



**smartEn**  
Smart Energy Europe

## SmartEn Position Paper

Design Principles for (Local) Markets for Electricity System  
Services

Smart Energy Europe  
Rue d'Arlon 69-71  
BE-1040 Brussels

+32 (0) 2 58 88 992  
[info@smarten.eu](mailto:info@smarten.eu)  
[www.smarten.eu](http://www.smarten.eu)

September 2019

## About smartEn - Smart Energy Europe

**smartEn is the European business association for digital and decentralised energy solutions.** Our members include innovators in services and technology for energy and data management, finance and research. By taking an integrated perspective on the interaction of demand and supply, our mission is to promote system efficiency, encourage innovation and diversity, empower energy consumers and drive the decarbonisation of the energy sector.

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*The positions expressed in this document represent the views of smartEn as an association, but not necessarily the opinion of each specific smartEn member*

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### Summary of Key Recommendations:

1. Setting the right incentive structures for (Distribution) System Operators
  - In line with the revised European Electricity Directive, incentive structures for (Distribution) System Operators should be based on total capital and operational expenditures (TOTEX), replacing the old CAPEX-based paradigm
  - Additional financial incentives are structurally justified and should support the necessary paradigm shift at DSO level
  - In keeping with the European market design, System Operators should be able to procure flexibility services from the market, and should not own and operate the resources providing the services
2. Enabling market platforms for flexibility
  - All flexibility markets at local level and at system level should be directly open and accessible to decentralised flexibility resources
  - Local flexibility markets should be consistent with the electricity wholesale markets and the procurement of system services at TSO level
  - It is likely that multiple market platforms emerge, operated by independent Third Parties. Such platforms should utilize open standards to further promote open competition.
3. Defining adequate product design
  - As established in the European Electricity Directive, products should be defined from a system-needs perspective, rather than the specific capacities of (traditional) providers. They should be open to all decentralised solutions including on-site generation demand response and storage
  - It is likely that availability and energy products will be required, both short-term and long-term. The challenge is finding the right balance to avoid unnecessary lock-in effects while encouraging competition
  - Product definitions should be diverse but compatible, so as to increase efficiency, enable a standardisation of technology and ensure liquidity across markets
  - Portfolio-based bidding should always be possible and products should be defined for the largest possible market area relevant to provide a specific service
  - Imbalance prices should not be distorted by congestion management actions that lead to modifications of the merit order
4. Ensuring transparency
  - The procurement of flexibility services should be transparent and non-discriminatory
  - TSOs and DSOs should provide information to the market regarding the expected congestion management needs and activities
  - Bilateral deals between System Operators and flexibility providers should be strictly limited to situations where market-based procurement verifiably cannot deliver. Such deals should be clearly targeted to the specific constraint only, limited in time, and information about their existence and use should be made public

## 1. Introduction: Flexibility resources for (local) system management

Across Europe, network congestion has been increasing at both transmission and distribution levels, driven in particular by the uptake of variable renewable energy and decentralised resources, as well as delays in network expansion. The further uptake of electric vehicles, heat pumps and other electric appliances adds a new dimension to the challenge, especially also at distribution level. These appliances add new loads, but can at the same time represent significant flexibility resources.

Relying only on grid investments to cope with this challenge could take too long to realise and would be very expensive. On the other hand, making use of distributed flexibility resources not only for transmission but also for distribution network management can lead to very significant cost savings and much more efficient integration of renewable energy sources.<sup>1</sup> The European Clean Energy Package for all Europeans recognises this and establishes, as a key element, that Distribution System Operators (DSOs) should procure flexibility services where these are cheaper than grid expansion.<sup>2</sup>

To achieve this, the recast of the European Electricity Directive indicates that incentive structures for DSOs should be adapted and DSOs “shall procure such services in accordance with transparent, non-discriminatory and market-based procedures”<sup>3</sup>.

