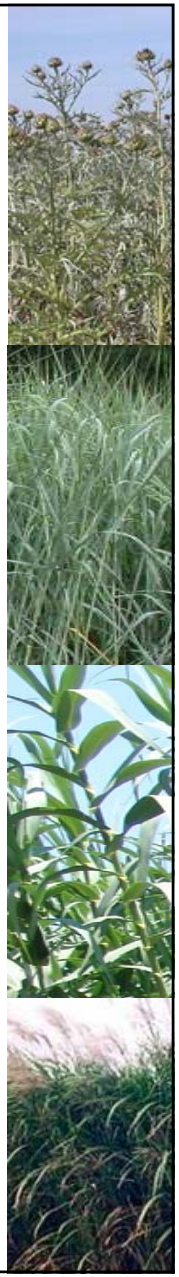
Biomass in Greece: Action Plans and Perspectives

Myrsini Christou

Center for Renewable Energy Sources - CRES



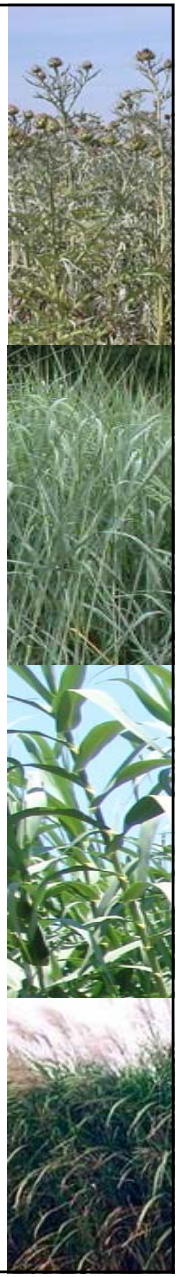
2nd Expert Meeting on National Biomass Action Plan

Brussels, 13 March 2007

Contents

Action Plans addressing biomass in:

- ✓ Ministry of Development
- ✓ Ministry of Rural Development and Food
- ✓ Ministry of Environment, Physical Planning and Public Works
- ✓ Ministry of Finance



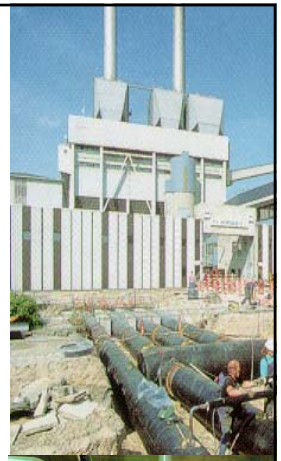
Greek energy balance

Area	132,000 km²
Population	10.96 millions

Gross national energy consumption (2004)		30,7 MTOE
Sources	ktoe	%
Oil products	17,499	57.13
Solid fuels	9,100	29.71
Natural gas	2,229	7.28
RES and large-scale hydros	1,560	5.09
Solar	108	0.35
Wind	96	0.31
Biomass	917	2.99
Biogas	36	0.12
Small Hydro (<10 MW)	26	0.08
Large Hydro (>10 MW)	376	1.23
Power (imports)		0.60
Total		100.0

Biomass Plans

Ministry of Development

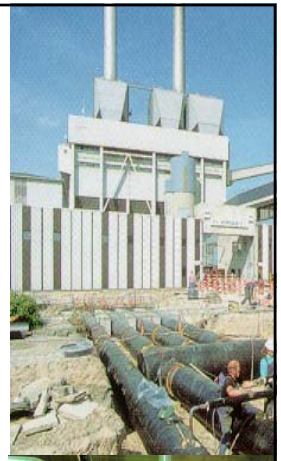


Legislation on electricity production from RES and CHP

- ✓ The Directive 2001/77 on electricity from RES has been adopted by the Greek government in June 2005, as **Law 3468/06**. The main scope of this new law is to simplify the permitting system for the RES investments in Greece (i.e. licensing procedures).

