



OEL FOUNDATION WHITEPAPER: BUILDING THE BLOCKCHAIN ECOSYSTEM FOR LOGISTICS

An Open Source Decentralised
Infrastructure for Logistics Applications

May 2018

Version 1.0

Disclaimer: This document is a working draft.

web: oel.foundation



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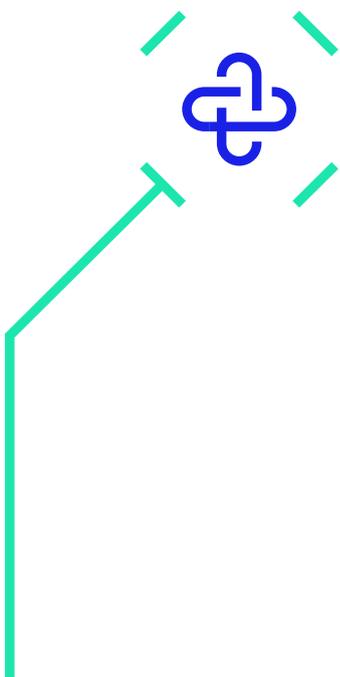
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SECTION 1.0

EXECUTIVE SUMMARY



Enterprise logistics in the supply chain is burdened by an unreliable and largely manual paper-based process. The resulting lack of transparency and absence of secure, trusted information creates cash flow delays and payment disputes affecting shippers and transporters globally. This situation makes maintaining liquidity very difficult in the transport industry.

Blockchain – by allowing the secure exchange of value and validation of transactions – is optimal for managing the movement of goods in a secure and traceable manner.

The OEL Foundation’s mission is to remove this burden through the adoption of a common, shared, and open source enterprise architecture utilising blockchain technology. To this end, the OEL Foundation will:

Build the OEL Enterprise Architecture.

A platform, protocol, and network used to deliver products and services for OEL Foundation Alliance members and the broader industry.

Launch the OPN Token.

A utility token, the OPN Token will fuel smart contract validation, serve as micro-rewards for sharing data to the network, and act as a point of access and stake on the network.

Host the OEL Foundation Alliance.

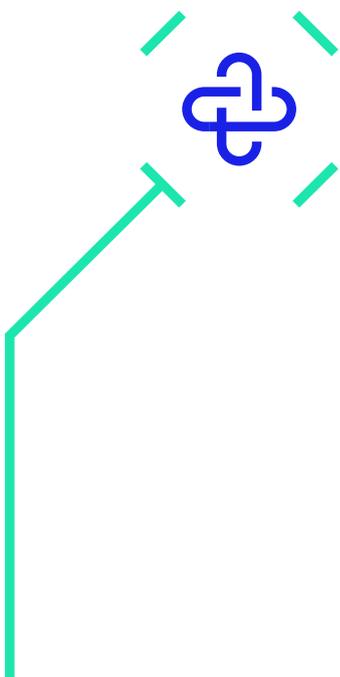
An alliance of supply chain participants, the OEL Foundation Alliance facilitates development and implementation of technical solutions for its members.

The ecosystem created by the Enterprise Architecture, Token, and Alliance will facilitate development of new logistics applications, with a particular focus on transport management.



SECTION 2.0

INTRODUCTION



ENTERPRISE TRANSPORT

Logistics and transport management generates approximately 13% of global GDP (The World Bank, 2016). By 2021, the business to business (B2B) transfer of ownership of retail goods will reach USD 15.5 trillion (Transparency Market Research, 2016).

The Open Enterprise Logistics (OEL) Foundation (hereafter ‘the Foundation’) estimates that the current outsourced spend on domestic road freight in Asia alone is over USD 143 billion per year, to service USD 6 trillion in retail goods transfers (PwC, 2016) (transport costs are typically 3% of freight value).

Road freight is the transport method of choice for conveyance of raw materials to manufacturing sites, and of finished goods to primary distribution centres, secondary distributors, and retailers. In emerging markets, increased turnover of merchandise in retail outlets has resulted in over-extended distribution networks.

Lack of secure supply chain control in the distribution channel, particularly in less developed markets, can drive up distribution costs due to lost sales, penalties from late delivery, theft or pilferage, and product damage.

The Foundation recognises that most deliveries to distributors and retailers in emerging markets are negatively impacted (delayed, disputed, short paid, or not settled) because of problems related to the paper process.



Growing demand for consumer goods in emerging markets has created a need to deal effectively with the excessive levels of fragmentation in the supply chain. The transport industry needs a more transparent, cost effective platform to solve the basic problems of distribution to locations around the world, including new and emerging consumer markets in Asia, Africa and South America.

GROWTH CONSTRAINTS

Buoyed by demographic growth in the consumer class, GDP growth in many road transport markets is 5% or greater (International Monetary Fund, 2017). When combined with the opening of new sales channels in the same countries, this increase results in companies across all verticals, as well as distributors, experiencing steady growth in their base sales. Growth in top-line sales leads to a similar growth rate in transportation volumes and spending. This demand is not well met by existing supply chains. The result is driving up costs in developing economies where transport spend can reach as high as 25% of GDP (The World Bank, 2016).

Projections through the year 2050 place emerging market growth, led by China, India, and Indonesia, at twice that of developed economies (PwC, 2017). Companies attempting to meet this demand are facing extraordinary logistics challenges. To meet growth in consumer demand, a shift to domestic raw material sourcing, manufacturing, and distribution has taken place. This demand exceeds the current capacity of supply chain infrastructure and availability of logistics services. The outcome is an industry that faces challenges related to expense, performance, and sustainability, as the cost of logistics rises at the same (or a faster) rate than new sales.



The world's largest fast moving consumer goods companies (FMCGs), for example, are paying for this outsourcing through a manual process weighed down by slow cash flow, lack of visibility, and procurement inefficiency. Adding to this challenge, paper-based proof of delivery exacerbates payment disputes, delays both invoicing and payment between retailers, brand owners (shippers) and transporters, and impacts negatively overall customer service.

The Foundation has identified the following major challenges facing brand owners, manufacturers, and distributors of a variety of product types, as they expand sales in many emerging markets:

Logistics costs as a percentage of sales are very high, with sub-optimal asset utilisation.

3PL (third party logistics provider) distribution networks are limited and sub-contracted by at least one level (adding 5-10% of additional cost).

The local transport and distribution supplier base is fragmented and difficult to manage, with little or no transparency into sub-contracting by local transporters.

Lost sales, excess inventory and penalties hurt both the top and bottom line.

Late, inaccurate, or missing proof of delivery reduces cash flow and increases administrative costs and transport rates through delayed invoicing, slow payments, and increased disputes.

Often, a full one percent of top-line revenue is lost due to inability to invoice caused by disputed, undelivered, or lost shipments.

