BLOCKCHAIN AND THE INTERNET OF THINGS
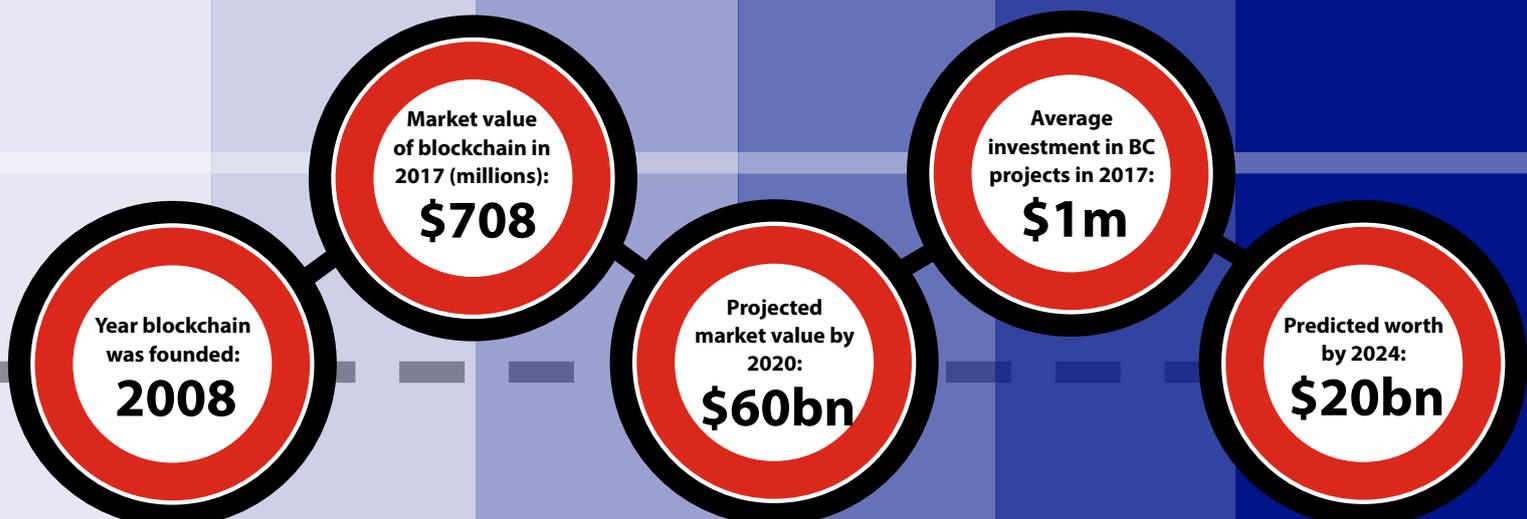
MONARCH PARTNERSHIP

Utilities simplified

Digitalisation of the energy industry

Energy management processes are becoming increasingly digitalised, from e-auctions and the introduction of blockchain in the industry, to new energy management software and smart meters. The involvement of artificial intelligence (AI) is something else which is becoming more prevalent in the energy world, along with discussions surrounding the Internet of Things and interconnection between smart devices. Advances in technology inevitably lead to cyberattacks, threats to data protection, and generally create another area of worry for consumers. However, if we can begin to tackle some of these issues, it's clear to see that the phenomenon of digitalisation and technological advancements in the energy industry is largely positive.

"The Internet of Things makes life convenient in ways we wouldn't have even imagined a few years ago"

