

## Written evidence submitted by Curve UK Limited, ICDEF Limited

### Introduction:

I am Lead Corporate Counsel at a London-based fintech (Curve OS), where I have worked extensively on the development and launch of our cryptocurrency offering. In this capacity I have also carried out a number of speaking engagements and B2C outreach activities, (e.g. Bitcoin Miami 2022 as exhibitor, as keynote speaker at the Crypto Coinference in Bologna, and hosting an Electronic Transactions Association roundtable as subject matter expert). I previously contributed to the FCA's Crypto Sprint 2022 (written submissions) and to HMT's stablecoin consultation, in partnership with Innovate Finance.

I am co-founding a research platform, the Independent Centre for the Digital Economy and Finance (ICDEF Limited - targeting Q4 2022 launch) to collate and curate current and proposed legislation from around the world, as well as academic studies, writing and other papers that satisfy certain selection criteria. I have been involved in the Bitcoin space since 2015 and the majority of my following submission will be with reference to Bitcoin as this is where my expertise lies. I am submitting evidence on a selection of the questions posed by the call, but I would be happy to provide further evidence if required.

### **1. To what extent are crypto-assets when used as digital currencies (such as Stablecoins) likely to replace traditional currencies?**

It is likely that cryptocurrencies will co-exist with fiat currencies as simply another payment or savings option (or with other functions attached to them as well, such as governance rights)<sup>1</sup>.

Regarding Bitcoin, this asset can be most readily understood as commodity money in digital form.

I distinguish this from central bank money, which as the Bank of England notes, is a liability of a central bank.<sup>2</sup> Being a liability, fiat or central bank money is backed by the institution or country that has issued it. Bitcoin is not a liability and thus has no counterparty risk. As it is neither debt nor liability, it requires no backing for the same reason that gold requires no backing. Bitcoin is a commodity, which people can own absolutely, which also happens to have many of the characteristics of digital fiat currency in terms of its transmissibility across space. The question regarding Bitcoin's security is a slightly different one - Bitcoin is secured by a globally distributed, decentralised computer network, which it is no longer computationally feasible even for a nation state to attack, although smaller altcoins whose networks are not as secure or widely distributed may still be vulnerable<sup>3</sup>. It is this imperviousness to attack, and its neutrality as an asset that is not controlled by any individual, state or corporation, that makes Bitcoin the most likely of all cryptocurrencies to continue to exist as a secure digital asset alongside surviving central bank currencies.

It is likely that much in the same way that central bank money, stablecoins and cryptocurrencies currently all co-exist, each of these monetary technologies will survive but with different purposes and likely (in the case of the latter two) a higher degree of regulatory clarity as to their use and promotion. I consider it

<sup>1</sup> <https://academy.binance.com/en/articles/what-are-governance-tokens>

<sup>2</sup> <https://www.bankofengland.co.uk/paper/2021/new-forms-of-digital-money>

<sup>3</sup> <https://dci.mit.edu/51-attacks>

unlikely that cryptocurrencies will in the near term fully replace central bank money, largely for the simple reason that no central bank or nation state is likely voluntarily to give up its power of seigniorage in issuing national or federal currency<sup>4</sup>.

One usage of the Bitcoin network that deserves further analysis is the use case of the network itself as a payment rail in conjunction with the Lightning Network<sup>5</sup> - a Layer 2 solution built on top of the Bitcoin network base layer (resulting in a payment network similar to Visa or to Mastercard, but with far greater speed, quicker final settlement, lower fees for the merchant, and a far greater capability for a higher number of transactions per second, estimated at around 1 million TPS). Commercial solutions already exist<sup>6</sup> that allow customers to pay in store at a point of sale using a traditional bank card, sending value over the Lightning Network, with an instantaneous currency conversion at each end (avoiding slippage and conversion risk) so that the merchant receives fiat currency, while at the same time without paying the high processing fees currently charged by payment rails such as Visa and Mastercard. In addition to its use case as a commodity savings technology, it is the payment innovation presented by Lightning that is in my view worthy of further investment and development in the UK. Companies such as Coincorner<sup>7</sup>, based in the Isle of Man, are already pioneering use of this technology in the UK retail space, and have even partnered with Oxford City football club to enable the acceptance of bitcoin payments<sup>8</sup>.

