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Beyond 12.5: The implications of an increase in Saudi crude oil production capacity

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ABSTRACT

A combination of factors is encouraging Saudi Arabia to consider raising crude oil production capacity beyond the current ceiling of 12.5 million barrels per day. The kingdom has managed to maintain a constant share of global crude oil markets, even as it copes with growing domestic demand for oil and a spate of investments in refineries, inside and outside the kingdom. Longer term, the threat of peak global oil demand – perhaps in response to climate change – enhances the attractions of a shorter time horizon to depletion. However, an increase in Saudi crude oil production would have consequences for markets and competing forms of energy, as well as for the kingdom's geopolitical stature. The wide range of potential outcomes suggests that a major capacity increase is a risky strategy.

1. Introduction

As recently as 2015, Saudi energy officials dismissed suggestions that the kingdom would seek to raise its crude oil production capacity above its theoretical maximum of 12.5 million barrels per day (m b/d). However, that stance has evolved. Public statements from officials at Saudi Aramco – operating since May 2016 under a new oil minister – indicate that the company expects to increase oil production above recent historic highs. Further ahead, the company is considering investments to increase its capacity beyond the current maximum 12.5 m b/d threshold.[1]

Saudi Arabia finds itself in an energy demand quandary. At home, the kingdom needs oil and natural gas for transportation, industrial production and electricity generation. Each of these sources of domestic demand is increasing, propelled by rising populations, growing incomes and subsidized end-user prices that, despite a recent adjustment, remain among the lowest in the world.[2]

Internationally, Saudi Arabia also faces conflicting priorities for its crude oil. It finds itself oscillating between cutting crude oil production to prop up prices and maintaining high levels of exports to defend its share of the crude market from competing suppliers.[3] Meanwhile, the kingdom's national oil company, Saudi Aramco, is in the midst of doubling a crude oil refining business that could see it compile ownership stakes in as much as 10 m b/d of capacity.[4] That amount is roughly equal to all of Saudi Aramco's current oil production.

As the kingdom endeavors to satisfy these competing demand sources, it increasingly sacrifices one of its most important strategic assets, the spare oil production capacity that it uses to balance markets in times of disrupted supply. Saudi Aramco's spare capacity has most likely slipped below 2 m b/d in recent years.[5]

An increase in Saudi oil production could also be incentivized by expectations that restrictions on burning of fossil fuel will intensify in the future, as importing states impose policies aimed at mitigating greenhouse gas emissions causing climate change. The Saudi government has announced plans to diversify its economy, thereby reducing its exposure to climate risk, by selling a 5% portion of Saudi Aramco, via an initial public offering (IPO) of ownership shares. Climate risk could also weigh into a decision to raise output. If policymakers

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[1] Bill Spindle and Summer Said, "Saudi Aramco Likely to Step Up Production." Wall Street Journal, May 10, 2016. [http://www.wsj.com/articles/aramco-aiming-to-double-gas-production-in-10-years-1462864819].

[2] See Jim Krane and Elsie Hung, "Energy Subsidy Reform in the Persian Gulf: The End of the Big Oil Giveaway." Issue Brief, Rice University's Baker Institute, April 28, 2016. http://bakerinstitute.org/files/10489/.

[3] Saudi Arabia agreed to cut roughly 500,000 b/d in November 2016. The cuts were extended by nine months in May 2017.

[4] Deema Almashabi, "Saudi Arabia Plans to Expand Oil Business as Global Demand Rises." Bloomberg, May 10, 2016; https://www.bloomberg.com/news/articles/2016-05-10/saudi-aramco-ceo-sees-significant-growth-in-oil-output-in-2016.

[5] This estimate is obtained by subtracting total crude oil production from the kingdom's theoretical production ceiling of 12.5 m b/d. At times when crude production rises above 10.5 m b/d, such as from June-October 2016, theoretical spare capacity drops below 2 m b/d. Some analysts maintain that Saudi spare capacity is lower. Consultancy Rystad Energy estimated 1.1 m b/d at the end of 2015. (Rystad Energy, 2015).

