The US shale revolution and the Arab Gulf States: the economic and political impact of changing energy markets

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The US Shale Revolution and the Arab Gulf States. The Economic and Political Impact of Changing Energy Markets

The United States will play a central role in the future development of the energy markets, and in international relations in the Persian Gulf. The Gulf region is where the influence of the shale revolution on US overseas engagement acquires strategic significance. An American pullback could shatter the region's security and threaten the internal stability of the Gulf states. Given that these states are highly dependent on revenues from oil and gas exports, the question is also whether the shale revolution is affecting the volume and pricing of Arab energy exports.

The shale revolution is, however, only one of several factors driving rapid change in the energy markets. Strong demand in Asia and within the Middle East itself are equally significant. The uncertainties in the energy markets remain large. The Russia-Ukraine crisis and developments in Iran and in Iraq are known "wild cards". It is hard to foresee how these trends will interact in the longer term. While the tight oil revolution will colour the coming decade, the Gulf region will remain the backbone of the global oil supply. Any lasting decline in oil prices would be problematic for the Arab Gulf states, but is not to be expected as long as demand in Asia remains strong. While American shale gas appears to be here to stay, there is no sign of US liquefied natural gas (LNG) exports revolutionising the global gas trade in the medium term. Qatar is therefore in a good position to defend its global market position in this sector.

Nonetheless, the Arab Gulf states find themselves confronted with change in the international energy markets, and with the broader consequences of the shale boom. Moreover, their own energy demand is growing so strongly as to call into question their role as exporters. All these trends converge to create a difficult situation that is exacerbated by growing need for investment in infrastructure and exploration to satisfy rising domestic consumption. There is an urgent need for energy policy reform in the Gulf states, but this is held back by the international market situation. Sociopolitically it is too risky for the region's rulers to raise domestic energy prices; economically this stance represents the main obstacle to reforms. In the longer term these problems will endanger the socio-economic

development of the Gulf states. Their state budgets are coming under growing pressure as the need for major investments in the energy sector intersects with pressure to keep domestic energy prices low. Well-stocked reserve funds would cover this strategy for some years to come, but at the price of squandering the resources required for structural reforms.

The foreign policy and security consequences of the shale revolution are also hard to assess. While Gulf politicians play down the issue, they are in fact very unsettled by fears of an American withdrawal. The shale revolution could further heighten their already existing doubts about Washington's reliability. Especially in the case of Saudi Arabia, such fears have for some years already fostered a more independent – some observers would say "offensive" or "aggressive" – foreign policy that exacerbates regional conflicts.

The shale revolution will make North America self-sufficient in energy for quite some time, and expand Washington's policy options in the Gulf. But it is not yet clear whether and how it will exploit these new possibilities. There is certainly no indication of the United States scaling down its diplomatic and military engagement in the Gulf. Ultimately, the region's energy wealth is but one reason for the US presence, and the Gulf states remain crucial as the backbone of the global oil supply. Washington can be expected to push for international burden-sharing, given that its European partners profit from its protection of Middle East oil and gas supplies (as do China and India in particular). The prospect of self-sufficiency allows the Americans to demand – principally from Germany and Europe – either a military contribution or a share of the cost of maintaining a presence in the Gulf. On the other hand, Washington would be wary of any stepping up of Beijing's political or security engagement.

Although Europe's wider neighbourhood will remain decisive for its own direct energy supply in the medium term, the Persian Gulf retains long-term strategic importance. In view of the region's geopolitical imponderables and the associated supply risks there are good reasons for Germany and Europe to push ahead with the shift to renewables, especially in the transport and mobility sectors. Qatari natural gas could contribute to diversification of European gas supplies. At the same time the new energy map demands greater dialogue and cooperation above all within the OECD – in cooperation with the emerging economies, but also in energy partnerships with the Gulf states.

The US Shale Revolution and the Dynamics of the Global Energy Markets

In order to clarify how the shale revolution affects stability in the Gulf, we must first examine its consequences more broadly. This means firstly the supply situation in the United States, secondly the international energy markets and the Gulf states' bilateral energy trade. The further we look into the future, the more uncertain the forecasts.[1] The uppermost question for the Gulf states is whether the shale revolution will lead to loss of market share and shrinking revenues. As we will see, this will depend not only on fickle price trends, but equally on future demand in Asia, in Europe, and within the Gulf itself.

Not without reason has the International Energy Agency underlined the "unprecedented uncertainty" facing the energy markets since 2010.[2] The "known unknowns" that could refashion energy market trends currently include the Russia-Ukraine crisis and geopolitical developments in Iran and in Iraq.

The US Shale Revolution and Its Geo-economic Consequences

The US shale revolution was made possible by the fracking process, which uses liquids and chemicals to release unconventional gas and oil deposits that are otherwise unexploitable. The breakthrough was achieved by the combination of hydraulic fracturing (fracking) with horizontal drilling. This development began less than ten years ago, driven by the high level of gas and oil prices.

The boom in unconventional oil and gas – above all tight oil and shale gas in the United States, oil sands in Canada – is making North America self-sufficient in energy.[3] By mid-2013 the United States had become the world's largest energy producer. Fracking is now an established technology, with continuous improvements leading to falling costs, efficiency gains and rising recovery rates. While it is hard to predict future technological developments, today's figures are already impressive.

Shale gas: Between 2005 and 2012 US natural gas production increased by one quarter.[4] The United States extracted 687 billion cubic metres of natural gas in 2013,[5] overtaking Russia as the largest producer. In its *World Energy Outlook 2013*, the IEA assumes that production of natural gas in the United States and the NAFTA region as a whole (United States, Canada and Mexico) will increase continuously until 2035, at an annual rate of 1.1 percent.[6]

But for about the past three years the American shale gas industry has been experiencing a market adjustment process, because extraction costs (not to speak of investment costs) were generally higher than realised prices. The rapid growth rates have therefore slowed. The price achieved at the main American distribution hub, Henry Hub in Louisiana, in 2012 was about $2 per million British thermal units (MBtu).[7] But shale gas is only regarded as economic at a price level between $3 and $8 depending on the specific play,[8] although the break-even price falls significantly (to $0.55 per MBtu) where both dry gas and lucrative condensate or crude are extracted from the same well.[9]

1 Developments concerning the next three years are characterised in this study as "short-term"; "medium-term" relates to the three- to five-year timeframe, "long-term" to the ten- to fifteen-year.

2 International Energy Agency (IEA), *World Energy Outlook 2010* (Paris: OECD and IEA, 2010).

3 The spectrum of formations that can be designated "unconventional" in this context is very broad and poorly defined. The term encompasses geographical, geological, technological, and chemical differences vis-à-vis conventional reserves and production methods. In the United States the new fracking technologies behind the production boom are employed principally to extract shale gas (from sandstone, mudstone and carbonate reservoirs), tight gas and tight oil (from dense strata), and shale oil.

4 BP, *Statistical Review of World Energy* (London: BP, 2014), 22.

5 Ibid.

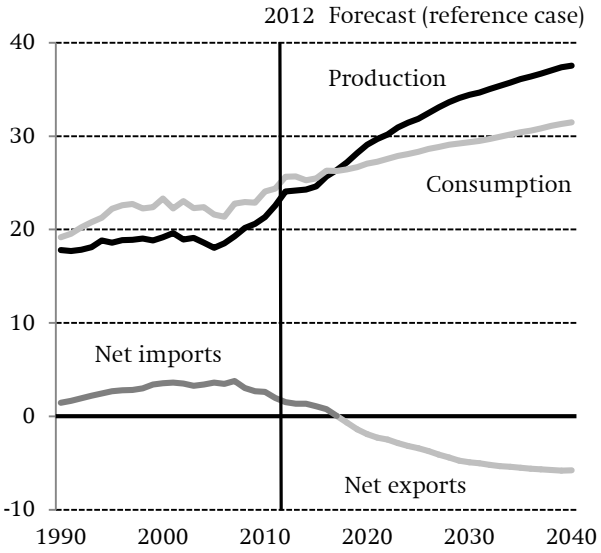
6 IEA, *World Energy Outlook 2013* (Paris: OECD/IEA, 2013), 108.

7 U.S. Energy Information Administration (EIA), "Henry Hub Natural Gas Spot Price", http://www.eia.gov/dnav/ng/hist/rngwhhdd.htm (accessed 1 September 2014).

8 Massachusetts Institute of Technology (MIT), *The Future of Natural Gas: An Interdisciplinary MIT Study* (Boston, 2011).

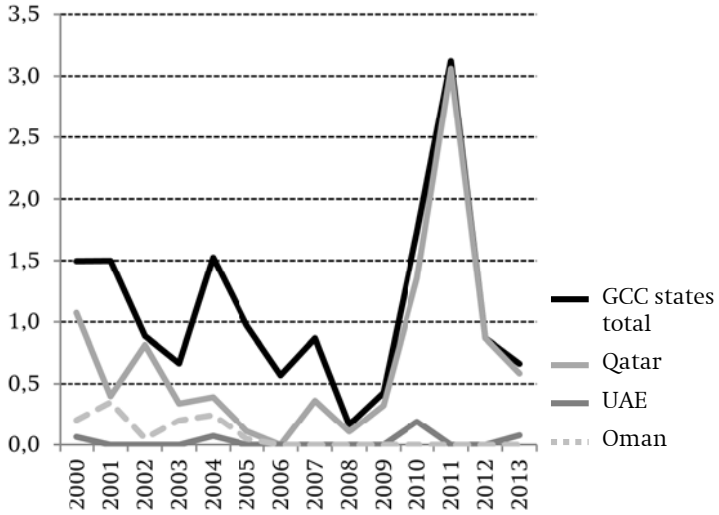
9 Gürcan Gülen, John Browning, Svetlana Ikonnikova and Scott W. Tinker, "Well Economics across Ten Tiers in Low and High Btu (British thermal unit) Areas, Barnett Shale, Texas", *Energy* 60 (2013): 302–15. The "break-even price" is the threshold at which production becomes profitable. Theoretically, variable and fixed costs are then covered.

Figure 1
US gas production, consumption and net imports/ exports (trillion cubic feet)



Source: U.S. Energy Information Administration (EIA), http://www.eia.gov (accessed 22 August 2014).

Figure 2
Gulf states' shares of US gas imports (%)



Source: UNCTAD, UNCTADstat, http://unctadstat.unctad.org/EN (accessed 22 August 2014).

In 2013 the average gas price was $3.73, in the first half of 2014 $4.90.[10] These figures are, however, approximations that will vary considerably depending on formation, type of extracted hydrocarbons, age of well, technology used and regulatory requirements.

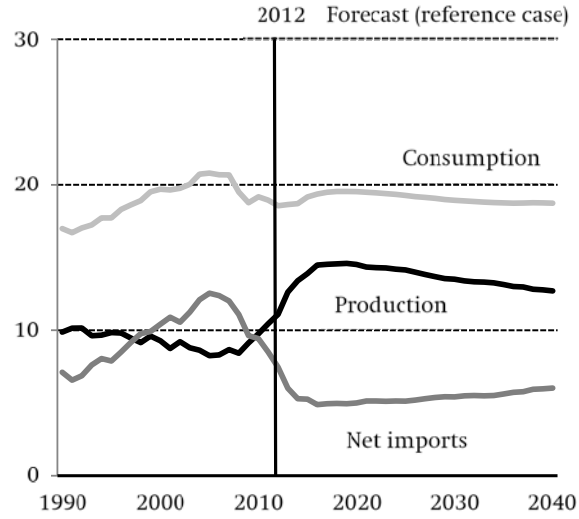
One decisive development in recent years is that US gas production has increased considerably faster than domestic consumption. The pipeline-connected NAFTA gas market now increasingly satisfies domestic needs. Consequently, total natural gas imports to the United States fell by more than 30 percent between 2008 and 2013, LNG imports to one tenth.[11] Because the United States has practically ceased importing LNG from overseas, the North American gas market has become largely detached from the international markets. Interestingly, there have been extreme fluctuations in gas imports from Qatar during the past ten years. The United States purchased most gas there in 2011 (3 percent of total imports), at a point where the shale gas boom was already in full swing.[12]

In terms of repercussions on the international gas markets, the shale revolution has further reinforced the existing division into three major regional markets (North America, Europe, Asia/Pacific). The United States has largely detached itself not only from LNG imports, but also from the international pricing mechanisms. Given the existing infrastructure in the North American and European markets, pipeline gas dominates in both, whereas LNG accounts for more than 80 percent in the Asia-Pacific region. LNG is also central to an increasingly global and flexible gas trade. Alongside the shale gas boom, rising demand for gas in Japan (and South Korea) after the reactor meltdown in Fukushima in 2011 has reinforced the segmentation between gas markets. This demand boost increased the Pacific market's share to almost 75 percent of the global LNG trade. North America's share in 2013 was something over 1 percent, Europe's about 15 percent.[13]

One effect of the shale gas boom is that the United States profits from very low gas prices in OECD comparison. In 2013 the average price in the United States was about $4.8 per MBtu; the comparable figure for Europe was $8.7 and the Far East $16.3.[14] The shale gas

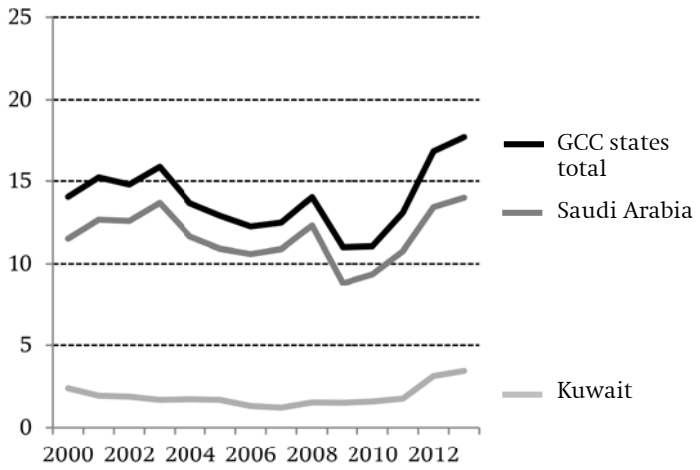
10 Calculations based on data from EIA, "Henry Hub Natural Gas Spot Price" (see note 7).
11 BP, *Statistical Review of World Energy* (see note 4), 30.
12 EIA, "U.S. Liquefied Natural Gas Imports from Qatar", http://www.eia.gov/dnav/ng/hist/n9103qr2A.htm (accessed 7 April 2014).
13 BP, *Statistical Review of World Energy* (see note 4), 38.
14 Energy Comment, *Global Energy Briefing* 6, no. 101, August 2014, 3.

Figure 3
US crude production, consumption and net imports/exports (million barrels/day)



Source: U.S. Energy Information Administration (EIA), http://www.eia.gov (accessed 22 August 2014).

