GENERATING DIALOGUE
CLEAN ENERGY, GOOD GOVERNANCE AND REGULATION

Background Paper for Discussion

There is a wealth of emerging practice within regulatory institutions on how to advance and implement sustainable energy solutions. There may often be more similarities than would initially appear in the issues facing regulators in different regions of the world when it comes to sustainable energy. This background paper is intended to help stimulate debate at the upcoming Forum on Clean Energy, Good Governance and Regulation.

Introduction

Concerns over energy security related risks are sparking new interest in renewable energy technologies as a means to diversify electricity generation choices and alleviate dependence on fossil fuels. Interest in the scope for energy efficiency to help reduce demand is also increasing. Whilst traditional sources and systems have a role to play, energy security, economic development, social equity and environmental protection can be enhanced through sustainable energy approaches.

In practice, however, it is not always easy to align the economic, social and environmental dimensions of sustainable development within the electricity sector. There may be real tradeoffs incurred, for example, between the often higher up front costs of renewable or cleaner energy technologies, and the need to keep electricity affordable. Improving transparency and public participation in decision-making processes can allow greater awareness of contradictions that must be addressed, a more equitable framing of problems, and a set of systems and procedures to manage these tradeoffs. Better governance creates the possibility of devising new, innovative solutions to contentious problems. Citizens and policymakers in these countries are increasingly looking at the regulatory process as an important mechanism to address inevitable tradeoffs, including issues relating to sustainable development of the sector.

This background paper explores the emerging role of electricity regulatory institutions in addressing sustainable energy. It reviews some of the key regulatory processes and mechanisms that impact on sustainable energy, including the processes for setting retail tariffs, and considers the challenges of balancing different interests in this context. We conclude by raising questions about how better governance might help address these challenges.

Regulatory institutions and sustainable electricity

Independent regulators are relatively new institutions in most developing countries. The practice of regulation and rule-making in Asia varies widely (see Table 1). Countries such as India, the Philippines and Singapore have introduced independent electricity regulators at the state and national level respectively as part of efforts to restructure and privatise their electricity sectors. Thailand's new Energy Industry Act established a fully independent regulatory commission with oversight of the power sector for the first time in 2008. In other countries such as Indonesia, for example, electricity is regulated by a unit within the government department or line ministry responsible for energy.

The objective of establishing an independent regulatory body has often been to separate political processes from decisions about technical and economic issues, and to attract private sector investment. Social and environmental considerations have not always been woven into the mandates of these institutions (Nakhooda et al, 2007). In practice, however, decisions made by regulators frame environmental, social and economic parameters for the sector.

Table 1: Profiles of the electricity sector

	Singapore	**India**	**Thailand**	**Indonesia**	**Philippines**
Ownership / structure	In 2001 the Electricity Act established a fully competitive wholesale and retail market. Liberalization began in 2003.	The 2003 Electricity Act paves the way for introducing full competition, especially for large consumers. More than 80% of generation and distribution remains under public ownership.	"Enhanced Single Buyer Model" wherein the Energy Generation Authority of Thailand purchases more than 40% of generation from Independent Power Producers.	Constitutional Courts overturn Electricity Reform Law No. 20/2002 in Dec 2004. New Electricity Reform Laws being drafted by Parliament. State-Owned Utility PLN Persero is single buyer of electricity from IPPs.	Electric Power Industry Reform Act (EPIRA) of 2002 introduces competition and full privatization of State-Owned National Power Corporation.
Executive body	The Ministry of Trade and Industry	Ministry of Power	Ministry of Energy; Energy Planning and Policy Office; National Energy Policy Council	Department of Energy and Mineral Resources: Directorate General of Electricity and Energy Utilization (DGEEU)	Department of Energy
Planning bodies	The Energy Market Authority, Energy Market Company	Central Electricity Authority + National Planning Commission	Energy Planning and Policy Office & National Energy Policy Council	BAPPENAS (National Development Planning Agency) & DGEEU & local government	Department of Energy
Regulatory structure	Energy Market Authority	Independent Central as well as State Electricity Regulatory Commissions	2007 Energy Industry Act establishes an independent Electricity Regulatory Commission	Director General of Electricity and Energy Utilization regulates PLN.	An independent national Energy Regulatory Commission established under EPIRA.
Freedom of Information Act	No	Yes (2005)	Yes (1997)	No	Yes (included in 1987 Constitution)
Household access to electricity[1]	100%[4]	55%	99%	53%	80%
Installed generation capacity[2]	10.2 GW in	126 GW	24 GW	25 GW	16 GW
Fuel mix[1] Oil Coal Diesel Natural gas Hydro Renewables	 20% 80% 	 58% 11% 24.6 6.4%	 40.8% 35.3% 20.3% 3.6%	 35.4% 33.0% 12.74% 4.86% 12.00% 2%	 10.3% 25.5% 13.3% 17.8% 20.7% 12.4%
GHG Emissions[3]	7.5 MtC 72.3%	159.4 MtC 54.7 %	20.3 MtC 38.0%	32.3 MtC 36.1%	7.2 Mtc 35.4 %