- ✓ A point of strong interest is the new electricity feed-in-tariffs system, applicable for the sales of RES-produced electricity to the grid. Electricity produced by biomass is set at 73 euro/MWh (while for photovoltaics is 400 euro/MWh).

- ✓ The current installed capacity is about **26 MW**, coming from the exploitation biogas energy of landfill generated in Sanitary Landfills (SL) and biogas generated in Municipal Wastewater Treatment Plants (MWTP). Requests for permits have been submitted and approved for another **32 MW** until 2010.



Electricity from RES (Directive 2001/77, Law 3468/06)
2010 Target: 20.1% RES contribution incl. large-scale hydro

	Requirements in installed capacity by 2010, in MW	Energy generated in 2010 in Twh	Share of every renewable energy source in 2010 (%)
Wind parks	3,372	7.09	10.42
Small-scale hydro	364	1.09	1.60
Large-scale hydro	3,325	4.58	6.74
Biomass	103	0.81	1.19
Geothermal	12	0.09	0.13
Photovoltaics	18	0.02	0.03
Total	7,193	13.67	20.10

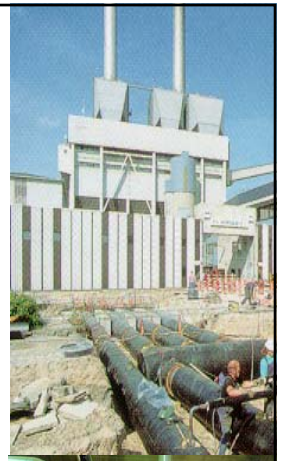
Bio energy in the heat market

- The concept of district heating is not widespread and the lack of regulated heat prices and infrastructure hinders the development in this sector. The only district heating schemes that exist in Greece are the ones using the waste heat from lignite thermal plants.

- Bioenergy in 2005 accounted for 1 Mtoe.

  - 73% (0.7 Mtoe) wood consumed directly in the domestic/residential sector

  - 27% (0.26 Mtoe) biogas from sanitary landfills and wastewater treatment plants, wood/agricultural/food industries‘ residues.



Liquid biofuels

- ✓ The Biofuels directive 2003/30 has been adopted as **Law 3423/05**.
- ✓ Biodiesel will be the main biofuel for the Greek transport sector with bioethanol playing a less important role until 2008.
- ✓ Obligatory use of all detaxed biodiesel in the existing refineries (in an up to 5% blend). Detaxed quantities are decided on an annual basis under a quota scheme.
- ✓ For 2006 14 investors have applied for detaxed biodiesel production amounting to the 91,000 m^3 set for 2006 and 13 investors applied for 114,000 m^3 for 2007.
- ✓ For 2007 the 30% of the 3 final months (Oct, Nov, Dec) has to be supplied by locally produced seed oils.
- ✓ The market for pure biodiesel does not exist yet.

Estimation of Biodiesel Required (2005 – 2010)

(1st National Annual Report on Biofuels www.ypan.gr)

Year	Estimated Automotive Diesel Consumption ('000 tons)	Biodiesel used (%)	Biodiesel Required (tons)
2005	2.084	2,00	46.976
2006	2.125	3,00	71.851
2007	2.167	4,00	97.695
2008	2.208	4,50	111.986
2009	2.249	5,00	126.739
2010	2.290	5,75	148.407

Estimation of Bioethanol required (2005 – 2010)

(1st National Annual Report on Biofuels www.ypan.gr)

Year	Estimated Automotive Gasoline Consumption ('000 tons)	Bioethanol used (%)	Bioethanol Required (tons)
2005	3.707	2,00	120.442
2006	3.800	2,50	154.329
2007	3. 892	3,00	189.678
2008	3.984	4,00	258.883
2009	4.077	5,00	331.157
2010	4.169	5,75	389.424

Biomass Plans

Ministry of Rural Development and Food

National Plan for Strategic Rural Development of Greece for the 4th programmatic period 2007-2013

