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ENERGY

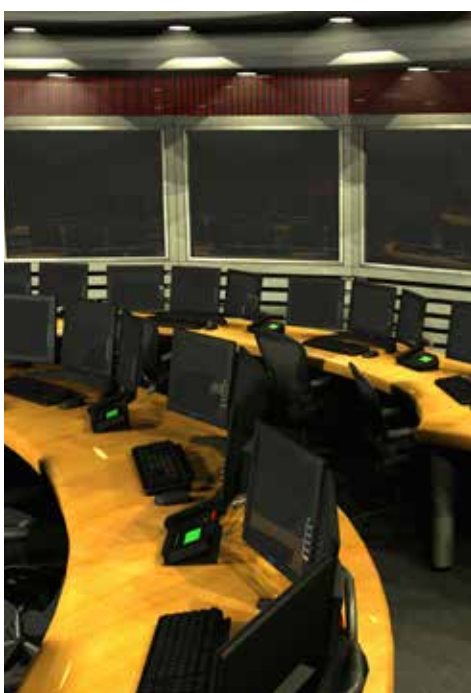
ENERGY TRADING AND RISK MANAGEMENT (ETRM) PRACTICE

Indra in energy wholesale markets

indracompany.com



ENERGY TRADING AND RISK MANAGEMENT (ETRM) PRACTICE



Indra in Energy Wholesale Markets

Liberalization of energy markets transformed the business of traditional companies, leading the emergence of new agents and business needs. Competition, exposure to market risks, process complexity, integrated multi-commodity operations, have resulted in an unprecedented change to this sector.

Indra has been an early actor in this global process, accompanying and supporting key actors through this transformation process, in our role of consultant and system integration company.

This early involvement has allowed us to have a global view of the evolution of the energy sector and its companies, having executed

relevant projects in several geographies in Europe, the Americas, the Middle East and Asia-Pacific through the implementation of solutions for Market Operators, ISOs and Trading companies.

Long lasting relationship with our customers is our best credential, and our experience is our greatest asset.

Projects in Energy Management Systems:

- Energy Planning, Optimization and Simulation
- Demand Forecasting
- Trading
- Contracts management (BackOffice)
- Market Nominations
- Metering
- Settlement
- Logistics



Energy Trading and Risk Management (ETRM) Practice in Indra

In the Mediterranean Region and Latin America, Indra is the market leader Company in terms of ETRM projects and experiences.

Indra has been implementing ETRM projects since the energy market's deregulation wave in the 90's. Initially, through the development of customized systems, and later with the introduction of third party ETRM solutions.

With the experience acquired, Indra has organized and developed an ETRM Practice to consolidate the knowledge and skills acquired over the years, using self-developed and third-party products.

ETRM Systems include functions used in the Front, Middle and Back Office:

- Data Management and Time series data systems.
- Management systems for commodity trading: Power, Natural Gas and LNG, Oil and derivatives, Coal, bio-fuels and other commodities, financial derivatives.
- Contracts and trades management.
- Logistics Management and nominations
- Optimization and risk management
- Settlement, Billing and accounting
- Reports and risk control

Indra has established a network of Centers of Excellence:

- Madrid (Western Europe)
- Colombia (Latin America)
- Prague (Central and Eastern Europe)
- Houston (USA)
- Manila-Sydney (Asia Pacific).

Over 80 ETRM consultants are assigned to these centers.



In 2008 Indra signed a partnership agreement with Allegro as System Integrator, to deliver consulting and implementation support for Allegro software. Since then, Indra has worked in various Allegro implementation projects in Europe, America and Asia.

In 2011, Allegro Development awarded Indra with the distinction of "Partner of the Year" as System Integrator.

Indra ETRM services



ETRM on-site Services

- On-site (or near-shore) functional support
- Project Management Office (PMO)
- Requirements analysis- Business partner
- Service Manager
- Training



ETRM Specialized Services

- Gap analysis
- Configuration of new functionalities
- Design of extensions
- Development and integration of optimization models: Optimization



ETRM Development Services

High quality off-site development services at our Software Labs Network :

- Extensions
- Interfaces (ERPs, CRM,...)
- Reports

In addition to our Centers of Excellence, Indra's ETRM Practice relies on 3 ETRM Software Development Factories to satisfy our clients' needs in terms of development of interfaces and extensions. These software factories are located in 3 different continents and can therefore provide 24x7 services:

- Madrid-Ciudad Real (Spain)
- Manila (Philippines)
- Bogota (Colombia)

These three factories share the same technical architecture, methodology, good practices, etc



Integration with forecasting, Planning and Optimization Tools

In the increasingly complex and changing environment that it is the energy sector, it is crucial to have tools that allow systematically minimizing risks as well as maximizing operation margins.

To achieve those objectives INDRA integrates in its ETRM implementations advanced mathematical forecast, simulation and optimization modules that allow to:

- **Anticipate** the evolution of key business energy variables over which we have no control. Ex: Reservoirs inlet forecast, generation from other producers, wind generation, demand, market prices.
- **Evaluate** the expected business alternatives, identifying alternatives economic and technical impacts and risks.
- **Optimize** and plan our processes continuously ensuring that all possible alternatives are evaluated and optimal solutions are consistently chosen.

The use of SOA architectures allows a seamless integration of these advanced modeling tools in the ETRM platform, boosting our customers planning business processes: data entry automation, extensions development, algorithms and models integration, ERP's integration.

Forecasting Models

- Demand.
- Generation by technology
- Contributions to reservoirs
- Market prices and volatilities.
- Generation costs.

Optimization Models

- Logistic optimization
- Generation Dispatch.
- Exploiting watersheds

Simulation Models and Evaluation

- Energy balances.
- Financial projections and cash flows
- Evaluation of operational and financial risk.





Since the establishment of our partnership with Allegro, in 2008, Indra has executed a substantial number of successful projects in the Americas, Europe and Asia.



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without notice