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GCC Energy Sector – Quarterly Review

December 2011



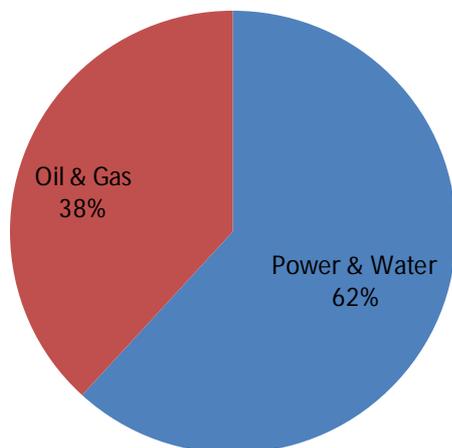
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Introduction

Putting aside fears of whether the impending global economic depression would leave a negative mark upon the future, the GCC energy sector had remained buoyant and upbeat with encouraging developmental initiatives in the last quarter of 2011. Leading the massive expansion plans is the global hydrocarbon leader Saudi Arabia with its commitment to invest over US\$100 billion on solar and nuclear energy plants over the next few years. Saudi Arabia plans to issue its first tender for nuclear power plant by 2012 which is likely to be followed by another 15 such plants thus reaching its target of 16 nuclear energy plants in the near future. Following closely is Qatar that had recently announced its construct a US\$ 1 billion polysilicon production facility which is likely to produce 8000 MTPY (metric tonnes per year) of high purity solar grade polysilicon and is scheduled to commence operations in the second half of 2013. Despite financial hurdles impeding economic development, UAE is also firmly committed to this expansion drive with its plan to develop nuclear power grid worth US\$ 30 billion. Continuing the trend set in the last quarter, contractor awards in energy sector witnessed increased focus on the utilities sector as depicted in figure 1 below

Figure 1: GCC Energy Contractor Awards split by sector, Sep - Nov, 2011



Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

The three months of September to November 2011 witnessed energy contracts worth US\$ 7528 million being awarded across countries in GCC. Augmented efforts to plug the demand supply gap led to GCC governments awarding contracts worth a whopping US\$ 4653 million in its utilities sector thus representing a share of 62 percent of the total GCC energy contracts awarded in the three months spanning September

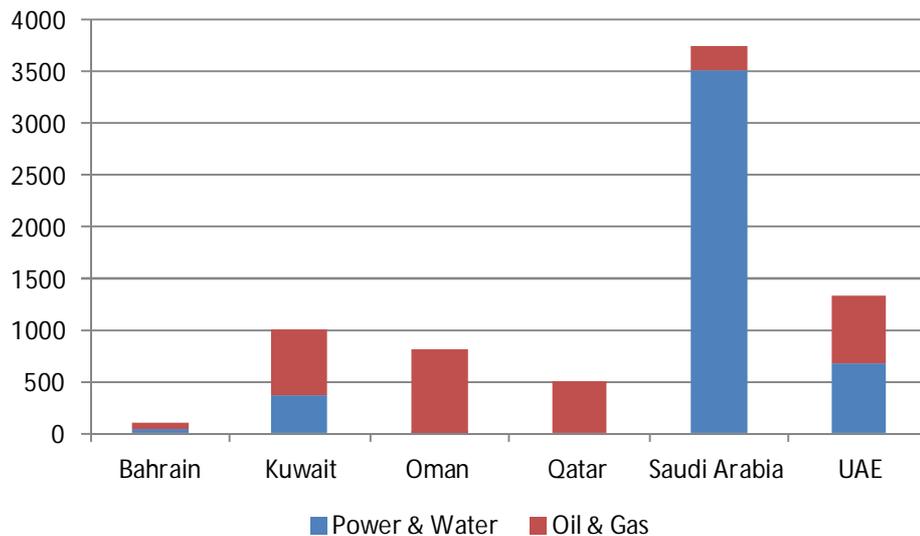
to November 2011. Recent announcements in the power and water arena include Saudi Arabia awarding US\$ 300 million worth of power contracts where in Saudi Electric Company (SEC) had commissioned US giant General Electric (GE) to supply 13 gas turbines and associated services for the expansion of six power plants in the kingdom. The expansions will add nearly 800 megawatts of power to the Saudi grid by the summer of 2013, in time to support peak electricity demands and reduce the risk of blackouts. In a related development South Korea based Hyosung Power & Industrial Systems Performance Group, has signed a 270bn won (\$233m) contract to build eight electricity substations in Qatar. Under the contract, Hyosung Power and Industrial Systems, a leading electrical equipment and industrial machinery provider, will build six 220-kilovolt and two 66-kilovolt electrical transformer substations by the end of 2013.

Contracts awarded in the upstream and downstream oil and gas sectors including pipeline works amounted to US\$ 2875 million thus representing a share of 38 percent of total energy contractor awards during September to November 2011. Global Oil demand is likely to witness a protracted growth due to a worsening economic outlook even as supplies increase thus leading to a balanced oil market through 2012. The International Energy Agency (IEA) cut its oil demand outlook for 2011 and 2012 by around 200,000 barrels per day (bpd) due to a more precarious economic backdrop. Oil demand is set to grow by 730,000 bpd in 2011 to 89 million bpd, which is 170,000 bpd lower than November's forecast. The IEA's 2012 demand growth forecast is 1.26 million bpd, 40,000 bpd lower than its previous forecast. Organisation of Petroleum Exporting Countries (OPEC) rose by 620,000 bpd to 30.68 million bpd in November, with Libya and Saudi Arabia accounting for 80 per cent of the increase. Despite the bearish outlook, oil prices witnessed an upward swing above US\$104 on account of worries on supply disruption after the US congress approved a bill imposing sanctions on Iran's central bank limiting buyer's ability to pay for oil from the Islamic Republic as well as fuelling speculations that further sanctions will curb supply from the second largest producer in OPEC.

As oil prices continue to stay above US\$100 a barrel significantly higher than the pre recession levels in 2008, energy sector in GCC is now desperately looking at alternatives to free their most precious commodity by resorting to alternative energy sources for their local power generation and water desalination facilities.

