

CLIMATE CHANGE, ENERGY AND ENVIRONMENT

BITCOIN ADOPTION AND MINING IN EL SALVADOR

Deepening of inequalities and setbacks in
environmental and climate change matters

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Equipo Impulsor Nacional
del Acuerdo de Escazú
EL SALVADOR

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INTRODUCTION

The recent approval and entry into force of the Bitcoin Law in El Salvador involves serious socio-environmental problems, ranging from the deepening of inequalities in access to electricity, increased dependence on imports of this good, to the environmental impacts that are mainly related to the global climate change phenomenon. Facing this, the present document aims to provide a look at these problems, taking into account that a decision without consultation and of such magnitude, not only implies the breakdown of the rule of

law, but that it will eventually provoke that the economic, social and environmental costs must be assumed by the entire society as a whole.

It is important to point out that, as context to this document, a previous issue called "*BITCOIN, ENERGY USE AND CLIMATE CHANGE; Global perspectives about cryptoasset mining*" has been generated, to which readers can refer in order to get a broader picture of Bitcoin mining.

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ADOPTION OF THE BITCOIN LAW IN EL SALVADOR

El Salvador has appeared recently in the international scenario, many years after its name appeared strongly due to the events generated by the armed conflict that ended with the signing of the Peace Agreements in 1992. Currently, the country is mentioned in the global map but not regarding the post-conflict, the growing insecurity or the gang phenomenon that plagues society, but due to the repeated outbursts of President Nayib Bukele, who in his obsession for total control, has provoked the breakdown of the rule of law, the weakening of democracy and the dismantling of institutions, consummating serious setbacks in matters of human rights.

Recently, in June 2021, the Presidency of the Republic announced that they would submit a project to the Legislative Assembly to make the bitcoin legal tender, an initiative that was approved by the official bloc of political parties allied to the President, particularly by *Gran Alianza por la*

Unidad Nacional (GANA) and *Nuevas Ideas*, this without carrying out a public consultation that guaranteed the right of access of citizens, in terms of access to information and participation.

With a lot of paraphernalia and a strong advertising apparatus, very characteristic of the president, it was officially announced that El Salvador would be the first country in the world to produce geothermal energy for Bitcoin mining, something that had a strong echo in the media in sectors of the population, generating serious doubts and questions about its implementation, especially because (as it has been a hallmark of the current government administration since it assumed its mandate), besides the announcement, no details were given nor official information was published regarding investment costs and social, economic and environmental feasibility studies of this initiative.

Besides the legal circulation of Bitcoin, the country has launched its own *App* and ATM network called “Chivo” to make transactions with this cryptoasset and has given, with public funds, a bonus in Bitcoin equivalent to US \$30.00 for people to use at their own discretion. Officially, the government administration did not submit to tender and contracting the company that manages the *App*. However, thanks to journalistic investigations, it is now known that the Chivo, S.A. de C.V. private company, owner of the application, has among its representatives persons that are members of the *Nuevas Ideas* party and its allies¹.

This is but one more example of the lack of transparency and opacity that reigns in the country with the current government administration. The really worrisome part of this maneuver of the Presidency is that, given that it is a private company, they want to create the perception that it is not under the obligation to comply with the guidelines of the Law on Access to Public Information and the regulation of the Court of Accounts of the Republic.

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STATUS OF THE ENERGY MATRIX IN THE COUNTRY AND ITS CAPACITY TO MINE BITCOIN

Besides all the irregularities occurred since the adoption of the Bitcoin, there is the issue of potential deepening of social inequalities and significant environmental impacts. This cryptoasset mining in a country where the needs of energy use and distribution are not solved, requires an analysis of which could be the consequences of a decision little discussed and with multiple abuses in its implementation. According to energy consumption data obtained by *The Cambridge Bitcoin Electricity Consumption Index* (CBECI), the Bitcoin Network has consumed at the world level, a total of 83.91 terawatts-hour (TWh) between January and October of this year, representing for the case of El Salvador, more than 13 times the consumption of the entire country for one year².

Given that scenario, it must be taken into account that at least 11 of every 100 Salvadoran households do not have direct access to electricity, having to satisfy this need by connecting to neighboring homes, the use of kerosene, candles or generators³. Thinking about allowing additional energy use, knowing that household needs are not yet resolved, is, to say the least, questionable.

The application to be used in mobile phones has proven to be extremely invasive and unreliable with respect to the use of the personal data of users. Technology experts have warned that its use does not meet the necessary security conditions and there are already many cases of complaints of identity theft about people that intend to obtain, illegally, the US \$30.00 bonus with which the government administration seeks to encourage the use of this cryptoasset. Neither the *App* nor the transactions count on guarantees or support; on the contrary, to use the technology, users must register and hold the company harmless in the future.

