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

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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

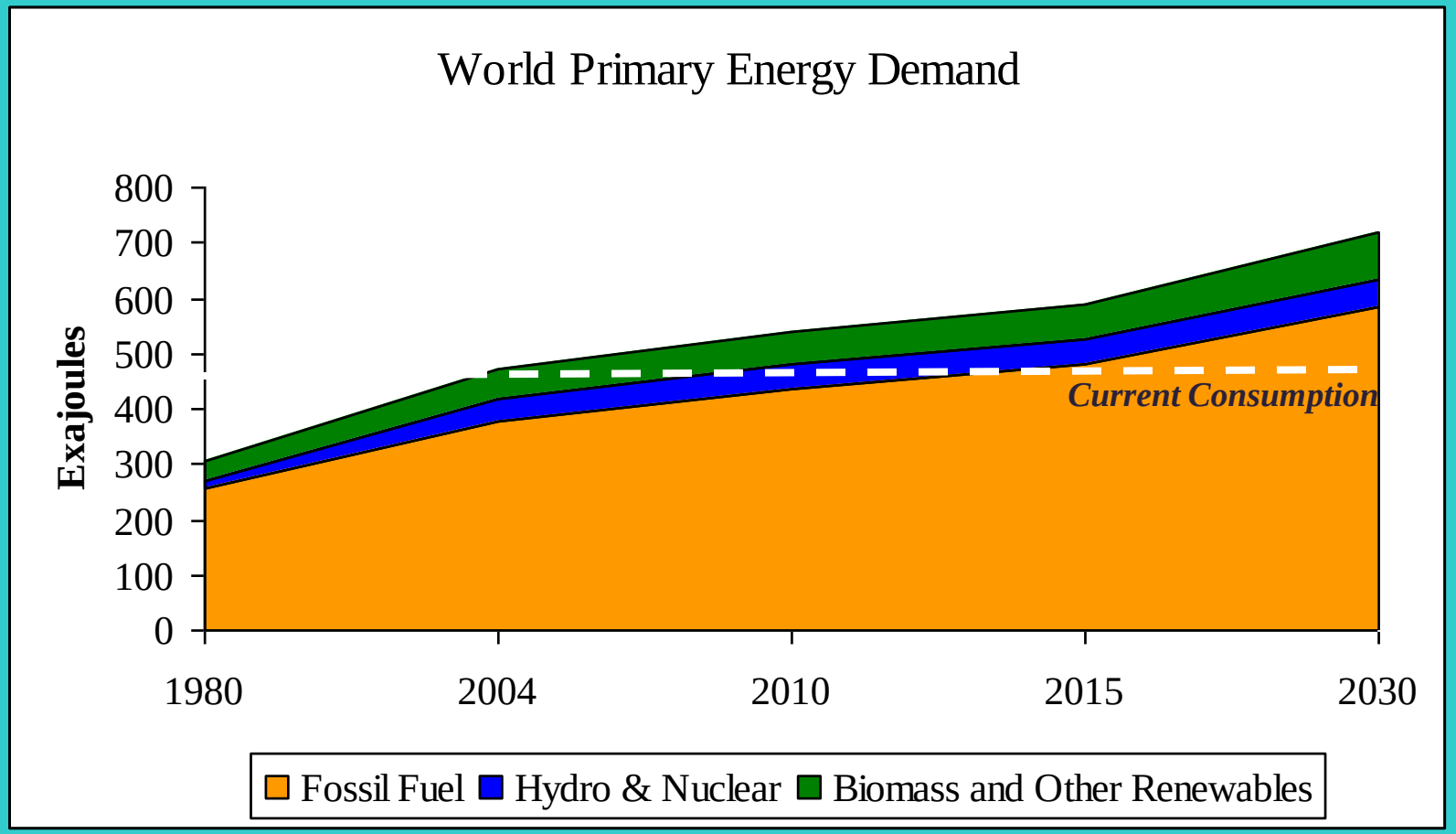
What makes this report different?	**The report makes policy recommendations, including** **–A target for annual efficiency improvements of 2.5%** **–A pledge and review process for ensuring sustained, high-level attention to achieve the target** **–Options of policies and measures for national implementation 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**

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.

