

**LCE-04-2017**  
**Innovation Action**



# flexitranstore

An Integrated Platform for Increased FLEXibility in smart TRANSmision grids with STORAge Entities and large penetration of Renewable Energy Sources



*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774407*

## D3.1 Regulatory framework Analysis to Support Wholesale Market Flexibility

<b>Report Identifier:</b>	D3.1		
<b>Work-package, Task:</b>	WP3	<b>Status – Version:</b>	Version 1.2
<b>Distribution Security:</b>	CO	<b>Deliverable Type:</b>	R
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<b>Quality Reviewer:</b>			
<b>Keywords:</b>			
Project website: <a href="http://www.flexitranstore.eu">www.flexitranstore.eu</a>			

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# Summary Report

## 1.1 Scope of deliverable

WP3 aims to increase wholesale market flexibility by developing a proposal for an enhanced market design focusing on the integration of renewables, promotion of regional collaboration to accelerate market coupling activities in the SEE region (including the establishment of a liberalised electricity market in Cyprus) and the transition to a low carbon future using flexibility sources. This report comprises the deliverable for Task 3.1. It is a gap analysis on current and proposed regulatory frameworks for technical and financial aspects of flexibility services.

## 1.2 Concept and Background

The current electricity market regulation contains certain provisions on flexibility. Although significant codification efforts have been engaged recently, the core aspects of the market design remain unchanged. Certain initiatives allowing flexibility services have been voluntarily introduced by a limited number of member states, but these efforts remain an exception. The need to reform market rules has been identified and the necessary actions for the adoption of a regulatory reform have been initiated in order to harmonise market rules at EU level.

## 1.3 Methodology and key activities

We conducted market analysis of existing and emerging flexibility business models and enabling technologies. We proposed a four-quadrant model for the future focus of an enhanced market design and provided examples of emerging business models relating to each. We included an analysis of the ideal enabling environment for business models for system flexibility and identified factors that support or prevent business model implementation in Europe.

We analysed the regulatory framework in Europe and identified gaps that exist in implementing the flexibility models. We described the impact of the gaps and made recommendations for change that would need to take place at European level. We presented the state of play matrix and made recommendations on next steps for the Flexitranstore project.

We analysed the market framework and settings in Europe and identified gaps that exist in implementing the flexibility business models. We described the impact of the gaps and made recommendations for change that would need to take place at European level.

## 1.4 Key results/findings

There are a number of routes to market for flexibility. There is evidence of regulator and TSO-led changes to procurement to encourage flexibility, including those that allow smaller players to participate, changes to market resolution, and new product development, for example related to frequency response. The role of the aggregator and demand response has been established in some, but not all markets. There are also TSO-DSO projects underway in some countries. However, there are still significant barriers to providing additional flexibility, including distortion of market signals caused by existing subsidies, regulatory and political support for existing forms of generation, and a lack of clarity on rules relating to flexibility in balancing, wholesale, and capacity markets.

Contemporary electricity systems are based on 'top down' control, regulation and trading. This hierarchical approach does not reflect the state of modern technology that is available to the electricity network. Smart technologies and distributed generation create opportunities for new value propositions in the wholesale electricity market. In spite of the emerging opportunity, power and energy markets continue to be dominated by traditional generators and traditional utilities, and in many markets in Europe it remains very difficult for small scale producers or suppliers to compete with incumbents. Products are also defined in a way that favours traditional actors.

Analysis has highlighted insufficient intra-day liquidity, or in some cases a lack of or partial implementation of the intra-day market. There is inadequate market coupling, with misalignments in gate closure times, differing products, and differing rules between markets. Time frames are defined in a way that do not allow RES to participate as sources of flexibility, meaning that the market before gate closure is dominated by traditional generators, utilities or near monopolies inherited from nationalised energy sectors. There is also increased reliance on SO to balance electricity system using ancillary services. The XBID project may address this issue for countries within it.

Operational and financial support is provided to RES producers on a national basis. RES generation may impose negative externalities on neighbouring countries including increased grid management costs from loop flows; increasing price volatility; and reduced trade opportunities. Considering cross-border trading of energy from renewable sources is constrained, it further increases local impact of RES and intensifies need for flexible solutions.

These factors indicate that the full scale capability of flexibility resources is not being taken up. There is a lack of churn in markets, restrictions to new entrants and inconsistent demand signals. Flexibility options are also primarily limited to those available in-country which reduces choice and increases costs. Governments continue to pick winners, for example through capacity auctions, and have a tendency to choose existing solutions.

## 1.5 Conclusions

This report comprises the deliverable for Task 3.1. It is a gap analysis on existing and proposed regulatory frameworks relating to the techno-economic support for flexibility services. It focuses on analysis of the current and proposed regulatory frameworks in order to identify regulatory gaps in the current situation regarding technical and financial support for flexibility services. During subsequent WPs, solutions will be proposed for a new approach to wholesale markets which supports both individual and combined flexibility services.

In the short term, the analysis has identified that priorities are changes to wholesale markets and ancillary services remuneration with an emphasis on grid stability and cross border interconnection. Improvements are required in all areas where wholesale energy transactions take place, including forward, day ahead, intra-day, balancing and ancillary services markets.

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From a technology point of view, demand response is a potential 'quick win' that can be achieved without significant investment in new infrastructure. A legal framework exists at EU level, but there is still a significant discrepancy between the provisions in the legislation and implementation in practice, with demand response often limited to the largest providers. Electrical energy storage technologies have the potential to provide highly effective ways of absorbing net load variability. However, in spite of the gains made by alternative technologies, the most widely used form is mechanical. Distributed generation such as combined heat and power is well positioned to increase power system flexibility because of its suitability for relieving network congestion and providing ancillary services.

Deliverable 3.1 provides a basis for future work within the Flexitranstore project. WP3 should continue regulatory analysis focused on each demo site to understand impact of regulatory barriers on practical implementation of commercially viable flexibility products and technology. It should also jointly conduct

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commercial analysis with demonstration sites – it should assess commercial signals available to flexibility products offered by sites in the existing regulatory frameworks, and assess their impact on IRR / investment targets.