The Economist

Letters

# Letters to the editor

*On renewable energy, voting*

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## Renewing energy markets

You succinctly described the conundrum faced by electricity markets adapting to renewable energy ("A world turned upside down (http://www.economist.com/news/briefing/21717365-wind-and-solar-energy-are-disrupting-century-old-model-providing-electricity-what-will) ", February 25th). Existing renewable-energy plants with zero marginal generation costs will price any fossil-fuel power plant out of the market.

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Today's liberalised electricity markets, where prices are set by the marginal cost of generation, were concocted in the 1990s. These markets are not determined by physical laws; we should question established orthodoxies and design more effective alternatives. The current system neither guarantees that there are sufficient price signals to maintain the high availability of electricity we are used to, nor achieves the deep levels of decarbonisation required to keep the planet inhabitable.

We need to look at the cost of the "package deal" for a reliable, low-carbon electricity system, as Simon Müller of the International Energy Agency poignantly puts it, without assigning the derogatory term "subsidies" to individual components of that package. By all means, market principles should rule the new regime, for example through large-scale competitive tendering of renewable-energy plants. Recent results demonstrate that such tenders can achieve extremely competitive pricing for carbon-free electricity. Visionary policies are what's called for, not patches on a colossal market failure.

MORITZ BORGMANN
Partner
Apricum—The Cleantech Advisory
Berlin

By 2040 global electricity demand is forecast to rise by 70% thanks to its decarbonisation potential and the electrification of industries such as transport. Energy storage will

become increasingly important as intermittent renewable-power increases: pumped storage hydro is the economically viable technology that is proven to work and can be delivered on a large scale. Other storage technologies such as batteries will also play an important role as part of the grid, to balance fluctuations.

But we need new market frameworks to support this change. This means stronger carbon-price signals to incentivise clean-energy investment and technology rather than subsidies for polluting fuels. As you point out, it also requires spending to enhance and digitise electricity networks. Networks are more important than ever in a smart energy world, to manage localised multidirectional power flows and to ensure the stable supply of electricity.

Many utilities are already adapting to deliver this transformation. But policymakers also need to meet their side of the bargain.

IGNACIO GALÁN
Chief executive officer
Iberdrola
Madrid


Alex Chinneck/London Design Festival

Energy policies are increasingly and mistakenly geared towards expanding renewable energy as an end in itself, rather than achieving carbon reductions and maintaining reliability. The cost of providing system backup power or storage is not reflected in the wind and solar "levelised cost of energy" or the market price. With more renewable production, these shadow costs escalate because a full-sized system of on-demand power or oversize seasonal storage (which does not practically exist today) is needed to cover multiple days and weeks when there is little wind or sun. If it existed, this storage system would face the same challenge that capacity markets face in a high-renewables world: large capital costs and low usage. High renewable penetration makes all forms of energy production "intermittent" and therefore costly.

Most studies suggest that achieving a low carbon grid at a manageable cost will require a mixture of nuclear, gas with carbon capture or other zero carbon on-demand sources in addition to renewables. To redesign markets to facilitate very high uptake of renewable energy for its own sake is indeed a way to turn the world, and economic logic, upside down.

JANE LONG
Lawrence Livermore Laboratory (ret.)
Oakland, California

ARMOND COHEN
Clean Air Task Force
Boston

In New York state we are modernising the regulatory regime and electric grid. These reforms include allowing utilities to earn returns for their shareholders by advancing clean-energy solutions, rather than only by investing more capital in the expansion of the

grid's capacity. This is one way of solving the "utility death spiral". New York's utilities now have a clear business motive to improve the energy and financial efficiency of the state's entire grid. For example, by using transparent price signals in retail energy markets, utilities will be able to deploy more renewable generation and energy-efficiency projects

where they can help with grid congestion in high-use areas, which will reduce the need for capacity payments to dirty and expensive "peaker" plants. As a result, these clean-energy deployments will benefit all users of the grid, not just those homes and businesses that have the opportunity to implement clean-energy projects. We want to provide customers with what they want, instead of what regulators and utilities think they want.