- Measure 1. Enhancement of competitiveness in Agriculture and Forestry sectors
  - Cultivation of energy (non-food) crops is envisaged, to provide alternative solutions for agriculture, in order to avoid abandonment of agricultural lands (now cultivated with tobacco, cotton and sugar beets) and maintenance or increase of farmers' incomes. Specifying the new CAP regime, the Greek government applied full decoupling to all arable crops and 65% decoupling for cotton.
- Measure 2. Protection of environment and rural areas
  - Specific target 1. Soil protection
  - Specific target 2. Water protection
  - Specific target 3. Maintenance of biodiversity
  - Specific target 4. Prevention of climate change (through energy crops cultivation)
  - Specific target 6. Reinforcement of the effectiveness of all above with technical support and public awareness

Projections announced by the Ministry

In 2007:

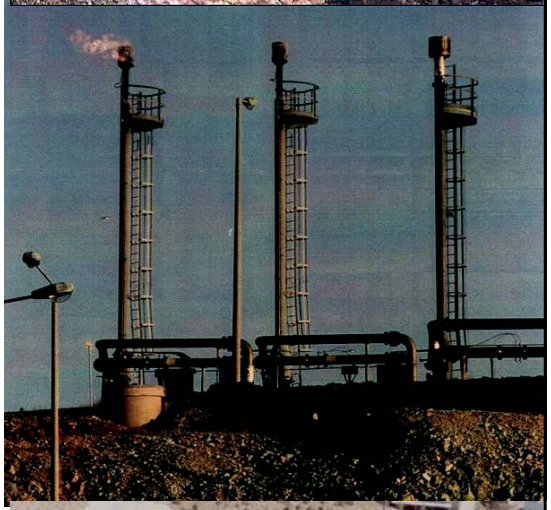
- ✓ 11.200 ha will be grown with energy crops, with relevant contracts, for biodiesel production.
- ✓ In addition, 72.833 tons of locally produced oil seeds, mainly cotton oil seeds (68.833), will be used for biodiesel production.
- ✓ The pure biodiesel that will be produced, will derive by 23,7% from local resources, a percentage that could increase to even 39%.
- ✓ Two sugar plants of the Greek Sugar Industry in Xanthi and Larisa will shift to ethanol production. That will give a strong boost in energy crops, as the resources to be used in the two plant will amount to 600,000 tons of sugar beets and 600,000 tons of cereals.

Other Directives adopted

- **Renewable Energy Directive (2001/77/EC).** Adopted in Law 2773 (ΦΕΚ 286/A/22.12.1999).
- **CO2 Emission Trading Directive 2003/87/EC. A**dopted in CMD 54409/2632 (ΦΕΚ 1931/B/27-12-04).

Biomass Plans

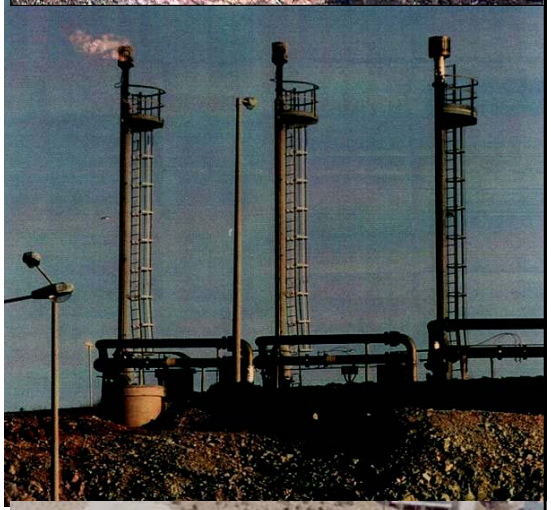
Ministry of Environment, Physical Planning and Public Works



