



**United Nations Forum on  
Energy Efficiency and Energy Security for Sustainable Development  
Taking collaborative Action on Mitigating Climate Change**

**Co-organized by:**

**United Nations Department of Economic and Social Affairs  
Korea Energy Economics Institute (KEEI)  
Korea Chamber of Commerce and Industry (KCCI)**

**Realizing the Potential of Energy Efficiency  
Targets, Policies, and Measures for G8 Countries**

**Hi-chun Park  
Inha University & UN Foundation**

**KCCI Headquarters, Seoul, December 17, 2007**

## United Nations Foundation : Mission



- The UN Foundation was created in 1998 with entrepreneur and philanthropist Ted Turner's historic \$1 billion gift to support UN causes and activities.
- The UN Foundation builds and implements public-private partnerships to address the world's most pressing problems, and broadens support for the UN through advocacy and public outreach. The UN Foundation is a public charity.

# The Report: Background



*Why was the report undertaken?*

In December 2006, the United Nations Foundation convened a meeting in response to a request from the Climate Science Advisor to the German Chancellor.

*Who authored the report?*

A distinguished panel of 21 energy efficiency experts from 14 countries known as the Expert Group.

*Who is the audience?*

The report is intended for the G8 governments and is also being presented to other developed and developing countries.

# The Report: Background



*What makes this report different?*

The report makes policy recommendations, including

- A target for annual efficiency improvements of 2.5%
- A pledge and review process for ensuring sustained, high-level attention to achieve the target
- Options of policies and measures for national implementation and international cooperation

*What is the intended impact of the report?*

Action on a strategy that fuels global development and keeps atmospheric concentrations of carbon dioxide below 550 ppm by 2100 (present concentration: 380 ppm).

*What impact has the report had to date?*

The process helped bolster the German position on efficiency during its G8 presidency this year, and early indications are that the Japanese may similarly wish to engage in 2008.

*Where will the report be available?*

[www.unfoundation.org/energyefficiency](http://www.unfoundation.org/energyefficiency)