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believed that threats to monetizing oil reserves will grow stronger in the future, they may opt to increase oil output in the present, a phenomenon described as the "green paradox" (Sinn, 2008, 2012). In other words, if the long-term outlook for fossil fuels looks risky, a short-term strategy becomes more attractive. Thus the kingdom's energy policymakers find themselves revisiting a pressing question: Should Saudi Aramco invest in oil production capacity beyond 12.5 m b/d?[6]

2. A change in thinking

During the period of tight oil markets that saw prices reach an all-time high of $147/b in 2008, then-Oil Minister Ali al-Naimi announced the kingdom's intent to raise oil production capacity to 15 m b/d. Al-Naimi reversed course a few months later when prices plummeted amid the global financial crisis.[7] Since then, suggestions that the kingdom might move beyond its longtime 12.5 m b/d maximum have been rejected.[8] In 2013, a senior member of the ruling al-Saud family, the former intelligence chief and US ambassador Prince Turki al-Faisal, said that the kingdom planned to increase capacity to 15 m b/d by 2020. He said the increase was needed to raise export levels to 10 m b/d while allowing for rising domestic consumption.[9]

Al-Naimi rejected the notion. He said Saudi Aramco had no need to move beyond the maximum sustainable capacity (MSC) of 12.5 m b/d, a level that the company determines it could sustain after a six-month period of capital and operational investment.[10] Saudi Aramco declared that it had achieved the 12.5 m b/d MSC under the late King Abdullah, who approved investments to raise capacity from about 9 m b/d at the beginning of his tenure.

> "I don't know what (Prince Turki) means by 15 million. He may be thinking … that Saudi Arabia is capable of doing it, building capacity to 15 million. Now, based on what we see as projection and call on Saudi oil, we don't see anything like that, even by 2030 or 2040. So the need to build the facilities and drill wells to produce 15 million or have the capability for 15 million is not there," al-Naimi said during a speech in Washington. "Based on all projections that I have seen, including ours, there is no call on us to go past 11 (million), 11.5 (million) by 2030 or 2040."[11]

Three years on, al-Naimi has retired and been replaced by former Aramco CEO Khalid al-Falih, who heads an expanded Ministry of Energy, Industry and Mineral Resources.[12] Shortly after al-Falih's ascension, Aramco's new CEO, Amin Nasser, publicly stated what Aramco officials have long said in private, that the 12.5 m b/d MSC would be maintained "for now," but could be expanded in the future.[13] A month later, al-Falih said much the same thing.[14]

Sources of pressure on Saudi production capacity include the following:

- An increase in global demand in response to the sustained period of low oil prices since late 2014.
- The perception that non-OPEC producers have deferred so much capital investment since late 2014 that, without sufficient Saudi spare capacity, future tightening in oil markets could trigger a damaging price shock.[15]
- The kingdom's limited ability to constrain growth in domestic hydrocarbon consumption. Recent subsidy reforms and an emphasis on substituting natural gas for oil in the domestic economy appear to have slowed, but not eliminated, demand growth.[16]
- The erosion of spare production capacity, in particular via recent downstream investments that, combined with other demand sources, could challenge the kingdom's capability to continue as dominant global supplier of raw crude.
- Longer term, future demand could be undermined by climate-driven disincentives to oil and the emergence of substitute fuels and technologies. Worries about premature peaking of global oil demand could incentivize stepped-up production and shorter-term depletion strategies.

In summary, if Saudi Aramco intends to maintain all of its commitments to its myriad demand sources – while protecting the kingdom's strategic supply role – the company may decide to intensify upstream investment, increasing production capacity to 13, 14 or 15 million barrels per day. Longer-term threats reinforce this logic, implying that accelerated monetizing of reserves may be pragmatic.

