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Why are the GCC States turning to Nuclear Power?

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Introduction

After the nuclear disaster at Fukushima most countries around the world curtailed their nuclear power ambitions. However one region remained unperturbed in its desire to acquire nuclear technology, and instead intensified efforts—the Gulf Cooperation Council (GCC). At the 27th GCC Summit in December 2006, the six members—Saudi Arabia, United Arab Emirates, Oman, Kuwait, Qatar and Bahrain—decided unanimously to adopt nuclear technology to fuel their domestic electricity & desalination needs. Since then, the GCC, led by United Arab Emirates (UAE) and Saudi Arabia has seriously pursued this initiative, signing deals and Memoranda of Understanding (MOU) with various countries for technology and supplies.

The Gulf States cite the reason to shift from conventional fossil fuels to nuclear energy—their need to feed the massive per capita energy needs, one of the highest in the world. With few natural resources beyond fossil fuels, the GCC countries need nuclear energy for their growing domestic energy requirements. The UAE has already signed deals with France, South Korea, Japan, UK & USA. It will soon start construction of its first nuclear plant in Abu Dhabi. Like wise, Saudi Arabia has signed deals with France, Argentina, South Korea and China.

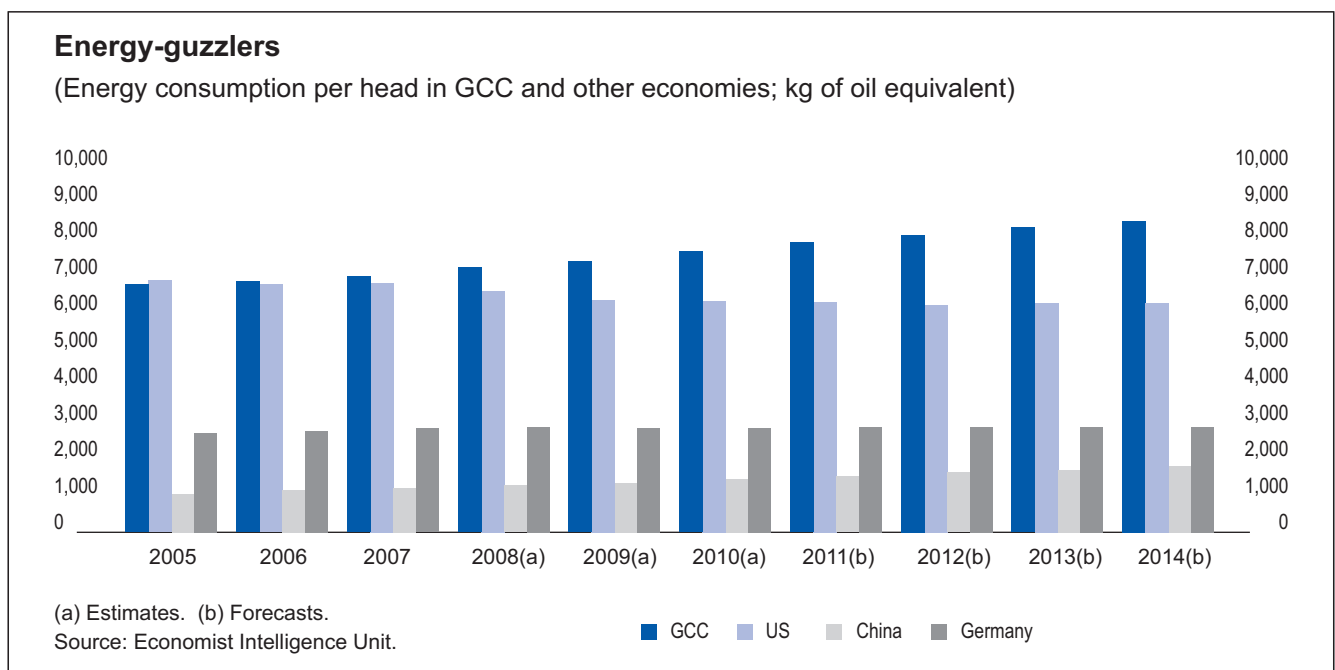
What is interesting is the speculation among western nations that the Gulf States are pursuing nuclear technology to be able to use it in warfare should the need arise, given the fact that Iran is on the

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threshold of becoming a nuclear state. What motivates the Gulf States, whether energy or warfare, is something that will be explored in this paper. It is not possible to analyze nuclear programmes solely on energy terms, given the security situation in the region.

