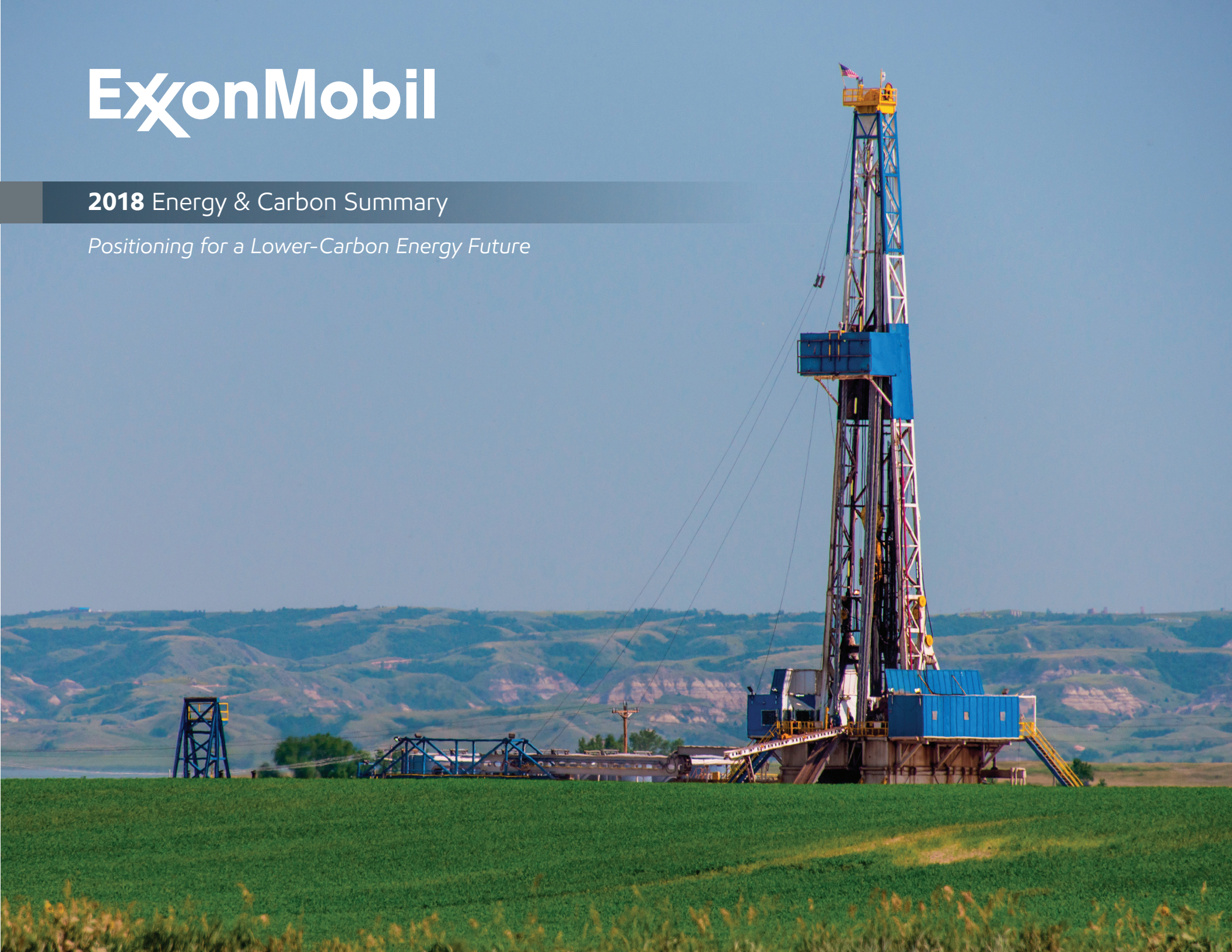
ExxonMobil

2018 Energy & Carbon Summary

Positioning for a Lower-Carbon Energy Future



COVER PHOTO: **ExxonMobil has established an enhanced management program to reduce methane emissions. Further details can be found on page 17.**

Statements of future events or conditions in this report, including projections, targets, expectations, estimates, and business plans, are forward-looking statements. Actual future results or conditions, including demand growth and energy source mix; the impact of new technologies; production rates and reserve growth; efficiency gains and cost savings; emission reductions; and results of investments could differ materially due to, for example, changes in the supply in and demand for crude oil, natural gas, and petroleum and petrochemical products and resulting price impacts; the outcome of exploration and development projects; the outcome of research projects and ability to scale new technologies on a cost-effective basis; changes in law or government policy, including environmental regulations and international treaties; the actions of competitors and customers; changes in the rates of population growth and economic development; unexpected technological developments; general economic conditions, including the occurrence and duration of economic recessions; unforeseen technical difficulties; and other factors discussed in this report and in Item 1A of ExxonMobil's most recent Form 10-K. Third-party scenarios discussed in this report reflect the modeling assumptions and outputs of their respective authors, not ExxonMobil. References to "resources", "resource base," and similar terms include quantities of oil and gas that are not yet classified as proved reserves under SEC definitions but that we believe will ultimately be produced. For additional information see the "Frequently Used Terms" on the Investors page of our website at *exxonmobil.com*.

References to "oil" and "gas" include crude, natural gas liquids, bitumen, synthetic oil, and natural gas.

Prior years' data have been reclassified in certain cases to conform to the 2016 presentation basis.

The term "project" as used in this publication can refer to a variety of different activities and does not necessarily have the same meaning as in any government payment transparency reports.

Letter from the Chairman

Providing affordable energy to support prosperity while reducing environmental impacts – including the risks of climate change – is our industry's dual challenge.

Ensuring ExxonMobil does our part to address this challenge is a priority of mine. We are working hard across our businesses to find effective solutions that meet the needs of society.

In the near term, we are improving our own operations. Our drive to operate more efficiently also reduces emissions and environmental impacts.

Our chemical businesses manufacture products that improve the sustainability of our customers' products and reduce associated emissions.

We are also helping to lower emissions in today's power sector by facilitating the switch to cleaner-burning natural gas.

For the longer term, more technological solutions are needed. The global energy system is massive. The world needs solutions that can scale. ExxonMobil has been a leader in researching and developing potential energy and environmental game changers. I'm excited about the progress we're making.

Our algae biofuel program holds great promise. The world will need liquid transportation fuels for road, sea, and air. We are conducting fundamental science in pursuit of needed breakthroughs.

We are also a leader in carbon capture and storage (CCS) research. The world will need much more CCS in the future. Our partnership with FuelCell Energy, Inc. has potential to dramatically lower the cost of carbon capture. Additionally, we are developing technology to lower the energy intensity of industrial processes.

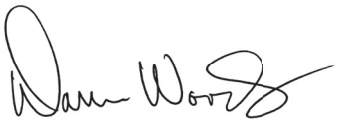
We are at the forefront in developing all these exciting technologies, many of which could play big roles in a lower-carbon future. I'm a firm believer in the power of technology to solve hard problems, and to improve and transform lives.

Policy has a place here, too. We've been vocal in our support of a carbon tax, and recently joined the pro-carbon-tax Climate Leadership Council. We also support the Paris Agreement.

ExxonMobil is positioned to remain the energy industry leader, now and in the future.

The report you are reading looks into a lower-carbon future. It provides a perspective on what such a future might mean for our business.

As one of the world's premier technology companies, we are well positioned to succeed in a changing world. Over the past 135 years, our company has evolved and adapted to a variety of environments and conditions. We will continue to build long-term value for our shareholders and stakeholders. We are committed to successfully addressing the dual challenge.



Darren Woods, Chairman and CEO

Summary at-a-glance

Our annual *Outlook for Energy* incorporates recent developments in economic conditions, policy, and technology.

The *Outlook* anticipates global energy needs will rise about 25 percent over the period to 2040, led by non-OECD countries. While the mix shifts toward lower-carbon-intensive fuels, the world will need to pursue all economic energy sources.

- Worldwide electricity from solar and wind will increase about 400 percent
- Natural gas will expand its role, led by growth for electricity generation
- Growth in oil demand will be driven by commercial transportation and the chemical industry, while more electric cars and efficiency improvements in conventional cars will likely lead to a peak in liquid fuels demand for the light-duty vehicle fleet
- Efficiency gains and growing use of less-carbon-intensive energy sources will contribute to a nearly 45 percent decline in the carbon intensity of global GDP

This year's *Outlook* also includes sensitivities to provide greater perspective on the energy landscape. For example, greater penetration of electric vehicles (EV) and/or wind/solar deployment beyond our base *Outlook* assumptions could slow the growth in oil and natural gas demand, respectively.

Relative to our *Outlook*, a theoretical 2°C pathway would generally lower the world's demand for total energy, oil, natural gas and coal, but increase nuclear, bioenergy, and non-bio renewables.

- Signposts in the energy system will provide important indicators on whether society is moving toward a 2°C pathway
- Even under a 2°C pathway, significant investment will be required in oil and natural gas capacity, as well as other energy sources
- Production from our proved reserves and investment in our resources continue to be needed to meet global requirements

Our company has a proven record of successfully responding to changes in society's needs. With long-standing investments in technology, we are well positioned to meet the demands of an evolving energy system

Our businesses are well positioned for the continuing evolution of the energy system.

Near-term actions, consistent with society's energy requirements and environmental objectives, include:

- Expanding the supply of cleaner-burning natural gas
- Transitioning our manufacturing facilities to higher-value distillates, lubricants, and chemical feedstock
- Mitigating emissions from our own facilities through energy efficiency and reduced flaring, venting, and fugitive emissions
- Developing consumer products that help others reduce their emissions, such as premium lubricants, lightweight plastics, and special tire liners
- Engaging on climate policy to address the risks of climate change at the lowest cost to society

Importantly, on a longer-term horizon, we are pursuing technologies to enhance existing operations and develop alternative energies with a lower carbon intensity, including:

- Researching breakthroughs that make CCS technology more economic for power generation and industrial applications
- Developing process intensification technologies to reduce energy requirements of manufacturing facilities
- Progressing advanced biofuels for commercial transportation and petrochemicals

Highlights from our *Outlook for Energy*

The *Outlook for Energy* is ExxonMobil's global view of energy demand and supply through 2040. Importantly, it provides an annual update to reflect recent energy trends and developments, notably in technology and policy. We use the *Outlook* to help inform our long-term business strategies and investment plans.

