

North American “Crypto Rush” – A benchmarking study of regulatory and rate design frameworks adopted in 2017 and 2018 to cope with utilities’ dilemma

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Overview

From a financial point of view, cryptocurrencies are often seen as either a revolution in the waiting or just a dream on the verge of becoming a nightmare for the growing participating investors in the last 10 years. Supporting the most common cryptocurrencies now on the market, blockchain technology is used to record all transactions in a “distributed, decentralized public ledger¹”. The so called many “blocks” will each store their part of the information about the transaction from each party separately, and then “chaining” them with a unique crypted code, referred as an “hash”.

Using blockchain in itself is not that energy hungry. Energy intensity arise with the number of “validations” needed, or quantities of “hash” to produce in order to secure and validate². The amount of energy for each transaction then becomes very high. With some protocols, like the one used by the most common cryptocurrency in 2018, depending on the rig technology used³, it can consume up to 50 000 kW of electricity for the equivalent of many units of time to produce only one unit of Bitcoin. Some producers said publicly that electricity cost would represent almost 75% of their operating cost⁴. As for the fixed cost, like in any classic mining industry, those crypto miners who invest in better rig mining technologies, given the same conditions to find the same unit of value (Bitcoin or Gold in the more classic mining), will be able to move efficient. Using this classic mining analogy, some gold miners can move more dirt and find the gold faster than those who have less processing power, but they also need sufficient water flow to clean the dirt faster in their trommel-. Contrary to gold miners who only use the nearby creek, crypto miners must pay for their equivalent of water, electricity price becomes important aside from the technology used.

Putting aside the financial and technological issues of producing and using cryptocurrencies in the future, many political, economic, social, environmental and legal issues have been raised in the energy sector by the sudden energy demand of this new emerging crypto mining industries. Some North American regulators, mainly those with low electricity prices, had to cope in 2017-2018 with conflicting issues around the classic monopolistic electricity distribution of this so called “public service”. One of the dilemmas arousing across North America jurisdiction is the access to the public service according to the risk of an emerging industry, should utility investors be exempted from their obligation to serve? Also enlighten with crypto miners, should we create industry specific rate category? If yes, should it be cost based, market based or politically/legally engineered? These questions have been answered very rapidly earlier in the year 2018 while the real anticipated demand has not been as high as expected for now.

Methods

A benchmarking methodology has been used in an exploratory study. A content analysis review of North American regulatory decisions in 2017-2018 has been completed in relation to the electric service demand for cryptocurrencies using blockchain technologies. The decisions and contexts gathered were first broadly analysed in order to assess their adequacies with common energy sector regulatory frameworks⁵: 1) the capacity to attract required capital, 2) providing reasonable rate, 3) market efficiency, 4) demand control and 5) cross-subsidization. Then, we classified each of the decisions found according to the rate design rational⁶: 1) Cost, 2) Market, and 3) Policy based. A comparison of the actual demand, costs and final rate that would be applicable in 2019 for various jurisdiction will be presented in the session.

¹ <https://www.investopedia.com/terms/b/blockchain.asp>

² Often referred as “proof of work”, the Bitcoin protocol for validation is 1000 times slower than today's financial transactions

³ One of the most cited study from EliteFixtures.com used AntMiner S9, Antminer S7 and Avalon 6 to mine Bitcoins but it was done in a time when the value of the Bitcoin reached unprecedented highs.

⁴ Public hearings in front of the Régie de l'Énergie bu Vogogo Inc. <http://publicsde.regie-energie.qc.ca/layouts/publicsite/ProjectPhaseDetail.aspx?ProjectID=457&phase=1&Provenance=C&generate=true>

⁵ Tomain, J. P. & Cudahy, R.D (2011). Energy Law in a nutshell, 2nd edition

⁶ Conkling, R. L. (2011). Energy Pricing : Economic and Principles.

Preliminary results

Globally, the North American benchmark analysis showed that there is an absence of common methodology to really understand the real amount of electricity needed to produce different cryptocurrencies, making it difficult for utilities to analyse the potential demand and integrate it into their future supply plan, and invest accordingly. The absence of consensus about the future demand for crypto miners and the absence of a method for the assessment of their specific risk, were the main motivation for most regulators to treat this new industry differently.

A preliminary summary of the broad benchmark results for New York, Washington, and Alberta jurisdictions is presented here. Other jurisdictions decisions are coming for early 2019. Space being limited here, a more detailed analysis, with cost, market, and policy background will be presented in the session.

Jurisdictions (Preliminary)	Current position about crypto miner's public demand
Franklin (Washington)	Moratory on cryptocurrencies electricity usage
Grant (Washington)	New category of customers and new rate
Benton (Washington)	Usage of existing rate
Chelan (New York)	Intensity base rate developed
Plattsburgh (New York)	Moratory on cryptocurrencies electricity usage
New York (New York)	Creation of a rate rider for high intensity
Medicine Hat (Alberta)	Shared 10 years upfront investment risk with crypto miners

When comparing each of these jurisdictions positions with classic rate design rationales, we find only one jurisdiction using existing rate, two simply refusing to offer the public service, two using energy intensity as a risk to manage, one creating a new category and another one partnering with one customer at the time. The lack of constancy among the ways they approach the “crypto rush” problem is obvious even with these preliminary results.

Discussions

Still awaiting some development in 2019, the classic regulatory framework and rate design rationales are clearly not used by North American regulators and utilities. Rightfully or not, this new cryptocurrency industry is being discriminated in many ways, classic regulatory frameworks and rate design rationale theory are often protecting existing customers, limiting investments for utilities and pushing them off the grid.

Compared with some other energy intense industries like Aluminium or Steel production, it can be argued that this emerging industry is being treated in an unfair way to have access to the so called “public” service. In times when many utilities are talking about a possible “death spiral”, they won't accept taking the risk of adding new demand. The existing customers, politicians and regulators are in front of a dilemma that could arise from any numeric industries, the new electric demand might come from unknown industries, we should study how to cope with this, not losing track of what is the role of a “public” utilities, the Bitcoin could then be seen a heads up for what's to come.

References

Some references were put as end of page notes. All decisions available upon request.