

**Future Climate Change Policy:  
Looking beyond 2012  
International workshop, 11-14 April 2007, Prague**

**Working Group 1:  
After COP12/MOP2: Strategies towards Post 2012 Reduction  
Pathways**

**Case of Poland: Energy efficiency in transport and building sectors**

# Outline

- EU goals in Energy and Climate package
- Energy and Efficiency related Policies and measures in Poland
- Current Polish policies, measures and strategies
  - in transport
  - and buliding sectors
- Sectoral energy efficiency challenges in Poland in transport and building sectors
- Some energy and energy-efficiency statistics for PL, new MS and UE
- *General summary*
- Burden sharing between MS– how might be adequately distributed

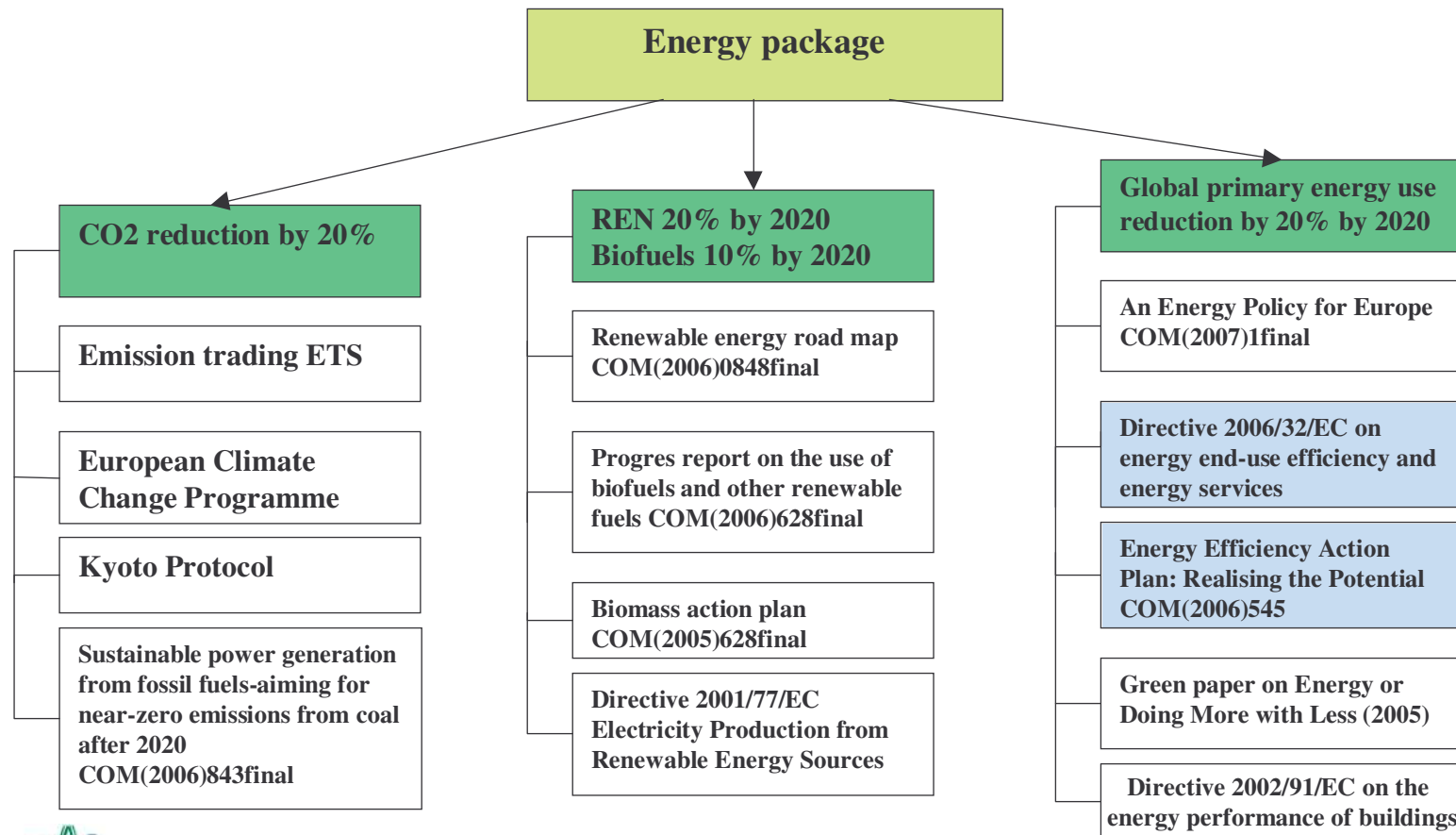
## 1. EU goals in Energy and Climate package – new technology revolution: towards low-carbon, low-energy, high energy efficiency economies

<b>EU goals by 2020 vs 1990</b>			
<b>GHG emission reduction</b>	<b>Energy efficiency</b>	<b>Renewable energy</b>	<b>Biofuels</b>
<b>20%</b>	<b>20%</b>	<b>20%</b>	<b>10%</b>

Environment Council Conclusions of 20 February 2007  
European Council Conclusions of 9 March 2007

„Improving energy efficiency is one of the major challenges in moving towards delivering energy policy objectives and sustainable energy economy in the longer term”.

# Energy package



# Directive 2006/32/EC

## on energy end-use efficiency and energy services

- Indicative target for energy savings  
→ 9 % in the 9th year
- National indicative target for energy efficiency
- Mechanisms and system of incentives
- Barriers identification and removal
- End users energy services market development
- Availability of energy audits
- White certificates
- Exemplary role of public sector
- Data collection and reporting system



# Energy Efficiency Action Plan: Realising the Potential

COM(2006)545 of 9 October 2006

## Key goal: Reducing EU primary energy use by 20% by 2020

(UE saving each year 780 million t CO<sub>2</sub> and EUR100 billion)

### Key measures:

- Accelerating the use of **fuel efficient vehicles for transport**, making better use of **public transport**; and ensuring that the true costs of transport are faced by consumers;
- Tougher standards and better labelling on appliances;
- Rapidly improving **the energy performance** of the EU's **existing buildings** and taking the lead to make **very low energy houses as the norm for new buildings**;
- Coherent use of taxation to achieve more efficient use of energy;
- Improving the efficiency of heat and electricity generation, transmission and distribution;
- **A new international agreement on energy efficiency**



## **2. Energy and Efficiency related Policies and measures in Poland**

# Poland: Policy papers and strategies on environment and energy efficiency related issues

- Poland's Climate Policy. Strategies for greenhouse gas emission reductions in Poland until 2020 (2003)
- The Second State Environmental Policy (2001)- with later amendments
- Poland 2025: Long-term Strategy for Sustainable Development (2000)
- The National Reform Programme for 2005–2008 for the Implementation of the Lisbon Strategy (2005)
- Environmental Protection Law Act (2001)
- Strategy for changing the production and consumption patterns to those favouring implementation of the principles of sustainable development (adopted by the Council of Ministers on 14 October 2003)
- Energy Law Act (1997, with later amendments)
- Energy Policy of Poland until 2025 (2005)
- Strategy for renewable energy development (2001)
- Act of 18 December 1998 on supporting thermomodernisation projects
- The State Transport Policy for the years 2006–2025 (2005)
- The State Environmental Policy for 2007–2010 with the perspective for 2011-2010 (2006)



# Poland Energy Policy until 2025

## Long-term action directions

- generation capacities of domestic fuels and energy sources,
- volume and types of stocks of fuels,
- transport capacities, including cross-border connections,
- energy efficiency of the economy,
- protection of the environment,
- development of use of renewable energy sources,
- restructuring and ownership changes of the fuels and energy sector,
- research and development work,
- international cooperation

Source: KAPE

## Comment on Energy policy

- ❑ Energy policy of Poland shall be switched to sustainable energy policy
- ❑ The Energy Law creates the prerequisites for more competition, stable framework conditions and the necessary basis for reliable planning required for urgently investments into energy industry
- ❑ Efforts to merge EE and RES into Energy Policy are challenging but worth taking
- ❑ Low public awareness on energy sector importance and its huge needs for investment capital
- ❑ Energy market reforms shall improve the competitiveness of Polish utilities and contribute to reducing the cost burden of consumers.
- ❑ Progress is likely only when cohesion measures of global scale are taken
- ❑ Initiatives from EU are crucial in developing modern energy market
- ❑ Synergy effects due to international co-operation will contribute enormously to sustain development

Source: KAPE

# Poland energy policy. Presence and future

- Energy Policy of Poland until 2025 (adopted 4 January 2005) with execution program till 2008
- Program for Electric Power Sector (proposed 2 March 2006)
- General revision of the Energy Law (envisaged for mid 2007)
- Energy sector issues in National Cohesion Strategy 2007-2013  
introduction energy into regional policies

Source: KAPE

# The Polish Energy Law Act

## **Energy Law Act - 10 April 1997 (since revised ca. 30 times)**

The purpose of the act is to create the conditions for sustainable development of the country, for ensuring energy security, for efficient and rational use of fuels and energy, the development of competition, for counteracting negative consequences of natural monopolies, for consideration of natural environment protection requirements, of obligations stemming from international agreements, and for balancing the interests of energy undertakings and fuels and energy consumers.