Energy Needs and Current Trends

Energy consumption of GCC countries has entered uncharted territory with all major growth indicators—population, economy and standard of living—showing an upward spiral. This has put a big strain on the resources of the region. By 2020 the GCC population is expected to reach 53.5 million, which is a 30 per cent increase since 2000. The region's GDP is expected to grow by 56 per cent, from \$342 billion in 2000 to \$1010 billion¹ in 2010, and projected to touch \$2 trillion in 2020.² There is no doubt this growth is positive and the GCC is reaping its rewards. However there are quite a few dangers it brings to a region starved of essential resources. Some member states have already begun to witness power shortages (blackouts and brownouts), water shortages and rising prices of



essential commodities like food. Forecasts for the electricity demand in GCC countries by 2015 show excess of 80% with respect to current installed capacity.³ Hence, there is need to utilize revenue generated from the export of crude oil towards energy sustainability.

The six member states hold 40 per cent of the world oil reserves and 23 per cent natural gas reserves. At first glance the situation might seem comfortable in the long run, considering that these reserves could last for at least 50 years at present consumption patterns. However, demand for electricity is already outstripping supply; the fast population growth could also create acute shortages. Moreover,

using fossil fuels to generate electricity means having less available for export, income from which still fuels the economy.⁴

Another development harming the GCC states' future prospects is the world's decreasing reliance on the Middle East for energy. The latest trends in energy are shifting towards alternative fuels like biofuels. New discoveries have further begun to dent the GCC's position as the oil supplier to the world. One such discovery was the Gorgon gas field in Australia in 2009, which added 0.6 per cent to the world's natural reserves and is strategically located to cater to Asian markets. Shale oil was also discovered in the US recently in substantial quantities. Venezuela now holds the largest reserves in the world and has started inviting major players to invest. However due to the difficulty in extracting these reserves, there is no immediate serious threat to Middle Eastern supplies.

