Damas MMS

Market Management System

- **Providing comprehensive support for business and technical processes of transmission system operators, HVDC interconnectors, and market operators.**
- **Managing the system balance using balancing services.**
- **Purchasing balancig services in tenders.**
- **Operate day-ahead and intraday markets.**
- **Keeping records of contracts, providing balance evaluation and settlement.**
- **Cross-border transmissions and congestion management.**
- **Communicating with market participants, authorities, and energy community.**
- **Working with plans, real-time operational data, and evaluations, including advanced optimisation and analytical functions.**
- **Compliance with EU legislation, full support for ENTSO-E standards, and compatibility with ENTSO-E operation rules and ACER regulations.**
- **Automated operation and process management.**
- **Exceptional flexibility and sustainable system upgrading and development.**
- **Extensive customisability to provide support for clients' specific processes and environments.**
- **Integration to Microsoft Office.**
- **State-of-the-art web technology.**

Damas MMS is a comprehensive information system for energy market management, designed and developed to meet the needs of transmission system operators, HVDC interconnectors, and market operators in open energy market environment.

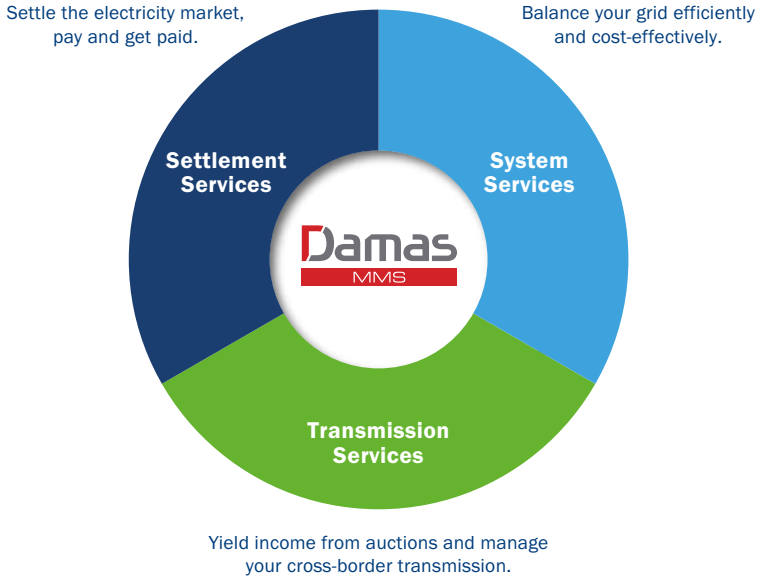

Fig. 1 – Basic Damas MMS Subsystems

In business terms, the major added value provided by Damas MMS is its full coverage of business and technical processes in the balancing services market, energy markets, their evaluation and settlement, as well as management of international energy transmissions, congestion management, and international cooperation (see Fig. 1). Also, Damas provides support for all phases of transmission system operators' and market operator's activities, from forecasting, to long-term planning and purchasing, to day-ahead and intraday markets and operation scheduling, to evaluation, settlement, and invoicing.

Damas MMS was designed to meet particularly the following requirements: an easily scalable solution using a modular concept, open architecture with extensive configurability, high flexibility to quickly adapt to changes, high performance, high reliability and availability, transparency and security, standardised interfaces to external environments, and last but not least, a great user interface.

Damas MMS fully supports market processes of transmission system operators in the following areas:

- **System Services** – Keep the system in balance with efficient use of balancing services while maintaining security and minimising costs.
- **Transmission Services** – Profit from capacity auctions and control cross-border flows.
- **Settlement Services** – Settle and bill for energy market transactions, pay and receive payments.

System Services

Transmission system operators use system and ancillary services to ensure high quality and reliability of power supply on a national transmission system level and to meet their international obligations and conditions for interconnection of systems on an international level.