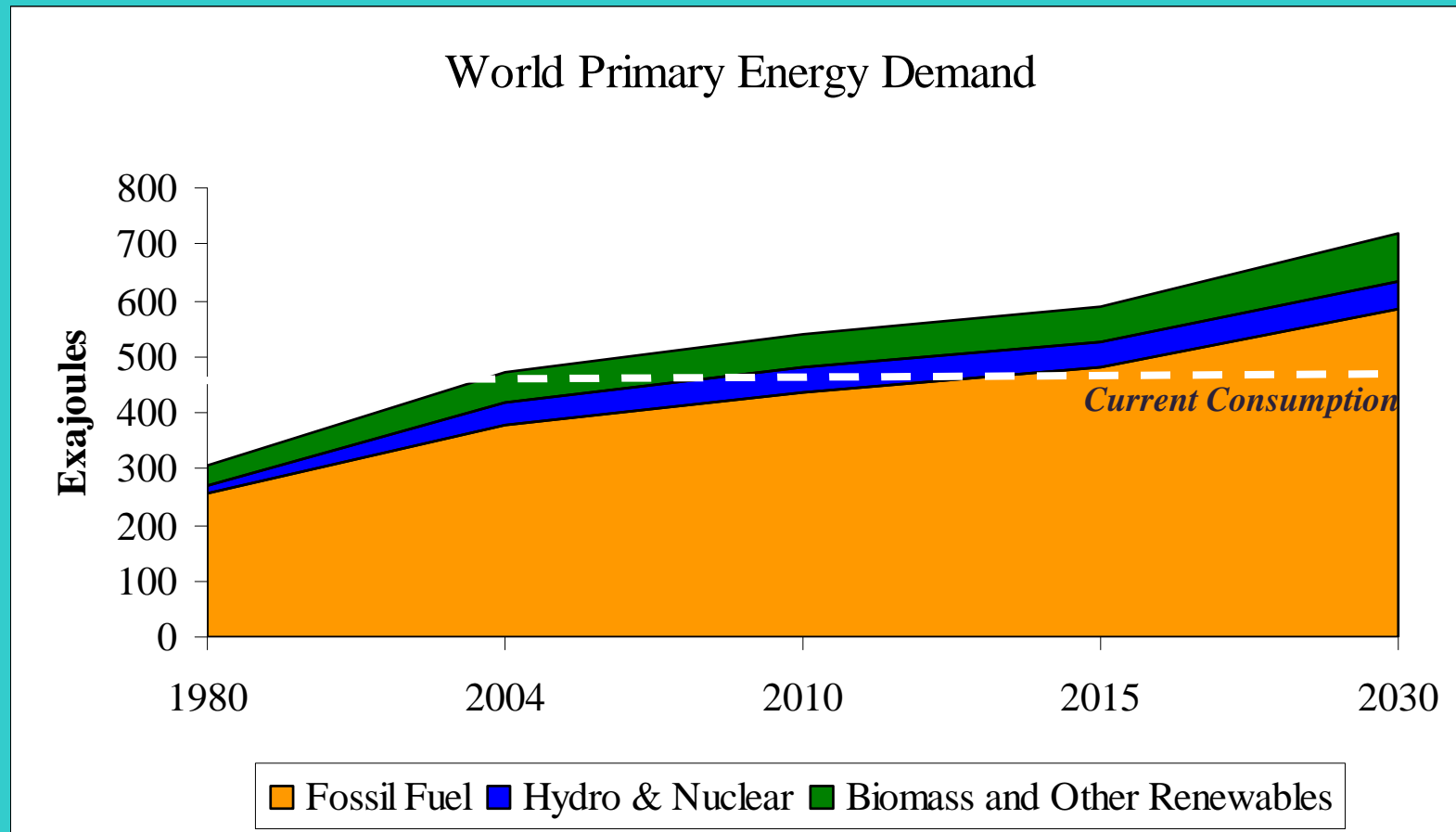
# The Big Picture

**Objective #1:** Provide the energy services for sustainable global development.

**Objective #2:** Avoid further interference with the climate system.

- Development requires building new energy supply or doing more with less. It will be a combination of both.
- Energy efficiency is cleaner, cheaper, and more readily available than any new supply options. The resource of first choice.
- Bringing energy efficiency to scale will bring significant economic and environmental benefits that will help us meet these twin objectives.

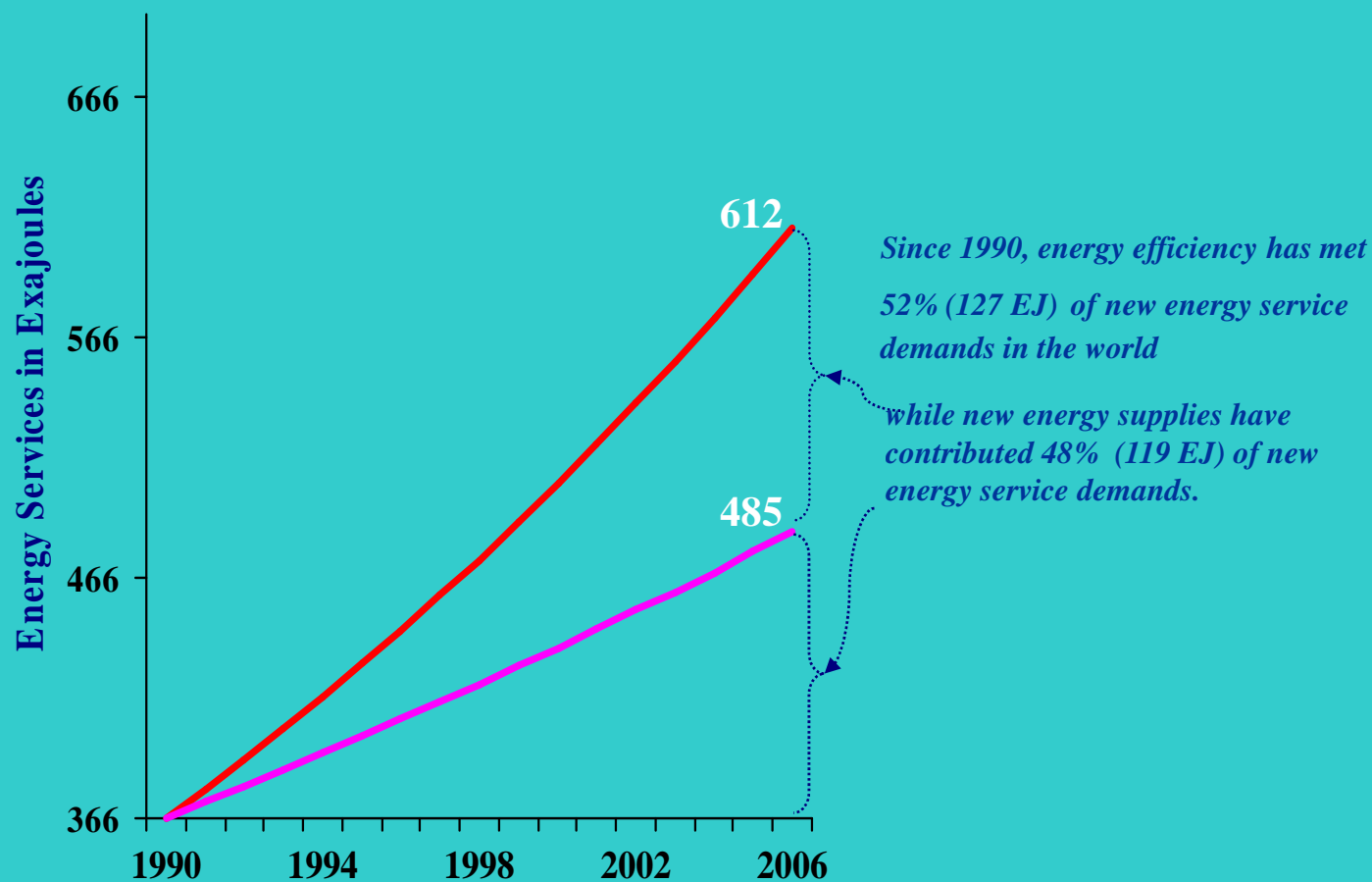
# Rising Energy Demand Will Further Increase Pressure on our Climate and Economies.



