

## Nuclear Revival in Post-Suharto Indonesia

### ABSTRACT

Indonesia is planning to build a nuclear power plant to meet soaring demand for energy. Opposing this policy, an anti-nuclear alliance is emerging from grassroots groups driven by distrust of the government's ability to handle high-risk technology. This article explores the contemporary politics of Indonesia's nuclear power program.

**KEYWORDS:** nuclear power, post-Suharto Indonesia, anti-nuclear movement, energy crisis, democracy

ON JUNE 12, 2007, ABOUT 5,000 PEOPLE gathered in downtown Kudus in the district of Jepara, Central Java. *Kudus* means silent, but on that extraordinary day it was completely the opposite. A crowd of local residents, activists, artists, and students was fervently shouting, creating an uproar that shook the peaceful town. They all had come to express their firm rejection of Jakarta's plan to build four nuclear reactors in the Muria Peninsula on the north coast of Central Java. Some demonstrators raised banners showing their condemnation of what they saw as the government's malicious ambition. An art performance by noted religious poet Emha Ainun Najib animated the event. Joining the protesters, interestingly, were public officials, district Parliament members, military territorial commandants, and police chiefs. The district head of Kudus even delivered a speech with a clear message that "[n]uclear power reactors should not be built in Muria because the people do not want it."<sup>1</sup>

The large-scale protest unfolding in the heartland of Java was part of a series of adverse responses increasingly emerging from the grassroots level

---

SULFIKAR AMIR is an Assistant Professor in the Division of Sociology, School of Humanities and Social Sciences, Nanyang Technological University, Singapore. This article stems from a research project funded by the School of Humanities and Social Sciences, Nanyang Technological University. The author wishes to thank the reader for critical comments and inputs to an early version of this article. Any errors in the article belong to the author. Email: <sulfikar@ntu.edu.sg>.

1. "Demo Anti-PLTN Merambat ke Kudus" [Anti-nuclear protests spread to Kudus], <[http://www.walhi.or.id/kampanye/energi/pltn/070612\\_pltnkds\\_cu/](http://www.walhi.or.id/kampanye/energi/pltn/070612_pltnkds_cu/)>, accessed July 8, 2007.

---

*Asian Survey*, Vol. 50, Number 2, pp. 265–286. ISSN 0004-4687, electronic ISSN 1533-838X. © 2010 by the Regents of the University of California. All rights reserved. Please direct all requests for permission to photocopy or reproduce article content through the University of California Press's Rights and Permissions website, <http://www.ucpressjournals.com/reprintInfo.asp>. DOI: AS.2010.50.2.265.

against nuclear energy, a form of technology that one Indonesian non-governmental organization (NGO) calls “the destroyer of human future.”<sup>2</sup> It all began almost one year earlier when Minister of Energy and Mineral Resources Purnomo Yusgiantoro announced Indonesia’s plan to build a nuclear power plant to meet soaring demands for energy. As stated in Kebijakan Energi Nasional (National Energy Policy, KEN), conceived by the Yudhoyono government in 2005, Indonesia expects to have a nuclear power plant within 10 years. This represents the resurrection of an on-and-off program that has been around since the early 1970s. After prolonged procrastination, this time the Yudhoyono government determined that it was timely for Indonesia to go nuclear. Badan Tenaga Nuklir Nasional (National Nuclear Power Agency, BATAN), a research agency under the Ministry of Research and Technology, along with Badan Pengawas Tenaga Nuklir (Nuclear Regulatory Agency, BAPETEN), was given the responsibility for formulating a comprehensive plan for the nuclear power program.

According to BATAN’s original roadmap, in 2008 the government was planning to invite foreign contractors to submit tenders for the construction of the Muria plant, expected to commence in 2010. The plant was scheduled to operate commercially by 2016, yielding up to 4,000 MW of electricity in 2025. The estimated cost for each megawatt is US\$1 million, to be covered by the designated contractor. Parallel to the planning process, the state-owned Perusahaan Listrik Negara (Indonesian Power Company, PLN) signed an agreement with Korea Electric Power Corporation (KEPCO) to conduct detailed studies of the location, regulations, safety, environmental impacts, and costs of the Muria plant. It is assumed that nuclear-generated electricity costs will be less than 4.2 cents per kilowatt hour.

In light of the resurrection of Indonesia’s nuclear power program, which is concomitantly challenged by the anti-nuclear movement emerging from grassroots groups, this article seeks to explain the contemporary politics of nuclear power in Indonesia. It sheds light on the juncture of several factors that have opened up the way for nuclear power to regain popularity. First, it highlights the political implications of the energy crisis that has heavily burdened President Susilo Bambang Yudhoyono’s efforts to rekindle the Indonesian economy and stabilize the popularity of his government. Second,

2. See WALHI’s (Wahana Lingkungan Hidup Indonesia) online publication, <[http://www.walhi.or.id/kampanye/energi/pltn/070625\\_pltn\\_cu/](http://www.walhi.or.id/kampanye/energi/pltn/070625_pltn_cu/)>, accessed July 12, 2007. WALHI is a leading environmental NGO relentlessly fighting against the implementation of nuclear power in Indonesia.

this study explores organized efforts by pro-nuclear bureaucrats to include the nuclear option in the national energy policy, with full support from various actors including politicians, private corporations, and international nuclear agencies. Last, this article observes the growing strength of the anti-nuclear movement that has arisen to respond to Jakarta's nuclear ambition. It argues that the rise of such an organized resistance by civil society groups is forged less by immediate fears of nuclear accidents than by distrust of the government's ability to handle high risk technology. Thus, this article points to fragile institutional conditions resulting from the democratic transitions Indonesia has gone through since Suharto's departure in 1998. This institutional precariousness appears to be a factor shaping society's distrust of the government's capacity to safely and securely produce nuclear power.

### ENERGY PREDICAMENT

For 30 years or so, oil was nothing less than nature's blessing to Indonesia. During its early period, the success of the New Order government (1966–98) led by President Suharto in boosting the Indonesian economy depended heavily on oil abundance. The state monopoly on oil production through the state-owned company Pertamina gave Suharto discretionary funds mostly used to build the power and prestige of his regime. Thus, while a portion of oil revenues was spent to improve public sectors such as infrastructure and basic education, a larger bulk allocated through off-budget channels went to megaprojects, most notably the airplane manufacturing center in Bandung, Java.<sup>3</sup> Oil revenues also helped retain the military's support Suharto needed to keep his power intact.<sup>4</sup> Parallel to such political uses, from the outset Suharto subsidized the prices of oil products such as gasoline, kerosene, and diesel to keep them affordable for lower and middle class Indonesians. This proved to be an effective policy to win the hearts of the majority.