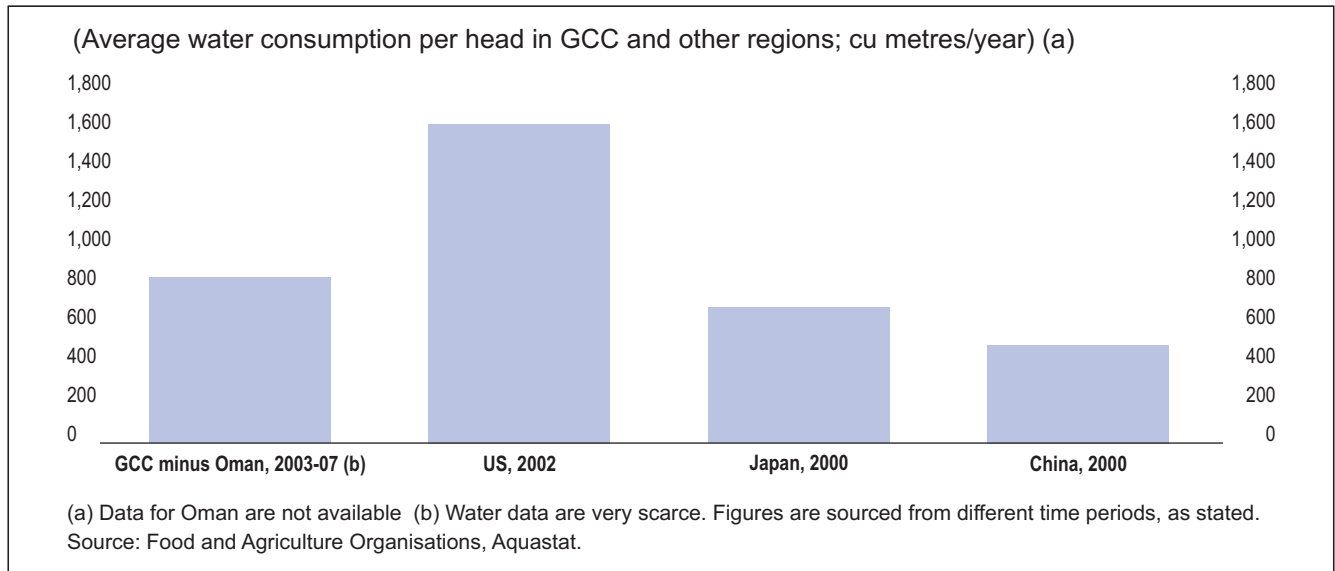
Energy consumption totals, million tonnes of oil equivalent, GCC countries, 2000-20																					
Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
						(a)	(a)	(a)	(b)	(b)	(b)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Bahrain	8.6	8.0	9.3	9.9	9.8	10.7	11.4	12.0	12.7	13.2	13.8	14.3	14.9	15.4	16.2	16.8	17.5	18.3	19.0	19.9	20.7
Kuwait	21.6	20.9	21.0	22.8	23.9	27.5	26.9	28.1	29.8	30.5	31.7	33.0	34.3	35.6	36.9	38.4	39.9	41.4	43.0	44.6	46.4
Oman	8.6	8.7	9.1	9.0	9.6	12.3	14.1	14.5	15.3	16.1	17.1	18.1	19.2	20.3	21.5	22.8	24.2	25.7	27.2	28.8	30.6
Qatar	14.6	11.3	11.9	13.2	15.6	19.7	21.1	23.5	26.4	29.2	35.2	41.4	45.3	48.9	52.5	59.2	65.7	72.0	79.1	87.1	96.3
Saudi Arabia	114.6	121.3	127.1	133.9	144.2	153.2	160.1	169.0	179.1	187.8	198.0	208.8	220.5	233.0	246.2	260.0	274.5	289.9	306.2	323.4	341.6
UAE	42.5	43.1	46.8	47.7	50.3	52.4	55.9	60.5	66.3	67.0	70.1	73.7	77.8	82.2	87.0	91.7	96.7	102.2	107.9	113.9	120.2
GCC Total	210.4	214.3	225.3	236.1	253.8	275.8	289.6	307.6	329.6	343.9	365.8	389.3	412.0	435.4	460.5	488.9	518.5	549.5	582.4	617.7	655.7

(a) Actual (b) Estimate (c) Forecast
Source: Economist Intelligence Unit.

The high per-capita energy consumption in the GCC is due to several reasons, including high economic and population growth and extremely hot climate leading to extensive use of air conditioning systems in contrast to air cooling systems in place in other parts of the Middle East. Another regional trend is the low (and in some cases, free) cost of electricity, especially provided to the citizens, leading to a culture of wastage and excess. Often, high consumption is even encouraged in infrastructure facilities and buildings. Energy efficiency of cooling systems, transport systems and other systems is extremely low, and in many systems nonexistent, due to the low pricing of electricity.

Water demand is expected to grow significantly too in the Middle East as the GCC's growing upper middle class adopts an increasingly energy and water intensive lifestyle, exceeding that of the most affluent Western nations and projected to be the highest in the world by 2020. Swimming pools,

gardens and golf courses are increasingly becoming the norm for many middle class residents of these countries. However, since the region has almost no natural water sources, desalinated sea water is used to meet these needs, due to which GCC economies account for 40 per cent of global desalinated water capacity. These desalination plants are energy intensive and hence as the water consumption is expected to grow, so is the power consumption to generate the water.



The Transition to Nuclear Power: The Process

At the end of the 27th GCC Summit in Riyadh in December 2006, all six member states of the Gulf Cooperation Council (GCC) confirmed their intent to pursue a joint nuclear programme for peaceful purposes to meet their domestic energy needs.⁵ So far only the United Arab Emirates has taken concrete steps towards the establishment of nuclear power plants. Saudi Arabia and Bahrain have signed Memoranda of Understanding (MoU) on nuclear cooperation with the USA, and Kuwait has set up a national nuclear energy commission, in cooperation with the International Atomic Energy Agency (IAEA). Qatar has undertaken to establish a regional nuclear training centre in Doha in collaboration with the IAEA.⁶ Oman is yet to undertake any nuclear related activity.

