

The Payne Institute for Public Policy



PAYNE INSTITUTE COMMENTARY SERIES: **RESEARCH**

Country Spotlight: Gas Flaring in India

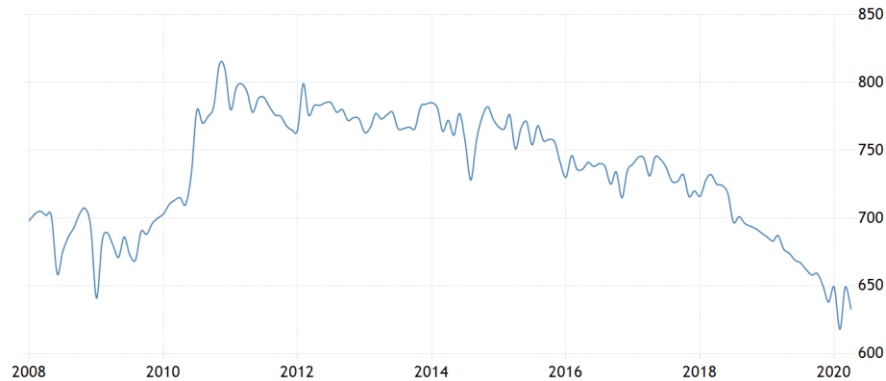
By Utkarsh Srivastava, Greer Gosnell, Morgan D. Bazilian, and Christopher Elvidge

[According to the IEA](#), India is the fourth largest refiner of oil (behind the US, Russia, and China), and the third largest importer of crude oil and LNG (behind China and the US), though is outranked by 24 other countries on oil production, with declining trends. China and India have been the most important drivers of crude oil demand globally since 2012. About 71% of oil production in India is attributable to the state-run Oil and Natural Gas Company (ONGC).



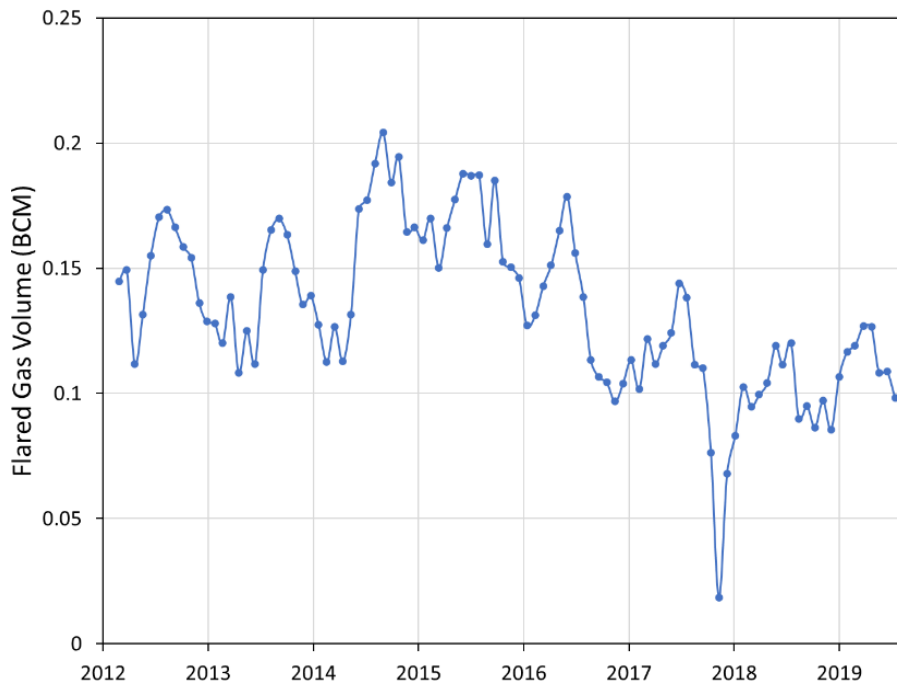
Notes: The red symbols indicate upstream flaring, while yellow symbols indicate flaring at a refinery. Data is from 2018.

Given its relatively low oil production, little attention has been paid to gas flaring¹ from oil production in India, which appears to follow a seasonal cycle increasing in the winter months and dipping in the summer months. The extent of flaring throughout the period covered by our data appears to have adjusted upward toward the end of 2014, [then readjusted downward in early 2017](#) (with a large dip in July 2018, when Indian oil production dropped 5%).



