

Module 3 : Biomass, the energy resource with the highest potential in Romania

Opening remarks

- Potential
- Contribution to RES targets
- European cooperation

Biomass - the largest RES in Romania ?

High biomass potential

- “traditional” estimation
about 7 594 thousand toe per year (318x10⁹ MJ per year), with
no energy crops consideration on available land

- REFUEL project assumption:

Cultivated land (arable land and permanent crops) use in 2030,
'Baseline' scenario

Food & Feed area requirements	4213 kha
Potential area for bio-mass feedstock production	5490 kha
Land conversion to building and others	205 kha

Biomass present use: c.a. 140 PJ/year

- **Direct burning** in the kilns, stoves for space heating, cooking and hot water preparation is about **95 percent of the biomass use**.
- The rest of the biomass is used in thermal plants to generate **industrial steam and hot water** in sawmills and in other industries equals about 5 percent of biomass usage.



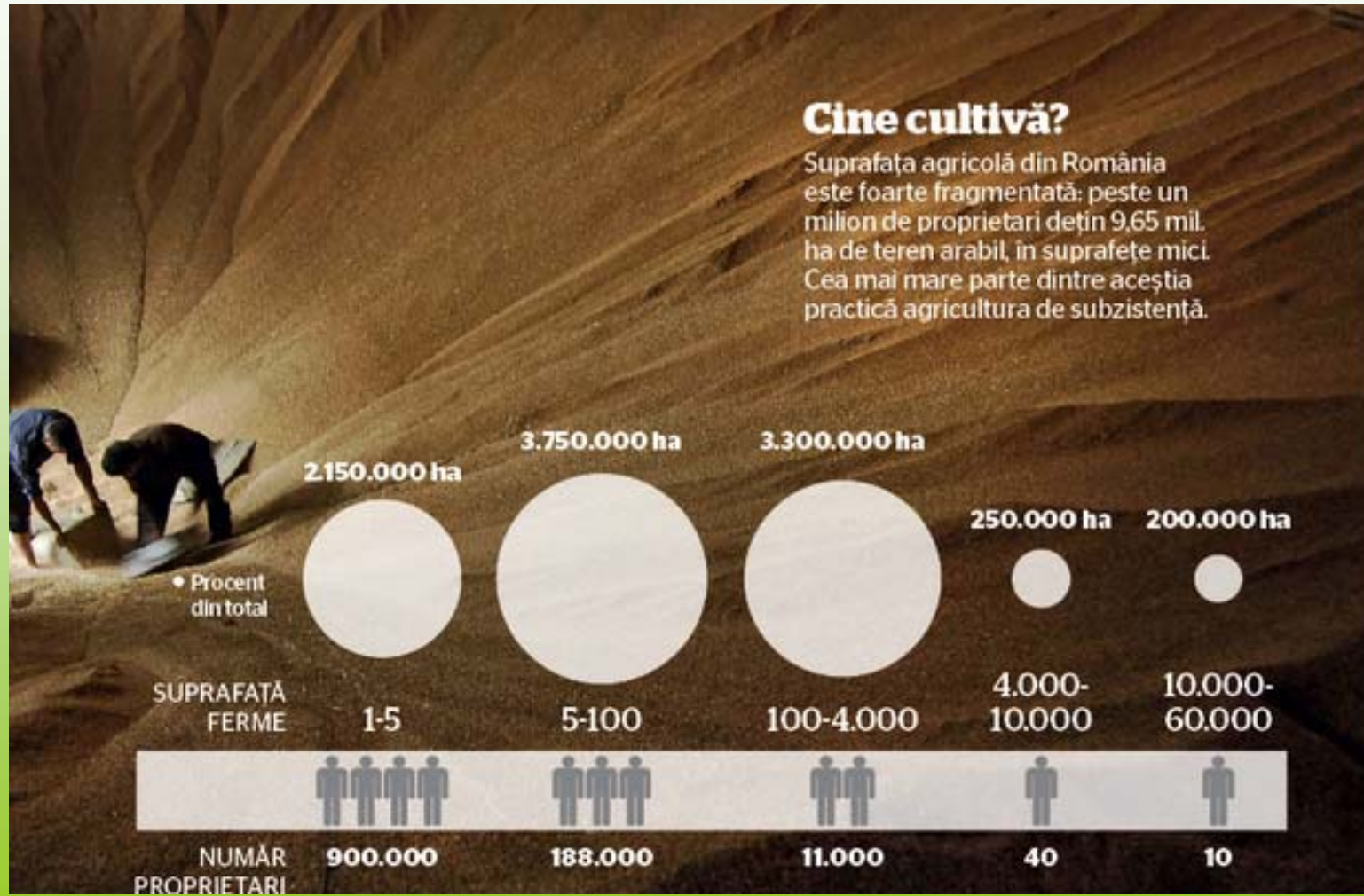
RETS
Renewable Energies Transfer System

