



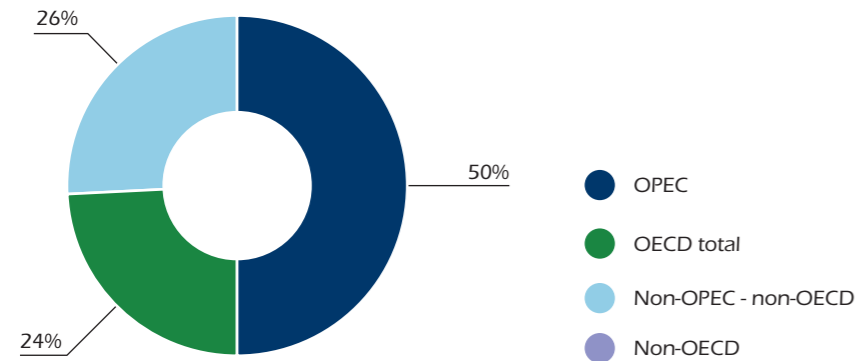
Worldwide engagement for sustainable energy strategies

- Ensuring global energy supplies and economic growth
 - Building a cleaner, more efficient energy future globally
 - Promoting energy technologies to bridge the future
 - Tackling energy challenges together... without borders

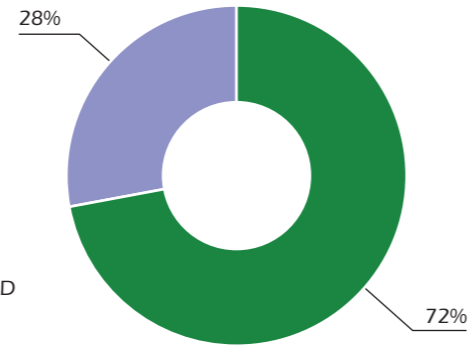
2014

In the **BEGINNING**, energy **SECURITY FOCUSED** on **OIL**

World oil production, 1974



World oil demand, 1974



In 1974, non-OECD countries accounted for 76% of world oil production but only 28% of world oil demand

● *The IEA yesterday: prioritising reliable oil supplies*

In the early 1970s, oil powered the global economy. The 24 industrialised member countries in the Organisation for Economic Co-operation and Development (OECD) accounted for 72% of world oil demand. The relatively new producer group, Organisation of Petroleum Exporting Countries (OPEC), produced 50% of the world's oil. In 1974, when OPEC (Organisation of Arab Petroleum Exporting Countries) implemented an embargo cutting oil supplies to major consumer countries, the International Energy Agency (IEA) was born.

The 16 founding members of the IEA had two primary objectives:

- to secure access to reliable and ample supplies of oil;
- to establish and maintain effective emergency response capabilities.

The founders set up a system that still works today. Under their 1974 accord, IEA member countries agreed to hold oil stocks equivalent to at least 90 days of each prior year's net oil imports and – in the event of a major supply disruption – to release stocks, restrain demand and/or increase supply

to restore oil market stability. Collective action is taken only when physical oil supplies are affected, not in response to rising prices.

Until now, the IEA emergency response system has been activated three times – in the run-up to the Gulf War in 1991; after Hurricanes Katrina and Rita destroyed oil infrastructure in the Gulf of Mexico in 2005; and as global demand picked up after civil war stopped Libyan production in 2011. In all cases, the rapid IEA response offset concerns about supply shortfalls and stabilised global markets. In other situations – such as the large oil disruption in the Gulf of Mexico after Hurricane Ike in 2008 – the IEA stood ready to act, but Agency analysis showed adequate excess capacity in global oil markets to ensure supplies and offset the loss. A market solution was found and no intervention required. In numerous other occasions, individual IEA member countries have used oil stocks to compensate for local supply disruptions.

Governments rely on the IEA to offer sound advice and recommend appropriate action, both day-to-day and in times of crisis.

IEA: 39 years of co-ordinated response to world events

1960

- OPEC founded

1973

- Arab-Israeli War (Yom Kippur)

1974

- **First Oil Shock**
- **IEA founded** by 16 major energy-consuming countries to respond collectively to oil supply disruptions
- Ulf Lantzke (Germany) is named Executive Director

BUT the WORLD has CHANGED...

● *The IEA today: taking on new challenges*

Almost four decades after the Agency's founding, ensuring access to global oil supplies remains a core IEA mandate but new energy-related concerns have arisen. Energy security is no longer only about oil. And industrialised nations are no longer the only major consumers of energy. Climate change driven by greenhouse gas emissions – 70% of which derive from energy production or use – is a growing threat. So energy policy was tasked with a new objective: to cut greenhouse gas emissions while maintaining economic growth.

