

Oil Security Index

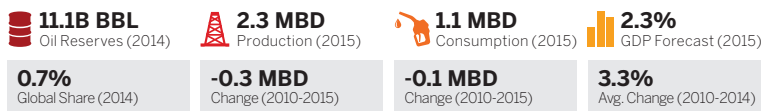
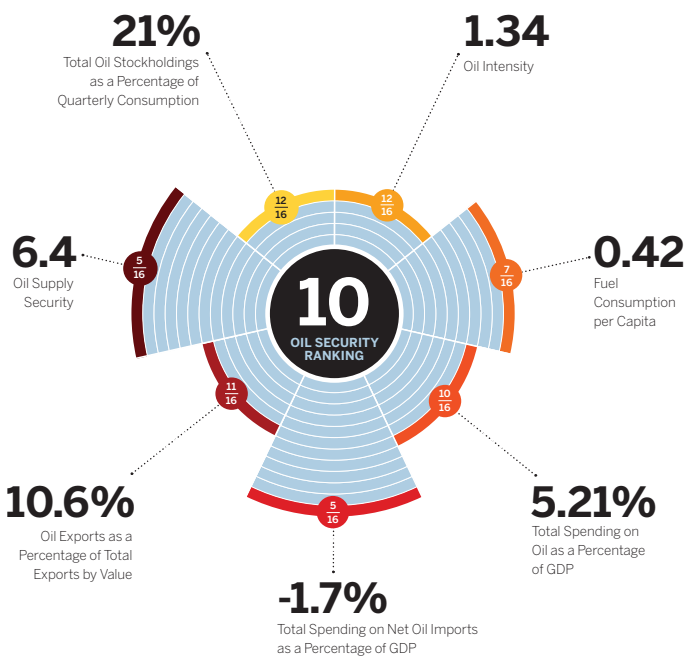
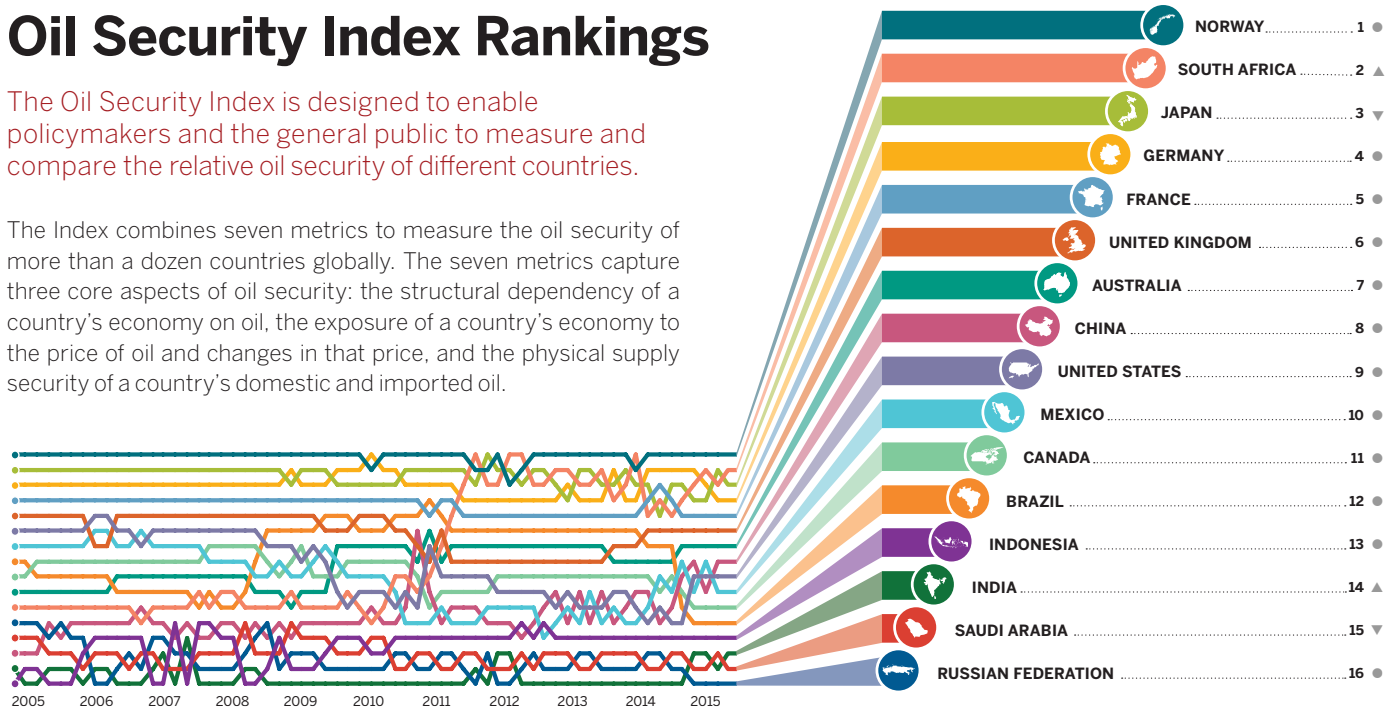
Quarterly Update / January 2016



