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ExxonMobil Releases Energy & Carbon Summary and Outlook for Energy

IRVING, Texas--(BUSINESS WIRE)-- [ExxonMobil](#) today released its *Energy & Carbon Summary: Positioning for a Lower-Carbon Future* and its *Outlook for Energy: A View to 2040*. The reports highlight ExxonMobil's analysis of 2 degree Celsius (2°C) scenarios and include sensitivity analyses on electric vehicle penetration and renewables deployment. They are in response to a 2017 shareholder resolution seeking additional climate disclosures about the impacts of technology advances and global climate change policies on the company.

The *Energy & Carbon Summary* and a new special section in the annual *Outlook for Energy* include consideration of the impact on future energy demand from an analysis of multiple lower-carbon scenarios published by the Stanford University Energy Modeling Forum. The forum's scenarios are publicly available and are used for analytical purposes, including by the UN's Intergovernmental Panel on Climate Change.

The global scenarios assessed by ExxonMobil, which include a full range of energy technologies, contemplate limiting global greenhouse gas (GHG) emissions to have a likely chance of holding atmospheric concentrations to the equivalent of 450 parts per million CO₂ in 2100; these scenarios are generally considered to be consistent with pathways that would limit global average temperature rise in 2100 to 2°C above pre-industrial levels.

The company's analysis of these 2°C scenarios examined the mean of the annual average demand growth rates of the various model outputs between 2010 and 2040 for multiple sources of energy. This analysis of these 2°C scenarios indicates: total energy demand increases about 0.5 percent per year; oil demand decreases about 0.4 percent per year; natural gas demand increases about 0.9 percent per year; coal demand decreases about 2.4 percent per year; and renewables demand increases about 4.5 percent per year.

All energy sources remain important across the assessed 2°C scenarios to 2040. As a result of ongoing demand coupled with natural hydrocarbon field decline, trillions of dollars of additional investment in oil and gas production will be required, including to meet a 2°C pathway. Based on the average growth rates of assessed 2°C scenarios, natural gas demand is estimated to increase to 445 billion cubic feet per day by 2040; oil demand is estimated to decline to 78 million barrels per day by 2040.

"Our job is to supply the energy the world needs in an environmentally responsible way," said Darren W. Woods, chairman and chief executive of Exxon Mobil Corporation (NYSE:XOM). "It's a dual challenge – we need to meet society's growing need for energy while addressing the risks of climate change. We are committed to being part of the solution by investing in new technologies that can provide economic solutions on a globally scalable basis."

Many experts agree that advancements will be needed to reach and maintain a 2°C pathway through 2100. ExxonMobil has invested billions of dollars in research and development, including multiple university and business partnerships around the globe, aimed at achieving the technical breakthroughs required.

“Since 2000, our investments to develop lower-emission energy solutions have totaled about \$8 billion,” Woods said. “We are deploying technologies such as cogeneration and carbon capture and storage, while researching next-generation solutions such as algae biofuels and advanced carbon capture using fuel cells. Continued research will be critical.”

With growing global populations and economies, key levers to address the risks of climate change include further energy efficiency improvements and reducing the GHG intensity of the world’s energy system. “For our part, we continue to take action to mitigate our emissions and help consumers lessen their GHG impact,” Woods said.

ExxonMobil’s *Outlook for Energy: A View to 2040* describes a rapidly growing global population and rise in living standards in developing countries that will drive a growth in worldwide energy demand of about 25 percent from 2016 to 2040. At the same time, energy efficiency gains and gradual reductions in the GHG intensity of the energy system, will help to moderate energy use and reduce by nearly 45 percent the carbon intensity of the global economy, according to the report.

Emerging economies in countries that are not part of the Organisation for Economic Co-operation and Development (OECD) will account for essentially all energy demand growth, led by an expanding Asia-Pacific region.

As prosperity rises, electrification continues as a significant global trend. Energy demand for power generation accounts for about 50 percent of global demand growth, with much of that coming from non-OECD countries.

“Natural gas use is likely to increase more than any other energy source, around 40 percent, with about half its growth for electricity generation,” said T.J. Wojnar, vice president for Corporate Strategic Planning. “The abundance and versatility of natural gas, in addition to its significant air quality benefits, make it a valuable energy source to meet a wide variety of needs, while also helping the world to shift to a less carbon-intensive source of energy.”

Among the most rapidly expanding energy supplies will be electricity from solar and wind, together growing about 400 percent.

While energy demand will grow, global carbon dioxide emissions are likely to peak by 2040, at about 10 percent above 2016 levels, as energy sources shift toward lower-emission fuels such as natural gas, renewables, and nuclear.

The *Outlook* predicts a rise in electric vehicles as well as efficiency improvements in conventional engines. This will likely lead to a peak in liquid fuels use by the world’s light-duty vehicle fleet by 2030. However, oil will continue to play a leading role in the world’s energy mix.

“Our in-depth analysis shows that even if every light-duty vehicle in the world was fully electric by 2040, the demand for liquids could still be similar to levels seen in 2013,” said

Wojnar. "This is because of growing demand from commercial transportation and the chemical sector."

The *Outlook for Energy* is ExxonMobil's long-range forecast developed through data-driven analysis, reflecting broad knowledge of energy markets and the expertise of economists, engineers, and scientists. It examines energy supply and demand trends for approximately 100 regional/country areas, 15 demand sectors and 20 different energy types. ExxonMobil uses the forecast as a foundation for its business strategies and to help guide multi-billion dollar investment decisions.

Key findings from this year's Outlook:

- In 2040, oil and natural gas continue to supply about 55 percent of the world's energy needs; oil continues to provide the largest share of the energy mix with demand rising about 20 percent driven by commercial transportation and chemicals.
- Nuclear and renewable energy sources are likely to account for nearly 40 percent of the growth in global energy demand to 2040.
- The share of the world's electricity generated by coal is expected to fall to less than 30 percent in 2040 from approximately 40 percent in 2016.
- Increasing electrification of light-duty vehicles is anticipated to grow strongly. In total, full hybrid, plug-in hybrid, and electric-only vehicles will be approaching 40 percent of global light-duty vehicle sales in 2040, compared to about 3 percent in 2016.

For more information on the Energy & Carbon Summary and *Outlook for Energy*, visit www.exxonmobil.com/energyoutlook.

About ExxonMobil

ExxonMobil, the largest publicly traded international energy company, uses technology and innovation to help meet the world's growing energy needs. ExxonMobil holds an industry-leading inventory of resources, is one of the largest refiners and marketers of petroleum products, and its chemical company is one of the largest in the world. For more information, visit www.exxonmobil.com or follow us on Twitter www.twitter.com/exxonmobil.

Cautionary Statement: Statements in the *Outlook for Energy* and this release relating to future events or conditions are forward-looking statements. Actual future global or local conditions (including economic conditions and growth, population growth, energy demand growth and mix, energy supply sources, efficiency gains, the impact of technology, and carbon emissions) could differ materially due to changes in supply and demand and market conditions affecting oil, gas, and other energy prices; changes in law or government regulation and other political events; changes in technology; the occurrence and duration of economic recessions; the actions of competitors; the development of new supply sources; demographic changes; and changes in other assumptions or factors discussed in the *Outlook for Energy* and under the heading "Factors Affecting Future Results" on the Investors page of our website at www.exxonmobil.com. See also Item 1A of ExxonMobil's latest Form 10-K.

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