Source: KAPE

### **3. Current Polish policies and measures in transport and buliding sectors**

# Current Polish policies and measures in transport sector in Poland (1)

## State Transport Policy for the years 2006-2025 (2005)

**Policy Goal: to achieve a sustainable transportation system** (technically, spacially, economically, socially and environmentally) under the country's developing market economy

**This requires parallel action in three directions:**

- to optimize traffic and transportation growth rate,
- to influence the way the passengers or goods are transported to use to a maximum extent the transport means that are least harmful to the environment,
- to use technical and organisational solutions that reduce unfavourable environmental impacts

Source: 4th National Communication under UNFCCC

# Current Policies and Measures in transport sector in Poland (2)

## **LEGISLATIVE AND FINANCIAL:**

- o road tax
- o promotion and use of biofuels and “environmentally clean” motor vehicles

## **TECHNICAL:**

- o Construction of motorways, by-pass roads and express roads;
- o Improvement of vehicle energy effectiveness, incl. measures connected with vehicle construction;
- o Restrictions in speed rates in towns

## **LEGISLATIVE AND ADMINISTRATIVE :**

- o Promotion of public transport
- o Programme for development of combined (intermodal railway) transport
- o Improvement of the infrastructure for cyclists and pedestrians
- o Improvement of the quality of water transport
- o Measures to reduce greenhouse gas emissions from air transport

**EDUCATIONAL:** Information and educational activity related to the need for behavioural changes

Source: 4th National Communication under UNFCCC

## **Current measures in transport sector - Poland - comment**

- Current measures are oriented mainly at infrastructure and mobility aspects, but not at energy efficiency**
- Lack of Transport Law Act of Poland –in preparation**

# Current Building and energy legislation in Poland

- **Building Law, 1994**
- **Technical requirements for buildings and their locations, 1997**
- **Energy Law, 1997 (including energy planning obligation)**
- **Act and Fund Supportig Thermomodernisation Undertakings in Buildings, 1998, with further modifications**
- **Ordinance on mandatory heat supply metering, 1998**
- **Ordinance on the scope and form of Energy Audit, feasibility assessment of thermomodernisation projects, and samples of energy audit cards, 1999, with further modifications**
- **Ordinance on required Energy Efficiency of Equipment, 2001**
- **Ordinance on purchase obligation of Electricity produced from Renewable energy, 2002**

Source:KAPE

## Thermal Modernisation Act (1998)

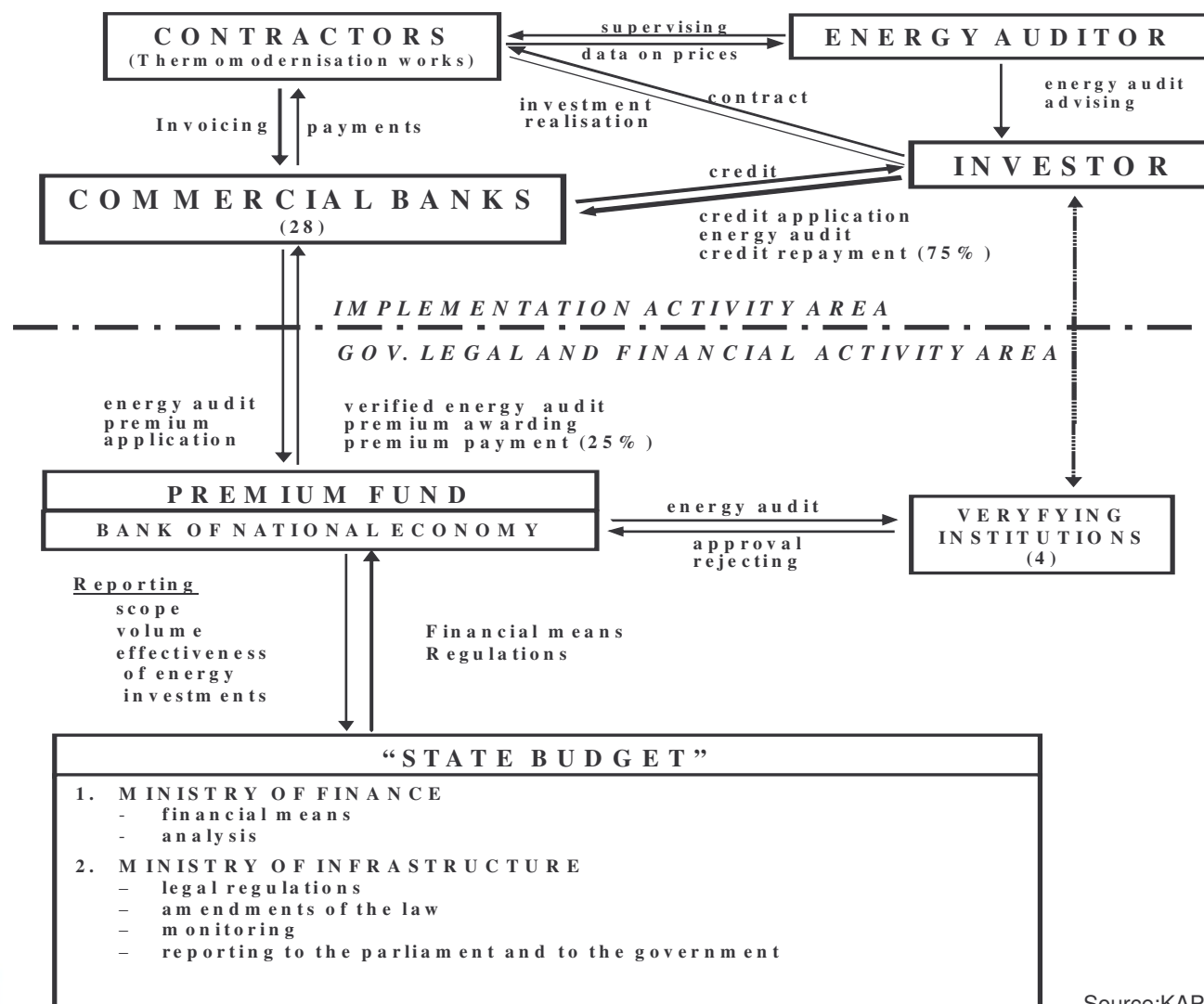
- Within its framework covers:
  - **Thermal refurbishment of all types of residential buildings (excluding state owned buildings)**
  - **Buildings used by municipal entities for purposes of public services (schools, kindergartens, hospitals, etc.)**
  - **Local district heating networks and local heat sources up to 11,6 MW of thermal power**
  - **Installation of renewable energy sources**
  - **Connecting the buildings to the DH systems**
- Providing financial support for the e.e. measures in a form of premium (repayment of the amount of 25% of credit taken from commercial bank)