The Agency has grown to 29 member countries and its substantive focus has broadened, based on the adoption of new "Shared Goals" in 1993, to include the "3Es" of sound energy policy:

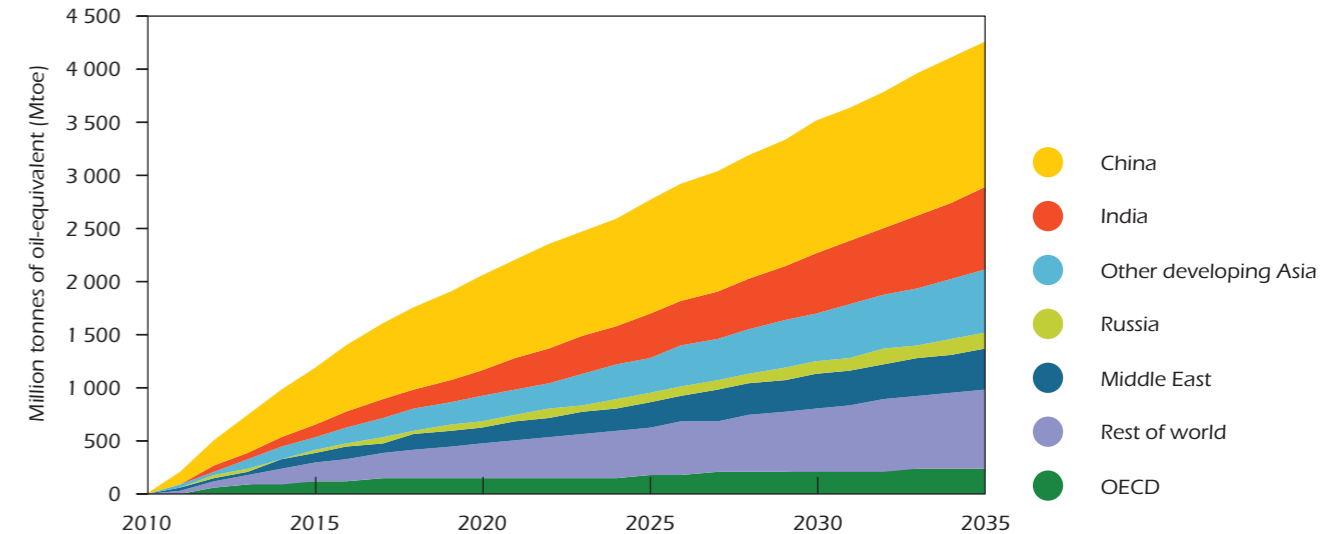
- **energy security** to secure reliable access to supplies of all forms of energy, including oil, natural gas, electricity, coal, nuclear energy and renewables;

- **environmental protection**, including a particular focus on reducing greenhouse gas emissions – especially CO₂ – which lead to climate change;
- **sustainable economic development** which both relies on and contributes to long-term energy security.

As many countries outside the IEA have become major players in world energy markets, the Agency increasingly engages with key consumers and producers, including China, India and Russia.

The IEA also works closely with private sector and industry representatives to promote public-private partnerships, particularly through the IEA Energy Business Council.

Growth in primary energy demand in the New Policies Scenario



Global energy demand increases by one-third from 2010 to 2035, with China and India accounting for 50% of the growth

1975

- International energy technology collaboration facilitated in establishment of first IEA Implementing Agreement (later Clean Coal Centre)

