



indra

SMART ENERGY

SMART GRID SOLUTIONS

More than 140 Utilities companies worldwide make
use of Indra Solutions

indracompany.com



SMART GRID SOLUTIONS



Integrated Solutions for Smart Grid Management

Electrical **supply's sustainability, competitiveness and security** challenges lead to a profound transformation of power management.

This transformation requires the integrated management of all network resources: generation, demand, storage and network devices

Driven by the dynamics of the new energy environment and relying on its deep business and technology experience, **Indra has developed a comprehensive vision of Smart Grids based on four basic principles:**

FLEXIBILITY

To meet changing customer needs, responding quickly to the changes and challenges ahead

ACCESSIBILITY

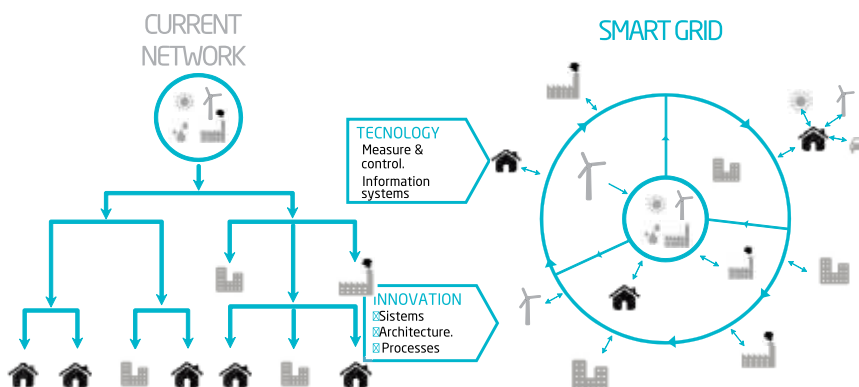
Allowing free access to all network users (open and interoperable communications).

RELIABILITY

Ensuring the safety and quality of the power supply, minimizing the risks and uncertainties in real time

OPTIMIZATION

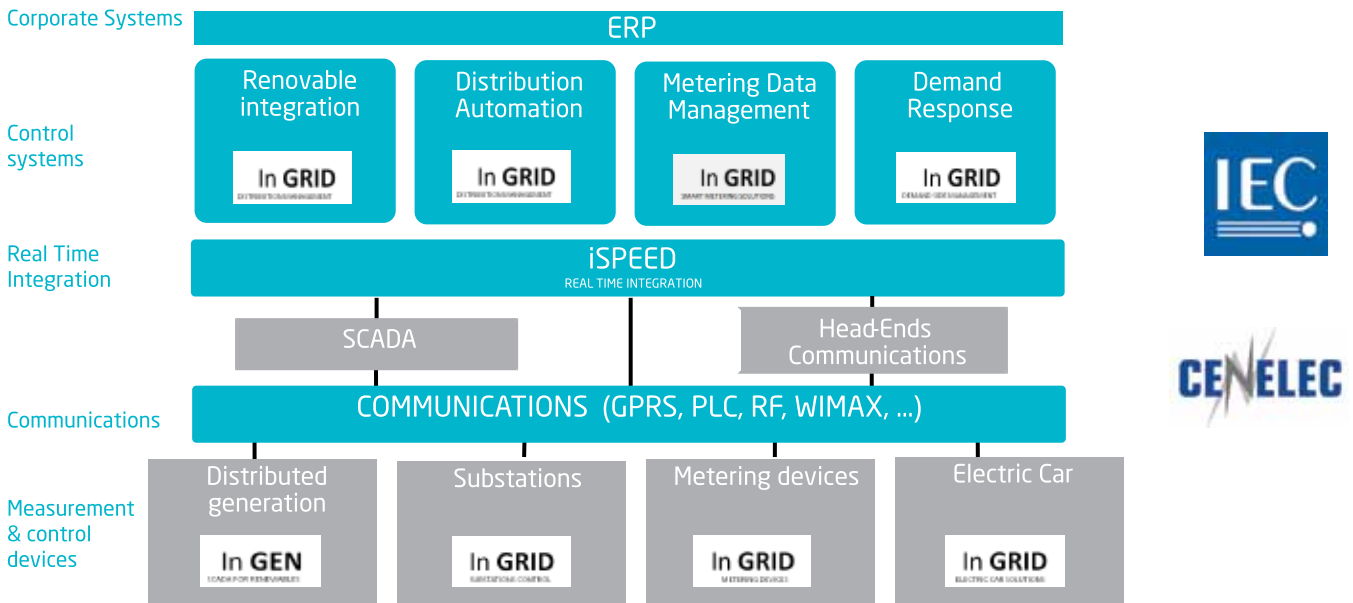
Through innovation and technology, energy is managed efficiently reducing operation and maintenance costs.



