Environmentally harmful technologies – Should they be banned? Can they be banned? Part 2

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There is no such thing as sustainable technology, as technological development excludes sustainability. It does not mean that all technology efforts directed at improving the ecological *status quo* are void and created to appease the conscience of some of the more aware scientists. In this part of the article two further emerging technologies are going to be examined and followed by a conclusion summarizing the two parts of the article.

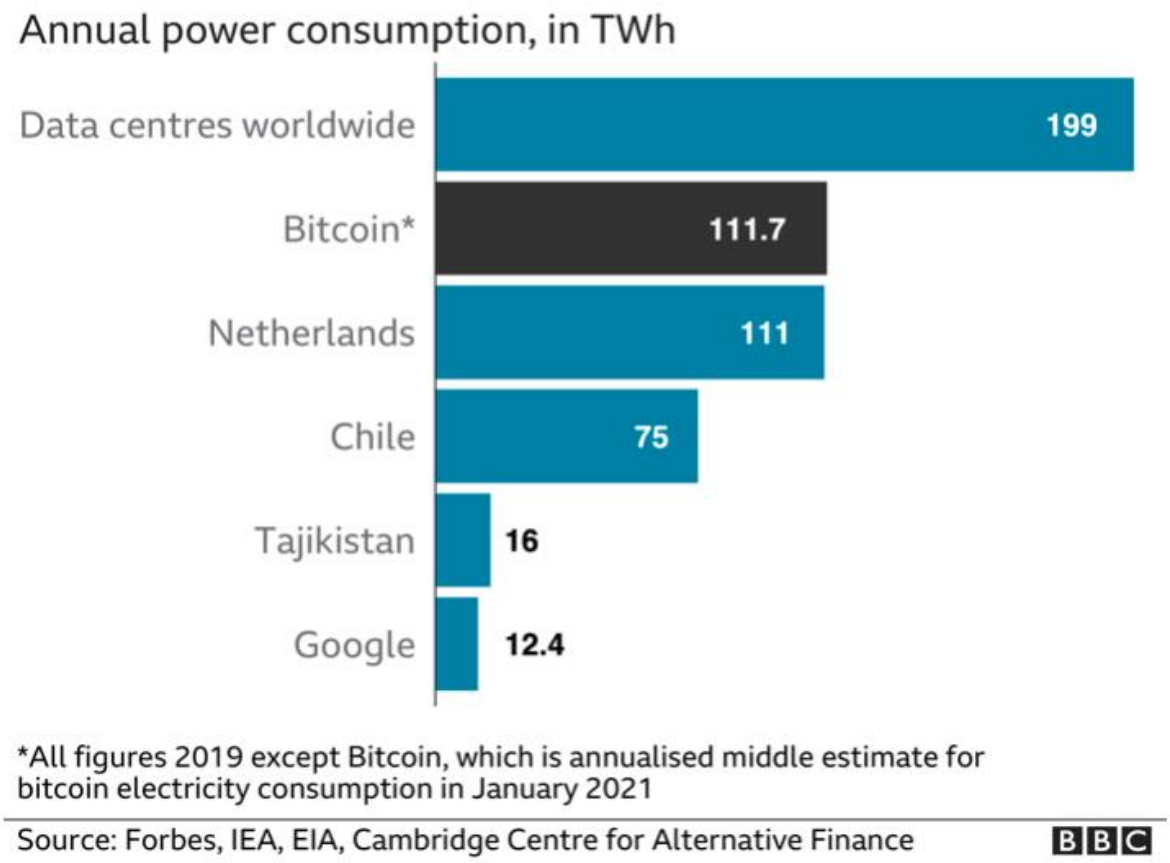
Non-fungible tokens and cryptocurrencies

