



INTERNATIONAL ENERGY AGENCY

In support of the G8 Plan of Action

**TOWARD A
CLEAN, CLEVER & COMPETITIVE
ENERGY FUTURE**

2007



**REPORT TO THE G8 SUMMIT
IN HEILIGENDAMM, GERMANY**

**THE INTERNATIONAL
ENERGY AGENCY,
SUPPORTING
THE GLENEAGLES
PLAN OF ACTION**

At the Gleneagles Summit in July 2005, the G8 heads of state asked the International Energy Agency (IEA) to identify measures to map out the path to a “clean, clever and competitive energy future.” This request came in recognition of the Agency’s strengths and offered the opportunity to draw on its existing expertise and programmes. We responded with a broad array of initiatives to develop strategies to mitigate climate change, secure clean energy and achieve sustainable development. These efforts encompassed the following priority areas:

- ⊙ Alternative energy scenarios and strategies.
- ⊙ Increased energy efficiency, especially in buildings, appliances, transport and industry.
- ⊙ Cleaner use of fossil fuels.
- ⊙ Carbon capture and storage.
- ⊙ Renewable energy.
- ⊙ Enhanced international co-operation.

A number of projects require close co-operation with Russia, Brazil, China, India, Mexico and South Africa; with industry; with the World Bank and other international financial institutions; with UN agencies; and with the IEA technology network. All IEA member countries are actively engaged. Some early results are reported below. As a result of this work, the IEA presented four energy efficiency policies for implementation to G8 leaders at their Summit in St. Petersburg, Russia in July 2006. These recommendations covered electronic equipment, transport and lighting. These four policies were selected because they deliver significant cost-effective savings.

Building on these proposals, the IEA continues this important work for the G8. The IEA will present more comprehensive results and further recommendations to the German G8 Summit in Heiligendamm in June 2007 and ultimately, to the G8 Summit in Japan in 2008. We will emphasise and demonstrate the huge potential of energy efficiency to bring cost-effective savings in a relatively short timeframe. Developing and implementing energy efficiency policies now is critical, not only in G8 member countries but around the world. Energy savings must be global to make a meaningful difference. To support governments in adopting these measures, the IEA is prepared to take on new responsibilities including monitoring and measuring progress. But energy efficiency alone is not the answer.

New technologies that enable cleaner use of fossil fuels and the development of alternatives will be essential. IEA analysis has demonstrated the potential of technology to transform the global energy economy at costs that are within reach. Work now in progress will spell out global technology roadmaps as to how this can be achieved. Vigorous policies for research, development, demonstration and deployment will be essential.

Close international technology co-operation, especially with major developing countries, must receive full support. The IEA and its technology network have launched a major initiative to engage these countries more fully.

For more information on the IEA or any of the work and activities mentioned in this document, please see www.iea.org/G8. Questions may be addressed to G8Programme@iea.org.



INITIATIVES

SCENARIOS

Energy Technology Perspectives, published in June 2006, contains a comprehensive economic analysis of the potential of energy technologies already available or under development to make a difference to the global energy economy. It includes scenarios showing how we can bring CO₂ emissions back to current levels by 2050, and halve the growth of oil demand, at costs that are within reach. Energy efficiency, carbon capture and storage, renewables, and CHP all have important parts to play as well as nuclear power, where it is chosen. And we need to put more effort into developing the technologies of the future such as advanced renewables and bio-fuels, photovoltaics, hydrogen, and fuel cells. Vigorous action is needed through R&D, demonstration and deployment programmes, and to provide predictable low carbon incentives. A further edition of the book is planned for early 2008. This will include technology analysis of key regions such as India and China as well as global road maps for individual technologies.

Key Message: *Governments need to act now to bring forward the low carbon technologies that can transform the global energy economy of the future.*

The *World Energy Outlook 2006* explores two visions of the energy future: under-invested, vulnerable and dirty – or clean, clever and competitive. It responds to the remit of the G8 world leaders by mapping a new energy future. Strong policy action is needed to move the world onto a more sustainable energy path. An Alternative Policy Scenario demonstrates that the energy future can be substantially improved if governments around the world implement the policies and measures they are currently considering. Improved efficiency of energy use contributes most to the energy savings. Increased use of nuclear power and renewables also help reduce fossil-fuel demand and emissions. Just a dozen specific policies in key countries account for 40% of the reduction in global CO₂ emissions. The shifts in energy trends described in this scenario would serve all three of the principal goals of energy policy: greater security, more environmental protection and improved economic efficiency.

