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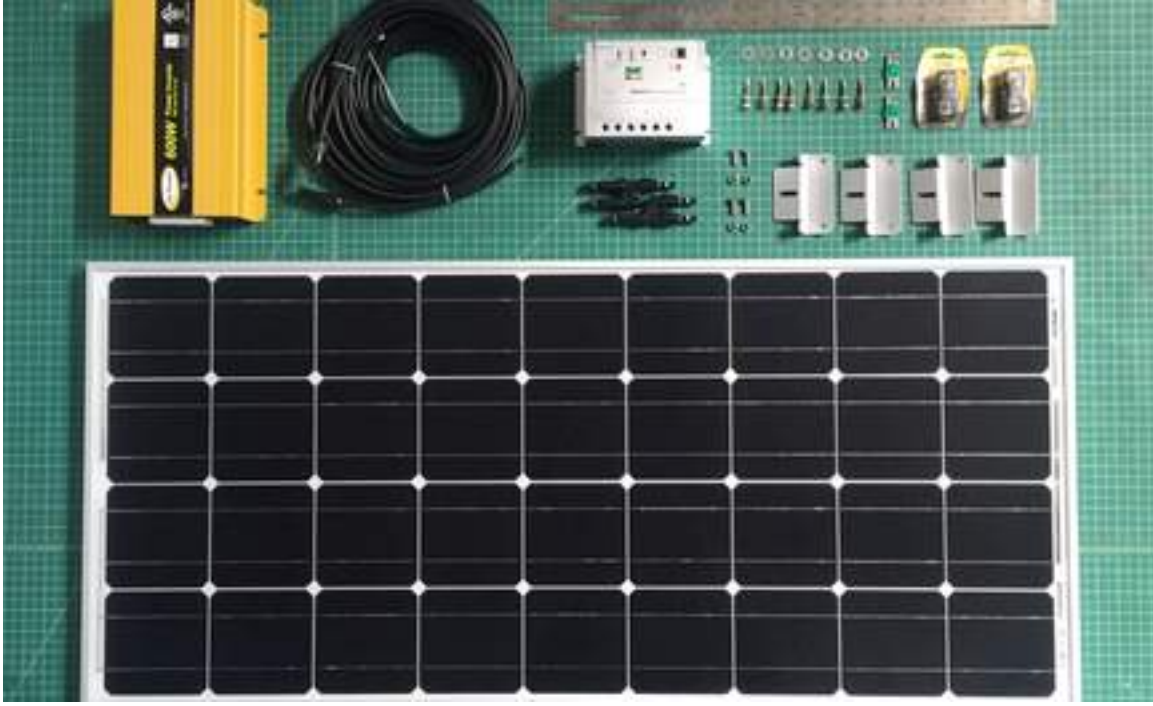
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How the blockchain will disrupt energy markets

[Heather Clancy](#)

Monday, October 3, 2016 - 2:15am



[Courtesy of](#) IDEO CoLab

What's possible with the blockchain? IDEO CoLab, Nasdaq and Internet of Things company Filament collaborated on a prototype system for automating the creation and verification of renewable energy credits.

Name a big software company involved in the cloud computing services movement, and it's a pretty safe bet that work includes experiments involving a technology called the [blockchain](#) — the transaction processing technology that underlies the Bitcoin digital currency.

Just last week, Google [disclosed its involvement](#) in experiments by Royal Bank of Scotland, mainly for handling the clearing and settlement of financial transactions. Microsoft is involved in a [similar project with Bank of America Merrill Lynch](#).

IBM also has been extremely vocal. On Sept. 28, the company published [self-funded research](#) suggesting that about 15 percent of all banks would dabble in blockchain technology by the end of 2017 and that roughly two-thirds will have formal services in place within three years.

"There are many advantages to being an early adopter of blockchain technology," said Likhit Wagle, global industry general manager for IBM Banking and Financial Markets, in a statement. "To start, first movers are setting business standards and creating new models that will be used by future adopters of blockchain technology. We're also finding out that these early adopters are better able to anticipate disruption, fighting off new competitors, along the way."

Distributed energy is really about generating your own energy, being self-reliant, selling excess energy to others.

