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# ***CAPACITY IN ENERGY EFFICIENCY PROJECT PREPARATION IN SERBIA***

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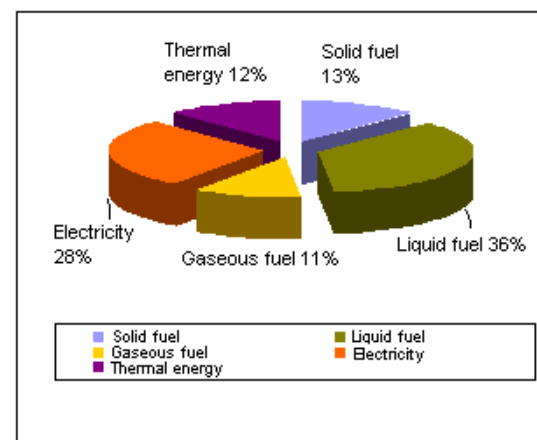
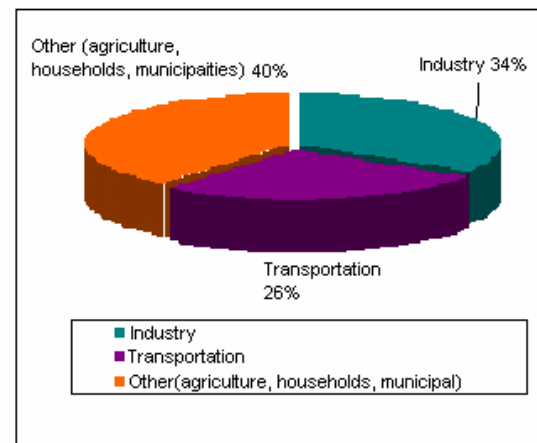
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Ministry of Mining and Energy



*Geneva, February 2008*

# Current state of energy consumption

- **Low energy consumption per capita (vs EU)**
  - 1.9 toe/cap - Up to 3 times less primary energy consumption
  - 3.5 MWh/cap - Up to twice less electricity consumption
- **High energy intensity**
  - **Low energy efficiency at demand side but also low effectiveness of the economy**
  - **EI 0,9-0.58 toe/1000\$ (several times higher than EU-15)**
- **High losses in energy conversion and transportation (FE to PE ratio ~ 51%)**
- **Relatively low import dependency (~40%)**
- **FEC in tertiary sector - non convenient structure (~50% electricity, ~0.12 gas)**



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# *Existing Legal framework*

## ❖ **Energy Law (2004)**

### ➤ **Energy policy:**

... **Creating conditions to increase energy efficiency**

### ➤ **Institutional Framework**

➤ Energy Agency (Regulator)

