The Oil Drum
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Revenge of the Shia?

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This article's title is taken from The Revenge of the Shia by Martin Walker, published in Autumn 2006 issue of The Wilson Quarterly.

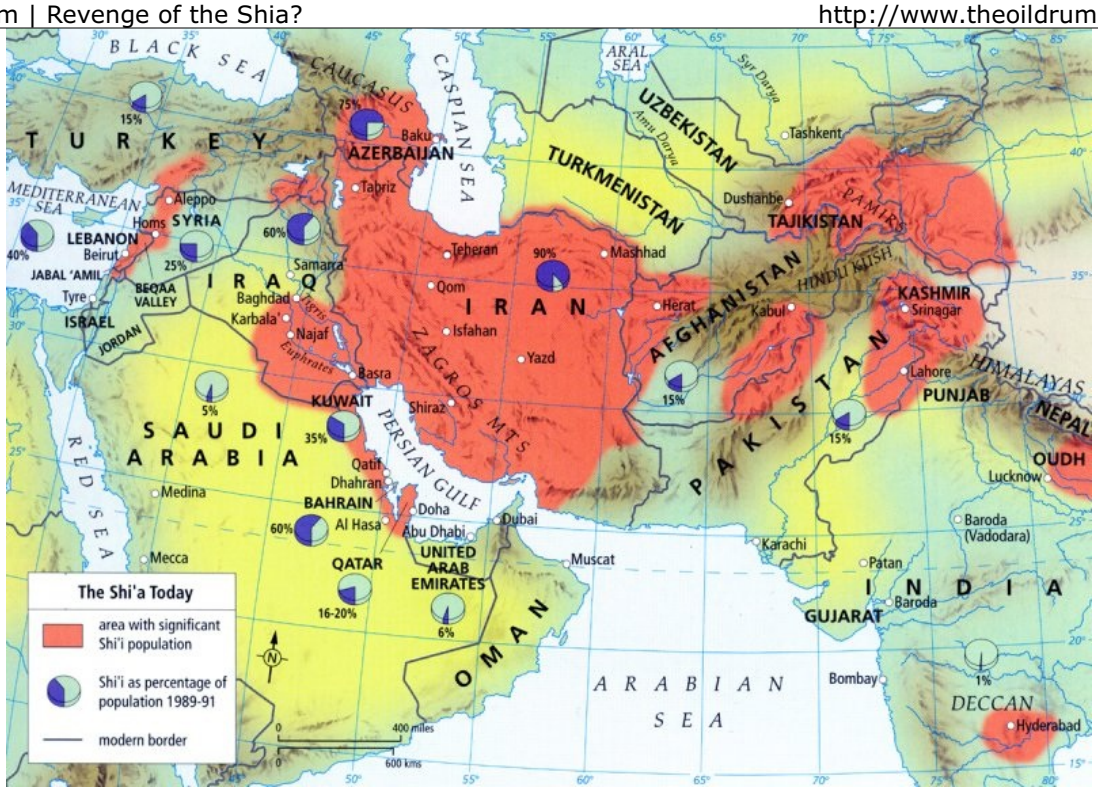
> In December 2004, as the United Nations Security Council began to grapple with the challenge of Iran's nuclear ambitions and as Iraq started its slow topple into civil war, one of the closest and most trusted American allies in the Middle East began to warn publicly of the emergence of a "Shia crescent" in the region. Jordan's King Abdullah, a Sunni who claims direct descent from the Prophet Muhammad, sounded the alarm that a vast swath of the region, stretching from the Mediterranean Sea to the Indian Ocean and from the oil-rich Caspian Sea to the even richer Persian Gulf, was coming under the sway of the Shia branch of Islam. More ominously, he implied that this looming Shia empire would take its direction from Tehran. President Hosni Mubarak of Egypt echoed this warning last year when he said, during an interview on al-Arabiya television, "Most of the Shias are loyal to Iran, and not to the countries they are living in."

The geopolitical situation in the Middle East is becoming more complicated and riskier all the time. This article primarily discusses Iran's geopolitical strategy, energy policies and energy predicament. In the final analysis sections, Saudi Arabia's reactions, in the context of the Iraqi civil war, are discussed. The outcomes are not known but it is not a pretty picture, especially for Japan, China and the EU, which depend on Iranian oil exports. Nor, probably, for the rest of us.

