

R & D GAD PROJECT

IBERDROLA



Metering Europe 2007, Session 13

IBERDROLA DISTRIBUCION



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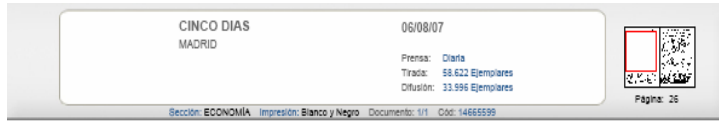
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TIMING OF THE PROJECT



THE PRESENT

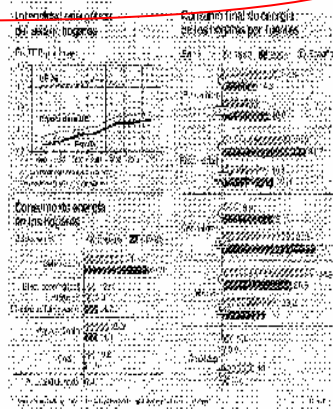


El consumo medio en las viviendas españolas subió un 77% entre 1990 y 2004

El uso energético de los hogares en España crece el triple que en la Unión Europea

El consumo energético de los hogares españoles aumentó un 77% entre 1990 y 2004, casi el triple que en la Unión Europea. La Comisión considera que España tiene un índice elevado de energía en la edificación y propone sus medidas para reducir el consumo de energía en las viviendas.

El estudio coincide con el hecho de que España es uno de los países europeos con mayor consumo de energía por habitante. Según los datos de la Unión Europea, el consumo de energía en los hogares españoles creció un 77% entre 1990 y 2004, casi el triple que en la Unión Europea. La Comisión considera que España tiene un índice elevado de energía en la edificación y propone sus medidas para reducir el consumo de energía en las viviendas.



Un cambio cultural y de renta que aumenta el uso eléctrico

El País. Madrid. De ahí que, desde 1990, el uso de la electricidad en los hogares españoles haya crecido un 77%, casi el triple que en la Unión Europea. Este aumento se debe a un cambio cultural y de renta que ha impulsado el uso de electrodomésticos y sistemas de calefacción y refrigeración.

Spain has an enormous electricity demand growth 77% during the 1990 – 2004 period
 (Source: "CINCO DIAS" aug 6, 2007)

Recent laws enforce smart metering for residential market customers starting January 2008
20 Million homes affected

It is time for a R & D project



GAD CONSORTIUM STRUCTURE



THE GOAL OF THE GAD PROJECT IS...



Energy efficiency through new smart meters, optimising electricity consumption and the associated costs of this consumption in a way that also satisfies consumer needs within the same quality framework.

Project budget: € 23 million
Project scope: 2007 to 2010

Funding of over € 11, 5 million from the Spanish Government (Department of Industry, under the R&D CENIT programme)



15 COMPANIES



SISTEMAS DE INFORMACIÓN

14 Scientific and Technological Agents



- **CEDETEL** Centro para el Desarrollo de las Telecomunicaciones de Castilla y León
- **Centro Politécnico Superior de la Universidad de Zaragoza**
- **CITIC** Centro Andaluz de Innovación y Tecnologías de la Información y las Comunicaciones
- **CTTC** Centre Tecnològic de Telecomunicacions de Catalunya
- **GEUMA** Grupo de Energía de la Universidad de Málaga
- **IIC** Instituto de Ingeniería del Conocimiento
- **IIT COMILLAS** Instituto de Investigación Tecnológica
- **IKERLAN** Centro de Investigaciones Tecnológicas
- **ITE** Instituto de Tecnología Eléctrica
- **ITA** Instituto Tecnológico de Aragón
- **LABEIN**
- **Universitat Ramon Llull – La Salle**
- **Universidad de Alcalá de Henares**



Technical Office



Project Office



GAD WORKING LINES



WORKING LINES



They intend to solve in an integrated way all the questions that may arise from the various stake holders related to Active Demand Side Management

- **Technical issues: WHAT to INSTALL** (meter and controller design), **HOW to Communicate** (protocol specification and network design), **HOW to operate** a complex smart metering system.