1978-79

- Iranian Revolution leads to "Second Oil Shock" and recession

1980

- Iran-Iraq War leads to growing concern over security of oil supplies

1983

- IEA publishes first *Oil Market Report*

1984

- Helga Steeg (Germany) is appointed IEA Executive Director

1986

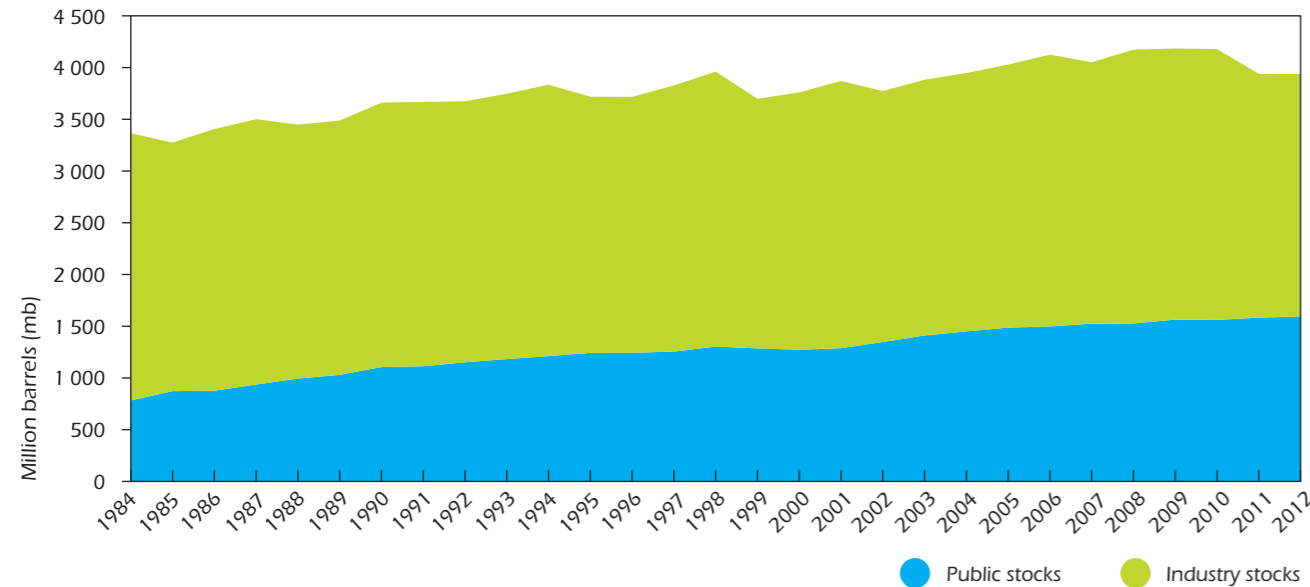
- Oil prices collapse to USD 10 per barrel

1989

- Berlin Wall falls

The IEA in ACTION: ENSURE access to GLOBAL energy SUPPLIES and SUSTAINABLE economic GROWTH

Stockholding in IEA member countries



From the mid-1980's to the present, public stockholding in IEA member countries almost doubled from 800 mb to 1 560 mb

● Respond promptly and effectively

World energy markets continue to be vulnerable to disruptions precipitated by events ranging from geopolitical strife to natural disasters. As oil demand and imports continue to grow, the IEA emergency response capability will remain essential.

But energy security concerns go beyond oil. The Ukraine-Russia gas dispute in January 2009 caused the largest natural gas supply crisis in Europe's history. With increasingly integrated electricity grids, blackouts can cascade and affect multiple economies simultaneously. The IEA is working to identify measures to prevent and react to supply disruptions across all sources of energy.

To provide better understanding of the dynamics and trends in energy markets in the past, present and future, the IEA offers the latest analysis in its reports, papers and publications, including:

- *monthly Oil Market Report*;
- *World Energy Outlook*; and
- *Medium-Term Reports for Oil, Gas, Coal, and Renewable Energy*.

The IEA also compiles and provides comprehensive, timely and authoritative energy data and statistics to underpin the Agency's work. As a founding partner of the Joint Organisations Data Initiative, the IEA cooperates with countries around the world to improve the quality, timeliness, transparency and coverage of energy information.

1990

- IEA begins outreach: completes first policy review of non-member country (Poland)
- IEA analysis shows for first time more than 50% of global energy consumption outside of OECD

1991

- Soviet Union collapses
- Gulf War starts: IEA co-ordinated action restores calm to oil markets
- Producer-consumer dialogue begins – IEA participates in first meeting in Paris

1992

- Rio de Janeiro Earth Summit launches Climate Change Convention

1993

- IEA Governing Board adopts "Shared Goals" broadening IEA scope to include energy security, economic growth and environmental protection
- IEA publishes first *World Energy Outlook*

1994

- IEA data coverage expands to more than 100 non-member countries (in addition to OECD)
- Energy Charter Treaty signed in Lisbon

1995

- COP1 meeting in Berlin – IEA participates
- Robert Priddle (United Kingdom) is appointed IEA Executive Director

The IEA in ACTION: BUILDING a CLEANER, more EFFICIENT energy FUTURE GLOBALLY

● Improve energy efficiency

Meeting future energy demand while substantially reducing associated greenhouse gas emissions will require nothing short of an energy revolution. The energy sector currently accounts for approximately 65% of CO₂ emissions, which directly contribute to climate change.