By the end of the New Order period, oil turned into a curse as Suharto's expedient policy had created an oil-dependent society while Indonesian oil production had begun to decline. Furthermore, the misuse and mismanagement of oil-based resources under the monopoly of Pertamina entailed severe

3. Sulfiqar Amir, "Nationalist Rhetoric and Technological Development: The Indonesian Aircraft Industry in the New Order Regime," *Technology in Society* 29:3 (2007), pp. 283–93.

4. William Ascher, "From Oil to Timber: The Political Economy of Off-Budget Development Financing in Indonesia," *Indonesia* 65 (1998), pp. 37–62.

inefficiency in almost every layer of energy production, distribution, and consumption. It was the oil dilemma that spurred the breakdown of the New Order regime when the International Monetary Fund, in light of the Asian financial crisis, came to compel Suharto to withdraw oil subsidies. This decision instantly sparked student protests around the country. In May 1998, Suharto reluctantly stepped down<sup>5</sup> following riots that broke out in Jakarta and other big cities, killing hundreds of innocent people.<sup>6</sup>

In years to come, Suharto's legacy of a reckless energy policy left a considerable burden to his successors, both economically and politically. When the late President Abdurrahman Wahid<sup>7</sup> signed the 2001 *Oil and Gas Law* opening the oil business in Indonesia to multinational corporations, Pertamina was exposed to a competitive environment it had never encountered. In 2000, the Wahid government took a set of measures to improve Pertamina's efficiency and performance, but to many observers it was too late. By then the market was already liberalized, and multinational oil giants had penetrated into the domestic market.

In 2004, Indonesian politics saw the rise of Yudhoyono,<sup>8</sup> who came to power after outdoing the incumbent Megawati Sukarnoputri in the first direct presidential election. It took no time for Yudhoyono to recognize crucial challenges he had to cope with in order to stay in office. An immediate dilemma was a large portion of oil subsidies that burdened the state budget. The same problem haunted Megawati, but she took no action to cut the oil subsidy, in an effort to avoid losing her popularity in the 2004 election.

5. In May 1998, because of the Indonesian Constitution, Suharto was replaced by his vice president, B. J. Habibie, who became the third Indonesian president, serving for less than two years. Habibie attempted to extend his presidency but then cancelled his decision to run for president after his accountability speech was rejected by the Majelis Permusyawaratan Rakyat (People's Consultative Assembly, MPR).

6. James T. Siegel, "Early Thoughts on the Violence of May 13 and 14, 1998, in Jakarta," *Indonesia* 66 (1998), pp. 75–108.

7. Abdurrahman Wahid was named the fourth Indonesian president by MPR in October 1999. Wahid's vice president was Megawati Sukarnoputri, daughter of the first Indonesian president, Sukarno, and chair of Partai Demokrasi Indonesia Perjuangan (Indonesian Democratic Struggle Party, PDIP). In 2002, Wahid was impeached by the Parliament due to corruption scandals and eventually replaced by Megawati who completed the term in 2004.

8. Susilo Bambang Yudhoyono is a retired general who served as coordinating minister of politics and security affairs in the Megawati administration. A few months before he finished serving his term, he resigned from the cabinet and decided to run for president in the first direct presidential election in 2004. See R. William Liddle and Saiful Mujani, "Indonesia in 2004: The Rise of Susilo Bambang Yudhoyono," *Asian Survey* 45:1 (2005), pp. 119–126.

When Yudhoyono started his administration, Indonesia began to import more oil than it exported, making the subsidy unbearable. This rendered Indonesia a net importer and consequently losing a membership in the Organization of Petroleum Exporting Countries (OPEC).<sup>9</sup>

It is instructive to have a brief look at Indonesia's energy consumption to understand the severity of its energy crisis. Primary energy consumption during the past two decades grew at a relatively fast 8% per year. In 2005, 50% of total energy consumed came from oil. Nowadays, Indonesia's proven oil reserves pump out around 500 million barrels annually, but the reserves, according to expert predictions, will only last until 2020. With no substantial efforts to find a substitute for fossil fuel, oil consumption is increasing rapidly, particularly for transportation. Dependency on oil, created by Suharto's regime, is also high in the electric power grid, contributing 63.8% of the 28,484.18-megawatt total installed capacity. Caught up in this situation, importing oil is inevitable for Indonesia to keep meeting its soaring domestic demand for energy.

Only a few months after being formed, the Yudhoyono government was slammed by the sudden rise of crude oil prices in the international market, which this time reached \$57 a barrel, while the state budget priced it at \$35. That wide gap would have crippled the Yudhoyono government with insolvency if adjustments were not made immediately. Thus, in March 2005 Yudhoyono decided to raise oil prices an average of 29%. By this action, the government saved US\$3.3 billion in the state budget, a portion supposedly spent to subsidize oil products. Not surprisingly, the hike sparked protests from the Indonesian Parliament, the Dewan Perwakilan Rakyat (People's Representative Council, DPR). A small group of opposition legislators who strongly wished to annul the new prices created an agenda to impeach Yudhoyono for his decision. Fortunately for him, the attempt failed as Vice President Jusuf Kalla, chair of the biggest party, Golkar,<sup>10</sup> signaled all Parliament members from his party to block the impeachment.

9. In May 2008, the Yudhoyono administration decided to withdraw Indonesia's membership in OPEC starting in 2009.

10. Golongan Karya (Golkar) was Suharto's ruling party. Although it suffered a dramatic loss of votes in the 1999 election after Suharto's collapse, in the 2004 election Golkar won 25% of Parliament seats. This helped Yudhoyono to secure political support from the majority in the Parliament, because his vice president was chair of the Golkar Party. For a historical account of Golkar, see David Reeve, *Golkar of Indonesia: An Alternative to the Party System* (Oxford: Oxford University Press, 1985). For a contemporary account of Golkar, see Dirk Tomsa, "Party Politics and the Media in Indonesia: Creating a New Dual Identity for Golkar," *Contemporary Southeast Asia* 29:1 (2007), pp. 77–96.

