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# **Energy Efficiency: From Barriers to Policy**

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# Why focus on energy efficiency?

- **Economic development**
  - ◆ reduced energy costs
  - ◆ improved private sector competitiveness
  - ◆ overall financial benefits
- **Energy security**
  - ◆ improved access to energy services
  - ◆ improved reliability of energy services
- **Environment protection**
  - ◆ reduction of emissions that affect humans, infrastructure and ecosystems



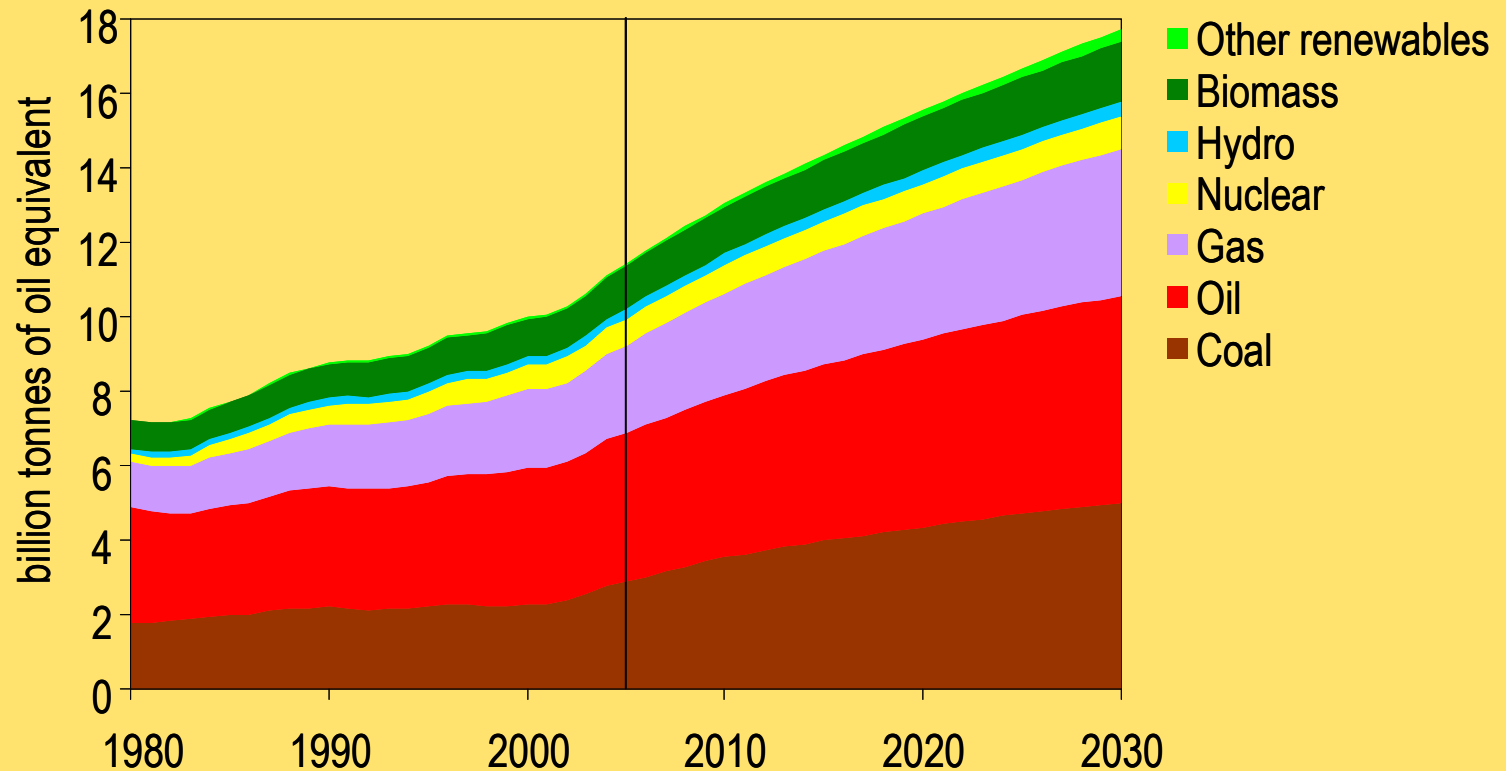
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## Reference Scenario: World Primary Energy Demand