Non-fungible tokens (NFTs) are digital assets that represent real-world objects, such as art, music, in-game items, and videos. They are traded online, typically with cryptocurrency, and function under a similar software as the cryptos. They are, however, non-fungible — that is, they cannot be easily exchanged for the same value[1]. Many NFTs represent creations that already exist somewhere in the world. NFTs allow the buyer to own the original item, and the rights themselves might be sufficiently profitable[2]. **The technology is gaining popularity year by year, and the prices for certain items are skyrocketing, making the technology the next step from cryptocurrencies, a technology that may inevitably make the sort of transactions even more popular than before.** For example, with the use of NFTs, in February 2021 an animated Gif of Nyan Cat sold for more than $500,000. Twitter's founder Jack Dorsey promoted an NFT of the first-ever tweet, with bids hitting $2.5m[3].

The reason why NFTs are problematic for the environment is similar to the reason why the 5G technology is — the amount of electric energy it requires to run. And the following discussion applies to cryptocurrency technologies as much. It is not known exactly how much energy cryptocurrencies or NFTs use, as by design they are hard to track. Nevertheless, the consensus is that the development and running (mining) of such technologies requires much energy. To illustrate, it has been estimated that bitcoin consumes similar amounts of energy to the entire Netherlands[4]. A Bitcoin transaction consumes 980 kWh, enough to power an average Canadian home for more than three weeks, as reported by some commentators[5]. The more

[1] One bitcoin is exchangeable one bitcoin, just like one dollar is exchangeable for one dollar.
[2] Conti R. and Schmidt J. 2021. "What You Need To Know About Non-Fungible Tokens (NFTs)". Forbes. https://www.forbes.com/advisor/investing/nft-non-fungible-token/ accessed 10 October 2021.
[3] 2021. "What are NFTs and why are some worth millions?". BBC. https://www.bbc.com/news/technology-56371912 accessed 10 October 2021.
[4] Rowlatt J. 2021. "How Bitcoin's vast energy use could burst its bubble". BBC. https://www.bbc.com/news/science-environment-56215787 accessed 10 October 2021.
[5] 2021. "Sustainability solution or climate calamity? The dangers and promise of cryptocurrency technology". UN News. https://news.un.org/en/story/2021/06/1094362 accessed 23 October 2021.

computers are used to create cryptocurrency or token, or to transfer it, the safer it becomes. Hence, the tokens get more valuable, and the technological and energetical costs inevitably increase[6]. **One must note the reported efforts to make crypto-transactions carbon—emission-free.** Admittedly, if implemented on a wide scale, these would change the ground of this discussion. Yet, whether this becomes a reality is doubtful, and a question will remain — of whether it is not wasteful in itself to spend such amounts of energy on something that is not essential[7].



Graphic source: https://www.bbc.com/news/science-environment-56215787

Only a small fraction of countries have banned bitcoin, with some being sceptical and partially restricting its use. The most well-known example of a ban on such technologies is China's

[6] Rowlatt J. 2021. "How Bitcoin's vast energy use could burst its bubble". BBC. https://www.bbc.com/news/science-environment-56215787 accessed 10 October 2021.
[7] 2021. "Sustainability solution or climate calamity? The dangers and promise of cryptocurrency technology". UN News. https://news.un.org/en/story/2021/06/1094362 accessed 23 October 2021.

regulatory battle to prohibit the use of bitcoin. The primary reasoning behind the move was not an environmental concern; environmental implications were, however, acknowledged[8]. On top of official regulations, China's National Development and Reform Commission was set to cut off financial support and electricity supply for mining of the units[9]. Such laws are also affecting the mining and trade with NFTs. Even though some were remaining positive China would double down on the restrictions, from the newest declarations it seems the course of action will not change[10].

This is, however, a discussion on cryptocurrencies. Thailand is an example of a country that explicitly banned NFTs. Notably, only trading with NFTs is prohibited, not the issuing, which requires the largest quantities of energy[11]. It is because digital asset exchanges are easier to control. The Thai regulator did not list environmental concerns as the primary reasoning behind the ban[12].

India is said to possibly set out a law banning all crypto-like technologies, including even their possession (unlike China)[13].

