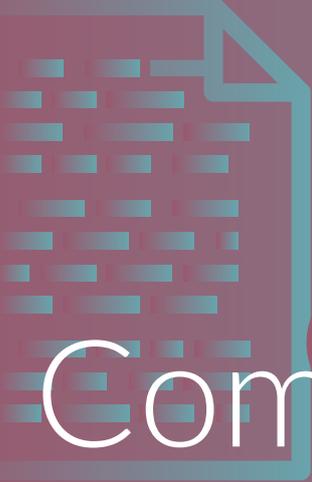


SOLARPLAZA



Comprehensive
Guide to
Companies
involved in
Blockchain
& **Energy**

**BLOCKCHAIN
BUSINESS**

5-6 FEB 2018 – AMSTERDAM

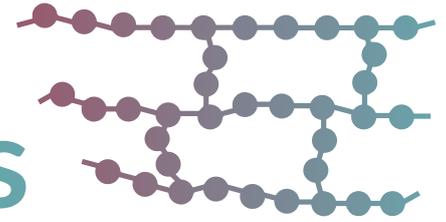


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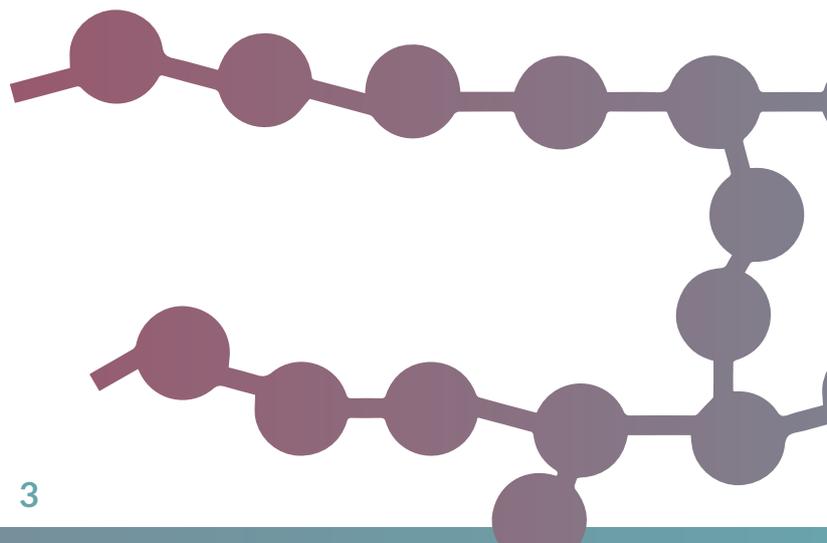
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Glossary/Acronyms



Blockchain	a blockchain is a continuously growing list of records called blocks, which are linked and secured using cryptography
Cryptocurrency	A cryptocurrency is a digital asset designed to work as a medium of exchange using cryptography to secure the transactions, to control the creation of additional units, and to verify the transfer of assets
Bitcoin	Bitcoin is a worldwide cryptocurrency and digital payment system called the first decentralized digital currency as the system works without a central repository or single administrator
Ethereum	a major open-source, public, blockchain-based distributed computing platform featuring smart contract functionality
Tendermint	a high-performance blockchain consensus engine that enables you to run Byzantine fault tolerant applications, written in any programming language, on many machines spread across the globe, with strong security guarantees
AI	artificial intelligence
API	application programming
BTC	bitcoin
DSO	distribution system operator
ETH	Ethereum token
EV	electric vehicle
ICO	initial coin offering
IoT	internet of things
LES	layered energy systems
p2p	peer-to-peer
REC	renewable energy certificates
TSO	transmission system operator



Introduction



On the 22nd of May, 2010 the first real-world transaction using bitcoins took place. Laszlo Hanyecz, a programmer from Jacksonville, Florida bought his 25 dollar pizza with 10.000 bitcoins. The value of that amount of coins today would be equivalent to 75.000.000 USD. Although this (pretty bad) investment in fast food may be a landmark in the history of Bitcoin, the landmark that might have left a far greater mark on society happened almost a year and a half earlier, when the Genesis Block was mined. This was the first record of blockchain, the technology on which Bitcoin is based, and promises to shake up several industries.

[This article](#) provides an introductory explanation of blockchain for those who are completely unfamiliar with the subject matter. The concept of blockchain basically comes down to it being a distributed ledger, which provides transparency, security and irreversibility - and therefore most of all trust - between two parties to transact without a third party involved. Although the technology was initially invented to create an online (crypto) currency to bypass banks, direct, transparent and trustworthy transactions soon showed their potential beyond just the financial sector. Adoption of the technology is exemplified through the rapid appearances of start-ups, pilot projects, alliances and so forth in sectors such as insurance, supply chain management, healthcare and the energy sector.

The ongoing energy transition is reforming the landscape of the sector. Generation of power is shifting from stable, centralized, but often polluting and unsustainable power sources towards clean, sustainable, but often decentralized and less constant power sources such as wind and solar energy. On top of the relative instability of the power supply comes the increasing peaks in power demand. Microgrids are popping up in emerging markets without grid connection to provide electricity access or to function as backup for the grid. Surpluses of green energy are traded through certificates in often untrusted, or at least non-transparent trading schemes.

Blockchain may not be the holy grail that will solve all problems of this energy transition, nor is it - at this point - a mature technology that can be implemented on a large scale. It is, however, a promising technology that might work as a catalyst of the energy transition. Therefore it is no surprise that blockchain-related start-ups and pilot projects are emerging rapidly, leading to an active but slightly opaque landscape of blockchain applications in the energy sector.

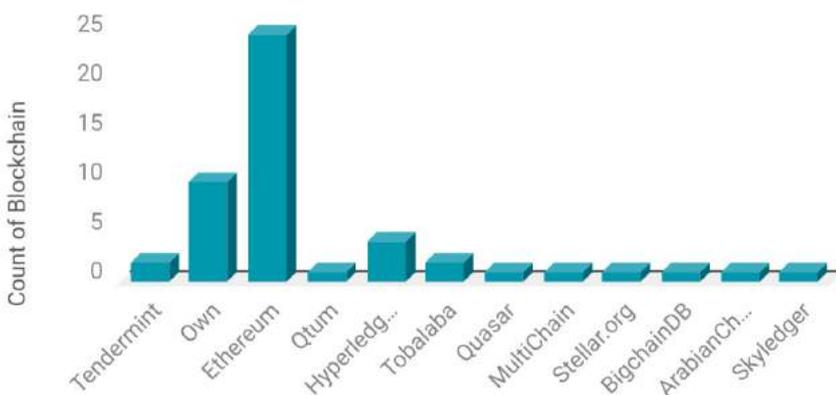
This guide aims to provide you with a comprehensive overview of players and initiatives currently active in the field, accompanied by a brief description of their activities and the latest news regarding their efforts.