In October 2005, Yudhoyono shocked Indonesia by raising oil prices once more, by an average of 107%, the highest level ever in the country. “The government has gone too far!” wrote a noted economist who concurred with the necessity of raising oil prices but not to that extent.<sup>11</sup> Justification for the abrupt reduction of oil subsidies that consequently increased oil prices rested on the argument that oil subsidies, which absorbed nearly one-third of the state budget, were enjoyed mostly by the upper middle class in cities such as Jakarta, Bandung, and Surabaya. There, energy consumption was many times higher than for those living under the poverty line. Looking at this fact, the anti-subsidy economists in the government believed that oil subsidies had diverted the benefits of public funds that could otherwise be used to provide educational and health services for the poor.

To lessen the consequent impact of this policy on those living in acute poverty, the Yudhoyono administration launched a cash transfer program called Bantuan Langsung Tunai (Direct Cash Subsidy, BLT) to compensate for sudden high inflation caused by the oil price hikes. This was in line with Yudhoyono’s promise during his presidential campaign to alleviate poverty. However, the efforts to enact such a program earned Yudhoyono and his economic team harsh criticism. As John Farrington and Rachel Slater have shown, cash transfer policies can be ineffective because of complexity in administration and fund allocations.<sup>12</sup> This was precisely the case when the Yudhoyono administration distributed BLT without prior experience. As a result, the 2005 BLT program turned rampageous, as sloppy coordination provoked unnecessary conflicts between beneficiaries and local administrators.<sup>13</sup> In the end, the poverty rate in Indonesia remains high despite the BLT program.

11. “Pemerintah Keterlaluan: Kenaikan Harga BBM Melampaui Kemampuan Masyarakat” [The government has gone too far: The fuel price increase exceeds people’s ability], *Kompas* (Jakarta, Indonesia), October 1, 2005.

12. John Farrington and Rachel Slater, “Cash Transfer: Panacea for Poverty Reduction or Money Down the Drain?” *Development Policy Review* 24:5 (September 2006), pp. 499–511.

13. Lack of coordination in distribution of cash transfer resulted in riots in a few places driven by the disappointment of the people as to how the officials managed the program. Even worse, a number of elders were killed from suffocation when queuing to collect the cash in the crowd. See “Antrean Dana BBM Kembali Menelan Korban” [Distribution of oil compensation cost more victims], *Suara Merdeka* (Semarang, Indonesia), October 18, 2005; “Pencairan Dana BLT Di Mulia Rusuh” [Cash transfer distribution in Mulia ended up in riots], *Kompas Cyber Media* (Jakarta, Indonesia), October 14, 2006.

The disturbing incidents staining the BLT program damaged the popularity of Yudhoyono's leadership. This demonstrated some political implications of the energy predicament Yudhoyono inherited from his predecessors. When the president started his term, his government faced many problems, from imminent deindustrialization and clumsy microeconomic progress to constant natural disasters, political violence, and social conflicts. However, it was the energy issue that practically posed the most serious threat to the longevity of Yudhoyono's presidency. A little tremor in the stability of the energy supply would produce a big wave of trouble, impacting almost every aspect of socioeconomic life. The dynamics of Indonesia's fragmented politics after the demise of Suharto's authoritarianism made Yudhoyono's presidency vulnerable to political attacks from his opponents, most notably Megawati Sukarnoputri, who was eager to return to the presidential palace. Although the Yudhoyono leadership was completely legitimate when he took power through a fair and direct election, his legitimacy grew thin over time. It became evident that his administration had failed to take coordinated, effective action that could guarantee a sustainable supply of affordable energy for domestic demand. The ruined image of the Yudhoyono government worsened after the president reluctantly raised oil prices 28% in May 2008 when the international oil price struck \$130 a barrel. This was exacerbated by regular blackouts throughout Java and Bali caused by the limited capacity of PLN, the sole electricity provider in Indonesia.

Yudhoyono was by no means oblivious to the crisis plaguing Indonesia's energy infrastructure. Being a former minister of energy and mineral resources in the Wahid administration (though for only a very short period), Yudhoyono was keenly aware that the stability of energy security was crucial. Many of his programs to revitalize industrial sectors depended on this stable energy flow, and the situation put his government at risk. Success in sustaining energy provision would probably boost his leverage for reelection in 2009, but failure would definitely compromise his prospects. Thus, the strategic option Yudhoyono and his ministers determined to pursue was to curb overreliance on fossil fuels through energy diversification, exploiting different available resources. This opened up possibility for nuclear power to soon become part of the planned solution for the energy crisis, an opportunity instantly seized by nuclear advocates in Indonesia. When Yudhoyono successfully grabbed his second term in the 2009 presidential election, pro-nuclear groups remain confident that Yudhoyono's second administration will materialize the nuclear power program.

## THE NUCLEAR OPTION

Nuclear power is hardly new in Indonesia. The country has been acquainted with nuclear research since the late 1950s, when President Sukarno, concerned about the radioactive fallout from U.S. thermonuclear weapons tests in the Pacific, formed a Commission on Radioactivity Research. Tempted to acquire a nuclear capacity, Sukarno created Lembaga Tenaga Atom (Institute of Atomic Energy, LTA) in 1959, which was later renamed Badan Tenaga Atom Nasional, which is now BATAN. A first research reactor was put to work in Bandung as a result of assistance from the U.S.'s Atoms for Peace program in 1961.<sup>14</sup> For a short time, Indonesia's nuclear program turned political: Sukarno, inspired by China's explosion of an atomic device in October 1964, set off his own shock waves by announcing a plan to explode a nuclear weapon before the end of 1965.<sup>15</sup> The change of the political landscape after Suharto came to power in 1966 eventually tilted the nuclear program completely toward peaceful use. During the Suharto regime, two other research reactors were added, a 100-kilowatt reactor in Yogyakarta and a 30-megawatt facility in Serpong, on the outskirts of Jakarta. In addition, BATAN operates a cobalt radiator at the research facility in Pasar Jumat, Jakarta, for agricultural purposes.

Since its inception, BATAN has continuously conducted applied research that produces a variety of isotopes useful for medical and agricultural purposes. But many BATAN researchers and officials have yearned for years to see a nuclear power plant erected in Indonesia. The idea of producing nuclear power in Indonesia first surfaced in 1968; since then, a number of attempts were made to realize BATAN's vision. A practical effort began in 1972 when the International Atomic Energy Agency (IAEA) assisted BATAN's study of the feasibility of nuclear power in Indonesia.

However, for the next 30 years, BATAN's ambition to construct the first nuclear power plant in Southeast Asia never bore fruit. The first proposal sent to Suharto in 1980 was rejected on the grounds that nuclear energy was not economically viable, given the limited capacity of the electricity grids. The second attempt took place in the late 1980s after Suharto gave a green

14. For an account of the early period of Indonesia's nuclear program, see Daniel Poneman, *Nuclear Power in the Developing World* (London: Allen and Unwin, 1982).