Oil Security Index Rankings

The Oil Security Index is designed to enable policymakers and the general public to measure and compare the relative oil security of different countries.

The Index combines seven metrics to measure the oil security of more than a dozen countries globally. The seven metrics capture three core aspects of oil security: the structural dependency of a country's economy on oil, the exposure of a country's economy to the price of oil and changes in that price, and the physical supply security of a country's domestic and imported oil.



Spotlight on Mexico

Mexico's efforts to rejuvenate production through privatization and auction of oilfields are on track for success but will take time to reverse declines.

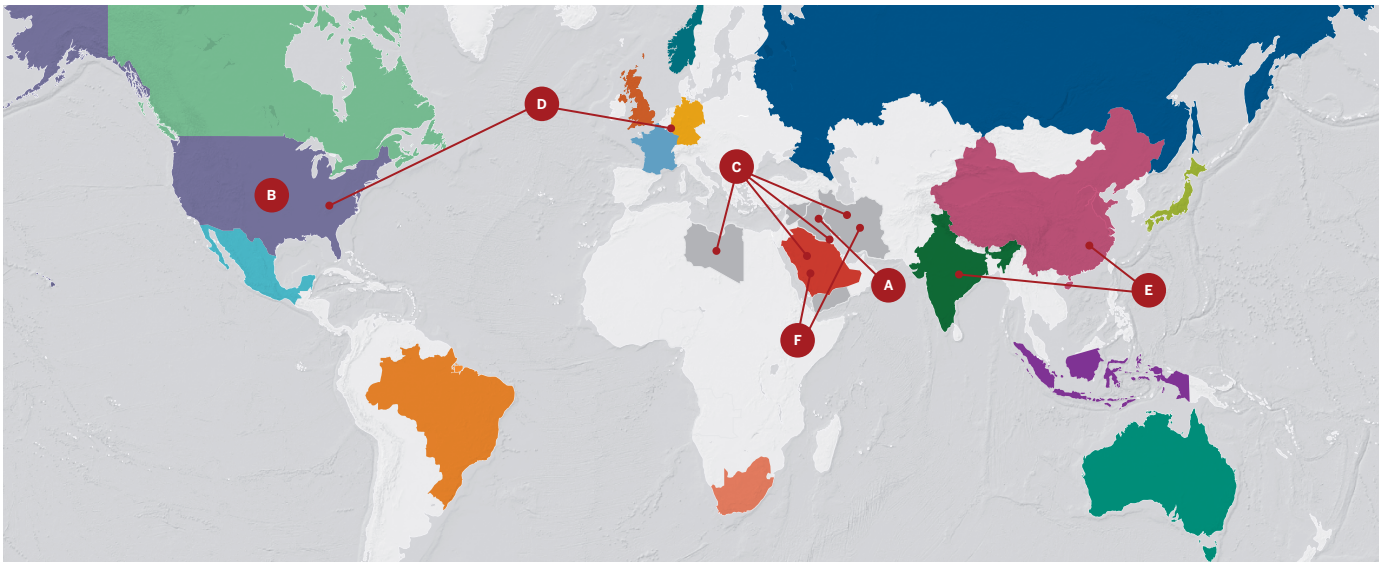
Q3 saw Mexican crude oil production continue its decline, falling to levels not seen in more than 30 years¹. In an effort to jumpstart the industry, three waves of oil block auctions were held in 2015. While the initial auction in July only succeeded in selling 2 of 14 blocks, results have improved, culminating in all 25 of the onshore fields included in the December auction being sold. With Mexican president Enrique Peña Nieto setting a target of increasing production by approximately 50 percent to 3.5 mbd by 2025², the reforms hold promise but will not be an immediate fix for Mexico's diminished capacity.