POWER, TWh	
WIND (on shore)	0.2
WASTE	0.00
BIOGAS	0.06
BIOMASS	0.10
GEOHERMAL	0.00
PV	0.00
All hydro	17.80
<i>hydro large</i>	16.8
<i>hydro small</i>	1.00
Total, TWh	18.16
HEAT&BIOFUELS, PJ	
SOLID BIOMASS	135
BIOGAS etc	0.04
SOLAR	0.06
GEOHERMAL	0.08
BIOFUELS	9
Total heat and biofuels, PJ	144.2
Gross final consumption, PJ	1083
TOTAL POWER, HEAT, BIOFUELS, PJ	222
Quote RES of gross final consumption	20.5%

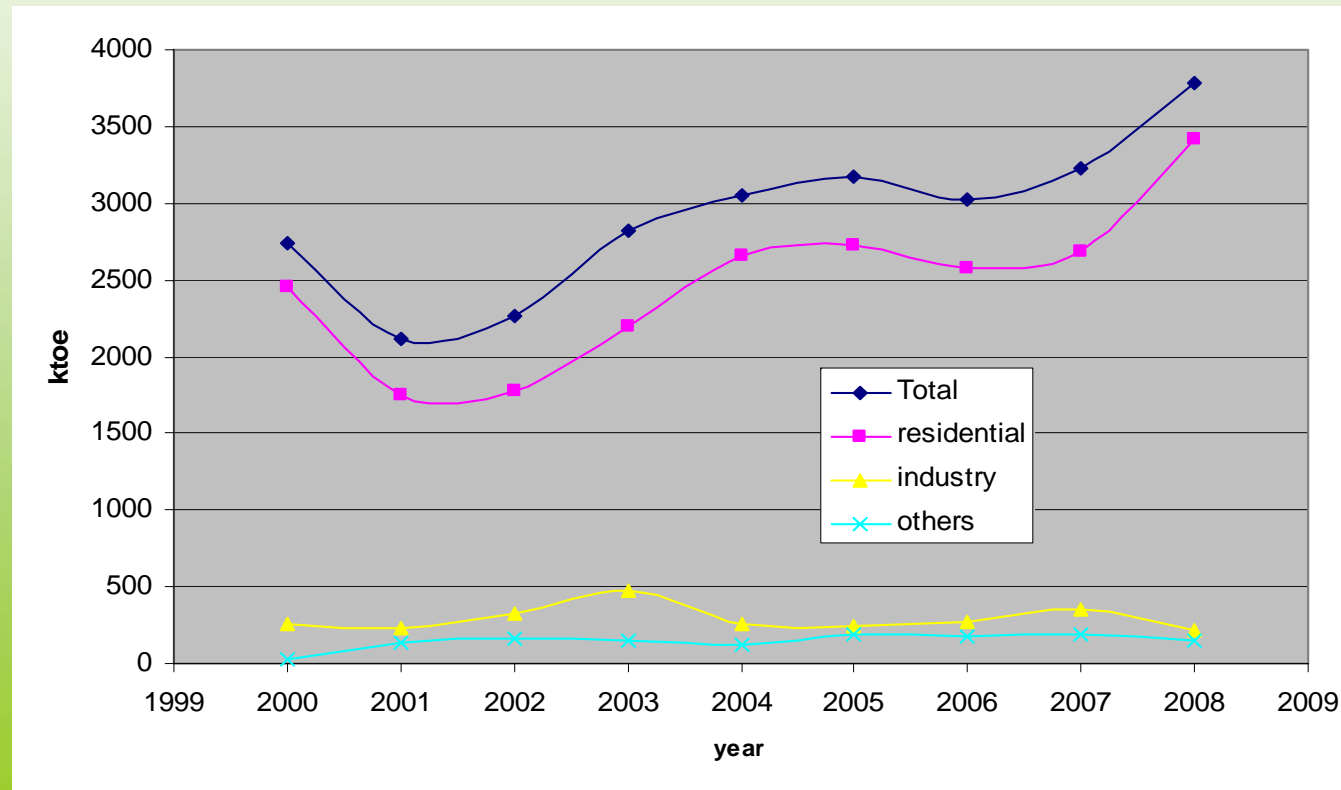
**Present RES
development-
2010**

- In Romania there is a large **historical experience** to collect, deposit and use the biomass for local heating in rural stoves.
- The rural area is close to biomass resources and at the same time is fitted for decentralized, local heating systems. One may say **BIOMASS use development means also RURAL Development**
- **Need to switch to efficient innovative technologies for biomass heating**
- **Land fragmentation**

Land ownership fragmentation



The statistics on biomass consumption are not very reliable. In 2008 the residential consumption rose abruptly by 28% !?