As with the *Chivo App*, the acquisition of equipment to install the first mining farm was not put out to tender, nor was information about its cost made public. The farm is located in the municipality of Berlin, in the department of Usulután, where a plant of the La Geo government company is installed, which manages the geothermal wells of that energy generation facility.

On the other hand, there is a growing demand from other sectors, including large and medium demands from diverse economic sectors. According to the General Superintendence of Electricity and Telecommunications, for 2019, 36 % of the demand was concentrated in the residential area and 44 % in large demand. These two categories represent the largest percentage in energy use (Graph 1). Analyzing this distribution is important since, as with any good or service, the quantity is limited and introducing additional uses would generate pressure on the demand, where necessarily one of the current categories would be affected, presumably, the residential sector.

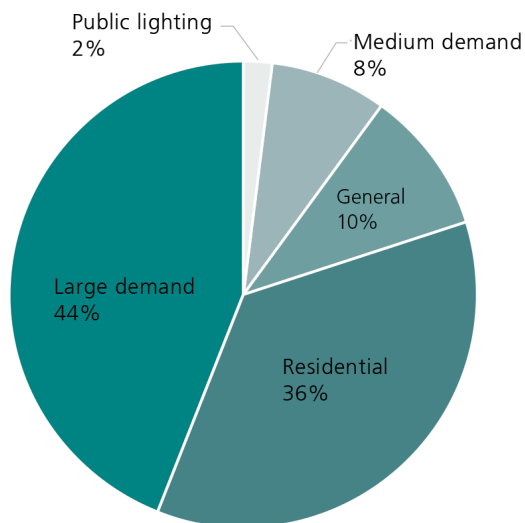
Additionally, El Salvador still depends on energy imports. According to SIGET, in 2019, 21.8 % of the energy consumed came from countries such as Honduras and Guatemala. The Latin American and Caribbean Energy Information System (SIELAC) shows for the case of El Salvador how the Energy Import Dependence Index has been increasing in recent years (IDIE, Graph 2), reflecting the country’s loss of capacity to satisfy its energy needs through self-supply.

¹ El Faro. 2021. Chivo is a private companies financed by public funds (on line, web site). Consulted 11 Nov. 2021. Available at https://elfaro.net/es/202109/el_salvador/25707/Chivo-es-una-empresa-privada-financiada-con-fondos-públicos.htm.

² The University of Cambridge. 2021. Cambridge Bitcoin Electricity Consumption Index (CBECI).

³ DIGESTYC. (2020). Multi-Purpose Household Survey 2019.