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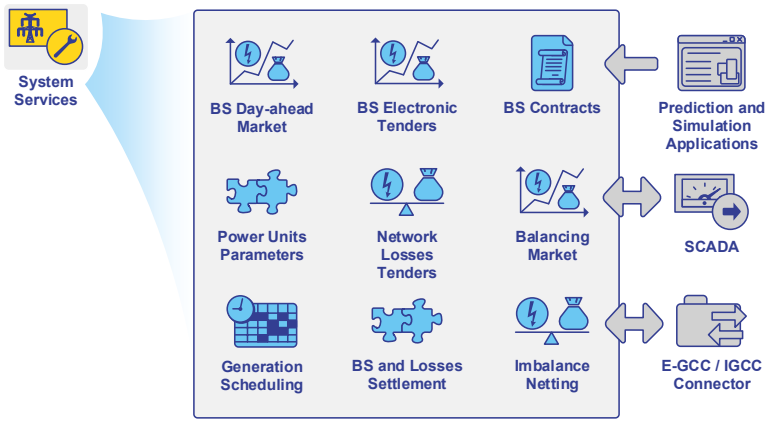

Fig. 2 – System Services Subsystem

Fig. 4 – Transmission Services Subsystem

The quality involves mainly frequency and voltage parameters, as defined by Grid Codes pursuant to ENTSO-E RGCE standards (see Fig. 2).

Balancing Services

- Full support for procurement of balancing services: forecasting and defining plans of needs, determining demand, purchasing in long-term and short-term tenders and in the day-ahead market, keeping records of contracts signed with providers (see Fig. 3).
- Certification and administration of technical parameters for generation and consumption units providing ancillary services.
- Planning the operation of each transmission system based on operation schedules of generation units.
- Evaluation of provided ancillary services in terms of quality parameters.

Balancing Energy

- Purchasing balancing energy in day-ahead and intraday balancing markets.
- Support for regional balancing energy markets (GCC, TERRE).
- Evaluation of consumed balancing energy obtained from activation of ancillary services and other sources (e.g. from abroad).
- Communication with the SCADA, metering systems, DataHub, BI/DWH and other technical applications.

Network Losses

- Purchasing energy to cover transmission system losses.
- Evaluation and settlement of losses.

Transmission Services

This subsystem provides support for all activities related to cross-border energy transmissions and congestion management, including capacity nominations and allocations (see Fig. 4).

Principal functional areas of transmission services include:

- Capacity calculations based on grid models.
- Long-term, day-ahead, and intraday allocations of transmission capacities in both explicit and implicit auctions.
- Management of PTRs, including the integration with auction offices (e.g. JAO)
- Secondary market (capacity resale and transfers).

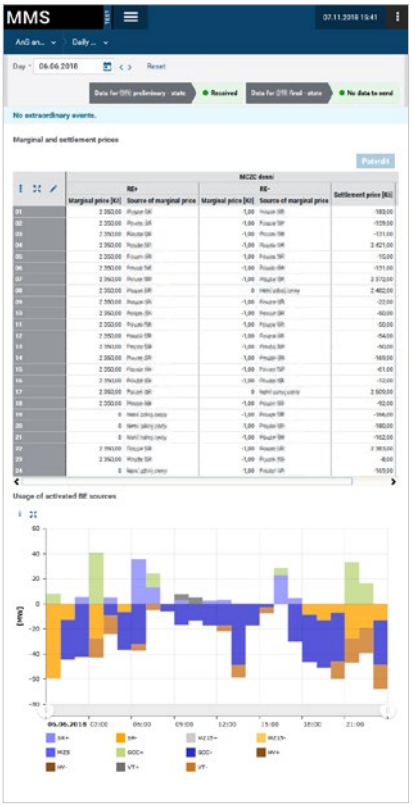

Fig. 3 – Control Dashboard of Imbalance Netting Process (GCC)

- Nomination management, including international matching (on regulation area, unit, and zone levels).
- Special nominations (trading between two TSOs, compensations, etc.).
- Real-time transmission reduction and capacity curtailment.
- Risk management and financial security.
- Automated data interchange with market participants and appropriate authorities.
- Support for HVDC technology – special features for DC connections including integration with HVDC interconnector protection and management systems, namely with our Interconnector Network Control Application (INCA).