In Europe, the use of the technology is not restricted. The European Union has only recently begun to look at its restriction, nevertheless, for the sake of transparency and halting of money-laundering rather than because of environmental concerns[14]. The question is if it could be – and the environmental ground for prohibition could be found. The primary source of such can be found already in the Treaties, in Article 3(3) of the Treaty on the European Union (TEU) to be exact in which it is stated that the Union 'shall work for the sustainable development of

[8] Xin L. 2021. "China regulators to ban crypto trading and speculation". Pinsent Masons. https://www.pinsentmasons.com/out-law/news/china-regulators-to-ban-crypto-trading-and-speculation accessed 10 October 2021.
[9] John A., Shen S. and Wilson T. 2021. "China's top regulators ban crypto trading and mining, sending bitcoin tumbling". Reuters. https://www.reuters.com/world/china/china-central-bank-vows-crackdown-cryptocurrency-trading-2021-09-24/ accessed 10 October 2021.
[10] Yang Z. 2021. "Can NFTs happen in a crypto-less China? Amazingly, yes.". Protocol. https://www.protocol.com/china/china-nft-crypto-workarounds accessed 10 October 2021.
[11] 2021. "Thailand bans NFT trading". Ledger Insights. https://www.ledgerinsights.com/thailand-bans-blockchain-nft-trading-nonfungible-token/ accessed 10 October 2021.
[12] 2021. "Thailand bans NFT trading". Ledger Insights. https://www.ledgerinsights.com/thailand-bans-blockchain-nft-trading-nonfungible-token/ accessed 10 October 2021.
[13] Ahmed A. and Anand N. 2021. "India to propose cryptocurrency ban, penalising miners, traders - source". Reuters. https://www.reuters.com/article/uk-india-cryptocurrency-ban/india-to-propose-cryptocurrency-ban-penalising-miners-traders-source-idUSKBN2B60QP accessed 10 October 2021.
[14] Bateman T. 2021. "EU will make Bitcoin traceable and ban anonymous crypto wallets in anti-money laundering drive". EuroNews. https://www.euronews.com/next/2021/07/21/eu-will-make-bitcoin-traceable-and-ban-anonymous-crypto-wallets-in-anti-money-laundering-d accessed 10 October 2021.

Europe (...) and a high level of protection and improvement of the quality of the environment'[15]. A little bit further, in the same article, it is said that the Union is obliged to contribute to 'sustainable development of the Earth' in its relations with the wider world[16]. This is further highlighted in Article 21 TEU concerning the external action of the Union. Article 11 of the Treaty on the Functioning of the European Union restates the obligation codified in Article 3 TEU, that 'Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development'[17]. **These notes are ground for establishing a framework both for internal as well as external handling of the technology for the EU. The question of whether the law should be harmonised, and on what grounds, is a subject of a more detailed investigation.**

Looking even wider, having in mind the manifold declarations, programmes, and conventions of the UN[18] and beyond, most countries and international bodies have bound themselves with the duty to promote and oversee sustainable development. Finding a transgression in their inaction when it comes to the control or ban of cryptocurrencies is not difficult and could set a ground for an introduction of concrete legislation.

5G

5G is defined as the fifth-generation (hence the most commonly-used name '5G') of cellular networks. It is 100 times faster than the technology of the fourth generation[19]. The increased speed is possible since the technology is designed to use a wider radio spectrum, which also allows more devices to be connected simultaneously[20]. As said, it is to create new business opportunities and is to transform life as it has been known[21], primarily because of the incentives such speediness and hence, easiness of use this creates.