Describing Sunni fears explicitly, Walker continues.

> Abdullah and Mubarak, two of the most prominent Sunni leaders, have, along with senior Saudi officials, evoked the specter of a new Middle East divided along sectarian lines. It would set the long-downtrodden Shia against their traditional Sunni masters, rulers, and landlords. If the first battlefield was Iraq, the two leaders suggested, the next would be the oil-endowed regions of the Persian Gulf, southern Iraq, and Azerbaijan, where Shia happen to live. In this scenario, the ayatollahs of Shiite Iran could then secure control of the Iraqi, Saudi, and Caspian oil and gas fields by placing them under the protection of their own nuclear arsenal, thus establishing the first Islamic state to achieve great-power status since the collapse of the Ottoman Empire in 1918.

To understand the "Shia Crescent" and the fears of Saudi Arabia, it almost suffices to look at a good map.



The geography of the Islamic Sunni and Shiite sects
Figure 1 — Click to enlarge

I shall return to the plausibility of the nightmarish scenario suggested by *Figure 1* at the end. What is important, however, is that 1) Iran has both potential geopolitical advantages and serious obstacles to overcome; and 2) Saudi Arabia perceives the Shia uprising outcome as a realistic possibility and has good reasons to fear it. See Stuart Staniford's A Credible Threat? for background regarding the second point.

Iranian Oil Production and Exports

While Iraq is the trigger, Iran is the key. It is quite impossible to discuss Iran's political policies outside the context of their oil production, yet this is done all the time. Usually the talk is framed as worry about their nuclear ambitions. However, even this pending capability can not be understood unless you have also grasped the economic and energy pressures Iran is facing. Therefore, let's examine Iran's anticipated oil production, as well as related issues concerning domestic consumption, natural gas and downstream capabilities, in some detail.

From the EIA Country Brief
Figure 2

The issue is Iran's oil exports —these are forecast to decline. A spate of news stories accompanied the release of The Iranian petroleum crisis and United States national security by Roger Stern, who is in the Department of Geography and Environmental Engineering at The Johns Hopkins University. Stern's analysis provides a springboard for a proper analysis of Iran's oil production. Here's the summary.

> The U.S. case against Iran is based on Iran's deceptions regarding nuclear weapons development. This case is buttressed by assertions that a state so petroleum-rich

> cannot need nuclear power to preserve exports, as Iran claims. The U.S. infers, therefore, that Iran's entire nuclear technology program must pertain to weapons development. However, some industry analysts project an Irani oil export decline [e.g., Clark, J.R. (2005) Oil & Gas Journal 103(18):34–39 (subscription)]. If such a decline is occurring, Iran's claim to need nuclear power could be genuine. Because Iran's government relies on monopoly proceeds from oil exports for most revenue, it could become politically vulnerable if exports decline. Here, we survey the political economy of Irani petroleum for evidence of this decline. We define Iran's export decline rate (*edr*) as its summed rates of depletion and domestic demand growth, which we find equals 10 –12%. We estimate marginal cost per barrel for additions to Irani production capacity, from which we derive the "standstill" investment required to offset *edr*. We then compare the standstill investment to actual investment, which has been inadequate to offset *edr*. Even if a relatively optimistic schedule of future capacity addition is met, the ratio of 2011 to 2006 exports will be only 0.40–0.52. A more probable scenario is that, absent some change in Irani policy, this ratio will be 0.33–0.46 with exports declining to zero by 2014–2015. Energy subsidies, hostility to foreign investment, and inefficiencies of its state-planned economy underlie Iran's problem, which has no relation to "peak oil."

Note: — Stern refers to *depletion*, which is the estimated amount of oil in place (OIP) that has been produced. Regarding depletion, the overall global *recovery factor* is about 37% which means that, on average, when reservoirs are depleted (produced) to that extent, all of the recoverable oil that can be produced has been produced. What Stern actually means is Iran's *decline rate* in existing production, as will be made clear below.

Iran's export decline rate, the *edr*, is calculated by assuming an annual, constant 8% decline in existing production flows "plus its domestic demand growth rate (5%) (from Clark) expressed as a percentage of total production (2%), i.e., 10%." Stern assumes Iran's current production is about 4.0 mbd with exports amounting to about 2.5 mbd—see *Figure 2*. In this scenario, Iran's exports will just about disappear by 2015. I made the same conjecture in November, 2005, here at The Oil Drum and used exactly the same decline rate. See the article for the details.