Energy supports rising prosperity

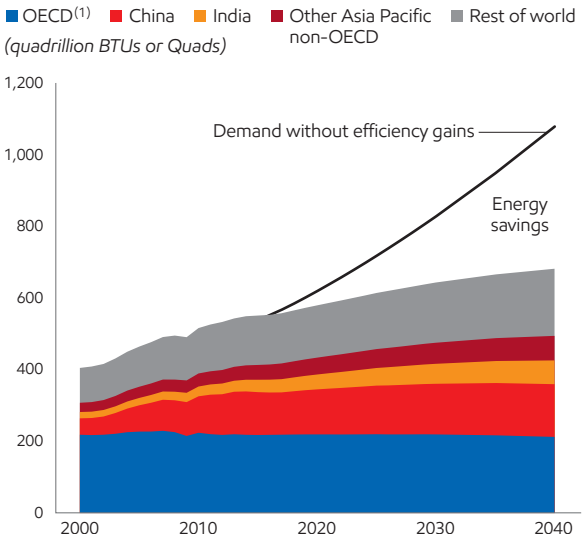
A significant energy transition is under way, and many factors will shape the world's energy future. By 2040, world population is expected to reach 9.2 billion people, up from 7.4 billion today. Over that same period, global GDP will likely double. Billions of people are expected to join the global middle class.

Energy efficiency improvements will help curb the growth in global energy demand to about 25 percent over the period to 2040, roughly equivalent to adding another North America and Latin America to the world's current energy demand. Emerging markets in non-OECD nations will account for essentially all energy demand growth, led by the expanding economies in the Asia Pacific region, such as China and India.

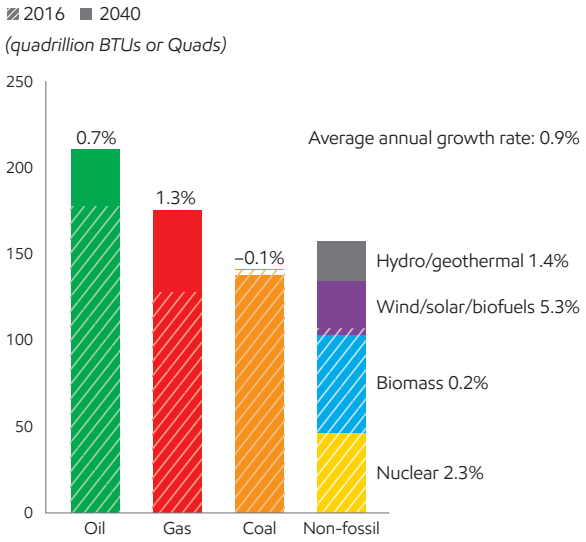
Providing reliable, affordable energy to support prosperity and enhance living standards is coupled with the need to do so in ways that reduce potential impacts on the environment, including the risks of climate change. As the world's economy nearly doubles by 2040, energy efficiency gains and a shift in the energy mix will contribute to a nearly 45 percent decline in the carbon intensity of global GDP. Progress on energy and climate objectives requires practical approaches that will contribute to both while providing high economic value for society.

The dual challenge is to provide affordable energy to support prosperity while reducing environmental impacts

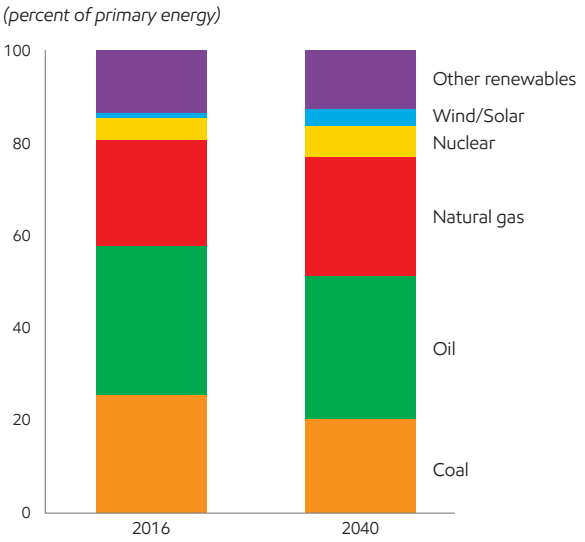
Global efficiency limits demand growth



Oil and gas: Largest global energy sources in the future



Energy mix shifts globally to lower-carbon fuels



Global energy mix is shifting

Electrification and gradual decarbonization continue as significant global trends. Renewables and nuclear see strong growth, contributing nearly 40 percent of incremental energy supplies to meet demand growth. Natural gas grows the most of any energy type, reaching a quarter of all demand. Oil will continue to play an important role in the world's energy mix, as commercial transportation (e.g., trucking, aviation, marine) and chemicals sectors lead demand growth.

Testing uncertainty

Demand for liquid fuels is projected to grow by about 20 percent through the *Outlook* period, even as liquids demand from light-duty transportation peaks and declines during this period with more-efficient vehicles. Sensitivities help assess potential impacts to light-duty liquids demand using alternate assumptions around electric vehicle penetration, changes in fuel efficiency, or broader mobility trends. As an example, for every additional 100 million electric vehicles on the road in 2040, liquids demand could fall by approximately 1.2 million barrels per day.

Investment needs

Significant investments will be needed to meet global demand for oil and natural gas. The International Energy Agency, in its New Policies Scenario, estimates cumulative oil and natural gas investment may reach approximately $21 trillion between 2017 and 2040.

Highlight: *Outlook for Energy* projections

25% increase

Global energy needs rise about 25 percent, led by non-OECD nations (e.g., China, India)

Despite efficiency gains, global energy demand will likely increase nearly 25 percent by 2040. Nearly all growth will occur in non-OECD countries as prosperity expands.

Demand for electricity nearly doubles in non-OECD nations

Natural gas use is likely to increase more than any other energy source, with about half of its growth attributed to electricity generation. Electricity from solar and wind increases about 400 percent.

x2

Oil plays a leading role in mobility and modern products

Oil will continue to play a leading role in the world's energy mix, with growing demand driven by commercial transportation and the chemical industry.

Energy efficiency gathers momentum worldwide

Since 2000, global energy intensity has improved by about 1 percent per year; from 2016 to 2040, this rate will approximately double.

Predicting the energy future is challenging, given uncertainty on policies and technologies

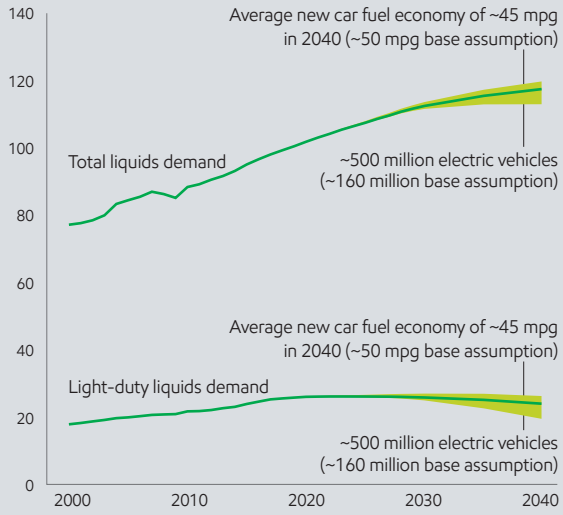
Meeting the dual challenge of mitigating the risks of climate change while boosting standards of living will require additional technology advances.

Sensitivities included in our *Outlook* projections

We use sensitivities to provide greater perspective on how changes to our base *Outlook* assumptions could affect the energy landscape. The charts below depict potential impacts to demand related to fuel economy and EV penetration, full EV penetration in light-duty vehicles, and potential changes affecting natural gas demand for electricity generation. Further discussion on sensitivities can be found in the *Outlook for Energy*.

Liquids – Light-duty demand sensitivities

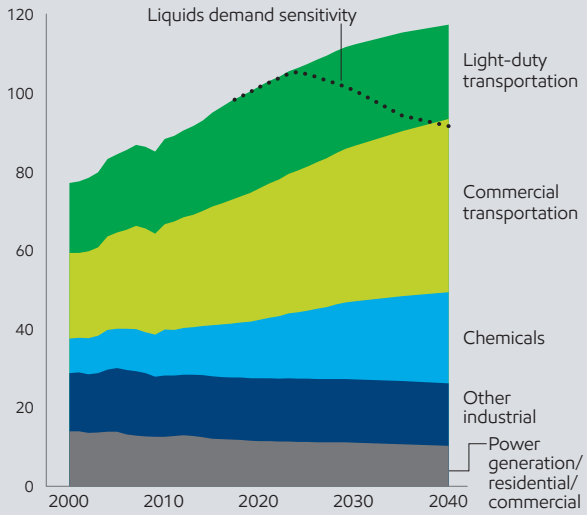
(million oil-equivalent barrels per day)



- Shaded ranges are indicative of potential shifts in global demand relative to base *Outlook*
- Liquids demand could fall about 1.2 million barrels per day for every additional 100 million electric vehicles on the road in 2040
- Trends in fuel economy gains lower than the *Outlook* basis could add more than 2 million barrels per day of liquids demand by 2040

Liquids – Full EV demand sensitivity

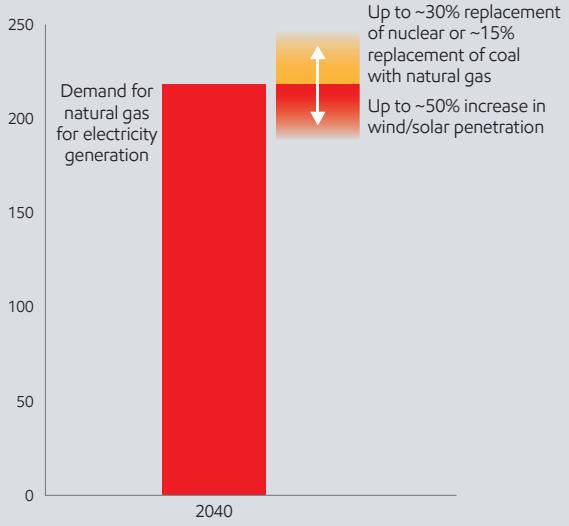
(million oil-equivalent barrels per day)



- Sensitivity assumes the global light-duty vehicle fleet is 100-percent electric by 2040, requiring all new light-duty vehicle sales to be electric by 2025
- Battery manufacturing capacity for electric cars would need to increase by more than 50 times from existing levels by 2025
- Total liquids demand in 2040 could be similar to levels seen in 2013

Natural gas – Electricity demand sensitivities

(billion cubic feet per day)



- Accelerated deployment of solar and wind globally due to swifter cost declines and/or more generous policies could reduce natural gas demand relative to base *Outlook*
- Stiffer public sentiment against nuclear or coal and/or a shift toward more technology-neutral carbon abatement policies could increase natural gas demand for base load electricity

Considering 2°C scenarios

The annual *Outlook for Energy* represents ExxonMobil's updated view of the most likely future for the global energy system and forms the foundation of the company's strategic decisions, business plans, and investments. However, many uncertainties exist concerning the future of energy demand and supply, including potential actions that society may take to address the risks of climate change. The following analysis is intended to provide a perspective on hypothetical 2°C scenarios.