Smart Grid Solutions Platform

INDRA's integrated Smart Grid vision is embodied in a solution map guided by the following principles:

- **Global vision:** through a distributed Real Time integration platform, following an integration model that allows managing big data volumes.
- **Cyber security:** ensuring the confidentiality and integrity of information of the Smart Grid.
- **Modular solutions:** avoiding large centralized systems, developing flexible and scalable solutions.
- **Distributed Architecture.** Decentralized solutions that take advantage of distributed processing capacity and ensure scalability.
- **Interoperability:** open solutions aligned with both electrical (IEC), communications (PLC, ZigBee ...) and systems (SOA, WS) standards.

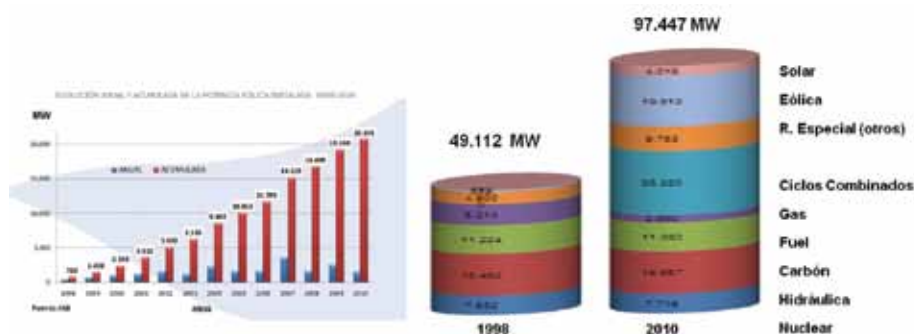


Smart Grid Consulting

Indra's comprehensive approach to current and future power systems' operation, with expertise and solutions in the generation, transmission and distribution businesses, allows us to offer consulting services to our customers to support them in the transition to the Smart Grid.

- Plans and deployment campaigns of smart meters.
- Roadmap definition for the evolution of national systems to the Smart Grid.

- Analysis and proposal of regulatory and technical changes required to allow renewable energies' integration .
- Consultancy services to improve the efficiency of power systems and energy markets.
- Implementation of energy efficiency programs.
- Launch of Smart Grid pilots.
- Electric vehicle integration plans.



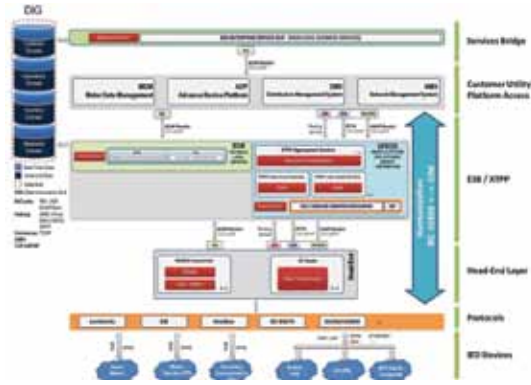
Smart Grid Solutions

i SPEED

REAL TIME INTEGRATION

Real Time integration Platform

- **Integration of Information and control technologies**, allowing shared real time access between multiple systems.
- **Integration of extreme processing technologies (XTPP)**, Complex Event Processing (CEP), acquisition of data from multiple sources and systems, dynamic information modeling (CIM) and integration with mass storage solutions (Big Data).



- **Innovative solution**, aligned with leading technological standards (IEC 61968-70, 61850)..