# Thermal Modernisation Act

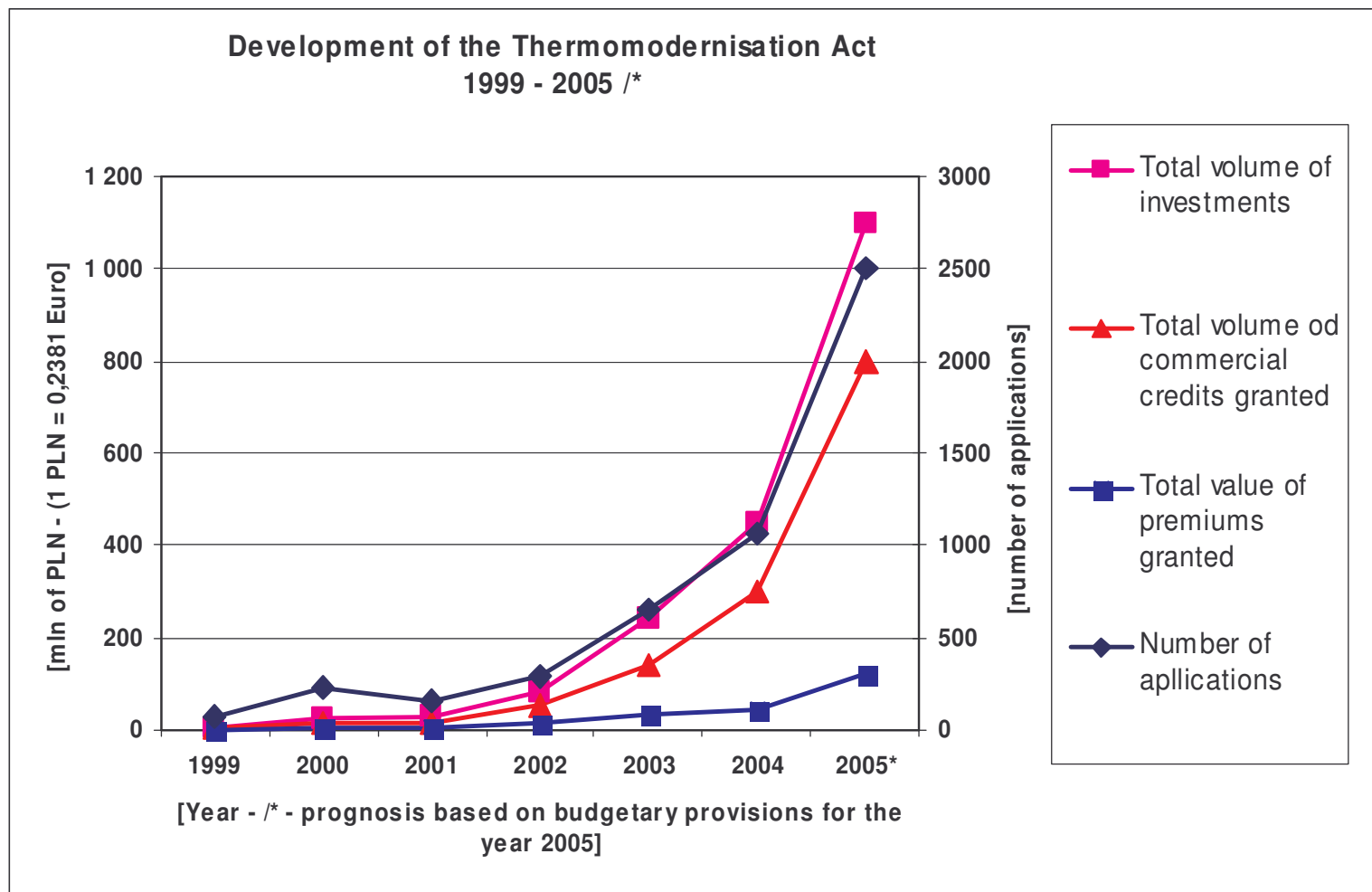
- Energy audit obligatory - comprehensive approach
- Optimisation methods applied
- Standard of the energy audit and calculation methods precisely defined by the ordinances (including economical optimisation)
- Calculation methods determined (energy and economic efficiency)
- Relatively restrictive e.e. requirements defined
- ➔ Minimum level of energy reduction obligatory
- Repayment of the credit must be covered by the energy cost savings

Source:KAPE

# Thermal Modernisation Act – General Scheme



# Thermal Modernization Act– results and prognoses



Source: KAPE

## **4. Sectoral energy efficiency challenges in Poland in transport and building sectors**

# Energy Efficiency Act –planned

(trasposition of the Directive 2006/32/EC  
on energy end-use efficiency and energy services)

will cover among others the following issues:

- energy efficiency targets,
- supporting mechanisms,
- exemplary role of public sector,
- monitoring system and collection of data,
- access to information, education and energy efficiency advice,
- reporting system
- white certificates

## Important dates:

**Draft Act: September 2007; Entry into force: May 2008**

# Energy efficiency potential in Poland

## Findings of the KAPE expertise on EE potential

**An Expertise (of December 2006) on energy efficiency** for the purpose of elaboration of draft legal Act and executive Ordinances as well as

**Assumptions for National Plan of Action on Energy Efficiency (NPAEE)  
– implementing the Directive 2006/32/EC and Green Paper on Energy  
Efficiency COM(2005) 265 of 22 June 2005**

Measures proposed in NPAEE are aimed at:

- Meeting the energy efficiency reference target in compliance with the Directive 2006/32/EC i.e. **9% in 2016**
- Meeting the intermediary target **2% in 2010**.

Proposed NPAEE confines:

- key measures
- additional measures, to be introduced in the course of implementation of the NPAEE as a response to introduction of additional measures of the European Commission

Source: KAPE

# Energy efficiency potential in Poland

Sector	Findings of the KAPE expertise on EE potential
Building	135-238 PJ/rok of heat energy dependent on mechanisms 4 500 000 GWh/year of electric energy
Industry	115 PJ/year of final energy with the exception of entities within NAPI with reference to consumption level of 2004. 107 PJ/year of final energy with the exception of entities within NAP2 with reference to consumption level of 2004.
Services	83,4 PJ/year of final energy (rough assessment)
Heating	2,14 PJ/year of energy for entities with sources smaller than 20 MW nominal power together with connection network 12,3 PJ/year of energy for entities with sources smaller than 20 MW nominal power and for all heating network
Transport	150 PJ/year of final energy for the current scenario for transport development
Agriculture (as an element of building sector)	80-127 PJ/year of final energy (30% in heating and 20% in electricity)

# Energy efficiency potential in Poland

## Big reduction potential in energy consumption: (findings of the KAPE expertise)

- ❑ EE potential in each sector is 2-3 fold higher than reference target



**Energy efficiency reference target 9% in 2016** (Directive 2006/32/EC) for the whole economy and all sectors together **could be met** within 9 years **provided that:**

- ❑ Essential independent measures in the individual sectors would be taken up
- ❑ Energy efficiency potential would be reflected in the National Plan for GHG emissions reduction

Source: KAPE

# Energy efficiency challenges in transport and building sectors in Poland

Sector	Findings of the KAPE expertise
Transport	<p>Most difficult to assess and diagnose. Changes are very dynamic, some aspects difficult to predict (i.e. massive import of old and fuel inefficient passenger cars in recent years).</p> <p>Core possibilities to use the EE potential of 150 PJ/yr are in:</p> <ul style="list-style-type: none"> <li>- support for public transport development and promotion of its use</li> <li>- promotion of energy efficient means of transport, incl. those using REN and alternative fuels</li> </ul>
Building	<p>Very high investment cost of EE measures (est.&gt;43 mld PLN for the existing potential). Scope of investments highly influenced by attitudes of owners and managers. The potential depends on supporting mechanisms selection and their use as well as the EE assessment method taking into account environmental aspects</p> <p><u>20 years needed</u>- with the current pace of the implementation of the Act on thermomodernisation.</p> <p><u>Necessary to speed up process</u>: continuation and <b>additional support</b> for the Act and Fund Supporting Thermomodernisation Undertakings in Buildings (1988)</p>

## Sectoral energy efficiency challenges in transport and building sectors in Poland

Priority measures indicated in draft National Plan of Action on Energy Efficiency

Sector	Action	Priority <small>**very high *high</small>
Transport	Development of <b>plans for sustainable urban transport</b>	**
	Training courses for private and duty drivers on energy efficient car driving	*
	Introduction of systems of mobility and transport infrastructure management	*
	<b>Alternative fuels</b> market development	**
Building	Implementation of the Directive 2002/91/EC on the energy performance of buildings ( <b>legislation</b> )	**
	Carry out of <b>thermal refurbishment</b> measures	**
	Energy efficient lighting in buildings	*

Source:KAPE

# Comment on Energy efficiency challenges in Poland

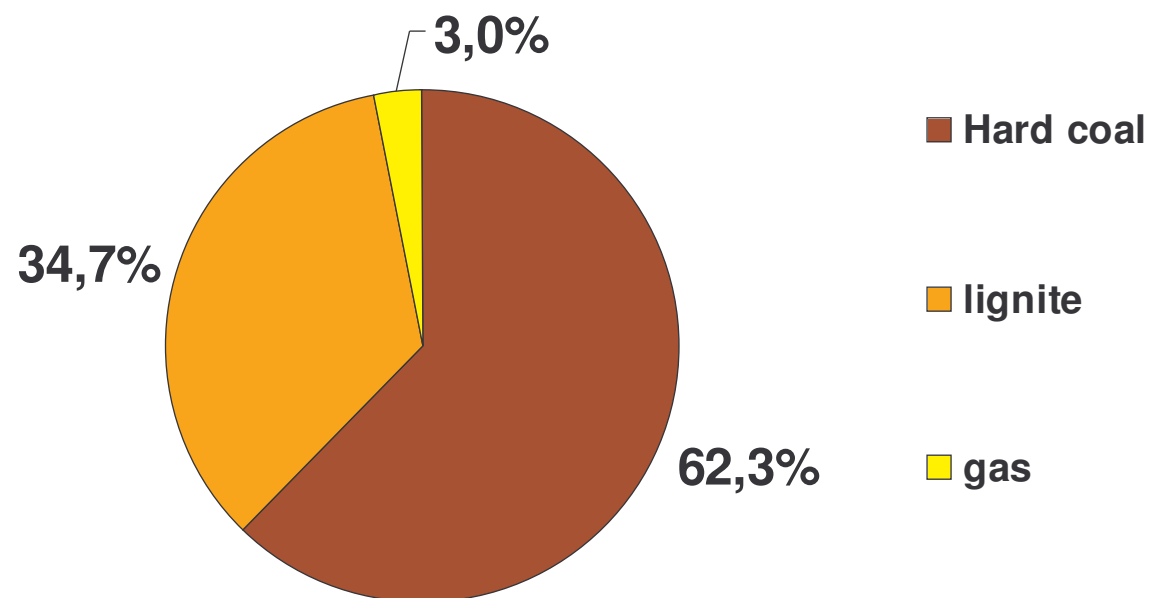
Findings of the KAPE expertise

Key conditions for meeting the EE targets proposed in draft National Plan of Action on Energy Efficiency (NPAEE):

