

Chapter 2

Rethinking Market Governance and Energy Security

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Abstract Energy security is no longer just a matter of securing access to adequate energy supplies—it is concerned with other aspects as well, such as the environmental and social costs of energy use. This chapter presents the principles of good market governance and argues that proper market governance in the energy sector, combining government regulatory measures and the workings of the free market, would be instrumental in ensuring long-term energy security. Japan is presented as a case country. The chapter illustrates that Japan, by adopting proper market governance in the energy sector, has not only ensured the sustainability of energy supplies but also mitigated accompanying environmental and sociopolitical risks of energy use, albeit the Fukushima accident, which has forced it to review and upgrade its market governance.

Keywords Energy governance · Energy security · Fukushima accident · Principles of market governance

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2.1 Introduction

Contemporary energy security is concerned not only with the security of supply but also environmental and socioeconomic well-being. Greenhouse gases (GHGs) emitted from the burning of fossil fuels lead to climate change and, in so doing, cause a host of non-traditional security (NTS) problems, such as environmentally induced migration. Still, although energy security is part of international dialogue, such as during the G8 Summit held in Japan in July 2008, the matter of GHG emission cutbacks is yet to be addressed properly.

Unprecedented high energy prices have had widespread effects that have permeated extensively through societies and are posing sociopolitical risks, prompting populist calls for concrete government measures in numerous countries. Civil societies have begun to beseech governments, industries and citizen consumers to pay more attention to environmental and socioeconomic problems associated with energy consumption. However, regardless of such rising calls from certain quarters of the society for a stronger government role, examples of how governance has been overused or abused in the name of energy security do persist. The recent nuclear accident at the Fukushima Daiichi nuclear power plants following the earthquake and tsunami in Japan in March 2011 has caused the decades-long question of the role of governance in ensuring energy security to resurface. The Fukushima disaster shows that tenuous governance between the regulator and those regulated and the lack of a properly functioning energy market can cause unfathomable damage to the economy by thwarting efforts aimed at ensuring energy security.

This chapter argues that proper market governance, combining government regulatory measures and the workings of the free market, would be instrumental in ensuring long-term energy security. [Section 2.2](#) introduces the energy security concept and presents an overview of current global energy trends with respect to the security of supply and the environment. In [Sect. 2.3](#), the pitfalls of market and governance are tabled along with an outline of the principles of good market governance. [Section 2.4](#) discusses the relationship between good market governance and energy security at length. Lastly, [Sect. 2.5](#) provides a concluding summary and puts forth brief policy recommendations.

2.2 Energy Security and Global Trends

2.2.1 *The Energy Security Concept*

‘Energy security’ is defined broadly as “a condition in which a nation and all, or most, of its citizens and businesses have access to sufficient energy resources at reasonable prices for the foreseeable future free from serious risk of major disruption of service” (Barton et al. [2004b](#), p. 5). The concept of energy security is further refined for this chapter as ‘an adequate and reliable supply of energy resources at reasonable prices’. The focus of energy security is: (1) limiting vulnerability to disruption given

increased dependence on imported energy resources, especially oil from the volatile Middle East region; (2) the provision of adequate supply over time for the increased demand, albeit at reasonable prices; (3) addressing the environmental impact of increased GHG emissions; and (4) the prevention of intentional sabotage to energy infrastructure, particularly in the aftermath of the 9/11 terror bombings in the US (Barton et al. 2004b).

Energy security has critical economic ramifications, nationally and globally. Energy interdependence, as Verrastro and Ladislaw (2007) point out, is the way forward for ensuring energy security, as energy independence is fraught with problems such as the reliability and economic competitiveness of domestic sources vis-à-vis energy imports. A more sophisticated approach to energy policymaking, according to these authors, that fully appreciates global market interdependence and the complex nature of energy security is required to manage policy trade-offs (Verrastro and Ladislaw 2007, p. 95). Energy security is not just confined to the problem of supply and demand but also emerging issues, such as environmental concerns, especially now. This is particularly important taking into account the increasing interconnectedness of countries, implying a need for collective solutions to contemporary energy security problems; as such, ensuring energy security through energy independence may no longer be deemed feasible.

2.2.2 Global Energy Trends: Present and Future

The global energy usage increased by 23 % between 1990 and 2005, with a corresponding 25 % increase in GHG emissions; most of this was on account of developing countries and was largely attributed to the expansion in the transport and service industries (IEA 2008b, p. 15). For the same period, electricity consumption increased globally by 54 % although developing nations continued to rely chiefly on traditional biomass and coal (IEA 2008b). Oil products, according to the International Energy Agency (IEA), remained the most important energy commodity, with a 37 % global share of the total in 2005 (IEA 2008b). According to another IEA study, global oil product demand was expected to reach 87.7 mmbd in 2009, compared to 86.9 mmbd in 2008, representing an annual increase of 1 % (IEA 2008a, p. 4). It remains to be noted, however, that people with uninterrupted access to electricity supply are a minority in the world; over a quarter of the world population has no access to electricity even as nearly 2.5 billion people still depend on traditional biomass for their fuel needs (Noe and Pring 2004, pp. 431–434).

