2010 The Outlook for Energy: A View to 2030

ExxonMobil

Taking on the world's toughest energy challenges.™

Contents

Welcome to ExxonMobil's *The Outlook for Energy: A View to 2030.*

Energy enables economic growth and social progress in countries around the world.

Because of energy's universal importance, it is essential that not only those of us in the energy industry, but also leaders from across government, business and civil society – as well as consumers at large – understand the fundamental realities that govern energy demand and supply worldwide, and the prospects for meeting our shared economic and environmental goals.

ExxonMobil's The Outlook for Energy: A View to 2030 *offers our perspective on these realities and prospects.*

The forecasts of global energy trends offered in this report are grounded in a fundamental fact: Demand for energy is tied to the human desire for a better life.

By enabling people to become more productive – and expanding their opportunities – access to reliable, affordable energy can transform people's lives and the communities in which they live.

Energy also plays a key role in advancing social progress. Considering that 1.4 billion people worldwide lack access to electricity, expanding access to modern energy will be essential to meeting global targets for reducing poverty and hunger, and improving health and education.

As populations grow, economies expand and societies develop, demand for energy will continue to rise. ExxonMobil sees global demand in 2030 about 35 percent higher than it was in 2005 – even with substantial gains in efficiency.

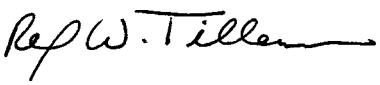
Oil, natural gas and other forms of modern energy will continue to sustain economic growth and job creation, and enable the widespread adoption of new energy-powered technologies in fields including agriculture, medicine and computing.

Meeting this rising demand for energy – safely and with minimal environmental impact – is ExxonMobil's mission, and a key challenge facing governments and societies worldwide.

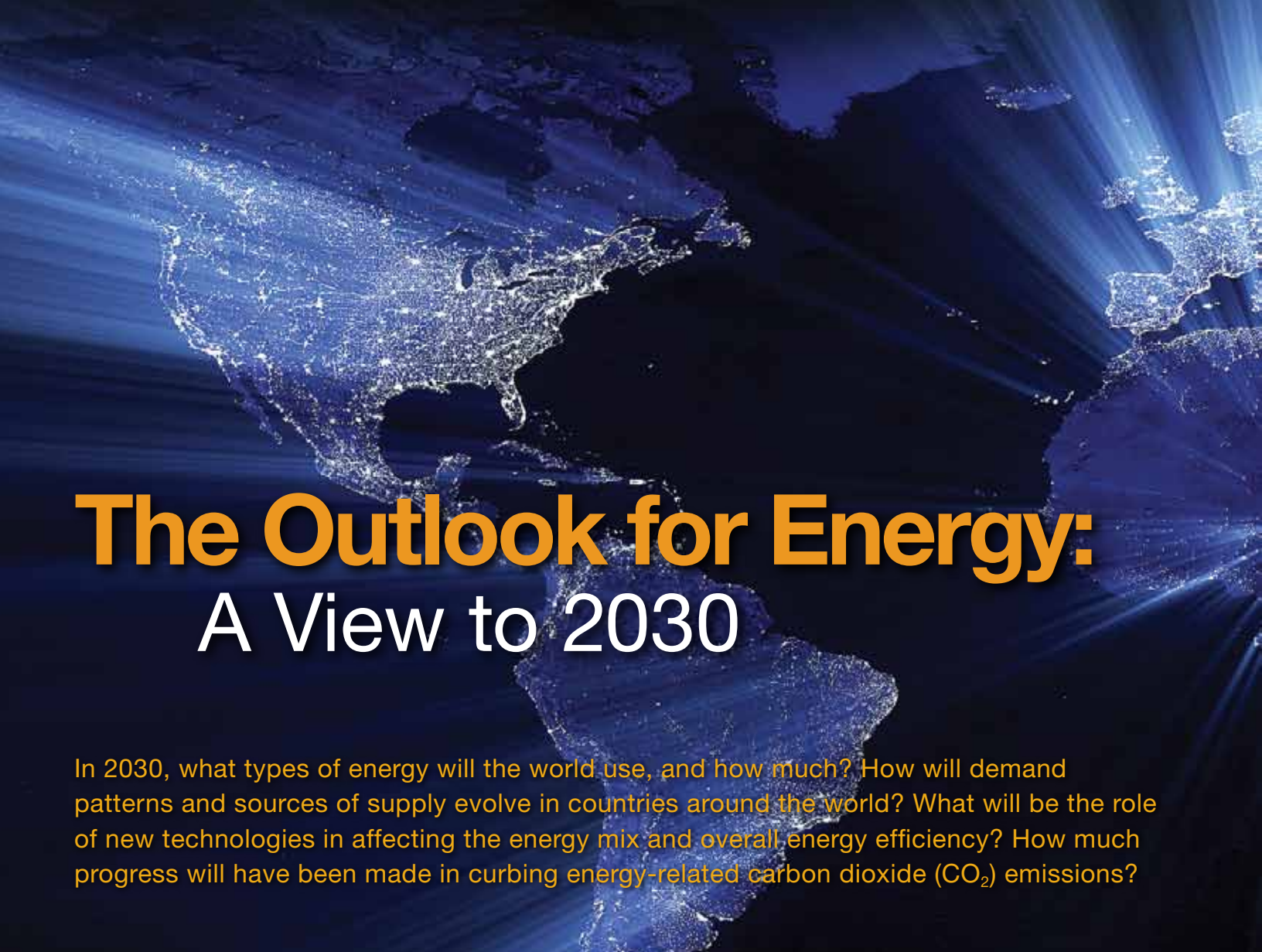
As the *Outlook* shows, success will depend on expanding access to economic energy sources that meet a number of fundamental criteria: They must be widely available, reliable, affordable, versatile and be produced and used responsibly. This will require the development and application of new technologies; tremendous levels of investment in technology and infrastructure; and international partnerships and cooperation. Together, these will enable the world to expand its energy choices, improve efficiency and reduce emissions.

Prepared by a team of experts using both publicly available and proprietary information, *The Outlook for Energy: A View to 2030* helps guide ExxonMobil's global investment decisions. We share it publicly to encourage broader understanding of energy issues.

I hope you find the *Outlook* informative, and that it helps answer your questions about many of the realities and challenges – and solutions – that will shape our energy future.



Rex W. Tillerson
Chairman and CEO



The Outlook for Energy: A View to 2030

In 2030, what types of energy will the world use, and how much? How will demand patterns and sources of supply evolve in countries around the world? What will be the role of new technologies in affecting the energy mix and overall energy efficiency? How much progress will have been made in curbing energy-related carbon dioxide (CO_2) emissions?

These are questions that ExxonMobil sets out to answer in *The Outlook for Energy: A View to 2030.* Updated each year, the *Outlook* analyzes the trends that will shape global energy supply and demand over the coming decades.

As you will see in this year's edition, the answers are both encouraging and challenging – and vary greatly at a country and regional level:

OECD energy demand flat.
The developed economies that belong to the Organization for Economic Cooperation and Development (OECD) will need energy to fuel continued economic recovery and growth. Yet, even with that economic expansion, OECD energy demand will be essentially unchanged through 2030. The fundamental driver of this result is increased energy efficiency. And efficiency, combined with a shift toward cleaner-burning fuels, will cause OECD emissions to decline substantially through 2030.

Non OECD energy demand up more than 70 percent.
Among Non OECD countries, China will lead a dramatic climb in energy demand as the rising prosperity of its large population is reflected in trends such as increased vehicle ownership and higher electricity consumption. Even so, by 2030 per-capita energy use in Non OECD countries still will be far below that of OECD nations. Efficiency gains will not be enough to offset this growth in demand and thus, CO_2 emissions in Non OECD countries will continue to rise through 2030.

Global energy demand up 35 percent.
ExxonMobil expects global energy demand in 2030 to be about 35 percent higher than in 2005. Demand growth would be far higher – with 2030 energy consumption nearly double 2005 levels – were it not for expected improvements in energy efficiency.

We will need to continue to expand all available energy sources to meet this substantial increase in demand.
These sources must include oil, natural

Enhanced satellite image of the earth at night

gas and coal, which by 2030 will continue to meet about 80 percent of the world's energy demand.

But just as energy and technology have evolved dramatically over the past 200 years, the *Outlook* sees significant changes continuing through 2030. For example:

- By 2030, consumers will make greater use of personal vehicles that have significantly better fuel economy; as a result, global demand for personal-vehicle fuels will flatten and decline slightly by 2030 – the first decline in this category in modern history. Demand for commercial transportation, however, is rising sharply.
- New technologies will continue to open up previously unreachable supplies of natural gas, the cleanest-burning major fuel, enabling natural gas to overtake coal as the second-largest global energy source.
- Modern renewable fuels – wind, solar and biofuels – will expand significantly. Coal will decline sharply in OECD countries, but continue to be the predominant fuel for power generation in Non OECD countries.
- In all parts of the world, new energy-saving technologies will greatly improve energy efficiency, curbing growth in both demand and emissions.

Meeting demand for energy – safely, and with concern for environmental impact – will continue to be a challenge on an enormous scale. Today, global demand averages the equivalent of 16 *billion* British thermal units (BTUs) every single second. The scale of this challenge will grow bigger as population increases and people seek better living standards.

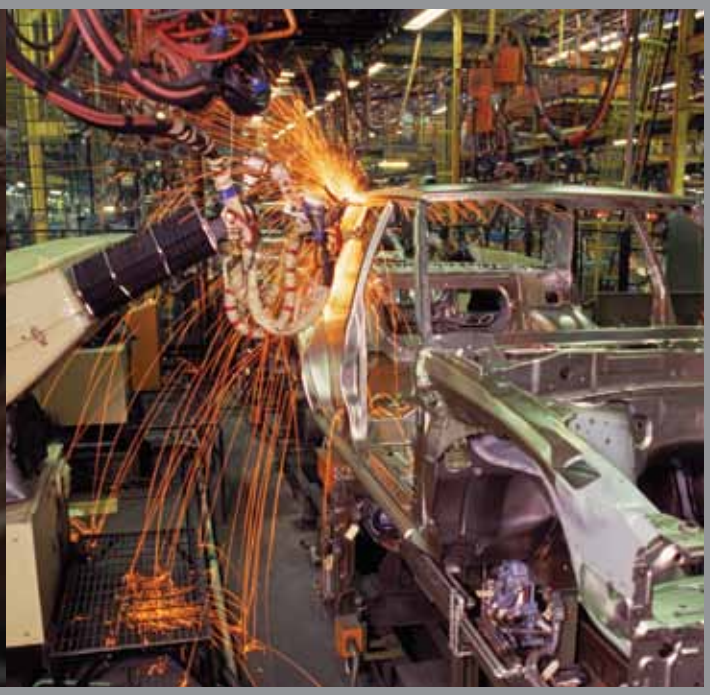
Technology will continue to evolve and play a key role in increasing efficiency, expanding supplies and mitigating emissions. These three elements must be pursued with vigor and constancy of purpose in order to meet our global energy and environmental challenges.

Economic and energy evolution

Many of the hallmarks of human progress – the improvements in how people live, work and stay safe and healthy – are enabled by energy. As societies and technologies develop, people's energy usage will continue to evolve.

Throughout history, access to energy has helped individuals and societies to advance by helping people to be more productive and by expanding their opportunities.

Consider, for example, how long it might take to perform certain tasks without modern technology and energy – activities such as



carrying wood by hand to meet daily energy needs, cooking by fire, manufacturing commercial goods or plowing a field.

The tremendous rise in living standards over the past 100 years would not have been achieved without advanced technologies and the modern energy supplies that enabled their widespread use.

As societies advance, they will continue to need energy to power industry, transportation, electricity generation and other vital services. The *Outlook* examines each of those demand sectors in detail.

World population continues to expand

Population growth continues to be one of the biggest factors behind rising energy demand.

By 2030, the world's population will reach close to

8 billion,

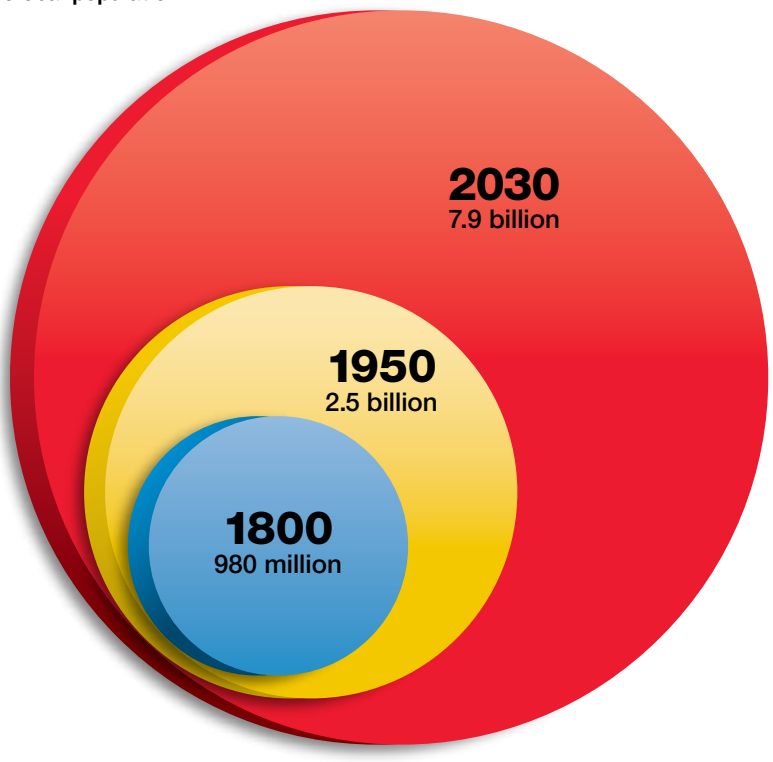
with 85 percent residing in Non OECD countries.

From a base of about 1 billion people in 1800, the world's population has continued to rise. Population expansion accelerated in the second half of the 20th century, as advances in medicine and other fields such as agriculture greatly influenced population trends, including child mortality.

Today, the world's population is approaching 7 billion. By 2030, it will likely reach close to 8 billion people. Most of these people – close to 85 percent – will live in Non OECD countries. We project that as personal incomes grow, the pace of population expansion will slow – a trend that has already emerged over the last 10 years.

As the global population continues to rise and people around the world strive to improve their lives, ExxonMobil and many others recognize that energy will continue to play an essential role in development.

Global population



Sources: United Nations and The World Bank

Rush hour in
New York City, USA

Energy sources evolve over time

Just as the world's energy needs expand and evolve over time, so do the *types* of energy used to meet those needs.

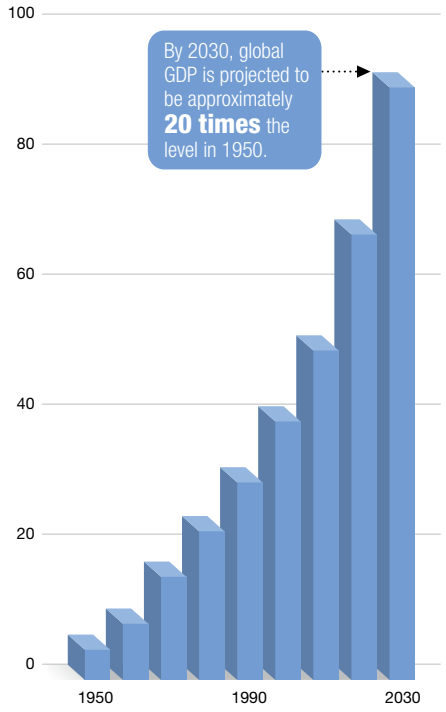
New technologies influence both
energy supply,
as new energy technologies enable access to new energy supplies,
and demand,
as advances such as commercial aviation in the 1950s and personal computers in the 1980s alter energy-demand patterns.

Standards of living improved dramatically over the past century, as global economic output expanded rapidly. Fueling this growing prosperity was – and continues to be – advanced technology and access to energy. A century ago, fuels like wood and coal were most prominent. Today, growing access to modern technologies continues to drive growing demand for – and supplies of – oil and natural gas. Nuclear energy and, more recently, renewable energies like wind, solar and biofuels are also contributing more to the energy mix.

Helping expand access to modern energy and technology will remain critical to help people prosper in the decades ahead, with the mix of economical energy supplies continuing to evolve.

Global gross domestic product

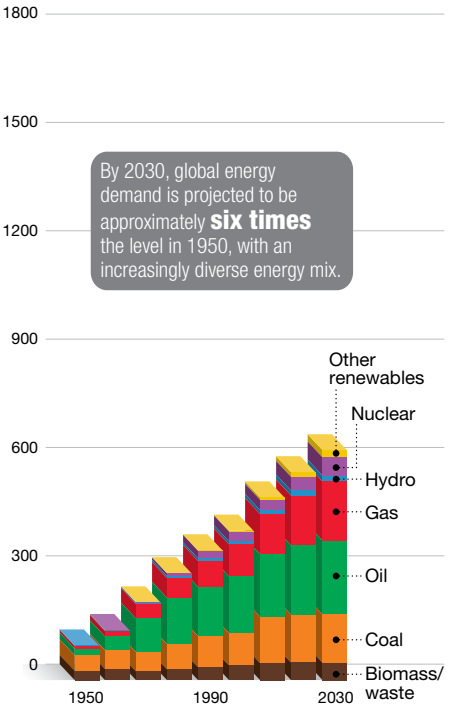
Trillions of 2005 dollars



Source: Maddison, *The World Economy: The Millennial Perspective*; ExxonMobil

Global demand by fuel

Quadrillion BTUs



Source: Smil, *Energy Transitions*; ExxonMobil

Besides population, the other major influence on energy demand is economic growth. While energy efficiency can – and will – continue to play a powerful role in curbing growth in energy demand, in general, as economic output increases and living standards rise, so does demand for energy.

ExxonMobil sees global energy demand rising steadily. By 2030, we project global energy demand to be about 35 percent higher than it was in 2005.

But that 35 percent increase doesn't tell the whole story. For that, we need to look at the breakdown between OECD and Non OECD countries, because the trends in those two groups are starkly different. For example, through 2030, energy demand in OECD countries will change little; but demand in Non OECD countries will rise by more than 70 percent, led by China and India.

But first, a note: Dividing the world's nations into two groups – those who are, and are not, part of the Organization for Economic Cooperation and Development (OECD) – is useful for studying energy trends. This is because the members of the OECD generally have more mature economies and well-developed patterns of energy use. Non OECD countries, because they are not as economically advanced, have very different energy-use patterns.

It is also important to remember that *population* in these two groups is nowhere near equal. About 5.5 billion people live in Non OECD countries, compared to 1.2 billion in OECD countries.