Specific Spatial Planning Framework for RES

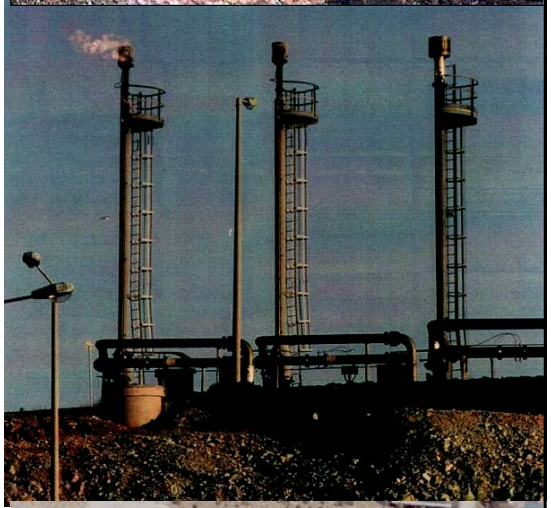
According to this plan:

- For biomass and biogas exploitation, favorable areas are considered these located in near proximity to agricultural lands where biomass is produced, waste treatment plants, food industries, animal breading farms. Minimum distances from the nearby land uses are set.
- The plan is under public consultation.



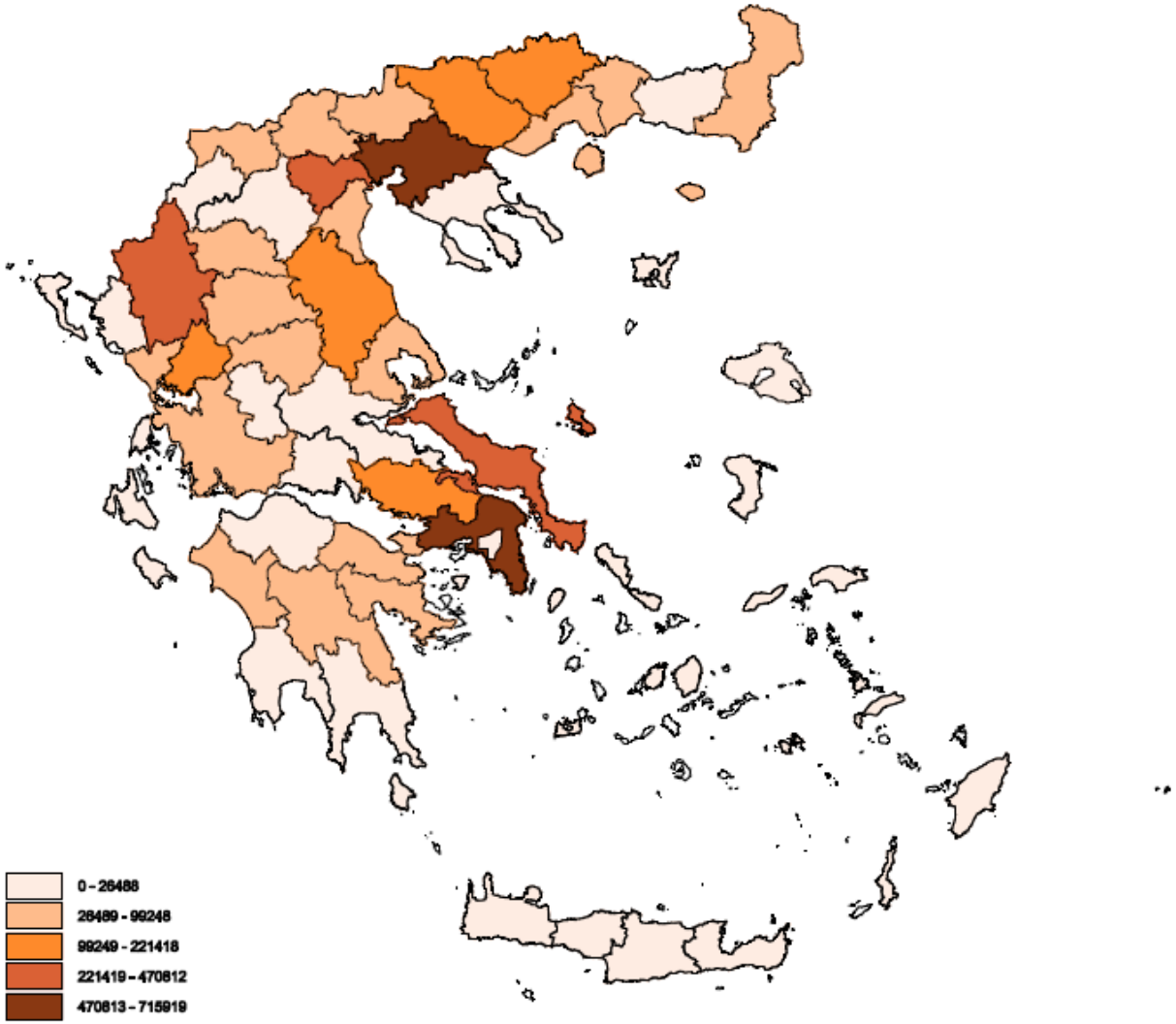
Other Directives adopted

- **Landfill Directive (99/31/EC).** Adopted in CMD 29407/3508/2002 (ΦΕΚ 1572/B/16.12.02).
- **LCP Directive (2001/80/EC). A**dopted in the MD 58751/2370/93 (ΦΕΚ 264/B/15.4.93).
- **Waste Incineration Directive (2000/76/EC)**. Adopted MD 922/77 (ΦΕΚ 315/A/14.10.77)
- **IPPC Directive (1996/61/EC).** Adopted in Law 3010/02.



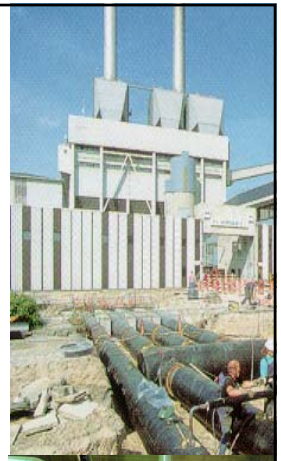
