



Energy Efficiency: The Role of Government in an International Perspective

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IEA Energy Efficiency Policy Analysis

*Seeking the Frontiers: Highly-Efficient Energy
Utilisation in Factories and Buildings*
Tokyo, 19 January 2004



Overview

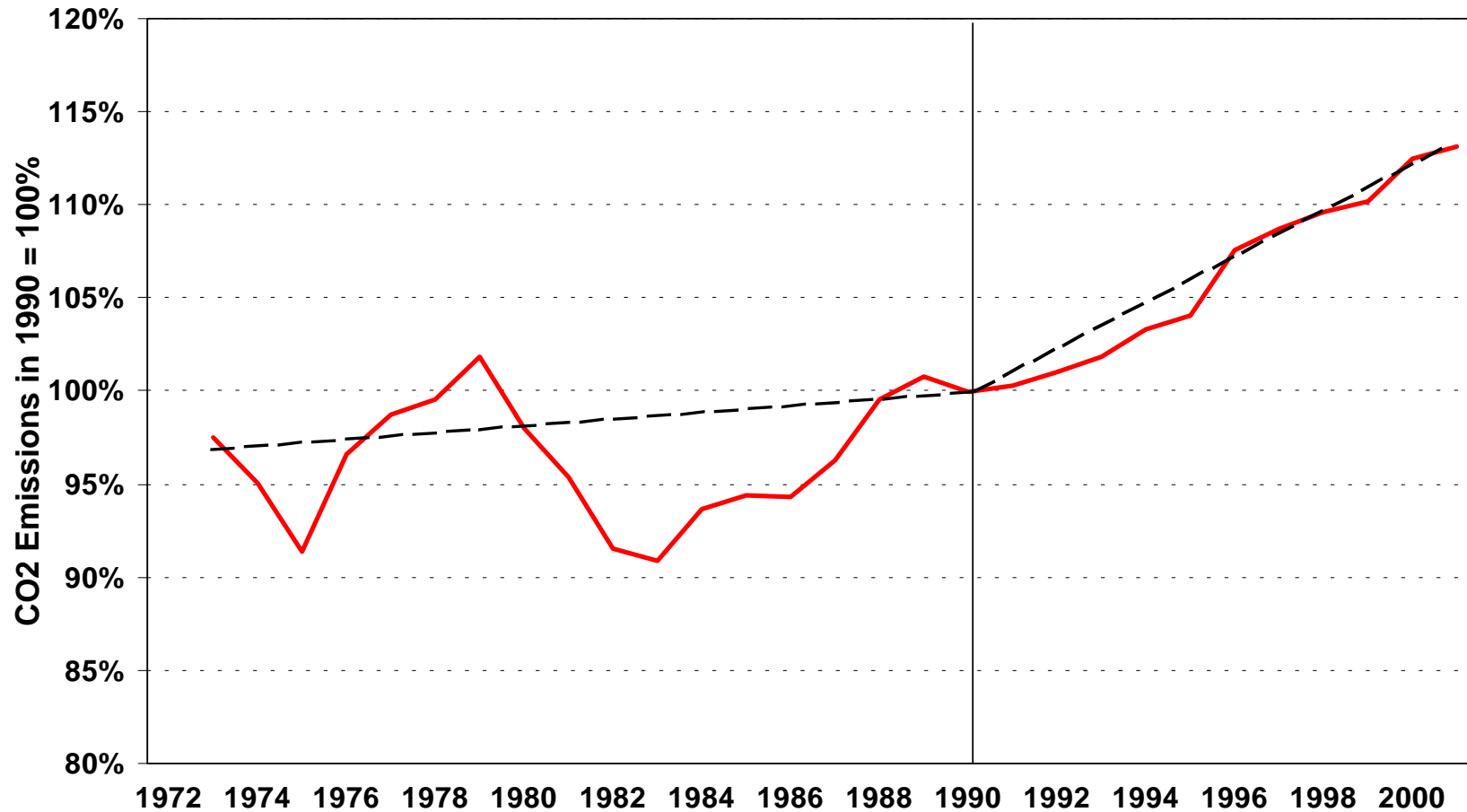
- Policy challenges
- Efficiency opportunities and potentials
- The role of government



Policy Challenges



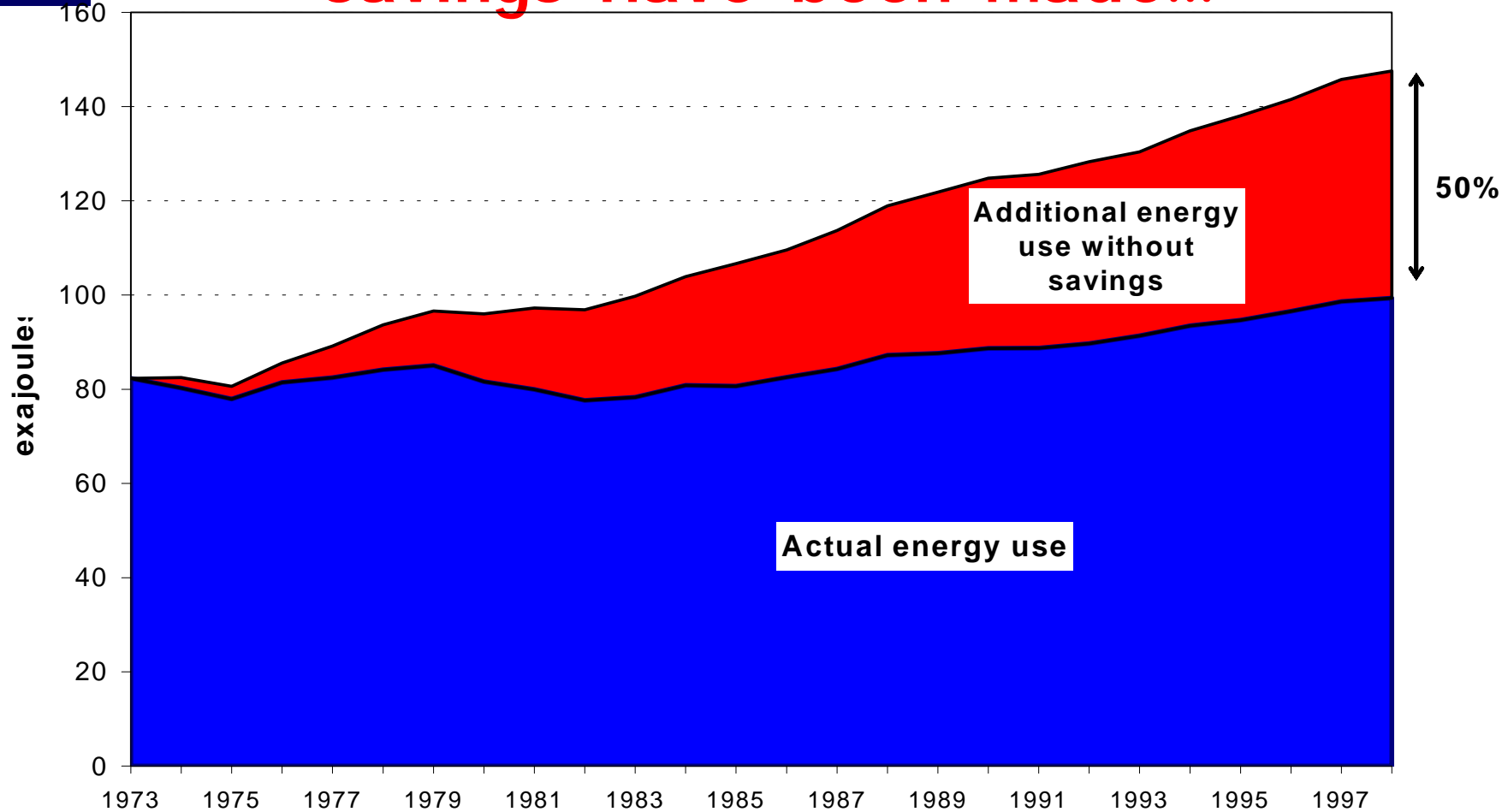
Challenge #1: Getting CO₂ emissions on track