15. An analysis on this turn of events is presented in Robert M. Cornejo, "When Sukarno Sought the Bomb: Indonesian Nuclear Aspirations in the Mid-1960s," *The Nonproliferation Review* (Summer 2000), pp. 31-43.



light to BATAN. But to the dismay of BATAN officials, their proposal<sup>16</sup> was once more turned down by Suharto, for unclear reasons. At that point, there was no indication that Suharto took nuclear power seriously. Even B. J. Habibie, later president but then minister of Research and Technology and Suharto's closest aide, who previously favored nuclear power, changed his mind, saying that nuclear power would be the last resort Indonesia would need to pursue.

Despite this suspension, the planning of nuclear power development had been publicized and had sparked controversy lest the Muria plant repeat the Chernobyl disaster. Fierce resistance came from Abdurrahman Wahid, then chair of Nahdlatul Ulama (NU), Indonesia's largest Islamic organization, who pledged to undertake a hunger strike in Muria were the nuclear plant to be constructed.<sup>17</sup> BATAN could only hold back its proposal but continued to seek another chance. In February 1997, DPR passed the Nuclear Power Act, which led to the establishment of BAPETEN. A few months later, the Asian financial crisis wiped out Suharto's political power and economic achievements. At this point, nuclear power remained a dream without clear prospects.

After a few years in hiatus, the weakening of energy security that had imperiled the stability of post-Suharto governments forged a renewed momentum for BATAN to bring back the idea of building a nuclear power plant in Muria. The planning for nuclear power in national policy after *reformasi* (reform) was underway first reappeared in the 2004 KEN conceived by the Department of Energy and Mineral Resources. In fact this had originated a few years earlier when then-IAEA Director-General Mohamed ElBaradei paid a visit to Indonesia in December 1999. ElBaradei came personally to persuade then-President Abdurrahman Wahid to open up the possibility for the introduction of nuclear energy as an alternative source in the future. The director-general also promised that IAEA would support financial and technical efforts to study all potential resources for power generation in Indonesia.

16. This proposal was conceived by the New Japan Engineering Consultant (New JEC) that won the bid to carry out the study covering multiple aspects of technology, safety, waste management, financing, operational management, and geological conditions. In the 1993 report, New JEC advised Indonesia to build 12 units of 600 MW reactors to be constructed in 1996 and to operate commercially in 2003.

17. "Antiklimaks Nuklir Muria" [Anticlimax of Muria's nuclear plant], *Tempo* (Jakarta, Indonesia), January 29-February 4, 1994.

Eventually a study was produced entitled “Comprehensive Assessment of Different Energy Sources” (CADES).<sup>18</sup>

To the delight of BATAN, ElBaradei’s lobbying worked well. A former strong opponent of nuclear power, this time Wahid gave his blessing. Jointly directed by BATAN and Badan Pengkajian dan Penerapan Teknologi (Agency for Assessment and Application of Technology, BPPT), the CADES project kicked off in 2001 to assess potential contributions of various energy options, taking into account key economic, social, and environmental factors. Participating in the project were the Directorate-General of Electricity and Energy Development (Direktorat Jenderal Listrik dan Pemanfaatan Energi, DJLPE); Directorate-General of Oil and Gas (Direktorat Jenderal Minyak dan Gas Bumi, DJMIGAS); the Environmental Impact Control Agency (Badan Pengawasan Dampak Lingkungan, BAPEDAL); the National Statistics Bureau (Biro Pusat Statistik, BPS); and PLN. Based on this list, the CADES project seems to be the first initiative involving such a broad range of participants from which coordinated action could be expected.

The study produced an overall estimate of energy production that Indonesia needs immediately to secure its energy supply in the long run. The CADES report covers different sources of energy, but its conclusion places an explicit emphasis on nuclear power. It says: “Given the projected dynamics of Indonesia’s energy system development, nuclear power becomes a competitive electricity generating option for Indonesia some time between 2014 and 2020.” Thus, “a decision to move forward with nuclear power needs to be taken soon” and “a ‘go ahead decision’ is imminent.”<sup>19</sup>

In May 2004, Energy Minister Yusgiantoro signed KEN, which laid out a comprehensive energy plan derived from the CADES report. It is basically a revision of the 1998 Kebijakan Umum Bidang Energi (General Policy on Energy Sector, KUBE). In this 60-page document, nuclear power is highlighted as an economically competitive and environmentally friendly energy source Indonesia must harness to sustain its electricity supply.<sup>20</sup> To enforce

18. Bakrie Arbie, “Status of Nuclear Power Development in Indonesia,” *Asia Nuclear Cooperation Network Newsletter*, no. 2 (March 2000), <[http://www.fnca.mext.go.jp/english/newsletter/fnca\\_news\\_no2.pdf](http://www.fnca.mext.go.jp/english/newsletter/fnca_news_no2.pdf)>, accessed July 22, 2007.

19. “Comprehensive Assessment of Different Energy Sources for Electricity Generation in Indonesia” (Jakarta, 2000). Report prepared by a team of experts from Indonesia with the guidance of IAEA under the technical cooperation project INS/o/016.

20. Indonesian Ministry of Energy and Natural Resources, *Kebijakan Energi Nasional* [National energy policy] (Jakarta, 2004), pp. 8 and 11.

the implementation of KEN, President Yudhoyono issued Presidential Decree No. 5 in January 2006. The decree sets forth the so-called Energy Mix, a predetermined composition of different energy sources Indonesia will utilize by 2025: fossil fuel (less than 20%); natural gas (30%); coal (33%); biofuel (5%); geothermal (5%); new and renewable energy, including biomass, nuclear, microhydro, solar, and wind (5%).

