# Energy Efficiency and Renewable Energy - challenges and opportunities in Romania

"Threats and Opportunities in the Energy Markets in the
Current Economic Crisis"

**3rd South East Europe Energy Dialogue**

***Dr. Tudor CONSTANTINESCU***

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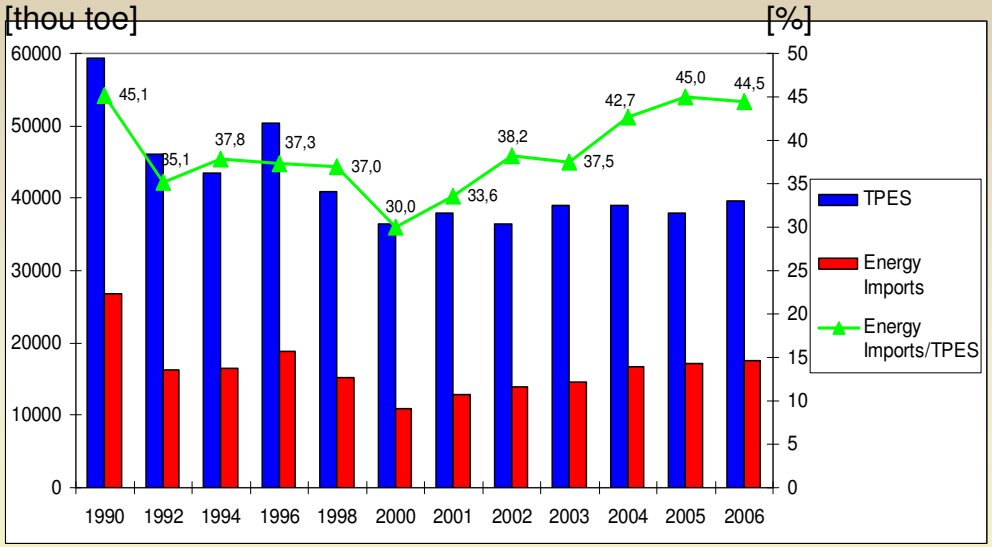
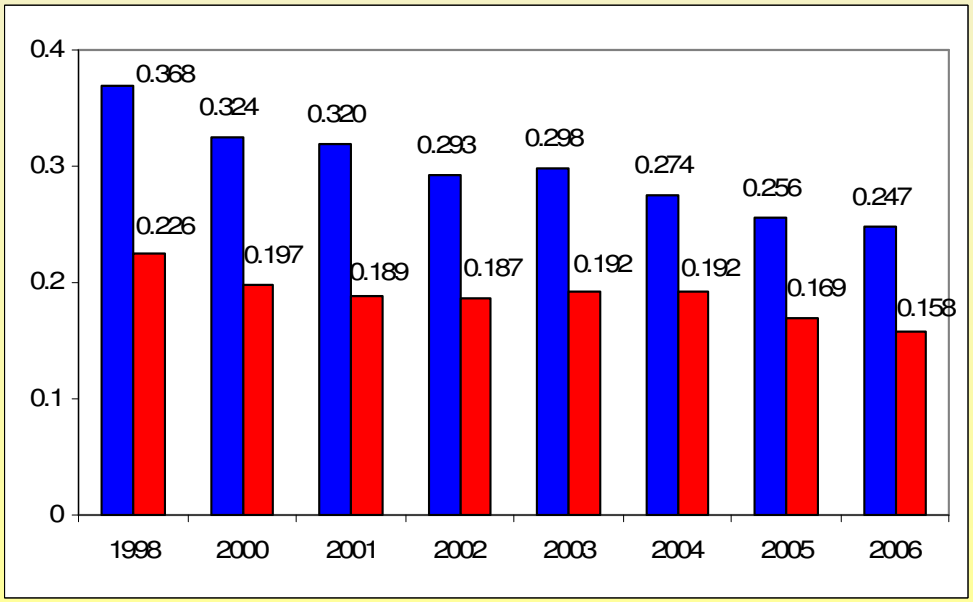
## *Evolution of Total Primary Energy Supply and Energy Imports*



