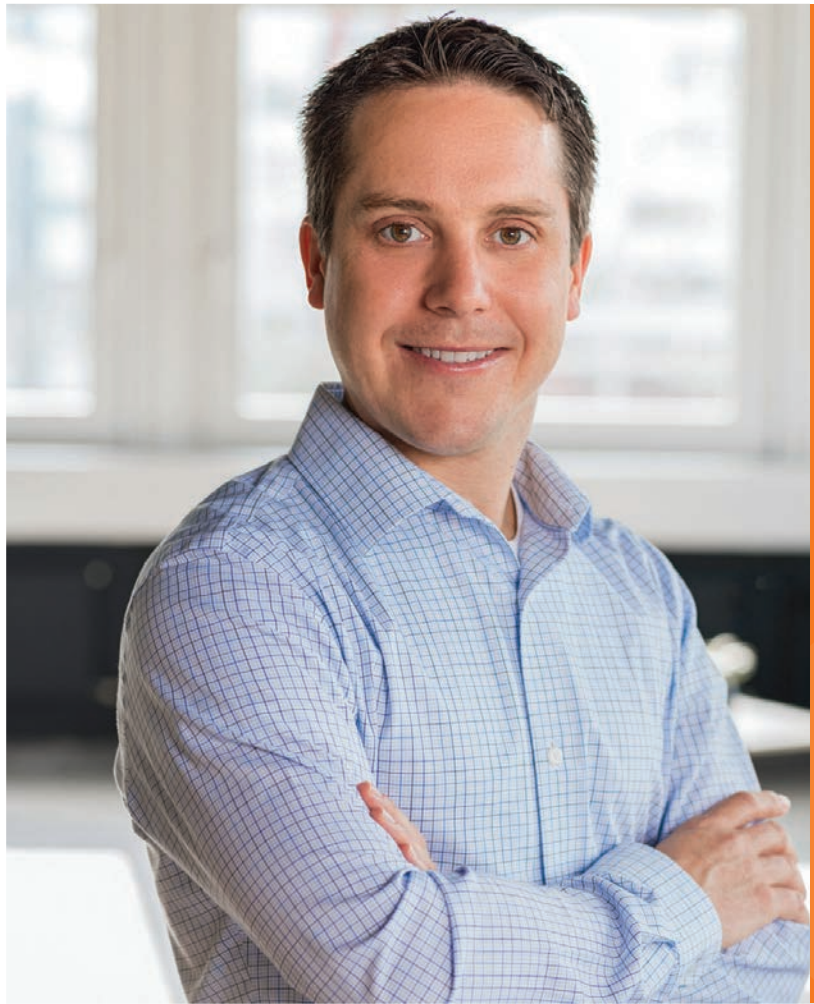# Tezos Foundation

Biannual Update

August 2019

Preface

Dear Tezos community,

I am excited to share with you the first Tezos Foundation Biannual Update. Before going any further, I want to take a moment to thank the entire Tezos community. We have come so far in the last year. I am humbled to be a part of such a vibrant global project and, like many of you, continue to do all that I can to help further the Tezos ecosystem. We each have different talents and abilities. Whether one is a developer, researcher, organizer, educator, entrepreneur, enthusiast, evangelist, or some other community member, there is a place for all to contribute and help build the Tezos ecosystem.

Ryan Jesperson, President of the Foundation Council

"I am humbled to be a part of such a vibrant global project and, like many of you, continue to do all that I can to help further the Tezos ecosystem."

Because this is our first biannual update it will cover the time period spanning from the betanet launch, when a genesis block was proposed on 30 June 2018, through the end of July 2019 (our next biannual update will be released after the end of 2019). Reflecting on some fundamental highlights, the first non-test Tezos network went live with the launch of the betanet on 30 June 2018. The network has performed well and the betanet rolled into a mainnet on 17 September 2018. What stands out to me is the Tezos network launched feature-complete with a Liquid Proof of Stake (LPOS) consensus algorithm (the first large-scale network to do so), an original codebase written from the ground up in OCaml, and a built-in method to upgrade the protocol through an on-chain governance mechanism that is open for all stakeholders to participate in.

There are now roughly 460 bakers (network validators) in 30+ countries, smart contracts are beginning to be formally verified, asset standards are being implemented, and Tezos' on-chain governance process has proved itself with the Athens upgrade. A new voting cycle with an exciting proposal is currently under consideration by stakeholders.

> **The future is even brighter for the Tezos ecosystem in the months and years to come."**

We are now seeing the emergence of a first major use case for Tezos, asset tokenization and, in particular, Security Token Offerings (STOs). In the past six months, Elevated Returns announced that it will tokenize its pipeline of real estate assets in excess of USD 1B on Tezos, and BTG Pactual -- one of the largest investment banks in Latin America -- and Dalma Capital announced that they will tokenize an additional USD 1B worth of assets. We expect more to come, as smart contract safety and long-term upgradability make it particularly well-suited for asset issuance.

At the Tezos Foundation and at other Tezos-focused entities around the world, there is a continued focus on adoption efforts in the areas of digital assets (asset tokenization and STOs), payments, financial services, gaming and mobility. There is also a focus on improving integration capabilities for these new use cases and enhancing communications capabilities. We have also worked to improve the efficiency and efficacy of the Foundation's grantmaking process and will focus on supporting additional educational efforts to train developers to build on Tezos.

Our team will continue to grow to have the necessary operational capabilities to fulfill the Foundation's mandate to provide resources to support the advancement of a robust, diverse, and flourishing Tezos community. We are still in the early stages of a long journey and are excited to see the growth of existing projects that are building on Tezos and look forward to seeing new ones emerge. Each day the community grows and strengthens.

> **What stands out to me is the Tezos network launched feature-complete with a Liquid Proof of Stake consensus algorithm."**

The Tezos Foundation will continue to provide weekly updates and I am excited to travel to upcoming Tezos events around the world to interact with members of the community. As always, we welcome feedback and will improve and refine these biannual updates in the future. We are honored to contribute to a project that we believe will ultimately drive social, political, and economic innovation on a global scale.

Kind regards,

Ryan Jesperson
President of the Foundation Council

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Role of the Tezos Foundation

Tezos is a technology that powers a distributed, peer-to-peer, permissionless network. No single entity owns, manages, or controls "Tezos." Understanding this paradigm is fundamental to understanding Tezos.