**Global demand grows by more than half over the next quarter of a century, with coal use rising most in absolute terms**

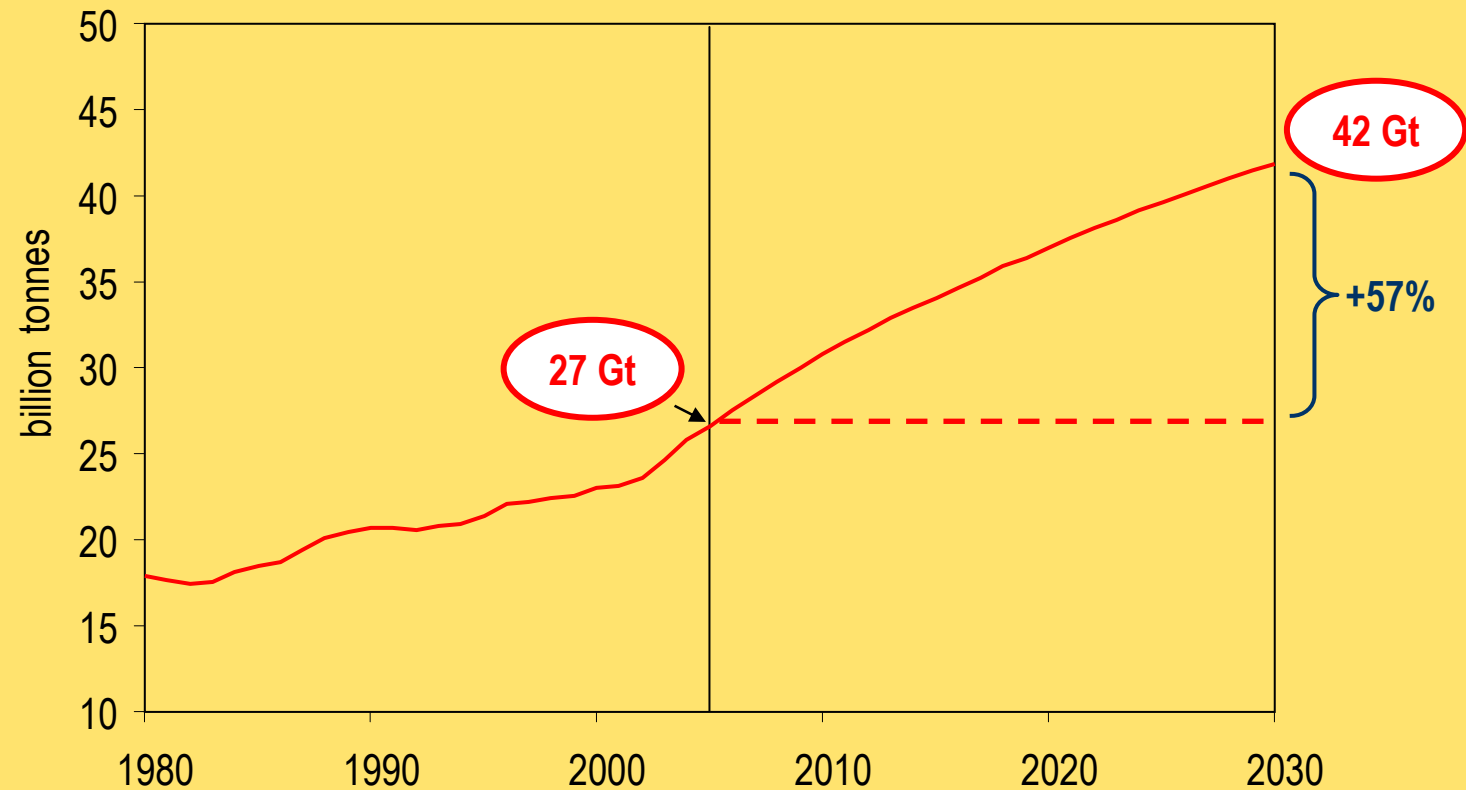


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## Reference Scenario: Global Energy-Related CO<sub>2</sub> Emissions



