



## Subtask 5- Spanish Technology Case Study

### SP Tech Case #2: Research and development of a new methodology about demand management capacity of large consumers of electricity

#### A. Brief Overview

The aim of the study is the development of a new methodology based on surveys that will help to determine the potential of demand management for large consumers of electricity. Based on the results, the study identifies mechanisms that would permit to increase the energy and economic efficiency of electrical systems.

Final results expected:

For electric systems:

- The economic side of management options is considered to:
  - Increase the energy efficiency of the system
  - Increase the reliability of supply
  - Comply with Kyoto (substitution of contaminant energies)

For Consumers:

- Reduction of Energy bill
- Lower energetic costs and higher economic productivity and better market competitive position

#### B. Description of the DR Technology

Four large consumers have been contacted/surveyed during development project:

- Motor vehicles manufacturer
- Fish farming
- Airport
- Trains manufacturer

The contents of previous surveys were used for complement the results:

- Siderurgical Arc furnaces (steel industry)
- Cement
- Hydrolysis

The survey has eight sections:

I. Characterization

Identification data: Name, address, connection

Consumption and power: Electricity and other sources.

Load curve: Load curve, forecast

Production: Organization, characterization, variability

Costs: Energetic costs and relationship between energetic and production costs

CHP and security generation

II. Electrical supply contract

Tariff/Market:

TARIFF: Tariff characteristics

MARKET: Supply contract Identification data: Name, address, connection

III. Processes description

Manageable processes:

Manageable power

Manageability scale

IV. Manageable processes analysis

Process description: Functional description, load curve

Future previsions: Substitution, evolution

Active power management:

Management pattern: Power, notice time, duration, frequency.

Costs and barriers for its implantation (technical, logistical)

V. Reactive power management

Capacity to supply/absorb reactive power:

Technology

Power (KVA<sub>r</sub>)

Notice time

Manual/automatic

Actuation periods

VI. Management options

Application, barriers and suggestions:

Demand modifications to get profits in market

Growing of modulation

Relay for disconnecting charges

Collaboration with Operator System in operations

Offer secondary and tertiary regulation

Voltages control

Interruptible tariff

DESTENS contract (for access tariff: frequency relay and reactive power management)

VII. Electric market regulation

Tariff to market change

Risk management and evaluation  
 Opinion about the deregulation of electricity

### VIII. Demand management

Opinion about the participation in management programs:

If consumer participates in management programs:

Strategies, power, profits, characteristics

Suggestions

### C. Conclusions

- Consumers aren't aware of their management options could be interesting for the System operation.
- There is a wide range of load management alternatives reported.
- The weight of manageable power in relation to the contracted power is frequently high.
  - Car industries: 22%
  - Fish farms: 96%
  - Airports: 96%
  - Train builders: 81%
- Consumers could interrupt consumption and give power from their generation capability. This can be done simultaneously or not.
  - Motor vehicles manufacturer:
    - 10 MW manageable
    - 1 MVA of security/emergency generation
  - Fish farm:
    - 3 MW manageable
    - 6.4 MVA of security/emergency generation
  - Airport
    - 14.5 MW manageable
    - 21 MVA of security/emergency generation
- Consumers haven't indicated important technological barriers.
- Consumers that buy the electricity in pool market have flat rate contracts.
- Consumers are not too interested in the market deregulation.
- Consumers consider that complete factory management is more realizable than an only process management.
- Complete factory management requires longer notice.

Extrapolation from Spanish survey:

The surveys' result was extrapolated for all Spain and Europe, the following table shows the result of this extrapolation.

ACTIVITY		SPAIN		EUROPE	
Description	NACE code	Contracted Power MW	Reductible Power MW	Contracted Power MW	Reductible Power MW
Manufacture of motor vehicles	3410	280	66	1595*	382*

Fish Farming	0502	7	7	-	-
Airports	6323	112	108	-	774
Manufacture of railway equipment	3520	-	50	-	-
<i>* Only UCTE Countries</i>					

## D. Further Information

[www.ree.es](http://www.ree.es)