1 SAFE/RGE analysis

2 UPI, "Experts: Mexican oil could have profound regional impact," July 24, 2015

Q3 2015 Global Highlights

Changes in oil demand and supply in different countries around the world impact both those countries' oil security and the global oil market.



- A** Iraq saw record-high production levels in Q3, reaching 4.2 mbd of output, a 13.7 percent y-o-y increase. While a subsequent dip in production in October raised questions about the sustainability of its production growth, the Q3 figure represented progress toward Iraq's goals of vastly increasing its production capacity.³ Iran is widely expected to increase production by at least 0.5 mbd by mid-2016.⁴
- B** Q3 saw the low oil price environment finally translate into declines in U.S. oil production. While the total of 12.8 mbd was still 1.0 mbd higher than output in Q3 2014, the 0.1 mbd dropoff from Q2 2015⁵ represented the first quarter-over-quarter (q-o-q) decline in U.S. output since 2011.⁶
- C** Unplanned oil supply outages continued their overall upward trend, rising 0.1 mbd from Q2 to 3.7 mbd. The vast majority, 2.9 mbd, came from OPEC, with war-torn Libya accounting for 1.2 mbd of disruptions and sanctions against Tehran still keeping 0.8 mbd of Iranian oil offline. Disputes between Kuwait and Saudi Arabia in their shared production zone kept 0.5 mbd from the Wafra and Khafji fields offline.⁷
- D** Driven by gasoline demand increases encouraged by low oil prices, overall global demand growth totaled 2.1 mbd y-o-y. The United States and OECD Europe accounted for 0.7 mbd of this increase, approximately one-third. In the United States, for example, total vehicle miles traveled per day rose by 275 million y-o-y⁸ and passenger vehicle sales rose by 6.3 percent. In the light-duty segment, sales of fuel-efficient vehicles have suffered, while the share of light trucks (including SUVs) rose to 57.2 percent in Q3 from 53.3 percent in Q3 2014.⁹ Sales of SUVs and crossovers have increased markedly, rising 22.6 percent y-o-y in Q3.¹⁰
- E** Non-OECD Asia, responsible for 1.3 mbd of the 2.1 mbd global y-o-y total increase, continued to be the driving force in oil demand growth. China, undeterred by headline-grabbing financial turmoil, led the way by adding 0.7 mbd y-o-y, or 7.0 percent of consumption. In percent-age terms, India's Q3 demand grew even faster—up 9.0% y-o-y—to 3.9 mbd.
- F** Major Middle Eastern oil consumers reported y-o-y decreases in oil demand, with consumption in both Saudi Arabia and Iran falling by 0.1 mbd vis-à-vis Q3 2014. This represented a 1.4 percent decrease for Saudi Arabia and a 3.2 percent decrease for Iran; both nations' economies have been affected by falling oil prices.

3 SAFE analysis based on data from: International Energy Agency (IEA), Oil Market Report (OMR), November 2015

4 IEA, OMR, December 2015

5 Id.

6 SAFE analysis based on data from: U.S. Energy Information Administration (EIA), Short Term Energy Outlook (STEO), July-October 2015

