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Al-Bayan Center for Planning and Studies

Electricity generation in Iraq Problems and solutions

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Introduction

Meeting energy needs in a manner that achieves security for Iraq has become a major source of concern for the electricity sector in the country; with the industry claiming that it lacks the capacity to meet current peak demand, especially with production running at about 50% of the country's requirements. There is little doubt that over the coming years peak demand for electricity will greatly exceed the capacity of existing power stations. In view of the aforementioned, the need for the construction of new power stations has never been more pressing, however, it will not be without certain obstacles, most significantly the availability of fuel and other unforeseen technical problems, such as breaches of the contracts for the construction of new power stations.

Iraq's electricity generation problems are not new. Historically, the country has suffered from severe power shortages since 1990, which were further compounded after 2003 by the unworthiness of the old power generation plants and the acts of sabotage during the intervening years. All this culminated in prolonged power cuts lasting anything between 14–20 hours a day; forcing ordinary people to rely on private

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neighbourhood generators and/or small household generators, both of which have added a considerable financial burden on people.

Iraq's current electricity generation capacity

In 2010, Iraq's demand for electricity was estimated at 57 TWh (TW (terawatt) is the largest unit used for measuring electrical power generation on a national scale. $1 \text{ TW} = 10^{12} \text{ Watts}$), at a time when the country was unable to supply more than 58% of its the energy needs, i.e. only about 33 TWh. Studies indicate that demand for electricity will multiply and reach as much as 170 TWh by 2035 as a result of economic and population growth. It is also estimated that over the next 20 years, demand for electricity will be divided almost equally between domestic and industrial usage¹.

Water usage in the energy sector

Water is seen as an important determinant of Iraq's future prosperity, as both economic and population growth will lead to an increase in demand for water and energy resources. As such, water scarcity is understandably a source of concern for the future, with the inflow of water from the Euphrates and Tigris rivers expected to continue to decline in the coming years. According to reports by the International Energy Agency (IEA), water usage to support the activities of the energy sector (oil and gas production and electricity generation) accounted for no more than 1% of Iraq's total consumption in 2015 and is not

1 - Iraq energy outlook, p:84.

expected to be a decisive factor in the water strategy. Gas turbines, particularly those used in combined-cycle power stations, have lower water requirements when compared to many other technological alternatives, including oil-fired power plants. The development of hydroelectric power in Iraq will be closely linked to the type of water policy adopted by any future administration.

Notwithstanding, water is likely to become an important factor in Iraq's overall energy strategy – especially in the south of the country – where water is injected to maintain oil production, but where also freshwater supplies remain relatively scarce. In order to reduce the excessive demand on freshwater resources in the south, it is necessary to invest early and continuously in bringing future water supplies inland from the Gulf to meet energy needs. Iraq is expected to invest in desalination capacities to help meet the increasing demand for potable water, but the volume and timing remain uncertain².

Importing electricity from neighbouring countries

Iraq currently imports approximately 1300 MW of electricity from Iran through four high pressure power lines: 400 MW via the Khorramshahr-Basra line; 400 MW via the Karkh-Amara line; 400 MW via the Kermanshah-Diyala line; and 130 MW via the Serpil-Zahab-Khanaqin-Diyala line. Iraq also imports 100MW of electricity from Turkey. All the imported electricity goes towards helping increase

2 - Iraq energy outlook, Ibid, pp: 102-103.

the hours of available power supply for Baghdad, Basra, Maysan and Diyala.

Iran's electricity exports to Iraq were interrupted several weeks ago, largely due to the accumulation of unpaid debts by the Iraqi side, but also as a result of other technical difficulties, according to the Iranian Ministry of Electricity. However, exports resumed again last week. Iran's energy minister Reza Ardakanian confirmed that, "Iran has resumed the export of electricity to Iraq, Afghanistan and Pakistan after the electricity crisis, which Iran faced recently, was resolved." Ardakanian also added that the Islamic Republic is now implementing its commitments for exchanging energy with neighbouring countries³.

There is a new offer on the table from Saudi Arabia to finance Iraq's power needs, which includes the construction of a power station in the Kingdom within one year of an agreement being signed. The station is designed to produce 3000 MW of electricity. In this regard, Iraq is waiting for a response from Saudi Arabia regarding their proposals for cooperation in the field of energy⁴.

3 - Iran resumes exports of electricity to Iraq, Afghanistan and Pakistan; IRNA.

4 - Following the interruption of supplies from Iran ... what are Iraq's alternatives for securing electricity?