Since 1992, when nations around the world established the United Nations Framework Convention on Climate Change, an international effort has been under way to understand and address the risks of climate change. After more than two decades of international effort, in December 2015, nations convened in Paris and drafted an agreement that for the first time signals that both developed and developing nations will strive to undertake action on climate change.

The ultimate aim of the Paris Agreement is to "strengthen the global response to the threat of climate change... by: Holding the increase in global average temperatures to well below 2°C above pre-industrial levels." As part of the Paris Agreement, signatories have committed to:

- "prepare, communicate, and maintain successive nationally determined contributions that it intends to achieve."
- "communicate nationally determined contributions every five years."

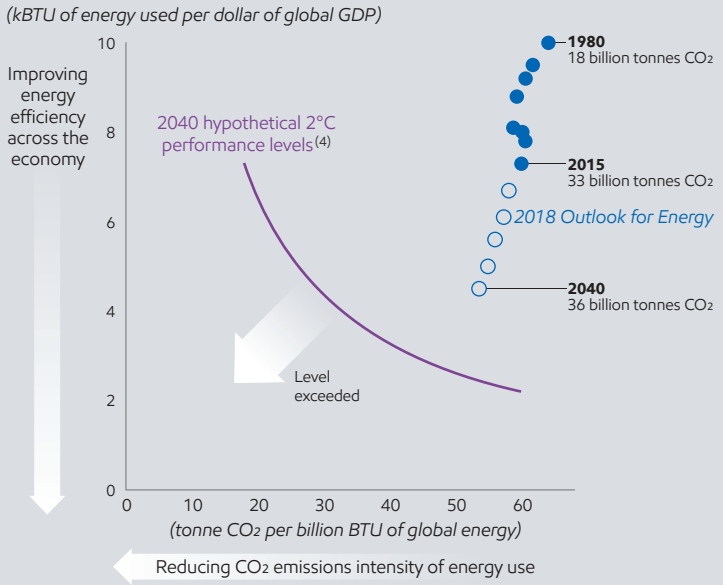
These nationally determined contributions (NDCs)[2] provide important signals on government intentions related to the general direction and pace of policy initiatives to address climate risks. It is worth noting that the Paris Agreement indicates that "the estimated aggregate greenhouse gas emission levels in 2025 and 2030 resulting from the intended nationally determined contributions do not fall within the least-cost 2°C scenarios."[3]

While the current NDCs do not appear to achieve a 2°C scenario, the Paris Agreement is a positive step in addressing the risks of climate change.

When considering the aim to achieve a 2°C future, it should be recognized that due to the complexity and scale of the world's energy system and its interaction with societal aspirations, no single pathway to 2°C can be reasonably predicted. However, it is generally recognized that pathways to 2°C depend on multiple variables, the most impactful of which are:

- *Population*
- *Economic growth*
- *Energy intensity of the economy*
- *Greenhouse gas (GHG) intensity of the energy system*

World energy-related CO_2 emissions related to energy intensity and CO_2 emissions intensity



This chart shows global energy intensity (left axis) and CO_2 emissions intensity (bottom axis).

From 1980 to 2015, there have been large gains in efficiency, though energy-related CO_2 emissions rose from 18 billion to 33 billion tonnes. The blue circle shown for 2040 indicates these emissions are projected to be about 36 billion tonnes even with significant gains in efficiency and CO_2 emissions intensity.

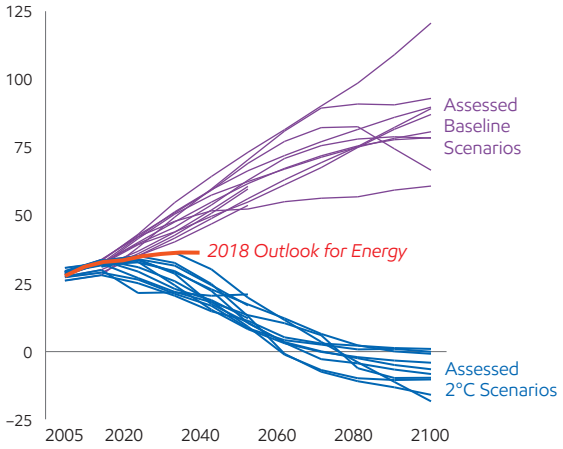
To be on a 450 ppm, or hypothetical 2°C pathway, the performance in 2040 likely needs to be significantly closer to the purple line, implying faster gains in efficiency and/or faster reductions in CO_2 emissions per unit of energy. This would increase the chance of reaching a 2°C pathway, with further gains required between 2040 and 2100.

It is generally accepted that population and world economies will continue to grow and that measures to address the risks of climate change should accommodate these factors. The levers that therefore remain for society are: (1) to reduce the energy intensity of world economies via further efficiency, and (2) to reduce the GHG (CO_2 equivalent) emissions intensity of the world's energy system.

The chart on the previous page illustrates 2040 hypothetical "2°C performance levels." This purple line reflects hypothetical combinations of global energy intensity and CO_2 emission intensity levels that, if reached in 2040, would likely indicate the world was on a 2°C pathway. Transitioning towards a 2°C performance level would imply that global emissions have peaked and are steadily declining to near 1980 levels by 2040, in spite of a global population that may have doubled, and a world economy that may be five times as large.

Global energy-related CO_2 emissions[9]

(billion tonnes)



According to the International Energy Agency (IEA), setting upon a "well below" 2°C pathway implies adoption of "comprehensive, systematic, immediate, and ubiquitous implementation of strict energy and material efficiency measures."[5] Because there are multiple potential options for energy efficiency and decarbonization, there are also numerous theoretical paths to a 2°C outcome. Given limited global resources and the wide range of global societal priorities,[6] such as poverty, education, health, security, affordable energy, and climate change, approaches to address these issues will need to be as economically efficient as possible. Inefficient approaches to address the risks of climate change can divert resources and detract from society's ability to address other important priorities. Due to the unprecedented change that would be needed in the global energy system to achieve a 2°C outcome, we believe that only those scenarios that employ the full complement of technology options are likely to provide the most economically efficient paths.

Considerable work has been done in the scientific community to explore energy transformation pathways. A recent multi-model study coordinated by the Energy Modeling Forum 27 (EMF27)[7] at Stanford University brought together many energy-economic models to assess technology and policy pathways associated with various climate stabilization targets (e.g., 450, 550 ppm CO_2 equivalent or CO_2e), partially in support of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

The chart (below left) illustrates potential CO_2 emission trajectories under EMF27 full-technology scenarios[8] targeting a 2°C pathway (Assessed 2°C Scenarios) relative to our 2018 *Outlook*, and baseline pathways (Assessed Baseline Scenarios) with essentially no policy evolution beyond those that existed in 2010.

Our 2018 *Outlook* incorporates significant efficiency gains and changes in the energy mix, resulting in a projected CO_2 emissions trajectory that resides between the pathways illustrated by the baseline and 2°C scenarios. The emissions trajectory of our *Outlook* closely approximates in shape the intermediate RCP 4.5 fossil fuel CO_2 emissions profile of the IPCC through 2040, but is slightly under it in magnitude. Although our *Outlook* does not extend to 2100 and we do not estimate global temperatures under our *Outlook* process, the IPCC projects its intermediate RCP 4.5 emissions profile would result in an average global temperature increase of approximately 2.4°C by 2100 from the pre-industrial age.[10]

The Assessed 2°C Scenarios, as shown on the following page, produce a variety of views on the potential impacts on global energy demand in total and by specific types of energy.

The scenarios also show a range of possible growth rates for each type of energy. We have taken the average of the Assessed 2°C Scenarios' growth rates in order to consider potential impacts on energy demand for this report.[11]

Considering 2°C scenarios, continued

Based on this scenario analysis, primary energy demand on a worldwide basis is projected to increase about 0.5 percent per year on average from 2010 to 2040. Expected changes in demand vary by model and energy type (lower charts):

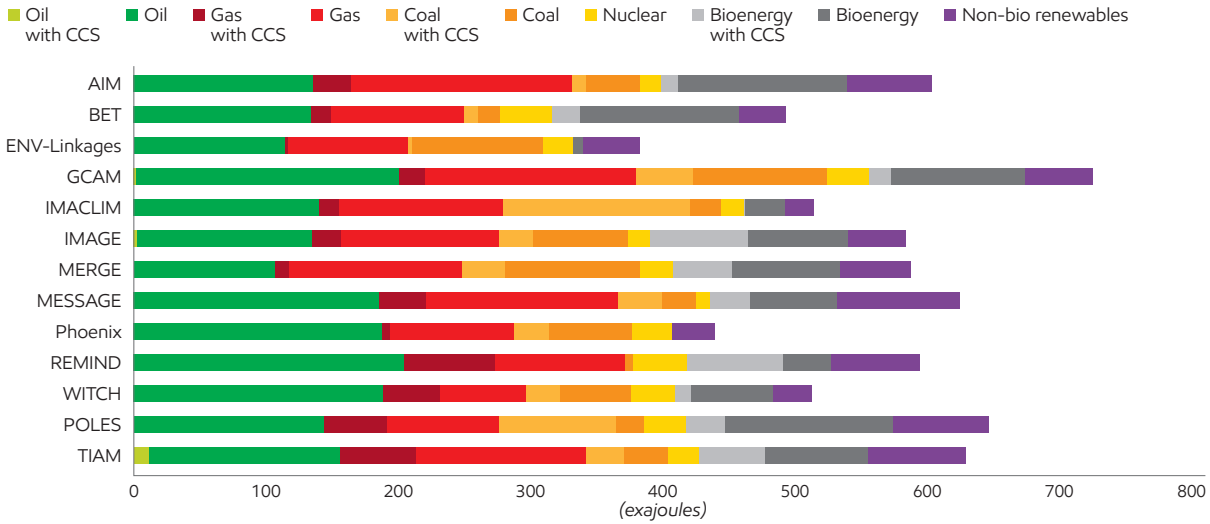
- Oil demand is projected on average to decline by about 0.4 percent per year
- Natural gas demand is expected on average to increase about 0.9 percent per year
- The outlook for coal is the most negative, with diverse projections showing an average decline of about 2.4 percent per year, or about a 50 percent decline by 2040
- The projected growth rates for renewable energies and nuclear are generally quite strong averaging between 4 and 4.5 percent per year for non-bioenergy (e.g., hydro, wind, solar) and bioenergy, and about 3 percent per year for nuclear

All energy sources remain important across all the Assessed 2°C Scenarios, though the mix of energy and technology shifts over time. Oil and natural gas remain important sources, even in models with the lowest level of energy demand. Oil demand is projected to decline modestly on average, and much more slowly than its natural rate of decline from existing producing fields. Natural gas demand grows on average due to its many advantages, including lower greenhouse gas emissions.