7 U.S. EIA, STEO, October 2015

8 SAFE, Energy Security Fact Pack, Q3 2015

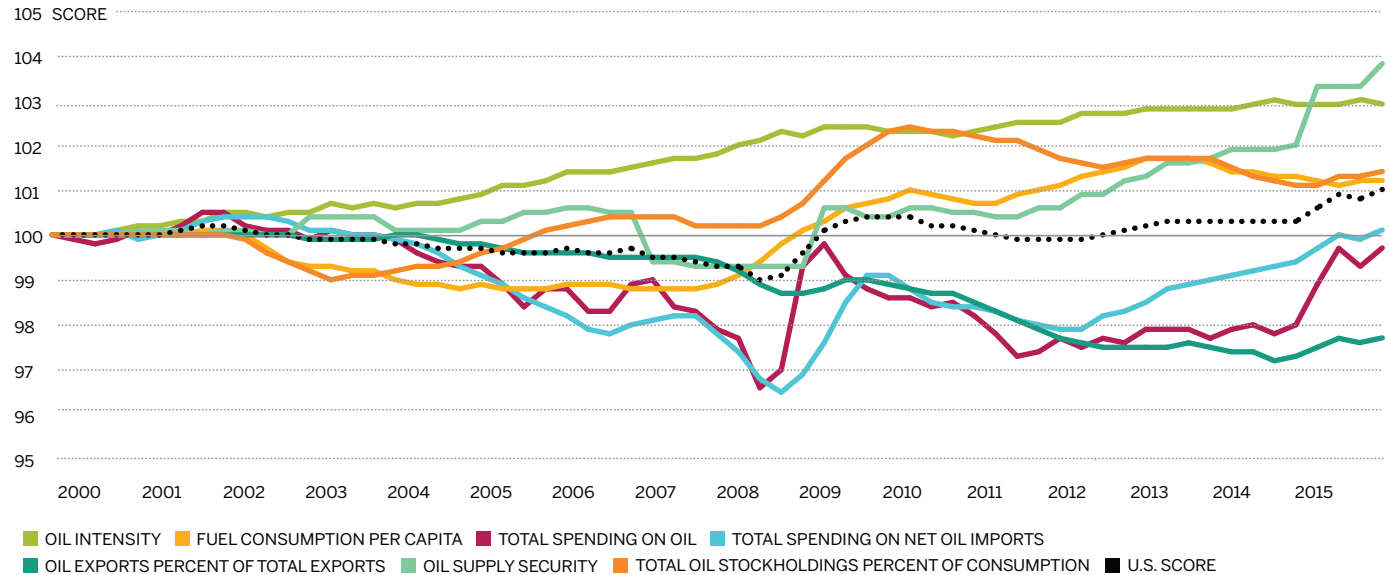
9 SAFE analysis based on data from: U.S. Bureau of Economic Analysis

10 SAFE analysis based on data from: Wall Street Journal Market Data Center

Oil Security in the United States

The United States is improving its oil intensity, but risks losing progress on both decreasing consumption and increasing production due to lower oil prices.

U.S. Index Score and All Metric Scores Q1 2000 to Q3 2015



Source: SAFE/RGE analysis

The United States has largely maintained improvements in the oil intensity of its economy. Despite a slight uptick to 1.02 barrels per \$1,000 of GDP in Q3, the nation is on a long-term positive trend from 1.22 five years ago and 1.52 ten years ago.¹¹ U.S. oil security also continues to benefit from total net oil imports that have fallen by more than 50 percent in less than a decade to 5.8 mbd in Q3,¹² resulting in an improved trade balance. However, this was a marginal increase from Q2, as domestic oil production decreased nearly 170,000 barrels per day between Q2 and Q3. While the level of 9.3 mbd is still only a slight decrease from the highest levels seen in decades, it is an indication that U.S. production is being significantly affected by low oil prices.¹³ Overall, however, production has more than doubled from levels observed as recently as Q3 2008, displacing imports from countries like Angola and Nigeria which are at higher risk of supply disruption. This has helped bring the petroleum trade deficit to just 16 percent in Q3 2015 from over 60 percent as recently as 2011.¹⁴ This shift is helping promote a gradual—but substantial—improvement in the Oil Supply Security metric from 5.6 in 2008 to 7.0 in Q3 2015.¹⁵

