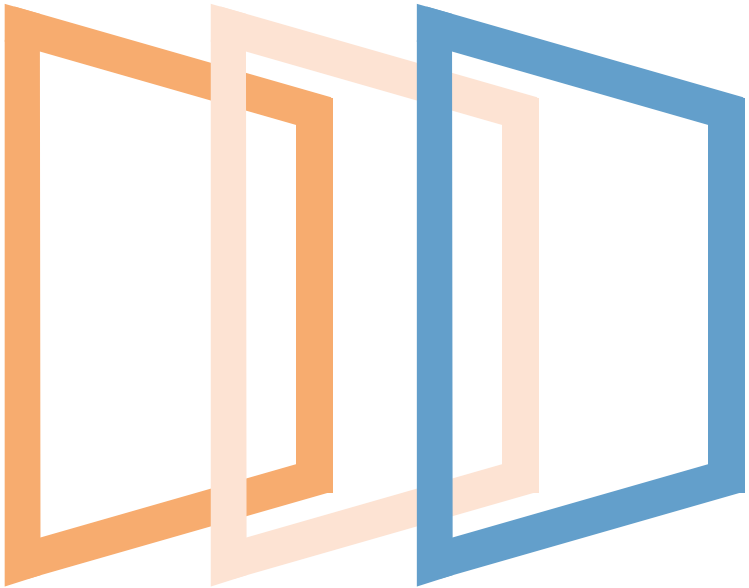
Advanced Energy Services



Industrial & Consumer Markets

October 2018

minsait

An Indra company

Índice

Context and vision

00

oo. Context and vision

Energy Inefficiencies

Non-compliance with environmental policies (excessive pollution)

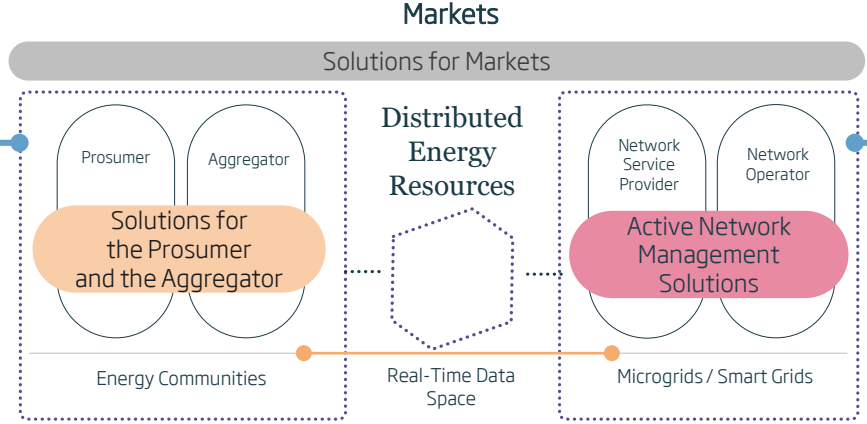
High supply costs

Management problems arising from decentralized consumption

oo. Context and vision

In the new energy model, consumption points multiply their value if they are integrated into the network adopting a multidisciplinary role.

- Consumers are also producers: **Prosumers**
- New roles appear that group other points of consumption: **Aggregators**
- Both Prosumers and Aggregators need new Solutions



- Consumption points and the network are integrated through a **common and dynamic vision of energy assets**: Distributed Energy Resources (DER).