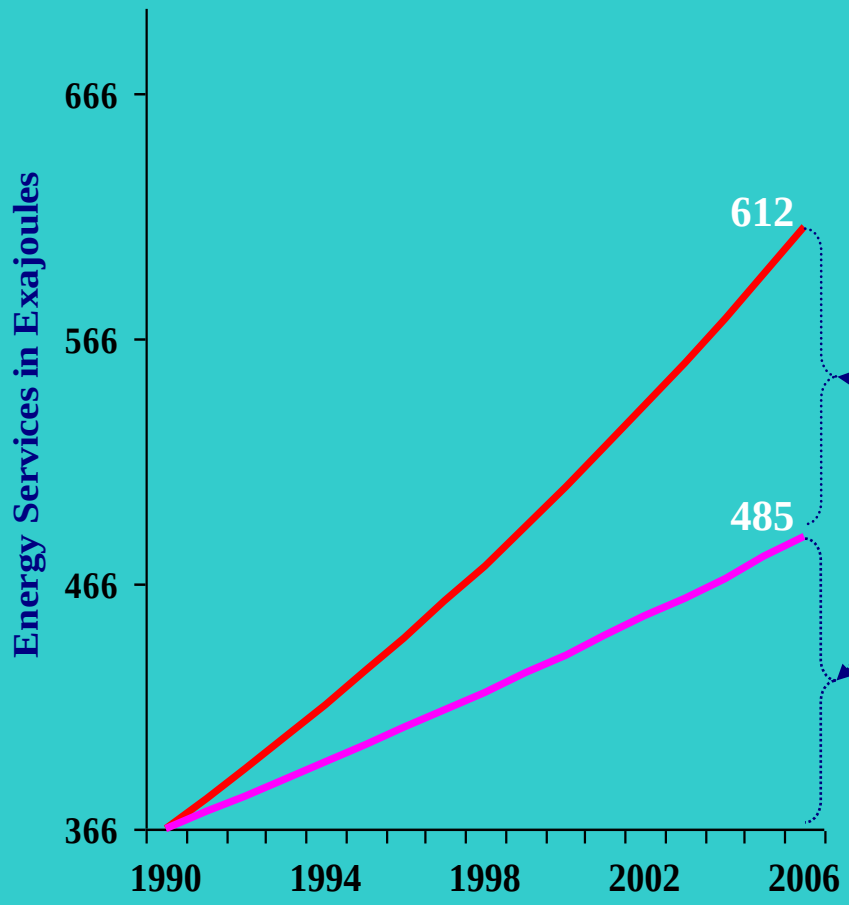
Rising Energy Demand Will Further Increase Pressure on our Climate and Economies.



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



Since 1990, energy efficiency has met 52% (127 EJ) of new energy service demands in the world

while new energy supplies have contributed 48% (119 EJ) of new energy service demands.

Source:

We can do much more.

