

Opportunities and Challenges in Reforming Energy Prices in Gulf Cooperation Council Countries

About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology, and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.

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Key Points

The recent fall in oil and natural gas revenues has brought renewed attention to domestic energy pricing issues among GCC governments. Fuel and feedstock prices are typically set below world market prices to support domestic energy-intensive activities such as petrochemicals production. GCC members can explore different pathways for reforming energy prices, as demonstrated by the successes in Dubai and Tunisia. Such reforms result in more efficient production and consumption of energy and a positive contribution to a nation's finances.

- To remain competitive in the global market, domestic energy-intensive industries – such as petrochemicals – have long benefited from government subsidies in the form of low natural gas prices.
- Trading natural gas among GCC countries could bring joint gains while allowing the petrochemical industry to maintain its competitiveness.
- Although pricing distortions in domestic markets create obstacles to determining fair trading prices between countries, the power generation sector could gain tremendously from electricity trading, especially since an interconnected network is already in place.

Summary for Policymakers

Following the rise of oil prices during the last decade, countries in the Gulf Cooperation Council (GCC) experienced rapid economic growth. The large revenues generated made it possible for GCC governments to pursue multiple objectives: spurring investments in domestic energy-intensive sectors; providing the public with affordable access to water, electricity, and transportation fuels; and making large investments in infrastructure, education and social services. Fuel and feedstock prices are typically administered; set below world market prices but above marginal production costs to support domestic energy-intensive activities like petrochemicals production.

Partly as a result, per capita domestic consumption of primary energy in the GCC reached levels among the highest in the world. The GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) are six of the top 12

countries in energy consumption per capita. Qatar, in fact, consumes the most primary energy per capita of any country in the world, followed closely by Iceland.

The recent fall in oil and natural gas revenues has brought renewed attention to domestic energy pricing issues among GCC governments and also brought to light opportunities for further collaboration among GCC members to alleviate the challenge of decreased export revenue. GCC members can explore different pathways for reforming energy prices, resulting in more efficient production and consumption of energy and a positive contribution to a nation's finances. An environment of low oil and natural gas prices is an opportune time to introduce energy price reforms because the shock of price increases to stakeholders can be smaller compared to introducing reforms when world energy prices are high.

Background to the Workshop

In September 2015, KAPSARC hosted a workshop in Riyadh, Saudi Arabia to explore the role of energy prices in GCC countries.

The one-day workshop benefited from the participation of regional and international experts from policy making bodies, regulatory authorities and research centers, as well as the electricity and oil and gas industries. The objective of the workshop was to discuss opportunities and challenges for cooperation in reforming prices in three segments of the energy value chain:

- Industrial fuel prices.

- Electricity trade and pricing.
- Household electricity price reforms.

Whereas previous workshops investigated the unique features of GCC energy markets and the mechanics of quantitative modelling, this workshop focused on the potential for mutual gain and challenges through cooperation on reforming energy prices in the GCC. In the months following the workshop, several reforms took place, which are described at the end of this document.

Opportunities and Challenges of Energy Price Reforms in GCC Economies

Levels of per capita domestic consumption of primary energy in the GCC countries are among the highest in the world. Policies that support domestic industries and share resource rents through low energy prices have contributed to a complex set of energy-related challenges for GCC countries. Notably, they have introduced economic inefficiencies and an inability to use prices as a coordination mechanism among domestic industrial and other sectors. The consequences of lower energy prices include:

- Increasing domestic demand for energy.
- Declining revenues from energy exports.
- Potentially sub-optimal allocation of fuels.

Market distortions resulting from domestic energy prices set by governments rather than market forces.

The recent fall in oil and natural gas revenues has brought renewed attention to domestic energy pricing issues among GCC governments. In the search for potential areas of price reform, workshop participants first outlined important concerns related to competing objectives.

Equity: Higher prices can exacerbate fuel poverty and reduce energy accessibility for lower-income demographics. Higher energy prices also change how the economic rent from hydrocarbons is distributed to the public.

Financial viability: In some instances energy products, such as electricity and water, are priced below cost of production. This is particularly the case for electricity in the residential sector. Price reforms on the demand-side, such as increasing electricity tariffs, could improve the financial viability of utilities.

Development and employment: Energy is an important factor for developing regional economies, either directly as an input to domestic industries or indirectly in the form of employment to citizens. Reforms to energy prices must consider the impacts on development and employment.

Competitiveness: Low feedstock prices have contributed to the competitiveness of energy-intensive industries. Higher energy prices could make industries such as petrochemicals less competitive.

Environmental protection: Efforts to improve regional air and water quality and reduce climate impacts include adopting more efficient energy technologies and fuel switching. Energy prices impact the cost-effectiveness of technologies, and therefore the environment.

These sometimes conflicting goals helped guide the discussions that followed. The subsequent section provides an overview of the different conditions in industrial energy prices, the power market and household electricity tariffs.