The Tezos Foundation is a Swiss foundation, supervised by the Swiss Federal Foundation Supervisory Authority which is part of the Swiss Federal Department of Home Affairs. Its purpose is the promotion and development of new technologies and applications, especially in the fields of new open and decentralized software architectures including the promotion and development of the Tezos protocol and related technologies.

As highlighted in the Tezos position paper, the success of any decentralized network is determined by the efforts of a robust, diverse, and flourishing community. The Foundation exists as a part of this ecosystem, alongside developers, scientists, network validators ("bakers"), enthusiasts, and many others all working towards the success of a platform that we believe will ultimately drive innovation on a global scale.

The Foundation's role within the community is to deploy resources that support the long-term future of the Tezos project. Grants and other capital deployment vehicles offer a strategic way to help community members, such as educational and research institutions, developers, or activists from all over the world to support the advancement of the Tezos technology.

Tezos' potential rests in the hands of its community which is among the strongest and most exceptional in the blockchain ecosystem. All interested parties are welcome to join the Tezos community and contribute to the project.

> "The Foundation's role within the community is to deploy resources that support the long-term future of the Tezos project. Grants and other capital deployment vehicles offer a strategic way to help community members, such as educational and research institutions, developers, or activists from all over the world to support the advancement of the Tezos technology."

One Year with Tezos

It has been just over one year since the Tezos betanet was launched. In that short time frame, the community has grown immensely and achieved incredible milestones.

Betanet launch
June 30, 2018

A Tezos genesis block is proposed.

Public baking begins
July 10, 2018

Public baking starts at Cycle 7 with 40 bakers and nearly 20,000 rolls.

Mainnet launches
September 17, 2018

A switch of the protocol name with all transactions from betanet persisting onto the mainnet.

First ever amendment proposal process begins
February 7, 2019

The first amendment proposals, Athens A & Athens B, were proposed by Nomadic Labs.

Leading asset tokenization company migrates to Tezos

February 11, 2019

Elevated Returns and Securitize announce their efforts to tokenize USD 1B of real estate assets on Tezos. ER called Tezos a superior blockchain for asset tokenization, future-proofing ER's offering and offering a greater focus on smart contract security.

Coinbase Custody announces staking and governance support for Tezos

March 29, 2019

Coinbase Custody launches with XTZ as their first staking asset.

The Athens amendment to the Tezos protocol is approved and activated

May 30, 2019

Tezos completes its first amendment process - becoming the first blockchain to upgrade itself automatically without forking.

The Babylon amendment to the Tezos protocol is injected

July 26, 2019

Babylon, a recent proposed amendment to the Tezos protocol, was injected by the team at Cryptium Labs.

Grants

Priorities and Process

A key activity of the Tezos Foundation is to deploy resources to entities and initiatives that will help to ensure the long term success of Tezos. At present, the Foundation is focused on three grant categories:

Research, Education & Core Development Grants

Foster innovation, development and education about the Tezos core protocol. These grants include a range of projects from master's and doctoral theses to core development.

Ecosystem - Tools & Applications Grants

Incentivise the development of new tools and applications to improve the adoption of Tezos.

Community Grants

Support other organizations and events that strengthen and grow the Tezos community to which the Foundation belongs.

The evaluation process for new grant proposals normally takes between four and six weeks. It is essential that prospective grantees and their projects are evaluated diligently to ensure that the deployed resources add proportional value to the Tezos ecosystem.

Step 1

Applications are initially vetted to ensure they fulfill the Foundation's formal requirements.

Step 2

Technical applications that pass through the review phase are then sent to the Technical Advisory Committee (TAC), chaired by Michel Mauny, a Tezos Foundation council member, for technical due diligence and evaluation. The list of current TAC members can be found in this update. The TAC does not make grant decisions itself, but rather offers advice on the technological strength and usefulness of proposals.

Step 3

Grants that pass technical review then complete a due diligence process before final decisions to approve, decline or revise grant applications are made by the Foundation Council.

Step 4

Final decisions about grant proposals are communicated to applicants after they are made by the Foundation Council. Lastly, approved applicants collaborate with the Foundation to complete legal paperwork before a grant is finalised.

In rare circumstances, when grant proposals are of significant importance to the Tezos ecosystem, the Foundation Council will push applications through an out-of-cycle process. It is important to note that although these applications are expedited, they undergo the same due diligence process and require the same approvals.
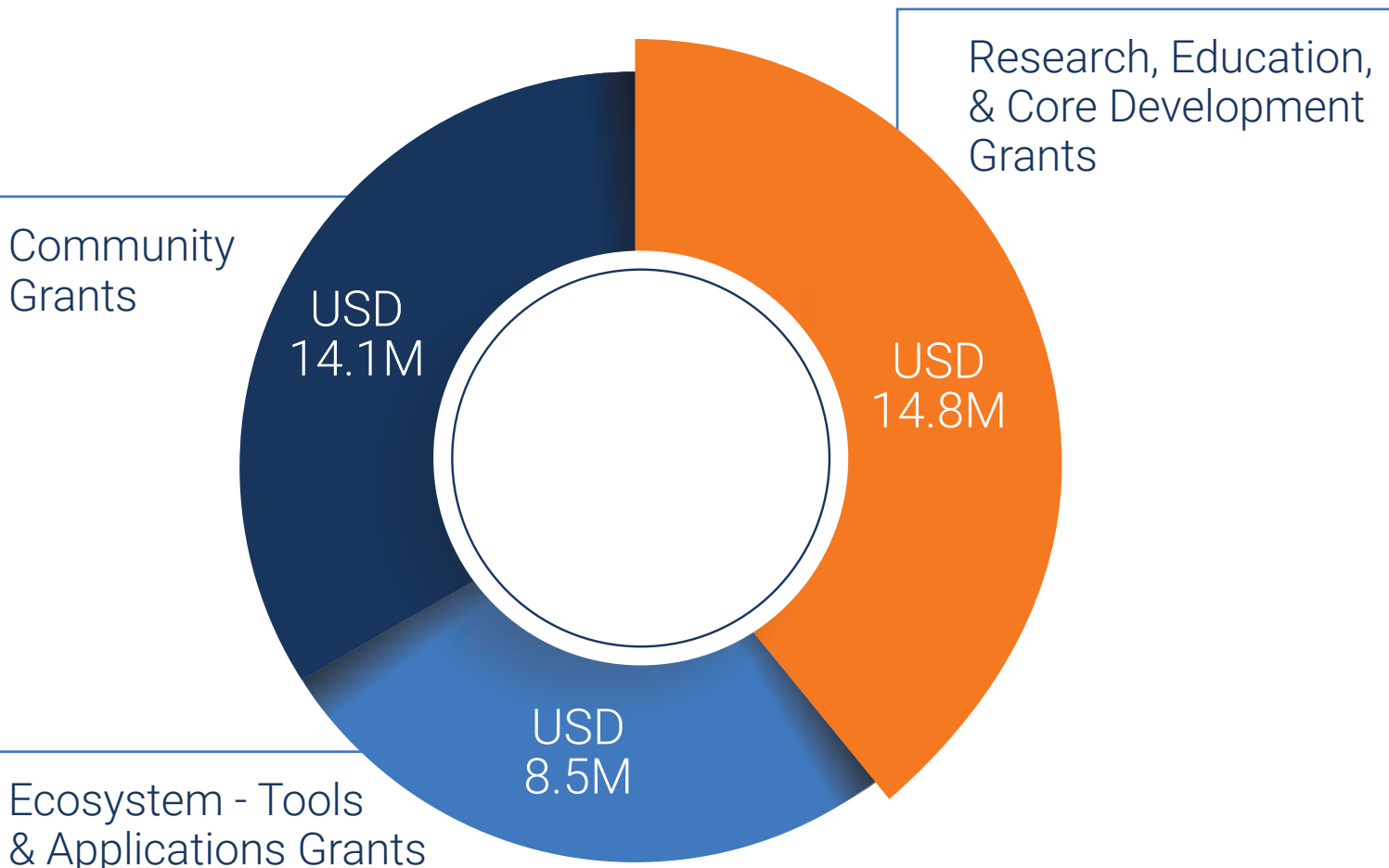
Grants are almost always paid out in multiple installments. Such payments are subject to a payment interval schedule to ensure predefined milestones are achieved. The Tezos Foundation controls payments and, depending on the size of the payment, audits reports from grantees prior to follow-on payments. It may involve the TAC in this process if technical assessments are needed.