➤ **Energy Efficiency Agency – SEEA**

➤ TSMO – Transmission and Market System Operator

### ➤ **Structural Changes**

➤ Public Energy Companies restructuring

### ➤ **New Actors**

➤ Individual Power/ Heat producers

▪ Privileged Power/Heat Producers

➤ Eligible customers

## ❖ **Law on environmental protection**

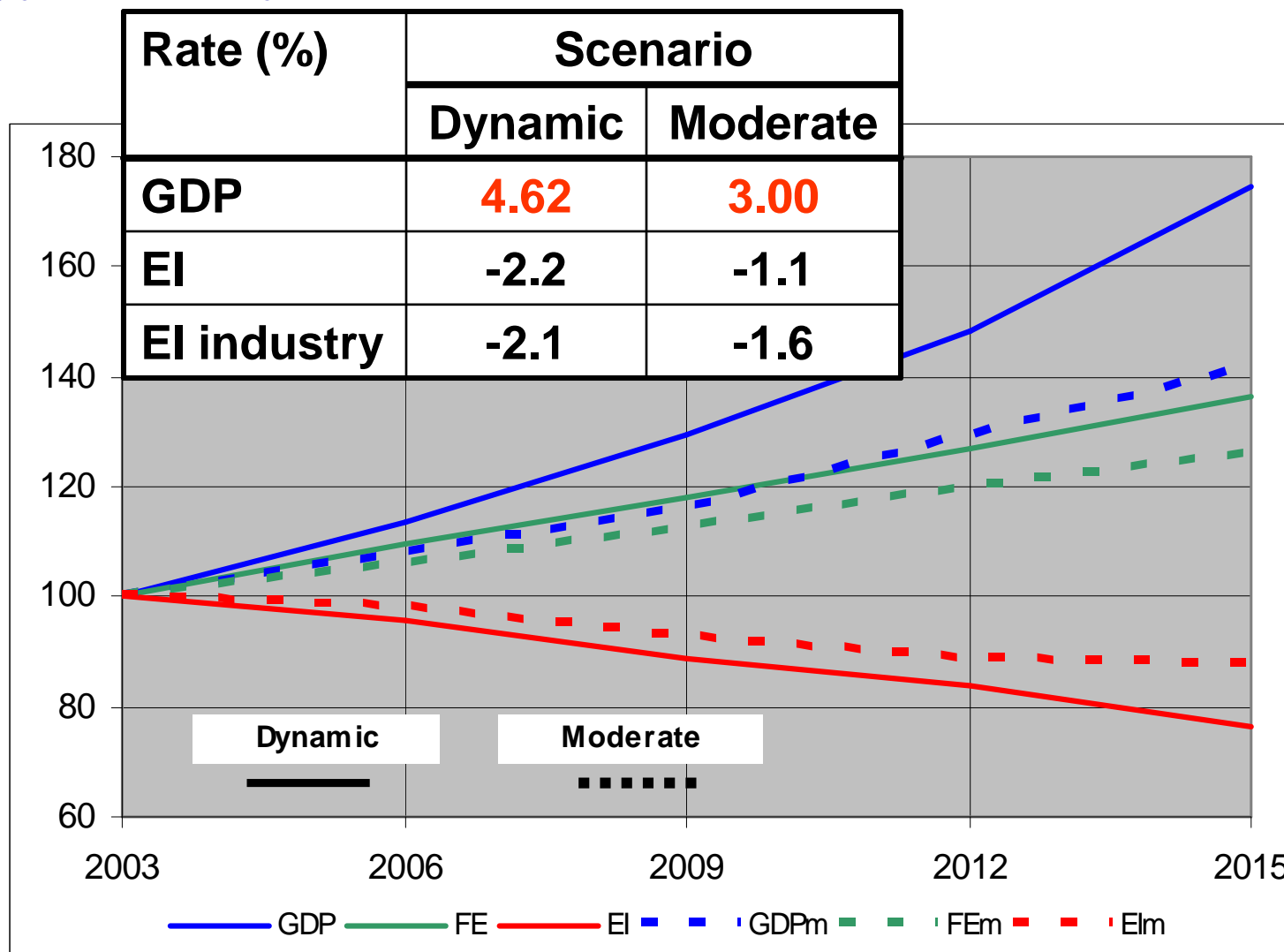
## ❖ **Law on Construction**

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# Energy Policy Objectives



Source: Energy Development Strategy until 2015,  
Parliament, May 2005.

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## *Existing Strategic framework*

- ❖ **Energy Sector Development Strategy by 2015**  
(Parliament - May 2005)
- ❖ **Strategy on economic development of Republic of Serbia** (GoS)
- ❖ **National Environmental Strategy** (GoS)
- ❖ **Strategy on cleaner production** (under development)
- ❖ **CDM strategy** (under development)
- ❖ **Strategy on sustainable development** (under development)



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# *Energy Sector Development Strategy by 2015 - Priorities*

- **I Priority of continuous improvement of technological and operating performance of energy sources and facilities**
- **II Priority of rational use of energy products and increase of energy efficiency (production, distribution and utilization)**
  - **Substitution of power for thermal services in Building sector with gas or DHS**
  - **Increased operating efficiency of thermal sources in industry and municipal services**
  - **Decrease losses of electrical (DS) and thermal energy in DHS, Industry and buildings**
  - **Introduction of new energy efficient electric appliances/equipment/systems**



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## *Existing Institutional framework*

- ❖ **Ministry of Mining and Energy**
  - Energy policy, legislation
- ❖ **Ministry of Environmental Protection**
  - Environmental protection policy, legislation
- ❖ **Ministry of Science**
  - Scientific development
- ❖ **Serbian Energy Efficiency Agency**
  - Programs, measures, technical regulations for increase of EE
  - Implementation of EE projects
- ❖ **Regional Energy Efficiency Centers**
  - Implement EE projects
- ❖ **Serbian Industrial Energy Efficiency Network**
  - Awareness and training, benchmarking
- ❖ **Energy Managers in Municipalities and Industry**
  - to be introduced



# *Institutions*



■ **Serbian Energy Efficiency Agency**

● **Regional EE Centres**

• Belgrade

• Novi Sad

• Nis

• Kragujevac

• Kraljevo

▲ **Industrial EE network**

**Grant by the Kingdom of Norway**



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## *POS 2007-2012\**

### **Module on Energy Efficiency - Barriers**

- **Low motivation of energy consumers**
  - low energy prices and price disparity
  - relatively high investment costs and low life standard
- **No incentive instruments**
- **Low institutional capacities**
- **Expensive loans and non attractive loan conditions**
- **Low financial capability of industry and citizens**
- **Undeveloped market of EE products and services**
- **Lack of awareness and information**
- **Ongoing privatization of municipal companies which largely contribute to energy consumption**

