Blockchain Contracts For Electricity: Sweet Spots

December 27th, 2017 by **Michael Barnard**

Blockchain is hot right now, not only as the underpinning of bitcoin, but because it has the promise to be a disruptive technology in multiple sectors. I started my exploration of how it will impact electricity's transmission, distribution and sale in "**Bitcoin's Hot But Blockchain For Cleantech Is Interesting**," and continue in this three-part series of articles on the nature of smart contracts based on blockchain technology.

Part 1, "**Blockchain Contracts for Electricity: Underpinnings**," lays out the technical and business underpinnings of smart contracts.

Part 2, "**Blockchain Contracts for Electricity: Business Drivers**," lays out 9 factors which can be used to determine where smart contracts will shine and where they won't.

Part 3, this article, looks at the implications for different business models in general and for the electrical generation and distribution business overall.

All articles on cleantech + blockchain are also being published on **https://future-trends.cleantechnica.com/cleantech-blockchain/**

So what are the sweet spots in general for smart contracts?

Obviously, shorter contracts rather than longer ones are good right now. With the volatility of cryptocurrencies, even one-month contracts have potential risks for both parties. This limits them substantially, but it's easy to see a future where volatility of one or more major cryptocurrencies comes down to similar levels to fiat currencies so that Herstatt risks are more manageable.

As noted, they aren't good for mass ecommerce, and even direct exchange of cryptocurrency for immediate delivery of electronically deliverable services or products has its issues. This is another substantial limitation. I can certainly see small software vendors choosing to transact in cryptocurrencies for their software products and hosted services, but it's still unclear what is in it for most buyers.

Escrow contracts are useful for infrequent transactions which aren't immediately resolved by

Top News On CleanTechnica


Porsche Mission E Details Emerge. Pricing Matches Tesla Model S


Under Trump's Nose, Wyoming Wind Energy Set To Explode


China Opens 1-Kilometer Long Solar Road


Sustainable Neighborhoods + Electric Transport = Winning The Future


Tesla's New Christmas Easter Egg → More Than A Gimmick


Shanghai Experiments With "Sponge City" Technology


Microsoft "AI For Earth" Project Will Democratize Access To Climate Change Data

ecommerce between entities with little to no history with one another. Where no trust or ongoing business relationship exists, smart contracts will be helpful. This has the potential to be advantageous for larger purchases of services or delivered goods without intermediaries such as Amazon, but it's unclear how eliminating Amazon from the equation actually improves service or costs for the majority of transactions. Given that it's possible to buy items worth **hundreds of thousands of dollars** on Amazon today, it's unclear what is going to happen in this space.

One clear area where smart contracts have potential is in cross-border purchases of finished goods or raw materials where no business relationship exists. Herstatt risk already applies due to the exchange rates with the foreign seller, although at a lower level of risk. Projecting accounts receivable into a distant country is problematic at best.

This is especially true for purchases from countries with a poor track record for respecting the rule of contractual law. Buying raw materials or finished goods from countries with significant corruption or judicial capture by business or corrupt officials is fraught with risk. Smart contracts could derisk this significantly.

For transactions within countries with endemic corruption challenges, smart contracts are advantageous as well. If buyers and sellers do not have access to legal recourse, a smart contract's automatic and inviolable resolution has obvious advantages.

Obviously criminal elements will continue to be happy with cryptocurrencies and will like smart contracts a lot. They have not means to enforce normal contractual law and typically don't trust anyone including often their own mothers. Smart contracts work for dark web transactions just fine, which explains bitcoin's dominance in that space.

There aren't a lot of multi-party agreements where smart contracts won't add complexity without adding value, but this is an area where smart contracts start to enable disaggregated business value systems. This is a sophisticated space, and there's likely some gold in there.

Where the buyer has specific additional needs outside of merely the delivery of the goods or services which are measurable, of value, and sellers already agree to penalty clauses for non-delivery is the current business sweet spot.

The other sweet spot are monopolies. As the sole provider of a good or service, they get to set the terms of the contract much more than the buyers do. It's an uneven power situation.

What does this mean for electricity distribution contracts?

Electrical utilities which own the generation and distribution network will love smart contracts. They get all of the advantages while purchasers get most of the disadvantages. They have guaranteed payment, no accounts receivable problems, and the contracts will be between only two entities, so they'll be simple. Right now, major jurisdictions like Germany or California see around a million customers unable to pay their bills on time annually, with resulting accounts receivable costs, loss of the money they spent on the electricity and getting it to the customers, and the costs of turning electricity off and on again, only some of which they can recover.

In many places, utilities are monopolies for purchase of electricity by consumers and businesses. I'm unaware of any situation where they don't have a monopoly on distribution grids. That's why they are typically regulated to prevent consumers from being gouged. But it's easy to foresee utilities convincing regulators that smart contracts will lower overall rates and forcing smart contracts on consumers with risky financial situations. As stated, where a monopoly exists, the monopolist will be very happy with smart contracts.