Graph 1
EL SALVADOR: STRUCTURE OF ENERGY DEMAND IN THE DISTRIBUTION SYSTEM 2019

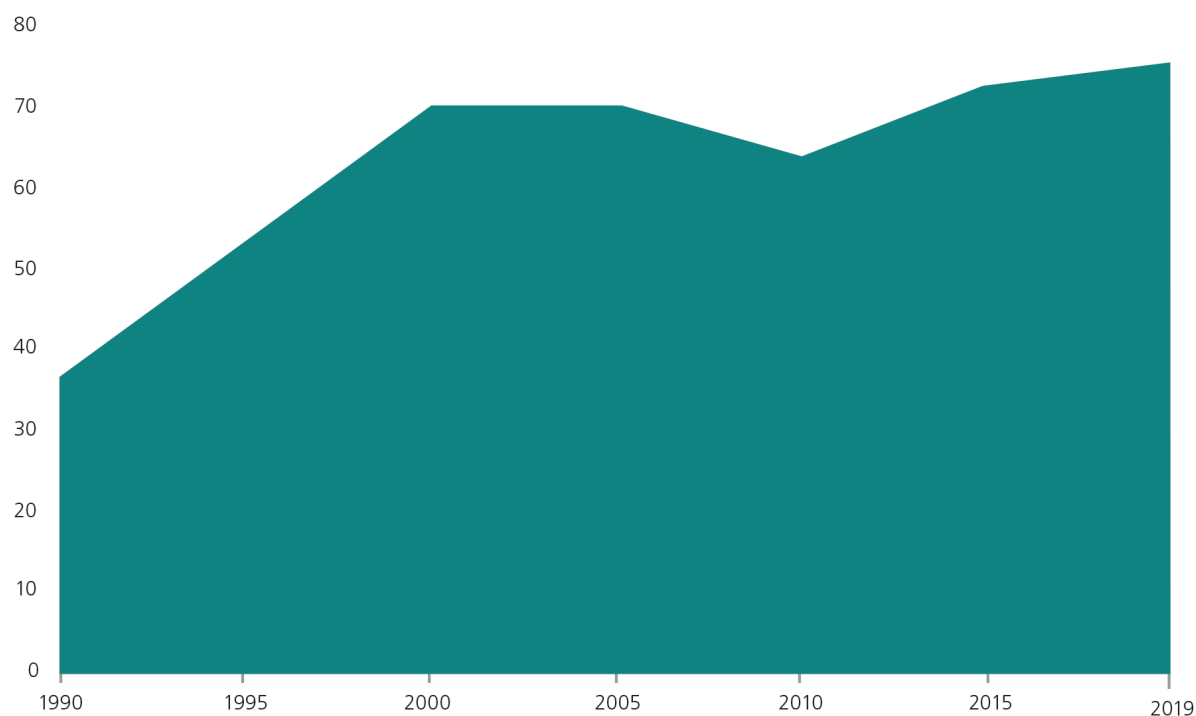


Source: Prepared in-house based on SIGET data (2019)

It is necessary to point out that, although the government administration has announced that bitcoin mining would be carried out in the country with geothermal energy, this does not imply that the impacts on increased inequalities in access to energy are lower, since, although that source is the second most important for the case of the country (Graph 3) and could be considered renewable energy, the

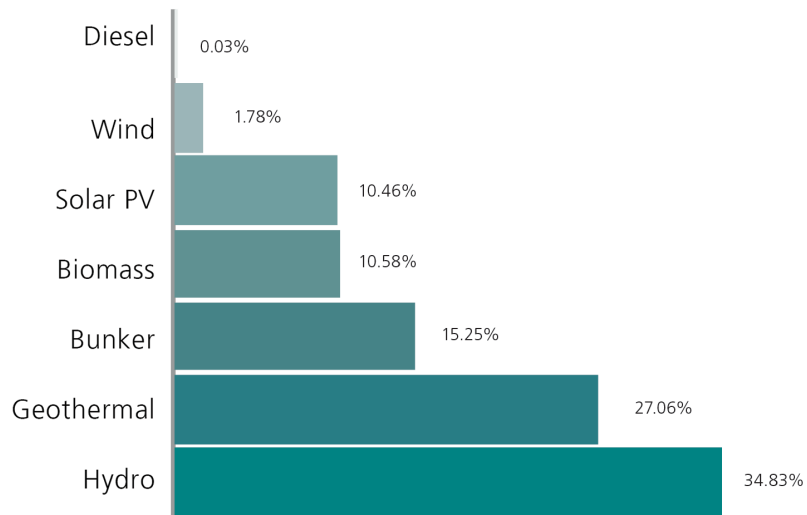
gap between energy demand and supply has not closed. Besides, renewable energy supply indicators per person in the case of the country have not fallen, implying that even if renewable sources are increasingly significant, population growth has been greater than the supply coming from renewable sources (Graph 4).

Graph 2
EL SALVADOR: ENERGY IMPORT DEPENDENCE INDEX (IDIE), 1990-2019



Source: Prepared in-house based on SIELAC, 2021.

Graph 3
EL SALVADOR: CUMULATIVE ELECTRICAL GENERATION MATRIX IN 2021. PERCENTAGE DATA TO OCTOBER 31.



Source: Prepared in-house based on data from the National Energy Council (2021)

Graph 4
EL SALVADOR: RENEWABLE ENERGY OFFER PER CAPITA (PRODUCTION/INHABITANTS), 2005-2019



Source: Prepared in-house based on SIELAC, 2021.

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SOCIO-ENVIRONMENTAL IMPLICATIONS OF BITCOIN ADOPTION

It is known and recognized internationally with broad consensus from the scientific community that the polluting energy matrix based on fossil fuels and the production and consumption patterns of the development model based on extractivism and consumerism, are two of the great causes of climate change and environmental deterioration on the planet since the time of industrialization.

Based on those premises, Bitcoin mining does not imply anything transforming or innovative with respect to those patterns. Concretely, it is technology that comes to deepen practices that are leading societies to a point of no return with respect to the possibility that life as we know it can continue and reproduce.

Bitcoin mining is not sustainable because it does not represent a long-lasting solution. To the extent that Bitcoin is based on extractive practices from the logic of the exploitation of nature seen as a commodity, without taking into consideration the right of current and future generations to fully enjoy a healthy, safe, clean and resilient environment, it makes this technology be non-sustainable by not working indivisibly the three dimensions of sustainable development: social, environmental and economic.