Figure 2 provides the country wide split of GCC Energy contractor awards during September to November 2011

Figure 2: GCC Energy Contractor Awards split by country and sector, Sep-Nov'11



Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

Accounting for a 50 percent share with contractor awards worth US\$ 3752 Mn, the Kingdom of Saudi Arabia was the largest amongst all GCC nations during the three months spanning September to November 2011. The global leader widely regarded as the fuel rescuer of the last resort had invested contracts worth US\$ 3513 Mn in its utilities sector and US\$ 238 Mn in its hydrocarbon sector. UAE with contractors awards worth US\$ 1346 Mn was the distant second largest followed by Kuwait with 13 percent share, Oman with a 11 percent share Qatar with 7 percent and Bahrain with a 2 percent share respectively.

The following chapters provide a comprehensive overview of the energy sector in the six GCC nations.

Saudi Arabia Energy Sector Overview

Home to the largest fuel reserves in the world, the fuel laden Kingdom of Saudi Arabia is the largest producer and exporter with over 264 billion barrels of proven oil reserves with substantial spare capacity that can be brought online at short notice. Its oil reserves are located in eight main fields including the giant Ghawar, world's largest oilfield, and Safanyaia, world's largest offshore oilfield. Saudi produces a range of crude oils, from heavy to extra light. Of Saudi Arabia's total oil production capacity, about 65-70% is considered light gravity, with the rest either medium or heavy. Saudi Arabia's natural gas reserves are estimated at 7.57 trillion cubic meters, making the country as world's 5th largest gas producer. Bulk of the country's gas reserves lies in Ghawar oil field, around 33.3%, in the form of associated gas, while other noticeable fields are Safiniya and Zuluf. In addition, 60% of Saudi Arabia's gas reserves are composed of

associated gas. Saudi Arabia's oil & gas sector operations are dominated by the state-owned oil company, Saudi Aramco. Saudi Aramco is the world's largest oil company in terms of proven reserves and production of hydrocarbons.

KSA Power and Water Sector

Recent updates in the power and utilities sector in Saudi Arabia includes the Saudi Water and Electricity Ministry commissioning a number of contracts worth over SR 539 million including the launch of an ultra modern sewage treatment plant worth SR 300 million. Commissioned by the Ministry of Water and Electricity the plant is to be located on the Al-Kharj-Riyadh Road and its daily production capacity is 200,000 cubic meters. The plant is environmentally friendly and has several advantages that allow it to produce 2.5 megawatts of electricity, which allow the project to cover its cost. The three-year project forms part of a strategy for sustainable management of renewable energy resources. The contract was awarded to a three-party consortium made up of Al-Orab Company, German BWT Company and the Austrian ILF Company.

Despite its ambitious expansion plans in the pipeline the kingdom faces imminent challenges in meeting its power demands. Actual power general capacity in the largest Arab economy reached 49,138 MW by the end of 2010, having risen at a 10 year CAGR of 6.7%, but overall consumption and peak load demand grew at 10 year CAGRs of 6.4 per cent and 7.7 per cent, respectively, amounting to 212,263 GW and 45,661 MW. This rapid pace of consumption has reduced the Kingdom's reserve generation capacity to a mere 7.6 per cent, just below the industry norm of 10-20 percent. Saudi Arabia needs to expand its power capacity and networks to support the Kingdom's ambitious industrialization plan, as well as meet its growing population demand. However, projects in the Execution and planning phase in the four years spanning 2011 to 2015 will amount to a total of 28,369 MW thus bringing the actual generation capacity to 76,487 MW resulting in a feasible reserve generation capacity of 15.4 per cent, by 2015. However the critical challenge in the execution of the commissioned projects lies in the artificially low tariffs in a highly regulated sector thus impeding profit margins and inefficient use of electricity. In its efforts to reduce subsidies and improve profitability, the Electricity and Water Ministry had revised the tariffs in July 2010 whereby Industrial and governmental consumer groups were subjected to higher rates, thereby cross-subsidizing residential subscribers who account for the largest share of demand. The second challenge in the power sector is the rising fuel consumption, as the government wishes to reserve crude oil for export purposes. The kingdom is tapping into alternative sources of energy, such as nuclear and solar power, as a means of providing a more sustainable portfolio of energy sources. The third challenge is the large amount

of funding required for SEC's projects and IPPs. The private sector's finance, operation and management of the Kingdom's power sector are considered essential if Saudi Arabia is to meet its demand requirements over the forecast period. The total expenditure for upgrading the transmission network is estimated at SR12.95bn annually over the next five years. As for expanding, maintaining and improving its distribution network, SEC is estimated to spend SR7bn annually over the same period.

Maintaining the right balance between fuel exports and meeting the escalating local demand for utilities, Saudi Arabia is now harnessing its potential in the alternative energy sources arena. Earlier in February 2011, the country agreed with France to cooperate in the development of nuclear energy in addition to utilizing geothermal, wind and solar power and is expected to allocate a sizeable portion of its US\$100 Bn energy plan to the development of alternative energy sources. The kingdom sees solar power and other non-hydrocarbon sources as crucial parts of a plan to boost generating capacity by 50 percent in this decade with the officials from the King Abdullah City for Atomic and Renewable Energy (KA CARE), the apex organization for promoting alternative energy expected to announce its guidelines and targets for solar generation at a conference in Riyadh later this year. Industry sources estimate the country to target 20 percent (equivalent to 18,000 megawatts) of its electricity demand to be met from renewable energy sources by 2030. Saudi Arabia can support a huge amount of solar generation, with the country's combination of sun and need for power at peak during mid day when sunshine is brightest. Saudi Arabia is already experimenting with solar power to desalinate water.

KA CARE confirmed its plans to build the country's first fleet of 16 nuclear reactors by 2030 in the first week of June 2011. At a cost of over US \$100 Bn this nuclear mega-project is the most lucrative energy contract in the Middle East and North Africa and over five times as large as the current nuclear contract from neighboring nuclear utility ENEC (Emirates Nuclear Energy Corporation) in the UAE. The total costs involved in this ambitious project could escalate to over US\$ 300 Bn by the time the final units get deployed in 2030. Saudi had already allocated US\$ 3 billion to produce solar energy panels in Jubail and Yanbu plants. Additionally Saudi Electric Company had signed contracts worth US\$ 300 million with US Giant General Electric to supply 13 gas turbines and associated services for the expansion of six power plants in the kingdom. The expansions will add nearly 800 megawatts of power to the Saudi grid by the summer of 2013, in time to support peak electricity demands and reduce the risk of blackouts.