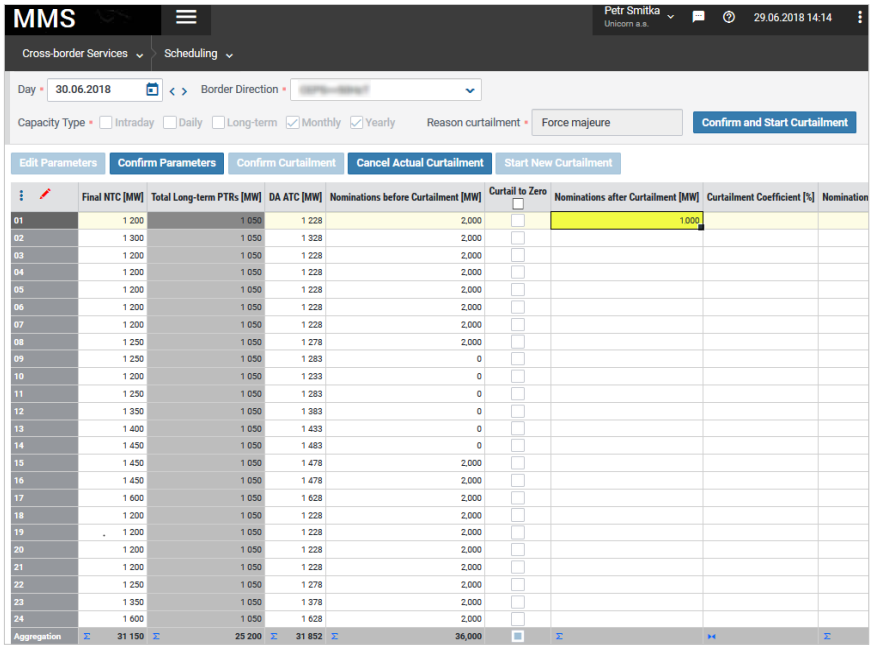

Fig. 5 – Transmission Services (Nomination Curtailment)

Damas MMS is fully compatible with established industry standards (ENTSO-E regulations, ESS and ECAN data standards). As a part of its preparation, legal issues have been thoroughly studied to ensure that the system provides the maximum possible security and meets requirements of EU legislation, while it still remains easy to use for its users and third-party integrators. Communication with neighbouring transmission system operators using the MADES (ECP) standard is supported, as well as integration with the ENTSO-E Transparency Platform.

Settlement Services

This subsystem of Damas MMS covers all processes and activities associated with market operators' responsibility to physically and financially evaluate and settle business transactions (see Fig. 6). This includes the following major functional domains:

- Receiving and processing bilateral trades between balance responsible parties (BRPs) using the ESS standard.
- Checking scheduled volumes against available financial security (risk management).
- Aggregating metered values and regulation energy data.
- Calculating the total system imbalance, amounts of imbalances, and prices for each BRP.

Furthermore, this subsystem provides settlement services for all other subsystems and their commodities (ancillary services, regulation energy, PTRs, losses, fees, penalties, etc.) and its outputs include regular (daily, monthly, annual) aggregated payments transferred to accounting and invoicing systems. Naturally, it provides automation of claim settlement processes. All relevant data can be analysed, in order to generate user-defined reports (see Fig. 7).

Benefits of Damas MMS

- **Industry and technical know-how** – Full support for business and technical processes based on our deep knowledge of the energy industry acquired from dozens of projects implemented across Europe since 1999.