IEA findings show there is significant potential to decouple economic growth – and energy production and use, in particular – from its proven environmental impacts. The Agency continues to advise governments on developing effective policies to:

- reduce energy demand;
- choose cleaner energy sources;
- deploy the best available energy technologies and practices.

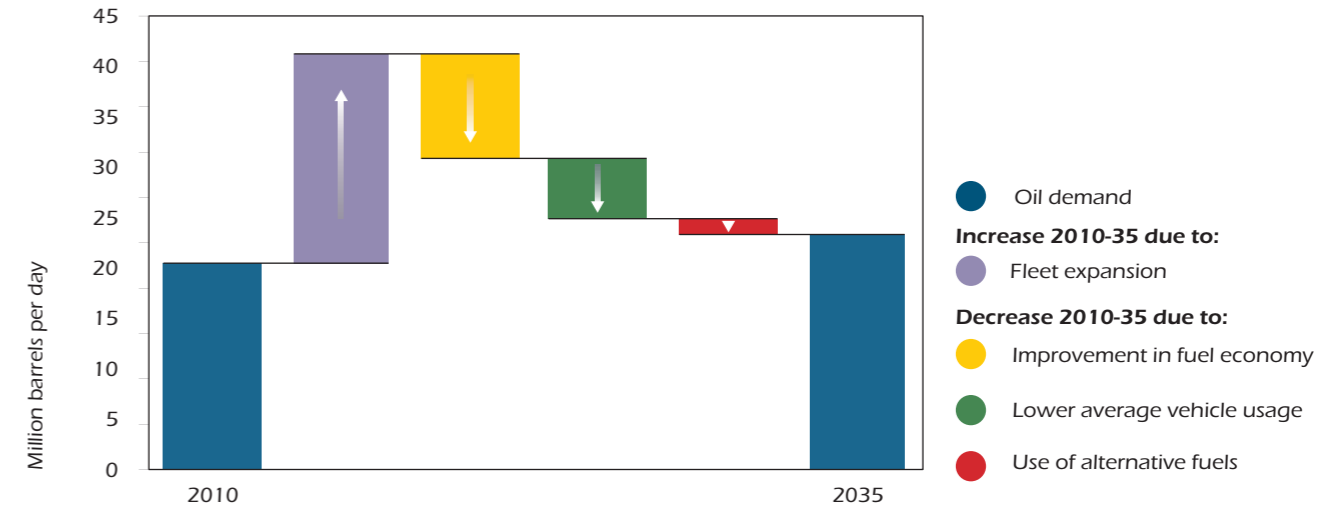
The first step is to improve energy efficiency. Such measures not only cut energy consumption and CO₂ emissions, but are often low-cost, immediately available, and relatively easy to implement. IEA research shows that energy efficiency improvements in many countries lag below levels where they could and should be.

The IEA Secretariat has hosted the International Partnership for Energy Efficiency Co-operation (IPEEC) since 2009 to encourage greater uptake of energy efficiency policies worldwide.

Since 2008, the IEA has proposed 25 energy efficiency recommendations which could, if implemented globally and without delay, reduce worldwide CO₂ emissions by 17% per year by 2030 – equivalent to roughly 1.5 times the amount of current US annual CO₂ emissions. An update to these recommendations was endorsed at the 2011 IEA Ministerial Meeting.

Since 2011, the IEA has also provided an annual progress report to the Clean Energy Ministerial, tracking key technological developments and clean energy deployment progress among countries. In 2013, the IEA published the first *Energy Efficiency Market Report* to emphasise efficiency as “the first fuel”.

World vehicle oil demand in the New Policies Scenario



1997

- Asian economic crisis
- Kyoto Protocol adopted
- IEA releases first edition of *CO₂ Emissions from Fuel Combustion*

1998

- Oil price drops to under USD 10 per barrel

2000

- Producer-consumer dialogue formalised as International Energy Forum

2001

- Joint Oil Data Initiative (JODI) launched by six international organisations; IEA takes key role

2002

- Executive Director Priddle makes first official visit by IEA head to OPEC Secretariat in Vienna
- IEA circulates first OPEN Energy Technology Bulletin