Interestly enough, Stern states that his conclusion *has no relation to "peak oil"*, the only reference in his paper to this loaded phrase. *Au contraire*, Roger. First, the EIA tells us that "roughly 60 percent of Iran's oil production comes from fields more than half a century old." Consequently, Clark's Oil & Gas Journal article *op cit* states that Iran is losing 350 kbd of oil production and the declines "could increase to 500,000 b/d/year by the end of the decade. Onshore decline rates have risen to 8%/year from 7%/year and offshore decline rates to 13%/year." Futhermore, the EIA states that "the [existing] fields are in need of upgrading, modernization, and enhanced oil recovery (EOR) efforts such as gas reinjection. Current recovery rates are just 24-27 percent."

Clark, citing Dr. Fereidun Fesharaki, head of FACTS Global Energy, describes the ongoing debate within Iran concerning natural gas exports. The argument made by Iran's elected representatives is that all of Iran's available gas production — if not lost in flaring and wet gas shrinkage — will be needed to meet domestic consumption needs and for enhanced oil recovery to achieve higher incremental production flows. Here is the country with the 2nd largest natural gas reserves in the world *debating* whether they can afford to export gas. Amazing.

> Opponents to gas exports, led by Kamal Daneshyar, head of the Energy Committee of the Majlis (parliament), say Iran has 30 fields in need of gas injection totaling 12-14

> bcfd. Only 3 bcfd currently is being injected. All of the 20 bcfd the opponents say will be needed for injection by 2010 to avert a massive decline in oil production would come from South Pars.

Stern is *annoyed* that the National Iranian Oil Company (NIOC) has begun exporting gas in the last few years. It seems irrational to him that NIOC is not devoting more of the available natural gas to enhanced oil recovery, let alone investing to produce more of it. Instead, more and more gas is being used for generating electricity and other non-essential stuff like that. What Stern seems to be unaware of is that such EOR techniques come with a *limited warranty* — injecting gas for post-primary oil recovery to boost reservoir pressure will work for some years, but the end will come and declines will likely be steep, as has apparently happened at Cantarell (NO2 injection since the mid-1990's). At that point, you don't have the oil and you haven't sold the gas, either, though you may have been able to recycle some of the gas in the recovery. On the other hand, perhaps it makes more sense, in the world of the future, to boost revenues by creating a healthy natural gas export business, a business that could generate profits for decades.

If these are not "peak oil" issues, perhaps I do not understand what is meant by this phrase.

What A Mess!

Dr. Stern scolds Iran for making foreign investment difficult, if not impossible, blaming them entirely for their oil production problems. This is the familiar refrain of the IEA and the international oil companies. Stern is *upset* that Iran is not cooperating to allow the much greater production which would *presumably* follow on greater investment. And, there's more. Here, I shall cite his editorial Iran actually is short of oil — *Muddled mullahs*. See his full article published by the National Academy of Sciences for the details.

> This [oil production decline] is what is happening in Iran, which has failed to reinvest in new production. Why?
>
> For the mullahs, the short-run political return on investment in oil production is zero. They are reluctant to wait the 4 to 6 years it takes for a drilling investment to yield revenue. So rather than reinvest to refresh production, the Islamic Republic starves its petroleum sector, diverting oil profits to a vast, inefficient welfare state.
>
> Employment in the loss-making state-supported firms of this welfare state is essential to the regime's political survival.
>
> Another threat to exports is the growth in domestic demand. Iranian oil demand is not just growing, it's exploding, driven by a subsidized gasoline price of about 9 cents a liter. This has created a 6 percent growth in demand, the highest in the world.
>
> So Iran burns its candle at both ends, *producing less and less while consuming more and more* [**Note**: — my emphasis, I couldn't have stated this so-called "peak oil" issue better myself -- DC].

So, Iran's leadership is also culpable for using its oil revenues to subsidize internal consumption. That's not how it's taught in Econ 101 and, of course, it's true because Iran's oil production is not sustainable — they don't teach that in Econ 101, either. Slowing domestic demand by relaxing

subsidies and more liberal political policies encouraging investment would buy time, but that's all. Importantly, such a policy would not make Iranian President Mahmoud Ahmadinejad or Supreme Leader Ayatollah Ali Khamenei very popular.