Efficiency Compared to New Supply

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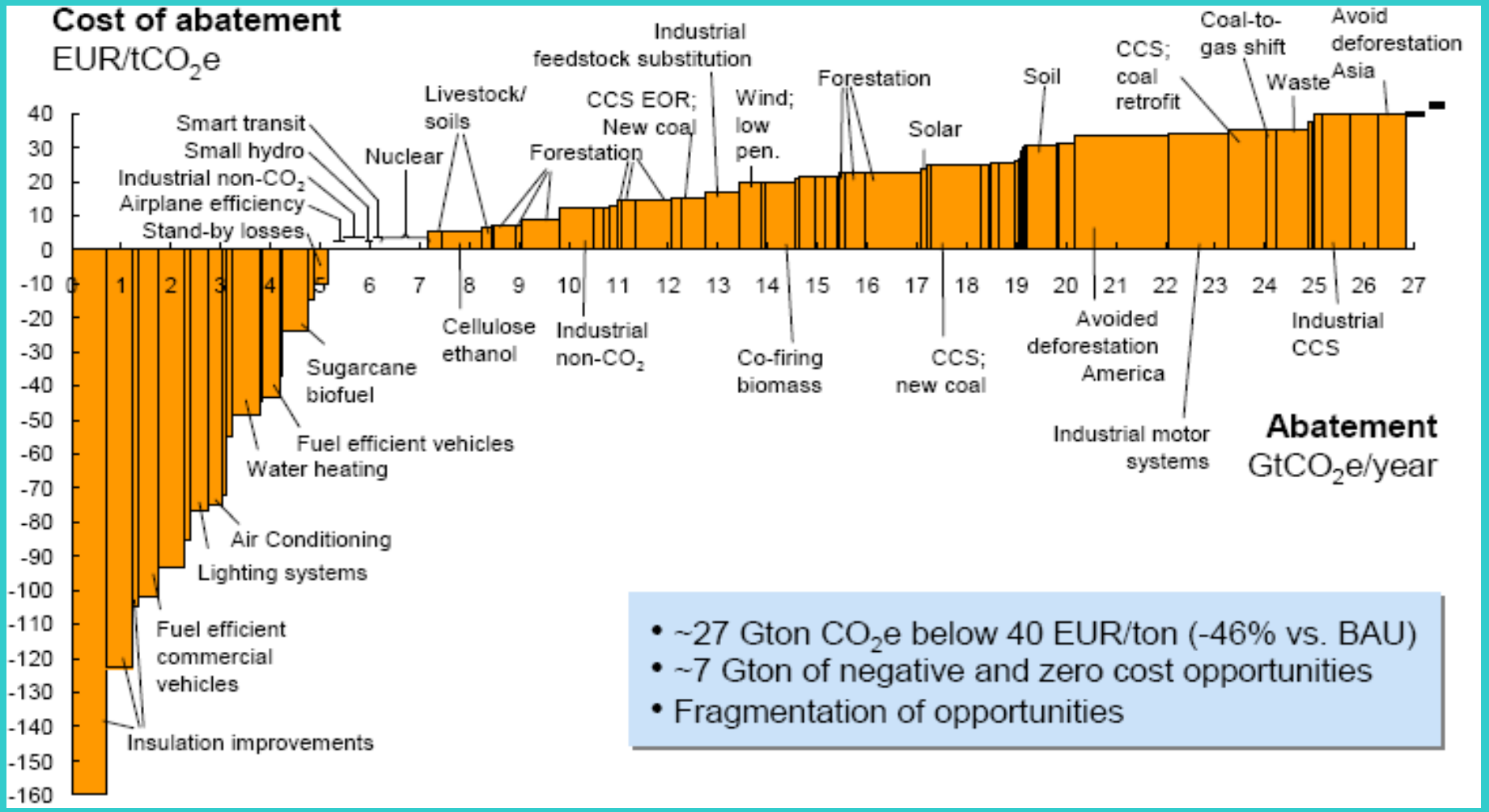

Analysis of CO2 mitigation options prepared by Vattenfall, 2007.

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
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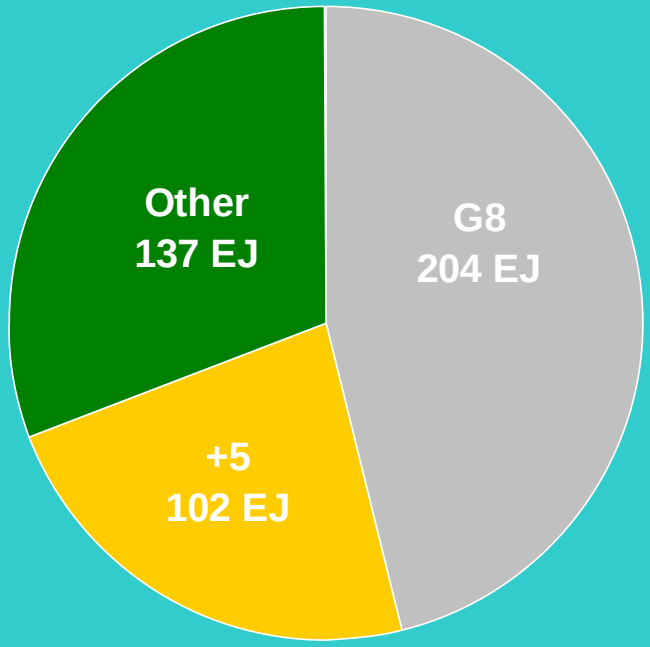
Eric Usher, UN Environment Programme, Energy Branch
Ernst Worrell, Ecofys, the Netherlands
Wang Yanjia, Tsinghua University, China