The provision of energy ‘have-nots’ with access to modern energy sources, together with a projected increase in global demand for energy resources due to a rapidly growing world population, indicates the need for considerably more energy resources in the future. As Birol (2007) points out, global energy demand is expected to steadily rise at least for the next 25 years. In his reference scenario for the year 2030, Birol (2007, p. 1) projects an annual growth rate of 1.6 % in energy demand, with over 70 % of the total increase being attributed to developing

countries.¹ It becomes apparent that this projection is not an exaggeration if it were assumed that socioeconomic development in developing countries would eventually result in increased energy consumption; China and India would be good examples of such a scenario. Fossil fuels are predicted to remain the dominant source of energy until 2030, with demand for coal increasing slightly (Birol 2007).

Regardless of current and projected energy demand patterns, the security of supply is fraught with uncertainties, such as volatile energy prices. While crude oil futures did fall back from the early-July 2008 peak of US\$145 per barrel, prices have remained high due to a meagre 2008 stock-build, tight distillate markets and ongoing geopolitical risks (IEA 2008a, pp. 1–53). The last factor, geopolitics, is a major driving force influencing the supply of energy resources. For instance, crude oil prices tipped at US\$125 per barrel barely a month after prices hit the ceiling, as tensions in Iran and Nigeria raised supply worries.² In the coming years, the world would need to rely on increasingly less accessible, high risk and less reliable fossil fuel sources, such as those in the politically volatile Middle East. Apart from this, contemporary NTS threats, such as terrorism, have added further uncertainties over the safety of energy infrastructure, such as oil refineries and sea lines of communication (SLOC) for oil tankers ferrying the precious commodity from far-flung areas over long distances to consumer nations. The post-9/11 international security environment is certainly not encouraging on the issue. For instance, Alexei Miller, head of Gazprom, a Russian gas giant, recently remarked that the world might face a huge energy shortage after 2012.³ Though this remains to be seen, and irrespective of the diverse and sometimes-contradictory scientific claims and counterclaims thrown around over energy resource depletion, the security of supply remains a contentious issue for both developed and developing countries and energy producers and consumers alike in a mutually dependent world.

As previously mentioned, the period 1990–2005 saw a rise in not only global energy usage but also GHG emissions. Continual increases in energy demand can therefore be expected to cause increased GHG emissions, leading to global warming. Unsurprisingly, GHG emissions are projected to rise by 55 % between 2004 and 2030 (Birol 2007, pp. 7–9). Scientific and environmental communities have been warning of the dire consequences of climate change, such as rising sea levels from the melting of ice glaciers, while calling for reductions in GHG emissions by urging key emitters to impose concrete measures. Citing a temperature increase of 1.8–4.0 °C in the present century due to global warming, R.K. Pachauri, chairman of the United Nations Intergovernmental Panel on Climate Change (IPCC), beseeched developed countries to cut back on GHG emissions before it was

¹ Demand was, in fact, projected to increase by more than a quarter in 2015 alone.

² Tensions were caused by the Iranian nuclear weapons programme and the possibility of a US or Israeli military strike on its facilities as well as due to militant attacks on the Royal Dutch Shell pipelines in the Niger Delta region; see “Oil Creeps above \$125 on Iran, Nigeria Tensions”, in: *Reuters* (29 July 2008).

³ “Gazprom Predicts Global Energy Shortage after 2012”, in: *Reuters* (23 July 2008).

“too late”.⁴ This is, however, easier said than done, given the strong differences that persist among various nations. This was reflected in the recently concluded G8 Summit as well, which failed to reach a consensus on numerical emissions targets, but announced a somewhat vague commitment to adopt a 50 % reduction in GHG emissions by 2050.⁵ International consensus on GHG emission cutbacks is likely to remain a pipedream in the near future due to a lack of political will. Nonetheless, there are promising prospects for national-level research and development (R&D) initiatives in areas such as alternative energy and energy efficiency technologies for reducing reliance on fossil fuels, and gradual steps are being taken in this direction with regard to long-term energy security too.

2.3 Energy, Market and Governance

This chapter treats governance as the institutional arrangements that govern the transactions of produced goods and services in an economy. There are three institutional factors that are controlled by the bounded rationality and opportunism inherent in the behaviour of economic agents—uncertainty, the specificity of goods and services being traded, and the frequency of transactions. These institutional factors produce four alternative modes of governance—market, bilateral, trilateral and unified. Market governance is an adequate form of governance in which generalised or non-specific goods and services are traded regardless of frequency. Bilateral governance is appropriate for situations where recurring transactions occur at some degree of specificity while trilateral governance is the best form when a third party guarantee is required for securing transactions. Unified governance is required for transactions that occur at very high degree specificity.

2.3.1 *Pitfalls of Market and Governance*

The end of the Cold War was monumental in attesting to the failure of socialist-style centrally planned economies and the contrasting success of free market economies. Since then, a wave of globalisation has literally swept the world. Still the buzzword today, globalisation has come to affect the way commercial activities

⁴ “Cut Carbon Emissions before It’s Too Late: Pachauri”, in: *The Hindu* (28 July 2008).