Transporters, constrained by limits placed on their fuel, labour and other operating costs by delayed cash flow, face many issues of their own. Lack of IT infrastructure to directly service large shippers results in layers of sub-contracting. In addition, delayed and inconsistent payments often exacerbate working capital challenges, as the various parties in the logistics pipeline await acceptance for paper-based proof of delivery (which triggers payment) by the shipper.

INDUSTRY READINESS

The globalisation of trade in recent decades has brought significant complexity to global supply chains. Large technology providers have made integrated Transport Management Systems (TMS) a standard part of Enterprise Resource Planning (ERP) while fast moving start-ups have been able to extract value from the supply chain by providing asset light services such as online marketplaces, dynamic, real-time pricing, and automated capacity matching (PwC, 2017). It is also notable that major online retailers such as Amazon and Alibaba have made technology investments in areas such as warehousing and last mile delivery.

Given the importance of visibility, irrefutability, security, and efficiency to supply chains it is unsurprising that blockchain has become part of the efforts by corporations and start-ups to find further solutions to problems in the space. Product provenance was one of the earliest blockchain use cases to be identified and continues to be widely explored. IBM has begun work on a blockchain solution for food safety, creating a system of traceability that would enable the tracking down of dangerous food in the supply chain in seconds. A consortium of consumer goods companies and retailers, including Unilever, Nestlé, and Walmart, have signed on to pilot the solution (Coindesk, 2017). This level of traceability, according to IBM, will not only save costs due to greater efficiencies but also the toll in human life caused by tainted food.



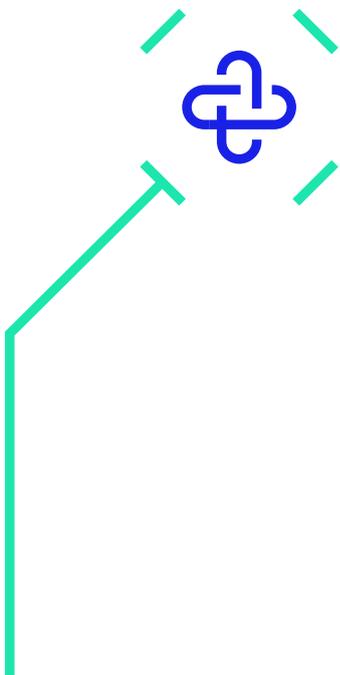
Working in combination with IoT and RFID tracking, there are multiple on-going projects leveraging blockchain to authenticate products and bring real time visibility to product journeys. This is especially important in sectors like pharmaceuticals and in the movement of high value goods and materials and is important for brands in maintaining the trust of their end customers. Corporate entities are taking note, with HSBC, BNP Paribas, and other financial institutions testing trade finance use cases (Coindesk, 2017) and IBM and Maersk partnering to build a global trade platform for shipping players on the Hyperledger Fabric (Fortune, 2018). IBM has also teamed with Capgemini to create a Smart Container prototype using blockchain technology. The aim is to place sensors in shipping containers to transmit quality data to an integrated IoT platform, visible to all parties and guaranteed reliable (Capgemini, 2017). The use of blockchain as the infrastructure for marketplace tendering of logistics services is also being explored by UBiMS, as is the problem of bills of lading irrefutability by CargoX.

Activity in the space is therefore significant. There are many innovative start-ups and projects seeking to address inefficiencies in the supply chain and it is encouraging to see talent and capital move in to the space. However, as long as these efforts exist in isolation from each other and in the context of resistance towards data sharing and collaboration the same bottlenecks will be faced due to the inevitable information asymmetries that arise. Innovative upgrades to state of the art digital ERP and TMS systems among corporate supply chain players for example are ineffective in a fragmented environment where different actors work on different information standards. With growing innovation and activity in the space, there is a requirement for a common standard decentralised architecture that can support a range of stakeholders. A key part of the Foundation's role is to bring together different industry participants and encourage adoption of the OEL Enterprise Architecture to ultimately eliminate this friction.



SECTION 3.0

PROBLEM



MARKET FRAGMENTATION (SUB-CONTRACTING)

In many markets, a large percentage of logistics for road transport is handled by brokers known as “3PLs” (third party logistics providers, sub-contracting services) or “4PLs” (fourth parties used to manage 3PLs). When a truckload of toiletries arrives in an Indonesian town, for example, that shipment has already gone through three or even four iterations of handling by sub-contractors. The person performing the actual delivery to the consignee at the end of the supply chain could be the owner or operator of an individual van or truck. These transporters typically do not have IT systems for recording data on their shipment and rely on manual processes.

The result is that transfers are made through a fragmented base of outsourced transportation providers without real-time tracking, limiting the visibility of shipment events for the shipper.

MANUAL PROCESS & PHYSICAL RECORDS

Without an integrated platform from shipper to consignee, an extensive manual paper trail is required, which slows the payment process for all parties. Proof of Delivery (POD) is made by paper records, which creates a ‘shadow credit’ period during which the shipper cannot invoice the retailer, and the transporter cannot invoice the shipper. This shadow credit period can easily extend beyond 10 days in emerging markets, affecting the working capital of transporters. Paper records are also open to dispute, which adversely affects customer satisfaction and further delays the flow of cash between shippers, retailers, and transporters.



LIQUIDITY & CASH FLOW

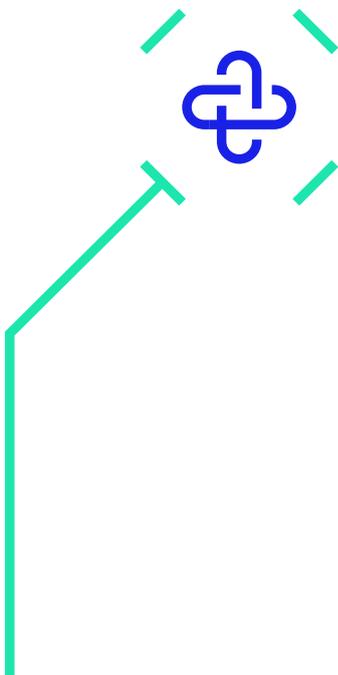
Lacking the means to provide verification of transactions and shipment events makes it difficult to ensure the complete and intact delivery of goods. The result is a cash-squeezed supply chain addled by inefficiency, lack of liquidity, and revenue loss.

However, if the occurrence of that transaction is irrefutable, and the records contained in the decentralised ledger are available to all parties involved in the exchange of goods, then an immutable audit trail is created. A liquidity provider, such as a financial institution or insurance company, would then be likely to offer favourable rates to a transporter who factored their invoice, or to a shipper who has invoiced a consignee. This is discussed in the next section.



SECTION 4.0

SOLUTION



VISION

With paper records as the de-facto standard, the Foundation aims to empower the transport industry by moving paper-based and off-ledger digital records onto the blockchain. Through distributed ledger technology a shipment related entry becomes immutable, providing an indisputable record of the freight's history linked to a digital agreement – a smart contract.

