Some Guideposts on the Road to Formulating a Coherent Policy on EU Energy Security of Supply

The authors offer 10 unexciting rules that can help solve the dilemmas of energy security of supply by improving markets rather than making grand policy statements – unexciting, because they are based on economic arguments rather than identifying heroes and villains.

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Energy security of supply is an extremely political matter. It involves considerations of international relations, geography, and infrastructure control. Despite these realities, economics has much to offer to improve policymaking in this realm. In fact, economists can say a great deal about markets and policy. Markets, for balancing, storage, reserves, and access to cross-border capacity, and investment, which is guided by market prices, both play a critical role in delivering security of supply, as does public policy (e.g., for energy efficiency, storage obligations, and the fuel mix). Moreover, security of supply can give rise to ''free-riding,'' a phenomenon familiar to economists. Over the past two years, we have analyzed this topic with other economists,[1] especially in focusing on gas and nuclear power. What follows is a synthesis of our conclusions.

1. Short-term and long-term disequilibria in security of supply are different phenomena

They must be analyzed differently and may need to be

addressed with different policy instruments.

Short-term disruptions in energy supply are transitory; they can be caused by a variety of factors (e.g., equipment failure, human error, weather events, crime, or accidents). Moreover, the provision of short-term security of supply may have to deal with the problem of free-riding. If one company (or country) invests in improving security, others can free-ride, deriving part of the benefit without paying for it. One measure to protect against such free-riding might be to charge appropriately for the protective service (e.g., by short-term scarcity pricing of access to storage or reserves that others had secured on more favorable long-term contracts). In the absence of such cost-reflective charging, there is a risk of under-provision of security of supply services.

Long-term disequilibrium comes from a structural mismatch between supply and demand, such as that forecast by the International Energy Association today in gas and oil. Long-term energy demand is especially difficult to predict with sufficient accuracy to assess future prices, whereas investments to respond to potential future shortages or high prices have to be decided now. Substitute sources of energy or supply (e.g., nuclear power, liquefied natural gas import facilities, or alternative pipeline routes) can therefore occur.

2. Solidarity among EU member states to cope with energy disruptions is necessary and even more so in the absence of satisfactory market liberalization and market design

Member states are, and will continue to be, key players in providing short-term security of supply within the EU. However, emergency access to gas reserves need to be guaranteed under well-defined criteria and on well-defined terms, otherwise it will be expected that they will be withheld to address national disruptions, with little credible improvement in EU security. A solidarity mechanism is required to ensure the necessary pooling of, and access to, resources that the whole EU requires. In electricity markets, regulatory barriers that impede the national and cross-border contracts which can provide security of supply to national demand on equal terms should be removed. Otherwise, each country will have to fully provide for its own security of supply. Under the right conditions, disruption in one place would be more quickly solved and would not contagiously spread elsewhere.

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To date, the voluntary EU solidarity contract has failed to deliver satisfactory outcomes. It is the role of the EU institutions and rules to enforce cooperation whenever the common interest is larger than the sum of the member states' individual interests. The European Commission must propose and implement credible and robust solidarity mechanisms.

3. Information provision and sharing improve energy security for all

Information may be costly to produce (e.g., reliable energy and capacity forecasts) and information may deliver a strategic advantage to individual agents (e.g., higher payback to a storage facility, higher scarcity prices for balancing services). It is therefore to be expected that there will be under-provision of some information as well as incentives not to communicate other information.

In order to improve responsiveness to disruptions and to provide resilience efficiently, EU energy security policy needs to mandate adequate information acquisition and dissemination.

Transparency, open access, and real-time dissemination of information are key for short-term security of supply. Such information deals at least with weekly statistics of gas storage in each country of the EU. Furthermore, explicit methodology and assumptions, scenario discussions, regionalization and collegialization of the forecasting studies, and an agreement on the data to be collected and made available (e.g., storage capacity, import capacity, reserve margins, and investment plans) are vital mechanisms for long-term security of supply.

4. Open access pan-European networks are the backbone of EU security of supply

The electricity transmission grid and the gas transportation system contribute to both short- and long-term security of supply. They connect different sources of supply and therefore increase the availability of flexible and diverse resources that can be accessed to cope with a short-term disruption. They also ensure a better long-term match between energy demand and supply, because what consumers need and buy is *delivered* energy, the combination of energy and transportation services. They cannot use electricity or gas only provided at some distance to their home or business.

National network operators and regulators are responsible to their national consumers and governments. However, they frequently fail to deliver when cross-borders links are at stake. At best, they may give equal priority to a pan-European investment as to a national investment. It is fair to say there exists a trans-European network policy that recognizes security of supply as one of its basic aims.

Policymakers have to make greater efforts to fight against the NIMBY syndrome that often obstructs the building of infrastructures.