[15] Consolidated version of the Treaty on European Union - TITLE I: COMMON PROVISIONS, Official Journal 115 , 09/05/2008 P. 0017 - 0017.
[16] Consolidated version of the Treaty on European Union - TITLE I: COMMON PROVISIONS, Official Journal 115 , 09/05/2008 P. 0017 - 0017, Article 3(5).
[17] Consolidated version of the Treaty on the Functioning of the European Union - PART ONE - PRINCIPLES, TITLE II - PROVISIONS HAVING GENERAL APPLICATION, Article 11.
[18] Notable example being the United Nations Framework Convention on Climate Change 1992.
[19] "5G by Ericsson". Ericsson. https://www.ericsson.com/en/5g accessed 6 October 2021.
[20] 2020. "What is 5G and what will it mean for you?". https://www.bbc.com/news/business-44871448 accessed 6 October 2021.
[21] "5G by Ericsson". Ericsson. https://www.ericsson.com/en/5g accessed 6 October 2021.

5G emits high-frequency millimetre waves, which do not reach far, hence, for the technology to run appropriately, there need to be many antennas in close proximity. It makes the technology inept to replace 3G or 4G, but rather it may serve as an addition enhancing the experience. The radiation emitted by the 5G antennas is what is so controversial about the technology. Some scientists claim that the radiation which enters the atmosphere is not ionising, hence it is said not to be potent for affecting atoms or molecules (which could lead to cancers and other unpredictable mutations in living beings)[22]. Still, there are large groups that advocate for its ban and cease of implementation. The public has been polarised for years. There have been as many recommendations for development as reports instructing caution or ban.

The matter is difficult to investigate, as mentioned above, since the technology is relatively new and there is much controversy surrounding it, with some groups claiming and publishing not always truthful or diligent works that confirm one thesis or another — that the technology is dangerous to human health and the environment, or not. One of those uncertain reports is the one from 2018, from the Netherlands, in which it was claimed that the technology caused the death of hundreds of birds due to the radiation emitted by a nearby 5G mast[23]. As it happened, it was found to be a hoax[24].

Yet, one thing being certain, such development comes at a cost. All cellular networks, since running at high frequencies, consume large amounts of energy[25], according to IEEE Spectrum, up to three times the energy it takes to power the LTE networks[26]. Certainly, mere energy demand is not entirely harmful, as the energy can come from renewable energy sources. Nevertheless, taking the large demand, and the universal 'struggle' to drop fossil fuels, it is

[22] Wolf J. 2021. "Is 5G bad for the environment? Five Fast Facts". Sustainable Review. https://sustainablereview.com/is-5g-bad-for-the-environment/ accessed 11 October 2021.
[23] 2018. "Hundreds Of Birds Dead During 5G Experiment In Netherlands". Captain Planet. https://www.captain-planet.net/hundreds-of-birds-dead-during-5g-experiment-in-netherlands/ accessed 6 October 2021.
[24] 2019. "Hundreds of birds were found dead in the Netherlands but it had nothing to do with 5G". Full Fact. https://fullfact.org/online/birds-5G-netherlands/ accessed 6 October 2021. And interestingly, such claim was made again, just 2 years after: 2020. "False claim: Pictures link bird deaths to new 5G mast in the Netherlands". Reuters. https://www.reuters.com/article/uk-factcheck-starlings-netherlands-idUSKCN22A3D9 accessed 6 October 2021.
[25] Salem F. E., Tall A., Altman Z. and Gati A. 2016. "Energy consumption optimization in 5G networks using multilevel beamforming and large scale antenna systems". IEEE. https://ieeexplore.ieee.org/abstract/document/7564904?casa_token=VHpUknTm3FoAAAAA:0tiw4W61YeVgP9iPWfOmV4pd5pAvJ1JO4rbRIAmUlnLHDQxrTuNm3UR5jKBcqEBaJmp-uXjc-x-hdw accessed 6 October 2021.
[26] Lessing M. 2020. "What Is the Environmental Impact of 5G?". SDX Central. https://www.sdxcentral.com/5g/definitions/what-is-environmental-impact-of-5g/ accessed 11 October 2021.

typical that the energy comes from the most impactful energy sources. Notably, however, some service providers, such as Ericsson, committed to creating energy-efficient 5G networks on renewable energy sources, also for storage[27]. This is not a mainstream approach, and unless it becomes such, the technology should be deemed a potent polluter. Moreover, which is not mentioned frequently, the needed infrastructure for 5G leads to increased deforestation[28].