We've analyzed over 65 companies and pilot projects working with blockchain and energy. The following are some of the key insights:

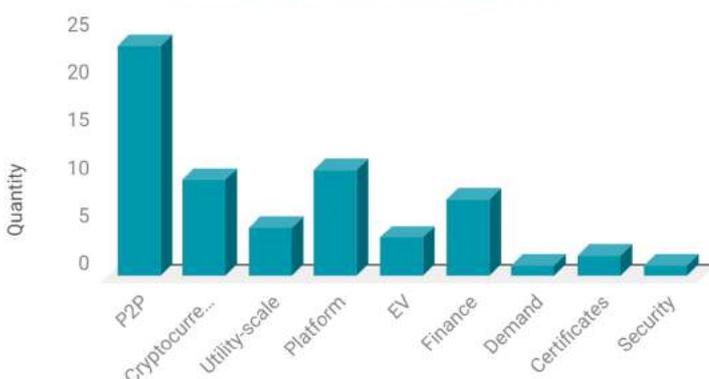
- 🔗 Most of the action (over 64%) is concentrated on the European continent. See figure.
- 🔗 The top 3 countries are the Netherlands, Germany and the US.
- 🔗 In terms of use cases, the most common one is P2P energy trading.
- 🔗 The Ethereum blockchain enjoys a significant lead over the rest of the blockchains. Around 50% of the projects use Ethereum.
- 🔗 Close to 74% of the companies were started/founded between 2016 and 2017, which reflects the early stage the technology is still in.
- 🔗 1 out of every 4 companies have conducted (or are planning) an ICO/ token sale.

This field is moving so fast, that trying to keep with it is reminiscent of the [Red Queen Hypothesis](#). Please let us know if we are missing any important entries; if there are any factual inconsistencies; or if you have any suggestions or comments.

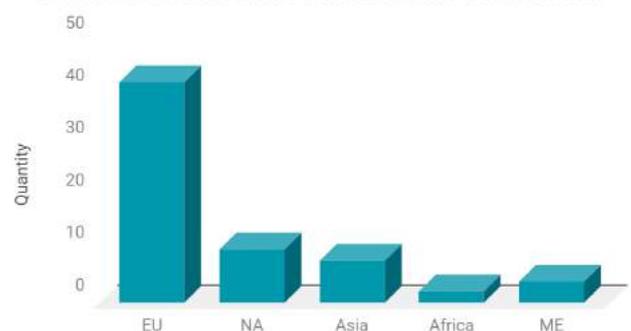
Count of Blockchain



Total amount of use cases



Continents with active blockchain businesses



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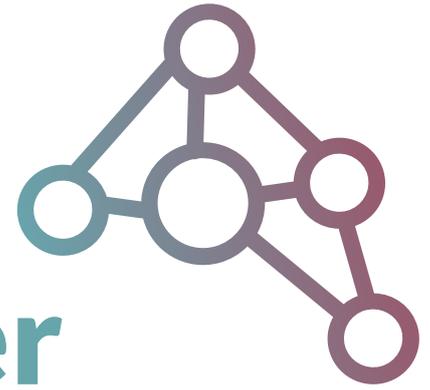
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1

Peer-to-Peer



Ponton *Represented at Event*
BLOCKCHAIN BUSINESS



Site	www.ponton.de
Country	Germany
Year Founded	2001
Blockchain	Tendermint

PONTON is the driving force behind the “Enerchain” project, a decentralized energy trading platform for the OTC wholesale energy market which is supported by more than 30 of the leading European Energy Trading companies. An initial trade over the blockchain was demonstrated in November 2016 at the EMART conference in Amsterdam. Almost one year later, also at the EMART, the world’s first real end-to-end live trades over the blockchain were made by E.on, Enel, Neas Energy and Wien Energie. Enerchain is going to support a wide range of commodities, with initial focus on power and gas products across a multitude of maturities. The vision of Enerchain is to “blockchainify” the entire deal-cycle and enable an ecosystem of

service providers to connect via an open API.

The possibilities with the Enerchain are endless: over-the-counter trading, balance group management, wholesale trading and much more. Due to its high success, 33 European companies now form part of the ecosystem.

In addition, PONTON is developing other blockchain based applications, one of them is “Gridchain” which improves communication in the grid management process between different stakeholders such as TSOs, DSOs, aggregators, suppliers and generators.



LO3 Energy



LO3 ENERGY

Site	www.lo3energy.com
Country	US
Year Founded	2016
Blockchain	Own

LO3 Energy, Inc. (“LO3 Energy”) is an energy technology company based in New York City that has developed the famous “[Brooklyn Microgrid](#)” (BMG) project in collaboration with Siemens. BMG makes use of a p2p energy platform used exclusively for the trading of energy within a community in Brooklyn. This allows prosumers with an excess of solar energy to directly sell to their neighbors and contribute to the local economy. BMG has plans to include additional features, such as demand response through device control and location-based pricing in the future. Additionally, creating a greater return on local energy creates clusters of devices that can become part of a physical microgrid, which can operate even if the main grid goes down. This was the first demonstration of p2p trading within a local community in the world.

The [BMG app](#) was just released for residents of Brooklyn. One of the first features is the BMG Map which allows users to pinpoint where solar panels are located or what could be possible sites for them.

BMG works on a private blockchain platform developed by LO3 Energy for the specific purpose of distributed grids and energy.

This includes the software and hardware. For example, the participants of the BMG must have a TransActive Grid-element (TAG-e), a hybrid meter/computer, to be able to measure their energy and share the information in the network.

LO3 is now setting its eyes on South Australia with a [collaboration](#) with Yates Electrical in which they will make 6 MW of distributed solar generation available with their system. LO3 has set up an office in Australia, which promises to be one of the key targets for distributed generation and p2p markets. Additionally, LO3 plans to announce new projects in Europe and the US in the near future. LO3, alongside Energie Südwest AG and Karlsruhe Institute of Technology, [announced the Landau Microgrid Project \(LAMP\)](#) where residents of Landau (Germany) will be able to trade energy through LO3’s blockchain platform. 20 households will be part of the pilot project. In addition, LO3 is working on another pilot with energy supplier AÜW in Kempten (Germany).

LO3 [secured funding](#) from Braemar Energy Ventures and Centrica Innovations on October 2017.



Power Ledger



Site	www.powerledger.io
Country	Australia
Year Founded	2016
Blockchain	Ethereum

Power Ledger is an Australian start-up which focuses on blockchain applications such as p2p energy trading. This allows for the exchange of surplus energy of residential and commercial units in the grid or acting alone as a microgrid. For example, their [first trial run](#) was with utility Vector from New Zealand in Dec 2016. On top of this, their application also allows for a multitude of other uses: asset management, carbon trading, EV charging and more.

Power Ledger recently conducted an ICO where they raised more than 17M AUD in its pre-sale and 17M AUD in the main-sale. Additionally, Power Ledger just announced a [partnership](#) with [Origin Energy, one of Australia's biggest energy retailers](#). Here, they will be testing Power Ledger's platform in a technical trial which will last three months starting in October 2017. Power Ledger is also working on another project in Tasmania with Nest Energy, where they are supporting the deployment of 1 MW of solar.