Yes, Iran does run a "welfare state", they subsidize gasoline and even import it due to lack of refining capacity. Yes, Iran makes foreign investment difficult, because they are negotiating the most favorable terms they can get. It is *their* oil. Part of the truth, however, is not all of the truth. It is also very helpful to look at U.S. puts squeeze on Iran's oil fields from the Los Angeles Times (January 7, 2007), where we learn —

> As Washington wages a very public battle against Iran's quest for nuclear power, it is quietly gaining ground on another energy front: the oil fields that are the Islamic Republic's lifeblood.
>
> Iran's oil industry has raked in record amounts of cash during three years of high oil prices. But a new U.S. campaign to dry up financing for oil and natural gas development poses a threat to the republic's ability to continue exporting oil over the next two decades, many analysts say.
>
> The campaign comes at a moment of unique vulnerability for Iran's oil industry, which also faces challenges from rising domestic energy consumption, international isolation, a populist spending spree by President Mahmoud Ahmadinejad and trouble closing contracts with foreign oil companies — a recipe for potential disaster in a nation with one of the world's largest reservoirs of oil.
>
> "If the government does not control the consumption of oil products in Iran ... *and at the same time, if the projects for increasing the capacity of the oil and protection of the oil wells will not happen, within 10 years, there will not be any oil for export*," Mohammed Hadi Nejad-Hosseinian, Iran's deputy oil minister for international affairs, said in a telephone interview.

The devil is in the details. Here are some.

- Stern references Chris Skrebowski's Megaprojects schedule. As first pointed out by Ace, there is an error in the database. Yadavaran and Kushk/Hosseinieh (300 kbd) are the same oil field, but Skrebowski counts them separately.

  Given this revision, let's assume that Iran can pare down internal consumption and successfully uses gas injection EOR to revive their old fields — getting down to an overall decline rate of 8%, not 10%. If *all* the projects on Skrebowski's list were implemented as scheduled, and assuming a 2006 productive capacity of 4.0 mbd, then Iran's production would be 3.815 mbd in 2013. Not sustainable, even in a perfect world. Alas, the world is not perfect. As for the *edr*, this will go down regardless but the decline depends on how much new production is added, as Mohammed Hadi Nejad-Hosseinian says. It sits at about 61% now. In the worst case, assumed by Stern, no new capacity is added.

- In his "Muddled Mullahs" story, Stern talks about the Azedegan project.

  > Investment in Iran has become so unattractive that even energy-desperate states have quit trying. Japan's Inpex, for example, just abandoned a seven- year

> negotiation for the Azadegan field [2009, 125 kbd]. Had Iran been a better negotiating partner, Azadegan oil would be flowing today.

What really happened was that Japan couldn't find any investment partners to develop Azedegan. As the LA Times story *op cit* states:

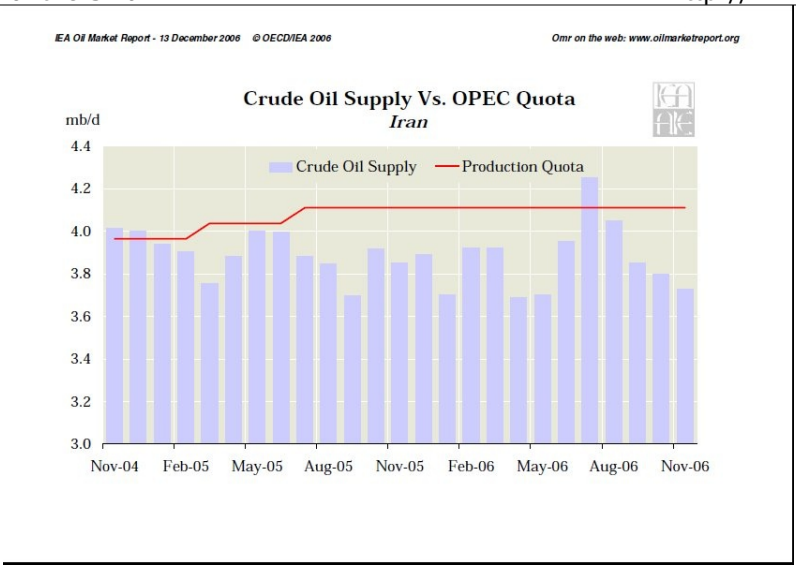
> More than two decades of U.S. sanctions have had little effect on Iran's oil industry — U.S.-based companies have been replaced, largely by Europeans. But this new attack on financing [by the US] has rapidly started to dry up potential loans on dozens of projects, according to oil industry insiders in Tehran and the West.
>
> One of them is reportedly the giant Azadegan oil field in southwestern Iran near the Iraqi border. Japan's INPEX Holdings Inc. in October pulled out of all but a 10% stake in the $2-billion project under U.S. pressure, and alternative financing from foreign banks has failed to materialize, said one source with close connections to the Iranian Oil Ministry.