**Global CO<sub>2</sub> emissions rise to 42 gigatonnes in 2030, 57% above current levels and double the 1990 level**



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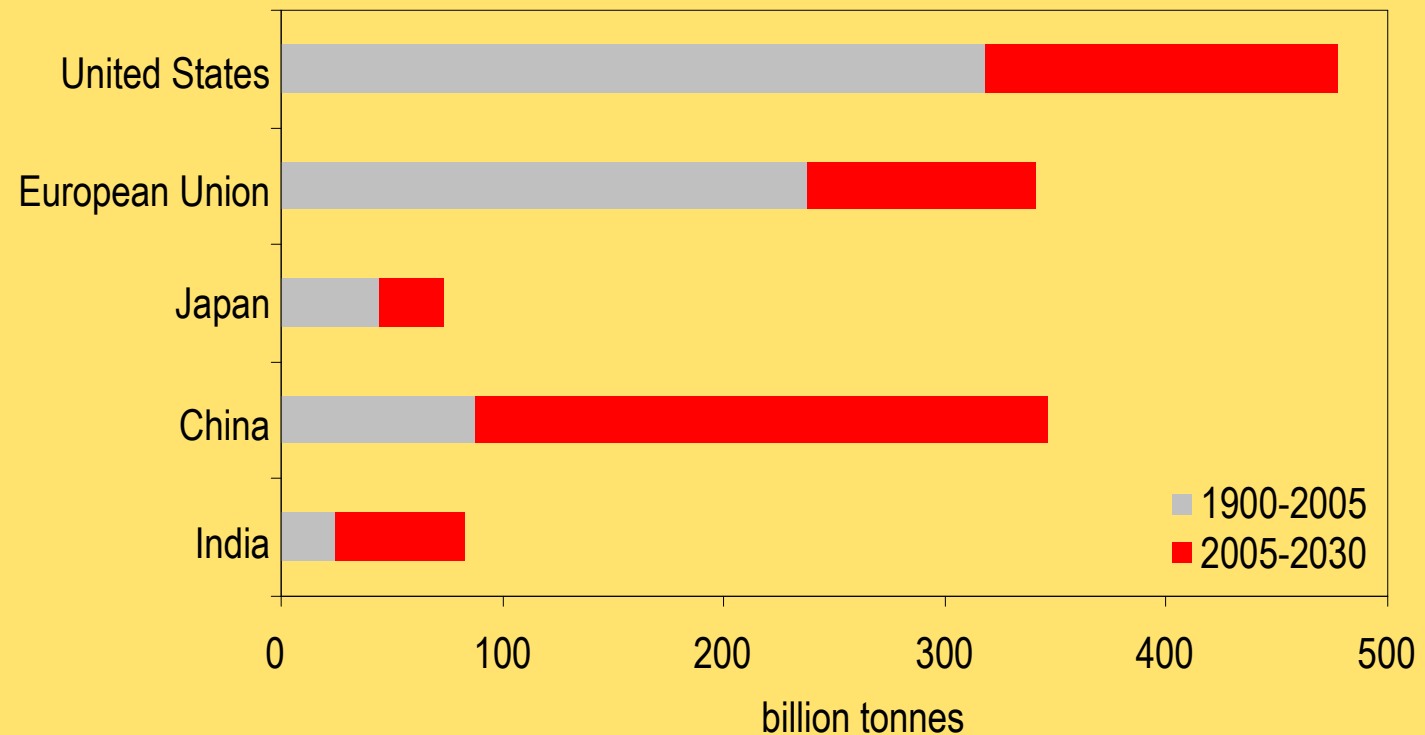
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# China & India in Global CO<sub>2</sub> Emissions