However, its budget to invest in new links in gas and electricity networks is less than 1 percent of the annual spending of all national networks. More money to fund economic cross-border connections has to be found, as well as more incentives and duties for national operators and regulators to take pan-European investments projects seriously. This is where adequate information that allows external parties to assess the desirability of potential links is critical, as not all links are equally useful and the scarce funds should be allocated to those that deliver the highest value.

Clear regulations that assign the responsibilities for the new investments, the participation of stakeholders in the process, and the allocation of cost to the network users are of essence in this respect. Moreover, policymakers have to make greater efforts to fight against the NIMBY syndrome that often obstructs the building of infrastructures that are so important to improving security of supply.

5. Public policies that are not specifically devoted to security of supply may be at least as critical in improving security of supply as *ad hoc* policies directed specifically at such objectives

Deciding on a mechanism for collective access to security reserves, building new grid connections, and creating an information network, as mentioned above, are examples of specific policies directed at improving security of supply. It would be misleading to only focus on them, as security of supply is affected by other public policies.

Energy efficiency policy is a good example. While generally aimed at reducing CO_2 emissions and/or trade deficits, its impact on security of supply can be considerable. The more energy is saved, the more adequate will be the existing storage capacity as

well as the margins of installed capacity over demand, and the lower will be import dependence; reducing the addiction of the economy to energy is the most obvious way to reduce dependence on imports and the concomitant risk of supply security. However, it must be remembered that a more energy-efficient system may be less flexible: in case of emergency there will be fewer types of inefficient consumption that can be curtailed (e.g., by reaction of consumers to higher prices or by compulsory rationing).

Technology policy is another example. Smarter networks, smarter devices that can reduce user demand at short notice, as well as diversity in power generation can do much to improve short- and long-term security of supply. Technological innovation and adoption in these areas can be facilitated by public policies.

A last example is foreign policy. As a truism, energy security depends on good relations with neighbors.

6. Markets are central to providing security of supply

The market is a mechanism that allocates scarce resources. When an energy disruption occurs, the market responds to the resulting short-term scarcity by rationing use through higher prices and by moving flexible supplies to where they are most needed. The U.S. gas market, for instance, succeeded in coping with the Katrina and Rita hurricanes that shut down 20 percent of the Gulf region capacity (amounting to 5 percent of national capacity) with quite modest price spikes and impacts on consumers.

As far as long-term security of supply is concerned, the market reacts to anticipated scarcity by incentivizing investments. Anticipated high prices trigger decisions to build new facilities.

When markets are opened to effective competition, there is frequently a rush of new projects.

Interestingly, when markets are opened to effective competition, there is frequently a rush of new projects, reducing future scarcity and lowering future prices. Thus, in the EU gas sector, we have recently observed a surge in investment in new LNG terminals and peak-shaving storage. The nuclear industry which also contributes to improving security of supply enjoys a revival, with market-based financing of new construction now appearing as a viable business possibility.

7. Security of supply is enhanced when markets are wider

The larger the geographic extension of energy markets, the more they are able to absorb disruptions because more resources are available to damp price spikes. Besides this insurance or resilience effect that improves short-term security of supply, wider markets also provide more diversity of primary fuel types and of geographic sources, and therefore ensure a better long-term security of supply.

Moreover, the wider the market, the greater the number of players, and therefore the more competitive the market. This point is important because uncompetitive markets allocate scarce resources inefficiently. For instance, if electricity companies cartelize, they will restrict investment in new power plants to keep prices high. The cartel's interest is similar to a monopoly's interest, that is, to create, not reduce, scarcity.

8. Public policies that facilitate market enlargement and competition improve security of supply

Left to themselves, markets will expand and erode monopoly

 1040-6190/$–see front matter , doi:/10.1016/j.tej.2008.10.017

positions, but it can take time. This is especially true in electricity and gas where transportation costs can be high and innovation is slow. Public policies can speed up the process by decreasing barriers to trade and to entry. This is the reason the EU internal energy market was created in 1996. Note that the opening of electricity and gas to competition also requires the creation of a complex series of related markets that must be designed. They bear esoteric names such as day-ahead markets, balancing markets, capacity payments markets, as well as institutions such as explicit auctions, and market coupling. Whenever they are badly conceived or implemented, trade is less efficient and usable cross-border interconnection capacity reduced. Competition is hindered and thus security of supply is reduced.

This is one area where the EU could make considerable progress at modest cost. The so-called Third Package of directives related to the gas and electricity markets, once adopted, will contribute to such progress. As a consequence, a quick, full, and cooperative implementation of the new package would be an important step to improve the EU security of supply.

9. Good competition policy enforcement helps security of supply

Antitrust law, merger regulation, and state aid control all contribute to protecting competition in energy markets and therefore, as a side effect, to the provision of security of supply in the EU. However, antitrust authorities are sometimes biased in reaching their decisions. They can put more weight on short-term losses than on long-term benefits, or on anticompetitive effects than pro-competitive effects, say of a merger or an agreement between firms, or on national rather than continental benefits. Moreover, case law might not be sufficiently clear and decisions difficult to anticipate.

