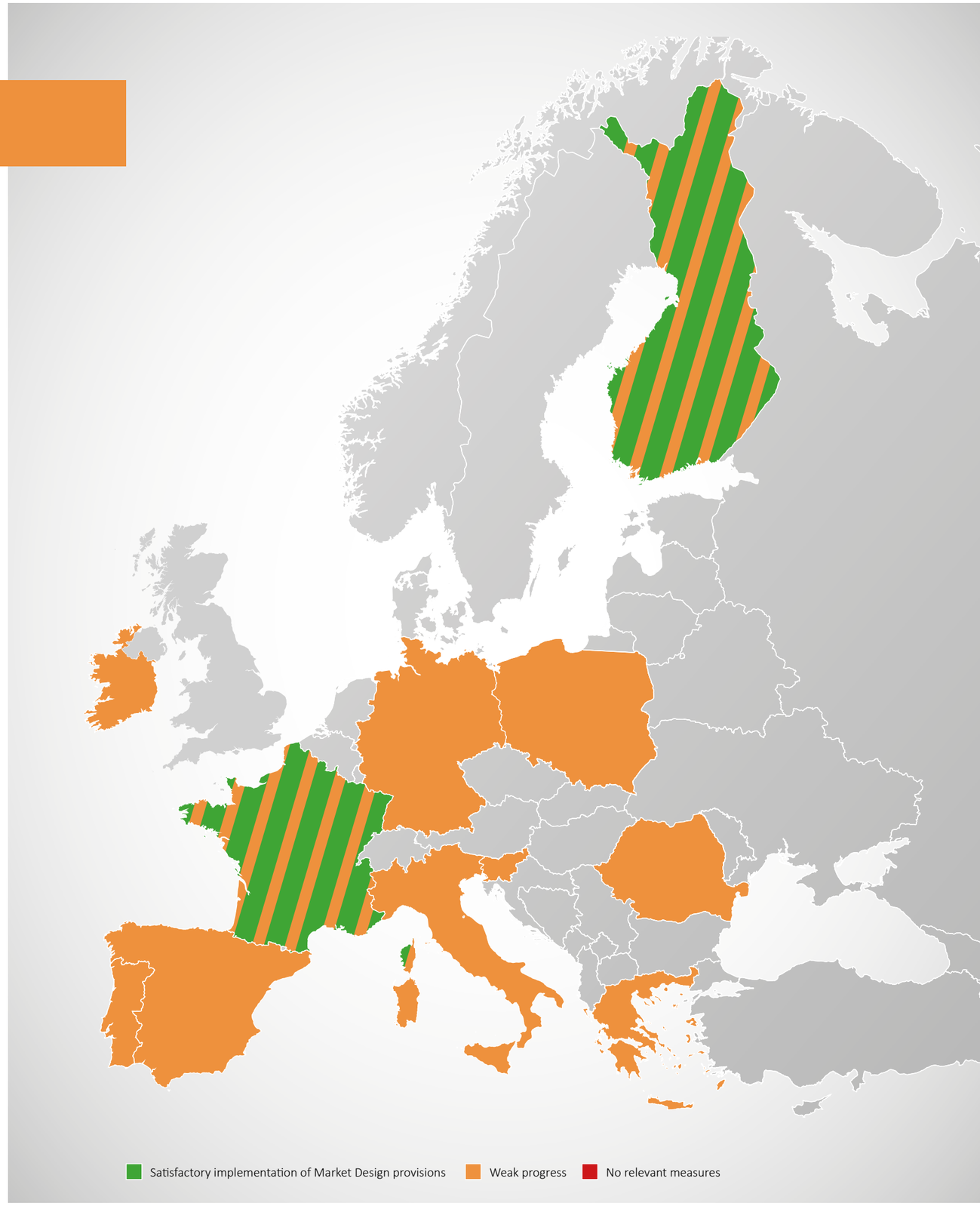
- **Germany** already had a number of resource adequacy mechanisms (strategic reserves and interruptibility schemes) prior to the adoption of the Electricity Regulation, but technical requirements limit the participation of DERs other than industrial loads.

- **Greece** has an interruptibility scheme which is only open to industrial consumers and a Transitional Flexibility Remuneration Mechanism which de facto excludes DERs from participating. However, both are being phased out at the time of writing.

- **Ireland's** current capacity market arrangements have been in operation since 2018 but technical requirements like metering requirements and an onerous testing procedure have de facto excluded DR.

- **Poland** started the operation of its capacity market in 2021. The first auctions for 2022-2023 took place in 2018. Although this mechanism is technology-neutral in principle, technical barriers such as frequent testing requirements do not allow for the participation of DERs.

- Lastly, **Spain** is currently developing a capacity mechanism, pending approval, which will be directed at generation assets, storage and demand-response. However, requirements for demand-side units, such as a mandatory operation time between 00:00 and 8:00 will exclude most assets other than large industrial consumers.



Provisions covered by this mapping:
Articles 6-8, 13, 20-22 of the Electricity Regulation.

1. More information on this topic can be found in 'smartEn Map Resource Adequacy Mechanisms – 2021'.

MAP 3

Frameworks for innovative services

The Electricity Directive fosters innovative data-driven energy services. It enables new market entrants, small players, independent demand-response aggregators and citizen energy communities to unlock the demand-side flexibility potential of all end-users. It enables all final electricity customers, large and small, to participate in electricity markets directly or through aggregation, either by trading self-generated electricity or by providing demand-response or storage services.

With the Electricity Directive, the **EU has for the first time put in place an EU framework for demand-response (DR) aggregation,** incentivising Member States to encourage DR aggregation. Customers should be empowered to make full use of the advantages of aggregation which is likely to play an important role as an intermediary between customer groups and the market. Since the last report, only Slovenia has joined France in allowing demand-response through aggregation to participate in all markets. In most countries, the situation remains largely unchanged and DR through aggregation is mainly, if not exclusively, allowed in balancing markets (Germany, Italy, Poland and Spain) or other dedicated schemes like the interruptible load programme in Germany or capacity markets in Poland, although technical barriers in these countries hamper the participation of demand response. Finland is currently revising its framework, while Greece, Ireland and Portugal have either very basic and insufficient provisions or have not yet addressed this issue in their regulatory framework.

With the **recognition of independent aggregators** as market actors, the Electricity Directive ensures that final customers are free to purchase electricity services independently of their supplier. The necessity of **prior consent by suppliers** has been a major obstacle for independent aggregators. Article 13 of the Electricity Directive eliminates this possibility, but at the time of writing only France, Italy, Romania and Slovenia have enshrined this principle in national legislation. This can still be considered progress, albeit slow, since in 2020, only France had such provisions in place. Germany has eliminated this prior consent only for balancing markets, but not for wholesale markets (day-ahead or intraday) or interruptible loads programme. Other countries have not yet implemented such a provision, but Poland and Spain are currently revising their existing frameworks. Both countries are experiencing some delays.