Industrial Energy Prices

The pricing of natural gas in GCC countries illustrates how subsidies can create economic distortions. Natural gas is an important input for petrochemical processes and also a fuel for power generation and water desalination. Although each country sets its own natural gas price, prices in GCC countries (except Oman) have been below the U.S. Henry Hub spot price, even as the Henry Hub price approached its lowest level in the last decade (Figure 1).

Because petrochemical products are sold on a global market and must compete with the products of other producers, below-market natural gas prices contribute to some specific GCC countries' competitiveness in that industry (i.e. Saudi Arabia). Reforming natural gas prices could therefore harm the competitiveness of specific national industries, particularly if they do not operate as efficiently as their international peers. This case helps explain the resistance to price increases among some circles.

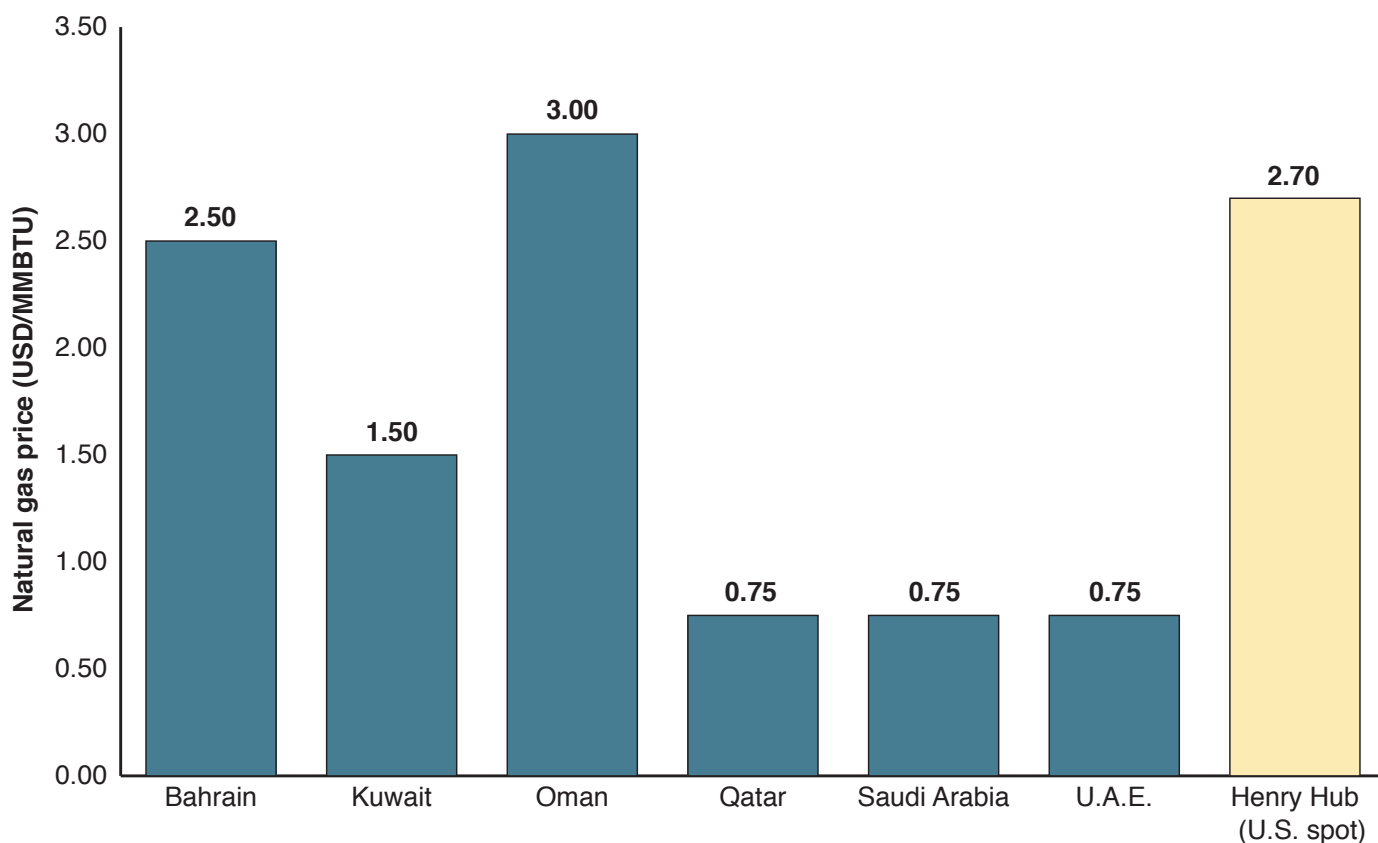


Figure 1. Comparison of GCC and global natural gas prices (September 2015).

Source: KAPSARC analysis.

Industrial Energy Market

Electricity demand in GCC countries has steadily increased at an average annual rate of 11.2 percent over the last four decades (Figure 2), with Oman and the United Arab Emirates having the fastest growth of 19.4 and 15.7 percent, respectively. These growth rates stand out compared to the 3.4 percent annual average growth of world electricity demand over the same time period. The rapid pace of electricity demand growth has created challenges in terms of managing future demand.