While much of this early activity understandably is being driven by financial institutions, experts believe that blockchain technology absolutely will play a role in corporate sustainability strategies. For some, the blockchain is a means for [improving supply chain transparency](#). It's also likely to have a profound impact on corporate energy procurement, according to a panel of technical experts speaking last month at [VERGE 2016](#) in Santa Clara, California.

"Blockchain is not only useful in moving money, it's useful in moving any asset in a very transparent and reliable way," David Bartlett, chief technology officer for GE's digital power services business Current, told VERGE attendees.

Think of a blockchain as a gatekeeper, said another VERGE panelist, Reid Williams, design lead with IDEO CoLab, a research and development organization that is experimenting with applications using blockchain, artificial intelligence, virtual reality and the Internet of Things.

Technically speaking, it is a piece of cryptography that manages the handoff of an asset — one that is either digital or physical — from one person to another. It keeps a perpetual ledger of every time an asset changes hands and also ensures that duplicates aren't created along the way.

"The Bitcoin blockchain allows you to do something stupid simple," added Alex Zinder, director of global software development for Nasdaq, which has been working on blockchain applications for three years as part of its [Nasdaq Linq initiative](#). "You have participants on a network; each one of them has a unique address. Then you have this coin, this thing, that you're able to move from one address to another. That's really it. That's everything that it does."

Enabling 'frictionless' commerce

Put another way, the blockchain makes it far simpler and far more cost-effective to experiment with new systems of bartering services or "things" that aren't currently accommodated by existing transaction models.

"It helps you verify all the different touch points and points of origin along the way," Zinder said.

What's possible? As a potential catalyst for experiments, Nasdaq — along with IDEO CoLab and an Internet of Things device startup called Filament — have [hacked together an entirely new system](#) of automating the creation of [renewable energy certificates](#). It took them just four weeks to get their concept up and running.

At the center of their prototype are a solar panel and battery outfitted with Filament's sensors, which collect metrics about how much power is being generated and stored. The co-conspirators are studying how that data might be used to automate the creation of RECs, which could allow far more businesses to participate than is currently possible.

"Most smaller operations aren't participating, because there is so much involved with validating that you do, indeed, have a solar panel, and that it's producing energy," said Shilpi Kumar, who works on strategic partnerships and special projects for Filament.

Systems of this nature potentially might disrupt existing methods of obtaining and trading RECs, a process that today lies in the hands of regional market authorities.

"Suddenly, the cost per transaction is so low that you can start using it for things you would never have imagined as having a market," Williams said.

Make 'virtual power plants' possible

Blockchain technology also could play a central role in the rise of so-called "virtual power plants" (VPPs) that represent energy generating resources that are connected across a smart grid but that aren't necessarily concentrated in one central location, such as traditional power plants.

"Imagine living in a community where your neighbor is able to produce excess energy," said Current's Bartlett. "Rather than just buying a credit, you know you're buying that energy from your neighbor. You're getting the most efficient transfer of that energy."

In a [recent report about VPPs](#), Navigant Research suggests that VPPs could help optimize the use of existing power resources across the evolving electric grid, helping the industry move toward a more distributed model.

These VPPs would aggregate emerging generation sources — including solar panels or microgrids or energy storage installations — and correlate those resources with demand responses programs that enable businesses to receive rate cuts for reducing their power consumption.

Blockchain is not only useful in moving money, it's useful in moving any asset in a very transparent and reliable way.

Navigant figures that spending on the metering technologies, communications devices and software necessary to enable this sort of intelligence will be about \$182.6 million in 2016, growing to around \$2.1 billion by 2025. The research firm notes: "The primary goal of a VPP is to achieve the greatest possible profit for asset owners while maintaining the proper balance of the electricity grid — at the lowest possible economic and environmental cost."

That's in large part because this model removes centralized control of energy-generating assets, according to Bartlett. "Distributed energy is really about generating your own energy, being self-reliant, selling excess energy to others," he said during the VERGE panel discussion.

It seems increasingly likely that services by blockchain technologies could play a useful role in automating and securing the transactions that make this dream possible. Companies such as Nasdaq, IBM and Microsoft ultimately could play a role in facilitating the creation of applications for supporting these barter or peer-to-peer trading networks.

"It's hard to imagine a market like this today for multiple reasons, one of which is that the transactive platform would be too expensive to build for just a single purpose," said IDEO CoLab's Williams.

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