- ✓ **Bigger financial support** from state budget for the implementation of Thermal modernisation Act
- ✓ Setting up the **Energy Agency** in 2007 (Directive 2006/32/EC),
- ✓ **NPAEE into force** 01.01.2008 r.
- ✓ **National indicative target** – adopted in 2007 (decision of the Minister of Economy) and confirmed by the Ordinance to Energy Efficiency Law Act,
- ✓ **Energy Efficiency Law Act** – entry into force 01.01.2008
- ✓ Entry into force since 01.01.2008:
  - **White Certificates** System,
  - System of **Voluntary Commitments** in Industry
- ✓ From 2008- operationalisation of **National Energy Efficiency Fund**

## 5. Some statistics and charts related to energy and energy efficiency in Poland

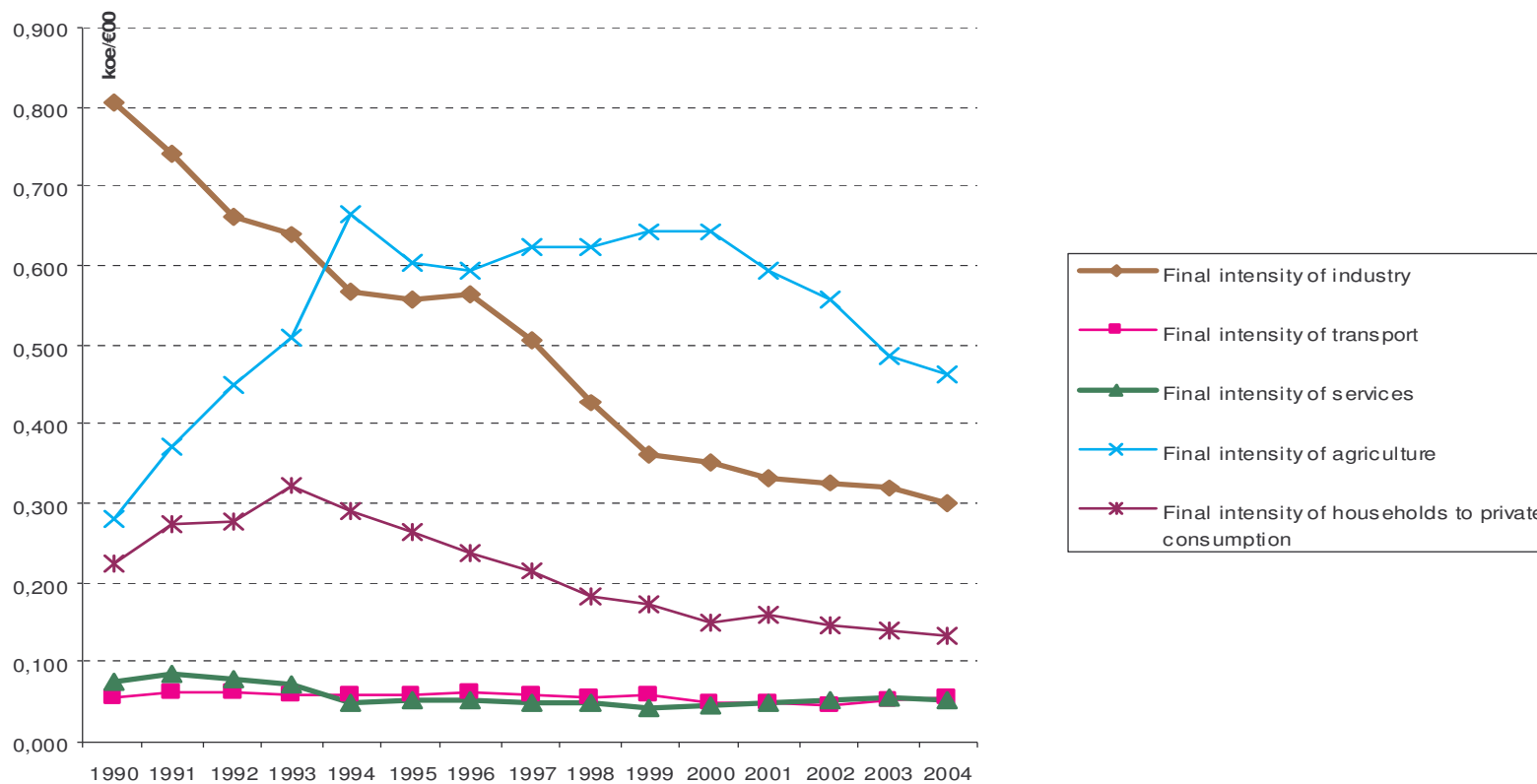
## The structure of fuels used for power generation - excluding RES in POLAND 2004