While other alternatives exist in principle, they represent significant challenges today:

1. *A bidding zone re-configuration.* Although this could lead to specific system signals, this approach does not appear politically realistic in most European member states today.
2. *Locational, dynamic grid usage charges and connection contracts.* While interesting in theory, charges that fully reflect the network situation for targeted leverage of flexibility resources are complex to implement and often imply high levels of uncertainty for network users. This option can therefore not be expected to drive the necessary flexibilities on its own. However, a more sophisticated network tariff design could still complement a market-based approach as also encouraged by the Electricity Directive.
3. *A rule-based approach on resources curtailment or re-dispatch (with cost-based compensation).* Such an approach should be avoided, as it leads to low transparency and can be expected to deliver inefficient results.

In all cases, options should be avoided that lead to a high concentration of market power with the system operator, as would be the case in a rule-based approach, but could also be relevant for other design-options described. Such concentration of market power is particularly concerning in cases of incomplete ownership unbundling.

Before this background and in line with the European energy market design, **smartEn fully supports the procurement of system services based on markets as the most**

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<sup>1</sup> See e.g. Imperial College/ NERA for the UK Committee on Climate Change: [https://www.theccc.org.uk/wp-content/uploads/2015/10/CCC\\_Externalities\\_report\\_Imperial\\_Final\\_21Oct20151.pdf](https://www.theccc.org.uk/wp-content/uploads/2015/10/CCC_Externalities_report_Imperial_Final_21Oct20151.pdf)

<sup>2</sup> Art. 32 in the Directive for the Internal Market in Electricity (Recast) 2019

<sup>3</sup> Art. 32 in the Directive for the Internal Market in Electricity (Recast) 2019

**realistic solution.** The present position paper describes a set of key recommendations for the procurement of system services in line with the European Electricity Directive. The recommendations are grouped into four chapters:

1. Setting the right incentive structures for (Distribution) System Operators
2. Enabling markets for flexibility
3. Defining adequate product design
4. Ensuring transparency

Different approaches are already being tested in sandbox-trials. A progressive rollout and streamlining should follow without delay.

## 2. Setting the right financial and regulated incentive structures for (Distribution) System Operators

The active management of the Distribution System with the procurement of flexibility resources implies a complete overhaul of the previous approach of a unidirectional power system with electricity flowing from large generation to consumers who were mostly indifferent to the situation and requirements of the electricity system. While the role of a DSO consisted mostly of ensuring sufficient network capacity and its maintenance, the focus was naturally on (network) assets that were owned and operated by the DSO directly. Active system management with the procurement and use of flexibility resources adds a significant new dimension to the role of the DSO.

### TOTEX Based Incentives

The starting point for any flexibility markets for system services must be a change of regulated incentive structures to encourage DSOs (and where this is not yet the case also TSOs) to **procure flexibility as an alternative to network reinforcements**. A consequent **adjustment of incentive structures from CAPEX to a TOTEX-based approach**, as introduced in the European Electricity Directive, is therefore critical. To date, the United Kingdom is the only country in Europe where such an adjustment has been implemented by the regulator.

### Additional incentives to support the transition

The shift from a pure CAPEX-driven paradigm to enabling a market-based procurement of flexibility represents nothing less than a cultural change for system operators. An adjustment to TOTEX-based incentives may not be sufficient to drive this cultural change in the near term. Based on their experience under the CAPEX-focussed regime, system operators are likely to underestimate the benefits of procuring flexibility services. In particular, the benefit of delayed investments and the reduced risk of stranded assets may be underestimated by system operators, given that the investment risk for system operators as regulated actors is largely borne by society/ final consumers and thus not directly reflected in their investment costs. **This is why additional financial incentives should make the procurement of flexibility at least as attractive as investment in CAPEX.**

