



Trending:



Fossil



Health and Safety



NE

EMBER 2017

ANALYSIS

chain: a natural partner for 21st century grids

is Lo

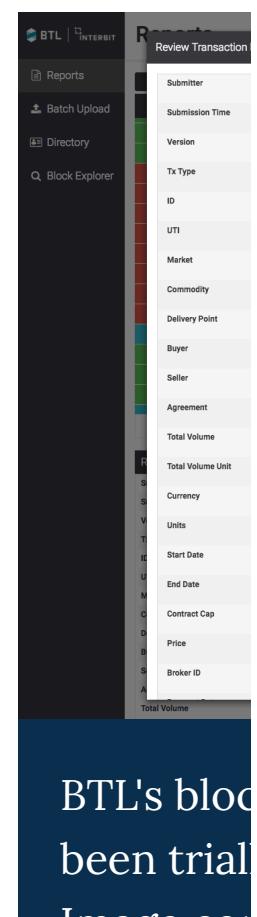


off 6,900

chain technology – a distributed ledger database that maintains continuous records in the form of time-stamped and modification-resistant blocks – is emerging as a key enabler of the current wave of energy

ation. From underpinning a small unity energy scheme in Brooklyn ilitating a trial of utility-scale y trading in Austria, how is chain supporting the roll-out of ed energy technologies?

```
79513 INFO Height 146000 of 36
89623 INFO Height 147000 of 36
19026 INFO Height 148000 of 36
19771 INFO Height 149000 of 36
84086 INFO Height 150000 of 36
90697 INFO Height 151000 of 36
12279 INFO Height 152000 of 36
47010 INFO Height 153000 of 36
30196 INFO Height 154000 of 36
73995 INFO Height 155000 of 36
82626 INFO Height 156000 of 36
74327 INFO Height 157000 of 36
INFO Height 158000 of 36
INFO Height 159000 of 36
INFO Height 160000 of 36
INFO Height 161000 of 36
```



'on' might not be a strong enough word for the changes that have been taking place in the global energy landscape. Over the decade or so, a surge of innovation in renewable generation, grid technology and community energy schemes has been driving a shift away from the utility-centric provision paradigm of old and towards a decentralised system that helps integrate energy sources, empower customers and consumers – from individual homeowners to industrial users – to feed power into the grid as well as draw from it.

Expectations around electricity supply and associated issues continue to change, power systems will have to change with them. New digital technologies have the potential to make this transition smoother. Take blockchain, for example, a distributed database system that is swiftly becoming a hot topic in energy circles, not to mention a

other industries.

Blockchain's energy potential

The blockchain concept was originally developed by a pseudonymous programmer (or programmers) using the pseudonym of Satoshi Nakamoto in 2008, and the concept was first implemented as part of the core technology underpinning the cryptocurrency Bitcoin. Essentially, a blockchain is a digital ledger that records and logs transactions (financial or otherwise), grouping them into chronologically-linked ‘blocks’.

That's enough premise, but it's the associated benefits that come with a blockchain that make it an attractive proposition. The database is distributed across a network of computers, leaving no single entry point that could be targeted by hackers. The system is also completely transparent, with users able to see transactions and changes to the blockchain, and once data is entered into a block on the chain, it is inherently resistant to any

ation as any change would require a brute-force attack on the whole chain.

But the blockchain concept has proven itself by showing stability and transparency for bitcoin – the value of which has now passed \$14bn – others are working out how blockchains could benefit their businesses. Clear advantages in the industry are already being found, with solar-isising cryptocurrency SolarCoin implementing a plan to log data and automatically make instant payouts to solar producers.

Consumers, power networks and utilities stand to benefit greatly from blockchain, if they can get their heads round its implementation and implications, as the start-up eco-system has sprung into life to seize the opportunity. But what blockchain-enabled innovations are being developed for the energy sector? The four case studies below illustrate the increasing scope and scale of the technology's potential for the grids of the near future.

Brooklyn microgrid: a community perspective

ain has immense potential at the local level as of tracking and verifying transactions as part nunity energy schemes. LO3 Energy's h microgrid has been an early advertisement xchain's facilitating role in local energy.

rogrid, currently installed in a small Brooklyn urhood, allows for peer-to-peer trading n local residents, so those with rooftop solar an sell excess power directly to their urs. The well-established, blockchain-based ted computing platform Ethereum is used to d log the contracts that are automatically ed between users, providing reliability and ency between the energy vendor, recipient one else on the network.

ain is a really good communications protocol : we want to do," LO3 Energy founder and Lawrence Orsini said at MIT Technology

Business of Blockchain conference in April. “It’s not just about settling energy bills,” he added, “but self-organising at the grid edge, which can’t be done with normal databases.”

Bronx microgrid might be small-scale, but the company has plans to expand its concept, and there’s no doubt that consumer appetite is high. At the same conference, Orsini quoted an Accenture survey which found that 69% of consumers are interested in an online trading marketplace, while 47% planned to participate in or invest in community solar schemes.