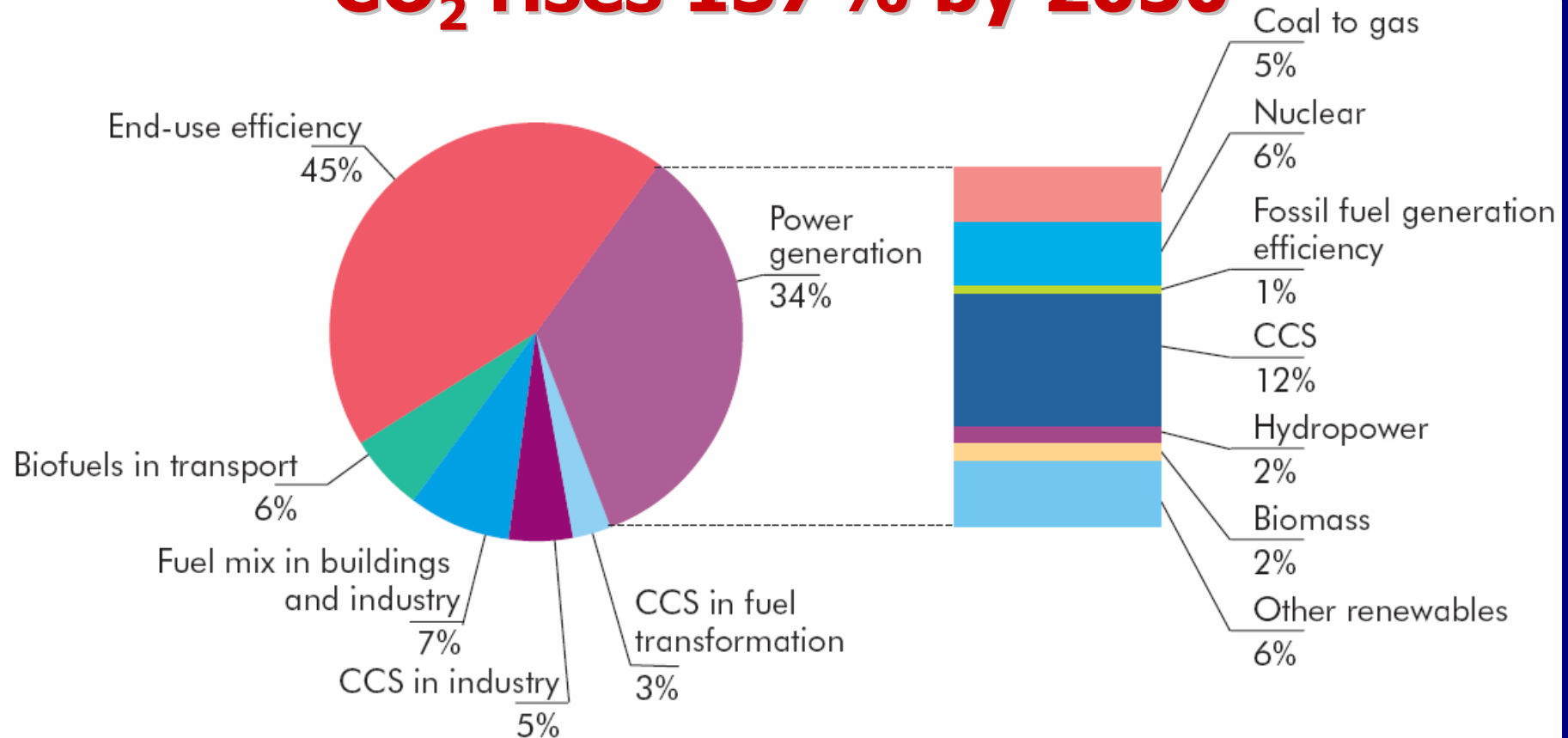
Cumulative Energy-Related CO<sub>2</sub> Emissions



***Around 60% of the global increase in emissions in 2005-2030 comes from China & India***



# Business-as-usual: CO<sub>2</sub> rises 137% by 2050



**A portfolio approach could bring CO<sub>2</sub> emissions back to today's level by 2050. End-use energy efficiency is an essential piece.**

Source: IEA, 2006, Energy Technology Perspectives



**Why doesn't the market take full advantage of this potential?**



## Barriers to EE

- Best policy practice
- Lack of awareness re cost-effective savings potentials
- Missing or partial information on energy performance and lack of common standards
- Split incentives
- Access to capital markets not well developed to support the efficiency market
- Inherent nature of the energy market
- Technology barriers
- Capacity building needs