3. Discussion: rationales for raising Saudi Arabia's oil production capacity

Why would Saudi Arabia seek to increase oil and gas production capacity? At the time of writing, Saudi Arabia had reaffirmed a 2016 commitment to *cut* oil production by nearly 500,000 b/d, as part of an OPEC-led supply restriction aimed at balancing an oversupplied market and boosting prices. There are also practical financial questions about investing in infrastructure that may never be fully deployed. However, a convergence of demand and revenue pressures, along with long-term risk factors, point to the possibility that the kingdom's production ceiling is under reconsideration.

Production decisions in the kingdom are subject to painstaking deliberation over the optimal pace of depleting reserves. Even though costs are among the world's lowest, Saudi Arabia has pursued a long-

[6] Saudi Aramco declared 12.5 m b/d as its "maximum sustainable capacity" after the company reported reaching that level in 2009. However the US Energy Intelligence Administration and the International Energy Agency estimate Saudi Arabia's production ceiling at around 12 m b/d. The kingdom has never produced more than 10.6 m b/d for any sustained period. Actual capacity is understood to fluctuate based on demand conditions and the pace of investment.

[7] Rania el-Gamal and Reem Shamseddine, "Saudi looking beyond oil price slump as rig count spikes." Reuters, March 21, 2015. [http://www.reuters.com/article/saudi-oil-drilling-idUSL6N0WM33S20150321].

[8] See, for example: Rania el-Gamal, "Will Saudi boost oil capacity? Naimi's retort: Show me 10 pct return." Reuters, June 5, 2015. [http://uk.reuters.com/article/opec-meeting-saudi-capacity-idUKL5N0YR0Y820150605] Also: Rania el-Gamal, Reem Shamseddine and Andrew Torchia, "OPEC won't bear burden of propping up oil price: Saudi minister." Reuters, March 22, 2015. [http://www.reuters.com/article/us-saudi-opec-idUSKBN0MI06720150323] Also: Said, Summer and Keith Johnson. "Rift Emerges Over Saudi Oil Policy." *Wall Street Journal*. Apr. 30, 2013. [http://online.wsj.com/news/articles/SB10001424127887323528404578454683761056470].

[9] Prince Turki al-Faisal, "Saudi Arabia's New Foreign Policy Doctrine in the aftermath of the Arab Awakening." Transcript of April 25, 2013 public lecture at Harvard University. [http://belfercenter.hks.harvard.edu/files/PrinceTHKSPublicLecture.pdf].

[10] The ambitious six month timeframe for reaching 12.5 m b/d stems from Saudi Aramco's internal guidelines, according to an employee interviewed on condition of anonymity in 2016.

[11] Ali al-Naimi, "A Conversation with His Excellency Ali al-Naimi, Minister of Petroleum and Mineral Resources, Kingdom of Saudi Arabia." Center for Strategic and International Studies, Washington DC, April 30, 2013. [http://csis.org/files/attachments/133004_TS_Al_Naimi.pdf].

[12] The former Ministry of Petroleum and Mineral Resources was expanded to include domestic energy policy and renamed the Ministry of Energy, Industry and Mineral Resources on May 7, 2016.

[13] Ibid, Spindle and Said, May 10, 2016.

[14] "Interview with Khalid al-Falih," Argus, June 2, 2016. [http://www.argusmedia.com/news/article/?id=1250725].

[15] Wood Mackenzie estimates that upstream investment to 2020, including in exploration, has been cut by as much as $1 trillion. As a result, discoveries of new oil supply have plummeted. See: "Global upstream investment slashed by US$1 trillion," Wood Mackenzie, June 15, 2016. [https://www.woodmac.com/analysis/global-upstream-investment-slashed-by-US1-trillion] Also see: Mikael Holter, "Oil Discoveries at 70-Year Low Signal Supply Shortfall Ahead." Bloomberg, Aug. 29, 2016. [https://www.bloomberg.com/news/articles/2016-08-29/oil-discoveries-at-a-70-year-low-signal-a-supply-shortfall-ahead]

[16] Joint Oil Data Initiative figures for 2016 show Saudi oil demand growth reaching its lowest level since 2010, while demand for refined products dropped nearly 2% in the first half of 2016, with diesel demand down by more than 5%. BP figures show Saudi oil demand grew only 1% in 2016, far lower than average.