Source: ARE

# Final energy consumption in sectors in Poland

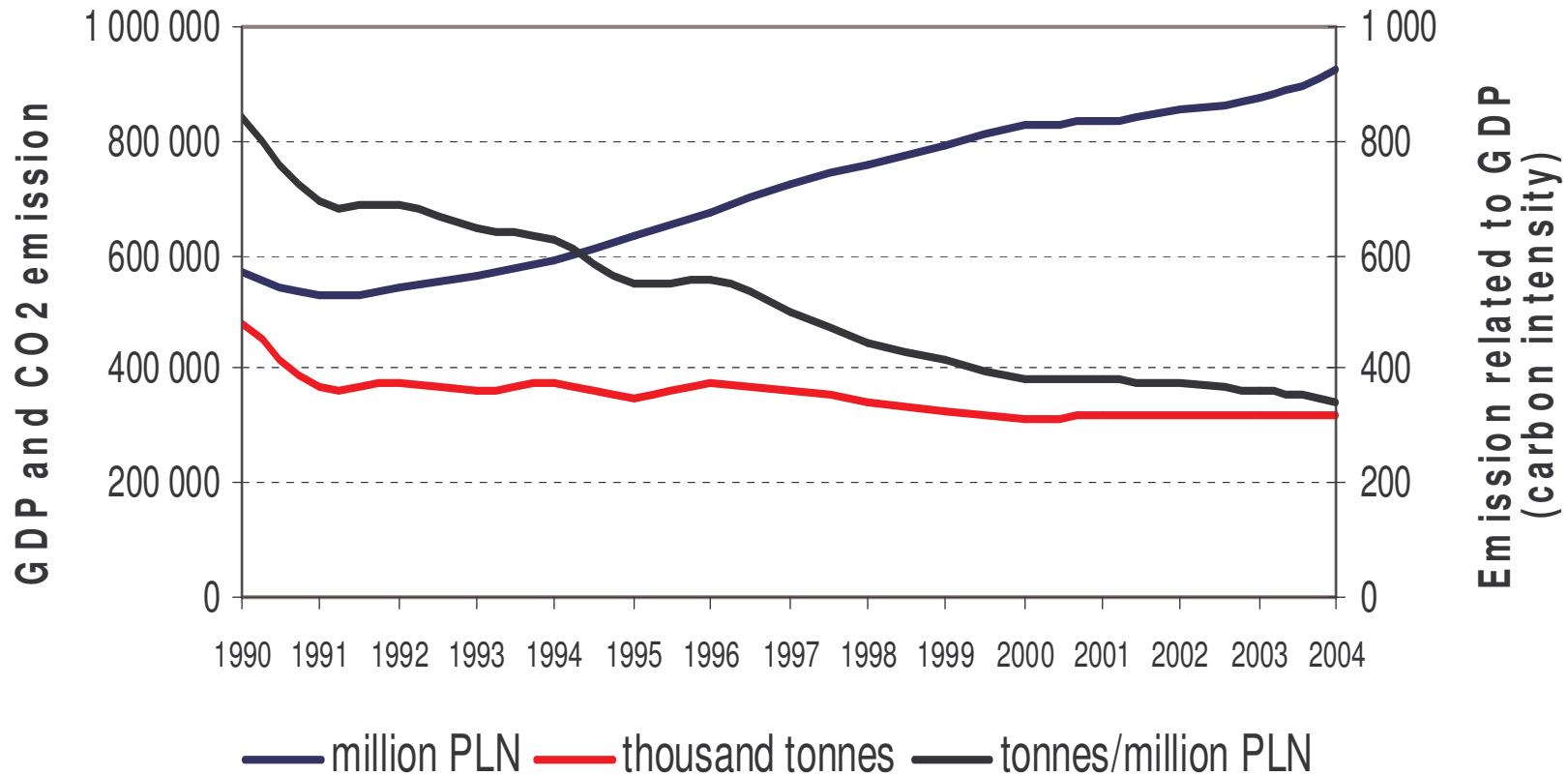
Sectoral intensities



Source: KAPE based on GUS

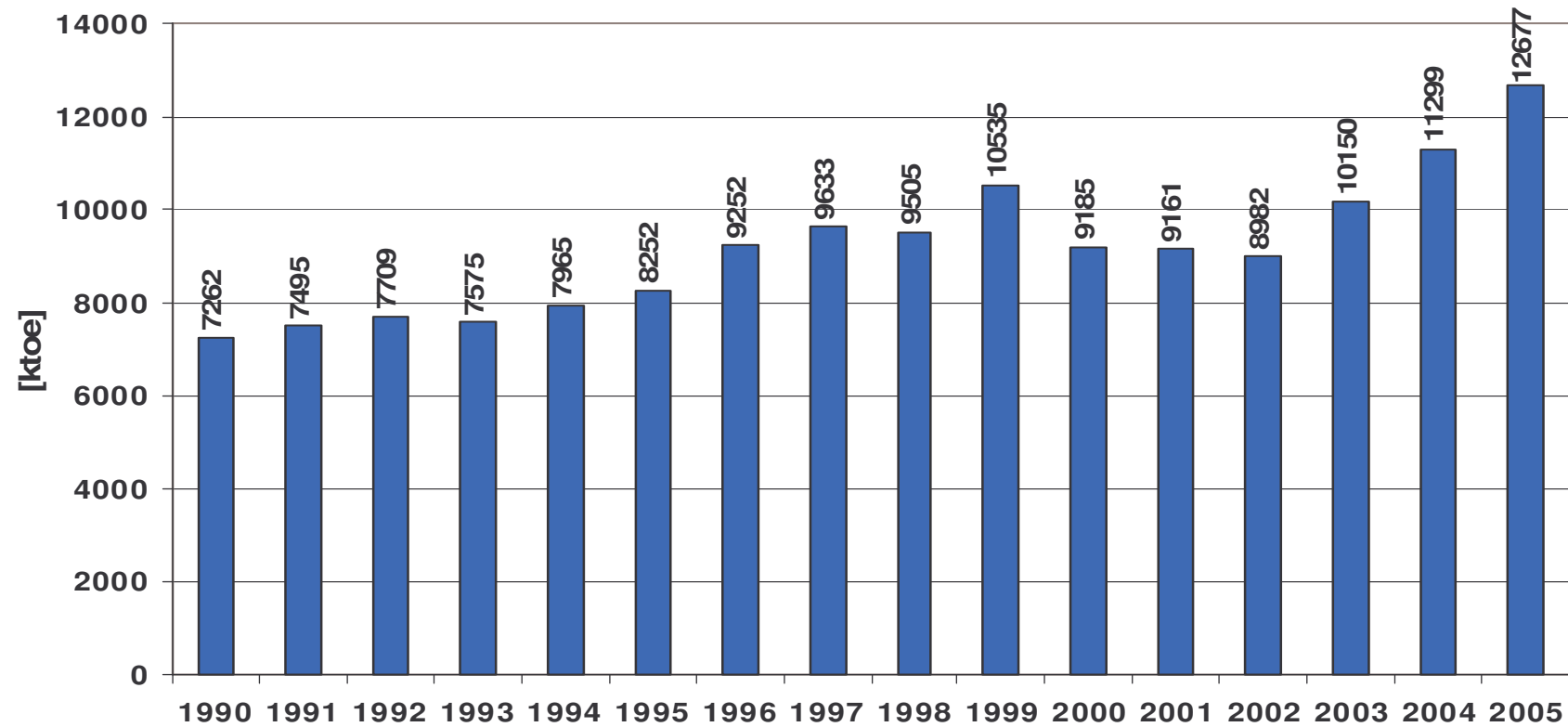
# GDP, CO<sub>2</sub> emission, and carbon intensity

## 1990 – 2004: unbundling economy growth in POLAND



Source: KAPE

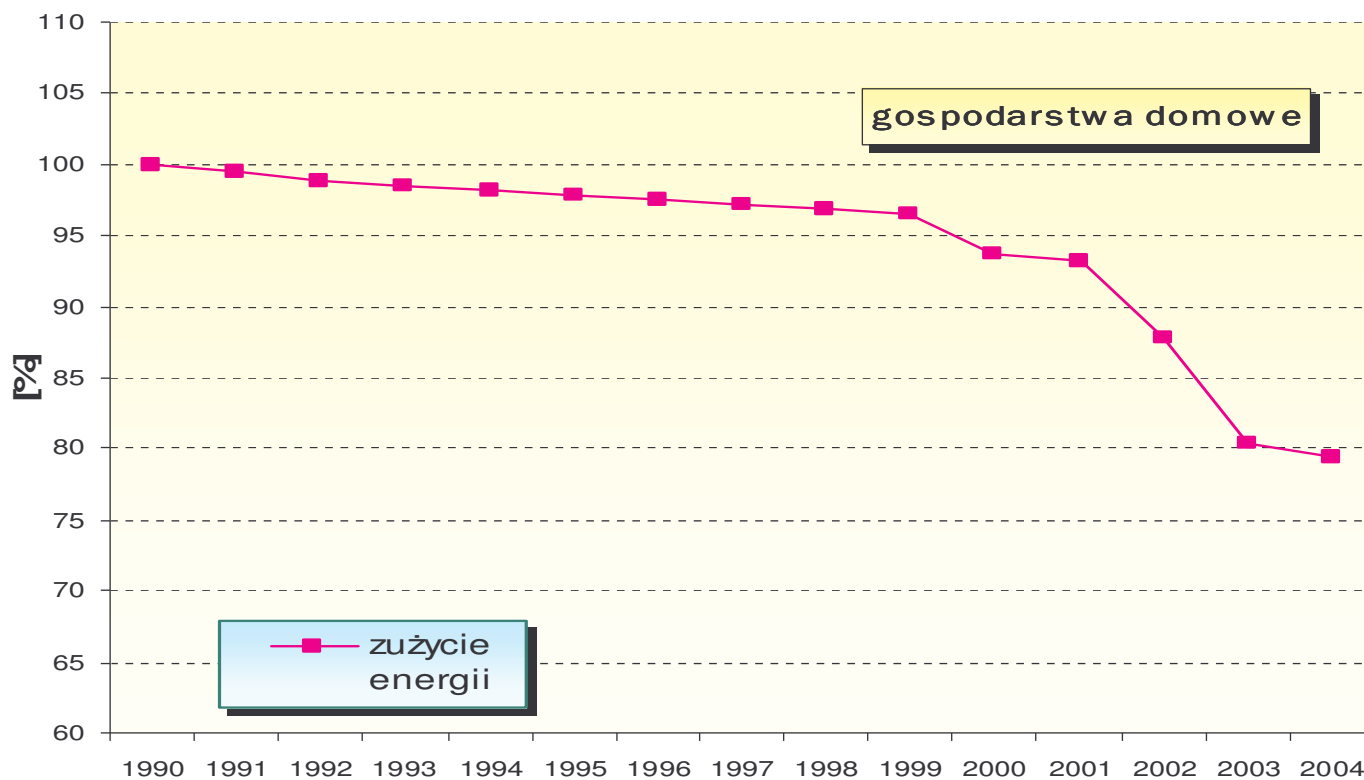
# Final energy consumption in transport in Poland 1990 – 2005