Despite these challenges, some opportunities have been identified. For instance:

The recently completed GCC interconnection creates the conditions for electricity trade and cooperation among the six countries. They could either coordinate electricity prices or develop a GCC electricity market. However, since beginning its operations in 2009, the integrated grid has been used only for emergency transfers of electricity to meet peak loads or to shore up lost capacity from plant outages to help avert partial blackouts (presentation by Ahmed Al-Ibrahim, GCCIA, Sept 2015). Currently, exchanges of power on the interconnection are overwhelmingly unscheduled, with a small amount of energy trade occurring in 2011 (see Figure 3).

Other opportunities may exist to leverage the interconnection to more efficiently cope with electricity demand variations across countries through sharing reserve capacity. A GCC electricity market could allow for more optimized decisions in sharing generation capacity and operation.

Efficiency gains could result from transporting electrons instead of oil and natural gas within a country or across borders. A recent study commissioned by the Gulf Cooperation Council Interconnect Authority (GCCIA) concluded that \$23.57 billion could be saved from 2014 to 2038 through a reduction of fuel and operations and maintenance costs. The accompanying carbon dioxide reduction for the same period is estimated at approximately 190 million metric tons (ibid).

Constraints to operating a regional electricity market continue to exist, however. For instance:

Market distortions due to administered pricing and lack of visibility of real electricity costs hinder electricity trade. Administered pricing has, in fact, been specifically identified as a main obstacle to inter-state trading.

Each country accounts differently for the cost of oil and natural gas for domestic use, raising questions about how potential economic gains would be captured.

Domestic electricity production can be seen as a matter of national security. GCC countries are not accustomed to relying on other countries for their electricity needs.

A regional electricity market raises questions about which generation technologies and which fuels could be used in a complementary way to meet future demand.

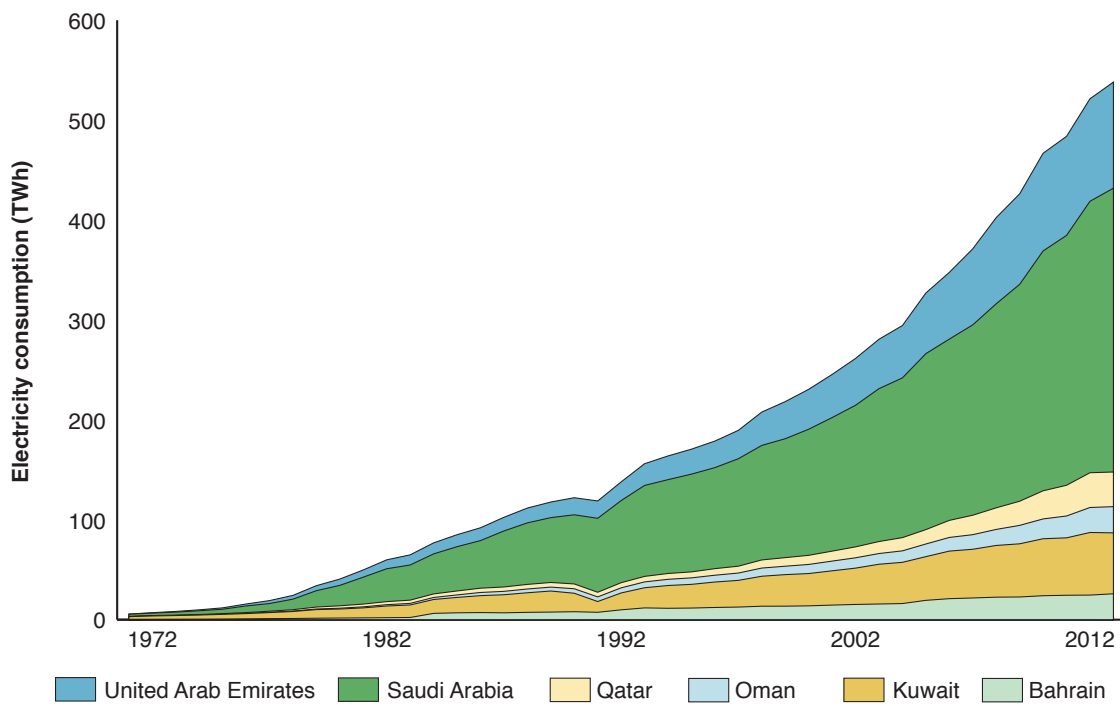


Figure 2. Growth of electricity demand for GCC countries in TWh. Data from IEA World Energy Statistics 2015.

Source: KAPSARC analysis.

