

**EUROPEAN TASK FORCE FOR THE IMPLEMENTATION OF SMART
GRIDS INTO THE EUROPEAN INTERNAL MARKET**



SGTF EG3

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Business-As-Usual (BAU) Market Model

SGT-EG3 delegate: Marielle Liikanen, EIS Sweden/CEER

Description of the model

The electricity markets operating today in member states have developed over many decades from different starting points and to meet different objectives. While there are commonalities between them there are also material differences.

The Third Package is designed to strengthen the commonalities and enhance the single market for electricity. The core provisions of the Third Package can therefore be seen as today's BAU market model. These provisions relate: to the unbundling of Transmission System Operators (TSO); the establishment of single, independent national regulatory authorities (NRA); the promotion of co-operation between NRAs and TSOs; the development of common, legally binding network codes; and the promotion of smart metering.

However, the provisions of the Third Package still allow quite different approaches to market models to be pursued and this can be seen particularly in the different approaches to smart metering.

The BAU market model is:	The BAU market model is not:
- As described by the provisions of the Third Package, is a high level 'framework' designed to further liberalise the European energy markets to offer consumers more choice and better value for money while ensuring supply security and meeting environmental targets	- It is not a model that prescribes in detail how markets should operate

Benefits for consumers

The BAU market model takes an essentially 'top down' approach to the development of the single market with a focus at TSO level. This is also demonstrated by the development of common network codes which is being led by the TSOs through ENTSOe. It is expected that the benefits of more active cross-border trading will filter down to consumers. However, the 'top down' approach is balanced by consumer protection provisions relating to customer bills and the contents of supply contracts, as well as the time for which supply data must be retained. It also stipulates that it should take a consumer no more than 3 weeks to switch its electricity or gas provider.

Implementation

The EU Third Package legislation on European electricity and gas markets came into force on the 3rd September 2009. It required member states to implement the legislation by March 2011.

The 'top-down' provisions are very much about cross-border issues and are being developed across member states on a common basis. However, the consumer and smart meter provisions are much more specific to individual member states. The flexibility allowed in the Third Package is being used so that implementation of these provisions is showing material differences between member states.

The diagrams below describe the structure of the BAU model in terms of: the physical components, information flows and commercial transactions.