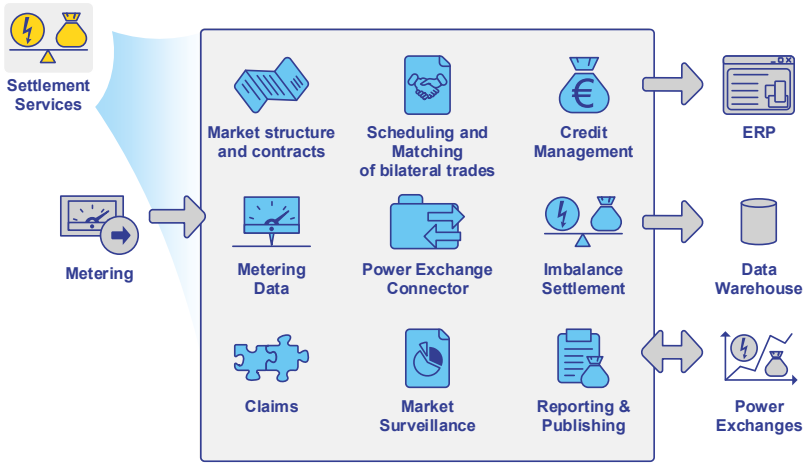

Fig. 6 – Settlement Services Subsystem

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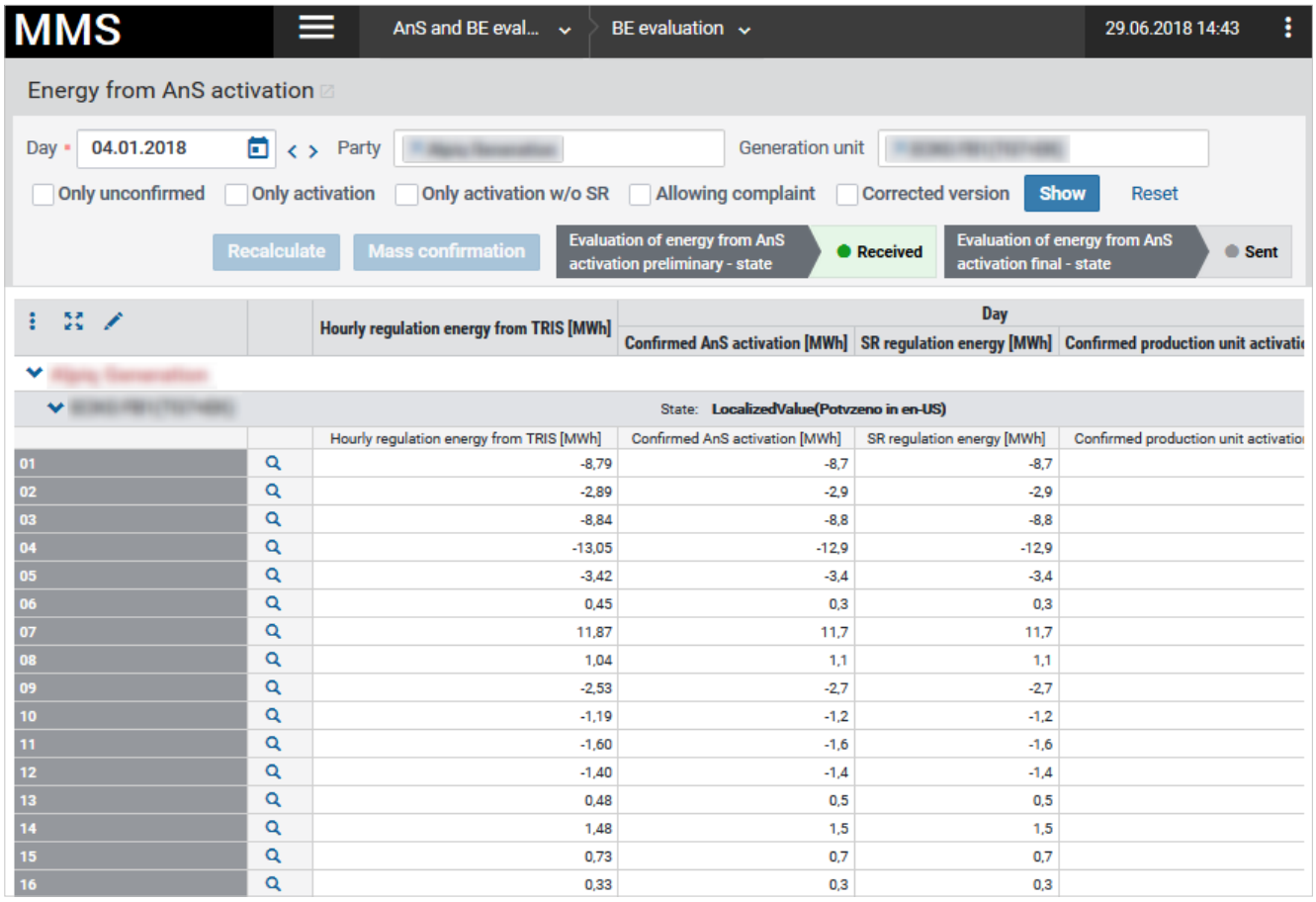

Fig. 7 – Evaluation

- **Quick delivery** – A solution based on a balanced combination of off-the-shelf product configurations and implementation of specific needs.
- **Long-term perspective** – Long-term product development and upgrading, with its roadmap reflecting current opportunities, technology developments, and changes to applicable legislation.
- **Openness** – Extensive data and process integration options.
- **Flexible licensing policy** – Based on solution modularity and providing the optimum licensing model for any client.
- **Web-based architecture** – No need to install client workstations; multiplatform solution.
- **Modern, ergonomic user interface** – Rich payload and excellent response times.

References

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- **ČEPS, a. s.**
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- **EMS Elektromreža Srbije**
- **eSett – Nordic Imbalance Settlement**
- **National Grid plc**
- **OST (Operatori i Sistemit te Transmetimit)**
- **PTC SEE CAO LLC**
- **Réseau de Transport d'Electricité (RTE)**
- **Slovenská elektrizačná prenosová sústava, a. s.**
- **Swissgrid AG**
- **TenneT TSO GmbH**
- **Terna Rete Italia S.p.A.**
- **Transelectrica – Romanian National Power Grid Company**
- **UKRENERGO**

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