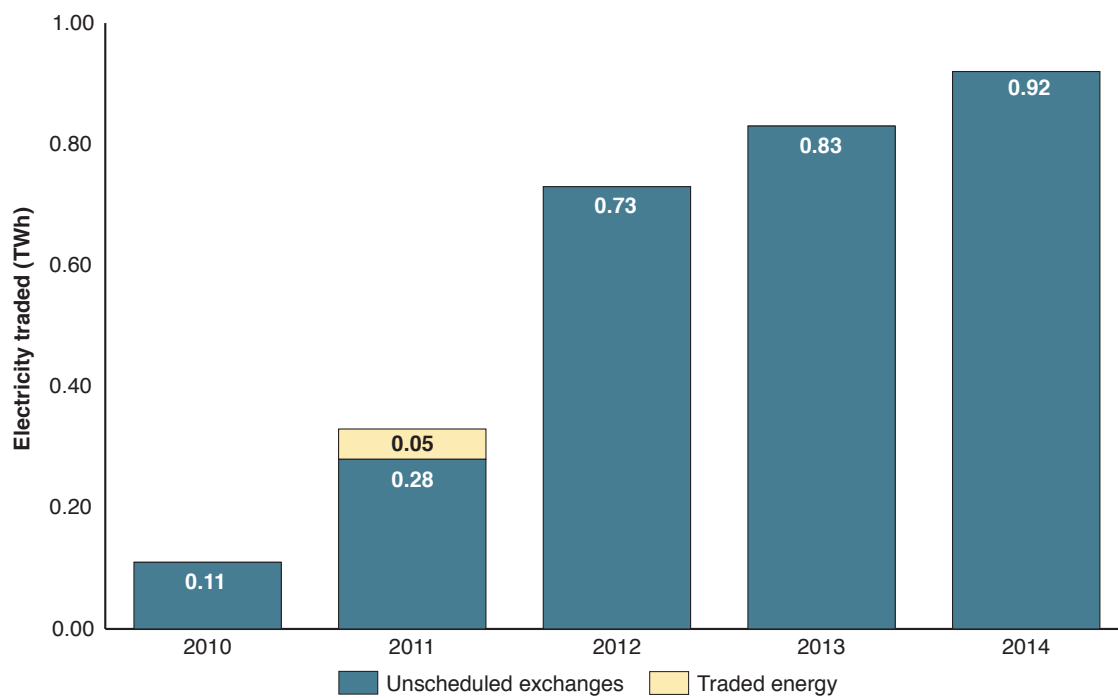


Figure 3. Scheduled and unscheduled energy exchanges on the GCC interconnect in TWh. Data from GCCIA.

Source: KAPSARC analysis.

Reforming Household Electricity Tariffs

End-consumers in the GCC countries benefit from direct government intervention in energy pricing in two ways. First, the low prices of fuel and feedstocks for industrial users (like the power and water sectors) are passed along to consumers. Second, government-set tariffs insulate consumers from price fluctuations and guarantee affordable access to energy products. Prices charged to end-use customers greatly influence consumption of final products like electricity, gasoline, and diesel. While consumers see low prices as a benefit, they still result in economic inefficiencies. For instance:

- Higher prices motivate users to consume less. This potential effect is lost when prices are fixed.

By setting energy prices below their market value, governments could incur an opportunity cost both in terms of fiscal revenues and also human or physical investment.

Since higher income groups consume more of the resource (e.g., drive bigger cars, more vehicle miles), much of the subsidy is wasted on population groups that can afford to pay the full market price.

Direct transfers provide greater economic benefit, and are thus more efficient than subsidies.

Dubai provides an example of price reform. In January 2011, the Dubai Electricity and Water Authority raised electricity and water tariffs for expatriates and nationals (Figure 4).