⁵ The failure to agree on emission targets was due to disagreements between developing nations (which were calling for higher emission cuts by richer developed countries) and the G8. The latter argued that emission cutbacks could only be a global effort if it involved China and India as the two countries are in the midst of socioeconomic development and thus account for a large share of global emissions; see “G8, Emerging Nations Seek ‘Deep Cuts’ in CO₂ but Wrangle over Target—yodo”, in: *BBC Monitoring Newsfile* (9 July 2008).

are operated globally. One of the most profound impacts of globalisation has been on the way that governments' roles are being perceived—the state in the era of globalisation is no longer prevalent in the provision of public goods. With the exception of such sacrosanct areas as national defence, for instance, most public services have been privatised based on the premise that competition in the free market would help provide public goods at a lower price. Energy supplies is one such area, where increased decentralisation of the energy market in countries worldwide aims to derive the best benefits for consumers through competition between energy suppliers.

However, the use of markets alone to provide energy security encompasses its own flaws, especially when the government is unwilling or unable to step into rectify negative externalities. There are examples where markets have failed to ensure energy security. For instance, the US\$44 million Chalillo Dam project, which was initiated in the late 1990s in Belize, became a controversy over the lack of government oversight that resulted in environmental degradation and more costly instead of cheaper energy supplies for the country's citizens. In fact, based on an independent economic analysis, critics charged that the dam actually benefited Fortis Inc.—a Canadian company that owns 68 % of the stakes in the South American state-owned power supplier, Belize Electricity Limited—instead of the average Belizean.⁶ Another notable example was that of Amnesty International accusing the American oil giant, ExxonMobil, in 2005 of prioritising profits over human rights in its involvement in the multi-billion Chad-Cameroon oil pipeline. The pipeline agreement was claimed to have been made without public purview, hence making oil companies de facto unaccountable for rights abuses in the pipeline zone.⁷

With the steady increase in energy prices since 2004, oil and gas are being viewed by the governments of some producer states as 'strategic commodities' that could be exploited for parochial purposes. Emergent 'resource nationalism' in some countries has even cast uncertainty over the supply of energy. For instance, since 2004, Hugo Chavez, the President of Venezuela, has renationalised the country's oil sector and forced foreign investors who refuse to relinquish the majority ownership stakes to accept higher tax payments or leave.⁸ In a sign of deteriorating bilateral relations, President Chavez threatened to sever oil supplies to the US if the latter continued to harbour perceived aggressive intent towards his government.⁹ More often than not, it is the average citizen—the ultimate end-user of energy supplies—

⁶ Compared with the US\$3.4 million in earnings from over 800 GW of energy sold in Newfoundland and Labrador, Canada, profits from the Chalillo Dam raked in US\$5.6 million for Fortis Inc. even as Belizeans paid the company more than three times the average energy rates in Canada; see Loverock (2002, pp. 1–2).

⁷ "Amnesty International Says US Consortium's African Oil Pipeline Threatens Human Rights", in: *Associated Press* (7 September 2005).

⁸ "ANALYSIS—Oil Firms to Take Latest Chavez Bombshell in Stride", in: *Reuters* (10 January 2007).

⁹ President Chavez announced that his government had uncovered a plot by active and retired Venezuelan military officers, with alleged US tacit approval, to stage a coup against his

who is the most affected in such situations. A case in point is that of Myanmar, where the ruling military junta has reportedly exploited the country's oil and gas revenues to fund grandiose projects, including substantial build-up of armaments for its armed forces, even as the population at large remains in abject poverty.¹⁰

The above examples underline the fact that reliance on markets or governance alone cannot ensure energy security and that market forces cannot be held to be fully responsible for the global energy system. There is a need for appropriate contingency measures in the event that markets fail to respond quickly to demand signals. Louder grassroots appeals calling for government interventions that can arrest prevalent energy problems and alleviate the plight of the man on the street point strongly to a need for stronger government roles in ensuring energy security. However, the geopolitics of energy, which involves both energy supply and access to energy resources, has traditionally been a driving force for global prosperity and security. Any disruption of energy supply could impinge on virtually every nation; energy crises could easily unravel democratic and authoritarian regimes in developed and developing countries alike. The political power of energy resources—with respect to political and industrial players as well as the common man—and the potential risk of its overuse or abuse cannot be underestimated, and that being so, the market domain will have to reconcile with legal and regulatory measures that make certain that governments continue to play a viable role in ensuring energy security at the national and societal levels. As such, a combined approach of markets and governance is required in the form of good market governance. The following section outlines the principles of good market governance prior to discussing its intricate links with energy security.

2.3.2 *Principles of Good Market Governance*

Good market governance is defined as “the best set of all laws, regulations, processes and practices that affect the functioning of a regulatory framework and the market” (Hancher et al. 2004). Market governance as a concept is not of an economic nature and, therefore, does not offer a framework for assessing the economic efficiency of a regulatory framework. It does, however, enable the legislature or the executive branch of a government as well as administrative authorities to formulate laws, policies, regulations and decisions of a high quality. No doubt, this applies greatly to the energy sector, which is sandwiched between the market domain and an acute need for a certain degree of government involvement. Good market governance is derived from documents reflecting the

(Footnote 9 continued)

government; see “Venezuela Expels US Ambassador, Threatens to Cut Oil”, in: *Agence France Presse* (12 September 2008).

