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# Managing Oil Market Disruption in a Confrontation with Iran

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## BACKGROUND

U.S. and European Union (EU) officials are preparing to sanction Iran's crude oil exports as part of a coercive diplomatic strategy aimed at raising the cost of Tehran's defiance of the international community over its nuclear program. Iran has responded by threatening to disrupt the flow of oil through the Strait of Hormuz, the world's most important oil chokepoint, through which nearly seventeen million barrels per day (mb/d), or about 35 percent of seaborne traded oil, moves.<sup>1</sup> The escalation has already added a significant, perhaps five to ten dollars per barrel, risk premium into the price of crude oil. The prospect of any further "Iran premium" on oil prices deeply troubles U.S. and EU officials, given the fragile global economy. Currently, they are designing sanctions to minimize the risk that Iran's exports will be reduced, since that would raise global oil prices. Instead, sanctions would aim at reducing what Iran earns on its sales. Nevertheless, market participants are concerned that the stand-off will escalate beyond limited sanctions and disrupt physical supply at a time when the Organization of Petroleum Exporting Countries' (OPEC) spare capacity is insufficient to comfortably offset the loss. Against this backdrop, effective policymaking requires a thorough understanding of possible contingencies and of potential policy options for mitigating any oil market consequences.

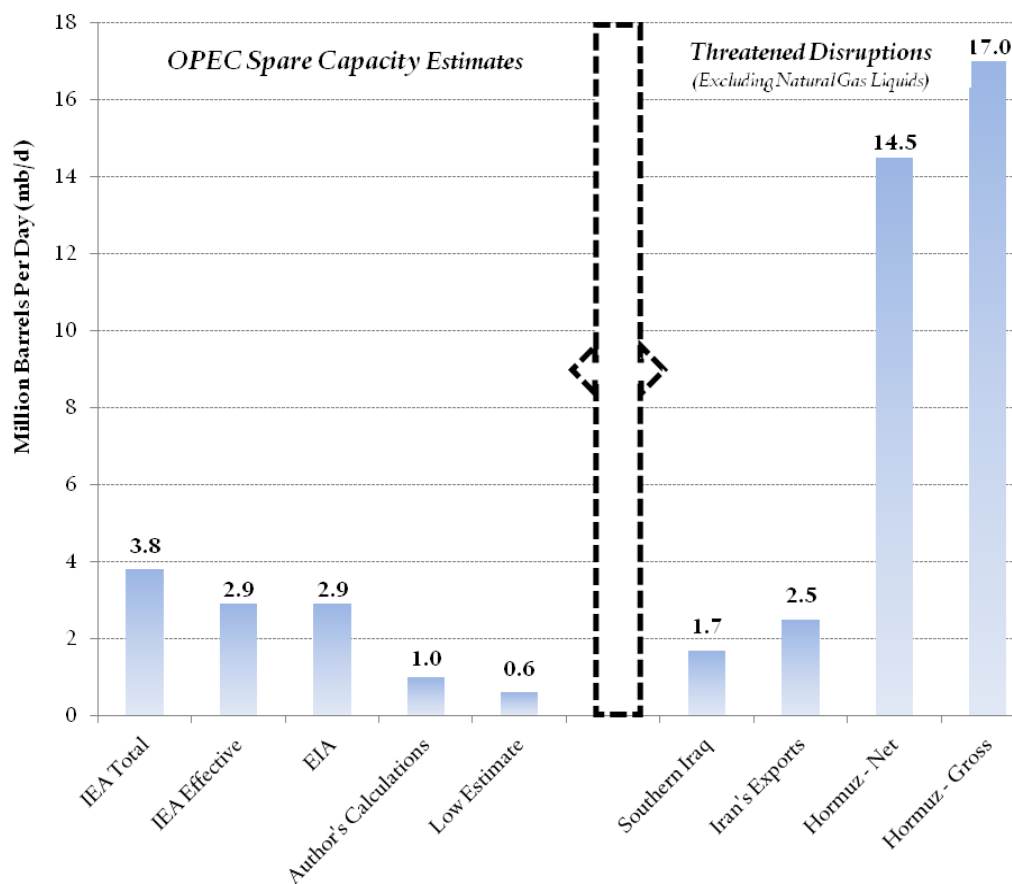
There is currently little margin for error in the global oil market. As an informal rule of thumb, oil market analysts believe that OPEC needs to hold at least 5 percent of global oil demand in "spare"—production capacity that is not normally used but that can be brought online quickly—in order to maintain stable prices. In today's 90 mb/d market, that desirable spare capacity cushion is about 4.5 mb/d. According to the U.S. Energy Information Administration (EIA), OPEC's spare capacity is 2.8 mb/d and will climb to about 3.9 mb/d this summer, which is deeply inadequate given the geopolitical landscape in 2012. Moreover, official estimates of OPEC's spare capacity are probably inflated, and inescapably dependent on untested assumptions of Saudi total production capacity.