Power Ledger also has a partnership with Project Brainstorm to bring p2p trading to Queenslanders. In India, Power Ledger announced a [partnership](#) with Tech Mahindra in order to bring "microgrids-as-a-service" to the booming urban populations in India. This will result in several technological trials in different sites starting late 2017 for twelve months in Tech Mahindra's campuses. Results will be [announced](#) by Tech Mahindra at its Mission Innovation conference, around mid-December 2017.

Power Ledger won the Energy Innovation of the Year prize (2017) at the West Australia's Energy Awards. Additionally, Power Ledger has partnerships with Bancor and Coinimi to support the liquidity and trading of its token POWR.

In Europe, Power Ledger is [collaborating with the Liechtenstein Institute for Social Development](#) to host its blockchain platform to support microgrid developments in Europe.



Grid+

GRID+

Site	www.gridplus.io
Country	US
Year Founded	2017
Blockchain	Ethereum

Grid+ is part of ConsenSys, which uses blockchain technology to create (software) applications in many different fields. Grid+ uses the Ethereum blockchain and a hardware device (Agent) to have access to wholesale energy markets. This allows for a reduction in energy prices as consumers can access the wholesale price without markups. Grid+ raised around 29M USD in its token pre-

sale and more than 48.5M USD in the main sale. The target is to deploy its system in Texas on Q2 2018.

In October 2017, Grid+ and TEPCO have [announced](#) a partnership where both will work together in order to gain insights into their own business models.



Energo Labs



Site	www.energolabs.com
Country	China
Year Founded	2016
Blockchain	Qtum

Energo Labs is a Chinese start-up with the intent of creating a p2p platform for a distributed energy system using blockchain technology with a special focus on microgrids. They also work with p2p EV charging. They have developed a smart meter (EME 1.0) and an app that goes with it to facilitate their vision. The company is pursuing projects in China and the Philippines. In the Philippines, Energo Labs is [collaborating](#) with an energy company to enable p2p transactions between

buildings in a microgrid of a campus. They had their ICO in July 2017 and raised over 500 BTC and over 1 million Qtum tokens. Due to regulation in China, Energo Labs had to refund some of their tokens to the investors. Energo [is now reaching](#) into the Southeastern Asian market, expecting to release its token into the market by the end of October 2017. Energo Labs [is also looking to launch](#) projects in the Netherlands.



OneUp

oneup

Site	www.oneup.company
Country	Netherlands
Year Founded	2014
Blockchain	N/A

OneUp is a software company that builds products with a combination of data science, IoT (Internet of Things) and blockchain. OneUp won the startup award at Event Horizon 2017 for its product **POWR** which allows customers

and suppliers to communicate directly via the platform. They have formed a partnership with PwC to help companies succeed in this new environment.



Volt Markets



Site	www.voltmarkets.com/blockchain
Country	US
Year Founded	2016
Blockchain	Ethereum

VoltMarketsaimstoenablemonitoring,managing, originating and trading energy in a peer-to-peer market. Volt Markets uses blockchain to streamline the distribution, tracking and trading of energy. In addition, they also use blockchain

to track and issue RECs (Renewable Energy Certificates). Volt Markets uses the Ethereum blockchain due to the inherent possibilities of smart contracts.



Energy21 & Stedin



Site	www.energy21.nl
Country	Netherlands
Year Founded	2013
Blockchain	Quasar

Energy21 & Stedin developed the Layered Energy System (LES): a market model based on community markets in which the blockchain enables local trade as well as the exchange with wholesale markets. The layered market model distinguishes itself from the more common peer-to-peer models over blockchain by developing

an open peer-to-market system. This is done to incentivise energy and flexibility trading on both a local and (inter)national scale. The model leads to lower grid and balancing costs, accelerates the distributed energy transition and counters energy poverty.



ToBlockChain



Site	www.toblockchain.nl
Country	Netherlands
Year Founded	2009
Blockchain	N/A

ToBlockChain is a Dutch blockchain innovation firm. ToBlockChain is developing the software platform PowerToShare to accelerate the transition to a new energy world. Their mission is to make the future energy system profitable, achievable and accessible to the European prosumers and businesses. Today, the PowerToShare software platform includes five decentralized applications (one example being peer-to-peer energy sharing) running on top of a blockchain network and a multi-actor marketplace for sustainable products and services.

TU Delft, The Green Village and Blocklab, ToBlockChain is developing the PowerToShare software platform in the Rotterdam region. In addition, with DNV GL and Gasunie they are working on the PowerToShare community project in the Groningen region.

ToBlockChain won several prizes at the Dutch Blockchain Hackathon and ABN Amro Hyperledger Hackathon. Together with ENGIE,

Early prototypes of PowerToShare are built on Hyperledger and Ethereum blockchain and limited by transactions per second. Currently, the team is developing PowerToShare on faster distributed ledgers and blockchain technologies that offers thousands of transactions per second.



Conjoule



Site	www.conjoule.de/en/home
Country	Germany
Year Founded	2017
Blockchain	N/A

This Innogy spin-off provides a blockchain based platform to enable PV owners within the same region to interact with each other. Two pilot projects are running since October 2016 in Essen and Mülheim (Germany). In these pilots, prosumers can choose to supply either a school

or a water company, allowing them to invest their energy surpluses in either bright minds or fresh water.

Conjoule raised 4.5M EUR in Series A funding on July 10, 2017 with 3M EUR coming from the Japanese company TEPCO.



Greeneum Greeneum

Site	www.greeneum.net
Country	Israel
Year Founded	2016
Blockchain	Ethereum

Greeneum uses blockchain technology and AI (Artificial Intelligence) to build a platform for green energy producers and consumers. They use an ethereum-based blockchain to incentivize green energy through certificates and carbon credits and allow p2p trading of energy over their marketplace. It is being developed by the

team of SolarCoin. Greeneum is testing some pilots in Europe, Cyprus, Israel, Africa and the US. Greeneum will be conducting an ICO in October/November 2017 for its token GREEN. Greeneum expects its platform to be completed somewhere in mid-2018.



WePower



Site	www.wepower.network
Country	Gibraltar
Year Founded	2017
Blockchain	Ethereum

WePower runs a [platform](#) for p2p energy trading through blockchain. In addition to being a trading platform, it also finances renewable energy projects and estimates supply and demand through AI. An ICO will be conducted by February 2018. [More than 3M USD](#) was raised in the WePower pre-sale of its token WPR, with

a big investment from Prime Block Capital. The [first trial run](#) of its platform will be based in Spain with an energy producer of 1000 MW. WePower [signed a memorandum of understanding](#) with the Estonian TSO Elering. This will allow both parties to connect their platforms together in order to innovate on the Estonian energy grid.



PowerPeers



Site	www.powerpeers.nl
Country	Netherlands
Year Founded	2016
Blockchain	N/A

Launched by Vattenfall in June 2016, PowerPeers is a Dutch startup that has built a digital platform for p2p energy trading. This not only includes trading between residential homes but also with Dutch suppliers of wind, solar and hydropower.