Critical for an effective AMM deployment

- **“Not so Technical” issues: WHO** can save energy in peak time (consumer load patterns), **WHY** (willingness to change habits), **HOW** to achieve an effective energy saving while keeping the same quality of life



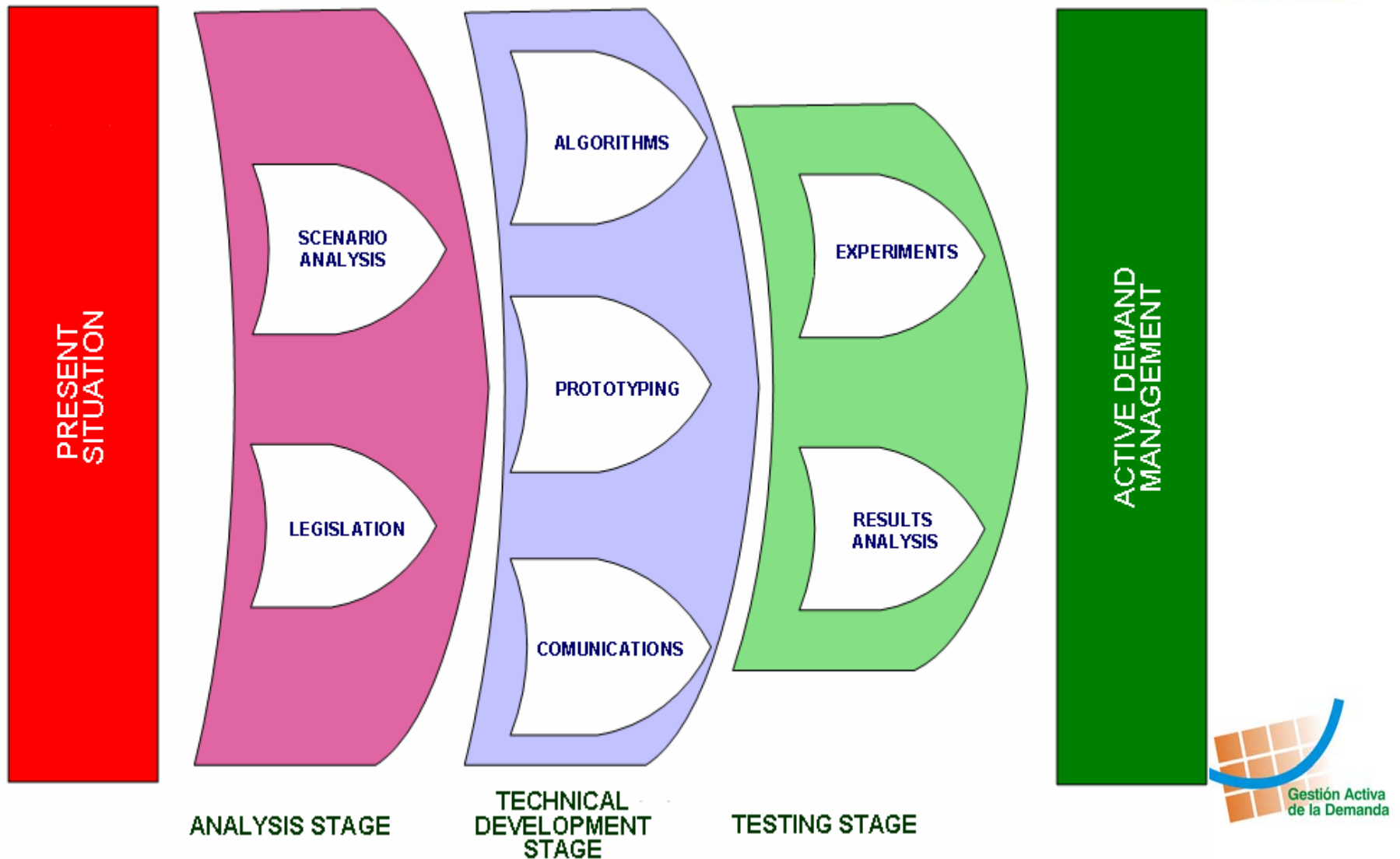
Critical for an Effective Demand Side Management

The answer is...