Figure 4
Gulf states' shares of US imports of crude oil and petroleum products (%)



Source: UNCTAD (see Fig. 2, p. 8).

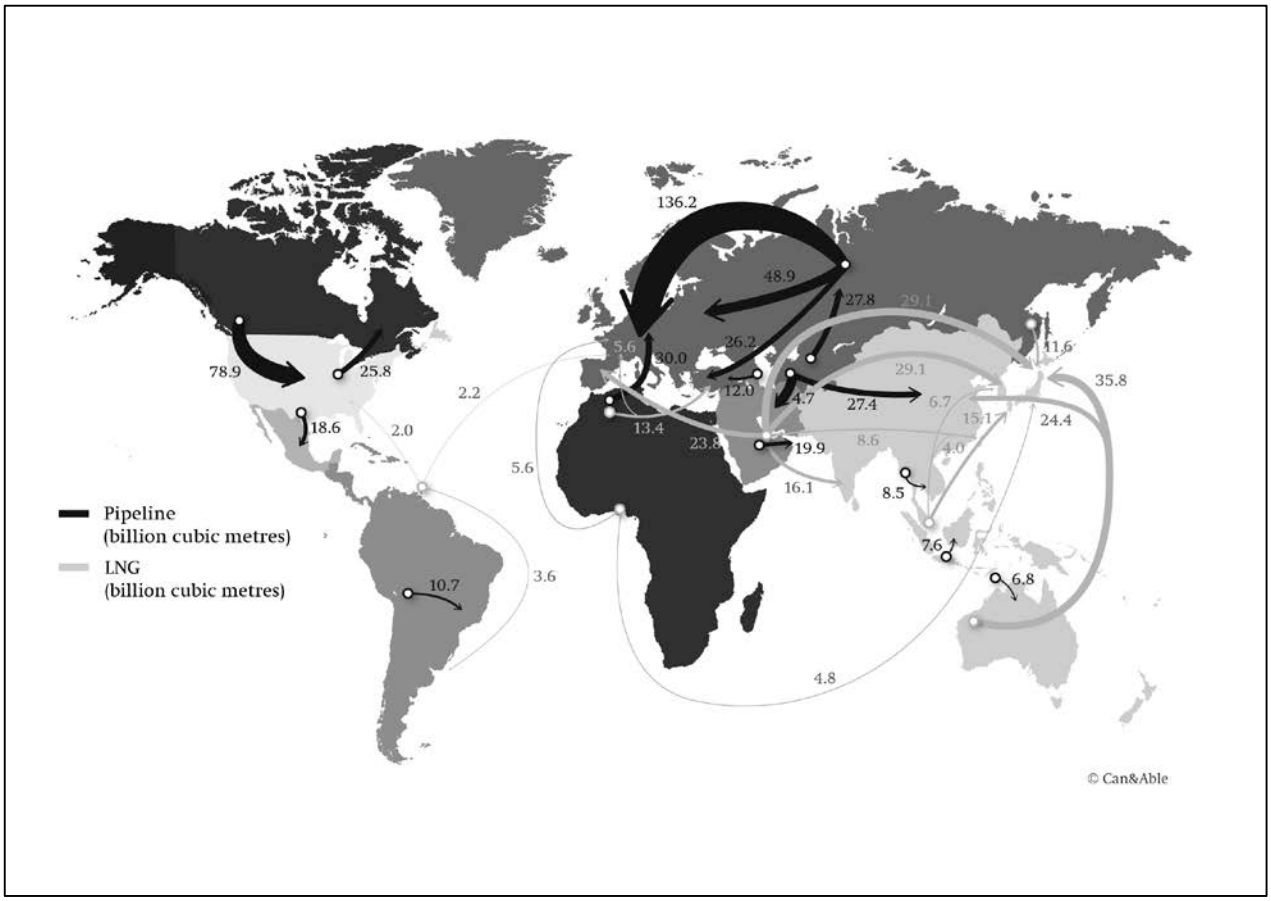
boom has generated considerable differences between the pricing mechanisms in the three main markets. Whereas gas-to-gas competition rules in the United States and about half the European gas trade is today based on spot market prices (tendency rising), the Asia-Pacific region is still long-term and oil-indexed.[15] That creates considerable price differences, because oil price indexing in particular keeps the gas price high. One of the open questions for the future is to what extent prices in the different gas markets will converge. This will depend on the extent of US gas exports, new LNG projects and demand trends. In mid-2014 it would appear that the differences are set to lessen, but that the United States will retain relative price advantages in gas and electricity.[16]

Tight oil: Overall, US oil production increased by 50 percent during the past three years; at the beginning of 2014 production amounted to 8.1 million barrels/day.[17] In 2013 tight oil contributed about 2.3 million barrels/day to that figure.[18] Total US production is projected to increase to 11.8 million barrels/day by 2025.[19] But after that the IEA and the US Energy Information Administration both expect the production curve to flatten off.[20] So on the basis of current data, the role of OPEC oil would have to expand again from the mid-2020s, if global demand is to be satisfied.[21] But future North American oil production will depend on technological progress, on cost, and on international prices; longer-term trends are therefore almost impossible to predict.

The impact of the tight oil boom on bilateral trade between the United States and the Arab Gulf states is limited, because Washington has been working since the oil crises of the 1970s to reduce its dependency on imports from the Middle East. Thus even before the

15 Gas-to-gas competition is increasing as oil price indexing for natural gas declines in Europe. DG Energy, *Quarterly Report on European Gas Markets 1/2013*, Market Observatory for Energy (Brussels, 2013), 14f.
16 The IEA also shares this expectation, see IEA, *World Energy Outlook 2013* (see note 6), 24, 261–300.
17 EIA, "Crude Oil Production", http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbblpd_a.htm (accessed 5 November 2013); Commerzbank, *Commodity Research*, 17 January 2014, 4.
18 EIA, "Annual Energy Outlook 2014: Market Trends: Liquid Fuels", http://www.eia.gov/forecasts/aeo/MT_liquidfuels.cfm#tight_oil (accessed 7 April 2014).
19 Commerzbank, *Commodity Research* 6, no. 101, 17 January 2014, 4.
20 IEA, *World Energy Outlook 2013* (see note 6), 481; Adam Sieminski, "Outlook for U.S. Shale Oil and Gas", presentation at the IAEE/AEA meeting, 4 January 2014, Philadelphia, http://www.eia.gov/pressroom/presentations/sieminski_ 01042014.pdf (accessed 10 July 2014).
21 IEA, *World Energy Outlook 2013* (see note 6), 457.

Map 1
Global gas trade



Sources Map 1 and 2: BP, *Statistical Review of World Energy* (London, 2014), 29 (gas trade), 19 (oil trade).

shale revolution began, the United States was no longer importing strategically relevant amounts from the Gulf.[22] The direct impact of the shale revolution on Gulf exporters has therefore been small to date. Between 2006 and 2013 average US imports fell slightly, from 2.2 million to 2.0 million barrels/day. Imports from Saudi Arabia, which supplies 13 percent of total US oil imports, also fell only slightly.[23] This is partly because refineries configure their processes for specific grades of crude. American tight oil is high quality with a low sulphur content, and has principally substituted West African crude of similar quality. Saudi Arabia, on the other hand, supplies heavy oil with a high sulphur content, which is more susceptible to displacement by Canadian tar sands. But the state-owned Saudi Aramco is also active in the US refining sector, where it can to some extent secure the market for its own crude.[24]

With respect to the international oil markets, the shale boom leaves the United States importing less crude and exporting (net) more oil products.[25] This

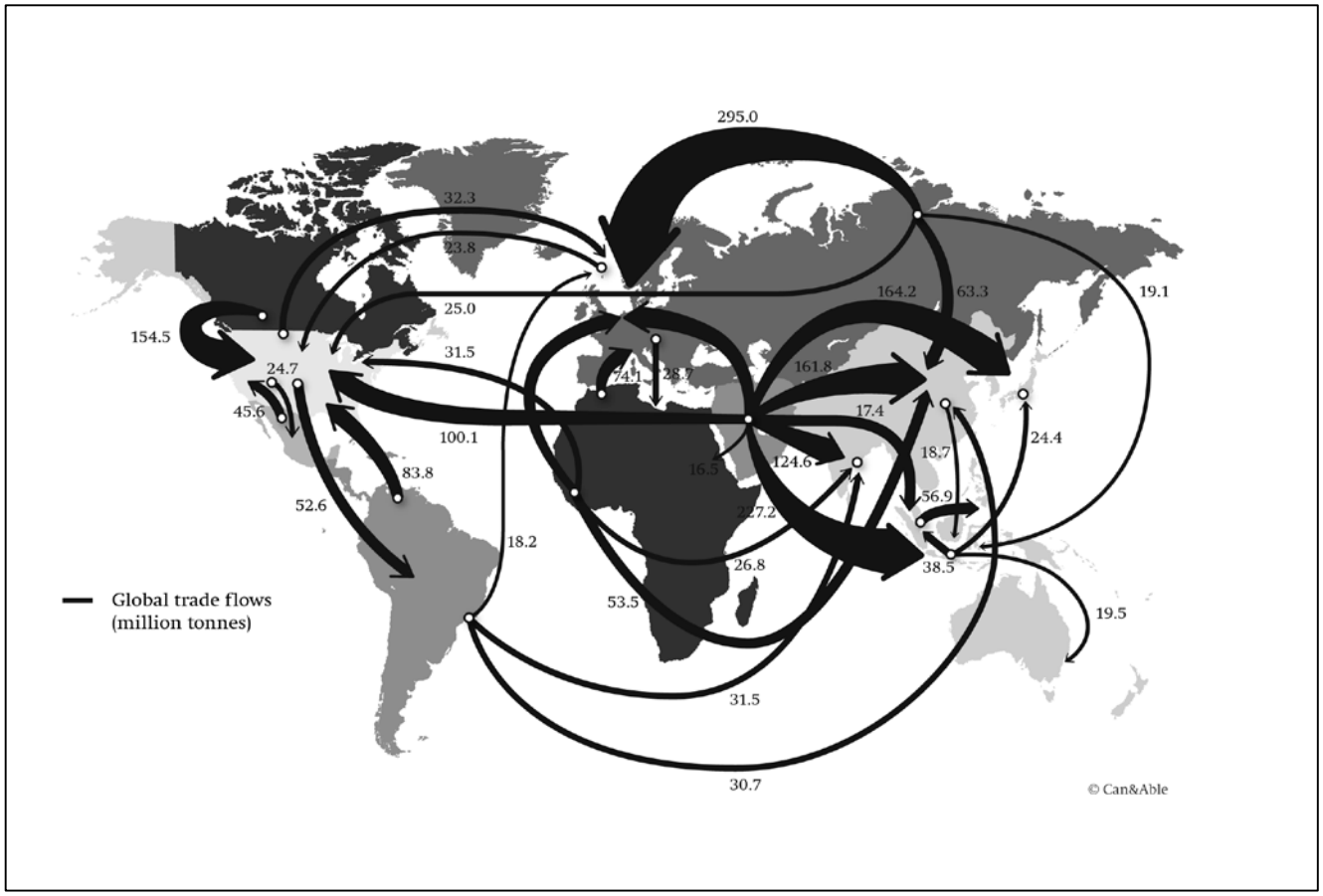
22 Daniel Yergin, *The Global Impact of US Shale* (Project Syndicate, 8 January 2014), http://www.project-syndicate.org/commentary/daniel-yergin-traces-the-effects-of-america-s-shale-energy-revolution-on-the-balance-of-global-economic-and-political-power (accessed 7 April 2014).

23 From 1.5 million barrels/day to 1.3 million. EIA, "U.S. Imports by Country of Origin", http://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbblpd_a.htm (accessed 7 April 2014).

24 Clifford Krauss, "Texas Refinery Is Saudi Foothold in US Market", *New York Times*, 4 April 2013, http://www.nytimes.com/2013/04/05/business/texas-refinery-is-saudi-foothold-in-us-market.html?pagewanted=all&_r=1& (accessed 10 July 2014).

25 The United States possesses the world's largest installed refining capacity, with 18.2 percent of global volume in 2012. IEA, *Key World Energy Statistics 2013* (Paris, 2013), http://www.iea.org/publications/freepublications/publication/KeyWorld2013_FINAL_WEB.pdf (accessed 5 November 2013), 11, 21, 23. Exports of petrol and diesel are at historic records: 310,000 barrels/day and 480,000 barrels/day.

Map 2
Global oil trade



has repercussions above all on other producers of light oil, and places increasing pressure on European refineries. The Gulf region, on the other hand, remains absolutely crucial to the international oil markets. Even after the shale revolution, a loss of production there would be almost impossible to compensate. Almost 24 percent of global oil production is in the Gulf, and one third of the entire international oil trade originates there, destined principally for Asia.[26] The Gulf possesses the largest spare production capacity and as such plays a decisive role in setting the global oil price.

As far as price trends are concerned, the decisive observation is that despite the US tight oil boom the international price has remained stable and high since 2010/2011. The reason for this is steadily rising demand in Asia coupled with supply disruption in the Middle East and North Africa (Libya, Syria, Iran). Additionally, large, older conventional fields across the world are gradually passing plateau production, with reservoir pressure dropping and/or equipment and infrastructure requiring renewal.[27] This trend will accelerate. It is also clear that demand is the central determinant of developments in the energy markets. The extent to which the United States again becomes more dependent on oil imports from the Middle East after its oil boom tails off (as expected for the mid-2020s) will depend above all on whether it succeeds in switching from oil to cleaner natural gas and boosting energy efficiency. Both are declared goals of the Obama Administration.

26 BP, *Statistical Review of World Energy* (see note 4), 6, 8, 18.

27 IEA, *Mid-Term Oil Market Report 2014* (Paris: IEA and OECD, June 2014), 18f.

The New Energy Map

The energy map is changing rapidly.[28] The US shale revolution is a central accelerating factor, but not solely decisive. Another equally important aspect is that future demand increases will be located almost exclusively in East Asia and the Middle East. The United States is not only still the biggest energy consumer (alongside China), but now a leading oil and gas producer. The Arab Gulf states are witnessing a countervailing trend, as they shift from being major producers to significant consumers.

The shale revolution provides the United States with access to an energy supply that is stable, reliable, affordable, and in the case of natural gas also relatively clean. This significantly enhances its energy security. And reduced vulnerability to energy crises also expands Washington's strategic options, for example to impose embargoes on energy-rich states. Other major energy consumers, like Europe, China, India, Japan and South Korea, on the other hand, find themselves confronted with growing import dependency. And the more oil and gas they have to import from abroad, the stronger their dependency on secure trade routes and shipping. Global supply and demand patterns are shifting; as Europe's demand stagnates, trade flows migrate to the Pacific. This changes states' geopolitical interests and mind maps, even if non-energy interests relating to security and order – such as the fight against terrorism – remain extant.