The OEL Foundation is committed to enabling logistics players across the transport industry to blockchain-enable their technology, bringing the benefits of the distributed ledger to as many participants as possible.

The Foundation is driving development of a decentralised infrastructure to meet the challenges of transport management. The blockchain-based ecosystem of OEL Enterprise Architecture, OPN Token, and Alliance members enables and supports distributed applications (dApps) that leverage irrefutable shipment data. Supply chain stakeholders gain the ability to cut through complex layers of sub-contracting by rewarding the sharing of data through micro-reward incentivisation, and to leverage immutable proof of shipment events to drive cash flow.



VALUE PROPOSITION

The OEL Enterprise Architecture drives development of logistics solutions for supply chains, with an initial focus on transport management. The potential impact of blockchain on the enterprise transportation industry is significant. Implementation of the Enterprise Architecture will make blockchain applications real, accessible, and functional for all parties in the supply chain. With network participants incentivised to share data, service levels and accountability improve. The transparency and trust introduced into the resultant blockchain-driven transport ecosystem enables acceleration of payments, from the multinational manufacturer and shipper, down to the consignee acquiring the goods, to the local transporter delivering those goods to remote storefronts. Improvement of service levels and acceleration of payment cycles will drive profitability and create liquidity. The benefits of such an ecosystem are to:

Eliminate reliance on intermediaries by using a blockchain to transmit orders, letters of credit, bills of lading, and delivery receipts without requiring bonded couriers.

Drive market efficiency, transparency, and cost savings using an immutable and auditable public ledger for recording documents and events, while utilising smart contracts to trigger payments and micro-rewards.

Facilitate fluid demand and supply side relationships, reducing reliance on brokers and clearing houses.



Proof of this concept was established by OpenPort¹ in May 2018, when a blockchain-enabled invoice factoring transaction was completed with Acudeen Technologies (Acudeen Technologies, 2018). OpenPort used its blockchain-enabled proof of delivery solution to irrefutably confirm delivery of a shipment, the invoice for which was posted on Acudeen’s AssetChain marketplace. It was verified without the need to interact with the seller’s payor and was quickly bought at a competitive rate. This demonstrates the ability to provide immediate and cheap financing for transporters in a blockchain ecosystem.

Future applications extend far beyond improving the cash cycle. The ability to gather immutable data for analytics on tracking and visibility of IoT related sensor data, i.e. temperature monitoring, pallet tracking, returnable packaging, and vehicle weights, has significant implications for the optimal management of transport assets, and the creation of sustainable supply chains.

Fatigue Management – the tracking and management of driver hours – can be greatly improved, improving safety and reliability in transport networks.

¹ OpenPort Ltd. (www.openport.com) hosts the Foundation via a Service Agreement. Details of this are contained in the Governance section of this document.



OEL FOUNDATION ALLIANCE

Blockchain is a technology best utilised by a focused community that derives value from its decentralised nature. Active members of the OEL Foundation Alliance, together with the OEL Enterprise Architecture, form the OEL blockchain ecosystem driving innovation for logistics applications.

The OEL Foundation Alliance will be comprised of stakeholders in the supply chain industry; from multinational brand owners and manufacturers, to freight forwarders and third-party logistics companies (3PLs), transporters, and retailers. The OEL Foundation Alliance will also encompass ancillary service providers – technology providers, developers, and financial services for the supply chain industry.

Alliance members are involved in the conceptualisation, development, and implementation of blockchain applications using the OEL Enterprise Architecture, with the goal of making blockchain applications real and actionable for stakeholders.

Membership in the OEL Foundation Alliance comprises three tiers, to be as accessible as possible to all, while acknowledging those organisations who wish to contribute material resources.

General Members have access to the information produced by the Foundation, and to production ready applications.

Premium Members have quarterly access to the development team, along with access to software development kits (SDKs) and beta releases for early stage blockchain applications.

Enterprise Council Members influence the direction of development of the Enterprise Architecture, and can co-author articles, studies, and other content released by the Foundation. They receive the same full technology access as Premium members.



TRACK RECORD

OpenPort, the commercial entity contracted by the Foundation to provide development and administrative support for the OEL ecosystem, was incorporated in 2015 and has achieved over USD 500k in monthly revenue across four Asian markets, providing digital logistics solutions for some of the largest consumer goods companies in the world and the global 3PLs managing their supply chains.

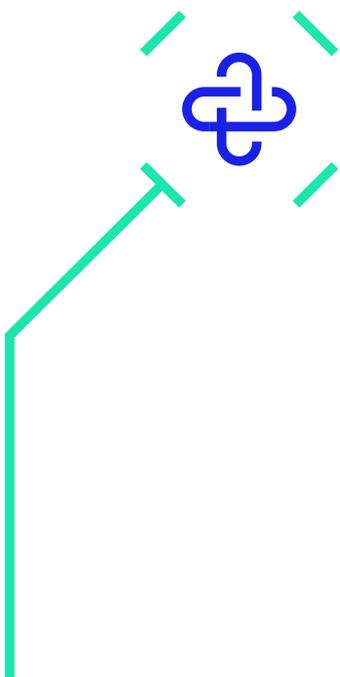
OpenPort and the Foundation are currently operating a private blockchain network which supported the blockchain-enabled proof of delivery, micro-rewards and invoice factoring pilots successfully executed by OpenPort in early 2018.

The Foundation will leverage OpenPort's existing client base, experience, and knowledge gained through these pilots to design, build and implement the OEL Enterprise Architecture with understanding and access to the real-world requirements of enterprise logistics.



SECTION 5.0

TECHNOLOGY



ARCHITECTURE

The OEL Enterprise Architecture references relevant industry standards and provides a framework to understand the enterprise environment and the technical layers and components that comprise the product and service offerings.