RICHARD KAUFFMAN
Chairman
Energy and Finance, New York state
Albany, New York

I agree with your analysis. We expect that by 2030, half of the electricity in the European Union will come from renewables. Upgrading the design of outdated electricity markets is thus an urgent matter. The European Commission has published wide-ranging proposals, such as allowing price spikes at moments of scarcity and deregulating prices at the retail level, measures to prevent blackouts and clearer rules on cyber-security and the smartening of power grids, and more interconnection between EU states. This renewables revolution is only possible with the buy-in of consumers, who need to be empowered as part of this energy democratisation. The role of providers and innovators is indispensable for enabling active consumers and providing them with new state-of-the art services.

MAROS SEFCOVIC
Vice-president of the European Commission in charge of the Energy Union
Brussels

Cross-border power markets can significantly alleviate some of the problems you mentioned. Through a well-integrated Nordic electricity market, Denmark avoids curtailed power because of fluctuating wind energy by exporting excess capacity to Norway and Sweden when the wind blows and importing hydro power when it doesn't. In this way, the Nordic power market provides flexibility across renewable-energy types, ensuring that electricity generated everywhere and through every source enters the grid and reaches consumers.

LARS CHRISTIAN LILLEHOLT

Danish minister of energy
Copenhagen

It is said that the shift to renewable energy will reduce profitability. However, when considering "The Coal Question" in 1865, William Stanley Jevons found that as the efficiency of energy generation increases, the quantity of energy consumed goes up by a disproportionate amount. With the switch to abundant, cheap renewable energy, consumption, and profits, will rise.

JAMES SHERWIN-SMITH

London


* You made plain in your piece that challenges remain when it comes to renewables and the power sector. Yet all fuels and energy technologies received public support early in their development, and many have continued to benefit from favorable policies well after becoming commercially viable. The International Energy Agency has estimated that global subsidies for fossil fuel consumption in 2014 neared half a trillion dollars, more than quadruple the subsidies to renewables. Annual average subsidies to fossil fuels are still more than 13 times what is provided for renewables, and indirect subsidies are also large, though more difficult to track.

Use of renewable power has increased tremendously over the past decade, led in many cases by the private sector, while the economy has grown and emissions have fallen. Subsidies have played a role, but so have falling costs driven by advances in technology and manufacturing, new business models, and consumer demand. As you noted, further technological advances such as digitalisation, storage, and more distributed energy systems can help ease the transition while providing other benefits. But as you highlighted, growing demand for new technology and services will only further strain the current system.

Additionally, leaving market design as it stands in the face of growing demand for new sources of power is the ultimate government subsidy to incumbent fuels and technologies.

Existing industries will seek protection from new technologies and ways of doing business. Markets have tremendous power to direct resources efficiently, but we must design them to match new technological, political, and business realities. As this newspaper has long argued, only by pricing carbon emissions in a way that accurately reflects the impacts of traditional energy will markets effectively manage externalities in energy production and consumption.

This disruption in electricity systems is no reason for governments to stop supporting renewables. A recent National Academy of Sciences report observed that public investments can play an important role in establishing industries, but work best when they are performance- or outcome-oriented. Similarly, markets with bidirectional incentives would support further innovation and value creation without creating new market distortions. It also noted the importance of establishing appropriate pollution prices to help establish a level playing field and consistent market.
Now is the time for good policies and well-constructed markets to provide incentives to continue a transition to clean energy. Public subsidies for clean energy are addictive, just as they have been for oil and natural gas. But beating that addiction requires properly structured markets and investments that level the playing field for all sources of electricity and reflect their true environmental and public health costs. State and federal policymakers must work closely with the private sector to craft market solutions that fit this emerging reality.

CHRIS COONS
US Senator

Wilmington, Delaware

* Your recent article reaches some sensible conclusions but via an error-strewn path. Germany doesn't subsidise renewables; its feed-in tariffs transparently procure them and charge customers, using no general tax revenue. But in countries that temporarily do, like America, fossil and nuclear power generally enjoy bigger and permanent subsidies. Modern (ex-big-hydro) renewables nonetheless add over half the world's new capacity, because they're cheaper. Solar and windpower now often win unsubsidised auctions, bidding all-in levelised prices around 2–4 American kilowatthours and falling. This beats opex alone for thermal plants. Their owners seek greater subsidies or shields from competition, but they were already compensated for investment risks and shouldn't be paid twice.