**Particularly in developing countries!**

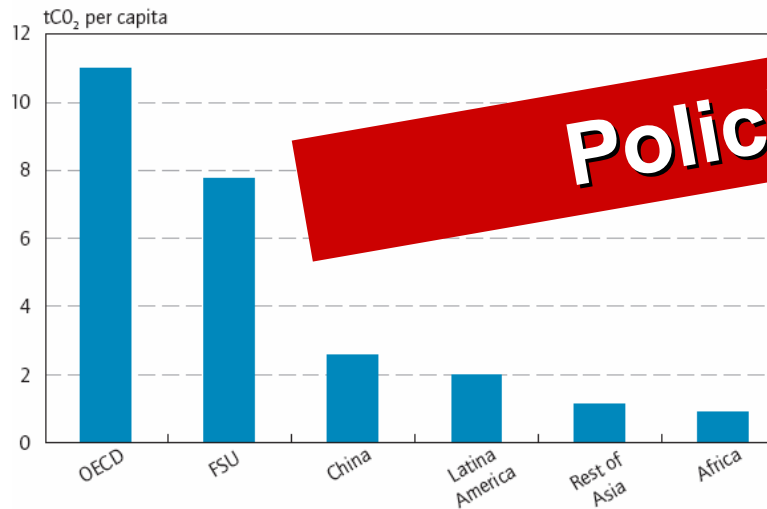
→ emphasis on upfront, not on life-cycle costs



# Energy in Developing Countries

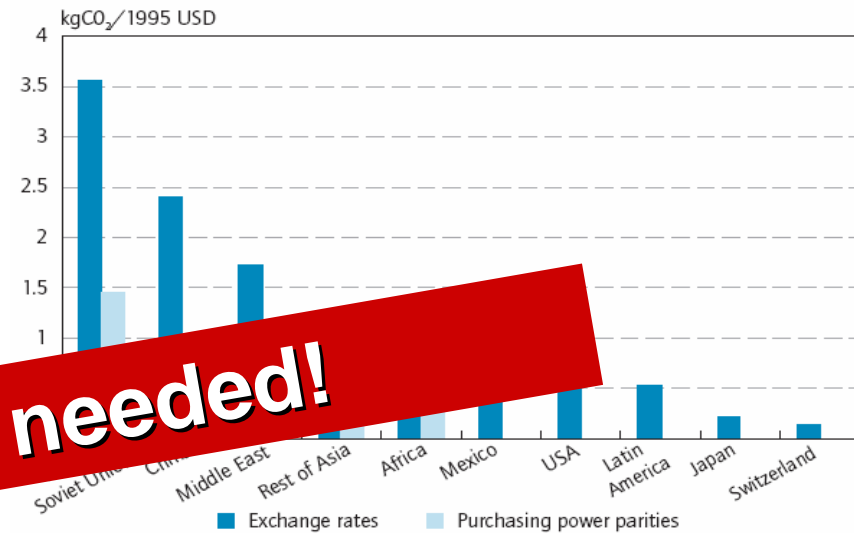
High CO<sub>2</sub> intensities and the development of infrastructure indicate opportunities for cheap reductions...

Per capita emissions (energy-related CO<sub>2</sub>)



Source: IEA statistics

CO<sub>2</sub> intensities of GDP for selected countries and regions



Source: IEA statistics.

