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## Editorial

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### M.P. Ram Mohan\*

The Energy and Resources Institute (TERI),  
India Habitat Centre, Lodhi Road,  
New Delhi 110003, India  
Email: mprmohan@teri.res.in  
\*Corresponding author

### Els Reynaers Kini

M.V. Kini & Co, Advocates and Solicitors,  
Mumbai 400 001, India  
Email: else@mvkini.com

**Biographical notes:** M.P. Ram Mohan is Fellow of the Energy and Resources Institute (TERI); Chairman of the Nuclear Law Association of India, New Delhi; and a research scholar of the Indian Institute of Technology, Kharagpur, India.

Els Reynaers Kini is a partner in M.V. Kini & Co., Advocates and Solicitors, and Secretary of the Nuclear Law Association of India.

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In India, nuclear energy has suddenly become a contested topic. This contestation is based on two factors: (1) the large-scale expansion plan of nuclear power subsequent to India's entry into global nuclear commerce and (2) the issue of nuclear energy and its consequences has come into public discourse largely consequent to the Parliamentary debate on civil nuclear liability law. The Fukushima accident in Japan further added suspicion of the 'safety' of nuclear power plants and possible social and environmental impacts on communities.

Currently, nuclear energy constitutes approximately 4800 MW, i.e. 4% of the overall power production in India. Coal will remain India's most important energy source at least until 2030, though it is estimated that the domestic extractable coal resources will be exhausted in 45 years. Hence, in a country potentially starved of power and unable to meet the growing demands of the economy and households, the Government is convinced that a much larger nuclear route is one of the options to shore up the energy supply. However, up-scaling indigenous capability has been hampered both by limited uranium resources and by technical constraints due to sustained sanction on India subsequent to its nuclear tests in 1974 and 1998. This also led India to actively pursue research in an indigenous thorium fuel cycle, as it controls 25% of all known thorium reserves in the world. As the first step towards re-engaging with the global nuclear supplier countries, in 2005 India and USA entered into a *civil nuclear energy cooperation agreement*. The main objectives of the agreement are to facilitate India in overcoming a three-decade long isolation in nuclear energy collaboration and to open its market for imported high capacity nuclear reactors. The cooperation was successfully concluded in 2008 with the NSG (Nuclear Suppliers Group) waiver to India and final

approval by the US Congress. India has also signed bilateral agreements on civilian nuclear energy technology cooperation with other countries, such as France, UK and Canada, as well uranium supply agreements with Russia, Mongolia, Kazakhstan, Argentina and Namibia.

Armed with the prospects of a major expansion, the Department of Atomic Energy (DAE) revised its target and projected 20,000 MW by 2020 – a fourfold increase from the current production – and further to achieve 60,000 MW by the early 2030s. India even cherishes the ambitious plan to supply 25% (300 GW) of electricity from nuclear power by 2050. The execution of these targets is to be achieved by importing high-capacity reactors and through the DAE's own programme, including the thorium-based programme.

In order to achieve the targets, the DAE has lost no time in negotiating with supplier countries in setting up nuclear power parks in several parts of the country. However, in terms of setting-up of nuclear power plants, the whole programme is trapped in a quagmire of difficulties, largely between the DAE and anti-nuclear activists, which has resulted in a high trust deficit between the government and civil society. Issues of land acquisition, the secrecy of the programme, impact assessments that lacked depth, and unproductive public hearing processes have all been the source of poignant arguments of anti-nuclear activities. The DAE on its part has not been able to shape public opinion in its favour, particularly in the communities that would feel an immediate impact, by comprehensively explaining the multiple layers of safety features of NPPs – an aspect that is largely misunderstood by many – the good safety record of Indian NPPs and the misunderstood radiation fear. Further, even after much effort by the DAE in educating the public on radiation, the fear of the impacts of radiation exposure to life, livelihood and the environment persists in India.

In terms of the law, one of the first legislative steps in enabling India's entry into world nuclear commerce was to adopt a civil nuclear liability law that fully reflects the concerns of the public and industry alike. After much debate, the Parliament of India passed *The Civil Liability for Nuclear Damage Act 2010 (Nuclear Liability Law, hereafter)*. Rules have also been framed. Interestingly, there has been a strong voice from the civil society against several provisions of this liability law: whether it can stand the test of the Constitution? The Act was challenged before the Supreme Court on constitutional grounds. Further, a safety reassessment of all nuclear facilities in India and a comprehensive long-term cost-benefit analysis of the nuclear plants in India by an independent expert body have also been sought through this Public Interest Litigation. While the Court agreed to examine the constitutional validity of the nuclear liability law, however declined to go into the safety of nuclear plants in the country. The court said it does not have the 'expertise' to examine highly technical matter such as this and observed "it is for Parliament and the government to go into the safety aspects".

Another important institutional issue with respect to a credible nuclear energy programme is to have an empowered independent (technically, financially and administratively) regulator. At present, the Atomic Energy Regulatory Board (AERB), which reports to the Atomic Energy Commission (AEC), is perceived as not fully independent. With the expected expansion of India's energy programme, the country would need a regulator whose role and function is not just technical safety regulation, but a re-defined institution that aims at the highest standards of public safety, security, and environmental safety, seeks the best practices in operating NPPs, and undertakes decisions in a transparent manner. Basically, an institution that is capable of passing the

test of independence and achieving public acceptance and gaining trust. To initiate the establishment of an independent regulator, the government has tabled *The Nuclear Safety Regulatory Authority Bill, 2011* in the Parliament, which is yet to be taken up for discussion (as of February 2012).