Market value of blockchain in 2017 (millions):
$708

Average investment in BC projects in 2017:
$1m

Year blockchain was founded:
2008

Projected market value by 2020:
$60bn

Predicted worth by 2024:
$20bn

The Internet of Things

IOT AND SMART METERS

The Internet of Things (IoT) has become a key player in the world of energy lately, and has changed the way we use our energy data. IoT connects all kinds of devices, from smart meters and smart thermostats, to smart phones and smart watches. Something which makes the IoT particularly useful for utilities management is that it promotes smart devices learning from users' behaviour. An example of this is smart meters knowing at which points in the day a household uses the most hot water, and then instructing the boiler to heat the water at these times. Devices can also control a home's energy use based on the prices of electricity throughout the day, according to household budgets. Studies have shown that you can save at least 15% on your yearly energy bills through the use of smart meters and smart thermostats. The IoT allows devices to learn from our behaviour and adapt to our preferences, arguably making many aspects of life easier. However, there are concerns around how this data might be used should it fall into the wrong hands. One prime example is that it's obvious to see when in the daily routine a house might be empty, encouraging burglaries, or the data could suggest to hackers which houses have lone occupants, making them more vulnerable. Like all aspects of digitalisation in the energy world, this links back to cybersecurity and the need for solid data protection.

The IoT also promotes smarter communities and has been said to improve the distribution of power throughout a local area. Connecting sensors and other smart devices to the power grid means that restoring power after storms can happen more quickly, and has also reduced power cuts in communities by 50%.

Another example of how new technology benefits society is the introduction of "smart bins" in local authorities, which communicate to the waste management service when they are full. In some cases, these also lock shut once full, to prevent them from overflowing and stop a build-up of rubbish left on top of or around the bin. The IoT facilitates this communication, making the entire process much more efficient. Similarly, the IoT arranges which "smart streetlights" are turned on at which points in the day. They can automatically adjust brightness depending on how naturally light the location is, and types of activity occurring in the area. Studies have shown that smart LED streetlights have reduced energy usage by up to 70%, highlighting just how beneficial new technology can be for our sustainable goals.

ELECTRIC VEHICLES

A Europe-wide sustainability goal is to reach zero carbon emissions by 2050, and a large part of this centres around electric vehicles (EVs) and sustainable energy generation. Smart grids allow residents to partake in community solar power schemes, producing fewer emissions overall. The IoT and smart grids also help with the ongoing introduction of EV charging points across cities and towns. Integrating these points nationwide will be a large, steady operation, but proposals include the idea that the IoT will notify users when electricity is at its cheapest – adding a further incentive for users. It's clear to see that incorporating the IoT within our energy technology makes life convenient in ways we wouldn't have even imagined a few years ago. The main issue, however, is ensuring that the information is protected and utilised properly and by the right people.

Blockchain and E-auctions

An area of energy technology which has been making waves over the past couple of years is blockchain. Following extensive research, it seems that everybody is a bit vague on the definition of blockchain, exactly what it does, and how it can benefit the energy sector. Commonly described as a "public ledger", blockchain acts as digital evidence of past transactions, providing a secure, immutable record. It is the absolute, unchallengeable nature of blockchain that makes it so popular in the energy industry. This means that the figures cannot be skewed or edited, promoting transparency between all parties involved.

Blockchain is particularly useful when it comes to peer-to-peer grid networks, where users – either domestic or commercial – produce energy and supply it to other members of the community, away from a centralised source. Trading and buying energy between individuals and companies requires transparency and energy law compliance, which is something that can be tracked and proven if the users utilise blockchain. The entire process promotes decentralisation and the creation of "microgrids", where users become more self-sufficient and energy efficient with their own sources of generation. The chain records, stores, and tracks energy data such as market prices, protecting it from deliberate, malicious corruption, and also from accidental human error. This eliminates wasted time throughout the tracking process of energy prices and transactions between suppliers and buyers.