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	Mod-est[3]
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

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Pledge

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

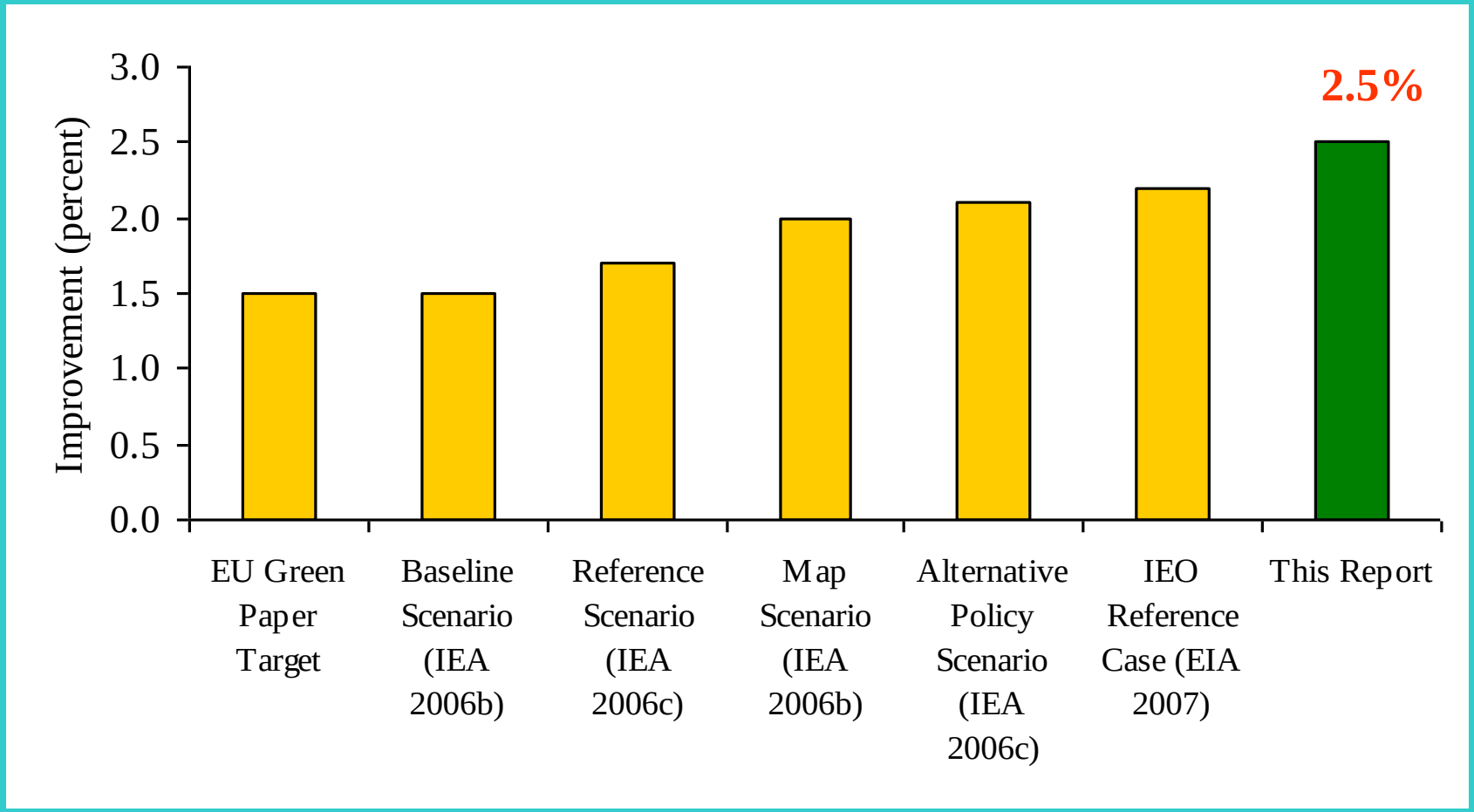