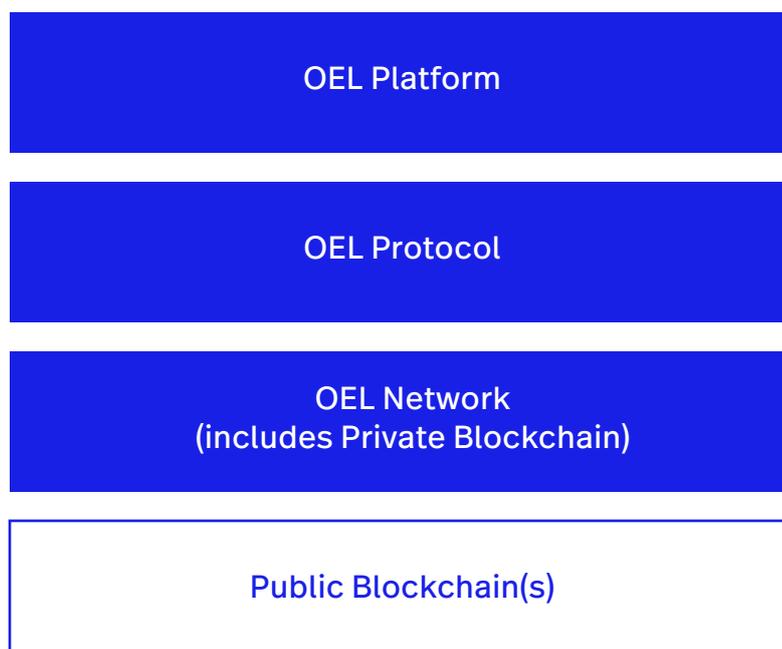
The two industry standards that the OEL Foundation has leveraged are:

1. The *Enterprise Ethereum Architecture Framework* (<https://entethalliance.org/resources/>) published on 2 May 2018
2. The *OnChain Distributed Networks Architecture* (<http://www.onchain.com/en-us/>)

The main layers in the OEL Foundation Enterprise Architecture are:

1. The Open Enterprise Logistics Platform (OEL Platform)
2. The Open Enterprise Logistics Protocol (OEL Protocol)
3. The Open Enterprise Logistics Network (OEL Network)

These are discussed below.



OEL PLATFORM

The OEL Platform encompasses components in the Application and Tooling layers of the Enterprise Ethereum Architecture Framework and services within the OnChain DNA Services layer. Specifically, the following components are contained within the OEL Platform layer:

OEL Foundation dApps (Foundation and third-party use cases)

Dashboards and BI tools

Smart Contract DSL

Identity Management

Role Based Authorisations

Client on-boarding Wizards



OEL PROTOCOL

The OEL Protocol includes components in the Tooling and Privacy/Scaling layers of the Enterprise Ethereum Architecture Framework and services within the OnChain DNA Services layer. Specifically, the following components are contained within the OEL Protocol layer:

Smart Contract Templates

On-chain and off-chain scaling using e.g. state channels or sharding

Encryption (PKI X.509)

APIs

Inter-chain (cross-chain) Integration

Integration of third-party services e.g. payment gateway

APIs are RESTful (conforming to Representational State Transfer architectural style) or GraphQL and will typically use JSON, although other Alliance member requirements for web services or data-interchange formats will be accommodated.



OEL NETWORK

The OEL network includes components in the Core Blockchain and Network layers of the Enterprise Ethereum Architecture Framework and services within the OnChain DNA Core and OnChain DNA Cross-chain Adaptor layers. Specifically, the following components are contained within the OEL Network layer:

Private Blockchain mainchain

Precompiled Smart Contracts

Virtual Machine

Private Consensus (using POS or dBFT algorithms)

Off-chain Storage (e.g. IPFS, BigchainDB)

BLOCKCHAIN SOLUTIONS

The OEL Foundation uses a hybrid blockchain model, with mainchain, side chains and inter-chain connectivity to other service providers whose offerings are implemented with proprietary or public blockchain protocols.



STANDARDS

Wherever possible, the OEL Foundation will use industry standards to facilitate interoperability with OEL Foundation Alliance members and other third-party service providers. These include but are not limited to GS1 (<https://www.gs1.org/>) and the World Customs Organization Commodity Description and Coding System (Harmonized System) (<http://www.wcoomd.org/en/topics/nomenclature/overview.aspx>). All Foundation components are implemented using cloud-based multi-tenant Software as a Service (SaaS) and Platform as a Service (PaaS) services and browser and mobile phone- based user interfaces.

DEVELOPMENT METHODOLOGY

OEL Foundation staff have extensive experience of a range of software development methodologies including Agile, Dynamic Systems Development Model (DSDM), other Rapid Application Development (RAD) methods, Lean Development (LD) methodology, and traditional approaches such as waterfall. Development staff utilise behaviour-driven development and test-driven development practices together with continuous integration, automated testing and continuous deployment. When working with and on-boarding members we are happy to accommodate the member's preferred way of working.



CRITERIA

SCALABILITY

The platform provides low cost, consistent transaction speeds, with the ability to automatically scale to cater for increasing logistics traffic volumes. Scalability is enabled through both on-chain and off-chain enabling solutions such as sharding and state channels.

CONFIDENTIALITY

Data privacy and security is compliant with industry best practices and relevant regulations such as the Global Data Protection Regulation (GDPR). Ecosystem participants benefit from identity management and have full control over their personal data.

GOVERNANCE

The OEL Foundation serves as the governing body ensuring openness, transparency, trust and accountability. The Foundation will maintain the protocol and platform, which will be made available to third parties under a GPL license, and will build a developer ecosystem.

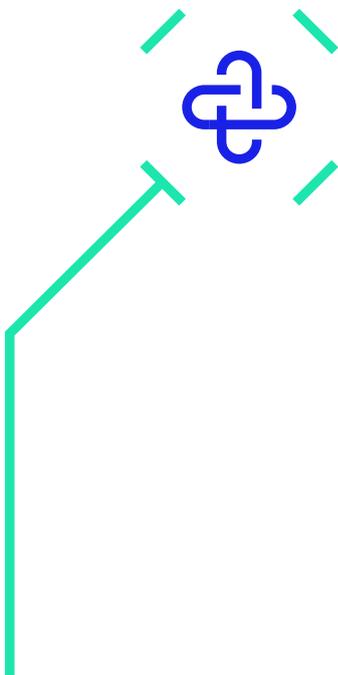
SHARING

A rewards-based scheme to encourage supply chain participants to share supply chain data such as location and available capacity in exchange for OPN Tokens.



SECTION 6.0

TOKEN



INTRODUCTION

There will be two token generation events for the OPN Token (OPN), the first phase of the token generation event (TGE Phase 1) will occur in Q3 2018 and the second phase of the token generation event (TGE Phase 2) will occur in Q2/Q3 2019. OPN Tokens issued during the TGE Phase 1 will conform to the ERC-20 standard. Should the OEL Foundation change components within the OEL Enterprise Architecture, and a different underlying token standard be used, there will be an exchange of OPN Tokens on a one-for-one basis with native tokens on the new technical infrastructure.

TOKEN ROLES

The OPN Token is the **utility token** powering the OEL Protocol through four key utility functions that the token will progressively support:

Smart contract validation

Micro-rewards and incentivisation

Point of Access

Staking



SMART CONTRACT VALIDATION

OPN Tokens will be required to fuel smart contracts deployed on the OEL Network and pay transaction fees to the network nodes. Using the solutions provided by OpenPort as an example, for each irrefutable blockchain ePOD issued (in essence, a smart contract adapted to OpenPort use cases), transaction fees will be paid in OPN Tokens to the network.