- **How to improve the policies and scenarios for bioenergy and geothermal development to 2020 and after ?**
- **Which may be the targets for RES Heat from solid biomass, biogas, geothermal, solar ?**
- **Which efficient/innovative technologies shall be promoted for RES heat from solid biomass?**

Selection of priority technology chains

The following technology chains may be a priority for biomass use projects in Romania, on short term:

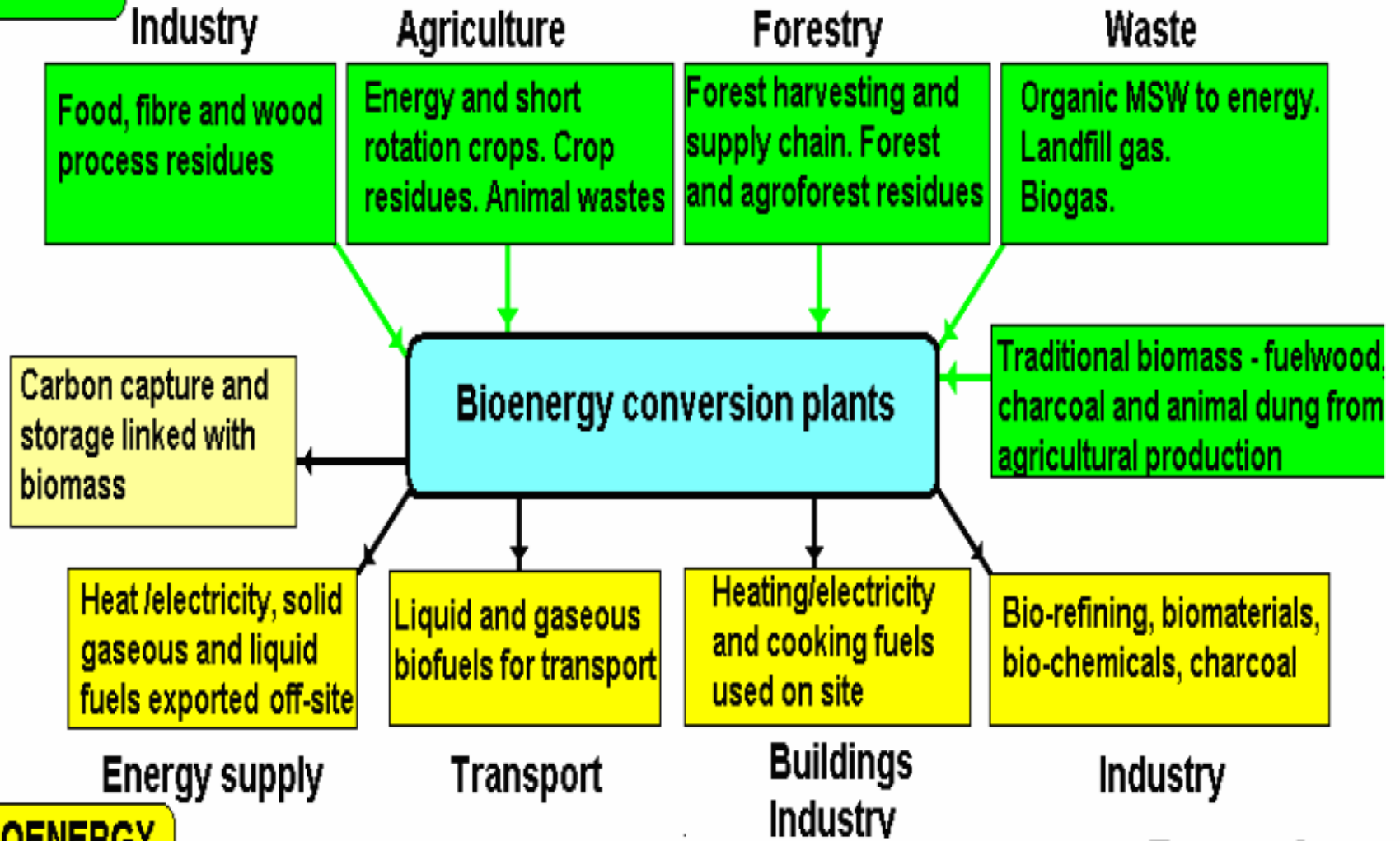
HEATING: **medium size**
- **boilers**
- **CHP** (and **POWER**)