Source: KAPE S.A. Based on GUS



# Energy efficiency factor ODEX for households in POLAND

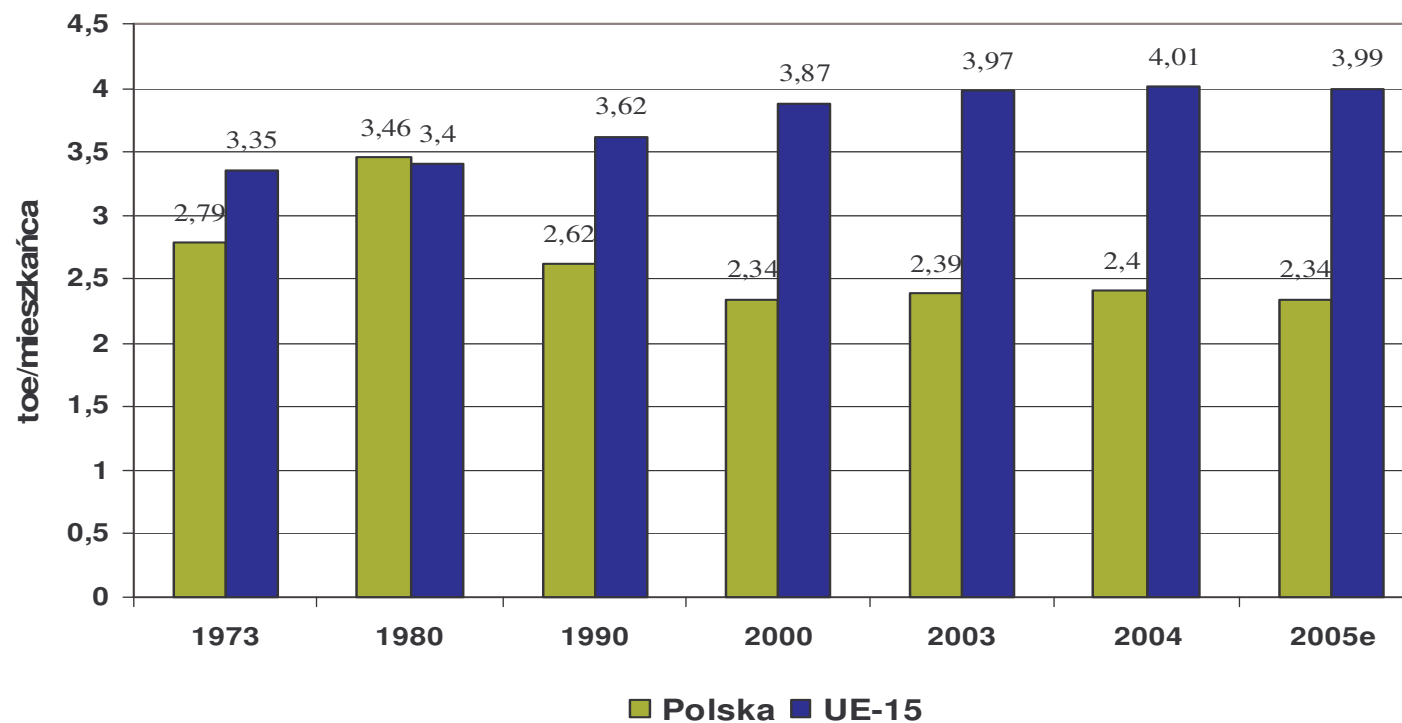


Source:GUS

# Some EU statistics and charts related to energy and energy efficiency

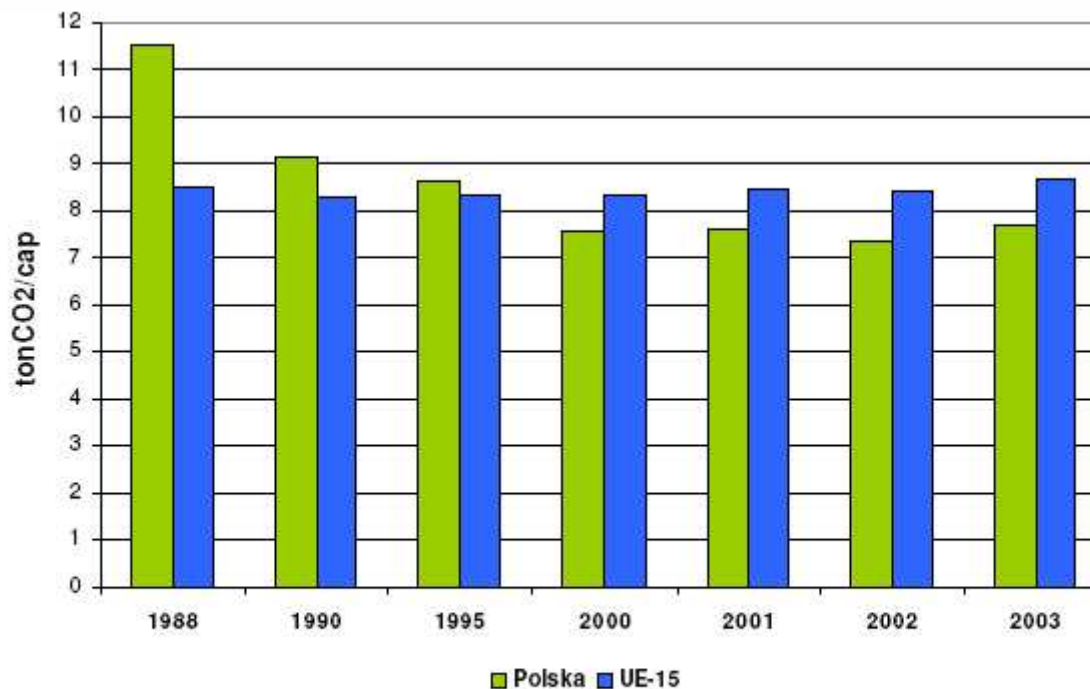


## Primary energy use per capita in Poland and UE-15



Source: KAPE from: "Electricity information" IEA 2006

# CO<sub>2</sub> Emission/capita in Poland and UE15

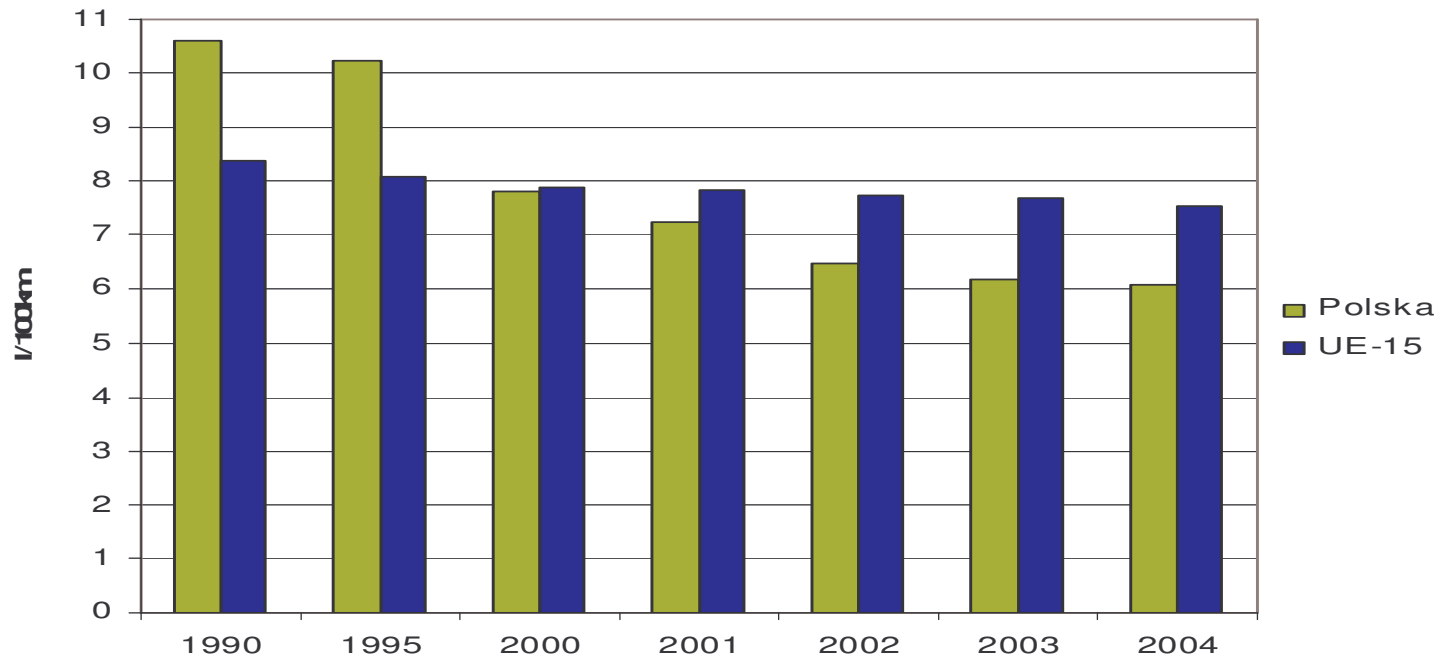


Źródło: "CO<sub>2</sub> emissions from fuel combustion 1971-2003", IEA 2005

Rysunek 4.47 Porównanie zmian wskaźnika emisji CO<sub>2</sub> w gospodarce Polski i krajów UE-15