For countries such as El Salvador, the use of energy for Bitcoin mining represents the deepening of territorial and national inequalities in access to energy that, although not yet recognized as a right, impoverished communities do claim it and affirm it as such.

On the other hand, taking into account that the transformation of production and consumption patterns is one of the great urgent and necessary challenges to tackle given the effects and accelerated manifestations of climate change, it is important to make visible that, despite being

one of the aspects that rarely appears in the discussion on Bitcoin mining, such mining results in excessive generation of electronic waste. According to information obtained by social networks from official accounts of the government administration (since it has not been officially reported), it is known that the country's mining farm has at least 300 computers for Bitcoin mining. Application-Specific Integrated Circuit (ASIC) equipment, which is the most widespread and widely used worldwide and is difficult for non-corporate or state users to access, has a basic cost of US \$4,000.00 and has a relatively short lifespan, between 6 months and 1 year as a maximum.

Bitcoin mining is a luxury that this impoverished country cannot and should not afford. While there are computers mining 24/7, communities are denied their rights, without real and effective solutions for the domestic use of energy as a global common good. The abusive imposition of this technology is outside of all ethical sense and political commitment to the environment and human rights. The prevailing reality of the country demands, instead, that significant investment be made in the critical stages of people's life cycle and in strengthening the framework of public policies for environmental protection.

The situation is much more dramatic if we take into account the severe condition of the country's public finances, with a high level of indebtedness that impacts negatively on the full realization of human rights, which are denied through cuts to the public budget, mostly in the social and environmental areas. The Bitcoin experiment in a country like El Salvador will be very expensive for current and future generations, because it does not represent a long-lasting sustainable solution, but a false solution to maintain and preserve the culture of privilege and impunity that subdues peoples and exploits nature.

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BITCOIN MINING IN EL SALVADOR AND ITS IMPLICATIONS FOR CLIMATE CHANGE

It is undeniable how since their appearance, crypto assets have positioned themselves internationally as a high-growth stream; however, there are many aspects that have not been adequately considered, especially in terms of the impacts and repercussions that these may have with respect to the fulfillment of the international commitments of States in environmental and climate change matters.

The energy consumption for this competition that implies Bitcoin mining is very large and at a high cost, not only economic. Numerous studies indicate that Bitcoin consumes as much energy as entire countries, for example, Norway and Argentina, among others⁴. What this situation implies in particular is an environmental disaster, considering that renewable energies at present are not stable enough to sustain the great energy demand of this cryptoasset, because the cheapest and continuous energy necessary to keep this technology running uninterruptedly, ends up being coal and fossil fuels, something totally counterproductive for the achievement of the goals established in the instruments on environment and climate change, such as the Paris Agreement, the United Nations Framework Convention on Climate Change (UNFCCC) and the Resolutions of the United Nations Environment Assembly.

With the decision to impose Bitcoin as legal tender in the country, the Executive Branch is turning its back on the fulfillment of the foundation that no one is left behind, established in the 2030 Agenda and the Sustainable Development Goals (SDGs), where the inclusion of historically and systematically excluded people and groups is clearly defined as a priority. In addition, it establishes specific goals and indicators in matters of transformation of the energy matrix and production and consumption patterns.

The electronic waste that is being generated with Bitcoin mining will significantly increase the debt and ecological footprint across the planet and represents an affront to the

fulfillment of international commitments on climate change and environmental protection, especially efforts to meet the global goal that global temperature does not increase to more than 1.5°C.

The Conference of the Parties (COP26) began with a powerful message from the Secretary-General of the United Nations, Antonio Guterres, with a not particularly diplomatic speech, urging States to take drastic actions urgently. Likewise, it has been the strong calls of young people such as Greta Thunberg from Sweden and Francisco Vera Manzanara from Colombia, who have warned of the importance of climate change in the face of the prospects for the future of children and youth at a global level.

While decisions regarding climate change extend beyond the COP26, States are walking different and diverse paths, often counterproductive. In general, there is a total lack of sense of urgency, being evident that the calls of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) that warn of the need to take forceful actions before 2030, have not been enough to become aware that the continuity of life as we know it is under threat.

For countries of the Global South, such as El Salvador, although it is true that it is not a country considered a significant emitter of Greenhouse Gases (GHG), since it only represents 0.04% of total emissions generated at the global level⁵, it is urgent and necessary to adopt adaptation measures to achieve the resilience of communities, since, according to climate change scenarios and projections, extreme events will be increasingly intense and frequent. Given this situation, the country must clearly establish its Nationally Determined Contributions (NDCs), prioritizing fundamental rights such as water, food, and energy, among others.