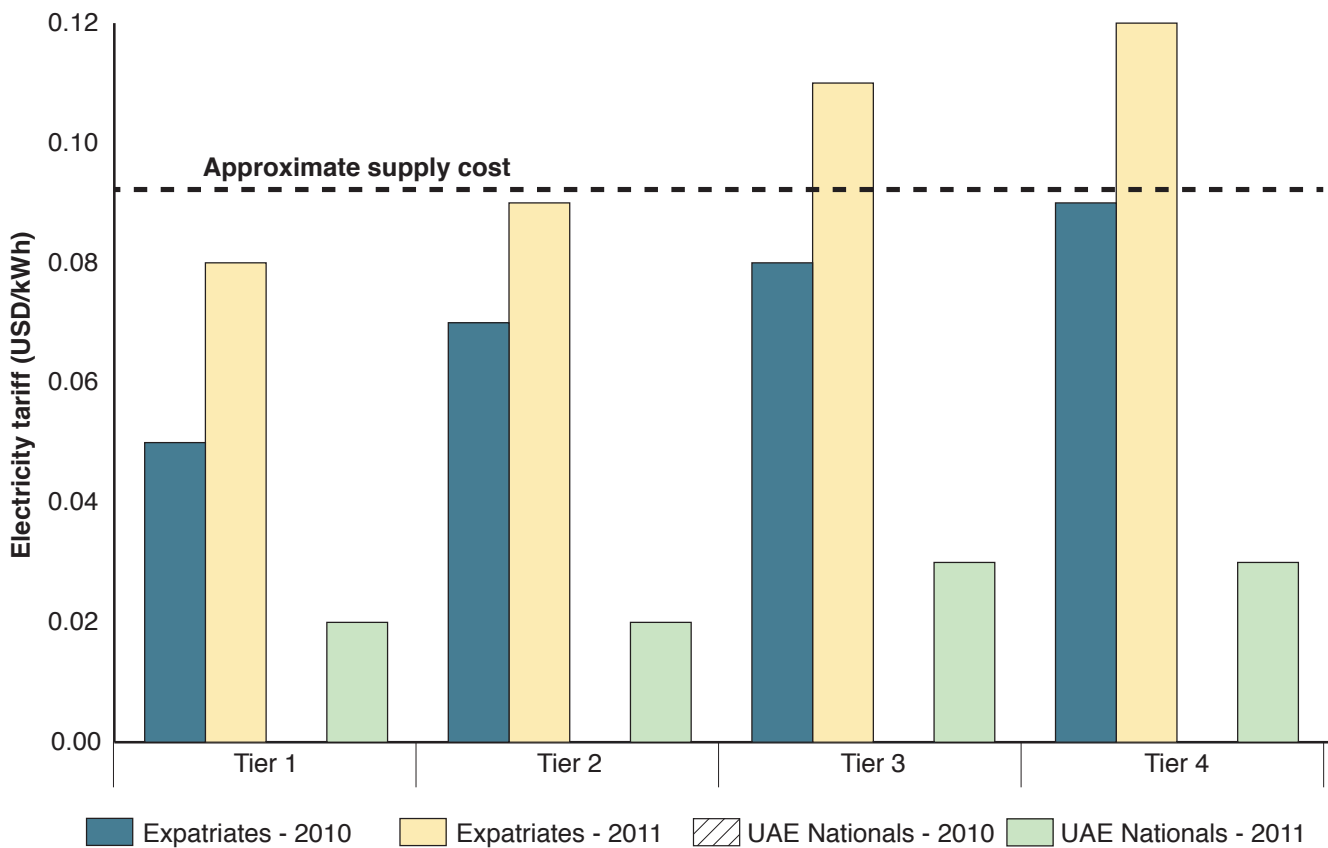


Figure 4. Dubai electricity tariff reforms. Data from Masdar Institute of Science and Technology. UAE National 2010 = 0.

Source: KAPSARC analysis.

On average (of all consumption tiers), electricity tariffs for expatriates increased 40 percent, while nationals, who had enjoyed free electricity, were required to pay for it after 2010. According to the Masdar Institute of Science and Technology, expatriate tariffs are now approximately cost reflective.

There has been little resistance to energy price reform among Dubai residents. A possible reason could be that the expatriate population, which

represents about 89 percent of Dubai's residents, is accustomed to paying more for electricity in their home countries and finds Dubai's tariffs less expensive. However, analysis indicates that the impact of tariff reform on residential electricity consumption held for three years and then began to fade away (Masdar Institute of Science and Technology). Again, the significant expatriate population might explain this observation; most expatriates are characterized by relatively short work stays of two to three years.

Options for energy price reforms in GCC economies

Workshop discussions examined the role of energy prices in GCC countries as well as opportunities and challenges for cooperation on price reform in three segments of the energy value chain: industrial fuel prices, electricity trade and pricing, and household electricity price reforms. In summary, the workshop discussions highlighted that:

Low natural gas prices help domestic energy-intensive industries – such as petrochemicals – maintain competitiveness in a global market. Trading natural gas among GCC countries could bring joint gains and allow the petrochemical industry to maintain its competitiveness.

The GCC interconnect is underutilized. Coordinated electricity prices through a GCC power market could leverage regional resources and more efficiently allocate power generating fuels and capital. The power generation sector could gain tremendously from electricity trading,

especially since an interconnected network is already in place. However, electricity is perceived to be a good whose production the government must control. Pricing distortions in domestic markets create an obstacle to determining a fair trading price between countries.

Although the effects appear somewhat mitigated after three years, Dubai has successfully reformed residential electricity prices. The demographic makeup of Dubai is probably a significant contributor to the success of price reform. Questions remain as to whether this success can be replicated in other GCC countries that do not have such a large percentage of expat white-collar workers.

Beyond the experiences of GCC countries, Tunisia provides an example of how a price reform scheme might be planned that mitigates perceived hardship over higher prices and alleviates disruptions to industry stakeholders (See over).

Lessons Learned From Successful Energy Price Reforms: Tunisia

Tunisia's experience in reforming its electricity and natural gas prices serves as an example of a successful strategy. The Tunisian government introduced energy subsidies in the 1970s as a way of ensuring equitable access to what they call "products of first necessity" – such as oil, natural gas, and electricity. However, as it was designed, the system introduced market distortions, encouraged over-consumption of electricity and natural gas, and burdened the country's finances. Energy-related subsidies grew from 0.5 percent of GDP in the 1970s to as much as 9 percent of GDP, largely due to the increase in oil prices. Tunisia is an oil-importing country.

Starting in 2013, the Tunisian government enacted electricity tariff reforms. The objective was to correct the tariff structure to reflect actual production and distribution costs. Progressive consumption brackets were introduced for household consumers and industries (like the cement sector).

