Blockchain Policy Recommendations

April 2023

1 Introduction

By 2030, Blockchain deployment could add $3 trillion in international trade.[1] Luxembourg will be particularly impacted by blockchain. By 2030, Blockchain is anticipated to have the second-highest worldwide impact by 2030, increasing Luxembourg's GDP by 2,6%, or USD 2 billion. In addition, 6.600 additional jobs will be created because of blockchain.[2]

Blockchain technology and other distributed ledger technologies (DLT) can provide significant benefits to Luxembourg's economy, particularly in its most important economic sectors, including financial services, supply chain, logistics and ICT. Blockchain technology also has major advantages for the public sector, including the capacity to enhance data security and privacy, increase openness and accountability in government procedures, and boost operational efficiency and effectiveness.

Luxembourg needs to be prepared for the challenges raised by blockchain and to reap the benefits.

Potential developments in DLT in other centres could supersede core activities in Luxembourg industries, particularly Finance, where Luxembourg is lagging behind countries like France, Germany, Liechtenstein, Switzerland or the UK.[3] Luxembourg needs to take the lead for its own future competitiveness. The goal of Luxembourg is to be a leading digital nation; a focused blockchain strategy will significantly advance this goal.

In view of the upcoming legislative elections, this document provides recommendations from the Luxembourg Blockchain Innovation Cluster, the Luxembourg Blockchain Lab,[4] to the Luxembourg political parties with regards to the inclusion of Blockchain and DLTs in their political programmes.

The Luxembourg Blockchain Lab remains available for further discussion and exchange on all the topics.

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[1] https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf

[2] https://www.pwc.com/hu/en/kiadvanyok/assets/pdf/Time_for_Trust_The%20trillion-dollar_reasons_to_rethink_blockchain.pdf

[3] Infrachain, *Blockchain 2030 study report,* Luxembourg, March 2022, cf. https://infrachain.com/wp-content/uploads/dae-uploads/Blockchain2030-report-presentation_20221006.pdf

[4] The Luxembourg Blockchain Lab was founded by Infrachain a.s.b.l., LëtzBlock (Luxembourg Blockchain & DLT Association a.s.b.l.), the LHoFT Foundation (Luxembourg House of Financial Technology), the LIST (Luxembourg Institute of Science and Technology) and SnT (Interdisciplinary Centre for Security, Reliability and Trust – University of Luxembourg).

2   Policy recommendations

- **Provide clear political support.**

  Blockchain has the potential to significantly change the financial industry. As mentioned above, blockchain is predicted to increase Luxembourg's GDP by 2,6% and generate a net of 6.600 new employment by 2030.

  Luxembourg needs clear political support for blockchain and DLTs.

  We need to be driving upcoming transformations.

  Luxembourg should launch an initiative anchored at the highest level of government. In Belgium, for instance, the State secretary for Digitalization, in charge of Administrative Simplification & Privacy, launched Blockchain4Belgium[5] in March 2023, a holistic initiative to affirm Belgium's "digital sovereignty, by displaying its support for innovation which will make it possible to attract new capital, create jobs, promote growth, and increase the retention and attraction of human talent who are experts in these technologies."

  All public authorities should pro-actively present legal and regulatory recommendations and investigate the use of blockchain to increase the global economic competitiveness of Luxembourg and well-being of its citizens. This is also made possible with a harmonized communication by all authorities, by circulating a positive message to external observers.

- **Constantly monitor legislation and regulation.**

  Blockchain is a fast-moving topic. While innovation must not be stifled by overregulation, the private sector needs legal certainty to proceed to large-scale deployments of blockchain. The public sector should put in place procedures to ensure that laws and regulations are adaptable, clear, simple, and flexible. Such mechanisms should be applicable to all economic sectors and include the private sector. These mechanisms should also guarantee that government positions at EU level duly consider the interests of the economy.

- **Provide clear guidance on relevant regulatory and fiscal questions.**

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[5] https://www.blockchain4belgium.eu/fr.html

The use of blockchain raises a lot of questions related to regulatory compliance or fiscal considerations. Some clarification has been provided in the past. However, the private sector as well as citizens need further legal certainty based on more and clearer guidance on regulatory and fiscal topics. As such, the communications and clarification should be made publicly available as to benefit to citizens and corporates.