"

The Technical Advisory Committee offers recommendations to the Tezos Foundation on each grant proposal's technical strength and usefulness."

Grantees and Other Funded Entities

Since July 2018, the Foundation has distributed funds to 62 entities/projects across 23 countries for a total amount of USD 37.4M. 36 new grant proposals are currently progressing through our review process.

Research, Education, & Core Development Grants

Community Grants

USD 14.1M

USD 14.8M

USD 8.5M

Ecosystem - Tools & Applications Grants

Research, Education & Core Development Grants

The Tezos Foundation supports research on and education about a wide spectrum of domains including distributed systems, cryptography, programming languages, and formal verification. A significant amount of resources are allocated towards supporting scientists and engineers at top-tier institutions and organizations around the world, as well as educational programs to train future talent. These initiatives, and others that contribute to core development, are a top priority for the Foundation.

Grantees and Other Funded Entities

- B9lab, UK**
- Cambridge University, UK
- Cornell University, USA
- Cryptium Labs, Switzerland*
- DaiLambda, Japan**
- Edukera, France
- France-IOI, France
- IIT Madras, India
- IMDEA Software Institute, Spain***
- Imperial College London, UK
- Inria, France
- Kyoto University, Japan
- Marigold / LIGO, France*
- Nomadic Labs, France**
- Tarides, France
- The Initiative for CryptoCurrencies & Contracts (IC3), USA
- University of Beira Interior, Portugal

Total: USD 14.8M

In order to enable more developers to build real applications on Tezos, the Foundation supports a number of initiatives designed to train future talent and make Tezos development more accessible. In October 2018, the Foundation announced its commitment to provide free training for 1,000 new Tezos developers. The Foundation supported B9lab, a leading provider of blockchain-specific education and training, to build a training program to teach developers how to create Tezos smart contracts in LIGO, SmartPy, and Michelson. B9lab also offers a free, Tezos 101 course as a taste of its full course and a brief introduction to Tezos.

At Cambridge University, OCaml Labs is a top-tier functional programming and multi-disciplinary computer science team. The OCaml Labs team receives Foundation support to research and develop improvements to the popular Lwt OCaml library, which is used in the Tezos codebase. Additionally, OCaml Labs recently received a grant to upstream multicore OCaml and extend the Tezos tool stack, specifically Irmin and Lwt, to be multicore capable. They are working with researchers at The Indian Institute of Technology Madras (IITM), one among the foremost institutes of national importance in India in higher technological education and applied research, on this project.

> "At Cambridge University, the OCaml Labs team receives Foundation support to research and develop improvements to the popular Lwt OCaml library, which is used in the Tezos codebase."

*grantees that provide functions in several categories
**organizations that receive funding from the Foundation via service contracts or other appropriate agreements but are not grantees
***working to finalise an updated research framework agreement

"

The Tezos Foundation helps Inria establish dedicated labs and commit research teams to work on cryptography, formal verification, distributed systems, and generally strengthen the institution's involvement with Tezos and blockchain technology in general."

Cornell University is an Ivy League research university in New York with leading cryptocurrency researchers. The Foundation issued a grant to Professor Emin Gun Sirer and his team for a two-year research and development project on possible sharding implementations for Tezos. The Tezos Foundation is also a member of The Initiative for CryptoCurrencies & Contracts (IC3), which has close ties to Cornell and other premier universities with faculty focused on cryptocurrency and smart contract research.

Cryptium Labs, a Switzerland-based entity, is dedicated to distributed ledger research and protocol development. Cryptium Labs researches and develops a number of technologies to help advance the Tezos project. Notably, they work on consensus algorithms, privacy-preserving features, proof-of-stake and staking products, governance, smart contracts, sharding, and more. The team collaborated with Nomadic Labs and The Marigold Project on the recent Babylon proposal and represents the Tezos project at conferences and events around the world.

DaiLambda, is a software engineering company based in Kyoto, Japan, dedicated to research and development of the Tezos core protocol. The DaiLambda team has extensive experience with OCaml, stemming from time in academia at Inria, and contributes to the growth of the Tezos ecosystem in Japan and the greater Asia region through training and consulting engagements.

The Foundation also provided support to France-IOI, a leading provider of online teaching resources that anyone can use to learn about programming and algorithmics, and the entity responsible for selecting and training the French team that competes in the International Olympiads in Informatics (IOI). France-IOI develops educational tools, content, and activities to help a growing number of students learn about programming, high-level algorithmics, and the technologies underpinning Tezos.