Table 1 listed below highlights the major power and water contracts awarded in Saudi Arabia during the three months spanning September 2011 to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
PP10 Power Plant Conversion	1500	Sep 2011
Shuaiba 2 Power Plant	1300	Oct 2011
Water Transmission System in Makkah	150	Oct 2011
Maaden Aluminium Smelter - Electrical & Instrumentation Package	33	Nov 2011
Dynamic Reactive Power Compensator	24	Oct 2011
110 kV XLP Cable for Al Maabdah Substation	10	Nov 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

Saudi's top officials involved in determining the Nation's energy plans met with international manufacturers and solar energy developers in a summit in Riyadh on 27th and 28th of September 2011 to discuss the further steps involved in country's commitment towards solar energy. Thus with its commitments towards developing renewable energy sources to power its utilities sector firmly in place, the Kingdom of Saudi Arabia is set to explore every possibility in its capacity to remain the undisputed leader in the global hydrocarbon sector by establishing itself as a fuel lender of last resort under any crisis that may arise in future.

Saudi Arabia Oil and Gas sector

The global hydrocarbon leader will invest US\$ 125 billion in its upstream and downstream oil projects over the next five years to enhance its production capacity. State run Saudi Arabian Oil Co (Saudi Aramco) completed its previous capital spending program of more than \$100bn, which was then the biggest in its history. Saudi Arabia produced 10 percent more oil in the first half of 2011 compared with a year earlier earning a 26 percent increase in the kingdom's nominal gross domestic product. Saudi Arabia will spend about \$17bn developing the Manifa oil field as the national crude producer shifts focus to developing natural gas deposits and refining and petrochemical plants. Saudi Aramco will spend \$90bn expanding its refining and petrochemical assets, thus vying to be a "top-tier" producer of petrochemicals within the next decade. The Manifa field is set to begin producing crude in 2013. The primary focus of Saudi Aramco lies in downstream fuel projects as well as gas production. The country is seeking to produce more gas to run power plants and save more valuable crude for exports, with local electricity demand growing by about 8

percent, according to government figures. The kingdom used 8.1 billion cubic feet of gas a day. Aramco is boosting investment in gas exploration and will look for deposits in the Red Sea and for shale oil. The company plans to start drilling for gas in the Red Sea next year and may expand exploration to deeper water areas in later half of 2012. Aramco made a conventional gas discovery in the northwest of the kingdom that it is still evaluating. Aramco is developing the Manifa oil field to raise output of heavy crude, which is thicker and more difficult to refine. The company is planning three refineries to process the blend, which generally fetches lower prices on international markets compared with lighter grades. It is producing over 9 million barrels a day.

Table 2 listed below highlights the list of major Oil and Gas and pipeline projects awarded to contractors during the three months spanning September 2011 to November 2011 in Saudi Arabia.

Project Name	Project Value (US Mn\$)	Contractor Awards
Elastomers Plant at Kemya - Methyl Propanediol Plant	100	Sep 2011
Jubail Petrochemical Complex - Phase 3 - Polymers Compounding Plant	60	Oct 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

UAE Energy Sector Overview

The second largest oil and gas market within GCC, UAE is home to world's sixth largest oil reserves estimated at 97.8 billion barrels with its capital city Abu Dhabi blessed with abundant resource of hydrocarbons accounting for over 95 percent of the total oil reserves in the country. In 2010, UAE produced 2.85 billion barrels of Oil a significant 3.5 percent increase over 2009 production while domestic consumption remained at 682,000 barrels per day. Similarly Gas production in 2010 amounted to 51 billion cubic meters (BcM) whilst consumption increased to a whopping 60.5 BcM thereby leading the country to remain a net importer of natural gas despite being a significant producer. Increased domestic demand for electricity, the desalinization of water, growing demand from the petrochemical industry, and the need for an enhanced oil recovery (EOR) system based on natural gas injections in mature oil fields have caused the UAE's domestic demand for natural gas to rise.

Abu Dhabi, UAE's fuel capital representing a lion's share of 85 percent of nation's oil output and 95 percent of total oil reserves, faces challenges similar to Saudi Arabia in terms of conserving its fuel resources for exports and balancing the local fuel requirements for its utilities sector. Abu Dhabi's peak power production will exceed 10,000 megawatts (MW) for the first time next year, buoyed by its ambitious energy projects and exports to the northern emirates. Abu Dhabi has revised up its 2020 power demand forecasts by about 6,000MW to 28,000MW in the wake of an announcement by UAE President Sheikh Khalifa Bin Zayed al-Nahyan for increased investment in the Northern Emirates' power and desalination sector earlier this year. The emirate's peak demand in 2011 was around 9,800MW, up 14 percent over last year.

UAE Power and Water Sector

The Power and Water desalination Industry is typically characterized by a restricted source of supply struggling to accommodate to the escalating demand aroused by ever-increasing population and superior standards of living fuelled by booming petrodollar spending. Abu Dhabi's industry this year received more than 600MW, of which 500MW went to Abu Dhabi National Oil Company (ADNOC), which produces the bulk of oil in the UAE, one of the top five crude exporters in the world. Abu Dhabi's plans to raise its oil and gas production will quadruple power supplies to ADNOC by 2015. In 2015 electricity supply to ADNOC will rise to 2,000 MW due to new projects such as Shah Gas, Takreer and similar others. Residential and service sectors in Abu Dhabi received 6,140MW in 2011 while some 2,100MW of power was exported to the relatively poorer northern members of the United Arab Emirates - another factor driving Abu Dhabi's power generation higher. Abu Dhabi began exporting power to Bahrain in 2011. ADWEC's exports to Bahrain were 50MW in August and 100MW in September this year, accounting for 2 percent of total exports.