Source: IEA World Energy Outlook 2006

Demand for global energy services to support economic growth has grown by 50% since 1980 and is projected to grow another 50% by 2030, or nearly 250 EJ.

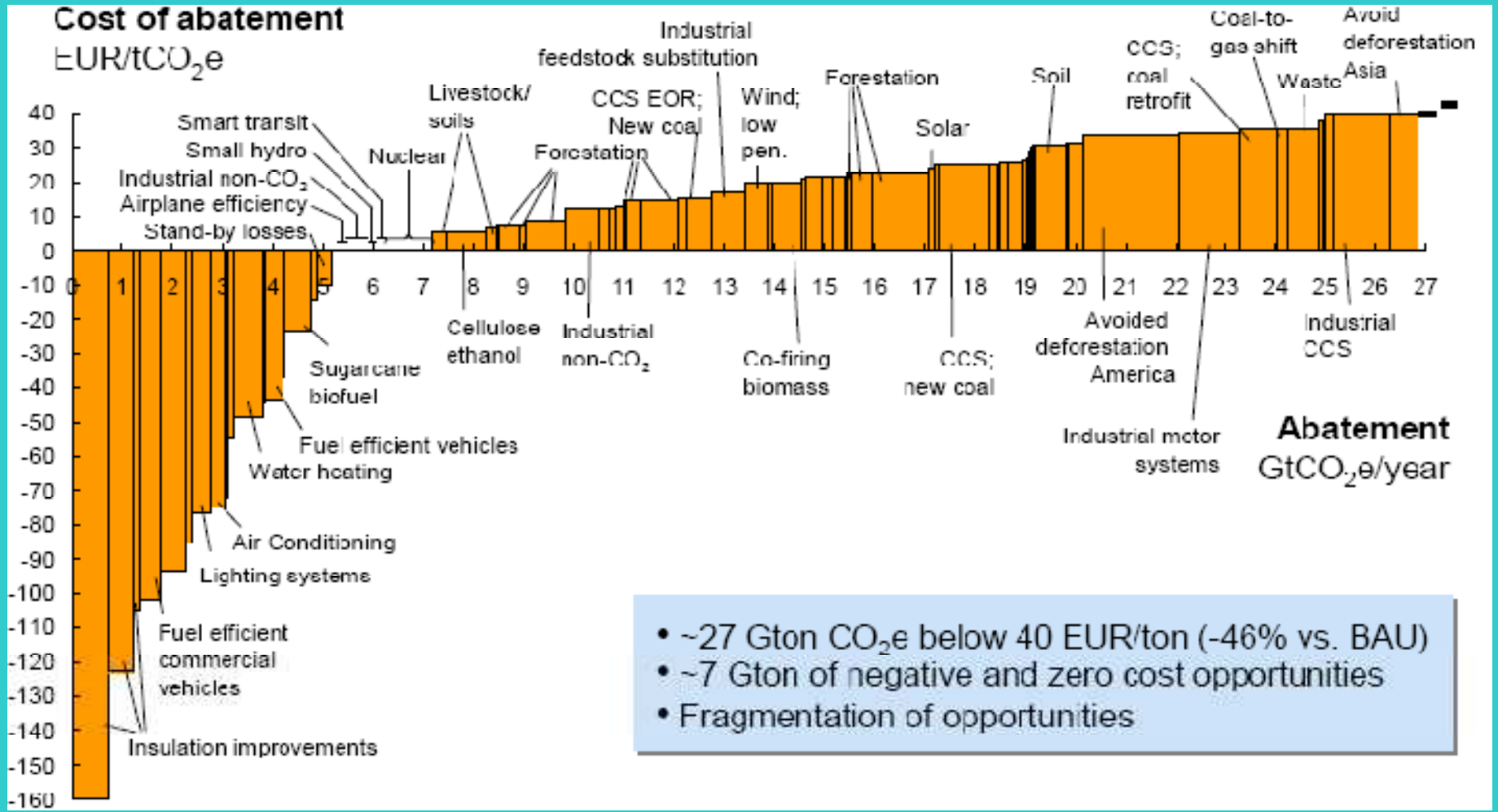
# Energy Efficiency Contributed Significantly to Meeting Past Demand for Energy