\* POS 2007-2012: Energy Sector Development Strategy by 2015 Implementation Program for the period 2007-2012



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# *POS 2007-2012*

## **Module on Energy Efficiency – Measures**

- **Create favorable regulatory framework**
  - **Law on energy efficiency** and corresponding secondary regulation (Energy management, EU EE directives etc)
- **Introduction of stimulating financial measures for EE**
  - **Energy Efficiency Fund**, tax alleviation and other subsidies
  - “Green” public procurement,
  - Creating conditions for work of ESCO companies
  - CDM Projects
- **Strengthen Institutional framework**
  - **MoME**
  - **SEEA**
  - **REECs**
  - **SIEN**
  - **Energy managers**
- **Rising awareness, promotion, education**



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# *POS 2007-2012*

## **Module on Energy Efficiency - Measures**

### **Technical measures:**

#### ➤ **Industry:**

- ✓ Utilization of waste heat (savings 20%)
- ✓ Replacement of electrical motors (4000MW) with eef1 | eef2 (saving el energy 188 GWh/y)
- ✓ ...

#### ➤ **Buildings:**

- ✓ Fuel switching (electricity for heating to other en sources - (annual savings 1500 GWh)
- ✓ Replacement of incandescent bulbs ((annual savings 701 GWh)
- ✓ Replacement of insulation (annual savings 350 GWh)
- ✓ Replacement of windows (annual savings 740 GWh)
- ✓ ...



# *Programmes/Projects 2000- 2007*

- *EU (EAR) – grant € 5 M (2002-2006)*
  - € 3.75 M for programs
  - Grant for running costs of SEEA
- *WB – Serbian Energy Efficiency Project \$ 25 M (\$ 21 M - IDA loan) (2006-2010), extended with 28 M\$*
  - Reconstruction of heating system in Clinical center of Serbia
  - EE retrofitting of social services buildings
  - Reconstruction of heating systems in the Clinical center of Nis
- *Kingdom of Norway (2003-2007)*
  - Technical assistance to MoME, SEEA, REECs and SIEN grant around €300,000 annually
- *National Energy Efficiency Program - around € 1 mil. annually, state budget, Ministry of science RS*
  - Studies



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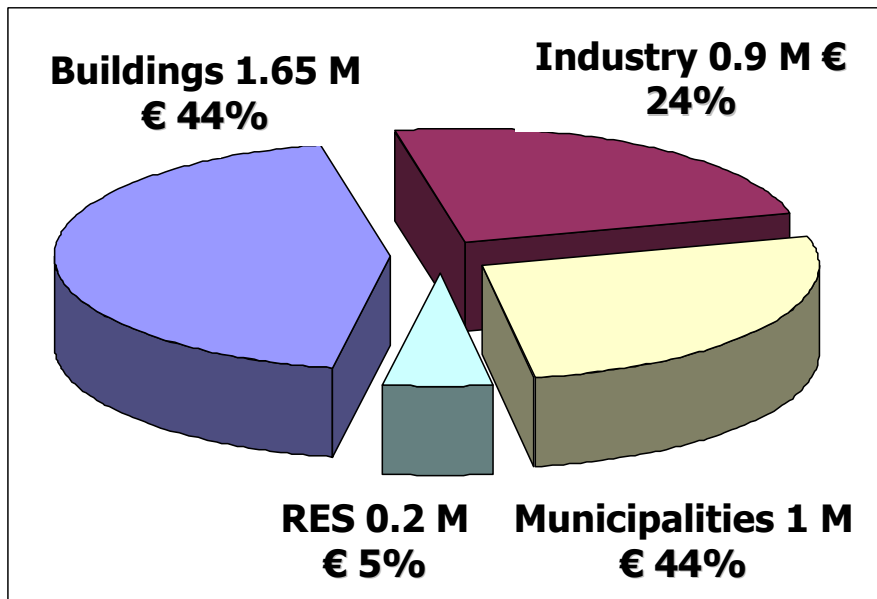
## *SEEA Multi Annual Programs*

- **Alignment of Serbian Government Policy with energy efficiency trends / no funding**
- **Energy Efficiency in Buildings / EU (EAR)**
- **Energy Efficiency in Municipalities / EU (EAR)**
- **Energy Efficiency in the Industry / EU (EAR)**
- **Energy Efficiency in Transport / postponed / no funding**
- **Renewable Energy Sources / EU (EAR)**
- **Cogeneration / USTDA**



