

- By Jim Krane*

First it was solar power. Then came nuclear. Now it's coal. The natural gas-dominated power sector in the United Arab Emirates is diversifying quickly.

Plants burning natural gas still remained far and away the largest source of the UAE's 138 terawatt-hours of power generated in 2019, but the share generated by alternate sources is rising.

The UAE's strategic plan calls for gas, which once covered nearly 100% of the country's power needs, to be relegated to 38% of installed capacity by 2050, with renewables at 44% by capacity, nuclear at 6% and coal at 12% (MEES, 13 January 2017). This plan is probably unrealistic, but it signals aspirations for a major change in energy policy.

Examined closely, the changes suggest a fragmentation in energy policy. The UAE is simultaneously pursuing incompatible choices in clean and dirty power. Why?

Some of the changes are geopolitically driven. Abu Dhabi's push to decrease reliance on natural gas reflects increasing hostility toward Qatar and Iran, the region's two largest natural gas producers and reserves holders.

A similar "energy independence" strategy appears to be playing out inside the UAE, with Dubai and perhaps Sharjah seeking to reduce their dependence on the Abu Dhabi-supplied national grid.

Among the most interesting aspects is the clean-dirty dichotomy.

The UAE – home to the UN's International Renewable Energy Agency – is simultaneously developing power plants that produce electricity with zero emissions, as well as the giant Hassyan plant, which produces electricity in the dirtiest and most carbon-intensive way, by burning coal (MEES, 16 December 2016).

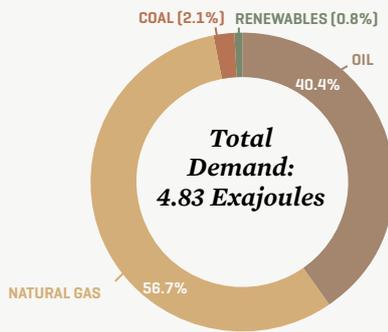
The UAE's "clean energy" reputation was a bit of a façade, at least until recently. The country reaped enormous publicity benefits from its renewables projects long before any were built. Initially disappointing results of Abu Dhabi's Shams-1 solar thermal plant in 2013 (MEES, 29 November 2019) forced a pause on the clean energy strategy.

Plummeting costs of solar led Dubai and then Abu Dhabi to revisit renewables. Major investments in photovoltaic solar set a series of record low tariff offers from developers, with recent bids falling below the 2 US cents per kilowatt-hour threshold (MEES, 31 July)

By the start of 2020, installed renewables capacity in the UAE reached 2.1GW, equal to 7% of the country's roughly 30GW of installed capacity. But the lower capacity factor for intermittent renewables versus thermal generation meant that renewables produced just 3% of nationwide power. Renewables provided less than 1% of the UAE's primary energy in 2019 (see charts).

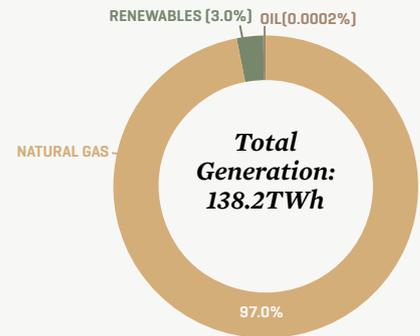
Abu Dhabi's Baraka nuclear plant, just

RENEWABLES ACCOUNTED FOR LESS THAN 1% OF THE UAE'S 2019 PRIMARY ENERGY DEMAND...



SOURCE: BP

...AND JUST 3% OF POWER GENERATED



beginning to generate round-the-clock zero-carbon power (MEES, 21 August), looks like a useful compliment to intermittent renewables. The \$25bn, 5.6GW-capacity plant could produce up to 25% of the UAE's electricity by mid-decade. The first of four 1.4 GW reactors started up successfully in 2020.

Since nuclear and solar power emit no carbon dioxide when they generate electricity, these choices comport well with global action on climate change and the UAE's 2015 Paris Agreement pledge to build out clean power.

But the UAE's story is not as simple as a dash for low-carbon power. That is because Dubai is now in the final stages of building a massive coal-fired power plant.

When it opens this year or next, Hassyan's first phase, at 2.4 GW, will make it the second-largest coal-fired power plant in the Middle East. If the Hassyan plant reaches 3.6 GW capacity as planned, it would be substantially larger than the 2.8 GW Afsin-Elbistan Power Station in Turkey, currently the largest coal plant in the Middle East.

Since coal emits roughly double the CO2 per unit of electricity produced by gas, it will obliterate the clean energy gains – and image – that Abu Dhabi has so assiduously striven for.

WHY THE COAL DETOUR?

It is worth remembering that demand for electricity in the UAE continues to grow. Per capita electricity consumption in the UAE, driven partly by subsidized prices, was near world-leading levels of 13,000 kilowatt-hours in 2017, according to the IEA.

Changes to the UAE's power portfolio are also being driven by negative views on natural gas, based in geopolitical rivalries with the two largest reserves holders in the region, Qatar and Iran. The UAE's natural gas imports have also exposed it to fluctuating market prices on fuels that it sells domestically at low, fixed prices.

Energy policy in Abu Dhabi aims to increase freedom of maneuver in foreign policy through US-style 'energy independence' aspirations, which prevent unfettered nationalist policies being restrained by dependence on imports – particularly those from Qatar.

Meanwhile, Dubai's decision to build out coal and renewables appears based on a similar calculation. But rather than avoiding dependence on Qatar, Dubai seeks to avoid dependence on Abu Dhabi.

COAL TO ECLIPSE SOLAR

In spite of all the publicity around solar, Dubai's coal plant, if operated anywhere near nameplate capacity, will produce more electricity than all of all the UAE's planned solar arrays combined. (Hassyan's 3.6GW of coal capacity operated 60% of the time would generate almost 19GWh of electricity in a year. That is nearly double the 11GWh of power produced from the UAE's eventual 5GW of solar installations operating at a 25% capacity factor.)

The glaring disconnect in policymaking between Abu Dhabi and Dubai raises the possibility of future inter-emirate disputes. While both emirates pursue diversification away from natural gas, Abu Dhabi's power mix aligns with the future possibility of carbon taxation and border adjustment tariffs. Dubai's does not.

Given the increasingly negative global views of coal – particularly in the home markets of Dubai's tourist arrivals – Dubai's embrace of coal is risky.

Coal emissions from Dubai could penalize the entire UAE, subjecting UAE exports to carbon adjustment tariffs in Europe or elsewhere which would render those exports less competitive than products from countries with smaller footprints.

The specter of a wealthy petro-state free-riding on emissions sacrifices elsewhere could also expose the UAE to boycotts, sanctions, and other types of political and regulatory action from governments, non-government organizations, or international agencies.

Perhaps that is why Dubai's coal-fired power investments are downplayed and misleadingly labeled as 'clean.' ♦♦

**Jim Krane is the Wallace S. Wilson Fellow for Energy Studies at Rice University's Baker Institute in Houston. His recent book is "Energy Kingdoms: Oil and Political Survival in the Persian Gulf."*