



NEWSLETTER #1

Introduction to Dominoes

The DOMINOES concept is making the combination of a local energy market structure and supporting aggregation & demand response services transparent and effective so that it will be possible to enable local sharing and optimization of renewable resources in MV and LV grids. The project will empower prosumers and demand response service provision. The DOMINOES project aim is to create relevant and liquid flexibility for innovative distribution management.

DOMINOES is a different kind of market development project since we are focusing into interoperability of flexibility resources instead of local optimization. Without a proper market design, part of the flexibility value will be lost, and resources wasted. It can be seen that we are moving from centralized markets to internetworked communities and there are already local markets appearing. DOMINOES tries to solve how DSO can actively manage grid balance in emerging future.

European Utility Week

Dominoes will be present in the European Utility Week that will be held in Paris Expo Porte de Versailles between the 12th and 14th of November, 2019 (<https://www.european-utility-week.com>). The European Utility Week offers an end-to-end European energy experience for the whole energy supply chain, from power generation through to end-use, under one roof. The event is a business, innovation, networking and information platform and is seen by the industry as their terrain. Industry uses the event as their annual meeting place to thrash out strategies and do business to help drive efficiencies in meeting their sustainable development goals.

Visit the Dominoes project stand located at M70.p1

Summer school

DOMINOES held a summer school integrated in the Artificial Intelligence in Power and Energy Systems (AIPES) thematic track at EPIA Conference on Artificial Intelligence at Vila Real, Portugal on September 3rd-6th, 2019. EPIA is focused on research in all areas of Artificial Intelligence (AI), covering both theoretical/foundational issues and applications, and the scientific exchange among researchers, engineers and practitioners in related disciplines. **Event video** [here](#).

DOMINOES project also held a 90 min special session and panel discussion on local electricity markets, including their drivers, limitations, and market design at EEM 16th International Conference on the European Energy Market at Ljubljana, Slovenia on September 18th- 20th, 2019. EEM is a well-established international conference in Europe concerning energy markets. **Event video** [here](#).



Local market model, initial results

First release of the DOMINOES scalable local energy market architecture

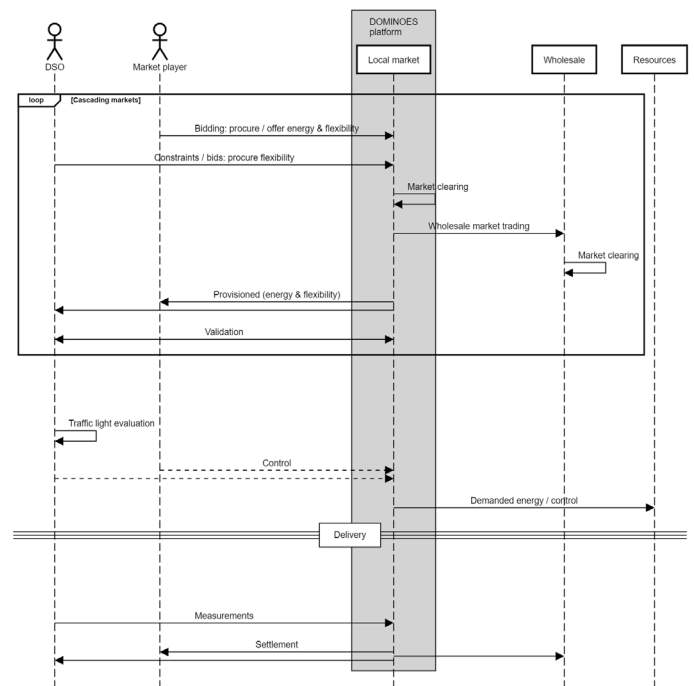
The DOMINOES local market model has been released. The [deliverable](#) describes the required components and processes required for the operation of a local marketplace. The deliverable first explores different approaches for local distribution grid management using transactive methods based on existing research literature and ongoing projects. In the report, the requirements of the DOMINOES concept are then evaluated and a local market concept is proposed.