An innovative communications architecture that goes beyond the electricity meter, down to the electrical goods



PROJECT STAGES



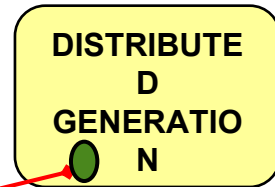
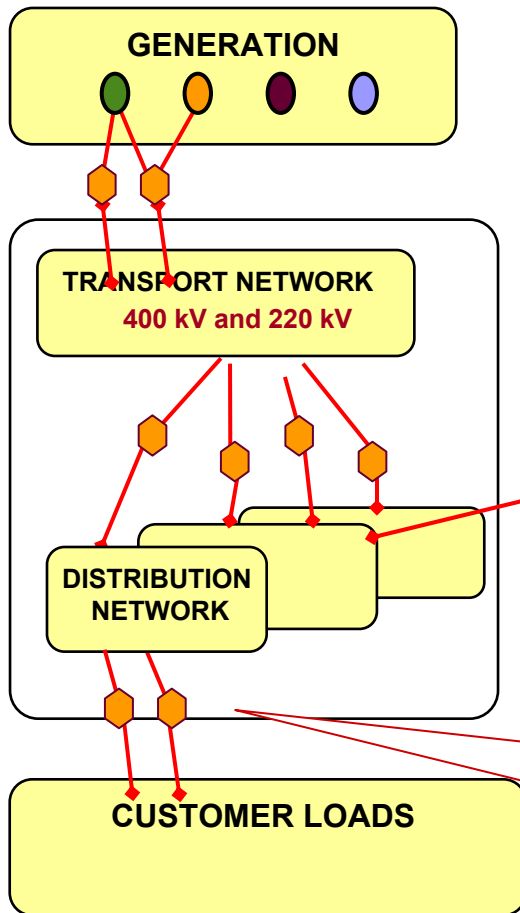
SCENARIO ANALYSIS: Loads and Clients



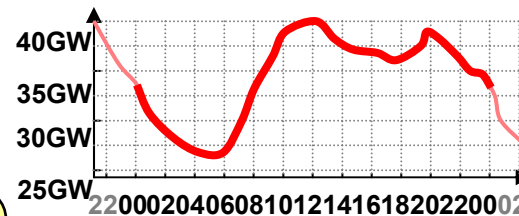
LOAD ANALYSIS



The difficulty to manage residential loads arises mainly from consumer's day to day habits and lack of smart devices to control the individual loads



at home



Demand Curve

Individual customer curves

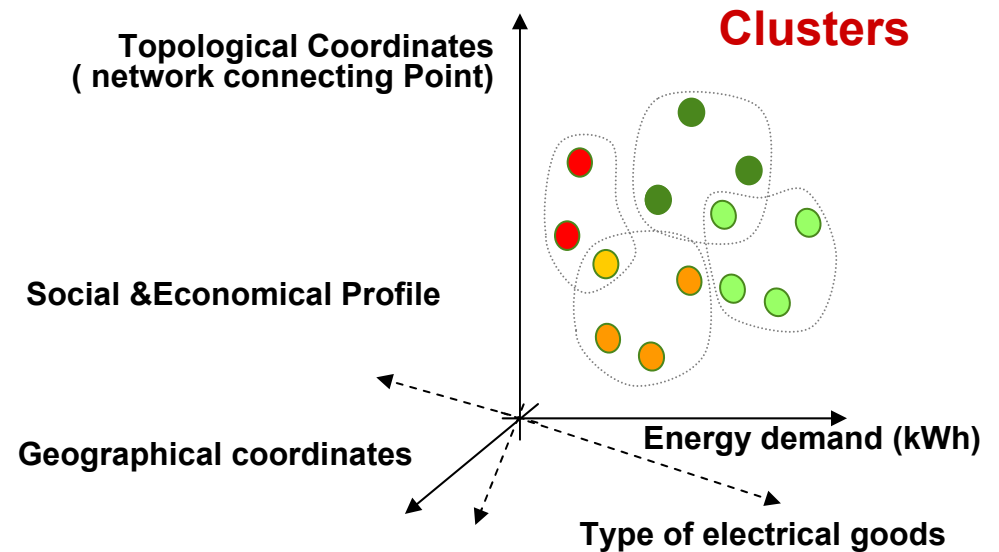


CLIENT ANALYSIS



¿WHO?