The GCC and IAEA have concluded an agreement to carry out three projects over the next couple of years, including a field training centre for GCC nationals. The other two projects are on using nuclear energy for generating electricity and looking into the legal and structural frameworks for the peaceful use of nuclear energy in the GCC.

Although the Gulf States have repeatedly insisted they are only interested in the pursuit of nuclear energy for power production and sea water desalination, UAE's nuclear agreement with the United States has a clause allowing it to adapt its nuclear deal to that of any deal the United States signs with

any country. Though the Gulf States have repeatedly called for inspecting Israel's nuclear sites, they are increasingly more afraid of Iran's nuclear programme. This is primarily due to increasing Shia-Sunni conflicts in the region. Iran is the sole Shia state in the Middle East while all the other nations are Sunni ruled and hence find Iran's rise as the Middle East leader unacceptable. Iran has offered to help the GCC develop nuclear energy, while insisting its programme is entirely peaceful. Iran has also offered to invite the IAEA to supervise its role in the GCC nuclear programme.⁷ However, it is extremely unlikely the Gulf States will grant the proposal a second glance and risk losing critical western support.

In May 2009, during the 1st GCC Nuclear Summit in Dubai various subjects were discussed, including the risks and benefits of nuclear power, peaceful uses of atomic energy in the Middle East, nuclear development as a national or a regional programme, the essentials of a strong nuclear regulatory infrastructure and the nuclear safety imperative to the US-UAE political, military, commercial, social and nuclear energy partnership. Many experts in nuclear energy were present at the conference like Amr Moussa (Secretary General of Arab League), Dr. Adnan Shihab-Eldin (Former Secretary-General of OPEC), Dale Klein (Chairman of US Nuclear Regulatory Commission), and Peter Wakefield (Deputy Director of World Association of Nuclear Operators).⁸

Despite the US insisting on complete support for the GCC nuclear plans, as conveyed by Gregory Schulte, US Permanent Representative to the UN Office in Vienna and the IAEA, Saudi Arabia and UAE are approaching the matter tactfully.⁹ If faced with the highly likely prospect of a nuclear-armed Iran, GCC states would be forced to rely even more intensively on US protection, which the Americans are aware of and are showing their support with unprecedented arms deals with the two regional powers. In 2010, the US signed arms transfer deals with Saudi Arabia valued at \$60.1 billion for the sale of aircrafts and helicopters.¹⁰ The United States also completed a \$3.5 billion arms sale to UAE in December 2011. The sale is the first overseas transfer of the highly advanced Theater High Altitude Area Defense (THAAD) system, part of its accelerating military buildup around Iran.¹¹ But also wanting to multiply their options, Saudi Arabia and the UAE recently embraced closer defence ties with resurgent Russia. Ultimately, the GCC will mix tactics of balancing and potentially confronting Iran with diplomatic entreaties to encourage Iranian goodwill.¹²

United Arab Emirates and Nuclear Power

In April 2008, the government of UAE announced interest in valuating nuclear energy as an additional source to meet the country's growing energy demands. Since then UAE has signed a nuclear deal with France in January 2008, South Korea in June 2009, Japan in January 2009 and the United Kingdom in December 2010.¹³ However the most important milestone in the UAE nuclear energy

programme was the signing of the US-UAE bilateral agreement on peaceful cooperation in December 2009.

UAE has based its nuclear programme on a decision to forgo domestic uranium enrichment or fuel reprocessing and to rely on international market sources for its nuclear fuel services. This decision has reduced proliferation concerns among many observers, including some members of US Congress. UAE government representatives report that the UAE sought and received inputs on its draft nuclear law from the United States, United Kingdom, Japan, Korea, and France.¹⁴ In conjunction with the issuance of the law, a Board of Management for the FANR (Federal Authority for Nuclear Regulation) was announced, and the board named former US Nuclear Regulatory Commission Executive Director for Operations Dr. William Travers as FANR's first Director General.



