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## *The emerging regulatory practice for new businesses related to distribution grids*

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### *Highlights*

- Activities related to new businesses, such as market facilitation (e.g. data hub operation), electrical storage, and electric vehicle- charging infrastructure are grey areas in regulation.
- In these grey areas, there is potential for a market approach, but there are also conditions which can prompt the involvement of DSOs.
- By taking stock of the emerging regulatory practice, we have identified the main elements that regulators need to consider when moving into these grey areas.
- If the approach is market based, the regulator needs to design the market; and check whether there is a need to correct market failures. To involve the DSOs is one way, but not the only way, to correct the market failures for new businesses.
- If the approach is to engage with the DSOs, the role of the regulator is to define the scope of the DSO involvement; to consider dedicated quality of service regulations for each of the new businesses that the DSO is involved in; and to make sure that the DSOs have sufficient incentives to innovate when investing in new businesses.
- The role of the DSOs in the energy value chain is diverging in Europe, which might be an issue for the ongoing market integration.

POLICY  
BRIEF

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## 1. Introduction<sup>1</sup>

Market and technology innovations are taking place in power systems, challenging the role of the more than 2300 Distribution System Operators (DSOs) in Europe<sup>2</sup>. The Council of European Energy Regulators (CEER) therefore conducted a consultation on the role of DSOs in new businesses related to distribution grids. In the conclusions paper<sup>3</sup>, many activities have been labelled as grey areas: there is potential for a market approach, but there are also conditions under which the involvement of the DSOs can be instigated.

The grey areas include activities related to electric vehicle-charging infrastructure, electrical storage, and market facilitation (i.e. activities related to the installation of data communication devices and data handling and management, such as the role of the data hub operator). Each of these activities merits a separate analysis as it concerns new technologies or new business models in existing markets, and also the development of new markets, but the contribution of this brief is to provide an overview of the issues that regulators need to consider when acting in these grey areas. Note that “regulators”, in this brief, refers to the legislators, the energy regulatory authorities and other competent authorities at the national level that shape the regulatory practice for the new businesses.

This brief can also contribute to the development of a more harmonised approach in Europe, even though there are good reasons for the different approaches. The market approach can fully enable the dynamic benefits from competition and innovation, but there can also be market failures, and involving the DSOs is one way to correct them. The national context determines the need for intervention, for instance, because the national energy policy might require an acceleration of the new businesses. The national context also conditions the appeal of the DSO intervention, for instance, because the consolidation and unbundling of DSOs differs widely across Europe. In what follows, we discuss the role of the regulator in the market approach and the DSO approach. We do that by taking stock of the emerging regulatory practice related to electric vehicle-charging infrastructure, electrical storage, and market facilitation.

1. This brief has been developed with support from the DSO Chair at Vlerick Business School with founding partners Alliander and Eandis.
2. Note that these DSOs are heterogeneous in size, ownership structure and unbundling levels.
3. [http://www.ceer.eu/portal/page/portal/EER\\_HOME/EER\\_PUBLICATIONS/CEER\\_PAPERS/Cross-Sectoral/Tab1/C15-DSO-16-03\\_DSO%20Conclusions\\_13%20July%202015.pdf](http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Cross-Sectoral/Tab1/C15-DSO-16-03_DSO%20Conclusions_13%20July%202015.pdf)

## 2. The role of the regulator in the market-based approach

If the approach is market based, the regulator needs to consider the design of the market for the new businesses. Regulation will also be needed to deal with market failures, and assigning a role to the DSO is one way to correct these market failures in the development of the new business related to distribution grids.

### 2.1 Designing the market

It is not always possible to have several players competing for the new businesses related to distribution grids. But, if competition in the market is not possible, the regulator can also consider designing a competition for the market by organising tenders.

The first market design option is competition in the market. Electrical storage has traditionally been considered to be a production activity that will compete in the market with other means of flexibility. In the case of electric vehicle-charging infrastructure, there is typically competition in the market for private locations, while this is not necessarily the case for the public domain where space is more limited. Sweden and the Netherlands are examples of countries that chose for competition in the market, as well as for public locations, but both countries do have city-level tendering for charging infrastructure. Market facilitation is typically a business with a limited number of players due to the positive network effects on the user side. Most countries have indeed chosen to assign the role of data hub operator to a single entity, so that there is no competition in the market, while there can be competition for the market.

The second market design option is competition for the market by organising tenders. The UK has tendered for the role of data hub operator for market facilitation, resulting in a Data Communication Company. Tendering for electric vehicle-charging infrastructure in the public domain has already been applied by cities. Tenders for location-specific flexibility to support the grid could be envisaged in the future distribution grids, as is already done for transmission grids via ancillary service contracts, and electrical storage could compete with other means of flexibility in these tenders. In principle, everything can be tendered for, but organising tenders is also costly, and these transaction costs are market failures that can motivate the regulator to consider alternative solutions, like giving a role to the DSO.