It is, however, not only the rapidity of change that characterises the energy markets, but also the historically unprecedented uncertainty about future developments.[29] On the supply side it is hard to assess where and when fracking will be adopted in other countries,[30] whether and how the cost factor for the new technologies will change, and how and where environmental regulations may restrict production or increase costs. On top of that come geopolitical risks in the so-called strategic ellipse (Russia, Caspian, Middle East), which houses over 70 percent of the world's conventional oil and gas reserves. Event-related risks also play a role; for example, accidents can quickly disrupt supplies.

How demand for the various energy sources will develop is also uncertain. Future energy demand will depend strongly on economic growth in China, India and East Asia, as well as on the as yet unclarified fate of nuclear power in Japan and South Korea. The future energy mix is also hard to foresee. At the global level it is predicted that oil, gas and coal will continue to dominate with roughly equal shares of about 27 percent.[31] But regionally the ratio could differ considerably. Fuel switch effects, for example where gas and/or renewables replace coal for electricity generation, are absolutely decisive. In the mobility and transport sector oil could lose ground to gas and/or electromobility. In industry, not least petrochemicals, natural gas is increasingly favoured for process heat and feedstock. These substitution effects also have effects on price trends, but these are hard to predict. Additionally, there is unclarity about national and international environmental regulation and climate protection. Such moves would promote a shift from "dirty" coal to "clean" natural gas, but could also place limits on fracking.

In view of such imponderables, a wait-and-see attitude can be observed, especially in the traditional producing countries. But risk aversion is also noticeable among the big multinational oil corporations, which have for some years shied away from major investments in big new fields. Here the investment cycles are long and significant capital is required. Such equivocation also favours the "smaller" shale gas and tight oil projects (close to existing markets and infrastructure), which have shorter investment cycles and are often more quickly realised, cheaper and less complex. Another unanswered question is how much domestic natural gas the United States will export, and whether export restrictions on crude oil will be eased.

28 As also argued by the IEA, *World Energy Outlook 2013* (see note 6).

29 Ibid.

30 Geological and market circumstances and political frameworks vary globally between regions and countries and are not necessarily comparable with the favourable conditions in the United States. Nonetheless, China, Australia, Argentina and Russia can be expected to follow in introducing fracking. IEA, *Medium-Term Oil Market Report 2014* (Paris: OECD and IEA, 2014); IEA, *Medium-Term Gas Market Report 2014* (Paris: OECD and IEA, 2014).

31 BP, *Energy Outlook 2030* (January 2013), http://www.bp.com/content/dam/bp/pdf/statistical-review/EnergyOutlook2030/BP_Energy_Outlook_2030_Booklet_2013.pdf (accessed 31 July 2014).

US-Exports: Strategic Considerations and Commercial Rationale

While the shale gas boom was discussed in the United States – at least until Russia's annexation of Crimea – as a matter of economic benefit, the debate on crude oil has traditionally been more strategically coloured. This also influences US export policy. Since spring 2014, responding to the Ukraine crisis, Washington has been seriously discussing selectively relaxing restrictions on crude oil and natural gas exports.[32] But to date this has involved only isolated proposals affecting particular deposits or oil grades. The ban on exporting crude remains in place.[33]

Gas exports also remain restricted,[34] even though studies commissioned by the US Department of Energy demonstrate that LNG exports would benefit the US economy as a whole.[35]

The question of how much domestically produced gas the United States will export as LNG from 2015/2016 is of strategic importance for the international gas markets. Export contracts are appearing with Henry-Hub indexed price formulas but without specific destination clauses. It is clear that US LNG projects require long-term contracts as the basis for final investment decisions and commercial realisation.[36] Given the present situation in the energy markets, this appears to be a larger obstacle than the formal approval process. In other words, profit expectations and business models will decide whether the United States becomes a net gas exporter in the coming years.[37] In 2013 the United States already exported 330,000 barrels/day of gas condensates (propane, butane, etc.), making it one of the biggest exporters in that category.[38]

32 American oil producers lobby to that end, because while US refineries profit from the local "oil glut", producers lose their "rents".

33 Despite the ban, the Bureau of Industry and Security (BIS), an agency of the US Department of Trade, may issue export licences, but only on condition that an equivalent amount of oil is also imported. It must also be possible to terminate the contract immediately if the US oil supply is interrupted or seriously threatened. See BIS, *Short Supply Controls*, 2f., http://www.bis.doc.gov/index.php/forms-documents/doc_view/425-part-754-short-supply-controls (accessed 22 October 2013). For detail see Julia Howald, Stormy-Annika Mildner and Kirsten Westphal, *Tipping the Power Balance? The Shale Revolution and U.S. Foreign Policy* (Transatlantic Academy Publications, 7 March 2014), http://www.transatlanticacademy.org/publications/tipping-power-balance-shale-revolution-and-us-foreign-policy (accessed 31 July 2014).

34 Under the Natural Gas Act of 1938, anyone wishing to export natural gas must first apply for a licence from the US Department of Energy. If the recipient is a country with a free trade agreement with the United States, the licence will be "granted without modification or delay". In this case LNG exports are automatically regarded as concordant with the national interest. But if the exports are destined for a country without a FTA, the Department must decide whether they are in the national interest, taking into consideration factors including domestic demand, supply situation, environmental aspects and geopolitical questions. On 15 August 2014 the Department changed the procedures. First, applications to export liquefied natural gas (LNG) from the lower-48 states to non-FTA countries have to be reviewed by the Federal Energy Regulatory Commission (FERC) as required by the National Environmental Policy Act (NEPA). FERC is responsible for approving the construction and expansion of import and export facilities, where it also considers aspects of environmental protection and safety. For detail see Michael Ratner, Paul W. Parfomak, Ian F. Fergusson and Linda Luther, *U.S. Natural Gas Exports: New Opportunities, Uncertain Outcomes* (Washington, D.C.: Congressional Research Service, 17 September 2013), http://www.fas.org/sgp/crs/misc/R42074.pdf (accessed 21 October 2013); BIS, *Short Supply Controls* (see note 33), 2f.; Blake Clayton, *The Case for Allowing U.S. Crude Oil Exports*, Policy Innovation Memorandum 34 (July 2013), http://www.cfr.org/oil/case-allowing-us-crude-oil-exports/p31005 (accessed 21 October 2013); http://energy.gov/fe/downloads/order-precedence-non-fta-lng-export-applications (accessed 28 October 2014).

35 NERA Economic Consulting, *Macroeconomic Impacts of LNG Exports from the United States* (Washington, D.C., 2012), http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf (accessed 7 April 2014); ICF International, *U.S. LNG Exports: Impacts on Energy Markets and the Economy* (Fairfax, 2013).

36 IEA, *Medium-Term Gas Market Report* (Paris, 2014), 15.

37 As of September 2014, 35 applications have been submitted to the Department of Energy for LNG export terminals with an overall capacity of 1,053 million cubic metres/day for non-FTA countries. As of 14 October 2014 the Federal Energy Regulatory Commission had approved four terminals, but only one, Sabine Pass in Louisiana, is actually in possession of all necessary permits and under construction (see note 34). The first US exports from Sabine Pass are expected in late 2015/early 2016, with a volume of 61 million cubic metres/day. U.S. Department of Energy, *Summary of LNG Export Applications* (2014), http://energy.gov/fe/downloads/summary-lng-export-applications-lower-48-states (accessed 20 October 2014); Federal Energy Regulatory Commission, *North American Import/Export LNG Terminals*, http://www.ferc.gov/industries/gas/indus-act/lng/lng-approved.pdf (accessed 20 October 2014).

38 Bassam Fattouh, *The US Shale Revolution and the Changes in LPG Trade Dynamics: A Threat to the GCC?* Oxford Energy Comment (Oxford, July 2014), 2.

US Strategic Interests

The United States has been the dominant political and military power in the Persian Gulf since the Iran-Iraq War of 1980–1988. And securing access to the region's oil reserves has been a central priority since the end of the 1970s.[39] In that context, the question arises whether Washington's policy in the Gulf would alter if the shale revolution reduced its oil and gas imports from this region while at the same time energy dependencies in Europe and Asia increased. US retrenchment could have far-reaching consequences for the states in the Persian Gulf.

Changes in the energy markets are only one of several relevant factors in this regard. More recently, Washington's military security and options have been noticeably restricted by budget constraints, political polarisation in Washington and the intervention-weariness of the American public. The coincidence of more restrictive domestic circumstances with the shale revolution is a major contributing factor to the assumption (or fear) within and outside the country that the United States could withdraw from the Gulf region.[40]

However there is to date no objective evidence for such plans, and it is significant that non-energy-related interests continue to dominate US policy towards the Gulf. This applies above all to non-proliferation of weapons of mass destruction, not least with respect to the Iranian nuclear programme, and to the fight against terrorism.[41] The latter point has become yet more important after the Islamic State in Iraq and Syria (ISIS) captured major Iraqi cities in summer 2014. American politicians also cite protecting Israel as a relevant reason for the continuing US presence in the Persian Gulf.

Nonetheless, it is widely assumed in Washington that the shale revolution will reduce US energy import dependency and thus open up new policy options. This perception could in the medium to long term bring about changes in the mix of instruments deployed by the United States, for example in terms of a less direct military engagement that prioritises helping the Gulf states to build their own capabilities. Economic sanctions could also become more important relative to military options.

US Engagement in the Persian Gulf

In his second term President Obama has invested increasing diplomatic capital in the Gulf and the Middle East, both in talks over the Iranian nuclear programme and in efforts to restart the Middle East peace process. Since 2013 Secretary of State John Kerry and Secretary of Defence Chuck Hagel have signalled Washington's intention to strengthen engagement in the region in order to counteract insecurity among the Gulf states, not least Saudi Arabia, caused by US diplomatic overtures to Iran.

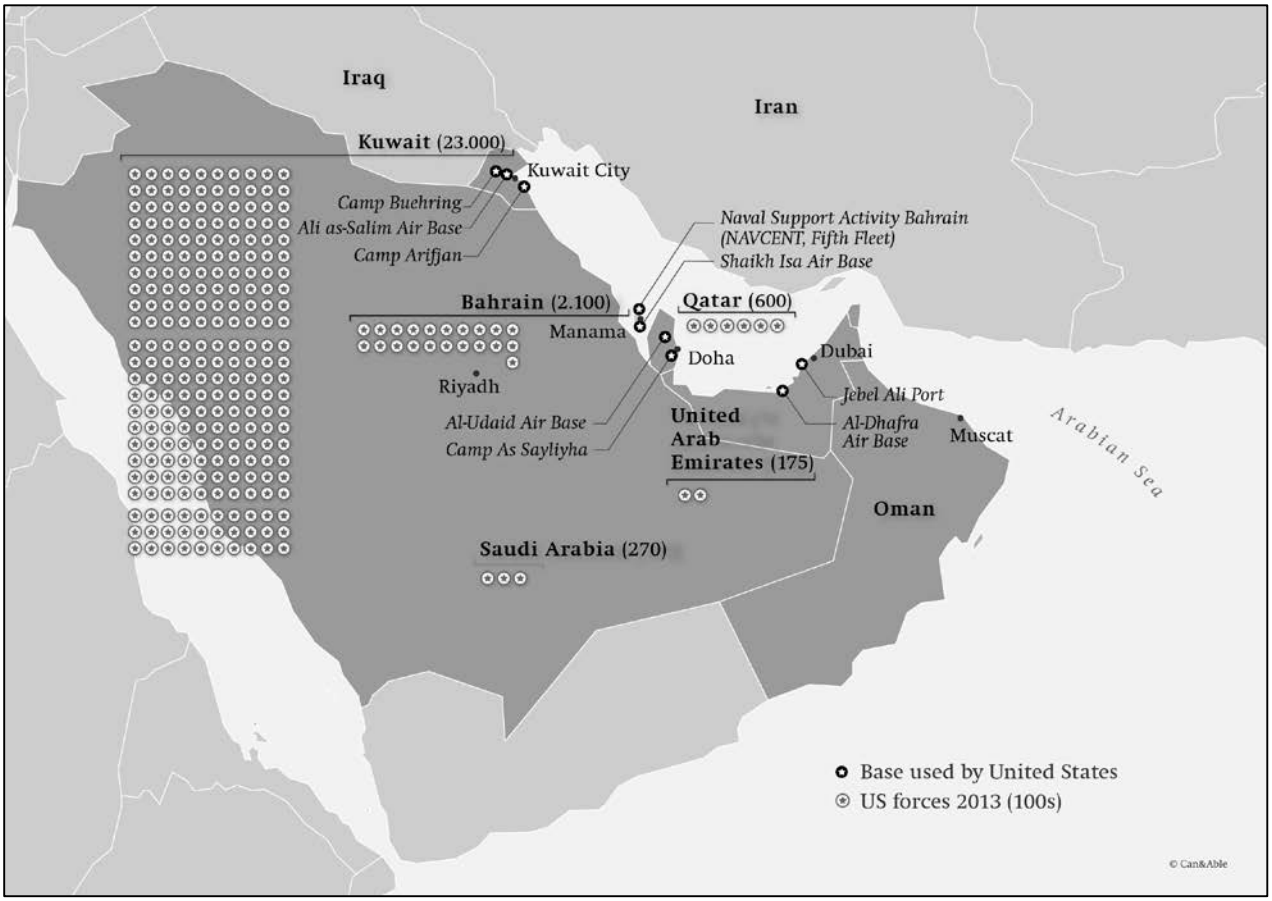
The military presence is a good indicator of Washington's engagement in the Gulf. After the invasion of Iraq in 2003 there were more than 120,000 US troops there and another 25,000 in Kuwait.[42] Most US forces had been withdrawn from Saudi Arabia by 2003. At the end of 2011 the American armed forces also left Iraq. But the withdrawals from Saudi Arabia and Iraq were accompanied by expansion or consolidation of the US military presence in Qatar, Kuwait and Bahrain.

Despite these major fluctuations, the overall "American footprint" in the six member-states of the Gulf Cooperation Council was significantly larger in 2013 than before the Iraq War. Whereas the United States had about 14,000 troops stationed in the GCC states in 2002, by 2013 the figure had risen to more

39 Sarah E. Emerson and Andrew C. Winner, "The Myth of Petroleum Independence and Foreign Policy Isolation", *Washington Quarterly* 37, no. 1 (2014): 21–34 (22).
40 Ibid., 21.
41 The White House, "Remarks by Tom Donilon, National Security Advisor to the President, at the Launch of Columbia University's Center on Global Energy Policy", 24 April 2013, http://www.whitehouse.gov/the-press-office/2013/04/24/remarks-tom-donilon-national-security-advisor-president-launch-columbia- (accessed 7 April 2014).