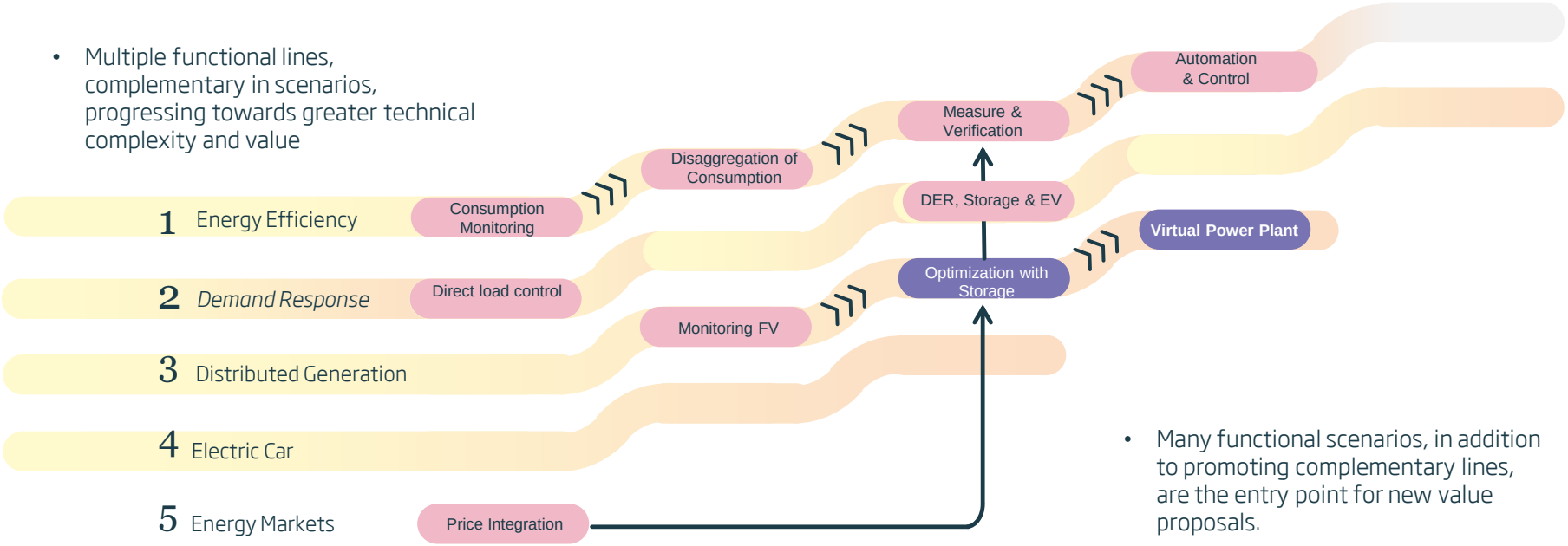
- A **sensorization of the MV/LV** network to which the consumption points are connected is produced in order to integrate them in the new model.
- **New roles** appear capable of **providing services** to the MT/MT network making use of an active management of consumption points.

Energy assets are modeled as Distributed Energy Resources and are able to participate in new **global efficiency business models**.

oo. Context and vision

Each actor must design its transition to the new model in an orderly manner, ensuring profitability in each step.

- Multiple functional lines, complementary in scenarios, progressing towards greater technical complexity and value



- Many functional scenarios, in addition to promoting complementary lines, are the entry point for new value proposals.

Scalability and progressivity are the keys that allow each stakeholder to adjust its **value proposal** to the role they want to play in the **new model**.

Value Proposal

01

01. Value Proposal

End to End Service that covers the design of the solution, the supply and installation of devices, the commissioning of the platform and its operation and maintenance.

ARCHITECTURE

3 onesait platform

SaaS

MQTT
DDS
AMQP
SSAP
ws:/wss:

Mongo DB
Hadoop DB

- Real-time and historical databases
- BigData and Analytics Capabilities
- Optimal data operation

2 Gateway/Datalogger

Intelligent device ecosystem management and coordination

Ethernet
Wifi

ZigBee
ModBus
OPC-UA
Open protocol

- Strong communication network
- Efficient collection of all monitored variables

1 Sensors/Relays

Monitoring of supply points:

ZigBee
Bus
MESH
IEC

- Main panel of the installation
- Lighting circuit
- Air conditioning circuit

4 Energy Management Software

WS:REST/SOAP
JSON
http/https

- Front Web
- Presentation of information
- Clear and Intuitive Interface

Operational DB
& Business Services

01. Value Proposal

FUNCTIONAL DETAILS

ENERGY EFFICIENCY PLATFORM

- **Personalized Widgets** for quick access to platform functions and displays an overview of the most important consumption variables (electricity, water, gas, etc.)
- **Generates Energy Conservation Measures (ECM)** based on end-users consumption habits
- **Real-time visibility with intelligent and dynamic control** monitoring of consumption and KPIs at each supply point, both individually and aggregated by different levels of labels.
- **Personalized reports** with temporary details to choose and receive them periodically by email
- **Alert configuration & management** and event scheduling that allows the location of anomalous behaviors that involve an extra cost.
- **Multi device management** allows system access through web and mobile applications
- **Integration with different systems** thanks to the advanced architecture of our node#1. BMS, PLC, CCTV, etc.
- **Remote functionalities** control over the actuators deployed at the supply points, from anywhere and at any time
- **Invoice module**[1] that runs billing simulations and presents a breakdown of the invoice by nature of costs
- **Document repository** based on ISO 50001

[1]Depends on geography

01. Value Proposal

BENEFITS

Energy Savings	15-20% and increase in equipment lifetime
Control	dynamic and intelligent for each supply and consumption point in real time
Centralization	with existing BMS and other facility management systems (Maintenance, ERP, CCTV, PLCs, etc.) with aggregated view of all facilities.
Integration	With existing BMS and other facility management systems (Maintenance, ERP, CCTV, PLCs, etc.) with aggregated view of all facilities.
Identification	of inefficiencies and saving measures
Intelligence	Implementation of Distributed Intelligence / Demand Response models
Environment	Reduction of pollutant gas emissions

Implementation approach

02

02. Implementation approach: PoV

- Implementation of an **advanced Energy Efficiency pilot** in a facility chosen by the client. The project will be conducted as follows:

  1. **Site Survey:** Gathering of relevant information about the installation with a first visit questionnaire to the customer
  2. **Device definition:** Identification of monitoring and controlling equipment to be used for the setup
  3. **Equipment installation:** Installation of the equipment defined in the previous step by highly qualified technicians
  4. **Platform Service:** Commissioning of the Energy Efficiency Platform on the customer and verifying that all devices report correctly
  5. **Consumption monitoring:** Generation of reports defining the application KPIs for the characterization of established uses, and sending recommendations for improvement actions that are identified. Likewise, the necessary alerts are established to control unwanted consumption by automatic rules of action on devices.

- The following components are included:

  - **Devices** (Gateway and actuators)
  - **SaaS Model** - Minsait`s Energy Efficiency Management and Monitoring platform
  - **Professional Services** (Technical support during the 3 month pilot)
  - **Installation** in client's chosen premise
  - **Platform License** and guarantee during the pilot (consumption monitoring)

Delivery Model

Phase 1 - 3: Local
Phase 4 - 5: Access to Minsait`s Energy Efficiency platform in service mode and Energy Management

Sizing

Consumption monitoring: 1 installation
1 Gateway
2-3 Approved and certified wireless devices

Plan

Implementation: 1-2 weeks (depending on stock)
Consumption monitoring: 3 months

Price(1)

Devices, implementation and service maintenance:
6.000 - 10.000€

(1) Price estimation. Subject to number of devices and local taxes

02. Implementation approach:100 sites

- The implementation of an **advanced Energy Efficiency project** at the client's 100 sites follows the **following phases**:

1. **Site Survey**: Gathering of relevant information about all facilities. Characterization of the different types of sites to optimize the solution design.
2. **Solution design:** The equipment necessary for monitoring, controlling and acting on the relevant consumption is defined and the optimum connectivity is designed to guarantee the quality of the service.
3. **Equipment installation:** Installation of the equipment defined in the previous step by highly qualified technicians, following the Deployment plan.
4. **Platform Service:** Commissioning of the Energy Efficiency Platform on the customer and verifying that all devices report correctly
5. **Energy Management (Optional** Generation of reports defining the application KPIs for the established use characterization, and sending recommendations for improvement actions that are identified. Likewise, the necessary alerts are established to control unwanted consumption by establishing automatic rules of action on devices.