¹⁰ “Activists Urge UN to Impose Energy Sanctions on Myanmar”, in: *The Oil Daily* (21 November 2007).

best practices of market regulation in that the practices ensure that regulation promotes competition and welfare while not restricting economic growth (Hancher et al. 2004, p. 341). Good market governance, according to Hancher et al. (2004, pp. 342–352), should adhere to the following principles:

1. *Transparency*—This calls for the protection of all interested parties, including government, industrial and citizen players. It envisages all decisions and legislature to be made easily accessible, so that the state can act in an openly defensible manner while non-government parties are able to safeguard their rights. Legislature shall contain a clear formulation of the regulatory authority's powers and relation to purposes of law and also define clear areas of responsibilities that would be shared between authorities. At the implementation level, authorities would remain open to stakeholders about objectives, processes, records and decisions while being able to explain to the latter the rationale behind any decision made. In all, transparency would contribute to the legitimacy of the legal framework and actions of the agencies involved.
2. *Independent supervision of the market*—Stakeholders—political and industrial players, in particular—would not be able to unduly influence the outcome of regulatory procedures. However, independence does not equate to complete autonomy from government policies but rather means that the administrative authority is independent in implementing the regulations and policies free from government intrusion while, at the same time, heeding government policies as stipulated. With independent supervision of the market, issues with regard to regulations would be less likely to create controversies and hence less prone to allegations of partiality and arbitrariness.
3. *Clear legislative mandate*—This notion is strongly related to the principles of transparency; the independent authority would implement the will of the legislature as expressed in the legislative outcomes. The legislature would not only serve as a mandate for the authority of the administrative body charged with regulating the market but also provide clear guidance to the body on implementation issues.
4. *Flexible powers*—While the regulatory authority is supposed to follow the mandate of the legislature, it should not be placed in a strait-jacket, receiving well-delineated but limited powers to act. This is particularly so for such sectors as the energy and technology industries, where situations could evolve more quickly than the legislature can react. However, the risk of the agency being afforded too much leeway, allowing it to act beyond its established jurisdiction, also remain.
5. *Proportionality*—This principle means that regulatory action would only be taken when really necessary, that the measures chosen are appropriate to achieve their goals and that the effects of the measures chosen are proportionate to the objectives. As such, the principle of proportionality mainly protects regulated firms so that interference via regulation would be minimised, placing limits on the scope and substance of regulatory measures and hence forcing political and regulatory executives to follow transparent and efficient procedures, thereby also improving on accountability to the public and corporate sectors.

6. *Consistency*—Over time, consistency of treatment could serve as a means of improving confidence in the regulatory regime. This is linked to the provision of consistent and fair rules that do not adversely affect business performance of a specific participant in the regulated sector. Key mechanisms for achieving consistency include the formulation of clear and substantive rules and transparent procedures.
7. *Predictability*—By establishing decision-making criteria that are well defined, the provision of clear timetables for the review of standards and regulations as well as transparent decision-making procedures, the principle of predictability, if achieved, would allow regulated firms to plan with confidence for the future and be assured that their investments, many of which require long time horizons, will not be generally threatened by unexpected changes in the regulatory environment.
8. *Accountability*—Strongly associated with the principle of transparency, accountability would serve to protect the interests of all parties involved—regulated firms, citizens and the government itself—through a process of explanation, participation and control. Regulatory authorities would be held accountable to the political control instruments, to the judiciary through legal instruments, to citizens by explaining and publishing policies as well as to other interested parties, such as corporate firms, via public consultation procedures. However, for accountability to work, all non-governmental parties should be allowed to air their opinions on proposed measures taken by the regulatory authority through feedback. Judicial review of administrative actions taken by the regulatory authority would be an indispensable element to ensure accountability.
9. *Respect for general principles of competition policy*—The substance of regulatory measures should not conflict with the general competition law regime, as there could be risks of duplicity and rivalry if more than one agency is empowered to take action against certain behaviour of the regulated firm. Regulators should then be obliged to respect the general competition law and to consult competing authorities before taking action, thus preventing duplication of procedures and forum shopping.

2.4 Market Governance and Energy Security

2.4.1 Market Governance and Its Importance

It is necessary to note that the role of law in energy security is a double-edged sword. On the one hand, constitutional restrictions on private energy investments in Latin America, for instance, were able to stifle the energy market by precluding competition among industrial players. Conversely, legislation also helps ensure that citizens are rightfully entitled to adequate energy access and remain protected

against errant profit-seeking energy firms. As Barton et al. (2004a, p. 463) highlight, countries vary considerably when it comes to the degree to which energy security is deemed as an explicit legal objective of decision-makers although, in the positive, general sense, the constitutional (and legislative) dimension helps protect energy infrastructure and supply against civil unrest while legally justifying government action to ensure energy security. Good market governance is thus necessary to formulate and implement effective energy policies that are underpinned by a combination of market forces and legal/regulatory framework.