As shown in these figures, nuclear power seems to hold only a tiny portion (slightly less than 2%) of the total energy supply through 2025. However, this is the first time nuclear power has been included in the national energy scenario, which gave BATAN more than enough impetus to regain confidence for turning its dream into reality. Following up KEN, BATAN formulated a road map consisting of several phases through which the nuclear power program is to be realized. Ownership designation and construction bidding were scheduled to take place between 2005 and 2010. The construction of the first reactor was targeted to commence in 2010 followed by the second in the following year. By 2016, the first reactor was projected to be operating commercially, with the second in 2017. The third will be started in 2018 followed by the fourth in 2019. Both will start operating commercially around 2025. By then, the Muria plant will be producing up to 4,000 megawatts of electricity, which counts over 2% of the whole energy demands across Java and Bali, which are predicted to reach approximately 80 GW by 2025.<sup>21</sup>

To tackle the safety and security aspects of nuclear production, in 2006 BATAN produced “Guidance for the Application and Development of Sustainable Nuclear Energy System in Indonesia.” Conforming to IAEA regulations, this guidance defines basic principles and requirements of the nuclear system, taking into account such factors as economics, safety, environment, waste, proliferation, and infrastructure.<sup>22</sup> The guidance, according to BATAN officials, warrants the application of IAEA’s universal nuclear safety standards to the Muria plant.<sup>23</sup> In addition, the development of a nuclear emergency system is underway. Once established, the system will be

21. BATAN, *Energi Nuklir Sebagai Bagian Dari Sistem Energi Nasional Jangka Panjang* [Nuclear energy as part of national long-term energy system] (Jakarta, 2005).

22. Ibid., *The Guidance for the Application and Development of Sustainable Nuclear Energy System in Indonesia* (Jakarta, 2006), <[http://www.batan.go.id/ref\\_utama/guidance\\_NES.pdf](http://www.batan.go.id/ref_utama/guidance_NES.pdf)>, accessed July 27, 2007.

23. Interview with Adiwardojo, Jakarta, January 15, 2007.

run by a cross-departmental task force involving the police, military, environmental protection, and the Health Ministry.<sup>24</sup>

### GROWING SUPPORT

One significant factor paving the path toward Indonesian nuclearization comes from the global trend, which is witnessing a nuclear renaissance in many industrialized countries. Nuclear power looms as a compelling option in today's circumstances, which are marked by price fluctuations of oil commodities on the international market and concerns over global warming. Related to the former, the skyrocketing price of fossil fuel has hurt, rather than benefited, Indonesia after it shifted to being a net oil importer, as discussed above. Such a situation provides BATAN with ammunition for going nuclear. Although Indonesia has only a limited supply of domestic uranium, expected to last less than 20 years, nuclear advocates emphasize that the market price for this kind of fuel remains much lower and more stable than for oil commodities. This offers a high level of certainty for Indonesia to maintain its energy security in the long run. In a situation where oil prices are remarkably high, a director of BATAN argues, "It would be financially strategic for Indonesia to use low-cost nuclear power and sell its oil to other countries while the prices are high."<sup>25</sup>

In a similar vein, escalating concerns over climate change bolster BATAN's ammunition to press for nuclear power for Indonesia. This goes hand-in-hand with Yudhoyono's commitment to minimize global warming. In this discourse, nuclear power is claimed as one potential solution to lessen Indonesia's production of carbon emissions. BATAN further argues that nuclear power can help Indonesia to significantly reduce the greenhouse effect, improving the country's image that was damaged by rampant forest fires in Sumatera and Kalimantan affecting neighboring Singapore and Malaysia.

Today, support for nuclear power from both the executive and legislative bodies is mounting.<sup>26</sup> The Ministry of Research and Technology (Kementerian Riset dan Teknologi, RISTEK) and the Ministry of Energy and Mineral

24. Interview with As Natio Lasman, Jakarta, February 22, 2007.

25. Adiwardojo interview.

26. For a detailed account of contemporary nuclear politics in Indonesia, see Sulfikar Amir, "The State and the Reactor: Nuclear Politics in Post-Suharto Indonesia," *Indonesia* 89 (April 2010).

Resources (Kementerian Energi dan Sumber Daya Mineral, ESDM) are playing pivotal roles in promoting the nuclear option. As approved by DPR, RISTEK allocated 5 billion rupiahs (\$550,000) for nuclear socialization programs in 2007 alone. For the 2010–14 period, the National Development Planning Agency (Badan Perencanaan Pembangunan Nasional, BAPPENAS) has allocated 188 billion rupiahs (\$20.9 million) for nuclear socialization organized by BATAN. This is in addition to a budget of 453 billion rupiahs (\$50.3 million) to be spent during the same period for preparing basic infrastructure documents meant to facilitate the nuclear power program.<sup>27</sup>

The socialization program is targeted to increase acceptance among local residents in Jebara District, where the Kudus demonstrations occurred, and also among influential religious figures. Considering that the majority of the local community follows NU, RISTEK has been actively lobbying leading NU *kyais* (clerics) including its chair, Hasyim Muzadi. The ministry promises that the Muria plant will meet high safety standards, and the local community will be the first to benefit from its operation.<sup>28</sup> Along with the socialization program, at the technical level ESDM has submitted to the president's office a blueprint for a task force responsible for planning and overseeing the whole production process of Indonesian nuclear power. Once approved, this interdepartmental task force, comprising experts from related fields, is expected to have the authority to determine the location, ownership, and financial underpinning arranged for the future nuclear power plant.<sup>29</sup>

The conviction that it is timely for Indonesia to go nuclear has also penetrated into Parliament. This is a significant move, given the DPR's political supremacy in public decisions in the post-Suharto era. Its Commission VII, responsible for overseeing energy, technology, and environmental policies, has voiced its commitment to nuclear power and advised the Yudhoyono government to mobilize necessary resources for the realization of the Muria plant. Despite dissenting voices by a few members of the commission, the majority believe Indonesia has plunged into a chronic energy crisis and has no other long-term options immediately available. Accordingly, the commission

27. BAPPENAS, *Buku 1 Prioritas Nasional Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2010–2014* [Book 1 national priority of the national mid-term development planning, 2010–2014] (Jakarta: Badan Perencanaan Pembangunan Nasional, 2010).

28. Interview with Roosmalawati, Jakarta, February 22, 2007.

29. Interview with Evita Legowo, Jakarta, August 16, 2007.

is urging the government to act so that nuclear power can be realized without evoking public resistance.