CO₂ emissions in IEA countries have grown much faster since 1990



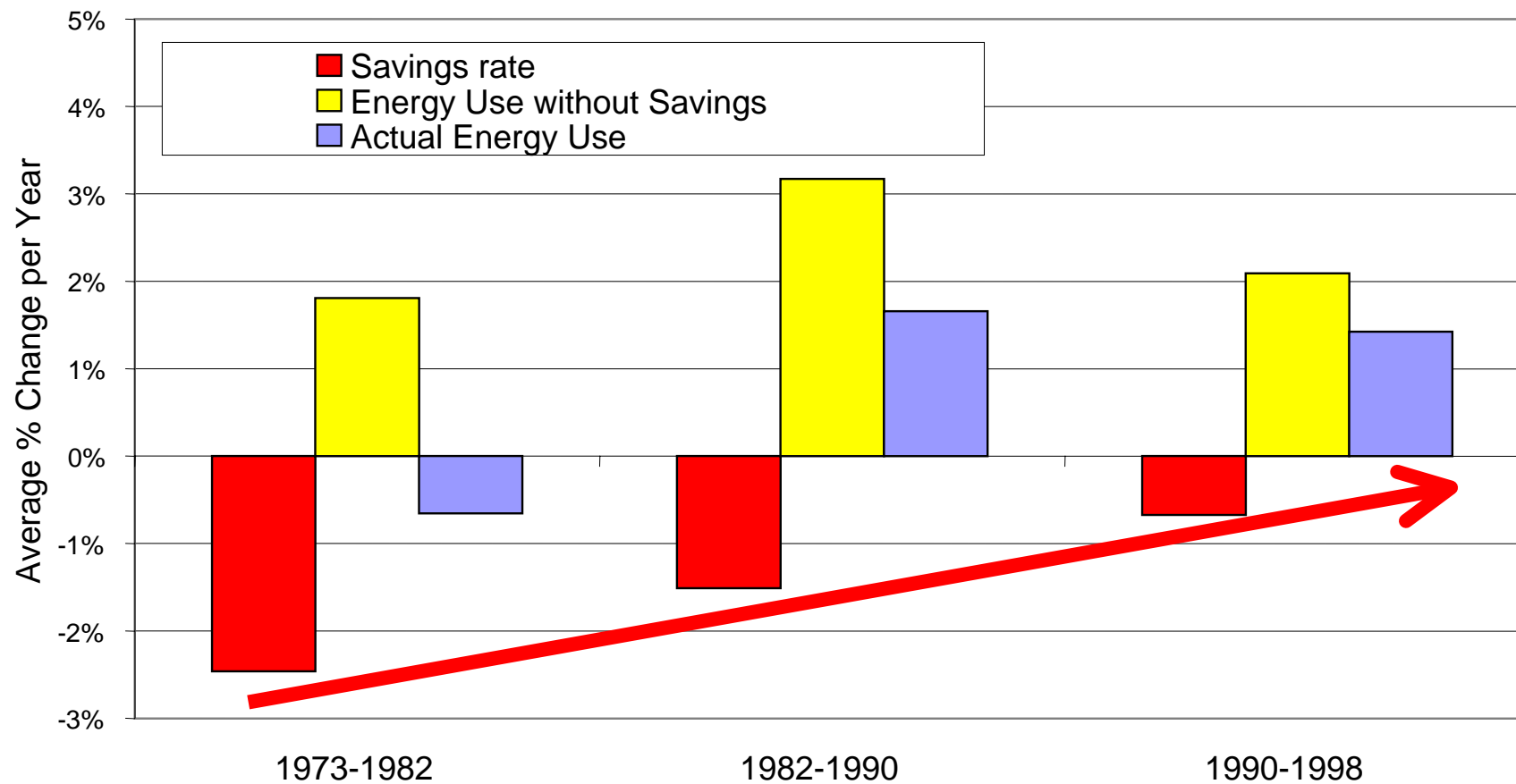
Even though significant energy savings have been made...



Without falling energy intensities, energy use in 1998 would have been 50% higher (IEA-11)