The dearest of nine ways to balance the grid are thermal stations (old or—thankfully unfinanceable—new) and bulk electrical storage: they're seldom needed. Last year the ultrareliable and trading-adept former East German utility got 49% of its electricity from renewables, three-fourths of it solar and wind—the only two variable renewables. Dispatchable renewables available when needed were 54% of modern renewables' 2016 global output with or 29% without small hydro. Well done grid-balancing costs little—and probably less for a diversified renewable portfolio than for giant thermal plants because their lumpiness needs more backup when they too fail.

Better grid integration and markets, dispatchable renewables, flexible demand, and distributed thermal or electric-car storage worth buying can together prevent 'duck curves' and sustain renewables' value at scale. Excluding such options causes your contrary findings.

The death spiral I described in 1976 is obvious but utilities' challenge runs deeper. They sell a commodity to customers wanting an infrastructure or a service. Thomas Edison sold light not kWh so more-efficient lamps would cut future costs. Once his clever business model lapsed in 1892, utilities sold kWh, so customer efficiency cuts revenues not costs—a bigger threat than cheap renewables, since most electricity is wasted and negawatts beat megawatts. Customers, now gaining more market power than providers, are realising they can buy fewer electrons, use them far more productively and timely, even produce and trade their own. It's smart to sell customers what they want before someone else does and to let profits flow to least-cost solutions. All the rest is detail.

AMORY B LOVINS
Cofounder and Chief Scientist
Rocky Mountain Institute
Basalt, Colorado

* Pricing is not an unfamiliar challenge. Around the United States, innovative solutions are being tested and implemented. California, for example, hopes to move most electricity customers to a pricing system based on time of use by 2019. If done right, this can shift energy demand to the times of day when cleaner, inexpensive renewable energy is more plentiful and accelerate the transition away from gas-fired resources. In Texas there is a

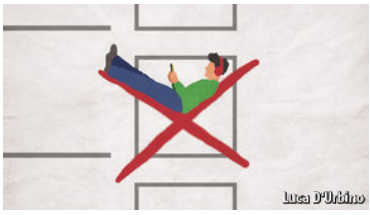
programme in place that varies prices during the day and offers completely free energy during the night, when the wind blows strongest.

DEBORA SCHNEIDER
Communications manager for clean energy
Environmental Defence Fund
New York

* It seems far more likely that the investment problem identified in your article reflects signals about subsidising renewables. In subsidised environments, the profit-maximising game for investors is to invest only when they think they have maximised their net return from future expected subsidies, revenues and costs. It is not hard to see how this could lead to delayed investment.

BRENT LAYTON
Chair
Electricity Authority
Wellington, New Zealand

**Youth and democracy**




* Research shows that voting intentions are formed at a young age, so I very much agree with you that there is a strong case for reducing the voting age to 16 ("Vote early, vote often (http://www.economist.com/news/leaders/21716030-young-voters-are-becoming-disillusioned-elections-catch-them-early-and-teach-them-value) ", February 4th). However, if adult politicians are unwilling to make that legal change, is there anything else that can be done?

At the beginning of February the school in Denmark where I teach participated, along with more than 600 other Danish schools, in *skolevalget* ("the school election"). With a campaign launched by the prime minister, more than 60,000 pupils between 14 and 17 years old took part in debates with the parties' youth wings, political discussions in class, the production of political videos, and (at the end) a voting process, complete with electoral rolls, formal ballot cards and boxes, voting booths, counting and results.

It may all have been no more than a bit of fun, but it did have an effect. I started the three weeks with 146 politically apathetic tenth graders. By the end there were heated discussions about assisted suicide, mooted cuts in student support, and the implications for the world of Brexit and Donald Trump. Perhaps this is the reason Denmark topped your table as the country with the lowest ratio of old registered voters to young.

ROBERT SATCHWELL
Haarby, Denmark

* Letters appear online only