



Comprehensive
tools for reliable grid
operations and fully
competitive markets

HITACHI
Inspire the Next



Network Manager

Market Management System

The most advanced and comprehensive market management solution for modern electricity markets

Challenges



Pricing and efficiency

Are you able to realize the benefits of efficient markets that enable feasible market schedules, accurate price signals, lower dispatch costs and zero market power? Can you avoid transferring costs to consumers while potentially achieving billions in savings to maximize social welfare for your consumers?



Distributed energy resources (DER)

Are you able to fully integrate renewable resources into forward and real-time markets to respond quickly to surplus or deficit conditions? Are you able to efficiently incorporate demand-side participation in markets?



Market evolution

Can you support regional market integration across both highly AC-meshed and/or HVDC connected grids to avoid inefficiencies and added costs? Does your market maintain adequate capacity and reserves? With growing availability of data, does your market have improved situational awareness across the system?



System reliability, resilience and maintenance

Can you maintain seamless and reliable market operations that achieve near-zero interruptions and reduce lifecycle costs?



Automate processes

Can you develop effective and repeatable processes across market-related functions to enable operator and IT staff to make better informed decisions?

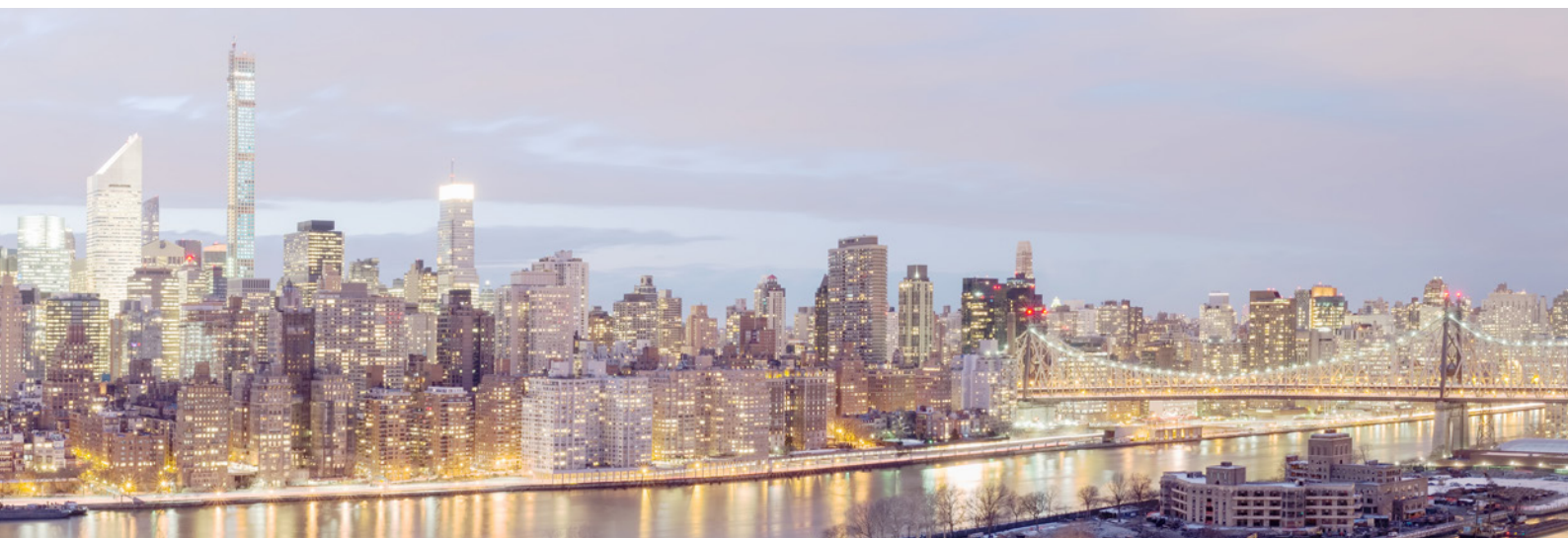
Enable efficient market and system operations worldwide

Market and system operators worldwide are responsible for reliable grid operations and efficient administration of open and competitive wholesale electricity markets. This involves mission-critical control of the transmission network and efficient markets, in order to maximize the social welfare of the end-customer.