Economic factors are not alone in pushing realization of the nuclear project: nationalist sentiments fostered a strong commitment among pro-nuclear members of Parliament to endorse the project. As one member of the commission revealed, the nuclear project is tightly linked to a desire to enhance national pride, something that he believes has been missing in recent years in Indonesia. The presence of nuclear power, he argues, “will restore a shared feeling of nationalism that will unite the Indonesian people.”<sup>30</sup> Such a view is shared by the Wahid administration’s former minister of Research and Technology, A. S. Hikam, also a Parliament member from Partai Kebangkitan Bangsa (Nation Awakening Party, PKB). Serving on an expert panel on nuclear power, Hikam encouraged the government “to put nuclear power at the top priority, for it is strategic to fulfill growing electricity demands but also a symbol of national pride.”<sup>31</sup>

Responding to the whole process of nuclearization undertaken by his administration, President Yudhoyono paid a visit to BATAN’s reactor in Serpong on July 4, 2007. In his speech before BATAN officials and journalists, Yudhoyono remarked on the importance of nuclear research as a means to solve a wide range of problems overwhelming Indonesia, ranging from the energy crisis to food production to global warming. Although nuclear power itself was not explicitly mentioned, Yudhoyono’s message signaled his commitment to BATAN’s efforts.<sup>32</sup>

Finally, another element crucial to strengthening the move toward nuclearization comes from private sectors. With 85% of the financing for the Muria plant expected to derive from private investments, an Indonesian leading energy company, Medco Energi, had decided to join this mega-project. Medco fashioned a special unit, led by a former BATAN nuclear engineer, to deal with building the first reactor in Muria.<sup>33</sup> Its first step, taken in 2006, was reaching agreement with Korean Hydro and Nuclear Power (KHNP) to carry out the project.

30. Interview with Tjatur Sapto Edy, Jakarta, September 12, 2007.

31. “Activity Report of Expert Committee on Nuclear Power, 2006–2007,” <<http://www.batan.go.id/bp/Extra/Laporan%20Kegiatan%20KATN%202006.pdf>>, accessed July 25, 2007.

32. See Yudhoyono’s speech at BATAN on July 4, 2007, <<http://www.presidensby.info/index.php/pidato/2007/07/04/686.html>>, accessed July 27, 2007.

33. Interview with Arnold Y. Soetrisnanto, Jakarta, April 17, 2007.

## SOCIETY DISTRUST

In spite of the full support the Yudhoyono administration is giving to BATAN, and the regulatory preparations and safety system, public fear of nuclear disaster remains strong. The very fact that Indonesia sits precisely on the “Ring of Fire,” an area of frequent earthquakes and volcanic eruptions encircling the Pacific Basin, raises concerns over the safety of the Muria nuclear plant. Soedyartomo Soentono, former chair of BATAN, argued that Indonesia’s geological condition ought not to be a major issue for erecting a nuclear facility in Java. He pointed to Japan, which has operated its 55 nuclear reactors despite frequent earthquakes,<sup>34</sup> as a model of safety Indonesia could learn from, in particular when building “quake-friendly” nuclear reactors.<sup>35</sup> However, the horrific image of the Soviet Union’s 1986 Chernobyl nuclear disaster is frequently invoked by anti-nuclear activists and continues to preoccupy residents around the Muria Peninsula with visions of imminent catastrophe.

To counter this sort of image, RISTEK initiated a socialization program aimed at increasing public acceptance of nuclear power through education and dialogue. This program has run into criticism by anti-nuclear activists, who say it emphasizes the benefits of nuclear power while concealing its great risks. From the activists’ point of view, fair socialization should cover both aspects so that local residents are informed and active, rather than being merely a passive audience for nuclear promotion.<sup>36</sup> This critical point is valid.

But a bigger error lies in the government’s ignoring public anxiety. The issue is not that people lack knowledge of nuclear, as assumed in the socialization program. Rather, they are perturbed that for the past few years, Jakarta has failed to build the capacity to provide secure public services. That the public doubts the ability of the government to control nuclear power safely is completely reasonable. Indonesians are already frustrated by frequent disasters, both natural and manmade, that have killed many people and incurred vast economic losses. For instance, in recent years the Indonesian public transport authority has accrued a notoriously high record of deadly accidents. This reputation worsened with a series of accidents beginning in early

34. “PLTN Muria Siap Di Bangun Tahun 2010” [Nuclear plant to be built in 2010], *Sinar Harapan* (Semarang, Indonesia), January 8, 2007.

35. Personal communication with Adiwardojo, Singapore, September 1, 2007.

36. Interview with Nur Hidayati, Jakarta, February 22, 2007.

2007.<sup>37</sup> In addition to multiple airplane crashes, train derailments, and boat sinkings, the massive Sidoarjo mudflow in eastern Java exemplifies the government's failures in public safety. The human-caused disaster displaced thousands of Sidoarjo residents and wasted millions of dollars on impotent measures aimed at halting the flow of hot mud.<sup>38</sup> Many observers question whether the government possesses the competence to manage high-risk technology.

The bottom line is that post-Suharto, the government has suffered from weakening capacity to exercise its authority, which, following Joel Migdal, is a weak state.<sup>39</sup> Harold Crouch explains that the New Order's strong state relied not on institutional structure but on Suharto's patrimonial relations.<sup>40</sup> The abrupt disappearance of his regime led to a rupture of the government's capacity.<sup>41</sup> In this light, two forms of government paralysis are very likely to cause flawed implementation of the nuclear program. The first is the acute

37. It started when the Senopati boat carrying almost 200 passengers sank in the Java Sea on New Year's Eve of 2007. The next morning, the privately owned Adam Air's 574 flight departing from Surabaya to Manado filled with 96 passengers and six crew members was lost off the Sulawesi island. The rescue team failed to discover the plane or passengers' bodies and called off the search. A month later, the Levina ferry caught on fire a few minutes after departing Jakarta's harbor, killing tens of people including three journalists who incautiously jumped into the boat to take a deep look just a moment before it sank. The worst happened when Garuda, a government-owned airline with high safety records, crashed in Yogyakarta, killing 38 people on March 7, 2007.

38. On May 28, 2006, Lapindo Brantas, an oil company whose majority shares belonged to Coordinating Minister of People's Welfare Aburizal Bakrie, drilled a borehole in Sidoarjo, East Java. Seeking to push down the cost, the company recklessly decided not to use a steel casing, which is needed to prevent potential circulation loss. Consequently, when the drilling reached 9,000 feet down, it resulted in a blowout of hot mud. A number of technical solutions have been tried by Lapindo to completely cover the well of the mudflow, but they all failed. After two years, hot mud continues to flow out, inundating several villages, highways, and train rails. A prediction says that the mudflow, popularly called Lumpur Lapindo (Lapindo Mud) after the company, is likely to last for another thirty years. To handle social and environmental impacts of the mudflow, Yudhoyono formed a national task force responsible for resident relocation and environmental recovery. However, after the team was dismissed, the appalling situation in the Sidoarjo mudflow has not been handled completely. For an in-depth account of this tragedy, see Jim Schiller, Anton Lucas, and Priyambudi Sulistiyanto, "Learning from the East Java Mudflow: Disaster Politics in Indonesia," *Indonesia* 85 (April 2008), pp. 51–77.