42 International Institute for Strategic Studies (IISS), *The Military Balance 2004* (London, 2004), 126, 129.

Map 3
US military presence in the Persian Gulf



Source: IISS, *The Military Balance 2014* (London, 2014).

than 26,000.[43] Altogether in 2013 there were approximately 35,000 US troops in the Persian Gulf or its immediate vicinity.[44] The American presence includes modern air, sea and land forces, as well as missile defence components (ship-based interceptor systems, radar installations and Patriot SAM batteries).[45] US naval forces in the Gulf region, which normally comprise forty vessels and at least one carrier battle group, are of particular strategic significance.[46] The US Fifth Fleet is based in Bahrain.

Secretary of Defence Hagel recently reiterated that Washington has no plans to alter its military presence in the Gulf region.[47] The Arab Gulf states in particular are anxious that a relaxation of US-Iranian relations – as appeared to be on the cards after the November 2013 interim agreement between Tehran and the E3+3 – could open the door to a US military withdrawal.[48]

In fact, the United States expanded its Gulf minesweeping capacity after Tehran threatened in early 2012 to blockade the Strait of Hormuz.[49] It also ex-

43 The six members of the GCC are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Figures based on IISS, *The Military Balance 2002* (London, 2002); IISS, *The Military Balance 2014* (London, 2014).
44 U.S. Department of Defense, *IISS Manama Dialogue: Speech Delivered by Secretary of Defense Chuck Hagel* (Manama, Bahrain, 7 December 2013), http://www.defense.gov/transcripts/transcript.aspx?transcriptid=5336 (accessed 7 April 2014).
45 Ibid.
46 Ibid.
47 Ernesto Londoño, "Hagel, in Saudi Arabia, Tells Arab States Not to Fear Nuclear Talks with Iran", *Washington Post*, 14 May 2014.
48 The E3+3 comprises three EU members (France, United Kingdom, Germany) plus the United States, Russia and China.
49 Jean-Loup Samaan, *The Strategic Dimensions of the Shale Gas Revolution: Shared Views from NATO and Gulf Countries*, Conference Report (Rome: NATO Defense College, October 2013), 2; Eric Schmitt, "Eyes on Iran: Navy in Gulf Stays Ready", *New York Times*, 9 December 2013.

panded the Fifth Fleet's headquarters in Bahrain, reportedly investing $580 million. Since 2008 the base's contingent has more than doubled from 3,000 to 7,000.[50]

The Debate in the United States

There is thus as yet little to suggest that the shale revolution is encouraging a US political and/or military withdrawal from the Persian Gulf. In fact, in September 2013 President Barack Obama promised the United Nations General Assembly that the United States would continue to guarantee the security of global trade routes despite its own declining dependency on foreign oil.[51]

"Energy independence" is very positively connotated in the United States and remains a declared goal of the Administration.[52] Nonetheless, experts prefer to speak of "energy security" or "energy self-sufficiency",[53] because the United States and its closest allies will continue to be affected by developments in the international energy markets. In the American media and think-tanks there are growing calls for the transformation of the energy markets to be reflected in a broader distribution of the costs and risks associated with securing the trade routes in the Persian Gulf and in Asia.[54] As well as its European allies, China and India in particular profit from Washington's security presence in the region. Thus far Washington has downplayed the burden-sharing debate, but this could change in the medium term. Concrete security demands would be addressed in the first place to Europe. Greater Indian (or still less Chinese) engagement in the Persian Gulf would appear less geopolitically desirable from the US standpoint.

There is a widely shared expectation in Administration and Congress that the shale revolution will create new leeway and new foreign policy options. Fundamentally, the thinking runs, domestic oil and gas production strengthen the US economy and thus the material basis of American foreign and security policy.[55]

It is also suggested that the energy boom will make security objectives easier to achieve.[56] As an example of new possibilities opened up by the shale revolution, commentators and government officials frequently cite the implementation of international sanctions against Iran, arguing that growing oil production in the United States neutralises worries about rising world market prices and thus enables action to be taken against Iranian oil exports.[57] Members of Congress argue that increasing energy self-sufficiency in North America serves US national security by reducing the danger of price shocks caused by conflicts in the Middle East. Thus, they say, the United States also becomes more independent of "unstable dictators like Bashar al-Assad".[58] President Obama has also used this argument himself.[59]

50 Hendrick Simoes, "Bahrain Expansion Latest Signal of Continued US Presence", *Stars and Stripes*, 13 December 2013, http://www.stripes.com/news/bahrain-expansion-latest-signal-of-continued-us-presence-1.257371 (accessed 7 April 2014).
51 The White House, "Remarks by the President Obama in Address to the United Nations General Assembly", 24 September 2013, http://www.whitehouse.gov/the-press-office/2013/09/24/remarks-president-obama-address-united-nations-general-assembly (accessed 1.8.2014).
52 The White House, "President Barack Obama's State of the Union Address", 28 January 2014, http://www.whitehouse.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address (accessed 7 April 2014).
53 On the basis of interviews in the US Departments of State, Energy and Defence and in the US Senate, conducted in March 2014 in Washington, D.C.
54 Ian Bremmer and Kenneth A. Hersh, "When America Stops Importing Energy", *New York Times*, 22 May 2013; Tim Johnson, "Impact of US Oil Boom: Global Reordering", *McClatchy-Tribune/MSN News*, 28 November 2013; Elizabeth Rosenberg, *Energy Rush: Shale Production and U.S. National Security* (Washington, D.C.: Center for New American Security, February 2014).
55 David Hastings Dunn and Mark J. L. McClelland, "Shale Gas and the Revival of American Power: Debunking Decline?" *International Affairs* 89, no. 6 (2013): 1411–28 (1412); Bill Flores and Henry Cuellar, "America Needs Its Shale Energy and Hydraulic Fracturing Provides It", *The Hill*, 19 November 2013.
56 Tom Donilon, "Energy and American Power: Farewell to Declinism", *Foreign Affairs*, 15 June 2013.
57 Roger Howard, "How Shale Energy Reshapes American Security", *National Interest*, 3 May 2013; Information Handling Services, *Daniel Yergin: Unconventional Oil and Gas Revolution in US "Goes beyond Energy Itself"*, 5 February 2013, http://press.ihs.com/press-release/energy-power/daniel-yergin-unconventional-oil-and-gas-revolution-us-goes-beyond-energy (accessed 16 April 2014).
58 Republican Representatives Lee Terry, member of the House Energy and Commerce Committee. Lee Terry, "Mideast Instability Necessitates Keystone Pipeline", *The Hill*, 3 September 2013, http://thehill.com/blogs/congress-blog/energy-a-environment/319995-mideast-instability-necessitates-keystone-pipeline- (accessed 4 August 2014).
59 For example: The White House, "Remarks by the President on American Energy", Argonne National Laboratory, Lemont, Illinois, 15 March 2013, http://www.whitehouse.gov/the-press-office/2013/03/15/remarks-president-american-energy-lemont-illinois (accessed 4 August 2014).

Other geopolitical effects of the shale revolution are also discussed in the United States. Whereas American leaders see opportunities for US power and action, they regard the main producers of conventional oil and gas – the OPEC states, Russia and Iran – as losers of the shale revolution and expected their shrinking market shares to hamper their ability to exploit their energy resources for foreign policy purposes.[60] Ultimately, at least in the longer term, Washington also believes it will be able to make its European partners more independent of Russia by supplying LNG, which is especially significant in the context of the Ukraine crisis.[61]

Not all of these arguments are shared in expert circles. For example American energy experts doubt that the shale revolution actually facilitates the implementation of international energy sanctions,[62] especially where the United States is not yet exporting oil and gas on any large scale. They also point out that the American gas sector functions overwhelmingly as a free market, where Washington cannot simply "decree" exports, for example to Europe. But regardless of such objective scepticism, "economic statecraft" is gaining ground in the United States as enthusiasm for military operations wanes.[63]

Whether this will alter the US engagement in the Persian Gulf in the longer term depends in the first place on how the central framework of American foreign and security policy develops. If isolationist tendencies in Washington are boosted by budget crisis and domestic conflicts, the shale revolution could be used as a justification for stepping back from international obligations (regardless of any real need to do so). But currently there is no sign of that.

In the medium and long term it is more likely that the shale revolution will strengthen tendencies that have arisen independently of developments in the energy markets. The United States is increasingly directing its security interventions towards helping regional partners to expand their own capabilities. But in the case of the Gulf region there are also very tight bounds to this approach, as long as the GCC states fail to work more closely together on shared defence priorities, uniform standards and interoperability.[64]

60 Dunn and McClelland, "Shale Gas and the Revival of American Power: Debunking Decline?" (see note 55), 1412, 1418, 1421.

61 U.S. Department of State, "Joint Press Statement EU–U.S. Energy Council", 2 April 2014.

62 For example: David Goldwyn, "Making an Energy Boom Work for the U.S.", *New York Times*, 12 November 2012; Interview with an expert at the Center for a New American Security (CNAS) in Washington, D.C., March 2014.

63 The term "economic statecraft" designates the deliberate use of economic resources and instruments (such as sanctions) for foreign policy purposes.

64 For example Awad Mustafa, "GCC Still Struggling to Develop Integrated Air Defense", defensenews.com, 1 May 2014, http://www.defensenews.com/article/20140501/DEFREG04/305010020/GCC-Still-Struggling-Develop-Integrated-Air-Defense (accessed 4 August 2014).

The Economic Impact of the Shale Revolution on the Gulf States

The analysis of developments in the energy markets presented above has shown that the Gulf producers remain the backbone of the global oil supply. At the same time, growing production of tight oil (as well as other "new oil" like oil shale and gas condensates) has kept the oil price stable despite rising demand and disruptions in the Middle East and North Africa. This comparably stable and long-lasting high-price phase serves the interests of oil producers worldwide. Moreover, the discovery of new unconventional reserves means that "peak oil" and warnings about the resource running out no longer dominate the debate. This reduces the audience for those pushing for alternatives to oil.

But the great uncertainty in the markets also affects the Arab Gulf states. As long as demand in Asia remains strong, disruptions in Libya and Syria reduce supply and Iraq's difficulties developing its oil industry persist, the rents of the Gulf states are likely to remain stable at a high level. These revenues are dependent above all on supply and demand, and on price trends in the oil and gas markets. Qatar also remains in a comfortable position in the global LNG market, having concluded long-term contracts for sizeable deliveries to Asia and possessing the necessary export infrastructure.

One trend that is initially independent of the shale revolution but a great deal more dangerous for the Gulf states is their own surging demand for energy and electricity. This demand boom is domestically explosive because it places the rent economies under pressure on the spending side. It can also lead to a reduction in oil and gas exports from the region. That in turn would have far-reaching consequences for the world economy. This problem threatens to create new conflicts in the region. It is clear that the socio-economic development model of the Gulf states cannot survive unless they succeed in satisfying domestic demand for affordable energy as well as upholding exports. Thus the shale revolution does have an indirect influence on the handling of this local energy crisis.

The Position of the Gulf States in the International Energy Markets

The Gulf producers remain of immense strategic importance for the global energy supply because they control almost one third of the world's oil reserves. Furthermore, several crucial trade routes pass through the Middle East. The foremost of these is the Strait of Hormuz, through which 20 percent of all internationally traded oil passes, as well as 20 percent of traded LNG. This makes the Strait the most important choke point of the global energy supply.[65] Securing this trade route is of particular strategic importance for Asia, because 85 percent of the oil shipped through Hormuz is destined for the Asian markets (principally Japan, India, South Korea and China).[66]

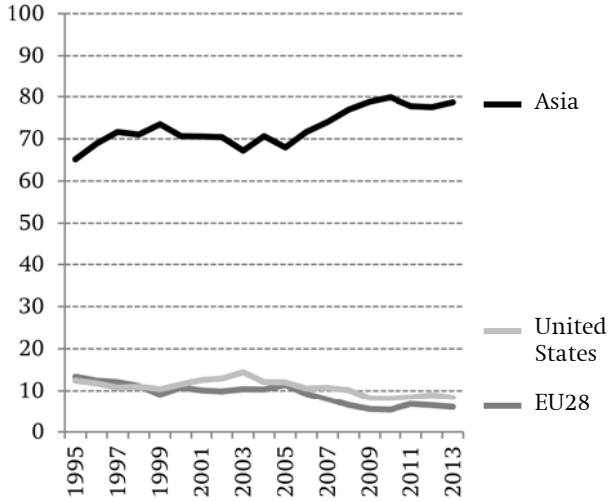
However, Saudi Arabia also has the option of using its East-West Pipeline to transport crude to the Red Sea port of Yanbu for export. This route, which has a capacity of 4.8 million barrels/day and considerably shortens the distance to the Suez Canal, is especially relevant for European purchasers.[67] The UAE has a pipeline to the emirate of Fujairah on the Gulf of Oman, which also offers an alternative to the Strait of Hormuz route.

But regardless of the shale revolution, any major loss of supplies from the Gulf would be impossible to substitute, because almost one quarter of the world's oil production originates there. Asia is the main destination for Gulf exports.[68]

In 2012, 97 percent of oil exports from UAE went to Asia.[69] Saudi Arabia exported 15 percent of its oil to Europe and another 15 percent to United States, but 54 percent to Asia.[70] It is also strategically relevant that the Gulf region produces its oil from enormous

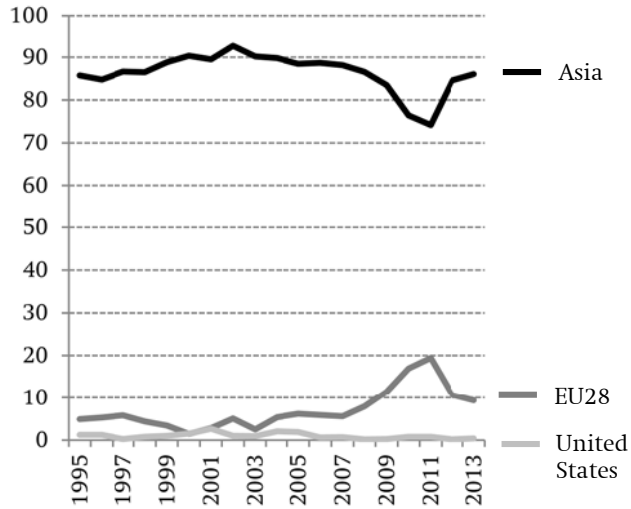
65 EIA, "World Oil Transit Choke Points", http://www.eia.gov/countries/regions-topics.cfm?fips=wotc&trk=p3 (accessed 20 June 2014).
66 Ibid.
67 EIA, "Saudi Arabia", http://www.eia.gov/countries/cab.cfm?fips=SA (accessed 20 June 2014).
68 BP, *Statistical Review of World Energy* (see note 4), 6, 8, 18.
69 EIA, "United Arab Emirates", http://www.eia.gov/countries/cab.cfm?fips=TC (accessed 7 April 2014).
70 EIA, "Saudi Arabia" (see note 67).