The same countries (France, Italy, Romania and Slovenia) have eliminated the possibility for suppliers to **discriminate against customers** that have a contract with an aggregator. Regulatory changes are planned in Finland, Poland and Spain.

A key enabler of innovative services is **free access to final customer data** by eligible parties, based on consumer's consent. While in 2020, France, Finland, Germany and Slovenia had already set national rules allowing it, they have now been joined by Romania, Poland and Spain.

However, in Poland, the new Metering Data Operator scheme may take a few years to be fully implemented. Other countries have either not yet transposed this obligation, or have limited it to Renewable Energy Communities only, as in Portugal.

The Electricity Directive sets out a framework for **active customers** that define their general rights and obligations. It aims to create a level-playing field for customers that choose to become active and participate in markets, and ensure accurate price signals for their activities in the electricity system. Over half of the analysed countries have now introduced provisions to ensure final customers are entitled to act as active customers (France, Finland, Greece, Italy, Slovenia and Spain). Others are currently defining their regulatory framework, although some are moving faster than others.

Article 15 of the Electricity Directive foresees the elimination of **double network charges** for active customers owning an energy storage facility as this can discourage them from interacting with the electricity system. Currently, four of the analysed countries are compliant (France, Italy, Poland and Spain) while in Portugal this is only the case for Renewable Energy Communities. Finland has eliminated double taxation but not double network charges. However, double taxation is not addressed within the Electricity Market Design, even though it constitutes a barrier to prosumer business models. The current revision of the Energy Taxation Directive should be the vehicle to address these barriers.

Recognising the role of community-led initiatives in boosting consumer empowerment and in speeding up the clean energy transition, Article 16 of the Electricity Directive requires Member States to develop an appropriate regulatory framework for **Citizen Energy Communities.** It contains a number of provisions to facilitate their uptake and ensure they can access all electricity markets and provide flexibility, either directly or through aggregation. Such frameworks are now established in France, Finland, Italy and Slovenia which is an improvement considering that no specific national framework was in place in 2020. Poland is also currently developing a framework while Spain and Portugal have been more advanced in establishing Renewable Energy Communities which, are required under the Renewable Energy Directive. Greece and Spain will use their existing provisions on energy communities, collective self-consumption and net-metering to establish a specific framework for Citizens Energy Communities.

Provisions covered by this mapping:
Articles 13, 15-17 and 23 of the Electricity Directive.

MAP 4

Access to price signals for end-users

The Electricity Market Design has introduced clear provisions to move from regulated electricity prices to market-based prices and time differentiated grid tariffs for end-users.

The deployment of smart meters is essential for access to price signals and it drives innovative business models to automatically adapt energy consumption on the basis of external signals. It is a prerequisite for the development of innovative tariff formulas, such as dynamic electricity price offers, which can help optimise the use of electricity, and empower consumers, while increasing comfort and efficiency.

Article 19 of the Electricity Directive requires Member States to **roll-out smart meters** that assist customers in actively participating in the electricity market. All analysed countries have either completed or launched the roll-out of smart meters, although the pace of progress varies across countries. In Romania strong delays are being experienced, while Germany has put a halt to its roll-out following a decision from the Higher Administrative Court to stop the mandatory installation of smart meters.

France, Finland, Italy, Portugal and Spain have already defined that the new smart metering systems should be interoperable with both energy management systems and smart grids to ensure full interoperability both behind and in front of the meter. In Germany, smart meter requirements are very high and constitute a barrier to interoperability with energy management systems. In Portugal, this possibility is only available to large customers.

While blanket regulation is not outlawed as such and there is no agreed end date for retail price regulation, Member States must regularly review their price regulation measures and report on progress towards the transition to market-based prices. Final customers with a smart meter can request **dynamic electricity price contracts** that reflect the price variation in the spot markets, including in the day-ahead and intraday markets.

Finland, Italy and Spain are complying with this. Spain and Ireland are also offering time-of-use tariffs. Poland and Slovenia are currently developing regulatory frameworks to apply this provision. In France, compliant legislation has been adopted and will apply no later than January 1, 2023 for consumers whose subscribed capacity is greater than 36 kVa, and no later than July 1, 2023 for consumers whose subscribed capacity is less than or equal to 36 kVa. In Germany, the long delay of smart meter roll-out implies that no such contracts are available yet. Other countries have not yet implemented such requirements.

Where Member States have implemented the deployment of smart metering systems, **time-differentiated network tariffs** can be introduced to reflect the use of the network. This depends on the approval by the NRAs of cost-reflective and transparent network charges that also take into account the need for flexibility. This is the case in France and Finland, as it was in in 2020. In Italy, Poland and Spain, network tariffs are cost-reflective and transparent but do not take into account the need for flexibility.

Only in France and Finland, the NRA has introduced **tariff methodologies and/or performance targets to incentivise DSOs** to increase their efficiency, support investments in digitalisation and flexibility services. In Germany, Greece and Poland, flexibility is not incentivised by tariff methodologies and/or performance targets. Instead, they are favouring CAPEX investments, meaning grid reinforcements and expansions.

Provisions covered by this mapping:
Articles 11 and 19 of the Electricity Directive and article 18 of the Electricity Regulation.

