Renewable energy won't fix Abu Dhabi's consumption problem, research finds

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(Phys.org) —Abu Dhabi's recent expensive renewable energy venture will neither allow the United Arab Emirates (UAE) to forgo construction of conventional energy generation, nor will it provide more than a token reduction in carbon-emissions growth, according to a new paper from Rice University's Baker Institute for Public Policy.

The paper argues that Abu Dhabi could more effectively restrain growth in electricity demand – and carbon emissions – by raising the subsidized electricity prices that account for about one-fourth of the sheikhdom's power demand. Titled "An Expensive Diversion: Abu Dhabi's

Renewable Energy Investments Amid a Context of Challenging Demand," the paper was authored by Jim Krane, the Wallace S. Wilson Fellow for Energy Studies at the Baker Institute and an expert on Persian Gulf economics and politics.

"Faced with a growing shortage of natural gas and intensifying competition over insufficient domestic production, Abu Dhabi chose to make highly publicized investments into renewable energy," Krane said. "These investments are characterized by significant cost and effort that will provide only marginal help in meeting fast-growing electricity demand. A demand-driven campaign to reduce energy consumption and penalize waste by raising tariffs would be many times more effective in stabilizing the energy balance than the tiny increase in generation capacity from renewables."

Abu Dhabi citizens pay just 1.4 U.S. cents per kilowatt-hour of electricity, which amounts to a fraction of the government's cost of generating and providing electricity. Non-citizens pay higher prices – 4.1 cents – but their rates cover less than half the government's cost.

Krane said the Abu Dhabi government has leveraged its renewables investment to enhance its international prestige, recasting itself as a clean-energy leader in OPEC and the developing world despite its slow on-the-ground progress. "This benefit carries a high value in a traditional sheikhdom and should be understood within the political economy context of the rentier state, where external image enhancements translate into a strengthening of the regime's domestic legitimacy."

In 2009 the government of Abu Dhabi launched a drive into renewable energy that was trumpeted by the global media as evidence that an old-line petro state had embraced the global low-carbon agenda, Krane said. By 2020, renewable energy sources were to account for at least 7 percent of Abu Dhabi's total electric power generation capacity. When bundled

with its concurrent and much larger nuclear plans, Abu Dhabi's low-carbon sources would account for 30 percent of its electricity generation capacity.

Through these ventures, the government said it aimed to ease the growth in carbon-dioxide emissions while diversifying supply and continuing to meet fast-growing demand for electricity and desalinated water.

However, Abu Dhabi's goal is not to generate 7 percent of its electricity with renewables, but to use them for 7 percent of the emirate's installed capacity, which, in 2020, is expected to comprise about 1.5 gigawatts (GW) of an overall capacity of 23 GW, Krane said. The capacity factor of solar electricity is generally below 25 percent, compared with roughly 80 percent for a baseload combined-cycle gas turbine plant; so a 1.5-GW installation of mainly solar-driven generation capacity would provide only about 2.5 percent of Abu Dhabi's overall electricity. "A more effective policy, in terms of efficiency gains and emissions reductions, would be a campaign that penalizes waste by raising tariffs," Krane concluded.

More information: The complete paper is available online: bakerinstitute.org/research/ex … atural-gas-shortage/

Provided by Rice University

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