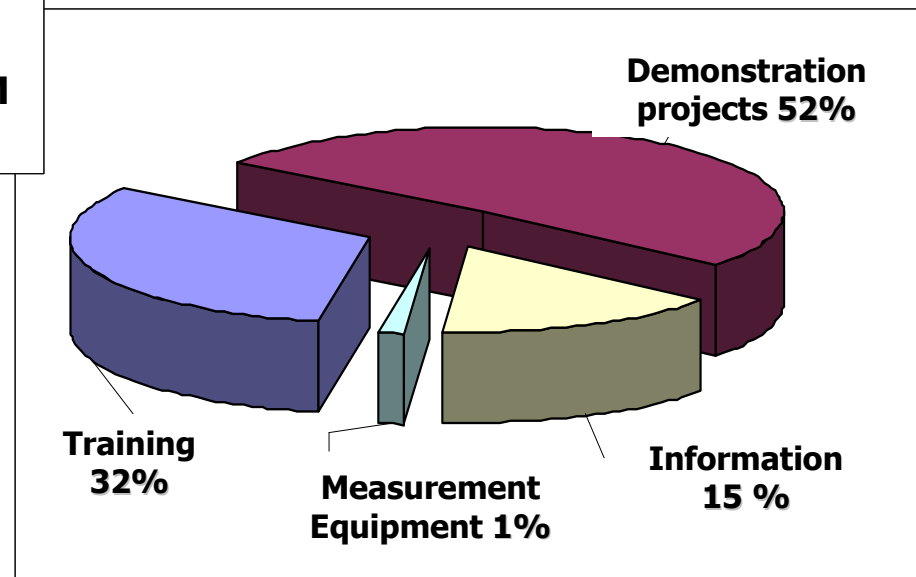
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# *EU - Special Fund Structure 3.75 M €*