Nearly all of OPEC's spare capacity is held in Saudi Arabia; consequently, estimates of OPEC's spare capacity hinge on how much Riyadh can produce relative to how much it is already producing. Saudi oil minister Ali Naimi has recently said Saudi Arabia holds roughly 2.5 mb/d in spare and that the Kingdom can produce a total of 12.5 mb/d.<sup>2</sup> Many market participants, however, doubt that Saudi Arabia can produce that much oil. On an annual basis, Saudi Arabia has not produced more than 10 mb/d since 1981.<sup>3</sup> Goldman Sachs estimates total Saudi capacity to be around 10.5 mb/d and other reports indicate Saudi Arabia could produce 11 mb/d only "if pushed."<sup>4</sup> In terms of current production levels, Saudi Arabia's oil minister announced recently Saudi crude production is over 10 mb/d, similar to EIA's estimate.<sup>5</sup> If true, and considered alongside Goldman Sachs' estimate of 10.5 mb/d in total Saudi production capacity, this would suggest Saudi spare capacity is just 0.5 mb/d (see Figure 1). Although EIA projects spare capacity will rise by over 1 mb/d by summer, a paucity of excess capacity leaves the oil market with precious little margin for error should Iranian supplies be disrupted.

Moreover, the 5 percent spare capacity rule of thumb applies best when geopolitical conditions are calm, as they were through most of the 1990s, when OPEC's spare capacity was about 5 percent and oil prices were relatively stable. Since 2003, however, OPEC's spare capacity has been low and geopolitical disruption risks (including Iraq, Nigeria, Venezuela, Yemen, and Libya) have been high. Consequently, oil prices have been high and volatile. Given current and threatened disruptions, OPEC will need to hold more than 5 percent to reassure traders and stabilize prices. Achieving that comfort margin, however, is unlikely in the foreseeable future.

Escalating geopolitical tensions with Iran compound these vulnerabilities. Tehran poses a credible, if only short-term, threat to the 17 mb/d produced in and shipped from the gulf, which dwarfs OPEC's spare capacity, all of which is in any case located north of the Strait of Hormuz.

Figure 1. OPEC Spare Capacity and Oil Production and Flows



Sources: IEA, EIA, press reports, and author's estimates.

Consequently, as the long-running Iran nuclear issue shifts into an oil sanctions phase, nervous market participants are unlikely to be reassured by official estimates of OPEC's spare capacity. Barring a diplomatic breakthrough, the Iran risk premium is likely to rise further, and officials will need to manage it. The following four scenarios illustrate how political events could play out, what their impact on the global oil market might be, and what options policymakers have to deal with these disruptions.

## SCENARIOS

### *1. Partial sanctions on Iran's crude oil exports; Iran harasses gulf production and shipping*

This scenario appears to be taking shape, as the United States enacts sanctions on Iran's central bank and the central banks of those who purchase Iranian crude (though President Barack Obama can

waive them), the EU implements an embargo on imports from Iran, and Japan and South Korea come under more intense pressure to reduce their imports of Iranian crude. These sanctions are designed to prevent global oil price spikes by keeping Iran's oil flowing, but still forcing Tehran to sell at a discount to a limited pool of remaining buyers, including China, India, and Turkey, each of which has an economic self-interest in extracting a below-market price.

