Prosumer power

Microgrids that enable households to trade small quantities of locally-sourced power directly with each other using blockchain could disrupt traditional business models.

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Remember the days when you borrowed a cup of sugar from your neighbor? Now imagine if you could buy or sell small amounts of sugar to your neighbor whenever the need arises.

Such peer-to-peer micro-transactions may well be the future of energy trading.

The global push to cut carbon has helped distributed energy resources like solar and wind to grow rapidly, reducing dependence on large-scale, fossil fuel power generation.

The latest statistics from UN-backed renewables policy network REN21 show 98 GW of solar photovoltaic capacity was added globally in 2017.[1]

This was nearly double wind power's extra 52 GW and more than the combined net additions of coal, gas and nuclear.

The traditional power supplier-hub model is at risk of losing its prominence.

Environmentally conscious prosumers with smart meters, rooftop solar PV installations, backyard wind farms or battery storage placed within a smart-technology-driven microgrid are emerging as the newest market players.

Smart microgrids are scaled-down versions of a traditional power network, but differ in their objectives. The microgrid is able to operate autonomously – off-grid – or in parallel to the larger network it connects to, creating a community energy system.

Such transactive energy systems look to integrate locally-sourced renewables more effectively, increase efficiency and grid reliability, cut carbon emissions and encourage end-user participation with smart energy meters and apps.

The US National Institute of Standards and Technology defines transactive energy as "a system of economic and control mechanisms that allows the dynamic balance of supply and demand

> *"Transactive energy is a system of economic and control mechanisms that allows the dynamic balance of supply and demand across the entire electrical infrastructure using value as a key operational parameter."*
> *— US National Institute of Standards and Technology*

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In effect, prosumers and consumers get price signals that encourage them to balance their supply and demand more frequently, which can be a cost-effective way to use power more efficiently.

Disruptive potential

In principle, microgrids have the potential to disrupt utilities' traditional business model for supplying small end-users, which is often based on static pricing with infrequent billing.

They also change the environment for the existing distribution system operators, who manage the physical flows to the end-user.

Eurelectric, the European trade association for utilities and DSOs, published a downbeat assessment of blockchain's near-term value to the electricity sector in May 2018.[2] It argued that the currently available technology has high costs, slow transaction speeds and may be difficult to scale, among other things.

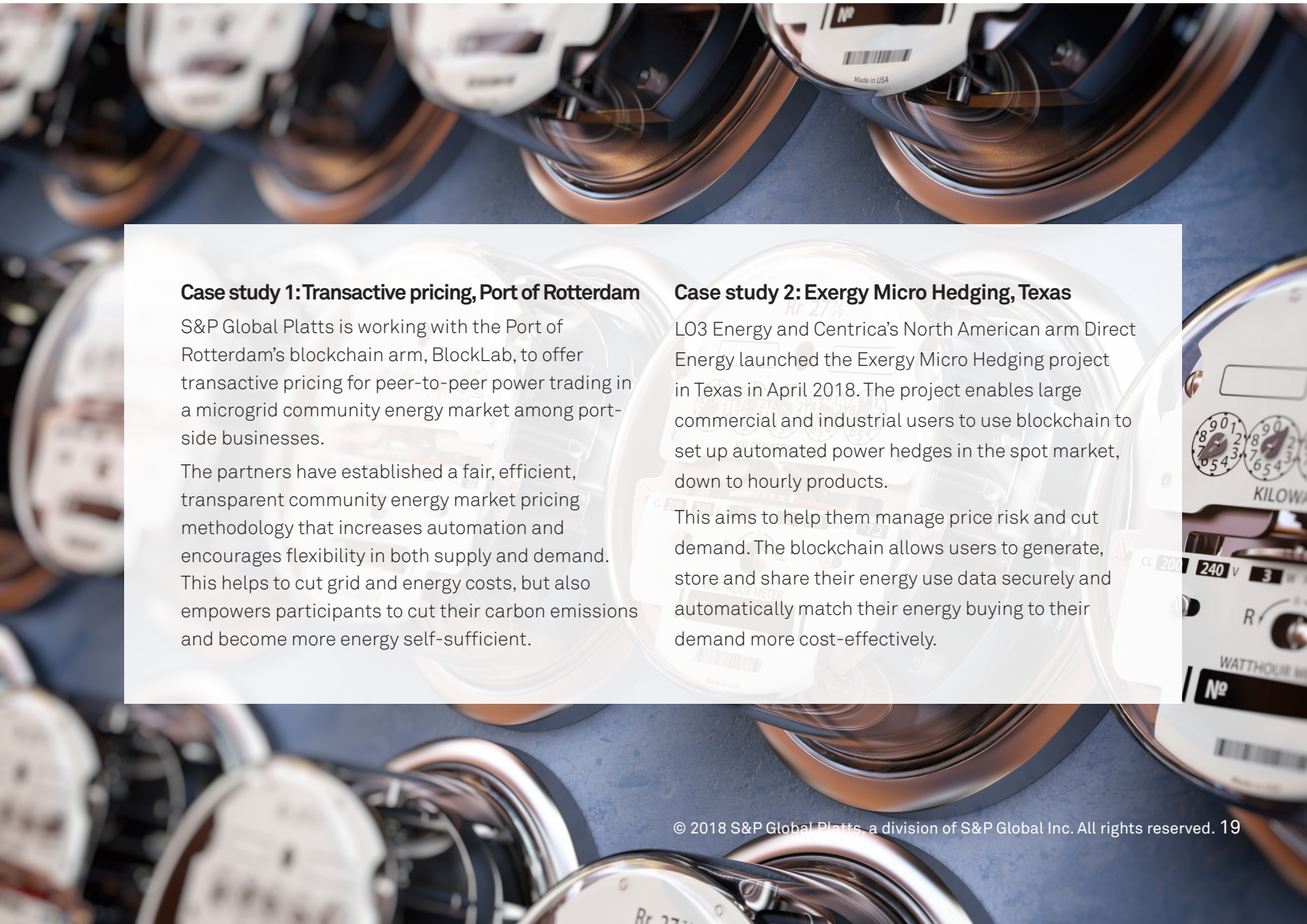
But the key constraint for microgrids is likely to be regulatory rather than technological.

The current rules in most jurisdictions were written with a centralized system involving large enterprises in mind. For many prosumers, the cost of complying with the standard licensing rules and obligations is likely to outweigh the profits of peer-to-peer micro-transactions, unless regulators can be persuaded to offer exemptions or change the rules.

For more information:

[1] http://www.ren21.net/gsr-2018/pages/summary/summary

[2] https://cdn.eurelectric.org/media/3115/paper1_blockchain_eurelectric-h-CB8D6920.pdf



Case study 1: Transactive pricing, Port of Rotterdam

S&P Global Platts is working with the Port of Rotterdam's blockchain arm, BlockLab, to offer transactive pricing for peer-to-peer power trading in a microgrid community energy market among port-side businesses.

The partners have established a fair, efficient, transparent community energy market pricing methodology that increases automation and encourages flexibility in both supply and demand. This helps to cut grid and energy costs, but also empowers participants to cut their carbon emissions and become more energy self-sufficient.

Case study 2: Exergy Micro Hedging, Texas

LO3 Energy and Centrica's North American arm Direct Energy launched the Exergy Micro Hedging project in Texas in April 2018. The project enables large commercial and industrial users to use blockchain to set up automated power hedges in the spot market, down to hourly products.

This aims to help them manage price risk and cut demand. The blockchain allows users to generate, store and share their energy use data securely and automatically match their energy buying to their demand more cost-effectively.