Act

- 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

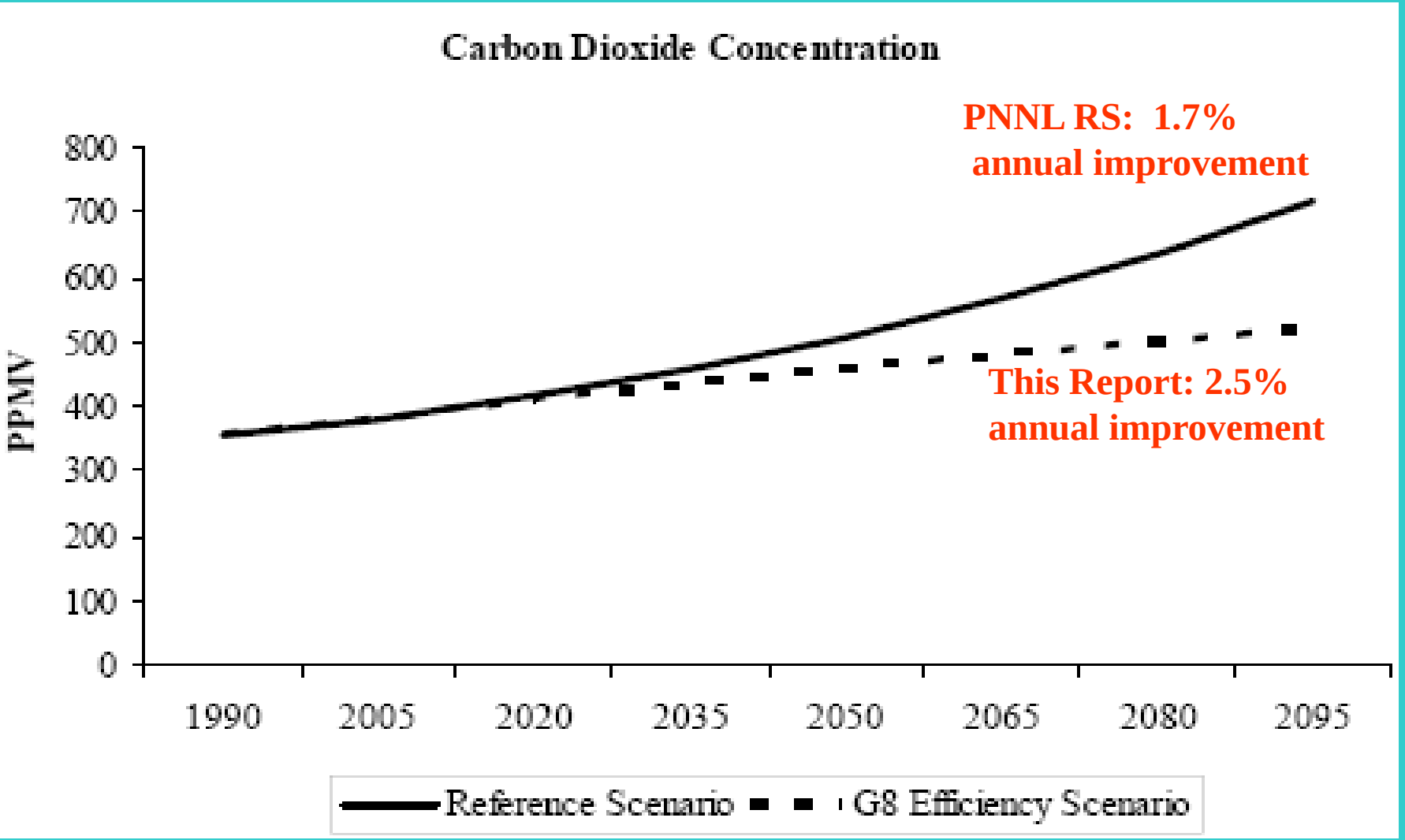
- Collect and analyze internationally comparable data by an international body (perhaps an agency of the United Nations) to gauge progress.