The BAU Model

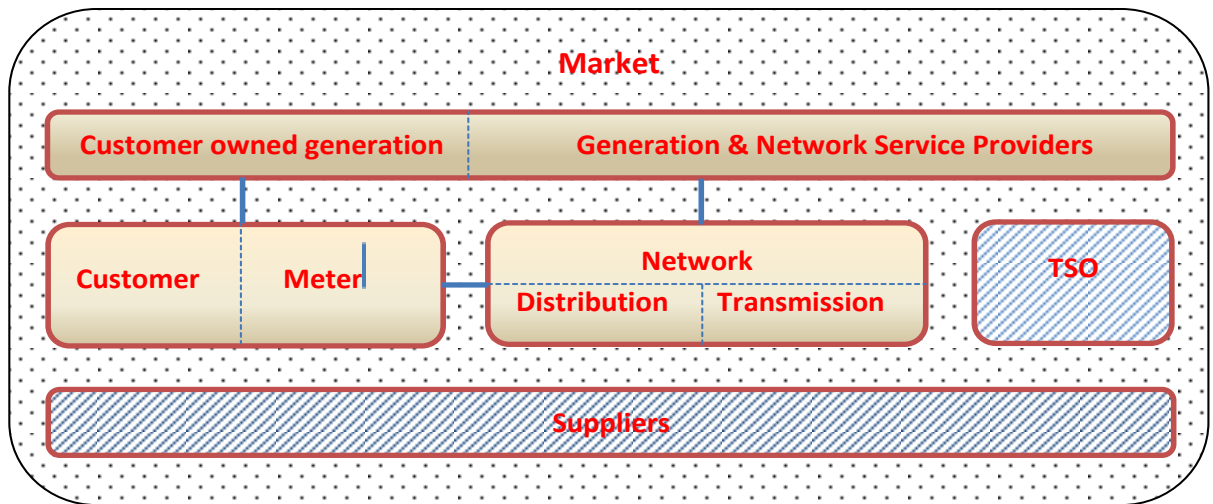


Figure 1. Physical Component Layer

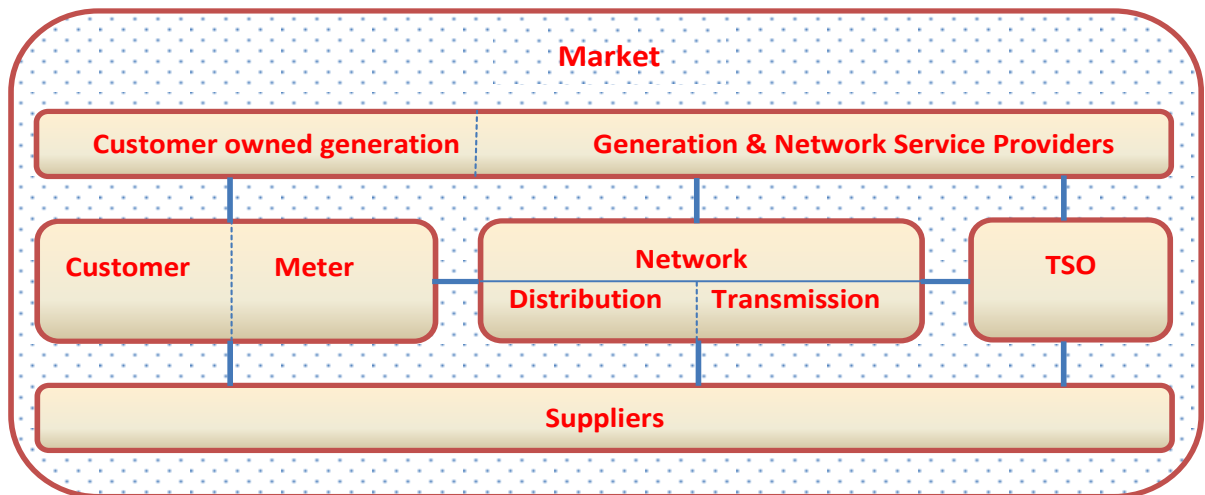


Figure 2. Information Layer

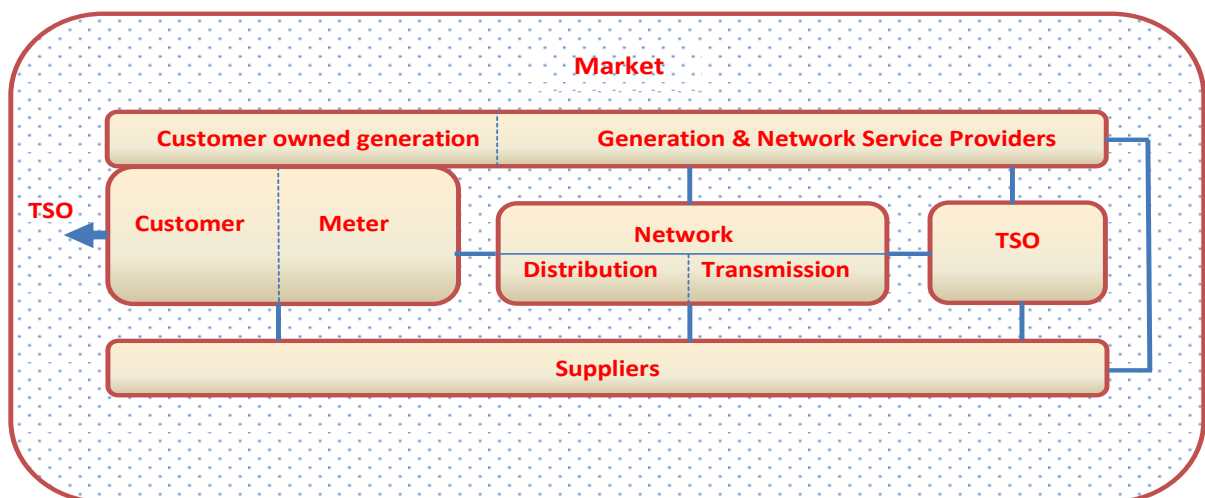


Figure 3. Commercial Transactions Layer

Case I: DSO as Market Facilitator

SGTF-EG3 delegate: Gunnar Lorenz, Eurelectric

Description of the model

The DSO as market facilitator model favours a model based on a data hub, which is the standardized centralized or decentralized point for the market parties to collect relevant data about customers, their technical possibilities, their consumption and production, etc. The DSO provides this data to the market via the data hubs, as a regulated neutral market facilitator in a non-discriminatory manner. It is up to the market parties to enrich this data with other information (e.g. price signals, tariffs, etc.) in order to create new innovative services. For data security and privacy reasons customers will always be the owner of their 'personal' data and have to approve if data should be sent to third parties.

DSOs are the operators of the technical infrastructure, including data hubs and the enablers of new value-added services, i.e. they are in charge of reliable operation of the distribution grid and act as neutral market facilitators for generators and suppliers.

The DSO Market Facilitator is:	The DSO Market Facilitator is not:
- A model that allows DSOs to provide a platform on which market players can build innovative businesses: value creation on top of smart grids	- A model that requires significant changes to regulation, supervisory mechanisms and has large transition costs (to implement a number of new systems, market processes and interfaces)
- A model with ownership and control by DSOs of the (de)central data hub with clear partnership options with ICT and Telco providers	- It does not fragment integrated market processes (like switching) into multiple complex sub-processes and information flows managed by separated agents