COMPLETE TABLE

Electricity Regulation

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
Balancing Market (art. 6)	**Is the non-discriminatory participation of all decentralised energy resources effectively ensured, both individually and aggregated, in Balancing Markets in this Member State?**	Yes, the TSO has updated the format of services to make it possible for any resource to participate as soon as it has the technical capabilities to fulfill the needs of the TSO.	Yes, but independent aggregation is allowed with certain limitation in the reserve markets.	Yes, but asset backing for FCR capacity across different TSO areas is still not possible.	Partially. PV net metering, resedential and PV<400kW are not currently allowed to paticipate in Balancing Market. Individual and aggregated participation is allowed only for dispatchable production. Participation of demand-side response in the balancing market is under preparation.	NO There are some technical barriers to participation not imposed on other technology types, e.g. aggreagation minimum quantity of 4MW.	Partially with some limitation with regards to renewables, storage and consumption. At the moment, only Relevant generation unit (>10MVA) can participate to Balancing Market (BM), but ARERA and Terna in 2017 started a process of balancing market opening to decentralised resource (generation, demand , stationary and non stationary storage) individually and aggregated, through pilot project. Minimum size is 1 MW (0,2 MW for V2G aggregates). These aggregates can provide some of the ancillary services, sometimes with ad hoc requirements.	Currently, the recipient's participation in the balancing market is possible only through the energy supplier, Independent participation is possible only in a very rare situation when the recipient is a Balancing Responsible Party for himself. The possibility of aggregation has been limited to almost zero- the aggregation is limited to one high-voltage node. There are nearly 2,700 such nodes in Poland, and cases where two or more large consumers are connected to one node are rare.	NO In Portugal, only consumers with large loads connected to the Medium Voltage or High Voltage networks can participate in the provision of flexibility services, with a minimum load mobilization capacity cap of 4MW (in the case of interruptibility contracts which ended in October 2021) or 1 MW (in the case of regulation reserve services which replaced "interruptibility" contracts in November 2021). So although it is not explicitly closed to an independent aggregator, the fact that the contract is with the end customer excludes in practice any independent aggregator.	Yes, implemented by Ord. 236/2019.	YES	From January 26 2021, all market participants with generation, demand or storage with a minimum supply capacity equal to 1 MW can be Balancing Service Providers (BSPs). It is possible for DR aggregation to participate in Balancing markets but through a supplier (the participation of aggregated DERs is not possible with an Independent Aggregator). Independent aggregator details not yet defined.
	What is the minimum bid size?	1MW	FCR-N: 100 kW, FCR-D: 1MW Other: 5-10 MW	mFRR and aFRR: 1 MW, FCR: +/- 1 MW	1 MW	1 MW	1 MW	1 MW	A minimum load mobilization capacity cap of 4MW (in the case of interruptibility contracts) or 1 MW (in the case of regulation reserve services).	1MW	1MW	1MW
Day-Ahead and Intraday Markets (art. 7-8)	**Is the non-discriminatory participation of all decentralised energy resources effectively ensured, both individually and aggregated, in Day-ahead and Intraday Markets in this Member State?**	Yes, both market are portfolio-based and do not make any difference between resources behind the offers and bids.	YES	Yes, but there is still a requirement for aggregators to get permission of the supplier when aggregating and selling customer load flexibility to these markets.	Aggregated residential demand is not permitted in wholesale electricity markets, specifically the forward, day-ahead and intra-day markets. PV net metering, resedential and PV<400kW are not currently allowed to paticipate in Intaday and Day-Ahead Markets.	NO	Yes, DA and ID market participation for generation is unit-based. Consumption units under the same contract can be aggreggated in one virtual point per market zone. A new intraday continuous market has been introduced and enhances the participants to bid and offer hourly products to balance single unit positions strictly ahead the delivery hours, with a pay as bid pricing mechanism. the participation of generation by portfolio or by unit is possible.	Currently, the recipient's participation in the Day Ahead and Intraday is possible only through the energy supplier, Independent participation is possible only in a very rare situation when the recipient is a Balancing Responsible Party for himself and has separate supply contract.	The aggregation of small-scale, residential flex-offers including third-party participation is not yet possible in Portugal due to the lack of enabling regulatory frameworks. Only two forms of DR services are legislated in Portugal: (i) interruptibility contracts (which ended on 31 October 2021); and (ii) regulation reserve services, which are nonetheless still subject to many restrictions.	YES	YES	Decentralized resources can participate in the wholesale markets both indirectly (via supplier or representative) and directly as a direct consumer with a minimum offer of 0.1 MW in a single type of participation (as a buyer or as a generator). Stand alone storage, that is not pumping storage, needs further regulatory proposals.
	The minimum bid size should be 500kW or less. Is this provision respected?	YES 0,1 MW	NO - 1 MW	100 kW	YES	The minimum volume increment in the DAM and IDM markets is 0.1 MW.	1 kWh for day ahead and intraday auction with marginal price position, 100kWh for intraday continuous market with pay as bid mechanism.	0,1 MW	NO	Provision is to be implemented by the upcoming updates in the Energy Law 123/2012.	Products / intervals tied to common NEMO agreement; currently still 1 MW and 1h.	0,1 MW
	Market participants should trade energy in time intervals at least as short as 15min in both day-ahead and intraday markets, unless NRAs have granted derogations or exemptions. Is it the case?	The ISP is 30 minutes until 2025. IDM is trading 30 minutes product. DAM makes 1h product only.	Trading with 1 hour resolution. As of Q2 2023 the 15 min balance settlement period will be introduced, after which 15 minutes' products shall be introduced in ID but no specific timeline.	15 min time intervals in both day-ahead and intraday markets.	IDM is trading 30min products while DAM only 60min products.	DAM operates to 1 hour Trading Period and the ID markets operate to 30 min Trading Periods.	Trading minimum time interval in DA and ID markets is 1 hour. Also the new Standard Intraday Continous (SIDC) market, part of XBID project, is based on 1 hour product.	The resolution of offers is currently 1h, as part of the derogation, the implementation of the resolution of 15 minutes has been delayed until the beginning of 2023.	YES	No derogation or exemption.	Yes, transition to 15min ISP completed on 1.1.2021.	Not yet. The granularity of the products is still 1 hour. There is a derogation to implement the 15' Imbalance settlement period (ISP) until 2025, but with the intention to implent the 15' ISP in Oct 2023.