### Regulatory scrutiny of investment planning and markets tests

To complement the financial incentive structures, transparency and regulatory oversight are essential for a holistic perspective on system planning, investments and operation. Before any investment decisions above a certain threshold for each voltage level are taken, the regulator should **request a counter-factual-scenario from the system operator, based on a non-wire alternative**. A market check, as already foreseen by the European Electricity Directive for investments in storage<sup>4</sup>, should be conducted also for network infrastructure investments by system operators. To this end, and in due time, the system operator should publish all relevant information about the problem that an investment is meant to solve and, as early as grid studies or even before, invite market offers to resolve the issue. This process should be scrutinised by the regulator and only if the market cannot deliver a reasonable solution to resolve the problem, should investments be authorised.

### Only market-based ownership of flexibility resources

The proper functioning of the market will depend on the fully market-based ownership of flexibility resources. Direct ownership and operation of flexibility resources by DSOs and TSOs would be in obvious contradiction to the objectives of the Electricity Directive and the European principles on unbundling of network operation and market activities. The cheaper access to capital for Network Operators whose risk is borne by society would lead to unfair competitive conditions for other market actors aiming to offer flexibility services. At the same time, it would be challenging for the regulatory authority to monitor price discipline by the System Operator. Any ownership of flexibility resources by System Operators would also open the door for anti-competitive behaviour, as the respective TSO or DSO might favour the procurement of services from their own assets or provide better service to them.

Finally, ownership of decentralised energy and flexibility resources by system operators could lead to an under-utilisation of these assets, as they could not be offered to other market participants for the stacking of services.

smartEn, therefore, supports a strict implementation of the principle of market ownership established by the Electricity Directive. In cases where flexibility is most cost-effective to develop on DSO or TSO property, the relevant space could be leased to competitive market participants.

## 3. Enabling markets for system services

Flexibility will be required at different levels in the electricity system. Market parties typically rely on it to balance their portfolios, TSOs require flexibility for system management and the increasing needs by DSOs are now added to these forms of use. For the efficient operation of the electricity system it is essential, that flexibility resources can offer their services to all these parties and be remunerated for their benefit to TSOs, DSOs and market parties for services delivered. This means that flexibility resources should be able to compete with bulk generation in wholesale and TSO markets, while also being able to offer relevant services at local level.

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<sup>4</sup> Directive (EU) 2019/94 on common rules for the internal market for electricity, Articles 36 and 54

### Direct access for decentralised resources to all market platforms

In order to achieve the best allocation and use of flexibility services, TSOs, DSOs and market parties should be able to compete for these resources. This can be achieved through one or multiple market platforms on which users of flexibility procure what they need, while flexibility providers should have access to all of them. Such an approach would create transparency and fair competition between resources while allowing them to be used where they are most valued. It still requires effective communication between TSOs, DSOs and market parties to avoid adverse effects of flexibility activations on the respective higher- or lower-voltage network. This is further described e.g. in the White Paper on Flexibility Platforms by USEF.<sup>5</sup>

As opposed to a coordinated dispatch in which TSOs and DSOs would acquire flexibility by creating a single buyer, the market-based competition for flexibility resources can ensure that resources are allocated transparently and adequately valued while reducing overall system costs.

The competition for flexibility resources is also clearly preferable to a bottom-up approach, in which the DSO would procure services and could pass them on to the TSO. Such a bottom-up approach, giving the DSO a role of a gate-keeper, would lead to high complexity and necessitate strict and detailed regulation. There would be a very significant risk that decentralised resources would not receive appropriate remuneration and would be at a disadvantage for rendering services to the TSO.

### Consistency of markets at all levels

In order to enable flexibility providers to serve the different markets and users effectively, markets for local flexibility services should be aligned as far as possible with the procurement of system services at TSO level, as well as with the electricity wholesale markets. While the creation of a single market platform may not be necessary nor realistic, complementarity and coherence between platforms should facilitate the bidding into different markets. It should also be possible for flexibility providers to provide services to different users simultaneously, i.e. stacking value, where they have the technical capacity to meet the respective requirements.

