

# Electricity pricing reform

A bitter pill for GCC industries

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#### **EXECUTIVE SUMMARY**

The current electricity pricing policy in Gulf Cooperation Council (GCC)<sup>1</sup> countries is unsustainable. It is characterized by significant subsidies to end users and growing demand. The region needs reform to achieve its ambitious industrialization agenda and have an economically viable electricity sector. However, there is an objection to pricing reform: that it will put large industrial companies at a competitive disadvantage.

Counterintuitive though it may appear, properly structured electricity pricing reforms can actually make electrical systems economically viable while also helping grow the region's industrial base. To achieve these dual goals, tariffs must closely reflect the underlying costs that different types of users put on electrical systems.

Specifically, large end users — industries that consume significant electricity at steady base loads with little or no variability throughout the year — have a very low cost to serve and should thus pay a lower tariff. In contrast, companies that consume less power but have large spikes in demand should pay a higher tariff, to cover their correspondingly large share of the costs from expensive peaking and cycling power generation assets. Electricity makes up a much smaller share of the overall costs for this second group of customers. They have various options for mitigating the increase, such as becoming more energy-efficient, reducing costs in other areas, or passing on modest increases to their consumers.

Such reforms could lead to opposition, but governments can use targeted support for affected groups, giving them time to adjust to higher tariffs. Electricity tariff reform will spread the cost of power generation, transmission, and distribution infrastructure and operation more equitably among the full range of users, while ensuring that large industrial companies remain competitive.

<sup>1.</sup> The GCC countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

#### THE DIFFICULTY OF WEANING FROM POWER SUBSIDIES

The prevailing philosophy of electricity pricing in the GCC arose during the oil boom of the 1970s, amid a surplus in government revenues, and in the context of smaller and poorer populations. Subsidized electricity was an effective means of channeling some of the surplus to industry and citizens. An overabundance of hydrocarbons led policymakers to regard fuel as essentially a free means of improving the quality of life and welfare for citizens, creating wealth, and building the national economy.

Today, subsidies for electric power have changed from a success to a problem because many users now depend on them. By keeping prices artificially low, subsidies have boosted overall demand. There is now roughly 70 Terawatt-hours per year of unnecessary demand, according to our estimates, or about 11 percent of the current electricity demand in GCC countries. In addition, subsidies have reduced the impetus for end users to become more efficient in their energy consumption and have affected choices in the design of the electrical grid and electricity consuming equipment (see *Exhibit 1*).

#### **EXHIBIT 1**

#### Price reform can lead to lower consumption

GCC power demand adjusted for potential efficiency gains and conservation (in Terawatt-hours)



Source: Abu Dhabi, Regulatory & Supervisory Bureau; Bahrain, Electricity and Water Authority; Kuwait, Ministry of Electricity and Water; Oman, Authority for Electricity Regulation; Qatar, Kahramaa; Saudi Arabia, Electricity & Cogeneration Regulatory Authority; Strategy& analysis

In the current fiscal environment, such policies are no longer affordable. We estimate that the electricity subsidies have cost GCC countries more than US\$120 billion over the past 20 years. Leaving these policies in place until 2030 would cost an additional \$150 billion as demand increases.

Recent developments in the region have made the problem starker. The push to industrialize GCC economies and to bring manufacturing supply chains to the region, along with increasing electrification of industrial processes, is creating soaring industrial demand for electricity. At the same time, population growth and quality of life improvements in the context of the GCC region's hot and harsh climate have translated into an ever-rising residential demand for electrically powered cooling and refrigeration. Although residential tariffs are important, this analysis focuses on commercial and industrial tariffs as they have a different political and social calculus.

For the first time in the history of the region, policymakers need to make tough economic choices about how to remove subsidies for the different end users of electricity. The dual goals of making the electricity sector self-sufficient and industrializing the economy would seem to be in opposition. Several aspects of electricity compound the challenge for policymakers. (See *Electricity: A commodity unlike any other.*)

# Electricity: A commodity unlike any other

Any reform in electricity subsidies must take into account some of the technical characteristics of electrical power and how those shape the dynamics of power systems.

- Currently, electricity cannot be stored economically: it must be generated, transmitted, and consumed instantaneously. As a result, electricity systems are sized for peak demand rather than average demand. Consequently, not all power generation assets operate the same way.
- Some assets operate to deliver base-load power. They are fully utilized across all four seasons, day and night, for more than 80 percent of a given year (7,000 hours a year).

- Other assets operate only when demand peaks, typically just a handful of hours a year. However, these assets are a necessary part of any electrical system that meets demand with high reliability and the lowest cost possible.
- Different types of electricity customers have different demands for base-load and peak assets, depending on how they consume electricity. All users consume base-load power, and should bear the cost of those assets. Only some customers, those with highly variable demand, require that electrical systems build and maintain the capacity to meet the simultaneous maximum demand of all users.
- Any reforms should take into account the relative use and cost of these varying types of assets by different customers.

#### A PRESCRIPTION FOR TARIFF REFORMS TO POWER INDUSTRY

Any new policy framework for electrical power pricing in the GCC needs to meet two broad criteria.

- It must ensure that the electricity sector is financially sustainable, in that aggregate revenue for the system needs to cover the full cost of current operations and fund future growth.
- Tariffs charged to individual users should reflect the cost that they each impose on the system.

GCC countries seeking to reform electrical power tariffs can meet both of these criteria provided that they categorize companies in two groups, based on the costs that they impose on the electrical system and on the role that electricity plays in the cost structure of each group.