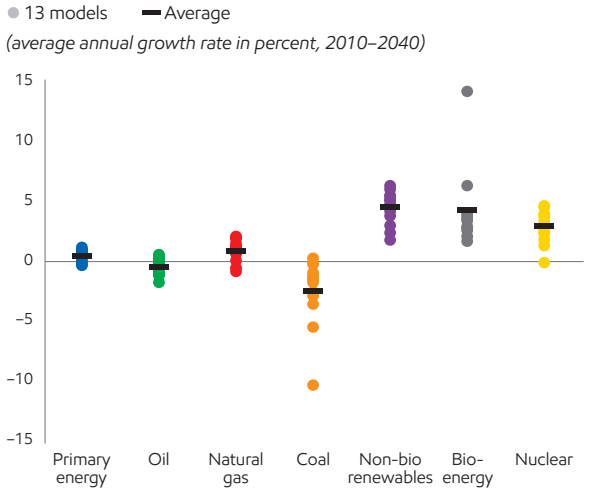
Oil and natural gas remain important sources, even in models with the lowest level of energy demand

Low-side energy growth rates for the Assessed 2°C Scenarios were also considered. The low-side for each energy source sees oil dropping 1.7 percent per year, natural gas dropping 0.8 percent per year, and coal dropping 10.2 percent per year through 2040. This is compared with high-side growth rates for bioenergy, nuclear, and non-bio renewables of 14.1, 4.8, and 6.3 percent per year, respectively.

2040 global demand by energy type by model in the Assessed 2°C Scenarios



Ranges of predicted changes in global demand in Assessed 2°C Scenarios



Signposts for the evolving energy landscape

Changes in the relative cost of new technology when compared against existing or alternative energy sources may indicate shifts in the global energy mix. Utilizing Company and external sources, we monitor a variety of indicators that may serve as signposts for potential shifts in the energy landscape, such as:

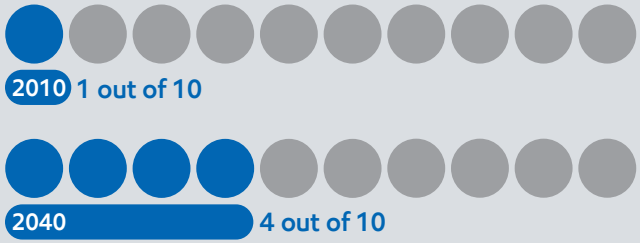
- New NDCs and significant policy initiatives, such as carbon pricing
- Increased electrification of energy system
- Increasing penetration of renewables with technology developments that reduce costs and increase reliability of energy storage
- Development of scalable alternative energies such as biofuels that don't compete with fresh water or food, leading to displacement of gasoline and distillate in the fuels market
- Advances in CCS technology to lower cost
- Announcements for planned capacity expansion of multiple technologies, as well as the associated financing that support these expansions
- Energy efficiency gains exceeding historical trends
- Consumer acceptance and preferences

Further details and discussion of Assessed 2°C Scenarios can be found in the special section of the *Outlook for Energy* – "Pursuing a 2°C pathway."

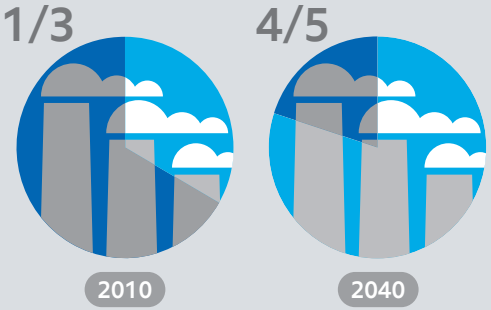
Up close: Indicators for a 2°C pathway

The continued evolution of the energy system will provide important indicators on whether society is moving toward a 2°C scenario. The following would demonstrate progress toward that objective by 2040 compared to 2010:

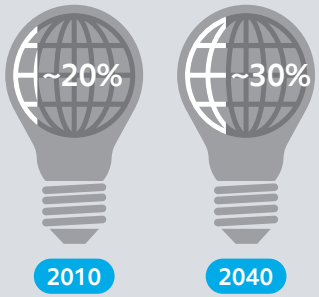
Renewables, nuclear, and fossil fuels with CCS rise from 10% to 40% of primary energy demand [12]



Low-carbon power generation (including CCS) grows from 33% to 80% of total supply [15]

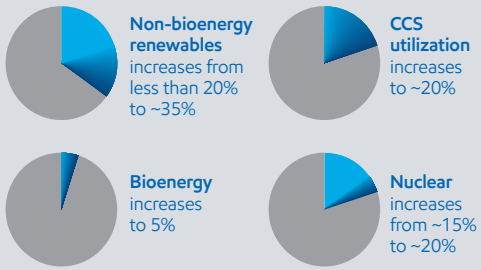


Total electrification of energy demand [13]



Oil demand falls [14]

Global electricity generation shifts [16]



Summary of demand growth rates Mean annual demand growth rate 2010-2040	Average of the Assessed 2°C Scenarios [17]	ExxonMobil 2018 *Outlook for Energy*	2010-2016 Actual
Energy demand	▲ 0.5%	▲ 0.9%	▲ 1.2%
Oil	▼ (0.4)%	▲ 0.8%	▲ 1.3%
Natural gas	▲ 0.9%	▲ 1.4%	▲ 1.6%
Coal	▼ (2.4)%	0.0%	▲ 0.1%
Nuclear	▲ 3.0%	▲ 1.6%	▼ (1.0)%
Bioenergy	▲ 4.3%	▲ 0.7%	▲ 1.9%
Non-bio renewables	▲ 4.5%	▲ 3.7%	▲ 5.8%

Potential proved reserves and resources impacts considering 2°C scenarios

Over the coming decades, oil and natural gas will continue to play a critical role in meeting the world's energy demand, even considering the Assessed 2°C Scenarios discussed in the previous section. The following analysis is intended to address the potential impacts to the company's proved reserves[18] and resources[19] through 2040 and beyond, considering the average of the Assessed 2°C Scenarios' oil and natural gas growth rates (2°C Scenarios Average).[20]

Proved Reserves and Producing Assets

At the end of 2016, ExxonMobil's proved reserves totaled about 20 billion oil-equivalent barrels, of which approximately 53 percent were oil and 47 percent were natural gas. These proved reserves, which represent a diverse portfolio, are assessed annually and reported in our annual report on Form 10-K. A recent study concluded that the main driver of intrinsic value of an integrated oil company's upstream operations is its proved reserves.[21] Based on currently anticipated production schedules, we estimate that by 2040, over 90 percent of our year-end 2016 proved reserves will have been produced. Considering that the 2°C Scenarios Average implies significant use of oil and natural gas through the middle of the century, we believe these reserves face little risk.

For the less than 10 percent of our year-end 2016 proved reserves that are projected to be produced beyond 2040, the reserves are generally associated with assets where the majority of development costs have been incurred before 2040. While these proved reserves may be subject to more stringent climate policies in the future, we believe that investments could mitigate

Up close: Significant investment still needed in 2°C scenarios

Considering the 2°C Scenarios Average, global oil demand would be projected to decline from 95 million barrels per day in 2016 to about 78 million barrels per day in 2040. Using the lowest oil demand growth rate among the Assessed 2°C Scenarios, oil demand would still be 53 million barrels per day in 2040, as seen in the chart below.[22] However, absent future investment, world oil production to meet demand would be expected to decrease from 95 million barrels per day in 2016 to about 17 million barrels per day in 2040. This decrease would result from natural field decline as oil is produced. This natural field decline rate is forecasted to greatly exceed the decline rate in global oil demand even under the 2°C Scenarios Average.

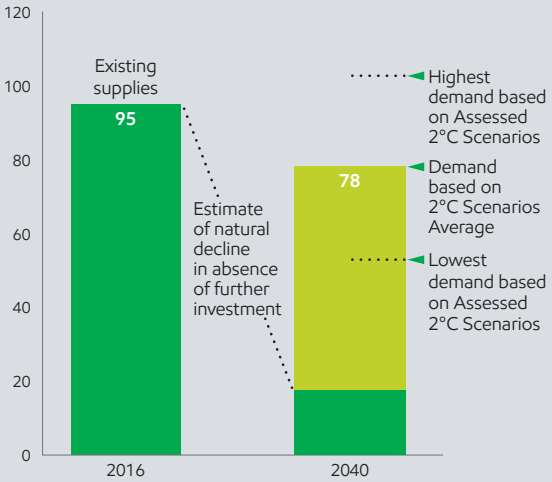
With the potential 2040 imbalance (absent future investment) the more than 90 percent of our proved reserves that are projected to be produced by 2040 are clearly supported by ample demand, and therefore face little risk related to the 2°C Scenarios Average.

Natural gas reserves face even less risk, as demand in 2040 is expected to increase under the 2°C Scenarios Average, versus 2016 demand levels.