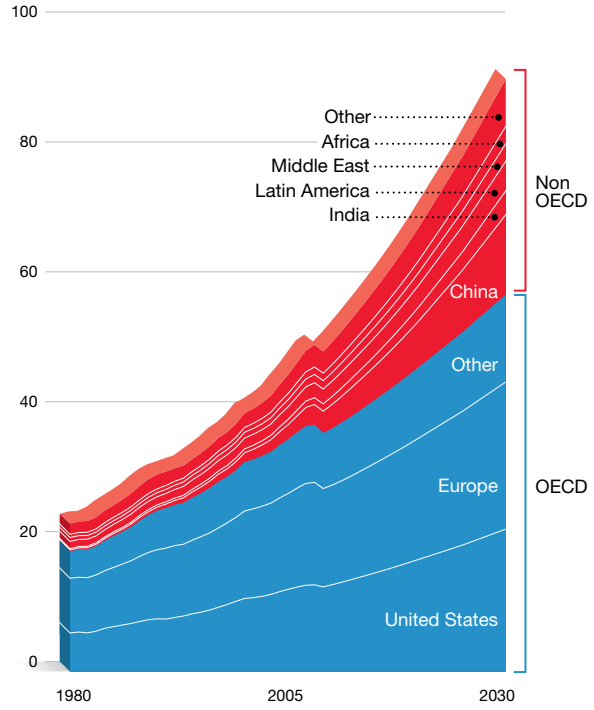
Global economies grow through 2030

Economic growth, particularly in Non OECD countries, will drive energy demand higher through 2030.

China and India
are fast-growing economies, each with average annual GDP growth of
6 percent
from today to 2030.

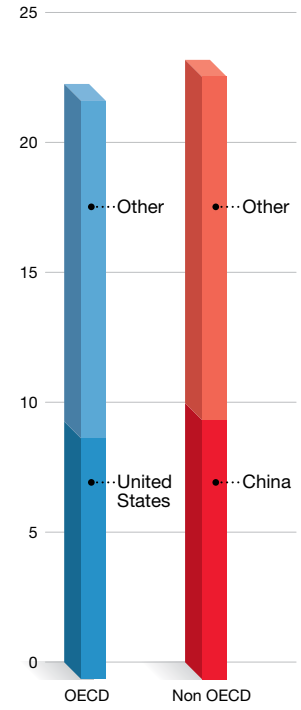
GDP

Trillions of 2005 dollars



GDP growth 2005-2030

Trillions of 2005 dollars



Through 2030, the global economy will continue to expand, but growth will be fastest in Non OECD countries.

ExxonMobil expects OECD economies, as measured by GDP, to expand at about 2 percent a year on average, as the United States and others continue on the path to economic recovery and growth. GDP growth in Non OECD economies, however, is projected to be almost 5 percent per year.

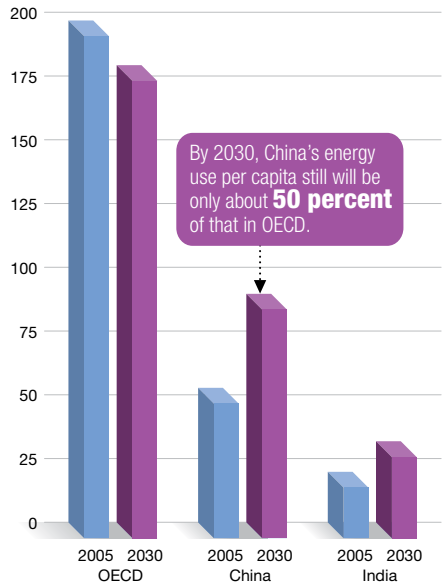
Because of this faster growth, Non OECD countries will account for an increasing share of global economic output, approaching 40 percent of world GDP in 2030. And, as a result, Non OECD countries will account for an increasing share of energy demand.

We expect that economic and population growth will not always translate into higher energy demand, as illustrated by our outlook for OECD nations, where energy use will stay essentially flat through 2030 even as populations grow and economies expand by more than 60 percent. This is possible because the OECD's rising energy needs through 2030 can be offset by ongoing efficiency gains. We expect these gains will be stimulated in part by government policies that seek to address the risks of climate change by imposing a cost on CO_2 emissions.

Non OECD countries will also see significant improvements to efficiency.

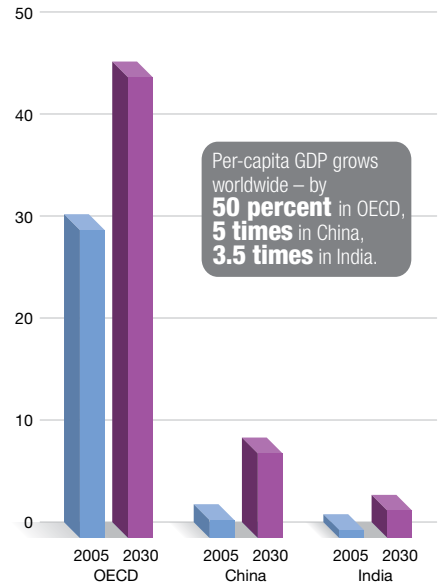
Energy use per capita

Million BTUs



GDP per capita

Thousands of 2005 dollars



China leads demand growth

Rising prosperity in Non OECD countries is the largest influence on energy trends through 2030.

China and the U.S. together contribute about

40 percent

of global GDP growth through 2030, when they will be the leading global economies.

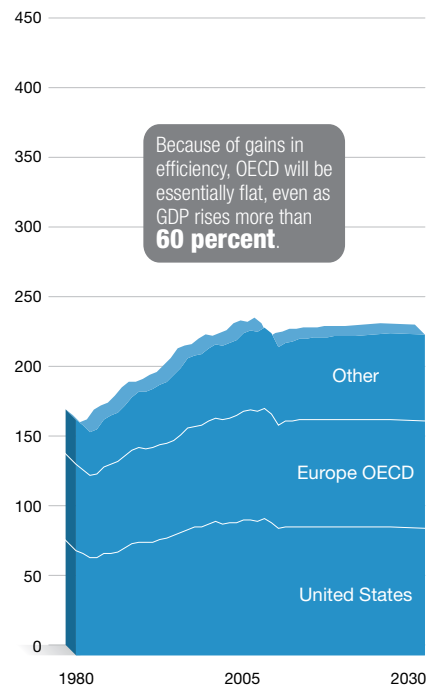
But rapid economic expansion, especially in China, will outpace these gains. By 2030, energy demand in Non OECD countries will be about 75 percent higher than OECD demand.

And yet, because the population of the Non OECD is nearly five times bigger than OECD, there still will be a large imbalance in terms of the energy used – both directly and indirectly – by citizens in those countries. Even by 2030, per-capita energy use in China will be only one-half the level of the OECD.

As our world continues to find ways to use energy more efficiently – in homes, vehicles and industry – ExxonMobil expects that it will take relatively less energy per capita to produce the equivalent growth in per-capita GDP.

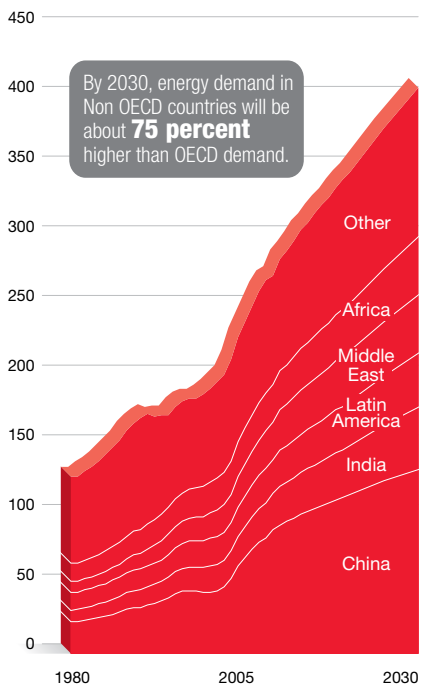
OECD energy demand

Quadrillion BTUs



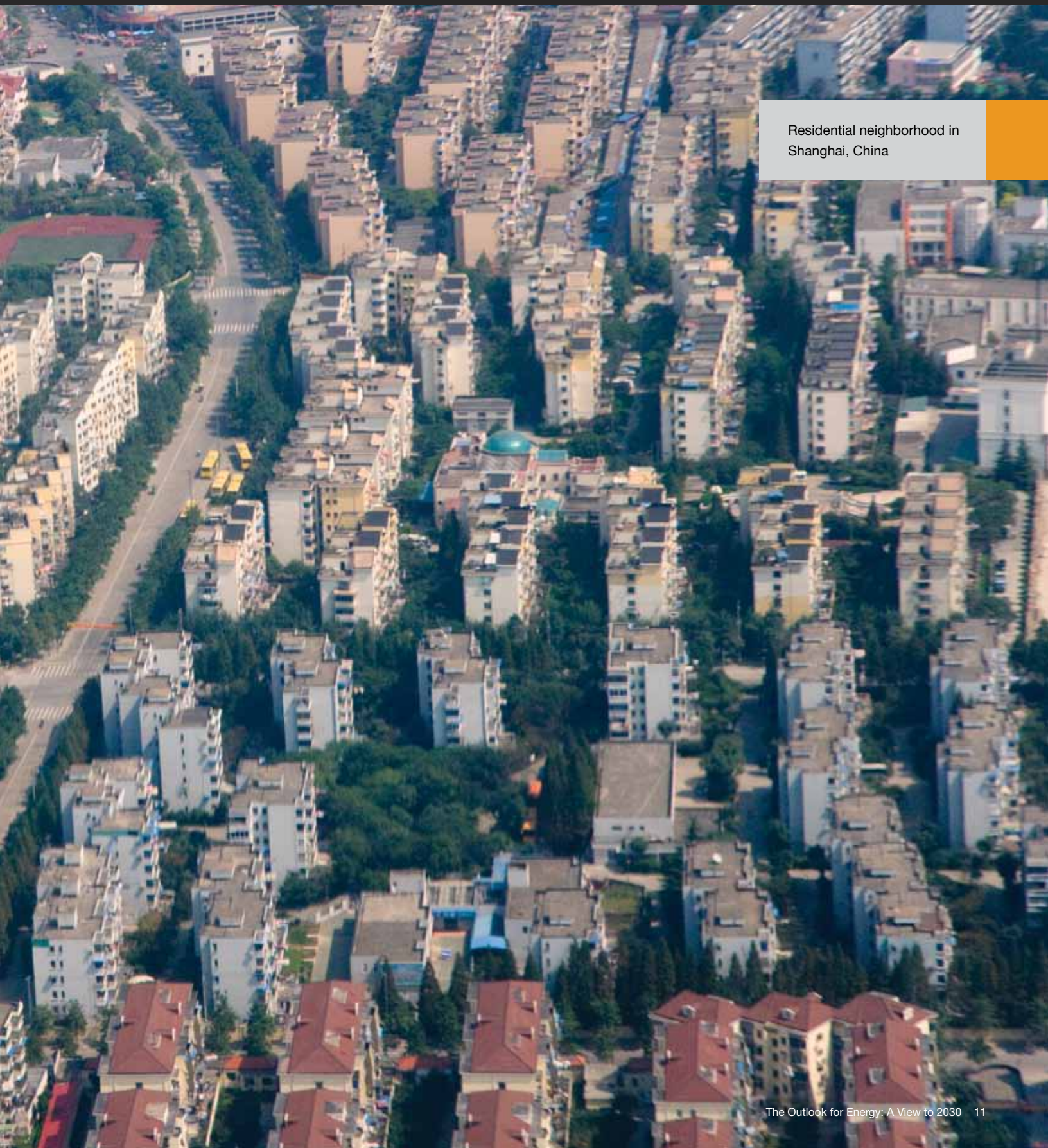
Non OECD energy demand

Quadrillion BTUs



Residential/commercial

From a simple wood fire to modern appliances for refrigeration, cooking, heating and cooling, the evolution of energy begins at home. Through 2030, more homes and businesses will need energy, but the fuels they use will grow cleaner, more diverse and more efficient.

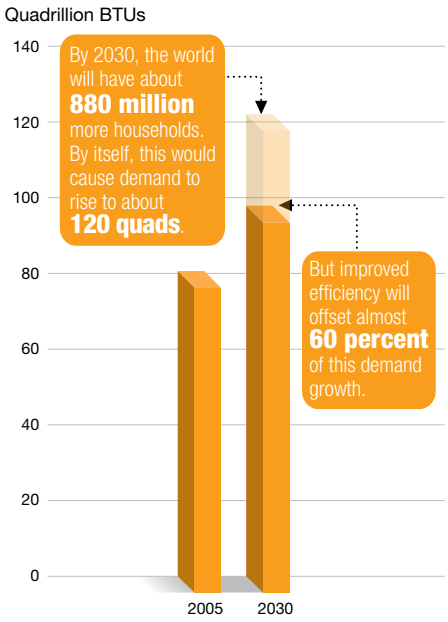


Residential neighborhood in Shanghai, China

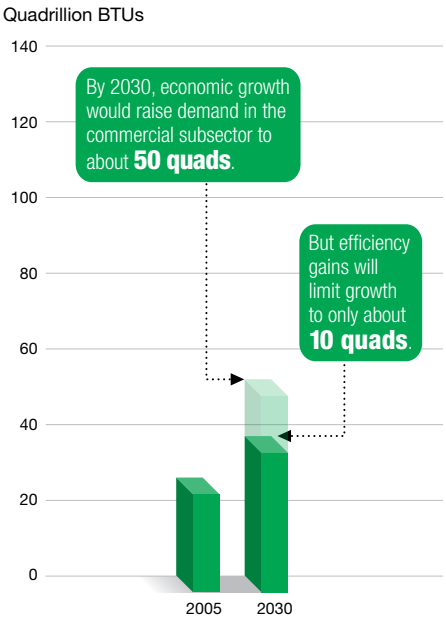
Demand in the residential and commercial sectors is expected to grow substantially over the period covered by this *Outlook for Energy.*

Residential demand, the larger of these two sectors, is seen rising by more than 20 percent from 2005 to 2030. This includes energy used directly in the home, such as fuels for heating and cooking, as well as electricity for things like lighting, appliances and air conditioning. Most of this growth will occur in Non OECD countries.

Residential demand changes



Commercial demand changes



Residential/commercial energy demand rises

Demand for energy for homes and businesses will expand substantially through 2030, driven mostly by the addition of hundreds of millions of new households, but also by rising living standards and economic growth.

Almost 90 percent
of growth in households will occur in Non OECD countries.

In general, as the number of households increases, residential energy demand rises. However, ongoing improvements to energy efficiency – everything from improved building insulation to more energy-efficient lighting and appliances – help mitigate demand growth.

Efficiency is a powerful energy saver. By 2030, there will be about 2.6 billion households in the world, up nearly 900 million from 2005.

On their own, these additional households would increase global residential energy demand by about 50 percent. But because of expected gains in efficiency in both OECD and Non OECD countries, from 2005 to 2030 global residential demand is projected to grow by less than half that amount.

Similar patterns are expected in the commercial energy sector, which represents energy used in office buildings, stores and other non-industrial businesses. Efficiency gains are expected to cut demand growth in this sector by more than 55 percent through 2030.

Despite these efficiency gains, the world will see a tremendous rise in demand for electricity for residential/commercial purposes through 2030, when electricity will meet more than 35 percent of demand in this sector.

In addition, there will be strong growth in the direct use of natural gas as a residential/commercial energy source, displacing coal, oil and traditional biomass fuels such as wood and dung for heating and cooking.

Global energy demand for homes and businesses will rise

25 percent

from 2005 to 2030. Nearly all of this growth will occur in Non OECD countries.

Despite ongoing progress, today about

1.4 billion

people – 20 percent of the world's population – lack access to electricity, and about

2.7 billion

people – 40 percent of the world's population – lack access to modern cooking fuels.

Preparing a meal,
Han Thao Village, Vietnam

Demand in the residential/commercial sector is met by a diverse array of fuels.

Although the mix of fuels varies greatly by region and economic progress, these differences are expected to shrink over time as Non OECD countries shift away from traditional biomass fuels, as OECD countries did over the course of the 19th and 20th centuries.

No matter where you are in the world, however, one trend holds true: Electricity demand for homes and businesses is growing fast. In the OECD countries, where electricity is displacing oil, by 2030 electricity will make up nearly 50 percent of the residential/commercial picture, up from about 40 percent in 2005.

In Non OECD countries, electricity demand is also growing rapidly, as is natural gas. Together, these two are benefiting from a dramatic shift toward cleaner sources of energy for residential and commercial needs in Non OECD countries.

The shift is positive for human and social development; traditional biomass fuels – specifically wood and dung – are inefficient, harmful to air quality and often dangerous to use indoors.

Biomass, which had about a 50 percent share of the Non OECD residential/commercial sector in 2005, will decline to just above 30 percent by 2030, as more of the world's population switches to modern energy for lighting, heating and cooking.

Still, the International Energy Agency has estimated that by 2030, premature deaths from household air pollution from the use of biomass will be higher than deaths from malaria, tuberculosis or HIV/AIDS.

Residential/commercial fuel supplies evolve

The widespread use of traditional biomass fuels, particularly in the home, is just one example of how Non OECD countries such as China and India are at a different stage of energy development compared to countries in the OECD.

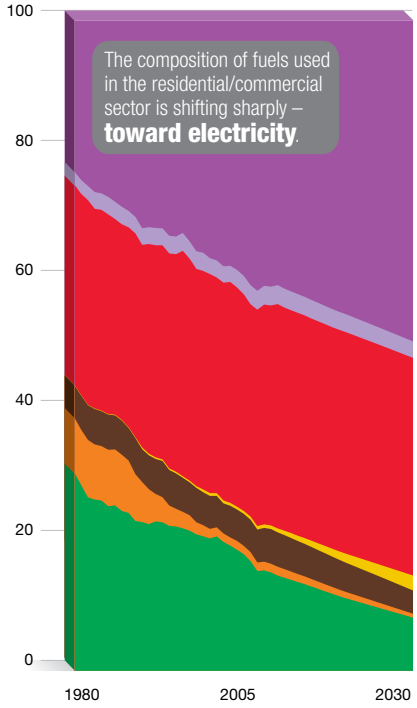
By 2030, global electricity use will be more than

35 percent

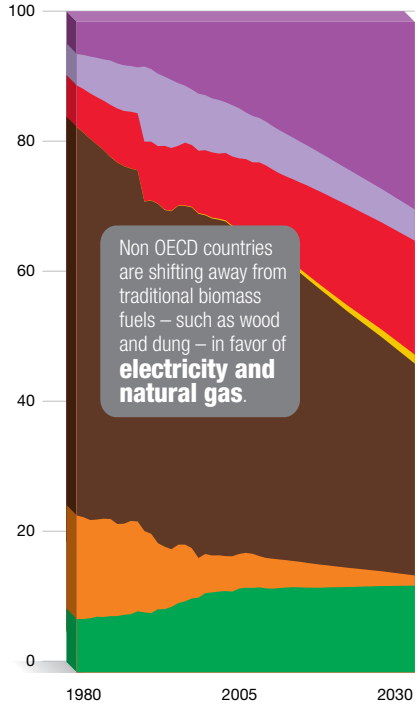
of residential/commercial energy consumption, up from about 25 percent in 2005.