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
Redispatching (art. 13)	Is redispatching open to all decentralised energy resources according to market-based rules?	YES Redispatching for constraints on the transmission network (>50kV) is open to all resources participating in the "mécanisme d'ajustement". Price, location, and dynamic capabilities are taken into account to select the redispatching actions. There is no Redispatching by DSOs (< 50 kV)	YES	No, there is no market based redispatch, only mandatory redispatch for all resources larger than 100 kW starting from 1 October 2021.	No, only for dispatchable production units.	YES	No, it is done by TSO with the units enhanced to a specified market, without any evidence in the accounting. The TSO does not provide, for now, a separate accounting of different action taken in balancing, redispatching for voltage regulation pourpose, etc.	There is a Central Dispatching system in place in Poland, the operator also decides about possible generation changes. The largest power plants (centrally dispatched) are managed and, if necessary, some of the largest CHPs under separate contracts.	YES	NO	N/A	No, but revision of the Redispatching rules to allow the partipation of demand, storage has been initiated, and it is expected for Q12022.
	Are derogations foreseen to the market-based redispatching?	Yes, in case there is no sufficient bid, TSOs and DSOs can refer to the Network Access Contract of the network users to request a non market-based redispatching.	NO	Cost-based redispatch in Germany is a complete derogation to the market-based EU standard. This is justified by a study by the Department of Energy which affirms that market-based redispatch would lead to gaming in any case (INC DEC gaming) and should therefore not be implemented in Germany at all.	YES	NO	Yes for wind generation curtailment.	PSE tries to change the rules of the balancing market so as to minimize the need for redispatching.	N/A	NO	N/A	Currently TSO performs a market-based redispatch, no change foreseen.
Network charges (art. 18)	Has the NRA approved network charges which are cost-reflective, transparent and take into account the need for flexibility?	Yes, Network charges are technology-neutral and take into account the actual outcome.	YES	No, network charges still do not take into account the need for flexibility. On the contrary, there are incentives for inflexible consumption behavior in the energy-intensive industry.	NO	NO. NRA is currently consulting on Electricity Network Tariff Structure (Q4 2021).	Yes, network charges are clearly defined and cost reflected but they don't include flexibility. Flexibility needs are not explicitly considered. Recently a new NRA's act (352/2021/R/eel) has been published and intoduces a new testing phase to verify the possibility to supply flexibility and ancillary services in the DSO's grid and not only at a TSO level.	The network tariffs approved by the NRA are transparent and reflect the costs, however, they do not motivate to increase the flexibility of consumption to reduce network costs and increase power reserves. Network operators are not rewarded for using the flexibility of loads to avoid excessive network investments, but are entitled to a return in the WACC tariff for capital invested in network investments.	NO	NO	N/A	The new Spanish network tariff methodology regulated in Circular 3/2020 is transparent and cost-reflective. Tariffs obtained from the methodology defined in Circular 3/2020 are finally applied to consumers since the first of June of 2021. For household customers (Pot<15kW), There are now time-dependent network charges (2 daily periods for contracted power + 3 daily periods for energy). Weekends and bank holidays, all hours are valley. The need of flexibility is not strictly taken into account, however it could be considered that they promote flexibility as they are time of use, where peak hours have an expensive price, and there are a lot of off-peak hours with a low price. Additionally, it is foreseen that the NRA will create a group to assess if the network tariff structure contributes with the goals of the energy transition.
	If the Member States is implementing the deployment of smart metering systems, are time differentiated network tariffs promoted?	Network tariffs make it possible for System Operators to propose innovative approaches based on a regulatory sandbox concept. They can incorporate network flexibility in connection charges as well without any financial penalty. Also, network operators are financially incentivized for the deployment of smart meters.	NO DSOs have the possibility to offer different tariff options based on principles of cost-reflectivity and simplicity. Simple time differentiated tariffs are widely avaialbe (night-day or seasonal pricing).	Germany starts the smart meter rollout for customers above 6'000 kWh annual power consumption, prosumers with more than 7 kW photovoltaics installation and controllable assets such as EV charging stations. Time differentiated network tariffs are still not promoted by the first smart meter generation.	NO	NO NRA is currently consulting on Electricity Network Tariff Structure (Q4 2021).	Yes but only for customers with a new 2G hourly based smart meter (roll-out will end at least in 2026).	There is no noticeable interest in suppliers and customers in the application of time tariffs after installing meters with remote reading. There is still very little air conditioning and electric heating in Poland, and retail customers' interest in such tariffs is limited	Yes, but not very actively.	NO	N/A	The Spanish access tariffs (network + charges) are static time of use.
	Has the NRA introduced tariff methodologies and/or performance targets to incentivise DSOs to increase their efficiency, support investments in digitalisation and flexibility services?	YES	Regulatory model has a built in mechanism to promote efficiency and lowering operational costs. This can promote investment in digitalisation.	NO There is still a strong focus on CAPEX investments and not in digitalisation or flexibility.	NO	NO NRA is currently consulting on Electricity Network Tariff Structure (Q4 2021). ESB Networks DSO is incentivised under their Price Preview 5 (PR5) revenue control for 2021-2025 to develop a framework for procuring flexibility services.	Not yet, but a new NRA's act (352/2021/R/eel) has introduced the first testing phases ot these new services.	The only significant change in this respect is the allocation of the costs of the Capacity Market to network tariffs between 7:00 a.m. and 9:00 p.m.	NO	No, slow implementation of DSOs targets for smart meter deployment (until 2028). No incentives for digitalisation.	N/A	The remuneration scheme of Spanish DSOs foresees some incentives for quality and loss but flexibility is not mentioned.

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Resource adequacy (art. 20-22)	**Has this Member State introduced or is it planning to introduce a capacity mechanism or strategic reserve or any other similar mechanism in 2021?**	YES The French capacity mechanism has come into force in December 2014. In 2016, DG COMP has approved this mechanism as a State aid scheme under two given conditions to be implemented as soon as 2019: 1) the explicit participation of cross-border capacities; 2) the implementation of a multiannual scheme dedicated to new capacities development. Those conditions have been fully implemented before delivery year 2020.	YES For the period 1.7.2020 - 30.6.2022 611 MW of strategy reserves are contracted.	No, but Germany has already a number of capacity mechanisms officially claimed to be open and technology neutral, but the technical details do not allow DER to participate: - 1'200 MW "special network equipment" for four gas power plants of 300 MW each in southern Germany, - 2'000 MW capacity reserve with 1'056 MW bids of eight gas power plants for 68'000 EUR/MW/a, - 2'700 MW security readiness over four years for eight lignite-fired power plants, - 10'647 MW network reserve 2022/2023 ("winter reserve").	N/A	The current capacity market arrangements have been in operation since 2018.	In Italy a CRM was introduced before entry into force of Electricity Regulation. The Italian CRM is centralised market-based reliability option Mechanism, approved by European Commission. New tenders for Italian capacity mechanisms are foreseen between end of 2021 and beginning of 2022 for delivery from 2024 onward. Only for 2022 and 2023 Capacity market (DCM 28 giugno 19) auctions have already been completed.	The capacity market has been operating in Poland since 2021, the first auctions for 2022-2023 took place in 2018.	The interruptability mechanism is being phased out and potentially be replaced by a new service that industrial companies will deliver and be paid by the TSO.	NO	NO The new law should contain provisions that MAY (!) allow for such a mechanism to be put in place, in line with the new Electricity Regulation.	The Ministry has done a Proposal of a capacity mechanism (under consultation). the process is currently on hold adn approval is pending. It is a market with firm capacity products (€/MW·yr) in two time-horizons: 5 year and 1 year. It would be directed at generation assets, storage, and demand response.
	If introduced, are they open to the non-discriminatory participation of all decentralised energy resources?	YES	YES	NO The so-called capacity reserve is offically open, but the technical details discriminate decentralised enegy resources such as demand-side management and storage.	Greece has an interruptibility scheme which is only open only to industrial consumers and a Transitional Flexibility Remuneration Mechanism which de facto excludes DERs from participatingon. However, both are being phased out at the time of writing.	NO Demand participants in the capacity market do not receive payments in the energy market (except under some limited circumstances and price events) and current arrangements represent an "interim" solution to State Aid compliance which discriminates against demand participation.	YES Italian CM is open to all kind of resources (generation, demand, storage, foreign resources, also renewable non pogrammable generation is allowed to participate) but with different operational rules (e.g. different derating factors that represent the adequacy contribution of every technology). Participation is open to decentralised resources (for instance, can participate also generation unit < 10 MW, even if these unit cannot participate to ancillary service market, but only to DA and ID market).	As a rule, the capacity market can be considered technologically neutral and allows the participation of DER and DSR. But technical barriers for DERs and demand side flexibility due to frequent testing (up to 4 times a year) and very costly consequences of not completing 100% of the tests (high penalty + possible loss of quarterly remuner).	Still restricited to energy-intensive large consumers. No aggregation allowed yet.	N/A	N/A	On paper it allows the participation of all resources (generation, storage, demand response). However, it seems that the proposed design presents barriers for aggregation.