Figure 5
Regional distribution of GCC exports of crude oil and petroleum product (%)



Source: UNCTAD (see Fig. 2, p. 8).

Figure 6
Regional distribution of GCC gas exports (%)



Source: UNCTAD (see Fig. 2, p. 8).

old fields that have the world's lowest costs (estimated to be $3 to $5 per barrel),[71] and no less that Saudi Arabia, Kuwait and the UAE possess the largest spare production capacity (estimated at 3.1 million barrels/day).[72]

Asia also represents the Gulf's main market for natural gas. Qatar is the world's second largest gas exporter (after Russia) and the biggest LNG exporter, where it accounts for more than one third of world trade.[73] In 2012, 63 percent of Qatari LNG exports went to Asia.[74] As the Gulf's biggest gas producer, Qatar accounts for 4.7 percent of global production.[75] With 25.1 trillion cubic metres, it also possesses the world's third-largest conventional gas reserves after Russia and Iran.[76]

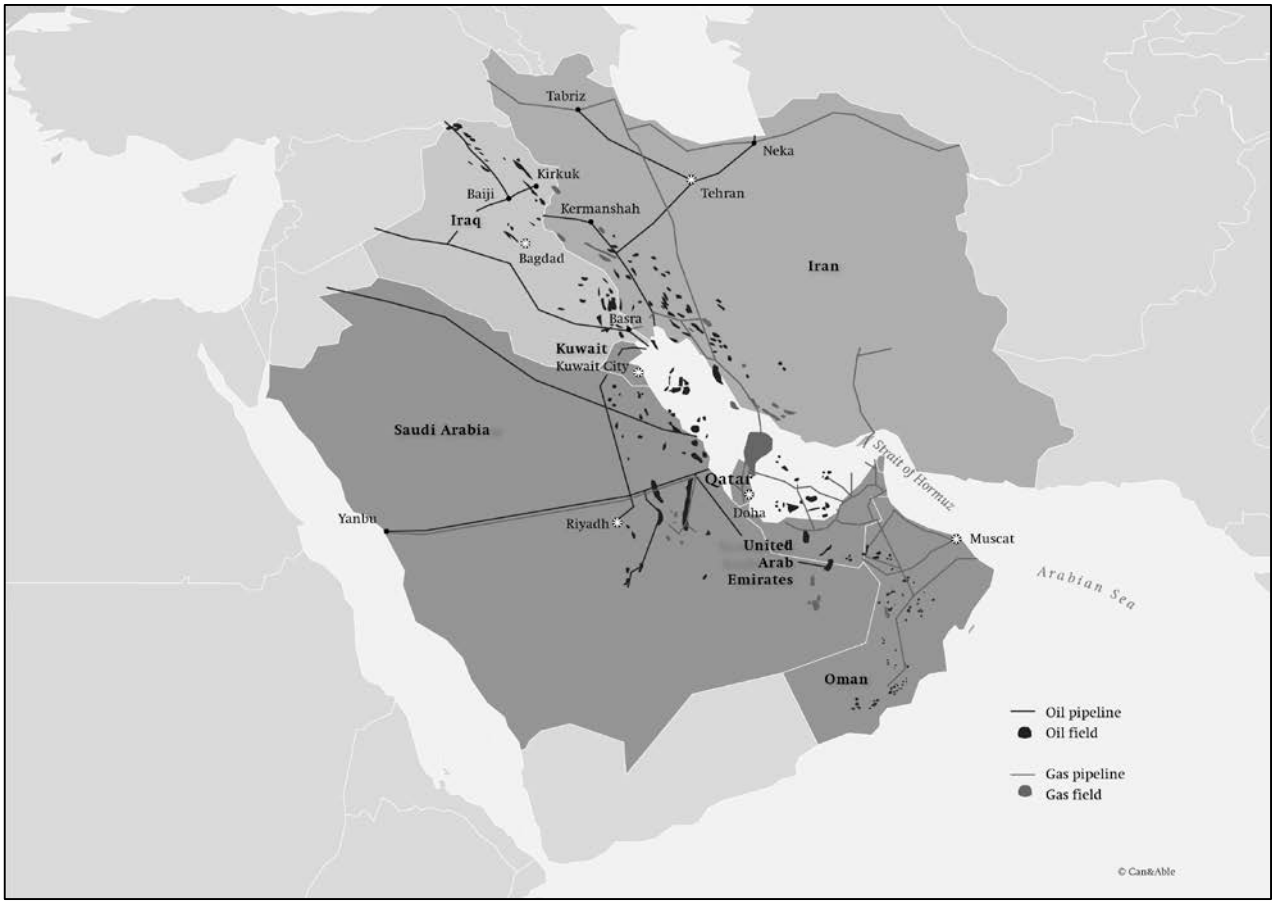
The Gulf States and the Changing International Energy Markets

The further one looks into the future, the harder it becomes to assess how the shale revolution might affect the Gulf states. As well as international price developments, a number of factors come into play: a possible expansion of oil and gas exports (including LNG), a possible increase in (un)conventional oil and gas production, and demand trends in different regions and sectors.

Gas Markets. It would be obvious to conclude that Qatar was the big loser of the shale revolution, because it loses at least the major North American market in the longer term. But that would be shortsighted. Qatar has 90 percent of its short- and medium-term exports (until 2020) secured via sales and purchase agreements.[77] Even after 2020, the IEA expects Qatar to remain the most important exporter of LNG. It currently possesses 150 billion cubic metres of annual LNG export capacity, with another 16 billion cubic metres in planning. Qatar enjoys a favourable starting position because it has established itself as a flexible supplier not only in the long-term trade but also mid- to short-term redirecting its market flows. It exports to all the regional gas markets. Qatar also enjoys a special position thanks to its low production costs, its ability to increase its LNG exports within the

71 Bassam Fattouh and Laura El-Katiri, *Energy and Arab Economic Development*, Arab Human Development Report, Research Paper Series (United Nations Development Programme, Regional Bureau for Arab States, 2012), 9.
72 Estimates of spare production capacity in the Gulf vary widely. The EIA says 2 million barrels/day, the IEA 3.1 million; Energy Comment, *Global Energy Briefing* 6, no. 100 (June and July 2014), 7. The IMF puts the figure as high as 4.5 million barrels/day; International Monetary Fund (IMF), *Annual Meeting of Ministers of Finance and Central Bank Governors: Economic Prospects and Policy Challenges for the GCC Countries* (Riyadh, Saudi Arabia, 5 October 2013), 7.
73 Ibid., 29.
74 EIA, "Qatar", http://www.eia.gov/countries/cab.cfm?fips=QA (accessed 14 April 2014).
75 BP, *Statistical Review of World Energy* (see note 4), 22.
76 Ibid., 20.
77 EIA, "Qatar" (see note 74).

Map 4
Gas and oil in the Middle East



Source: Energy Information Administration

capacities of existing liquefactions trains and its own large shipping fleet.

The Asia-Pacific market is the most lucrative destination for LNG exports. In the medium term Qatar must secure its market share there, especially given that a series of existing long-term contracts expire after 2020.[78] Numerous LNG export terminals are under construction across the world and scheduled to come on stream before 2020. They will together provide an annual capacity of 150 billion cubic metres (expectation as of mid-2014),[79] with 70 percent located in Asia.[80] So competition in the Asia-Pacific region will increase significantly, and is likely to put the high price of LNG under pressure.[81] The Qataris gain room for manoeuvre from the fact that they produce natural gas under very favourable conditions, and make large profits for the state budget not only with gas but also on a similar scale with the sale of crude and liquids (LNG and condensates). Qatar is also market leader in gas-to-liquids technology for converting dry gas into diesel, naphtha, etc.[82] It is increasingly investing in other sectors of the LNG business too, and might end up earning revenue from US exports of LNG as co-owner of terminals in the United States.

78 Hakim Darbouche, "The Pricing of Internationally Traded Gas in MENA and Sub-Saharan Africa", in *The Pricing of Internationally Traded Gas*, ed. Jonathan P. Stern (Oxford: Oxford Institute for Energy Studies [OIES], 2012), 224–45 (237); Andy Flower, "LNG in Qatar", in *Natural Gas Markets in the Middle East and North Africa*, ed. Bassam Fattouh and Jonathan P. Stern (Oxford: OIES, 2011), 343–85.

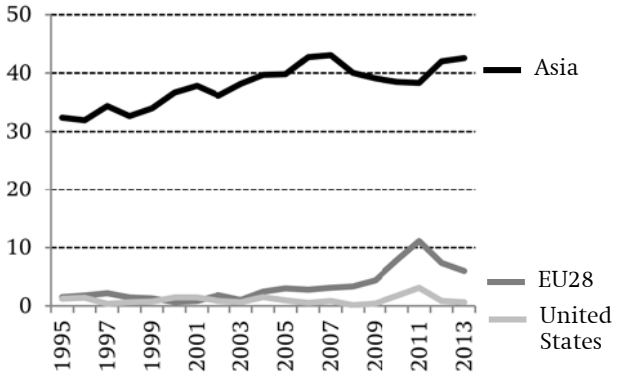
79 However the viability of many of these projects is questionable, so delays are likely and some may remain unrealised. IEA, *World Energy Outlook 2013* (see note 6), 128.

80 IEA, *Medium-Term Gas Market Report 2014*, (see note 30), 130.

81 Also because the first generation of Qatari LNG contracts, which are tied to the Japanese Crude Cocktail, will expire in 2021 and 2024.

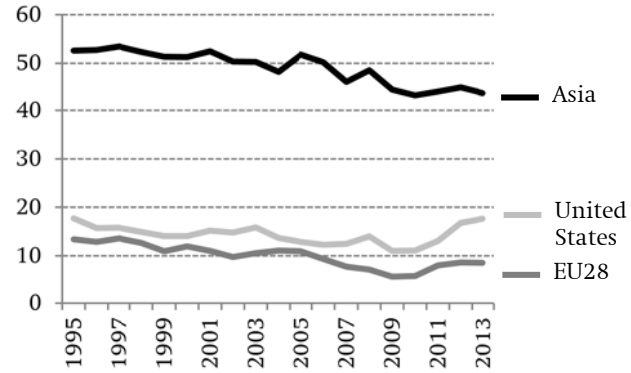
82 EIA, "Qatar" (see note 74).

Figure 7
GCC share of natural gas imports by region (%)



Source: UNCTAD (see Fig. 2, p. 8).

Figure 8
GCC share of crude oil and petroleum product imports by region (%)



Source: UNCTAD (see Fig. 2, p. 8).

These developments are creating conflict within the Gas Exporting Countries Forum (GECF). Other traditional exporters like Russia, Algeria and above all Iran (with which Qatar shares the North/South Pars Gas Field) insist on oil indexing in long-term contracts, to keep gas prices high. But Qatar has already demonstrated great flexibility in pricing mechanisms for its LNG exports to the United States and North-West Europe, which are tied to Henry Hub or European hubs.[83] In this way Qatar secures its market share at a moment in time when all gas exporters face competition in their traditional markets.

Oil Markets. The Gulf countries have planned their state budgets for an international oil price between $55 and $95 per barrel (fiscal break-even price).[84] Price movements are the decisive determinant here. With respect to future developments in the oil markets, it is conspicuous how relaxed the Arab OPEC states are about the risk of oversupply, even if they do not completely ignore it.[85] OPEC's *World Oil Outlook 2013* dismisses the danger as temporary, on the grounds that the unconventional oil boom will flatten off again before 2020, and will not expand beyond North America anyway.[86] Events in Libya, Syria and Iraq appear to confirm that assessment. The current destabilisation of Iraq by the terrorist group ISIS could further darken the country's oil exporting prospects. Altogether, it is increasingly obvious that oil production in the Middle East is plagued by uncertainties, with an ever more volatile supply situation. With the IEA forecasting that additional production in Iraq will cover no less than 45 percent of expected growth in demand, there will be far-reaching consequences in the oil markets if this fails to materialise.[87]

Geopolitics aside, the situation within the industry also gives grounds for relative calm. Significantly, American producers and the Gulf states share an interest in a stable and relatively high oil price. In the United States the most important geological formations have high break-even prices of $78 to $96.[88] Even

83 Contracts with the United Kingdom are tied to the National Balancing Point (NBP), those with Belgium to Zeebrügge. For detail see Darbouche, "The Pricing of Internationally Traded Gas" (see note 78), 237; Flower, "LNG in Qatar" (see note 78).

84 The fiscal break-even price is the threshold above which rentier states can fund their budgets. The cited fiscal break-even prices were named by experts in the region for the respective current budgets. Qatar's break-even price is said to have been corrected this year from $54 to $65 per barrel. The figures vary depending on the source. See also "The Oil Price Balancing Act in the Middle East", *Middle East Economic Digest*, 9 May 2013, http://www.meed.com/sectors/oil-and-gas/the-oil-price-balancing-act-in-the-middle-east/3177424.article (accessed 15 April 2014).

85 "The Unconventional Oil Age: Shale Is Going Global: Its Arrival Will Shape the Supply Picture for Years to Come", *Petroleum Economist*, February 2014, 36f.

86 Organisation of the Petroleum Exporting Countries (OPEC), *World Oil Outlook 2013* (Vienna, 2013). However IEA and OPEC diverge significantly on this point. The IEA sees the peak not reached until the mid-2020s, and its forecasts see production curves flattening off later than OPEC's. IEA, *World Energy Outlook 2013* (see note 6), 481.

87 IEA, *World Energy Outlook 2012*, (Paris: IEA/OECD, 2012), 26.

88 Figures for the Permian Basin, Eagle Ford Shale and Bakken Shale formations, http://www.bloomberg.com/news/

if these figures are only approximations, they illustrate well the interaction between supply and demand in the search for equilibrium: the higher the price the more unconventional oil (tight oil, oil shale, oil sands, Arctic oil, deep-sea oil, etc.) can be produced.[89] The advantage of tight oil is that it is produced in comparatively small projects with short investment cycles. This allows the corresponding producers to function as a type of swing supplier in the North American market, able to respond after a certain time-lag to price rises. At the same time, in the medium to long term these producers will be the first to be forced out of the market.