Residential/commercial demand by fuel

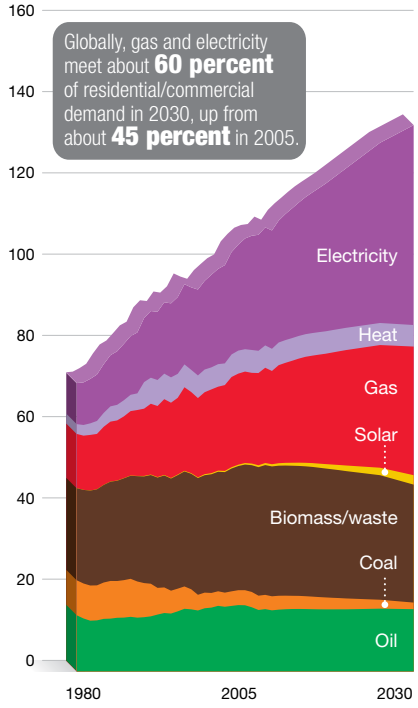
OECD, percent



Non OECD, percent



Global, quadrillion BTUs



Fujian Chemical Plant in Fujian Province, China

Petrochemicals: Enabling efficiency for consumers

Innovations in the chemicals industry play an important role in meeting the world's energy and environmental challenges. Through lightweight plastics and other products that enable consumers to use energy more efficiently, ExxonMobil is helping reduce emissions associated with energy use.

In fact, a recent study – industry-commissioned and independently validated – concluded that for every unit of greenhouse gas (GHG) emitted by the chemical industry during production, more than two units of GHGs are saved by society through the use of products and technologies enabled by our industry.

As a leader in the global petrochemical industry, ExxonMobil is focused on providing value and improving the efficiency of our customers throughout the supply chain.

A major focus is on vehicles. ExxonMobil develops strong, lightweight plastics for car parts that reduce vehicle weight to improve fuel economy, curb emissions and lower manufacturing costs. We also developed a polymer that keeps tires properly inflated longer, reducing fuel consumption.

Packaging is another key area. Stronger-yet-lighter products reduce packaging material and shipping weights, requiring less energy for transportation. Also, plastic packaging lengthens the shelf life of food products, minimizing waste and thereby lowering transportation costs.

Because transportation accounts for about half of the world's daily oil consumption, finding more efficient ways to move people and goods is important. But petrochemicals contribute in many other areas; for example, synthetic lubricants enable industrial equipment – everything from machinery for paper manufacturing to wind-power turbines – to operate more efficiently.

We continue to curb our own emissions by reducing material and energy use in our manufacturing operations.

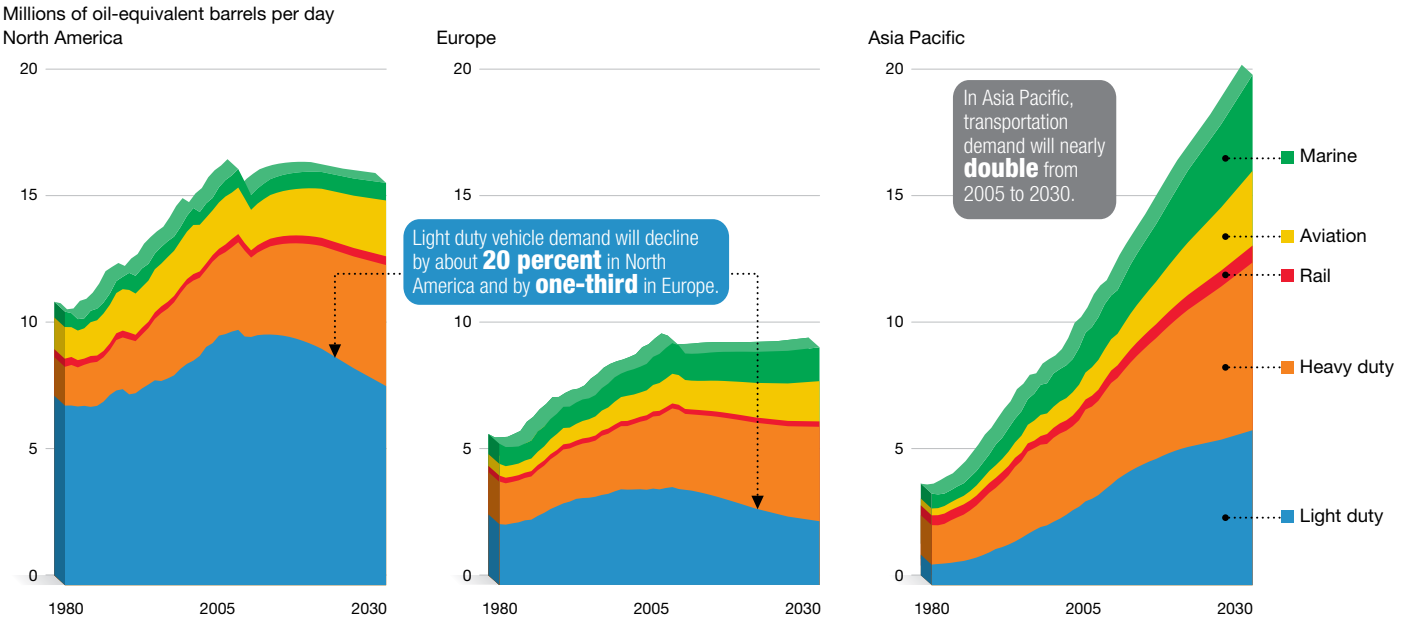
As this *Outlook* shows, better efficiency will be one of the most powerful tools through 2030, reducing global energy demand growth and associated emissions by about 65 percent. Part of these savings will come from advanced plastics and other products made from petrochemicals.

Transportation

Modern transportation facilitates both economic activity and individual opportunity. Through 2030, rising demand for transportation fuels is led by trucking, aviation and marine requirements, and by a surge in the number of personal vehicles in Asia.

Traffic in Central Bangkok, Thailand

Transportation demand by region



Transportation fuels to see rising demand

Globally, transportation-related energy demand will rise by nearly 40 percent from 2005 to 2030, the result of increased economic activity and rising incomes, particularly in the Asia Pacific region.

1.2 billion light duty vehicles will be on the world's roads by 2030, **400 million more than today.** However, as the fuel economy of new vehicles improves, global light duty **demand will flatten and decline** slightly by 2030.

Transportation – covering the vehicles that move people and goods by land, sea, rail and air – is the second-fastest-growing global demand sector through 2030, behind power generation.

This growth is heavily concentrated in Asia Pacific, where many countries and individuals are making rapid economic progress. Rising personal incomes will produce a steep increase in vehicle ownership in this region.

As a result, even as the fuel economy of new vehicles improves, light duty demand in the Asia Pacific region will rise by 80 percent from 2005 to 2030.

In North America and Europe, however, where vehicle ownership already is very high, better fuel economy will have a more noticeable effect on demand. Energy demand for light duty vehicles in North America and Europe actually will decrease through 2030 – the only transportation subsector in which demand is projected to decline.

Light duty vehicle demand will decline by 20 percent in North America and more than 30 percent in Europe.

Projected gains in the fuel economy of the world's personal transportation fleet are the result of ongoing improvements to conventional internal-combustion vehicles, and also the increasing penetration of hybrids and other advanced vehicles. *(For more detail, see page 20.)*

But personal vehicles are only one part of the transportation picture. While fuel demand for personal vehicles may be falling in some parts of the world, demand for trucks and other forms of commercial transportation – aviation, marine and rail – will continue to rise sharply in all regions.

Demand for fuel for commercial transportation will grow by about 30 percent in North America and Europe, and more than 100 percent in the Asia Pacific region, over the course of the period covered by our *Outlook for Energy.*

The cars people drive every day – to work, school and stores – are the largest component of transportation-related energy demand today. But that is changing.

Fuel demand for trucks, buses and other heavy duty commercial vehicles is growing rapidly, and by 2030 will have become the largest single component of the transportation sector.

The biggest reason is increased road-freight movements around the world. Economic growth means more goods need to be shipped to consumers, much of it by heavy duty vehicles.

Just as cars and SUVs are achieving better fuel economy, so are many of the world's commercial vehicles; improved efficiency will reduce heavy duty demand growth by about 40 percent through 2030.

These gains in fuel economy will come from new technology and modifications to physical operation, such as reduced idling and improved route logistics. Also, larger truck size reduces demand by capturing economies of scale. This occurs predominantly in developing countries, where fleets are still maturing.

However, these gains are more than offset by increased economic activity, resulting in growth in the movement of goods within and between countries, along with operating inefficiencies such as increased road congestion, lower-density cargo and the increasing share of deliveries made directly to the consumer.

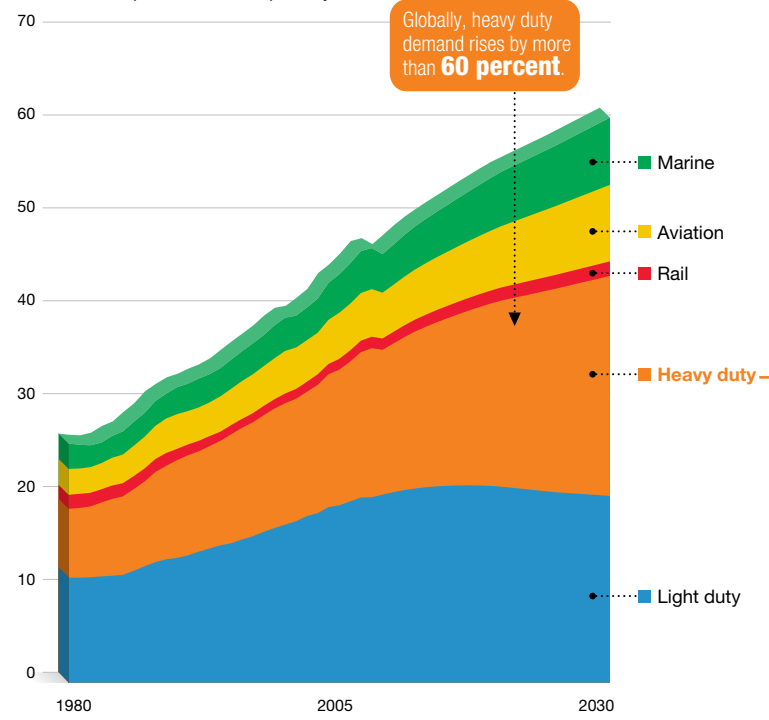
Heavy duty vehicles lead demand growth

Heavy duty vehicles – commercial vehicles such as freight trucks and buses – are the biggest influence on transportation demand through 2030.

New powertrain technology, reduced idling and improved route logistics in the heavy duty sector will lead to an anticipated **40 percent efficiency gain.**

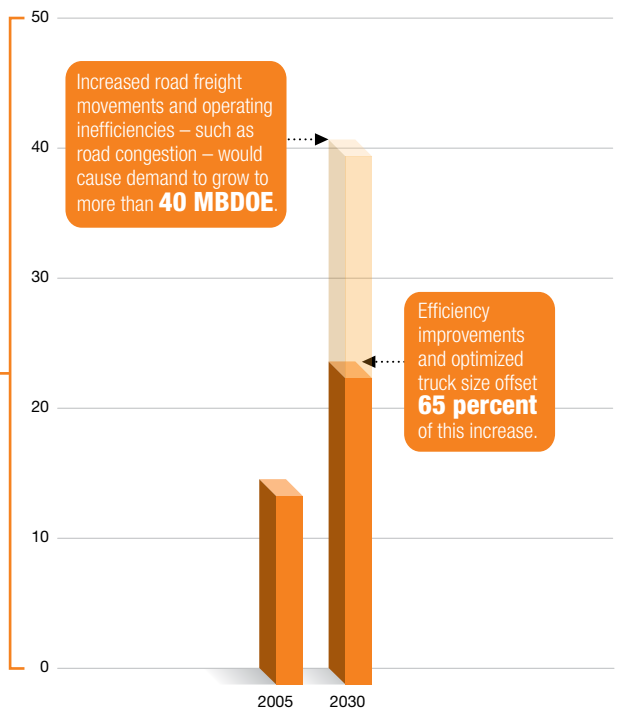
Demand for heavy duty transportation

Millions of oil-equivalent barrels per day



Heavy duty demand changes

Millions of oil-equivalent barrels per day

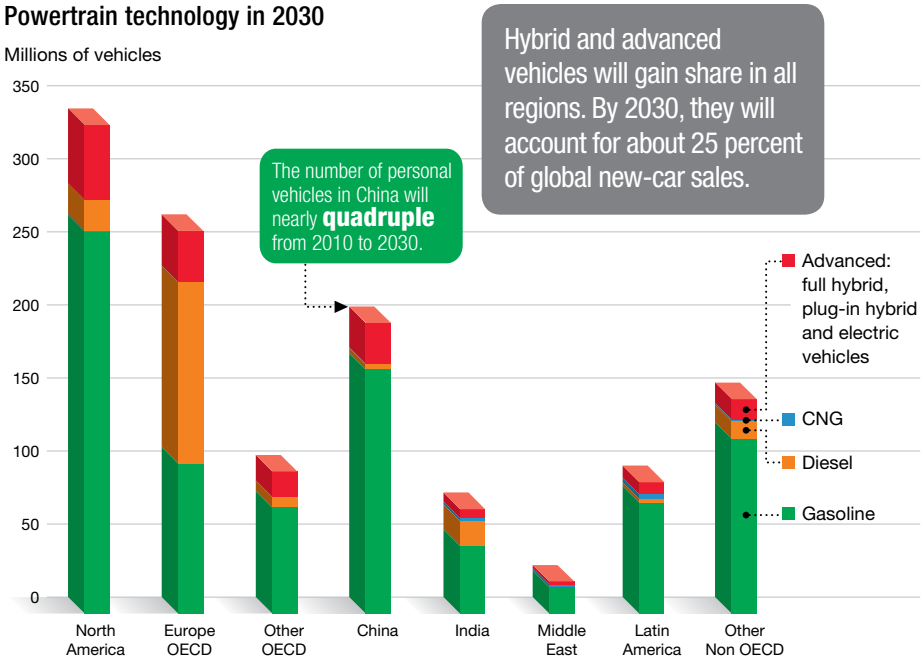


By 2030, ExxonMobil expects to see significant changes in the composition of the world's personal-vehicle fleet.

The number of vehicles will continue to grow in all regions, although through 2030 growth will be fastest in those countries that do not already have a high level of vehicle ownership. For example, of the 400 million new cars that will be added to the world's roads between today and 2030, more than one-third of them will be in China.

The world's personal-vehicle fleet also will continue to achieve better fuel economy.

Powertrain technology in 2030



Personal-vehicle fleet expands and evolves

Cars and other personal vehicles are growing in number, particularly in China and other Non OECD countries. However, they also are growing more fuel-efficient.

75 percent

of the increase in light duty vehicles through 2030 will be in **Non OECD countries.**

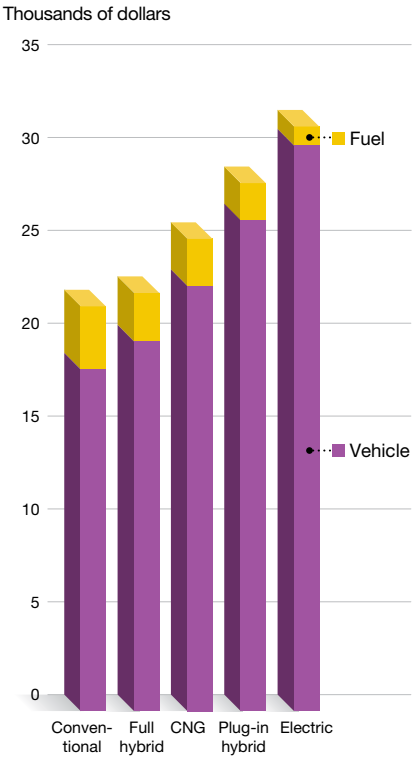
One reason will be shifts in ownership economics. While the global vehicle fleet is measured in hundreds of millions, its evolution depends on purchase choices made at an individual level. And those choices depend heavily upon fulfilling an individual's personal vehicle criteria at the lowest cost.

Today, based on purchase price and fuel costs, conventional vehicles are the most economic option for consumers; hybrids are second, carrying an additional cost of about $2,000 on average. By 2030, that differential will have narrowed significantly.

Through 2030, ExxonMobil expects that hybrids and other advanced vehicles will account for about 25 percent of global new-car sales, and almost 15 percent of all personal vehicles on the road. Growth in these advanced vehicles will be centered on full hybrids. Other types – plug-in hybrids, electric vehicles and compressed natural gas (CNG) vehicles – are likely to be limited by economics.

By 2030, ExxonMobil expects conventional vehicles to fall to about 85 percent of the world's fleet, compared to more than 99 percent today. Although hybrids and other advanced vehicles are attractive in part for their higher fuel economy, which can curb emissions and save fuel costs, it is important to remember that through 2030, new, cost-effective technologies will continue to make conventional vehicles more fuel-efficient, too.

Five-year cost of ownership in 2030



North American school bus fleet

Heavy duty fuel – lighter environmental impact

As nations around the world move toward greater prosperity, economists predict a dramatic increase in the global need for heavy duty equipment for transportation and off-highway use in the construction, mining and agriculture industries. That translates to a surging demand for diesel fuel. Our *Outlook for Energy* projects that global diesel demand in 2030 will be about 13 million barrels per day higher than in 2005.

To help meet that demand, ExxonMobil has invested more than $1 billion in refineries in the United States and Belgium to produce cleaner diesel fuel. The fuel, known as ultra-low sulfur diesel, or ULSD, powers everything from tractor-trailer trucks and buses to backhoes and threshers.

The recent expansion of facilities in Baton Rouge, La., and Baytown, Texas, along with a project in Antwerp, Belgium, means an increase of 6 million gallons a day in ultra-low sulfur diesel. The boost in production at these facilities is roughly equal to the diesel produced from about four average-size refineries.

Use of ULSD helps address environmental concerns directly by reducing sulfur emissions and also allows for the use of cleaner-burning engines and the latest vehicle emissions control devices. ULSD, used in combination with these advanced technologies, results in significant improvements to air quality.