This is the real story, as has been verified by a number of other sources. Removing land mines left over from the Iran/Iraq war was one of the key issues — and that costs money, although it is not a standard item on the E&P expense ledger.

- Reading Stern, one would think that Iran engages in no foreign investment at all. This is not true. ENI is the operator at Darquain (= Darqoein, Darkhovin), where 55 kbd are currently produced. Phase 2 is delayed — Skrebowski has it in 2006 — but will produce 160 kbd when completed. Now, ENI is negotiating with Iran to operate the Azedegan field.

  Furthermore, China's Sinopec has signed on to develop Yadavaran (2011). However, there are problems. Clark *op cit* reports that the 300 kbd target has been exaggerated by Iran's NIOC in order to attract the investment. Now, Sinopec and NIOC are haggling over the Chinese rate of return. Yes, Iran prefers "buyback" contracts and is tough to negotiate with. See Stern's paper for details.

Finally, what is happening with Iran's production? That is unclear. As Stern notes, Iran is not meeting their OPEC quota, although that may not be a bad thing (for now) in so far as OPEC is attempting to cut production to sustain a floor on the oil price. There is conflicting data. The EIA shows fairly flat production at around 4.0 mbd but the IEA paints a different picture in its Oil Market Report, December 13, 2006 — as shown in *Figure 3*.



Iran — crude oil supply versus OPEC quota
Figure 3 — Click to enlarge

As far as I know, both data sets pertain to liquids, including NGLs. The dip in November is attributed to oil field maintenance.

What a mess! Generally speaking, it is advantageous to know something about the oil & gas business when discussing it on NPR. Let's now turn to the main theme — the geopolitical outcome of Iraq's civil war, Iran's strategic position, the role of the United States and the Saudi Arabian reaction to these unstable factors.

Geopolitical Analysis & Saudi Arabia

Now that we have a pretty good understanding of the pressures Iran is under, it is time to ask: *What would you do if you were Iran's leadership?* Here is the situation, which is presented as accurately as possible, keeping spin to a minimum. Earthshaking geopolitical events affecting the oil supply from the Middle East are indeed possible in the next few years. That the oil markets have decided to ignore the dangers there for the time being does not make the dangers any less real.

1. Iraq is a failed state. The Sunni/Shia civil war proceeds apace. The Iraqi government will collapse once the U.S. starts the inevitable withdrawal of its troops. There is little popular support for the occupation in America. The Kurds have carved out a *de facto* independent state in the north, along with a separate oil policy. The planned oil law to allow exploitation of Iraq's oil resources by foreign companies is surreal.

2. Iran is enriching uranium and, if left alone, are likely a decade away from being a full-fledged nuclear power. The U.S. and Israel will never permit that to happen, but the outcome is well down the road at this point. In the meantime, Iran will have less and less ability to finance their economy through oil export revenues. The U.S. is waging economic war on Iran which affects their ability to put new oil production onstream. As the major Shia power in the Islamic world, Iran wields great influence in other Shiite regions including Iraq, where a retired four-star general told Seymour Hersch that Iran could take Basra with "ten mullahs and one sound truck".