Six elements contributed to Tunisia's success:

1. **Communication:** Transparency and clarity are key. Information about the role of subsidies in the economy, what subsidies will be adjusted, and who will be impacted should be carefully articulated so it does not come as a surprise.
2. **Careful planning:** The long-term strategy must be presented with clear objectives in consultation with key industry stakeholders so that all parties can plan for changes.
3. **Gradual transition:** A gradual removal of subsidies has a better chance of succeeding, allowing industry stakeholders to make investment decisions based on an understood roadmap of changes.
4. **Equity:** Different segments of the population will be impacted by changes in energy prices. Care should be taken that lower income demographics are protected from price increases.
5. **Management:** Streamlining management of public enterprises helps reduce the cost of subsidies and tariff increases and aligns interests along a common objective.
6. **Politics:** Energy price reforms can be contentious. Understanding the institutional inertia and potential resistance to change is important. Depoliticizing energy pricing can improve the chance of success.

Recent Energy Price Reforms in the GCC

As oil and natural gas revenues have fallen, the hydrocarbon exporting countries of the GCC have introduced various energy price reforms to improve fiscal balances. The pace of these reforms has accelerated in 2016. For instance, the Saudi government announced a broad-based five-year reform that covers a wide range of fuels, including natural gas, gasoline, diesel and electricity,

as well as water. We also outline the expected impact of these new energy prices on Saudi industries. In early January 2016, Oman, Bahrain and Qatar followed in Saudi Arabia's footsteps and announced an increase in fuel prices. Kuwait is expected to take similar action in the coming months (see Table 1 for more details on recently announced energy price changes in GCC countries).

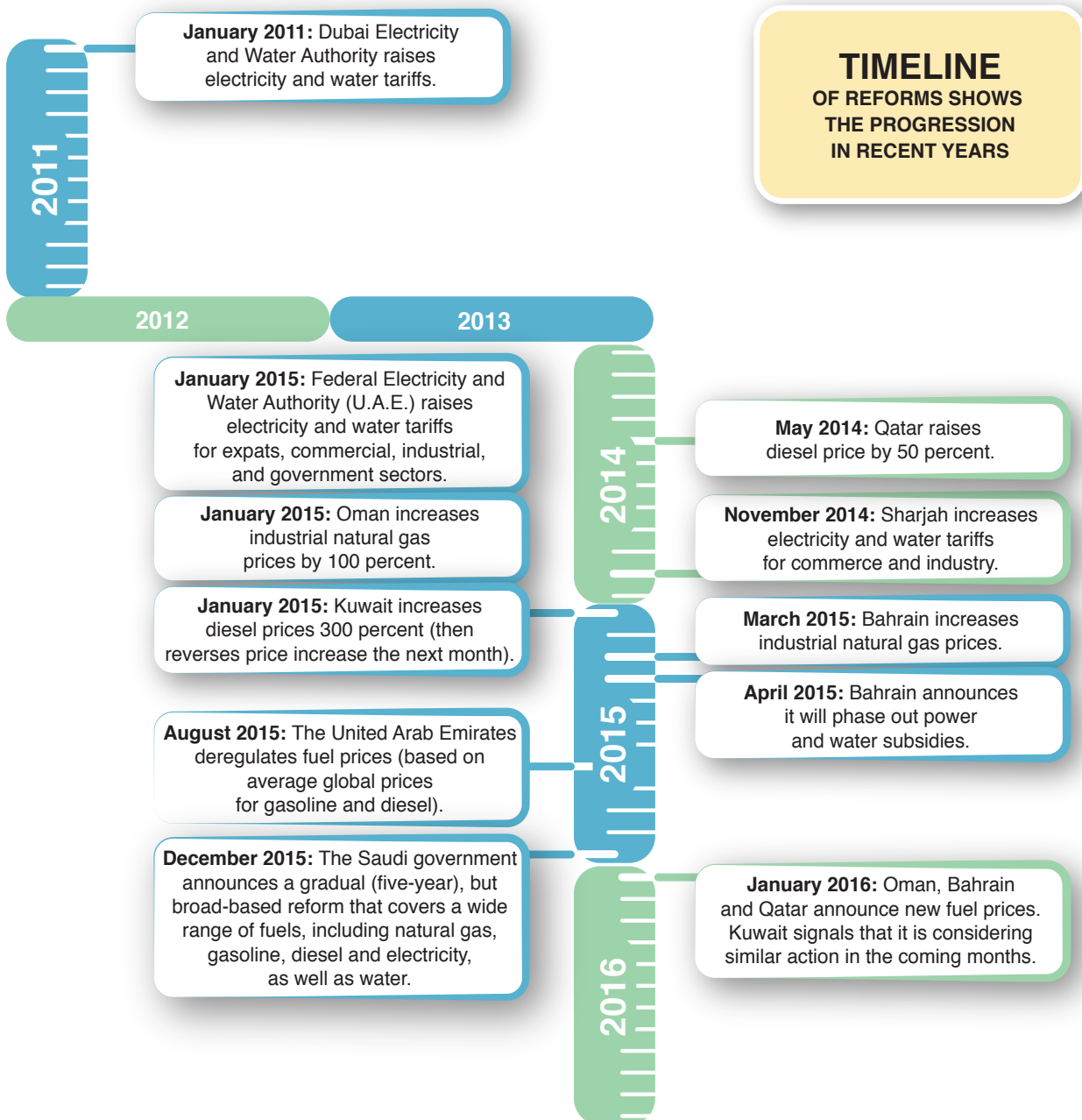


Table 1. Recent price changes across energy products in GCC countries.