FUELLED by

- **solid biomass from wood and agricultural vegetal waste**
- **biogas from anaerobic digestion of organic waste streams from municipalities and agricultural origin**

**BIOMASS
RESOURCE**

Technology chains



Innovative technologies according to the EC Decision dated 3 November 2010

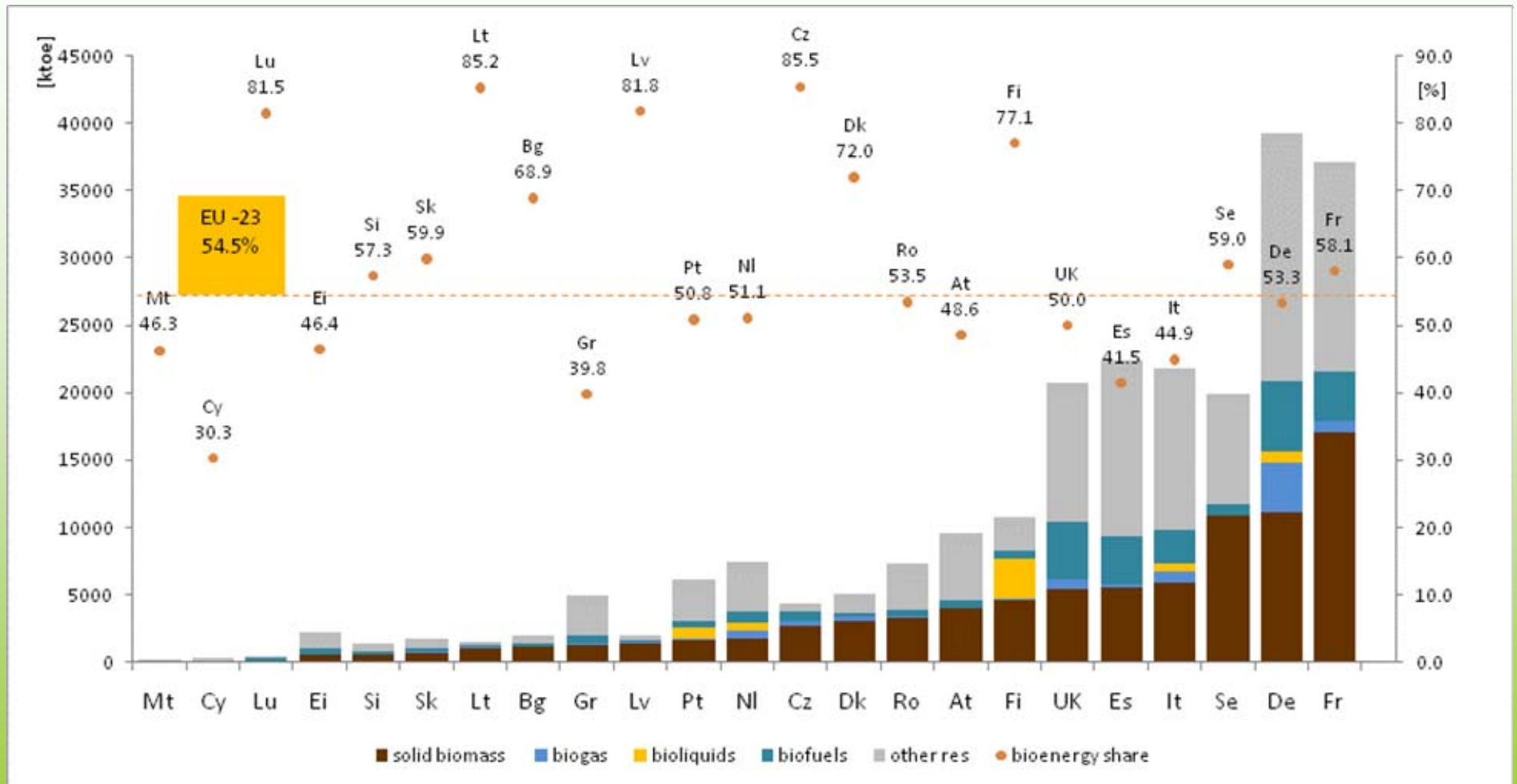
II. Innovative RES demonstration project categories (with minimum size thresholds)