Making such a major investment during an economic downturn illustrates the long-term business perspective of ExxonMobil. Competitiveness requires investment and adaptation regardless of the temporary business climate. Expanding existing refineries, moreover, is much more cost-effective than building new facilities from scratch. This long-term, disciplined approach brings enhanced value to shareholders.

The expansions of ExxonMobil refineries in Baton Rouge, Baytown and Antwerp increase the supply of cleaner diesel fuel and have positively impacted the local economies. These projects have provided construction jobs to more than 4,000 workers – some 11 million hours in labor – an especially welcome development in these times of high unemployment. They have also provided a significant boost to the economies of local communities.

Additionally, ExxonMobil announced plans to build a diesel hydrotreater at our Singapore Refinery. We have completed feasibility studies and early design work on the new unit. Once the unit is completed, the refinery's total low sulfur diesel capacity will rise to more than 25 million liters per day.

As our recent investments in ultra-low sulfur diesel demonstrate, ExxonMobil is committed to meet the challenge of producing the energy needed to meet global demand – and in ways that help mitigate environmental impact.

Industrial

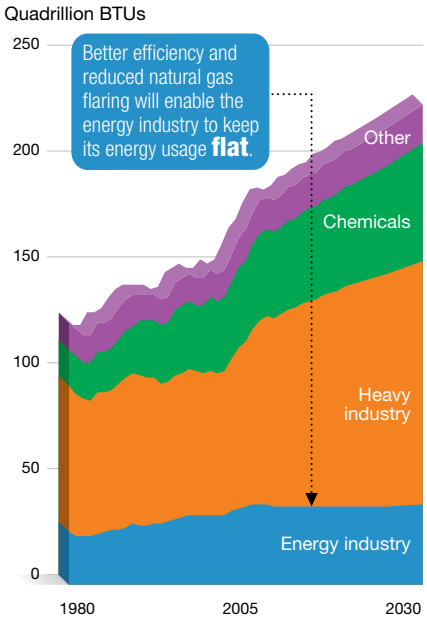
As economies expand through 2030, so will demand for energy to manufacture the cement, steel, chemicals and other durable goods that are the foundation upon which today's economies are built.

Steel production facility in Asia

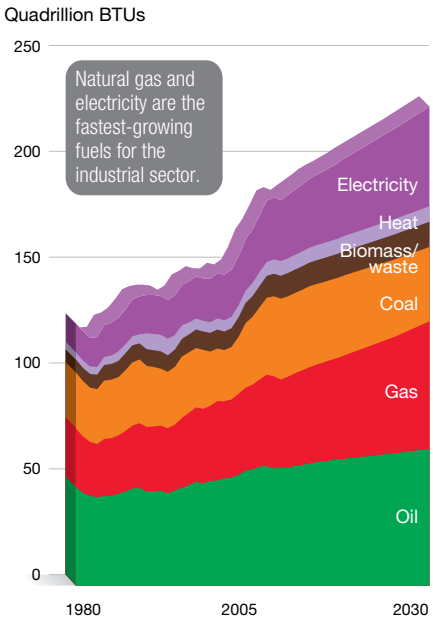
Since coal became the predominant global fuel in the early 1900s, modern energy and modern industry have been closely linked. This will continue to be true through 2030, although the geographic center of industrial demand growth has shifted to Non OECD nations, particularly those in Asia Pacific.

Globally, industrial energy demand is projected to grow by about 35 percent from 2005 to 2030. This growth is driven by an expected doubling of steel and cement production, as well as strong growth in general manufacturing. Also,

Industrial demand by sector



Industrial demand by fuel



Industrial demand continues to climb

The industrial sector represents the energy used in heavy industries such as steel and cement production, production of energy and chemicals, manufacturing of durable goods, and other activities, such as agriculture.

Energy demand rises

35 percent

in the industrial sector from 2005 to 2030.

chemicals production is expected to more than double over this time period.

Rising industrial activity will boost demand for all major fuels. However, demand would be far higher were it not for the fact that the industrial sector grows less energy-intensive over time. This is due in part to the use of energy-saving technologies – such as electric arc furnaces for steelmaking and cogeneration, which is the simultaneous production of both electricity and heat – but also growth in less energy-intensive industries such as computers and electronics.

In fact, efficiency improvements will offset 60 percent of the demand growth in the heavy industry and chemicals subsectors.

Efficiency gains will also be clearly evident in the energy industry, the third-largest industrial subsector, which includes the production of oil, natural gas and coal. Energy industry demand stays about flat through 2030, even as demand for energy products grows substantially. This achievement is the result of ongoing efficiency improvements in energy production, and a reduction in the flaring of natural gas associated with production processes.

In 2005, natural gas flaring accounted for 15 percent of total demand in the energy industry sector. By 2030, we expect flaring losses to be reduced nearly 85 percent and for flaring to account for less than 3 percent of demand in this category.

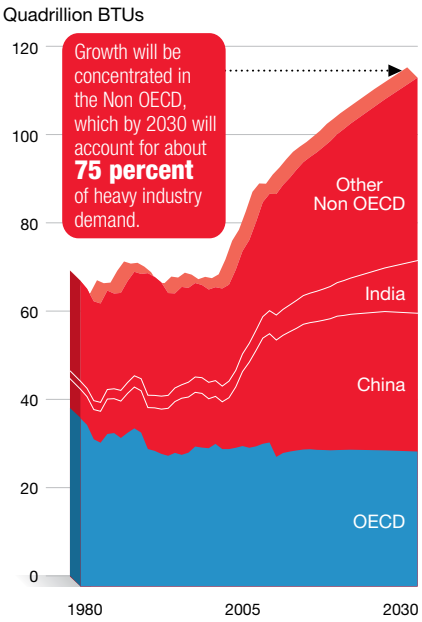
It is worth noting that the industrial sector is a large user of electricity. *(See page 28 for a look at how industrial growth will contribute to driving global electricity demand higher through 2030.)*

In general, growth in energy demand through 2030 is coming not from those mature economies in the OECD, but from fast-developing Non OECD countries such as China and India. This is especially true in the industrial sector.

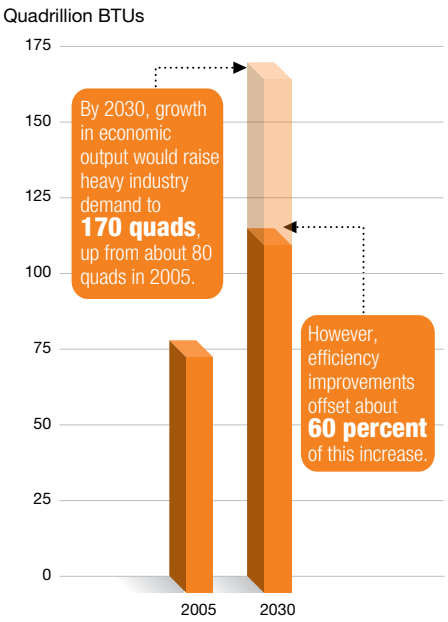
By 2030, Non OECD countries will account for about 75 percent of heavy industry energy demand. This increase is driven by continued growth in steel and cement production and increased manufacturing of goods for local consumption and export.

The largest growth in heavy industry demand will be in China over the next

Heavy industry demand



Heavy industry demand changes



China, India spur industrial growth

Fast-developing economies in Asia and the Middle East are the main drivers of industrial energy demand from 2005 to 2030.

India's demand for energy for heavy industry and chemicals will

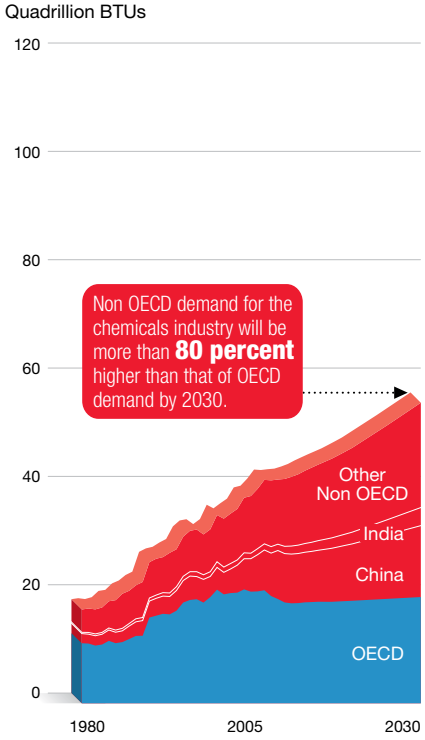
nearly triple

from 2005 to 2030.

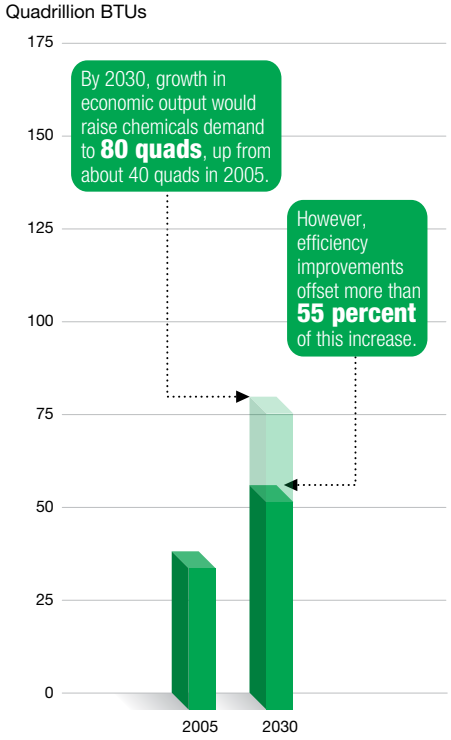
10 years, but then shifts to India, Brazil and other areas after 2020. In OECD countries, demand is down slightly.

Similar patterns are seen in the chemicals industry, where Non OECD energy demand doubles from 2005 to 2030. One factor is the Middle East, which is undergoing tremendous capacity expansion to take advantage of local oil and natural gas feedstocks. China and other developing Asian countries also are aggressively expanding capacity to lower their dependence on imports.

Chemicals demand



Chemicals demand changes



Power generation

Meeting rapidly growing demand for electricity is one of the world's biggest energy challenges. At the same time, a shift to natural gas and other cleaner energy sources for power generation offers one of the most economically effective options for curbing CO_2 emissions.

New York City, USA

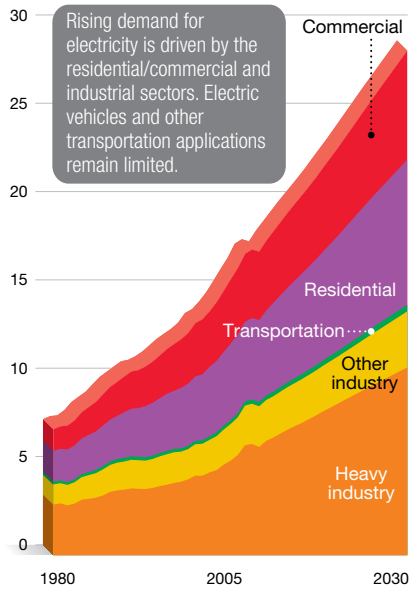
Electricity powers industry, as well as homes, offices, retail stores and critical services such as hospitals. Rising demand for electricity, and the choices of fuels used to generate that electricity, is one of the largest influences on the global energy landscape through 2030.

Global electricity demand will rise by more than 80 percent through 2030 – led by Non OECD nations, where demand will be up more than 150 percent.

Demand for electricity is driven by the residential/commercial and industrial sectors. Electric vehicles and other transportation applications remain limited. *(See page 20 for a look at the economics of alternative vehicles.)*

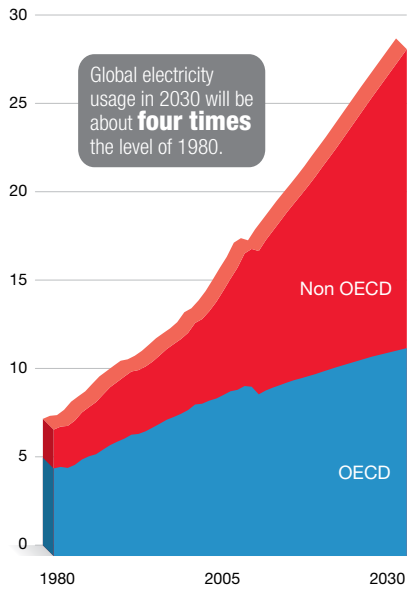
Electricity demand by sector

Thousands of terawatt hours



Electricity demand by region

Thousands of terawatt hours



Demand for electricity rises sharply

Rising demand for electricity, particularly in Non OECD nations, will have a profound influence on energy and environmental trends through 2030.

Non OECD electricity demand rises by more than **150 percent** through 2030; **OECD rises by about 25 percent.**

Electricity demand tends to rise in conjunction with broader prosperity and rising personal incomes. Therefore, as Non OECD countries continue to transition to more developed economies, they will see rapid growth in electricity demand – much like OECD countries did decades ago.

In fact, about 80 percent of the growth in global electricity demand through 2030 will likely occur in Non OECD countries. China alone accounts for 35 percent. But because Non OECD countries have significantly larger populations, their per-capita demand will still be far lower than OECD countries by that time.

This rising demand for electricity is a sign of economic and social development; for example, households shifting away from traditional biomass fuels and instead using electricity. Yet even today, approximately 1.4 billion people – about 20 percent of the world's population – still lack access to electricity.

Providing the energy to meet growing electricity demand will be a tremendous challenge through 2030.

Growing production of natural gas to fuel advanced power plants will help meet this rising demand. As a clean-burning energy source, natural gas will also help mitigate environmental impacts, as the power-generation sector is the single largest contributor to global energy-related CO_2 emissions.

By the year **2015**, electricity demand in Non OECD countries will exceed OECD demand.

What types of fuels will be used to meet rapidly growing demand for electricity?

Answering this question is complex, because power can be generated by a wide range of fuels – traditional sources such as coal and natural gas, and renewable sources such as wind and solar. With so many options, the future mix of fuels depends heavily upon cost. Costs are important because power buyers and utility companies will seek to buy the lowest-cost power first.

In most regions of the world, coal and natural gas are the most economical fuels for power generation. Today, about 40 percent of the world's power comes from coal, while about 20 percent comes from natural gas.

However, many governments are seeking to limit greenhouse gas emissions by enacting policies that put a cost on CO_2 emissions. As CO_2 costs go up, economics shift. Coal – which emits far more CO_2 than other fuels – becomes less economically attractive.

ExxonMobil anticipates that, by 2020, adoption of these policies will be equivalent to adding CO_2 costs of about $30 per ton in the OECD. At this level, natural gas becomes a lower-cost source of electricity than coal, while nuclear and wind become increasingly competitive. This shift becomes even more pronounced if CO_2 costs rise to $60 per ton, which is where we anticipate policies in the OECD will drive costs by 2030.

Even at $60 per ton, some options may still not be competitive absent major breakthroughs to reduce costs – including solar and coal- and gas-fired plants that employ carbon capture and storage (CCS) technology, where CO_2 emissions are captured and stored underground.

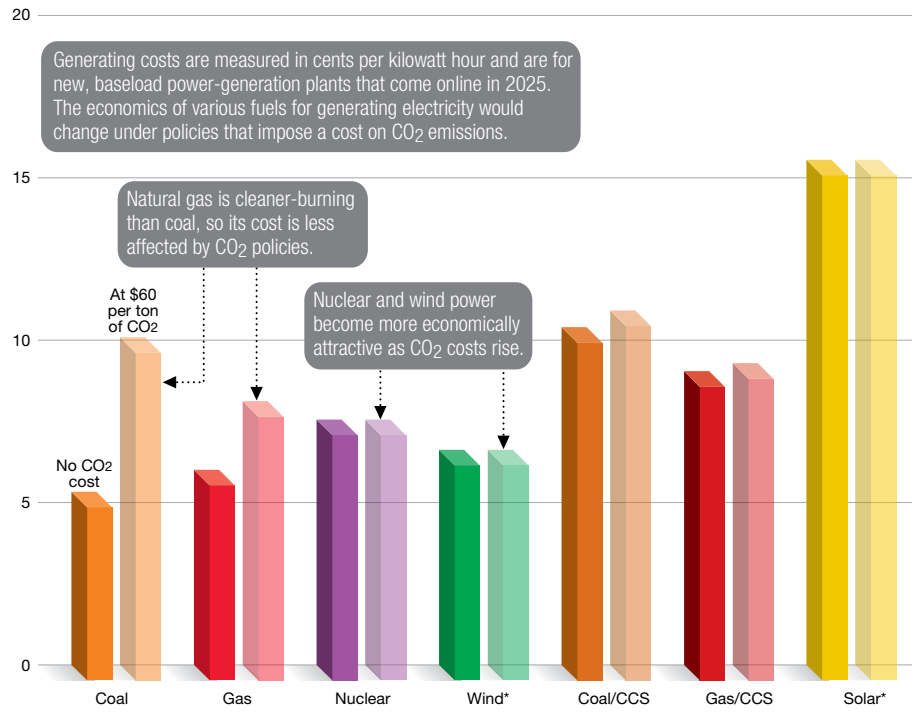
Carbon policies will shift power generation choices

Environmental policies that put a cost on CO_2 emissions will shift the economics for power generation. Under any scenario, natural gas is an attractive choice.

Using gas instead of coal
for power generation could lead to a potential
60 percent
reduction in CO_2 emissions.

Average U.S. cost of electricity generation in 2025

Cost per kilowatt hour in 2010 cents



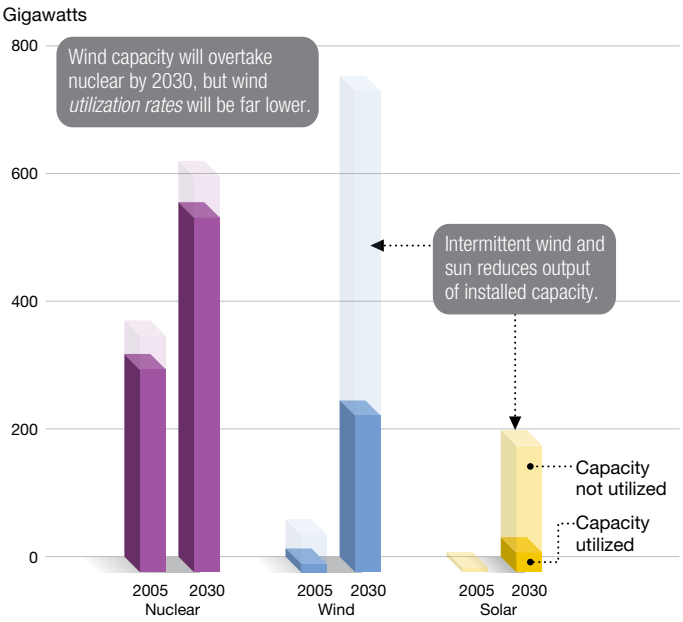
* Wind and solar exclude costs for backup capacity and additional transmission

While ExxonMobil believes CCS has the potential to be an effective technology for curbing emissions, we expect that through 2030, most CCS projects will require government support.