Source:

**We can do much more.**

# Efficiency Compared to New Supply



Analysis of CO2 mitigation options prepared by Vattenfall, 2007.

Investments to gain efficiency have shorter paybacks than investments in new supply.



# Realizing the Potential of Energy Efficiency



## Expert Group



**Zhou Dadi**, Energy Research Institute, China (Co-Chair)

**Eberhard Jochem**, Fraunhofer Institute Systems and Innovation Research, Germany, and CEPE/ETH Zurich (Co-Chair)

**Richard Moss**, UN Foundation (Project Director)

**William Chandler**, Transition Energy (Senior Advisor)

**Igor Bashmakov**, Center for Energy Efficiency, Russia

**Ugo Farinelli**, Italian Association of Energy Economics, Italy

**M K Halpeth**, The Energy & Resources Institute, India

**Nigel Jollands**, International Energy Agency

**Tony Kaiser**, ALSTOM, Switzerland

**John “Skip” Laitner**, American Council for an Energy-Efficient Economy, United States

**Mark Levine**, Lawrence Berkeley National Laboratory, United States

**François Moisan**, Agence de l’Environnement et de la Maitrise de l’Energie, France

**Hi-Chun Park**, Inha University, South Korea

**Alexandrina Platonova-Oquab**, World Bank

**Roberto Schaeffer**, University of Rio de Janeiro, Brazil

**Jayant Sathaye**, Lawrence Berkeley National Laboratory, United States

**Judy Siegel**, Energy and Security Group, United States

**Diana Urge-Vorsatz**, Central European University, Hungary

**Eric Usher**, UN Environment Programme, Energy Branch

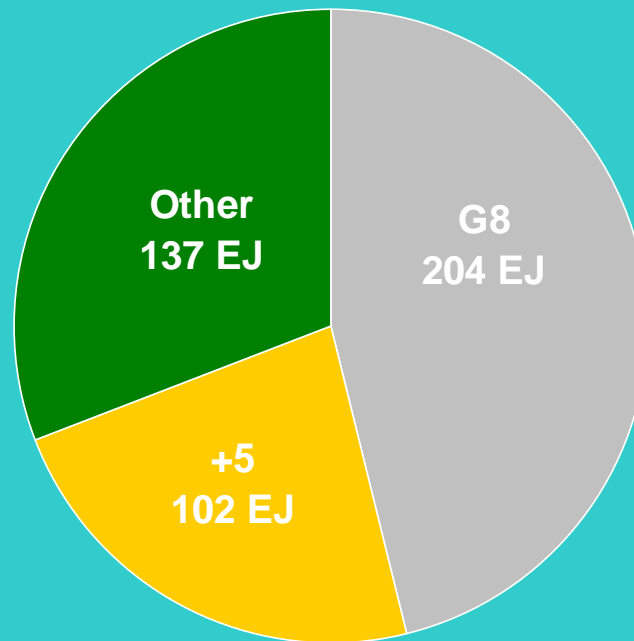
**Ernst Worrell**, Ecofys, the Netherlands

**Wang Yanjia**, Tsinghua University, China

## Why the G8?

- The G8 countries make up a huge portion of world energy consumption.

**2005 Energy Consumption:  
443 Exajoules (EJ)**



- Many G8 countries have taken positive steps to improve efficiency. This document calls for those governments to act to achieve more of the available improvements.