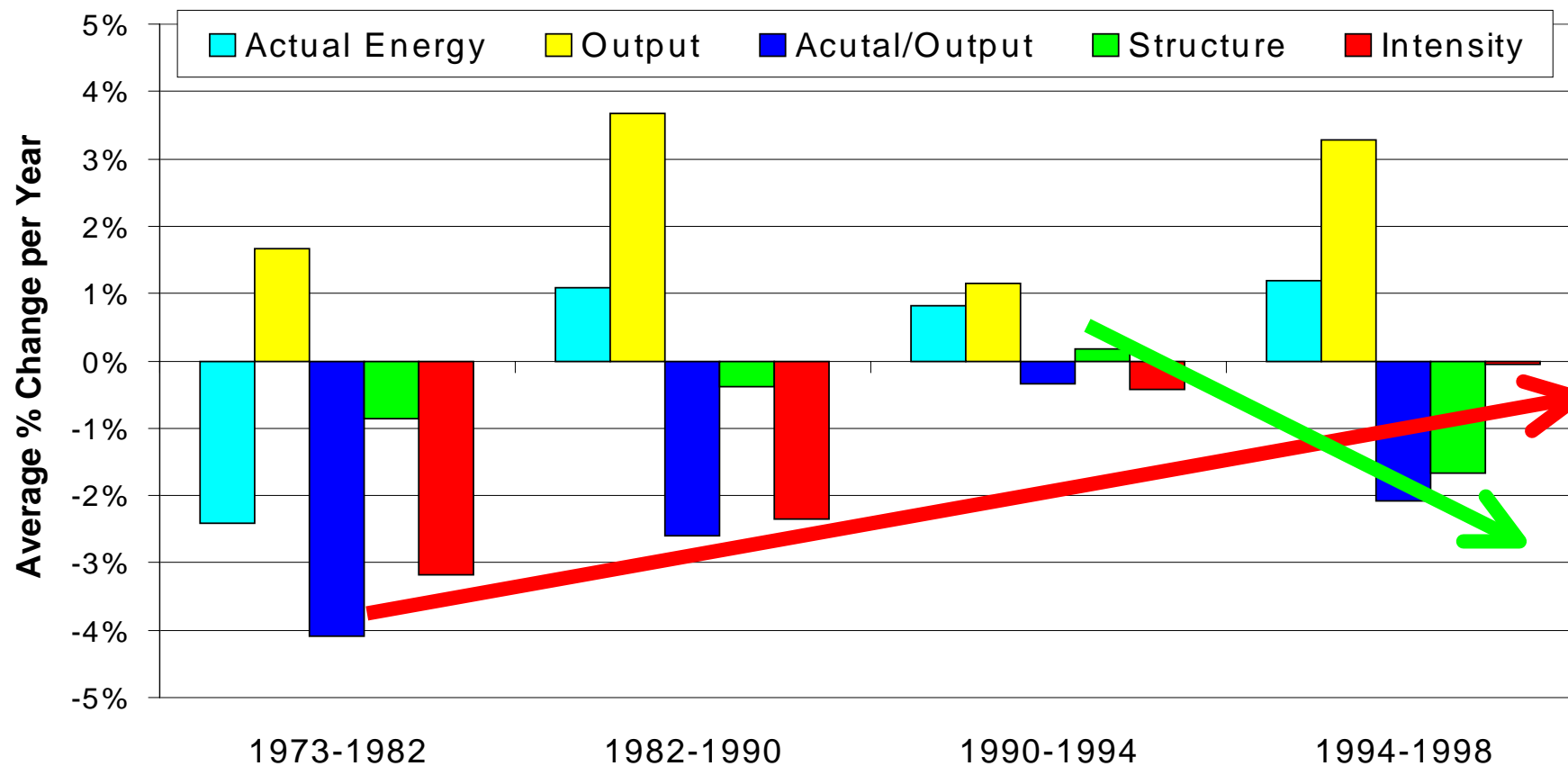
...they have been made at
an ever-decreasing rate



*Energy savings have slowed significantly since mid-80s
("reverse oil shock" of 1986?)*



Similar trends in industry, but masked by structural change

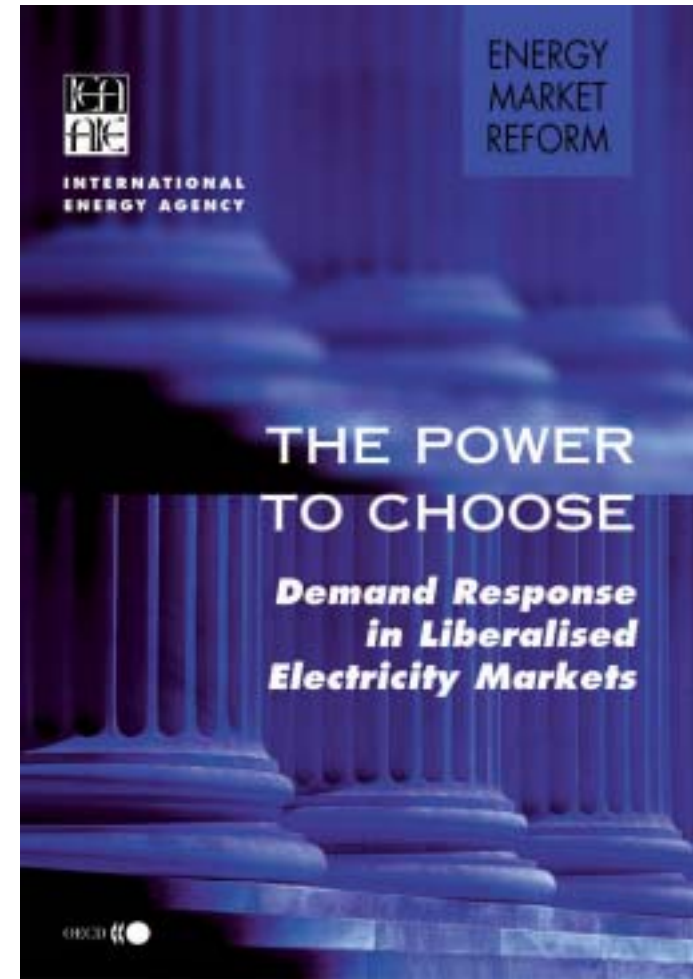


Industrial Sector Energy Use (IEA-11)



Challenge #2: Security and reliability in IEA power systems

- Major security and reliability events or concerns recently in:
 - ◆ US, Canada, Italy, UK, Sweden, Denmark, Norway, New Zealand, Japan
- Security is not only a supply side issue
 - ◆ Unchecked growth in demand is increasingly threatening electricity market stability
 - ◆ Energy efficiency and demand response are key priorities





Energy security and energy efficiency

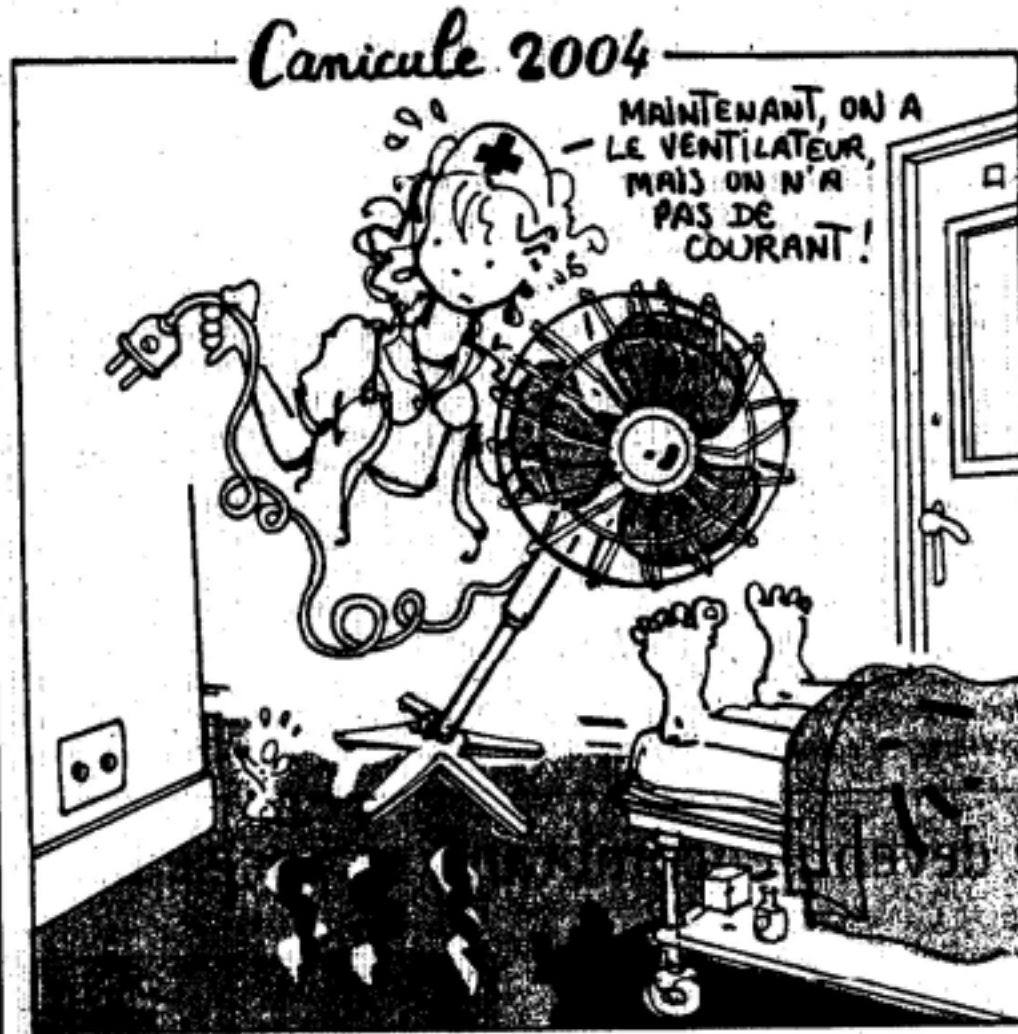
“If the EU cannot reverse current energy consumption trends...it will have to resign itself to massive dependence on imports for its energy supplies...”