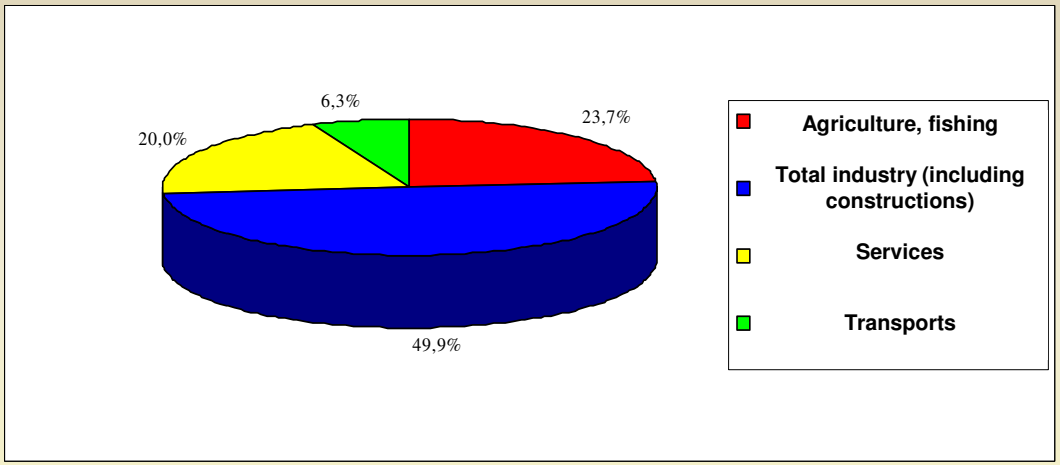

## *Evolution of the Final Energy Intensity*

**[toe/1000Euro2000 ppp]**

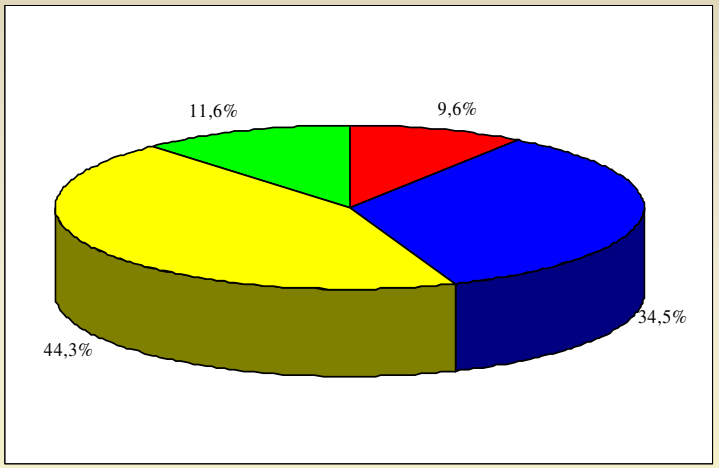


## The Structure of Gross Added Value

### 1990

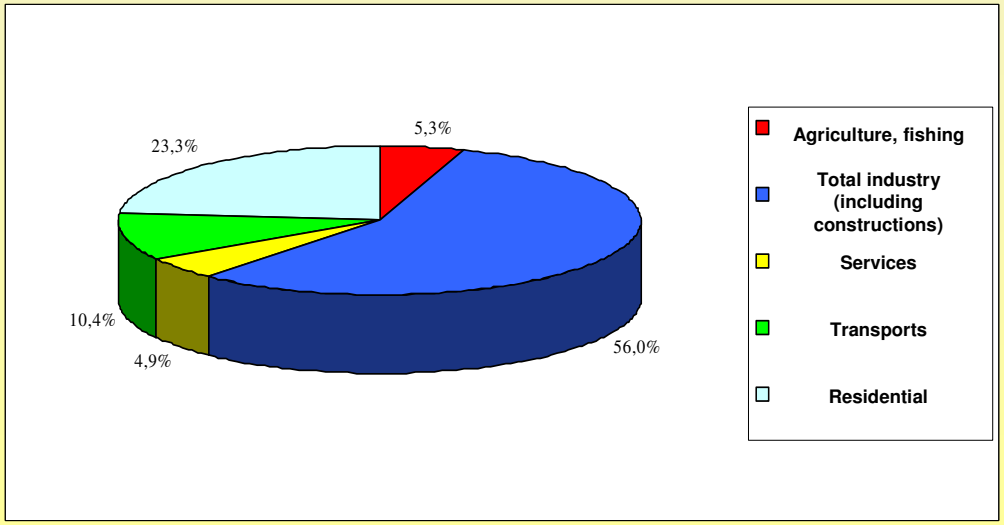



### 2005

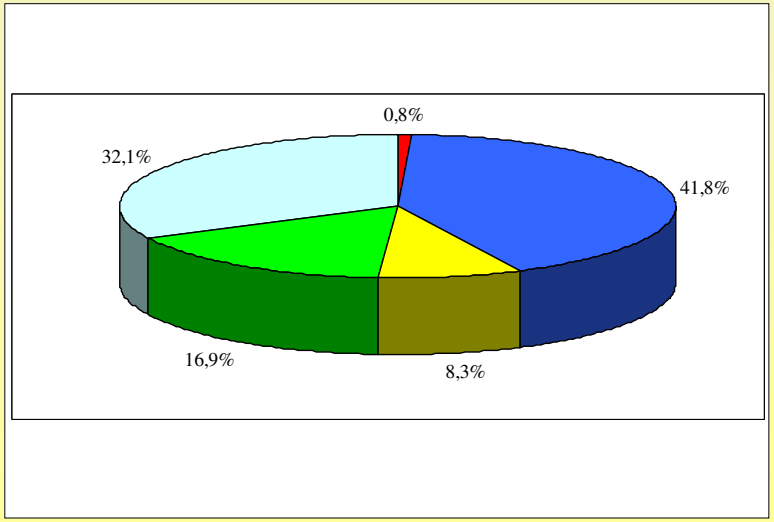



## The Structure of the Final Energy Consumption

### 1990




### 2005



# *EU ENERGY POLICY TARGETS*

- ***Directive 2006/32/EC (ESD)***

**Purpose**

***Energy efficiency increase in energy end-use sectors, by:***

- ***providing the indicative targets*** **as well as mechanisms, incentives and institutional, financial and legal framework necessary for the promotion of efficient energy end-use;**
- ***creating the conditions for the development and promotion of the*** **market for energy services**

**Target**

- ***Energy savings*** ***of 9% for the end of the period 2008-2016, respectively 1% per year, of the annual average of the final energy consumption in the last 5 years (period 2001-2005) (the companies under emission trading scheme are excluded)***

**National Energy Efficiency Action Plans**

***Deadlines :*** **30th June 2007; 30th June 2011; 30th June 2014**

- ***Integrated Energy and Climate Change Package, 2007-2008***

**Target**

- *Reducing GHG by 20% by 2020 comparatively with 1990;*
- *Energy savings of 20% of the EU total primary energy supply by 2020;*
- *Share of the renewable energy of 20% in overall energy mix by 2020, and a minimum target of 10% for biofuels.*

***Legislative proposals:***

- *Modifying the ETS Directive (2003/87/EC)*
- *Directive proposal on the use of the renewable energy sources*
- *Proposal for establishing the GHG targets for the non-ETS sectors*

***Targets for Romania:***

***+19%*** ***Target on GHG emission for non-ETS sectors***

***-21%*** ***Target on GHG emission for ETS sectors***

***24%*** ***Share of RES in final energy consumption***

## •National Energy Efficiency Action Plan

***Targets:***

- ***13,5 % by 2016, 1.5 % per year respectively***

*[thou toe]*

| | |
|---|---|
| *Average final energy consumption under ESD for the period 2001-2005* | *20,840* |
| *Energy saving target by 2016* | *2,800* |
| *Intermediary energy saving target by 2010* | *940* |

