

In chains we trust

Karthik Suresh, director at Ameresco and UKAEE committee member, questions what blockchain really is and how might it impact the energy industry

Blockchains are hot. Search interest in the term has increased exponentially since 2015 alongside the growth of its cousin Bitcoin and the technology has been linked with applications that range from disintermediating the financial industry to ending world poverty.

The basic premise of blockchain is simple. Take a sentence, for example: “The UKAEE is running an evening of talks on energy trading using blockchain technology.” Running this sentence through a piece of software called a hash generator results in something that looks like this: 4f7359e55ff958237b7d4df8054aa24a.

This is called a hash, a fixed-length coded version of the sentence.

If we run a different sentence through the generator with the words “on Wednesday 24th January 2018 at 17:30”, we get a new hash that looks like this: db8d42b-378bebc86cdcaa6d476221b4f.

The two hashes are very different.

Now, if we took the hash of the first sentence and combined it with the text of the second sentence, like this: “4f7359e55ff958237b7d4df8054aa24a on Wednesday 24th January 2018 at 17:30”, we would end up with a new hash like this: 5194308176defdf344a4639717c0455d.

In addition, we have just created a blockchain.

The two sentences are linked by the inclusion of the hash of the first one as part of the second sentence. The resulting hash is unique and changing even a single character in the first sentence will result in a completely different hash. It is also very hard to break the hash and work out the original contents – made even harder by using advanced cryptographic algorithms.

This chain can be extended indefinitely and creates a secure set of connected records – perfect for an application such as a financial ledger.

Without going into too much detail,

WHEN TO USE BLOCKCHAIN

- 1  When there is a network
- 2  All parties agree
- 3  An audit trail is needed
- 4  Security is crucial
- 5  Agreements are final

this innovative way to connect information into a blockchain combined with the power of the internet to host and distribute multiple copies of it and a method to verify which blockchain is the right one through consensus – agreement between participants – has gotten many people very excited about the potential of blockchain based systems to change the world as we know it.

Energy industry application

This is particularly interesting to the energy industry. The traditional model, especially with power generation, is for energy to be generated in one location and used elsewhere. In between the producer and consumer sits an entire industry of intermediaries, including suppliers, network operators, data collectors and settlement companies that make sure that every kilowatt-hour (kWh) of generated power is processed, priced and paid for. Energy data sits at the heart this operation, with kWh flowing, being lost and being used across the network.

At one extreme, we could replace the system that holds this national energy data with a blockchain-based one. The main players, generators, network operators, distribution companies and consumers would add their transactions to the blockchain and settle their accounts with each other. At the other extreme, you might have a community or village that decides to go mainly off grid and supply energy to each other but again recording and settling their transactions on a blockchain based system.

Blockchain, so what?

So what, one might think? We can measure energy and settle transactions now. How does blockchain change that? And the point is it doesn't. We will still distribute and use energy and create energy technology in the same way we have been doing so far.

The difference is blockchain has the potential to make it easier, faster and more secure for participants in the system to record information, verify transactions and get paid, and so could unlock more and smaller sources of generation than previously. By creating an ecosystem of



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Anniversary event

Decentralised Energy Talks: Disrupt. Create. Innovate.
WeWork, Moorgate, London - 24 January 2018

January 2018 marks the UK Association of Energy Engineer's five-year anniversary. To celebrate, UKAEE invites you to an Energy Talks event on Wednesday 24 January 2018 at WeWork Moorgate, London from 5.30pm to 8.30pm.

New disruptive models of decentralised energy will be presented and will include talks given by key players on the legal, financial and infrastructural implications of decentralised energy. There will also be drinks and nibbles to toast the growth of this field and UKAEE. For more information please visit ukaee.org.uk

rewards and incentives, participants could also be incentivised to change their behaviour and reduce energy in return for tokens that can be redeemed for rewards.

One way to think about this is to compare it with how a membership scheme like Tesco Clubcard works. Tesco has effectively set up a parallel currency we earn by spending on its products that can be converted into spending in the real world at a market exchange rate. With blockchain, a network of neighbourhood shops can do the same thing and effectively compete with a global giant.

Or, coming back to our own industry, blockchain promises a transformation over control of data that is similar to the global shift from large centralised generators to distributed generation such as domestic PV.

Gaining market momentum

Blockchain is gaining market momentum, and scarcely a day seems to go by without another start-up announcing its blockchain technology and Initial Coin Offering (ICO). Those of us that may use this technology need to start by understanding how it works, the kinds of solutions that are out there and how we might be able to benefit.

As with any technology, there will be a number of market entrants, the number of options will increase exponentially, a few companies will gain disproportionate market share, there will be a shakeout in the industry and we will end up with a few firms that have sustainable business models – perhaps over a period of 10 years.

Right now, however, we should begin by considering how we could improve the way in which we trade and use energy by participating in a blockchain-based platform and whether we might have the ability to enter into a pilot to use blockchain to, quite literally, write our energy data. **te**

UKAEE is the UK chapter of the global energy management organisation, the Association of Energy Engineers (AEE), with its HQ in the USA.

UKAEE covers a range of expertise in the energy management and energy efficiency sectors. It delivers a range of technically focused seminars and offers excellent networking opportunities for energy and sustainability professionals.

It offers Continued Professional Development opportunities for AEE certifications such as Certified Energy Manager, Certified Measurement and Verification Professional and Certified Energy Auditor.

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