## 2. What impact could the use of crypto-assets have on social inclusion?

Much of the focus on cryptocurrencies in the advanced economies has been on their potential as investment assets. However, this overlooks the very important role they play in the developing economies by extending financial inclusion to the unbanked. In Mozambique, for example, only c.30% of the population have a bank account, but 70% have mobile internet access, and Bitcoin is being adopted there as both a payment network and a way of preserving earned income<sup>9</sup>. The potential financial inclusion of the unbanked is an important issue even in the UK - recent numbers are hard to verify, but by 2019/2020 the FCA estimated that over a million UK adults still had no bank account<sup>10</sup>. This is not the forum in which to delve deeply into the Bitcoin protocol, but suffice to say that with only a mobile phone and access to the internet any person should be able to set up a Bitcoin wallet and more or less instantaneously send or receive value digitally, largely without cost, and across international borders if they so desire. The Human Rights Foundation (in particular Alex Gladstein<sup>11</sup>) has done valuable work highlighting the positive impact of this technology, and I recommend that the committee review progress made in Afghanistan<sup>12</sup>, challenging the regime in Russia<sup>13</sup>, or protecting the value of savings in Nigeria<sup>14</sup> as further examples of the opportunity for social inclusion and positive social change presented by Bitcoin.

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<sup>4</sup> <https://www.ecb.europa.eu/ecb/educational/explainers/tell-me/html/seigniorage.en.html>

<sup>5</sup> <https://www.kraken.com/en-gb/learn/lightning-network>

<sup>6</sup> <https://www.pymnts.com/blockchain/bitcoin/2022/bringing-bitcoin-firmly-into-payments-strike-partners-with-ncr-shopify-blackhawk/>

<sup>7</sup> <https://www.coincorner.com/>

<sup>8</sup> <https://www.oxfordmail.co.uk/news/20596167.oxford-city-enables-fans-use-bitcoin-buy-tickets/>

<sup>9</sup> <https://cointelegraph.com/news/making-money-escaping-poverty-bitcoin-and-lightning-in-mozambique/amp>

<sup>10</sup> <https://www.fca.org.uk/publication/research/financial-lives-consumers-across-uk.pdf>

<sup>11</sup> <https://hrf.org/team/alex-gladstein/>

<sup>12</sup> <https://twitter.com/gladstein/status/1539472536307568642?s=20&t=AoCUTS7P3Gmv9sh8xwASSw>

<sup>13</sup> <https://twitter.com/gladstein/status/1539472569845264384?s=20&t=AoCUTS7P3Gmv9sh8xwASSw>

<sup>14</sup> <https://twitter.com/gladstein/status/1539472996808568832?s=20&t=AoCUTS7P3Gmv9sh8xwASSw>

**3. Are the Government and regulators suitably equipped to grasp the opportunities presented by crypto-assets, whilst at the same time mitigating against the risks?**

Given the positive messages and statements that have emerged from a number of different bodies this year, government and regulators appear to be heading in the right direction on this subject, although there is some distance still to go. HM Treasury's<sup>15</sup> recent statements have been positive for the industry, as has the direction of travel indicated by the most recent Queen's speech. A simple and constructive suggestion here would be for regulators and lawmakers to continue to engage actively with industry participants to ensure they are as fully briefed as possible on the risks and opportunities presented. The UK has a brief window of opportunity to distinguish itself from the EU direction of travel<sup>16</sup> and to gain significant market share in a new industry; additionally there are a large number of highly committed and motivated industry professionals in the UK, ready to offer advice and counsel to legislators and regulators.

**4. What opportunities and risks could the use of crypto-assets—including Non-Fungible Tokens—pose for individuals, the economy, and the workings of both the public and private sectors?**

See my response to question 1 regarding the promising payments use case presented by the Lightning Network. For consumers, this offers a faster, cheaper and more secure means of payment than traditional methods, and for merchants this would present lower transaction fees, final instantaneous settlement, and lower risks of chargebacks, which could in turn lead to lower consumer prices. CoinCorner is an example of a UK company doing valuable work in this space.