The Iranian "nuclear threat" is overblown, a red herring. It has been used politically in the U.S.

by neoconservatives to create another external enemy in the "Axis of Evil". A bomb is many years away and, in any case, the Western powers would never permit it. Other attempts to explain it also fail. From Stern —

> The allure of nuclear power to a regime in such straits [Iran] is obvious. First, Russians are financing the new capacity, something foreigners are increasingly unwilling to do for oil and gas. [**Note**: — this is false, as shown above]. Second, Russian reactors will substitute for power now generated by petroleum, freeing petroleum for export. Although the prospective nuclear power capacity is *insignificant to Iran's total energy budget*, it is part of a larger if ill managed plan to preserve exports. For example, ambitious goals have been set for power generation capacity additions from coal (38), hydro (39), solar, and thermal (40) resources. Just as with petroleum, however, foreign investment in power generation has been inadequate (38). The power generation problem has become so acute has that the unprecedented step was recently taken to partially privatize it....
>
> To summarize, Iran's claim that its nuclear technology is entirely peaceful appears to be false (insofar as we can judge from the statements of arms control officials). However, the oil export decline we project implies that Iran's claim to need nuclear power to preserve exports is genuine....

Iran's refineries produce around 30% fuel oil (as opposed to 16% gasoline) and they have large gross exports of this oil grade. Iran's electricity is generated as follows.

Iran had installed power generation capacity (2004) of about around 34.3 gigawatts (GW). Of this total, over three-quarters was natural gas-fired, with the remainder either hydroelectric (7 percent) or oil-fired (18%). For 2005, Iranian power generation capacity is expected to reach 36 GW). Source: EIA — Figure 4

Most likely, nuclear power would substitute for natural gas, thus freeing it up for export or EOR. In part, it could substitute (along with coal, etc.) for fuel oil but the potential savings would be relatively small. Therefore, one must look to political reasons for Ahmadinejad's focus on Iran's nuclear capability. As Iran's leadership has basically said all along, it is a nationalistic point of pride cynically meant for internal political consumption to appease the populist conservative base of a leadership propped up by the Islamic Revolutionary Guards. See Iranian presidential election, 2005 for some insights. Because Iran faces the economic crisis created by declining oil export revenues — endangering subsidies — the government's popular support will weaken further (especially among Iran's poor) over the next decade. Hence, the nuclear rallying cry becomes ever more crucial to those in power to solidify that support. Conveniently, declining revenues can be blamed on America, the Great Satan. There is even some truth to the assertion, as discussed above.

Let us now turn to the real issue, which is perceived correctly by Saudi Arabia — Iranian influence in Southern Iraq and in other Shia regions, including the minority population in the Kingdom itself (see *Figure 1* at the top). What will Iran really do in the face of declining oil exports? Will they just roll over, or as a friend told me, fade quietly away saying "Oh, well, we had a good run ... but it's all over now." First, this ethnically diverse country is Persia, a country with a

very long history. Secondly, *de facto* control over Iraq's southern oil fields would substitute very nicely for failing future oil exports. Third, fomenting rebellion in Shia Saudi Arabi in the Gulf region would be potentially disruptive to the Kingdom's oil production. It is not unprecedented.

> Shia came to occupy the lowest rung of the socioeconomic ladder in the newly formed Saudi state. They were excluded from the upper levels of the civil bureaucracy and rarely recruited by the military or the police; none was recruited by the national guard. The discovery of oil brought them employment, if not much of a share in the contracting and subcontracting wealth that the petroleum industry generated. Shia have formed the bulk of the skilled and semiskilled workers employed by Saudi Aramco. Members of the older generation of Shia were sufficiently content with their lot as Aramco employees not to participate in the labor disturbances of the 1950s and 1960s.
>
> In 1979 Shia opposition to the royal family was encouraged by the example of Ayatollah Sayyid Ruhollah Musavi Khomeini's revolutionary ideology from Iran and by the Sunni Islamist (sometimes seen as fundamentalist) groups' attack on the Grand Mosque in Mecca in November. During the months that followed, conservative ulama and Ikhwan groups in the Eastern Province, as well as Shia, began to make their criticisms of government heard. On November 28, 1979, as the Mecca incident continued, the Shia of Qatif and two other towns in the Eastern Province tried to observe Ashura publicly. When the national guard intervened, rioting ensued, resulting in a number of deaths. Two months later, another riot in Al Qatif by Shia was quelled by the national guard, but more deaths occurred. Among the criticisms expressed by Shia were the close ties of the Al Saud with and their dependency on the West, corruption, and deviance from the sharia.