Although PowerPeers does not use blockchain yet, they reckon the fit of the technology with their business model and are therefore exploring the possibilities of implementing it.



Verv by Green Running LTD



Site	www.greenrunning.com www.verv.energy
Country	UK
Year Founded	2015
Blockchain	Ethereum

Verv is a home energy assistant that uses AI to reduce carbon footprints, lower electricity costs and identify possible problems for consumers. In [October 2017](#), Verv announced a p2p trading solution (called Verv 2.0) based on blockchain which will support its home energy assistant

platform. This will allow customers to sell surplus power to neighbors who may not have it. This comes after Verv received a 250,000 pound grant from the UK government. [Verv raised 1.23M pounds](#) through the crowdfunding platform Crowdcube for a 4.72% stake in the business.



Energy Bazaar



Site	www.energybazaar.org
Country	Netherlands
Year Founded	2017
Blockchain	Ethereum

Energy Bazaar looks to empower rural communities in India by developing a blockchain-enabled platform that allows for decentralized energy exchange for consumers, prosumers, microgrids and distribution companies. The overall platform will be also supported by a game-theoretical market model for grid-balancing

incentives, AI for predictive analysis and incorporate social dynamics that might influence the use of the platform. A [proof of concept](#) has been developed between two households during the 2017 Blockchain for Social Impact Hackathon.



Dajie



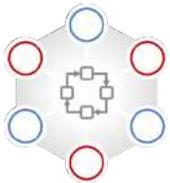
Dajie allows prosumers to trade their energy with their neighbours through the Dajie Box, which is a piece of IoT hardware that functions as a node of the blockchain. Each kWh traded over the

Site	www.dajie.eu
Country	UK
Year Founded	2017
Blockchain	N/A

blockchain is represented by 1 Energy Coin, which can be stored in a wallet, used to redeem carbon credits or transferred to other wallet holders in exchange for other products or services.



Oursolargrid



The German feed-in tariffs have dropped by 75% in the last seven years from 40 to 10 cent/kWh, while the price of solar energy has only dropped from 28 to 14 cent/kWh. Oursolargrid aims to restore the incentives to invest in solar

Site	www.oursolargrid.org
Country	Germany
Year Founded	2016
Blockchain	Ethereum

power by allowing producers and consumers to share or trade energy within the community. The decentralized, tamper-resistant and efficient characteristics of blockchain make this technology an ideal fit for this p2p sharing.



SunContract

SUNCONTRACT

Site	www.suncontract.org
Country	Slovenia
Year Founded	2016
Blockchain	Ethereum

SunContract is using blockchain to create a decentralized energy market where the users can trade electricity p2p. This is done by joining power producers and consumers through their own mobile app. The token sale (ICO) amassed

more than 2M USD and 8700 ETH with a total of 2.274 contributors. The SunContract is working with several EU associations such as SolarPower Europe.



Pylon Network

P  **LON**

Site	www.pylon-network.org
Country	Spain
Year Founded	2017
Blockchain	Own

Pylon Network is a platform where users can trade energy p2p and get rewarded for the production of sustainable energy. Pylon Network uses the smart meter Metron, which is integrated into the blockchain in order to validate all the transactions. Pylon Network will soon start its

first pilot for around 800 customers in Spain. Pylon Network is currently doing an ICO which will last until the end of November 2017. Pylon Network has partnered up with GreenHydrogen from Denmark and with Faircoop and Faircon.



toomuch.energy

Site	N/A
Country	Belgium
Year Founded	2017
Blockchain	N/A

toomuch.energy is a p2p trading platform for corporate customers which can sell their surplus electricity to other companies instead of feeding it to the grid. The [first projects are planned](#) for Belgium and Austria.



Divvi



Site	www.divvi.xyz
Country	Australia
Year Founded	2017
Blockchain	Ethereum

Divvi aims to enable more equitable access to renewable energy through a decentralized, community focused energy trading platform. This platform will not only enable new ownership models for community energy projects, but also incentivize green energy production and use.



OmegaGrid



Site	www.omegagrid.com
Country	US
Year Founded	2017
Blockchain	N/A

OmegaGrid is a p2p energy platform specifically made for utilities. This platform can be used to manage the new dynamics of the grid: balancing and market settlement. OmegaGrid is being supported by the [Ameren accelerator](#).

Solar Bankers



Site	www.solarbankers.com
Country	Singapore
Year Founded	2011
Blockchain	Skyledger

Solar Bankers is a decentralized energy system that allows its users to generate and trade solar energy in a p2p manner. Solar Bankers is releasing its SunCoin token with an ICO scheduled for

November 2017. Solar Bankers is working with ShellPay, a Chinese blockchain company, to promote and develop the decentralization of its system.



BP/Shell/Statoil



Site	N/A
Country	UK
Year Founded	2017
Blockchain	N/A

A consortium of companies (BP, Shell, Statoil, Gunvor, Koch Supply & Trading, Mercuria, ABN Amro, ING and Societe Generale) will develop a blockchain-based platform to trade energy commodities. The platform would aim to reduce

risks and costs of physical energy trading as well as improve back-end trading operations. The platform is expected to be online by the end of 2018.



2 Utility-Scale



Site	www.electron.org.uk
Country	UK
Year Founded	2015
Blockchain	Ethereum/ IPFS

Electron is a start-up based in London which aims to use blockchain technology to transform the UK's energy infrastructure. Their approach is top-down (e.g. they work in collaboration with key stakeholders). They have developed several platforms, which include: meter registration platform, flexibility trading program and smart meter data privacy.

In collaboration with French energy company EDF, Electron is working on a

community electricity trading project within a neighborhood in London. Electron received funding from the UK government in Sep 2017 to scale and integrate their flexibility trading platform. They are supported by the National Grid and Siemens. In addition, Electron's platform was awarded the 2017 tech pioneer status by the World Economic Forum and recently they won the Initiate! Startup Award at the European Utility Week 2017.



Drift



Site	www.joindrift.com
Country	US
Year Founded	2011
Blockchain	Ethereum

Drift is a power utility company based in Seattle which uses a combination of blockchain, machine learning, artificial intelligence, high-frequency trading and other tools to provide their customers with cheaper wholesale energy prices while predicting their energy consumption. By

taking out the middleman, Drift is able to pass the savings to its customers, between 10% and 20%. Drift is currently in operation in New York with plans to expand to other markets. Drift has raised over 12M USD after the Series A round.



TenneT/IBM/ Vandebrom/Sonnen



Site	www.tennet.eu
Country	Netherlands
Year Founded	Pilotproject in 2017
Blockchain	Hyperledger

TenneT and IBM have joined forces for two blockchain pilots. In their role of TSO, TenneT is responsible for maintaining the balance of the high-voltage grid. In the two pilots they explore the use cases of blockchain in guaranteeing a continuous supply of electricity by balancing supply and demand. In a pilot in the Netherlands, in which they partner with energy utility Vandebrom, they use car batteries to maintain a stable 50Hz frequency, which is normally done by power plants. In Germany, Sonnen has joined a pilot in which decentralized battery storage

systems are used for congestion management, eliminating the expensive need to cut down the supply of wind turbines in case of supply surpluses. The digital process of verifying and documenting the performance values of these distributed flexible energy devices is delivered using IBM Blockchain, built with Hyperledger Fabric, a blockchain framework implementation and one of the Hyperledger projects hosted by The Linux Foundation. The pilot is expected to run until the middle of 2018.