	Gasoline (high grade)			Diesel (transport)			Natural Gas			Electricity (residential)		
	Sep-15	Jan-16	% Diff.	Sep-15	Jan-16	% Diff.	Sep-15	Jan-16	% Diff.	Sep-15	Jan-16	% Diff.
	U.S. dollars per liter						U.S. dollars per MMBtu			U.S. dollars per KWh		
Bahrain	0.27	0.42	56	0.27	0.31	15	2.50	2.50	-	0.01 - 0.04	0.01 - 0.04	-
Kuwait*	0.21	0.21	-	0.39	0.36	-8	1.50	1.50	-	0.03 - 0.03	0.03 - 0.03	-
Oman	0.31	0.42	35	0.38	0.42	11	3.00	3.00	-	0.03 - 0.08	0.03 - 0.08	-
Qatar	0.27	0.36	33	0.41	0.27	-34	0.75	0.75	-	0.02 - 0.06	0.02 - 0.06	-
Saudi Arabia	0.16	0.24	50	0.07	0.12	71	0.75	1.25	67	0.01 - 0.07	0.01 - 0.08	0 - **
UAE	0.53	0.43	-19	0.51	0.44	-14	0.75	0.75	-	0.06 - 0.10	0.06 - 0.10	-
United States	0.53	0.59	11	0.64	0.58	-9	2.70	2.54	-6	0.13	0.13	-

Source: Prices in GCC countries come from GlobalPetrolPrices.com, government agencies, and country authorities. Price figures for the USA on gasoline, diesel, natural gas price (Henry Hub Natural Gas Spot Price, September 1, 2015), and electricity tariffs come from U.S. EIA. MMBtu stands for million British thermal units, KWh for Kilowatt-hour. Electricity tariffs for the UAE are for Dubai.

* The Kuwaiti government announced on January 17, 2016 that it also intends to cut subsidies and raise energy prices in the near future.

** Saudi Arabia electricity prices are based on a progressive tariff structure. While there is no change for the first 4 MWh/month consumed by the household, there is a 66.56% increase for 4 to 6 MWh/month. For 6-7 MWh, that increase is 100% but only once this level of consumption is reached. For instance, even if an household did consume 7 MWh in a month, it is not equal to a growth in cost of 100%. Rather, the first 4 MWh would still be at the same price and 4-6 MWh would be at a rate 66.56% higher.

Impact of the Recent Energy Price Increase

The Saudi government announced that new energy prices would apply at the beginning of 2016, including price increases of 133 percent for ethane, 67 percent for methane, 40 percent for electricity and water and 50 percent for gasoline, as well as a reduction in the discount on heavy feedstock from 28 percent to 20 percent. As a result, several Saudi companies were quick to announce the impact of these new energy prices on their operating costs and revenue. While some experts assume that companies will cut or streamline expenses to cope with the new energy prices, others say that the only way they can compensate is by improving efficiency. More specifically:

The state-owned oil producer Aramco stated that it expects to maintain its profit margins, with no potential impact on the company's financial results.

Petrol station operators Aldrees Petroleum and Transport Services Company and Saudi Automotive Services Company (SASCO) indicated that they will raise oil derivative prices in line with the Kingdom's new policy.

The Saudi Basic Industries Corporation (Sabic), one of the world's biggest petrochemical producers, announced that annual costs would rise by 5 percent next year as a result of the new energy prices and the effect would be felt as soon as the first quarter of 2016.

PetroRabigh, a joint venture between Saudi Aramco and Japan's Sumitomo Chemical, stated that it does not expect to be immediately hurt by subsidy reforms. It projects, however, the impact could reach 300 million Saudi riyals next year.

The National Gas and Industrialization Company (GASCO), expects little impact on their business as price changes do not extend to households' gas cylinders.

The Saudi Arabian Mining Company (Maaden) believes that it will be affected by the subsidy cuts, given that it relies mainly on power and natural gas to operate its phosphate and aluminum plants.

The state-owned utility Saudi Electricity Company (SEC) projects that higher power tariffs will drive revenues. It expects, however, that rising fuel costs incurred to produce electricity will broadly offset the higher revenues.

The Saudi Cement Company expects an impact on their operating costs and revenue. In fact, Saudi Fransi lowered the 2016-2017 profit forecast for the cement maker by 18 percent. The Bank estimates that 2016's net profit will drop 25 percent year-on-year, with the financial impact of the new higher energy prices expected to reach 67 million riyals, or 9 percent of the expected net income.