I can't say the same for any consumers of electricity, however. What's in it for them? They get some convenience in that once the contract is set up, it's automatically executed and paid, but that's what direct deposit does already. I get notified when my electricity bill is due and how much it is, and don't have to do anything else today. The value has to be outside of the contractual structure, something which takes the cost of electricity down a lot or the stability

of the electricity up a lot.

In developed countries, poorer customers who most often default and so would be the natural target of monopolistic utilities would be most hurt by the need to put money in up front. But pre-payment plans already exist for exactly that purpose, and have for a long time. This is just a different mechanism for them, and might be a better one.

Utilities which only own the distribution are still potentially going to be happy. They could easily have smart contracts with their customers and net 30 contracts with their suppliers. As necessary intermediaries who supply the grid, they don't have to apply smart contracts on both sides unless they want to. Once again, they will only use smart contracts with suppliers if there is a significant reduction in price or a significant increase in other elements.

Generators would, of course, love smart contracts with purchasers of any sort. They get all the benefits from the contractual structure and very few downsides. Renewable electricity generators especially will love smart contracts, as they have no fuel suppliers to worry about and low costs. Fossil fuel generators, like utilities, will try to have smart contracts with purchasers and net 30 contracts with fuel suppliers.

It's easy to see that any seller of electricity will be working hard to convince buyers of the advantages. And it's easy to see a lot of buyers being convinced.

From the penalties clauses value to buyers, however, we can start seeing some value propositions. Say an aluminum smelter — a very large consumer of electricity — enters into a smart contract with a utility for a certain amount of electricity at a certain time and voltage. If the utility doesn't deliver it due to brownouts and the like, the smelter doesn't pay as much.

Similarly, there's a lot of construction in electrical generation and distribution, and smart contracts which automatically enforce penalties for various aspects of delivery could be advantageous.

If efficiencies for utilities are seen which substantially reduce their cost of doing business, for example in the order-to-cash process, and these savings are passed on to consumers, then there will be a transformation. That isn't a given however.

It's in the developing world with poorly developed grids and poor contractual law where smart contracts for electricity might have value. If there is no order-to-cash system and grid operator in place, smart contracts between generators and purchasers would likely be able to use smart contracts to create a distributed version. It's difficult to say where these pockets might be however. In countries with poorly served rural regions, those rural regions are still regulated by the country's laws. In failed states and lawless regions, it's difficult to see what would prevent local warlords from merely ripping down the ramshackle wires that sprang up if they didn't receive their cut.

As these 3 articles show, blockchain-enabled smart contracts aren't a home run in the utilities sector. There are many cases where the advantages are strongly one-sided. But that doesn't mean that they have no value or that value won't emerge.

The articles also show that *caveat emptor*, let the buyer beware, still applies in this emerging space. Most of the advantages of smart contracts accrue to the seller, so the buyer has to know exactly what advantages they are getting. Further, smart contracts will dominantly be developed and offered by sellers initially, and while they are very useful constructs, they are not necessarily a contract in the eyes of the law. Where a seller intentionally or unintentionally creates a bad contract which doesn't resolve or resolves inappropriately in their favor, there's little reason to believe that existing case law will be current and able to deal with disputes. And that's in areas with systemic respect for contractual law. In areas of the world with little respect for contractual law, there will be very little available recourse.

Subsequent articles in this series on blockchain for the electricity sector will include a look at use cases outside of smart contracts and case studies of startups and experiments in this space. The 9 factors will be used to assess them and will also be checked against them. A theoretical model like the 9 factors can always run into exceptions.

As always, I'll be paying close attention to comments. If I've mischaracterized something or

and 9 Canadian provinces.

made other mistakes, please let me know. Similarly, if there are emerging smart contract examples or utilities accepting cryptocurrencies, point them out to me, especially in non-English language countries.

Tags: Bitcoin, blockchain, Cryptocurrencies, Ethereum, generators, innovation, Utilities

About the Author

Michael Barnard

Mike works with startups, existing businesses and investors to identify opportunities for significant bottom line growth in the transforming low-carbon economy. He regularly publishes analyses of low-carbon technology and policy in sites including Newsweek, Slate, Forbes, Huffington Post, Quartz, CleanTechnica and RenewEconomy, with some of his work included in textbooks. Third-party articles on his analyses and interviews have been published in dozens of news sites globally and have reached #1 on Reddit Science. Much of his work originates on Quora.com, where Mike has been a Top Writer annually since 2012. He's available for consultation, speaking engagements and Board positions.