Overall the analysis shows that production trends in Iraq and Iran have an incomparably greater influence than the shale revolution. If the nuclear dispute is resolved and Western capital and modern technology return, Iran might be able to gradually expand its exports. That would undermine the quota discipline of the oil-exporting countries. Iraq, on the other hand, is not bound by quotas. Its production leapt by more than 11 percent between 2011 and 2012, before growth flattened in 2013 at 0.8 percent.[90] But if the political situation in those countries improved after all (at least in the longer run), and especially if sanctions on Iran were also lifted, the Gulf states would indeed see a risk of oversupply in the oil markets. It can be assumed that unconventional production in North America will in fact continue to increase until after 2020. This would create great challenges above all for Saudi Arabia, which would have to cut back its own production in order to stabilise prices. As a swing supplier it could find itself in the position of having to deal with a drop in production of almost one million barrels/day.[91] Not until 2030 would Saudi Arabia return anywhere close to its 2012 production figures,[92] and that would mean even more of its (expensive) capacity lying idle.[93] A situation of significant overproduction could also erode the OPEC discipline and encourage certain members to exceed their production quotas and/or to lower price in order to defend their own market shares and crowd out producers. The price slump of October 2014 may hint at such strategies as Saudi Arabia and Kuwait do not seem to be willing to curb production for the sake of the oil price level. They might also aim to pressure other OPEC producers to reduce their respective quotas and to share the burden. Saudi Arabia can sustain a period of lower oil prices as it has no fiscal deficit and special state funds. Beyond the geopolitical risks, awareness is also growing that the legal and economic frameworks fail to offer adequate incentives to attract the foreign investment and technology needed to overhaul and gradually replace the old supergiant oilfields.[94] Here again, the impact of the shale revolution is felt. In view of the broader geological availability of oil and gas, hydrocarbon-rich countries must increasingly compete with one another for investments by the companies that possess patents on important technologies (techniques for dealing with high sulphur content, drilling technologies, liquefaction technology, etc.).

Despite the shale revolution, the energy markets remain subject to the "swine cycle".[95] Rapidly rising demand in combination with a shrinking supply could quickly produce very high oil prices. If the demand trend remains unbroken, the Middle East will have to expand production from 20 million to 22 million barrels/day by 2035.[96] However, global oil consumption is increasingly concentrated in two sectors: transport and petrochemicals. Natural gas could be used increasingly in both, especially in the United States. Such fuel switch effects are hard to foresee, and therefore amplify uncertainty and discourage investment.

2013-10-24/oil-s-5-trillion-permian-boom-threatened-by-70-crude.html (accessed 5 April 2014).

89 The effects on the global markets are indirect, via reduced US demand. According to an IEA forecast North America will move from being a net importer of oil (5.1 million barrels/day in 2012) to a net exporter (1.7 million barrels/day in 2035).

90 BP, *Statistical Review of World Energy* (see note 4), 8.

91 Since the fall of the Shah in 1979, Saudi Arabia has fulfilled this swing supply function in tacit agreement with the United States.

92 IEA, *World Energy Outlook 2013* (see note 6), 484.

93 In the medium term it is expected that the spare production capacity could increase temporarily from 4.5 million barrels to 7 million; IMF, *Annual Meeting of Ministers of Finance and Central Bank Governors* (see note 72), 7.

94 IEA, *Mid-Term Oil Market Report 2014*, 12, 14f, 18f.

95 The energy sector is susceptible to this mechanism. When prices rise, investment increases, capacity expands and production rises. But long lead times mean there is a delay before the increased supply reaches the market. In order to sell the oil the price now has to fall, in turn causing production and investment to be scaled back. The central cause of this typical supply pattern is the relatively unresponsive, unelastic demand for energy, which prevents the price mechanism from functioning properly. Investment decisions are also complicated by opacity of commodity markets and sometimes contradictory signals from politics.

96 BP, *Energy Outlook 2035: Fact Sheet Middle East* (2014), http://www.bp.com/content/dam/bp/pdf/Energy-economics/Energy-Outlook/Regional_insights_Middle_East_2035.pdf (accessed 1 September 2014).

Table
Importance of oil and gas for GDP, exports and state budgets in the Gulf states (2013)

	Oil and gas sector as proportion of GDP (%)[a]	*Oil and gas exports as proportion of total exports (%)*[b]	*Proportion of state revenues from oil and gas sector (%)*[a]
Bahrain	21	39.8	83
Qatar	40.7	91.8	> 75
Kuwait	n.s.	90.7	94
Oman	11.6	76.4	n.s.
Saudi Arabia	c. 35	85.0	c. 90
UAE	n.s.	58.2	n.s.

Source: (a) Economist Intelligence Unit, *Country Reports*, http://www.eiu.com; (b) UNCTAD (see Fig. 2, p. 8).

Major shifts are already becoming felt in the refining sector too, with indications of a global capacity surplus. Refineries compete for cheap high-grade crude and for markets for their products. Competition for markets in Europe and Asia is becoming tougher, where the Gulf states have to hold their own against the United States and Russia. This development is especially important for Europe. The competitiveness of European refineries is declining, and in future the continent will have to import more of its oil products. That has implications for security of supply, because the more oil products Europe has to source directly from the Gulf or Asia, the greater its dependency on the Gulf region and the trade routes there.

Another development is also noteworthy: The increasing Asian orientation of Arab Gulf states is reflected in joint ventures along the entire value chain. Where Western, South Korean and Japanese corporations were traditionally active in the Gulf region, it is now increasingly (state-owned) Chinese, Indian and Taiwanese entities that are investing there. And state-owned operators from the Gulf states, in turn, are expanding their distribution and refining activities in the major Asian markets. Europe will in future be dependent on these conglomerates, while the Western oil giants lose market share along the whole value chain. United States, too, must wonder whether the growing business relationships between the Gulf states and Asian corporations will weaken US influence on Gulf energy policy.[97]

97 At least in the case of Qatar, there are grounds to believe that the United States played a role in initiating and developing the country's export strategy.

Socio-economic Developments in the Gulf

In view of the upheavals in the Arab world, any lasting fall in the oil price and/or loss of market share (as might be associated with the boom in unconventional oil and gas) would represent a threaten to the Gulf regimes, which rely on oil and gas revenues to fund their domestic and foreign policies.

In the GCC states as a whole, the oil and gas sector supplies 44.2 percent of GDP and 80.7 percent of the state budgets.[98] In order to run balanced budgets the individual countries need an oil price between $55 and $95 per barrel.[99] The oil price thus remains the determining variable. Even Qatar, which is seen above all as a gas exporter, earns at least as much and sometimes more from sales of crude oil,[100] which is neglected in most analyses.

Although Saudi Arabia, the UAE and Qatar maintain considerable state reserves, they also face rising costs to fund increasingly proactive foreign policies

98 Averages for 2010: Fattouh and El-Katiri, *Energy and Arab Economic Development* (see note 71), 13.

99 Figures for fiscal break-even prices differ even within individual sources. For Saudi Arabia they vary between $67 and $86, for Qatar between $46 and $66, for the UAE between $67.5 and $87. "The Oil Price Balancing Act in the Middle East" (see note 84); "Drop in Crude Price Could Divide Opec", *Middle East Economic Digest*, 11 July 2013, http://www.meed.com/sectors/oil-and-gas/drop-in-crude-price-could-divide-opec/3183186.article (accessed 15 April 2014).

100 In 2012 sales of natural gas and condensates and of crude oil and oil products each contributed 46 percent of Qatar's export revenues. United Nations Conference on Trade and Development (UNCTAD), *UNCTADStat* http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?sCS_referer=&sCS_ChosenLang=en (accessed 16 April 2014).

and generous subsidies to placate their populations. In their own right, energy subsidies make up a relevant share of GDP in all the Gulf states, ranging from more than 3 percent in Qatar up to 10 percent in Saudi Arabia.[101] The fiscal break-even price continues to rise. It is already foreseeable that this trend will be untenable in the longer term.

Collapsing prices and/or volatility could have negative short- and medium-term ramifications, because GDP growth in the Gulf states tracks the oil price. This increases macro-economic uncertainty and shortens planning horizons. In theory a plentiful global hydrocarbon base and fuel switching in the transport sector could place the producers' scarcity rents under pressure in the long term. Then rents would become contingent on relatively low production costs and geographical proximity to markets. That in turn would place considerable pressure on state budgets.

The budgets of the Gulf states are further burdened by the generous subsidies that underpin their low energy prices. They also rely on affordable energy for their economic diversification strategies, which aim to extend value chains and keep them in the region. As well as developing petrochemicals and energy-intensive industries like aluminium smelting and cement, the Gulf states are also encouraging airlines and logistics. However, the smaller emirates in particular end up competing with one another in the same sectors.

A massive conversion is underway in the US petrochemicals industry, which is increasingly using ethane (a main component of natural gas) as its feedstock in place of crude-based naphtha. To that extent the United States will continue to profit from relatively cheap energy and from proximity to raw materials and markets. But the repercussions of this development will primarily affect the competitiveness of European businesses, and less the Gulf states whose gas prices remain far below the American level (between one tenth and nearly half). Thus Gulf industrial competitiveness still benefits from considerable price advantages. A second reason why US developments do not for the moment threaten the Gulf states is that their main market for petrochemical products remains East Asia. But now China is also opening up its unconventional gas reserves, and Asia is sourcing more gas condensates from the United States. If these developments lead to a restructuring and a further expansion of the Asian petrochemical industry,[102] the Gulf states will lose important market shares in those products.

Growing Domestic Demand, Home-grown Crises and Political Quandaries

Low prices in the Gulf states lead to high energy consumption, which is increasing faster than GDP. Demand for energy is rising at between 7 and 11 percent annually, more than doubling within the space of a decade.[103] Unless they succeed in rapidly increasing their production of oil and especially gas, and/or in substantially improving their energy efficiency, the outcome could be an increasingly dwindling supply of oil available for export.

What we see here are the indirect effects of the shale revolution. At a juncture where expanding investment would be required, export revenues have become less sure and acquisition of foreign partners and technologies more difficult. Given that the cross-subsidisation of cheap domestic prices by high-volume exports cannot continue unabated, energy policy in the Gulf is at a turning-point. The extent to which the GCC countries are willing to invest in expanding production in the face of the uncertainty on the international markets remains to be seen. It is questionable whether they possess the capacity to implement energy reforms. Thus the high energy intensity of their economies becomes a pressing problem.

This is particularly apparent in the case of Saudi Arabia,[104] whose rapidly growing population has reached almost 30 million. With fuel, electricity and water all heavily subsidised there is no incentive to use energy more efficiently. The transport sector accounts for 40 percent of Saudi oil consumption,[105] while more than 50 percent of electricity generation in the Gulf states uses oil.[106] Saudi Arabia's electricity demand is growing at 7 to 8 percent annually, which

101 IEA, *Fossil Fuel Consumption Subsidy Rates as a Proportion of the Full Cost of Supply* (Paris: OECD and IEA, 2011), http://www.iea.org/subsidy/index.html (accessed 7 April 2014).

102 For detail see Fattouh, *The US Shale Revolution* (see note 38).

103 Rabia Ferroukhi, Haris Doukas, Stella Androulaki, Emanuela Menichetti, Andrea Masini and Arslan Khalid, *EU-GCC Renewable Energy Policy Cooperation: Exploring Opportunities*, GRC Gulf Papers (December 2013), http://eu-gcc.kcorp.net/common/publicationfile/49.pdf (accessed 23 April 2014).

104 For detail see Said Nachet, "Saudi Arabia's Energy Challenges", *Saudi Economic Journal* (January 2014).

105 Ibid., 2f.

106 Bassam Fattouh and Richard Mallinson, *Refining Dynamics in the GCC and Implications for Trade Flows*, Oxford Energy Comment (Oxford: OIES, December 2013), 7.

means doubling every ten years.[107] The Kingdom already consumes almost one third of its own oil production (about 3 out of 10 million barrels/day) and its entire gas production. Some observers warn that unless the rapid growth in domestic consumption is curbed, Saudi Arabia will become an oil importer by 2030.

The increasing energy demand in Saudi Arabia is intensifying the water-energy-food-nexus: Up to 84 percent of water consumption is taken by agriculture, but a growing population and rising prosperity are additional drivers. With Saudi Arabia increasingly resorting to desalination, the subsidies on fuel, electricity and water create a vicious circle. The Kingdom's development path is wasteful of water and energy and unsustainable in terms of security of supply.[108] In the medium term the country's stability is endangered; in the short term electricity blackouts and water shortages risk popular dissatisfaction. Growing internal energy demand is one of the central factors mediating the consequences of the shale revolution for the Gulf region: domestic demand and the boom in unconventional energy potentially reduce Saudi oil revenues while at the same time the uncertain international market environment deters (foreign) investment. Consequently, the fact that no profit can be made from domestic sales of oil, gas and electricity plays a much greater role than it used to. Subsidies remain a large and potentially increasingly burden on the state budget, while export profits threaten to fall.

The problem here and in other Gulf states is a home-grown consequence of political decisions. These countries are rich in sunshine and wind and could easily put more energy into renewables, not only as a component of industrial and technology policy but also as a pillar of the energy system in its own right. The Gulf states already have renewable energy programmes addressing some of their future energy needs,[109] but are simultaneously developing nuclear power. In UAE a nuclear plant with four 1.4 GW blocks is scheduled to come on stream in 2020. Saudi Arabia could follow in the same footsteps.[110] In fact, improving energy efficiency would be the key to necessary change in the Gulf. But that is blocked by the high level of energy subsidies. Fundamentally, although the Gulf states have recognised the problem, they lack the political and bureaucratic capacities to reform the energy system and its pricing mechanisms. Ultimately this touches on the foundations of power and rent extraction of the Gulf. At the same time, their cooperation in the electricity sector remains limited and difficult, despite a regional electricity grid being inaugurated in 2009.

Gas Crisis amidst Rich Reserves

To date gas has been the Gulf states' strategy of choice for satisfying domestic demand, perpetuating fossil production and utilisation paths. However, all apart from Qatar are facing a "gas crisis". While the IEA reports production in the Gulf rising at about 2.4 percent annually, demand is increasing much faster at 5.6 percent.[111]

Overall, there is insufficient local gas available for electricity generation and a lack of transport infrastructure. Gas production faces a series of difficulties. Firstly, too much gas is flared off at wellheads or lost to consumption through being pressed back into oil fields to maintain production flow. Secondly, production of associated gas (extracted together with oil) depends on OPEC quotas. In order to circumvent these, Saudi Arabia intends to open up new non-associated gas fields. But their development is technically com-

107 More conservative estimates put the increase at 5 to 6 percent. Kevin Baxter, "Riyadh Races to Raise Gas Production", *Middle East Economic Digest*, 22 January 2013, http://www.meed.com/sectors/oil-and-gas/gas/riyadh-races-to-raise-gas-production/3163374.article (accessed 17 February 2014).

