



# MÁSTER EN ECOEFICIENCIA Y MERCADOS ENERGÉTICOS

(Master in Ecoefficiency and Energy Markets)

2008/09





**Training of professionals specialized in the management and efficient use of energy and material resources**

- **Feasibility analysis and management of renewable energy and co-generation plants.**
- **Knowledge of the operating mechanisms of energy markets and emission trading schemes.**
- **Application of energy saving measures in processes and equipment.**
- **Process integration and industrial systems.**
- **Redesign of products and activities according to ecoefficiency criteria.**
- **Business management strategies for sustainable development.**
- **Improvement of the environmental and social responsibility of companies.**

- 1 – Renewable energies (25 cr ECTS)
- 2 – Energy efficiency in thermal systems and cogeneration (9 cr ECTS)
- 3 – Energy efficiency in electrical systems and automation (7 cr ECTS)
- 4 – Energy auditing and energy certifying of buildings (4 cr ECTS)
- 5 – Ecodesign and Life Cycle Assessment (4 cr ECTS)
- 6 – Introduction to Energy Markets (7 cr ECTS)
- 7 – Industrial Ecology (4 cr ECTS)
- 8 – Master thesis (10 cr ECTS)



## 1 – Renewable Energies (25 cr. ECTS)

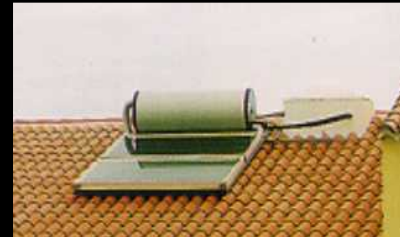
Energy, fundamentals and socioeconomical factors

1.1. Solar energy

1.2. Wind energy

1.3 Hydroelectric energy

1.4 Biomass



## 2 – Energy efficiency in Thermal systems and cogeneration (9 cr. ECTS)

- 2.1. Steam generators and auxiliary equipment.
- 2.2. Industrial furnances
- 2.3. Heat exchangers
- 2.4. Heat networks
- 2.5. Thermal insulation
- 2.6. Air-conditioning systems
- 2.7. Fundamentals of cogeneration
- 2.8. Alternative engines



## 3 – Energy efficiency in electrical systems and automation (7 cr.ECTS)

3.1. Lighting systems

3.2. Motors, transformers and electric furnaces

3.3. Power control

3.4. Electric distribution at low voltage

3.5. Transport and distribution of electricity at high voltage

3.6. Measurement, treatment and control of signals and systems

3.7. Automation and monitoring of processes

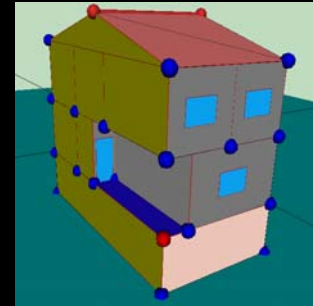



## 4 – Auditing and Energy certification of buildings (4 cr. ECTS)

4.1. Techniques for the development of energy audits

4.2. Energy certification of buildings

4.3. Environmental management of systems in companies



Certificación Energética de Edificios		
Indicador kgCO2/m²	Edificio Objeto	Edificio Referencia
		
15.4-23.9 C	15.0 B	17.5 C
Demanda calefacción kWh/m²	C 41,9	C 42,7
Demanda refrigeración kWh/m²	A 7,2	A 7,7
Emisiones CO2 calefacción kgCO2/m²	B 10,6	C 13,6
Emisiones CO2 refrigeración kgCO2/m²	C 3,3	A 1,9
Emisiones CO2 ACS kgCO2/m²	A 1,1	D 2,0

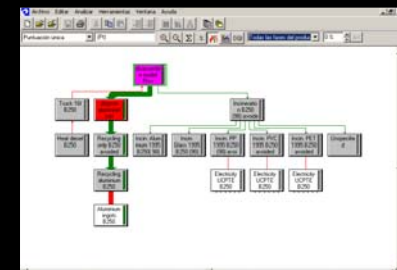
## 5 – Ecodesign and Life Cycle Assessment (4 cr. ECTS)

5.1. Ecoefficiency concept

5.2. Integral policy of products. Ecoproducts

5.3. Environmental management systems in companies

5.4. Life Cycle Assessment methodology



## 6 – Introduction to Energy Markets (7 cr. ECTS)

6.1. Introduction to energy markets: regulation and basic principles.

6.2. Introduction to the electricity sector

6.3. Introduction to the natural gas sector

6.4. Other energy sectors



## 7 – Industrial ecology (4 créditos ECTS)

- 7.1. Sustainability of industrial processes
- 7.2. Eco-industrial parks
- 7.3. Green technologies
- 7.4. Pollution prevention
- 7.5. Environmental design
- 7.6. Materials selection

## 8 – Master thesis (10 cr. ECTS)



- **Participation of professionals as teaching staff**
  - OPEL, BSH Balay y ENDESA, Regional Government, IDAE
- **Tours to energy installations**
- **Master thesis in a company**

- **Duration: 70 credits ECTS (1 academic year)**
- **Nº Promotions: 5**
- **Profile: Energy and environmental professionals in companies, organizations and public administration. Students coming from engineering, business administration, law.**
- **Dates: 1 October – 29 May**
- **Monday to Thursday 16:00 to 20:00h; Friday 9:30 to 13:30h**
- **7 independent subjects:**
  - **Possibility of registering to independent subjects.**
  - **Labs and seminars, tours, conferences, workshops, computer training...**
  - **Evaluation: tests and resolution of real problems in the industrial sector.**



## **Centro de Investigación de Recursos y Consumos Energéticos**

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### **Entidades Colaboradoras**