COMPLETE TABLE

Electricity Directive

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
Smart metering (art. 19)	How is this Member State advancing in the smart meters roll out?	> 30 M The smart meter deployement is scheduled to be completed at the end of the year.	Smart meters have been rolled out already. Next generation meters are already replacing current smart meters as the +10 years life cycle is ending.	Since February 2020 Gemany is implementing a restricted smart meter roll-out. Customers above 6'000 kWh/a and prosumers with 7 kW installations will get a smart meter within the next 8 years, all other costumers receive a digital meter that can be updated to a smart meter later. Advancing is bad: The Higher Administrative Court has stopped compulsory installation of smart meters in March 2021. The currently available smart meters are not legally compliant and should therefore not be installed. Further process has not yet been clarified in a legally secure manner.	Smart meter deployment has been launched partially with the installment of more than 170,000 devices until now. It is expected to be installed around 7.5 mln smart meters until 2030. The very recent sale of 49% stake of the distribution network operator (DEDDIE/HEDNO) is expected to speed up the whole procedure.	Smart meter rollout is networks-led. Implementation underway since 2019 by ESB Networks and is expected to be completed in 2024.	In Italy 1st generation smart meters roll out started in 2001 and was completed by 2011. The main DSO started 2G rollout in 2017 and already installed more than 23 million of 2G meters. In 2019 ARERA established that roll out plans for 2G smart meters have to start at the latest by 2022 for all DSOs and almost completed (95% of the fleet) by 2026. However, roll out plans of some DSOs have some delay due to covid crisis.	The replacement of meters is to be divided into stages. The first will cover 15 percent. recipients and is to be completed by December 31, 2023, the next (35 percent. recipients)- by the end of 2025, the third (65 percent. recipients) by December 31, 2027 and the last one, already covering 80 percent. customers by the end of 2028.	Portugal is advancing very well in the urban areas and progressing in the rural areas.	Slow implementation of DSOs targets for smart meter deployment even though the the rollout of smart meters is targeted to be completed by 2024.	Progressing steadily; under 43kW approx. 50%+ already "smart"; roll-out to be completed by 2025.	The deployment strategy of a large scale roll-out of smart meters lasted from 2011 to 2018 and is now completed. The rollout for consumers with contracted power under 15kW ended on December 31st 2018, with 98% of meters replaced. On December 31st. 2019 this percentage reached 99%. The regulation also allows the possibility to install Smart Meters upper to 15kW in low voltatge network.
	Are smart meters interoperable with energy management systems and smart grids?	YES There is a protocol (IEC 62056-7-5) that allows energy management systems to get the needed data from Linky Smart meters (and from other type of industrial meters).	YES	In general, national legislation and technical guidelines should respect these requirements. However, smart meter requirements are very high, so that there are several energy management systems that do not even try interoperability with official smart meters.	NO	NO	YES On the end-user side, 2G LV meters can supply data to Energy Management Systems through a dedicated PLC communication channel interfaced with an IHD. On the network side, the meters can send some operating data upward to the' head end system' that manages the measurement process (e.g. a'last gasp' alert), but this data exchange is not a continuous operational interaction; commands related to remote management commercial operations are received downward by meters.	The measurement data acquisition system will be centralized and run by the transmission system operator acting as the OIRE measurement operator. The data can be shared with recipients. The system does not provide support for high-speed system services where the required sampling period will be less than 15 minutes	YES	NO	N/A	YES In fact, systems are already interoperable in terms of sharing data at central system layer. Datadis is an example, it is a national data hub platform that join all national DSO Smart Meter information.
Dynamic price contracts (art. 11)	Does this Member State ensure that final customers with a smart meter can request to conclude dynamic electricity price contracts?	The principle of an obligation for suppliers with more than 200 000 sites to propose a dynamic price contract is enacted and the rules defined by the NRA. The implementation deadline is set no later that January 1, 2023 for consumers whose subscribed capacity is greater than 36 kVa, and no later than July 1, 2023 for consumers whose subscribed capacity is less than or equal to 36 kVa.	YES. All customers have smart meters and customers are free to choose supplier and the type of contract. Dynamic price models are available widely from various companies.	The long delay of the German smart meter rollout implies that no such contracts are available yet.	N/A	Yes. Customers with a smart meter can avail of a time of use tariff via their electricity supplier.	Every supplier is free to offer dynamic prices. Some suppliers are providing specific contracts with hourly dinamic prices for small customers with a smart meter installed. According to EMD2 (art 8) customers with a smart meter can ask supplier to subscribe a dynamic price contract (this applies only to suppliers that have > 200.000 customers).	The draft law introducing the mandatory offering of dynamic prices by sellers with more than 200,000 recipients is in the consultation phase.	YES, but only larger customers.	No specific provision. Upcoming changes may come along with updates with the Energy Law 123/2012.	Yes, a provision will be included in the new law, which is currently in Parliament.	YES Suppliers are able to offer dynamic price contracts according to Law 24/2013, to all consumers whose meters are prepared (households and industrial customers´ meters are already prepared for dynamic pricing. However not all SME customers´ meters are prepared). A TOU tariff is now possible through the regulated tariff called 'PVPC' (a tariff for small consumers with contracted power less than 10 kW). The energy cost of this tariff is set on time-zones based on the hourly price of the day-ahead electricity market. Network charges are now time-dependent: e.g. in the same day it is possible to choose 2 contracting powers and 3 access tolls for the term of the energy; for the rest of the tariffs (commercial and industrial consumer), there are six periods for the energy and power terms.