108 Ibid.

109 By 2022 Qatar hopes to generate 2 percent of its electricity from renewables. That would represent 640 MW. Despite an ambitious renewable energy plan (SIDEBAR) that proposes 54 GW by 2032, Saudi Arabia had only installed 7 MW solar power by 2014. By 2022 7 to 11 percent of the Saudi electricity supply (24 GW) should be from renewables. Dubai hopes to generate 5 percent of its electricity using solar by 2030, Abu Dhabi 7 percent by 2020. Installed capacity of renewables in the UAE is reported to be 155.5 MW (as of 2013). Directorate of Energy and Climate Change, IRENA and REN21, *Renewables Status Report MENA 2013* (Paris, May 2013); Ferroukhi et al., *EU-GCC Renewable Energy Policy Cooperation* (see note 103); King Abdullah City for Atomic and Renewable Energy (K. A. CARE), *Proposed Procurement Process for the Renewable Energy Program* (n. p., 2013); Economist Intelligence Unit, *Industry Report: Energy – Saudi Arabia* (London, August 2013).

110 Peter Shaw-Smith, "Riyadh Aims for Nuclear Plant for 2020", *Financial Times*, 29 September 2011; Matthew Martin and Verity Ratcliffe, "Nuclear Aspirations Deflate", *Middle East Economic Digest*, 20 July 2012, 20f.

111 Justin Dargin, *The Shale Gas Revolution: The Implications for MENA and the UAE* (October 2013), 21, http://www.justindargin.com/uploads/5/1/5/3/5153441/shale_gas_and_mena.pdf (accessed 7 April 2014).

plex, because they either contain "sour" gas (high in sulphur and toxic gases) or are shale gas or tight gas deposits. Production costs are also comparatively high.

Since the 1980s natural gas has been crucial for Saudi Arabian industry.[112] But given that recent efforts to expand gas production have not been a success story, future difficulties must be expected. The Saudi gas initiative was launched in 1998, partly in response to falling oil prices in the aftermath of the Asian financial crisis,[113] but abandoned five years later because Saudi and foreign business interests were too far apart. The Saudis wanted cheap gas for their diversification strategy, but the rates of return demanded by Western firms were too high. The latter also hoped to gain access to oil production, whereas Saudi Arabia wanted to open up only non-associated production and the state-owned Saudi Aramco sought to preserve its upstream monopoly. Circumstances have not improved since then, with estimated production costs for new projects between $3.5 and $6 per MBtu (similar to the United States).[114] So major investment is required. At the same time the domestic gas price is about $0.75 per MBtu, and difficult to raise at present. Saudi Aramco consequently announced at the end of August 2014 that it intended to invest more than $40 billion annually over the coming decade in order to maintain oil production at 12 million barrels/day and more than double gas production.[115]

The "gas crisis" also has regional dimension. Gas-rich Qatar would actually be geographically well-positioned to supply gas to other Gulf states. Since 2007 it has been supplying 56 million cubic metres per day to Abu Dhabi, Dubai and Oman via the Dolphin Pipeline.[116] But the pipeline's capacity is not fully exploited. The buyers would like to import more but Qatar earns much more in the Pacific market.[117] Saudi objections prevent the Dolphin Pipeline from being extended to Bahrain and Kuwait.

These developments affect the web of relations between the Gulf states, potentially in far-reaching respects. Abu Dhabi recently began developing unconventional gas reserves in its western territories and is building an LNG import terminal and regasification facilities. In spring 2014 Oman agreed a pipeline construction project with Iran that – if realised – would enable it to export Iranian LNG to India and other Asian countries and dash UAE's dreams of becoming the regional gas hub. Oman is geographically better placed, and by avoiding the choke point of Hormuz the new pipeline would offer Iran strategic advantages. Gas importers like Kuwait and UAE, which are looking for or already using alternatives in Russia, Iran and North America, could also profit from less strained gas markets. On the other hand, rising regional gas demand amidst a changing international energy landscape could spark conflicts over borders. Iran shares with its Arab neighbours at least fifteen gas and oil fields in areas where the border is contested, including Qatar's important North Field, which stretches over into the Iranian South Pars Field. If Qatar lifts its North Field production moratorium in 2015, far-reaching conflict with Iran could ensue.

112 That is when the Master Gas System, a network of gas gathering, pipeline and processing facilities, came on stream.

113 For detail see Guido Steinberg, "Saudi-Arabien: Öl für Sicherheit", in *Petrostaaten: Außenpolitik im Zeichen von Öl*, ed. Enno Harks and Friedemann Müller (Baden-Baden, 2007), 54–76 (60).

114 Saudi Aramco and Shell are negotiating about developing the promising Kidan Field even before 2020, but there has been little progress to date. The Kidan Field in the Rub al Khali Desert in the south of the country is expensive, with development costs of about $6 per MBtu. Saudi Arabia also intends to produce non-associated sour gas from offshore fields (Karan Field, Arabiyah and Hasbah). Bassam Fattouh, "The Saudi Gas Sector and Its Role in Industrialization: Developments, Challenges and Options", in *Natural Gas Markets in the Middle East and North Africa*, ed. Fattouh and Stern (see note 83), 196–234 (220f.). Further invitations to tender were prepared in autumn 2013, including for the South Ghawar Field in the Eastern Province (the Ghawar Field being the world's biggest oilfield) and for fields on the Iraqi and Jordanian borders in the north. "Aramco Renews Focus on Shale Gas", *Middle East Economic Digest*, 4 December 2013, 4, 7.

115 "Saudi Aramco CEO: Oil Industry 'Needs Timely Investments'", *Arab News*, 26 August 2014, http://www.arabnews.com/economy/news/620836 (accessed 1 September 2014).

116 Amy Myers Jaffe, Jareer Elass and Keily Miller, *The Gulf Cooperation Council Natural Gas Conundrum: Geopolitics Drive Shortages amid Plenty* (25 October 2013), 9, http://bakerinstitute.org/news/the-gulf-cooperation-council-natural-gas-conundrum-geopolitics-drive-shortages-amid-plenty/ (accessed 7 April 2014).

117 The price negotiations are difficult because the UAE and Oman wish to pay no more than $1.30 per MBtu with price rises under 2 percent. In summer 2010 short-term interruptible contracts were arranged at prices of $5 per MBtu. Ibid., 15.

Political Consequences for Gulf States

In the coming years the policies of the Gulf states will be shaped by domestic economic problems and changes in energy markets. Saudi Arabia, UAE and Qatar fill leading roles in the region and have for some years been pursuing increasingly active foreign policies. Given steadily rising the costs of those interventions and of the generous subsidies required to placate their own populations, any longer-term fall in international oil and gas prices would be difficult to compensate financially and could negatively affect their stability. While stability is not currently acutely endangered, they are heavily dependent on strong revenues to fund state benefits for their citizens.

Surprisingly, though, the shale revolution does not feature highly in domestic policy debate in the Gulf states. It could, however, further deepen their leaders' worries (observed since 2011, above all in the oil states Saudi Arabia and UAE, less so in Qatar) that the United States could withdraw from Middle East and abandon the region to its enemies, above all Iran. Already today that perception leads Saudi Arabia to pursue an increasingly autonomous and sometimes aggressive regional policy. Growing awareness of the economic consequences of the shale revolution could amplify fears about a US withdrawal and tendencies to adopt an offensive stance in the region.

The Economic Elites and the Shale Revolution

The Gulf states are and remain so central to the global energy markets that their governments feel little anxiety over the repercussions of the US shale revolution on their energy sectors and economies. Public debate in the region did not even touch on the issue until 2013, and it is conspicuous that perceptions of the shale revolution remains reduced to economic and energy policy aspects, the discussion consequently dominated by economists. The geopolitical aspects are barely mentioned in the Gulf states.

At least outwardly, the powerful Saudi oil bureaucracy remains unimpressed by the shale boom, which it regards as natural consequence of high prices enabling development of unconventional reserves. Saudi Oil Minister Ali Al-Naimi has spoken in that vein, while Aramco CEO Khalid Al-Falih even welcomed additional "new oil" as a price-dampening element. With the Saudi oil bureaucracy assuming that today's global oil demand of about 90 million barrels/day will increase to about 110 million barrels/day by 2030, growing US production – which Aramco does not expect to exceed 6 to 7 million barrels/day – would in fact be crucial for securing the global energy supply.[118] One advisor to the Saudi oil ministry even argued at the 2013 Manama Dialogue that the shale boom was a "bubble" set to burst.[119] The influence of the Saudi oil bureaucracy is probably responsible for OPEC taking a very similar stance. Its *World Oil Outlook* forecasts the boom in unconventional oil flattening off very quickly, before 2020, and remaining restricted to North America.[120]

Critical voices in Saudi Arabia have a hard time gaining a public hearing, with energy and economic questions no exception. The only successful example to date was Prince Al-Waleed bin Talal Al Saud's May 2013 open letter to the oil minister, which he published on Twitter. Prince Al-Waleed criticised the state's dependency on oil revenues and demanded a rapid diversification of the Saudi economy which, he said, had been left vulnerable by competition from American shale oil. The letter was notable because Prince Al-Waleed is one of the world's richest businessmen and a grandson of the founder of the Saudi state, Ibn Saud. But he remains excluded from the inner circle of power in Saudi Arabia because his father belonged to the opposition "free princes" movement in the early 1960s. In recent years both have repeatedly demanded deep reforms, but to little avail.

118 Ed Crooks, "Saudi Arabia Welcomes US Shale Oil Boom", *Financial Times*, 14 May 2013.

119 Discussion with Mohammed Al Sabban at the IISS Manama Dialogue on 8 December 2013. He also pointed to the problem of high domestic consumption in Saudi Arabia and the other Gulf states, which he said needed to be limited.

120 The IEA forecasts diverge considerably from this estimate, see note 86.

Risks to Internal Security

Against the backdrop of the "Arab spring", the shale revolution has the potential to negatively impact the stability of the Gulf states. But apart from Bahrain, where suppression of the spring 2011 protests led to ongoing unrest, there are only sporadic and rather isolated indications of any real danger to the regional rulers.

One such sign is the great nervousness with which the Gulf regimes responded to the political upheavals. This applies above all to Saudi Arabia, where in spring 2011 King Abdullah announced direct and indirect transfers to the population amounting to about $130 billion. This move is one important reason why the Saudi fiscal break-even price has rising so strongly over the past three years. Spending also increased in all the other Gulf states as they expanded their security forces by several tens of thousands and stepped up their presence in potentially restive regions. Saudi Arabia applied this above all to the Eastern Province, where Shiites represent up to 15 percent of the population (between two and three million people) and are massively discriminated against by the government. The Shiite-populated areas saw repeated demonstrations, which continued after 2011. Riyadh is particularly sensitive about the Shiites of the Eastern Province (and Bahrain) whom it regards as a potential Iranian fifth column. The Saudis accuse Tehran of inciting Shiite minorities in order to destabilise the Gulf states. Since 2011, incidents in the Eastern Province have become a regular occurrence, with many Shiite youths becoming radicalised after losing faith in the possibility of achieving equality by peaceful means. The "Shiite problem" acquires a particular strategic edge through the geography, where the oil industry and all the biggest oilfields are also located in the Saudi Eastern Province.[121]

Fear of its own Shiite population was also behind the Saudi invasion of Bahrain. In March 2011 Saudi Arabia, with UAE, Kuwait and Qatar in tow, intervened to prop up the Bahraini regime after Shiite protests threatened to spiral out of control. Like in the Saudi Eastern Province, the conflict in Bahrain continues to fester. Since 2011 there have been almost nightly clashes between demonstrators and security forces in the Shiite villages surrounding Manama. Many young protestors have been killed, very occasionally police. Activists increasingly use Molotov cocktails and in there have been a number of unclaimed attacks using small improvised explosive devices.[122] Violence could explode at any moment in Bahrain. If it did, there would be enormous repercussions for security in eastern Saudi Arabia.

A second sign of the nervousness of the Gulf rulers is attempts by Saudi Arabia and the UAE to suppress the influence of the Muslim Brotherhood in the region. Their rejection of the Brotherhood is rooted above all in their perception that it promulgates a rival – more modern, republican and frequently also revolutionary – interpretation of political Islam. After the victory of the al-Nahda Party in the November 2011 elections in Tunisia it was clear that the Brotherhood and ideologically related groups would play an important role in the Arab transformation states. They feared that this new threat from Egypt could be as dangerous to them as President Nasser in the 1950s and 1960s, who propagated pan-Arab nationalism, socialism and the toppling of the regional monarchies. The "Arab cold war" he provoked, conducted above all in Yemen, caused great trouble for the Saudi regime.[123]

In the early 1990s Islamists influenced by the Muslim Brotherhood dominated a strong opposition movement in Saudi Arabia. So when the transnational Muslim Brotherhood took power in a country as important as Egypt, with the accession of President Morsi in 2012, the Saudi ruling family saw this as a danger to the internal stability of their own kingdom.

The measures taken by the Gulf states against the Muslim Brotherhood cumulated in July 2013 with Saudi Arabia, UAE and Kuwait supporting the Egyptian military coup against Morsi.[124] At the same time they tightened internal repression, which is directed in Saudi Arabia partly, but in UAE primarily against the

121 Guido Steinberg, *Anführer der Gegenrevolution: Saudi-Arabien und der arabische Frühling*, SWP-Studie 8/2014 (Berlin: Stiftung Wissenschaft und Politik, April 2014), 10ff.

122 Inga Rogg, "Eskalation in Bahrain: Polizist durch Sprengsatz getötet", *Neue Zürcher Zeitung*, 20 October 2012.

123 Malcolm Kerr, *The Arab Cold War: Gamal Abd al-Nasir and His Rivals 1958–1970* (London: Oxford University Press, 3rd edition 1971), passim.

124 It can be assumed that the governments of Saudi Arabia and the UAE were informed in advance of the coup plans and may even have argued for the coup. Hardly a week after the Muslim Brotherhood was overthrown, Saudi Arabia, the UAE and Kuwait announced that they would support Egypt over the subsequent months with budget assistance, central bank deposits and oil products totalling $12 billion. Michael Peel, Camilla Hall and Heba Saleh, "Saudi Arabia and UAE Prop Up Egypt Regime with Offer of $8bn in Aid", *Financial Times*, 10 July 2013.

Muslim Brotherhood. This was surprising given that the emirates branch of the organisation, al-Islah, was regarded as rather weak. In March 2014 both countries, ignoring evidence to the contrary, declared the Muslim Brotherhood a terrorist organisation.