The policies of consumers and producers, as a result of a dynamic energy market, may vary over time in response to each other or according to market developments. Elucidating this interaction, Birol points out that energy prices are likely to increase should producers' investments decrease (2007, pp. 14–15). In their defence, consumers could adopt policies that curb demand growth and import dependence by tempering the long-term effects of lower producer investments on prices and the amplification of depressive effects of increased prices on global demands. If successful, these policies would more likely lead to producers adopting measures to sustain production and global market share, thus reducing energy prices (Birol 2007). Since market forces cannot be held fully responsible for the global energy system, appropriate contingency measures would be required in the event of market inability to respond quickly enough to demand signals (Bochkarev and Austin 2007, pp. 6–8). Good market governance would thus be crucial in preventing producers and consumers from attempting to preserve their 'rights' to fluctuate demands arbitrarily outside legal frameworks, which could frustrate efforts to fund major energy investments and socioeconomic development projects.

Bochkarev and Austin (2007) suggest that establishment of the best national resilience and international contingency practices as well as international mechanisms that promote information sharing should be encouraged. At the national level, legal and regulatory measures emplaced by the government as an insurance against upheavals in the volatile and unpredictable global energy market would include, inter alia, price controls, restrictions on energy exports, subsidies as well as multinational frameworks to ensure the physical security of energy infrastructure, for instance, for combating unconventional maritime security threats, such as terrorism at sea. Indeed, fearing the politico-societal consequences of rising energy prices, some governments have resorted to subsidies although such moves could hasten demand growth by encouraging increased consumption and thus raise energy prices.¹¹ The long-term strategy would logically be to reduce energy consumption and promote the use of alternative energy sources.

¹¹ This is the case in many countries worldwide, where political security is deemed as top priority in the face of massive street protests over populist calls for the government to raise subsidies in order to alleviate increased energy prices. Such measures might invariably lead to economic slowdown; see "With Fuel Subsidies, Solutions Beget Problems: Unrest Quelled, but No Incentive to Save", in: *International Herald Tribune* (29 July 2008).

Good market governance is no less important from the international standpoint. For example, in July 2008, Russia sharply reduced oil supplies to the Czech Republic without any explicit reason, probably in response to the latter signing an agreement allowing the US to base a radar installation in the country as part of its National Missile Defence (NMD) programme, which the Russian government perceived as a threat to its national security.¹² From the consumer's point of view, the episode highlighted the importance of adequate regulatory mechanisms that could have provided for transparency on the security of supply, and thereby insulated the Russia-Czech oil supply from likely domestic political interference emanating from Moscow. The need for good market governance was also reflected in measures that were taken to bolster the European Community Commission's powers to act in a possible oil crisis in the wake of Iraqi aggression in 1990.¹³ The moves were widely criticised for being proposed without consulting member countries, with fears that such moves could send panic signals to the energy market.¹⁴ In this case, respect for accountability emerged as being necessary for long-term commitments towards investing in the capital-intensive fossil fuel industries (Hancher et al. 2004, pp. 343–345).

From the supply and environmental perspectives, the long-term solution to energy security would be to boost investments in both traditional and alternative energy sources, as satisfying the rising global demand for energy does call for corresponding investments into energy infrastructure. Pascual (2008) points out that, according to company plans, capital expenditure by leading energy companies increased sharply in nominal terms over the first half of the century's first decade and continued so until 2010. Even so, notwithstanding cumulative energy infrastructure investments that are projected to amount to about US\$20 trillion (in 2005 dollars) over 2005–2030, there remain lingering uncertainties over the exact cost of discovering and exploiting energy sources over the coming decades.¹⁵ What is more, the prospect of additional energy capacity generation from such increased investment spending is being blunted by rising costs. Not surprisingly then, investments in 2005 were reportedly lower than that in 2000 and capacity additions due to planned upstream investment up to 2010 were expected to boost global spare crude production only slightly (Pascual 2008, p. 6)—one of the

¹² Reports suggest that probably less than 300,000 metric tonnes of oil would be supplied instead of the 500,000 metric tonnes that was contractually agreed upon; see “Czechs Report ‘Sharp’ Cut in Russian Oil Supplies after Signing of US Radar Deal”, in: *BBC Monitoring European* (14 July 2008).

¹³ Member states would not easily agree to transfer control of their energy stocks to the Commission or empower it to dictate crisis measures for the entire regional body given the lack of an adequate framework that was based on general consensus; see “EC Energy Crisis Measures Ill-Timed, Diplomats Say”, in: *Reuters* (25 October 1990).

¹⁴ Ibid.

¹⁵ Investments totalling over US\$11 trillion are required in the power sector; capital expenditure is expected to be US\$4.3 trillion and US\$3.9 trillion in the oil and gas sectors, respectively. About half of all energy infrastructure investments will be in developing states, where demand and production are projected to increase the fastest. (Bochkarev and Austin 2007, p. 3).

reasons being regulatory delay—underscoring the fact that while securing reliable and affordable energy depends largely on adequate investments, this would only be possible in an environment of good market governance.

Problems remain with regard to the usage of alternative energy options. As the world population grows and demand for food increases, biofuel development using currently available technology would compete with food production for agricultural land and resources.¹⁶ Where nuclear energy is concerned, nuclear power would become more viable only if governments are willing to facilitate investments and satisfactorily address concerns over plant safety, waste disposal and technology proliferation (Bochkarev and Austin 2007, pp. 10–11). Significant R&D is needed to mature such technologies. However, unlike established energy giants, small- and medium-sized enterprises (SMEs) that specialise in innovative energy solutions would likely be deterred by significant cost-benefit calculations. Indeed, the R&D of energy efficiency and alternative energy technologies involves long lead times and considerable costs, and such constraints call for prudence on the part of SMEs in particular. Here too, a business environment conducive for energy investment could be facilitated by the exercise of proper market governance.