MICRO-REWARDS AND INCENTIVISATION

OPN Tokens will be used to reward information sharing to the decentralised network in very granular ways, creating a data economy and encouraging specific behaviours by network participants. With this feature, any supply chain participant, for instance drivers, can receive OPN Tokens when providing information back into the network upon pick-up, delivery or when in transit (geo data, current capacity, SKUs exceptions, etc.).

ACCESS

OPN Tokens provide a point of access for the management of authorisations, and a tool for governance. Shippers or third-party service providers like OpenPort will be required to hold OPN Tokens to push high volume of transactions across the network. Transporters will need OPN Tokens to execute smart contracts and to incentivise drivers to the micro-rewards scheme. Shippers, transporters and other supply chain participants all stake value, in the form of OPN Tokens, onto the network, in order to access and benefit from it.

STAKING OR BOOKKEEPING

The OEL Network will use industry standard consensus algorithms with OPN Token stake rewards to the operators of participating nodes during the first years of operation.



TOKEN SALE

The TGE Phase 1 shall comprise of a private purchaser pre-sale (with bonus tokens allocated to early contributors) and a public purchaser main sale. The TGE Phase 1 is targeted for Q3 2018 with the following parameters:

Price: USD 0.50 / token

Soft cap: USD 4 million

Hard cap: USD 15 million

Upon implementation of the OEL Foundation main net, TGE Phase 2 will take place as a public sale in Q2/Q3 2019. This sale will comprise of an issue of new tokens at the then prevailing market price and, if relevant, an issue of replacement OPN Tokens for holders of ERC20-compliant OPN.



Participants in OPN Token sales will undergo screening processes to comply with KYC/AML (Know Your Customer/Anti-Money-Laundering) regulations of vetted jurisdictions. OEL will communicate directly with any individuals purchasing over USD 25,000 worth of OPN Tokens during TGE Phase 1 and 2. A lock-up on the token distributions will be imposed as follows:

Thirty-three percent of tokens purchased by participants will be distributed to participants upon closing of the public sale

The remaining 66% of tokens purchased by participants will be distributed monthly over a period of six months, commencing 30 days after the closing of the TGE Phase 1

(In other words, 11% will be issued 30 days after closing of the TGE Phase 1, an additional 11% will be issued 60 days after the closing of the TGE Phase 1, and so on.)

Bonus tokens attaching to pre-sales will be subject to the same lock up schedule.

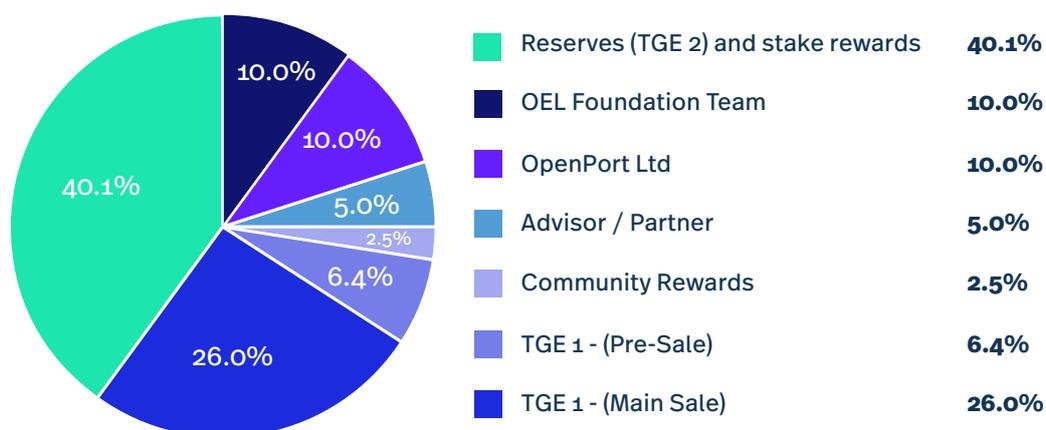


The following table summarises the key parameters of the token sale (assuming the hard cap of USD 15 million is achieved and includes a pre-sale of USD 2 million at a bonus of 60%):

	TGE Phase 1		TGE Phase 2
	Pre-Sale	Crowdsale	Crowdsale
Who?	Private	Public	Public
What?	Contract (available only to vetted parties)	ERC-20 compliant token	OPN Token (compliant with relevant standard)
When?	Q2 / Q3 2018	Early Q3 2018	Main net roll-out (Q2 / Q3 2019)
Where?	Pre-vetted jurisdictions		Pre-vetted jurisdictions
Raised Amount (USD)?	Soft cap: USD 4 million Hard cap: USD 15 million		Market price
Token Price?	0.50 USD / OPN Token + Pre-sale bonus	0.50 USD / OPN Token	
How Many?	6,400,000 OPN Tokens	26,000,000 OPN Tokens	30,075,000 OPN Tokens (approximately)
Purchaser Limit	USD 10,000 - USD 1 million	USD 250 - USD 25,000	USD 250 - USD 25,000

TOKEN SUPPLY AND DISTRIBUTION

OPN Token supply is fixed at 100,000,000 tokens with initial distribution in TGE Phase 1 and 2 in Q3 2018 and Q2/Q3 2019. The intended token distribution is shown below:



THE OEL FOUNDATION TEAM WILL BE ALLOCATED 10% OF THE TOKEN SUPPLY

Tokens will be distributed according to a 30-month vesting schedule. For those OEL team members that are involved in TGE Phase 1, 5% of their allocations will be distributed in TGE Phase 1.

OPENPORT LTD WILL BE ALLOCATED 10% OF THE TOKEN SUPPLY

Tokens will be distributed to OpenPort according to a 15-month vesting schedule. OpenPort through a service agreement, is providing a range of services including marketing and administrative, as well as up-front financial support. OpenPort has a binding agreement to use the OEL Platform as its sole smart contract platform for its ePOD product ensuring the platform will be used within several large supply chains starting from day one.

ADVISORS AND PARTNERS WILL BE ALLOCATED 5% OF THE TOKEN SUPPLY

Advisors and partners will be subject to a 12-month vesting schedule.

UP TO 2.5% OF THE TOKEN SUPPLY WILL BE ALLOCATED FOR COMMUNITY REWARDS

Community rewards will be allocated on specific initiative to drive adoption and awareness of the OEL Foundation's initiatives and plan.

RESERVES AND STAKE REWARDS

Any tokens not sold during TGE Phase 1 (because, for example, if advisor/community rewards allocations are not fully used or the hard cap is not reached) will be allocated to Foundation reserves and used during TGE Phase 2 once the OEL Network main net is ready. Part of the reserves will be set aside as stake rewards to incentivise nodes acting as validators on the network during the first few years after the network launch. The Foundation will, at its discretion, use token reserves as it sees fit to best serve the community and in the general interest of all participants in the ecosystem.