The concept for the local market has been iterated in collaboration within the diverse DOMINOES consortium with the help of a local market game. The game was used as a tool for simplifying the complex issue and for setting a common starting point for discussion. The market game will be iterated for wider use outside the consortium when the market model has been further enhanced.

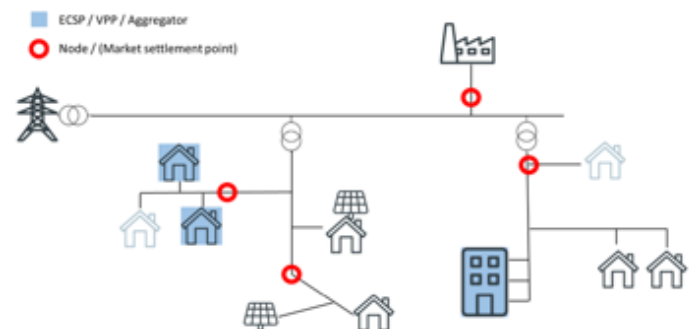
The core of the market design is the aim to develop a market structure/mechanism that:

- enables local sharing, and optimization of renewable resources in MV and LV grids
- creates relevant and liquid flexibility for innovative distribution management
- empowers prosumers and demand response service provision

These targets are going to be reached with the DOMINOES model which is compatible with wholesale markets while embracing the potential of distributed resources. Sequential markets while avoiding overlap with existing markets will enable the cascading use of the resources in a hierarchical manner, starting from local use. In addition, extending the concept of balance responsibility to a smaller scale will enable the network operator to precisely procure flexibility in case of need and provides incentives for the inclusion of locational information in trading. These choices enable a scalable solution which can utilize existing infrastructure and services for auxiliary services such as market analysis.



Simplified outline of the DOMINOES local market operation sequence



Topology information in the market model

Use Cases

Project defined five different use cases that define the scope of the project and will help to identify how the results of this project could be implemented. Use cases are also used in designing the local market infrastructure and business models.

- UC1** Local market flexibility and energy distributed resources for optimal grid management: Focus on the optimization of distribution network operation using flexibility
- UC2** Local energy market data hub manager and technical validator of market transactions: behaviour of the Data Manager (DM) and Technical Validator (TV) at local market
- UC3** Local community market with flexibility and energy asset management for energy community value: The objective is to validate the retailer's activities as local market manager
- UC4** Local community flexibility and energy asset management for retailer value: Investigate and validate how retailers can take advantage of the flexibility
- UC5** Local community flexibility and energy asset for management for wholesale and energy system market value: Aggregation of resources from communities for the benefit of the energy system for some services.

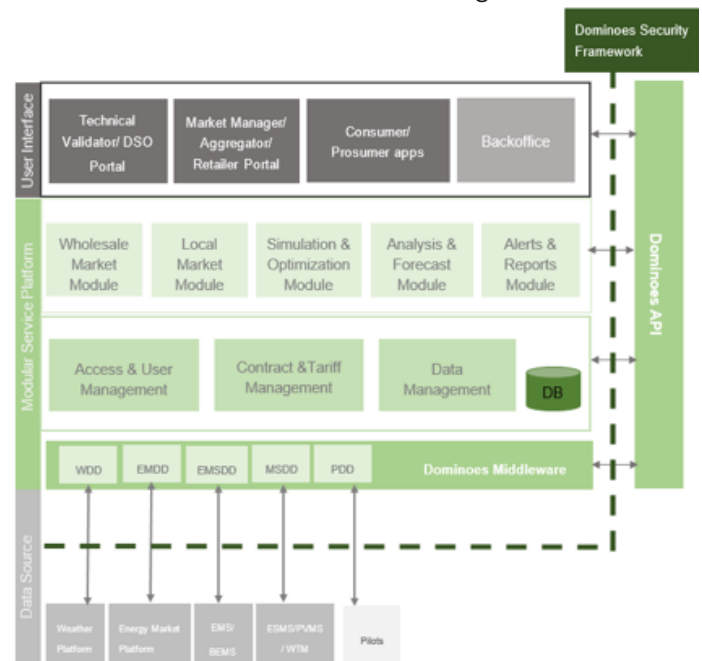
The [deliverable](#) D1.3 Use Cases and application scenarios requirements describes more in detail the work methodology and the scope, objectives, description, KPI's, use case diagrams and actors of all the five use cases.