Find the targets to
guarantee optimal
energy saving



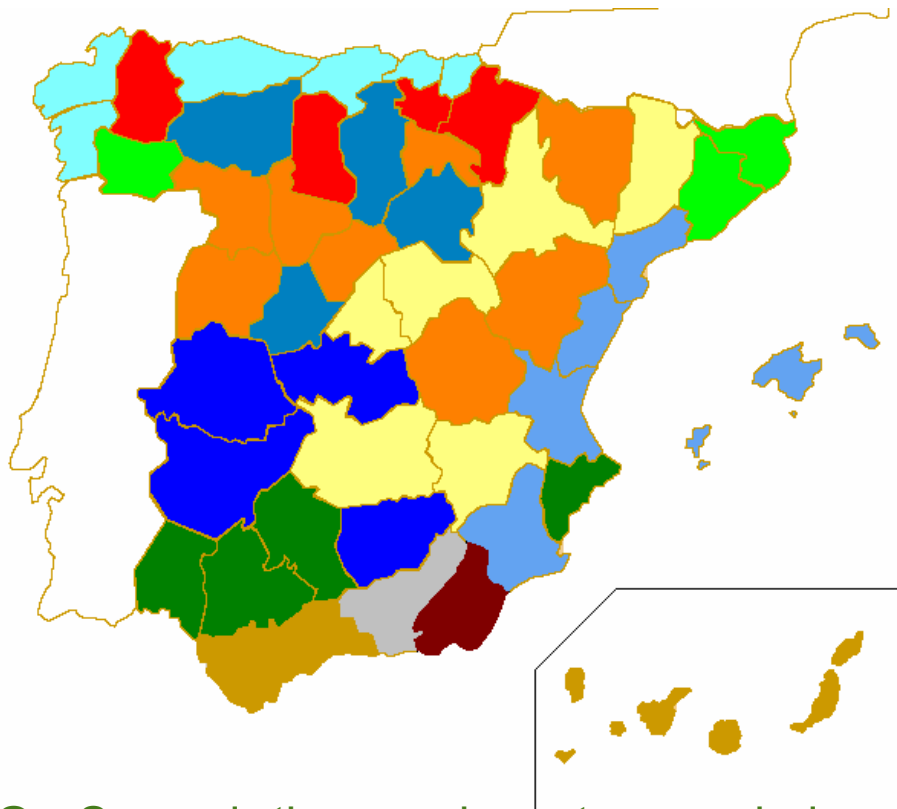
Theoretical Model: Customer is an n- dimensional entity



Experimental Model: Surveys and hourly metering of selected customers



Experimental Model



A3	Light blue
A4	Dark blue
B3	Light green
B4	Dark green
C1	Light yellow
C2	Yellow
C3	Orange
C4	Red
D1	Light orange
D2	Orange
D3	Light red
E1	Red