Inria, the French national research institute for the digital sciences, promotes scientific excellence and technology transfer to maximize its impact. The Tezos Foundation helps Inria establish dedicated labs and commit research teams to work on cryptography, formal verification, distributed systems, and generally strengthen the institution's involvement with Tezos and blockchain technology in general. Inria's research activities funded by the Tezos Foundation started in 2019 and covered both research and development of the OCaml and F* programming languages and verification tools that are used by the core Tezos protocol.

Kyoto University is the second oldest Japanese university and one of Asia's leading research institutions with 18 Nobel laureates, more than any other university in Asia. Kyoto University conducts research on the current, simple Michelson type-checking to develop static verification techniques for Michelson and higher-level Tezos smart contract languages. Their research team will create an accessible development tool for such verification techniques and contribute to the growth of the Tezos ecosystem in Japan and the greater Asia region.

> ❝
> The Cryptium Labs team collaborated with Nomadic Labs and The Marigold Project on the recent Babylon proposal and represents the Tezos project at conferences and events around the world."

Awa Sun Yin, Cryptium Labs

The Foundation provides resources to masters and doctoral students conducting research in relevant fields. Over the past year, this has included grants to:

Nomadic Labs (NL) conducts ongoing research into formal verification of smart contracts, consensus algorithms, and possible zero-knowledge cryptography implementations for Tezos. NL continues to work on Michelson, a domain-specific language for writing smart contracts on Tezos, as well as an additional low-level language, Albert, which will serve as a compilation target for other high-level languages. The team recently proposed Emmy+, an improvement to the current Tezos consensus algorithm, Emmy, and plans to propose the addition of privacy-preserving technologies to Tezos, among other things. NL collaborates with the wider Tezos developer community to support development initiatives and streamline workflows across various teams and contributors.

Tarides is a widely respected engineering team specializing in distributed systems, virtualizations, and programming languages. Tarides is focused on packaging Tezos for MirageOS, an open source library operating system their team developed, which will help users set up nodes on the Tezos network more efficiently.

Imperial College London (ICL) is a global top ten university with a world-class reputation in science, engineering, business, and medicine. With the Foundation's support, a Ph.D. student is exploring and researching: 1) potential attacks against on-chain governance in Tezos, including attack development and discovery, 2) detection of attacks while they're happening, 3) recovery mechanisms of attacks at the protocol level, and 4) potential dangers and counter-measures of off-chain governance.

University of Beira Interior (UBI) is a top-tier public research institution in Portugal. Graduate students at UBI received grants for two separate projects. The first project, which funded two master's theses, involved research on the implementation of Tezos for event logging of robots in factory environments. The second project, which supported two Ph.D. theses, explored tools for the static analysis of smart contracts in Michelson and focused on formal verification techniques and support for machine-checked smart contracts using proof assistants like Why3 and Coq.

Ecosystem - Tools & Applications Grants

Tezos offers a platform to create smart contracts and build applications. Additional tools are being built that help developers of varying skill levels build applications and contribute to the growth of the Tezos ecosystem. To date, we have focused on four main areas: programming languages, block explorers, smart contract development, and infrastructure.

> "
> The Foundation is focused on four main areas of tool development: programming languages, block explorers, smart contract development, and infrastructure."

Pascal Brun, AirGap

Grantees and Other Funded Entities

- Ackee, Czech Republic
- Altoros, Canada
- Baking Bad, Russia
- camlCase, USA
- Chorus Mobility, USA**
- Clause, USA
- Cryptonomic, USA
- Decet, USA
- Ledger, France
- Marigold / LIGO, France*
- MyTezosBaker, Hong Kong
- Nomadic Labs, France
- Obsidian Systems, USA
- OCamlPro, France
- Papers / AirGap, Switzerland
- Pocket Network, USA
- Simple Staking, Slovakia
- SmartPy, USA
- Stove Labs, Slovakia
- TezBridge, Asia
- Tezos IntelliJ Plugin, Germany
- Tezos Rio, Brazil
- TezTech, New Zealand
- Tezzigator, USA
- Tplus, Austria
- TQ Tezos, USA
- TzStats, Germany
- zednode, USA
- ZenGo, Israel

Total: USD 8.5M

*grantees that provide functions in several categories
**organizations that receive funding from the Foundation via service contracts or other appropriate agreements but are not grantees

Programming Languages and Libraries

ConseilJS is a library developed by Cryptonomic for building applications on Tezos. The library is connected to the Nautilus infrastructure for high-performance analytics provided by the Conseil blockchain indexer and for live chain data and operations via an integrated Tezos node. In July of this year, ConseilJS was updated to include metadata enhancements as well as dockerfiles and scripts for running in containers. ConseilJS aims to give developers better data to work with, and to make it easier to access that data in more development environments through tools like Docker.

ConseilPy is a Python library developed by Baking Bad that provides SQLAlchemy-like query syntax for the Conseil blockchain indexer. Indexers like Conseil are critical components of block explorers, scraping a blockchain network for the relevant data the explorer needs. SQLAlchemy is an SQL toolkit for Python, and a widely used method for data science and analytics tasks. Introducing SQL-style methods for querying block explorer data will allow more developers and analysts to work with Tezos network data and inspire future development.

LIGO, developed by the Marigold Project, is a simple smart contract language designed for developing longer contracts than those typically written in Michelson. An imperative language that compiles down to clean Michelson code, LIGO currently supports two different syntax formats: CamLigo for OCaml-like syntax, and PascaLigo for Pascal-like syntax. Development of a generic front end is underway, which will make support possible for a wider range of new language syntaxes. The Marigold Project also works on Marigold, a plasma-like layer-2 scaling implementation for Tezos and contributed to the recent Babylon proposal.

Michelson, maintained by Nomadic Labs, is the programming language for Tezos smart contracts and was designed with formal verification in mind. Even though it is a rather low level, stack-based language, its static type system eliminates a whole class of programming errors before the execution of smart contracts. As writing large programs in such a low-level language can be cumbersome, the Tezos Foundation has provided support to developers creating several high-level programming languages, each of which corresponds to a classical programming style and culture.

Morley and Lorentz are smart contract development frameworks developed by a team with representatives from camlCase, Serokell, and TQ Tezos. Morley is a library designed to make writing smart contracts in Michelson pleasant and effective. Lorentz is a powerful meta-programming tool that lets developers write smart contracts directly in Haskell, one of the most popular functional programming languages. Together, Morley and Lorentz offer a direct route for functional programmers to pick up developing on Tezos.