Nuclear energy discussion in India has entered an interesting and productive phase. An institution considered as one of the important scientific institutions that has made the country proud and which has traditionally been shielded from any intrusive inquiry, is now slowly opening up for public scrutiny. The unprecedented legislative and judicial scrutiny of nuclear energy development and its consequences has brought lots of issues to the forefront. The role of government and civil society, social and environmental impact analysis, waste management, radiation effects, etc., are all contentious issues. Most of the issues can be earnestly addressed within the four corners of strong laws and empowered institutions. DAE's openness in slowing engaging in most of the issues is indeed commendable. Scientists are trained as innovators and may not have the necessary public engagement skills for effective communication while dealing with the consequences of scientific development. Greater responsibility rests with the political leadership in engaging the public and taking into consideration social and environmental safety and security, while also ensuring that the progress of the country is in no way compromised.

The broad theme of this special issue is 'Role of law and legal institutions in the development of nuclear energy in India and South Asia'. The special issue is in two parts. Part 1 contains the preface, the address from the French (ex) President and five India-specific papers on nuclear politics and nuclear liability law. Part 2 consists of five papers, and covers nuclear regulatory structure in India and Bangladesh, South Asian nuclear risk community and world governance for nuclear safety in the aftermath of Fukushima accident. Part 1 was published in Volume 3, No. 4 (2012) of this journal.

The special issue has been made possible through contributions by several researchers; their contributions are discussed below.

Rajeswari Rajagopalan and Uma Purushothaman elaborately articulate the role of the parliament, political parties and prominent civil society groups in influencing the 'nuclear debate' and framing policy. The 2005 Indo-US civil nuclear deal and the Civil Liability for Nuclear Damage Act 2010 are taken as the two prominent case studies in driving the point.

In the post-civil nuclear deal phase, India is poised for major expansion of nuclear power programme that are fraught with several complex issues. Swati Ganeshan investigates the role of the state and influence of stakeholders, the key domestic concerns around nuclear energy expansion and social and environmental externalities that lay ahead for India.

In respect to nuclear liability law, Saurabh Bhattacharjee argues that the international liability regime is based on outdated assumptions on the price and utility of nuclear energy and also conflicts with contemporary international environmental law. He says that these international regimes cannot, in their present form, serve as appropriate models for Indian attempts at institutionalisation of its liability norms. Further on the critical and contentious aspect of liability law, right of recourse, Arghya Sengupta and Sanhita Ambast critically examine the legal architecture relating to the right of recourse in the context of the Constitution, Supreme Court judgments and the international liability regime. Arghya and Sanhita suggest appropriate reform to the Indian law to ensure that its provisions are sound in principle and effective in facilitating the safe, affordable and efficient supply of nuclear energy in India.

Questioning the legality of nuclear liability law within the constitutional scheme, Tanavi Mohanty and Aayush Kumar, suggests the law may not stand the test of constitutional mandates within the parameters of fundamental rights of life, liberty and equality.

An independent and empowered nuclear regulator serves as a crucial public institution that sets the parameters of nuclear power programme safety. As briefly articulated in the beginning, a lot depend on the functioning of the regulator; process of public engagement and gaining public confidence, addressing social and environmental concerns and many others. Kanika Gauba, in her critique, undertakes a detailed study of the regulatory process currently in place, reviews the Jaipatpur and Kudamkulam protests and suggests ways in which the regulatory environment could be strengthened. To contestualise India in the international regulatory regime, Timothy P. Matthews and Esther K. Park, provides interesting insights and lessons through comparing the existing and proposed organisational structures in India, with the organisational structures of independent national regulators from the USA, the UK, Japan, the People's Republic of China and the United Arab Emirates.

In South Asia, many countries see nuclear energy as an important energy option. Other than the current nuclear energy producing countries, i.e. India and Pakistan, Bangladesh and Sri Lanka have concrete plans in setting up nuclear power projects. An interesting insight from Bangladesh – a country that is in the process of setting up its nuclear power plant – explains in detail its nuclear energy programme and the proposed regulatory structure. Alak Chakraborty, K.M. Rezaur Rahman and Mohammad Shawkat Akbar, provide an overview and analyse the draft 'Bangladesh Atomic Energy Regulatory (BAER) Act, 2011', which has been drafted with input from the IAEA and most interestingly also assisted by a 'vendor country'. In May 2012, the Parliament of Bangladesh passed the law, which was brought into effect on 19 June 2012 through a gazette notification, notifying the BAER Act 2012. The authors have informed us that though, "the paper was based on the Draft Act there is no major change between the Draft Act and the Act that had been passed in the Parliament".

South Asia is one of the densely populated regions of the world. A disaster in the nature of nuclear accident in one country will have a significant impact on the life and livelihood of large populations across the region. M.P. Ram Mohan, K.D. Raju and M.V. Shiju, argues for establishing a formal South Asian nuclear risk community. They explain, since major economies in South Asia are either expanding or planning to start their nuclear energy programmes, the transboundary risk associated with this should be addressed. The risk is aggravated by the fact that countries in South Asia are not a part of any common international nuclear liability framework, nor do they have reciprocal domestic law.

After the 1986 Chernobly nuclear accident, the March 2011 Fukushima nuclear accident in Japan was a reality check. All countries are now re-assessing their nuclear energy programmes and also strengthening their safety features. In the post-Fukushima environment, Patrick Reyners argues in the light of accident in Japan, "that under the pressure of events – and that of public opinion – the law must adapt to the change of policies and nuclear law is especially reactive in this respect". Patrick raises the issue of how Fukushima accident could serve as a catalyst for real progress in the global regime of nuclear safety.