Considering the IEA's Sustainable Development Scenario (a 2°C scenario), the IEA estimates that almost $14 trillion of investment will be needed for oil and natural gas supply between 2017 and 2040.[23]

Global liquids supply estimates

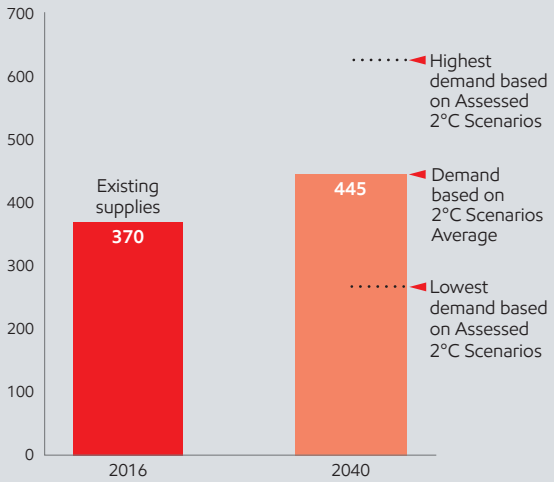
(million oil-equivalent barrels per day)



Excludes biofuels

Global natural gas supply estimates

(billion cubic feet per day)



Considering the 2°C Scenarios Average, we believe our reserves face little risk

production-related emissions and associated costs. In addition, these assets have generally lower risk given the subsurface and operational knowledge that accumulates over many decades of production. Accordingly, we believe the production of these reserves will likely remain economic even under the 2°C Scenarios Average.

For producing assets that do not currently meet the SEC's definition of proved reserves, we expect to continue producing these assets through the end of their economic lives. We continue to enhance the long-term viability of these assets through increased efficiency, cost reductions, and the deployment of new technologies and processes.

Resources

At the end of 2016, ExxonMobil's non-proved resources totaled about 71 billion oil-equivalent barrels. The size and diversity of ExxonMobil's undeveloped resource base provide us with considerable flexibility to profitably develop new supplies to meet future energy demand and replenish our proved reserves. We also continue to increase the quality of our resources through successful exploration drilling, acquisitions, and ongoing development planning and appraisal activities.

The underlying economics of commercializing and producing resources are dependent on a number of factors that are assessed using a dynamic resource development process, as highlighted further in the box on the following page. We seek to advance the best resource opportunities and monetize or exit lower potential assets. As indicated, the world will continue to require significant investment in hydrocarbons, even considering the Assessed 2°C Scenarios. Under the 2°C Scenarios Average, ExxonMobil still would need to replenish approximately 35 billion oil-equivalent barrels of proved reserves by 2040, assuming the company retains its current share of global production over that time period.[24]

Considering the multiple factors that will influence decisions to commercialize undeveloped resources, it is not possible to identify which specific assets ultimately will be commercialized and produced. As we consider the implied oil and natural gas demand to 2040 under the 2°C Scenarios Average, it is possible that some higher-cost assets, which could be impacted by many factors including future climate policy, may not be developed. We are confident however, that the size, diversity, and continued upgrading of our undeveloped resources, along with technology developments, will enable the ongoing replenishment of our proved reserves under a range of potential future demand scenarios for decades to come.

Up close: Reducing costs using technology to compete

Trillions of dollars of investment in oil and natural gas will be needed, even considering a 2°C scenario. By leveraging high-impact technologies from our world-class research organization, we can reduce costs and environmental impacts. This positions our Upstream portfolio to successfully compete.

Recent examples showcasing our technical strength:

- **Record-setting extended-reach wells in Sakhalin to significantly reduce drilling costs and environmental footprint**
- **Full-physics modeling and next-generation completion designs for unconventional developments to reduce drilling and improve recovery**
- **Advanced technologies to enhance our oil sands portfolio, such as use of specialty solvents to reduce the energy intensity of the development**

Potential reserves and resources impacts considering 2°C scenarios, continued

We test our investments over a wide range of commodity price assumptions and market conditions. As we consider a third-party's estimate of future prices under its 2°C pathway, we note that these fall within the range we use to test our investments.[25] Additionally, over our long history we have successfully competed in periods where supply exceeds demand. In such a business environment, the lowest cost of supply will be advantaged. ExxonMobil's long-standing focus on efficiency and continuous improvement will help ensure we compete successfully.

Lastly, a portion of our resources represent unconventional liquids assets in the United States. These assets have shorter development cycles than other capital-intensive resources, which we believe make this class of assets resilient under the 2°C Scenarios Average. Natural gas assets form another portion of our resources. The 2°C Scenarios Average anticipates abundant demand growth of this cleaner-burning fuel in the future, making these assets resilient under the 2°C Scenarios Average. Our remaining undeveloped liquids resources, in some cases, may not be attractive investments considering the 2°C Scenarios Average, assuming no advances in technology, processes, or designs. However, the carrying value of these undeveloped liquids resources is less than 5 percent of ExxonMobil's total carrying value of property, plant and equipment as of September 30, 2017.[26]

Up close: Dynamic resource development planning

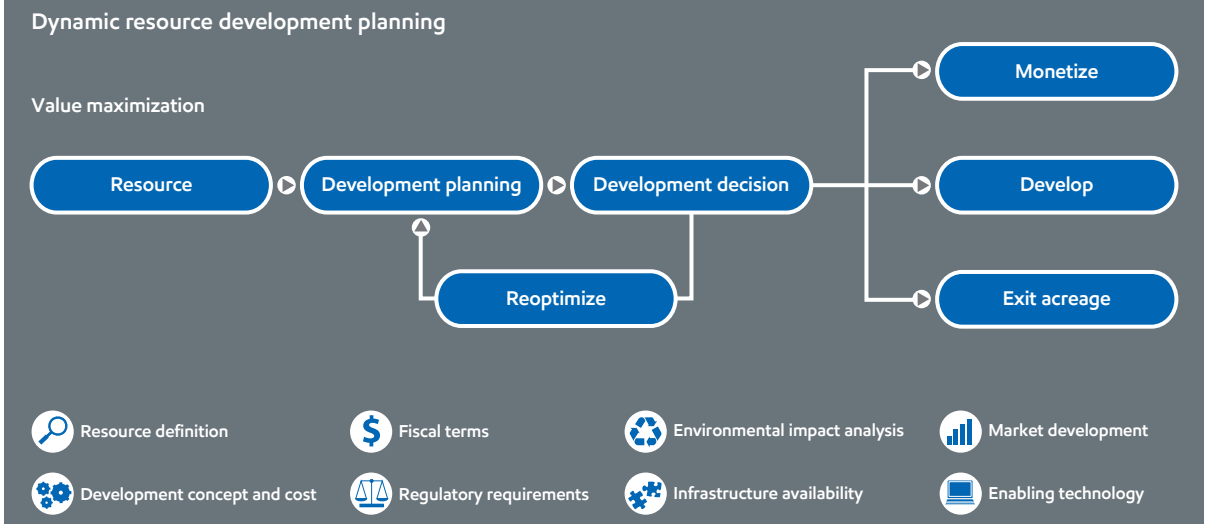
This process considers a wide range of variables over time, including as appropriate: the extent and density of the resource, development concepts, fiscal terms, regulatory requirements, proximity to existing infrastructure, market conditions, enabling technologies, and policy developments, including climate policy.

We optimize our resource development plans in line with these variables and prioritize developments that are competitively advantaged in delivering long-term shareholder value. Decisions can range from developing the resource (which eventually moves to proved reserves), monetizing the resource by selling to others, or exiting the acreage.

With a very large resource base, this process can take decades as technologies are discovered, market conditions change, and competition evolves. Two recent examples illustrate this:

Hebron ▪ The Hebron project in Eastern Canada was commissioned and produced its first oil in December 2017. However, the field was originally discovered in 1980.

East Natuna ▪ In contrast, we relinquished East Natuna in Indonesia, which was originally awarded in 1980. In this case, the global growth of more competitive sources of supply offsets advances in technology, resulting in less attractive returns.



The global energy system has continued to evolve throughout ExxonMobil's history due to growing demand and developments in technology and policy. While the future is difficult to predict, we are well positioned to respond to a range of future outcomes, which will be driven largely by society's needs.

Our annual *Outlook for Energy* process is a vital tool for understanding energy markets. It provides valuable insights on energy supply and demand trends, advancements in technology, and developments in policy. It also provides a forum to monitor lower-carbon signposts that could signal shifts in efficiency and decarbonization trends toward 2°C pathways.

With the ongoing changes in the energy system, ExxonMobil has continuously evolved its portfolio, capabilities, and flexibility to respond. This flexibility is due in large part to our:

- Portfolio diversity, including integrated upstream, downstream and chemicals businesses
- Long-standing research and development program assessing a wide spectrum of energy alternatives
- Disciplined operating and investment capabilities
- Financial strength and access to capital

As we look to the future, we remain confident that these proven capabilities will enable our businesses to adjust to society's needs, including those that may result from evolving technology and policy.

Taking near-term action

As demonstrated by the Paris Agreement, governments have signaled an aspiration to move towards a lower-carbon energy system. We have already observed the beginnings of a shift, and are taking action to position ourselves to help meet future global energy needs. For example, we are:

Expanding supply of cleaner-burning natural gas ▪ This will enable greater substitution of coal with natural gas in power generation. Natural gas can be up to 60-percent less carbon intensive than coal for power generation and is a significant component of ExxonMobil's portfolio and investment activities.

ExxonMobil cogeneration capacity is enough to power

2.5 million

homes in the United States

Our cogeneration plant at our Beaumont, Texas, refinery can produce about 500 megawatts of electricity, which not only powers refining operations, but also supplements the local power grid.

ExxonMobil has considerable flexibility and optionality for a wide range of future energy scenarios

Transitioning our manufacturing facilities ▪ We are retooling our refining capacity to shift from fuel oils and light-duty vehicle gasoline to higher-value distillates (e.g., diesel, jet fuel), lubricants, and chemical feedstock. This reflects projected trends in consumer products and policy, such as growing EV penetration, increasing requirements for heavy-duty transportation fuels, higher performance lubricants, and increasing demand for chemical products that provide sustainability benefits.

Mitigating emissions from our own facilities/ operations ▪ Our prime focus is on energy efficiency and reducing flaring, venting, and fugitive emissions. ExxonMobil also extensively employs cogeneration in its operations to increase energy efficiency and reduce net emissions while reducing the need to import power. Currently, our global gross capacity for cogeneration is 5.3 gigawatts, enough to meet the annual electricity needs of 2.5 million U.S. homes.

Positioning for a lower-carbon energy future, continued

The Shute Creek Gas Plant in Wyoming. CCS will be an important long-term technology to reduce emissions.