- Bioenergy – project subcategories:
 - Lignocellulose to intermediate solid, liquid or slurry bioenergy carriers via pyrolysis with capacity 40 kt/y of the final product.
 - Lignocellulose to intermediate solid, liquid or slurry bioenergy carriers via torrefaction with capacity 40 kt/y of the final product.
 - Lignocellulose to Synthetic Natural Gas or synthesis gas and/or to power via gasification with capacity 40 million normal cubic metres per year (MNm³/y) of the final product or 100 GWh/y of electricity.
 - Lignocellulose to biofuels or bioliquids and/or to power including via directly heated gasification with capacity 15 million litres per year (Ml/y) of the final product or 100 GWh/y of electricity. Production of Synthetic Natural Gas is excluded under this subcategory.
 - Lignocellulosic raw material, such as black liquor and/or products from pyrolysis or torrefaction, via entrained flow gasification to any biofuels with capacity 40 Ml/y of the final product.
 - Lignocellulose to electricity with 48 % efficiency based on lower heating value (50 % moisture) with capacity 40 MWe or higher.
 - Lignocellulose to ethanol and higher alcohols via chemical and biological processes with capacity 40 Ml/y of the final product.
 - Lignocellulose and/or household waste to biogas, biofuels or bioliquids via chemical and biological processes with capacity 6 MNm³/y of Methane or 10 Ml/y of the final product.
 - Algae and/or micro-organisms to biofuels or bioliquids via biological and/or chemical processes with capacity 40 Ml/y of the final product.

The NREAP considers a bulk of about 4,000 ktoe RES heat (54% from the RES target), with no indication regarding the resource (bioenergy, solar and geothermal), or technology

Bioenergy has the decisive role to fulfill the RES quota, but the estimations on bioenergy development are the most “fluid”.

Bioenergy share in RES target



BIOMASS FUTURES

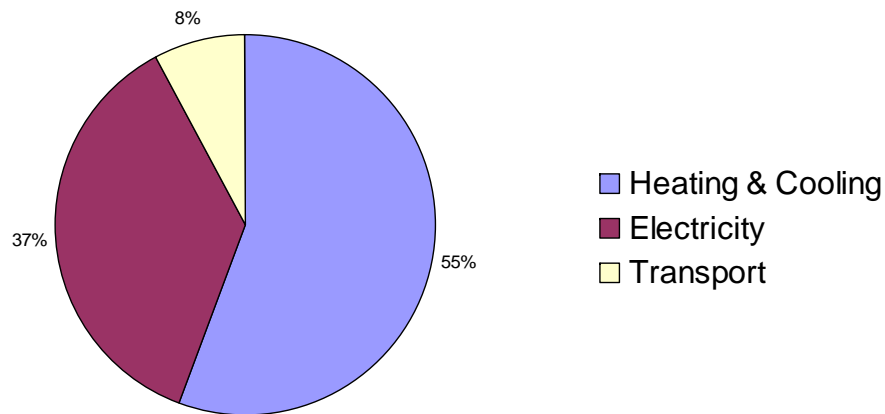
Bucharest 15th June 2011

RES development in Romania-NREAP

	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Heating & Cooling (%)	18,72	17,86	17,51	18,15	17,63	17,00	17,07	17,27	18,07	18,86	20,44	22,05
Electricity (%)	30,08	27,48	30,83	33,84	36,66	40,04	41,86	42,84	42,57	42,63	42,70	42,62
Transport (%)	1,39	5,82	6,37	6,90	7,32	7,72	8,11	8,43	8,80	9,23	9,69	10,00
Overall energy (%)	17,90	17,50	18,00	19,04	19,35	19,66	20,13	20,59	21,21	21,83	22,92	24,00
Deficit to be covered from stat. transfers	0	0	0	0	0	0	0	0	0	0	0	0
Surplus to be valorified as statistical transfers	0	0	0	0	0	0	0	0	0	0	0	0

RES development in Romania-NREAP

ktoe	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Heating & Cooling	3516	2819	2834	3000	2969	2925	3000	3058	3220	3390	3707	4038
Electricity	1347	1435	1624	1802	1991	2195	2333	2448	2511	2566	2621	2666
Transport	58	275	310	345	375	405	436	458	483	511	542	564
Overall energy	4921	4529	4768	5147	5335	5525	5769	5964	6214	6467	6870	7267



Potential for RES cooperation on biomass.

Romania is preparing the regulatory framework for cooperation mechanisms, as a Governmental Decision draft is posted on the Ministry of Economy web site

After Energy Commissioner Oettinger recently said that “we will have (...) a proposal from the Commission side for a long-term target for 2030 and 2040 and 2050”, Climate Commissioner Hedegaard told in an interview with the Guardian that the EU needs to have ambitious targets. “It would be one way to send a long-term price signal for renewable energy - that renewable energy is not just going to stop growing after 2020”, she said.

EREC: “45% by 2030”

The “missing” Renewable Heating and Cooling Directive



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