The tokenisation of assets and fractional ownership via NFTs, and the consequential transferability of such assets is also an interesting growth area. I cite the example of Crypto Club Global<sup>17</sup>, which has recently purchased a private members' club in London. Rather than a subscription model, the club offers memberships via the purchase of NFTs, which are then transferable in a way that a traditional membership is not - entry to the club is simply granted to the holder of the NFT.<sup>18</sup>

**5. Could regulation benefit crypto-asset start-ups by improving consumer trust and resilience?**

Yes. At present, both companies in the space and individual users - and the development of the UK's own cryptoasset industry - have been hampered by a lack of regulatory clarity and the slow pace of regulatory change. For example, a number of cryptocurrency firms have taken the decision to move offshore owing to the delays in the FCA dealing with the cryptoasset firm registration regime<sup>19</sup>, which had to be extended owing the huge backlog of firms that remained on the temporary register. My own organisation, Curve,

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<sup>15</sup> <https://www.gov.uk/government/news/government-sets-out-plan-to-make-uk-a-global-cryptoasset-technology-hub>

<sup>16</sup> <https://blogs.lse.ac.uk/europpblog/2021/07/05/what-the-eus-new-mica-regulation-could-mean-for-cryptocurrencies/>

<sup>17</sup> <https://www.cc-gbl.io/>

<sup>18</sup> I must declare a personal interest here as I have purchased such an NFT and am a member of CC Global.

<sup>19</sup> <https://www.fca.org.uk/news/press-releases/temporary-registration-regime-extended-cryptoasset-businesses>

was forced to find a complex workaround using a provider in the United States, rather than being able to offer cryptocurrency services directly to UK consumers.

The key issue is that while legitimate firms remain unregistered and operating in a grey regulatory area, illegitimate and dishonest firms are also freely able to offer products and services to customers who will then face an extreme risk of harm. I need only cite the offerings of Terra/Luna as an example here - customers globally were freely able to invest in the algorithmic 'stablecoin' scheme, with effectively zero protection, and catastrophic consequences. Good regulation should avoid such serious harm while at the same time allowing decent businesses to flourish.

## 6. How are Governments and regulators in other countries approaching crypto-assets, and what lessons can the UK learn from overseas?

A detailed examination of global regulation is beyond the scope of this submission. On some of the key jurisdictions legislating and producing regulation in the space:

**United States:** The Lummis/Gillibrand Bill<sup>20</sup> is the most significant piece of proposed legislation<sup>21</sup>; however the recently-published Stabenow/Boozman bill is also of interest<sup>22</sup>. Both draft bills are bipartisan and suggest the CFTC should regulate digital commodities (e.g. Bitcoin and Ether) with the SEC regulating the majority of other digital assets as securities.

**Japan:** Legislation and regulation is relatively well-advanced, though cryptoassets are defined neither as money nor as fiat currency<sup>23</sup>.

**Singapore:** Generally takes a pragmatic and tailored approach to cryptocurrencies<sup>24</sup>.

**Switzerland:** Largely very positive<sup>25</sup>; some cantons even permit the payment of tax with cryptocurrency<sup>26</sup>.

**South Africa:** South African Reserve Bank recently confirmed that it regards cryptocurrency as a financial asset and detailed regulation is planned<sup>27</sup>.

**EU:** The EU has struggled to find a unified way forwards, although member states have recently reached agreement on the text of its flagship legislation in the space, MiCA<sup>28</sup>. A number of EU countries, such as Germany, Malta and Cyprus are considered crypto-friendly. However, the European Commission appears at odds with the policies of several member states (particularly Germany). Germany has for example opposed the proposed collection of personal data by virtual asset wallet providers<sup>29</sup>.

Generally, there is a noticeable trend towards the cryptocurrency industry being welcomed and developed in open, market-driven economies, and repressed in those economies that tend towards centralised control or are 'top down'. As an open, outward-facing and market-driven economy, the UK would be well-

<sup>20</sup> <https://www.ropesgray.com/en/newsroom/alerts/2022/06/Lummis-Gillibrand-Digital-Asset-Bill-Key-Takeaways>

<sup>21</sup> <https://www.gillibrand.senate.gov/imo/media/doc/Lummis-Gillibrand%20Responsible%20Financial%20Innovation%20Act%20%5bFinal%5d.pdf>

<sup>22</sup> <https://www.bloomberg.com/news/articles/2022-08-03/push-to-give-cftc-more-sway-over-us-crypto-trading-gains-steam>

<sup>23</sup> <https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/japan>

<sup>24</sup> <https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/singapore>

<sup>25</sup> <https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/switzerland>

<sup>26</sup> <https://www.coindesk.com/markets/2021/02/18/switzerlands-crypto-valley-has-started-accepting-bitcoin-ether-for-tax-payments/>

<sup>27</sup> <https://businesstech.co.za/news/banking/605900/new-laws-coming-for-cryptocurrency-in-south-africa/>

<sup>28</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0593>

<sup>29</sup> <https://philippssandner.medium.com/germany-maintains-its-pro-crypto-attitude-and-opposes-the-eu-proposal-on-revealing-and-verifying-ca6ffa3fcc8c>

placed to capitalise on the growth in the cryptocurrency industry via thoughtful and pragmatic regulation rather than by repressing the industry and driving it to jurisdictions such as the United States or Switzerland.