In January 2010, UAE announced that it had chosen the Korea Electric Power Corporation (KEPCO of South Korea) to construct the first of four APR1400 nuclear reactors that would sell electricity to the Abu Dhabi Water and Electricity Authority. The plant construction is to take place at Baraka, near Abu Dhabi's western border with Saudi Arabia. All four plants are scheduled to be commissioned by 2020.

UAE officials estimate that their country must expand its power generation and transmission capacity from the current level of 16GW to 40GW by 2020 in order to meet projected demand increases, which they estimate will continue growing at 9 per cent annually. However, to date, UAE officials have not shared economic cost and energy use data referred to in briefings of the country's nuclear programme. UAE officials also have not named the members of the UAE nuclear energy policy advisory board. The unwillingness of UAE to disclose this information raises serious questions about its actual nuclear intentions, whether there really is a need for nuclear power in a country with the third largest oil deposits in the world, or are these just steps to ultimately become a nuclear state. Although

UAE has adopted a law governing export controls, one of the biggest US concerns is that the country has not yet issued implementing regulations. Since 2001, the UAE has been under increased US scrutiny as an alleged transshipment point for military exports to Iran, as an alleged hub of operations for weapons proliferators, and as a transit zone and financial conduit for terrorists and money launderers.¹⁵

But due to UAE's strong public stance against nuclear proliferation, the US and UAE governments have begun cooperating on military terms and arms sales, despite periodic differences with regard to UAE's political reforms, the Israel-Palestinian conflict, counter terrorism, and US policies on Iraq and Iran. The UAE hosts frequent port calls and shore visits for US naval vessels and allows the US military to use Al Dhafra air base for missions in the US Central Command (CENTCOM) area of operations. In 2007 and 2008, the Bush Administration notified Congress of \$19.4 billion in potential arms sales to the UAE, including what would be the first overseas sale of the Terminal High Altitude Air Defense system. In 2009 and 2010, the Obama Administration notified Congress of a further \$8.8 billion in potential sales, including the potential sale of 60 remanufactured and new AH-64D Block III APACHE helicopters.

In keeping with the US Atomic Energy Act of 1954, the US-UAE deal is based on UAE's willingness to abide by non proliferation standards. One of its major points reads as follows, “Developing UAE's civil nuclear energy use in a manner that supports global efforts to prevent nuclear proliferation, including, for example, the Global Nuclear Energy Partnership.”¹⁶ It also includes two provisions which are not found in any other US nuclear cooperation agreement. First, the agreement provides that the UAE bring into force the Additional Protocol to its IAEA safeguards agreement before the United States licenses “exports of nuclear material, equipment, components, or technology” pursuant to the agreement.¹⁷ In essence IAEA officials gain full access to UAE's nuclear facilities and information. Another provision, which is not typically included in nuclear cooperation agreements, requires both parties to give “due consideration to non-proliferation and physical protection aspects” when selecting a storage facility for special fissionable material.

Additionally, the US-UAE agreement provides a potential way for the UAE to transfer spent nuclear fuel to other countries. UAE may transfer spent nuclear fuel to France or the United Kingdom for storage or reprocessing, a privilege US has to date only given to Japan, Switzerland and Norway.¹⁸ This is an indicator of the trust the American government is placing on the United Arab Emirates, necessary given its close proximity to Iran geographically and its long standing border dispute with Teheran.

One interesting tenet of the MOU with UAE is that, in the event that Washington concludes a more favourable agreement with another regional country, the United States will consult with the UAE regarding the possibility of amending the US-UAE agreement to make its terms equally favourable to the new agreement. This gives the UAE much needed flexibility to cope with regional security uncertainties. If there should ever be the need to relax the stringent non-proliferation norms due to Iran's security threat to the GCC, the UAE will be able to adopt more favourable terms US may offer future allies. In fact negotiations over a US-Jordan Nuclear Cooperation Agreement were delayed during 2009 and 2010 as Jordanian officials debated the relative merits of adopting the UAE model versus preserving their ability to pursue domestic uranium enrichment in the future should the need for the same arise.¹⁹

Saudi Nuclear Energy Programme

In January 2011, Saudi Arabia signed a nuclear deal with France. Saudi's Bin Laden group, founded by Osama Bin Laden's father, signed the deal with French energy firm Areva. Interestingly, Saudi Arabia is not only looking at nuclear, but also solar power, which forms a part of the deal with Areva.²⁰ However, it is the nuclear aspect of the deal that has created waves, given Saudi Arabia's strong opposition to Iran and its desire to remain the dominant power in the region.