Fortum

Site	www.fortum.com
Country	Finland
Year Founded	2016
Blockchain	N/A

In collaboration with 3 research partners and 9 different companies, Fortum is part of the BOND project which aims to use blockchain to boost the Finnish industry. Fortum offers a blockchain solution where customers can optimize their heating consumption by taking forecasts and

electricity prices into account. The objective of this is to reduce the electricity bills. Fortum is working with two experiments using blockchain for EV charging and p2p energy trading.



CGI & Eneco

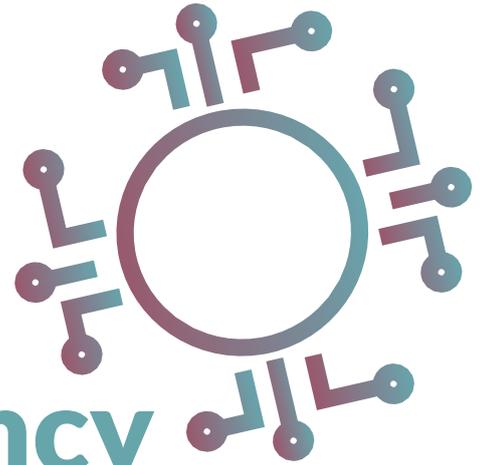
Site	www.eneco.nl
Country	Netherlands
Year Founded	2017
Blockchain	Tendermint

CGI and Eneco joined forces to build a prototype to demonstrate the technological feasibility of using blockchain for the administration of decentral trading in heat. The pilot is running in

the heat network that connects the AVR with the Warmtebedrijf Rotterdam, the network that transports the heat of the Port of Rotterdam towards the city of Rotterdam.



3 Cryptocurrency



Spectral Energy



Site	www.spectral.energy
Country	Netherlands
Year Founded	2017
Blockchain	MultiChain

Together with network company Alliander, Spectral recently launched (Oct 2017) its own coin, the Jouliette. With this coin, tenants of the Ceudel, an innovative hub in Amsterdam, can share their energy using a blockchain technology to settle the transactions and provide transparency and security. Further applications of the Jouliette, such as trading it for goods in the

local café or using it in a car-sharing program, will be explored in the near future. The goal of the pilot is to investigate whether blockchain technology can be harnessed to create greater social value and to support a bottom-up movement in our transition towards a 100% renewable energy supply.



ElectriCChain/ SolarChange/ SolarCoin ElectriCChain

ElectriCChain posts live data on solar energy in one openly accessible blockchain for academic use. The goal of ElectriCChain is to build a network of more than 7 million solar installations worldwide. Furthermore ElectriCChain functions as a claim-facilitating blockchain for the SolarCoin foundation. This foundation rewards every generated MWh of solar power with 1 solarcoin (SLR), which is the equivalent, at the time of this

writing, to 0.5USD.

A pilot (SolCrypto Datalogger) was run on June 1st, 2016 which demonstrated how solar inverters can communicate and store values directly on the blockchain. Other projects include: claim solarcoins from orbiting solar panels, connecting ElectriCChain to LEED facilities, connecting a data logger to IOTA and more.

Site	www.electricchain.org
Country	Andorra
Year Founded	2016
Blockchain	Multichain efforts: Solarcoin, Ethereum, IOTA



NRG Coin



NRG COIN

NRGcoin is a mechanism and a smart contract that rewards production of renewable energy and makes its local consumption cheaper. Prosumers mint NRGcoins by supplying renewable energy to the grid. Consumers pay 1 NRGcoin for every 1kWh of locally produced renewable energy

they use. NRGcoins are traded on a currency market for other coins or cash. The project is being developed by Enervalis in collaboration with Vrije Universiteit Brussel. The plan is to pilot the NRGcoin concept in real homes in the Netherlands by Q2 of 2018.

Site	www.nrgcoin.org
Country	Belgium
Year Founded	2015
Blockchain	Ethereum



Veridium

VERIDIUM

Site	www.veridium.io
Country	Hong Kong
Year Founded	2017
Blockchain	Ethereum

Veridium provides a network for natural capital and EcoSmart-commodities based on the Ethereum blockchain. The first Natural Capital asset is the TGR, a token backed by Triple Gold REDD+ credits, which delivers compound environmental and social returns. They represent forest & biodiversity conservation, carbon emissions savings & reductions and positive social impact for forest-dependent indigenous communities. These credits are

backed by Infinite Earth which has assets in the Rimba Raya Biodiversity Reserve in Indonesia. Veridium is collaborating with ConsenSys, EnVision Corporation and Brian Kelly Capital Management.

Veridium [hopes to raise 150M USD](#) by selling two tokens (TGR and VERIDIUM) in October 2017. These funds will then be used to further develop the platform.



ImpactPPA



Site	www.impactppa.com
Country	US
Year Founded	2017
Blockchain	Ethereum

ImpactPPA aims to create a new energy-based cryptocurrency for power purchasing in emerging markets. With the money raised by selling the MPAQ token, ImpactPPA intends to install renewable energy solutions in communities around the globe that lack access to electricity.

In addition, ImpactPPA uses another token, NRG, [to track renewable generation data and transactions](#). The MPAQ token is on pre-sale as of October 2017. ImpactPPA has [over 200 MW](#) in the project pipeline scheduled for Q2 2018.



Energi Token/ Energi Mine



Where most tokens are used to incentivize the generation of renewable energy, Energi token aims to incentivize energy-efficient behaviour. They hope to achieve behavioural change by rewarding tokens for energy saving behaviour, for example using public transport. These tokens represent cash value, but could also be used to pay the energy bill or charge their EV. Eventually

these tokens can also be used for p2p energy trading.

Energi Mine appointed an AI robot, Sasha, to the management board. Sasha will be able make decisions on trading and use machine learning to learn from sales figures and performance statistics.

Site	www.energitoken.com
Country	UK
Year Founded	2017
Blockchain	Ethereum



EcoCoin

ECO COIN

The ECO coin is a currency which aims to represent more than economic value by rewarding activities with a positive ecological footprint with ECO coins. The specific activities are decided by a community. The ECO coin will eventually be set up in blockchain to allow for more transparency, democracy and a global reach.

