

ENERGY MARKET REFORM -
Lessons Learned and Next Steps

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by
Gerald Doucet
Secretary General, World Energy Council

This presentation will be based on the World Energy Council's recently published report, *Energy Market Reform: Lessons Learned and Next Steps with Special Emphasis on the Energy Access Problems of Developing Countries*. The report draws on practical lessons from past studies carried out by the World Energy Council and on current experiences on the desirable architecture of market reforms in electricity and natural gas. The approach of the study was not to further deepen the analysis or to provide technical recommendations but rather, to build a debate guided by the common thread of energy security and end-user "empowerment", highlighting the possible areas of conflict of interest and the broad solutions that might be chosen depending on the local circumstances for different parts of the energy chains. The ambition was to identify key concerns and to initiate a debate on possible answers.

Four main topics are addressed in the report and will be highlighted in this presentation:

- Empowering end-users
- Security of supply: The wider challenge
- Wholesale market design
- Tariff-setting and energy poverty

In addition, the following broadly applicable messages flowing from the report's analysis will also be addressed in the presentation:

- Market reforms in energy systems are needed because organisations and work methods need to evolve as society and the business environment change;
- Successful energy market reforms are only a subset of the broader reform agenda, in particular, for the reliance on domestic capital markets;
- Regional integration is one of the surest means to reduce regulatory uncertainties and provide a larger market with economies of scale;
- Market design is a matter of local and regional circumstances; in the latter case, there is a need for agreement among the countries concerned to proceed in common;
- Lastly, there is no perfect model to address all market circumstances, but as WEC has already said in previous publications, governments and regulators need to compromise in favour of simple, robust, evolution-prone designs.

Empowering End-Users

The essence of market reforms is to replace the former top-down decision-making process with a bottom-up approach based on empowering end-users who want to have a say in the price and quality of their energy services, either directly for the largest consumers, or through

their LDC for the smallest consumers, providing their LDC remains under their close control. Distribution should be *a*, and sometimes *the*, priority of reforms. It is a major source of inefficiency, and in most developing countries, the *sine qua non* condition for success.

While there is no consensus in WEC on all the elements of reform related to energy end-use, and while one size does not fit all countries, it is possible to summarise four steps to reform in the downstream sector which should be addressed, one way or the other, by government energy policy and stable, clear, investor-friendly regulations based upon it:

Privatisation of the management and labour force: In the past, WEC has not put a high priority on privatisation in the context of energy market reform. However, the analysis of the evolution of state-owned utilities over time shows that, sooner or later, governance and financing problems arise and call for institutional changes. Even if the ownership of the electricity or gas networks in a country remain in public hands and operate in a commercial context, privatisation of state-owned utilities can improve the governance, bring new technologies and know-how and avoid the costs associated with the “public servant” status of the workforce. A key ingredient of success in energy market reform is to reduce the political and regulatory uncertainty because uncertainty has a cost in the form of increased risk; privatisation can help achieve this.

As one member of the WEC study group has said, “A monopoly is the most primitive form to generate or distribute a product or a service. At an early stage, and under specific conditions of the environment, it may be justified (e.g., the reconstruction of the energy infrastructure in Europe after World War II or the initial infrastructure development in developing countries). Yet if the concept of sustainability has not only a physical sense of natural resource and environmental conservation, but also a social (accessibility of commercial energies to all human beings) and economic sense (economic efficiency), the development of society will inevitably lead to their extinction in the long run as more efficient methods of production and distribution have evolved”.

Of course, privatisation is also driven by the need for cash to expand energy infrastructure and services, especially in markets where accessibility is a problem. In some developing countries this is an urgent matter but one that should only be addressed in the broader context of reforms which could unleash domestic savings to offset the need for foreign capital.

Making LDCs lean and mean: This can be accomplished by an appropriate combination of efficient regulation, franchising, out-sourcing, economies of scale and scope. Franchises, if they are chosen, may extend over 10-15 years, long enough for the quality of management and service to become clear, but not so long that they lose their sense of performance and their wish to be selected at the next auction. Regarding the possibility of mergers and acquisitions in the downstream sector, it is a matter for the political and regulatory authorities, possibly with input from consumer associations, to choose from among a combination of large holding companies, reliance on outsourcing or large regional distribution companies. Given the lack of experience to date, the most desirable market is one in which there are enough competing LDCs to allow customers to compare their own LDC against those of, say, 4-5 neighbouring LDCs. In developing countries, unless a regional energy market is already established, it may not be possible to achieve this until the energy market matures.