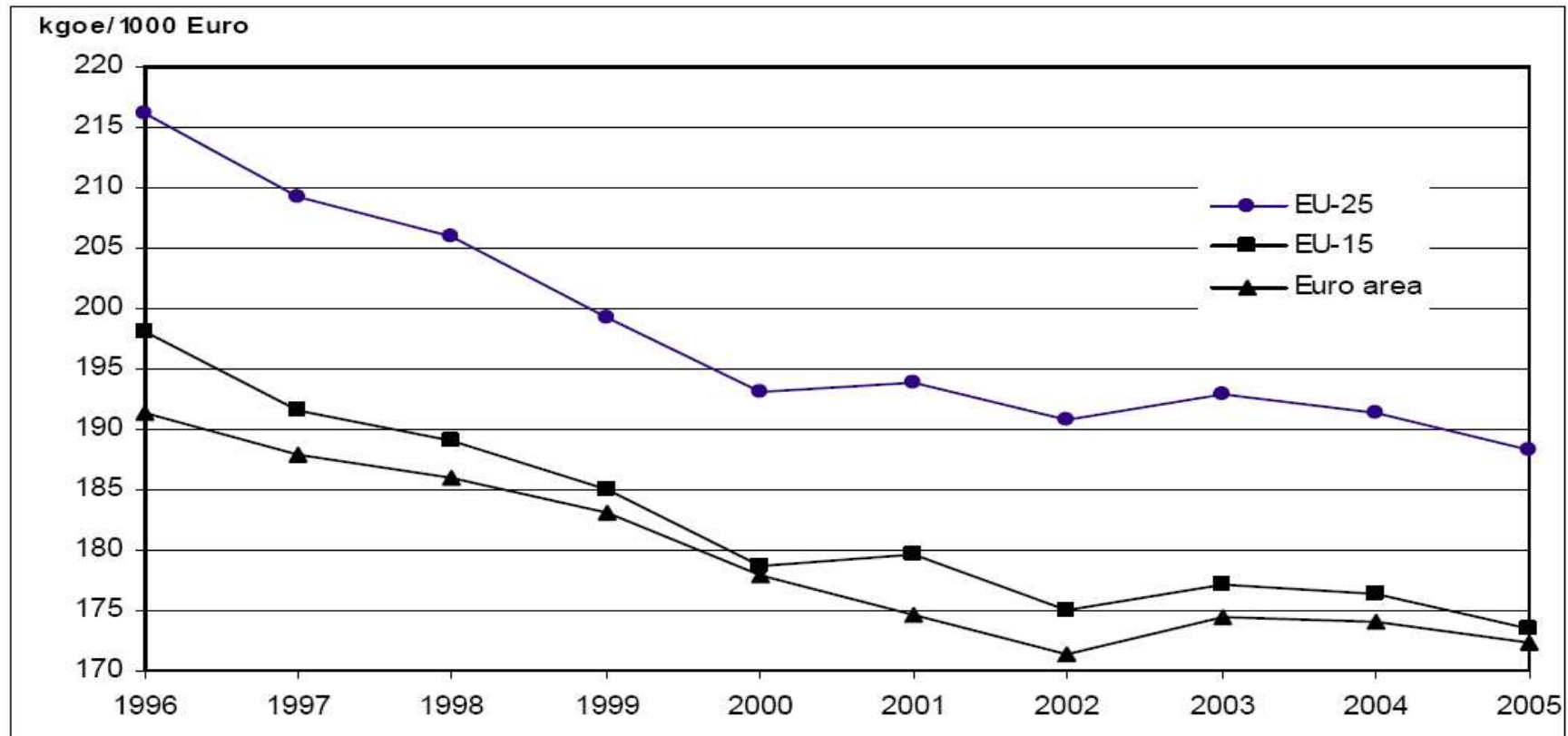
Source: KAPE : IEA 2005

# Fuel intensity of Polish transport



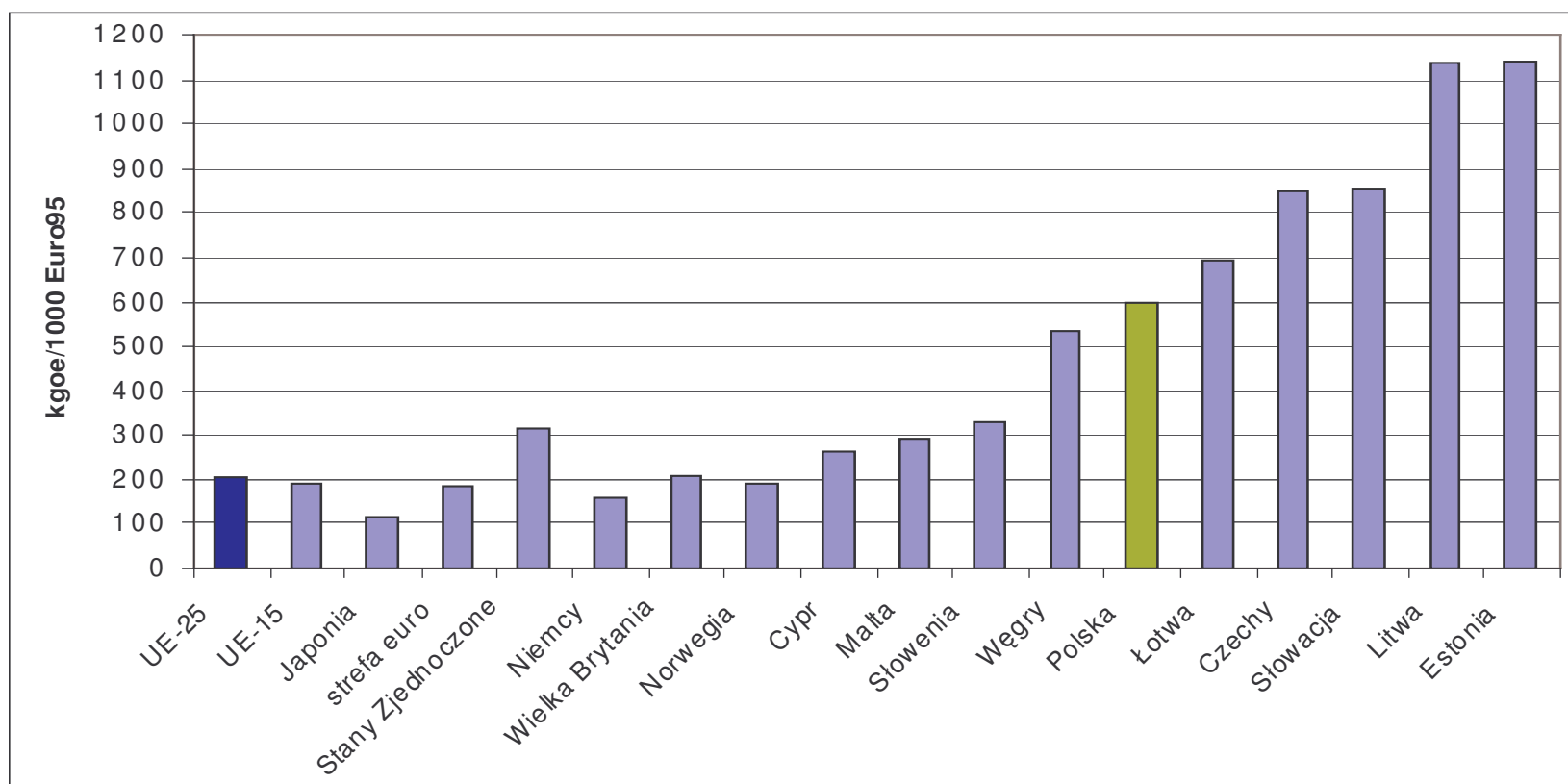
Source:KAPE S.A. Based on ODYSSEE

# Energy intensity in the EU



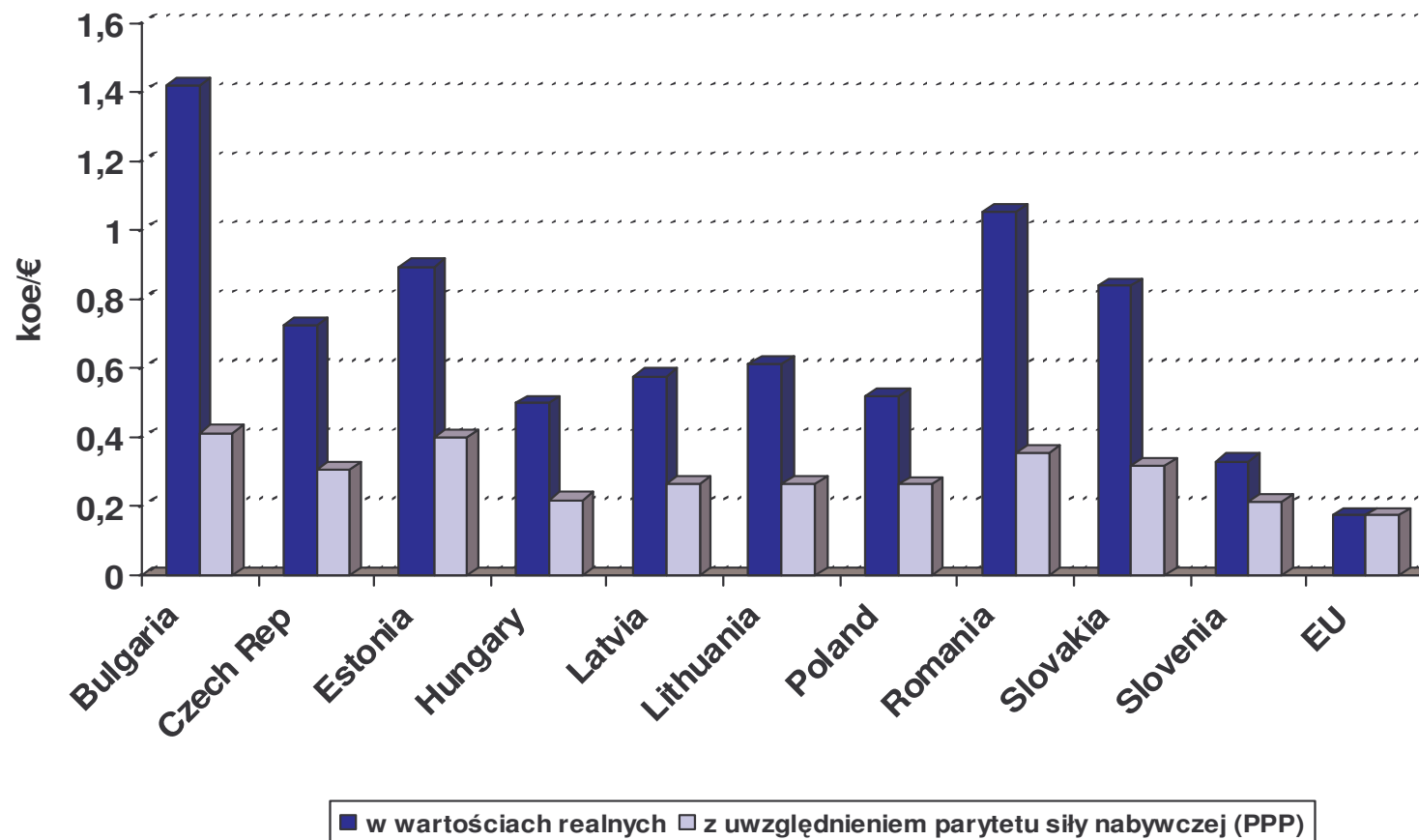
Source: EUROSTAT

# Energy intensity in selected countries 2004



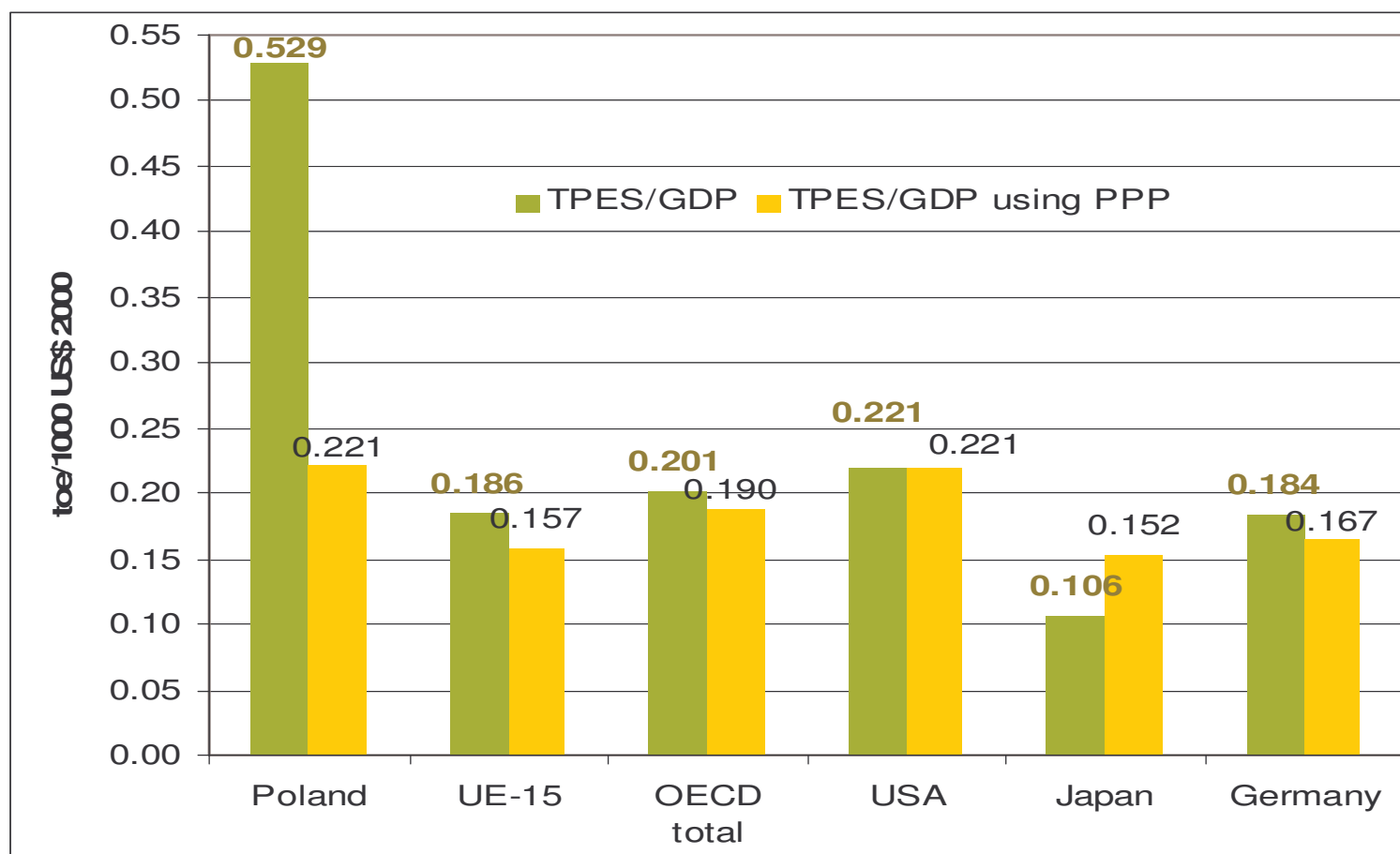
Source: EUROSTAT

# Energy intensity in new Member States of the UE



Source: EUROSTAT

# Energy intensity of GDP in 2003



Source: IEA 2005

## 6. General summary

Source: KAPE



# General summary (1)

## ❑ Energy efficiency potential:

- Big potential to reduce energy consumption in Poland
- Energy efficiency reference target 9% in 2016 (Directive 2006/32/EC) for the economy and all sectors together could be met within 9 years under several conditions

## ❑ Main issues:

- Large distance in GDP and electricity consumption per capita between Poland and EU-15 average
- **Electricity generation and district heating dominated by hard and brown coal; difficult to substitute** (natural gas, nuclear?)
- Highest unemployment rate in EU-25
- High costs of compliance with EU environmental requirements including emission standards (SO<sub>2</sub>, NO<sub>x</sub>, PM)

Source: KAPE



# General summary (2)

## Consequences

- Rapid GDP growth necessary to solve social and environmental problems in Poland
- Fast economic growth is impossible without significant increase in energy consumption which leads to CO<sub>2</sub> emission increase

Source: KAPE

## 7. Burden sharing between MS– how might be adequately distributed

- ❖ Transparency and fairness
- ❖ Cost effectiveness
- ❖ National analysis of mitigation potential
- ❖ National circumstances – capacities and capabilities
- ❖ Equilizing chances–the right for economy growth in new MSs
- ❖ KP base year of new MS respected
- ❖ Taking into account GHG emission reduction already done by new MS before they joined the UE vs emission increase in some UE15
- ❖ Decoupling economy growth from GHG emission and energy consumption
- ❖ Criteria for monitoring and reporting



# Thank you!