Oana Ladret Piciorus and Benjamin Canou, Nomadic Labs

> ## "
> In order to increase the accessibility of Tezos, the Foundation has been committed to funding smart contract languages that will help Tezos reach a larger audience of talented developers."

Francois Maurel, SmartPy

NETezos.RPC is a .NET standard library for interacting with the Tezos network via RPC calls developed by Baking Bad. The .NET programming language is popular among web and mobile developers. This technology makes web, mobile, and other front-end development more accessible to a wider range of programmers, and opens up opportunities for more developers within the Tezos ecosystem.

SmartPy is a library developed by Smart Chain Arena that gives developers the tools needed to write smart contracts using Python syntax that compiles down to Michelson. The language includes a set of high-level primitives, SmartML, a new virtual machine written in OCaml, and a compiler to translate SmartML into Michelson. Smartpy. io is a web-based editor and integrated development environment based on SmartPy that lets users simulate, debug, test, and analyze SmartPy smart contracts. Python remains a popular and flexible programming language with a wide range of use cases, making it a priority to support Python tooling like SmartPy.

PyTezos provides Python utils for Tezos. Baking Bad is running research and development to build out PyTezos into a full Python SDK for Tezos, including RPC functionality, cryptography tool support, and other features.

Solidity.fi is a high-level language developed by TezTech that compiles down to clean Michelson, allowing for easier development on Tezos. It is a statically typed language designed to be similar in syntax to ECMAScript/Javascript. Solidity.fi provides a coding experience similar to object-oriented programming, a familiar paradigm accessible to a wide range of developers.

Block Explorers

The Tezos Foundation has also made it a priority to fund the development of multiple open-source block explorers.

Arronax by Cryptonomic is a block explorer and a blockchain analytics tool all rolled into one. Built with ConseilJS and powered by the Conseil API, Arronax offers traditional block explorer data with a flexible front-end interface that allows for a wide range of drag and drop querying and data exploration. Tools like Arronax further data transparency within the Tezos ecosystem and equip developers with more sophisticated data to build more advanced applications. Mininax is a minimal retro-inspired block explorer for Tezos. Designed by Cryptonomic to be lightweight, easy, and accessible, Mininax delivers the basic block explorer functionality to support wallet users and simple lookups. Mininax also acts as a tool to work with Arronax, letting users access Arronax data if they're unsure of how to structure a query. Mininax serves as a simple but powerful tool, helping make complicated chain data more accessible.

Better Call Dev is a tool by Baking Bad for smart contract developers as well as users. The tool is a meta explorer designed to make smart contract development easier by surfacing interaction data through a straightforward front-end and high-level data abstractions. Better Call Dev's goal is to present interactions with smart contracts as a set of input parameters and side effects so users can easily understand the interactions by looking at the values. The focus on smart contract interaction data makes Better Call Dev a unique tool within the ecosystem, making Tezos smart contract development and testing more accessible.

> "
> Tezblock aims to set the standard for how modern block explorers serve meaningful data in a clean, easy to understand way."

Tezblock is an accessibility-focused block explorer developed by AirGap. Focused on making the Tezos protocol more accessible and delivering data in a meaningful way, Tezblock strips away features that can cloud a user's experience and introduce friction when users try to understand chain data. Tezblock aims to set the standard for how modern block explorers serve meaningful data in a clean, easy to understand way.

TzScan is a block explorer for the Tezos blockchain. Developed by OCamlPro, a French company and R&D lab focused on OCaml development, TzScan was one of the first block explorers in the Tezos ecosystem.

Tzstats is a newly-announced, analytics-focused block explorer for the Tezos blockchain by KIDTSUNAMI. This explorer was designed to offer traditional block explorer functionality with additional, comprehensive data analytics. Rich chain data not only offers greater transparency into network health to the wider community, but allows for more sophisticated, data-driven applications to be developed.

> ## "
> These asset standards will make it possible to develop a wide range of next-generation applications and digital products on Tezos."

Matej Sima, Stove Labs

Smart Contract Development

In the realm of smart contract development, the Foundation has focused on funding work on asset standards and tools to make building smart contracts easier.

An asset standard for Tezos was released by teams from Serokell, Nomadic Labs, and TQ Tezos proposing a standard interface for creating and managing fungible assets using smart contracts on Tezos. This asset standard closely follows the interface proposed in ERC-20, making it more easily portable to popular third party wallets and more accessible to developers already familiar with ERC-20. An initial implementation of a ledger asset was released, and development of standards similar to ERC-777 and ERC-1155 is underway.

Other projects focused on improving the experience of writing smart contracts are also underway. Granary, by Stove Labs, is a development environment manager for writing Tezos smart contracts in ReasonML, Liquidity, and Michelson. Future versions of Granary will be able to deploy contracts and easily test and visualize them in a sandbox environment with an intuitive user interface. ReasonML is a popular project that allows developers to write fast OCaml or Liquidity code with a Javascript-like syntax and easy interaction with Javascript libraries. Opening Tezos development to ReasonML introduces a broad, new community to Tezos development.

Flextesa, developed by Obsidian Systems, is a flexible sandbox testing environment that provides local, custom testing by creating configurable and scriptable environments for specific needs. Developers can use Flextesa to simulate a wide range of different environments and scenarios, adjusting the number of nodes/bakers, and even block time and transaction values. Robust testing tools like Flextesa help developers perform the rigorous testing necessary for building sophisticated applications.

Obsidian Systems also released the verbose signatures feature this year, making it possible for users to more easily confirm transactions on the Tezos network from a Ledger hardware wallet. Verbose signing allows for hardware wallets to parse a wider range of transactions, simplifying the data displayed to a user and allowing for easier confirmation from a hardware device.

Johann Tanzer, the lead developer of Tplus, also received a grant to support his work in building a development environment to help further improve the experience of developing on Tezos. Tplus is a collection of GUI (graphical user interface) and CLI (command-line interface) tools to make it easier to manage Tezos nodes for development and production use. It is fully open-source and manages the installation of language compilers and other development tools to make it easier for developers to create sandbox environments and test and deploy their smart contracts.