Figure 2. Iran Crude Oil and Condensate Exports for Selected Countries, January–June 2011

	<i>Percent of Iran's Exports</i>	<i>Total Volume of Crude Imported (000 b/d)</i>	<i>Iran as a Percentage of Total Crude Imported</i>
<b>European Union</b>	<b>18</b>	<b>450</b>	
Italy	7	183	13
Spain	6	137	13
France	2	49	4
Greece	1	20	14
Germany	1	17	1
UK	0	11	1
Netherlands	1	33	2
<b>Japan</b>	<b>14</b>	<b>341</b>	10
<b>India</b>	<b>13</b>	<b>328</b>	11
<b>South Korea</b>	<b>10</b>	<b>244</b>	10
<b>Turkey</b>	<b>7</b>	<b>182</b>	51
<b>South Africa</b>	<b>4</b>	<b>98</b>	25
<b>Sri Lanka</b>	<b>2</b>	<b>39</b>	100
<b>Taiwan</b>	<b>1</b>	<b>33</b>	4
<b>China</b>	<b>22</b>	<b>543</b>	11

Sources: Global Trade Atlas and APEX, as cited by U.S. Department of Energy.

In this scenario, global oil supply should remain unaffected, leaving physical market fundamentals largely unchanged, although that does not mean that prices might not respond in foreseeable ways. Spreads between different crudes would change according to their quality or region—for example, Russian export prices would likely rise as Urals crude could substitute for embargoed Iranian crude in Europe, while prices for heavy crude grades sold in Asia would fall as displaced Iranian barrels were diverted east. Average global crude prices should remain generally unaffected, though they may come under some upward pressure as market participants bid oil off the market to increase inventories as a precaution. Iran could also retaliate by storing crude on tankers for a few months or even stopping some production, which would increase global oil prices. However, many analysts believe Iran would resist a long-term shutdown of production because it would result in permanent damage to Iran's oil fields and recoverable reserves.<sup>6</sup>

Despite officials' efforts to avoid a supply loss, Iran's threats and the perceived possibility of future escalation have and likely will continue to lead nervous traders to add an Iran premium to global crude prices. Iran's leaders probably understand that a full-blown conventional conflict with the United States would be extremely costly, if not catastrophic. Making good on their threat to retaliate

to sanctions by attempting to close the Strait of Hormuz is unlikely, unless Iranian leadership believes the regime itself is endangered; in any case, analysts generally believe that Tehran could not close the strait for an extended period of time.<sup>7</sup> Short of a major confrontation, Tehran could escalate by harassing tankers in the region with mines, small boats, and missiles in order to raise global prices and possibly induce Russia or China to intervene diplomatically on its behalf to relieve pressure. Iran could also orchestrate bombings in the southern Iraqi oil production system, which normally exports about 1.7 mb/d.<sup>8</sup> In October and December 2011, bomb attacks against the Rumaila field in southern Iraq reduced oil production by a significant 0.6-0.7 mb/d, albeit for only a brief time.

Policymakers can address these real and perceived risks in several ways. Security in southern Iraq, especially the Basra Oil Terminal and tanks and pipelines associated with it, should be bolstered and preparations to defend the gulf and protect the Strait of Hormuz stepped up. False threats or reports of disruptions should be countered swiftly, but officials will need to walk a fine line between reassuring the market on the one hand and unintentionally spooking it on the other. Policymakers should recognize that adding a third carrier strike group to the region or conducting a test sale from strategic stocks might have the unintended consequence of scaring rather than reassuring the market, depending on prior perceptions of risk. The utility of these or similar steps would need to be based on an appraisal of actual and perceived risks at the time they were being considered. So far, the Obama administration has astutely countered panicky press reports and belligerent Iranian threats with calm reassurance and factual denials.

It is also important for the International Energy Agency to forge and project member unity about when and how to use reserves.<sup>9</sup> There was an unusual amount of public dissent among IEA members during the June 2011 stock release that IEA leaders should not wish to repeat. The IEA reportedly has recently reviewed standing plans for a 14.4 mb/d strategic stock draw over one month.<sup>10</sup>