- The following components are included:

- **Devices** (Gateway and actuators)
- **SaaS Model** - Minsait`s Energy Efficiency Management and Monitoring platform
- **Professional Services** (Technical support during the implementation and operation of the project)
- **Installation** in all sites
- **Platform License** and guarantee of the use of the platform

(1) Price estimation. Subject to number of devices and local taxes

Delivery Model

Phases 1-3 y 5: Local
Phase 4 : Access to Minsait`s Energy Efficiency platform in service mode

Sizing

Consumption monitoring for 100 installations
100 Gateways
Hotel Characterization (example)

- Small: 2-3 meters/actuators
- Medium: 4-5 meters/actuators
- Large: 6-7 meters/actuators

Comunications

Plan

Implementation: 4 months (25, 20, 20, 35)
Operation/Energy Management: 2 years

Price(1)

Equipment: 2,5K€ per site (including installation)
Service: 190€/site and month

Energy saving and ROI

Annual global consumption: 3.6 MM€ (3K/month and site)
Estimated minimum savings: 10%. 360K€/year
ROI: 1.3 years

Success case

03

03. Success case: Servicio Nacional de Aprendizaje (SENA) - Colombia

SENA is a public institution in Colombia. It offers free training to millions of Colombians who benefit from technical, technological and complementary programs focused on the economic, technological and social development of the country.

Implantation of:

- ✓ Energy Management Software Platform
- ✓ Energy Management ISO50001

- Project duration: 3 years. Beginning December 2015
- No. of sites where it has been implemented: 28 sites (100 additional sites planned for the next phase)
- Monitoring and Control of Electricity, Water and Gas (243 points monitored)
- Implantation of IoT Technology
- Installation of Equipment and Platform Monitoring, Control and Performance Software
- Internal Audit and Accompaniment ISO 50001 Certification

Benefits

- Average energy savings of 21%.
- Optimization of the installed powers
- Optimization of the use of equipment
- Many of the measures can be implemented in the short term
- Rates of return on investment in very short times. (1.7 years)

This project has received the Energy Efficiency Award in the category of Public Entities in Colombia, granted by the National Association of Public Services and Communications Companies (Andesco), as well as the enerTIC Awards in the category SMART International Projects.

Additional services

04

04. Additional services

Deployment Plan

Consultancy for advanced energy services deployment in the remaining facilities, including other countries if applicable.

Environmental and energy management Consultancy

Consultancy in implementation to get approval for internationally recognized environment certifications:

- ISO 14001, EMAS – Environmental management
- ISO 50001 – Energy management.

Green building Consultancy

Technical assistance for certifications :

- LEED
- BREEAM
- WELL

Other variable monitoring

Security and control Access

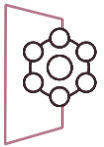
Comfort

Air quality

Fire detection

Water leaks

Multimedia



Asset management and maintenance monitoring

Active fixed data: purchase date, installation, brand, serial number, etc.

Active variable data: last preventive and corrective maintenance date, people in charge, costs, etc.

Programming Maintenance

Weak performance warnings

References

05

05. References

1 | Banco Occidente (Colombia)

- Proof of value of the Energy Monitoring System
- Target: verifying the energy saving potential in a bank office and detecting inefficiencies.
- Potential energy savings **10,66%**

2 | BBVA Continental (Peru)

- Implementation of the Energy Management Software Platform and ISO50001 standard.
- Target: optimize and reduce energy consumption and implement best practices
- Potential energy savings **17,05%**

3 | Entel (Peru)

- Proof of value of the Energy Monitoring System
- Target. demonstrate the savings achieved with the solution to offer the service to their SME customers
- Potential energy savings **12,2%**

4 | Endesa (Spain)

- Development of energy monitoring platform and Smart Home
- Green marketing: environmental awareness
- Energy saving strategy and consumption management.
- More than **180,000 users** uploaded to the platform

Mark Making the way forward

An Indra company