UAE is also one of the world's two largest desalination markets. The Emirate of Abu Dhabi has the highest per capita water consumption rate in the world, at 525 - 600 gallons a day (g/d). According to official estimates, the Emirate's total consumption of water resources exceeds its natural recharge capacity by twenty four times. In the UAE as a whole, desalinated water accounts for 80 percent of total water consumption. Demand for desalination products and services in the UAE are projected to increase 7.7 percent annually to US\$ 2.3 billion in 2013. Like many of the nations in the Gulf, the UAE is very dependent on desalted water for its water supply. The UAE's investments in water projects during the 2011 -2015 periods are estimated to be around US\$ 30 - 35 billion. The country plans to build 68 rechargeable dams in the 2011 -2015 periods to supplement the 114 dams in existence. A radical shift in Dubai's utility sector

investment came in the form its announcement of the first Independent Water and Power Project (IWPP) at Hassyan with a 454,000 m³/d desalination plant, Dubai in June 2011, whereby the emirate had amended the royal decree that set up the Dubai Electricity & Water Authority (DEWA) in 1992 to allow more IWPPs.

Table 3 described below highlights the major power and water contracts awarded to various contractors in UAE during the three months spanning September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Emal Power Plant - Phase 2	580	Sep 2011
Utico Power Plant in Ras Al Khaimah	50	Sep 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

Recent announcement in the power and water sector include announcement made by Dubai Electricity and Water Authority (DEWA) that it would reveal the contractor for its first private power plant in February 2012. DEWA has received four bids from international consortia to construct the Hassyan 1 Power Project with the capacity of 1,600 megawatts of which a consortium held by Abu Dhabi National Energy Company, Japan's Marubeni and South Korea's SK E&S Co Ltd is the lowest bidder for the estimated \$1.3bn Hassyan 1 independent power project (IPP). The selected bidder will own 49 percent of the project, while DEWA will retain 51 percent. This will provide for the future energy needs of the Emirate of Dubai, and takes into consideration all the procedures that can conserve and protect the environment. The Hassyan project is the first of six phases of the privatization program which has a target to produce 10,000 megawatts of electricity.

However, despite the UAE government's augmented efforts to boost power and water availability, the nation continue to face challenges in terms of shortage of utilities and dearer costs of natural gas imports to fuel its local demand. Despite suffering financial bottlenecks, the emirate is committed to develop nuclear power at a sizeable investment of US\$ 30 billion. Emirates Nuclear Energy Corporation is going ahead with plans to develop four nuclear reactors in the UAE even as other countries halt atomic programs after the March earthquake and tsunami in Japan caused radioactive material to be released from its Fukushima plant. Korea Electric, the country's biggest electricity producer, won a contract in 2009 to complete the plants from 2017 to 2020, which will make the UAE the first Gulf Arab nation with atomic power. Abu Dhabi will provide most of the \$10bn equity, and \$10bn of the debt is likely to come from export-credit agencies, mainly from South Korea. Additionally the state-owned utility had planned to build a 1,500 megawatt coal-fired power plant to cut the emirate's heavy reliance on a steady supply of imported

gas. But now it is considering doubling the size of coal-fired power station to 3,000MW. The emirate wants to diversify sources of power and improve efficiency over the next two decades to ensure its long-term energy supply. Dubai aims to generate 70 per cent of its power from natural gas and the rest from coal, nuclear energy and renewable sources. An annual production capacity of 10,000MW of power and 400 million gallons of water will be sufficient for the emirate over the next five years.

Similarly, Abu Dhabi stands out as the Gulf's leader in renewable energy and the emirate is now renowned the world over as a hub for sustainable power as a result of its multibillion-dollar plans to build a carbon-neutral Masdar City. The world's first 24-hour solar energy plant, consisting of reflective mirrors arranged around a central tower could shine in Abu Dhabi. Torresol Energy, a joint venture between Masdar and Spanish engineering company Sener, is studying the possibility of building such a plant in the capital. The project depends on approval and subsidies of the concentrated solar power (CPS) project from the Abu Dhabi government and funding from the banks. Gemasolar, which is based in Spain, is the world's first commercial plant to use the central tower technology that costs about €300 million (Dh1.4 billion). The cost of the plant here would depend on the size and energy needs of Abu Dhabi.

Abu Dhabi is home to the region's first commercial-scale photovoltaic solar project and will be the first in the GCC to develop a major solar-thermal facility when its 100MW Shams 1 project comes online. The Masdar City scheme, although massively scaled back from its original form, is indicative of the emirate's commitment to renewable energy. It will build on this reputation over the next decade.

UAE Oil and Gas Sector

The Oil and Gas sector in UAE is witnessing a period of protracted growth impeded by the onslaught of global economic recession. Oil and gas concessions lie at the heart of United Arab Emirates' energy strategy which aims to boost its oil production capacity to 3.5 million barrels per day from the current 2.7 million bpd. Following the acute power shortages in June, UAE is anticipated to witness more fuel shortages if no federal action is taken to assist petrol retailers carry the cost of subsidizing oil prices. The Gulf state has dragged its heels over increasing the cost of petrol in the wake of the Arab Spring, despite \$100 oil spurring more than six days of fuel shortages in June across stations. Dubai-owned Emirates National Oil Co (Enoc) broke ranks in June to criticize the government-set petrol cap and to lobby for a change in the system but the situation remains unchanged as of date. Three of the UAE's four fuel retailers – Enoc, its subsidiary Eppco and federally-owned Emarat - have made losses for many years. Adnoc has been largely unaffected

because its upstream operations and vertically integrated supply system allow it to absorb any potential losses. The UAE has long subsidized fuel prices in an effort to cut living costs for residents, at a cost of millions of dollars a year. The Gulf state increased prices twice at the pump between April 2010 and January 2011, but scrapped a third planned rise in the wake of regional political upheaval. Dubai, which is recovering from its 2009 debt crisis, spent just over AED5.7bn on various subsidies including energy and other transfers in 2010, according to International Monetary Fund data. Abu Dhabi spent AED22.2bn - but its budget is more than four times the size of Dubai's. The government has made efforts to offer short-term solutions to its retailers, including raising the capital of indebted fuel retailer Emarat by 50 percent to AED9bn (\$2.45bn) in June but such cash injections or other short term support will remain insufficient for retailers to maintain reliable fuel supplies over the next 12 months.