2003

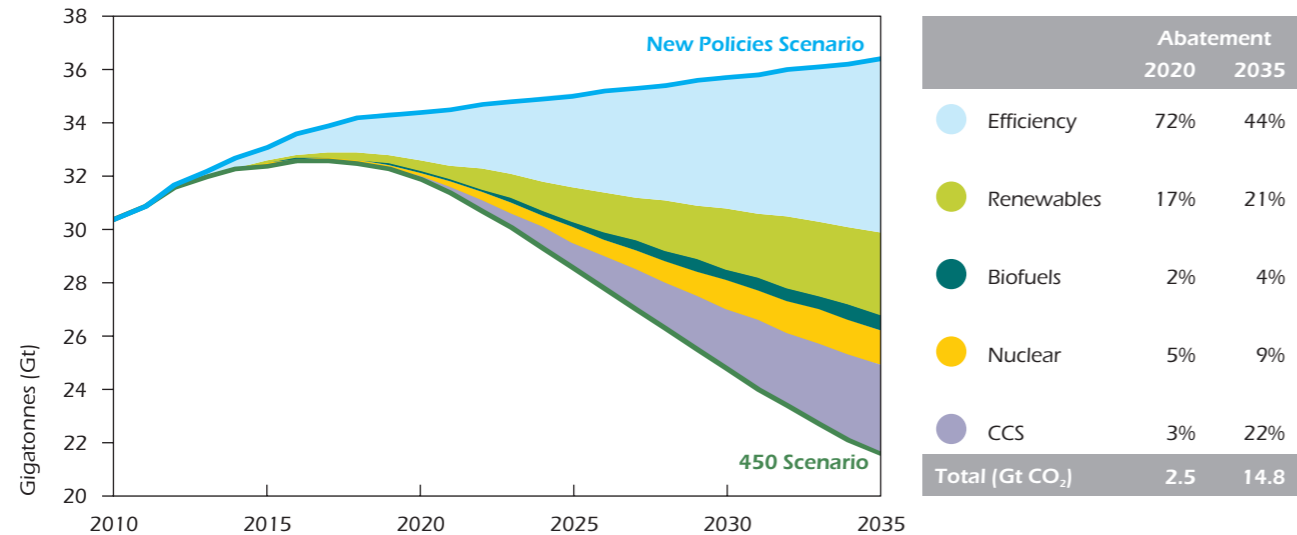
- Second Gulf war starts; IEA monitors markets and stands ready to take action to stabilise markets
- Claude Mandil (France) appointed IEA Executive Director

2004

- IEA publishes first *Energy Statistics Manual*

The IEA in ACTION: PROMOTING energy TECHNOLOGIES to BRIDGE the FUTURE

World energy-related CO₂ emissions abatement in the 450 Scenario relative to the New Policies Scenario



Energy efficiency measures – driven by strong policy action across all sectors – account for 50% of the cumulative CO₂ abatement over the Outlook period

● Work to deploy low-carbon technologies

Low-carbon technologies will have a crucial role to play to assure future energy supplies and offset energy's environmental impact. In addition to energy efficiency, many types of renewable energy, carbon capture and storage (CCS), nuclear power and new transport technologies must be widely deployed to reach emission goals. Following a G8 request to translate policy objectives into action, the IEA scenarios in *Energy Technology Perspectives* and the *World Energy Outlook* set out the mix of technologies required to achieve specific climate change objectives. The most recent series of IEA technology roadmaps provides even greater detail for individual technologies and sectors.

For almost four decades, the IEA energy technology collaboration network of "Implementing Agreements" has enabled a pooling of resources among governments, academia, industry and other organisations to focus on research, development, demonstration and deployment of energy-related technologies. The 41 Implementing

Agreements, which include industry and academic participants from both IEA member and non-member countries, cover topics ranging from concentrated solar power to carbon capture to wind energy to nuclear fusion.

More recent IEA technology initiatives include the Electric Vehicles Initiative, the Global Fuel Economy Initiative (with the International Transport Forum and the UN Environment Programme), and the International Smart Grid Action Network to accelerate the deployment of next-generation power grid technology.

The IEA Carbon Capture and Storage Unit works on the contribution that technologies for capturing and storing carbon dioxide can make to sustainability in fossil-fuel electrical power plants and industrial processes.

And since 2010, the Low-Carbon Energy Technology Platform brings together private and public sector stakeholders to share experience and compare progress on technological and deployment progress.