Phasing the introduction of retail competition: Retail competition may require load profiling and/or new sophisticated IT systems. The smaller the customer, the higher the cost and the less attractive the cost-benefit balance. Freedom of choice already exists in the European Union for 80% of the demand, i.e., all the large customers who access transmission directly, most medium customers and some small ones who rely on retail supply. European experts believe that it is beneficial and should be promoted, at least for the developed countries, but this would not appear to be a high priority in less mature developing country markets.

Ensuring that distribution tariffs are cost-reflective: Private LDCs will not subsidise consumption unless they are asked to do so and are paid for it, but they might be tempted to cross-subsidise the customers who could leave the LDC (e.g., the large commercial or small industrial customers) at the expense of the smallest captive users who are unlikely to leave. It will be up to the regulator to ensure that supply cost reflects wholesale prices and the load profile, that security cost is benchmarked, and that distribution costs are consistent with the load profile and the class of consumption to which the consumer belongs.

Security of Supply, The Wider Challenge

Energy security is what makes the difference between energy being seen as a commodity and energy being seen as an “essential” good for welfare and economic development. It can be provided in many ways via larger capacity margins, distributed energy or regional network and needs to cover three aspects:

- Quality and reliability of the supply;
- Adequacy of the supply from a long-term perspective;
- Resilience of the energy networks.

With the recent supply crises in some industrialised countries, security has become a key concern that now dominates the question of market design. Of course, for two billion people in the world (mostly in developing countries), this is ironic, since they live day-to-day in a permanent supply crisis, with no access whatsoever to commercial energy services; another two billion people in these countries have periodic or unreliable service. In the USA, where the momentum in favour of retail competition has stalled, the ongoing discussions focus on the possibility of imposing mandatory reliability standards defined by NERC (North American Electricity Reliability Council). In the EU, the debate over “reliability” has not reached the same level of urgency, but it is envisaged in the move to retail competition which is taking place there.

One might summarise the messages of Security of Supply as follows:

Quality and reliability of supply is the responsibility of the system operator. The main features of this responsibility are the fine-tuning of the balance between supply and demand given all the deviations from the initial plans and the management of ancillary services, such as reactive power/frequency for electricity or pressure for gas distribution networks. These tasks are similar to those of the former utilities, except that the capacity reserves are mostly in the hands of third parties and must be paid for.

Long-term adequacy of supply may be approached in different ways, decentralised or centralised, systematic or “ad hoc”, etc., providing that all generators are treated the same way. Guaranteeing that sufficient capacity margin will be available on time has become a much discussed issue in the EU and in other developed countries that are already engaged in

market reforms, with the question remaining of whether the design of wholesale markets provides security or needs to be adapted. Some experts fear that too little investment may come on line and that sooner or later, problems will arise. However, many others believe that security will not become an issue. They may be right because of the imperfect nature of electricity markets in which the major actors can, to a certain extent, control the outcomes in terms of prices and investment.

Resilience of the energy systems has two sides: diversification (fuels, fuel sources and technologies) on the one hand, and redundancy of some essential transmission or process facilities on the other hand (to avoid the risk that a breakdown of a single facility could interrupt all supply). Regarding diversification, the fact that marginal electricity prices increasingly reflect those of gas (convergence) means that electricity producers cannot expect to build long-term rents without diversifying out of CCGT fuelled by spot gas, which will push them to invest in base-load technologies (hydro, coal, nuclear) or rely on a gas price formula different from spot. Regarding transmission resilience, the recent blackouts or the cascade of electricity meltdowns from Ohio to the whole North-eastern US and Canada will certainly trigger actions for the grids (even though these problems have little to do with the design of competitive energy markets).

In all security of supply respects, distributed energy and regional integration are closely related because security has local and regional dimensions. Local supply with decentralised units is a first-rank insurance but needs the consolidation of a second-rank insurance, a deep regional market to provide back-up. The larger the region accessed by the grid, the more secure the back-up. Regional integration is a key issue in the EU by the very nature of the dynamics of the “single market”; in the USA and Canada, with the “Standard Market Design” proposed by FERC to increase the interstates flow of electricity; in Japan and in Australia. Developing countries are also moving ahead, either because of their size (Brazil, China, India), or because groups of states (such as those in Latin America for some time and now in Africa) recognise the benefits of integrating their energy markets, not only to increase the resilience but also to create a more stable and less risky institutional framework. It is a simple fact that, while common rules agreed among several countries are difficult to negotiate, once established, they are also more difficult to change and therefore they are more attractive to potential investors.