Table 4 listed below provides the list of various upstream and downstream Oil and gas contracts awarded to contractors in UAE during the three months of September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
NDC - Two Jackup Drilling Rigs	333	Oct 2011
Nitrogen Gas Injection at Habshan	160	Oct 2011
Debottlenecking of Das Island Crude Oil Processing Units	80	Sep 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

Thus the nation is currently forced to seek measures to ease out its domestic issues in the fuel front prior to embarking on its mission on boosting its output to emerge a sustainable economy.

Kuwait Energy Sector Overview

Similar to other countries in GCC, the energy sector in Kuwait too is driven by urbanization and growing population leading to an escalating demand for power and water thereby increasing pressure on the country's electricity and water supply. The demand on power in Kuwait has been growing at a rate of 5 to 7 percent per year and is estimated to reach 10 percent per year in 2011. Peak load for power is estimated to reach 10,500 MW this summer. If the same growth pattern continues, Kuwait would witness a national

peak load demand of 25,000 MW by the year 2025. This indicates that the Ministry of Electricity and Water (MEW) has to build an additional power capacity of 14,000 MW in the next 15 years to meet the national demand. Based on the current energy generation cost to upgrade power production by 14,000 MW the Ministry of Electricity and Water will have to spend around KD 7 billion. The hydrocarbon sector in Kuwait remains stable with Oil production estimated at 2.5 million barrels per day and natural gas production estimated at 1.1 BcF in 2010. Kuwait is planning to refine its production capacity over the next four years. The current refining output capacity is estimated at around of around 900,000 bbl/d and the new projects, which have a substantial cost associated with, would boost production rapidly. The projects involve the construction of new refineries and expansion of existing units and are designed to meet a steady growth in domestic consumption and external demand. These projects will have a sizeable increase in the country's refining capacity, but they are beset with challenges and obstacles, which could lead to postponement or abolition of some of them, mainly those related to new refineries. These obstacles include shortage of funding and low return on investment because refining ventures are normally not highly profitable.

Kuwait Power and Water Sector

The ever persistent problem of matching the limited supply to address acute water shortages remains the foremost challenge for the Kuwait utilities sector. In 2009, an estimated 1.5 million cubic meters of water was being consumed daily in Kuwait, dangerously close to country's maximum production capacity (1.51 million cubic meters of water a year). The Gulf state, like its neighbours in the United Arab Emirates and Saudi Arabia, has all but depleted their fresh water supplies and depend heavily on desalinated seawater to meet the demand of their growing population. The Kuwaiti Ministry of Electricity and Water has plans to add an additional 150,000 cubic meters daily this coming year, about a 10 percent increase in daily production. Even this was not expected to be adequate to keep up with the population growth and higher water demands. More capabilities were needed to meet demands in 2012 and 2013. The existing desalination plants in Kuwait are owned and operated by the Ministry of Electricity and Water and the market should be privatized to boost efficiency.

Table 5 listed below provides the major power and water projects awarded to contractors in Kuwait during the three months of September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Installation of 400 kV XLPE Cables in Sabah Al Ahmad	103	Oct 2011

Nine 132/11 kV Substations at Sabah Al Ahmad	79	Oct 2011
Eight 132/11 kV Substations at Sabah Al Ahmad - Contract 126	73	Oct 2011
Water Network and Storage Tanks in Kuwait - Phase C1	50	Nov 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

In June 2011, Kuwait Ministry of Public works and Ministry of State for Municipal affairs signed a contract at a cost of US\$96 million for building a sanitation line in Jahra. It includes establishing a new deep line to connect the new Jahra pumping station, currently under construction, and remove the current pumping stations, as well as Jahra plant for water treatment. It also includes building new sanitation and linkage lines between the areas of Al Jahra governorate on a main line at the length of 29 km, and diameters ranging from 300 mm to 2,200 mm, with a depth of up to 28 meters.

Kuwait Oil and Gas Sector

In its quest for expansion and development of nation's hydrocarbon output to facilitate increased export earnings, Kuwait National Petroleum Company (KNPC) has planned for new projects worth KD 500 Mn (US\$ 1.8 Bn) in the form of several large scale dynamic projects such as a fourth refinery, the production of environmentally friendly fuel and further two pipelines for liquefied gas, the removal of acidic gases project and similar others. The company posted profits estimated at KD462m in 2010-2011 and met the targeted production rate of 892,000 barrels a day. The state run Kuwait Petroleum Corporation plans to invest US\$ 90 Bn over the next five years in its oil and gas businesses and growth strategy. The Gulf Arab state said last year it would invest around KD3bn (\$10.4bn) in upstream developments by 2015 to expand oil production capacity to 4 million barrels per day (bpd) from 3 million bpd by 2020 and sustain the higher level for 10 years. Kuwait is also planning major investments in downstream operations, including the Al Zour oil refinery, which would be the fourth in the country. Al Zour, which was expected to start up in 2016, is currently stalled and may face further delays while it awaits the approval of the country's Supreme Petroleum Council. The OPEC member also plans to increase its refining capacity to 1.4 million bpd up from 936,000 bpd.

Recent updates in this sector include the announcement by state-run Kuwait Petroleum Corporation that it will drill for crude and natural gas in Vietnam and look for shale gas joint ventures in US following its measures to seek the necessary financial assistance for the US\$ 6.2 bn Vietnam refinery. The company has had three blocks in Vietnam since 2009 and will start drilling the first exploration wells there next year. The company is also looking for opportunities in North and South America along with Europe as it plans to boost the number of fields it operates outside Kuwait. Kuwait aims to produce 200,000 barrels of oil

equivalent from abroad by 2020. Earlier in November 2011, China Petroleum & Chemical Corp (Sinopec) and Kuwait Petroleum Corp started building their joint refining and petrochemical complex in the southern Chinese province of Guangdong. The 59bn yuan (\$9.3bn) project, including a 300,000-barrel-per-day refinery and a 1m tonne-per-year ethylene cracking unit, was expected to come on line in 2015.