Alison Mangiero, TQ Tezos, leads the governance panel at TQuorum Paris

Infrastructure

Infrastructure is important to a thriving blockchain ecosystem. In the case of Tezos, tools like indexers and relay networks make it easier for developers and bakers to extract data and interact with the protocol.

Kiln is a platform built by Obsidian Systems that streamlines the baking process, making it easier for individual bakers to set up their infrastructure using a Ledger hardware wallet. Baking (validating) is a key function within the Tezos network, and Kiln provides a way for those who hold one roll of XTZ and have a hardware wallet to start baking. Recently, the Kiln UI introduced a voting feature, allowing users to easily participate in Tezos on-chain governance.

"

Kiln is a platform built by Obsidian Systems that streamlines the baking process, making it easier for individual bakers to set up their infrastructure using a Ledger hardware wallet."

Nomadic Labs recently released an indexer for Tezos as an open source project. The indexer pulls data from Tezos nodes that is otherwise difficult to extract. Indexers provide all of the transactional data from nodes in a database that's both easy to access and fast, and they are necessary components for wallets, applications, and block explorers to exist on the Tezos network.

Nomadic Labs also released the snapshots feature earlier this year, allowing users to spin up a Tezos node in a matter of minutes. The History Modes and Snapshots feature allows for users to designate the type of node they want to deploy, providing efficient space saving options for different needs. The ability to access a Tezos node is crucial for development, and Snapshots make it a frictionless, straightforward process.

Pocket Network released the Core MVP 1.7 update which added official support for the Tezos blockchain. The update supports interacting with the Tezos network through REST API calls. Pocket is a relay network that coordinates API requests across nodes in a network, providing an alternative to services like Amazon AWS or Microsoft Azure.

TezBridge is a tool built by Catsigma that allows users to interact with applications built on the Tezos blockchain. Tools like TezBridge serve to connect the Tezos ecosystem together, allowing for more sophisticated applications to be developed.

Marigold is a Layer 2 scaling solution for Tezos in development by the Marigold Project. The solution is optimized for speed and low transaction costs, enabling the development of applications that scale. In these early stages, Marigold is based on extending Plasma onto Tezos. Scaling has historically been a challenge for blockchain networks and projects, and having solutions in active development is key for the long term health of the network.

A threshold signature proof of concept researched by ZenGo was introduced this year, as part of ongoing research to and security of wallet software. Threshold signatures remove the burden of a single private key, splitting the responsibility between multiple parties, and represent an advancement on Multisig functionality.

TezosJ_SDK is a Java SDK developed by Tezos Rio that can also be used for Android development. TezosJ_SDK enables Java developers to create applications that can communicate with the Tezos blockchain.

EzTz is a Javascript SKD by TezTech for front end development on Tezos. EzTz implements communication with the JSON RPC API providing key generation, signing, verification and contract interaction. The application is used in several projects including TezBox and Bakechain.
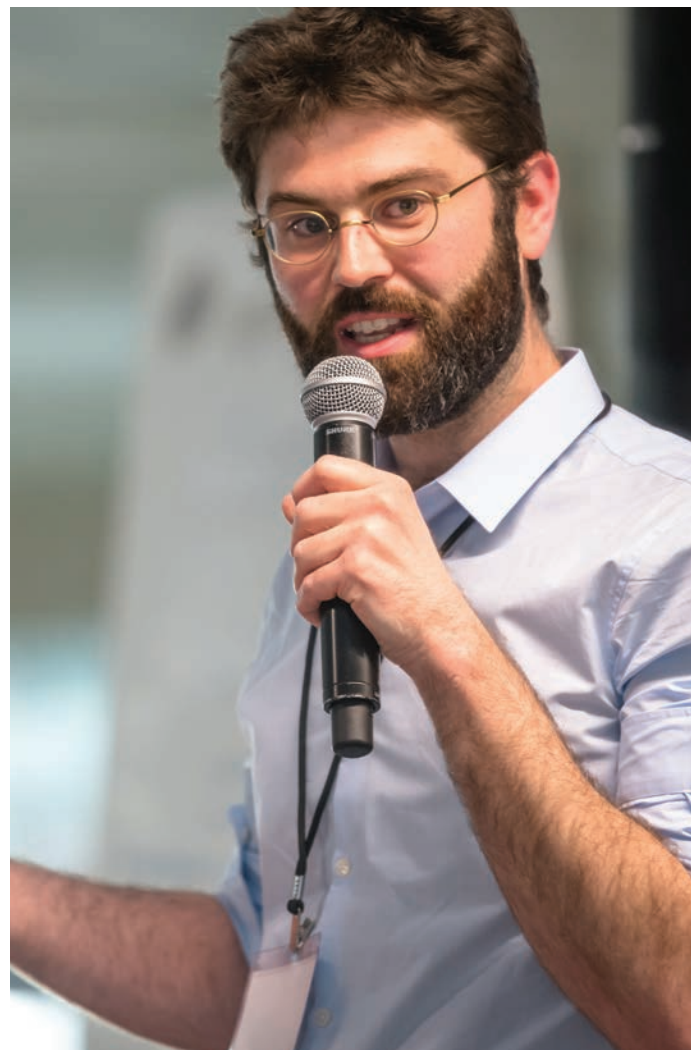
Bruno Bernardo, Nomadic Labs

Community Grants

Tezos was designed to be a digital commonwealth. The protocol code was deliberately written to empower individual members of the network through censorship-resistant, secure transactions, a proof-of-stake-based consensus algorithm, and built-in on-chain governance. These design choices were made to foster a collaborative, open, global community. To ensure communities around the world have the support they need, the Foundation provides funding to operational entities who support community development and events that grow the Tezos community.

Grantees and Other Funded Entities

- Coin Center Annual Dinner 2019, USA
- Cryptium Labs, Switzerland*
- Crypto Finance Conference, Switzerland
- Crypto Valley Summit, Switzerland
- Digital Securities Summit 2019, Thailand
- Distributed Governance Conference 2020, Greece
- Infrachain Conference, Switzerland
- Open Money Initiative, USA
- Paris Blockchain Week, France
- SF Blockchain Week, USA
- Swiss Blockchain Winter School, Switzerland
- Symposium on Principles of Programming Languages (POPL), Portugal
- Tezos Commons, USA
- Tezos Japan, Japan
- Tezos Korea, South Korea
- Tezos Riot forum, UK
- Tezos Southeast Asia, Singapore**
- The SNARK Challenge, USA
- TQ Tezos, USA**
- Trust Square Hackathon, Switzerland

Total: USD 14.1M

Tezos Commons

A community-focused organization supporting an engaged, informed, global community within the Tezos ecosystem. Tezos Commons produces educational content, provides training resources, and hosts Tezos events around the world.