### *2. Complete or nearly complete sanctions on Iran's exports*

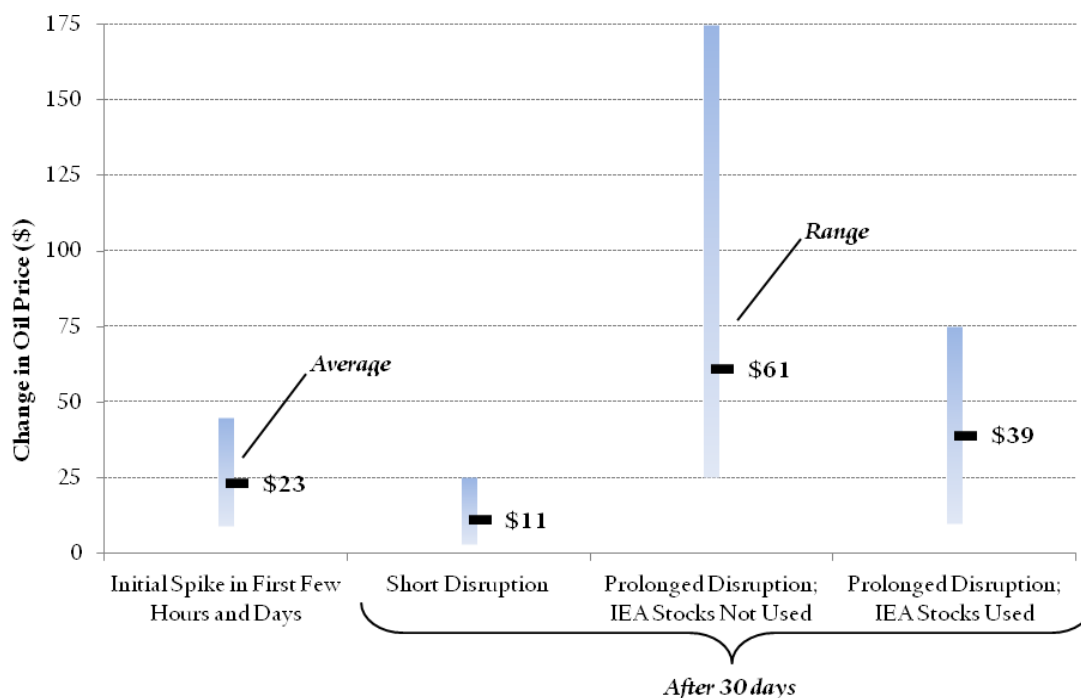
If the United States and the world went beyond planned, limited sanctions aimed at diverting and discounting Iranian exports and instead forced Iran to halt all or most of its exports, crude prices would likely jump considerably. Some analysts expect prices would reach old highs near \$140.<sup>11</sup>

As noted earlier, market participants doubt that OPEC can offset the loss of Iranian crude and still leave a spare supply cushion. Depending on how quickly Iran's oil was lost, prices would have to rise to balance the market by forcing consumption to drop. The short-term price elasticity of oil demand is low and could become even lower in a crisis as commercial stockholders sought to hold on to or increase the amount of oil in storage out of fear of a prolonged disruption. OPEC production increases could help isolate Iran politically but they are unlikely to reassure markets about supply availability. If officials wanted to offset the loss of Iran's supply, they could turn to IEA strategic stocks, which could easily flow at a 2.5 mb/d rate, roughly equal to Iran's exports, for many months or quarters if necessary. China, India, Thailand, and other non-IEA countries could be offered access to strategic stocks to prevent hoarding.

### *3. An Israeli or U.S. attack on Iran's nuclear facilities, but no oil infrastructure damage or disruption*

A military attack by Israel or the United States on Iran's nuclear facilities would likely lead to a sudden price shock (about \$23 per barrel in the first days should Israel strike according to a Rapidan Group survey of market participants) as traders priced in risk of a wider conflict. Subsequent price behavior would depend on market participants' expectations of the likelihood and duration of a conflict that damaged gulf infrastructure or blocked the Strait of Hormuz (see Figure 3).

Figure 3. Oil Price Change in Various Iran Scenarios (October–November 2011)



Source: Rapidan Group survey of market participants.

IEA and OPEC policymakers would need to closely monitor gulf oil production and shipping in the hours and days after military action, while reassuring market participants about their ability to respond to any disruption.

Assuming military attacks were limited to Iran's nuclear sites and associated air defense and lasted a short number of days, contingency planning for strategic stock releases could be conducted quietly to avoid signaling alarm. But if the conflict escalated to include attacks against economic or leadership targets, or Iranian attacks on tankers or onshore oil facilities, IEA contingency planning could be more visible and the United States could undertake a test sale from the Strategic Petroleum Reserve (SPR) to reassure the market about IEA's capability to offset a possible major loss of supply. The actual crude price effects of various threat scenarios and mitigation options depend on many variables and are difficult to predict definitively; policymakers will likely only know their effectiveness after they have been tried.