Small-scale energy trading could lead in Austria

It can be assumed that this process of distributed, decentralised energy systems facilitated by blockchain represents a threat to large utilities and traditional industry stakeholders. But it’s not necessarily the larger community projects that are starting to embrace blockchain tech; power companies – the

ogressive firms, at least – are keen to get
f this trend and assess how blockchain could
· them.

· largest utility, Wien Energie, is one example.
lary the company, which serves more than
ion customers, signed up to a trial run by
n blockchain specialist BTL testing blockchain
abler of large-scale, cross-border energy
The trial, which concluded recently, was
d to test BTL's Interbit platform as a tracker of
assets for gas trading. The trial involved Wien
as well as BP and Eni Trading & Shipping.

“demonstrated the reductions in risk and cost
that are achievable we now have an
nity to deliver the first successful blockchain-
application to the energy market,” said BTL co-
and CEO Guy Halford-Thompson after the
conclusion, also noting that the company is now
· to expand its roster of energy clients as it
owards launching a live, commercial version of
· gy trading over the next six months.

Electric vehicle charging and vehicle-to-grid

vehicle (EV) adoption is gradually picking up, one of the keys to load-balancing in an advanced grid will be to leverage the demand-response potential of these cars, each of which essentially contains a mobile battery unit, through emerging vehicle-to-grid technologies that allow available EVs to return electricity back into the grid during peak times.

Germany's energy company Innogy is working on its Car2Grid system, presenting its technology prototype at the Consumer Electronics Show in Las Vegas this year. Initial EV applications are likely to focus on simplifying charging for vehicle owners by using blockchain, which could be programmed to automatically charge users small amounts for topping up while on-the-go via inductive charging, forgoing the need to plug into a charge station.

The potential of vehicle-to-grid technology is still

off the ground, but there's little doubt that blockchain systems could facilitate these more complex load interactions at a range of scales, including microgrids, by simplifying the process and cutting transaction middle-men.

"The owner of the microgrid might be the owner of charging stations. There would be no bank involved and zero transaction costs," said Steve Davis, founder of California-based start-up Oxygen Initiative, which is teaming up with Innogy to bring blockchain-enabled EV charging to the US, in a March interview with Financial Knowledge. "The microgrid would be like a utility. They can give us their grid conditions and the EVs can respond accordingly."

Blockchain-powered utility charging

Meanwhile, another start-up is taking a different approach in its use of blockchain tech. Increased market competition means that today's

consumers have a wider array energy
rs to choose from, but the process of
ng can be inefficient, time-consuming and
ring enough to put off many of those who
otherwise jump ship.

ain energy firm Electron is in the process of
ing a UK-wide, blockchain-powered platform
ld reduce the time to switch from days to as
15 seconds. The company says the system,
currently being tested using dummy data,
handle 55 million supply points. Electron CEO
ner head of Npower Paul Massara told Utility
May that 22 independent suppliers have
ed interest.

not theory. We have a working model showing
could do it," Massara said. "What you really
quicker and more accurate switching, with
osts. Blockchain can do all that because it can
uppliers with meter points, so you don't have
reconciliation issues. And you can put in smart
ts, so you can start flagging things like if a
s on the priority register service."

that there are a multitude of applications for blockchain could be invaluable in the push for customer-centric and renewables-friendly decentralised grid systems. The technology could create clearer and more transparent relationships between customers and energy providers, reduce the risk of excess renewable power, eliminate manual load shedding and facilitate the building of fair community energy initiatives and microgrids.

any developing technology there are challenges to overcome, including regulatory issues, costs and potential resistance from key stakeholders. But if these stumbling blocks can be overcome, blockchain systems could make an ideal platform for 21st century energy systems.

MOST READ



1 Blockchain: a natural partner for 21st century power grids

2 Siemens to lay off 6,900 jobs worldwide

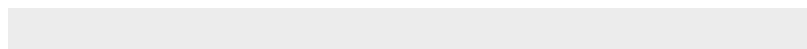
3 MHPS starts work on Cirebon coal-fired plant's 1GW expansion

4 Oracle Power

submits
proposal for
660MW plant
in Pakistan

5 BELECTRIC to
develop 120MW
solar farm in
Israel

RELATED COMPANIES



Ventx



BIS Both Industrial Services
BV



RITZ Instrument
Transformers



BOA Group



WHITE PAPER

werful Preservation with Munters



WHITE PAPER

ore than 60MW Extra For the Grid



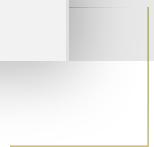
PRESS RELEASE

eeraner Dampfkesselbau Takes Part in Kraftwerkstechnisches
olloquium



WHITE PAPER

ntx: Industrial Silencer Solutions



About Us

Contact Us

Company A-Z

Privacy Policy

Terms and Conditions

© Copyright 2017 Kable, a trading division of Kable Intelligence Limited.