Site	www.ecocoin.com
Country	Netherlands
Year Founded	2016
Blockchain	Hyperledger



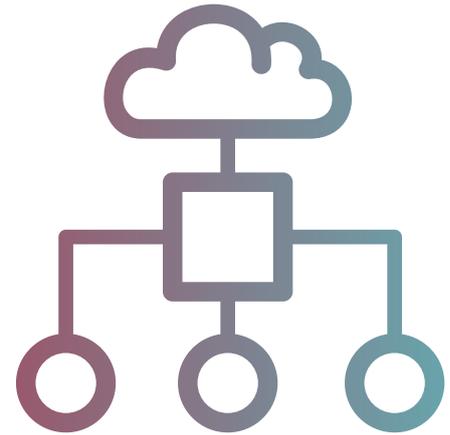
Farad

FARAD

Farad is introducing a token which is linked to the actual production of ultra-capacitors as energy storage. A token swap is programmed for Q4 2017.

Site	www.farad.energy
Country	UAE
Year Founded	2017
Blockchain	Ethereum

4 Platform



Energy Web Foundation



Site	www.energyweb.org
Country	Switzerland
Year Founded	2017
Blockchain	Ethereum modification

The Energy Web Foundation aims to develop a common open source network based on blockchain which can be used by a variety of energy stakeholders. This will allow for development consistency and business use cases which can be built on this network. It was co-created by Rocky Mountain Institute and Grid Singularity. More than 10 energy companies, which include Shell and TEPCO, have joined as affiliates. It secured 2.5M USD in an initial funding round.

During the European Utility Week (Oct 2017), the Energy Web Foundation launched a test network codenamed Tobalaba. Currently in preliminary testing phase, the network is aiming to scale on a commercial level by mid-2019.

The test network, Tobalaba, was released on Nov 1st and is now open to the public. The main features offered by the test network are authority whitelisting, simple deployment scripts and “secret contracts”.



Grid Singularity



Site	www.gridsingularity.com
Country	Austria
Year Founded	2016
Blockchain	Own

Grid singularity works on the creation of a permissioned decentralized energy data exchange platform, built on blockchain. The blockchain will be hosted by the Energy Web Foundation. It allows different actors to design and use a variety of applications, such as grid balancing, investment facilities, certificate trading and energy trading

and validation. Grid Singularity develops these applications, including a grid management agent.

Grid Singularity, along with FH Salzburg, [is providing the software](#) for two energy trading pilot projects in Austria. They will start Q1 2018 and will be evaluated by the end of 2018.



Slock.it

slock.it

Site	www.slock.it
Country	Germany
Year Founded	2015
Blockchain	Ethereum

Slock.it aims to revolutionize the Sharing Economy by making it possible to rent, sell or share any smart object through the blockchain. The German startup is developing the Universal Sharing Network, an open source infrastructure where manufacturers and end users can monetize their unused assets including apartments, white

goods, industrial machinery, sports equipment, etc. Their technology is already used in the wild by Innogy Innovation Lab, for whom Slock.it has developed [Share&Charge](#), a blockchain application allowing EV drivers to share their charging stations and benefit from the transactions.



Energy Blockchain Labs



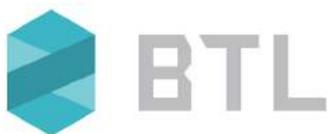
Energy Blockchain Labs works at the intersection of energy and fintech. They are developing a blockchain platform to provide a range of apps for the energy industry. During November

2016, they completed and showcased a carbon chain application at the Wuzhen Global Internet Conference in collaboration with IBM.

Site	www.energy-blockchain.com
Country	China
Year Founded	2016
Blockchain	Hyperledger



BTL Group



BTL has developed a multi blockchain platform (Interbit) targeting enterprises. BTL has run a successful energy trading pilot with BP, Eni and Wien Energie in conjunction with EY exploring how their Interbit platform can streamline the energy trading lifecycle. The pilot was successful in all 8 test scenarios. They are looking to

broaden the scope of the pilot and progress to the next phase. BTL now has interest from a larger consortium for the next phase of the trading project. BTL has filed patent applications for its Interbit platform. BTL is a publicly traded company on the Toronto Stock Exchange (TSXV:BTL).

Site	www.btl.co
Country	Canada & UK
Year Founded	2015
Blockchain	Own (Interbit)



DAISEE



Site	www.daisee.org
Country	France
Year Founded	2016
Blockchain	Ethereum

Daisee aims to design and deploy open-sourced, secured, distributed autonomous energy infrastructure systems, from supply and demand monitoring to distributed physical and data infrastructure. This infrastructure, the “Internets

of Energy”, lets prosumers decide how they share their energy, making conditions favorable for both energy appropriation and p2p energy management.



EnLedger



Site	www.enledger.io
Country	US
Year Founded	2016
Blockchain	Own

Besides their consulting and developing activities, EnLedger is working on their own blockchain-based platform, EnergyChain. EnergyChain functionalities include registration of ownership of grid-attached devices, tracking and notarization of energy meter data, automated

power exchange, registration of green devices and share tracking and dividend payments to owners of grid-attached devices. The Energy Efficiency Coin, EECoin, will function as the currency on the platform.



Prosume



Site	www.prosume.io
Country	Switzerland
Year Founded	2016
Blockchain	Own

Prosume is a blockchain-based platform with a multitude of applications: p2p trading, EV management, crypto-equity for projects, smart metering and more. An ICO is programmed for Q4 2017.



DAO IPCI



Site	www.ipci.io
Country	Russia
Year Founded	2016
Blockchain	Own

DAO IPCI develops a blockchain-based open source platform to support environmental initiatives where users can manage different environmental assets and liabilities. In this platform, all relevant stakeholders would have access to the common ledger. A proof of concept was developed during the World Bank's Innovate4Climate. The [first carbon credit transaction](#) occurred in March 2017 between the

Russian Carbon Fund and the Aera Group. DAO IPCI [is collaborating with Choose](#), a Norwegian company, in order to apply the technology to the carbon market. The Mitigation Token (MITO) will be released with an ICO in November 2017. In October 2017, [200,000 tonnes of carbon credits were offered](#) through the platform by Russian factory Hinprom.



Alastria



Alastria is a consortium blockchain platform, supported by some of the largest Spanish companies in finance, energy and telecommunications, that will be developed

specifically for Spain's legal and regulatory framework. This will be done in collaboration with the government and universities.

Site	www.alastria.io
Country	Spain
Year Founded	2017
Blockchain	Own



StromDAO

StromDAO

Transparenz. Integration. Partizipation.

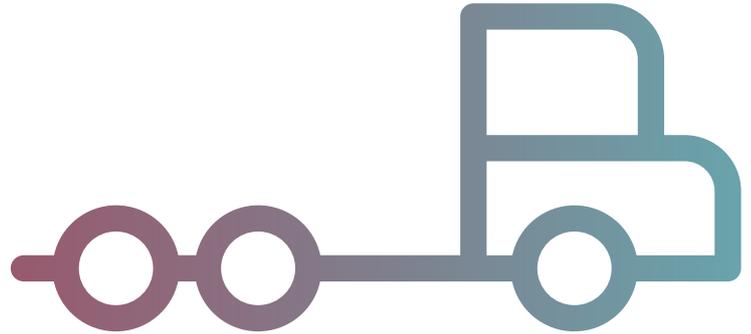
STROMDAO develops and operates a consensus system for decentralised energy markets. Their energy blockchain network is open to be utilised by various market participants (TSOs, DSOs, retailers, etc) to build and run their applications. It

also provides application developers with a broad set of open source tools and libraries designed to help facilitate straightforward integrations with existing IT systems.