Developing consumer products that help others reduce their emissions ▪ ExxonMobil has one of the largest chemical companies in the world. Leveraging proprietary technologies, we produce an array of materials that bring both energy efficiency and sustainability benefits to consumers.

Engaging on climate policy ▪ We continue to encourage policy that addresses the risks of climate change at the lowest cost to society.

We are actively engaged in evaluating potential renewable alternatives, including solar, bioenergy, and wind. Our focus is on contributing in areas where we can help make a difference in line with our technical capabilities. Our research and development program includes opportunities that could make renewable technologies more competitive. We also support the deployment of renewables as a supplier of synthetic lubricants to wind turbines around the world. The natural gas that we produce can also serve as an energy backstop to address intermittency issues associated with these energy sources. We continue to actively monitor developments in this area through our research activities and our annual *Outlook* process, advancing opportunities that appear to hold promise.

Preparing for the long term

We believe society will continue moving towards a lower-carbon energy system, and we are committed to longer-term solutions through our ongoing research and development program. We have collaborations with more than 80 academic institutions around the globe to progress an array of technologies that have the potential

Our research and development program includes opportunities that could make renewable technologies more competitive

to be scalable, reliable, and commercially viable. We are focused on fundamental research to discover or enhance energy solutions for the future.

Power generation ▪ One of the attributes of a lower-carbon future is the increased electrification of society. We have several areas of research that support this trend, including greater utilization of CCS and developments in energy storage technology. ExxonMobil is a leader in existing CCS, participating in more than one-fifth of the world's CCS capacity.

Industrial/Petrochemicals ▪ As economic development progresses, energy demand for industry and the need for petrochemicals will continue to grow. Here again, we expect CCS will be an important technology to reduce emissions. Biofuels, as an alternative source of energy or as feedstock, is another significant opportunity being investigated. We are also researching ways to reduce energy requirements of manufacturing facilities by fundamentally changing processes that require significant heat and pressure.

Commercial transportation ▪ Large-scale commercial transportation requirements by road, sea, and air will continue to require fuels with high energy density. Advanced biofuels offer potential to meet these energy requirements while reducing emissions and minimizing the impact on land, fresh water, and food supplies. Our research programs are focused on algae and conversion of agricultural waste to liquid fuels. These technologies could provide renewable, lower-emission fuels that utilize existing refining processes and infrastructure.

~22% of the world's CCS capacity involves ExxonMobil

Preparing for the potential of shifting demand

We also recognize that society's choices on lower-carbon energies may impact demand for some products we produce. For those sectors of our business that might see a decrease in demand, rationalization of industry capacity could occur. Capacity rationalization has been a key dimension of our industry for decades. For example, over the past twenty years, the global refining sector has been overbuilt, leading to industry rationalization. During this period, our Downstream business has strengthened its competitive position by divesting smaller, less-competitive facilities and redeploying resources and capital to our larger, more efficient sites that are integrated with chemical and lubricant manufacturing. This constant highgrading of our portfolio has positioned ExxonMobil's Downstream to be one of the most cost-competitive in industry, and positioned to address a wide variety of future scenarios.

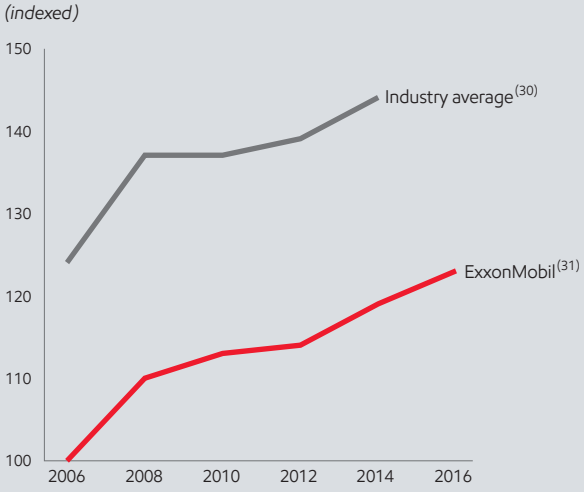
80+ academic institutions collaborate with ExxonMobil on research

In many regards, a lower-carbon scenario may just accelerate the trend of the past two decades. ExxonMobil's Downstream business is well positioned to compete in this environment as one of the lowest-cost producers, as illustrated in the chart below.

With our diverse portfolio and demonstrated capabilities, ExxonMobil can be successful in a wide range of future energy scenarios.

ExxonMobil Downstream's competitive advantage

Refinery unit cash operating expenses[27][28][29]



ExxonMobil is part of the solution

We are committed to providing affordable energy to support human progress while advancing effective solutions to address the risks of climate change. That's why we are working to be part of the solution. Our climate change risk management strategy consists of four pillars:

- **Mitigating emissions in our operations**
- **Developing scalable technology solutions**
- **Providing solutions for our customers**
- **Engaging on climate change policy**

Mitigating emissions in our operations

As we seek to produce oil and natural gas to meet growing global energy demand, we are committed to mitigating greenhouse gas emissions within our operations.

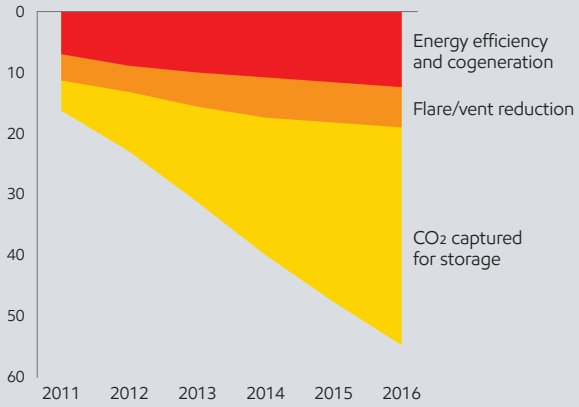
ExxonMobil has a robust set of processes to improve efficiency and mitigate emissions. These processes include, where appropriate, setting tailored objectives at the business, site, and equipment levels, and then stewarding progress toward meeting those objectives. We believe this rigorous bottom-up approach is the most-effective approach to drive efficiency improvements and reduce greenhouse gas emissions. Continuing to use this approach will yield further improvements in all sectors of our business.

In the near term, we are working to increase energy efficiency while reducing flaring, venting, and fugitive emissions in our operations. We are also deploying proven technologies such as cogeneration and CCS, where technically and economically feasible. Longer term, we are conducting and supporting research to develop breakthrough technologies.

ExxonMobil remains a leader in CCS technology. Our capacity is among the industry's largest, with a working interest in more than one-fifth of the world's CCS capacity. In 2016, we captured 6.3 million tonnes of CO_2 for storage, equivalent to switching electricity generated for about 500,000 U.S. homes to solar from coal.

Greenhouse gas emissions avoided

(net equity, CO_2-equivalent emissions, cumulative since 2011, millions of metric tons)



Up close: Investments in lower-emission energy solutions

Since 2000, ExxonMobil has spent more than $8 billion to develop and deploy higher-efficiency and lower-emission energy solutions across our operations, many of which generate an economic return. These include:

- **$4 billion at our Upstream facilities on emission reduction efforts, including energy efficiency and flare mitigation**
- **$2 billion at our refining and chemical facilities that reduce greenhouse gas emissions**
- **$2 billion in support of Upstream and Downstream cogeneration facilities to more efficiently produce electricity and reduce greenhouse gas emissions**

Up close: Taking actions to reduce methane emissions

ExxonMobil and its subsidiary XTO have established a methane management program that exceeds applicable regulations. The program prioritizes actions at the highest-volume production and midstream sites and includes efforts to develop and deploy new, more-efficient technologies to detect and reduce facility emissions. Most aspects of the program are voluntary.

Reporting ▪ Our efforts are discussed in ExxonMobil's annual *Corporate Citizenship Report,* as well as other materials available on our website, where the company reports 10 years of performance data on overall ExxonMobil methane emissions. In the United States in 2016, XTO reported 205,000 tonnes (5.1 million tonnes CO_2e) of methane emissions. Specifically for upstream operations, XTO-operated production emissions equate to about 410 methane tonnes per million barrels of oil-equivalent production, an emissions rate of 0.36 percent. XTO accounts for more than two-thirds of ExxonMobil's methane emissions.

High-bleed pneumatic phase-out ▪ Over the next three years, we are voluntarily switching out more than 1,000 high-bleed pneumatic devices for lower- or no-bleed devices that can significantly reduce emissions.

Leak detection and repair ▪ We have implemented an enhanced leak detection and repair program that prioritizes our largest-volume sites and greatest opportunities for emission reductions.

Planned events such as liquid unloading will be managed to reduce the release of methane emissions to the atmosphere. Liquid unloading removes liquid that has collected in equipment tubing and prevents natural gas from flowing up through the well. As part of our program, field personnel monitor and remain in close proximity during the manual unloading process to close all wellhead vents to the atmosphere.

Training ▪ ExxonMobil is currently developing an enhanced training program to complement these efforts.

Improved facility designs ▪ We continue evaluating opportunities to upgrade facilities to reduce emissions. This includes research in collaboration with equipment manufacturers to develop state-of-the-art, low-cost, minimum-emissions equipment.

Research ▪ As part of the company's efforts to better understand the magnitude and characteristics of oil and gas industry-related methane emissions, ExxonMobil participated in studies conducted by the University of Texas and the Environmental Defense Fund. This study quantified methane leakage rates in the United States from upstream gas production activities at 0.4 percent of the total gas produced.

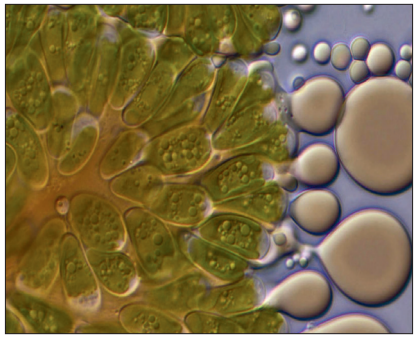
ExxonMobil remains active in ongoing methane research, including participation in a methane measurement reconciliation study with the Department of Energy's National Renewable Energy Laboratory, and in supporting research currently under way at Harvard University, the University of Texas at Austin Energy Institute, and Stanford University's Natural Gas Initiative.

Developing scalable technology solutions

As society pursues policies to lower greenhouse gas emissions, technological advancements will be instrumental in providing the global economy with the energy it needs.