[1] World Bank
[2] http://www.eia.doe.gov/cabs
[3] WRI Climate Analysis and Indicators Tool. http://cait.wri.org/
[4] http://www.unescap.org/esd/energy/information/ElectricPower/1999-2000/html/access.htm

Regulators play an important role in addressing considerations such as security of supply and ensuring adequate reserve margins for electricity, extending universal and high quality access to electricity. They are responsible for licensing new power plants and infrastructure, and can therefore help facilitate clean renewable energy technologies. They may also set service and efficiency standards.

Traditional energy systems are not supportive of sustainable energy. In both developed and developing countries there has traditionally been a focus on large-scale, centralised generation of electricity using coal, oil, gas, hydropower and nuclear energy that is transmitted over long distances to centres of use. These have been seen as the route to plentiful energy at low prices. Standard regulatory mechanisms are often not conducive to renewable energy, energy efficiency and distributed generation sources which may require different forms of price controls, investment incentives, and oversight.

Retail price (tariff) setting

Setting and overseeing retail prices for electricity is a core function of regulatory bodies. Few countries in Asia (with the notable exceptions of the Philippines and Singapore) have introduced competitive wholesale markets for electricity, so regulators and government have a very direct role in setting prices. These prices will of course affect energy consumption. For example, where consumers pay a higher rate for the first block of units followed by lower rates for additional use, the marginal and average price per unit declines and thus encourages more consumption. As an alternative, inverted or rising block tariffs offer a first block of units at a low rate, followed by higher rates for additional units which should encourage consumers to reduce energy use overall. Rising block tariffs have also been used in some countries for social reasons to provide a "lifeline" allocation of cheaper energy to help poor consumers.

Time of day tariffs charge different prices for energy consumed at peak and off-peak times. Investment in electricity infrastructure is driven by the need to service peak demand, which occurs only for short periods. Time-of-day tariffs may not result in any less energy being consumed, but can improve security of supply by shifting demand from peak to off-peak periods. The impact of such efforts on greenhouse gas emissions will depend on the marginal plant displaced, but may have other beneficial environmental impacts, for example by reducing the need for new overhead cables, or new power stations. If such measures allow the utility to avoid or reduce costs, such cost reductions may have general welfare benefits. Changes to retail tariffs will clearly produce winners and losers depending upon how people use energy.

Mechanisms for promoting sustainable energy

A number of different mechanisms have been established to provide support for energy efficiency and renewable energy in electricity markets. Many of these mechanisms result from national or state level legislation so the initiative comes from Government rather than regulators. Government departments have key roles in oversight of the sector, and influence regulators in many ways. At the same time there are many cases where regulators have taken the initiative themselves, as they consider that doing so would fall within their duties and powers. Their discretion to exercise leadership on these issues, however, is constrained by their mandate, and the policy frameworks within which they operate. However, even if the initiative originates with Governments, regulators often have a key role in the design and administration of particular mechanisms to promote

sustainable energy. Such mechanisms need to be designed to appropriately respond to local realities and the needs of a range of stakeholders. Some key mechanisms to promote sustainable energy have included:

Feed in tariffs for renewable energy: Feed in tariffs offer either a minimum guaranteed price for electricity from renewable energy sources, or a premium above the market price. Electricity utilities may be obliged to allow generators to connect to the grid, and to take all of an approved project's output at a pre-determined price. The tariffs can be banded, so that less developed technologies receive higher prices. The level of the tariff is usually set based on factors such as: the avoided cost to the utility of building its own new plant; the end price to the consumer; the level of tariff necessary to stimulate renewable deployment. The costs of the tariff may be covered either by a levy per kWh on consumers, or on taxpayers, or both. By 2005, at least 32 countries and 5 states/provinces had feed-in policies (REN 21, 2006). Because "feed-in" tariffs guarantee producers a basic price for electricity sold and access to the grid, they can be quite favorable to small renewable generators. On the other hand, feed in tariffs can be relatively expensive as well: much of the experience with these mechanisms is from Europe where renewable energy producers have been offered very generous feed-in terms. Questions have been raised about the terms on which "feed-in" tariffs offer a "fair" rate of return to potential investors.