Fuel consumption per capita stayed constant at 1.7 gallons per capita, still slightly above levels reached in 2012-13. The decrease in the oil price, reflected in lower prices for gasoline, has likely helped increase fuel consumption. Despite increased fuel consumption, low oil prices have kept total oil spending in the U.S. on a downward trend, reaching 3.8 percent of GDP in Q3, down from 7.1 percent one year prior and 7.7 percent in Q3 2013.¹⁶

The United States is increasingly orienting away from energy-intensive manufacturing to a knowledge-based service economy and boosting the efficiency of vehicles on the road. These trends, moving slowly and steadily in the direction of decreased oil consumption, have coupled with an unexpected oil and energy boom that has contributed to a collapse in the global price of oil. Taken together, the nation is spending a lower percentage of GDP on oil, consuming less oil per capita and using that oil more efficiently, all of which contribute to its absolute oil security, but increased domestic demand and stalled production growth, both attributable to current low oil prices, warrant attention going forward.

11 SAFE/RGE analysis

12 Id.

13 Id.

14 SAFE, Energy Security Fact Pack, Q3 2015

15 SAFE/RGE analysis

16 Id.

Definitions

Structural Dependency

Definition: A country's structural dependence on oil due to capital stock and other economic factors. The structural dependency metrics typically change slowly over time, providing relatively consistent measures of vulnerability, regardless of prevailing price conditions.

Oil Intensity captures the volume of oil consumed per unit of GDP (in this case, per \$1,000 of GDP). As such, oil intensity is a direct measure of the structural importance of oil in a country's economy and is perhaps the most meaningful measure of "oil dependence." Oil intensity changes little over short time periods and is almost entirely determined by oil-use efficiency levels, fuel diversity, and economic growth.

Fuel Consumption per Capita uses the size of a country's population, as opposed to the size of its economy, to contextualize oil consumption. This measure can be useful in comparing the different levels of oil consumption in countries with vastly different population sizes or GDPs. Fuel consumption per capita can give insight into a country's level of oil efficiency or its future demand growth potential.

Economic Exposure

Definition: A country's direct economic exposure to oil price volatility. Economic exposure is a function of structural dependency, but it is also more heavily driven by exogenous changes in global oil prices, and therefore variable over time. Economic exposure is measured by spending on oil across typical indicators like GDP and the current account.

Total Spending on Oil as a Percentage of GDP is the most straightforward measurement of a country's economic exposure to oil. Changes in oil prices have direct effects on the ability of governments, businesses, and consumers to effectively plan, budget, and make expenditures. Transportation can be particularly sensitive to changes in oil prices, as oil is the predominant fuel in the sector and there are few substitutes (demand is therefore highly inelastic).

Total Spending on Net Oil Imports as a Percentage of GDP

shows the extent to which countries rely on imported oil. This indicator provides a measurement of revenue either earned or spent through the oil trade and, therefore, oil's effect on a country's current account balance.

Oil Exports as a Percentage of Total Exports by Value

highlights the degree to which the economies of oil-producing countries are dependent on oil revenues for economic growth. In other words, "oil dependence" should be evaluated not only in terms of an economy's consumption requirements, but also its production and export requirements. Just as oil price spikes are devastating for many consumers, oil price collapses are highly problematic for non-diversified producers.

Supply Security

Definition: A country's vulnerability to physical supply disruptions and its response capabilities. While supply disruptions are typically addressed by price changes, the adjustment period can be highly damaging for import-dependent countries, especially if adequate and appropriate emergency inventories are unavailable.

Oil Supply Security is a proxy for the risk of disruption to a country's oil supply in both the short term (e.g. political instability and terrorism) and long term (e.g. tax and regulatory schemes). This metric accounts for the different levels of risk in the sources of supply that a country relies upon to meet its needs (in some instances, both domestic production and imports from a selection of other countries).

Total Oil Stockholdings as a Percentage of Consumption

indicates how prepared a country is to meet its own short-term needs in the event of a physical disruption to oil supplies. Total stockholdings include commercial inventories (held by companies) and public reserves (held by governments).



The Oil Security Index is an analytical tool developed by Securing America's Future Energy in partnership with Roubini Global Economics. The Index is designed to enable policymakers and the general public to measure and compare the relative oil security of more than a dozen countries around the world.

Learn more at OilSecurityIndex.org



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