

The draw of space and nuclear technologies

It remains to be seen whether the new ventures of Jeff Bezos and Bill Gates will strike a chord and benefit mankind



T.P. SREENIVASAN

Even as billionaire Jeff Bezos was preparing to blast off into space last month, another billionaire, Bill Gates, took an equally momentous decision to launch his own nuclear reactor with an eye on the possibility of exporting fast breeder reactors to power hungry nations (<https://reut.rs/3ylFSgW>). Both of them characterised their initiatives as essentially aimed at the environment to reverse climate change. Answering criticism on his expensive and wasteful adventure, Bezos insisted that he had an environmental vision: “We need to take all heavy industry, all polluting industry and move it into space, and keep Earth as this beautiful gem of a planet that it is,” he said. Mr. Gates stressed the importance of nuclear power as the clean energy required to meet the requirements of the world, even though the safety of nuclear reactors and the risk of proliferation of nuclear weapons are a growing concern.

The future of atomic energy

Back in 2007-08, the then Director General of the International Atomic Energy Agency (IAEA), Mohamed ElBaradei, had established a Committee of Eminent Persons to look at the future of nuclear power in 2020 and beyond. As an Executive Director of the Commission, I had helped to produce a report, which asserted that “the international community has both auspicious opportunities and significant challenges to tackle as the world moves into its seventh nuclear decade. Expanded use of nuclear technologies offered immense potential to meet important development needs. In fact, to satisfy energy demands and to mitigate the threat of cli-

mate change – two of the 21st century’s greatest challenges – there are major opportunities for expansion of nuclear energy”. The report predicted that a “nuclear renaissance” will solve not only the world’s energy problems, but also alleviate climate change.

Fukushima and after

But the expectation was short-lived because the Fukushima Daiichi accident in Japan on March 11, 2011 completely transformed the nuclear power situation beyond recognition and dealt a blow to plans for swiftly scaling up nuclear power to address not only climate change but also energy poverty and economic development. An IAEA article, “Nuclear power 10 years after Fukushima: the long road back”, says, as the global community turned its attention to strengthening nuclear safety, several countries opted to phase out nuclear power. The nuclear industry was at a standstill except in Russia, China and India. Even in India, the expected installation of imported reactors did not materialise because of our liability law and the anti-nuclear protests in proposed locations. India had to go in for more indigenous reactors to increase the nuclear component of its energy mix. More than 50 nations, which were knocking at the door of the IAEA for nuclear energy for peaceful purposes, quietly withdrew their requests.

After intensive efforts to strengthen nuclear safety, as said in this article, and with global warming becoming ever more apparent, nuclear power is regaining a place in global debates as a climate-friendly energy option once again. Countries such as Japan and Germany reopened their reactors to produce energy. But even as organisations such as the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA) recognise the ability of nuclear power to address major global challenges, it remains uncertain whether the value of this clean, reliable and sustainable



source of energy will achieve its full potential any time soon.

The Fukushima Daiichi accident, adds the article, continues to cast a shadow over the prospects of nuclear power. Furthermore, in some major markets, nuclear power lacks a favourable policy and financing framework that recognise its contributions to climate change mitigation and sustainable development. Without such a framework, nuclear power will struggle to deliver on its full potential, even as the world remains as dependent on fossil fuels as it was three decades ago.

The Gates plan

Even when the uncertainty continues and the anti-nuclear lobby is gaining momentum, TerraPower, the nuclear company founded by Mr. Gates, has just announced an agreement with private funders, including Warren Buffett, and the State of Wyoming, U.S. to site its Natrium fast reactor demonstration project there. Moreover, since it falls within the “advanced” small modular reactor project of the U.S. Department of Energy (DOE), the Department will subsidise the project of one of the richest men in the world to the extent of \$80 million this year.

As an article by the non-proliferation sentinels in the U.S, Henry Sokolski and Victor Gilinsky, titled “Bill Gates’ Fast Nuclear Reactor: Will It Bomb?” (<https://bit.ly/3fjM1Tc>) says, Mr. Gates believes that the fast breeder reactors will replace the current reactors. The DOE and other nuclear

enthusiasts also believe that small, factory-built, modular reactors will be cheaper and safer, and will be so attractive to foreign buyers that they will revive America’s nuclear industry and enable the United States to compete in an international market now dominated by China and Russia. Another benefit envisaged is that fast breeder reactors will provide a solid nuclear industrial base for meeting U.S. military nuclear requirements. DOE has found bipartisan Congressional support for funding the project.

Mr. Sokolski and Mr. Gilinsky have challenged the move on several grounds such as the failure of earlier efforts to develop such reactors, and the risk of the turning of inert uranium to plutonium, and then using the plutonium as fuel. They have argued in their article that it can even “breed” excess plutonium to fuel new fast reactors. What concerns them most is that plutonium is a nuclear explosive which can be used for developing a bomb. They are afraid that the availability of plutonium through commercial channels would be fraught with dangers.

As their article says, TerraPower announced in March that Natrium would be fuelled with uranium enriched to 20% U-235 rather than explosive plutonium. But the question being asked is if Natrium reactor takes off and is offered for export, will the same restraint apply. Currently, only a handful of nations can make 20% enriched uranium. The critics believe that there will be a rush to make 20% enriched uranium world wide. The main objection to nuclear enrichment beyond a point in Iran arises from the fact that it would lead to weapon grade uranium being available for them.

The other objection being raised against the Gates project, as cited in the article, is that the principal reason for preferring fast reactors is to gain the ability to breed plutonium. That is surely what foreign customers will want. The way it is configured, the reac-

tor would make and reuse massive quantities of material that could also be used as nuclear explosives in warheads.

Focus on India and China

India’s fast breeder reactor, which is not subject to international inspections, is seen as capable of feeding the nuclear weapons capability of India. And the recent reports that China is building two more fast reactors have immediately provoked international concerns about China’s possible weapons plutonium production. The opponents of TerraPower believe that India and China will be encouraged in their efforts to develop fast breeder reactors and may even want to buy them from Mr. Gates. They also think that the characterisation of TerraPower as small is a gimmick and they will have to be made big to make them economical. The claim that fast reactors are safer than light water reactors has also been called into question.

It has been pointed out that U.S. Presidents Gerald Ford and Jimmy Carter made it U.S. policy to discourage the commercialising of plutonium-fuelled reactors. President Ford had announced that the U.S. would not support reliance on plutonium fuel and associated reprocessing of spent fuel until “the world community can effectively overcome the associated risks of proliferation.” (<https://bit.ly/3fii71N>). The critics do not think that the world has reached such a stage.

No one can predict whether the space adventure of Mr. Bezos or the nuclear venture of Mr. Gates will benefit the U.S. and the wider world. But billionaires have the sixth sense to know how to multiply their own billions.

T.P. Sreenivasan is a former Ambassador of India and Governor for India of the International Atomic Energy Agency (IAEA). He is also Chairman, Academic Council, NSS Academy of Civil Services and the Director General, Kerala International Centre