Site	www.stromdao.de
Country	Germany
Year Founded	2017
Blockchain	Fury Network



5 EV



Oxygen Initiative



Site	www.oxygeninitiative.com
Country	US
Year Founded	2014
Blockchain	Ethereum

Oxygen Initiative focuses on charging infrastructure for EVs. They have a network of charging stations across the US. After the success of Share&Charge in Germany (from Slock.it

and Innogy), Oxygen Initiative has [brought the program](#), in collaboration with Innogy, to the US to test it against the American market.



Share&Charge



Site	www.shareandcharge.com
Country	Germany
Year Founded	2016
Blockchain	Ethereum

Share & Charge allows people to share their charging stations, parking spots and eventually their EVs. The payment system is based on blockchain. Together with US EV charging station company [eMotorWerks](#), Share&Charge is [rolling](#) out a trial (starting August 2017) in California to test its system abroad. Through the [Oslo2Rome](#)

project starting in October 2017, 10 e-drivers will drive across the European continent to test the future of e-mobility. Just in Germany alone, Share&Charge already has 1224 charging stations.

Parent company: [MotionWerk](#)

Car eWallet



Site	www.car-ewallet.zf.com
Country	Germany
Year Founded	2017
Blockchain	Hyperledger

Car eWallet will make your car function as an autonomous financial entity. It will pay for parking, charging, toll, without the need to manage multiple accounts. It can allow access to the vehicles, enabling car sharing and rental

without a physical key. Furthermore it acts as an immutable car pass, showing ownerships, mileage, maintenance, etc. Car eWallet is a partnership of ZF, UBS and IBM. The blockchain in use is IBM's Hyperledger Fabric.



Everyty

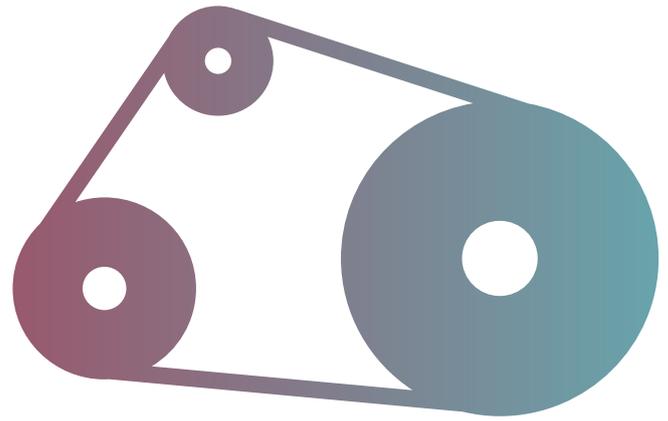


Site	www.everyty.com.au
Country	Australia
Year Founded	2016
Blockchain	Ethereum

Everyty is a p2p EV charging network in Australia. Users can make their charging available for others as well as use others' charging stations.



6 Other



The Sun Exchange

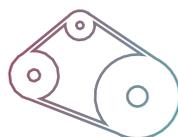
Represented at Event
BLOCKCHAIN BUSINESS



Site	www.thesunexchange.com
Country	South Africa
Year Founded	2015
Blockchain	N/A

With blockchain technology, The Sun Exchange makes it possible to own solar panels installed in the sunniest locations on earth and lease them to businesses and communities in developing nations. The owners of the solar panels then receive rental income through bitcoin and/or national currency. By breaking down ownership to a single solar cell, they have reduced the cost of going solar by two orders of magnitude. Solar projects that The Sun Exchange has hosted so far are 4 commercial rooftops (15, 17, 45 and 60 kW) with over 100MW in the making. The Sun

Exchange has won several awards for their work such as: Best Blockchain and Bitcoin Business in Africa 2016 & 2017, the 2017 SDO Global Blockchain Challenge in Dubai and won the 2017 Mondato Award for Social Impact in Sub-Saharan Africa. The Sun Exchange raised 1.6M USD in seed funding in October 2017. Previously, The Sun Exchange had raised over 16k pounds from an Indiegogo crowdfunding campaign. The Sun Exchange will finance 1 MW of rooftop solar for educational institutions in Dubai after being selected for the Dubai Solar Schools Program.



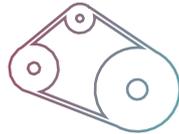
Bankymoon



Site	www.bankymoon.co.za
Country	South Africa
Year Founded	2014
Blockchain	N/A

Bankymoon is a software company dedicated to applying blockchain in distinct fields. In order to help utilities collect revenue from African consumers who don't have formal

banking capabilities, Bankymoon launched a prepaid smart meter that works with blockchain technology and bitcoin.



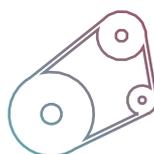
Freeelio



Site	www.freeel.io
Country	Germany
Year Founded	2016
Blockchain	Tobalaba

Freeelio, in collaboration with ecosystem partners, develops AdptEVE, an energy app that uses AI to optimize the costs and the use of solar power. AdptEVE uses blockchain to account for energy value in a building with different tokens of different purposes: feed-in, shifting, saving,

storing and sharing of electricity. Freeelio is a founding member of the German Blockchain Association and in the Early Access Program for Startups in the Energy Web Foundation. Freeelio will become a Decentralized Autonomous Corporation within 18 months.



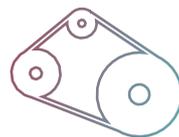
M-PAYG



Site	www.mpayg.com
Country	Denmark
Year Founded	2013
Blockchain	N/A

Concerned about the lack of access to electricity, M-PAYG uses blockchain to provide “pay-as-you-go” solar energy for families in developing countries. In collaboration with the Danish NGO DanChurchAid, M-PAYG is [testing a solution](#)

in a refugee camp in Bidibidi, Uganda. Users of M-PAYG will be able to pay from their mobile phones and get cheaper solar electricity. A similar project from M-PAYG has been held in Tanzania.



Poseidon

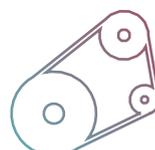


Site	www.poseidon.eco
Country	Switzerland
Year Founded	2017
Blockchain	Stellar.org

Poseidon aims to use Stellar.org’s blockchain technology to establish an ecosystem to simplify the carbon credit market. In this way it will allow carbon consequences to be visible for the first time by enabling a carbon value to be added directly into everyday products. Blockchain technology will enable consumers to participate through micro-transactions and will prevent double counting of carbon and provides

consistency across jurisdictions. Poseidon’s key partner for the carbon credits is Ecosphere+ in addition to other strategic partners. Poseidon is conducting pilot projects for [“a wide range of significantly polluting industries in various countries...”](#)

Poseidon [recently announced](#) a fundraiser for January 2018.