Note, finally, that regulators also need to reflect on the degree of unbundling that is required to create a level playing field in these markets. Some regulators are considering to revisit these



rules to take into account the increased importance of the DSOs in the value chain. Other regulators, dealing with the DSOs that are already independent from the incumbent utilities, are now applying rules to the commercial business they pursue in the grey areas. In the case of Alliander, the DSO in the Netherlands, this applies to a series of start-ups, like Allego which is active in electric vehicle- charging infrastructure, and EXE in market facilitation. In the case of UKPN, the DSO in the UK, this applies to UKPN Services, which is active in private grids.

To sum up, even if the market approach is chosen, there is an important role for the regulator in designing the market. The first choice to be made is competition *in* the market versus *for* the market. Other design choices to be made include the detailed market rules, like roaming for charging infrastructure, but this discussion is beyond the scope of this brief.

## 2.2 Correcting market failures

With market failures, such as high transaction costs, innovation spill-over effects, and other external costs, the new businesses might develop slowly; or not at all for some activities. National energy policies might also want to frame or replace the market for other reasons (as public service or political economy). Corrections are therefore typically about accelerating new businesses and introducing public service regulations.

The first type of corrections are measures to accelerate new businesses. In the case of electric vehicle- charging infrastructure, Sweden and the Netherlands are examples of countries where the context allows the regulator to wait and see if the market will develop. In Ireland, a small-scale rollout is being implemented by the DSO, as the country relies on electric vehicles to achieve its ambitious climate objectives. Note also, that there is only one DSO in the Republic of Ireland. Countries with more DSO consolidation will, indeed, more easily consider them as an interesting partner for market acceleration. In Italy, a DSO pilot as well as a pilot to test the market approach has been completed, and Belgium (Flanders) is also going in the direction of a DSO pilot for charging infrastructure. In the case of electrical storage, Italy and Germany are examples of countries that have accelerated the development of this new business. In Germany, this has been done by giving subsidies to homeowners to buy batteries in combination with PV-rooftop installations. In Italy, this has been done by allowing the TSO to invest in batteries in motivated cases. The DSOs have also been allowed to invest in battery pilots for demonstration purposes, for instance, in the UK and Italy.

The second type of corrections are public service regulations. In the case of market facilitation, countries will typically assign the role of data hub operator to a single entity with a universal service obligation. This can be implemented with a

market-based approach via a tender, as in the UK (i.e. Data Communication Company), or alternatively by mandating an existing third party, or with the DSOs or TSO expected to take up this role. The third party model has been followed in Italy (i.e. Acquirente Unico). The DSO model has been implemented in Belgium, which resulted in the creation of a joint venture data hub company (i.e. Atrias). Austria and France have legislation that goes in the same direction. The TSO model has been implemented in Denmark. Norway, Sweden, and Finland are going in the same direction; and Germany is also considering this approach. In the Netherlands, there is a joint venture in the form of a foundation that includes market parties, the DSOs, and the TSO (i.e. EDSN). In the case of electric vehicle-charging infrastructure, cities like Amsterdam, Berlin, and London have organised tenders to rollout infrastructure in the public domain. The city tenders typically include an obligation to invest in a certain number of poles within a certain time frame, which is similar to a universal service guarantee within the city context.

To conclude, the role of the regulator is not only to design the market, but also to correct the market failures, and the need for corrections are business and context specific. Assigning a role to the DSOs is one way to correct the market failures, but there are also alternatives, such as assigning a role to the TSO, giving subsidies to market parties, or imposing obligations on market parties.

## 3. The role of the regulator in the DSO approach

If the approach is to rely on DSOs, the regulator needs to reflect on the scope of the DSO involvement in the new businesses, and whether a combination of dedicated quality of service regulations and innovation incentives need to be implemented that are specific to the new businesses related to distribution grids.

### 3.1 The Scope of the DSO involvement

The scope of DSO involvement can be limited in terms of the infrastructure as well as the service dimension of the new businesses related to distribution grids.

The first issue, is the scope of the DSO involvement in infrastructures. In the case of electric vehicle-charging infrastructure, the DSO in Ireland is involved, but the assets have not yet been included in the regulated asset base. The costs have been recovered via the distribution tariffs, but kept in a separate company on a separate account. This means that the assets could easily be re-allocated to a market party if the regulator decided to go for a market- based approach after testing the



DSO approach. In the case of electrical storage, DSOs in the UK have invested in batteries, exempted from a generation license for capacities below 50 MW and possibly up to 100 MW in individual cases. Several other regulators have approved battery pilots in motivated cases, including in Italy, Finland and Germany. In the case of market facilitation, in-home display devices are increasingly considered to be devices that can be deployed behind the meter without DSO involvement.

The second issue is the scope of the DSO involvement in services. In the case of electrical storage, the UK introduced auctioning for battery capacity that is not used for grid services to avoid market distortions in a DSO pilot project. In Sweden, a DSO can own batteries, but it cannot operate them under its existing license. In the case of electric vehicle- charging infrastructure, DSOs can own and manage the assets, but the operation is a retail activity. In the case of market facilitation, the DSOs in Italy are not the data hub operators, but they do play a role in the validation of the data managed by the third party.