*grantees that provide functions in several categories
**organizations that receive funding from the Foundation via service contracts or other appropriate agreements but are not grantees

Tezos Korea

A non-profit organization that collaborates with Korean universities and hosts events, providing education, and engineering support. The affiliated Tezos Korea Company takes charge of business consulting and expanding the adoption of Tezos technology. Recently, Tezos Korea has announced the upcoming Tezos development boot camp in Busan.

Tezos Japan

A non-profit organization focused on supporting enterprise activites, engineering engagements, and the Tezos community in Japan. The organization engages with companies of all sizes, runs technical education seminars, and hosts community-driven events. To date, noteable in-depth sessions have been held at the University of Tokyo and Node Fukoka. Tezos Japan Foundation also actively engages in research and development and partners with regional organizations to help drive adoption in technical and regulatory areas.

Tezos Southeast Asia

A non-profit organization based in Singapore leading Tezos adoption and awareness of related technologies throughout the region. The foundation offers technical incubation and mentoring for startups looking to build on top of Tezos, implementation consulting, educational events, and providing a way for individuals and companies to ask about Tezos. In November 2019, Tezos Southeast Asia will be exhibiting at the Singapore Fintech Festival, one of the largest regional blockchain and fintech conferences.

TQ Tezos

A New York City-based organization that focuses on driving adoption and awareness of Tezos. TQ Tezos engages in business development, helps startups and enterprises adopt Tezos for a variety of exciting use cases, and works closely with the Foundation and other groups on communications, events, and development initiatives.

Institutional Adoption

The Tezos protocol continues to gain momentum as more institutions understand and consider adopting blockchain technology. Institutions approach technology choice as a business choice, and are exploring Tezos for a wide variety of use cases in diverse industries including capital markets, payments, insurance, mobility, real estate, and healthcare, among others.

In order to foster institutional adoption of Tezos, the Tezos Foundation supports various companies and institutions by helping them improve their technical understanding of the Tezos protocol and its capabilities, build applications or tools that are needed for such projects, or support the development of the technical standards required to do so.

Digital Assets and Capital Markets

The Tezos protocol's unique features make it particularly well-suited for digital asset issuance. Digital assets are comprised of smart contacts that govern an asset over its entire lifecycle, requiring high confidence not only in the safety of smart contract code, but also in the functionality of the platform over a multi-decade horizon. Tezos enables this confidence with institutional grade smart contracts, continuity, and upgradeability. Accordingly, Tezos is emerging as a leading protocol for digital assets.

Sometimes called "tokenized assets" or "security tokens," digital assets on Tezos can offer numerous advantages to issuers and investors, including a lower cost of capital, reduced OpEx, reduced settlement risk, automated dividend and distribution payments, automated regulatory compliance and reporting, automated real-time cap table management, and more. In the long run, digitally native capital markets could democratize access to investment opportunities and enable liquidity in historically illiquid asset classes.

The number of companies issuing digital assets on Tezos has grown significantly in the past few months, and in some cases, projects have migrated from other blockchains onto Tezos. In February, Elevated Returns, an investment firm focused on digitizing tangible assets, announced its plan to tokenize its pipeline of real estate assets in excess of USD 1B on the Tezos protocol. Elevated Returns is best known for tokenizing USD 18M of the St. Regis Aspen Resort, one of the first high-profile security token offerings. Elevated Returns' Aspen Digital offering was conducted on Ethereum. However, in collaboration with TQ Tezos and Securitize, a platform for compliantly digitizing securities on blockchains, Elevated Returns is conducting its future asset tokenization offerings on Tezos.

Significant tokenization projects announced this year include:

In February,

Elevated Returns, an investment firm focused on digitizing tangible assets, announced its plan to tokenize its pipeline of real estate assets in excess of USD 1B on the Tezos blockchain.

In early July,

BTG Pactual, Brazil's fifth largest bank, together with Dalma Capital, a prominent Dubai asset manager, announced plans to utilize the Tezos blockchain for security token offerings of assets worth more than USD 1B.

Also in July,

TokenSoft, Inc., a leading security token issuance and management platform, announced that it officially supports issuance of security tokens on the Tezos blockchain.

Bangkok, Thailand

Hubertus Thonhauser, Marylène Micheloud, and Ryan Lackey

> "The Tezos protocol is a natural fit for tokenization projects given its ability to support secure smart contracts through formal verification and its governance model, which makes it built to last."

Mobility

In March, the Tezos Foundation joined MOBI, a non-profit smart mobility consortium with members like BMW, Ford, and GM. MOBI is focused on using blockchain and related technologies to make mobility safer, greener, cheaper and more accessible. The Foundation also announced support for Chorus Mobility, a startup whose core focus is blockchain based peer-to-peer payment protocols and decentralized applications for connected vehicles. Applications of this technology could, for example, include human to vehicle connections such as decentralized autonomous taxi hailing, vehicle to vehicle connections to combat congestion and improve traffic efficiency, and vehicle to infrastructure networks to create decentralized and instant V2X (vehicle to anything) payments, such as paying per second when using a paid priority lane.

Other Areas of Interest

Of course, this is just a sample of current use cases. The secure and upgradable nature of the protocol makes it particularly well-suited for handling high-value transactions and real world assets. While the Foundation sees particular promise in the areas of digital assets, payments, financial services, gaming and mobility, it knows that there are use cases it has not yet imagined and stands ready to support projects in a variety of spaces.

Financials

Assets held at 31 July 2019 had a market value of

USD 652'224'830

61%
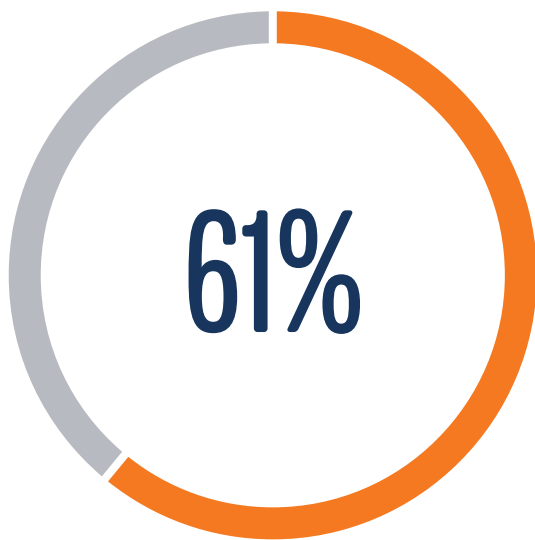
Bitcoin (BTC)

The Foundation's cryptocurrency assets are stored in several secure custody solutions.