# Why the G8?

Policy	Canada	France	Germany	Italy	Japan	Russia	UK	US
Appliance Labels & Standards	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Building Standards	No	Yes	Yes	Modest	Yes	Yes	Yes	Modest <sup>3</sup>
Fiscal Incentives	Few	Some	Yes	Few	Yes	Few	Yes	Some
Voluntary Agreements	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Auto/Fuel Policies	No	Yes	Yes	Yes	Yes	No	Yes	No

Source: Ademe/WEC 2007

# Pledge, Act, and Review: How the G8 Nations Can Take the Lead



## Pledge

G8 nations should commit to doubling their collective annual energy efficiency improvement to an average of 2.5%.

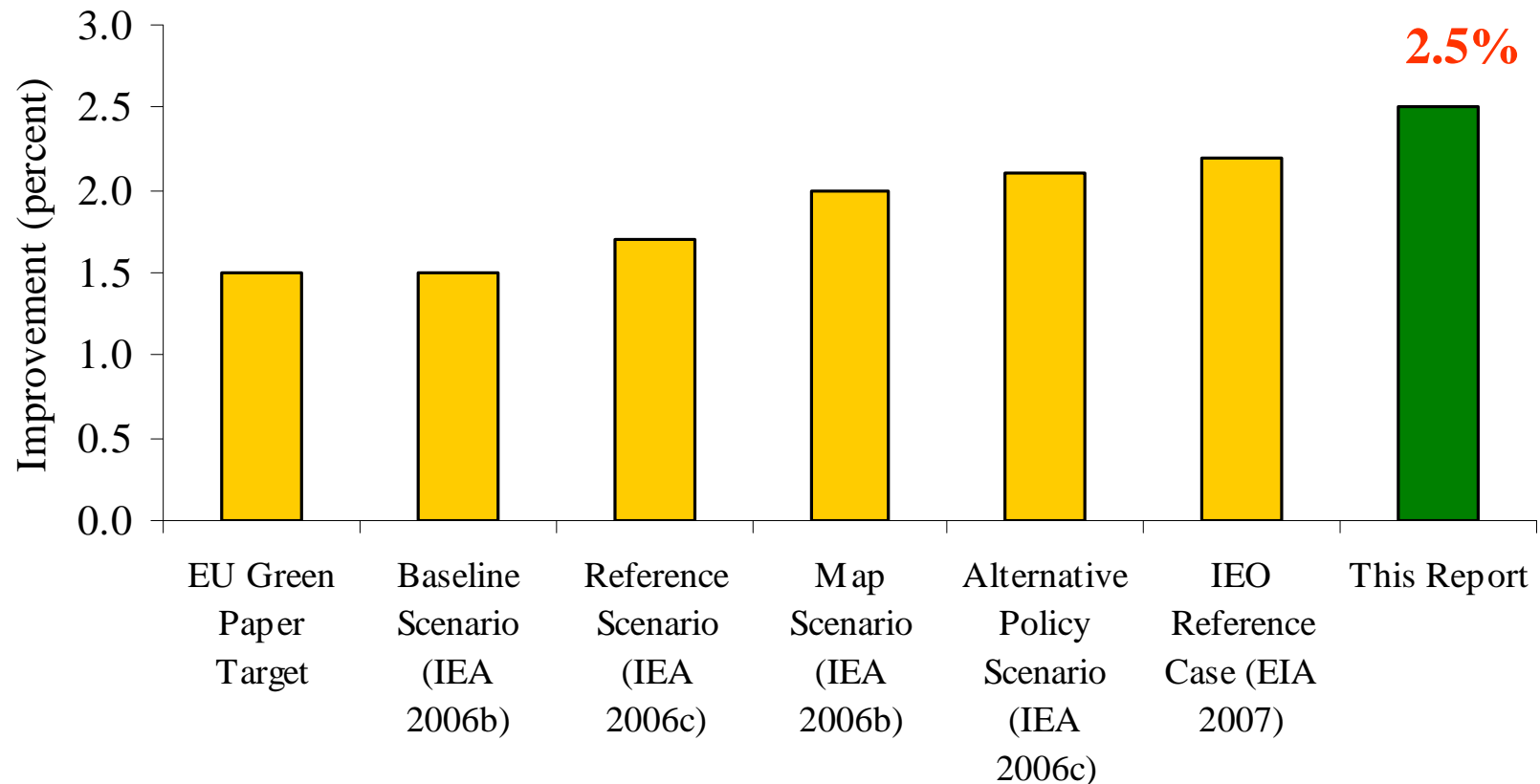
## Act

- Formulate individualized national strategies by participating countries.
  - Each nation will enact cost effective policies from a menu of proven options, recognizing that some countries have more opportunities than others.
- Convene an annual high-level “summit” consisting of the G8+5 countries to maintain momentum, with supporting work groups to facilitate technical cooperation.