39. Joel S. Migdal, "Strong States, Weak States: Power and Accommodation," in *State in Society: Studying How States and Societies Transform and Constitute One Another* (Cambridge: Cambridge University Press, 2001), pp. 58–94.

40. Harold Crouch, "Indonesia's 'Strong' State," in *Weak and Strong Societies in Asia-Pacific Societies*, ed. Peter Dauvergne (Canberra: Allen and Unwin, 1998), pp. 93–113.

41. Michael Malley, "Indonesia: The Erosion of State Capacity," in *State Failure and State Weakness in a Time of Terror*, ed. Robert Rotberg (Washington, D.C.: Brookings Institution Press, 2003), pp. 183–218.



corruption that hinders the government from providing adequate public services. Corruption is one factor that led the New Order regime to its dramatic end. However, the problem did not disappear, despite measures undertaken by the subsequent government to combat corruption.<sup>42</sup>

Eradicating corruption is indeed one of the primary goals Yudhoyono promised during his presidential campaign to accomplish. A few initiatives have been undertaken, including the establishment of Tim Koordinasi Pemberantasan Korupsi (Coordination Team for Corruption Eradication, TIPIKOR) as complement to the existing Komisi Pemberantasan Korupsi (Commission for Corruption Eradication, KPK). Numerous cases of corruption have been brought to court, and many high-profile officials have been sent to jail, including several Parliament members and university professors involved in election corruption. Still, corruption remains pervasive. The Yudhoyono government seems oblivious to the fact that the core problem is located not in individuals but in the bureaucratic system that lures and often forces officials to act corruptly.

It is this very fact that haunts the nuclear program and threatens to make it defective. Despite good facility management, as reported practiced at the BATAN reactors, success with a nuclear power plant on the Muria Peninsula requires the incorporation of a broader bureaucratic structure, a sociotechnical system that shores up the plant's operation. A large portion of this sociotechnical system—transmission networks, security systems, financial support, and infrastructure sustainability—is beyond the authority of BATAN and BAPETEN. This means corruption will easily encroach into vulnerable areas, in time degrading safety and security and heightening the likelihood for nuclear mishaps to occur.

No less alarming than corruption is the strife over authority between the central and local governments, a result of the decentralization underway as part of *reformasi*. Derived from Law 22/1999, created by the Habibie administration and enacted in 2001, decentralization results in more detriments than benefits. A number of problems have emerged caused by poor capacity of local governments to take over authority from Jakarta. This condition was inherited from the prolonged marginalization of local autonomy by

42. For analyses on efforts of corruption eradication in post-Suharto Indonesia, see Natasha Hamilton-Hart, "Anti-Corruption Strategies in Indonesia," *Bulletin of Indonesian Economic Studies* 37:1 (2001), pp. 65–82; Stephen Sherlock, "Combating Corruption in Indonesia? The Ombudsman and the Assets Auditing Commission," *ibid.*, 38:3 (2002), pp. 367–83.

Suharto's centralized government.<sup>43</sup> Among exemplars is the issue of acute malnutrition that afflicts several provinces, including Southeast Sulawesi, Nusa Tenggara Barat, and Nusa Tenggara Timur. This problem appeared after Jakarta handed over the authority for public health care to local governments whose resources were extremely limited.<sup>44</sup> Even worse, while intended to bestow autonomy on regional governments, decentralization in Indonesia has been largely hijacked by predatory interests originating from the old regime that managed to reinvent themselves in the new democracy.<sup>45</sup> Rather than create more effective public administration at the local level, decentralization has spawned lucrative venues for local elites to profit by imposing levies on business activities and public services.<sup>46</sup> Consequently, the decentralization program is creating intense conflicts over resources between Jakarta and regional governments, as well as within local governments.

The central government's authority dwindles while local governments lack the capacity to handle complex technical systems. This creates a fragile context for any mega-project. The situation certainly threatens the nuclear program, a sophisticated, capital-intensive project requiring centralized control to ensure the security and sustainability of a nuclear operation. Unless this issue is settled, building a nuclear power plant in Central Java will be a daunting enterprise.

It is the institutional precariousness illustrated above that overshadows Indonesia's endeavor to establish its first nuclear power plant. Thus, while nuclear power is steadily gaining currency among high officials and political elites in Jakarta, it is simultaneously being contested by grassroots movements organized by environmental activists and local anti-nuclear groups. Two NGOs fervently opposing nuclear power are WALHI and Greenpeace Indonesia, both based in Jakarta. Members of these NGOs are actively disseminating information on nuclear risks, using print media and the Internet.<sup>47</sup> They

43. Syaikhul Usman, "Indonesia's Decentralization Policy: Initial Experiences and Emerging Problems," *SMERU Working Paper* (September 2001).

44. "Otonomi dan Perut Yang Membusung" [Autonomy and malnutrition], *Tempo* (Jakarta, Indonesia), June 20–26, 2005.

45. Vedi R. Hadiz, "Decentralization and Democracy in Indonesia: A Critique of Neo-Institutionalist Perspectives," *Development and Change* 35:4 (2003), pp. 697–718.

46. "Wajah Bopeng Desentralisasi" [Ugly face of decentralization], *Kompas* (Jakarta, Indonesia), June 13, 2007.

47. The Internet has been an effective media for Indonesian anti-nuclear groups to counter the promotion of nuclear power by the government. One of the websites is provided by WALHI with regularly updated news on nuclear issues in Indonesia and abroad. The website can be accessed at

organize regular demonstrations to expose dangers inherent in nuclear energy. They also call on the government to look for other renewable resources such as hydro and wind power, which they perceive as more appropriate solutions for the energy crisis.<sup>48</sup>

Fighting locally is Masyarakat Rekso Bumi (Earth Nurturing Society), widely known as MAREM, an environmentally oriented organization founded and led by Lilo Sunaryo, who owns a hotel in Jepara and holds a doctoral degree in power engineering. Some financial support for local action has come from local businessmen, most notably Djarum, a Kudus-based major cigarette company whose owner feels threatened by the potential presence of a nuclear power plant in Muria. Moral support for anti-nuclear movements comes from critical scientists such as Iwan Kurniawan, a former nuclear physicist at BATAN, and Liek Wilardjo, a physics professor at Satya Wacana Christian University in Salatiga whose writings rebuke the government's decision to go nuclear.<sup>49</sup> One shocking response to the nuclear controversy came from the religious leaders of NU in Jepara,<sup>50</sup> who in September 2007 declared that erecting a nuclear power plant on the Muria Peninsula would be considered *haram* (forbidden) according to Islamic teachings. This is because construction would bring more *mafsadah* (harm) than *maslahat* (benefits) to local communities.<sup>51</sup> Anti-nuclear activists, scientists, religious leaders, and business persons, along with vote-pursuing local politicians, together constitute an anti-nuclear alliance, the most solid ever seen seeking to challenge Jakarta. They all share one stance: Nuclear is not the answer!