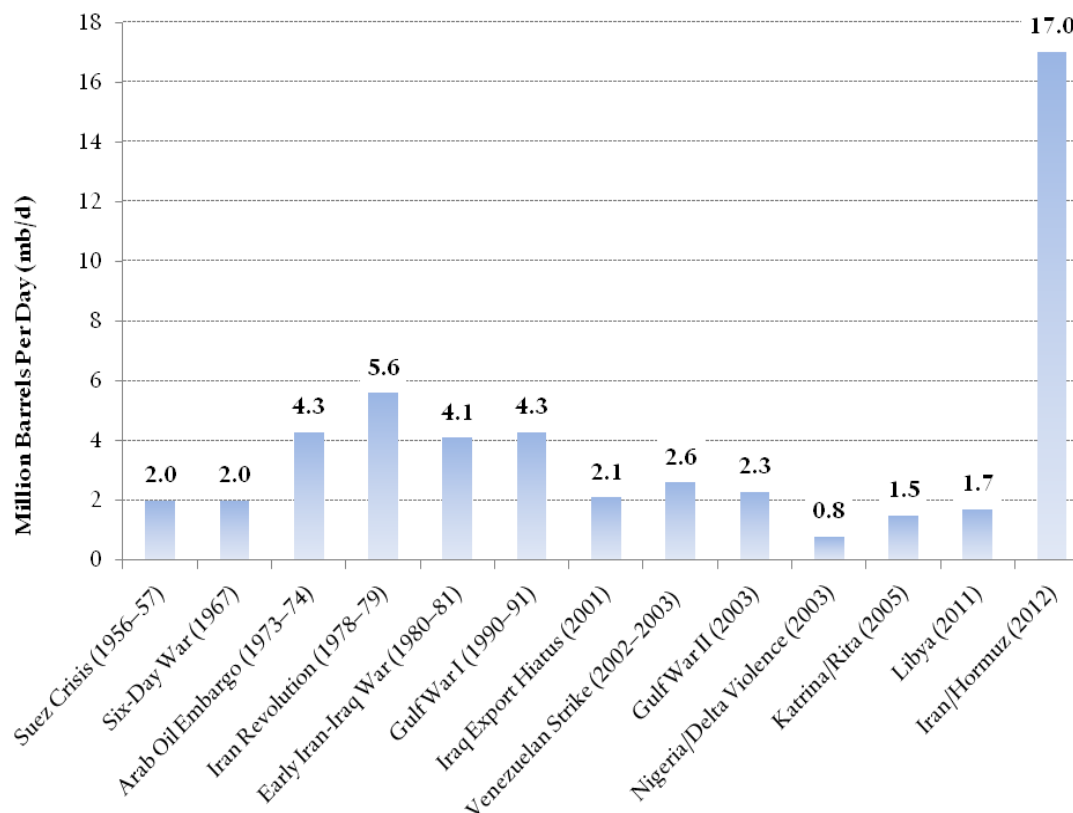
Short of attempting to block the Strait of Hormuz, Iran has other options to disrupt crude and liquefied natural gas (LNG) production and transportation in the gulf region. Using proxies or its own forces, Tehran could orchestrate attacks against energy facilities in Iraq, as previously noted, or attack Saudi or Qatari crude and natural gas export facilities. While much of the focus is rightly on oil, it should not be overlooked that Qatar exports about one-third of global LNG supplies.

#### 4. A regional conflict, including temporary closure of the Strait of Hormuz

If a confrontation with Iran escalated to a regional military conflict that disrupted oil traffic through the Strait of Hormuz, it would be much harder for the IEA to handle, unless the disruption lasted only a few days.<sup>12</sup> About 17 mb/d flows through the Strait of Hormuz. Its closure, even for a short time,

would dwarf any disruption in modern history in daily terms (see Figure 4). There may be some options to redirect some gulf exports away from the strait. Saudi Arabia could redirect 1.5 mb/d of production through unused capacity in the East-West pipeline to terminals near Yanbu, Saudi Arabia, which is on the Red Sea. A new United Arab Emirates pipeline, which bypasses the Strait of Hormuz, is expected to be ready to ship crude oil in the summer of 2012, and could provide an additional outlet for up to 1.5 mb/d.<sup>1</sup>

Figure 4. Historical and Potential Oil Disruptions



Sources: IEA, EIA, and author's calculations.