- It complies with the 3rd Energy Package	- It does not prevent synergies from the management of both the grid (quality of supply) and its associated data

Benefits for consumers

- **High quality** - The aggregated data for consumers is centrally or de-centrally stored; this enables effective verification and validation of **privacy, quality and security around customer data** in a regulated environment.
- **Neutral** - The **neutrality of data handling** by DSOs within this model towards all suppliers guarantees a level playing field and thus promotes competition in the electricity market.
- **Transparent** - Improved **transparency and clear responsibilities in public/ private cooperation**: lean and to the current system compatible processes will result in less adjustment costs, higher efficiency and transparency. The DSO is and will be the only market role that is constantly available and therefore has the needed information of the system users.
- **Cost-effective** - The data originating within the operations and organisation of the DSO is also directly controlled and used to efficiently effectuate the market facilitating role. Therefore additional data transaction costs are avoided. In other words, the market model guarantees **cost-effectiveness**.

Implementation

A trend towards information exchange through such data hubs can already be observed within the EU: some countries have already implemented it (e.g. the Netherlands (Central hub), the Czech Republic) or decided to adopt it (e.g. Belgium); others have decided to adopt it just for some processes such as switching (e.g. Austria, Italy, Spain). This does not mean, however, that data hubs should necessarily be nation-wide. Several decentralised hubs per member state are also conceivable.