Table 6 listed below lists the major upstream and downstream Oil and Gas projects awarded to contractors in Kuwait during September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Wara Pressure Maintenance Project	520	Sep 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

With its commitments to improve the refining process firmly in place, Kuwait Petroleum Corporation entered into memorandum of understanding with BP and Royal Dutch earlier in February 2011 encompassing area of exploration and refining. In addition to its focus on oil refining, the Kuwait government also aims at expanding its Natural Gas exploration wherein both Kuwait and Saudi Arabia had extended the bidding for onshore and offshore gas work at their shared Hout oil field in mid June 2011. The project developed by the Al-Khafji Joint Operations Co (KJO) would help recover the associated gas, which is now being flared. The process was delayed to August 1 from June 6 upon the request of the companies seeking more time to submit their bids for the project, which involves building offshore gas gathering facilities, pipelines and onshore gas facilities.

Thus with its rapid expansion plans aimed at enhancing its oil refining process and seeking additional gas reserves, Kuwait is well positioned to reap the advantages of increasing global demand for hydrocarbons whilst resorting to green fuels and renewable energy sources to address its local demand thereby conserving the oil and gas output for exports.

Oman Energy Sector Overview

Oman is a small, non-OPEC oil producer with an output of 876,000 barrels per day (bpd) in June 2011 with reserves estimating to 5.5 billion barrels. The discovery of Al Ghubar South in 2009 could be the most promising discovery in Oman in years, adding up to 1 billion barrels to reserves. The sultanate's oil

production in the first six months of this year rose 3 percent while exports were down by 1.8 percent compared to the first half of 2010. The landscape of Energy sector in Oman is set to witness dynamic changes following BP's plans to start Oman natural gas project by February 2013. The Sultanate of Oman witnessed an aggregate production of natural gas grow by 7.2 per cent to 1176.8 billion cubic feet (BCF) in 2010 compared with 1097.7 BcF in 2009. Earlier in September, State-run Oman Petroleum Company (PDO) was planning to award \$1.04bn of contracts for work in its oil and gas fields before the end of this year. Six contracts are to be awarded this year at the Hasirah and Hawqa gas fields, as well as steam injection work at the Al Ghubar oil field and a power station at Lekhwair. Typical of other GCC countries, Oman too experiences a steady increase in its local fossil fuel requirements to power its utilities sector thus prompting the country to resort to non fossil renewable energy sources for its local power requirements.

Oman Power and Water Sector

The year 2011 marks a milestone for the Oman Power and Water Procurement Company (OPWP) as the company prepares to manage the delivery of a number of projects, as well as the commencement of several others initiatives during the course of the year. In the company's Annual Report for 2010, released in June 2011, OPWP has listed to achieve a number of important objectives during 2012 in line with its mandate as the sole off taker of electricity and associated water output. Key among these is the task of ensuring that the Salalah Independent Water and Power Project (IWPP) meet its milestone of delivering early power by July 2011. Yet another goal set out for the year is to effectively manage the mobilization of 300 megawatts (MW) of temporary generation to ensure adequate power in the Main Interconnected System (MIS), which serves much of the northern half of the Sultanate. Also listed in OPWP's work program for 2011 is the management of the interconnection arrangement between Petroleum Development Oman (PDO) and the Salalah Power System, which is slated to become available by August 2011. The company's brief for the year also calls for the finalization of the bidding process for the massive Sur Independent Power Project (IPP) and getting it to the contract signature stage. Bid procedures for a water-only facility planned at Ghubra in Muscat Governorate will also be developed this year. Rounding off its notable goals for 2011 is a commitment to undertaking the development of the region's largest solar facility on behalf of the government.

Table 7 listed below highlights the major power and water contracts awarded to contractors in Oman during September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Transmission Pipeline from Wadi Adai to Al Amerat	36	Sep 2011
Water Supply to Villages of Ras Al Hadd	8	Sep 2011
Underground Cabling for Electrical Network in 18th November St.	5	Sep 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

In Q3 2011, the government of Oman may approve plans to build the country's first solar power plant, a facility with capacity to generate 200 megawatts. The country's Authority for Electricity Regulation recently conducted a feasibility study that confirmed the high potential for the development of solar energy projects in the region. Oman's government is expected to offer the contract for the power purchase from the project via a competitive tender. The construction contract for the solar project is expected to be awarded in around 14 months after it gets the full go-ahead from the government. Oman's Golden Dunes International and South Korea's energy solutions provider Kwan Won have signed an agreement to set up a solar energy plant in the Sultanate. The first phase of the project is to comprise a 5 megawatt demonstration project that will begin construction as soon as all the necessary formalities are completed with various authorities. The project is expected to operate under a feed-in-tariff, which will guarantee the pricing of electricity produced by the solar plant over a long-term period.

Oman Oil and Gas Sector

The recent updates on BP's plans to commence Oman natural gas production by February 2013 will mark a significant development in the Oman hydrocarbon sector. BP plans to start commercial development of a natural-gas project in Oman by February 2013 and to produce the first gas by 2016. BP estimates that Oman's Block 61 contains 100 trillion cubic feet of the fuel locked in rocks as much as 5km underground. The company expects to invest \$15bn to \$20bn to develop the field and drill 300 wells over the next 15 years. Oman and other Persian Gulf countries including the United Arab Emirates, Saudi Arabia and Kuwait face rising gas demand for power and industry amid limited supplies. Some are turning to more technically challenging and expensive projects to produce the fuel. BP's so-called tight gas project would maintain the sultanate's current gas output in the medium term and may raise output in the long term. The company would build a plant able to produce 1.2 billion cubic feet a day over at least 10 years with room to expand output further. BP has spent \$700m appraising deposits of tight gas and is producing at three of nine wells it has drilled.

Table 8 listed below provides the list of main upstream and downstream Oil and Gas projects awarded to contractors in Oman during September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Exploration & Production in Block 60 Concession	600	Nov 2011
Zauliyah Gas Compression Project	36	Sep 2011
Exploration in Block 40	35	Sep 2011
Expansion of Al Noor Oilfield	30	Oct 2011
Fahud Early Production Systems(EPS)	20	Oct 2011
Redevelopment of Raysut Terminal	10	Oct 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

The only GCC nation to remain outside the OPEC had indirectly enabled Oman to reap the advantages of an unrestricted supply of Oil and Gas for exports without any price restrictions as well. The Free trade of Oil and Gas had benefitted the economic growth particularly when other member nations were affected by the economic downturn in addition to restrictions on supply and pricing of hydrocarbons from OPEC. The enhanced growth prospects had thus lured international investors to this country and had enabled large scale investments thus helping the economic development of the country.

