



# European Energy Solutions Good Practices

**T@W Workshops**

**Bangkok, Thailand**

**25<sup>th</sup> and 26<sup>th</sup> February 2008**

**Ana Pipio,  
Sandrina Pereira, Luis Manuel Alves  
IDMEC - IST**



Grupo de Investigação em Energia e Desenvolvimento Sustentável

## Contents

- European Framework
- RGED / IDMEC
- EMINENT – European Project on promotion of European Energy Technology
- Nutroton – Energy Solution Provider
- Suldouro – Good Practice Example
- LusoCarbonFund – Carbon Fund

## European Targets

---

### European targets to reduce Greenhouse Gas Emissions

(approved by the EC in March 2007)

- To reduce GHG emissions by 20% by 2020 (target that can be increased to 30% in case of a global agreement);
- In the longer term, to reduce GEE by 60-80% by 2050 (to meet a global reduction of GEE of 50%).

### European targets for Renewable Energy and Energy Efficiency

(approved by the EC in March 2007)

- To ensure 20% of renewable energy sources in the EU energy mix by 2020;
  - To reduce EU global primary energy use by 20% by 2020.
- 

## SET - Plan

---

### European Strategic Energy Technology Plan (SET-Plan)

“Low carbon technologies will play a vital role in reaching our energy and climate change targets. The main goal of the SET-Plan is to accelerate the development and implementation of these technologies.”

---

## SET - Plan

---

**Key EU technology challenges for the next 10 years to meet the 2020 targets:**

- Make second generation biofuels competitive alternatives to fossil fuels, while respecting the sustainability of their production;
  - Double the power generation capacity of the largest wind turbines, with offshore wind as the lead application;
  - Demonstrate commercial readiness of large-scale Photovoltaic (PV) and Concentrated Solar Power;
  - (...)
- 