In June 2011 Saudi Arabia also signed a nuclear energy deal with Argentina. Water desalination and electricity generation projects have been introduced by Argentina's Atomic Energy Commission and technology firm INVAP. INVAP has previously built research reactors in Algeria and Egypt.²¹ In November 2011, Saudi Arabia concluded a nuclear deal with South Korea for the development of nuclear energy.²² This was after Saudi Arabia held talks with United States on the possibility of nuclear cooperation. As per the agreement with South Korea, the two countries will cooperate in the design, construction, operation, maintenance and development of nuclear power plants.

The most important recent development in Saudi Arabia's nuclear programme is the January 2012 nuclear deal with China. The agreement was signed by King Abdullah and Chinese PM Wen Jiabao and followed earlier public remarks by Saudi intelligence chief Prince Turki al-Faisal who said the country should develop nuclear weapons to counter rival Iran's nuclear arms, "Our efforts and those of the world have failed to convince Israel to abandon its weapons of mass destruction, as well as Iran. Therefore it is our duty toward our nation and people to consider all possible options, including the possession of these weapons."²³ The details of the deal were not fully provided by government-controlled Saudi Press Agency, but according to Hashim Yamani, president of the King Abdullah City for Atomic and Renewable Energy, the Kingdom has planned 16 commercial nuclear power reactors

by 2030.²⁴ According to Iranian expert Afshin Molavi of New America Foundation, the Saudi-China relationship is a strategic relationship, as compared to China-Iran relations, which is transactional.

The deal with China is worrying for the security of the region because of China's history as a covert arms supplier to Saudi Arabia and Pakistan. China supplied Pakistan with nuclear-weapon design information during the 1980s. That technology was discovered in Libya in 2003 after Tripoli decided to give up its covert nuclear program. China in the 1980s supplied Saudi Arabia with 36 DF-3 medium-range ballistic missiles that, although not equipped with nuclear warheads, are considered nuclear-capable systems. The Saudi administration's argument against Iran's reason for developing nuclear energy, that Tehran has enough oil to produce electrical power for a century, would also apply to itself. Saudi Arabia holds some of the largest oil reserves in the world and is China's main supplier of crude oil.

Bahrain's Nuclear Energy Programme

In March 2008 Bahrain signed a deal with the United States to commence its development of nuclear energy to augment its current fossil fuel driven power production. The deal was on peaceful nuclear energy cooperation and was termed by then US Secretary of State Condoleezza Rice as a 'model' for the Middle East that contrasts with Iran's disputed atomic programme. The MOU on nuclear energy cooperation was signed by Condoleezza Rice and her Bahraini counterpart, Sheikh Khalid bin Ahmed al-Khalifa, during a ceremony at the State Department. Condoleezza Rice stated that the MOU is a 'tangible expression of the United States' desire to cooperate with states in the Middle East, and elsewhere, that want to develop peaceful nuclear power in a manner consistent with the highest standards of safety, security and non-proliferation.'²⁵ Bahrain abiding by non proliferation norms is critical for the US role in the region. Bahrain is considered one of the biggest non NATO allies of the United States and hosts an American naval base.