**Policies needed!**

... but low per capita emissions and poverty make them hardly affordable

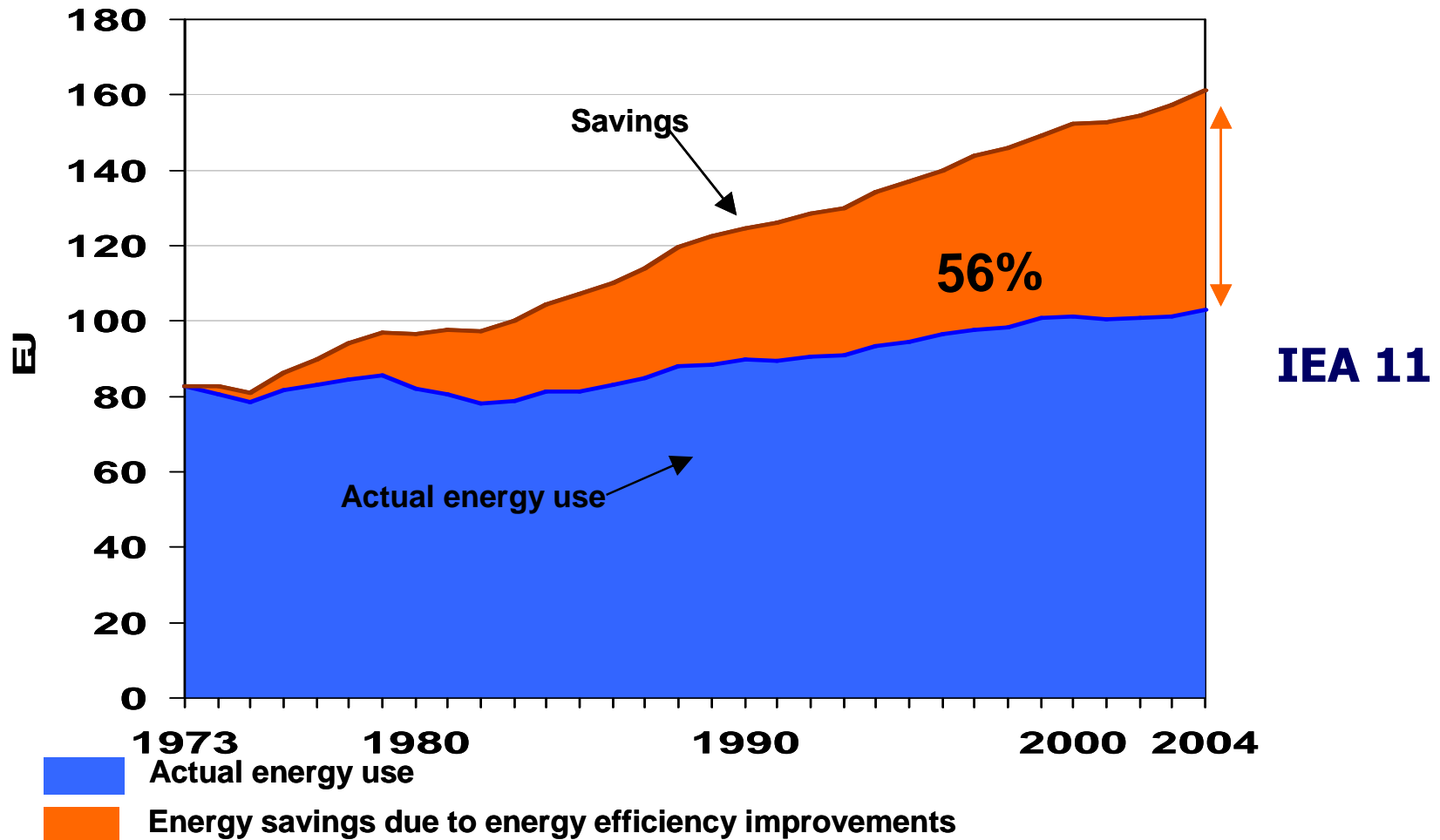


**But are energy efficiency  
policies effective?**



# Energy Efficiency: The Largest Fuel

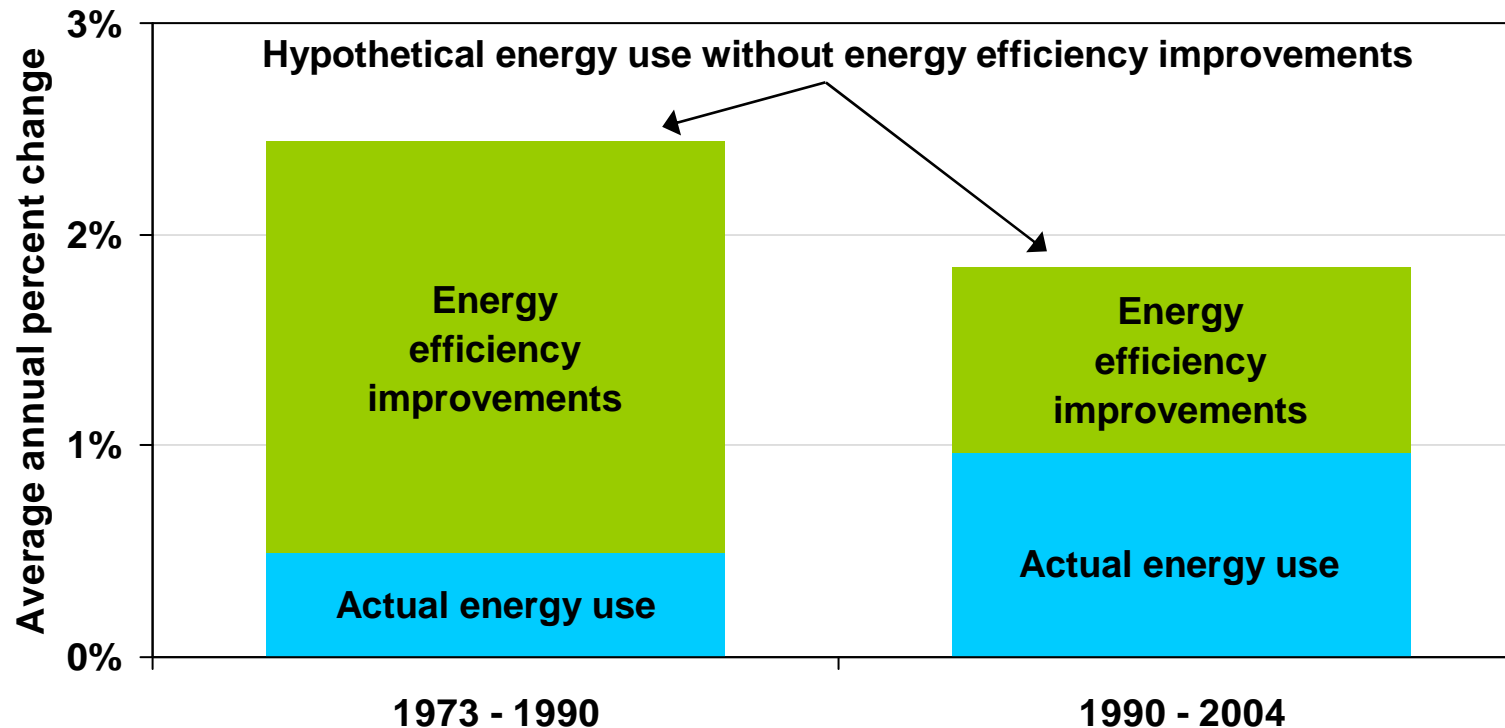
Hypothetical energy use  
without efficiency improvements



Source: IEA, 2007, Energy Use in the New Millennium



# Energy efficiency: More policy is needed



Since 1990, the rate of energy efficiency improvement in IEA countries has been less than 1% per year – much lower than in previous decades.