Case I: DSO as market Facilitator

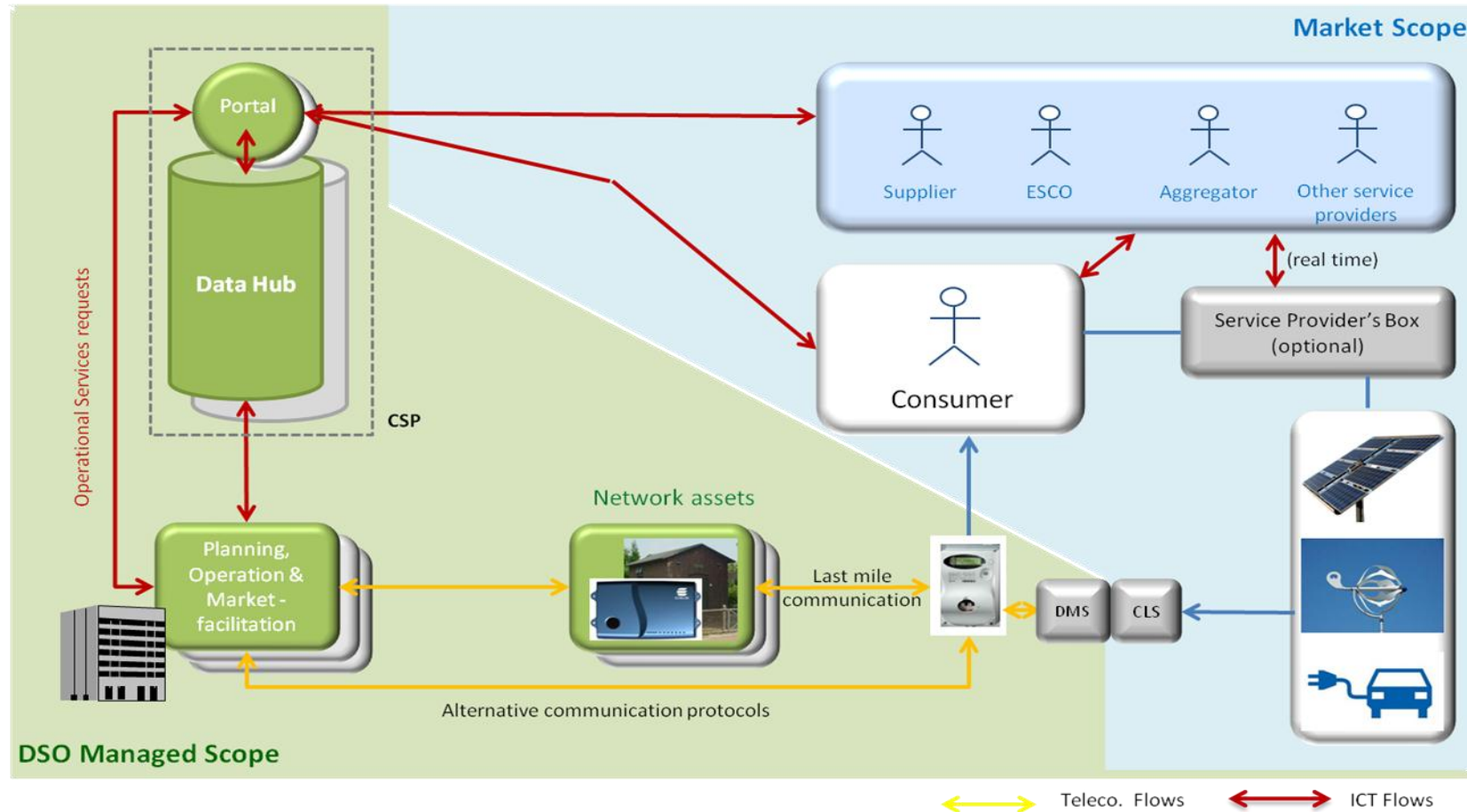


Figure 4. Case I: DSO as market facilitator – high-level model overview

Case II: Third Party Market Facilitator (Independent Central Hub)

SGTF-EG3 delegate: Alicia Carrasco, eMeter – Siemens

Description of the Model

This model consists of an independent central communication and data hub that will interact with different smart grid stakeholders, storing data and processing it. This will allow equal access by all market participants to meter data facilitating the market in a neutral manner, as the third party is by definition an independent one. The key functions of the hub are access control, receiving data from different parties and delivering it to the authorized parties, as well as aggregation and data storage for retrieval of historical data or tailor made services by end consumers, or their authorized agents, which could be electricity retailers, energy service companies, aggregators or other Services Providers

The Third Party Market Facilitator is:	The Third Party Market Facilitator is not:
<ul style="list-style-type: none">- It is a communication hub that ensures only authorized parties receive and send data	<ul style="list-style-type: none">- The hub is not a metering service. DSO metering and communications systems perform better when the DSO is responsible for data collection, data quality, timeliness and data delivery
<ul style="list-style-type: none">- It is a regulated agent, with oversight by a governmental agency or body. Its responsibilities have to be clearly defined and limited	
<ul style="list-style-type: none">- It could be responsible for the processes of supplier switching, meter data distribution to market participants and aggregation of data for use in market settlement, avoiding unnecessary or redundant data movements between market entities. It will not only pass data and charge for it, but it will process, aggregate, synchronize and redistribute it	
<ul style="list-style-type: none">- It can be sized for data needed by other parties in addition to the DSO	

Benefits for consumers

Case II offers several advantages: Independence, economies of scale and equal access, effectiveness for smart grid deployment, regulatory control, existing precedents, stakeholder support and bridging possibility towards other forms of regulation.