Architecture DOMINOES

One of the results of project is the DOMINOES Reference Architecture. It includes the definition of the main ICT platform components and how they communicate to meet interoperability, reliability and data protection requirements.

A logical view, comprising the static approach of the system, presenting all the architectural system elements that provide the different functionalities for the final users, was detailed in the project deliverable. The key diagram is here presented:

The architecture diagram present a logical decomposition of the system into smaller manageable components with well-defined responsibilities (in terms of data handling) and interfaces (in terms of data exchange).



Architecture diagram.

In general terms, the proposed architecture for the DOMINOES platform is firstly subdivided in three distinct layers. At the bottom, the Data Source layer comprises the external operational platforms and data systems that will be used as information providers and also as interfaces with the physical world. In the middle, the Modular Service Platform comprises the core data processing components of the system and data storage. At the top, the User Interface layer comprises the web and mobile applications used by the end users.

DOMINOES Implementation Plan Consortium

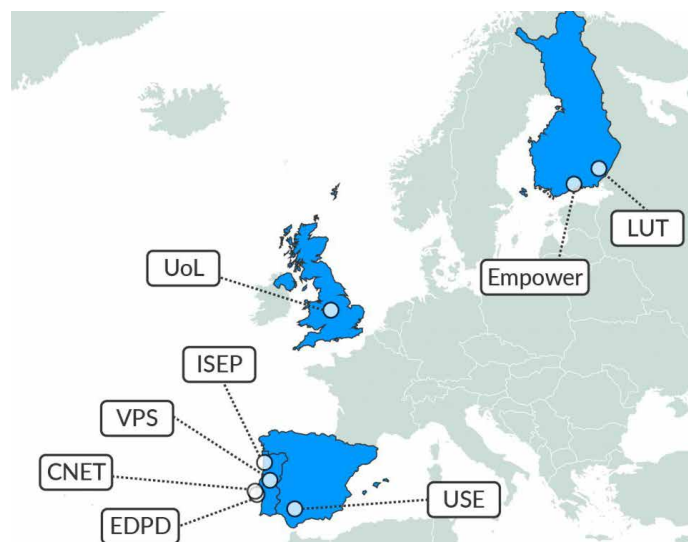
During the last period, an implementation plan for Dominoes' validation activities was created. There were defined KPIs which will assess the project development. These KPIs were organised according to its main target:

- Progress related KPIs – to measure the successful implementation of the project goals
- ICT framework related KPIs
- Operational and business related KPIs – to evaluate the implementation of the UCs and monitor the performance of the results

The implementation plan defines where each of the use cases will be validated in the 3 validation environments:

- Use cases 1,2 and 3 in both Évora and VPS environments
- Use case 4 in VPS and use case 5 in LUT Environment.

Then the requirements and the developments responsibilities for each demonstration were set and an implementation plan designed according to each demo site's needs. The demonstration activities are scheduled to start next year, but until then, the partners will work to prepare the validation and the demonstration activities in the 3 environments according to the specification and requirements defined in the Implementation Plan.



Facts

DOMINOES Smart Distribution Grid: a market driven approach for the next generation of advanced operation models and services

- Timeline 1.10.2017-31.3.2021
- Budget: 4 M€

Partners: Empower (coordinator – Finland), EDP (CNET and EDP Distribuição – Portugal), ISEP (GECAD - Portugal), Lappeenranta University of Technology – LUT (Finland), VPS (UK), University of Leicester – UoL (UK), and University of Seville (Spain)

Info

The DOMINOES project aims to enable the discovery and development of new demand response, aggregation, grid management and peer-to-peer trading services by designing, developing and validating a transparent and scalable local energy market solution.

Contact

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