To sum up, an important role of the regulator is to determine the scope of the DSO involvement. This requires a careful assessment, and clear conditions that will typically be stricter for services than for the infrastructure dimension of the new businesses.

### 3.2 Quality of service regulations

Quality of service regulation for the new business can be introduced via a combination of minimum functionalities and Key Performance Indicators (KPIs).

The first approach is defining minimum functionalities. They are typically needed to prevent the DSOs from installing technology that allows them to capture operational benefits, without enabling the potential benefits for other market parties and society. In the case of market facilitation with smart meters and data hubs, regulators typically require the DSOs to use non-proprietary communication protocols. In the case of electric vehicle- charging infrastructure, regulators will typically need to put in place multi-vendor requirements when they allow DSO involvement. In the case of electrical storage, regulators can require the DSO to auction the capacity of the unused batteries to support the distribution grid.

The second approach is to introduce KPIs. In the case of market facilitation with data hub operators, KPIs typically relate to the speed and accuracy of the data service. In Belgium, KPIs are being discussed between the DSOs and the suppliers, which will then need to be approved by the regulators. Non-compliance with these KPIs will result in penalties being paid by the DSOs to the suppliers. In the Netherlands, there are no penalties, but there is a form of sunshine regulation because KPIs have to be

published. In France and Austria, the law that assigns this role to the DSOs, also includes the KPIs that have to be met.

To conclude, most regulators already have quality of service regulations in place, but it is important to include dedicated regulations for the new businesses. These regulations will typically consist of minimum functionalities for the infrastructure dimension of the new businesses, and KPIs for their service dimensions.

### 3.3 Innovation incentives

The DSO incentives to innovate when investing in new businesses will typically be a combination of internal and external incentives.

The first type of innovation incentives are internal. Among the more than 2300 DSOs, there are leaders and laggards in innovation. For the leaders, innovation is a company strategy that can be motivated by corporate responsibility; and/or by the aspiration to expand the DSO role into new businesses. DSOs are also increasingly contested in their monopoly role (e.g. the emergence of private grids and micro-grids) and can expect to be more contested if they do not innovate quickly enough. Of course, even if there is a strong internal motivation to innovate, the DSO remains a regulated entity for which the regulatory framework determines to what extent the innovation strategy of the DSO is financeable. By allowing DSOs to develop commercial activities in grey areas, under certain conditions, regulators also increase the innovation incentives of DSOs.

The second type of innovation incentives are external. So-called incentive regulation for DSOs has been successful in mimicking competitive pressure with incentives to improve cost-efficiency and incentives to improve quality. The DSOs have achieved these improvements by innovating, but the innovation that is now required from the DSOs to enter into new businesses typically spans several regulatory periods, which is more difficult to capture in incentive regulation. Some authorities have therefore introduced dedicated R&DD budgets for DSOs. This is the case in Finland, Ireland, and Italy. The challenging task for the regulator is then to monitor whether the money is well-spent. The alternative is to rely on national and EU R&DD funding bodies. In countries like Germany, Sweden, and the UK, the DSOs compete with other players for funding. The funding agencies select and monitor the innovation projects, which relieves the energy regulator from this task. In Sweden, they can fund the entire project. In Germany, they typically only fund part of the project, but the DSOs can then ask the regulator to approve most of the remaining costs. At EU level, the Strategic Energy Technology Plan is an instrument that contributes to the identification of projects that need



funding; it is also an instrument that tries to coordinate innovation efforts in Europe.

To conclude, if the approach is to rely on the DSOs, the regulator needs to make sure that they have adequate incentives to innovate. The innovation incentives will come from the regulatory framework, but the company strategy is also significant.

#### 4. Shedding some light on the grey areas

By taking stock of the emerging regulatory practice related to electric vehicle- charging infrastructure, electrical storage, and market facilitation, we have identified the main elements that regulators need to consider when moving into these grey areas.

If the approach is market based, the regulator needs to design the market (i.e. competition *in* the market versus *for* the market with tendering); and needs to check whether there is a need for correcting market failures. Involving the DSOs is one way, but not the only way, to correct the market failures for new businesses.

If the approach is to involve the DSOs, the role of the regulator is to determine the scope of the DSO involvement (the infrastructure and service dimensions); to consider dedicated quality of service regulations for each of the new businesses that the DSO is involved in (minimum functionalities for infrastructures and KPIs for services); and to make sure that the DSOs have sufficient incentives to innovate when investing in the new businesses (company strategies and regulatory frameworks).

Our analysis in this brief has shown that the role of DSOs in the energy value chain is diverging in Europe, which might be an issue for the ongoing market integration. The extent to which we need a more harmonised approach must be considered for each of the new business separately, which is the next step in our research.



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