Wholesale Market Design

Alison Silverstein of FERC in the USA has said, “Bad market rules are worse than no market”. One cannot just let markets work. There must be constant vigilance by the regulator and the right tools to detect and remedy any market abuses. This is tricky because the borderline is very thin between a situation of genuine scarcity and a player gaming with transmission capacity or deliberately withholding power generation capacity.

The trouble is that there is no obvious optimum design for wholesale electricity competition, and trade offs need to be made. There are four issues to address:

- Ownership and unbundling in the upstream and midstream sectors;
- The natural emergence of market power in spot electricity markets;
- Market reforms and competitive wholesale markets; and,
- Accommodating public policies in a competitive market.

Privatisation and unbundling are touchy matters. Privatisation may go against the entrenched interests of the workers in state-owned companies but is increasingly needed because of governance problems. Large nuclear or hydro programmes may in certain circumstances need to remain in public hands, but such exceptions need to be transparently treated and periodically reviewed. Unbundling is at the heart of competition and the benefits it brings. However, it imposes the obligation on the regulator to ensure that there will be no gap in the supply responsibility chain.

The threat of market power is con-substantial to pool or residual balancing systems as the theory and empirical evidence show. Such potential power may ease long-term security concerns but needs to be tightly controlled and “contestable” in the sense that new entrants may freely invest. A greater reliance on smart meters (that make users sensitive to prices) and/or the drastic reduction of the number of bids may be used to alleviate this risk. Another approach may be to split the large incumbents into smaller “virtual generators”, but this has a limit because large regional companies are needed to bring financial, managerial and technological capacity, together with strong economies of scale, that would not otherwise exist. The regional integration of energy markets also plays a big role in addressing both security of supply and market power, with the added benefit that it helps “regulate the regulator” by establishing agreements and standards which are difficult to change for a solely national political purpose.

Simple market design should initially be preferred initially because sophisticated designs are costly, create regulatory uncertainty and risks and open doors to market power. For the developing countries, where national and regional circumstances play a key role, the choice of a design will be that of simple trade-offs. In the developed markets, where the design has already been chosen, simple rules are needed to ensure that there is no responsibility gap in the chain of supply and to prevent or limit market power.

Public policies for social or environmental purposes linked to the provision of energy services may be necessary and attractive. However, if the real costs are hidden, this creates the risk that governments may skew technology choices or pricing in ways which undermine the key objectives of energy market reform. Competition is good for the environment because it helps accelerate efficiency and the introduction of clean technologies, but only if the full and real costs of energy production, transmission distribution and utilisation are known and paid by the customer.

Tariff-Setting and Energy Poverty

Consumers are the “alpha and omega” of energy market reforms, either directly in developed countries or indirectly in developing countries that seek capital to fulfil their growing energy needs. In this respect, tariffs should reflect the workings of the electricity or natural gas systems in order to make relevant decisions and become the drivers of development, social cohesion and economic growth.

When it comes to tariff-setting in the context of energy market reform, four issues have been discussed:

- The significance of sustainable energy access in terms of national development;
- The structure of tariffs based on the load patterns of consumers;
- The parameters of subsidies in the national interest; and
- The provision of affordable and sustainable energy for the poor.

The significance of sustainable energy access is enormous. Even though energy is not the only basic service, it is the most important, because without energy, there is no clean water at the tap, no health care, no education and information and no way for a country and its people to get on the development path. Sustainable access to energy needs to be a national undertaking for the sake of the country, its people and greater world harmony.

The structure of tariffs is key to send the appropriate signals to consumers about the choices they make. In this domain, very simple approaches based on the maximum required capacity and average energy consumption allow one to track the load fairly well for broad categories of customers without relying on smart time-of-use meters that may still be too expensive in some markets.

Subsidies and cross-subsidies are not the best theoretical approach but exist in all countries to a greater or lesser extent. WEC has often made its position clear on subsidies: producer or cross-subsidies in the energy sector should be avoided, but consumer lifeline subsidies may be needed to address the energy access needs of the poor; if so, such subsidies should be targeted, transparent and temporary. While direct consumer subsidies from the public purse are theoretically better than tampering with the electricity tariff, there are ways in which the lifeline can be built into it.

Supporting the poor involves programmes which combine the most relevant tariff approaches, the elimination of the “stranded” costs in excess of the LRMC, the use of low-capacity meters to level the consumption load and the possible reliance on a direct tariff-based subsidy applying only to consumption below a certain threshold by a specified category of customer.