The National Industrialisation Company (Tasnee) estimates that the effect of new energy prices on its results will be about 190 million riyals next year. It stated, however, that streamlining expenses and improving efficiency could help to offset the cost increases.

Agricultural firms also expect to be impacted by the surge in diesel prices. The Al Jouf Agriculture Development Company estimates that higher energy prices will cost the company 32 million riyals a year; 6 million riyals of which will be indirect costs. The company also announced plans to increase efficiency to lessen the impact on its profit.

Source: Thenational.ae (Jan 3, 2016); Argaam.com (Dec. 29-30, 2015).

Conclusion

Falling oil and natural gas revenues have brought renewed attention to energy price reform in GCC economies. The issue is challenging, but it has brought to light opportunities for further collaboration among GCC member states. The GCC countries can explore different pathways for reforming energy prices to address negative externalities, resulting in more efficient production and consumption of energy and a positive contribution to a nation's finances. An environment of low oil and natural gas prices is an opportune time to introduce energy price reforms because the shock of price increases to stakeholders can be smaller compared to introducing reforms when world energy prices are high.

The objectives of the workshop were to discuss opportunities and challenges for cooperation in reforming prices in three segments of the energy value chain. The main insights from the discussions are the following:

Domestic energy-intensive industries – such as petrochemicals – have long benefited from government aid in the form of low natural gas prices that has helped them remain competitive in the global market.

Trading natural gas among GCC countries could bring joint gains while allowing the petrochemical industry to maintain its competitiveness.

Although domestic pricing distortions create obstacles to determining fair trading prices between countries, the power generation sector could gain tremendously from electricity trading, especially since an interconnected network is already in place.

Dubai has successfully reformed residential electricity prices. However, this success may be partially due to Dubai's expatriate population accustomed to paying higher electricity tariffs in their home countries.

Tunisia provides an example of how to plan a price reform scheme without causing angst over higher prices in the population or disrupting industry.

About the Workshop

KAPSARC convened the workshop in September 2015 with some 30 international and local experts to facilitate a dialogue on reforming energy prices in Gulf Cooperation Council countries. The workshop was held under Chatham House rules. Participants included:

Naif Alabbadi – Director General, Saudi Energy Efficiency Center

Samer AlAshgar – President, KAPSARC

Majid Aldraehim – Research and Innovation Manager, Ministry of Communications and IT

Nayef AlMusehel – Senior Research Associate, KAPSARC

Nourah Alyousef – Associate Professor, King Saud University

Andy Barrett – Senior Associate, IHS

Moncef Ben Abdallah – Former Minister of Industry and Energy of Tunisia

Leila Benali – Saudi Aramco

Salman Dossari – Saudi Aramco

Ahmed Al-Ebrahim – CEO, GCC Interconnection Authority

Mohammed Al Enzi – Director, Kuwait Institute for Scientific Research

Bassam Fattouh – Director, Oxford Institute for Energy Studies

Steve Griffiths – Vice President for Research, Masdar Institute of Science and Technology

Abdulrahman Al-Guaizani – International Olympiad General Director, Mawhiba

David Hobbs – Head of Research, KAPSARC

Malek Kabariti – Former Minister of Energy of Jordan

Ahmed Khalifa – Professor, Qatar University

Ryad Al-Khareif – Head of Studies Division, Saudi Arabian Monetary Agency
Nouredine Khelifa – Advisor of Deputy Minister for Electricity, Ministry of Water and Electricity

Marwan Khraishesh – Senior Research Director, Qatar Environment & Energy Research Institute

Glada Lahn – Senior Research Fellow, Chatham House

Suleiman Abu Lehyah – CEO, Bawan Company

Ahmed Al Mubarak – R&D Sector Director, Saudi Electricity Company

Frederic Murphy – KAPSARC Visiting Fellow, Temple University

Axel Pierru – Program Director, KAPSARC

Nasser Al-Qahtani – Deputy Governor, Electricity Co-Generation Regulation Authority

Shahid Rahim – Senior Engineer, Saudi Electricity Company

Saud Al Rashed – Advisor, Ministry of Water and Electricity

Matthew Shouler – First Secretary, British Embassy

Yousuf Al-Turki – Dean of Scientific Research, King Abdulaziz University

Hamad Nasser Al Washmi – Performance Manager, Saline Water Conversion Corporation

David Wogan – Research Associate, KAPSARC

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About the Team



Sylvain Côté

Sylvain is a senior research fellow in the Energy Systems Modeling and Economics program specializing in macroeconomics and labor market analysis. He previously worked at the Organisation for Economic Co-operation and Development and the North American Commission for Labor Cooperation.



David Wogan

David is a research associate in the Energy Systems Modeling and Economics program specializing in developing energy systems models. He holds master's degrees in mechanical engineering and public affairs from UT Austin.

About the Project

The workshop series “Energy Systems Modeling” provides a forum for discussing key sustainability issues in transportation, and current policy strategies to address them. In particular, much emphasis is placed on the adoption of fuel-efficient and alternative-fuel vehicles for road transportation, innovation in fuel and vehicle technology mixes and the shift from road to other modes of transportation.



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