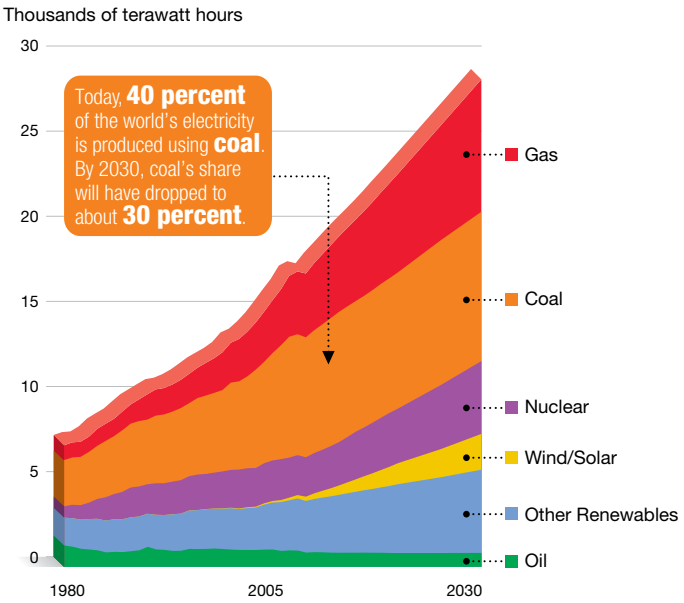
Under any scenario, natural gas is an attractive fuel choice for power generation. It is abundant and produces up to 60 percent less CO_2 emissions than coal. Also, gas-fired generation plants are based on proven technology, can be built quickly and are already cost-effective today.

ExxonMobil expects demand for natural gas for power generation to rise by about 85 percent from 2005 to 2030. By 2030, gas will be providing more than 25 percent of the world's electricity needs and will be well-positioned to become the top source for electricity production.

Global power generation capacity



Electricity demand by fuel



Nuclear, renewable fuels will expand significantly

Concerns about greenhouse gas emissions and the desire for more diversity in fuels are prompting increased investment in nuclear, wind and solar as power-generation fuels. Of these, nuclear will play the most significant role through 2030.

Global nuclear capacity is projected to rise by nearly

70 percent

from now through 2030.

The world will see significant additions to nuclear capacity through 2030. Wind and solar capacity will also rise sharply, albeit from a much smaller base.

This capacity growth, shown in the chart on the left above, is driven in the OECD by policies that impose a cost on carbon emissions, making these fuels more economic. In the Non OECD, much of the growth stems from China's plans to increase all forms of electric power generation.

Collectively, this growth will require significant investment over the next 20 years. But *building* capacity for power generation is not the same as *utilizing* that capacity.

The generating capacity and efficiency of a given power plant each contribute to its ability to provide an economic source to meet "baseload" and/or "peak" power requirements as electricity demand shifts throughout the day. Nuclear is a very reliable "baseload" technology, and up to about 90 percent of its capacity will be used to generate electricity.

Wind- and solar-powered generating facilities, however, are heavily dependent on natural variability in wind and sun conditions, which result in much lower capacity utilization levels. So while the absolute capacity of wind facilities is likely to overtake nuclear by 2030, much of this capacity will not be utilized due to the variability of wind resources.

Still, wind and solar will play a much bigger role in power generation in coming decades.

In fact, to meet projected increases in global demand for electricity, all economic fuel sources will need to expand through 2030. Of the increase needed from 2005, natural gas provides about 35 percent and coal about 25 percent.

Today, 40 percent of the world's electricity is made from coal. By 2030, coal's share will have dropped to about 30 percent.

In Asia Pacific, coal is the predominant fuel; in the U.S. and Europe, the mix is quite different, with coal being overtaken by natural gas, nuclear, and in Europe, renewable fuels. These differences will only grow more pronounced through 2030.

Demand for energy for power generation in Asia Pacific is projected to grow dramatically in conjunction with rapid economic growth and rising living standards. In fact, by 2030, Asia Pacific power-generation demand will be about one-and-a-half times the level of North America and Europe combined.

Much of the growth in Asia Pacific demand will be met by coal. Demand for coal for power generation in Asia Pacific will continue to rise sharply – with growth at about 85 percent from 2005 to 2030. Coal will lose some market share to natural gas, nuclear and renewable fuels, which will also see strong growth; by 2030, coal will account for less than 60 percent of the fuel required for power generation in Asia Pacific, down from about 70 percent today.

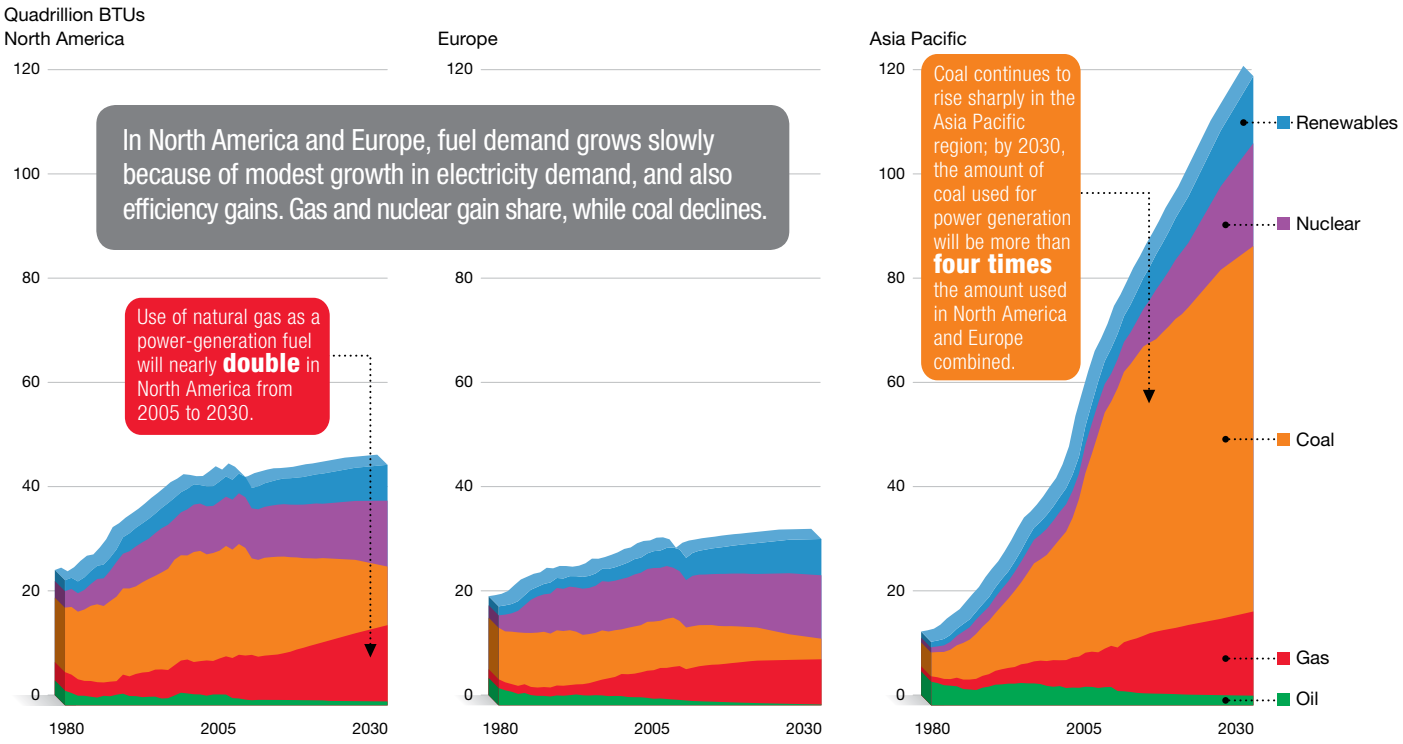
Power-generation demand is climbing less quickly in more mature economies of North America and Europe. In all regions, improvements to efficiency help curb demand growth.

Power-generation demand growth is led by Asia Pacific

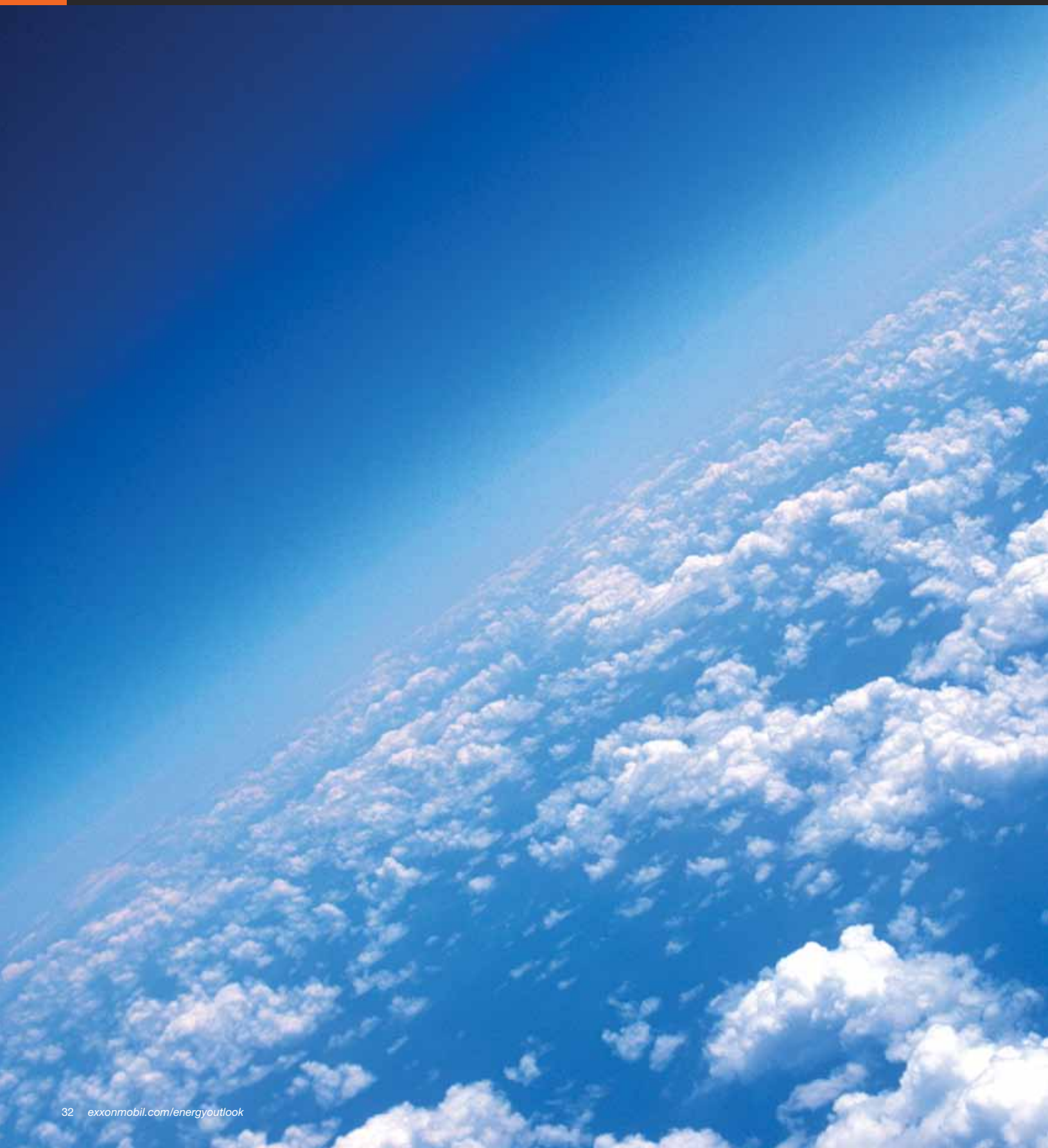
Demand for electricity, and usage of coal, is accelerating in the Asia Pacific region – a very different picture than in North America or Europe.

From 2005 to 2030,
demand for natural gas in power generation will increase by
85 percent.

Power generation by fuel



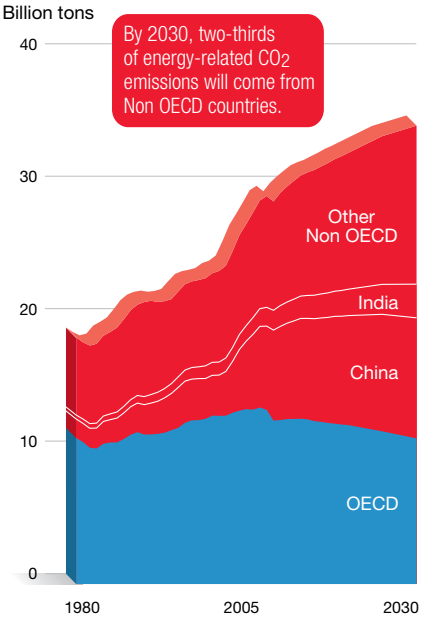
Greenhouse gas emissions



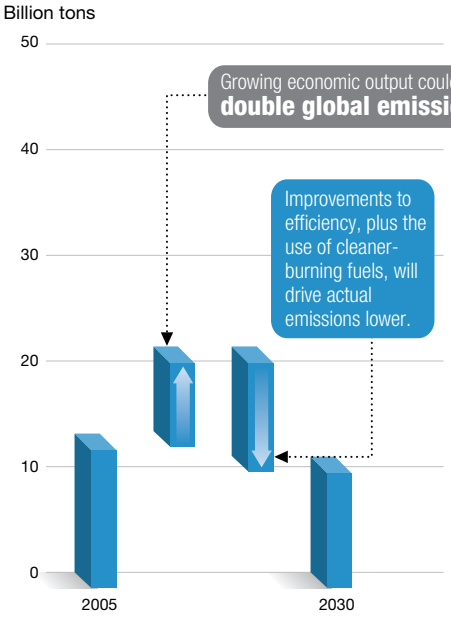
Meeting the world's energy challenges goes beyond balancing supply and demand; it also requires managing the risks posed by rising greenhouse gas emissions. Globally, rising energy demand will result in higher energy-related CO_2 emissions through 2030, but improved efficiency and a shift toward cleaner fuels will mitigate emissions growth.

View of earth from 40,000 feet

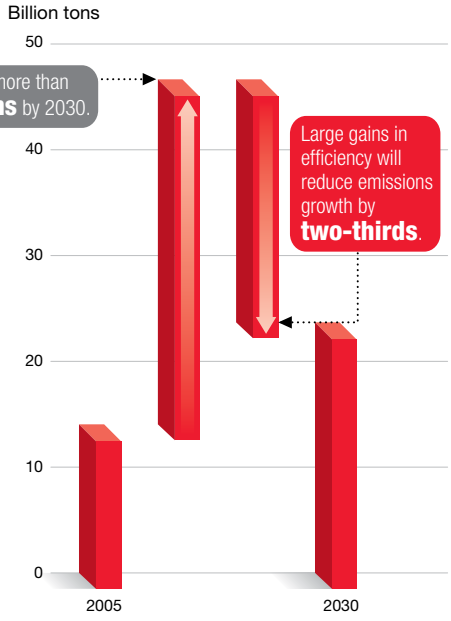
Energy-related CO_2 emissions by region



CO_2 emissions in OECD



CO_2 emissions in Non OECD



Global CO_2 emissions to increase through 2030

Reducing global emissions is increasingly recognized as a significant challenge. Because different regions are at different stages in their economic development, trends for energy-related CO_2 emissions through 2030 vary greatly between OECD and Non OECD countries.

By 2030, emissions in OECD countries will be **back to 1980 levels.**

The outlook for energy-related CO_2 emissions is linked directly to the types and amounts of energy required globally.

Today, energy-related CO_2 emissions in Non OECD nations exceed those in the OECD by almost 40 percent, and by 2030 are likely to be double those of OECD nations. In total, global CO_2 emissions are likely to increase about 25 percent from 2005 to 2030.

While the expected increase in CO_2 emissions is substantial, it is significantly lower than the projected 35 percent growth in energy demand. This outlook reflects broad energy efficiency gains in economies around the world and a shift toward natural gas and other less carbon-intensive energies.

In OECD countries, CO_2 emissions will decline through 2030 even as economic output grows by more than 60 percent and population grows by 10 percent.

Those reductions will be more than offset, however, by rising CO_2 emissions in Non OECD countries, where rapid economic development and rising prosperity will produce large increases in demand for energy, and particularly for power generation – a large portion of which will be met by coal, the most carbon-intensive fuel.

While Non OECD countries will see gains in energy efficiency and increase their share of cleaner fuels, the resulting CO_2 savings are more than offset by the tremendous rise in energy demand that will be needed to fuel rapid economic development. By 2030, Non OECD nations will account for approximately two-thirds of energy-related CO_2 emissions worldwide.

Even with this large projected share of global emissions, average per-capita CO_2 emissions in the Non OECD, while rising through 2030 in line with higher prosperity, will still be less than half the levels seen in the OECD at that time.

Another way to measure emissions is per unit of economic output. On this basis, OECD nations today have much lower emission levels than in the Non OECD. By 2030, the gap shrinks somewhat but remains significant.

While global CO_2 emissions are seen rising by about 1 percent a year on average between 2005 and 2030, that is lower than the projected average rate of growth in energy demand, which is more than 1.2 percent a year.

This achievement – meeting rising energy demand while slowing growth in emissions – is the result of accelerated gains in energy efficiency and a shift toward lower-carbon fuels. For example, natural gas can result in up to 60 percent less CO_2 emissions than coal, currently the most widely used fuel for power generation.

Progress will be most evident in the OECD, where emissions are projected to fall by about 15 percent from 2005 to 2030. By 2030, OECD emissions will be back to levels not seen since 1980.

Non OECD emissions, however, are projected to increase by almost 70 percent over the period from 2005 to 2030.

Yet Non OECD emissions growth would be far steeper without the significant improvements in efficiency expected in these countries through 2030. ExxonMobil expects efficiency gains in Non OECD countries to offset about two-thirds of the growth in emissions that would have been associated with the steep increases in demand projected for these countries; a shift toward fuels with lower carbon intensity will have a modest impact.

In all regions of the world, we see the dual power of efficiency, which not only helps balance market needs for reliable, affordable supplies but also helps mitigate risks associated with greenhouse gas emissions.

Efficiency to curb emissions growth

Improved efficiency and increased use of cleaner fuels, such as natural gas, are effective tools for reducing CO_2 emissions.