Recognizing the challenges associated with most existing low-GHG emissions energy technologies, particularly in delivering the necessary economy, scale, and reliability, we are conducting fundamental research aimed at developing energy solutions that have the potential to be economically feasible and scalable. ExxonMobil is pioneering scientific research to discover innovative approaches to enhance existing – and develop next-generation – energy sources.

Up close: Advanced biofuels and CCS



Advanced, or second-generation, biofuels offer the possibility of achieving significant GHG reductions while also minimizing the impact on land, fresh water, and food supplies compared with first-generation biofuels.

ExxonMobil and Synthetic Genomics recently announced a breakthrough in joint research into advanced biofuels involving the modification of an algae strain that doubled its oil content without significantly inhibiting the strain's growth.

Our broad portfolio of advanced biofuels research also includes biofuels derived from cellulosic biomass, which do not compete with food and fresh water.

ExxonMobil and Renewable Energy Group (REG) recently announced that by utilizing REG's patented fermentation technology, the companies' joint research program has demonstrated the ability to convert sugars from a variety of non-edible biomass sources into biodiesel.

We are conducting proprietary, fundamental research to develop breakthrough CCS technologies, with an aim to reduce the complexity and cost of this important technology, while increasing its efficiency.

We are working with research institutes like the Energy Research Centre of the Netherlands and leading universities like University of California, Berkeley to develop materials and process configurations for scalable, affordable carbon capture solutions.

Carbonate fuel cell technology could make CCS more affordable, easier to operate, and scalable for power plants which, according to the U.S. Environmental Protection Agency, are the single largest source of GHG emissions.

In 2016, FuelCell Energy, Inc. and ExxonMobil signed a joint agreement that will allow scientists from both companies to work collaboratively and further develop this emissions-saving technology. We are progressing this technology from the lab to a pilot plant.

Providing solutions that reduce greenhouse gas emissions for our customers

Over the next few decades, population and income growth – and an unprecedented expansion of the global middle class – are expected to create new demand for energy and hydrocarbon-based products.

Meeting these demands will require not just more energy, but will also require energy to be used more efficiently across all sectors. ExxonMobil is delivering solutions that enable our customers to reduce their emissions and improve their energy efficiency.

Natural gas

Natural gas emits up to 60-percent fewer GHGs than coal for power generation. Natural gas is an ideal source of reliable power and can supplement intermittent renewable energy sources such as solar or wind. ExxonMobil is the largest natural gas producer in the U.S. and is a leader in liquefied natural gas technology.

Advanced chemicals and lubricants

Demand for auto parts, housing materials, electronics, and other products made from plastics and other petrochemicals continues to grow. We produce weight-reducing plastics, friction-reducing lubricants, and mileage-increasing tire liners that can significantly improve efficiency and lower emissions for consumers.

Lightweight packaging

ExxonMobil also produces lightweight plastic packaging materials for everything from food to electronics. Lighter packaging means less transportation-related energy use and GHGs. Plastic packaging also helps extend the shelf life of fresh food by days or even weeks, improving safety and reducing food waste.

Up close: Lubricating wind power

ExxonMobil manufactures a number of products from petroleum, including lubricants and greases used in generators, gear boxes, and other parts of wind turbines.

Our high-performance lubricants are used in more than 40,000 wind turbines worldwide. Our lubricants require less frequent replacement and therefore reduce the volume of used oil that needs to be disposed of or recycled.

Engaging on climate change policy

ExxonMobil believes the long-term objective of effective policy should be to reduce the risks of climate change at the lowest societal cost, in balance with other priorities such as meeting increased demand for affordable energy and better addressing poverty, education, health, and security.

Climate change is a global issue that requires the collaboration of governments, companies, consumers and other stakeholders to create worldwide solutions. We engage with stakeholders directly and through trade associations around the world to encourage sound policy solutions for addressing climate change risks. Our scientists have participated since the inception of the IPCC in 1988.

Supporting Paris

ExxonMobil supports the Paris Agreement as an important framework for addressing the risks of climate change.

We welcomed the Paris Agreement when it was announced in December 2015, and again when it came into effect in November 2016. We have reiterated our support on several occasions in opinion pieces, blog posts, and letters.

We encourage society to remain focused on pursuing the most cost-effective greenhouse gas reduction options, as well as policies that promote flexibility and innovation.

Attributes of sound policy

- Promote global participation
- Let market prices drive the selection of solutions
- Ensure a uniform and predictable cost of greenhouse gas emissions across the economy
- Minimize complexity and administrative costs
- Maximize transparency
- Provide flexibility for future adjustments to react to developments in technology, climate science, and policy

CLIMATE LEADERSHIP COUNCIL

Up close: Climate Leadership Council

ExxonMobil is proud to be among the Founding Members of the Climate Leadership Council. Our support is anchored in a proposal put forth by former U.S. Secretaries of State George P. Shultz and James A. Baker, III. These statesmen argued for a carbon tax that calls for a gradually rising price on carbon. The revenues generated by the plan would be returned to American energy consumers, and not kept by government.

They also called for the rollback of existing, less efficient carbon regulations that would be made superfluous by implementation of such a tax, and border carbon adjustments to level the playing field and promote American competitiveness.

This is an approach that is similar to the principles ExxonMobil has espoused for nearly a decade.

Investment planning

ExxonMobil is committed to disciplined investing in attractive opportunities across the business cycle. Projects are evaluated under a wide range of possible economic conditions and commodity prices and we seek to ensure projects are robust by applying prudent safety margins. We expect all projects to deliver competitive returns throughout the cycle.

The company also stress tests its capital investments, which provides an added margin of safety against uncertainties, such as those related to technology, costs, geopolitics, availability of required materials, services, and labor. Stress testing provides us an opportunity to consider different economic outcomes in our planning and investment process, as appropriate.

Investment planning

Stress testing is a robust approach to evaluate a range of economic outcomes:

- Tests investments across key economic variables
- Defines economic resiliency and key economic drivers
- Captures insights to mitigate risk

Examples of economic variables (where appropriate):

- Fiscal terms
- Commodity prices
- Regulatory and environmental
- Cost and schedule
- Geopolitical risks
- Infrastructure and logistics
- Market considerations
- Technology applications

Up close: Considering future climate-related policies

Our *Outlook* seeks to identify potential impacts of climate-related policies, which often target specific sectors, by using various assumptions and tools including application of a proxy cost of carbon to estimate potential impacts on consumer demands. This approach assists us in assessing potential energy demand over time in many sectors where future policy actions are unclear or may involve a significantly broad suite of policy initiatives. In other demand sectors, where the direction of policies and related targets are clearer (e.g., fuel economy standards), a more direct approach reflecting assessments of targeted policies is used, as appropriate, and as an alternative to a proxy cost.

As such, the demand for energy projected in ExxonMobil's *Outlook* utilizes a proxy cost of carbon as well as targeted policy assessments to reflect potential policies governments may employ related to managing the risks of climate change, which can, in turn, impact future oil and gas demand. This is central to the development of the *Outlook for Energy* that is considered when evaluating ExxonMobil's potential projects.

ExxonMobil also evaluates the direct financial impact of existing and future greenhouse gas regulation on potential investments on a project-by-project basis, as appropriate. This GHG cost examines those existing and reasonably anticipated regulations that may have an impact on the economics of the project in question, as opposed to those policies that might have an effect on global demand.

Managing risks to meet energy demand

Many things we do contain an element of risk, whether technical, operational, environmental, or financial. Equipped with mature risk-management systems, we identify the risks inherent in our businesses, look to understand implications, and implement safeguards to eliminate or mitigate exposures.

Engineering resiliency

ExxonMobil has long operated facilities in a wide range of challenging physical environments around the globe. Our long history of design, construction, and operations provides us a solid foundation to address risks associated with different physical environments. The company is aware of the risks posed by weather and other natural elements, and actively designs its facilities and operations in consideration of this risk.

When considering physical environmental risks, we evaluate the type and location of our current and planned facilities. As an example, offshore facilities could be impacted by changes in wave and wind intensity as well as by ice flow patterns, while onshore facilities could be vulnerable to sea level rise, changes in storm surge, or geotechnical considerations.

Our facilities are designed, constructed, and operated to withstand a variety of extreme weather and environmental conditions. We use historical experience with additional safety factors to cover a range of uncertainties.

After construction of a facility, we monitor and manage ongoing facility integrity; for example through periodic checks on key aspects of the structures. In addition, we regularly participate with major engineering societies and industry groups to assess and update engineering standards.

Once facilities are in operation, we maintain disaster preparedness, response, and business continuity plans. Detailed, well-practiced, and continuously improved emergency response plans tailored to each facility help ExxonMobil prepare for unplanned events, including extreme weather. Regular emergency drills are practiced in partnership with appropriate government agencies and community coalitions to help ensure readiness and minimize the impacts of such events.

ExxonMobil's comprehensive approach and established systems enable us to manage a wide variety of possible outcomes.

Climate risk oversight ultimately is the responsibility of the Board of Directors

Climate risk oversight

ExxonMobil's Board of Directors is responsible for risk oversight, including the risks of climate change. The Board routinely reviews and considers this risk, including briefings on public policy, scientific and technical research, as well as company and external positions and actions in this area. Climate-related matters are also considered by the Board throughout the year in various other contexts, including reviews of the *Outlook for Energy*, the company's safety, health and environmental performance, the annual corporate planning process, shareholder proposals, and regulatory filings such as the 10-K.

Highlight: Incorporating risk management into executive compensation

- **Compensation of senior executives is determined by a committee made up of entirely independent directors**
- **The compensation program incentivizes effective management of all operating and financial risks**
- **More than 60 percent of senior executive compensation is based on performance share awards that have a restriction period that is 3 times longer than comparators. The size of individual awards is based on key performance metrics including safety and operations integrity, in which sustainability risks are incorporated.**

The longer restriction periods of the stock program ensure that senior executives consider how decisions made today will affect shareholder value a decade later; these decisions comprehend the risks of climate change where appropriate.

The Chairman of the Board/Chief Executive Officer and other members of the Management Committee have responsibility for management of climate risk, including in business plans, performance, and public policy. The long-term nature of ExxonMobil's compensation program requires consideration of the risks of climate change and other sustainability matters, as described more fully in the highlight box on the previous page.