Key Message: *Getting to the Alternative Policy Scenario and beyond is possible but will require rapid implementation of strong government policies.*

APPLIANCES

Improving the uptake of policies which address Standby Power and the growing energy use of “set-top” boxes and related devices in home networks are a priority. The IEA plays a strong leadership role in these fields. The development of a new IEA Implementing Agreement for efficient electrical end-use equipment will provide valuable support for government initiatives and promote the harmonisation of policy approaches for internationally traded goods.

Key Message: *Governments should implement:*

- *the horizontal 1 Watt standard for standby-power use in electric appliances;*
- *efficiency standards for television “set-top” boxes and digital television adaptors.*

Lighting

The IEA 2006 publication *Light’s Labour’s Lost: Policies for Energy-Efficient Lighting* identified that at least 38% of global lighting electricity consumption can be saved cost effectively by using lighting equipment that minimizes the life-cycle cost of the lighting service through higher energy efficiency. The IEA has convened a number of policy dialogues on this topic and as of April 2007 significant new policies to promote energy efficiency in lighting had been implemented or were under development in most of the G8, IEA and +5 countries.

Key Message: *Countries should adopt best practice policy measures to improve the energy efficiency of lighting.*

BUILDINGS

The IEA is conducting a comprehensive review of building codes and policies for energy efficiency in new buildings in IEA and developing countries. Based on this analysis best policy practices for energy efficiency in buildings are being developed.

Key Message: *The potential energy savings from improved energy efficiency in new and existing buildings is enormous.*

INDUSTRY

Tracking Industrial Energy Efficiency and CO₂ Emissions to be published in June 2007, contains an initial overview of how emerging and existing technologies can enhance energy efficiency and reduce CO₂ emissions in the industrial sector in both OECD and non-OECD countries. The book identifies a theoretical potential for saving up to 1 billion tonnes of oil or 3.2 billion tonnes of CO₂ emissions p.a. The book shows that energy intensive industry has made major gains in energy efficiency in recent decades. It underlines the potential for better heat management and use. A further publication on strategies and prospects in key sectors will be published later in the year.

Key Message: *Industry has made big strides in improving its energy performance but there is still significant cost-effective potential with proven technologies like co-generation.*





TRANSPORT

The IEA is undertaking wide-ranging analyses of the potential for energy-efficiency improvements in surface transport. Based on these analyses, the IEA identifies energy efficiency potential and is providing guidance on best-practice policy development in the IEA, the G8 and other countries including Brazil, China, India, Mexico and South Africa.

Key Message: *There is significant un-tapped savings potential in the transport sector based on existing technology.*

CARBON CAPTURE AND STORAGE (CCS)

CCS can make a huge contribution to CO₂ savings and enable coal to continue its key contribution economic and secure energy supply. A series of conferences is being held, jointly with the US, Norway, and Canada, on near term CCS opportunities. A book will be published on CCS as a key CO₂ abatement option, as well as reports on legal and regulatory frameworks, and on the capture-ready plant concept.

Key Message: *At least 10 full-scale integrated coal plants with CCS are needed by 2015 to demonstrate the technologies. The need for action is urgent; governments should focus on developing regulations and incentives to speed these demonstrations.*

CLEAN COAL

Coal power stations around the world vary in efficiency from 20-42%. China and India have many of the least efficient stations, but also some of the newest and most efficient. OECD countries also have many stations, usually older or smaller, that are well short of the best. The IEA is assessing the global potential to improve generation efficiency in coal plants. This includes the extension of a global data base, case studies on recently constructed plants, reports on best operating practice, and recommendations on upgrades, replacement, and future developments..