Furthermore, prequalification requirements for different markets should be coordinated and standardised to the degree possible, so as to reduce entrance barriers and enhance competition and liquidity.

### Independent Market Operation

Market platforms for flexibility services can in principle be operated by system operators directly (as is often the case for services to the TSO today) or by independent Third Parties. Given the multitude of DSOs in several European countries, and given that the unbundling of DSOs from other market activities is less complete than for TSOs (i.e. no ownership unbundling in most Member States), the role of independent Third Party market platforms has significant advantages, especially for local flexibility services. Operators of a market platform must not themselves be involved in market activities, i.e. the provision of energy or energy services.

It is likely that multiple platforms emerge and consolidation would be likely to occur over time. smartEn emphasizes that platforms should be interoperable, e.g. by having

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<sup>5</sup> <https://www.usef.energy/new-white-paper-flexibility-platforms/>



a published API, and work towards open standards to further promote open competition.

### Political resistance and the concern of gaming

In the debate on (local) system services markets, concerns have been raised about the potential of gaming. Especially in the very early stages of the market, there could be limited liquidity, which could encourage market players to elevate prices. A second concern refers to the potential of strategic bidding in specific cases of structural congestion. It is argued that, in such cases, market players could strategically bid in the wholesale market to create congestions, with the aim of being paid for solving these very congestions in the redispatch market.

While these concerns are to be taken seriously, there is a risk that they could be used as a blanket-argument against a market-based approach – possibly also to protect political interests not related to the functioning of the energy market. On the contrary, the potential for distortive and discriminatory practices in the electricity system is typically much higher without markets for system services in place.

In many European countries, network costs have been going up significantly, while information on the actual cost factors is often unknown and system management actions appear to general market actors as a “black box”. If congestion management actions are based on bilateral agreements or obligations, power is naturally centralised with system operators who may have vested interests – especially in cases of CAPEX-focussed or otherwise imbalanced incentive regulation, or in cases of insufficient unbundling. Regulatory oversight is often challenging and transparent information on market alternatives is usually not available in such cases.

Instead, a market-based approach can bring transparency on system management challenges and congestion problems. Likewise, it brings transparency on the variety of flexibility services available in the market, allowing for the identification of the most cost-effective solutions. The potential of this approach has been demonstrated for the procurement of different ancillary services for transmission system management, which has led to both efficient and cost-effective results, even though the flexibility potentials are still far from being fully developed yet.

As soon as the market is given the chance to develop, liquidity and competition can be expected to improve: innovative solutions, including demand response and other digitally-driven options that can often be accessed and developed within short time periods, will be unlocked. It should also be noted that the market-based procurement of flexibility will always be measured against the traditional option of network expansion. Any financial impacts on (distribution) system operation from a potential abuse of market power would thus naturally be limited, compared with the status quo. Also, long-term contracts can help limit gaming potentials, as also discussed for the product design below.

Nevertheless, the situation should be controlled through a strong regulatory oversight and effective penalties on market power abuse. While protecting commercially sensitive information, regulators should always be able to monitor and act upon single bids. As a temporary step, administrative prices or price caps can be considered where there are concrete indications of market power abuse. Such administrative interventions should always be set by the regulator (not the system operator) and limited in time.

#### 4. Defining adequate product design

The liquidity and effectiveness of the market platforms strongly depend on the definition of the products traded. TSOs and DSOs have various needs, and different products will be needed to respond to the full range of service requirements, be they for congestion management, voltage control or balancing. Also, the design of products is essential with a view to enabling the stacking of services to different users.