USE OF PROCEEDS

The OEL Foundation hopes to reach TGE Phase 1's hard cap of USD 15 million, on which the use of proceeds of the sale will be as detailed below:

30% of the proceeds will be allocated to developing and implementing the OEL Enterprise Architecture (hiring developers, service providers and infrastructure)

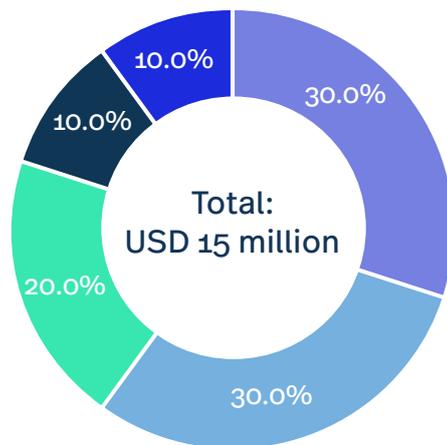
30% of the proceeds will be allocated to OpenPort as per the terms of service agreement to cover the services provided by OpenPort leading up to the token generation event and future services supporting the Foundation's initiatives)

20% of the proceeds will be allocated to the OEL Foundation Alliance build out and marketing initiatives supporting the adoption of the OEL Platform

10% of the proceeds will be allocated to cover administrative and legal expenses

10% will be allocated as reserves for contingency



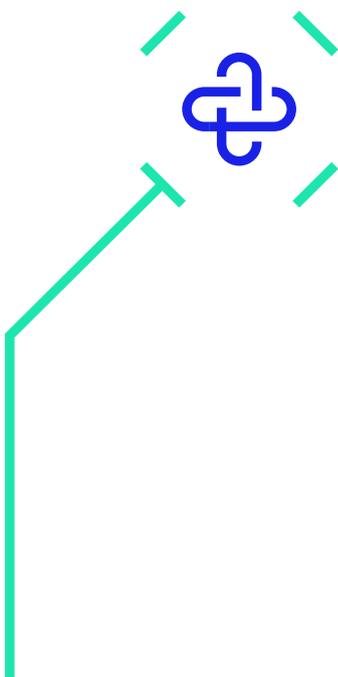


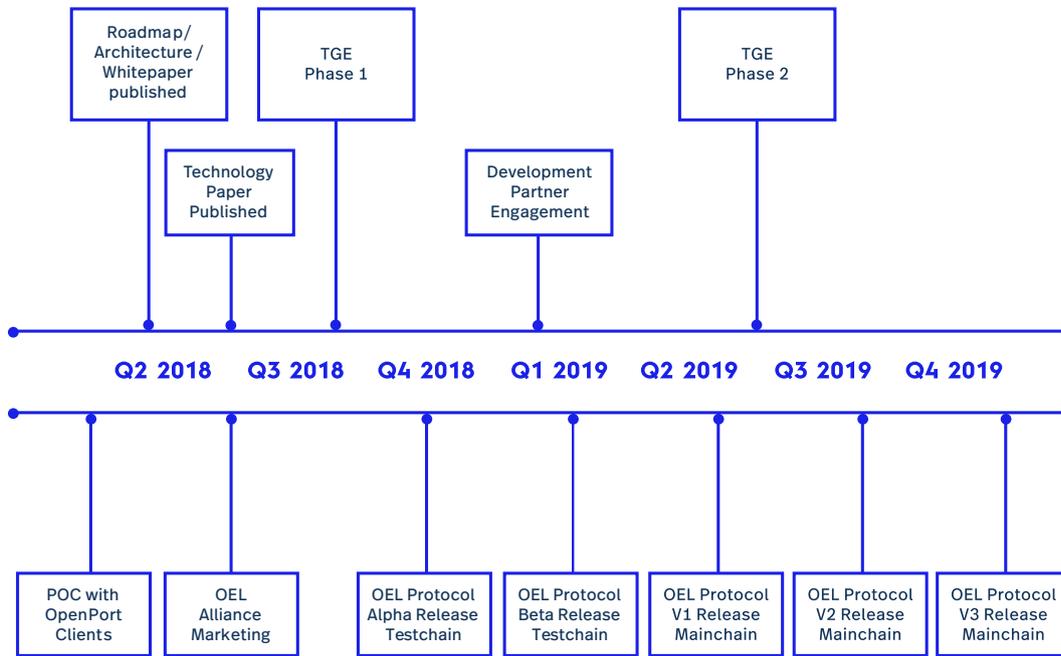
■ Alliance Build out and Marketing	USD3.0m	20.0%
■ Legal and Admin	USD1.5m	10.0%
■ Contingency	USD1.5m	10.0%
■ Platform Development	USD4.5m	30.0%
■ OpenPort Service Agreement	USD4.5m	30.0%

If the OEL Foundation only reaches its soft cap of USD 4 million during the TGE Phase 1, USD 2.5 million of the proceeds will be allocated to developing and implementing the OEL Enterprise Architecture, and the remaining initiatives will be covered with a limited budget of USD 1.5 million until TGE Phase 2 is complete.

SECTION 7.0

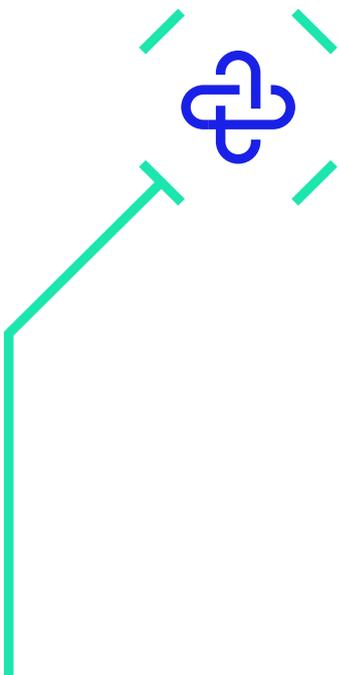
ROADMAP





SECTION 8.0

TEAM



A current list of the following parties is available at <https://oel.foundation> (from June 4th):

Board of Directors

Foundation Management

OpenPort Team

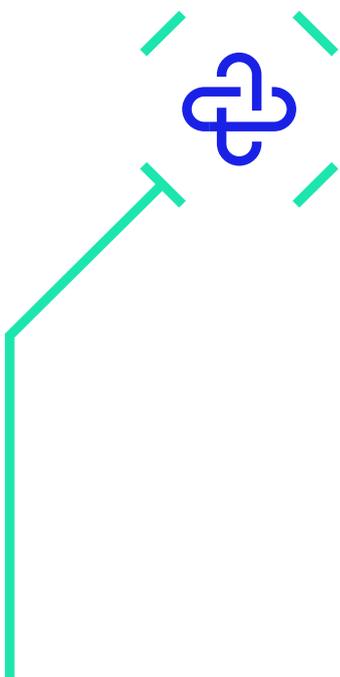
Advisors

Partners



SECTION 9.0

GOVERNANCE



The OEL Foundation was established in March 2018. Operating as an independent governing entity, the Foundation's central mission is to:

Stimulate and support adoption of the OEL Enterprise Architecture across the transport industry,

Promote adoption of the OPN Token as a means of rewarding behaviours aligned with sharing data to effectively drive transport and logistics management, and to

Encourage development of compatible digital applications for supply chain logistics.