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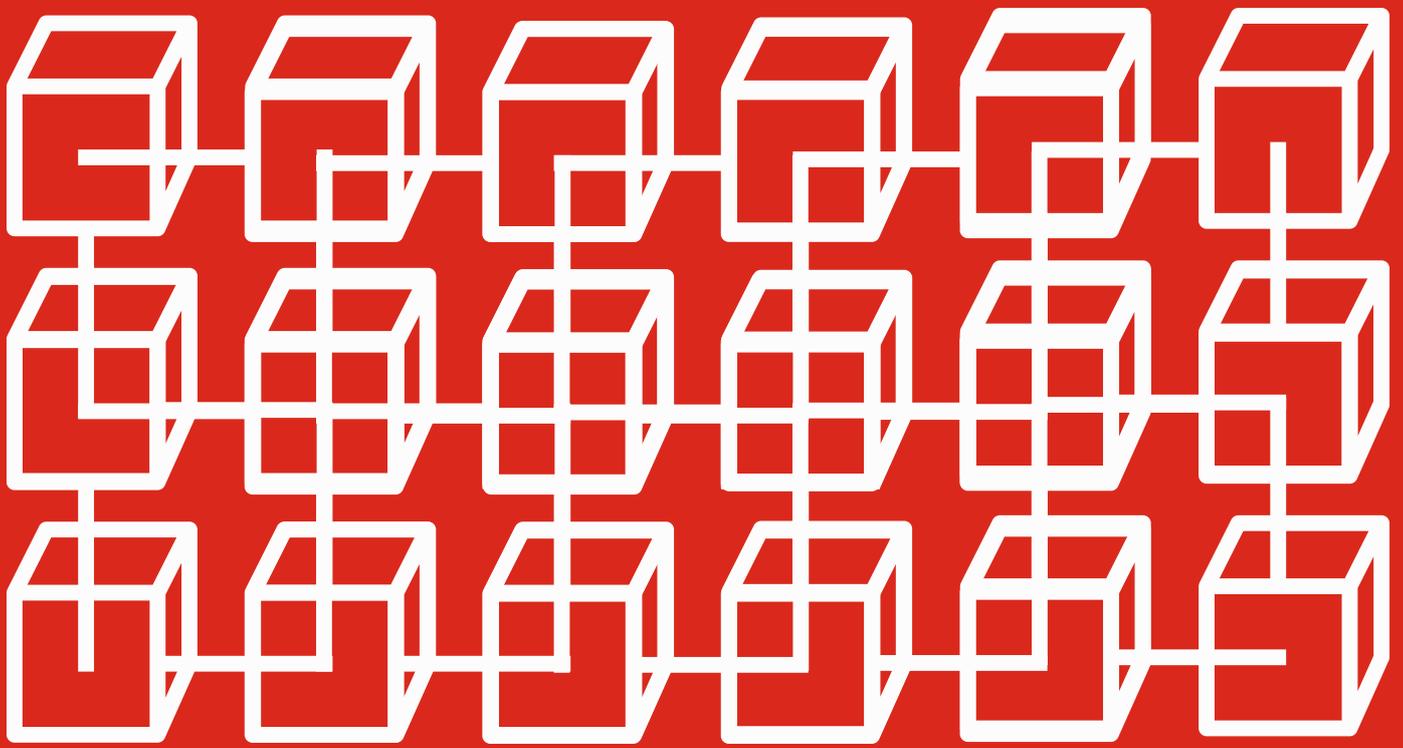
BLOCKCHAIN INNOVATIONS

An example of blockchain being utilised in the energy sector is We Power's renewable energy financing and trade service. The platform allows project developers to sell portions of their future energy generation, meaning that buyers purchase a set amount in advance. These processes are evidenced via blockchain, with details of the amount of energy generated and by whom, amount of energy bought and by whom, for what price, and then how much of this energy was either utilised or sold on to other users or the wholesale market. If it was sold, then the purchasing information will be shown again further down the chain. This creates a clear path to trace back the history and patterns of energy generation and its subsequent use. Using blockchain promotes transparency in the process for all parties involved and allows the right people to be held accountable.

Similar to We Power's methods of utilising blockchain for the transfer of energy, non-profit Repowering London and start-up company Verv conducted the UK's first physical blockchain energy trade earlier this year. Verv is the provider of an AI home energy assistant, providing users with real-time information about their devices around the home, and utilising the IoT to understand individuals' usage patterns and tailor the service accordingly. The partnership between Repowering London and Verv allows customers to trade their renewable energy and battery storage with neighbours, creating an extra source of income whilst also becoming more sustainable. As with We Power's use of blockchain, Repowering London and Verv use the public ledger to detail who purchases how much energy, helping to determine the amount of energy that individual homes demand. Clearly, sharing power among members of the community, facilitated by blockchain and technological advancements, is the way forward in the energy industry. The move away from central suppliers and wholesale energy is one which has been said to empower residents and generate more choice in the market.