Renewable Energy Portfolio Standards (RPS): Renewable energy portfolio standards (also known as quota or obligation schemes) place an obligation on electricity suppliers to source a certain amount of renewable electricity (and sometimes also combined heat and power) from sustainable sources. In some schemes, utilities can choose to pay a penalty rather than meet their allocation of the obligation. Unlike with feed-in tariffs, utilities are not required to allow renewable energy providers priority access to networks. The schemes may also be supported by tradable "certificates" for renewable energy, which certify that the supplier has actually bought green power. These certificates can be sold with the power, or traded separately. In either case, the value of the certificate adds value to the actual generation. At least 32 states or provinces worldwide have enacted RPSs. Most RPS policies require renewable power shares in the range of 5–20 percent, typically by 2010 or 2012. Deciding which technologies will count towards the RPS, and ensuring that these are well suited to local realities can also be complex as various stakeholders may have different interests and perspectives. In designing an RPS, policy makers and regulators may choose to favor certain renewable energy technologies, including by assigning them a certain percentage of the RPS. Prices for electricity may also be more volatile under an RPS scheme which does not guarantee a minimum price for renewable power, and larger generators may find it easier to cope with this volatility (REN 21, 2006).

Distribution Network Regulation: Electricity generators are often charged for use of transmission and distribution infrastructure.[1] Deep charges require generators to pay the full costs of connection and reinforcement of the network to enable their connection, and can act as disincentive to new generation. Shallow charges, where the generator pays only a proportion of costs as the rest will be recovered from future generators who connect to the grid, can often be more conducive to distributed generation. Such schemes may create new tensions between existing generators who have borne higher costs for distribution infrastructure, and new generators who now seem to have to bear a smaller burden. In addition, in many countries there has been significant underinvestment in the

[1] Related issues include securing fair access for new entrants in vertically integrated systems and license conditions.

distribution sector, which is in turn often linked to consumer dissatisfaction with quality of supply. Regulators may therefore have to manage trade-offs against the need to ensure adequate revenues to support distribution infrastructure.

Demand side management: covers a wide range of activities, particularly actions taken on the customer side of the electricity meter (the 'demand side'). These may include energy efficiency measures and power factor correction; arrangements for reducing loads on request, such as interruptibility contracts, direct load control and demand response; fuel switching, such as changing from electricity to gas for water heating; and distributed generation, such as stand-by generators in office buildings or photovoltaic modules on rooftops" (Crossley, 2004). Regulators can support DSM in many ways, for example by creating separate funds to incentivize utilities to implement DSM. These may include distribution of more efficient light bulbs, incentives for consumers to purchase more efficient appliances.

Public Benefits Funds (PBF): In many parts of the world, a surcharge to electricity generators, or on electricity rates is used to fund important public benefits such as environmental or social priorities (Wiser et al, 2003). These public benefit funds are often used to support energy efficiency and demand-side management programs, or renewable energy promotion efforts (including research and development). About half of the states in the US have a PBF for energy efficiency, typically set at around 2.5% of retail electricity sales revenue. Several developing countries including Brazil and Thailand have also established such funds (Wiser et al, 2003**)**. In Thailand, community development fund to support communities affected by coal fired power plants was recently set up in 2007. The effectiveness of PBFs is closely tied to how well they are administered. For example, some PBFs have been used to target efficiency opportunities within the poorest communities where many consumers do not pay for electricity, rather than with large scale consumers where there may be more scope for large scale efficiencies that may in turn reduce the electricity sales. Still other PBFs may accrue funds that are not actually spent. Priorities for the use of these funds need to be set in transparent and inclusive ways, and there needs to be accountability for how they are used.