Public Issues and Contributions Committee

The Board's Public Issues and Contributions Committee assists the Board in providing oversight of the corporation's safety, health, and environmental performance, including issues associated with climate risk. This committee reviews the effectiveness of the Corporation's policies, programs, and practices on safety, health and the environment, and social responsibility. The committee receives reports relating to operating units' safety and environmental activities and also visits operating sites to observe and comment on current operating practices. For example, in 2017, the committee and other Board members visited ExxonMobil's research and development facilities in Clinton, New Jersey, to review our research programs, including advanced biofuels and carbon capture and storage. All members of the committee are independent within the meaning of the New York Stock Exchange listing standards. The committee's charter is available on the Corporate Governance section of our website.

ExxonMobil scientist and innovator inspects a reactor in our lab in Clinton, New Jersey.

Disclosures

ExxonMobil is committed to providing our shareholders with disclosures that impart meaningful insights about our business, including how we manage climate-related risks. This report, along with the rest of our comprehensive set of disclosures relating to climate risk follow the framework established by IPIECA, including IPIECA's Climate Change Reporting Framework. IPIECA members represent a significant portion of the world's oil and natural gas production, including state oil companies, and is the industry's principal channel of communication with the United Nations. This broad, global membership enables a reporting framework that is tailored to the petroleum industry and better permits comparisons of member companies on a more consistent and standardized basis.

There are numerous other reporting frameworks under various stages of development, including the framework proposed by the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD). We continue monitoring developments regarding these other frameworks, including the TCFD recommendations, and believe our disclosures under the IPIECA framework substantially address many of the key disclosure aims of these other frameworks. Our financial reporting is in accordance with United States regulatory requirements and generally accepted accounting principles.

Web links to our other various climate-related disclosures are highlighted below:

- *Corporate Citizenship Report (http://corporate.exxonmobil.com/en/community/corporate-citizenship-report)*
- Emissions Data *(http://corporate.exxonmobil.com/en/community/corporate-citizenship-report/charts)*
- *Outlook for Energy (http://corporate.exxonmobil.com/en/energy/energy-outlook)*
- Technology *(http://corporate.exxonmobil.com/en/energy/research-and-development/innovating-energy-solutions/research-and-development-highlights)*
- Enhanced Methane Emissions Reduction Program *(http://xtoenergy.com/responsibility/current-issues/air/xto-energy-methane-emissions-reduction-program)*
- Climate Policy material *(http://corporate.exxonmobil.com/en/current-issues/climate-policy)*
- Current issues relating to energy and climate *(https://energyfactor.exxonmobil.com/perspectives/managing-climate-risk/)*
- ExxonMobil Energy Factor blogs *(https://energyfactor.exxonmobil.com/)*
- SEC Form 10-K *(http://ir.exxonmobil.com/phoenix.zhtml?c=115024&p=irol-finlanding)*

Existing policy frameworks (including the Paris NDCs), financial flows, and the availability of cost-effective technologies indicate that society is not currently on a 2°C pathway. Should society choose to more aggressively pursue a 2°C pathway, we will be positioned to contribute through our engagement on policy, development of needed technologies, improved operations, and customer solutions.

Footnotes

(1) OECD – Organisation for Economic Co-operation and Development.

(2) Article 4 paragraph 2 of the Paris Agreement *http://unfccc.int/files/home/application/pdf/paris_agreement.pdf*

(3) Decision 1/CP.21 Section II.17 *https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf*

(4) Based on average of Assessed 2°C Scenarios' CO_2 emissions (~20 billion tonnes including energy and industrial processes), ExxonMobil GDP assumptions consistent with 2018 *Outlook for Energy.*

(5) IEA, Perspectives for the Energy Transition, page 57.

(6) Such as the 17 sustainable development goals adopted by the United Nations. *http://www.un.org/sustainabledevelopment/sustainable-development-goals/*

(7) "EMF was established at Stanford in 1976 to bring together leading experts and decision makers from government, industry, universities, and other research organizations to study important energy and environmental issues. For each study, the Forum organizes a working group to develop the study design, analyze and compare each model's results and discuss key conclusions." *https://emf.stanford.edu/about*

EMF is supported by grants from the U.S. Department of Energy, the U.S. Environmental Protection Agency as well as industry affiliates including ExxonMobil. *https://emf.stanford.edu/industry-affiliates*

(8) To understand some of the characteristics of future transition pathways, we analyzed energy and emissions data from a range of EMF27 stabilization, policy and technology targets, primarily focusing on 450 and 550 stabilization targets, as well as no-policy cases that utilize a full suite of technologies. The suite of full technologies (FT) includes a range of options, including: energy efficiency, nuclear, carbon capture and storage (CCS), biofuels and non-bio renewables such as solar and wind. The EMF27 study considered other technology-limited scenarios, but a key finding was that the unavailability of carbon capture and storage and limited availability of bioenergy had a large impact on feasibility and cost. Given the potential advantages to society of utilizing all available technology options, we focused on capturing the results of different EMF27 models that ran 450-FT cases; we were able to

download data for 13 such scenarios, and utilized that data as provided for analysis purposes (most of the scenarios had projections extending from 2010 to 2100). Data downloaded from: *https://secure.iiasa.ac.at/web-apps/ene/AR5DB*

(9) EMF27 cases include CO_2 emissions from energy and industrial process.

(10) IPCC (2013) Climate Change 2013: The Physical Science Basis assessed in its Table SPM.2 that temperature increased from the period of 1850-1900 to the period 1986-2005 by 0.61°C, and that the mean CMIP5 model temperature projection of RCP 4.5 increased from the period 1986-2005 to the period 2081-2100 by an additional 1.8°C, giving a total increase of 2.4°C from the period of 1850-1900 to the period of 2081-2100.

(11) The Assessed 2°C Scenarios produce a variety of views on the potential impacts on global energy demand in total and by specific types of energy, with a range of possible growth rates for each type of energy as illustrated in this report. Since it is impossible to know which elements, if any, of these models are correct, we used an average of all 13 scenarios to approximate growth rates for various energy types as a means to estimate trends to 2040 indicative of hypothetical 2°C pathways.

(12) Based on the average of the Assessed 2°C Scenarios referenced in this report, the combination of renewables, nuclear and fossil fuels using CCS is estimated in these scenarios to increase significantly as a percentage of total primary energy demand, rising from approximately 10% in 2010 to roughly 40% in 2040.

(13) Total electricity delivered as a percentage of total final energy demand increases from 18% to 28% on average across the 13 Assessed 2°C Scenarios referenced in this report.

(14) Under the Assessed 2°C Scenarios, the average growth rate for oil demand is -0.36% from 2010 to 2040, which implies a decrease in absolute level of demand in 2040 by ~10% relative to 2010 levels, which is near 2000 levels. Oil demand has increased about 9% since 2010, hence it would require a demand decrease of ~20% to reach the same 2040 level relative to today's demand. Trends toward a level close to 2000 would imply oil used in road transportation trends toward 30 Moebd, and oil used for aviation and marine trends toward 9 Moebd.

(15) Electricity delivered from fossil fuels without CCS as a percentage of total electricity delivered decreases from 66% to 20% on average from 2010 to 2040 under the Assessed 2°C Scenarios. Share of electricity from non-bioenergy renewables (e.g. wind, solar, hydro) increases from less than 20% to ~35%. Share of electricity generation utilizing CCS increases to about 20%. Share of electricity from nuclear increases from ~15% to ~20% (implies double the level of nuclear capacity from 2016 to 900 GW).

(16) Based on average global demand growth rates under Assessed 2°C Scenarios.

(17) Based on average global demand growth rates under Assessed 2°C Scenarios.

(18) For the purposes of this report, proved reserves are year-end 2016 proved oil and gas reserves for consolidated subsidiaries and equity companies as reported in the Corporation's Annual Report on Form 10-K. Proved oil and gas reserves are determined in accordance with Securities and Exchange Commission (SEC) requirements. Proved reserves are those quantities of oil and gas which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible under existing economic and operating conditions and government regulations. Proved reserves are determined using the average of first-of-month oil and natural gas prices during the reporting year.

(19) For the purposes of this disclosure, resources are total remaining estimated quantities of discovered quantities of oil and gas that are expected to be ultimately recoverable. The resource base includes proved reserves and quantities of oil and gas that are not yet classified as proved reserves. At year-end 2016, the total resource base totaled approximately 91 billion of oil-equivalent barrels including 20 billion oil-equivalent barrels of proved reserves.

(20) To estimate global demand in 2040 for oil and natural gas, the average of the Assessed 2°C Scenarios' growth rates for oil and natural gas covering the period 2010-2040 have been applied to standard baseline estimates of oil and natural gas demand in 2010.

(21) IHS: Climate-Related Financial Risk and the Oil and Gas Sector, page 23.

(22) The Assessed 2°C Scenarios growth rates imply a range in 2040 global oil demand from about 53 to 103 Moebd and for 2040 global natural gas demand from about 265 to 625 Bcfd.

(23) IEA: World Energy Outlook 2017.

(24) Hypothetical cumulative production determined by proportioning ExxonMobil's 2016 average daily production (Form 10-K, page 8) and 2016 average daily global oil and gas production to estimated 2040 average daily production (assuming ExxonMobil's current market share and 100% proved reserves replacement to maintain its proved reserves consistent with its production ratio at the end of 2016) and implied oil and gas demand from the 2°C Scenarios Average. Assumed linear decline of estimated average daily production through 2040.

(25) IEA: Perspectives for the Energy Transition, page 56. Estimate for IEA crude oil and Natural gas and future prices for 2020, 2030, and 2040.

(26) As used here "carrying value" is our property, plant and equipment (PPE) net of accumulated depreciation. ExxonMobil's carrying value of property, plant and equipment as of September 30, 2017 was approximately $255 billion. The reference to "less than 5 percent of ExxonMobil's total carrying value of property, plant and equipment" is calculated by taking the PPE carrying value of ExxonMobil's resource base and subtracting from it the PPE carrying values of ExxonMobil's proved reserves, its producing assets that do not currently meet the SEC's definition of proved reserves, its unconventional liquids assets and its natural gas assets, and comparing this resulting value against ExxonMobil's total PPE carrying value as of September 30, 2017.

(27) Source: Solomon Associates.

(28) Solomon Associates fuels and lubes refining data available for even years only

(29) Constant foreign exchange rates and energy price.

(30) 2016 industry data not available. ExxonMobil data estimated.

(31) Assumed constant year-end 2016 portfolio.

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002CSN8C5B

Printed in U.S.A.