Key Message: *There is huge global potential for economic and environmental benefits from raising the performance of coal power stations.*



RENEWABLE ENERGY

Accelerated deployment of renewables can significantly reduce CO₂ emissions, enhance energy security and further reduce technology costs. The IEA is preparing recommendations for the 2008 G8 summit in Japan on best practice for the effective network and integration of electricity from renewables. The IEA is also preparing a detailed analysis of the effectiveness of renewable energy policies and measures to date and their impacts on deployment.

Key Message: *Greater R&D and market development, through innovative policy making, has the potential to bring down technology costs to make renewables increasingly competitive with existing energy alternatives.*

INDICATORS

Good quality consistent measures of energy performance, especially in energy efficiency, across the world will be essential as a basis for national and international policies for climate change, energy security and economic growth. *Energy Use in the New Millennium: Trends in IEA Countries*, to be published in July 2007, analyses in depth the energy efficiency trends in 20 IEA countries from 1990 to 2004. The overall improvement in energy efficiency has been less than 1% p.a, only about half the rate of improvement in previous decades and not nearly enough to stem the growth of CO₂ emissions. The IEA is now working with the World Bank and others towards the production of energy indicators with a global reach, including India and China. A first publication is planned for early 2008.

Key Message: *Governments should support urgent work to fill the gaps in available statistical data.*

NEET

(NETWORKS OF EXPERTISE IN ENERGY TECHNOLOGIES)

This initiative aims to strengthen the participation by major developing countries in the IEA international technology network as well as other international energy technology collaborations. A major event has been held in South Africa and similar events are planned for Mexico, Brazil, China, and India.

Key Message: *Enhanced international collaboration on energy technology is a top priority and the IEA technology network is playing an increasing role.*

IEA OPEN ENERGY TECHNOLOGY BULLETIN

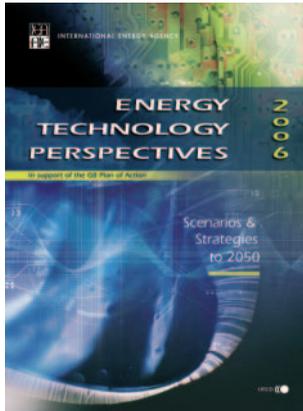
A newsletter that provides timely reports and updates on energy technology collaboration and developments across the IEA global network: <http://www.iea.org/impagr/cip/index.htm>.

The fundamental IEA role of producing global energy data and statistics provides an engine for all Agency analysis.

IEA WORK IN SUPPORT OF THE G8



PUBLICATIONS

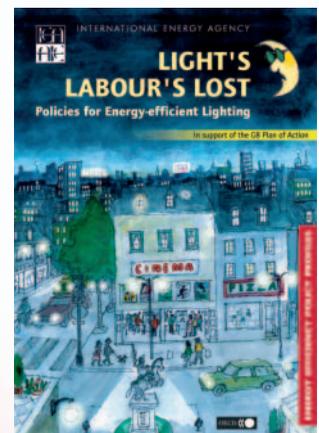


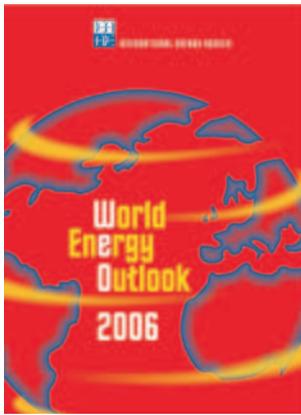
ENERGY TECHNOLOGY PERSPECTIVES: SCENARIOS & STRATEGIES TO 2050 (JUNE 2006)

The major IEA technology publication, *Energy Technology Perspectives*, is a groundbreaking study that demonstrates how energy technologies can make a difference in a series of global scenarios to 2050. Energy Technology Perspectives provides detailed technology and policy insights to help governments craft sustainable solutions.

LIGHT'S LABOUR'S LOST: POLICIES FOR ENERGY-EFFICIENT LIGHTING (JUNE 2006)

Energy efficiency can play a key role in meeting energy security and environmental goals, especially since technologies exist to reduce energy consumption at acceptable cost. This comprehensive study documents the broad range of existing energy-efficient lighting and assesses policy measures required to transform current practice.