Qatar Energy Sector Overview

Boasting one of the fastest growing economies, the state of Qatar is home to world's third largest natural gas reserves and is the largest supplier of liquefied natural gas (LNG) accounting for over a quarter of overall global LNG exports. Qatar produces about 2.8 billion cubic feet (bcf) of gas per day for the domestic market and plans to increase that amount to 4 bcf per day by 2015. Despite challenging economic climate deterring global syndicated lending, Qatar Petroleum had successfully completed a US\$ 10.4 bn financing of its Barzan gas project. The project will be funded with up to 30 percent equity and the remainder through a syndicated loan expected to total \$7.2 billion. The financing includes a commercial bank facility of US\$ 3.34 billion, an US\$ 850 million Islamic facility and US\$ 2.55 billion of export credit agency financing. The Barzan project will help meet growing domestic energy demand in the world's top liquefied natural gas

exporter. It is Qatar's most expensive since Royal Dutch Shell Plc launched a US\$19 billion Pearl gas-to-liquids plant in 2006. The project, expected to produce 1.4 bcf per day to meet the LNG exporting giant's growing gas needs at home, was delayed due to mounting construction costs. The first Barzan gas production line is expected to become operational in 2014 with the second in 2015. In addition to feeding power plants, it will supply natural gas to fuel water desalination plants and other industrial users in Qatar, while processing propane and butane for export. Rasgas will develop and operate the project on behalf of its Qatar Petroleum and ExxonMobil, which have a 93 percent and 7 percent stake in the project respectively.

The primary driver behind Qatar's phenomenal export increase was added production through train 6 at Qatargas 3 and train 7 at RasGas 3. Both these trains added 15.6 million tonnes to Qatar's overall production capacity in 2010. Qatar has been the world's leading LNG exporter since 2006, and accounted for 14.7 percent of overall global LNG trade during that year. Qatar will continue to be the leading global LNG exporter in 2011, with full production capacity reaching over 77 million tonnes by the end of the year. Similar to Saudi Arabia and UAE, Qatar's local fuel requirements too continue to increase at a steady pace with peak power demands recording an 11 percent rise in 2010. However unlike Saudi Arabia and UAE, this has not impacted the export earnings in a significant manner as the nation continues its investment program in its petrochemicals sector with over US \$70bn being invested into the development of Ras Laffan industrial city, which will double its current size to accommodate hydrocarbons demand for the next 30 years, while the government is also committed to investments worth more than \$125bn in the next five years, on construction and hydrocarbon-related projects. Additionally Qatar also aims to lead the GCC nations in the renewable energy sources arena by trying to establish itself as the 'green capital' of the Middle East as it begins to deploy its Qatar Sustainability Assessment System (QSAS) on a wide-scale. A number of buildings across Qatar have now been constructed to QSAS standards, with the rapid development being witnessed providing a ripe opportunity for developers and investors to implement energy efficiency technologies.

Qatar Power and Water Sector

The fast paced robust economic growth in Qatar has led to speedy population growth, fuelled mostly by expatriates settling in the country. The country's annual population growth is around 9 per cent and, according to the Qatar General Electricity and Water Corporation (KAHRAMAA), the population is likely to

increase by a further 85 per cent between 2008 and 2017 to reach nearly 2.7 million. This population growth, coupled with the soaring energy consumption, is at the root of the country's high demand for power and water. According to industry experts, Qatar's GDP growth will average over 8 percent between 2010 and 2014, that GDP per capita will rise by 21 percent during this period and the per capita electricity consumption will rise to around 30 percent. On this basis, electricity demand is likely to rise from an estimated 20 TWh in 2010 to 33 TWh in 2014, an increase of 65 per cent in just five years. To meet this demand, generating capacity is expected to grow by 49 percent between 2010 and 2014. Over the longer term a further increase in generating capacity of 52 percent is estimated to come between 2014 and 2019, equating to a ten-year increase of 127 percent. Most of this extra capacity is likely to be provided by thermal power plants.

Although the last three months witnessed a marginal investment in the power and water sector, Qatar has ventured into several initiatives aimed at improving its utilities sector. Earlier in May 2011, Qatar had completed and inaugurated its largest power generation and water desalination plant. The \$3.9bn Ras Laffan C independent water and power project (IWPP) possess power generation capacity of 2,730MW and water capacity of 63 million gallons a day. Additionally, Qatar's Public Works Authority (ASHGHAL) has also issued tender documents for the contract to build an estimated \$250 million sewerage tunnel in Doha. The project calls for construction of a 9.5-kilometre-long Abu Hamour southern outfall tunnel, which will run from Mesaimmer Street along the line from the proposed F-ring road to New Doha International airport. The contract will also entail the construction of a 580-metre tunnel to collect surface water. The project is estimated to take four years to complete. The tunnel will provide the main water drainage for most of Southern Doha, covering a total area of about 170km. The sewerage tunnel will provide drainage for the new F-ring road when it is completed. The F-ring road work will be about 8km in length and will extend from the intersections of Abu Hamour and Al-Muntazah streets to the New Doha International airport.

Qatar oil and gas Sector

The hydrocarbon sector remains the fundamental pillar upon which the fast paced economic development in Qatar is based upon. Natural Gas in particular had been instrumental in shaping the Qatari economy accounting for over one half of GDP and 90 percent of export revenues. Most of Qatar's natural gas is located in the massive offshore North Field, which holds more than 25 TcM of proven natural gas reserves and is the world's largest non-associated natural gas field. Banking on its vast natural gas resources, the country is all set to position itself as a global leader in the production and export of Natural Gas through its

massive expansion programs. Recent developments in this sector include Qatar Petroleum signing an agreement with UK's Centrica to explore new joint properties in the energy sector. The memorandum of understanding will see Qatar Petroleum International and Centrica, the parent company of British Gas; cooperate in energy-related investments around the world. Investment targets will include new or existing projects in upstream oil and gas including liquefied natural gas (LNG), gas storage as well as combined-cycle gas turbine (CCGT) generation assets and downstream opportunities. The non-exclusive strategic alliance will deepen the relationship between Centrica and Qatar established earlier this year with the signing of a three-year contract for the supply of 2.4 million tonnes of LNG per year. The contract, valued at £2bn, provides enough gas to meet approximately 10 percent of the UK's annual residential gas demand during the delivery period. Additionally Qatar signed a deal with Royal Dutch Shell on Sunday to develop a \$6.4bn petrochemicals complex in Ras Laffan in the Gulf Arab state. State-run Qatar Petroleum will have an 80 percent stake in the project and Shell the remainder.