Emissions per capita

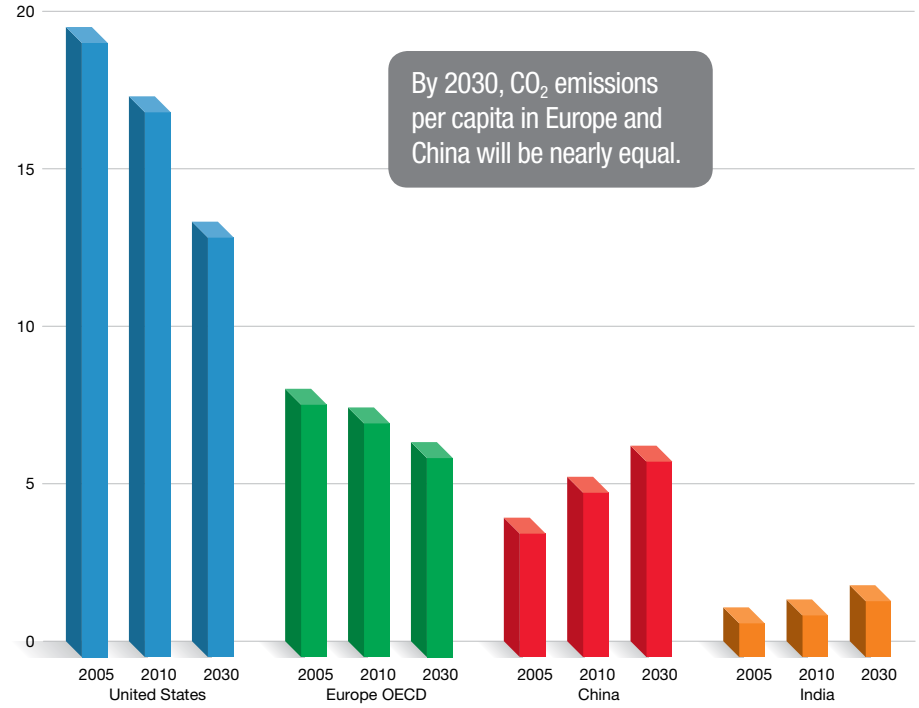
are falling

in the U.S., Europe and Asia Pacific OECD,

but rising elsewhere.

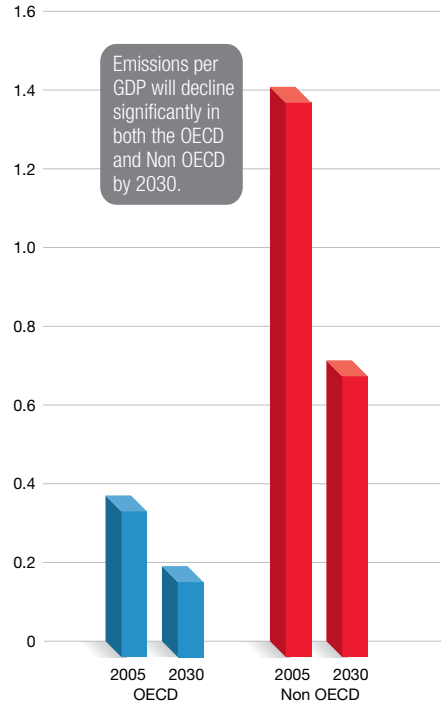
Emissions per capita

Tons per person



Emissions per GDP

Tons per GDP in thousands of 2005 dollars



Power generation is the world's largest and fastest-growing energy-demand sector. It is also the sector that produces the most emissions – accounting for slightly more than 40 percent of global CO_2 emissions.

Through 2030, ExxonMobil sees strong growth in cleaner energy sources for power generation, such as natural gas and nuclear, which will gain share from coal, currently the most popular fuel for power generation. This shift will be spurred in part by government policies – particularly in the OECD – that are designed to reduce emissions by imposing a cost on carbon.

This shift toward cleaner fuels for power generation will help slow growth in emissions from this sector even as demand for power generation rises dramatically. By 2030, as power generation's share of global energy demand rises from about 35 percent to more than 40 percent of energy demand, this sector's share of global emissions will remain roughly unchanged.

Collectively, the power-generation and transportation sectors account for almost two-thirds of energy-related CO_2 emissions today – and about 80 percent of the increase in emissions from 2005 through 2030. Rapidly growing electricity demand, along with increased activity from heavy duty vehicles, airplanes and other commercial transportation, contribute to this projection.

From a scale perspective, power plants emit more CO_2 than any other sector, and so are naturally an area of significant interest. Several options for cost-effective avoidance of emissions resulting from power generation are readily available. Building a new gas, nuclear or wind power-generation plant instead of a coal-fired plant enables emissions reductions for a cost of less than $50 per ton of CO_2 avoided. These options are competitive at the cost of CO_2 we assume in the *Outlook*.

Emissions growth moderates in power-generation sector

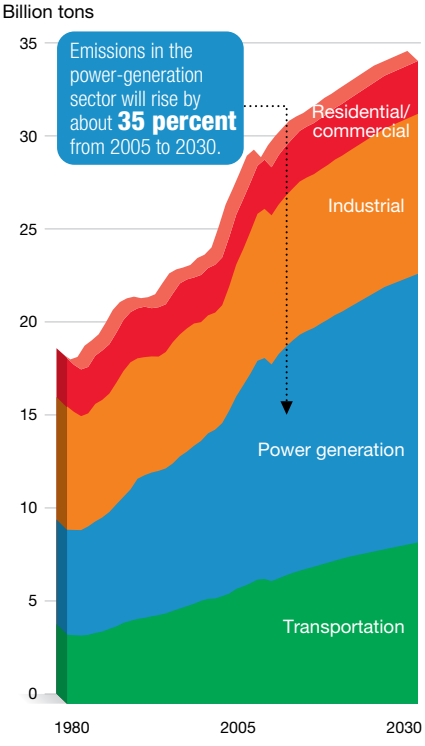
As the largest energy-consuming sector, and the one that emits the most CO_2, power generation offers a significant opportunity for curbing CO_2 emissions.

The annual rate of emissions growth from the power-generation sector in 2005-2030 will drop by more than

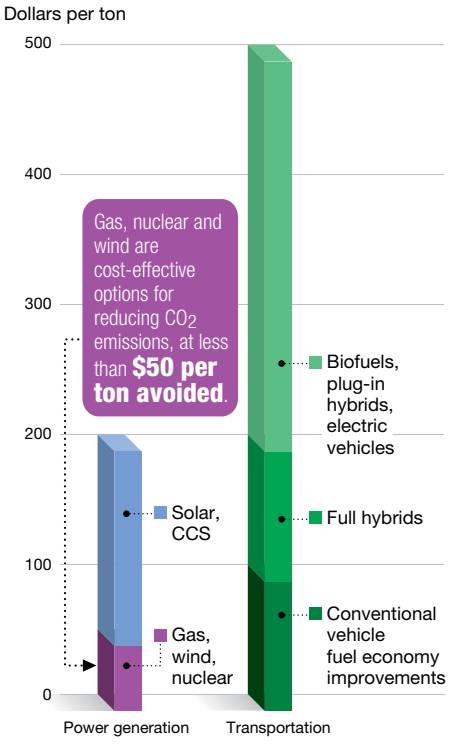
50 percent

vs. 1980-2005.

CO_2 emissions by sector



U.S. cost of CO_2 avoidance vs. new coal



Avoidance costs for CCS and solar are somewhat higher, ranging from $50 to $200 per ton of CO_2 avoided.

In the transportation sector, technologies and fuel types vary quite significantly in terms of the cost of CO_2 avoided. Only conventional vehicle fuel-economy improvements enable avoidance for less than $100 per ton of CO_2. Use of full hybrid light duty vehicles costs up to $200 per ton of emissions avoided, while biofuels, plug-in hybrids and electric vehicles have even higher costs of CO_2 avoidance.

Global CO_2 emissions in the industrial and residential/commercial sectors are projected to rise, but very slowly, reflecting increased electrification and a movement away from coal and other more carbon-intensive fuels.

Globally, ExxonMobil has interests in nearly

4,900 megawatts

of capacity for cogeneration – the simultaneous production of electricity and heat or steam that can be used for industrial purposes.

More than

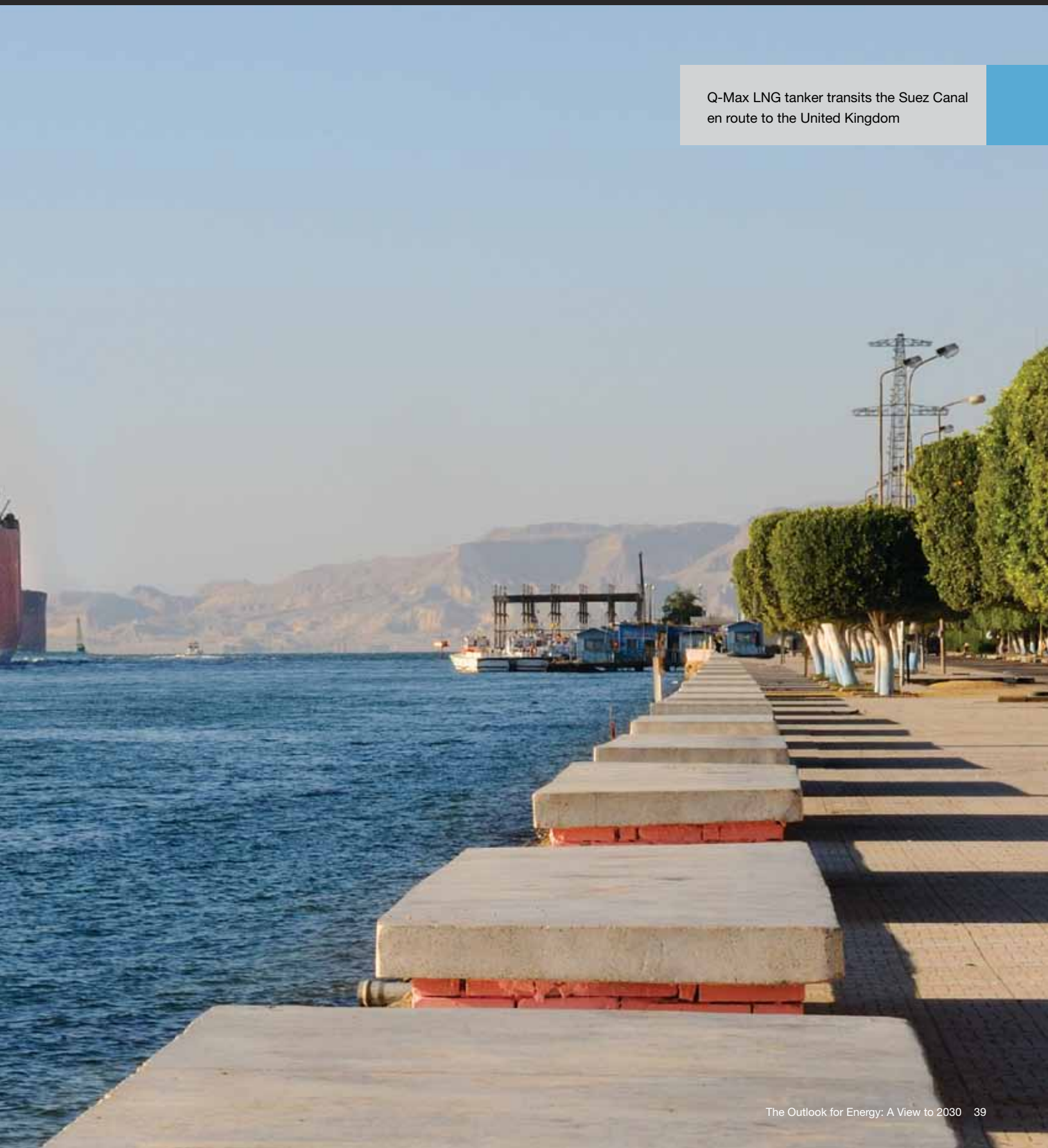
6 million tons

of CO_2 emissions per year are avoided from these operations.

ExxonMobil's newest cogeneration facility in Antwerp, Belgium

Supply

As populations and economies grow, our demand for energy expands. At the same time, as new technologies are developed, our energy sources evolve – growing cleaner and more diverse. And we continue to find ways to use energy more efficiently. These concepts – expansion, evolution and efficiency – will continue to shape energy trends to 2030.



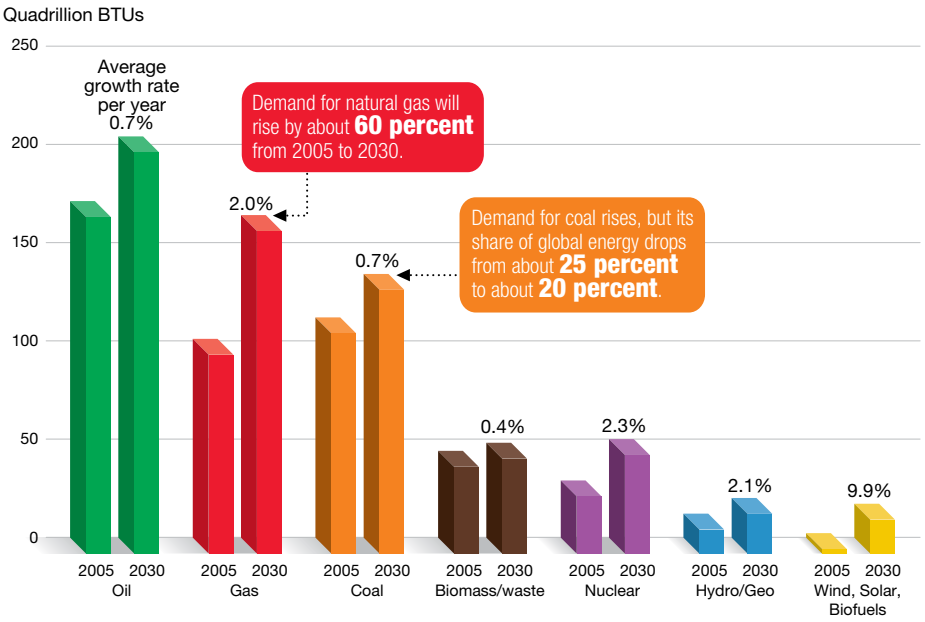
Q-Max LNG tanker transits the Suez Canal en route to the United Kingdom

With the scale of the world's energy needs already enormous, and global demand projected to rise by about 35 percent from 2005 to 2030, it is clear that all reliable, affordable energy sources must be expanded in order to provide the energy needed for economic growth and societal development.

However, through 2030, there will be some significant shifts in the composition of the world's energy.

Oil, natural gas and coal will remain the most significant energy sources. By 2030,

Global demand by fuel



Demand for all fuels to rise through 2030

Energy from all sources will expand through 2030, but gains will be fastest for fuels with lower greenhouse gas emissions: natural gas, nuclear and renewable fuels, such as wind and solar.

Natural gas

will be the fastest-growing major fuel source

through 2030, with its share of global energy rising from about 20 percent to

about 25 percent.

they will provide just under 80 percent of global energy, down slightly versus today.

But the fastest growing of these will be natural gas. This rapid expansion of natural gas demand through 2030 will be the result of two factors. One is a steep rise in demand for fuel for power generation and industry, particularly in Non OECD countries. The second is a shift away from coal in order to reduce CO_2 emissions, particularly in OECD countries.

Those two factors – rising power-generation demand and a desire to reduce CO_2 emissions – are also helping drive growth in nuclear power. Natural gas and nuclear power offer cost-competitive solutions for meeting rising demand while also reducing emissions.

These fuels are affordable, dependable and rely on proven technologies, so their contribution can make a significant impact in terms of scale.

Another significant shift in the world's energy mix through 2030 will be tremendous growth in wind, solar and biofuels. In 2005, the contribution of these three fuels was negligible – at less than half of 1 percent of total energy demand. By 2030, they will provide about 3 percent of the world's energy.

Oil continues to be the world's largest energy source. About 85 percent of the projected growth in oil demand through 2030 is tied to the transportation sector, where a steep rise in the use of heavy duty trucks and other forms of commercial transportation and substantial growth in personal vehicle ownership in the Asia Pacific region are more than offsetting improved vehicle efficiency.

By 2030, natural gas will have become the second-largest global energy source, ahead of coal. Growth of this cleaner-burning fuel is being aided by technologies that have unlocked vast new supplies of natural gas, including shale gas, tight gas and coal bed methane. *(See page 48 for more information on the outlook for natural gas supplies.)*

The market share of coal will decline, particularly in the OECD, but this abundant, affordable fuel will continue to play a key role through 2030 and beyond.

The coal shown here can meet the **world's coal demand** for just over **1 second.**

Rail cars carry coal to U.S. power facilities

Rising coal demand driven by Non OECD

While coal's share of the world's energy demand is declining, absolute demand continues to rise to meet power-generation needs in Non OECD countries.

Coal provides close to **25 percent of the world's energy,** and about **45 percent of fuel for power generation.**

Coal was the fuel that powered the start of the Industrial Revolution. But as technologies evolved and now, as concerns about CO_2 emissions are rising, we see the share of coal in the global energy market declining. This trend is expected to continue through 2030.

However, coal continues to be a significant source of energy.

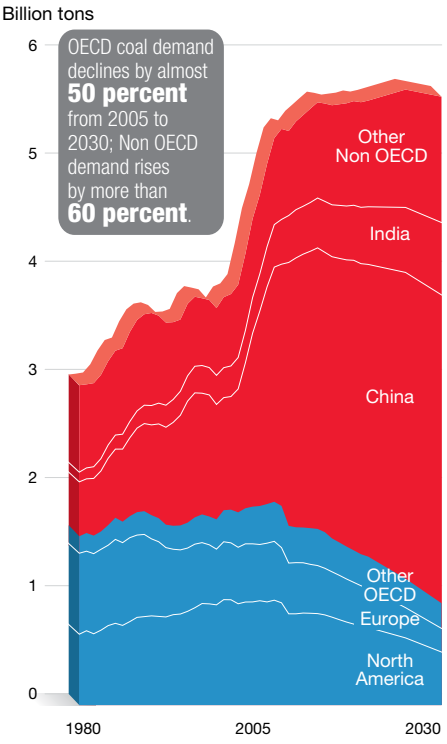
In OECD countries, demand for coal is projected to decline through 2030, driven by initiatives to increase the cost of CO_2 emissions and difficulties obtaining licenses to build new coal power plants. But that decline will be more than offset by expected strong growth in coal demand in Non OECD countries, to serve rapidly rising power-generation needs.

Demand will be particularly strong in China and India, where coal consumption is expected to rise by nearly 60 percent and almost 95 percent, respectively, from 2005 to 2030.

However, most of the projected growth in China's coal demand has already occurred. Demand will now grow less rapidly as the pace of build-up of China's national infrastructure starts to flatten out, and the country diversifies the fuels used for power generation.