- **Define support measures.**

  Specific support measures for blockchain projects are missing today. Especially projects based on digital assets not necessarily fitting in existing schemes. Support measures help attract and develop new activities and talent.

  There are currently no specific support mechanisms for blockchain projects. Projects, especially those dependent on digital assets, may not always fit into existing schemes. Support measures help attract and develop new activities and talent.

- **Provide Financial access to DLT companies.**

  While Luxembourg is positioning itself as being at the forefront of the digital innovation and a start-up nation, most companies active in the area of DLT and digital innovation face difficulties to access basic financial services such as the opening of bank account for example. It is a lengthy process for these companies which could deter them from being part of the Luxembourg ecosystem. A last resort solution needs to be provided or a specific agreement with one or two financial institutions should be guaranteed.

- **Support ecosystem collaboration.**

  One of the historic strengths of Luxembourg is the ease of access to decision makers and ecosystems. In particular, given that ecosystem collaboration is at the basis of the blockchain concept, Luxembourg has to leverage on this capability. Public and private sector need to continue and extend existing collaboration platforms and create new ones if needed. Initiatives like the Luxembourg Blockchain Lab play a vital role in this regard and should continue to receive active support.

- **Identify opportunities in key economic sectors and initiate large-scale projects that facilitate ecosystem collaboration.**

  Vertical and horizontal collaboration are key drivers for blockchain. Blockchain will disrupt many industries, including some key sectors in Luxembourg like finance and logistics. To maintain and reinforce the competitiveness of Luxembourg in these areas, large scale projects with a real impact should be initiated by the public sector. High attention needs to be given to interdisciplinarity and to the adequacy of the advantages brought by blockchain compared to the challenges to solve. Luxembourg also needs targeted support schemes to properly prepare the industry to a data-driven economy based on data, AI and blockchain.

  The Luxembourg Blockchain Lab is at the disposal of the upcoming new government to coordinate such large-scale projects and support schemes.

- **Create a secure environment.**
  - *Open-up the Public Sector Blockchain to the private sector.*

    The Public Sector Blockchain brings value by i.e., operating within a well-defined legal framework (the laws of Luxembourg) and by being based on validator nodes operated by trusted third parties (the public sector). Opening-up the Public Sector Blockchain to the private sector and creating bridges to public blockchains encourages more players to start their transition to blockchain adoption.

  - *Provide testbeds.*

    Making available test environments lowers barriers for getting experience with blockchain. They also provide an opportunity for large-scale demonstrators and for promotion. The Luxembourg Blockchain Lab in collaboration with Infrachain is currently contemplating the development of these testbeds within its infrastructure with the help of various DLT providers, in an agnostic way.

  - *Cybersecurity.*

    Through their inherent features, Blockchain and other distributed ledger technologies contribute to increased cybersecurity. For instance, Blockchains being decentralized, the technology reduces the risk of a single point of failure and make cyber-attacks much harder. Also, Blockchains are immutable; once data is recorded on the blockchain, it cannot be tampered. This makes the technology an important tool for improving cybersecurity, especially in sensitive industries such as finance, healthcare, and supply chain. Thus, collaboration between Blockchain and cybersecurity should be actively supported.

- **Favour sustainability.**

  To take into account sustainability considerations, any blockchain project involving or supported by the public sector should include relevant selection criteria such as energy consumption of transactions. By undertaking multiple initiatives, Luxembourg is establishing itself as one of the industry leaders. DLT is the technology that can address a wide range of problems; hence the Luxembourg Blockchain Lab is concentrating on the SDGs.

- **Prepare for cryptocurrencies.**

  As of today, the most exchanged crypto currency in volume is the Tether, a stablecoin pegged to the US dollar[6]. In Luxembourg, companies are already being paid in cryptocurrencies that are pegged to the dollar (Tether, Coinbase's USDC, etc …). The European Central Bank and other Eurozone central banks are actively pushing for Central Bank Digital Currencies (CBDC) and Digital Euro. In the timeframe from today to 2030, the advent of the Digital Euro is highly probable. The Luxembourg administration should prepare to accept Digital Euro for payment. Companies that operate using it should be able to pay VAT in this new currency.

  To a lesser extent, if plain vanilla crypto currencies (BTC, ETH) become more and more accepted as legal tender in the world, some operations should be considered to be made possible in Luxembourg (e.g. buying real estate, incorporating a company with capital in crypto currency, …).