##### Non-discriminatory product-design

To allow new market players and solutions to participate in the market and encourage innovation, it is essential that the products are defined from a system-needs perspective, rather than the capacities of specific (established) flexibility or energy providers. To ensure that products allow for all relevant solutions to compete and are not confined to solutions that system operators can deliver themselves, all relevant stakeholders should be closely involved in the definition of product design to ensure that all potential technologies can participate, on the basis of a clear technical description of the actual system need (e.g. congestion risk). The process to design products should be led by the regulator, so as to avoid the development of product definitions that could be supplied by system operator's own solutions, but not those of market parties and to ensure equal treatment of market and network solutions. All products should be open to all decentralised solutions, including generation, storage and demand response. To achieve this, they should be based entirely on the type of service delivered, rather than the type of technology providing a service. In order to facilitate interoperability, the structure of product parameters should be standardised to the extent possible across different platforms.

##### Availability and energy products, long-term and short-term

It is likely that availability products and probably also energy products will be required for the provision of flexibility for (local) system management, both short-term and long-term.

As soon as the liquidity of the market allows for it, an important volume of products should be traded as short-term as possible, so as to take advantage of all flexibility potentials. Short-term products would also help avoid lock-in effects that could hamper the overall efficiency of the system.

At the same time, a relevant share of long-term products is likely to be needed in many areas to provide the necessary reliability required by DSOs. Especially in the early stages of the market, a long-term dimension would enable system operators to better rely on flexibility services as an alternative to infrastructure investments.

At the same time, long-term products would also give investment security to flexibility providers and create the necessary market offer. Especially for innovative flexibility solutions like demand response and storage, a time horizon of several years is often required to unlock resources and secure new investments..

The challenge is thus to find the right balance of avoiding unnecessary lock-in of resources while encouraging competition. Within this context, and to enable the most efficient solution, free bids should always be possible, even where long-term contracts provide sufficient capacity to solve congestions.

Finally, it is important that products for system services are defined so as to not undermine the spot price formation.<sup>6</sup>

#### Diverse but compatible product definitions

A diversity of products is important to make optimal use of all system service solutions and to meet the distinctive needs of different system operators.<sup>7</sup> Nevertheless, in keeping with the objective of the alignment of markets across levels, product definitions should be compatible and streamlined across markets as much as possible. A definition of key criteria would enhance efficiency and facilitate the offering of services into different markets, including the stacking of value. For example, product durations should be defined as multiples of the same denominator. Such a streamlined product design would help ensure liquidity across markets and enable standardisation of technology.

#### Portfolio-based bidding for the largest possible market area

To reap the benefits of aggregated offers and increase liquidity and reliability, portfolio-based bidding should always be possible, respecting the local character and the technical requirements. To support this, products should be defined for the largest possible market area relevant to provide a specific service.

#### Undistorted balancing prices

In order to protect the optimal functioning of the market and secure transparency, balancing prices should not be distorted by other system management measures, namely congestion actions, which lead to modifications of the merit order.

### 5. Ensuring transparency

To enable a fully competitive market and encourage relevant and sustainable investments, transparency and equal access to information will be essential

#### Informing and involving the market in long-term planning

Building on the provisions of the European Electricity Directive<sup>8</sup>, all System Operators at transmission and distribution level should be obliged to conduct and publish a long-term network planning with a time-scale of at least 10 years, in which they inform market participants about expected congestion and system management challenges to which the investments are meant to respond. The plans should be updated on a regular basis, at least biannually, and made publicly available. They should always be defined with full stakeholder involvement under the supervision of the National Regulatory Authority, and systematically include non-wire alternatives for system

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<sup>6</sup> For a discussion of the challenge see e.g.:

[http://www.poyry.co.uk/sites/www.poyry.co.uk/files/media/related\\_material/balancing-resource-options.pdf](http://www.poyry.co.uk/sites/www.poyry.co.uk/files/media/related_material/balancing-resource-options.pdf)

<sup>7</sup> See for example:

[http://www.poyry.co.uk/sites/www.poyry.co.uk/files/revealing\\_the\\_value\\_of\\_flexibility\\_public\\_report\\_v1\\_0.pdf](http://www.poyry.co.uk/sites/www.poyry.co.uk/files/revealing_the_value_of_flexibility_public_report_v1_0.pdf) (figures 4 and 5)

<sup>8</sup> Directive (EU) 2019/94 on common rules for the internal market for electricity, Article 32

development. Before concrete investments are implemented, the principles on counter-factual scenarios and market checks should apply, as outlined in chapter 1 of this paper.