India, on the other hand, will see strong growth for coal throughout the period covered by *The Outlook for Energy*, with demand nearly doubling. By 2030, India will account for more than 10 percent of global coal consumption – the same amount used by the United States and all of the European OECD countries combined.

Coal demand by region



Oil is the world's single largest energy source and will remain so through 2030. Nearly all the world's transportation runs on liquid fuels because they provide a large quantity of energy in small volumes, making them easy to transport and widely available.

By 2030, global liquids demand will be the equivalent of slightly more than 100 million barrels per day (MBDOE), a rise of more than 20 percent from 2005 demand of 84 MBDOE.

This increase will be met nearly equally by the Organization of Petroleum Exporting Countries (OPEC) and Non OPEC sources.

Today, the world's largest source of liquid fuels is the crude oil and condensate produced in Non OPEC countries. That will continue to be true in 2030. However, Non OPEC production of crude and condensate is expected to be essentially flat through 2030, as growth in certain areas – deepwater and oil sands – offsets declines in more conventional oil fields.

Therefore, growth in demand for liquid fuels through 2030 will need to be met by expanded production in OPEC countries, as well as biofuels and other petroleum sources such as natural gas liquids (NGLs), coal- and gas-to-liquids, and gains achieved via improved refinery processing.

ExxonMobil expects that global production of liquid fuels, excluding OPEC crude, will grow to about 67 MBDOE in 2030, as shown in the lower shaded areas of the chart.

The difference between these supplies and projected global demand is termed the "call on OPEC crude." ExxonMobil projects the call on OPEC, currently around 29 MBDOE, to grow to about 36 MBDOE by 2030. We expect that this production level will be achievable, given OPEC's resource base and incentives for development.

Liquid fuels production rises to meet demand

Mostly because of growth in the transportation sector, global demand for crude oil and other liquid fuels will rise by more than 20 percent from 2005 to 2030.

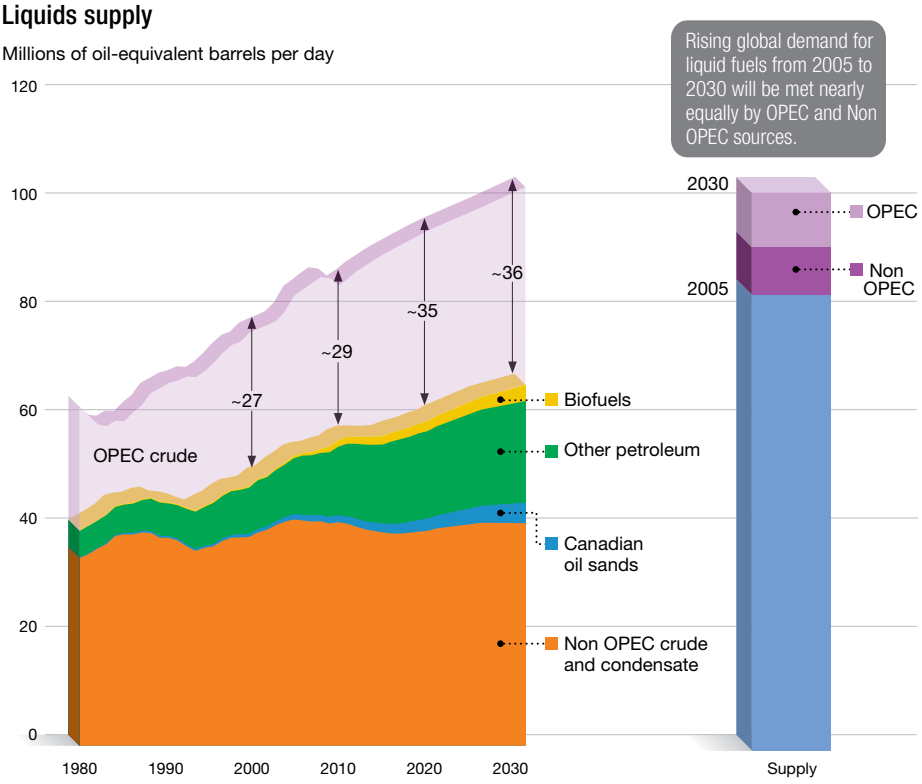
Canadian oil sands and biofuels are examples of how energy sources can evolve over time. These two sources, whose contribution was negligible less than a decade ago, will provide more than

5 percent

of the world's demand for liquid fuels by 2030.

Liquids supply

Millions of oil-equivalent barrels per day



Natural gas liquids (NGLs) will play an increasingly large role in meeting the world's need for liquid fuels. Global NGL output is seen rising through 2030 to about

11 million barrels

a day – an amount larger than Saudi Arabia's current oil production. By 2030, more than 10 percent of global liquid-fuel demand will be met by NGLs.

Deepwater drilling: Safeguarding a valuable resource

Before April 2010, few people outside the energy industry gave much thought to the rapid growth in deepwater drilling and development. But that changed with the Deepwater Horizon tragedy in the Gulf of Mexico, which brought worldwide attention to the increasingly important role that deepwater resources play in meeting global energy demand.

In recent years, more than 14,000 wells have been drilled in water depths of 2,500 feet or more, as technology advancements have made previously unreachable reserves economically viable. According to Cambridge Energy Research Associates, global deepwater production has more than tripled since 2000 to approximately 5 million barrels a day – and could possibly rise to as much as 10 million barrels a day by 2015. Additionally, deepwater exploration has accounted for approximately 50 percent of all global discoveries since 2006.

The Gulf of Mexico is one of the three leading deepwater regions in the world, along with West Africa and Brazil. Deepwater drilling in the Gulf of Mexico currently accounts for 30 percent of all U.S. crude oil production and is a key factor behind a recent drop in U.S. oil imports. In 2009, deepwater drilling helped the U.S. increase domestic oil production for the first time since 1991.

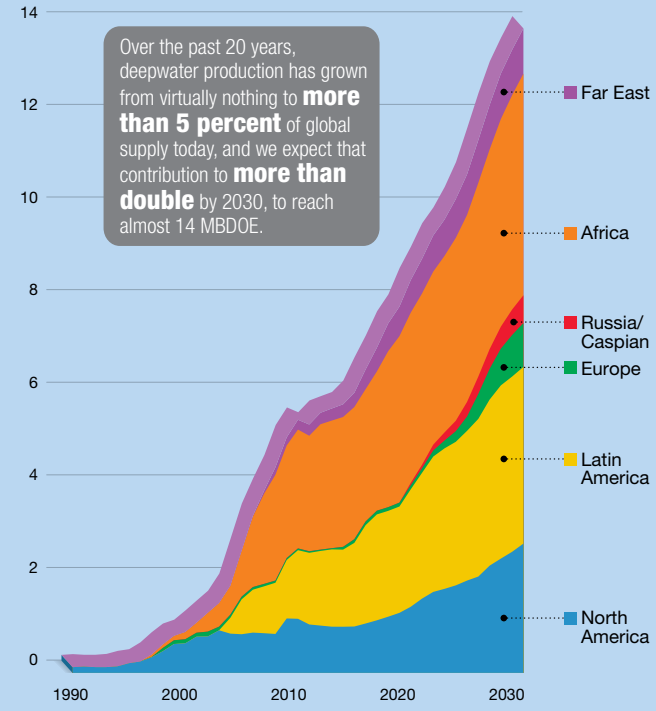
But oil and gas production in the Gulf of Mexico does more than provide affordable energy to U.S. consumers. Offshore energy production, including deepwater, accounts for approximately 170,000 direct and indirect jobs in the United States and generates many millions of dollars in taxes, royalties and other economic benefits to local and state communities.

Over the years, ExxonMobil has safely drilled more than 250 deepwater wells, including 35 in the Gulf of Mexico. Our experience has proven that with proper design, effective risk management, established procedures, built-in layers of redundancy, extensive testing, and an overarching focus on the safe and effective maintenance and operation of equipment, tragic accidents need not occur.

For example, our Operations Integrity Management System (OIMS) – which we utilize on every operation we undertake, including deepwater drilling – is just one of the tools that ExxonMobil uses to measure and mitigate safety, security, health and environmental risk. OIMS is a rigorous regime of 11 separate management elements that is deeply embedded into our culture, giving our employees and contractors a common global language for safety and accountability.

Deepwater outlook by region

Millions of oil-equivalent barrels per day



Through OIMS, we have documented standards for equipment and well design, and proprietary technology to predict pressures and model resource flow. We carefully analyze that data to reduce risk, and we ensure that everyone on board the rig, including contractors, knows their roles and responsibilities. OIMS ensures that all operations are in compliance with ExxonMobil's standards.

In addition to our own internal systems and processes, ExxonMobil has joined together with other leading energy companies to develop and deploy a new Marine Well Containment System. This billion-dollar system will be available to our industry to respond more effectively to a deepwater incident in the Gulf of Mexico, bringing our combined expertise, equipment and technologies to bear quickly and efficiently.

The new system will include a unique design capable of containing up to 100,000 barrels of oil a day (with potential for expansion) in water depths of up to 10,000 feet. It can begin to be mobilized within 24 hours of an incident. ExxonMobil is leading the design and development of this system, which should never be needed if everyone in the industry adheres to the stringent standards already in place.

Natural gas adapts to growing needs

Pre-1800 – Natural gas has its beginnings more than 2000 years ago, when it was first utilized by the Chinese for boiling sea water to make it drinkable. But it wasn't until the 1800s that the world began to realize the potential of gas – for lighting, cooking, heating and beyond.

1852 – For the first time, gas lights outnumber oil lamps in New York City.

1860 – Etienne Lenoir patents the gas engine. His experiments in France pave the way for gas-fired power-generation equipment and the internal combustion engine, which is subsequently used for gas compression in pipeline systems.

1800

In the late 18th and early 19th centuries, several cities on the U.S. east coast and in Europe began to use gas, either manufactured from burning coal or originating from natural seeps.

By 1850, gas was predominantly used as a fuel for gas lamps to light homes and city streets. At the same time, mid-century entrepreneurs promoted gas as a source of heat, paving the way for gas-fueled cooking and heating appliances.

1850

1821 – The first well specifically intended to obtain natural gas is dug in Fredonia, N.Y., in what is today known as the Marcellus Shale.

1880 – The first natural gas compressor station is put into operation by the Bradford Gas Company in Pennsylvania.

1880 – Manufacturers begin selling gas appliances – mostly cooking stoves and water heaters – to consumers in Europe and North America.

1812 – The British Parliament grants a charter to the London and Westminster Gas Light & Coke Company, and the first gas company in the world comes into being.

1859 – Natural gas from the first oil well drilled by Colonel Edwin Drake is transported via a small, rudimentary pipeline to the village of Titusville, Penn. The construction of this pipeline proves that natural gas can be brought safely from the underground source to be used for practical purposes.

1800 **1850**

1934 – Gas industry exhibit at the World's Fair in Chicago features "Gas in the Home."

1959 – The Groningen field is discovered in the Netherlands, marking the beginning of the gas industry in the North Sea. For more than 50 years, the field has reliably supplied European customers with vast quantities of natural gas.

1904 – European and American utility companies begin to use gas for central heating and large-scale hot water supplies.

1900

The 20th century brought the introduction of lengthy steel pipelines that allowed gas to be safely carried under higher pressures, thus in greater quantities, to fuel industrial, commercial and residential needs.

By the middle of the 20th century, natural gas was being used across all sectors, and demand was growing rapidly. Advances in gas liquefaction and transcontinental pipelines enabled long-distance transport, and gas became a globally rather than a regionally traded energy supply.

1950

1925 – The first long-distance, welded steel pipeline is built by Magnolia Gas of Dallas, Texas, stretching from northern Louisiana to Beaumont, Texas.

1938 – The U.S. Congress passes the Natural Gas Act, marking the entrance of the federal government into the field of regulatory and price control of the natural gas industry.

1940 – The first gas-powered turbine to generate electricity for public use is operated at a power station in Switzerland.

1959 – World's first liquefied natural gas (LNG) tanker carries 2,000 tons of gas from the U.S. to the United Kingdom. LNG transport further expands the market for gas and enables it to become a globally traded fuel.

1964 – First commercial-scale LNG plant is commissioned in Arzew, Algeria. Long-term supply contracts are quickly signed with the U.K. and France.

1968 – Austria becomes the first Western European country to negotiate a gas contract for Russian supplies.

1969 – Japan begins imports of Alaskan LNG, while Brunei becomes the first LNG producer in Asia Pacific to supply Japan.

1990 – The New York Mercantile Exchange (NYMEX) launches the world's first natural gas futures market.

2010 – The U.S. gas pipeline network, laid end-to-end, would stretch to the moon and back twice.

2006 – The first of Qatargas' megatankers is delivered, taking LNG carrying capacity to previously unheard-of levels. The tankers, known as Q-Flex and Q-Max, have capacities of 210,000 and 266,000 cubic meters, respectively.

2000

The use of lower-carbon fuels like natural gas to help reduce greenhouse gas emissions is essential to meet our current and future energy challenges. Given its abundance and properties as a clean-burning fuel, expanded use of natural gas – particularly in power generation – can not only help meet growing demand for electricity, but also enable advancement of environmental goals.

2030

1998 – The U.K.-Continent Interconnector, one of the most important European infrastructure projects in recent years, commences operation.

2002 – Reliance Industries discovers gas in the Krishna Godavari offshore basin in India.

2006 – China imports its first LNG cargo.

1983 – The U.S. government completes the process of deregulating the natural gas industry by passing the Natural Gas Wellhead Decontrol Act (NGWDA).

Global gas demand by end use

Billions of cubic feet per day

The expansion of natural gas – both in its application across sectors, as well as in the quantity of available, affordable supplies – is a prime example of how technological advances have enabled energy sources to adapt to the world's changing needs.

Natural gas power plant in the USA

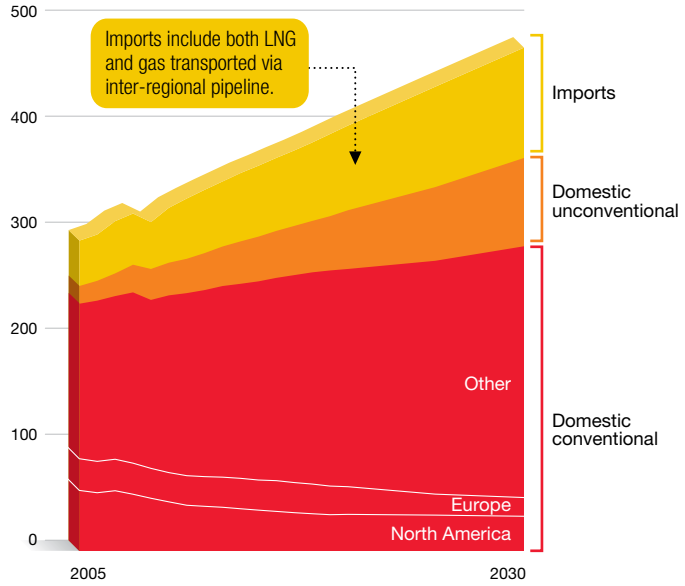
It's clear that changes in energy use and technology development reflect an evolutionary process that spans decades. Over time, however, the process leads to revolutionary impacts.

What began as a fuel to provide light has today evolved into a powerful tool for meeting rising demand for energy, while also helping to curb growth in energy-related CO_2 emissions. Over the last 100 years, natural gas has become an essential fuel for meeting our energy challenges, and now provides more than 20 percent of global energy demand worldwide.

Looking out to 2030, ExxonMobil expects gas to play an even larger role as the world's energy mix continues to grow more diverse. Recent technology advances have expanded economic supplies of LNG and unlocked vast resources of shale gas in North America, expanding opportunities for developed and developing nations to capture the benefits of gas as a reliable, affordable energy source that will also help support environmental improvements. These advances are part of the evolution that is contributing to the growth of gas as a key fuel source globally. By 2030, we expect that gas will supply more than 25 percent of the world's energy needs.

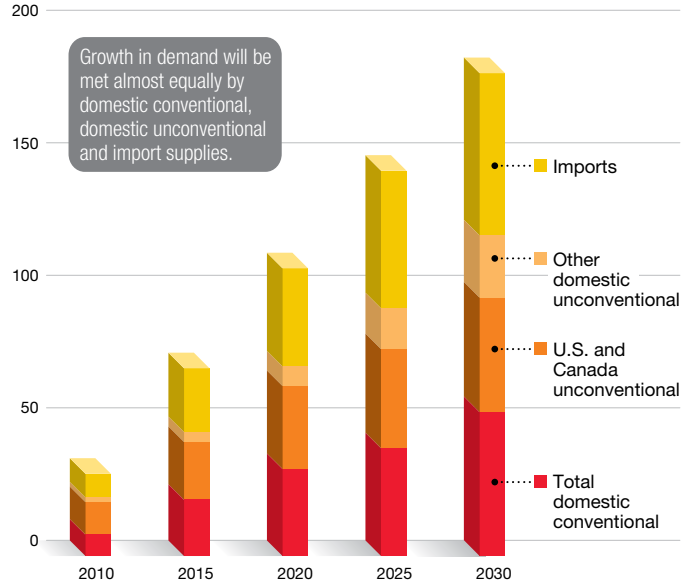
Natural gas supply

Billions of cubic feet per day



Growth in supply of natural gas versus 2005

Billions of cubic feet per day



Technology expands cleaner-burning natural gas supply

New technologies – including horizontal drilling and hydraulic fracturing – are safely expanding supplies of natural gas around the world.

Producing electricity using a natural gas combined-cycle turbine is about

30 percent

more efficient

than using a state-of-the art coal plant.

Natural gas will be the fastest-growing major fuel through 2030. Gas is attractive because of its environmental benefits, large resource base and flexibility as an efficient fuel in the power-generation, industrial and residential/commercial sectors.

Around the world, new technologies are expanding production of natural gas and delivering this cleaner-burning fuel to utilities and other customers who need it.

For example, up until relatively recently, natural gas imports were mainly limited to gas that could be transported across borders by pipeline. But because of advances in the technologies used to liquefy natural gas so that it can be safely and economically transported by tanker, today there is a large and growing market for LNG.

Expansion of the LNG market is one reason why imports are expected to account for a larger share of natural gas demand through 2030.

But the fastest-growing source of global natural gas supply is unconventional gas, a term that refers to natural gas produced using combinations of both new and existing technologies that have enabled producers to economically reach supplies found in tight rock and shale, as well as coal bed methane.

Globally, unconventional gas production is projected to grow fivefold from 2005 to 2030. The largest growth by far is in the United States, where unconventional production meets well over half of U.S. gas demand by 2030.

Domestic conventional supplies will continue to dominate globally through 2030, but they decline in North America and Europe. In 2005, domestic conventional gas made up 80 percent of total supplies. But, by 2030, that share declines to about 60 percent, with unconventional gas and imports supplying the remainder.