Future challenges facing Iraq's energy and electricity consumption

Over the coming years, the rapid increase in oil production capacity will spur an increase in GDP to a level five times higher than today's 100 billion dollars; with GDP expected to rise to about 500 billion dollars by 2035. Iraq is expected to experience GDP growth of over 14% annually over the period until 2020, whilst averaging nearly 8% growth per year over the projection period as a whole⁵.

However, the significant increase in demand for both liquid and gas fossil fuels to meet the diverse electricity, power and water generation requirements are likely to reduce the volume of oil available for export to 2.7 million bpd in 2020 and to 3.8 million bpd in 2035⁶. This means that electricity generation projects will be delayed or postponed, something that will pose a major challenge in the future and furthermore, impair the optimal utilization of hydrocarbon wealth and also threaten the main source of revenue which the state relies on to achieve sustainable development.

Rapid economic growth will drive energy demand even further in the future; by a factor of four over the coming years, peaking dramatically in 2035. It is not expected that the additional capacity planned by the Ministry of Electricity will meet the forecast electricity and water

5 - Iraq energy outlook, p:103

6 - Ibid, p:10.

consumption, especially in light of the ambitious new housing projects planned over the foreseeable future. This means that Iraq will be unable meet the additional demand for electricity, although it may just succeed in plugging the gap.

Current energy consumption patterns and consumer behaviour are unsustainable and will eventually lead to the depletion and exhaustion of the available energy resources. The main reasons may be enumerated as follows:

1. The electricity tariff and subsidy policy currently in force and the lack of public awareness of the burden in this regard.
2. The absence of an effective consumer watchdog to ensure that the rights, interests and needs of the electricity consumer are applied to new and future cities.
3. The failure to disseminate a culture of rationalisation in the consumption of electricity and water at all levels of industry and government; as well as commercially and domestically.
4. Dependence on fossil fuel plants, instead of relying on renewable energy sources for the generation of electricity.

Risks attending delays in finding the appropriate solutions

Based on the above, to postpone tackling these practices and challenges will result in the following risks:

1. Exhausting a large proportion of oil revenues on investment expenditure to provide fuel for the production of electricity.
2. Public budget deficit due to lack of oil revenues. The domestic consumption of fuel required to generate electricity is expected to consume a high proportion of total oil production by 2030.
3. Failure to achieve sustainable development through the optimal investment of hydrocarbon wealth over the coming years.

Urgent steps which must be taken to meet current and future challenges

There is an urgent need to take the following steps to achieve sustainable growth:

1. Integrate sustainable energy objectives, plans and strategies within national development strategies and policies, and achieve complementarity between the country's energy sector and national development policies.
2. Improving the efficiency of both energy production and consumption; and placing all national resources on a clear strategic footing in order to deal with the impending electricity and water crisis.

3. Changing unsustainable patterns of energy consumption, which in turn lead to the depletion and exhaustion of energy resources.
4. Reforming the electricity and water tariff structure in line with international standards, including placing consumers at the heart of service delivery, and to observe public service standards in the energy sector.
5. Reforming urban planning procedures and building regulations in line with international standards, and to have regard to special thermal insulation standards in the construction of residential units and putting in place guidelines for the optimisation of electricity and water consumption.
6. Using solar energy to generate electricity, as well as other forms of modern renewable energy sources, and minimizing the use of oil and gas derivatives in the generation of electricity and water.
7. Building the necessary capacities and expertise to implement R & D programmes and in the domestic production of gas, in order to achieve self-sufficiency with fuel sources and not to rely on external sources.

Conclusion

The search for solutions to the electricity crisis in Iraq requires exceptional and diligent work; thus, new foundations must be established for the monitoring and evaluation of the performance of government departments, especially those of the electricity sector. Although oil production will be a key indicator of Iraq's energy performance in the coming years; however, any future progress in developing the gas sector is likely to require a more concerted effort from state players.

The energy sector, more than any other sector, presents challenges for national policy coordination, requiring the continuous availability of energy as new sources of demand (in the generation of electricity and by industry) grow, even whilst taking into account the growth in modern refining capacity. Should Iraq fail to manage these challenges, a range of missed opportunities across the sector will come into play that could lead to increased domestic demand for oil – with additional consequences for oil exports and Iraq's financial position.

However, if Iraq succeeds in developing its energy sector, this will represent a major step in pushing the country away from direct dependence on oil; whilst also providing an indication of the availability of institutional capacity to meet the other challenges facing Iraq's energy sector and its economy.

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