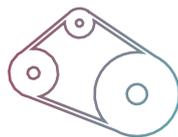
Clearwatts

Clearwatts

Site	www.clearwatts.com
Country	Netherlands
Year Founded	2017
Blockchain	BigchainDB (Ocean protocol)

Clearwatts uses blockchain technology to facilitate effective collaboration between counterparties in the energy industry. As an independent party, Clearwatts assists counterparties in an energy trade to set up a distributed database that discloses valuable and

reliable information (required to execute and settle agreements). The first phase will focus on the execution and settlement of a PPA between a windfarm and its offtaker.



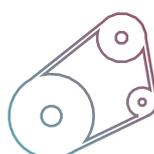
Guardtime

guardtime

Site	www.guardtime.com
Country	Estonia
Year Founded	2007
Blockchain	N/A

Guardtime is a blockchain platform company which leverages its platform to build enterprise applications. In regards to energy, Guardtime was contracted by the US DOE to increase the security of the grid as distributed systems and the digital grid start becoming a reality. This is being executed in collaboration with Siemens and other partners, such as universities and labs.

In addition, with Intrinsic ID, Guardtime will develop with blockchain a pilot to test the safety of data in smart meters after winning an award at the Blocklab opening in Rotterdam. Additionally, both companies will also develop a decentralized trading platform with funding from the Dutch Government, the city of Rotterdam and managed by Blocklab. The pilot will be conducted in the Rotterdam area.



WaveX

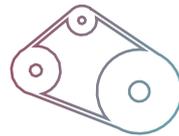


WaveX

Site	www.wavex.io
Country	Saudi Arabia
Year Founded	2016
Blockchain	ArabianChain

WaveX is a platform that connects solar panel investors with people who have empty rooftops or lots. Additionally, it also allows for the trade

of energy between two entities. WaveX uses the [ArabianChain blockchain platform](#), the first public blockchain in the region.



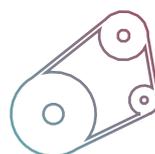
4New



Site	www.4new.co.uk
Country	UK
Year Founded	2017
Blockchain	N/A

4New uses blockchain as a platform to operate waste-to-energy power plants from collection of waste to sale of electricity. For this purpose, the 4NEW tokens will be made available to the

public in Q4 2017. 4NEW [announced a 25M USD investment](#) from a US private equity fund in order to construct 4NEW's first plant.



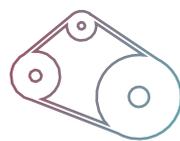
Solar DAO



Site	www.solardao.me
Country	Israel
Year Founded	2017
Blockchain	Ethereum

Solar DAO is a blockchain platform created to build and invest in solar plants around the world through crowdfunding. Solar DAO currently has

4 projects under development in Portugal (2x), Kazakhstan and Ukraine. Solar DAO's ICO is scheduled for December 2017.



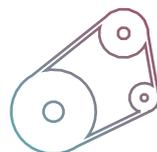
CarbonX



Site	www.carbonx.ca
Country	Canada
Year Founded	2017
Blockchain	Ethereum

CarbonX uses tokens, [linked to carbon offsets REDD+](#), to create a p2p system where users can get rewarded for carbon-saving behavior. CarbonX was launched in collaboration with

ConsenSys (which also supports Grid+). Additionally, CarbonX has also partnered up with Block Partners ULC.



DNV GL/Deloitte



Site	www.dnvgl.com
Country	UK
Year Founded	2017 (1864)
Blockchain	Own

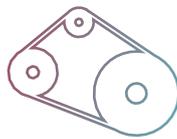
Along with Deloitte EMEA Blockchain Lab, DNV GL has created their own blockchain platform where they have [transferred all of its 90,000 certificates](#).



MyBit is a blockchain-enabled platform that allows IoT assets to be funded and owned by people all over the world. Owners can then profit from the revenues that the asset generates. Solar

energy is the first market that MyBit is exploring. MyBit secured 2.8M USD through their ICO on August 2017.

Site	www.mybit.io
Country	Switzerland
Year Founded	2017
Blockchain	Ethereum



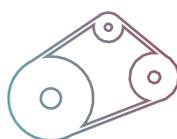
BCDC (BlockChain Development Company)



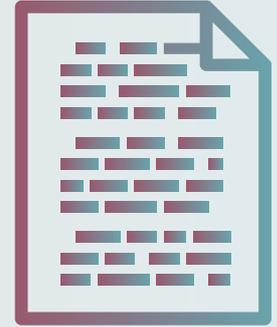
BCDC aims to improve the world's sustainability by using blockchain. They have launched the RecycleToCoin to incentivize recycling of plastic and aluminum. In terms of energy, BCDC operates

the EcoChain which is an investment platform to connect investors with renewable energy projects around the world.

Site	www.bcdc.online
Country	Scotland
Year Founded	2017
Blockchain	Ethereum



A word from the authors



The energy field has some serious catching up to do...

Blockchain energy startups are popping up everywhere. Keeping up to date has been a challenge due to the immense amount of activity that's happening on a weekly basis. And it is not only in the energy field, but across all industries.

The activity and hype surrounding blockchain is reminiscent of the dot-com bubble of the late 1990s. If we take a 10 year horizon, how many of these companies will realistically still be active? Many (technological) industries eventually turn into oligopolies of sorts (e.g. Google, Amazon, Facebook, Apple). Will the same happen with the blockchain and energy field? It will be interesting to see what the distribution will be like in a decade. This is an interesting thought in the case of this phenomenon particularly, as having an oligopoly (or 'winner-takes-all' mentality) goes against the very basic philosophical foundations of blockchain. Alternatively, could it be that we will end up with a distributed set of companies collaborating actively? There is no way anyone can know this. If someone says they do, they are probably fooling themselves. In either case, this is an exciting time. Many successes and failures will happen along the way, but one thing is for sure: the energy field will never be the same. It might take 1, 10 or 25 years... but it will catch on and revolutionize the field.

*Are we then fooling ourselves? Could be... But that's one of the main reasons why we are organizing a conference dedicated to the real-world business use cases of blockchain in the energy field. We want to identify and showcase down-to-earth, pragmatic approaches where blockchain is working in the energy field. The hope is that, as organizers and participants, we will be better informed and can - together - break through the hype. **The most interesting pilot projects. Proven startups. Engaging panels. Consider them your anti-hype, anti-bubble blockchain lenses. Join us and learn how blockchain will impact the energy field. Catch up!***



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SOLARPLAZA

ESTABLISHED IN 2004
100+ EVENTS
30+ COUNTRIES
60.000 + ENERGY PROFESSIONALS
IN OUR NETWORK

More than 60.000 energy professionals and businesses from all over the world rely on Solarplaza's work every day. Our newsletters, articles, interviews, market and industry reports, combined with our world-class solar events, empower the global transition towards a sustainable energy future. Since 2004, Solarplaza has organised more than 100 business events in both established and emerging markets across the globe.



For more information, please visit:

WWW.SOLARPLAZA.COM