Just the fear of such a mammoth disruption will build a risk premium into crude oil prices and shift the market's focus from OPEC's spare capacity, which would be inaccessible in any case, to the strategic stocks held by IEA members.



Figure 5. Policy Options in Case of a Major, Prolonged Oil Supply Disruption

OPTION	PROSPECTS AND IMPLICATIONS
Allow supply loss to be absorbed by demand destruction resulting from an oil price spike.	<i>Unappealing.</i> Given economic weakness, consuming countries' priority will be to prevent a severe and prolonged price spike by offsetting disruption as much as possible. By a rough estimate, the loss of 13 mb/d (17 mb/d Hormuz flows minus 4 mb/d gulf pipeline rerouting around Hormuz) would require a 140–240 percent price increase to balance the market <i>entirely</i> through demand destruction. This price shock would likely tip the global economy into recession.
Accept a drawdown from consuming country (OECD) stocks.	<i>Inevitable.</i> Some decline in OECD inventories is likely and acceptable, despite already low OECD commercial stock levels. As seen after the Libyan and Fukushima disruptions this year, those IEA countries that require companies to hold minimum inventory levels will likely ease requirements. But since a Hormuz disruption would be massive, to prevent excessively low commercial stocks officials will want to replenish OECD inventories with strategic stocks both during and after an interruption.
OPEC increases production that does not flow through Hormuz.	<i>Modestly helpful.</i> Little to no spare OPEC production capacity exists outside the gulf. All of Saudi "spare" capacity would be bottled up, but Riyadh could redirect some 2.5 mb/d of production through currently spare pipeline capacity to Yanbu on the Red Sea. And by summer the UAE may have a new Habshan-Fujairah pipeline, adding another 1.5 mb/d that can bypass Hormuz. Both countries will have commercial and geopolitical incentives to use any extra pipeline capacity that avoided the strait. Additional export volumes might be redirected through other pipelines (e.g., Kirkuk to Ceyhan) or on trucks, but these amounts are uncertain and likely limited to a few hundred thousand barrels per day. Iran's friend and OPEC member Venezuela would likely oppose higher production in public. It is less clear if Hugo Chavez would forgo higher earnings by actually ordering a supply cut in sympathy with Tehran. If he did, the case for an SPR drawdown would strengthen as Venezuela is the United States' fourth largest supplier and its short haul, 0.9 mb/d of exports to the United States, cannot be quickly replaced.
Production surge and demand restraint measures in IEA countries.	<i>Modestly helpful,</i> if implemented quickly and aggressively. An IEA report in 2005 entitled "Saving Oil in a Hurry" estimated that emergency demand restraint measures in transportation (telecommuting, carpooling, etc.) could save around 1 mb/d in the short term. In 2005, demand restraint and surge production accounted for 2 percent and 11 percent of the IEA's 60 million barrel response to Hurricane Katrina.
Coordinate a drawdown of IEA strategic inventories.	<i>Likely needed</i> if there were a prolonged loss of 2.2 mb/d of Iran's exports, a similar amount of supply from southern Iraq, or a larger regional or Hormuz disruption.

Source: Author's calculations.

In the event of a major, prolonged disruption in Persian Gulf oil supplies, consumer countries trying to protect their economies from oil price spikes will face a menu of unappealing and inadequate options (see Figure 5 above). The most robust option would be a drawdown of strategic stocks, which the IEA claims could average 14.4 mb/d in the first month.<sup>13</sup> On paper, the IEA could not cover the gross supply loss of 17 mb/d, but it could just about offset the net loss of about 14.5 mb/d, assuming 2.5 mb/d could be redirected through the East-West and Habshan-Fujairah pipelines.