Martin Walker (*op cit* at the top) expresses doubts about the scenario outlined here, stating that "in Saudi Arabia, despite the Wahhabi clerics and their claims of Shia heresy, the monarchy has chosen to conciliate its Shia minority, easing some of the restrictions it had placed upon them." I'll bet they have.

Saudis Adjust Long-Term Oil Strategy (Rigzone, Jan. 10, 2007) describes the reactions of KSA to the possible revenge of the Shia.

> Saudi Arabia's growing fear of Iranian hegemony in the Middle East may be driving the world's largest crude oil exporter to prepare a more aggressive long-term political oil strategy that could subvert an Iranian ascendancy, insiders and analysts say.
>
> Under a new, accelerated production program, the kingdom could increase its spare oil drilling capacity to at least 3 million barrels a day by 2011, up from around 2 million now. Intelligence experts estimate Iran might have the capability to develop nuclear weapons by then. Additional spare capacity could give the Saudis greater leverage as a political tool.
>
> Iran's alleged aim to develop nuclear weapons and its interference in Iraqi and Lebanese politics and conflicts are feeding fears among the Sunni states in the region, particularly Saudi Arabia, that Iranian ascendancy might tip the balance of power towards a Shi'ite domination of the Middle East.
>
> "Fear of an emerging Shi'a crescent has been reflected in speeches by Egypt's President

> (Hosni) Mubarak, Saudi princes and clergy, and other Sunni Arab heads of states," says Mordechai Abir, a senior Middle East analyst for Burnham Securities.
>
> That anxiety, along with concerns for domestic security, has spurred Saudi Arabia to boost its defense spending to between $50 billion and $60 billion in the next several years for a major upgrade of its entire military.

As noted above, an Iranian nuclear weapon by 2011 is not an issue — Saudi fears of an emerging Shi'a crescent is the problem. Let us first dispense with the "spare capacity" argument. There is no possibility that Saudi Arabia could flood the oil market to wage economic war on Iran, which is facing a decreasing *edr* anyway. Greater Saudi production would make up for Iranian shortfalls within OPEC. Increased Asian demand (China & India) is relentless and could eat up any new oil released to the market. Here, it is off-topic as to whether Saudi Arabia can actually implement their accelerated plans to increase productive capacity. What is important is that *they believe* they can. In any case, the time frame (by 2011) doesn't work as far as spare capacity in the global oil supply goes.

> The first phase, increasing production to 12.5 million barrels a day from current capacity of 11.3 million barrels a day, has been placed on an accelerated timeline. The second phase - to grow capacity as high as 13.5 million barrels a day by 2011 - is in the planning stage.
>
> With that kind of capacity, the country could be in a better position to influence prices....
>
> By the middle of the year, [Saad] Rahim [Country Strategies Manager at PFC Energy] said, Saudis' spare capacity will be able to compensate for a complete loss of Iranian exports of around 2.5 million barrels a day. "But that essentially soaks up global excess capacity," he said. "So any other disruptions (such as from Nigeria or Venezuela) would really stretch the system."
>
> Shibley Telhami, a senior fellow with Washington think tank the Brookings Institute, said the Saudis are unlikely to use their capacity as a weapon unless they have ruled out all other diplomatic means.
>
> "The Saudis want Iran contained, there's no doubt," said Telhami, "But they're also very worried about war with Iran," not least because it might prompt an uprising from their own Shi'a population.

Influence prices? Not downward. War with Iran? The loss of Iranian (and Saudi) exports resulting from such a war? These are real possibilities. Moreover, the Saudi's oppose any U.S. troop withdrawal — naturally — and are fearful of what may happen later this year or next year in this regard. Still, it appears that anything Saudi Arabia could do by politicizing their oil policy and increasing spare capacity would be too little, too late.

Conclusion

As the American Iraq quagmire draws to a close, as it inevitably must, the countries of the Persian Gulf region, and their residents, will be left to fend for themselves in a destabilized region. Iran will attempt to take advantage of the situation, given their declining exports and the

economic leverage now being applied against them by the United States. I have not touched on the Spring scenario for an Israeli attack on Iran, but that remains a possibility. Such an action would merely accelerate the chain of events outlined here. Iran might even welcome such an attack.

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