## Review

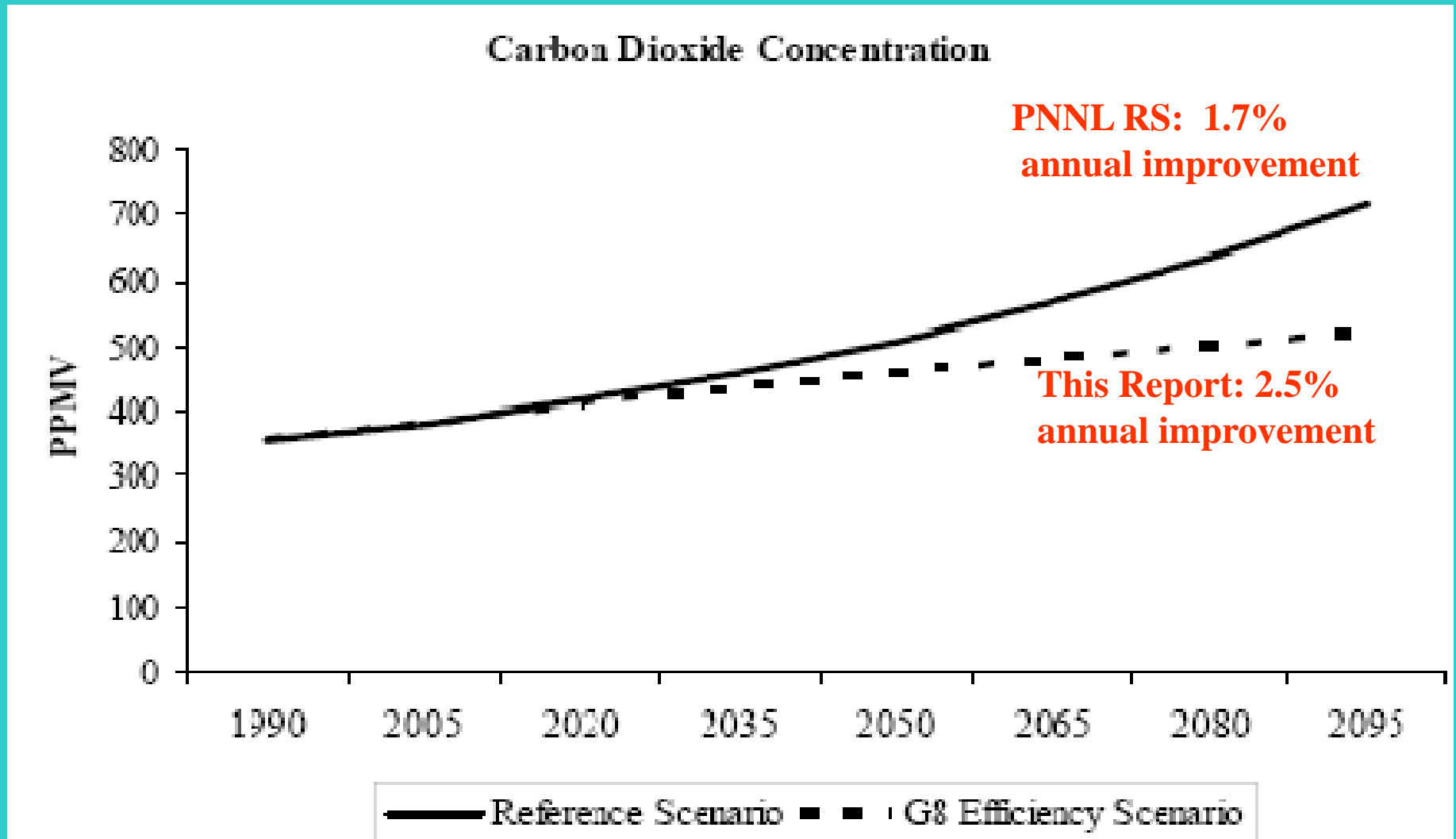
- Collect and analyze internationally comparable data by an international body (perhaps an agency of the United Nations) to gauge progress.