#### An open and transparent procurement process

When a market-check is conducted or when system services are procured, a transparent and non-discriminatory process is essential. System operators should publish all information about the problem to be resolved while leaving the call technology-neutral and open to all suitable solutions that may be provided by market parties. Also, information must be given to market parties with sufficiently long notice-time, allowing them to make the relevant resources available, as soon as a problem arises, and not only when grid investment have been studied or are delayed.

#### Information on expected congestion management actions and contracts

When a market is already in place for congestion management or other system services, system operators should provide information to the market regarding the expected congestion management needs and activities in advance. A heat-map could support this approach. This short-term information will help flexibility providers to offer and allocate their resources efficiently, allowing for optimal efficiency of the market. At the same time, information on the existence and use of flexibility service contracts should always be made publicly accessible.

#### Any exceptions to the market-based procedure to be very strictly limited

Where the pressure on the distribution network is increasing, it may seem tempting to resolve congestion problems through bilateral deals between the DSO and flexibility providers. Bilateral agreements that are not the result of a market-based procurement approach, can lead to highly inefficient results, locking in flexibility resources without being able to take into account all market signals and options. Also, such deals lead to the concentration of power with the system operator, with very low transparency for market participants. This is particularly concerning in cases where there is no full ownership unbundling of the system operator from energy market activities. This is why bilateral deals between System Operators and flexibility providers should be strictly limited to situations where market-based procurement verifiably cannot deliver. To this end, the principles of Article 32 of the European Electricity Directive should be implemented very strictly.<sup>9</sup> Crucially, such deals should be time-limited and clearly targeted to the specific constraint only. Information on the existence of such deals, including their durations and prices, should be made public.

## 6. Conclusion: Getting started

With the emergence of decentralised generation and demand resources, the management of Europe's electricity system is moving to the next level. DSOs will need to become buyers and users of flexibility services, alongside TSOs and any market

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<sup>9</sup> Namely, any exceptions should be subject to regulatory scrutiny and apply only to situations where a market-based procurement is not economically efficient or would lead to severe distortions or higher congestion

participants. While the paper has laid out important principles for flexibility procurement, the biggest challenge is to start and test such markets and their products despite different uncertainties to date.

smartEn welcomes the roll-out of different trials and sandbox approaches with high involvement of market parties. Existing projects like NODES, ENERA, Piclo Flex, EPEX Spot Local Flexibility Platforms, ETPA/GOPACS and OMIE IREMEL help demonstrate the availability of relevant solutions and prove the market-based approach. A broader rollout and streamlining should be fostered progressively and sufficiently rapidly.

# ANNEX: Examples of sandbox cases

The Annex lists exemplary cases of services markets including the distribution level. Important lessons can be learned also from various balancing markets across Europe, as shown e.g. in The smartEn Map , European Balancing Markets Edition.<sup>10</sup>

## Example 1: NODES<sup>11</sup>

### About NODES

NODES, as an independent market operator, is addressing key trends and challenges in the energy system such as increased share of renewable power production, decentralised generation and the rapid change of the customer behaviour. NODES' vision is to build Europe's most customer-centric, integrated energy marketplace to unlock the value of local flexible power resources and support the drive to a sustainable, emission-free future. Nord Pool, Europe's leading power market, and the energy company Agder Energi are equal owners.

