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Stuart Rankin, Europe at Night in 2012 https://www.flickr.com/photos/24354425@N03/15775721086 (Creative Commons CC BY-NC 2.0)

The global energy price shocks of the past two years have made it painfully clear that energy cannot be treated as an ordinary commodity and that many governments have been insufficiently attentive to energy security. Given its dependence on Russian gas, the EU has been ground zero for the crisis, with natural gas and electricity prices rising to unimaginable levels over the past eighteen months. But the crisis has rippled across the world, as EU member states have rushed to fill storage reservoirs to secure adequate supplies of natural gas for the coming winter, driving up prices and diverting much needed Liquified Natural Gas (LNG) cargoes from other buyers. All of this is coming on top of record high inflation and a post pandemic global economy marked by rising levels of precarity and unrest.

The EU and its member governments have intervened in various ways, providing direct subsidies to households, bailing out energy companies, proposing to cap some energy prices, and seeking to claw back windfall profits. The amount of spending by European governments is staggering, more than 7% of GDP in some cases. One report from October found that total spending across the block was around $700 billion, close to what these governments spent on pandemic relief.

Such numbers, of course, mask the uneven levels of spending across the EU member states, with some countries such as Germany spending far more than others, raising more than a few eyebrows among those who recall Germany's previous lectures to fellow member states on the virtues of austerity and fiscal responsibility. For governments in the Global South, of course, such spending is pure fantasy given much more limited fiscal capacity and a looming sovereign debt crisis.

While the EU seems to have avoided the worst-case scenario this winter, the longer term supply outlook remains dire. Several countries are rushing to build new LNG import terminals. Plans to shut down nuclear reactors in Germany have been put on hold. Coal-fired electricity has made a temporary comeback in some regions. And the EU itself is joining member governments to double down on support for clean energy in recognition that a clean energy future can also be a more secure energy future.

The tendency to view the current crisis solely as a supply shock, however, misses important questions about market design and the distinctive ways of price making at the center of natural gas and electricity markets. In particular, the current crisis has raised fundamental questions about the viability of current electricity market designs in the face of a growing dependence of electricity markets on natural gas. Because natural gas generation typically sets the clearing price in many of these electricity markets, extremely high natural gas prices are leading to extremely high electricity prices, delivering huge windfalls to non-gas generators and causing enormous pain for retail customers.

This post, which continues a series of previous LPE posts on energy prices (see here, here, and here), argues that the current moment offers a critical opportunity to rethink some of the basic commitments that have underwritten the push to liberalize energy markets over the past forty years, and particularly the use of markets for electricity provisioning. As we move to electrify more and more aspects of everyday life and transition to an electricity system that is increasingly dominated by renewable energy, the time is ripe for a reconsideration of such markets and their place in a clean energy future.

Neoliberal Electricity: A Short History

As with most things neoliberal, the first efforts to privatize electricity and subject it to market competition took place in Chile under the Pinochet dictatorship during the

early 1980s. Margaret Thatcher followed with her own effort to open up the UK electricity sector in the late 1980s. In both cases, the goal was to privatize formerly state-owned enterprises and to unbundle generation from transmission and distribution in order to create competitive markets for wholesale electricity.

Judged against the benchmark of consumer welfare, the results of these early efforts have been disappointing to say the least. In Chile, privatization led to massive concentration in the ownership of generation assets and very limited gains for consumers, as the new private actors captured extraordinary profits. In the UK, the experiment has stumbled along for several decades with multiple interventions to deal with chronic underinvestment, rising prices, and a growing backlash against the public asset stripping that has been the hallmark of privatization. Indeed, one of the great ironies of the UK experiment is that the buyers of many of the formerly state-owned power sector assets were large state-owned enterprises from the continent such as Électricité de France. Britons will take cold comfort from the fact that the high electricity bills they are paying this winter will go in part to the French government.

In the United States, California took the lead on electricity restructuring under Republican Governor Pete Wilson, who was eager to prove his pro-market bona fides as he prepared for a possible Presidential run. In the mid-1990s, Wilson appointed Daniel Fessler, at the time a professor of contracts law at UC Davis, to the state Public Utilities Commission and charged him with leading the effort. Fessler, who had no background or experience in electricity, was a committed free marketeer from Wyoming and an unabashed anglophile. After a trip to the UK as part of a delegation of electricity industry leaders and regulators from California, Fessler came back committed to the idea of harnessing the price system to create a new market for electricity in the Golden State. All of which found support from longstanding proponents of deregulation and a growing push by economists to embrace markets for electric power.