SOURCE: TRADINGECONOMICS.COM | U.S. ENERGY INFORMATION ADMINISTRATION

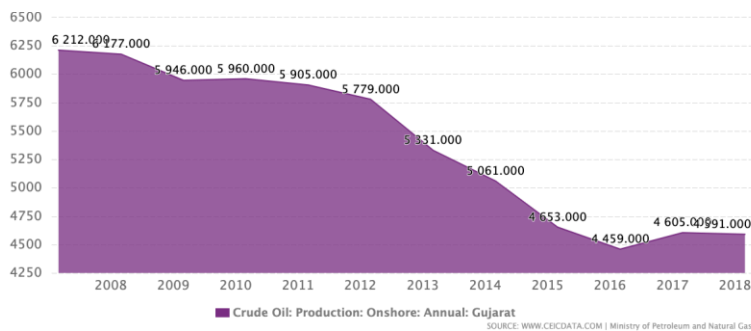
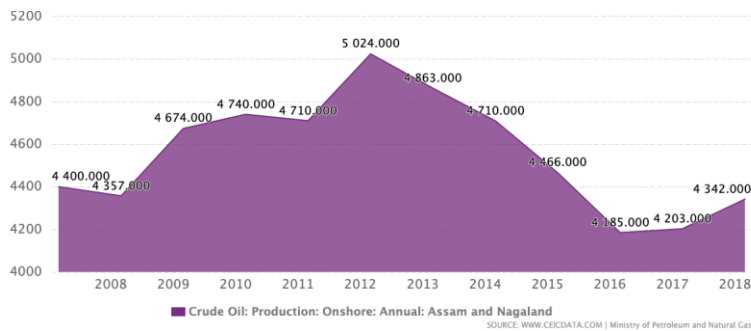
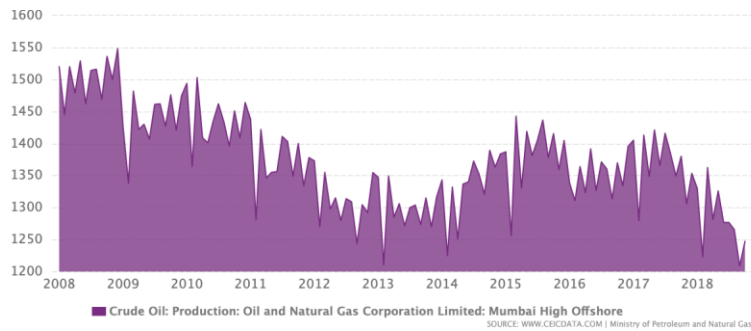
Notes: Indian oil production since 2011—in particular since 2018—has been on the decline. Units in thousands of barrels/day.



Notes: Fluctuating seasonal flaring trends appear to have dampened around January 2017.

¹ Natural gas flaring, the controlled burning of natural gas at oil and gas extraction sites, occurs when it is uneconomical for production companies to bring the gas from well to market for processing and sale. The burning of the gas—as opposed to releasing it directly into the atmosphere, or “venting”—is meant to reduce potential safety hazards and prevent methane, a more potent greenhouse gas that contributes to ground-level ozone, from entering the atmosphere. Both are distinct from “leakage”, which is unintentional and [can go undetected](#).

Our [advanced satellite data](#) suggests that the majority of gas flaring in India is concentrated in 3 regions: oil drilling off the coast of Mumbai (primarily the aging Mumbai High oil field operated by ONGC), drilling and refining activity in northeastern Assam (home to India’s first oil well and oldest refinery at Digboi) and Nagaland, and exploration and refining in Gujarat. We see pockets of flaring to a lesser extent along the coast in Tamil Nadu and Andhra Pradesh.



Notes: Oil production in the three regions with highest flaring volume.

India’s upstream regulator—the Directorate General of Hydrocarbons—[issued a directive](#) in January 2019 to oil producers to halve flaring over the following year. Despite the directive, the volume of gas flared appears to be as high or higher in 2019 as it was in 2018. With COVID-19, it will be difficult to attribute any decline in flaring in the near term to this directive given immense fluctuations in global oil prices. [Expansion of pipeline production and gas price reform](#) in India may decrease the cost of access to pipelines while making natural gas more competitive, bringing promise that flaring will become less attractive from an economic perspective.

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Utkarsh graduated from Colorado School of Mines with a masters in Petroleum Engineering and a minor in Mineral and Energy Economics. He has been involved with Dr. Bazilian and the Payne Institute since the summer of 2018. He has a chemical engineering background, as well as an interest in oil and natural gas markets and the impact of policies on those markets.

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Greer is a Senior Researcher at the Payne Institute for Public Policy at the Colorado School of Mines. Her research combines experimental and behavioral economics to reveal cost-effective climate change mitigation strategies at the microeconomic level. Her current research focuses on commercial fuel efficiency, residential energy and resource use, virtual grid capacity, and energy and development. She is also a BITSS Catalyst promoting transparency and reproducibility in social science research.

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Morgan Bazilian is the Director of the Payne Institute and a Professor of public policy at the Colorado School of Mines. Previously, he was lead energy specialist at the World Bank. He has over two decades of experience in the energy sector and is regarded as a leading expert in international affairs, policy and investment. He is a Member of the Council on Foreign Relations.

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Christopher D. Elvidge has decades of experience with satellite low light imaging data, starting in 1994. He pioneered nighttime satellite observation on visible lights, heat sources including gas flares and wild fires, as well as bright lit fishing vessels. He led the development of these nighttime remote sensed products with images from DMSP, JPSS, and Landsat satellites. These data are very popular and used globally in both public and private sectors. As of February 2018, he has more than 11,000 scholarly publication citations.

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ABOUT THE PAYNE INSTITUTE

The mission of the Payne Institute at Colorado School of Mines is to provide world-class scientific insights, helping to inform and shape public policy on earth resources, energy, and environment. The Institute was established with an endowment from Jim and Arlene Payne, and seeks to link the strong scientific and engineering research and expertise at Mines with issues related to public policy and national security.

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