Energy efficiency obligations: An obligation may be placed on certain actors in the energy sector to achieve a certain amount of energy saving or reductions in greenhouse gas emissions. The actors may take these energy saving actions themselves, or pay others to do so. A mechanism to track these energy efficiency measures may therefore be necessary: in many countries the term "white certificates" is used to describe certified energy reductions. The PBF approach determines the amount of money to be raised, whereas the "obligation" mechanism determines the volume of savings to be achieved, and energy companies are then free to achieve those reductions as cost-effectively as they can. The "white certificate" scheme has been used with some success in the UK and the state of New South Wales in Australia, and is also being developed in Italy and France. The effectiveness of these schemes hinges on the soundness of the methods by which these energy savings are quantified (although there will always be some uncertainty), and the credibility of the reductions. There may also be challenges with ensuring that the benefits of the energy savings measures implemented have positive impacts for consumers.

Balancing different interests, managing tradeoffs

There can be a number of tradeoffs associated with promoting sustainable energy from a public interest perspective and for regulators whose primary role may be economic or who may have to balance economic, social and environmental objectives.

Renewable energy technologies still have significant associated environmental and social impacts and that can often be difficult to overcome. For example, land rights and siting issues for wind farms can be quite contentious, and due process to ensure that the rights of people impacted by such projects are upheld remains essential. Tensions can also arise between environmental and social objectives due as a result of the costs of feed-in tariffs or public benefits funds which affect prices for consumers.

Utilities and electricity generators always have more information about what their true costs and constraints are in implementing sustainable energy programs. This information asymmetry is a pervasive challenge for regulators, who must make judgements about what constitutes "reasonable" cost. Regulators may have a greater certainty about "reasonable costs" for established conventional energy technologies than they do for relatively new renewable energies.

Regulators often have limited financial and human resources at their disposal to execute the basic functions with which they have been entrusted. They may face practical constraints in integrating renewable energy and efficiency measures, such as capacity to assess the viability of proposals at hand, policy constraints, or direct opposition from some interests.

However, there clearly are limits to what regulators can do within the policy frameworks that governments provide. This inevitably involves judgments about priorities. There are cases in which regulators may need clearer guidance from government and policymakers on how to set priorities, particularly in cases where stakeholder interests are difficult to reconcile.

Conclusion

Energy market regulators have become increasingly involved in the energy policy process and how this impacts on sustainable energy at the national (or sub-national) level. Electricity regulation may be one place where national objectives can be honestly juxtaposed and balanced against global and other considerations.

Through the Forum on Clean Energy Good Governance and Regulation, we seek to explore how regulatory mechanisms and procedures can be framed more clearly to help manage some of the tradeoffs associated with promoting clean energy. The discussion will emphasize the processes through which these efforts have been advanced, in order to draw out lessons on how they can be enhanced. Questions to consider might include:

- Can greater information about the terms and rationale by which sustainable energy resources are being integrated into the energy mix be made available?
- Can making such information easily available and accessible help build stakeholder support for these initiatives?
- Can public hearings and consultations be used to help regulators understand the nature of tradeoffs associated with some sustainable energy options, so that these can be managed better?
- How can stakeholders including civil society, local authorities, and community representatives be involved in the design and implementation of innovative solutions to the challenges of sustainable energy?

References and further reading

Crossley, D. (2004) Demand Management Activities Applicable to Electricity Networks. Sydney: Energy Futures Australia.

Dixit, S et al. (2007) The Electricity Governance Indicator Toolkit – Benchmarking Best Practice and Promoting Accountability. Washington DC: World Resources Institute.

Dubash, N (2003) Revisiting electricity reform: the case for a sustainable development approach. Utilities Policy 11, 143-154

Dubash, N and N. Rao. 2005. The Practice and Politics of Regulation – Regulatory Governance in Indian Electricity. New Delhi: Macmillan.

Nakhooda, S et al. 2007. Empowering People – A Governance Analysis of Electricity in India, Indonesia, Thailand and the Philippines. Washington DC: World Resources Institute.

Owen, G. (2006) Evidence of steps towards a sustainable energy system in other countries. London: Sustainable Development Commission.

Owen, G. (2006) Sustainable development duties: new roles for economic regulators**,** Utilities Policy 14 (2006) 208-217

REN 21 (2006) Renewables Global Status Report. 2006 update

Wiser et al, (2003). International Experience with Public Benefits Funds: A Focus on Renewable Energy and Energy Efficiency. Regulatory Assistance Project.