## 7. The environmental and resource intensity of using crypto-asset technology.

**Initial abstract:** Two principal methods exist for securing public blockchains and removing the need for a trusted third party intermediary to confirm and validate transactions, namely Proof of Work (POW) and Proof of Stake (POS)<sup>30</sup>. POS systems reward the holders of the most tokens (the highest stake) with additional tokens in return for their role in validation and security, while POW requires network participants to expend energy and incur cost in order to validate and secure the network. Participants are only rewarded after having successfully done this work, thus ensuring that no new tokens in a POW system are ever awarded for free. The cost of securing the network is decoupled from the number of transactions on that network (i.e. it costs as much to mine an empty block as it does to mine a block containing two thousand transactions). The oft-cited ‘energy cost per transaction’ metric is therefore misleading and erroneous.

It is a widely-held view in the cryptocurrency space that virtually all cryptocurrencies other than Bitcoin could transition to POS, but that Bitcoin should remain a POW currency<sup>31</sup>, since the expenditure of time costs and resources in order to create and receive new bitcoin go to the heart of its monetary policy - namely that it is substantially different from easily-created fiat money, and is akin to a commodity money, like gold, that requires the expenditure of resources to obtain and secure. Most importantly, with a view to Bitcoin’s potential as a neutral global monetary system, only POW systems have been fully market-tested as secure, trustless, and censorship-resistant for more than a decade at the date of writing.

Bitcoin is currently the cleanest of all global industries in terms of its mix of renewables<sup>32</sup>. The use of renewable energy by miners has been increasing year on year and stands at close to 60% sustainable according to the latest available data<sup>33</sup>. In terms of overall power usage, as at August 2022 the network uses roughly 87 TWH per annum<sup>34</sup>, which is circa 0.5% of global energy consumption<sup>35</sup>. To put this in context, it is estimated that the Bitcoin network uses less electricity than Christmas lights do each year<sup>36</sup>, and it uses significantly less electricity than tumble driers<sup>37</sup>.

Having said this, Bitcoin miners (i) are heavily incentivised to find the cheapest sources of electricity available, which in many cases will include stranded, wasted and/or excess sources from a renewable source where such power would otherwise not be used by the grid, and (ii) are able to function as a buyer of first and last resort in conjunction with renewable energy plants, making renewable power generation

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<sup>30</sup> <https://seekingalpha.com/article/4468656-proof-of-work-vs-proof-of-stake>

<sup>31</sup> <https://bitcoinmagazine.com/technical/proof-of-work-superior-for-bitcoin>

<sup>32</sup> <https://www.forbes.com/sites/greatspeculations/2021/07/06/bitcoin-mining-uses-a-higher-mix-of-sustainable-energy-than-any-major-country-or-industry/?sh=753415f04cc9>

<sup>33</sup> <https://bitcoinminingcouncil.com/bitcoin-mining-electricity-mix-increased-to-59-5-sustainable-in-q2-2022/>

<sup>34</sup> <https://ccaf.io/cbeci/index>

<sup>35</sup> <https://hbr.org/2021/05/how-much-energy-does-bitcoin-actually-consume>

<sup>36</sup> <https://mawsoninc.com/bitcoin-mining-uses-less-energy-than-christmas-lights/#>

<sup>37</sup> <https://financialpost.com/fp-finance/cryptocurrency/bitcoin-energy-critics-should-check-their-own-footprints-first>

immediately profitable, and stabilising the grid by purchasing excess power when demand is low, and simply turning off, in minutes, when demand is high. I briefly examine two such instances below.