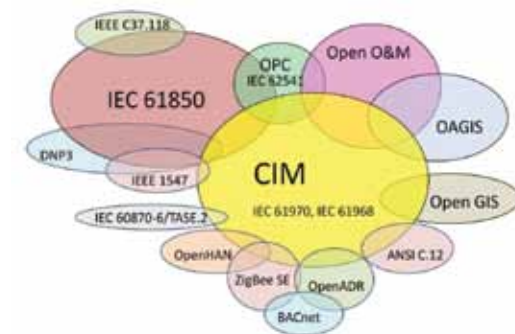
- **Integration with real-time systems**, both proprietary and third-party.



- **Open and interoperable architecture** enabling a new family of solutions.



- **Distributed** data processing and storage.



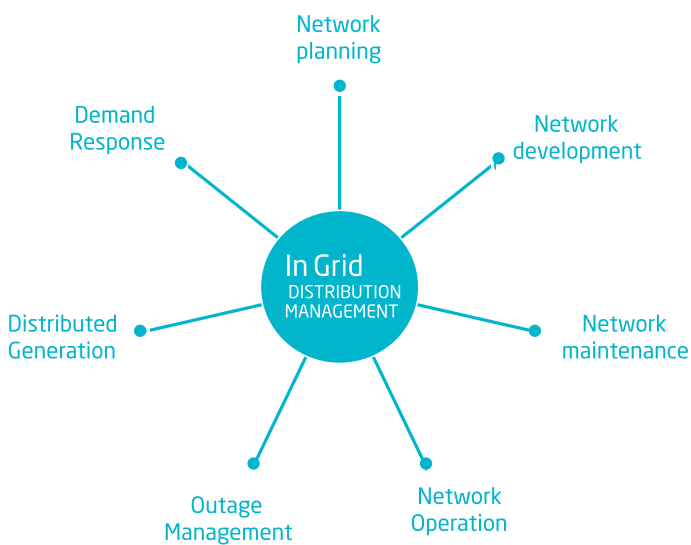
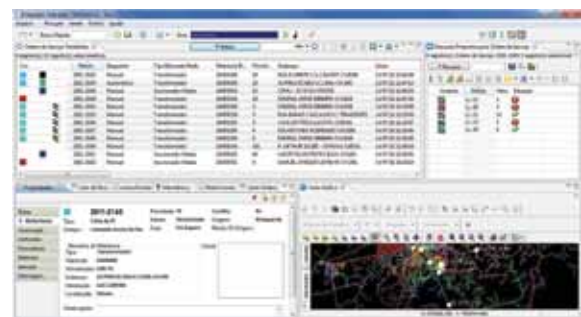
In GRID

DISTRIBUTION MANAGEMENT

Network Management

In GRID is a comprehensive modular solution for network monitoring and advanced operation (ADMS) supporting the key distribution business processes.

Advanced analysis and optimization features, allowing the integrated operation of **demand response and distributed generation**.



In GRID

SMART METERING SOLUTIONS

Smart Metering Solutions

- MDC Measurement Data Capture**
Capture and storage of smart devices' measurements , multiprotocol and scalable.
- MDM Measurement Data Management**
Distributed measurement's validation, processing and exploitation, based on RDBMS and Big Data technologies.
- MDA Analytical measurement exploitation**
Open analytical platform for meter data exploitation based on Big Data Analytics: demand forecast, customers energy efficiency benchmarking, anomalous consumption / fraud patterns , default's risk ...
- ECL Power Control and losses**
Energy management, energy balance, loss control and fraud management.
- EEP Energy Efficiency Platform**
Monitoring and real-time management of domestic and buildings' demand, allowing the interaction between the consumer, consumer's devices, smart meters and retailers and distributors.



In GRID

METERING DEVICES

Smart Metering and Control Devices

New generation of smart meters for residential customers.
Optimized for centralized topologies, N meters modular architecture and a single hub manage local communications (In-Home Devices, charging point) and external AMI infrastructure.

Intelligent control systems for electrical substations.
Flexible communications, multi-protocol, multi-access and multiport. Architecture SW based in specialized processing tasks allowing hot maintenance, upgrades and tasks distribution.

Electric Vehicle.
Modular equipment and centralized systems for managing electric vehicle conductive charging, three-phase and single-phase, with advanced features for communication and coordination with other charging stations and grid.

Distributed generation Control.
Real Time Renewable generation dispatch center (wind, solar, microhydro etc). Flexible and scalable solution integrated with network operators and Smart Grid platform.





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Indra reserves the right to
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