***GHG emission cut by 2016: 11.2 mil.tCO2 (cca 7% of GHG emissions in 2005)***

- ***Strategy for Renewable Energy Sources use (GD 1535/2003) and the promotion of electricity generation from RES (GD 958/2005, updated):***

***Targets:***

***– RES share in the total primary energy supply: 11% by 2010;***

***– RES share in the gross electricity consumption: 33% by 2010;***

***35% by 2015;***

***38% by 2020.***

- ***Promoting biofuels and other RES in transport (GD 1844/2005, GD 456/2007)***

***Targets:***

***- minimum share: 2% in total in 2007;***

***- minimum share: 5,75% in total in 2010.***

## *Programmes for promoting EE and RES*

- ***National programme for the Public sector 2009 - 2010 (HG 1661/2008)***

**2009 – 25 milioane RON**

**2010 – 40 milioane RON**

***Applied for:***

- *public buildings;*
- *District heating;*
- *public lighting.*

- ***Pollution tax for cars***

Financement of RES utilisation respectiv finanțare persoanelor fizice şi juridice care doresc să utilizeze echipamente RES

- **Programme for multi-level buildings from the period 1950-1990**

**Co-financement**

a) ***34%*** **(50) state budget;**

b) ***33%*** **(30) local authorities;**

c) ***33%*** **(20) owners associations.**

# Financial schemes to support renewable projects

- **Environmental Fund** is a fund supplied by penalties for pollution and state budget. Only renewable projects could be financed from this fund, not energy efficiency

  *“The replacement Program of traditional heating systems with systems that use solar energy, geothermal energy and wind energy or other systems that improved air quality, water and soil”*

- **Sectoral Operational Program – Increasing Economic Competitiviness**

  Priority axis IV - "Increasing energy efficiency and security of supply in the context of climate change"

  4.2. use of renewable energy to produce "green“ energy

- **FREE** (Romanian Energy Efficiency Fund) is a revolving fund established by World Bank.

# Promotion system of renewable energy sources in Romania

## Law no.220/ 2008

### Different allocation of green certificates

a. 1 green certificate for each 1 MWh delivered in the electricity grid by the generators of hydroelectricity from new HPP or HPP with max. 10 MW installed power and rehabilitated;

b. 1 green certificate for each 2 MWh delivered in the electricity grid by the generators of hydroelectricity from HPP (installed power 1- 10 MW) (which don't correspond conditions to letter a.)

c. 2 green certificate for each 1 MWh delivered in the electricity grid by the generators of hydroelectricity from HPP with max. 1 MW/unit installed power

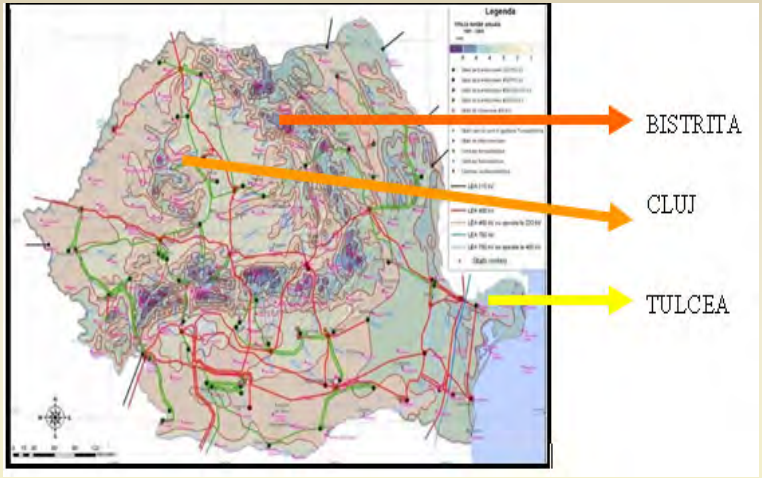
d. 2 green certificates for each 1 MWh delivered in the electricity grid by generators from wind-until 2015
1 green certificate -starting with 2016

e. 3 green certificates for each 1 MWh delivered in the electricity grid by generators from biomass, biogas, bioliquid, gas of waste fermentation, geothermal energy