Even policies aimed in principle at providing security of supply can have perverse effects.

Long-term gas contracts are a good illustration of how antitrust biases and uncertainties may work against security of supply, for they can discourage investment.

10. Bad public policies, including security of supply policies, can severely damage long-term security of supply

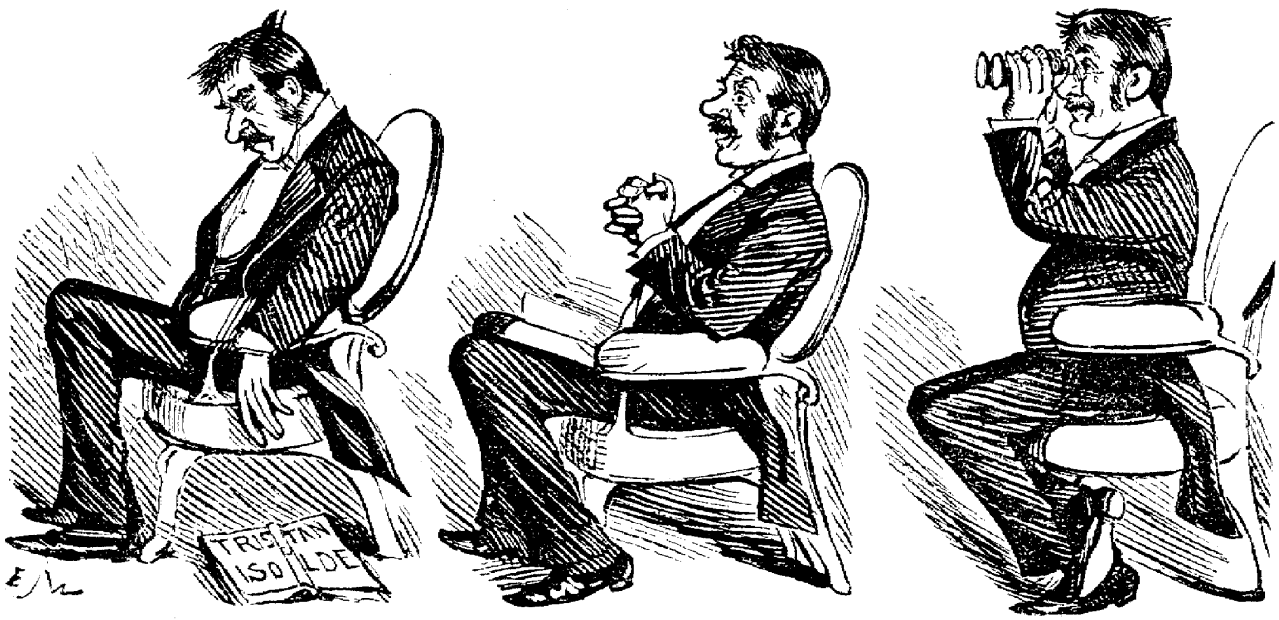
Assuming markets are competitive, very high prices signal un-manipulated scarcity and remunerate investments for extreme peaks of demand that may operate only a few days per year. High prices over a long period of time signal undercapacity in generation and attract new investments, as already mentioned above. But high prices hurt consumers. They may be quick to complain and induce policymakers to respond by capping prices on spot markets and/or maintaining low administrated retail prices. Such short-term redistributive goals are achieved at the expense of future consumers, for they delay investment in new capacity, raising future prices and/or causing shortages and rationing.

Even policies aimed in principle at providing security of supply can have perverse effects. Consider the example of badly managed strategic reserves. Because high prices are politically unpopular, governments and/or their agencies can be tempted to open them during periods of high prices just to damp down markets that are handling temporary shortages satisfactorily. Such actions are counterproductive, as releasing strategic reserves into the market lowers market prices and undermines the incentive for the market to invest to cope with future shortages. It reduces the capacity the market would have provided spontaneously and at lower cost, and may reduce future reserve capacity if the government cannot afford to take over this (unnecessary) responsibility.

These 10 conclusions may look unexciting to some, because they are based on economic arguments rather than identifying heroes and villains. Markets and public policies are both imperfect, and as usual economists recommend improving them both. Economists also argue that improving markets is normally cheaper and more direct than attempting to achieve the political consensus needed to impose change through policy. Improving markets is unfortunately less dramatic than making grand policy statements.■

Endnotes:

1. Within the framework of so-called CESSA research program (www.cessa.eu) gathering a group of economists from the University of Cambridge (David Newbery and Willam Nutall), University of Comillas (Julian Barquin and Ignacio Perez-Arriaga) and DIW (Christian van Hirschhausen and Franziska Holtz).



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