“Only a policy geared to controlling demand can lay the foundations for a sound energy supply security policy.”

- EU Green Paper, *Towards a European Strategy for the Security of Energy Supply*, 2001



Security and climate change challenges are linked



- Climate change is a new threat to energy security

- ◆ 15,000 deaths in 2-week heat wave in Paris
- ◆ Should expect more frequent, more severe events in future
- ◆ Additional stress on energy systems

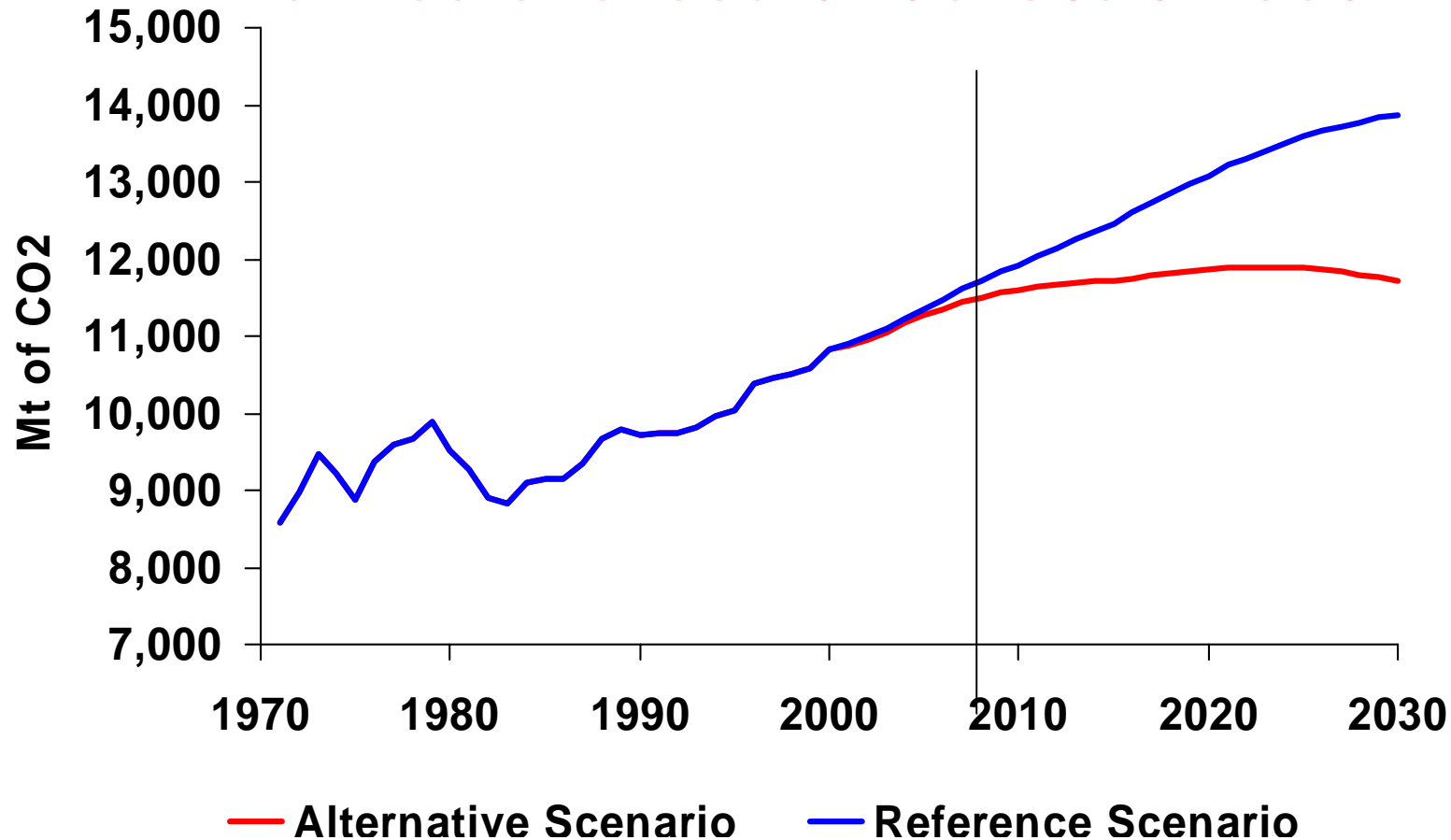
- Cartoon from *Le Monde*, 5/11/03



Efficiency Opportunities and Potentials



With stronger policies, greenhouse emissions could be stabilised



OECD CO2 Emissions

Source: IEA *World Energy Outlook*, 2002

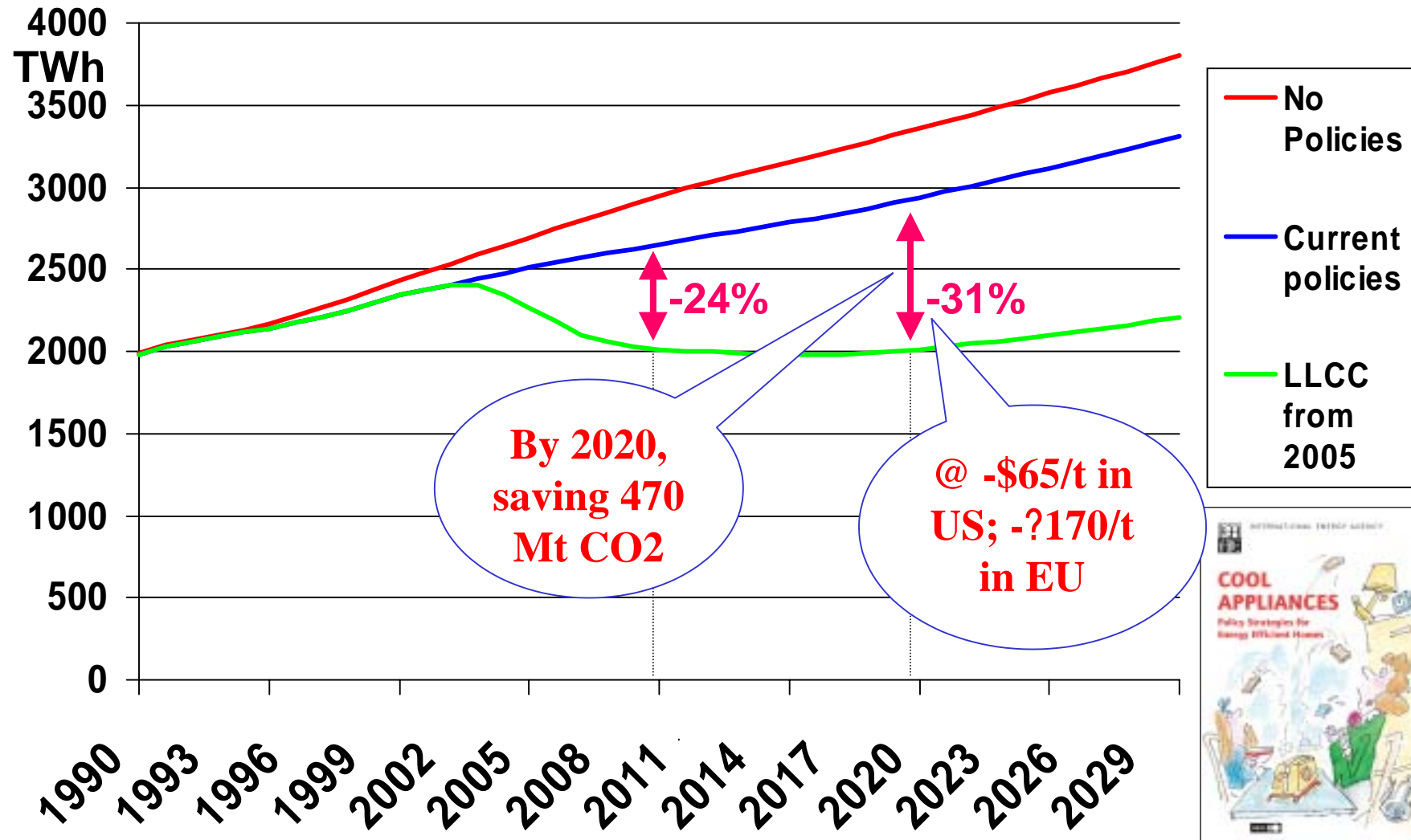


Efficiency potentials are very large

- Energy savings of 50% - 90% can be cost-effective
 - ◆ when policies stimulate product or process redesign and market transformation
- 30%+ savings (but often much more) are available with today's best practice technologies
- With stronger efficiency policies, some US\$700 billion (20%) of investment in IEA electricity infrastructure could be avoided to 2030
 - ◆ despite an extra \$250 billion investment in renewables
(source: IEA World Energy Investment Outlook, 2003)

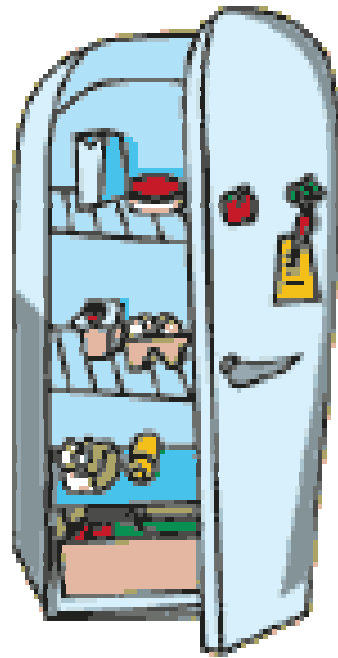


Eg: residential sector: huge savings with least life cycle cost policies



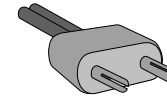


What is the least life cycle cost?

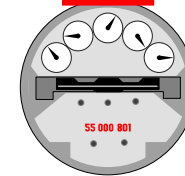


500?