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Dynamic price contracts (art. 11)	Is this Member State encouraging suppliers to offer dynamic electricity price contracts or disincentives still persist (e.g. regulated prices)?	Offering a dynamic electricity price contract to any customer who requests it is now an obligation in France for all suppliers with more than 200 000 customers. Regulated-prices-based contracts only represent an alternative to market-based offers that exist for all consumers, including for households and small companies. In addition, regulated tariffs are established by the French NRA, on the basis of a method that ensures that effective price competition can take place (replicable and contestable tariffs).	Pricing is free, several suppliers offers dynamic pricing and the NRA set price comparison tools.	Disincentives still persist. Final customers with a smart meter can request dynamic pricing. However, the "technically feasible and economically reasonable" provision is subject to misinterpretations. German legislation does not encourage suppliers to offer dynamic pricing.	N/A	Suppliers are required to offer a Time of Use Tariff to customers with a smart meter.	The national transposition of the European directive is awaited. In the market, however, offers with "dynamic" prices are promoted, for example indexed to the PUN (single national market price of the day before which has a price per hour) or offers that allow the customer to choose a different price (even 0) for some hours of the day. Regulated prices will end by January 2023.	Dynamic prices are at the design stage, prices for residencial customers are still regulated in line with the current rules. Another thing is that with a relatively low share of electric heating and air conditioning, the interest in dynamic prices among the smallest customers will be small (very limited possibilities of shaping consumption without significant loss of comfort).	There are still regulated prices.	No more regulated prices from July 2021. However, the interest in dynamic prices is still low.	No regulated prices, except for certain vulnerable customers, under heavy conditions.	YES Royal Decree 216/2014 establishes the regulated voluntary dynamic price for consumers with contracted power until 10 kW, that last resort suppliers have to offer to the mentioned consumers.
	Is the elimination of the prior consent by supplier clearly enshrined in legislation?	Yes, independent aggregator framework is effective since 2014, allowing aggregators and consumers to provide flexibility without having to sign a contract in parallel with the supplier of the BRP of the site.	There's no such an explicit prohibition. The retail market in Finland is very competitive and with respect to household customers the general term and condition are approved by the national regulator. They do not include such a possibility for prior consent. (Even if there is not a explicit legislation this is not an issue in practice).	Yes, but only for balancing markets (aFRR and mFRR).	NO	NO Not enshrined in legislation.	YES (confirmed by EMD2 art 12).	Such provisions are included in the draft amendment to the energy law - but the supplier needs to be informed about it.	N/A	Yes in ANRE Ord. 61/2020 (published on 02.04.2020) and ANRE Ord. 65/2020 introducing aggregation and updated balancing market rules.	Yes in the new Supply Act.	The Independent Aggregator is not fully regulated yet. Details of contract, roles and responsibilities are still to be developed. Just the definition is contemplated in the National law (simply specifying that indep aggregator is an an entity with 'no relations' with the supplier). the actual implementation of the proper regulatory framework to allow independent aggregators in Spain has been postponed again and is now foreseen for October 2022.
Aggregator contract (art. 13)	Is legislation eliminating the possibility for suppliers to discriminate customers that have a contract with an aggregator?	YES	Not yet- impementing measures presentation by end of the year 2021.	NO	NO	NO	YES	It is in the drafted regulation, but at this stage, it cannot be clearly stated whether the final shape of the draft regulation will ensure this. Currently, the main obstacle to aggregation is the aforementioned limitations of aggregation range to one high voltage station combined with unfavorable imbalance settlements on RB and the lack of separation of the Balancing Responsible Party role from the aggregator- Balancing Service Provider (separation of these roles will be possible according to plans at the end of 2022).	N/A	YES	Yes in the new Supply Act.	Aggregator figure has been developed, but details of contract, roles and responsibilities are still to be developed.
DR through aggregation (art. 17)	Has this Member State introduced a national framework to allow and foster Demand Response through aggregation? How?	In principle, allowed to participate in all markets. Since 2018 also an annual DR exclusive tender ("AOE", Appel d'Offres Effacement) gives the awarded DR capacities the opportunity the get an additional remuneration. Eligibility is limited to 6 years for sites ≤1MV and 4 years for sites > 1MW. The cap for this state aid has been increased to 60k€/MW.	By end of the year 2021: "Aggregation is not prohibited. More detailed legislation will be given by the end of the year."	Balancing Markets have been opened for DR and allowed DR to compete on a level playing field with generation. On top of that, Germany has introduced an interruptible load programme to foster DR and aggregation, but limited until 7/1/2022 without follow-up regulation up to now. DR aggregation is mainly allowed at TSO level. DR aggregation at DSO level or for intraday and wholesale market flexibility is not common.	Only a basic provision exists for the moment.	There is no national framework for Demand Response.	Only through pilot projects DR resources may participate to ancillary services market (MSD) to provide ancillary services through a pilot project called UVAM (mixed virtual aggregated unit); Potentially DR resources may also participate to Capacity Market. Moreover for the reform of the existing dispatching services market, the Italian regulatory authority has already foreseen that these resources will contribute to the provision of ancillary services even at the end of the pilot project . The main limit for their participation will be represented by technical requirements for providing the services.	DR is posible trough agregation on capacity market. Regarding balancing market and energy market, regulation is not yet in place. The definition of a DR aggregator both as a supplier and an independent aggregator is currently being drafted.	Decree-Law n.º 162/2019 and the the Commercial Relations Code (RRC) of 2020 address aggregation and allow independent aggregators although the "independent aggregator" scope is yet to be defined.	Not yet. Even if Demand Response is still not yet well understood by the regulator in the way that no difference is made between Implicit DR and Explicit DR, the "dispatchable consumption" is touched in the regulation, allowing an initial implementation phase. There are still some aspects to be clarified but it is expected that the anticipated regulation updates at the beginning of 2022 and also the upcoming update of Romanian Energy Law (to allign with 943/2019 and 944/2019) will bring more light into the topic.	Very clear (and open) provisions in the new law; possibility to participate in balancing for quite some time.	It is possible DR aggregation to participate in Balancing markets through a supplier since January 2021 (aFRR, mFRR and RR). Aggregator figure has been developed, but details of contract, roles and responsibilities are still to be developed. New congestion management services will be open to demand soon . However, the technical conditions for participation are still not very favourable for smaller loads.