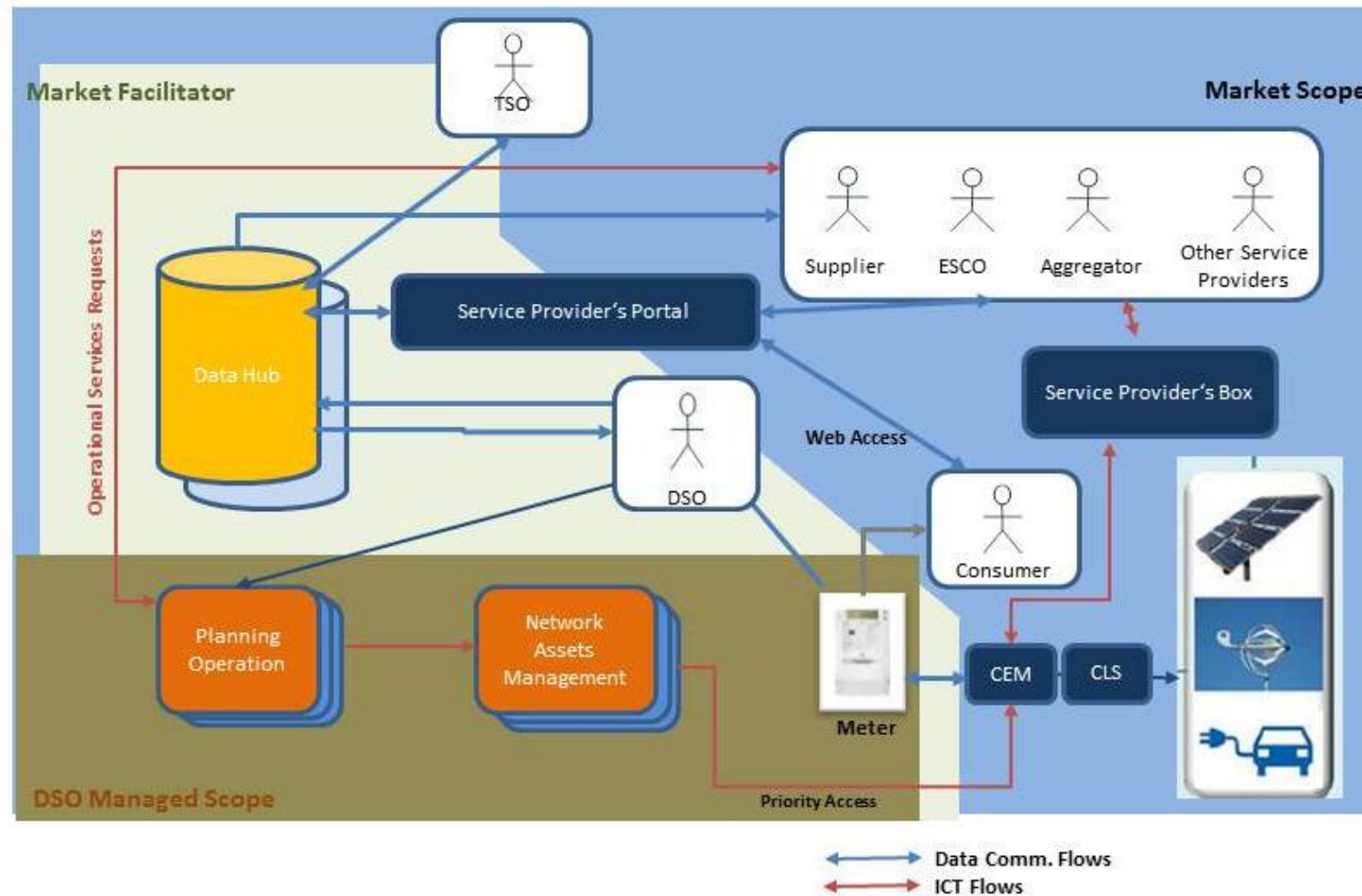
Example of how Case II could facilitate existing processes: Supply Switching: The new supplier would communicate and prove to the Central Hub (CH) the desire of the customer to switch suppliers, then the CH would stop sending data to the old supplier and begin sending data to the new supplier. This will shorten the current switching supplier process, enabling consumers to go shopping for the best supplier's offer, with no switching hassles and avoiding long switching periods due to the unwillingness of the old supplier to lose the client or inefficiencies in the administrative steps needed to switch suppliers.