Climate change adds another dimension to the dialogue on good market governance for energy security. In the face of threats to the ecosystem from climate change, environmentalists are prominently appealing for a reduction in GHG emissions. With the help of advanced media, their views could find resonance, especially in more educated and affluent societies, and potentially influence government policies. In 1991, for instance, environmentalists from Friends of the Earth challenged the Hong Kong government to develop an energy database and policy instead of establishing ad hoc measures only in times of panic, such as during the 1973 oil crisis.¹⁷ To achieve climate change objectives while ensuring sustainable access to reliable, adequate and affordable energy sources, incentives must be created to drive changes in consumption patterns as well as R&D and dissemination of energy production technologies. This is a monumental task given that current policy and available technology will not be able to achieve the target of carbon dioxide emissions less than 450–550 parts per million by 2050 (Bochkarev and Austin 2007, pp. 9–12). An alternative here for the international community would be to price carbon in order to curb consumption, spur technological innovation, affect fuel choices and stimulate investments.

Where governments were previously primarily concerned with tackling the issues of energy supply and demand and the attendant effects on economic well-being on the whole, in the contemporary era, relying solely on either free market

¹⁶ The Organisation for Economic Co-operation and Development (OECD) has refocused its efforts on reducing energy consumption in the transportation sector and to embark on second-generation biofuel research instead; see “Biofuels: OECD Report Blasts Biofuels as ‘Costly and Ineffective’”, in: *Europe Agriculture* (28 July 2008).

¹⁷ “Energy Policy Branded as Pitiful by Friends of Earth”, in: *South China Morning Post* (7 March 1991).

principles or government intervention could lead to energy insecurity. At present, energy (in)security is more than simply energy supply and demand, and policy-makers need to address a broader range of interrelated issues associated with energy use, including global warming. The interdependent nature of the global energy market, linking consumers and producers tightly together, necessitates a collective effort by all nations, especially where promoting energy efficiency and mitigation of climate change is concerned. Although progress in this respect has not been significant, examples can be found of the growing recognition that good market governance is key for ensuring energy security and of efforts towards finding a balance between market principles and regulation by the government. There is increasing worldwide interest in reinvigorating the governmental role, in conjunction with the market approach, for addressing issues relating to energy security. In February 2008, member countries of the European Commission, for instance, championed for the institution of an independent body, amalgamating the national energy regulators of member states, that would be equipped with flexible powers. The independent body would provide member representatives with powers to solve cross-border energy issues and allow them to take rapid and binding decisions when required in order to regulate the energy market.¹⁸ Similarly, in 2006, calls for an independent power regulator were raised in Thailand prior to the privatisation of the Electrical Generating Authority of Thailand.¹⁹ Likewise, in 2007, the United States Federal Energy Regulatory Commission (FERC) adopted new guidelines to enhance accountability among market operators and thus promote competition.²⁰ In short, good market governance, balancing the virtues of free market principles and government regulatory mechanisms, is increasingly being accepted as the way forward for mitigating externalities.

2.4.2 A Case Study: Japan

Respect for the principles of good market governance, according to Hancher et al. (2004, p. 341), would contribute to a good-functioning regulatory framework that will likely increase business confidence and produce stability required for stimulating long-term investment, so that the interests of consumers are better served with an appropriate supply and a dynamic market. To strengthen this argument, a case study of Japan is discussed here, which imparts valuable lessons on the importance of proper energy governance for energy security.

¹⁸ “Legal Battle Brews over EC’s Regulatory Agency Plan”, in: *EU Energy*, 176 (8 February 2008).

¹⁹ “Thailand: Democrats Criticize Government’s Energy Policy”, in: *Thai News Service* (11 August 2006).

²⁰ “Proposed Changes Would Raise Accountability of Market Operators”, in: *Platts Commodity News* (21 June 2007).

2.4.2.1 Japan in the 1970s and Early 1990s

Japan witnessed a public hysteria to stockpile consumables during the first oil crisis in 1973 that served to further drive up energy prices. To an important extent, Japan's weakness in implementing an adjustment response at the time was attributed to factional politics and rigidly compartmentalised policymaking (Weatherford and Fukui 1989, pp. 605–608). Policy implementation was highly contingent and based on ad hoc measures, not to mention also the inconsistencies and incoherence in the policymaking process. Under demands for public–private cooperation and coordination in order to secure Japan's economic development and position, the Japanese government first established a Ministerial Council on General Energy Policy in 1975 to provide an energy security framework, which paved the way later in the year for the enactment of the Basic Direction on General Energy Policy. The latter could facilitate energy diversification and promote indigenous energy R&D and energy conservation. One of the most notable post-1973 initiatives, however, was a long-term policy, titled 'Energy Stabilization Policy for the Coming Decade: A Choice for State Supply', enacted in 1976 to provide energy projections through a diversity of openly accessible government and independent sources. This forecast system was especially crucial since it provided a price signalling system in a highly competitive energy market while serving as a platform for the Japanese government to draw attention to problem areas and opportunities, defend public resource allocation as well as trigger private sector initiatives (Nemetz et al. 1984–1985, p. 560).