  Remaining outside crypto related ecosystem undouble damages Luxembourg reputation as leader in financial domain and digitalization aspects, and consequently harms economical activities.

- **Develop Luxembourg as the place for tokenization by encouraging the development of its ecosystem.**

  As of now, Luxembourg is home to promising companies active in the tokenisation of assets (financial or not). These solutions are recognised internationally, and we should encourage their development by providing legal certainty for their activities if needed, encourage the use

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[6] https://www.coingecko.com/en/coins/tether

of these solutions in various industries, favour the development of missing links of the value chain.

- **Support the transition to Decentralized Finance (DeFi), i.e. support the transformation of Luxembourg's asset servicing sector.**

  Financial decentralized is expanding quickly. DeFi refers to a financial system that operates independently of middlemen like banks and clearing institutions. DeFi offers a variety of financial services including P2P payments, accessibility, low fee transactions, security, and transparency as well as autonomy thanks to blockchain and smart contracts. As we approach 2030, the probability that DeFi will grasp more and more market share from centralized finance is high. The impact of this transformation is significant, and the traditional asset servicing sector of Luxembourg is doomed to adapt. Reconciliation and settlement are functions that are no more relevant in DeFi. New functions and new operators will be needed and welcomed in Luxembourg. Also, DeFi courses should be included in training programmes related to the financial sector. It is also essential to raise awareness for the general public as to what are the risks associated to these solutions given its expansion and its non-regulated nature.

- **Understand and welcome DAOs.[7]**

  Decentralized Autonomous Organisations, DAOs, are a growing mean to implement decentralised governance. For-profit companies, non-profit organisations, or even non-incorporated groups of people may use a DAO to operate their group. This is an interesting tool to implement transparent governance in particular when allocating government funded initiatives.

Blockchain in the public sector

- **Foster blockchain training for civil servants.**

  Proper understanding of blockchain and its potential use cases is essential in many ways: write well-informed laws and regulations; properly evaluate and implement digitalization projects;

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[7] Decentralised Autonomous Organisation

adequately rethinking processes, whether existing or new; etc. The public sector must ensure that civil servants are properly trained for the digital transition. The National Institute of Public administration INAP proposes the first Blockchain courses[8]. This offer needs to be extended and made available to the largest number possible.

- **Provide a digital identity that is usable with blockchain-based services.**
  A trustworthy digital identity is at the heart of many interactions made possible by blockchain. At the root, the most trusted – and obviously the only – provider of an official and trusted identity is the public sector. The public sector should provide digital identities for citizens and companies that can be stored in digital wallets and be used with blockchain-based services. Such an identity is a precious enabler that opens the door to the next level of digital services built on blockchain. It will stimulate the creation of novel solutions and enable the simplification of current services and procedures. Some of these solutions provide a higher level of control on the data shared by the citizen itself, pursuing the shift to a society where the citizen remains in control of the information he wants to share (self-sovereignty approach).

- **Streamline processes.**
  Many processes can be streamlined using blockchain. Increased transparency, less errors, greater speed of execution and lower costs are some of the benefits that the public sector could seize by using blockchain. Existing efforts towards the transition to blockchain should be reinforced and further blockchain-based use cases should be deployed. Some possible priority areas are citizen participation, reimbursement of medical costs, land registry, notarisation and process trails, circular economy, compliance with regulations.

- **Push large scale interdisciplinary projects and POCs for the use of data, AI & blockchain.**
  Data, AI and blockchain are cornerstones of the data-driven digital economy. The public sector needs to be prepared and launch large scale projects in association with academia and the private sector to adapt its processes for the data-driven economy. A politic where we encourage initiatives by providing specific funding or visibility is necessary. As stated, DLT is a technology that can provide endless possibilities for a variety of industries and is even stronger in coordination with other developing technologies.

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[8] https://fonction-publique.public.lu/fr/formation-developpement/catalogue-formations/secteur-etatique/06compdig/06-1-digbase/et_06-1-2-205.html

- **Provide full support to the European Blockchain Services Infrastructure (EBSI)**

  The European Blockchain Services Infrastructure was created by the European Blockchain Partnership, a joint initiative of the European Commission and all EU member states, plus Norway and Liechtenstein.[9] EBSI provides a secure, transparent, and interoperable infrastructure for public services across Europe. EBSI aims to facilitate cross-border digital transactions, enhance the security of data, and reduce administrative costs for public services. EBSI's capabilities are categorised in different families: Verifiable Credentials, Trusted Data Exchange and Track and Trace. The EBSILUX[10] project was implemented in Luxembourg to verify diplomas (verifiable credentials). Other use cases relate to self-sovereign identities or social security.