This model shows a good performance empowering consumers to actively participate in the energy system through demand response, due to the fact that retailers have easy access to information.

Implementation

Supporters of a central communication and data hub: UK, Estonia, Denmark, Poland, Nordic Exchange Markets and Italy. Other international supporters: Province of Ontario in Canada, State of Texas, and Ecuador, among others. Some countries will have a *de facto*, central hub, because there is only a single DSO that will have responsibility for collecting and distributing smart meter data. Ireland is an example.

Case II: Third Party Market Facilitator (Independent Central Hub)



CEM: Customer Energy Management

CLS: Controllable Load System

Figure 5. Case II: Third Party Market Facilitator (Independent Central Hub)

Case III: Data Access-Point Manager

SGTF-EG3 delegate: Thomas Weisshaupt, Cinterion

Description of the model

The DAM market model foresees the creation of a trusted Data Access-Point Manager (DAM) – a commercial role that shall be played by certified companies. This Data Access-Point Manager is designed to handle access to data and remote management of functionalities needed to create value added programmes within the Smart Grid.

The Data Access Point Manager shall provision and prioritise rights of any regulated and non-regulated market actor (service providers and consumers) via any implemented communication network over the whole lifetime of a relevant smart grid resource.

As a consequence, a suitable mechanism for handling the information and functionalities from a wide range of new and existing devices connected to the grid is required. This mechanism must allow for connections, updates, disconnections and localization of devices, including data and functionality information - without requiring the entire system to adapt and/or without developing single purpose regulatory frameworks.

The DAM concept is:	The DAM concept is not:
- A model that provides fair, open and secure access to data and functionalities of devices on the field level to various actors	- A model that fixes the contribution of the resources to the smart grid at the date of installation
- It adds the role of a certified service provider acting in a competitive environment	- It does not add a regulated actor being a geographical or resource domain monopoly
- It ensures consumer and citizens' rights on privacy and investment security	- It does not hold and handle energy data (e.g. as clearing house) centrally
- It eases devices integration and accelerate time to market of innovative technologies and services	- It does not create new regulatory structures for each type of device or business model

Benefits for consumers

Consumers can benefit by having the freedom of choice to participate in demand-side programs or to invest in resources in order to keep their energy cost stable. One example could be that a rooftop PV owner sells his production to a Virtual Power Plant (VPP) provider – after a certain time, the owner decides to take part in a micro-trading local market. The DAM would organise the de-provisioning of the VPP- and the provisioning of a micro trading scheme without touching the physical infrastructure. In the long run, the DAM would ease the process of switching suppliers by provisioning services and applications for suppliers directly to the smart metering system. The pre-requisite for the DAM would be the standardization of access, provisioning and security architectures of the smart grid.

Implementation

Elements of the DAM are already in use or being developed within certain European markets. For example, the UK's SMETS 2, (on the process side), and, Germany's BSI protection profile (on the technology side), both take elements of the DAM into consideration within Smart metering regulation. An abstraction towards the multi application environment is required to bring the DAM model to a better level of maturity. Other technological domains already deal with millions of connections and dynamic application management - within a multi-stakeholder ecosystem. These include mobile telecoms or near field communications in mobile payment systems. They demonstrate the technical feasibility of the DAM and point to lessons learned for the DAM model. It is undisputable that the physical foundation of the smart grid requires a proper analysis of analogies and differences. We invite the interested public to investigate the potential of the DAM model to foster a citizen driven, cost effective paradigm change in energy markets.