Related Posts

What About Florida? Energy Efficiency,

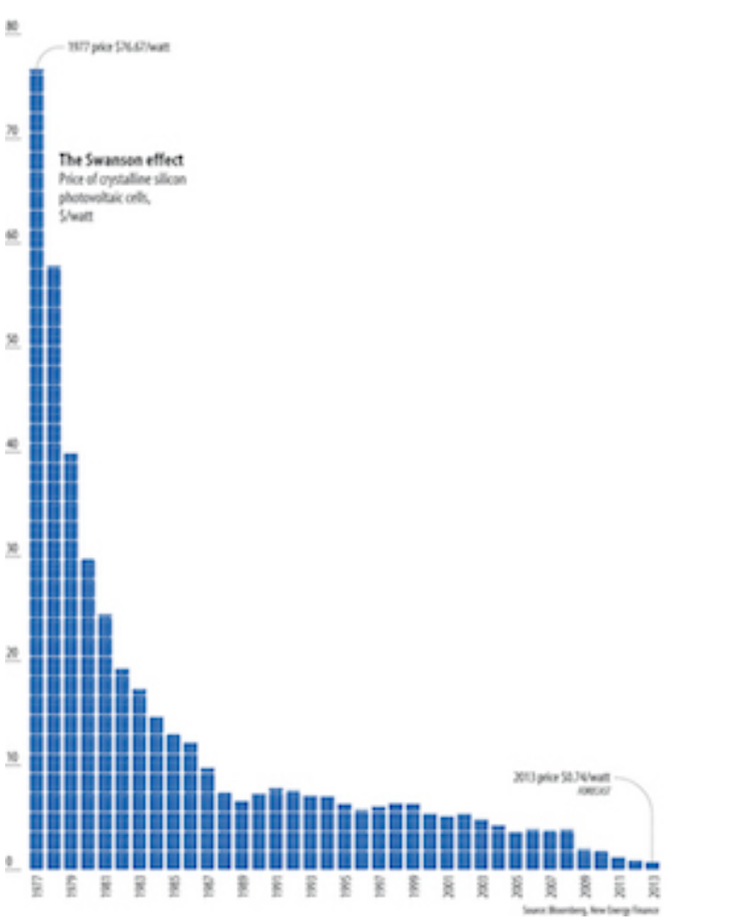
Funding Cleantech With Blockchain: 9

Blockchain For The Grid: 5 Use Cases →

Blockchain Contracts for Electricity:

Go 100% Renewable At Home

Cost of Solar Panels Collapses

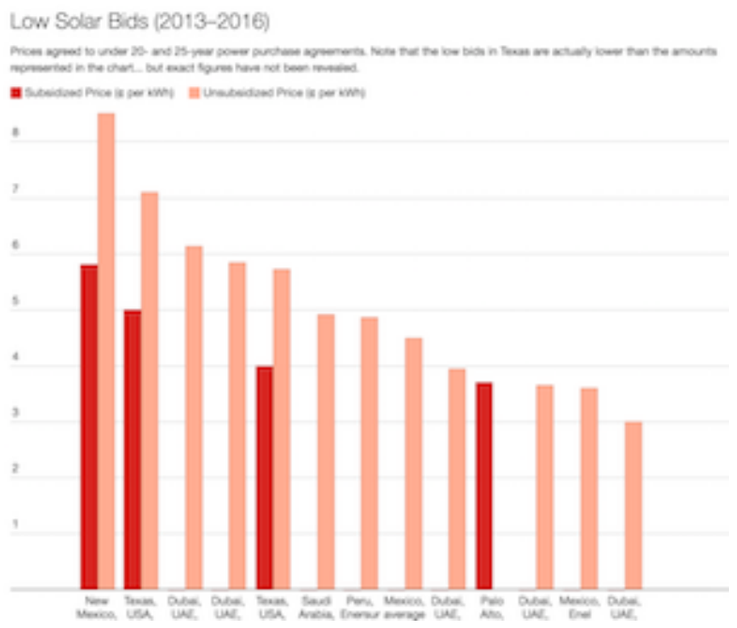


Wind & Solar Prices Beat Fossils

Solar Energy, & Regulatory Backwardness In The Sunshine State (Part 5): Utility Planning Amid Falling Electric Demand →

Things To Consider →

Business Drivers →

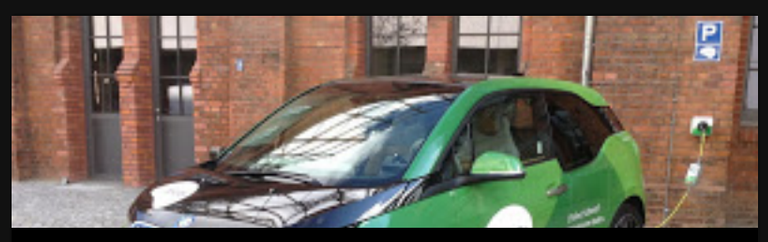


Debunking Anti-Cleantech Myths

IMPORTANT MEDIA

CleanTechnica is the #1 cleantech-focused news & analysis website in the US & the world, focusing primarily on electric cars, solar energy, wind energy, & energy storage. It is part of Important Media -- a network of 20 progressive blogs working to make the world a better, greener place.

The content produced by this site is for entertainment purposes only. Opinions and comments published on this site may not be sanctioned by, and do not necessarily represent the views of Sustainable Enterprises Media, Inc., its owners, sponsors, affiliates, or subsidiaries.



CleanTechnica

google.com/+Cleantechnica

The #1 Cleantech (Clean Energy + EV) Site on the Interwebs — Solar News, Wind News, EV News, &...

Follow