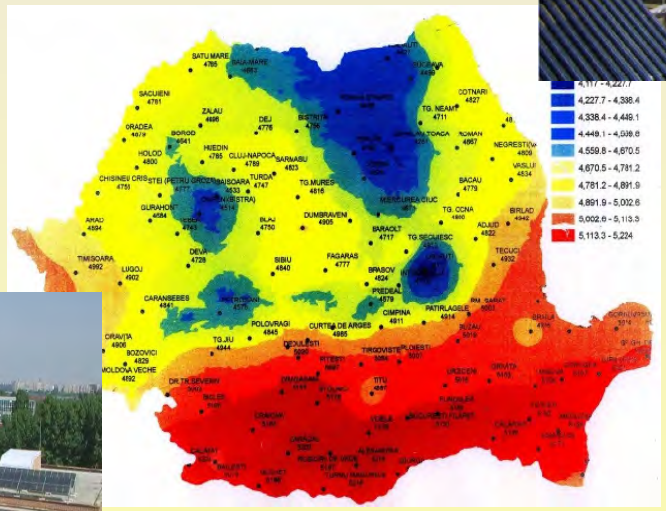
f. 4 green certificates for each 1 MWh delivered in the electricity grid by generators from solar sources

✓**1** green certificate can be traded for prices between **27 – 55 euro/ certificate**

# Areas in Romania where there are installed wind turbines




**ROMANIAN SOLAR RADIATION MAP**




Source: ARCE

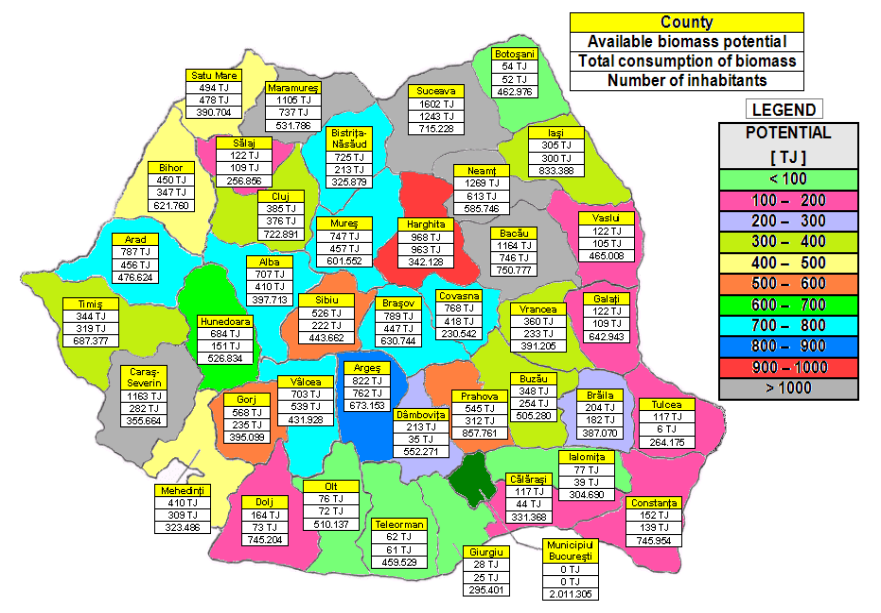
| | PRODUCER | RES | $P_i$ [MW] |
|---|---|---|---|
| 1 | Energy Holding S.R.L. | hydro | 5,950 |
| 2 | UZINSIDER GENERAL CONTRACTOR S.A. | hydro | 4,600 |
| 3 | S.C. HIDRAL INVEST S.A. | hydro | 0,760 |
| 4 | S.C. UZINA MECANICĂ SADU S.A., Filiala C.N. ROMARM S.A. | hydro | 1,200 |
| 5 | S.C. COMPLEXUL ENERGETIC TURCENI S.A. | hydro | 9,900 |
| 6 | S.C. ESPE ENERGIA S.R.L. | hydro | 5,080 |
| 7 | S.C. COLTERM S.A. | hydro | 1,200 |
| 8 | S.C. TERMOFOREST S.R.L. | hydro | 0,526 |
| 9 | S.C. ELECTROMAGNETICA S.A. | hydro | 4,069 |
| 10 | S.C. HIDROCONSTRUCȚIA S.A. | hydro | 0,600 |
| 11 | S.C. EVIVA HIDRO București | hydro | 0,202 |
| 12 | S.C. APAVIL S.A. VÂLCEA | hydro | 0,710 |
| 13 | Administrația Națională "APELE ROMÂNE" | hydro | 1,304 |
| 14 | S.C. ROMELECTRO S.A. | hydro | 1,640 |
| 15 | S.C. RAFINĂRIA STEAUA ROMÂNĂ | hydro | 0,820 |
| 16 | S.C. Exploatare Sistem Zonal PRAHOVA S.A. | hydro | 0,290 |
| 17 | S.C. ELSID S.A. | hydro | 8,197 |
| 18 | S.C. NEPTUN S.A. | hydro | 0,071 |
| 19 | S.C. SOBIS Solutions S.R.L. | hydro | 0,236 |