(i) **Cutting methane emissions:** Methane has more than 80 times the warming power of carbon dioxide over the first 20 years after it reaches the atmosphere. Cutting methane emissions represents the most efficient means available to us of immediately slowing the rate of global warming, as we decarbonize our economy.<sup>38</sup> The oil and gas industry has already recognized this opportunity, and 'flared' methane is now in some pilot programs in the United States already being utilised to mine bitcoin and to reduce emissions<sup>39</sup>. Prior to these projects, more than a billion dollars in natural gas was flared in the US alone (therefore both wasted and acting as a pollutant greenhouse gas), whereas captured methane can now be monetised and consumed in Bitcoin mining rather than being either flared or released.

Additionally, an alternative and largely untapped source of methane is in the process of being cleaned up in conjunction with Bitcoin mining - that is, the methane released from landfill sites throughout the world. Landfill gas is a natural byproduct of the decomposition of organic material in landfills, and according to the United States EPA this is approximately 50% methane.<sup>40</sup> Again in the United States, landfill waste sites are the third largest source of human-related methane emissions. In the UK, although methane emissions have dropped over the past 20 years, landfill still represents nearly 36% of our domestic emissions<sup>41</sup>. As noted above, methane has over 80x the warming power of CO<sub>2</sub> in the atmosphere and reducing methane emissions represent the fastest opportunity we have to slow global warming. At present, only a minority of landfill sites have infrastructure in place to mitigate methane emissions, and building out this infrastructure comes at a cost (likely both to the landfill and to the taxpayer). Many sites will simply need to build and maintain flaring capabilities, which have a high set up and maintenance cost with no financial upside.

Certain Bitcoin pilot projects are currently under construction and will partner with landfills and install modules to mine bitcoin on-site, using methane produced by the landfill, and make such mitigation projects financially viable and even profitable both for the landfill and the relevant local authorities.<sup>42</sup> As a matter of priority, I would recommend that the UK also explores such potential means of mitigating our domestic methane emissions as we transition to net zero.

(ii) **Bootstrapping and stabilising the renewable grid:** Bitcoin miners are the most flexible customers available for an electricity grid and can make new renewable plants economically viable from day one<sup>43</sup>. Bitcoin miners buy up spare capacity when it is not needed and turn off when demand is high. I recommend a review of recent statements made by the CEO of the Electric Reliability Council of Texas, where Bitcoin miners are already collaborating with renewable energy providers to stabilise the grid, in order to understand further detail on this topic<sup>44</sup>. A Bitcoin miner, unlike any other customer, will give a

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<sup>38</sup> <https://www.edf.org/climate/methane-crucial-opportunity-climate-fight>

<sup>39</sup> <https://www.cnbc.com/2022/03/26/exxon-mining-bitcoin-with-crusoe-energy-in-north-dakota-bakken-region.html>

<sup>40</sup> <https://www.epa.gov/lmop/basic-information-about-landfill-gas>

<sup>41</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48424/5556-methane-factsheet.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48424/5556-methane-factsheet.pdf)

<sup>42</sup> <https://vespene.energy/>

<sup>43</sup> <https://www.coindesk.com/policy/2021/10/11/bitcoin-mining-is-reshaping-the-energy-sector-and-no-one-is-talking-about-it/>

renewable grid enough excess power margin in order to keep the grid running at times of high demand; miners will buy up the excess power margin when not required by the grid and can power down in minutes when demand increases<sup>45</sup>. No other buyer of electricity is able to do this, and thus enable a renewable grid both to maintain consistently high power output capability, and to stay economically viable throughout. This is a developing area of power generation but is very promising as regards our capability to create a viable renewable grid in the near term<sup>46</sup>.

Looking at the development of the Bitcoin mining industry together with building out the UK's renewable grid would be a highly-innovative and likely profitable enterprise, given the extensive potential synergies with wind, solar and ocean thermal energy power generation<sup>47</sup>.

## ***August 2022***

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<sup>44</sup> [https://twitter.com/ShawnEnergy/status/1505920632705327106?s=20&t=RPjAEy\\_1xE3u1M3q3ft5IA](https://twitter.com/ShawnEnergy/status/1505920632705327106?s=20&t=RPjAEy_1xE3u1M3q3ft5IA)

<sup>45</sup> <https://www.cnn.com/2022/02/03/winter-storm-descends-on-texas-bitcoin-miners-shut-off-to-protect-ercot.html>

<sup>46</sup> <https://twitter.com/level39/status/1548550264218583040>

<sup>47</sup> <https://bitcoinmagazine.com/business/discussing-how-bitcoin-can-unlock-ocean-energy>