In an official statement, the Bahraini government said nuclear power had become a "necessity" for Bahrain, struggling to meet its energy needs. It has already set up various gas fired plants to augment its reliance on petroleum. However, no concrete steps have yet been taken for setting up of nuclear power plants in the country. In 2010, Bahrain hired Freshfields Bruckhaus Derringer of London as a legal consultant, and is in the process of tendering a bid for an energy consultant, to which 15 companies have responded, to provide background studies, primarily to set up a site for the power plant, according to classified US documents leaked by Wikileaks. According to the same documents, Bahrain officials admitted their lack of technical expertise and, hence, are heavily reliant on the United States for the entire programme.²⁶

Bahrain has decided to forgo sensitive fuel cycle technologies and rely on existing international markets for nuclear fuel, to clear international speculation about its real intentions behind the civilian nuclear energy programme. To further put to rest doubts, Bahrain joined the Global Initiative to Combat Nuclear Terrorism (GICNT) while signing the MOU with the US, becoming the 67th member country. GICNT was launched in 2006 by then US President George Bush and Russian President Vladimir Putin to reinforce control of nuclear facilities and materials in order to prevent terrorist groups from accessing them. Bahrain, like all other GCC states, has signed and ratified the Nuclear Non Proliferation Treaty (NPT).

Conclusion

A process that started off with the Gulf Cooperation Council member states deciding at the 27th GCC Summit in December 2006 to use nuclear technology for their domestic electricity and desalination needs seems well on track to completion. Since then, the GCC, led by United Arab Emirates (UAE) and Saudi Arabia, has intensely pursued this initiative, signing deals and Memoranda of Understanding (MOU) with various countries for technology and supplies. This process has continued unaffected despite global apprehensions about nuclear energy after Fukushima.

Despite the Gulf States insisting they will be unable to meet their energy needs, necessitating a civilian nuclear programme, regional security instabilities mean supplier nations need to tread carefully in transferring technology and fuel to these countries. The threat posed by Iran in a conflict-ridden region looms large, and hence Arab states increasingly feel the need to arm themselves to prevent Iran from dominating the region. Though all the Gulf States have signed and ratified the Nuclear Non-Proliferation Treaty (NPT), it cannot be taken for granted that they will abide by it should their sovereignty and security be threatened. Iran itself has been a signatory but has violated the treaty with impunity, managing to take its own course despite vehement Western efforts to destabilize its efforts. Keeping this in mind, the US has modified its nuclear agreements with the GCC states. The US-UAE agreement allows UAE to alter terms of its agreement should the US sign a more favourable agreement with any other state. The US has also signed unprecedented technology transfer arms deals with GCC states in order to equip them with the latest defence technology in the face of Iranian aggression.

Considering three of the six GCC member states—Saudi Arabia, UAE and Kuwait—have the world's second, sixth and seventh largest oil reserves, with estimated reserves for well over 100 years, nuclear energy may seem unnecessary and unwise from a pure energy vs. cost standpoint. However, with nearly the highest per-capita energy consumption in the world, these states contend they need nuclear fuel for their domestic needs so they can use oil exports to fuel their economies. In addition, due to the

lack of water resources in the region, desalination plants, which consume huge amounts of energy, need a sustainable energy source. Hence, the GCC states need alternative energy sources like nuclear power for a sustainable future.

The cause for concern, however, is Saudi Arabia's secret military relationship with China and both Saudi Arabia and UAE developing military ties with Russia. China has supplied Saudi Arabia weapons capable of carrying nuclear warheads. In addition, Pakistan considers itself indebted to Saudi Arabia for its nuclear arsenal and has pledged support, even for nuclear weapons and technology transfer. There is considerable international speculation that since Saudi Arabia had bankrolled the Pakistan nuclear weapons programme, the latter would immediately supply weapons or know-how should the Saudis ask. Such developments raise serious doubts about whether a programme initiated on civilian grounds will continue to remain civilian for long or whether it is merely a cover up for weapons ambitions.

Considering the region's dynamics and its history of instability, supplier states must encourage and support the Gulf States in developing nuclear energy only as long as they are willing to abide by strict standards of non proliferation and fuel processing. The process of fuel processing and storage should remain solely in the control of supplier states. To strengthen trust and remove concerns about their ambitions, Gulf States must conduct their nuclear programmes with complete transparency and keep all activities open to IAEA supervision. There is also need for the development of a strong regulatory system to reduce the threat of unlawful access to technology and fuel. The Gulf States want to look beyond oil to fuel their domestic needs so they can continue to grow and become self reliant, as every country is allowed to, and they should be encouraged in an atmosphere of transparency.

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