As a result of these developments, a second oil crisis in 1979 saw a different outcome in Japan, where no public hysteria ensued. For instance, wholesale and retail price stability was restored by May 1980 while a 50 % increase in exports saw Japan's trade account surplus return by mid-1980 (Weatherford and Fukui 1989, p. 614). On analysing the effects that the oil crises of the 1970s had on advanced economies, Japan was found to have registered a higher economic growth in 1980 (at 5 % gross national product growth) than in 1974 when growth was negative (−0.5 %) (Weatherford and Fukui 1989, p. 615). In comparison with the US and UK, whose economic growths were −1.4 and −2.0 %, respectively, in 1974 and −0.7 and −2.3 %, respectively, in 1980, Japan's performance may have been due to its improved energy governance structures, put in place following the lessons learnt from the 1973 oil shock (Weatherford and Fukui 1989, p. 615).

The Japanese government played a less interventionist but more consistent approach during the second crisis—its key role was psychological, instilling preparedness and optimism among investors and consumers. Some of the principles of good market governance discussed earlier seem applicable in Japan's case. The diverse information provided by the forecast system, arguably one of the most important aspects of the post-1973 policies, may have helped in promoting predictability, transparency, independent supervision of the market and accountability. Consistency was ensured by the government's policy commitments, which were reinforced by the oil crisis of 1979. Proper market governance may have helped the Japanese economy absorb the second oil shock more effectively and

rapidly than in 1973. Then, in 1990, during the US-led coalition's military build-up in response to Iraq's invasion of Kuwait, a potential energy crisis did loom large again for Japan. However, the Japanese society as a whole was better prepared, drawing on lessons learnt during the 1970s, and implemented contingency plans for energy savings.²¹ On the supply side, Japanese energy industries remained unfazed with regard to energy infrastructure investments in the Middle East.²²

2.4.2.2 The Fukushima Accident and Energy Governance in Japan: A Postscript

Proper energy governance in Japan has ensured energy security since the two oil shocks of the 1970s. However, the Fukushima accident in March 2011 could have exposed inadequacies in the pre-existing scope and extent of energy governance, which may have to be further ascertained in the ongoing government review of the latest disaster. While many reasons may have contributed to the accident, improper relationships between the regulators and those being regulated seem key among these, as they helped conceal the true technological and economic status of the nuclear power plants in question with regard to their operation and maintenance records—the nuclear power plants that were inundated by the tsunami and eventually malfunctioned would have been decommissioned by the time the tsunami struck if their technological status were reported and known to the regulator. Had such true records been revealed in the first place, the direct and indirect costs incurred following the nuclear accident could have been avoided.

The Fukushima accident has given Tokyo the opportunity, although rather forced, to review energy governance in Japan. This may propel the government to adopt market governance in the electricity industry, which might in turn lead to the demolition of the industry's existing region-based monopoly structure. The long-lasting effects of the nuclear accident may serve as a reminder for the government and the public alike of the real costs of twisted energy governance. Then again, it was functioning energy governance that eventually helped Japan overcome the apparent post-Fukushima energy crisis in the summer of 2011. Nonetheless, some loopholes might have existed and Tokyo is in the process of reviewing what went

²¹ "Gov't Calls for Energy Savings, Cites Gulf Crisis", in: *Associated Press* (13 August 1990). In the US, meanwhile, the gulf crisis created public panic over the possibility of an energy crisis, with some blaming the surge in gasoline prices on energy firms' greed; see "Half in US Fear Gas Crisis as a Result of Middle East Conflict", in: *Associated Press* (13 August 1990).

²² The export of petrochemical plant technology to the Middle East registered a significant surge (48.9 %) between April–September 1990, notwithstanding the Iraqi invasion and subsequent allied military build-up, compared to the same period in 1989. Even so, industrial officials admitted that it would have been almost impossible to resume plant construction in the region, if the war expanded, due to physical security concerns; see "Japanese Industry Shocked, but Copes Coolly with War (Iraq-Kuwait Crisis, 1990)" in: *Japanese Economic Newswire* (17 January 1991).

right and wrong in Japan's energy governance and will undoubtedly in the future produce a better variant of such structures to cope with future challenges. The Fukushima accident, in sum, highlighted the importance of adequate energy governance—addressing the adequacy of supply as well as associated environmental and human costs—for ensuring energy security when using nuclear power.