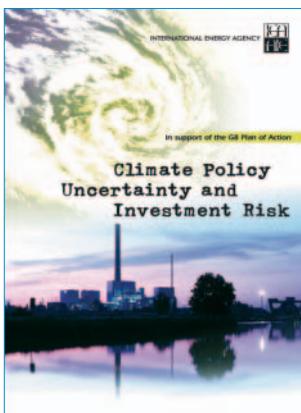
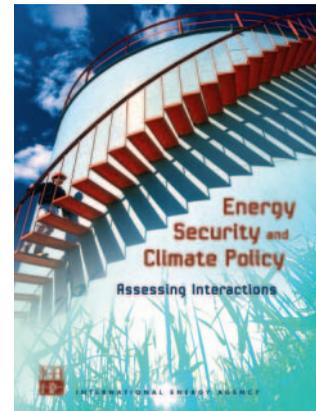


WORLD ENERGY OUTLOOK 2006 (NOVEMBER 2006)

Going beyond previous *WEO* scenarios, the annual IEA flagship publication projects the impact that targeted policies and more robust deployment of energy technologies could have on sustainability to 2030. It also provides in-depth analysis of economics of biofuels, Brazil's impact on global energy markets, cleaner fuels for cooking and heating for developing countries, nuclear energy, and technology prospects beyond 2030.

ENERGY SECURITY AND CLIMATE POLICY (MARCH 2007)

This new study underlines the close link between efforts to ensure energy security and those to mitigate climate change. Decisions on one side affect the other. To optimise the efficiency of their energy policy, OECD countries must consider energy security and climate change mitigation priorities jointly. The book presents a framework to assess interactions between energy security and climate change policies, combining qualitative and quantitative analyses. The quantitative analysis is based on the development of energy security indicators, tracking the evolution of policy concerns linked to energy resource concentration. The “indicators” are applied to a reference scenario and CO₂ policy cases for five case-study countries: Czech Republic, France, Italy, Netherlands, and United Kingdom.



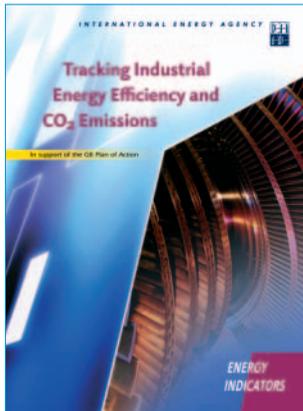
CLIMATE POLICY UNCERTAINTY AND INVESTMENT RISK (APRIL 2007)

This book identifies how climate change policy uncertainty may affect investment behaviour in the power sector. For power companies, where capital stock is intensive and long-lived, those risks rank among the biggest and can create an incentive to delay investment. Our analysis results show that the risk premiums of climate change uncertainty can add 40% of construction costs of the plant for power investors, and 10% of price surcharges for the electricity end-users. *Climate Policy Uncertainty and Investment Risk* tells what can be done in policy design to reduce these costs.

IEA WORK IN SUPPORT OF THE G8



PUBLICATIONS (CONTINUED)

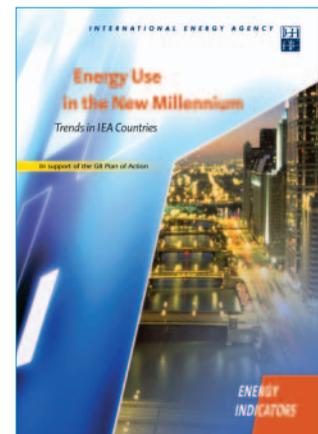


TRACKING INDUSTRIAL ENERGY EFFICIENCY AND CO₂ EMISSIONS (JUNE 2007)

Tracking Industrial Energy Efficiency and CO₂ Emissions contains an initial overview of how existing technologies can enhance energy efficiency and reduce CO₂ emissions in the industrial sector in both OECD and non-OECD countries. The book identifies a theoretical potential for saving up to 1 billion tonnes of oil equivalents or 3.3 billion tonnes of CO₂ emissions p.a. The book shows that energy intensive industry has made major gains in energy efficiency in recent decades. It underlines the potential for better heat management and use. A further publication on strategies and prospects in key sectors will be published later in the year.