### How the NODES marketplace works

DSOs and TSOs may need flexibility on a local level in order to relieve the grid from specific congestions. In addition, BRPs might retrade committed flexibility with other BRPs which offer cheaper flexibility. These buyers will have to define their willingness to pay for activation of flexibility at particular "grid locations" and feed this information continuously into NODES via an API. The flexibility is made available by the flexibility providers who will act on behalf of the owners of the flexibility assets and feed these offers into NODES via another API.

The flexibility providers will need to have a business model with the asset owners in place, and technology that makes it possible to activate the flexibility of those who have bought it. For the majority of operating hours during a year the flexibility is not

needed locally at the actual grid location – often it is needed only a few hundred hours a year. But it can still have a value in the rest of the system, for balancing purposes by the TSO or in the ID market for the BRPs. NODES will establish an interface that makes the flexibility available for these markets. Flexibility providers can also differentiate their offers depending on whether the flexibility assets are sold locally or centrally.

Selling locally at one specific grid location in many cases can be riskier, as there are fewer alternatives if the seller needs to rebalance due to unforeseen unavailability of some assets. Contractual positions in the ID market are much easier to rebalance.

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<sup>10</sup> <https://www.smarten.eu/smartenmap-balancing-marktets/>

<sup>11</sup> <https://nodesmarket.com/>

Thus, the price for flexibility is foreseen to be cheaper in the ID market than at a specific grid location.

### Example 2: GoPACS<sup>12</sup>

#### About GOPACS

GOPACS is a new platform that has resulted from active collaboration between the Dutch national grid operator (Transmission System Operator, TSO) TenneT and the regional grid operators (Distribution System Operators, DSOs). It aims to mitigate capacity shortages in the electricity grid (congestion) and thus contributing to keeping the Dutch grid reliable and affordable.

#### How GOPACS works

Imagine that congestion is expected somewhere in the electricity grid. To solve this congestion, the grid operators would like to see a reduction in electricity production or an increase in consumption in this part of the grid, for example. Next, through GOPACS, a request for bids is sent to market parties. Market parties with a connection in this area can then place a suitable buy order on a connected electricity market platform. However, a negative impact on the national balance of the electricity grid is to be avoided due to this action to solve congestion. This is why the reduction of electricity production in the congestion area is combined with an opposite order from a market party outside the congestion area. GOPACS quickly checks if that order will not cause any problems elsewhere in the electricity grid of any of the participating grid operators. If all the lights are green, the price difference between the two orders will be paid by the grid operators. In this way, the two orders are matched on the market platform and congestion can be solved.

GOPACS works in a way that is consistent with key European directives that relate to market-based mitigation of grid congestion and offers large and small market parties an easy way to generate revenues with their available flexibility and contribute to solving congestion situations. The collaboration among the grid operators also prevents congestion in one part of the electricity grid from causing problems elsewhere in the electricity grid at one of the other grid operators.

For GOPACS the grid operators collaborate with the intraday market platform of ETPA. They are currently having talks with other market platforms to connect these to GOPACS as well. The other Dutch DSOs Enduris, Coteq and Rendo, support this initiative and are investigating how they can participate in GOPACS.

### Example 3: ENERA: EPEX Spot local flexibility markets<sup>13</sup>

#### About Enera

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<sup>12</sup> <https://www.tennet.eu/news/detail/dutch-grid-operators-launch-gopacs-a-smart-solution-to-reduce-congestion-in-the-electricity-grid/>

<sup>13</sup> <https://www.ewe.com/en/media/press-releases/2018/02/enera-project-ewe-and-epex-spot-to-create-local-market-platform-to-relieve-grid-congestions-ewe-ag>



Enera is a part of the development program Smart Energy Showcases – Digital Agenda for the Energy Transition (SINTEG) by the German Federal Ministry of Economic Affairs and Energy. Its goal is to develop and demonstrate scalable standard solutions with a high share of renewable energies over large “showcase regions” for an environmentally friendly, secure and affordable power supply.