#### Energy-intensive industries should pay a lower tariff

The first group includes energy-intensive, export-focused industries such as aluminum smelting, cold storage and refrigeration, data centers, and inorganic heavy chemical production. This is a relatively small group of customers. They consume a significant amount of electrical power, but their consumption is steady and at high voltage. This makes them significantly less expensive to serve than other types of customers, yet in many GCC countries, industrial customers actually pay tariffs that are higher than the average system cost (see *Exhibit 2*). For that reason, any subsidy reform should reduce the electricity tariffs that this first group pays — not merely to the average system cost but at least 25 to 35 percent lower.

#### **EXHIBIT 2**

Large industrial users can pay higher than average tariffs for electricity Comparison of industrial and weighted average tariff, US cents/kWh, 2018



Source: Abu Dhabi, Regulatory & Supervisory Bureau; Bahrain, Electricity and Water Authority; Kuwait, Ministry of Electricity and Water; Oman, Authority for Electricity Regulation; Qatar, Kahramaa; Saudi Arabia, Electricity & Cogeneration Regulatory Authority; Strategy& analysis

That is a counterintuitive approach: customers that use more power should pay lower rates. However, it makes sense, for several reasons. These are the industries that can help GCC governments hit their ambitious industrialization goals. They are also the most sensitive to electricity prices, in that electricity is a huge contributor to their costs — the single biggest line item for many of them. Accordingly, governments should limit the burden of energy price reforms on them.

Most important, the key consideration in this approach is not just the amount of power that they consume, but the way they consume it.

- They do not require the addition of cycling and peaking generation units with low utilization rates.
- They utilize their portion of the electricity transmission grid assets fully with minimal variation between peak and lowest demand.
- They are directly connected to the high-voltage network and thus do not require investments in an electrical system's medium- and low-voltage networks, as do other commercial and residential customers.

These customers should pay a lower tariff because they require less in the way of generation, transmission, and distribution infrastructure, and cost less to serve.

#### Other users should pay higher tariffs

The second group of customers, non-power-intensive industries and commercial users, should pay higher tariffs that reflect the higher costs they impose on the system. As this is a much larger group, the actual increase to any individual customer will be manageable because the increased system costs can be spread among them.

In addition, electrical power is, by definition, not a major component of the cost structure for companies in this group (see *Exhibit 3*). For that reason, compared to the large industrial customers in the first group, they are better able to absorb higher tariffs. They also have several mitigation measures they can apply. For example, they can lower their costs by becoming more energy efficient and implementing conservation initiatives. They can also reduce costs in other parts of their business, such as labor and raw materials. Also, they can pass along the relatively small increase to their customers.

#### **EXHIBIT 3**



**Higher electricity prices will not affect all industries in the same way** Electricity cost as a percentage of gross value added (selected examples)

Note: Gross value added is based on operating expenses excluding the cost of raw material. Source: Strategy& analysis

#### Benefits for electrical systems and industry

This policy makes both electrical power systems and industrial companies more capital efficient.

On the electrical side, the policy encourages the growth of "always-on," base-load demand (as a share of total demand) and curbs the growth of cycling and peaking demand. Over time, it will reduce the peaks in electricity demand and increase the overall utilization of power generation and transmission assets, bringing down the average system cost for all end users.

On the industrial side, this policy encourages power-intensive industries to plan and size their production capacity more accurately, to ensure that the plants operate with full utilization and no seasonal swings in production. Companies will no longer be able to build a business case based on investments in sub-scale, variable output plants. In that way, it eliminates wasted capital, a key objective for developing economies.

#### MAKING THE TRANSITION MORE PALATABLE

Cost-reflective tariffs pose a social challenge to GCC countries. They could create a perception that the policy unfairly favors a few large industrial interests at the expense of many smaller interests. To succeed, any cost-reflective policy needs to consider the perspective of smaller non-energy-intensive industrial and commercial users, and incorporate several measures to mitigate the impact on users that face higher tariffs.

For example, governments can offer some level of financial support to help these users cover the higher costs, such as paying for some fixed connection charges. Governments can also help fund the installation of more energy-efficient equipment or other measures during a transition period of several years, giving users time to make the necessary internal changes to adapt.

In addition, tariff reforms will be more palatable if they are transparent and easily understandable by users. For that reason, the actual tariff structure should involve simple adjustments to metering and billing infrastructure and processes, with sufficient communication by government to explain the change and how it will be implemented. There should be a practical limit to the number of tariffs to reduce complexity. Tariffs should be differentiated by customer categories, voltage levels, time of day, and geographic regions.

Finally, policymakers can mitigate the impact of tariff reforms by phasing them in over time, thereby approaching the optimum price over years, without subjecting users to unfair shocks and large abrupt price changes. Regulators should expect to assess and revise tariffs over time, in response to evolving market realities.

#### CONCLUSION

Current electric power tariffs in the GCC are unsustainable, in light of growing demand, but any reforms need to be crafted in such a way as to support the ambitious industrialization plans that many governments have in place. Simply charging all users a higher tariff will not work. Rather, governments should charge tariffs that more accurately reflect customers' actual cost to serve. Proper policy reforms should actually lower the tariff that key industries pay, making them more competitive and boosting countries' industrialization agenda. Governments can smooth the implementation process by anticipating possible opposition and proactively taking steps to mitigate the economic shock non-industrial users face; for example, by offering financial support during a transition period. Overall, cost-reflective tariffs will lead to an electricity sector that is financially self-sufficient and will boost the industrialization of GCC economies — a policy reform from which all sides will benefit.

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