Natural gas drilling rig in Marcellus Shale, Pennsylvania, USA

Integrating technologies to produce more natural gas

In many countries around the world, natural gas has the potential to meet a growing share of energy needs. The United States, for example, sits atop tremendous resources, with several recent studies showing that the domestic natural gas endowment is plentiful enough to provide 100 years of supply at current demand levels.

The challenge is that much of the United States' onshore natural gas resources are locked away in difficult-to-reach formations, such as shale and tight gas. While recovering them has long been technically possible, it has not always been cost-effective.

These so-called "unconventional" resources can only be produced using a process called hydraulic fracturing – a technique that allows natural gas to move more freely (from the rock pores where it is trapped) to a producing well so that it can be brought to the surface. Hydraulic fracturing involves injecting a solution that is primarily water and sand – mixed with a small amount of chemicals often found in swimming pools, dish detergents and other common uses – to open up cracks in rock formations that allow the natural gas to migrate to the well.

Hydraulic fracturing isn't new. It's been used safely and effectively for more than 60 years. During that time, more than 1 million wells around the world have been drilled using hydraulic fracturing.

What is new, however, is the use of multiple technologies in conjunction with one another to make unconventional gas more economically viable. By combining developments such as horizontal drilling and multi-zone stimulation with hydraulic fracturing, companies such as ExxonMobil can safely produce affordable, reliable quantities of natural gas from previously untapped reservoirs – powering electrical-generation plants, manufacturing facilities, homes and businesses.

Developing these U.S. resources is important for a number of reasons. First, they are abundant. Shale formations are found everywhere from Texas, Oklahoma and Arkansas to the upper Midwest, and from Colorado to West Virginia, Pennsylvania and New York. And the industry continues to find more – total U.S. natural gas resource estimates have increased 35 percent in just the last two years.

Second, natural gas is cleaner-burning. When used to generate electricity, for example, natural gas can reduce CO_2 emissions by up to 60 percent versus coal. Additional comparative benefits of natural gas production exist as well. Ten times as much water is required to produce the equivalent amount of energy from coal, and ethanol production can require as much as a thousand times more water to yield the same amount of energy.

Finally, natural gas is vital to economic development. The natural gas industry contributed $385 billion to the U.S. economy in 2008 alone, supporting more than 2.8 million jobs (including 620,000 direct jobs), according to a recent study by Cambridge Energy Research Associates.

What can the nation do to maximize the benefit of its natural gas resources? To begin with, we must let natural gas compete with other lower-emitting electricity feedstocks such as renewables, clean coal and nuclear without setting mandates or preferences. And we must ensure that access to these resources remains open.

Most importantly, we need to maintain stable, predictable regulatory frameworks that allow for long-term natural gas investment. Doing so will encourage sound development of unconventional resources and allow the economic and environmental benefits to flow to communities across the United States.

In many regions, growing demand for natural gas is coming from the power-generation sector.

This is especially true in North America, where ample gas supplies provide a competitive alternative to coal for power generation as CO_2 costs increase due to government policies aiming to reduce emissions.

But in other regions, other factors are at work. For example, China's growing demand for natural gas is driven more by the residential/commercial and industrial sectors, where distribution lines are being rapidly expanded and gas is very competitive versus other major fuels.

In India, more than half the projected growth in gas demand is coming from the industrial sector, where gas provides the energy to produce steel and other essential products.

Gas is also used as a raw material for products such as paint, fertilizer and plastics. And in the Middle East, demand grows rapidly in both the power-generation sector and the industrial sector, primarily for chemicals.

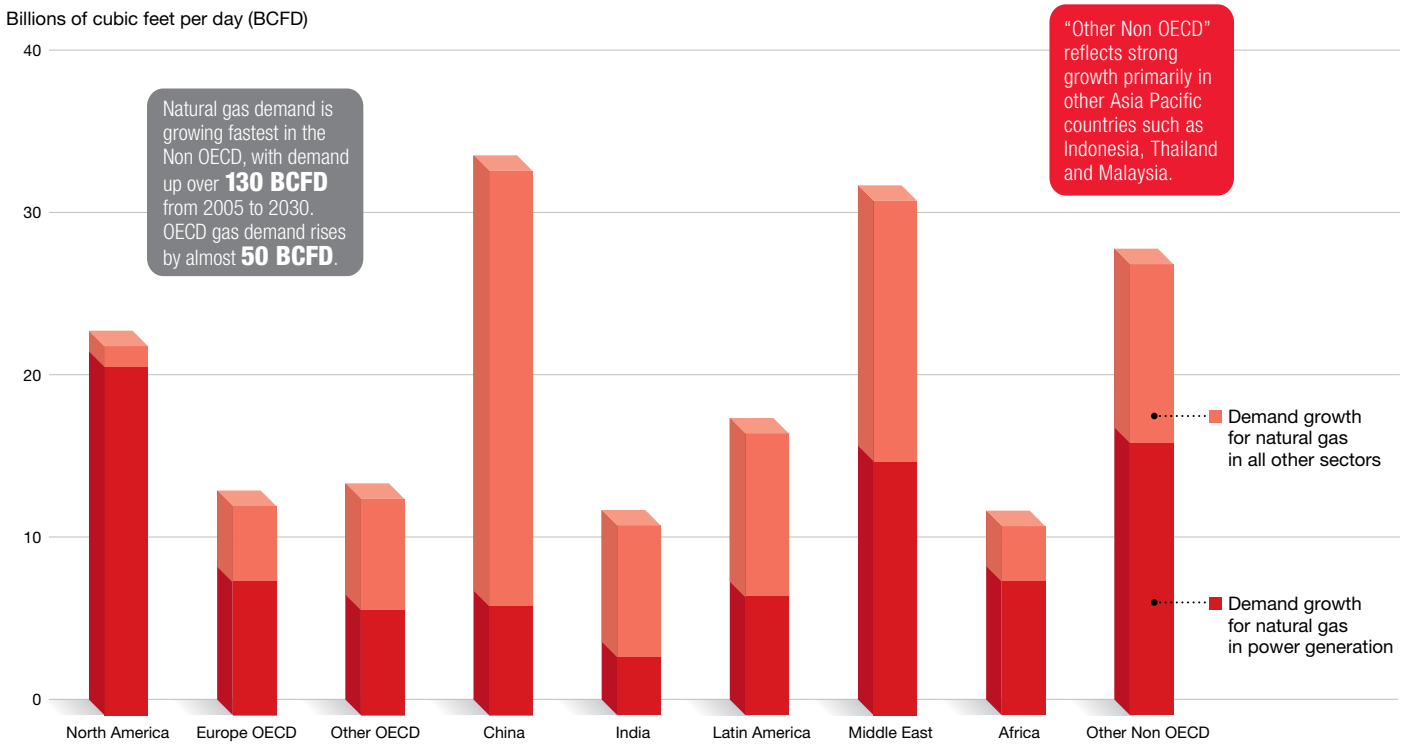
Natural gas continues to gain prominence as a major source of energy for the world. This trend is in keeping with the history of the natural gas industry, which has long exhibited an ability to adapt to growing needs as societies developed and new technologies emerged.

Natural gas demand to grow in all regions

While demand for natural gas is rising all around the world, growth is strongest in Non OECD countries and, in particular, China.

By 2030,
China's demand for natural gas
will be more than
6 times
what it was in 2005.

Natural gas demand growth 2005-2030



The gas processed by the Ras Laffan Train 5 LNG facility in one year could provide enough energy to electrify

every household

in the world for one week.

LNG production train in Ras Laffan, Qatar

Rising to the challenge: Actions for 2030 and beyond

In many ways, the challenges addressed by this *Outlook for Energy* are no different from ones that individuals and nations have faced over the past century, when the world experienced dramatic changes in energy-related technologies and the types of energy used.

People and societies continue to require affordable, reliable energy to enable advancement and prosperity. New technologies must continue to improve efficiency and boost supplies to help meet rising demand. And energy must continue to be developed safely and with concern for the environment.

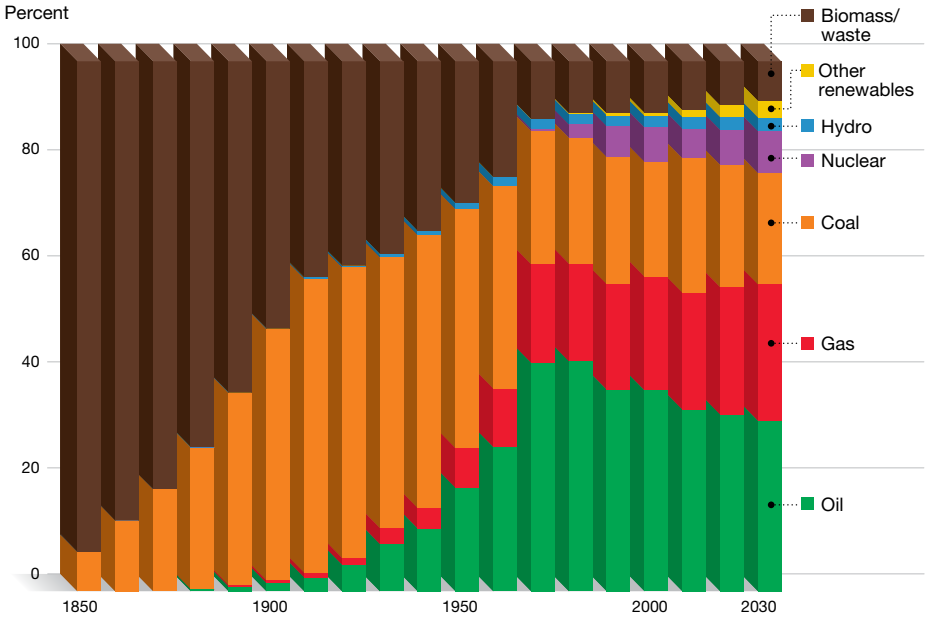
It's clear that significant shifts in the composition of the world's energy have taken place over decades. Today, we must also recognize that the *scale* of our energy and environmental challenges continues to grow.

There are almost 7 billion people in the world today, rising to 8 billion by 2030. Four-fifths live in Non OECD countries, where per-capita energy use still is relatively low, but where better access to modern energy is helping boost living standards and expand prosperity. Continuing progress through 2030 will drive significant increases in energy demand.

ExxonMobil projects global energy demand to rise by 35 percent from 2005 to 2030, even with substantial gains in efficiency across all regions around the world.

Meeting this demand, safely and with minimal environmental impact, will require an integrated set of solutions, including:

Global demand by fuel



Source: Smil, *Energy Transitions;* ExxonMobil

- **Expand all economic energy sources:** oil, natural gas and coal, as well as nuclear and renewable fuels.
- **Accelerate gains in efficiency.** Better efficiency is projected to reduce global energy demand growth by almost 65 percent through 2030, slowing growth in CO_2 emissions in the process.
- **Reduce CO_2 emissions** through better efficiency, new technologies and a shift to cleaner fuels such as natural gas.
- **Develop new energy technologies.** Human ingenuity will continue to make a powerful contribution to solving the world's energy challenges. For example, technologies enabling economic production of shale gas, tight gas and coal bed methane are unlocking important new options for meeting energy and environmental goals.

To provide solutions of the scale embodied by this *Outlook for Energy*, the world will need tremendous levels of investment, sustained over decades; an unwavering drive for innovation and new technology; and reliable policies that promote a level playing field for pursuing all commercially viable energy solutions.

A lot can happen in 20 years. And, as this *Outlook for Energy* envisions, ExxonMobil expects that people will continue to advance a wide variety of energy and technology solutions to sustain and expand progress around the world.

ExxonMobil's *The Outlook for Energy*

Regions	Energy Demand (Quadrillion BTUs) 1980	1990	2000	2005	2010	2020	2030	Average Annual Change 1980-2005	2005-2030	2010-2030	Share of Total 2005	2030
World	**296**	**359**	**414**	**469**	**506**	**575**	**636**	**1.9%**	**1.2%**	**1.2%**	**100%**	**100%**
OECD	169	190	224	233	223	230	230	1.3%	0.0%	0.2%	50%	36%
Non OECD	127	170	190	237	282	346	406	2.5%	2.2%	1.8%	50%	64%
North America	87	95	114	116	111	113	113	1.2%	-0.1%	0.1%	25%	18%
United States	75	81	96	97	92	92	91	1.1%	-0.3%	0.0%	21%	14%
Latin America	13	15	20	22	26	32	39	2.2%	2.4%	2.1%	5%	6%
Europe	67	74	79	83	80	82	83	0.9%	0.0%	0.2%	18%	13%
European Union	63	68	72	76	73	73	73	0.7%	-0.1%	0.0%	16%	11%
Russia/Caspian	46	57	38	41	40	42	45	-0.5%	0.4%	0.6%	9%	7%
Africa	13	17	22	26	28	34	42	2.8%	2.0%	2.1%	5%	7%
Middle East	8	11	18	23	29	36	42	4.3%	2.5%	2.0%	5%	7%
Asia Pacific	63	91	124	159	193	235	273	3.8%	2.2%	1.7%	34%	43%
China	23	33	44	69	92	114	132	4.4%	2.7%	1.8%	15%	21%
India	8	13	19	22	28	35	45	3.9%	3.0%	2.4%	5%	7%
World Energy by Type Primary	**296**	**359**	**414**	**469**	**506**	**575**	**636**	**1.9%**	**1.2%**	**1.2%**	**100%**	**100%**
Oil	128	136	156	171	173	191	204	1.2%	0.7%	0.8%	36%	32%
Gas	54	72	89	101	112	138	164	2.5%	2.0%	1.9%	21%	26%
Coal	70	86	90	112	128	133	134	1.9%	0.7%	0.2%	24%	21%
Nuclear	7	21	27	29	28	38	50	5.6%	2.3%	2.9%	6%	8%
Biomass/Waste	29	36	41	44	47	48	48	1.6%	0.4%	0.1%	9%	8%
Hydro	6	7	9	10	11	14	16	2.2%	2.0%	2.0%	2%	3%
Other Renewables	0	1	3	3	7	13	20	8.0%	7.4%	5.8%	1%	3%
End-Use Sectors – World Industrial												
Total	**124**	**138**	**148**	**169**	**185**	**206**	**227**	**1.2%**	**1.2%**	**1.0%**	**100%**	**100%**
Oil	47	45	50	55	56	61	65	0.7%	0.7%	0.7%	33%	29%
Gas	28	30	38	40	43	51	60	1.5%	1.6%	1.7%	24%	27%
Coal	27	29	25	32	38	38	35	0.8%	0.4%	-0.4%	19%	16%
Electricity	14	18	21	25	30	38	47	2.5%	2.5%	2.3%	15%	21%
Other	9	15	14	16	18	19	19	2.1%	0.7%	0.3%	10%	8%
Residential/Commercial												
Total	**71**	**87**	**98**	**107**	**111**	**124**	**134**	**1.6%**	**0.9%**	**1.0%**	**100%**	**100%**
Oil	14	13	16	16	15	15	15	0.7%	-0.2%	0.0%	15%	11%
Gas	13	17	21	22	24	28	32	2.1%	1.4%	1.4%	21%	24%
Biomass/Waste	23	26	29	31	32	31	29	1.3%	-0.3%	-0.5%	29%	22%
Electricity	10	16	23	27	30	39	49	4.0%	2.4%	2.5%	26%	37%
Other	11	15	9	10	10	10	9	-0.6%	-0.2%	-0.2%	9%	7%
Transportation												
Total	**53**	**65**	**80**	**90**	**96**	**112**	**124**	**2.2%**	**1.3%**	**1.3%**	**100%**	**100%**
Oil	51	64	79	88	92	106	115	2.2%	1.1%	1.1%	98%	93%
Other	2	1	1	2	4	6	9	1.3%	5.7%	3.8%	2%	7%
Power Generation – World Primary	**78**	**118**	**143**	**169**	**187**	**224**	**261**	**3.1%**	**1.7%**	**1.7%**	**100%**	**100%**
Oil	17	15	12	12	10	9	9	-1.3%	-1.2%	-0.6%	7%	3%
Gas	13	24	30	38	44	58	70	4.2%	2.5%	2.4%	22%	27%
Coal	34	48	61	76	87	93	97	3.3%	1.0%	0.6%	45%	37%
Nuclear	7	21	27	29	28	38	50	5.6%	2.3%	2.9%	17%	19%
Hydro	6	7	9	10	11	14	16	2.2%	2.0%	2.0%	6%	6%
Wind	0	0	0	0	1	4	7	44.2%	12.8%	9.3%	0%	3%
Other Renewables	1	3	4	5	6	8	11	7.1%	3.4%	3.1%	3%	4%
	Electricity Demand (Terawatt Hours)											
World	**7139**	**10136**	**13163**	**15657**	**17845**	**23061**	**28628**	**3.2%**	**2.4%**	**2.4%**	**100%**	**100%**
OECD	4948	6630	8559	9307	9352	10668	11744	2.6%	0.9%	1.1%	59%	41%
Non OECD	2192	3506	4604	6351	8493	12393	16884	4.3%	4.0%	3.5%	41%	59%
	Energy-Related CO_2 Emissions (Billion Metric Tons)											
World	**18.6**	**21.3**	**23.5**	**27.2**	**29.5**	**32.5**	**34.6**	**1.5%**	**1.0%**	**0.8%**	**100%**	**100%**
OECD	11.0	11.3	12.7	13.2	12.4	12.0	11.0	0.7%	-0.7%	-0.6%	49%	32%
Non OECD	7.6	10.0	10.7	14.0	17.2	20.6	23.6	2.5%	2.1%	1.6%	51%	68%

Rounding of data in the Outlook *may result in slight differences between totals and the sum of individual components.*

Glossary

ExxonMobil's *Outlook for Energy* contains **global projections for the period 2005-2030**. In the *Outlook*, we refer to standard units for the measurement of energy:

BCFD. Billion cubic feet per day. This is used to measure volumes of natural gas. One BCFD of natural gas can heat approximately 5 million homes in the U.S. for one year. Six BCFD of natural gas is equivalent to about 1 MBDOE.

BTU. British thermal unit. A BTU is a standard unit of energy that can be used to measure any type of energy source. It takes approximately 400,000 BTUs per day to run the average North American household. (Quad refers to quadrillion BTUs.)

Watt. A unit of electrical power, equal to one joule per second. A 1-GW power plant can meet the electricity demand of approximately 500,000 homes in the U.S. (Kilowatt (KW) = 1,000 watts; Gigawatt (GW) = 1,000,000,000 watts; Terawatt (TW) = 10^{12} watts)

MBDOE. Million barrels per day of oil-equivalent. This term provides a standardized unit of measure for different types of energy sources (oil, gas, coal, etc.) based on energy content relative to a typical barrel of oil. One MBDOE is enough energy to fuel about 3 percent of the vehicles on the world's roads today.

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