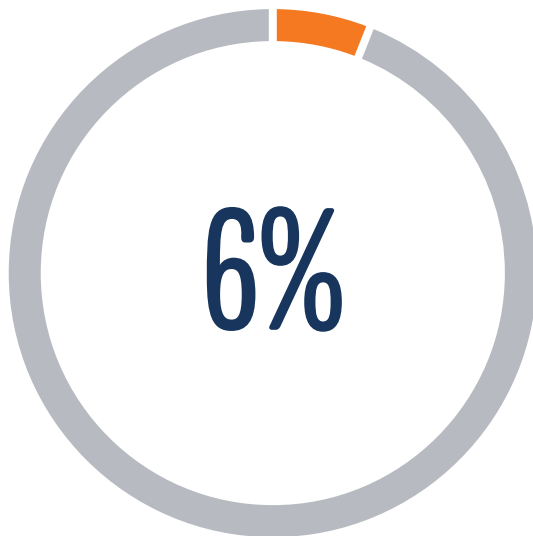### Stability Fund

TF holds a conservative and diversified portfolio with liquid assets such as Bonds, ETFs and Commodities at Swiss Banks.

15%

Tezos (XTZ)

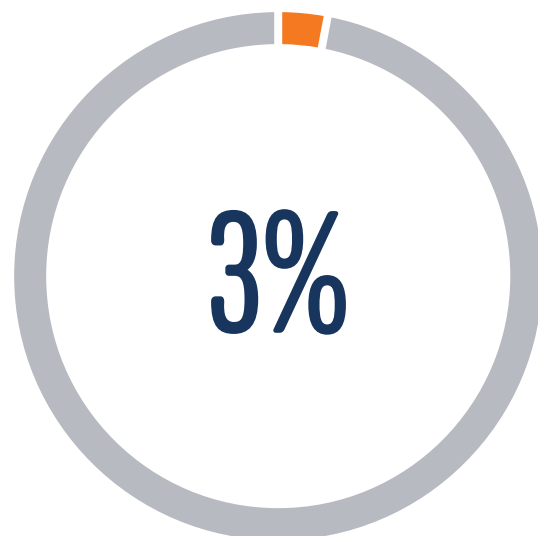The Foundation does not have plans to liquidate the XTZ from its genesis block allocation or related baking rewards.

15%

6%

Fiat:

The Foundation holds fiat with several banks in multiple jurisdictions. 97% in USD, 2% EUR and 1% in CHF and GBP

Other Assets

Other assets are predominantly crypto assets such as Ethereum, Bitcoin Cash or other Bitcoin forks.

3%

Foundation Council

The Tezos Foundation Council

" Individually, each council member brings expertise and insights from their respective fields. Collectively, they form a council full of unique backgrounds and experiences from all over the world."

The Tezos Foundation Council is composed of accomplished professionals who lead the Foundation as it supports the Tezos protocol and ecosystem. Individually, they bring expertise and insights from their respective fields. Collectively, they form a Council full of unique backgrounds and experiences from all over the world.

Ryan Jesperson

Ryan is the President of the Foundation Council. Most recently he was the Chief Operating Officer at Divvy, a FinTech company. Ryan received a BS degree, cum laude, from Brigham Young University, and an MBA from the Fuqua School of Business at Duke University.

Hubertus Thonhauser

Hubertus is a seasoned entrepreneur and tech-investor who is driven by his passion of adding value to excellent teams. He is Managing Partner of Enabling Future, his proprietary VC-firm operating out of Dubai, with a portfolio of 20 companies in the US, Europe and MENA and covering sectors like fin-tech, blockchain as well as food- and clean-tech.

Lars Haussmann

Lars is the Head of Corporate Management and Company Administration at Haussmann Treuhand AG. He has extensive experience in corporate management, administration, and accounting matters in demanding and complex situations.

Marylène Micheloud

First Swiss woman to have a Master's degree in Computer Science from Geneva University, Marylène worked as researcher, expert and professor. She acted 11 years as director of RERO, the Library Network of Western Switzerland (covering four universities and six Swiss cantons).

Michel Mauny

Michel is Chief Scientific Officer at Nomadic Labs. At Inria (the French National Institute for Computer Science and Applied Mathematics), Michel was a senior researcher and more recently Chief Executive Officer of the Inria Foundation.

Ryan Lackey

Founder of several computer security technology and applications companies, active participant of cypherpunks and the cryptography mailing list. Co-founder of HavenCo on Sealand in the North Sea.

Committees

Executive Committee

Hubertus Thonhauser
Chair of the Investment Committee

Ryan Jesperson
President of the Foundation Council

Roman Schnider
Chief Financial Officer / Head of Operations

Ulrich Sauter
General Counsel

Investment Committee*

Hubertus Thonhauser
Chair

Ryan Lackey
Chief Security Officer

Lily Liu
Co-founder of Earn.com

Ulrich Sauter
General Counsel

Roman Schnider
Chief Financial Officer / Head of Operations

Audit Committee

Lars Haussmann
Chair

Ryan Jesperson
President of the Foundation Council

Roman Schnider
Chief Financial Officer / Head of Operations

Technical Advisory Committee

Michel Mauny
Chair

Stephen Andrews
Founder of TezTech Labs

Bruno Bernardo
Research Engineer at Nomadic Labs

Arthur Breitman
Member of the Technical Advisory Committee

Benjamin Canou
Chief Technology Officer of Nomadic Labs

Jun Furuse
Director of Tezos Japan Foundation

Caleb Kow
President of Tezos Southeast Asia

Ryan Lackey
Chief Security Officer

Francois Maurel
President of Smart Chain Arena LLC

*Provides recommendations to the Foundation Council in regards to institutional adoption opportunities and is not involved in the management of the Foundation's assets.

Ryan Jesperson, Ulrich Sauter, Roman Schnider

"Each day the community grows and strengthens. We are honored to contribute to a project that we believe will ultimately drive social, political, and economic innovation on a global scale."

Tezos Foundation

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Get Involved with Tezos

Tezos.com