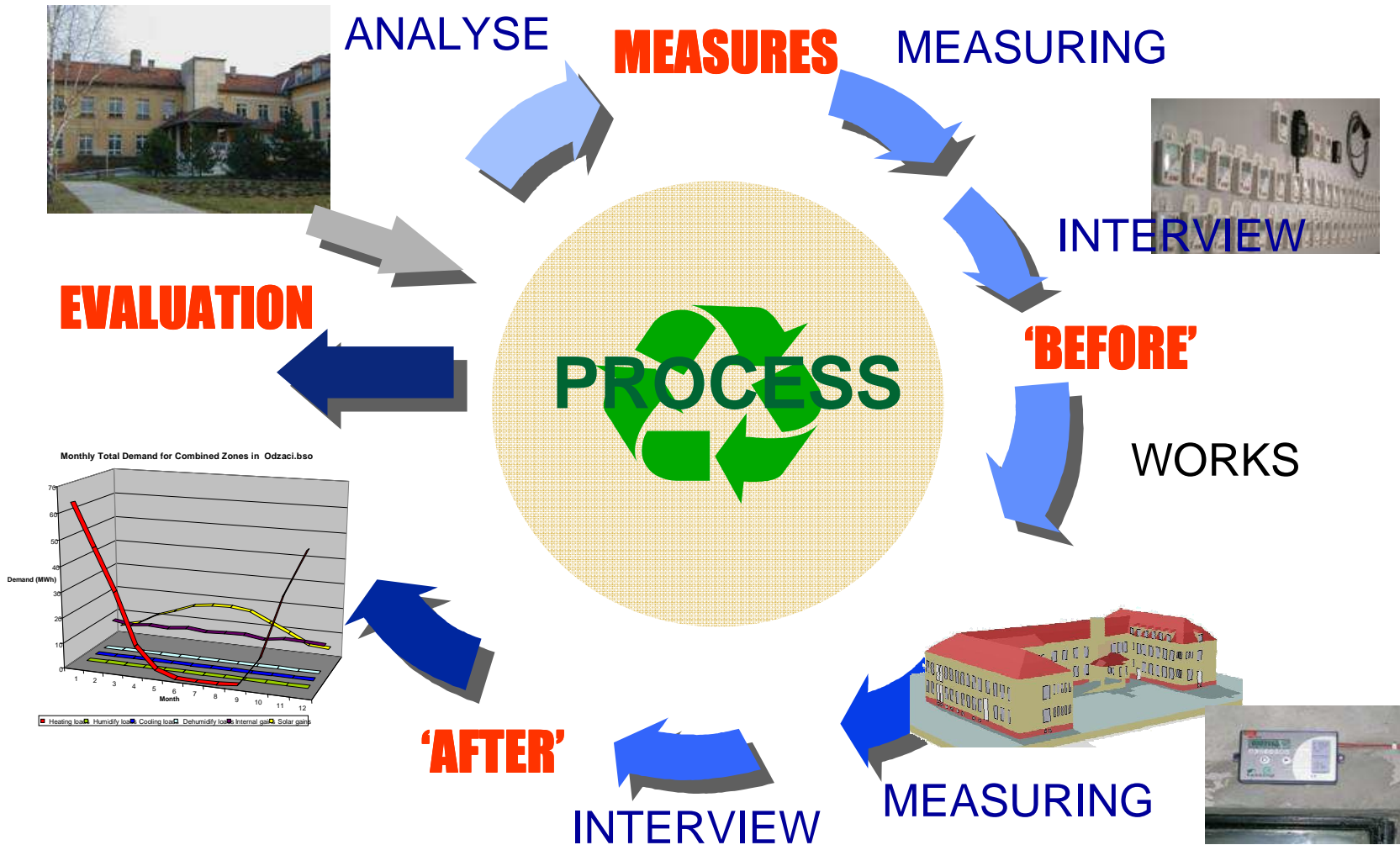
**Structure by sector**

**Structure by activity**





# SEEP – Methodology



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# *Schools*

- Total number of buildings: 16/ 54,035 m<sup>2</sup>
- Heat required for heating (MWh/y)
  - Before 12,439 -> after 7,132 **(-42.7%)**
- Specific power consumption for heating average
  - Before **230** kWh/m<sup>2</sup>,year -> after **132** kWh/ m<sup>2</sup>,year
- Emissions CO<sub>2</sub>
  - Before 3,303 t/year-> after 1,844t/year **(-44.2%)**
  - Emissions reduction CO<sub>2</sub> of **29.5kg/m<sup>2</sup>,year**
- Specific investments cost
  - Average **38.8 €/m<sup>2</sup>** in the range of **18.1 to 97.4 €/m<sup>2</sup>**



# *Hospitals*

- Total number of buildings: 11/ 50,934 m<sup>2</sup>
- Heat required for heating (MWh/y)
  - **From 14,600-> 8,695 (-40.4%)**
- Specific power consumption for heating average
  - From **366 kWh/m<sup>2</sup>,year -> 218 kWh/ m<sup>2</sup>, year (-40.4%)**
- Emissions CO<sub>2</sub>
  - Before 4,668 t/year-> after 3,101 t/year **(-33.6%)**
  - Emissions reduction CO<sub>2</sub> of **30.8 kg/m<sup>2</sup>,year**
- Specific investments cost
  - Average **36.7 €/m<sup>2</sup> in the range of 20.1 to 58.8 €/m<sup>2</sup>**



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## *Capacity building of municipal energy managers*

- **MoME has completed the training of Municipal energy managers which are currently preparing a database of energy indicators in their municipalities.**
- **MoME plans to further train these managers to prepare project proposal for funding from EU funds, the training will be made possible with the donation of the Norwegian government.**



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# *International commitments*

## **Treaty Establishing the Energy Community**

- Entered into force 1 July 2006
- Implementation of the Acqui on energy, competition, Environment and
- Possibly obligation for implementation of EU EE Directives will be added

## **Ratification of Kyoto Protocol**

- UNFCCC - ratified on May 12, 2001
- **Kyoto Protocol – Ratified in the parliament in October 2007**

**status: Non Annex 1 Country**

**→ Serbia eligible for CDM projects**

- **I National Communication** (with GHG Inventory) – under development



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# *CDM Projects – Awareness*

## **UNDP**

- Assessment of **CDM potential** in Serbia
- Workshop to present and discuss the results of national CDM assessment
- In-depth study of CDM potential in one selected sector
- Support development of selected CDM project ideas up to PIN stage

## **Norwegian assistance – CBF for Serbian inst**

- Capacity building of Serbian institutions (MoME, SEEA, REECs, SIEN)– PIN development
- Raising awareness of industrial companies

## **Italian assistance**

- Assessment of CDM potential in Serbia
- Capacity building of Serbian institutions



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# *Conclusions*

- **Sufficient technical capacity of Serbian experts**
- **Nonexistent legal obligations in terms of EE**
  - **Adoption of a Energy conservation**
- **Lack of systematic approach to implementation of energy management and energy audits**
  - **Legal framework**
  - **Training**
  - **Licensing**
- **Lack of incentives for EE projects, due to insufficient legal framework for introducing government funding**
  - **Establishment of EE fund and other incentive measures**
- **Lack of public awareness of EE importance**
  - **Further awareness raising and training**



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