# These Targets are More Ambitious than Other Recent Goals or Assumptions

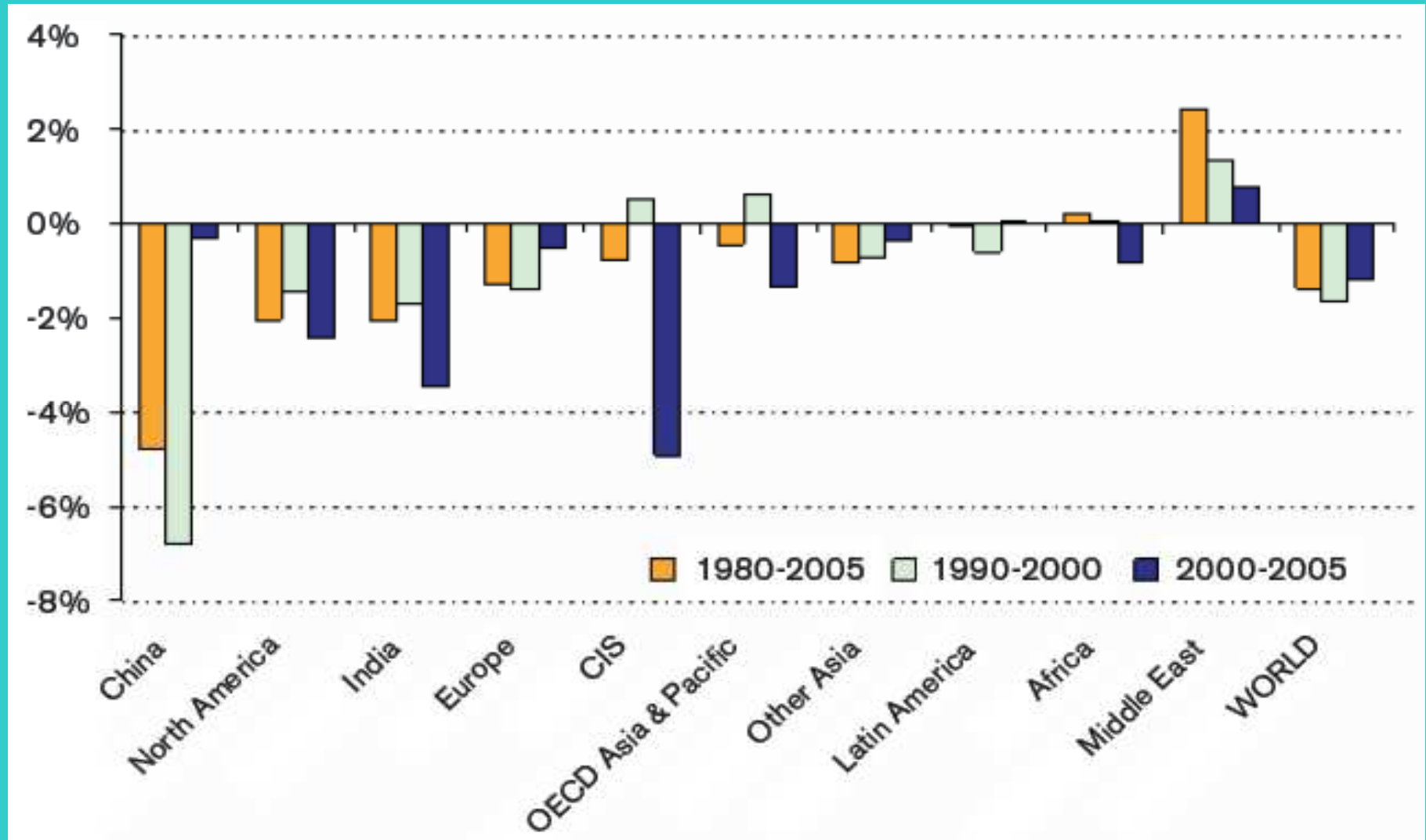


This report calls for slightly more ambitious annual improvements in efficiency than recent energy scenarios.

# Climate Implications of Doubling Efficiency



# Energy Intensity Trends by Region



- Measured in purchasing power parity (WEC-ADEME, 2007)



## Investment considerations

<b>Global Investment Assumption through 2030</b>	
	<b>(\$ billion)</b>
Baseline Investment (IEA WEO 2006)	\$20,192
New Investments in Efficiency	\$3,200
Avoided Investment in New Generation	<u>(\$3,000)</u>
Incremental Efficiency Investment	<u>\$200</u>
Net Total Investment	\$20,392

The analysis conservatively estimates that the investment will also generate \$500 billion in annual benefits resulting from consumer energy bill savings by 2030.