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
Active customers (art. 15)	Has this Member State introduced provisions to ensure final customers are entitled to act as active customers? How?	Yes, specific regulation on self-consumption even before Directive and possibility to participate to all electricity markets.	More detailed legislation may be given in the end of year, but active customers main principles are enforced.	No specific definition. Some changes in the framework with the hope that final customers can act more as active customers. Focus on the so called Mieterstrommodell (tenant electricity model) for final customers to profit from PV electricity from the roof, but still only very few projects. With over 900 DSOs in Germany, each with their own administrative and technical requirements, it is extremely burdensome and costly to become an active customer.	Active custmers are mentioned in the implementing regulation and specific regulation on self-consumption and energy communities already existed.	NO. The NRA consulted (CRU/21028) on Energy Communities and Active Customers and has published a "conclusions" document and a series of workstreams are to be established to progress work involving multiple stakeholders.	YES. (EMD2 art 14 defines active customers, allowing them: 1. to participate in the market individually or in aggregation/community 2. sell energy produced 3.take part in flexibility markets 4.to avoid paying double system and network charges (consumption-production)".	It is in the drafted regulation, but at this stage, it cannot be clearly stated whether the final shape of the draft regulation will ensure this.	NO dedicated framework but Portugal has recently introduced major modifications in the self-consumption regime of renewable electricity, guiding it towards the facilitation of RECs, individual/collective self-consumption, and P2P energy trading. This was done in the context of the transposition of the EU Renewable Energy Directive (RED II) into an enabling national regulatory framework in 2019, entitled Decree-Law No. 162/2019	Active customers are still to be defined by the upcoming updates to the Energy Law 123/2012, in accordance with 943/2019 and 944/2019.	Yes with the Supply Act.	No specific decidacted framework for active customers but final customers can participate in the wholesale markets also directly, as a direct consumer, with a minimum offer of 0.1 MW in a single type of participation (as a buyer or as a generator). There are provisions (e.g. RD244/2019) that allow for self-consumption and shared (collective) self-consumption.
	Has this Member State eliminated double network charges for active customers owning an energy storage facility?	YES	Network tariffs should be cost reflective (Electricity Regulation Article 18 point 7). Charging a separate network tariff for both injection to the grid and withdrawal from the grid can indeed be the most cost reflective and fair solution depending on the national tariff design, and thus shall not be categorically prohibited. In Finland, active customers can own and utilize both generation and/or storage on equal terms (new government decree on active customers given 22nd Dec 2020).	No unless for grid-level-storage and storage used only for self-supply purposes.	N/A	NO	Yes, EMD2 art 14 eliminates double network charges for active customers Through the resolution 109/2021, the NRA updated the conditions for the supply of the transmission, distribution and dispatching services of the electricity withdrawn and subsequently returned to the grid by the storage systems, also avoiding the double network charges.	Such regulations were already introduced in the amendment to the Energy Law.	Only within the context of Renewable Energy Communities.	NO	There is no G component in Slovenia.	Yes, since the publication of Circular 3/2020 the injection charge has been eliminated.
Citizens energy communities (art. 16)	Has this Member State set a national framework enabling citizens energy communities?	YES (ordonnance 2021-236 du 3/3/2021)	YES	N/A	A national framework is in force but is not fully compliant with the Directive.	NO The NRA consulted (CRU/21028) on Energy Communities and Active Customers and has published a "conclusions" document and a series of workstreams are to be established to progress work involving multiple stakeholders. No. The NRA consulted (CRU/21028) on Energy Communities and Active Customers and has published a "conclusions" document and a series of workstreams are to be established to progress work involving multiple stakeholders.	YES (EMD2 art 14)	Such regulation is drafted in the new Energy Law project.	Portugal only transposed the Renewable Energy Community concept into an enabling national framework, not the Citizen one yet.	Citizens energy communities are still to be defined by the upcoming updates to the Energy Law 123/2012, in accordance with 943/2019 and 944/2019.	In the new law.	Renewable Energy Communities have been defined (but not CECs). Broader development is needed. Spanish NECP establishes the current collective self-consumption regulation as the starting point for CECs regulation.
Data management (art. 23)	Is this Member State allowing the access to data of the final customer by eligible parties free of charge?	Yes for certified entities, on the basis of customers' consent.	Yes on the basis of customer's consent.	Yes for a "basic set" and not in real time, if customers gave consent.	N/A-On going procedure.	NO	No- only the final customer can see its consumption data asking for them to the DSO or directly in its dedicated web area (only for e-distribuzione grid and other primary DSOs) and on ARERA dedicated web page. Besides consumption data, costumers can check, for example: Fiscal Code/VAT Number,DSO of reference,Supplier's name,type of meter,power,start date and end date of contract,etc. In the future the service will be enriched with more data and greater details and related terms of access to Portale Consumi by third parties.	Yes, with customer consent, however the full implementation of the new scheme of the Metering Data Operator will take few years	Yes, for Renewable Energy Communities.	YES	YES	Yes, with customer consent.