# The hydro power is the most important RES in Romania

| | PRODUCER | RES | $P_i$ [MW] |
|---|---|---|---|
| 20 | S.C. ISPH S.A. | hydro | 12,470 |
| 21 | S.C. HIDROELECTRICA S.A. | hydro | 143,798<br>39,800 |
| 22 | S.C. LUXTEN LIGHTING COMPANY S.A. | hydro | 10,525 |

Source: ARCE

# *Wood waste biomass distribution map in Romania*




Biomass is grouped in two categories:

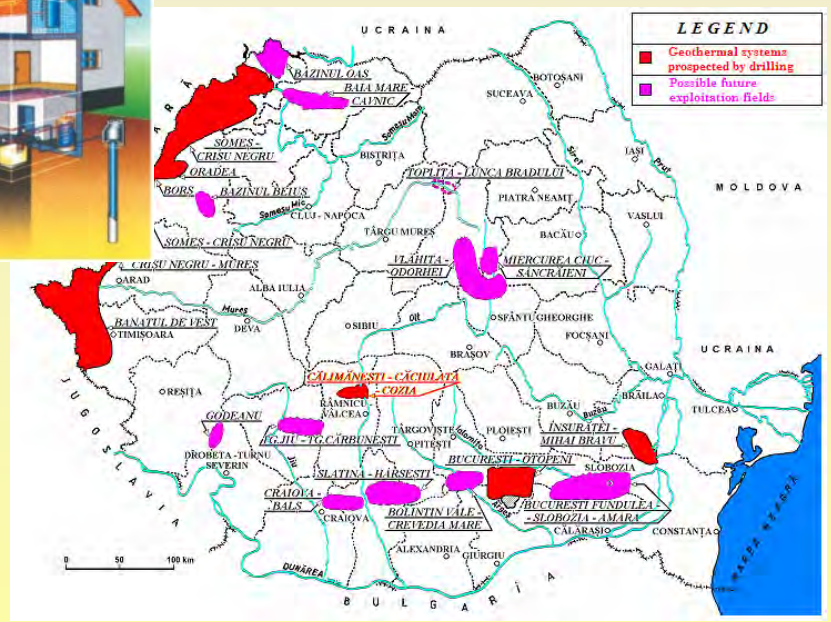
- Firewood & agriculture waste, etc.,
- Wood waste from industrial processes

Development of the biomass energy potential could cover 70% of the Romanian commitment regarding the percentage of renewable energy in total energy consumption.

Source: ARCE

# GEOTHERMAL POTENTIAL IN ROMANIA

The Ministry of Administration and Interior has a PILOT PROGRAMME : 10 schools will be equipped with heat pump that replace stoves and decrease pollution.




Applications:

– Oradea
– Calimanesti – Caciulata
– North Bucharest (Otopeni)

Source: ARCE

**THANK YOU FOR YOUR ATTENTION !**

**tudor.const@gmail.com**