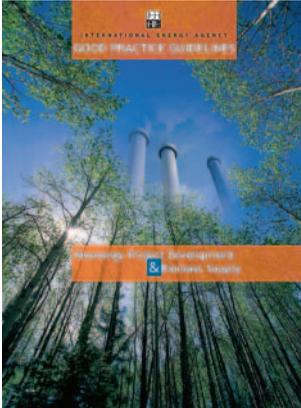
ENERGY USE IN THE NEW MILLENNIUM: TRENDS IN IEA COUNTRIES (SEPTEMBRE 2007)

Improved energy efficiency has a key role to play in moving towards a more sustainable energy future. By means of in-depth energy indicators, *Energy Use in the New Millennium: Trends in IEA Countries* examines how changes in energy efficiency, as well as other factors such as economic structure, income, prices and fuel mix have affected recent trends in energy use and CO₂ emissions in IEA countries. There are some disturbing signs. While there is a range between individual countries, the overall rate of improvement of energy efficiency has been less than 1% p.a. – only about half the rate of improvement in previous decades and not nearly enough to stem the growth of CO₂ emissions.



LEGAL ASPECTS OF CO₂ STORAGE: UPDATE AND RECOMMENDATIONS (JULY 2007)

CO₂ emissions from energy production and consumption are a major contributor to climate change. CCS represents one of the most promising potential solutions to contain emissions resulting from continued use of coal and other fossil fuels. However, challenges such as a lack of legal and regulatory frameworks must be addressed to facilitate the expanded use of CCS. This publication provides policymakers with a detailed summary of the main legal issues surrounding the CCS debate, including strategies that can be used to enable further development, deployment and demonstration of CCS technology.

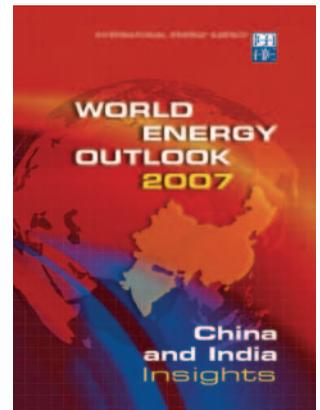


GOOD PRACTICE GUIDELINES : BIOENERGY PROJECT DEVELOPMENT AND BIOMASS SUPPLY (SUMMER 2007)

Developing a bioenergy project, negotiating contracts and seeking planning approval are often complicated. Furthermore, sustainably produced biomass feedstock will have to be secured over the long term. Due to these challenges that a project developer must overcome, biomass has not yet reached its projected potential in many countries. This new publication aims to assist project developers, policy makers and local authorities to complete biomass projects with fewer difficulties by learning from the experiences of others.

WORLD ENERGY OUTLOOK 2007: CHINA AND INDIA INSIGHTS (NOVEMBER 2007)

The next edition of the *World Energy Outlook* will focus on the outlook for energy markets in China and India and on the resulting implications for global markets. It will analyse the impact of rising energy needs in these countries on international energy prices, on investment needs and financing arrangements, and on energy-related greenhouse gas and other emissions. *WEO 2007* will also highlight the impact of coal use in China and India for global climate security, as well as explore the ability of potential energy-security and climate-change policies to rein in energy demand.



Outreach and consensus building: in addition to the publications, the IEA also engages in an extensive outreach programme that involves workshops, conferences and discussions with individual governments.





The International Energy Agency (IEA) is an autonomous body which was established in November 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD) to implement an international energy programme. It carries out a comprehensive programme of energy co-operation among twenty-six of the OECD's thirty member countries. The basic aims of the IEA are:

- To maintain and improve systems for coping with oil supply disruptions.
- To promote rational energy policies in a global context through co-operative relations with non-member countries, industry and international organisations.
- To operate a permanent information system on the international oil market.
- To improve the world's energy supply and demand structure by developing alternative energy sources and increasing the efficiency of energy use.
- To promote international collaboration on energy technology
- To assist in the integration of environmental and energy policies.

The IEA member countries are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States. The Slovak Republic and Poland are likely to become member countries in 2007/2008. The European Commission also participates in the work of the IEA.

WWW.IEA.ORG