Spain climatic zones

1000 REPRESENTATIVES OF DIFFERENT CLUSTERS SELECTED FOR HOURLY MEASUREMENT

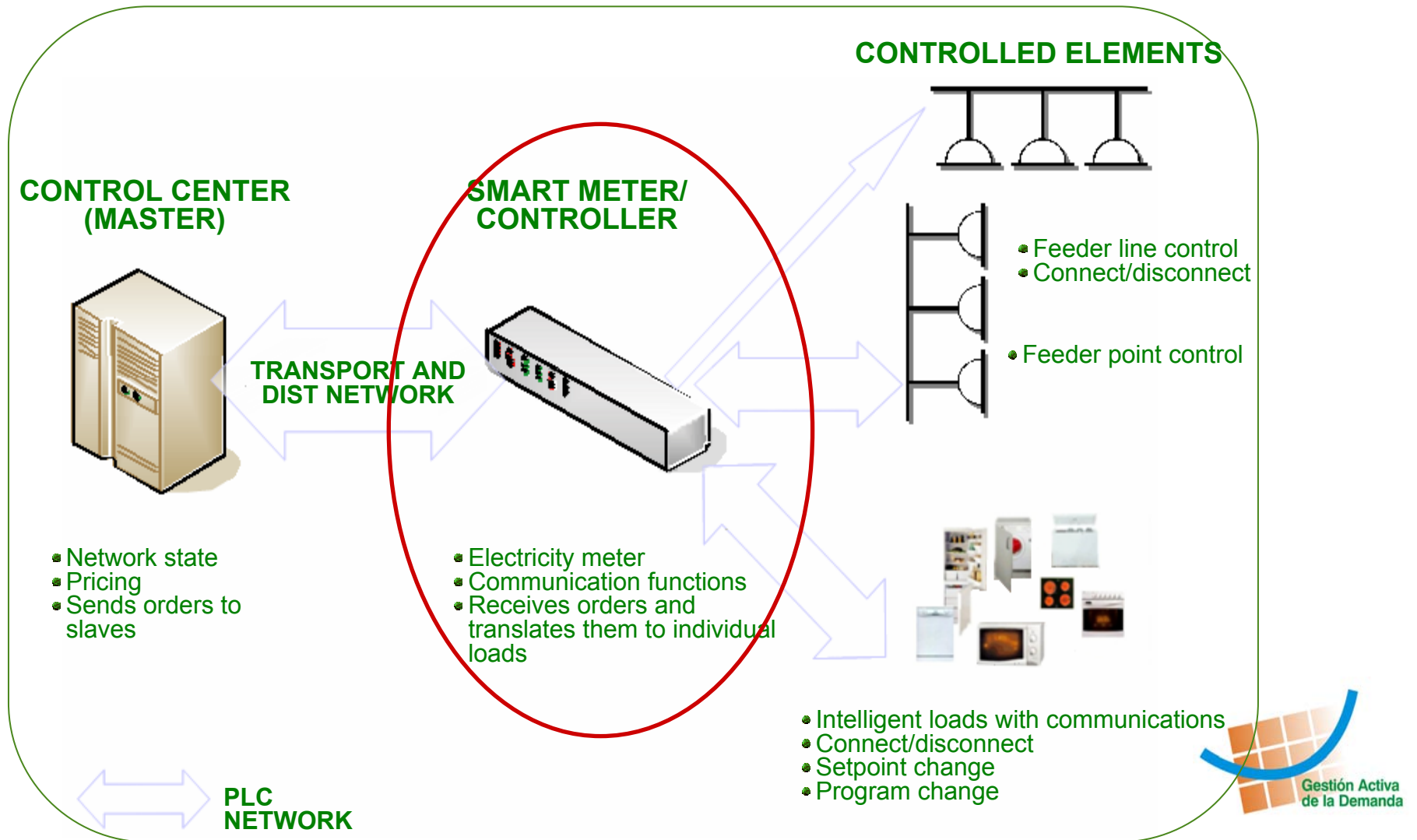
- **WHO:** Several thousand customers belonging to different climatic zones in Spain selected for telephone surveys
- **HOW:** Questions regarding type of home, number and type of electrical goods, usage habits and attitudes toward energy saving.



GAD WORLD



ARCHITECTURE



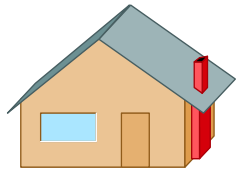
GAD Levels



INITIATIVE	Level 5	CLIENT SEARCHS FOR OPTIMAL GAD
EFFECTIVENESS	Level 4	CLIENT RESPONSE IS ALWAYS EFFECTIVE
EXECUTION	Level 3	CLIENT FOLLOWS REMOTE ORDERS
ACCEPTANCE	Level 2	CLIENT SIGNS A CONTRACT FOR GAD, HOMES WITH SMART ELECTRICAL GOODS
AWARENESS	Level 1	CLIENT IS AWARE & CAN SAVE ENERGY IN A SIMPLE WAY
NO GAD	Level 0	REJECTION / LACK OF INTEREST OR CONSUMPTION PROFILE IS INADEQUATE