The anti-nuclear movement proved powerful in influencing Yudhoyono in making a decision on the Muria plant. This is evident in the prolonged delay of his approval to form a nuclear power task force. When ESDM proposed the formation of the task force in 2007, Yudhoyono refused to approve

---

<<http://www.walhi.or.id/kampanye/energi/pltn>>. Another website is Greenpeace Indonesia accessible at <<http://www.greenpeace.org/seasia/id>>.

48. Sulfikar Amir, "Challenging Nuclear: Anti-nuclear Movements in Post-authoritarian Indonesia," *East Asian Science, Technology, and Society* 3:2–3 (September 2009), pp. 343–66.

49. See, for example, Liek Wilardjo, "Gegabah" [Careless], *Kompas* (Jakarta, Indonesia), June 12, 2007.

50. NU leaders in Jepara are strongly concerned with nuclear issues because NU adherents constitute a great majority of local residents in the Muria Peninsula.

51. "PCNU Jepara: Nuklir Mubah, PLTN Haram" [PCNU Jepara: Nuclear is recommended, nuclear power plant is forbidden], September 9, 2007, <[http://www.nu.or.id/page.php?lang=id&menu=news\\_view&news\\_id=10225](http://www.nu.or.id/page.php?lang=id&menu=news_view&news_id=10225)>, accessed October 10, 2007.

immediately given the public uproar against nuclear power. Obviously, at that time he did not want to risk his chance to secure a second presidential term considering his approval would instantly damage his popularity among voters in Central Java and the surroundings. But even after his landslide victory in the 2009 presidential election, Yudhoyono remains reluctant to proceed further with the Muria plant construction despite his favor for nuclear power. Such a situation gives BATAN no options other than to postpone construction of the Muria plant. Consequently, BATAN's nuclearization roadmap described earlier failed to meet the planned timetable, and the whole planning of the nuclear power program has been rescheduled accordingly. While waiting for favorable circumstances, BATAN also seeks to find another suitable area with less resistance. One potential site currently under consideration is along the northern coastline of Banten Province situated in the west end of Java Island.<sup>52</sup> Another possible scenario is to build nuclear power plants in Kalimantan Island. In a meeting with the Yudhoyono administration, governors of East Kalimantan and South Kalimantan requested the government to have nuclear power plants constructed in their provinces due to severe lack of electricity in Indonesia's largest island.<sup>53</sup> Although this seems incongruent with the original objective of BATAN's proposal, which is to provide electricity in Java, the Kalimantan scenario is not unlikely. With much less population density compared to Java, rich natural endowment for economic development, and dire needs of electricity, Kalimantan seems to offer a perfect location to establish Indonesia's first nuclear power plant.<sup>54</sup>

#### EPILOGUE: DEMOCRATIZING NUCLEAR

As described here, the aspiration for nuclear power in Indonesia has been around for a long time. It dates back three decades and has survived. The persistence of Indonesia's nuclear program has been underpinned by a blend of institutional and ideological factors, working together intimately through the use of bureaucratic resources, scientific knowledge, and nationalist rhetoric. In this light, it is important to focus a spotlight on the central role played

52. "PLTN Akan Dibangun di Pantura Banten" [Nuclear power plant to be constructed in northern coast of Banten], *Kompas* (Jakarta, Indonesia), August 5, 2008.

53. Anonymous interview with a government expert, Jakarta, February 12, 2010.

54. "Kalimantan Timur Siap Jadi Lokasi PLTN" [East Kalimantan ready to host NPP], *Koran Tempo* (Jakarta, Indonesia), February 9, 2010.

by BATAN, along with its sister agency BAPETEN, in continuously promoting the necessity for Indonesia to harness nuclear power as a means to maintain energy security. For nuclear advocates in BATAN and other governmental agencies, going nuclear is not solely driven by a pragmatic agenda, to generate energy. For these advocates, nuclear bears some ideological meaning: embracing scientific progress as well as attaining national prestige. Although such ideology is merely hinted at in the policy texts while pragmatic reasons get more emphasis, such ideological symbolism allows the desire for nuclear power to linger through three Indonesian political regimes, from the ambitious Sukarno, to authoritarian Suharto, to democratic *reformasi*.

The revival of nuclear power in the post-Suharto era is signified by the emergence of two forces emanating from different spheres. The decline of Indonesia's fossil-fuel reserves is coupled with promising advances in nuclear reactor design; in addition, consolidation of efforts by nuclear promoters helps create new opportunities for nuclear power to attract decision makers. A stronger commitment of the Yudhoyono government, itself a product of liberal democracy, helps to legitimize the inclusion of nuclear power in national policy debates. Yet, the same democratic context of the post-Suharto era, guaranteeing freedom of speech and public protest, spurs anti-nuclear movements that are arising broadly across grassroots groups—without the specter of coercive suppression frequently practiced by Suharto's regime. Thus, a striking feature in the post-Suharto nuclear program is the contestation of two equally powerful forces, the state-supported bureaucratic and technocratic elites versus the civil society alliance. Each brings in different rationalities, paradigms, and interests.

Which side will prevail remains to be seen, but it is certain that the saga will cost both sides. This cost can be largely minimized if the Yudhoyono government is willing to put its nuclear program under democratic control. Such a move follows Richard Sclove's suggestion: "If citizens ought to be empowered to participate in determining their society's basic structure, and technologies are an important species of social structure, it follows that technological design and practice should be democratized."<sup>55</sup> As a new democracy, Indonesia is still learning to manage complex and sophisticated circumstances caused by fragmented politics after the demise of Suharto's authoritarianism. The nuclear controversy offers an opportunity for the state and civil society

55. Richard Sclove, *Democracy and Technology* (New York: Guildford Press, 1995), pp. 26–27.

to settle their differences through a fair and equal political process toward agreement over how the nuclear program should be pursued. The participation of local residents accompanied by impartial experts is important at every level of the decision-making process. Benefits and risks should be broadly calculated and accurately communicated so decisions can be made. The government is vulnerable because of the corruption and decentralized authority highlighted above. Therefore, transparent dialogue and public accountability will be needed so that officials can develop the capacity to cope with the complexities of nuclear power, and to handle potential risks cautiously.