  The operation of EBSI is currently coordinated by the EU Commission in collaboration with the member states. Plans are to transfer by the end of 2023 the operational coordination to an EDIC, a European Digital Infrastructure Consortium. An EDIC is a new type of entity created under the Digital Decade decision.[11] EDICs have legal personality and are meant to implement multi-country projects.

  EBSI is a flagship project that strengthens the EU's sovereignty and reaps full benefits of the potential of blockchain. Thus, the development of EBSI will be beneficial for the whole European blockchain ecosystem.

  Luxembourg should continue to contribute to the development of EBSI by actively and fully supporting the EBSI EDIC, including through adequate financial support.

- Encourage and promote initiatives linked to European Regulation (EBSI sandbox)[12]

  The European Commission launched the European blockchain regulatory sandbox for Distributed Ledger Technologies running over 3 years, with a selection of 20 projects per year. Projects selected will be able to experiment and have a dialogue with the regulators, experts,

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[9] https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Home

[10] https://www.ebsilux.lu - The EBSILUX project concluded in February 2023 and was implemented by the Ministry for Digitalisation, Infrachain, LIST and SnT.

[11] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030

[12] https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Sandbox+Project

European institutions and constitute a unique opportunity for projects to be tested and drive adoption. The projects can be linked to several areas which are all of significance for Luxembourg. However, public institutions need to officially push and encourage such initiatives for Luxembourg to be visible at the European level as having the will and forces and be seen as an actor of the DLT ecosystem.

A note on energy consumption

Blockchains are often pointed at for their high energy consumption. While this might indeed be a concern for blockchains using Proof of Work (PoW), such as the Bitcoin blockchain, many blockchain and DLT solutions are completely in line with a mindful usage of resources.

For instance, many blockchain networks are adopting the Proof of Stake (PoS) – based consensus algorithm, which consumes significantly less energy than the traditional Proof of Work (PoW) algorithm. Unlike PoW, which requires miners to solve complex mathematical puzzles (using powerful computer resources) to validate transactions and add blocks to the blockchain, PoS allows network participants to validate transactions based on the number of coins they hold. This significantly reduces the energy consumption of the network.

Several blockchain platforms have been designed specifically to be more energy efficient. For example, the Hedera Hashgraph platform claims to consume less energy than a single lightbulb.[13] Other examples are Ethereum 2.0[14] or the Tezos blockchain.[15] Tezos uses a unique PoS mechanism called Liquid Proof of Stake (LPoS) and it has been designed to be more environmentally friendly by supporting the use of renewable energy sources. The Tezos community has launched initiatives to promote the use of renewable energy sources in the network's operations, such as the Tezos Foundation's "Eco-Friendly Baker Program," which incentivizes bakers[16] to use renewable energy sources to power their operations.

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[13] https://hedera.com/ucl-blockchain-energy
[14] https://ethereum.org/en/upgrades/merge/
[15] https://tezos.com/carbon/
[16] "Bakers" are the equivalent of "Miners", i.e. nodes that validate blocks.

3   Concluding remarks

The ecosystem wishes for an improved collaboration between the public and private sectors, as well as for business-friendly legislation and regulations. While the finance sector dominates the country, it must prepare for developments in areas such as cryptocurrencies, DeFi, and DAOs. Moreover, other industries should also be proactively experimenting DLT to have first-hand experience and be ready for the future of their industry. To address the shortage of blockchain expertise, Luxembourg needs to invest in developing technical and interdisciplinary capabilities. The public sector can play a role in driving progress by creating digital identities, utilizing blockchain technology to streamline its operations, and making the Public Sector Blockchain accessible to the broader economy. Following numerous talks with actors in various industries, it results that the technology adoption, even if promising, is difficult by the lack of means put in place to encourage projects as well as the lack of test environments. These test environments could result in the discovery of the varied technologies available based on the needs of the industry. The Luxembourg Blockchain Lab would like to coordinate national consortium, linked with the health system or investment funds for example, supported by various actors, public and private to drive the DLT adoption.