⁴ The University of Cambridge. 2021. *Cambridge Bitcoin Electricity Consumption Index (CBECI)*

⁵ López, M. 2020. Changes in the productive structure and carbon emissions in Salvadoran economy for the 2005-2014 period.

El Salvador went to the COP26 without having fulfilled the task, at the close of the meeting in Glasgow it was one of the countries that did not fulfill the responsibility of presenting the update or a new NDC, as established by the Paris Agreement, which is a Law of the Republic. With the support of the United Nations Development Program (UNDP) and with funding from the United Kingdom, the Ministry of the Environment. it has been working for months on a process called "NDC Agenda El Salvador", where they have prepared a set of measures to advance towards the update of the NDC, all this without publishing the draft of the document and without establishing any mechanism for public participation, excluding the voices of the various actors and sectors of society.

The Ministry of Environment and Natural Resources (MARN) acted opportunistically at the COP26, taking advantage that the regulation of carbon markets in the rulebook of Article

6 of the Paris Agreement failed to materialize⁶. Fernando López, Minister of the Environment, has maintained that the country will be a pioneer in the use of cryptoassets with respect to the financing of adaptation measures to climate change, through the commercialization of carbon credits based on Blockchain technology, an approach that, according to the evidence presented in this research, is totally contradictory, both because of the intensive use of energy that this technology implies, and of the potential increase in electronic waste that ASIC equipment used in Bitcoin mining can generate in the very short term. Regrettably, the MARN, as the governing institution of environmental policy and as the focal point of the United Nations Framework Convention on Climate Change (UNFCCC) in the country, has failed to fulfill its role as guarantor of the environmental rights of the population and as guarantor of the integrity of the environment throughout the national territory.

⁶ The rulebook of Article 6 of the Paris Agreement, was adopted in the COP24 in Katowice, Poland, and will function as a road map that will guide the actions of countries in the fight against global warming. It represents a set of common guidelines for the effective implementation of the Paris Agreement.

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CONCLUSIONS

The implementation of the Bitcoin Law is showing how the country is being managed as a private company, replacing public policies with advertising promotions of the private company that manages the services of the Chivo App, with the aggravating factor that it works with public funds. Deliberately, the current government administration has abandoned the environmental dimension in state public management, reducing the Ministry of the Environment to a permit issuing agency and not honoring the framework of national public policies in matters of environmental protection and climate change.

On the other hand, the country's citizens do not have a national public policy framework that ensures mechanisms of democracy and environmental governance. As previously shown, setbacks in access to public information, transparency and accountability are deliberate human rights violations by the current government administration, where people see an ever-increasing reduction, not only of the civic space, but above all, of the spaces of dialogue with the instances of the State, which establish a distance with the social organizations that claim social comptrollership as an unavoidable element for the full exercise of citizenship.

It becomes necessary to understand and assume that environmental protection goes hand in hand unavoidably with the exercise of citizenship. Article 12 of the Paris Agreement

and Article 6 of the United Nations Framework Convention on Climate Change clearly establish the importance of education, training, social awareness and public participation as transcendental elements for the mutual reinforcement of actions for climate empowerment. Without this level of ethical and political commitment, efforts will be insufficient and, therefore, any decision taken by States that may have negative repercussions on the integrity of the environment must be complete, without excuses, citizen participation as the main means of implementing public policies.

Finally, it should not be ignored that the adoption of Bitcoin in El Salvador represents a serious problem for communities and territories that, in the midst of 2021, still do not have their needs for access to electricity covered. The additional use that bitcoin mining implies will deepen inequalities in this matter, and may even lead to cost increases in the service, as well as to the eventual increase in energy imports, in order to meet national demand.

In conclusion, with the evidence presented, it is undeniable that Bitcoin mining in El Salvador is not sustainable economically, socially, or environmentally. Besides, it could imply in the short term, a significant barrier to the achievement of the commitments on climate change adopted by the country and in general, for the fulfillment of the Sustainable Development Goals.

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Friedrich-Ebert-Stiftung (FES) arrived in El Salvador in 1989, with the aim of supporting dialogue between the country's leftist forces, in the face of the peace agreement negotiations between the government and the Farabundo Martí National Liberation Front. It acquired its status as an "International Mission" in 1995 and, since then, has been able to support various processes of research, formation, debate and political advice in collaboration with diverse social, political and governmental actors who identify with democratic values, feminism, human and environmental

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