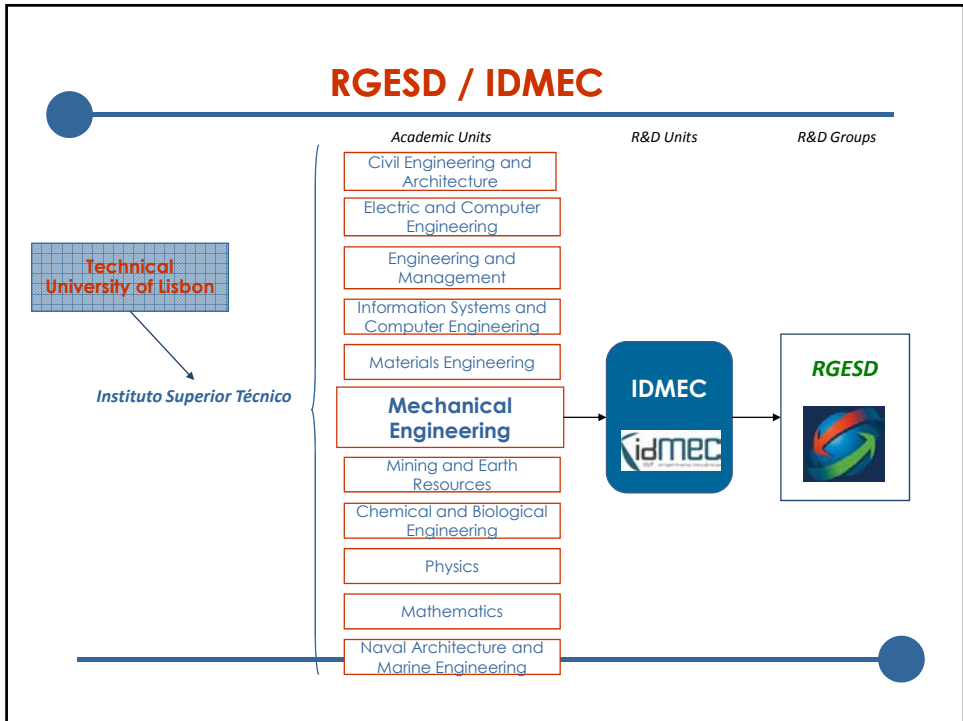
## SET - Plan

---

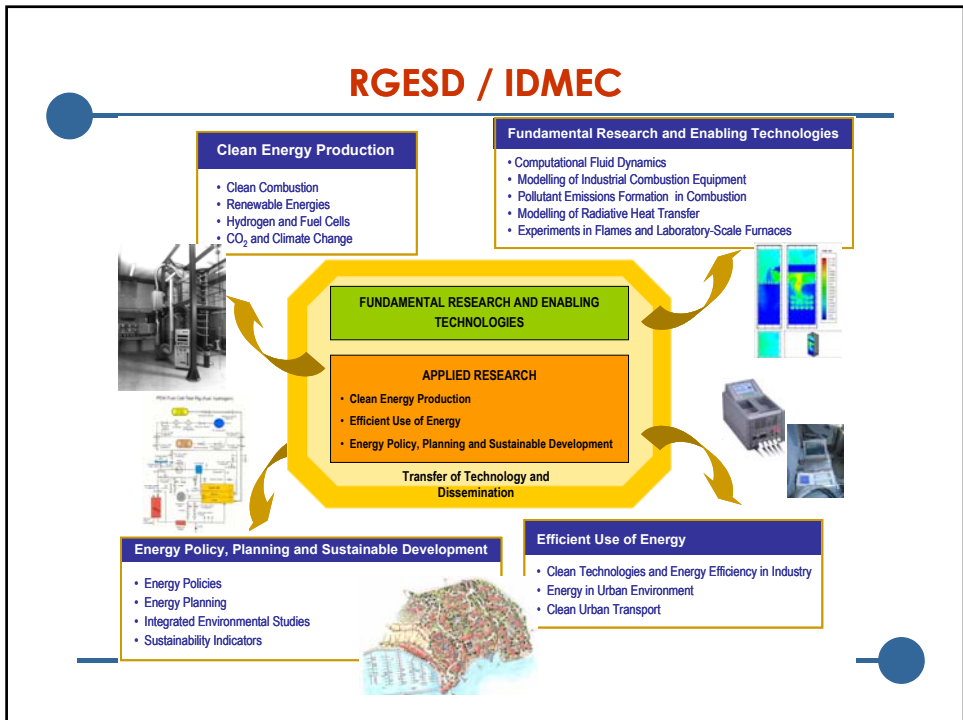
**Key EU technology challenges for the next 10 years to meet the 2050 vision:**

- Bring the next generation of renewable energy technologies to market competitiveness;
  - Achieve a breakthrough in the cost-efficiency of energy storage technologies;
  - Achieve breakthroughs in enabling research for energy efficiency: e.g. materials, nano-science, information and communication technologies, bioscience and computation;
  - (...)
-

# RGESD / IDMEC



# RGESD / IDMEC



## RGESD / IDMEC

### Research Projects

Clean Combustion → Polygeneration	12
Renewables Energies	4
Hydrogen and Fuel Cells	6
CO <sub>2</sub> and Climate Change	1
Clean Technologies and Energy Efficiency in Industry	8
Clean Urban Transport	3
Energy in Urban Environment	2
Energy Policies and Energy Planning	1
Integrated Environmental Studies	2
Sustainability	1
Capacity Building in Energy and Environment in Third Countries	1
Promotion of Energy Technologies	5

**Total on-going projects 46**

## International Cooperation Projects



## International Cooperation Projects



### CDM related projects

**CDMSIDS** - *Facilitating the Kyoto Protocol Objectives by CDM in Small Island Developing States*

**CDM for Sustainable Africa** - *Capacity Building for CDM in Sub-Saharan African Countries*

**CDM MEDA** - *Business Opportunities for CDM Development in the Mediterranean*

**CDM China** - *Capacity Building on business opportunities for CDM projects in China*

### Promotion of Energy Technologies

**OPET OLA**- *Promotion of modern, clean energy and transport technologies and policies in Latin America and Caribbean*

**EMINENT** - *Early Market Introduction of New ENergy Technologies*

## RGESD - Projects



### EMINENT Background

#### EMINENT I

Started in 2003, co-financed by DGTREN (European Commission)  
Ended in 2005 and was considered a success by the EC

#### EMINENT II

Started in 2006, co-financed by DGTREN  
Planned end in 2008

### EMINENT Project

The **main objective** of the project is to identify and accelerate introduction and implementation of leading edge European energy and environmental technology into the market place in Europe and worldwide.