Υ.ΠΕ.ΧΩ.Δ.Ε. : Ειδικό Χωροταξικό Πλαίσιο για τις ΑΠΕ

Η Ετήσια Κατανομή της Βιομάζας



Biomass Plans

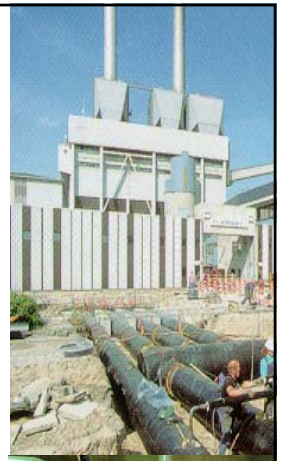
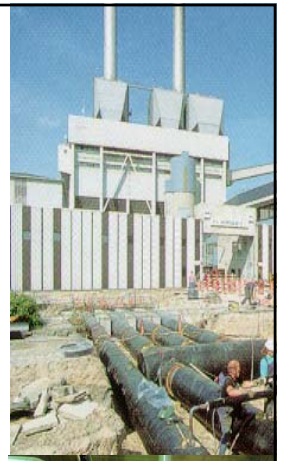
Ministry of Finance



Support measures

There are two main financial-support instruments that provide substantial public subsidies to RES investment projects:

- ✓ The "National Development Law" (**Law 3299/2004**). Subsidies vary from 40- 55% according to region and the type of the enterprise (in case of SMEs and specific regions they can reach up to 55%)
- ✓ The **Greek Operational Programme for Competitiveness**, active until the end of 2006. Support on capital cost (up to 40%) for biodiesel plants was included in the 3rd Community Support Framework (Energy). The 4th Framework is under development and respective provisions are expected to be put forth.



Thank you for your attention!