

# DAWN

## *Pakistan's nuclear energy plans: Q&A with physicist Abdul H Nayyar*

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**Pakistan's plans to build two nuclear reactors 40 kilometres from the bustling port city of Karachi, a metropolis of about 18 million people has become a bone of contention between scientists and the government.**

They are to be built by the China National Nuclear Corporation. Each reactor is worth US\$4.8 billion and the deal includes a loan of US\$6.5 billion from a Chinese bank. These reactors have never been built or tested anywhere, not even in China. If a Fukushima or a Chernobyl-like disaster were to take place, evacuating Karachi would be impossible, says a leading Pakistani physicist. He argues that building these nuclear reactors may have significant environmental, health, and social impacts.

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## **Interview with senior physicist Abdul Hameed Nayyar**

**China is transferring nuclear technology to Pakistan, a country that has not signed the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). China has been able to defy NSG restrictions because NSG had already weakened its own position by giving a waiver to India. China has taken a position that it made these supply agreements with Pakistan before becoming a member of NSG in 2004, and is therefore following a 'grandfather' agreement. This certainly is true for the Chashma reactors. But is it also true for the Karachi reactors?**

**Nayyar:** The doubters point out that the kind of reactors China is supplying to Karachi were not even designed in 2004. In my opinion, this nit picking is fruitless. The China-Pakistan nuclear deal will not be challenged at international legal forums.

**But isn't the Obama administration also trying to revive the 2008 deal with India so that American companies may invest in nuclear power plants in India? India has not signed the NPT either.**

**Nayyar:** Yes, the US is desperately looking for ways to find a nuclear market in India. India has money and a need for large nuclear power reactors, and the American nuclear industry is short of buyers.

Bush had promised that the US-India nuclear deal would revive the US nuclear industry and create jobs; that did not happen because of the Indian liability law, which lays that the liability in case of accidents will be on both operators and manufacturers.

Obama has now tried to push India to somehow circumvent the liability law. That has not happened yet. The big question is, will it?

**The world over, generating power through nuclear reactors (31 countries are generating power through nuclear reactors) is seen as a viable option, why not here in Pakistan?**

**Nayyar:** No, the global trend is not in favour of nuclear power. Many countries have abandoned nuclear power. Germany is a prime example. There are other examples too. No nuclear reactor has come into operation in the US for over 43 years. A few are under construction now but they have not set any trend.

China is certainly a strong counter-example. It has set up several nuclear industrial corporations, which have invested so heavily in the acquisition of the technical skill that they are now keen to export nuclear power technology abroad.

The Pakistan-China nuclear trade can be explained by a simple fact that no other country in the world is ready to sell a nuclear power reactor to Pakistan, and no other country has shown any interest in buying nuclear power reactors made in China so far. It is a marriage of convenience.

**What is your biggest concern if the reactors are built?**

**Nayyar:** Our biggest concerns are two: a Fukushima or Chernobyl-like accident at the new reactors, and inexperience with the reactor design.

The reactors are situated too close to the metropolis of Karachi. The Fukushima accident effects were observed up to a distance of 30 kilometres from the reactor site. From the proposed Karachi reactor site, the area up to 30 kilometres includes a densely populated area. If a severe accident happens at these reactors, these areas would be closed down for years. The impact of such a closure on the economy of Pakistan is going to be tremendous.

Also please recall that the entire population within the areas up to 30 kilometres of Fukushima was evacuated and has not been allowed in even after four years since the accident. Imagine evacuating the entire population of Karachi. Is it really possible? If we fail to evacuate 18 million people imagine the number of people that would get radiation sickness.

### **So how do you see Pakistan overcoming its energy crisis?**

**Nayyar:** This is a good question. Let us explore what is possible other than nuclear. We should note that in China, from where we are buying nuclear reactors for Karachi, is developing very strong wind energy and solar energy technologies, both of which are larger in magnitude in installed capacity than nuclear power.

As against the total nuclear electricity generating capacity of about 17 gigawatts (1 gigawatts = 1,000 megawatts), China has installed wind power plants of total capacity of 76 gigawatts. In the year 2014 alone, China installed wind power plants of 20 gigawatts capacity. If China can install such a large number of windmills on its soil, it must have a very strong windmill-manufacturing base.

This means that Pakistan could ask China to extend to it the same loan that it is giving for Karachi nuclear plants (US\$6.4 billion) to set up wind power manufacturing plants.

Pakistan is said to have a wind power capacity of at least 40,000 megawatts. Chinese loan could be used to establish a windmill manufacturing industry. The wind power has the characteristic that its installation cost is nearly half as much as nuclear plant, and has zero fuel cost. Wind electricity comes out much cheaper than nuclear electricity.

The global growth in wind power is phenomenal. Nearly 50,000 megawatts of new plants are installed every year globally. Pakistan needs only another 10,000 megawatts to meet all its power needs.

Then there is solar photovoltaic technology, the cost of which has tumbled down enormously recently. And like wind power it is also modular in nature.

The Punjab government has wisely embarked on a project to install solar power in modules of five megawatts and aims at 1,000 megawatts. Hence the answer to your question lies in wind and solar power plants.

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*This article has been produced by [SciDev.Net's South Asia desk](#).*

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