The result of the California experiment, however, was a disaster of truly epic proportions. In 2000-01, prices in the spot market increased by more than 1000 percent. One of the state's largest utilities failed for bankruptcy and another was forced into quasi-receivership with the state's Public Utility Commission. Rolling blackouts were common, while manipulation of gas and electricity markets reached "epidemic" levels according to FERC. Overall, Californians paid an estimated $40 billion in excess energy costs during the crisis. Litigation to recover some of these costs is ongoing, more than twenty years after the crisis.

In the wake of the California crisis, other states that had been actively pursuing deregulation pulled back, leaving the U.S. with a fragmented regulatory landscape. Nevertheless, the basic model of wholesale electricity markets that was first attempted in California has survived with various adjustments. Today, about two-thirds of U.S. electricity consumers receive their power through organized wholesale power markets run by Independent System Operators or Regional Transmission Organizations.

In the meantime, electricity restructuring has also spread around the world, from Australia and New Zealand to Scandinavia, South Africa and Turkey. A concerted effort within the EU, implemented through three major directives in 1996, 2003, and 2009, has also succeeded in establishing a single electricity market in the region.

Windfalls, Windmills, and the Contradictions of Electricity Auction Design

Although the specific details vary, most of these jurisdictions have organized their wholesale energy markets around the so-called uniform price auction (sometimes called the single price auction or pay-as-clear auction). Under this design, the last increment of generation needed to meet demand (or load) sets the clearing price for all other generation resources that bid in below that price. The virtue of this particular design is that it creates incentives for generators (sellers) to make offers at their short-run marginal costs so as to ensure that they will clear the market if the clearing price meets or exceeds their costs. The single price auction also creates the opportunity for inframarginal generators (that is, those generators that have offered to sell power below the clearing price) to receive inframarginal rents, which in theory are supposed to provide incentives for new investment.

In practice, however, there are several major problems with this auction design as applied to electricity markets. First, because of the requirement that generation and load be balanced in real time, generators can game the single clearing price during periods of constrained capacity, leading to much higher prices. Second, because natural gas is almost always on the margin setting the clearing price in most electricity markets, massive increases in the price of natural gas will lead to very large increases in the clearing price for electricity, which means that even low-cost non-gas generators will receive the higher price set by expensive natural gas generation. This has been happening in Europe during the current crisis. It has happened in California during extreme heat events each of the last two summers. It happened in Texas during Winter storm Uri. And it could happen this winter in New England and other states if another polar vortex develops, leading some to worry

about truly extraordinary increases in prices. Third, as we move toward a system dominated by renewables, which have zero marginal costs, the single price auction will start to break down. Because wind and solar have no fuel costs, they have no short run marginal costs. Rather, these projects are all essentially fixed capital costs. Even economists would have to admit that a market design built on the idea of marginal cost pricing cannot work if there are no marginal costs.

Decommodifying Electricity?

Recent history suggests that when the current crisis eventually passes, the great neoliberal experiment with electricity markets will continue to limp along. But there is at least some basis for believing that the current conjuncture is different. We are at the beginning stages of a global-scale energy transition—the kind of transition that comes around only once every few generations. The system we are moving towards is one in which the costs of providing electricity will be virtually all capital costs. Even with a large buildout of storage, the marginal costs of operating the system will be very low. And as that system is built out and eventually settles down, the absence of volatile fuel costs should lead to stable and affordable prices for consumers.

The task before us is to mobilize investment on a massive scale and to find ways to socialize the costs of those investments in a manner that is fair. This requires a basic normative commitment to a system of electricity provisioning that treats electricity as a necessity rather than a commodity. Here, public utility regulation and outright public ownership both hold great promise as ways to mobilize large investments at relatively low costs of capital and to guard against excessive profits for private actors. Redesigned markets and price signals surely have a role to play in this as well and there is much work to be done on that front. But any effort to fix the markets and improve the price signals must be subordinated to the task of building a shared infrastructure that can support the coming age of electricity.