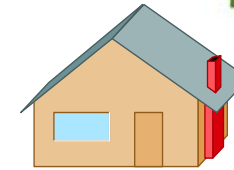


GAD WORLD

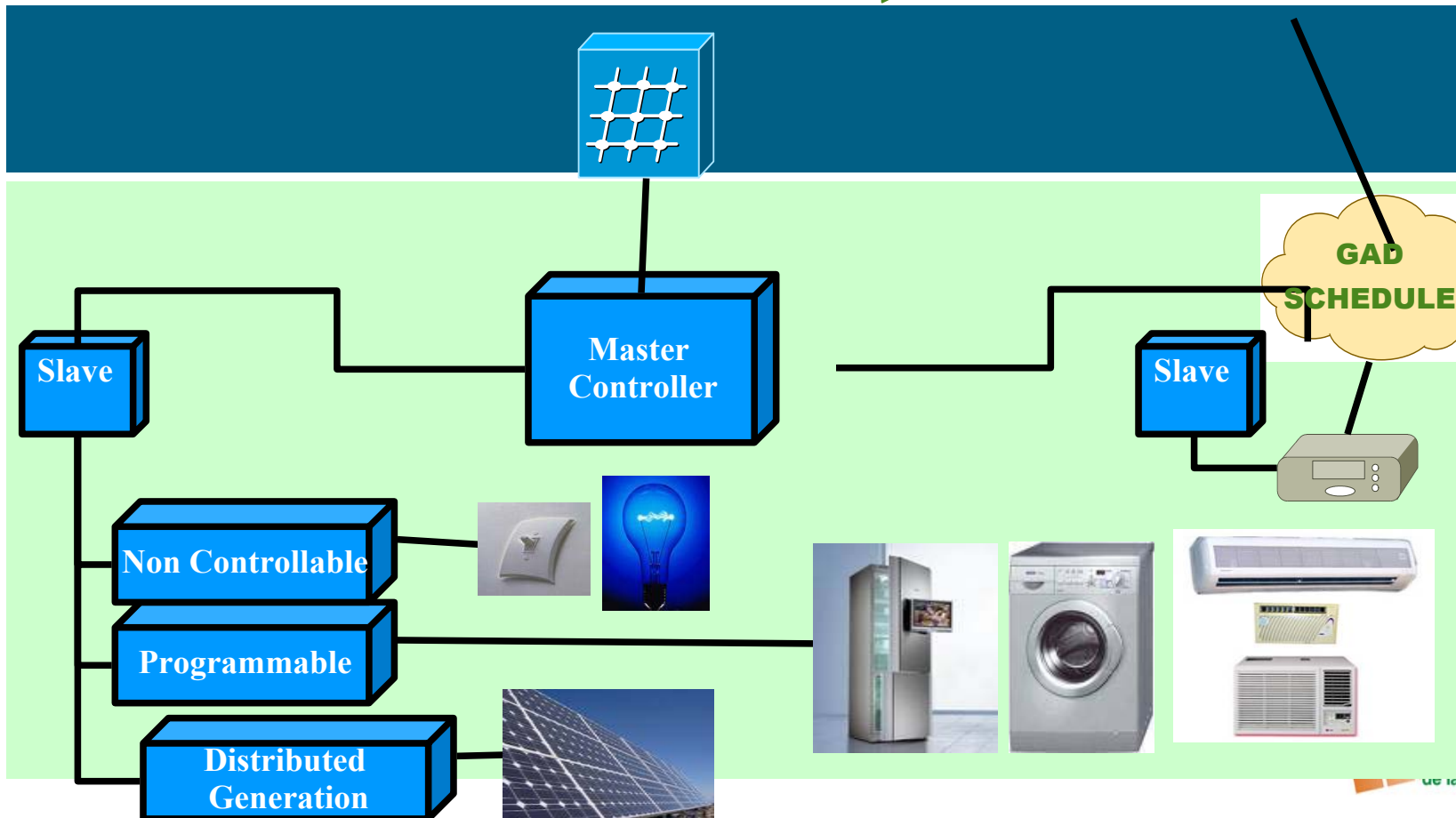


Level 0

Incentives



Level 5



ión Activa
ue la Demanda

R&D GAD PROJECT

THANK YOU FOR YOUR ATTENTION