+



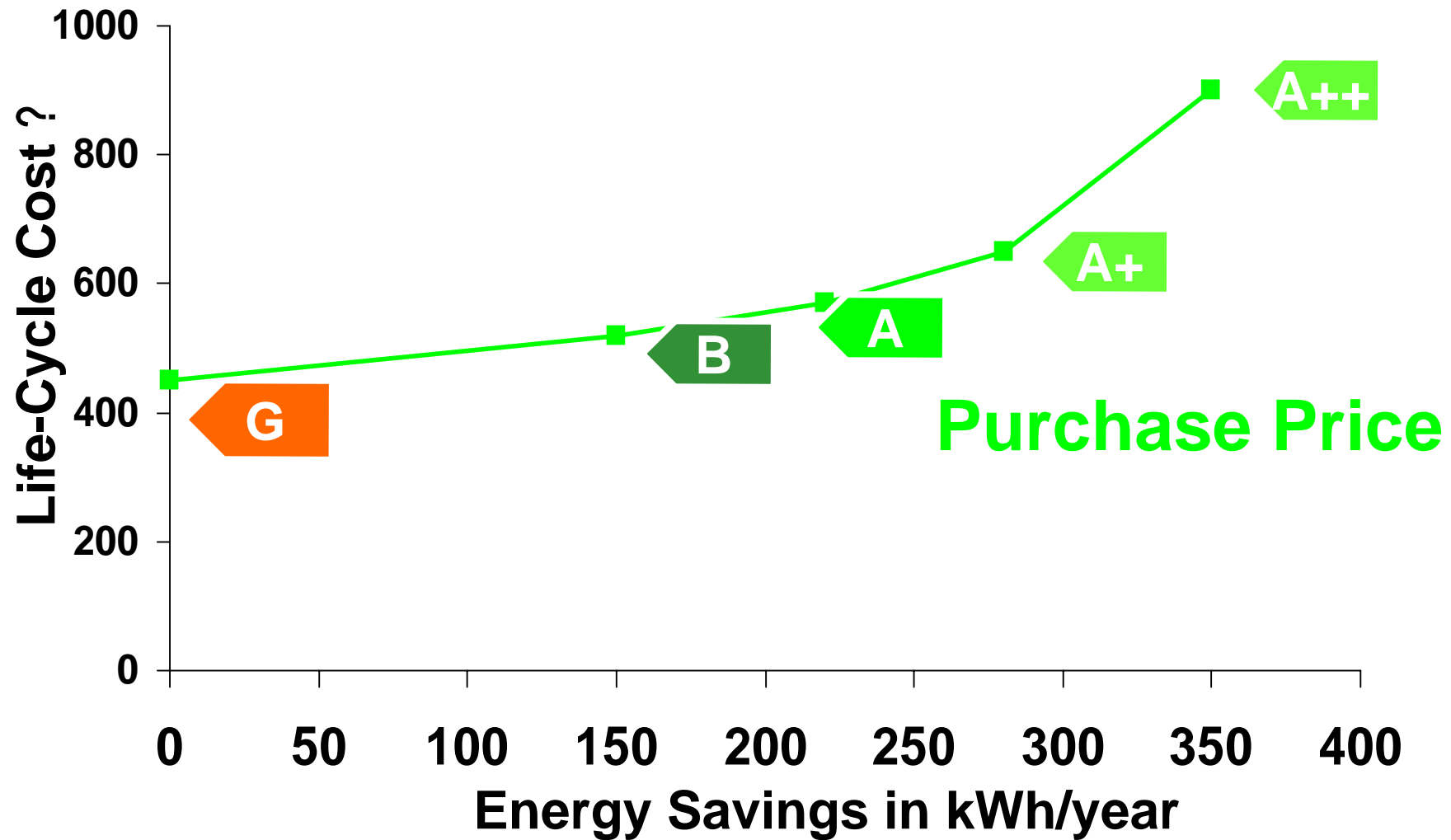
50?/year
x 15 years



Life Cycle-Cost = Purchase Cost + Lifetime Running Costs

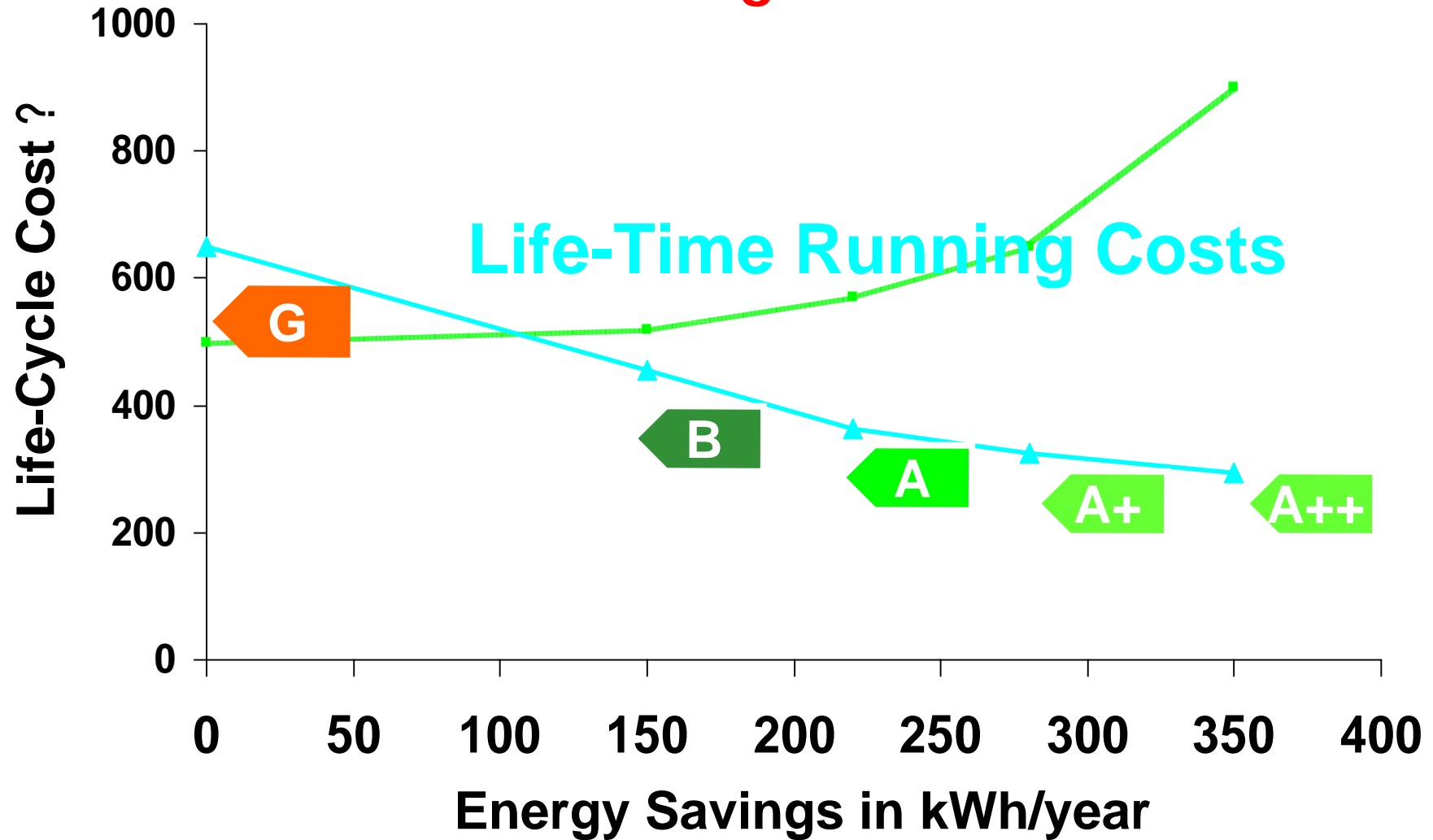


Typically, higher efficiency =
higher purchase price...