## Specific Recommendations: Options for Crosscutting Policies & Measures



- **Phase out subsidies for established energy sources** in G8 countries, and work with governments in +5 and other countries toward a similar change.
- **Levy an “efficiency penny” surcharge** on all energy end-users in G8 countries to support energy efficiency programs.
- **Accelerate capital deployment** for mitigating risks and costs unique to **improving demand-side energy efficiency**.
- **Commit to government procurement** of equipment, vehicles, and new facilities **with the highest standards of efficiency**.
- **Increase public awareness** through information and education campaigns.

## Specific Recommendations: Options for Buildings & Equipment



- **Realize energy savings of 25 to 30% in equipment and appliances by 2020** (compared to business-as-usual) by instituting **minimum energy performance standards and standardized product labeling**.
- **Reduce energy consumption of the buildings sector by 30% by 2030** relative to present consumption by instituting **minimum energy performance standards** for new construction and building capacity to refurbish existing buildings to a higher efficiency level.

## Specific Recommendations: Options for Industry



- Reduce industry sector energy consumption by 25% by 2020 and 40% by 2030.
- Develop an **energy management standard** for large industrial energy users and support the use of **energy management systems** by smaller users.
- **Set binding targets to reduce industrial energy consumption** over a 10 to 15 year period.
- **Adopt minimum energy efficiency standards for crosscutting technologies** such as motors, boilers, pumps, compressors, and other large energy-using systems.

## Specific Recommendations: Options for Transportation



- Establish a goal of a **35% increase in fuel economy by 2020** and a **60% increase by 2030** for new light-duty vehicles.
- Increase the effective energy efficiency of heavy-duty vehicles and rail, air, and marine travel by at least **20% by 2020**, and **35% by 2030**, through a combination of **technological improvements and actions to promote a changing pattern of freight and passenger movement.**
- **Reduce vehicle travel and freight movement by 10% by 2020 and 15% by 2030.**

## Specific Recommendations: Options for Energy Supply



- **Structure utility rates to provide higher rates of return on investments in end-use energy efficiency than on investments in energy supply, and ensure that at least 30% of demand for new capacity is met by demand-side management.**
- **Introduce tradable certificates to encourage the most cost-effective approaches to energy efficiency.**
- **Set an average efficiency standard for fossil-fueled electric power systems by 2030. Efficiency standards for new and recommissioned plants should be 50% for coal-fired and 60% for natural gas-fired by 2015.**
- **Produce 30 billion cubic meters (1.1 EJ) of marketable natural gas per year by eliminating losses from leaks and flaring.**

## **Specific Recommendations: Options for Developing/ Transition Economies**



- **Create multiple energy efficiency loan guarantee funds in developing countries to offer guarantees for efficiency investments.**
- **Invest in the people and institutions needed to capture the full benefits of energy efficiency in the buildings/appliances, transportation, industrial, and energy supply sectors.**
- **Foster export of energy efficient technologies and limit trading of used equipment.**

## Implementation Example

Recommendation	Suggested Implementation
Adopt minimum efficiency standards for crosscutting technologies	<ul style="list-style-type: none"><li>• <b>Create</b> “industrial standards frameworks” that include standards, policies, training, and tools that make system optimization for energy efficiency a routine aspect of typical industrial operating practices.</li><li>• <b>Monitor</b> market developments of new equipment and establish new standards as technology improves.</li><li>• <b>Promote</b> harmonized testing procedures and standards for comparing the performance of crosscutting technologies.</li><li>• <b>Introduce</b> internationally harmonized energy consumption labels for crosscutting technologies.</li></ul>



## Conclusion

- **G8 nations should take the lead in doubling historical rates of efficiency improvement**
- **By extending cooperation to “+5” and other major developing countries, it would be possible to get on a path to stabilize GHG concentrations**
- **If we fail to meet ambitious efficiency targets, it will not be possible to meet growing demand for energy services and avoid substantial risks to the climate system**
- **G8 leaders must build on their past declarations and commit to ACT to achieve the improvements that appear within reach**

**This report represents a major policy thrust, already underway, that must be sustained into the future.**

- **Developing** national assessments of current efficiency performance in the G8 and +5.
- **Tailoring** each nation's policy approach to closing its efficiency gap.
  - Public/private dialogues
- **Assessing** each nation's progress through an annual global summit meeting.

**Thank You!**

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