2.5 Conclusion

This chapter explores what proper market governance is and how it can be combined with government regulatory measures and free market principles to ensure energy security that is defined as 'an adequate and reliable supply of energy resources at reasonable prices'. Energy security is a perennial issue not only for energy-consuming countries but also for self-sufficient energy-producing ones. The projected increase in demand for energy, especially in rapidly growing economies such as China and India, as well as the continued reliance on fossil fuels in the foreseeable future will place strains not just on the future of supplies but also the environment. As such, energy security is no longer merely a concern over the security of supply and demand; it is also related to environmental impacts caused by climate change from prevalent energy usage patterns. To meet the projected increase in energy demand, investments in energy infrastructure, including an overhaul of the production facilities for fossil fuels and R&D into cleaner alternative sources of energy, are crucial. However, the modernisation of energy infrastructure will take time and colossal amounts of funding, the latter calling for substantial investments from the private sector. The business climate for the energy market thus needs to remain investor-friendly in order to encourage and sustain financial commitment from energy investors. As discussions have shown, instances of alleged profiteering by energy companies, such as Fortis Inc., and the overuse of governance, as in the case of Venezuela, indicate that using either the market or governance approach alone may not foster such investments. In order to strike a balance between the market and regulatory domain, good market governance is essential.

The importance of exercising proper and adequate market governance is highlighted by Japan's responses to the oil crises of 1973 and 1979. In contrast to the shocks experienced by the Japanese public during the first oil crisis due to its heavy reliance on the free market and inadequate government intervention, Japan could weather the second crisis better as a result of the formulation and implementation of policies that were able to instil confidence in investors and consumers alike. Similarly, the Fukushima accident also underscores the importance of properly functioning governance, balancing regulatory measures and market mechanisms, for ensuring energy security.

The eventual goal of government intervention would be the formulation of a standardised set of principles for good market governance that draws from the best national or regional practices. Until such a time, every player in the global energy

market would have to remain on guard against future energy crises, which are by no means remote possibilities. In the short run, proper market governance could probably facilitate investments needed for modernising and expanding production capabilities of traditional energy sources and help to meet the rising global energy demand. However, market governance would be even more crucial in the long term, facilitating investments in energy-efficient and alternative (cleaner) energy sources that will not only stabilise this demand but also mitigate global warming, which involves dire consequences for the environment and ecosystem.

The time is right for a reassessment of the scope and roles of market and governance for ensuring energy security. The following policy recommendations, if further developed, point to areas for potential research or policy action: (1) sociopolitical stability that provides an environment conducive for foreign investments; (2) clearly defined national energy policies and regulations instead of ad hoc reactive measures in times of market contingencies; and (3) promoting dialogue between governments, industrial players and civil societies in order to raise awareness on the importance of good market governance. Energy security through the exercise of good market governance would instil producer–consumer confidence and facilitate energy-related investments in the dynamic and uncertain global energy market, today and tomorrow alike.

References

- Barton B, Redgwell C, Ronne A, Zillman DN (2004a) Energy security in the twenty-first century. In: Barton B, Redgwell C, Ronne A, Zillman DN (eds) *Energy security: managing risk in a dynamic legal and regulatory environment*. Oxford University Press, New York
- Barton B, Redgwell C, Ronne A, Zillman DN (2004b) Introduction. In: Barton B, Redgwell C, Ronne A, Zillman DN (eds) *Energy security: managing risk in a dynamic legal and regulatory environment*. Oxford University Press, New York
- Birol F (2007) Energy security: investment or insecurity. *Coping with crisis*, CWC Working paper series, International Peace Academy
- Bochkarev D, Austin G (2007) Energy sovereignty and security: restoring confidence in a cooperative international system, Policy Pap, 1:1–33 (East-West Institute)
- Hancher L, Larouche P, Lavrijssen S (2004) Principles of good market governance. *Tijdschrift voor Economie en Management* 49(2):339–374
- IEA (International Energy Agency) (2008a) Oil market report: a monthly oil market and stocks assessment, July 10. IEA, Paris
- IEA (International Energy Agency) (2008b) Worldwide trends in energy use and efficiency: key insights from IEA indicator analysis. IEA, Paris
- Loverock K (2002) Chalillo chill: critics slam the dam that a Canadian company wants to build in Belize's valley of the Scarlet Macaw (sustaining livelihoods). *Altern J* 28(2):1–2 (22 March)
- Nemetz PN, Vertinsky I, Vertinsky P (1984–1985) Japan's energy strategy at the crossroads. *Pacific Aff* 57(4):553–576
- Noe SY, Pring G (2004) 'The 'fear factor': why we should not allow energy rhetoric to trump sustainable development. In: Barton B, Redgwell C, Ronne A, Zillman DN (eds) *Energy security: managing risk in a dynamic legal and regulatory environment*. Oxford University Press, New York

- Pascual C (2008) The geopolitics of energy: from security to survival. Brookings Institution, pp 1–16
- Verrastro F, Ladislav S (2007) Providing energy security in an interdependent world. *Wash Q* 30(4):95–104
- Weatherford MS, Fukui H (1989) Domestic adjustment to international shocks in Japan and the United States. *Int Organ* 43(4):585–623

Abbreviations

FERC	United States Federal Energy Regulatory Commission
GHG	Greenhouse gas
GW	Gigawatt
HSS	School of Humanities and Social Sciences
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
mmbd	Million barrels per day
NEA	National Environment Agency, Singapore
NMD	National Missile Defence
NTS	Non-traditional security
NTU	Nanyang Technological University
OECD	Organisation for Economic Co-operation and Development
R&D	Research and development
RSIS	S. Rajaratnam School of International Studies
SLOC	Sea lines of communication
SME	Small- and medium-sized enterprise
UK	United Kingdom
US	United States

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