Foreign Policy Consequences

Changes in the energy markets have knock-on effects on the international constellation in the Persian Gulf and thus on the foreign policy options of the Gulf states. Shifts in US interests and policies – real or perceived as such by actors in the Gulf – come into play here, as do patterns of cooperation and conflict between the Gulf states.

The Arab Gulf states are all strongly dependent on the United States, without which they would be incapable of defending themselves against their powerful neighbours Iraq and Iran. The United States has provided a de facto security guarantee to Saudi Arabia since 1945, originally regarding the USSR as the principal threat. Since the 1970s the US guarantee has become one of the central pillars of Gulf security. In the course of three major wars (1980–1988, 1990/91, 2003), Washington's alliance with the Arab Gulf states and hostility to Iraq and Iran has drawn it ever deeper into the region's conflicts.

However, the perceptions of Riyadh and Washington have grown apart since the 1990s. Since 2002/2003 the differences of opinion have focussed on Iraq and Iran, with Riyadh vehemently opposing the 2003 Iraq War on account of Saddam Hussein's value as a counterweight to Iran. Ever since then the Saudis have held persistent doubts as to Washington's regional political judgement, a concern further nourished by US policy towards Iran. Most of the Saudi ruling family regards the Iranian nuclear programme as a purely military endeavour directed primarily against Iran's Persian Gulf neighbours. What unsettles Riyadh is less the idea of Iran one day actually using nuclear weapons, but that Tehran could exploit a nuclear umbrella to support militant groups in neighbouring countries and thus destabilise the Gulf region with impunity. King Abdullah is indeed reported to have insisted that the United States attack Iran and "cut off the head of the snake".[125]

But since 2013 at the latest it has become apparent that Riyadh's worries extend far beyond the Iranian nuclear programme, to encompass more generally Tehran's striving for hegemony in the Gulf region and the Middle East. For that reason Saudi Arabia would not in fact welcome any US-Iranian agreement on the nuclear programme, because of the danger of Washington permitting Iran to establish regional dominance in return for nuclear concessions. Correspondingly, Riyadh's official response to the interim agreement between Tehran and the E3+3 in November 2013 was very reserved. Internally, the Kingdom even threatened to turn its back on the United States, while the official government press railed against the deal.[126]

American reactions to the "Arab spring" have further worsened relations between Washington and Riyadh. From the Saudi perspective the overthrow of Egyptian President Hosni Mubarak in February 2011 was a turning point. The ruling family was shocked when the Obama Administration showed not the slightest intention of standing by its long and loyal ally. The logical conclusion for Riyadh was to become more proactive itself in supporting its friends. Saudi Arabia thus increasingly became the protector of the region's monarchies and, as already mentioned, contributed actively to the restoration of military rule in Egypt in 2013.

Another turning point was the chemical attack by the Syrian army in the eastern suburbs of Damascus on 21 August 2013, in which about 1,400 civilians died. The Saudi were irate when Obama changed his mind after initially announcing a military strike against Assad, concluding that Syria and Iran would now cease to take American threats seriously. Riyadh's immediate response was to step up aid to selected rebel groups in Syria from September 2013.[127] The

125 Reportedly said during a meeting of leading Saudi princes with US General David Petraeus, commander of the multinational forces in Iraq, and the US ambassador in Baghdad, Ryan Crocker. During the discussion the Saudi ambassador to the United States, Adel al-Jubeir, "recalled the King's frequent exhortations to the US to attack Iran and so put an end to its nuclear weapons program". Cable from US Embassy in Riyadh, "Saudi King Abdullah and Senior Princes on Saudi Policy toward Iraq", 20 April 2008, http://www.wikileaks.org/plusd/cables/08RIYADH649_a.html (accessed 6 September 2013). Yousef al-Otaiba, UAE ambassador to Washington, made similar statements.

126 Damien McElroy, "Iran Nuclear Deal Changes Middle East Alliances as Saudi Arabia Rebels against US", *Telegraph*, 25 November 2013.

127 It is reported that Saudi Interior Minister Prince Prince Mohammad bin Naif intervened at the beginning of 2014 to moderate his country's Syria policy. The motive may have been worries, especially in the interior ministry, that Saudi

extent to which the Saudi government intends to continue this policy was not yet apparent of mid-2014.

The implications of the shale revolution for the foreign policy alignments of the Gulf states, not least Saudi Arabia, can only be understood against the backdrop of these irritations with the United States. While Washington downplays the consequences of the fracking boom for US policy towards the region, perceptions within the Gulf states are quite different. Although the shale revolution does not yet play any major role in their domestic debates, it does threaten to deepen alienation from the United States. Since the mid-2000s, growing mistrust of Washington has led Riyadh to pursue an increasingly active regional policy, working to counteract real or imagined Iranian encroachments in the Levant and in Yemen. The Gulf media were soon talking of an "aggressive" or "offensive policy" (siyasa hujumiya). The shale revolution and associated fears of a US withdrawal could further strengthen these trends.

Saudi Arabia's "offensive policy" also has consequences for relations among the Gulf states. Since the 1990s the smaller countries – UAE, Kuwait and Qatar – have in general orientated even more closely on the United States than on Saudi Arabia, expecting bilateral ties to the superpower to offer more effective protection against Iraq and Iran. But Saudi Arabia and Qatar came closer together after 2010, following a period of tense rivalry between 1996 and 2008. Growing fear of Iran probably played an important role. The easing of relations was still noticeable in the early months of the "Arab spring" when fears that the movement was spiralling out of control ensured that all the Gulf states took a cautious stance on Syria and initially avoided taking sides.

Later the smaller Gulf states went different ways. UAE supported Riyadh in Bahrain, Egypt and Syria and repressed the Muslim Brotherhood even more aggressively than the Saudis. Again, one motive was fear of Iran and dissatisfaction with Washington, although less unequivocally in the case of UAE because of differences between individual emirates. Because of its economic ties with Tehran, Dubai is regarded as more Iran-friendly than Abu Dhabi, but has seen its influence decline since the global financial and economic crisis of 2008/2009. Now all important political decisions are taken in Abu Dhabi.

Qatar, on the other hand, attempted a dual strategy. While continuing to seek good relations with Riyadh, participating with a symbolic contingent in the intervention in Bahrain and coordinating with its larger neighbour over Arab League affairs, Doha also made it clear that it would continue to conduct its own independent foreign policy of supporting the Muslim Brotherhood. This created conflict with UAE in particular, where Abu Dhabi and Dubai massively repressed the Brotherhood. The dispute escalated during the months following the July 2013 coup in Egypt, when Riyadh ratcheted up pressure on Doha to renounce support for the Muslim Brotherhood. When Doha refused, Saudi Arabia, UAE and Bahrain recalled their ambassadors at the beginning of March 2014. Political relations between Qatar and its Gulf neighbours had reached a historic nadir.

Although the shale revolution has to date had no direct impact on this relationship, the "gas crisis" and Qatari gas certainly do play an important role. Relations between the UAE and Qatar are also burdened by Doha's refusal to supply more gas at the conditions demanded by Abu Dhabi. The Dolphin Pipeline from Qatar to UAE and on to Oman is operating far below capacity. The fraught relationship between Saudi Arabia and Qatar has also prevented any expansion of the regional gas network towards Kuwait. So political problems between the Gulf states stand in the way of the most obvious answer to gas shortages, namely supply from friend and ally Qatar. This raises the question of what purpose a regional organisation like the Gulf Cooperation Council actually fulfils, if its members cannot even supply one another with urgently needed resources.

jihadists fighting in Syria could later return to the Kingdom. At the end of January 2014 Saudi Arabia made it a crime to participate in armed struggle abroad.

Conclusions and Recommendations

The shale revolution has contributed to maintaining equilibrium of supply and demand in the global oil markets. In the international gas markets it causes LNG flows to be diverted to Asia and Europe. The United States (more precisely North America) is on the road to self-sufficiency in energy and the Gulf region will in future concentrate even more strongly on the Asian growth markets. For Europe that means meeting its own growing demand largely from the energy-rich regions of Africa, Russia and the Caspian that are geographical close and possess existing infrastructure.

The Middle East will remain important for Germany and Europe as the backbone of the global oil markets and determinant of price trends. Two trends are central. Firstly, geopolitics will remain an important factor in the Gulf region, despite or precisely because of the shale revolution, engendering considerable uncertainty. Secondly Europe must prepare itself to share the burden of securing its energy supplies, including those from the Middle East, with the United States. There is, however, a range of different cost/benefit calculations within the European Union. While several southern member-states are strongly dependent on imports from the Gulf, many others do not presently import strategically significant proportions of their oil and gas supplies from there. But if refinery closures in Europe shift trade flows to such an extent that more oil products have to be imported from the Gulf region or from the large refinery complexes in Asia, direct dependency on the Gulf would increase for the European Union as a whole. Protecting maritime trade routes will therefore remain a priority for global security and international energy cooperation.

Only in the long term and in interaction with political factors do developments in the oil and gas markets have the potential to undermine the stability of the regimes in the Arab Gulf states. Tight oil and shale gas play a rather subordinate role here; the decisive factors are demand for oil in Asia and quota redistribution within OPEC, should Iraq and Iran crowd into the markets.

In the short and medium term the Gulf states will have to ensure their own energy supplies while still making oil available for export. They find themselves confronted with this challenge at a difficult time, with shrinking global market shares and downward price pressure. The current socio-economic model cannot simply be extrapolated into the future. The Gulf states are aware that they must overcome their dependency on oil and gas if they are to ensure their long-term stability. To this end they are all pursuing more or less serious diversification policies that also seek to create jobs for their own citizens. But it is precisely these diversification efforts that could be endangered by the shale revolution, if fracking ends up being exported to Asia or the Asian petrochemicals sector were to switch to condensate feedstock (for example from the United States).

The changes in the energy markets also create foreign policy and security challenges for the Gulf states. Although there is as yet little evidence of the United States pulling back from the Gulf on account of its domestic shale revolution, the characteristics of US engagement must be expected to change in the longer term. Firstly, economic (energy-sector) measures such as energy-based sanctions against Iran could grow in importance relative to military instruments. Washington will also increasingly press its Gulf partners to expand their own capacities to share the security burden. Largely independently of the debate within the United States, developments in energy policy could strengthen the doubts that already exist in the Gulf states about Washington's reliability as a guarantor of security.

Secondly, the shift in energy demand towards the Asia/Pacific markets creates a conflict potential in the Sino-American relationship, all the more so if China were to seek to back up its economic interests in the Persian Gulf with security engagement. This scenario meets with utter rejection in Washington. Precisely for that reason the United States will look above all to traditional partners such as Germany and other EU member states for security burden-sharing. This development has not yet been adequately reflected in Germany and the European Union.

In view of the economic, domestic and foreign policy challenges facing the Gulf states, the following

policy recommendations can be made for Germany and Europe:

Germany has no influence on the internal politics of the Gulf states, but it does enjoy good commercial relations. If the German government wishes to play a role in the Gulf it should give these relations a political dimension. This includes pointing out that the Gulf states can only preserve their stability if they permit greater participation and expand participation and rule of law. In all cases this means abandoning exclusion and working instead towards inclusion of political opponents. In Saudi Arabia this relates in the first place to equality for religious minorities, in the UAE renouncing the massive repression against the Muslim Brotherhood.

Germany's influence on energy markets is limited. The geopolitical imponderables in the Gulf and the associated supply risks give the German government good reason to further reduce import dependency and to push on with reconfiguring the German energy system for greater sustainability. Because oil is primarily consumed in transport and mobility, the German *Energiewende* (energy transition) should concentrate more strongly on that sector, especially as new trends increasingly force Germany and Europe to import more petroleum products rather than crude oil. This can affect both prices and security of supply, as state-owned Chinese and Indian corporations cooperate with state-owned corporations in the Gulf states and increasingly dominate trade, processing and marketing.

The situation with natural gas is different. Qatari LNG is strategically important for European importers, also because it is a significant diversification factor. The European Union must send clear signals to Doha if it hopes to import more Qatari gas.

Furthermore, Germany's energy cooperation with selected Gulf states could be placed on a broader footing; for example in the scope of an energy partnership to create a political framework for closer cooperation in (new) gas and oil production, in the feedstock industry, and also in renewables and energy efficiency. The uppermost goals must be to strengthen existing international governance forums and to advance multilateral cooperation in questions of producer/consumer dialogue, transparency and technological cooperation. The international dialogue should be intensified, and the major Asian consumers included.

In terms of foreign and security policy, Germany should work within NATO and the European Union towards closer cooperation with the United States and the Gulf states in the field of maritime security. A starting point is offered by the EU Maritime Security Strategy adopted in June 2014 by the Council of the European Union, which recognises the great importance of maritime security for energy supplies and identifies protection of international shipping as a core interest of the European Union. The document proposes mobilising all the Union's civilian and military instruments to that end, including the Common Security and Defence Policy. However implementation now needs to be in the focus with the action plan defining concrete measures and timetables due at the end of 2014. It is also problematic that although the European Union defines itself explicitly as a global security actor, the Maritime Security Strategy remains focussed on the European neighbourhood. It refers to the North Sea, the Baltic, the Black Sea, the Mediterranean and the Arctic – but makes no explicit mention of the Persian Gulf.

Opportunities for the European Union and its member-states to assume a more prominent role in the Persian Gulf exist especially in developing naval and coastguard capacities in the Arab states. At least in the longer term it would also be conceivable for the European Union and the GCC to hold joint exercises and for Europe to support the creation of minesweeping capacities.

Abbreviations

ASEAN	Association of South-East Asian Nations
BCF	Billion cubic feet
BIS	Bureau of Industry and Security (United States)
CSDP	Common Security and Defence Policy
E3+3	France, United Kingdom and Germany plus United States, Russia and China (Iran nuclear talks)
EIA	Energy Information Administration
EPCA	Energy Policy and Conservation Act (United States)
FERC	Federal Energy Regulatory Commission (United States)
FTA	Free Trade Agreement
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GECF	Gas Exporting Countries Forum
GTL	Gas to liquids
IEA	International Energy Agency
IEF	International Energy Forum
IISS	International Institute for Strategic Studies
IMF	International Monetary Fund
IRENA	International Renewable Energy Agency
ISIS	Islamic State in Iraq and Syria
LNG	Liquefied Natural Gas
MBtu	Million British thermal units
MENA	Middle East and North Africa
MIT	Massachusetts Institute of Technology
NAFTA	North American Free Trade Agreement
NATO	North Atlantic Treaty Organisation
NAVCENT	United States Naval Forces Central Command
NBP	National Balancing Point
OECD	Organisation for Economic Cooperation and Development
OIES	Oxford Institute for Energy Studies
OPEC	Organisation of the Petroleum Exporting Countries
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development

Further Reading

Guido Steinberg
Leading the Counter-Revolution.
Saudi Arabia and the Arab Spring
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