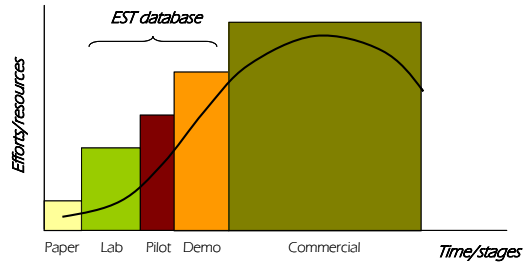
# RGESD - Projects



## EMINENT - Early Stage Technologies

Between the papers idea of a new technology and its introduction in the market, it can be identified three phases: Laboratory, Pilot and Demonstration. When the technology is completely developed it is necessary to introduce it in the market - Commercial phase.

In the EMINENT project the aim is to reduce the execution times of the laboratory, pilot and demonstration phases

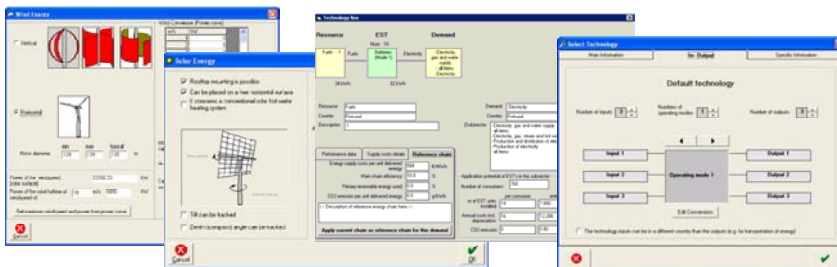


# RGESD - Projects



## EMINENT - Assessment Tool

The assessment tool measures, at the energy, environmental and financial levels, the potential impact of the introduction of an EST (Early Stage Technology) in a pre-defined energy supply chain, comparing the use of the EST to commercially available technology.



## RGESD - Partnerships

**nutroton**  
energias | sa

### 1. Who is Nutroton Energias ?

. A new company operating in the field of renewable energies.



**nutroton**  
energias | sa

## 1. Who is Nutroton Energias ?

. It sets out to consolidate and boost investments held in this field by three prestigious business groups in Portugal

- . JVC Group
- . Siram Group
- . Nutroton Group

. It has a business portfolio around 120 million Euros since its very outset



## 2. What does Nutroton Energias ?

. Nutroton Energias endeavours to tap into new investment potential in the renewable energy sector.

. Has the critical mass it needs to assert itself as a credible "player" in the renewable energies sector, representing a modern drive towards alternative energy solutions which are environmentally clean and sustainable from the perspective of future development.





nutroton  
energias | sa

### 3. How does Nutroton Energia ?

. Nutroton Energias has major projects in progress in three areas – in the fields of biomass, photovoltaic and wind energy.

nutroton  
energias






nutroton  
energias | sa

### 3.1 Biomass

. Nutroton Energias recently won the tender put out by the portuguese Government for the construction of a 5 MW Biomass Plant in Viseu

. In addition to this project, it is already awaiting licensing in three others:

- . A 5 MW Biomass Plant using gasification
- . A 5 MW Biomass Plant using forest biomass
- . A 3 MW cogeneration unit using forest and animal biomass




nutroton  
energias | sa

## 3.2 Photovoltaic

. In the field of Photovoltaic Energy, Nutroton Energias is awaiting licensing for two farms:

- . The installation of 6 MW Photovoltaic farm on the island of Madeira
- . The installation of a 2 MW Photovoltaic farm on the island of Porto Santo




nutroton  
energias | sa

The slide features a blue border with a white central area. The title '3.2 Photovoltaic' is in a bold, dark blue font. Below it, a paragraph and a bulleted list describe the company's pending licensing for two photovoltaic farms. The bottom half of the slide is a photograph of sunlight streaming through a cloudy sky, with a small Nutroton Energias logo in the bottom center.

nutroton  
energias | sa

## 3.3 Wind Energy

. In the field of Wind Energy, Nutroton Energias is undergoing licensing vis-à-vis the construction of a 10 MW wind farm in the Autonomous Region of Madeira.



nutroton  
energias | sa

The slide features a blue border with a white central area. The title '3.3 Wind Energy' is in a bold, dark blue font. Below it, a paragraph describes the company's licensing process for a 10 MW wind farm. The bottom half of the slide is a photograph of a wind turbine against a clear blue sky, with a small Nutroton Energias logo in the bottom center.