These Targets are More Ambitious than Other Recent Goals or Assumptions

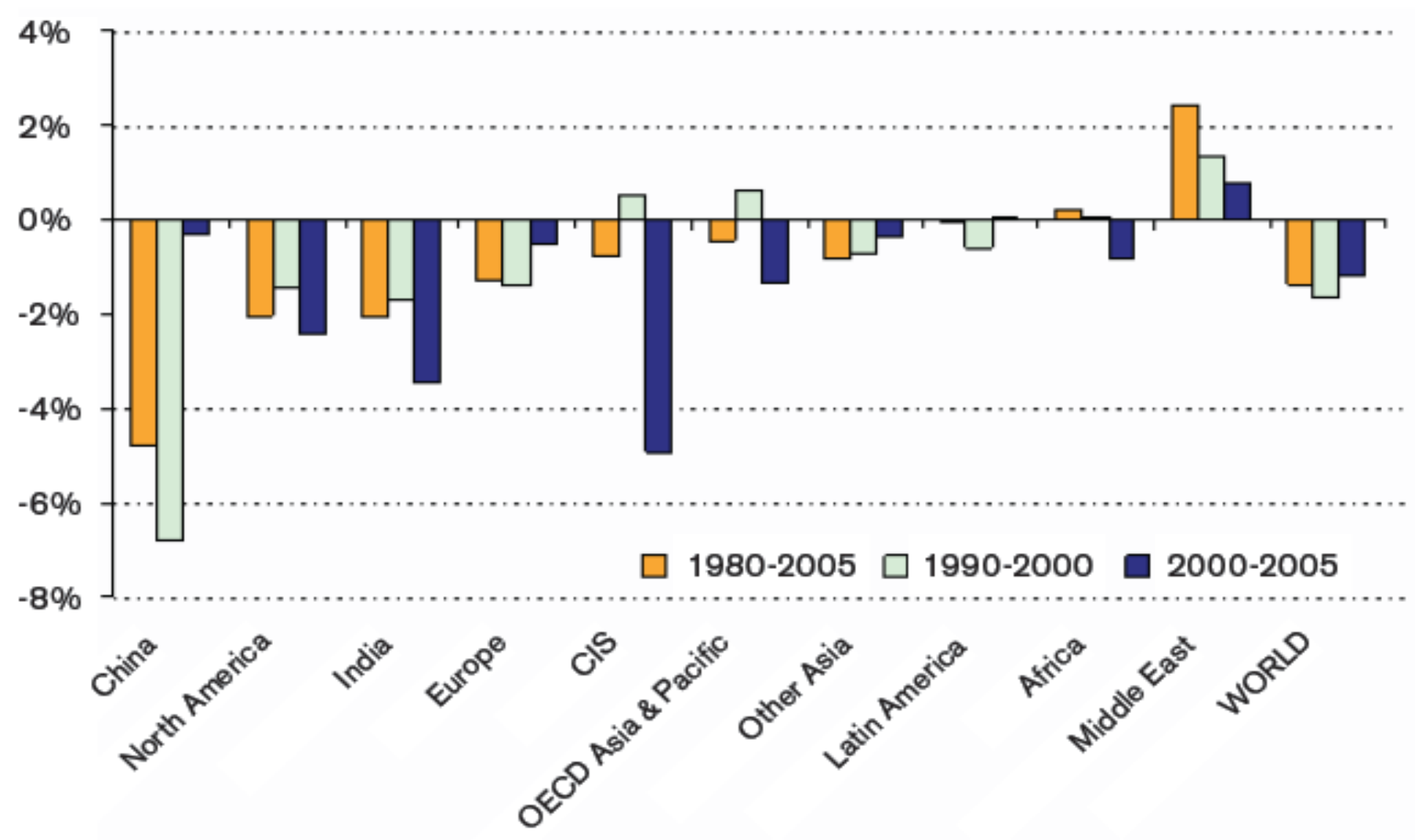


This report calls for slightly more ambitious annual improvements in efficiency than recent energy scenarios.

Climate Implications of Doubling Efficiency



Energy Intensity Trends by Region



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

Investment considerations

Global Investment Assumption through 2030	
	($ billion)
Baseline Investment (IEA WEO 2006)	$20,192
New Investments in Efficiency	$3,200
Avoided Investment in New Generation	($3,000)
Incremental Efficiency Investment	$200
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	• **Create** "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. • **Monitor** market developments of new equipment and establish new standards as technology improves. • **Promote** harmonized testing procedures and standards for comparing the performance of crosscutting technologies. • **Introduce** internationally harmonized energy consumption labels for crosscutting technologies.

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**

Next Steps

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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