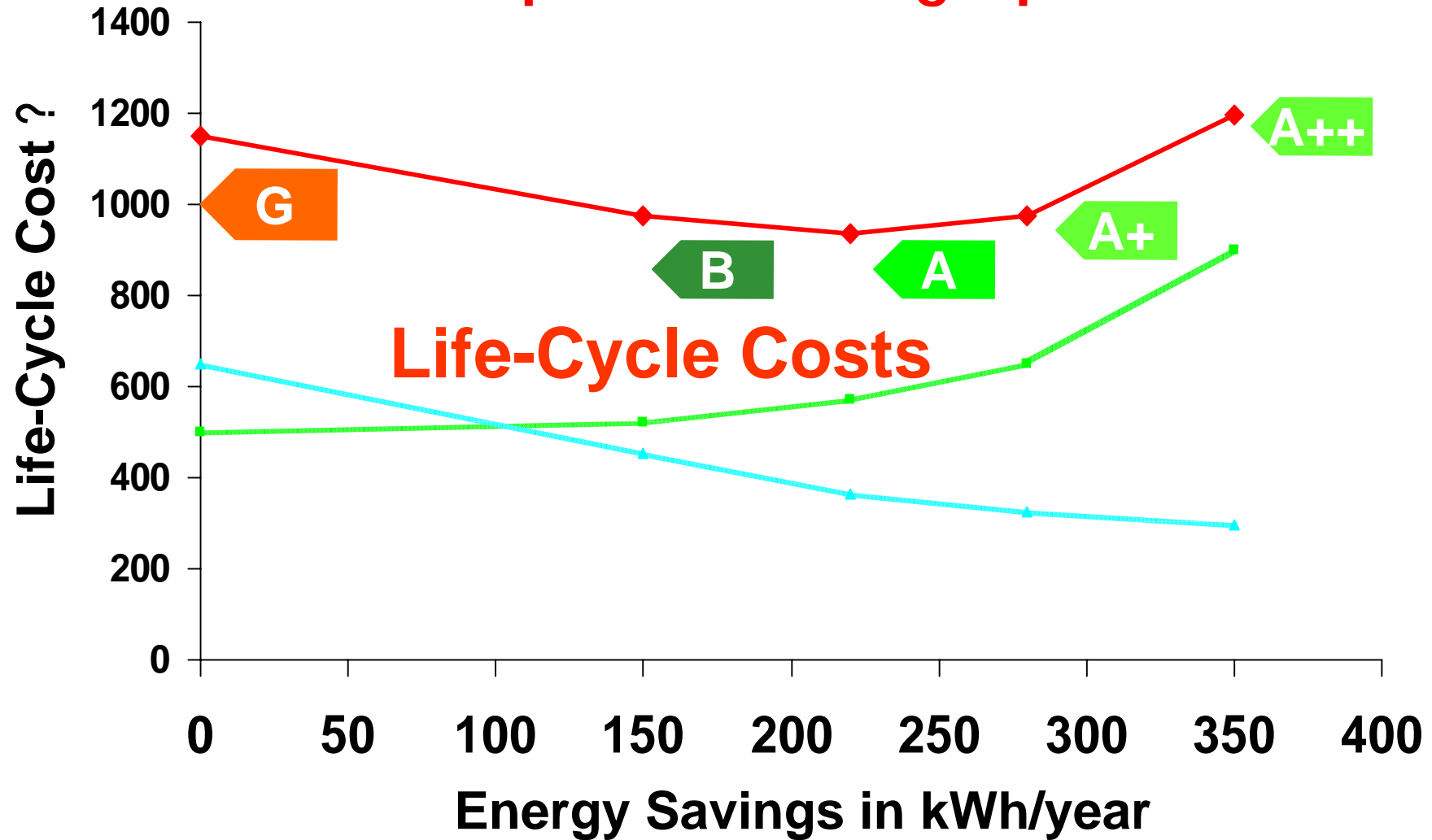


...but lower lifetime running costs...



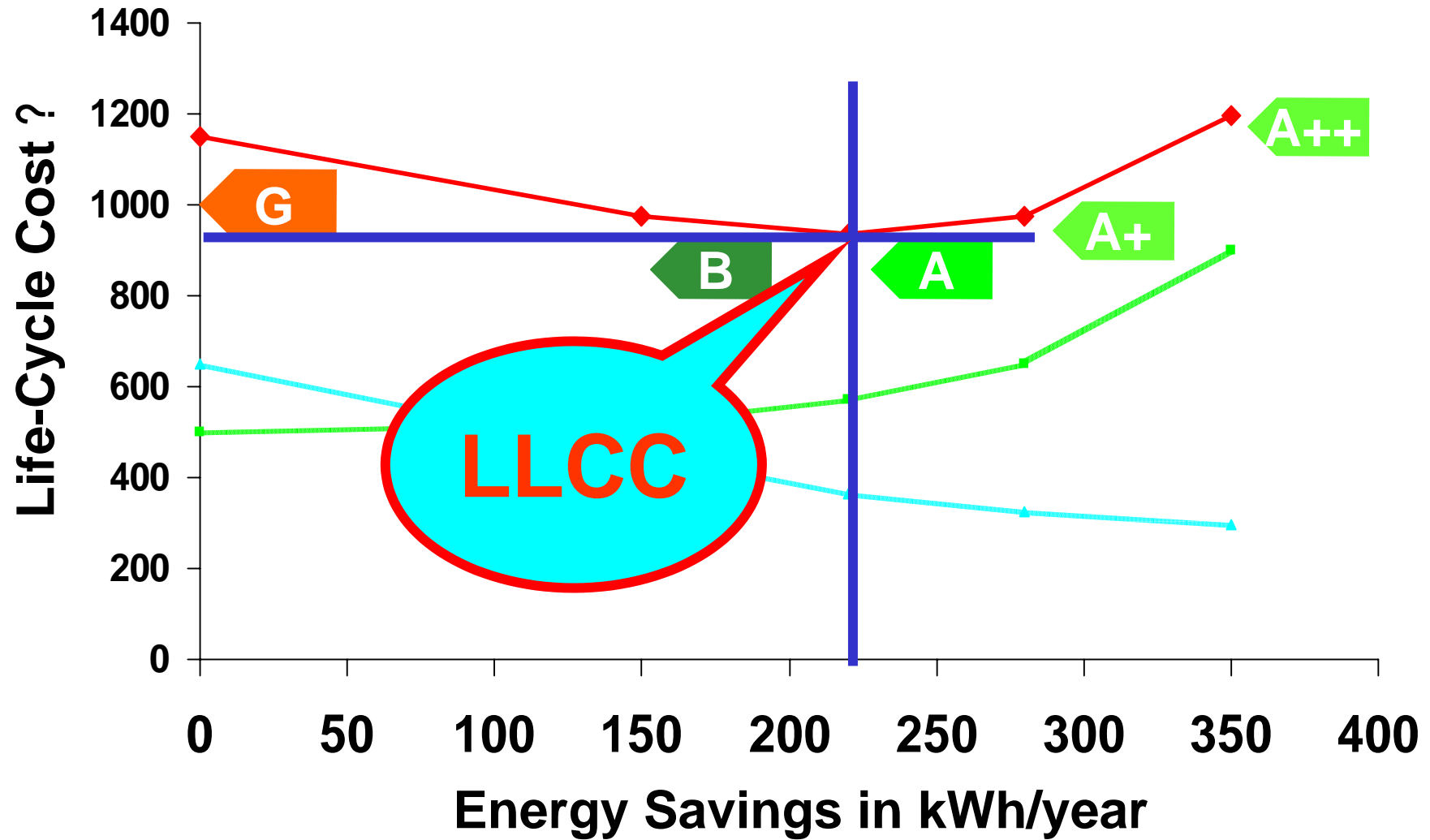


...combining the two, there is one optimal savings point...