The final tech innovation up for discussion in the energy world centres around e-auctions and how they are revolutionising the procurement and tendering process. Essentially, the roles of buyer and seller are reversed, with multiple energy suppliers bidding on an online platform against each other to win custom. Often, the buyer will lay out specific requirements tailored to their needs, and suppliers can alter their offers to meet these, meaning that quality of service and delivery are considered, rather than just the price. Suppliers can also view each other's bids and conditions online, so prices usually decrease with each offer made to the buyer. This innovation has simplified the process of renewing your energy contracts, allowing you to make quicker, more informed decisions when purchasing electricity, gas or water.
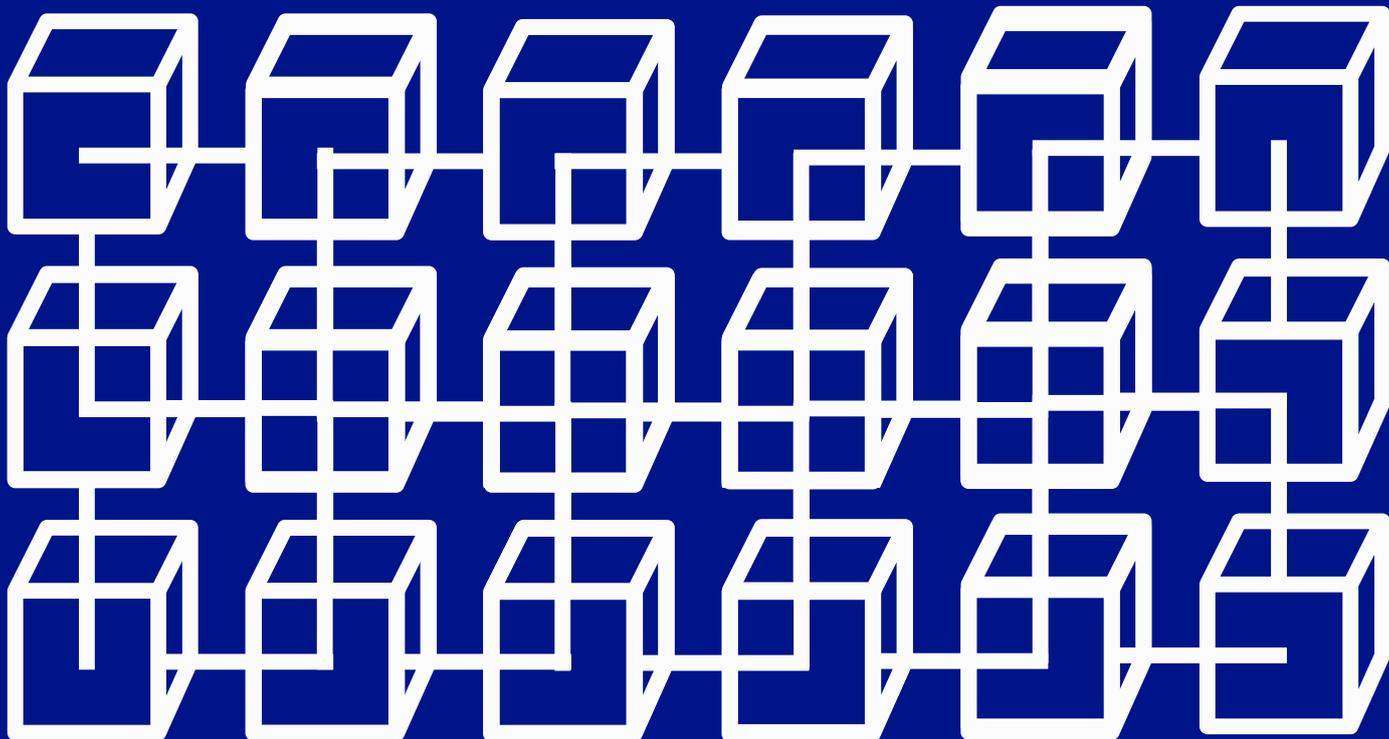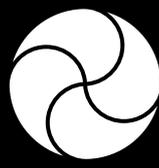
Ultimately, it's clear to see that digitalisation of the energy sector brings benefits on every level. It helps with energy efficiency, a reduction in emissions, overall tracking and organisation, and in seeking lower contract prices. It is, however, crucial to remember that cybersecurity remains a threat and precautions must be taken to protect data. While this is an issue affecting multiple industries, it is especially important to begin implementing new cyber-specific policies across the energy sector, given the particularly disastrous consequences of power being cut maliciously. It's hard to predict exactly which tech innovations will come to the forefront of the energy digitalisation discussion over the next few years. Ernst & Young sources