Table 9 listed below highlights the major Oil and Gas contracts awarded to contractors in Qatar during September to November 2011.

Project Name	Project Value (US Mn\$)	Contractor Awards
Barzan North Field Development - Process & Buildings Packages	330	Sep 2011
Diesel Hydrotreater & Sulphur Recovery Unit	100	Sep 2011

Source: Ventures Onsite MENA Projects Database www.venturesonsite.com

Over the last few years, global demand for LNG has been steadily increasing as countries seek cleaner fuel alternatives. Qatar is positioning itself to benefit from this demand. In the second week of June 2011, Britain's Centrica received its first Qatari liquefied natural gas (LNG) cargo, four months after it signed a 2 billion pound (\$3.2bn) delivery deal with LNG producer Qatargas. The 266,000-cubic-metre Mozah LNG tanker, one of the world's largest, berthed at Britain's Isle of Grain terminal had transferred the first of 7.2 million tonnes of super-cooled natural gas agreed under the three-year deal. Earlier in the first week of June 2011, Qatargas had delivered its first ever cargo of liquefied natural gas (LNG) to Thailand. Tanker Golar Viking delivered 131,000 cubic metres of LNG from Qatar in the spot market on May 31 for a trial run at the new \$880 million terminal in eastern Thailand, which is on track to start commercial operations in July 2011.

Thus with the expansion plans aimed at increasing the export revenues from LNG whilst initiating other renewable energy sources aimed at combating its local fuel requirements, Qatar is all set to lead the GCC nations Natural Gas sector.

Bahrain Energy Sector Overview

Bahrain, the smallest amongst the GCC nations is yet to witness recovery from turbulent economic conditions with the global economic downturn and recent political unrests challenging the economic development of the country. The state run Bahrain Petroleum Company (Bapco) had suffered losses to the tune of BD 6 Mn (US\$ 15.9 Mn) during the recent political unrests despite managing to limit the impact of the disruption on its performance. Furthermore, Bahrain had severed the gas import agreement with Iran due to the distressed political relations between the two countries in May 2011. The agreement was signed between the two countries in 2008 to import one billion cubic feet of natural gas per day, but the project was delayed due to Iran's interference in Bahrain's internal affairs.

The power and water sector in Bahrain is in dire need for new sources of power as well as upgraded and new power networks as it strives to meet the demands placed on by a growing economy and increasing population. This was made clear in July 2010, when energy consumption reached a record 2,650MW, as temperatures soared beyond 40 degrees Celsius. Bahrain had 2.4 Gigawatts (GW) of installed electric generating capacity at the end of 2009, all of which came from conventional thermal sources, mostly natural gas with some oil. The peak power demand was nearing total capacity. Bahrain's Ministry of Electricity and Water (MEW) estimated that electricity demand will grow by 7 percent annually through 2020. Bahrain is connected to the GCC Interconnection Grid, which will enable it to tap electricity from other countries, as well as participating in a future regional energy market. The authorities are keen on encouraging independent power plants (IPPs) to operate and they have also privatized some power assets controlled by the public sector. Bahrain is one of the few countries in the gulf region that has laid the regulatory framework for the privatisation of the power generation industry. The private sector has already contributed to the electricity and water sector in Bahrain through the construction of Bahrain's first IPP, Al Ezzel, and the enlargement of Al Hidd power and water station.

The Al Dur independent power and water project (IWPP), when fully operational in 2011, will be the Kingdom's largest electricity and desalination plant and will be operated on a built, own and operate (BOO) basis by GDF Suez and the Gulf Investment Authority.

Bahrain makes much use of its desalinated water and substantial investments are planned to increase production from the existing 143 million gallons per day, to 200 million gallons per day in 2011. New transmission systems and storage facilities will also be coming online in this period. In the waste water sector, production will reach 164,250 cubic meters annually by 2015, up slightly from the current 163,000 cubic meter annual capacity. Because of Bahrain's size, the bottlenecks it is facing in its water sector are easier to respond to than in larger neighbouring states, such as Saudi Arabia.

According to IMF, the population will reach 920,000 in 2012, up from 830,000 today. It should be noted that the industrial sector has grown its share of water consumed in the country, chipping away at agriculture's share. As economic growth accelerates, the industrial sector demand is also anticipated to rise. Bahrain's Electricity and Water Authority signed a Memorandum of Understanding (MoU) with Singapore's National Water Agency (PUB) in 2008. The two agencies will work in partnership on the operation and maintenance of water supply, and the design and construction of waste water treatment systems. This partnership will create prospects for Singapore's own water companies, such as Hyflux and Darco, to enter Bahrain's water sector.

Bahrain is also in the early stages of development in the renewable power sources arena with plans for utilising solar power for its utilities sector remaining in its pipeline. The recent political unrests in addition to the complete shut down in the hydrocarbons sector had unfortunately led to Bahrain not awarding any new contracts in the last three months. However with the situation stabilising and the market bouncing back, the future for this nation remains positive with hopes for sustainable development in the near future.

Conclusion

The future of GCC energy sector remains focused on renewable energy sources in the form of Solar, Wind, Geo thermal and nuclear power with every country formulating its development plans in this sector. Renewable energy currently account for just 0.3 per cent of all energy in the six GCC member states but is slated to account for over 20 percent of the energy mix in certain countries. Their development has been delayed historically by the region's role as a major oil and gas producer. However, half the GCC countries are now net importers of natural gas. The six countries will have to invest \$100bn in energy infrastructure in the next ten years to keep up with demand from rapidly growing population.

Thus conserving hydrocarbon output for exports and exploring alternative energy sources for its local requirements seem to be the rationale behind every GCC nation's energy sector growth trajectory.