In practice, it is doubtful that 14.4 mb/d would be released in the first month for commercial, logistical, and policy reasons. In past releases, IEA countries delivered much less oil than was offered at first,<sup>14</sup> as oil companies do not always take all the oil offered, depending on the price and each company's market position. Moreover, a 14.4 mb/d release rate greatly exceeds any previous IEA strategic stock draws and, as with market estimates of OPEC's spare capacity noted above, would likely be viewed by market participants with temporary skepticism. Additionally, releasing at maximum rates could signal panic that could incite increased private sector hoarding. Officials might want to conserve supplies for a potentially prolonged outage and other future contingencies. Furthermore, in the United States and some other IEA countries, the speed of strategic stock draws would be limited in the first month by bottlenecks in commercial inventories and previously scheduled import arrivals in the first week after the disruption. In those countries, strategic stock drawdowns into the commercial network cannot flow until the logistical system empties existing oil or the oil is diverted elsewhere.

Despite these constraints, in the event of a worst-case regional conflict that results in a major supply loss, officials may well opt to "go big" by announcing a headline-grabbing 14.4 mb/d release. But it may be more credible to assure the market that the supply loss can and will be made up over time by higher OPEC production and from IEA stock releases. The most effective and credible way to limit and shorten the oil price spike will be for the military to quickly and convincingly reopen the strait to tanker traffic.

## About the Author

**Robert McNally** is the founder and president of the Rapidan Group, a consulting group specializing in energy markets and policymaking. He has previously served as an oil market analyst with Energy Security Analysis, a market and policy analyst for Tudor Investment Corporation, special assistant to the president on the National Economic Council, and senior director for international energy on the National Security Council. He earned a BA/BS in international relations and political science from American University and an MA in international economics and American foreign policy from Johns Hopkins Paul H. Nitze School of Advanced International Studies (SAIS).

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## Endnotes

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1. "World Oil Transit Chokepoints," U.S. Energy Information Administration, December 30, 2011, <http://www.eia.gov/countries/regions-topics.cfm?fips=WOTC>. It should be noted that some 30 percent of global liquefied natural gas exports, nearly 3 percent of global demand, also flow through the Strait of Hormuz.
  2. "Saudi Arabia says it can raise oil production to fill any supply gap," Al Arabiya News, January 16, 2012. Saudi oil minister Ali Naimi said the Kingdom could increase production to 11.8 mb/d within days and reach 12.5 mb/d within 90 days.
  3. Statistical Review of World Energy 2011 (London, UK: BP, 2011).
  4. Barbara Lewis, "Saudi oil capacity depleted: Goldman," Reuters, June 13, 2011; Amena Bakr and Reem Shamseddine, "Saudi oil output nearing capacity," Reuters, January 10, 2012.
  5. Summer Said and Hassan Hafidh, "Saudi November Oil Output 10.047 Million B/D-Oil Minister," Dow Jones Newswires, December 13, 2011.
  6. Experts tend to believe that Iran is loathe to shut in its crude oil production because of the fact that its export crude grades are stimulated. Stopping and starting the stimulation process often leaves the field less productive afterwards.
  7. The risk of Tehran lashing out cannot be completely discounted, however: sanctions are taking an increasingly costly toll on its economy and its fractious regime is coming under enormous internal and external stress.
  8. Anthony H. Cordesman, *Iran and the Threat to "Close" the Gulf*, Center for Strategic and International Studies, December 30, 2011.
  9. The International Energy Agency (IEA) was founded after the Arab Oil Embargo in 1973 and comprises twenty-eight OECD member countries whose main role is to coordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets.
  10. Peg Mackey and Richard Mably, "West readies oil plan in case of Iran crisis," Reuters, January 6, 2012.
  11. Grant Smith, "Crude Oil Rebounds From Near Six-Week Low in New York as Equities Advance," Bloomberg, December 19, 2011.
  12. A 2009 paper by Caitlin Talmadge concluded that "the notion that Iran could truly blockade the strait is wrong—but so too is the notion that U.S. operations in response to any Iranian action in the area would be short and simple." See [http://belfercenter.ksg.harvard.edu/files/IS3301\\_pp082-117\\_Talmadge.pdf](http://belfercenter.ksg.harvard.edu/files/IS3301_pp082-117_Talmadge.pdf).
  13. "Fact Sheet: IEA Stocks and Drawdown Capacity," International Energy Agency, February 25, 2011, [http://www.iea.org/files/Potential\\_IEA\\_Stockdraw\\_Capacity.pdf](http://www.iea.org/files/Potential_IEA_Stockdraw_Capacity.pdf).
  14. During the 1991 IEA stock drawdown during Desert Storm, only 17.3 million barrels were delivered compared with 33.75 mb/d offered.