

# Work begins on our nuclear future

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The site on the Abu Dhabi coast where the Emirates Nuclear Energy Corporation intends to have a row of four reactors operating by 2020. Ravindranath K / The National

BRAKA // The rows of rustic shacks have been emptied and the glistening white beach is silent, with barely a footprint in the sand.

On the horizon an oil rig plumbs the depths of the Gulf, while a surveyor in a dune buggy drives along the water's edge.

A huge power plant is coming to this picturesque spot on the far western coastline of Abu Dhabi, the surveyor says, and his job is to map every contour of the land.

Less than one kilometre away, scores of trailers have been installed, part of the city of accommodation planned for the thousands of construction workers expected on the site. Dirt roads are being paved, a razor-wire fence is going up and a guard house is being built.

Located hundreds of kilometres from the capital and other major population centres, Braika will soon become the centre of the UAE's nuclear power programme, an ambitious, wide-ranging effort that has been held up as the "gold standard" for the development of peaceful nuclear power. In two years' time – if federal regulators approve both the site and the reactor design – contractors will begin pouring thousands of tonnes of concrete and lay the foundations of the country's first nuclear reactor.

By 2020, the Emirates Nuclear Energy Corporation (Enec) intends to have a row of four reactors operating on this site, producing 5,600 megawatts, amounting to a quarter of the emirate's

electricity demand, with even more plants planned.

The nuclear programme is central to Abu Dhabi's long-term economic development, officials say. It will provide the emirate and the country with a dependable, low-carbon source of electricity to feed ambitious industrialisation efforts, and will spur the development of an area largely passed by the past decade's economic boom. It will create jobs, cultivate industry and usher in a new age of development in the UAE.

Abu Dhabi has advanced its nuclear plans at one of the fastest rates in the history of civilian nuclear power. That pace is on display at Braka, where only three months ago Emiratis came for weekend holidays they have been replaced by teams of construction workers and engineers.

In late April, the community comprised about 65 homes, two grocery stores, one restaurant and one mosque, all powered by portable generators because the site was not connected to the electricity grid.

Residents were told of the announcement in late April and had to leave the area by May 20, said Talal Abdullah, a former Braka resident.

"I was worried about going back there because I didn't want to see the house being torn down," he said.

The former residents have been offered land in different areas in Al Gharbia, such as Mirfa and Sila in exchange, he said.

Residents were granted the land free of charge several years ago, with the understanding that they must relinquish it if a project were planned for the site, said Saeed Hilal, another former Braka homeowner.

The Government says the pace of the nuclear programme is being driven by ballooning electricity demand that leaves little room for construction delays. Rapid economic development and population growth have raised Abu Dhabi's electricity consumption as much as 10 per cent per year, forcing the Government to build a multibillion-dollar gas-fired power station nearly every year.

The growth rate, among the highest in the world, will see electricity demand double even before the first reactor comes online in 2017, according to the Government's ambitious reactor completion schedule.

A government study concluded in April 2008 that the country's abundant natural gas reserves, which have supplied low-cost electricity for decades, could not be developed quickly and cheaply enough to indefinitely fuel each new power station. Burning oil, meanwhile, would be prohibitively expensive, cutting into the emirate's exports, officials said. Coal would be too polluting and solar power too expensive to play the dominant role in electricity generation.

With those conclusions, officials took the bureaucratic and legal steps toward nuclear power: in less than two years they concluded cooperation agreements with major reactor suppliers including the US and France, set up an independent federal regulator and awarded a US\$20 billion (Dh73.46bn) contract to Korea Electric Power Corporation and its partners to build the country's first four reactors.

The Government ameliorated western concerns about nuclear proliferation by enshrining in law a pledge to import all of its nuclear fuel and not to enrich uranium on UAE soil. That step, designed to show the world that the country has no interest in developing nuclear weapons, has been resisted by other aspiring nuclear states such as Jordan that do not want to give up their right under the international Nuclear Non-Proliferation Treaty to create their own reactor fuel.

The UAE's approach was significantly faster than the traditional, decades-long model for nuclear power development in which countries first build research reactors and train engineers before even considering a commercial-scale plant, said Mustapha Bahran, a professor of physics at the University of Sana'a in Yemen and the country's former minister of energy and electricity.

"There are two tracks, a traditional track for nuclear integration and a fast track for integration," he said at a nuclear conference in Jordan this year. "The fast track is exemplified by what has happened in the UAE."

The pace of the programme presents many challenges, including a heavy reliance on foreign workers because the country has no history of training nuclear operators and engineers. The Khalifa University for Science, Technology and Research and the Institute of Applied Technologies are both racing to create domestic nuclear education programmes.

But investment in the nuclear programme – expected to total \$40 billion for the first reactors when all operations and fuel costs are factored in – will also jump-start economic development.

Studies of nuclear power stations across the world showed that the 2,000 staff who work in the plant amount to an average of only six per cent of the total number of jobs created when a plant is established, said Shaikha al Mehairi, the manager for people development at the Western

Region Development Council.

“Nuclear stations in the world usually create industrialisation themselves,” she said. “Imagine the 94 per cent more jobs created around the station, whether in the education field, the hospitals – it will create a lot of employment.”

The South Korean nuclear industry, which has built 20 reactors in the past 30 years, has played a major role in spurring the country’s industrial development, said Whang Joo-ho, a professor of nuclear engineering at Kyung Hee University and a high-level policy adviser to the South Korean government.

“Having nuclear education and training spreads the knowledge of quality assurance, which is not considered as important in other industries,” he said. “Quality assurance, once settled in the field, upgrades industries’ outputs.”

Based on the South Korean experience, the first domestic industries to benefit from nuclear power plants are construction and the manufacturers of simple components, he said.

“Nuclear power development helped Korean manufacturers of parts and components to meet a high-level code and standard,” he said. “This in turn increased exports.”