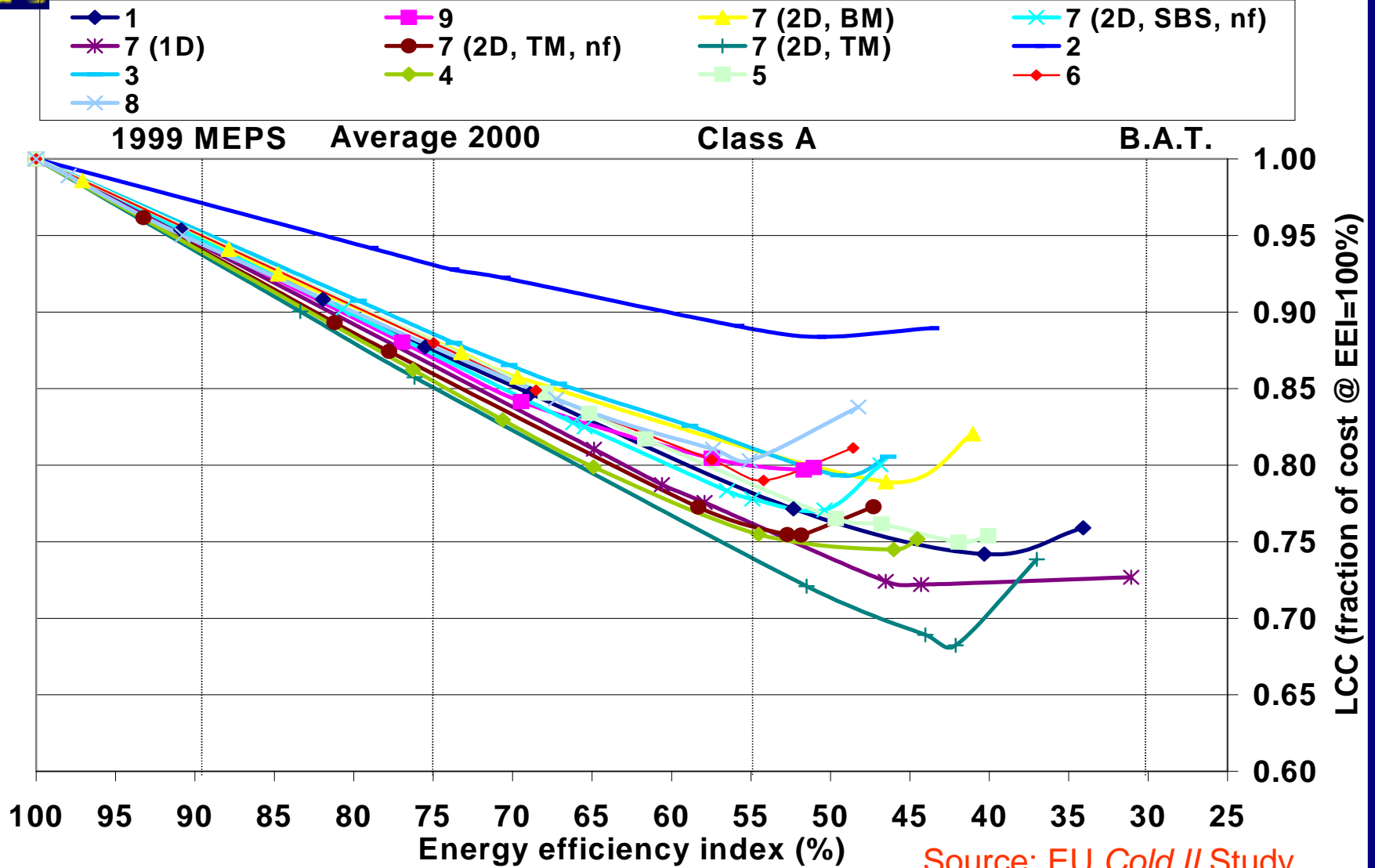


...the least life-cycle cost





Eg: cold appliances in Europe



Source: EU Cold II Study



Efficiency and ghg abatement

- Efficiency is usually the least-cost abatement strategy
 - ◆ least technical risk, highest availability, highest short-to medium-term potential
- Eg, Germany's CO₂ emissions 1990 - 2001:

Total	Population growth effect	Income effect	Fuel switching	Energy savings
-18%	+3%	+12%	-16%	-18%

Source: Hans-Joachim Ziesing, *Energy Policy*, forthcoming



Efficiency and clean energy supply

- Finally, efficiency is a necessary condition for meeting ambitious renewables or greenhouse targets
 - ◆ half of the UK's 2050 abatement goal (a 60% reduction in CO₂ emissions)
 - ◆ France's renewables target (21% by 2010) demands 22 TWhs of new renewables
 - but only 10 TWhs if BAU demand growth is shaved by just 10%



The Role of Government



Role #1 - Offer leadership

- Today's energy security and climate change challenges demand stronger policies
- Business and households have key roles to play
 - ◆ But these sectors will under-invest in energy efficiency without strong policy (or market) incentives
 - ◆ Governments must offer leadership



Eg: set national targets

- Specific, quantifiable and meaningful targets are a key element of energy efficiency policy
- Eg, Italian and UK schemes, involving market-based, tradeable efficiency obligations
 - ◆ IEA is creating a new international study “task” on these measures (“white certificates”) under the DSM Implementing Agreement
- Eg, Denmark: total final energy consumption to fall by 0.5%/year
 - ◆ Currently using less energy than in 1973, while GDP has more than doubled



Role #2 - Establish integrated, comprehensive policy frameworks

- Most countries have one or two examples of best-practice policies
 - ◆ Eg, Top-Runner in Japan
- But most countries also have large policy gaps and/or inconsistencies
- The goal should be to achieve the highest feasible energy efficiency
 - ◆ In all sectors, and in every case



How?

- Requires a *comprehensive* approach to efficiency policy
 - ◆ All sectors and all end-uses targeted systematically
 - drawing on careful research and analysis
 - ◆ Key approaches: national targets, economy-wide instruments; but also sectoral policies, regional strategies, strong institutions
 - ◆ Broad mix of policy measures likely to be more successful
 - Time to review effectiveness of 'softer' policy models, such as voluntary agreements?



Role #3: Set high standards

- Energy efficiency policies rarely deliver optimum efficiency outcomes
 - ◆ stringency should be higher for economic, social and environmental reasons
- Governments should benchmark policy stringency objectively in all sectors
 - ◆ Minimising the life-cycle cost should be considered *a minimum standard*
- Policies must be dynamic
 - ◆ Keep up with - or push - technological progress
 - ◆ Track changes in life-cycle cost over time



Role #D: Deal with policy conflicts

- Energy efficiency policies can easily be offset by other policies or trends
 - ◆ Eg, energy market liberalisation has pushed down prices, increased price volatility, broken utility-customer linkages
 - ◆ Many tax, transport and urban development policies undermine energy efficiency
 - need for 'joined-up' government
- Be alert for, and ready to act on, trends
 - ◆ eg, areas of rapid demand growth such as IT, entertainment equipment, power supplies, standby, air conditioning, transport



Summary

- Energy efficiency offers enormous benefits for energy security, sustainable development and greenhouse gas abatement
- These benefits can be realised at negative or very low cost
- But this will *only* occur under an ambitious and comprehensive policy framework
- Role of governments:
 - ◆ Offer leadership
 - ◆ Establish integrated, comprehensive policy frameworks
 - ◆ Set high standards
 - ◆ Deal with policy conflicts