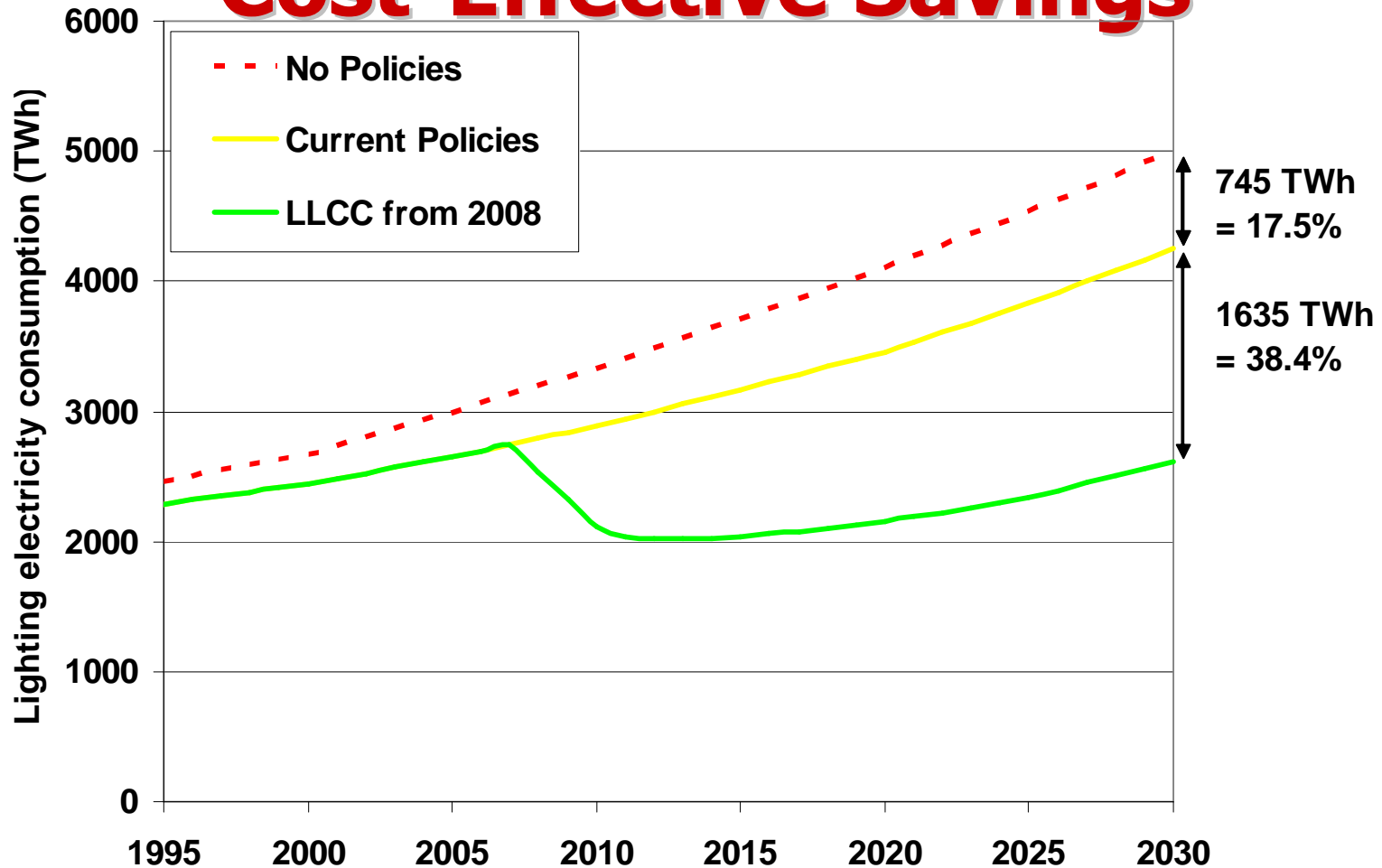
Source: IEA, 2007, Energy Use in the New Millennium

# Technological Improvement Potentials: Industry

	[EJ/yr]	[Mt CO <sub>2</sub> /yr]
<b>Sector Process improvements</b>	<b>12-17</b>	<b>1150-1550</b>
<b>Systems Options</b>	<b>13-20</b>	<b>750-1650</b>
<b>Total</b>	<b>25-37</b>	<b>1900-3200</b>
<b>Industrial Improvement potential</b>	<b>18-26%</b>	<b>19-32%</b>
<b>World Improvement potential</b>	<b>5-8%</b>	<b>7-12%</b>



# Lighting, An Example of Cost-Effective Savings



**Global cost of lighting could be reduced by US\$ 2.6 trillion  
16 billion tons of CO2 could be saved**

Source: IEA, 2006, Light's Labour's Lost



# G8 Process



## ● Gleneagles Summit

- ◆ Declaration recognises the threat of climate change
- ◆ Mandate (to World Bank and IEA) to identify best policy practice in energy efficiency
- ◆ «G8 plus Five» Dialogue

## ● Heiligendamm Summit

- ◆ IEA made 12 concrete EE policy recommendations – could save ~ 5.7 billion tons of CO<sub>2</sub> by 2030
- ◆ Topic-driven Dialogue between «G8 plus 5»
  - Promoting and protecting innovation; Enhancing freedom of investment; Defining common responsibilities for development; Sharing knowledge for improving EE and technology cooperation to reduce CO<sub>2</sub>



## Conclusions

- **A more sustainable energy future: possible with portfolio of clean & efficient technologies**
- **Policy needed to promote energy efficiency: targeted policy interventions**
- **How to enhance the role of carbon finance in energy efficiency investments?**