2005

- IEA invited to participate in G8 Summit in Gleneagles, tasked to provide concrete policy recommendations to achieve "clean, competitive clever energy future"
- Hurricanes Katrina and Rita destroy oil facilities in Gulf of Mexico – IEA prompt co-ordinated action ensures oil supplies and stabilises market
- Kyoto Protocol enters into force

2006

- IEA publishes first editions of *Energy Technology Perspectives* and *Natural Gas Market Review*
- Russia-Ukraine gas dispute threatens transit supplies to Europe

2007

- Nobuo Tanaka (Japan) appointed IEA Executive Director

2008

- IEA membership grows to 28 countries
- Global economic crisis slows growth
- Oil price spike to USD 147 per barrel, drop to just over USD 30 per barrel by year end
- Hurricanes Ike and Gustav destroy oil facilities in Gulf of Mexico; IEA watches closely and determines if market can offset loss without co-ordinated action

2009

- Russia-Ukraine gas dispute leads to large supply disruption
IEA provides data and other analysis to EU to help manage response
- IEA Energy Business Council created to promote closer consultation with private sector

The **IEA TOMORROW: TACKLING** energy **CHALLENGES** together... **WITHOUT BORDERS**

● *Seek global solutions*

In a world where non-OECD countries will account for nearly 90% of the growth in energy demand and all growth of CO₂ emissions to 2035 under currently pledged policies, the IEA can only find solutions to future energy challenges by engaging globally. Co-operation with non-member countries is not new to the Agency, as a number of activities and initiatives have required close collaboration, including:

- energy technology collaboration through Implementing Agreements;
- joint workshops, conferences and other co-ordinated projects;
- training programmes and seminars;
- global forums including IPEEC, the technology platform, etc.;

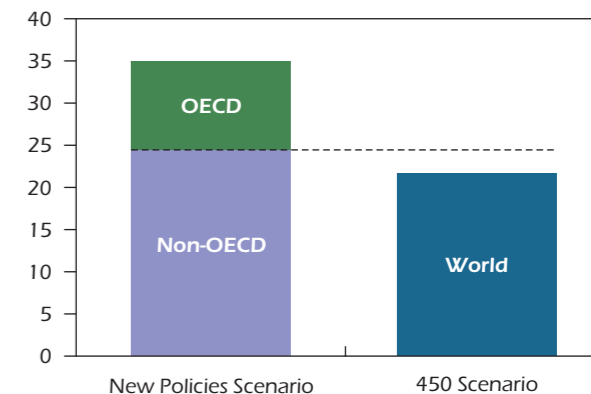
- secondments of non-member government officials and experts to the IEA;
- meetings with non-member government officials at all levels; and
- further efforts to intensify on-going co-operation with key non-member countries, including joint studies, country and sectoral reviews.

Yet even greater engagement and co-operation will be needed in the future. The *IEA World Energy Outlook* shows that even if OECD member countries cut their CO₂ emissions to zero, this reduction would not be sufficient to achieve the levels required to stop global warming. In short, climate change – and other pressing energy challenges – must be tackled globally, not separately or regionally.

While each country has its unique concerns, all are affected by shortages of supply, volatile prices, pollution and the threat of climate change.

Looking forward, the IEA will bring governments, industry, other international organisations, non-governmental organisations and individuals together from around the world to learn from each other's experiences, to share expertise, to maximise resources and to find energy solutions.

World energy-related CO₂ emissions in 2035 by scenario



OECD countries alone cannot put the world on a "450 ppm" trajectory – the stabilisation in carbon levels needed to keep global warming to a 2 C° increase – even if they were to reduce their CO₂ emissions to zero

2010

- BP Deepwater Horizon explosion spills 4.9 million barrels of crude oil into the Gulf of Mexico
- OPEC celebrates 50th anniversary
- China becomes the world's largest energy consumer

2011

- Fukushima nuclear crisis in Japan results from massive earthquake and tsunami
- Arab Spring affects major oil producers, and in Libya civil war shuts in all production
- IEA Libya Collective Action releases emergency oil stocks for the third time in IEA history
- Germany announces plans to phase out all nuclear power by 2022
- Maria van der Hoeven (Netherlands) appointed IEA Executive Director
- First issue of *IEA Energy* journal launched at Ministerial

2012

- Oil prices rise on Iranian tensions
- IEA publishes first edition of *Medium-Term Renewables Report*

2013

- IEA publishes first edition of *Energy Efficiency Market Report*
- IEA and six key partner countries issue Joint Declaration on Association
- IEA Ministers issue first Climate Statement on margins of biennial Ministerial meeting

2014

- Estonia becomes 29th member of IEA
- IEA publishes first statistics manual on energy efficiency indicators
- IEA celebrates 40th anniversary: secure, sustainable, together
- G7 focuses on gas security



IEA member countries:

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Japan
Korea (Republic of)
Luxembourg
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Spain
Sweden
Switzerland
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