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International Energy Outlook 2018 Executive Summary

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EIA's *International Energy Outlook 2018* (IEO2018) focuses on how different drivers of macroeconomic growth may affect international energy markets in three heavily populated and high economic growth regions of the world: China, India, and Africa. To perform this analysis, EIA updated the IEO2017 Reference case with new macroeconomic information and varied macroeconomic assumptions to create side cases for each region.

How these regions develop economically is likely to have important implications for global energy markets because of increased demand from the production and provision of goods and services. In addition, the way these countries develop economically will affect their industrial mixes, and, as a result, their energy consumption. These factors may also affect the United States as the country plays a larger role as an energy exporter.

The IEO2018 side cases focus on faster economic growth and different development patterns for the three regions. For China, the economy is assumed to grow at an average rate of 5.7% per year from 2015 to 2040 in the two high-growth cases, but one assumes China will transition from investment- and export-led growth to a more consumption-led growth pattern, while the other assumes the transition does not occur. For India, the economy is assumed to grow at an average rate of about 7.1% per year from 2015 to 2040 across three high-growth cases, while varying the magnitude of the investment-, consumption-, or export-led growth pattern when compared with the IEO2018 Reference case. For Africa, the high-growth case examines the affect that average annual economic growth of 5.0% per year from 2015 to 2040 will have on that country's energy consumption.

The side cases chosen for each region represent a variety of potential outcomes from a different set of economic structures. China is currently a manufacturing-based economy whose rapid growth is moderating energy consumption. India's economy is more balanced between manufacturing and services, and is projected to be the fastest growing region in the IEO2018 Reference case. Africa has relatively little manufacturing compared with services, and the region has great potential for growth.

The results of these side cases are summarized by the following key findings:

- Faster economic growth in China increases energy use, but the magnitude and rate depends on how quickly China transitions to a more service-oriented, personal consumption-based economy. In the No Transition to services case, delivered energy consumption increases by 25% relative to the IEO2018 Reference case in 2040, compared with a 20% increase in the Fast Transition to services case.
- Across all China cases, the country remains by far the world's largest producer of energy-intensive goods in 2040.
- India is projected to have the world's largest population and the fastest-growing economy over the projection period under all three India cases; however, Indian total energy use and energy use per capita remains lower than in China, the United States, and other industrialized countries over the next two decades.
- The India Export-led case results in the largest increase in Indian energy use, with 33% more delivered energy consumed in 2040 than in the IEO2018 Reference case. This side case also

leads to nominal gross output from the energy-intensive manufacturing sector that is about 50% larger than in the IEO2018 Reference case in 2040.

- India's industrial sector remains the largest energy-consuming end-use sector through 2040 across all India side cases in IEO2018.
- Higher growth in Africa leads to an expansion of the manufacturing sector and an increase in its industrial energy use because of possible regional competitive advantages. Higher assumed economic growth over the projection period leads to African energy consumption per capita that is 30% higher than in the IEO2018 Reference case in 2040, but still lower than many emerging economies, including India and Brazil.

The IEO2018 regional studies show that high economic growth rates drive energy consumption, while the initial starting points and different growth patterns vary that consumption—particularly because the industrial sector is often the largest energy-consuming sector in many countries. These findings highlight areas that would benefit from further investigation, specifically other factors related to development, such as personal income and population growth, which may affect overall energy consumption.