ROLE AND RESPONSIBILITY

The Foundation performs the following functions in the supply chain logistics ecosystem:

Provides an independent body of governance for the OEL Enterprise Architecture

Offers resources and support for development and distribution of the OEL Enterprise Architecture

Publicises and promotes the OEL Enterprise Architecture, dedicated to streamlining the supply chain logistics process for enterprise transport

The Foundation envisions adoption of the OEL Enterprise Architecture universally across the logistics industry. This will require that the OPN Token functions as the means of fuelling smart contract validation, serving as a point of access to the transport and logistics management ecosystem and as a stake on the network, as well as providing a mechanism of incentivisation in the OEL Enterprise Architecture-based token economy.

The Foundation will be responsible for all critical decisions regarding infrastructure development of the OEL Enterprise Architecture, issuance of the OPN Token, publicising and promoting the OEL Enterprise Architecture, growth and activity of the Foundation itself. The Foundation's membership and governance board will consist of well-regarded specialists in the fields of logistics, transport, supply chain, blockchain technology, and cryptocurrency.

MEMBERSHIP, CONSENSUS, AND VOTING

The OEL Foundation, a non-commercial entity, will make participation in the ecosystem feasible by all stake-holding parties involved in implementation of blockchain-driven use cases, through memberships and alliances, and in advising capacities.

The OEL Foundation is in the process of recruiting industry personae respected for their expertise, professionalism, and ethics. The Foundation's board will set criteria required for individuals and corporations to be OEL Foundation Alliance members. Individuals and companies may also participate and influence, but in a more limited scope, the Foundation's governance, through participation in the OEL Foundation Alliance. Finally, individuals may directly counsel and guide the OEL Foundation's board as official advisors.



SERVICE AGREEMENT

In the absence of participation within the OEL Foundation as members or through the OEL Foundation Alliance, companies participating in platforms made possible by the OEL Enterprise Architecture will not exercise any manner of direct control over the OEL Foundation, instead, service agreements will provide for development, marketing, and sales support by such companies to the Foundation, in exchange for agreed compensation.

RIGHTS

OPN Tokens do not entitle the holder to any rights in the OEL Foundation. Instead, OPN Tokens entitle the token holder to participate in the OEL-enabled ecosystem solely within the context of the token roles delineated in section 2.3, The rights listed in section 2.5, Token Economics, and within the confines of the disclaimer set forth in section 3.2, Risk Disclosure.

MARKET MANIPULATION

Holders of OPN Tokens are required to accept the terms of the TGE. This includes a requirement incumbent upon owners of OPN Tokens not to spread misinformation about participating projects in an attempt to manipulate the token price. In the event that the Foundation suspects that manipulation of the token price is taking place, the Foundation reserves the right to take legal or other action for damages and, if necessary, seek an injunction.

OPEN SOURCE

OPN Tokens are used to facilitate the growth of the OEL Enterprise Architecture, its related technology, and the evolution of the supply chain logistics ecosystem as an open, decentralised, ledger-hosted ecosystem. As such, no token holder shall have a claim to any intellectual property of the OEL Foundation.



DISPUTES

In the event that a token holder has a dispute regarding their token, the OEL Foundation requires that they bring their dispute to the Foundation for initial resolution. If no resolution is found, then the dispute will be handled via arbitration proceedings.

COMPLIANCE

The OEL Foundation will address regulatory and compliance issues, on a country by country basis, as they arise.

PUBLICITY CHANNELS

The OEL Foundation will operate a website, maintain an online presence, communication mechanisms, and social media channels.

OPENPORT LTD

In August 2017, Max Ward, founder and CEO of OpenPort, concluded that blockchain technology would be the natural progression to the products and services being made available to OpenPort's customers and set up a working group within OpenPort to explore this blockchain initiative, headed by Nicolas Husson, CFO of OpenPort.

Initially, OpenPort developed Ethereum based TMS and ePOD proofs of concept, which proved limiting in terms of costs, scalability and confidentiality. Recognizing the need for a dedicated blockchain architecture for the logistics industry, Max and Nicolas, in their individual capacities, founded the OEL Foundation, as founding members, with the expectation that to be truly effective, the Foundation must be independent.



As such, independent board directors will take up a majority of the seats on the OEL Foundation’s board and additional members will be accepted into the Foundation’s membership based on criteria determined by the Foundation’s board. To ensure the smooth running of the Foundation in its early days, however, Max and Nicolas will remain as founding members of the OEL Foundation and directors on the Foundation’s board.

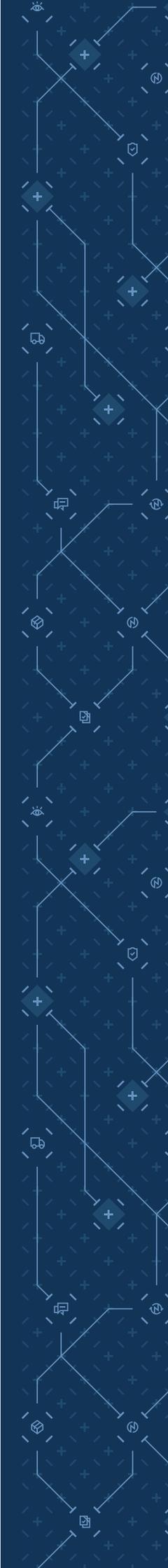
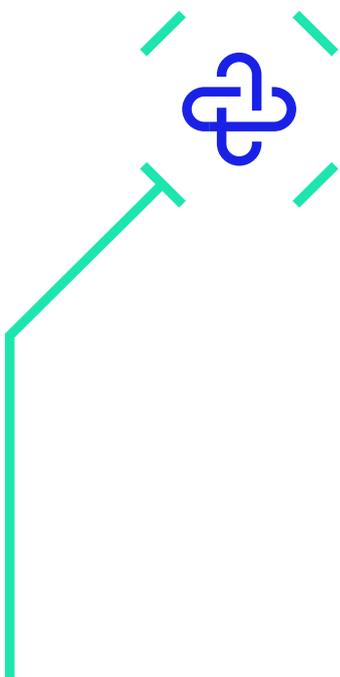
OpenPort meanwhile, is not a member of the Foundation. However, given the resources that OpenPort has to date expanded on its blockchain initiative, and the experience it has gained and goodwill among its customers it has generated, the OEL Foundation has contracted OpenPort to support it, through a service agreement, by allocating officers, staff, resources, and licensing of intellectual property, all of which would be critical to enable the Foundation to achieve its mandate. In other words, OpenPort will perform development activities involving the OEL Enterprise Architecture, the OPN Token, the suite of OpenPort products, and integrations with third-party systems.