## 4. What does Nutroton Energias in the field of Biomass ?

Technologies:

### **Direct Combustion of Poultry Litter and Forest Biomass for CHP production**

Investment – 2,5 M € / MWe

Global Electric Efficiency – 21% to 23%

Fuel – 8.800 ton/MWe.year (Forest Biomass 50% and Poultry Litter 50%)

Reduced CO<sub>2</sub> emissions – 2.300 tonCO<sub>2</sub>/MWe.year



## 4. What does Nutroton Energias in the field of Biomass ?

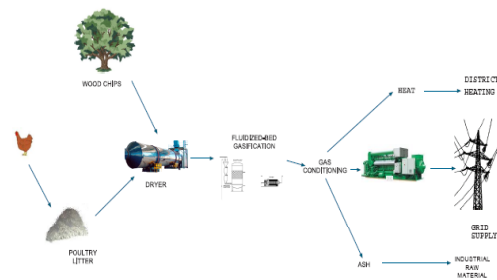
### Small scale CHP Gasification Unit




. Undergoing an R&D project aimed to overcome technical/economical uncertainties of Poultry Litter and wood chips fluidized-bed gasification through gas engine.

. Project site Portugal

- . Power production – 1,2 MWe
- . Fuel – 1000 kg/h ( 40 % poultry litter )
- . Global electric efficiency 27 -30%

## 4. What does Nutroton Energias in the field of Biomass ?





## Contacts

Manuel Marques da Silva  
General Director





e-mail.: manuel.silva@iberfer.nutroton.com

Gsm.: 00351 912 229 704

João Correia de oliveira  
Project manager

e-mail.: joao.oliveira@nutroton.com

Gsm.: 00351 917 701 732



## RGESD – SET Good Practice

### Energy from Biogas recover from the Landfill in Sermonde

- Portugal -

Project from *Suldouro, Valorização e Tratamento de RSU, S.A*

## RGESD – SET Good Practice

### SulDouro – General Figures



**Total Area – 384 km<sup>2</sup>**

Vila Nova de Gaia 303 x 10<sup>3</sup> inhabitants (in 2006)

Santa Maria da Feira 143 x 10<sup>3</sup> inhabitants (in 2006)

**Total 446 x 10<sup>3</sup> inhabitants**

**Production of MSW 173 222 ton/year**

1 060 g. hab./day

**Production of SW 14 900 ton/year**

92 g.hab/day



## RGESD – SET Good Practice

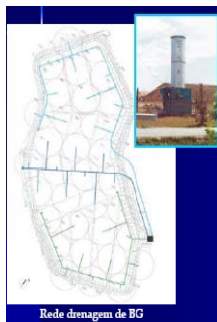
### SulDouro – Sermonde Landfill



- Initiated to work in March 1999
- Total waste dumped - 1 600 000 ton



- Extraction with burning of the gas started in January 2000;
- Second burner installed in 2002;
- Total Flow aprox. 500 m<sup>3</sup>/h

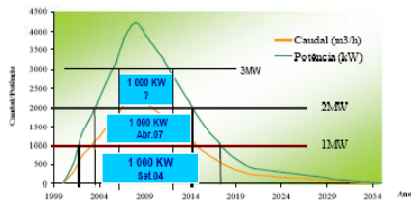


## RGESD – SET Good Practice



### SulDouro – Energy from Biogas

- Licencing process in DGGE for 1 000 KW
- International public process to purchase the technology
- Engine Jenbacher 20cil. of 1 000 KW power
- Start-up in September 2004
- Production full time in 2005
- Installation of a 2<sup>nd</sup> engine in April 2007



The production model pointed to a potential of:

- 1 000 KW from 2002 for 15 years;
- 2 000 KW from 2004 for 10 years;
- 3 000 KW from 2006 during 5 years.

## RGESD – SET Good Practice



### Suldouro – Energy Production

#### Electricity production

- 2005 – 8 709 MWh
- 2006 – 8 474 MWh
- 2007 – 14 000 MWh

For 6 000 households

4% of the domestic consumption of Vila Nova de Gaia



#### Heat Production

- Space heating
- Water heating

## RGESD – SET Good Practice



### SulDouro – Contact Person

**Sandra Oliveira**

[sandraoliveira@suldouro.pt](mailto:sandraoliveira@suldouro.pt)

[geral@suldouro.pt](mailto:geral@suldouro.pt)

Suldouro, Rua Conde Barão,  
4415-103 Sermonde  
PORTUGAL

Tel: (+351) 227 419 160

Fax: (+351) 227 419 169

**Thank You**

[anapipio@ist.utl.pt](mailto:anapipio@ist.utl.pt)