Case III: Data Access Point Manager (DAM)

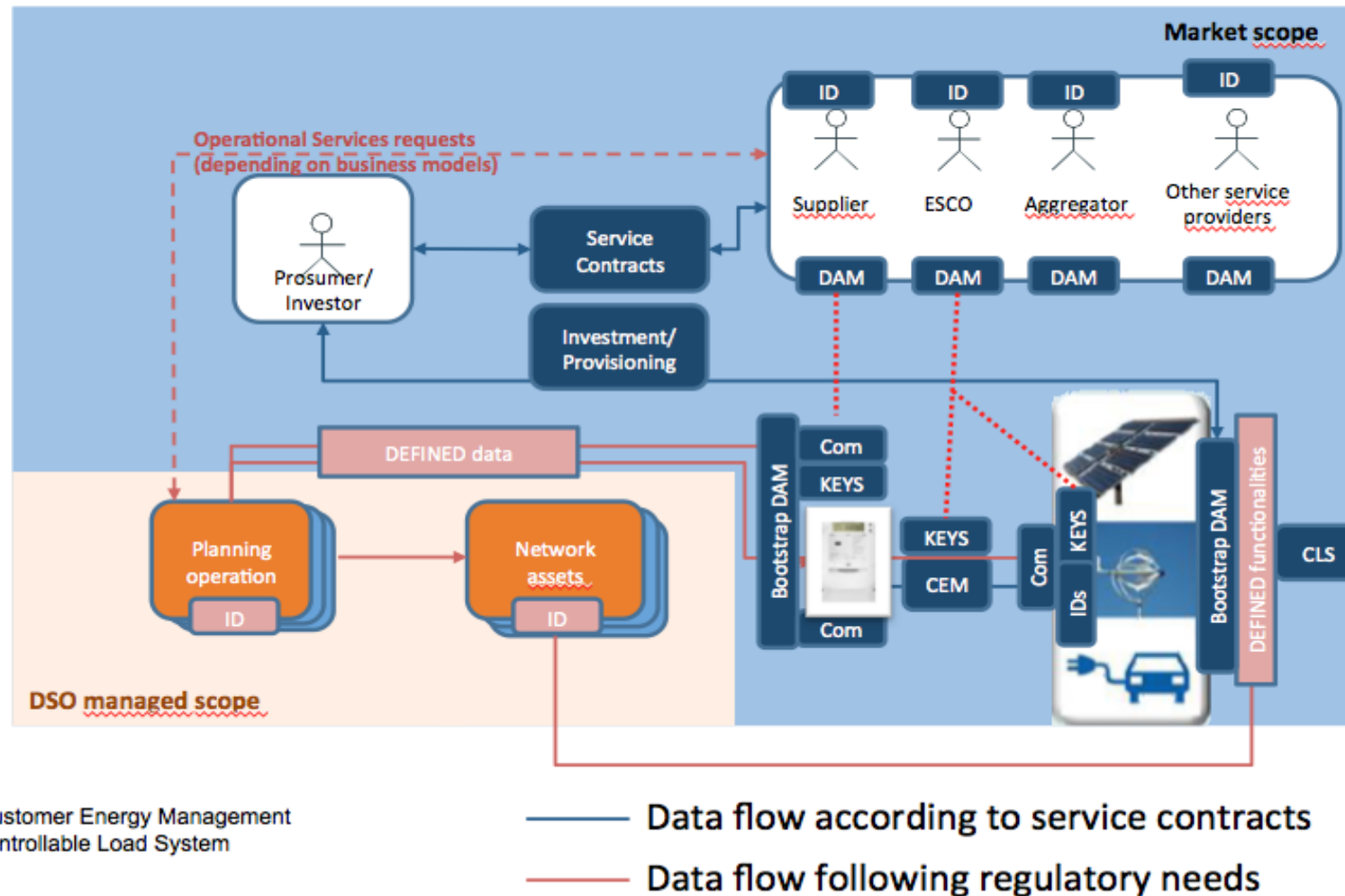


Figure 6. Case III: Data Access Point Manager (DAM)