Crucially, it is impossible to separate environmental concerns from health concerns while talking about 5G. Ultimately, if a technology that has detrimental effects on human, animal, and plant health is employed, this must have detrimental consequences on the natural habitats and environments.

Some lawsuits have been filed against the technology and its implementation, for example in India. The quite controversial suit of actor Juhi Chawla in the Bombay High Court was dismissed, however, on the grounds of being defective and, as said by the court, 'filed for media publicity'. The court did not dismiss the health and environmental concerns of the plaintiff, but rather noted that the claim she came forward with, for more research preceding the implementation, should have been addressed towards the government before reaching the court[29].

No state has banned 5G explicitly. Some countries have not introduced it yet, for mostly technical reasons or fearing public contempt. If a bad is reported, it is directed at a specific provider, for example, as happened with Chinese Huawei because of public security reasons. Interestingly, the European Union has not explicitly prohibited Huawei or other 5G equipment vendors, leaving the final decisions to the Member States[30].

Many countries are preparing to welcome the technology; hence, it can be assumed that the environmental concerns are not seriously considered worldwide. **Yet this technology is the more interesting for this discussion and the overall question of how far humanity can go in its consumption before it will start paying too high of a price**. When one looks for a list

[27] Saya S. "Enabling network connectivity through intelligent and green energy site solutions". 2020. Ericsson. https://www.ericsson.com/en/blog/2020/10/enhancing-rural-connectivity-through-green-energy-solutions accessed 11 October 2021.
[28] Wolf J. 2021. "Is 5G bad for the environment? Five Fast Facts". Sustainable Review. https://sustainablereview.com/is-5g-bad-for-the-environment/ accessed 11 October 2021.
[29] Ahsan S. 2021."HC dismisses Juhi Chawla's suit against 5G, imposes fine of Rs 20 lakh". Indian Express. https://indianexpress.com/article/cities/delhi/hc-dismisses-juhi-chawlas-suit-against-5g-technology-imposes-cost-of-rs-20-lakh-7344143/ accessed 6 October 2021.
[30] Goddard W. 2020. "Where Is 5G Available? Where is it banned?(Updated for 2021)". IT Chrnicles. https://itchronicles.com/5g/where-is-5g-available/ accessed 11 October 2021.

of countries that have banned the use of 5G, what information frequently appears is that bans are not seriously considered anywhere in the world as states 'cannot afford' to miss out on the opportunities the technology provides for their communication networks.

Analogously to the geoengineering techniques, because of the danger of polluting habitats, similar legal bases can be used to bar the implementation and use of 5G. For Europe especially relevant would be, for example, the Habitats Directive with its codified duties to create effective protection schemes. With the general charter obligations and international conventions and goals not being neglectable when it comes to the general aspect of the unsustainability of the technology. Additionally, if sufficiently convincing research data is gathered, the technology could be banned due to health reasons, based on the plethora of existing directives and regulations, transnational or national.

Conclusion

As quickly emerges from the article, the technologies can be drawn under bans under similar legislative acts. It shows that despite large differences, the main link they share, that is the fact that they might be unsustainable, is what could make an action against them rather uniform. **It is a conclusion lawyers may often come across; ultimately, the law is often very general and what is needed are people who can interpret it well and jointly.**

This article would not be objective if it did not acknowledge the redeeming qualities or prospects each of these technologies brings. They have been acknowledged above to a varied extent but it is important to note that when assessing what price humankind can still afford, it is crucial to not wave away the priceless benefits these could offer, for geoengineering this could be even the significant slowing down of the environmental catastrophe.

The assessment is not for the author of this article to be made. **Yet, what is certain, an open, informed, and inclusive dialogue on these matters is needed on the highest levels, internationally and nationally, to jointly answer the questions continuous technological development brings forward.**

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