Once the OEL Enterprise Architecture, is fully launched and deployed, OpenPort will transfer its current book of business running today on Ethereum, to the OEL Network.



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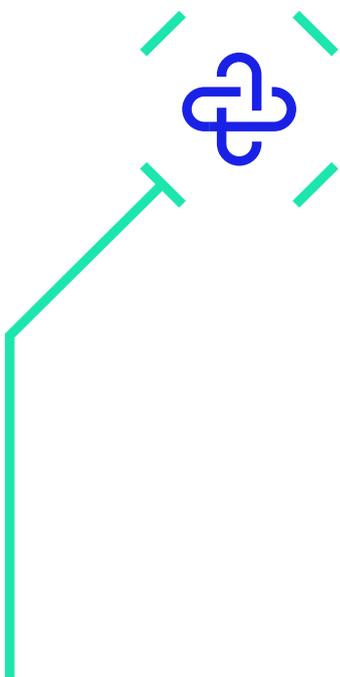
GLOSSARY



Term/Acronym	Definition
3PL	Third-party logistics provider; plays the role of broker and acts as a coordinator between shippers and transporters.
4PL	Fourth-party logistics provider; plays the role of managing the 3PLs.
dBFT	Delegated Byzantine Fault Tolerance
ePOD	Electronic Proof of Delivery
ERP	Enterprise Resource Planning
FMCG	Fast Moving Consumer Goods
GPS	Global Positioning System
KPI	Key Performance Indicator
MRP	Material Requirements Planning
OEL	Open Enterprise Logistics
OMS	Order Management System
OPN	OpenPort Network (token)
PaaS	Platform as a Service
PoA	Proof of Authority
POD	Proof of Delivery
PoS	Proof of Stake
SaaS	Software as a Service
Shipper	Refers to any company in the transport ecosystem with goods requiring transport. Typically, these are manufacturers and brand owners. Does NOT, in this context, refer to any company involved in moving freight.
SKU	Stock Keeping Unit
TGE	Token Generation Event
Transporter	Refers to the actual carrier of goods. While this could be an ocean or air carrier, in this context, the term refers to road carriers, these being truckers.

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DISCLAIMER



This whitepaper is for informational purposes only and is not an offer or solicitation to sell shares or securities or any other investment instrument in the OEL Foundation or any company or affiliate in any jurisdiction.

OPN Tokens, as well as the ERC-20 compliant tokens to be generated during the TGE Phase 1, are not securities, nor are they intended to resemble a security (debt or equity) in any form or in any jurisdiction.

OPN Tokens are not intended for speculative use and any speculative buyers do so at their own risk of possible financial loss. OPN Tokens are not evidence of ownership or right to control. Holders of OPN Tokens are not granted ownership or equity in any company, nor do OPN Tokens grant any right to participate in the control, direction or decision making of the OEL Foundation.

The information and analyses presented in this whitepaper should not be relied upon to form the basis of any purchase decision. Potential buyers of OPN Tokens should seek appropriate legal, tax, financial and other professional advice as to the implications of buying OPN Tokens.

This whitepaper may not be reproduced or distributed, in part or in whole, absent the entirety of this Risk Disclosure section. This whitepaper may not be reproduced and distributed to any country or jurisdiction where distribution of documents of this sort may be restricted or prohibited.

The OEL Foundation expressly disclaims any and all responsibility for any direct or consequential loss or damage of any kind whatsoever arising directly or indirectly from: (i) reliance on any information contained in this whitepaper, (ii) any error, omission or inaccuracy in any such information, or (iii) any action resulting therefrom.



REGULATORY ISSUES

This whitepaper has not been examined or approved by any regulatory agency of any jurisdiction. The publication and distribution of this whitepaper does not imply that the applicable laws, rules, or regulatory requirements in any jurisdiction have been complied with.

CAUTION REGARDING 'FORWARD-LOOKING STATEMENTS'

This whitepaper discusses the plans and forecasts of the OEL Foundation as regarding the development of its business through the OEL Enterprise Architecture and blockchain technology. It must be emphasised that these forward-looking statements do not, necessarily, reflect historical facts but instead discuss the Foundation's future plans.

These forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual future results, performance, or achievements of the Foundation, and the ecosystem it promotes, to materially differ from those discussed or anticipated in the whitepaper or even cause the OEL Foundation to be unable to realise the vision set out in this whitepaper. The circumstance that may impede the OEL's Foundation's vision may stem as a result of:

OpenPort Ltd being unable to, for whatever reason, fulfil the services agreement executed between it and the Foundation

There being insufficient capital available to the OEL Foundation for it to fully develop the OEL Enterprise Architecture

There may be changes in customer preferences or market conditions surrounding the OEL Enterprise Architecture, or blockchain in general

The OEL Foundation may be unable to, due to general unavailability or shortage of capital, to recruit a talented and qualified workforce and fulfil its needs to recruit and retain board members to ensure sufficient independence

There may be changes in legal, social, and economic conditions where the OEL Foundation is registered, as well as in those countries where OPN Tokens may be used

There may be changes in the regulation of crypto-currencies and blockchain networks, in that the function of OPN Tokens could be impacted by one or more regulatory inquiries or actions, including the licensing of or restrictions on the use, sale, or possession of digital cryptographic tokens, which could impede, limit, or end the development of the OEL Enterprise Architecture

There may occur catastrophic or long-term technical or security failures in the blockchain

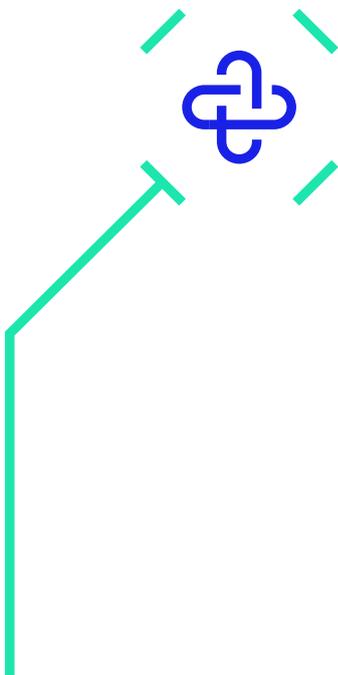
Finally, there may be completely unforeseen circumstances such as wars, acts of terrorism, or natural disasters that may impact, by a variety of means, the OEL Foundation as a whole

The above list of risk factors is in no way meant to be exhaustive. The TGE Phase 1 and 2 will be governed by specific terms and conditions which will set out additional risk factors that purchasers of OPN Tokens will be required to acknowledge before they are able to complete their purchase.



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