Network Manager includes a set of advanced applications and a modern IT infrastructure that supports a wide range of market-related functions performed by market/system operators worldwide. The solution provides market clearing and congestion management for nodal and zonal markets for forward, day-ahead, week-ahead, intraday and real-time/balancing timeframes.

Network Manager offers the flexibility and scalability required by market/system operators around the world. The system is built on an open architecture and industry standards, and is designed to support a wide range of market designs and environments. It includes advanced modeling and MIP/LR optimization methodologies to meet stringent performance criteria demanded by the largest and most sophisticated markets globally. It readily adapts to ever-evolving market rules and business practices with minimal rework and near-zero downtime.

Innovative solutions from Hitachi Energy have been implemented worldwide for maximum operational flexibility and economic benefit for our customers and their stakeholders.



Key features

Advanced applications

- Day ahead, intraday, real-time balancing and forwards for zonal and nodal markets
- Security constrained unit commitment and economic dispatch field-proven methodologies
- Co-optimization of energy, ancillary services, virtuals and transmission rights
- Smart grid features such as DER demand response, storage and renewables
- Multi-interval optimization, fully automatic and secured solution post-contingency corrective scheduling, phase angle regulator optimization, cross-border integration and demand forecasting
- Modeling for ramping, CCGT plants, hydro/pumped storage, jointly owned units and others
- Thousands of N-1 and N-x contingencies, special transmission protection schemes, graded switching between DC (incl. non-linear) and AC solutions for reliable market clearing
- ILFC for loop flow coordination and mitigation, OMS for generation and transmission outage management, TRACE for flow based coupling full network model with CIM/XML and MTS for market training simulation integrated with dispatch training simulator (DTS)

Market trading

- Energy, ancillary services, transmission rights, capacity and virtual
- Participant registration, market rule administration, real-time publishing and dispatch messaging
- ENTSO-E systems and protocols, enterprise integration/system services, market surveillance, meter data acquisition, commercial reconciliation – settlements, prudential risk, accounting and billing

In many cases, Network Manager provides IT solutions where none had previously existed. This spirit of innovation has produced a number of firsts in the industry. This includes pioneering work by Hitachi Energy, such as incorporating phase shifters within dispatch and scheduling optimization, as well as co-optimization of energy, ancillary services and financial transmission rights in bid-based market clearing. Most recently, this has included advancements in preventive optimization to yield lower scheduling and dispatch costs.

Key benefits

Accurate pricing and efficiency

- Accurate price signals for generation, load and demand response
- Improves system reliability and increases operation efficiency
- Market convergence for integration across borders and different market timeframes
- Lower dispatch and scheduling costs

Innovative and flexible technology

- Pioneers ground-breaking innovation worldwide by embodying best available technologies
- Adopts international standards such as ENTSO-E, FERC, NERC and IEC to provide a foundation for sustained progress
- Incorporates MIP and hybrid solvers for accuracy and performance
- Manages renewables integration and demand response to enhance market efficiency

Best value to meet current and future needs

- Modular/open system design
- Flexibility to adapt to new rules and operational needs
- Supports incremental growth/investment as and when necessary
- Offers lowest total cost of ownership through scalability and flexibility

Excellence in execution

- Exceptional experience and on-time delivery track record
- Selected by leading ISOs around the globe

For over 20 years, Hitachi Energy has established itself as the leading supplier of complex, mission-critical solutions for the restructured electricity industry. Every project we have taken on has been implemented on time. Our track record, coupled with superior technology and commitment to R&D, continues to make Hitachi Energy the partner of choice for market and system operators worldwide.



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