believe that blockchain is still 5-10 years away from being used to its full potential, so the coming years are likely to see major advancements in public ledgers and transaction chains. Whatever forms of new technology come in the future, it's likely that they will help society on its journey to more sustainable energy use, and work to achieve higher overall efficiency.
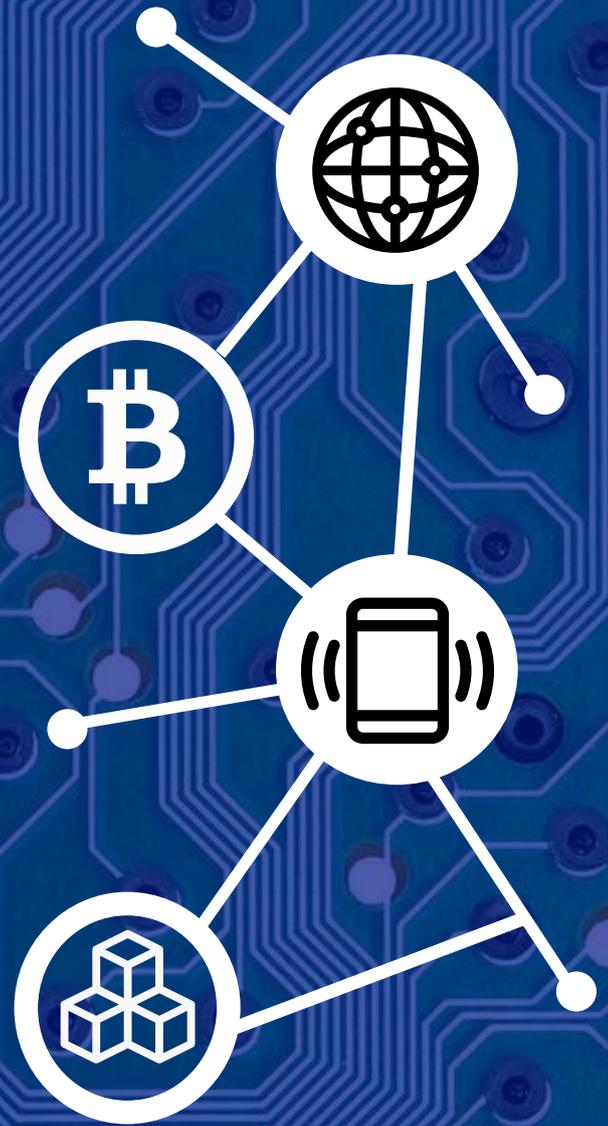
HOW WE CAN HELP

At Monarch, we understand the importance of efficient and intelligent energy management. We offer our clients a range of services to provide a holistic utility management solution: efficient cost management, smart asset management, intelligent procurement, and sustainability services. We also assist with waste efficiency, as well as void property management, tenant billing, and producing client utility reports.

We're embracing new technology all the time, from bidding at E-auctions to procure new contracts for our customers, to investing in electric vehicles. We know that blockchain is going to play a very big part in our clients' energy decision-making over the next decade, so rest assured that we are keeping pace with technological advancements and ensuring that are clients are prepared for the exciting times ahead.

We know that your ultimate aim is to reduce your bottom line, which can be achieved by reducing your consumption. Contact our sustainability manager at David.Carlyon@ monarchpartnership.co.uk to see how we can help you with this. For any of our other services, email savings@monarchpartnership.co.uk to start your intelligent utilities journey today.

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