Within the enera project, the energy group EWE AG and the European Power Exchange EPEX SPOT have launched a local market platform for flexibility sources together with the system operators Avacon Netz, EWE NETZ and TenneT. With this market platform, the project partners aim to efficiently tackle the issue of grid congestion. The market platform is available to system operators and flexibility providers of the project consortium. The goal of the cooperation is to develop scalable solutions in a showcase region, in this case in the windy Northwest of Germany, which can then be implemented on a much larger scale.

### **How the local market mechanism works**

Together with the enera project partners, EPEX SPOT and EWE aim to develop a clear and transparent market mechanism for flexibility providers who wish to participate in market-based congestion management. Locational order books centralize flexibility offers that can be used by TSOs and DSOs to alleviate congestions.

EPEX SPOT acts as a neutral intermediary between flexibility demand from system operators and suppliers active in the region, supervise price formation and guarantee a high level of transparency for this new market. All processes necessary on the side of flexibility suppliers and system operators to act on the market are set up in the project, allowing for a demonstration under real conditions.

### **Example 4: IREMEL - Integration of distributed Energy Resources through Local Electricity Markets**

#### **About IREMEL**

OMIE, the Spanish Iberian electricity spot Market Operator in collaboration with IDAE, Institute for the Diversification and Saving of Energy (Ministry for the Ecological Transition) launched the IREMEL project in order to facilitate and promote the implantation and efficient utilisation of Distributed Energy Resources (DERs) in distribution local areas. To validate the capabilities and advantages of the proposed model, IREMEL includes 5 pilots on local flexibility markets in different Spanish areas, with different participants and under different conditions.

The main goal of the project is to define and test a Market Model for the efficient integration of DERs (renewables, proactive consumers, storage installations, ...) and their participation in solving local congestions and DSOs' needs. This is to be achieved through their participation in the existing European electricity markets (Daily and Intraday) for the periods where no restriction exists, and in the local flexibility markets that would be created in case of necessity.



## How IREMEL works

IREMEL involves all the most relevant categories of participants: large and small DSOs, individual DERs, aggregation companies, proactive consumers, battery producers, tech companies, Energy Associations etc. All of them will participate in the different pilots in order to validate the correct functioning of the defined Market Model and the adequate possible alternatives to DERs participation, especially when a distribution network level congestion is detected by a DSO. Apart from DERs' participation in the existing European markets, the project will focus on the definition of the DSOs requirements and the capabilities of DERs to satisfy them through their participation in the Flexibility markets, benefiting from the market price signals to mitigate/relieve/remove the local problems on the grid, always ensuring the coordinated participation of DERs in the different markets.

In order to satisfy DSOs needs, two main sets of products are considered:

- Short term products that would be traded on demand, only when the need arises. All DERs would compete for a short term delivery, and there would not be a need for DSOs to ensure their long term commitment.
- Long term products for structural problems, where DSOs need to rely on the availability of one or several DERs to be able to react in a short term notice and need to contract this commitment for a long term period (month, months, year, ...).

The project includes the analysis and definition of information interchanges and procedures to follow between DERs, Aggregators, Markt Operator, DSOs and TSOs.

### Example 5: Piclo Flex<sup>14</sup>

#### About Piclo Flex

Piclo Flex was launched in June 2018 for buyers and sellers of flexibility in the UK. It is operated by Piclo, an independent software company. Currently, six DSOs in the UK are Piclo Flex members: UK Power Networks (UKPN), Scottish and Southern Electricity Networks, Electricity North West Limited, Northern Powergrid, SP Networks and Western Power Distribution.

#### How Piclo Flex works

Piclo Flex enables access for all types of DSO tenders on a single platform. Thereby, it enables streamlined procurement, dispatch and settlement.

In March 2019, the first flexibility tenders to deliver flexibility needs were organised by UK Power Networks on Piclo Flex. Contracts have been signed to deliver 18.1MW of flexibility.

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<sup>14</sup> <https://picloflex.com/>