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
DSOs incentives for flexibility (art. 32)	Does this Member States allow and incentivise DSOs to procure flexibility services, according to transparent, non-discriminatory and market-based procedures?	YES (ordonnance 2021-237 du 3/3/2021). In principle, DSO are now required to submit a 2-year plan for network development, taking into account DR possibilities. However, a pilot framework conducted by the DSO proved a failure so far, due to lack of visibility and shortcomings.	YES National legislation on 15th July 2021. Needed changes in the national regulatory model still in progress.	No, a DSO mechanism is missing entirely. The so-called inc dec discussion has stopped all advances in this field including the SINTEG R&D projects with high public funding.	N/A	YES ESB Networks DSO is incentivised under their Price Preview 5 (PR5) revenue control for 2021-2025 to develop a framework for procuring flexibility services.	Not yet. NRA act n. 352/2021/R/EEL introduces pilot projects regarding ancillary services offered by DSOs (consumption, production and storage units). Through this resolution, the NRA issued a set of high level guidelines, referring to the general criteria established by Articles 31 and 32 of the Directive, and provided for the launch of pilot projects for the procurement of flexibility services by DSOs ("projects ex 352") to evaluate the exploitation of these services both from a technical point of view and with regard to the most appropriate methods for their supply.	Not yet implemented.	NO	Not yet. Principles are still to be defined by the upcoming updates to the Energy Law 123/2012, in accordance with 943/2019 and 944/2019.	Pilot projects under way; the new legislative framework should contain such provisions.	Not yet implemented. Pilot projects are ongoing. Moreover, the last revision of the DSO remuneration mechanism did not mention flexibility.
	Does the procurement contemplate all DER?	No mention of technologies but it appears that residential DR is not taken into consideration.	YES National legislation given 15th July 2021.	NO	N/A	N/A The arrangements are in design currently.	YES The NRA guidelines provide for the possibility of participation for all DER and aggregators. "ex 352" pilot projects will then clarify which DERs are technically the most suitable for the purpose.	Not yet implemented.	N/A	Not yet.	N/A	Not yet implemented. Pilot projects are ongoing.
Integration of EVs (art. 33)	Is the principle of not ownership, development, management or operation of EV charging infrastructures by DSOs clearly enshrined in national legislation?	YES (ordonnance 2021-237 du 3/3/2021).	YES	No, the majority of charging stations is managed by DSOs.	I principle yes, with the exception in case DSOs own charging infrastracture for their own use.	NO Not enshrined in legislation.	YES Current legislation (law of transposition of Directive, art.13) foresees that DSOS "cannot own, develope and operate EV charging points except those for their own company use, and have to cooperate on a non-discriminatory basis with any person who opens or manages points charging stations accessible to the public.	NO If the number of installed charging stations required by the act is not achieved in a given time (very likely due to the slowly growing demand), distribution system operators will be obliged to build them and their costs will be transferred in the tariff. with the return on capital involved.	N/A	Not yet. Principles are still to be defined by the upcoming updates to the Energy Law 123/2012, in accordance with 943/2019 and 944/2019.	YES	Yes, only as a last resort. This means that DSO can only own EV infrastructures when an open tender has been launched and there is no private interest in investing in such infrastructures.
DSO storage (art. 36)	Is the principle of not ownership, development, management, operation of energy storage facilities by DSOs clearly enshrined in national legislation?	YES (ordonnance 2021-237 du 3/3/2021).	YES	In general yes, but in case of a negative market test DSOs might develop, own and operate own storage devices for a certain period.	N/A	NO Not enshrined in legislation.	YEs The DSO can not develop, own and operate storage systems except for those that are an integrated network component and only upon the NRA ex-ante approval.	NO The regulations introduced this year allow the transmission system operator and distribution system operators to build and operate energy storage and recover the construction costs along with the return on capital involved in the tariff.	N/A	Not yet. Principles are still to be defined by the upcoming updates to the Energy Law 123/2012.	YES	YES From December 2021, a new regulation allows DSOs and TSOs to own and operate storage facilities only if they are fully integrated network component as stated in the art 36 of the E.D.
	Has the NRA draw up guidelines or procurement clauses to help DSOs ensure a fair tendering procedure?	No, eventually after ordinance.	NO	Possibility of a market test for market-based ownership etc., but not implemented yet.	N/A	NO	So far, only high level guidelines have been set through the resolution 352/2021. Detailed rules will be defined at the end of the pilot projects "ex 352".	NO	N/A	NO	N/A	NO

ARTICLE	QUESTION	FRANCE	FINLAND	GERMANY	GREECE	IRELAND	ITALY	POLAND	PORTUGAL	ROMANIA	SLOVENIA	SPAIN
TSOs tasks (art. 40)	Does this Member State set clear rules for the market-based procurement of ancillary services?	Yes, part of TSO's mission, but still some rules limitate residential and aFRR opening is not live yet.	YES	Yes for balacing services and interruptible loads. Procurement of ancillary services that are not connected to frequency (such as e.g. reactive power) shall be possible, but there are still no details on requirements or tenders available.	YES	YES The current arrangements - DS3- are in operation. Future arrangements are in design.	Yes, there is an ancillary service market in place, with regulatory and network code rules. It is foreseen a review of ancillary service market and products.	No, the state legislations is not very detailed.	There is no such procurement at this stage.	Yes, a first version was put in place by ord. 61/2020, 62/2020 and 65/2020. Those orders are to be replaced with a complete piece of regulation at the beginning of 2022.	Yes; T&C for BSPs based on EBGL in place for some time; transition to market-based procurement of FCR done.	Yes. the rules to participate in the balacing markets (aFRR, mFRR, RR) allow for the participation of generation and now also of aggregation of demand-side flexible resources, including loads and storage.
	Does the national framework adequately remunerate TSOs for the procurement of such services?	YES	Yes, the depending of the service, the procurement costs are covered by balance settlement fees or with tariff incomes.	YES	NO	The revenues paid under DS3 system services arrangements are subject to approval by the NRA.	YES	YES	There is no such procurement at this stage.	NO	YES	TSOs recover balancing cost.
Network development (art. 51)	Do the TSOs in this Member State fully take into account the potential of the use of all DER as an alternative to system expansion in their 10-year network development plan?	Based on a decision of the French NRA, the new T&D tariffication applied from 2021 onwards provides that TSOs justify any investment in power lines/cables/transformers by demonstrating that it is more economical than relying on flexibilities.	YES	YES Several DER are included in the TYNDP, but the full potential might be higher.	NO	NO Not clear that this is part of system planning. Under Price Preview 5 (PR5) revenue control for 2021-2025 are broadly incentivised to encourage "flexibilty" and "innovation".	Yes, but without indicating a possible path or numbers to support this assumption.	NO	NO	N/A	Yes, the TSO has actively procured these services for quite a number of years and is constantly expanding the use of DER in ancillary services.	NO
TSO storage art. 54)	Is the principle of not ownership, development, management, operation by TSOs clearly enshrined in national legislation?	YES (ordonnance 2021-237 du 3/3/2021) (some derogations allowed).	YES	In general yes, but a new legislation allows for storage assets financed by grid tariffs to participate in the market which results in high market distortion.	NO	NO	Not yet transposed. The existing legislation foresees that the TSO is allowed to own, develop and manage storage batteries only if they are part of the Network Development Plan and are needed to ease the RES dispatching. The draft transposition Decree for Directive 2019/944 seems to reinforce this principle.	NO The introduced regulations allow the transmission system operator and distribution system operators to build and operate energy storage and recover the construction costs along with the return on capital involved in the tariff	N/A	NO	YES	NO In fact, Art. 7 of the Climate Change and Energy Transistion Law foresees that, by regulation, the technical conditions will be established to carry out the pumping, turbination and storage to maximize RES integration, regardless the plans of the owners of these units. That means that TSO could have a predominant role in defining how these kind of assets (hydro pump storage) will be operated.
	Has the NRA draw up guidelines or procurement clauses to help TSOs ensure a fair tendering procedure?	Not yet.	NO	NO The largest energy association BDEW has prepared some suggestions, but these are not officially approved and do not contain a full guideline for a fair tendering procedure.	NO	NO	There are not ad hoc NRA guidelines for the TSO tendering procedures. For tendering procedure (not only for storage) the Italian NRA is in charge to approve the procedures proposed by the TSO. The NRA can ask modification to the procedure, prior to approve. Arera Deliberation n°288/2012 and determination n°08/2012 draw up the procedure to follow to let TSO build and manage electrochemical storage battery (through pilot experimental projects).	NO	N/A	Not Yet.	N/A	NO

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