GFT

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Digital Green Bond Issuance

Powered by Daml, delivered by GFT

Data is power

Harnessing the extraordinary power of data to drive positive change across the global financial services industry is today's top priority. To achieve this, all parties must have fast, easy access to a single source of reliable, auditable information to create a more equitable, energy-efficient business environment. Read on to learn how using the GFT and Digital Asset tokenisation platform streamlines green bond issuance, heralding a new, more socially acceptable dawn for financial markets and their customers.

> **Green bonds are fixed-income instruments based on running environmentally sound practices and mitigating climate change. These can range from manufacturers that run on zero carbon emissions to companies producing renewable energies and much more.**

An exploding marketplace

Green bonds have taken the market by storm and have grown exponentially in size and importance over the last ten years. *According to the report by the Climate Bonds Initiative, in Q3 of 2020 alone, some US$70B of green bonds were issued.* The desire to build a sustainable offering around which a firm could emit bonds is now imperative.

Traditional service offerings no longer fit for purpose

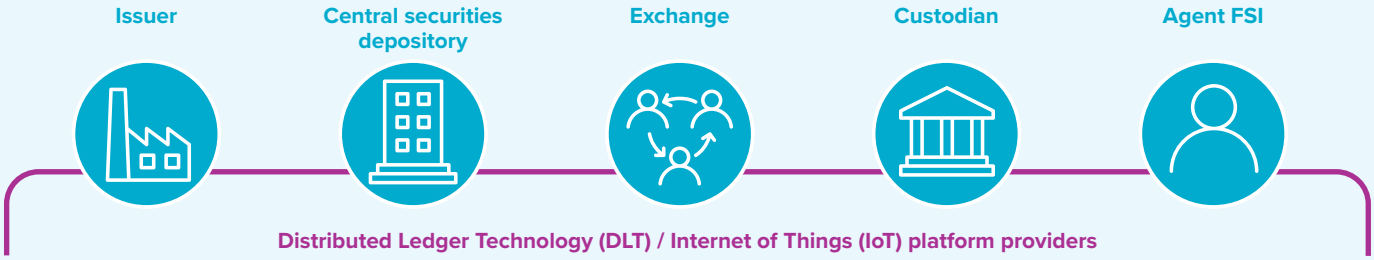
GFT has established a formidable reputation as a pioneer in financial engineering innovation. We consistently deliver modern technology solutions which supercharge both positive change and business development capabilities. However, there are still far too many inflexible, legacy-laden core systems in existence due to years of underinvestment. These are severely limiting the ability to respond to rapidly changing market demands. In many cases, this also means many traditional service offerings are no longer fit for purpose and do not support the modern customer's needs.

A fast-changing, data-centric world

Today's demanding consumers expect almost instant access to an ever-expanding array of modern, environmentally appropriate services, also at a much lower cost. Whilst this is a difficult situation, clients are determined to re-establish their reputation as innovators by offering forward-thinking, ecologically friendly products. European regulation such as the recent 2021 EU taxonomy for sustainable activities under a broad 'comply or explain' directive means that most financial firms and investment businesses are now prioritising the ecological impact of their investments, green bonds and other ecologically sustainable financial products.

To survive and prosper in this fast-changing, socially conscious data-centric world, financial firms must reinvent outdated technology environments to ensure their own sustainable future.

Green bonds – participants overview



An unsustainable business model

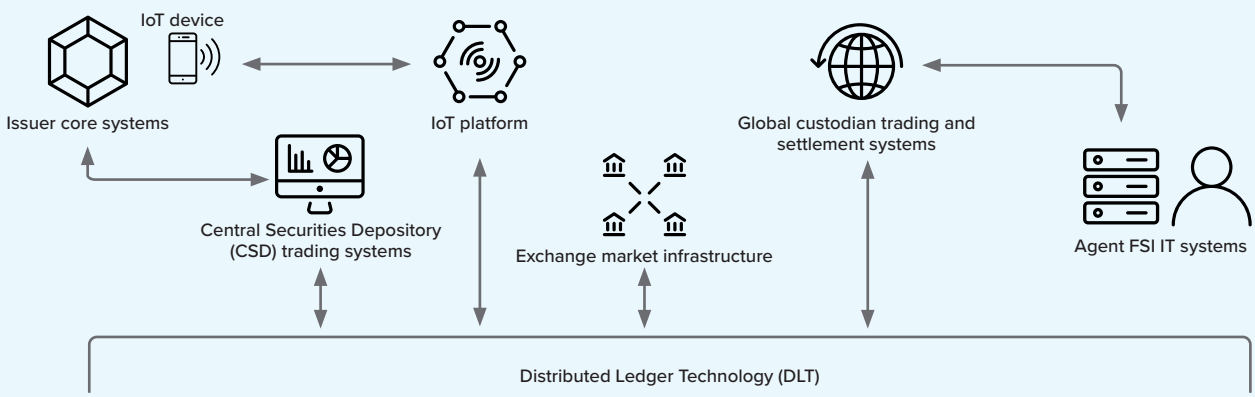
The growing importance of green bonds to the global business and consumer communities has further highlighted the shortcomings of existing systems. They have amplified the urgent need for a significant wholesale technology modernisation refresh, particularly for institutions looking to overhaul the preparation of debt request forms and their bond issuance process. Traditionally, they have relied upon error-prone and highly inefficient systems, using the phone, spreadsheets and a tsunami of emails which is now an unacceptable situation.

Industrial strength, knowledge and experience

With a track record of delivering successful data-synchronised solutions, GFT has both the vision and experience to provide practical and cutting-edge solutions to complex business challenges.

Together with Digital Asset, we bring industrial strength experience in supporting DLT / smart contract-driven corporate bonds and multi-bank / institution green bond issuance at scale.

Green bonds – high level architecture



The model distributed ledger platform

Working in close collaboration with clients, GFT has created a unique and highly effective platform using distributed ledger technology to create dynamic tokenised objects. The technology stack supports complex market infrastructures: Daml smart contracts, Corda Enterprise DLT platform and the Sphinx Open IoT platform.

Daml is the development framework created by Digital Asset that enables financial institutions to build interconnected economic networks that cross data boundaries. Through Daml's smart contract language, interoperability protocol and runtime, clients can digitise the issuance and servicing of green bonds by coding the green bond certification criteria, compliance mechanisms and monitoring directly into the issuance workflow.

This approach has simplified issuance using Daml smart contracts and tokenisation 2.0. The platform is proven to boost efficiency and increase transparency / credibility regarding the green bonds issuance process through an IoT backed certificate. The basis for this is a far-reaching digital energy management system that links energy and production data and tracks all CO_2 emissions. Central to IoT is the concept of the digital twin. Digital twins virtually represent the actual, physical production world with all its machines, buildings and processes. Digital twins, in combination with blockchain, ensure high environmental standards by immutably tracking energy, resource consumption, waste and emissions along the entire value chain.

Promote universal collaboration

A perfect example of this strategy in action is supporting the drive towards climate neutrality. It is a highly competitive market environment that requires a transformative approach – especially in those industries, responsible for over 19% of energy-related CO_2 emissions worldwide (**source: CO_2 emissions worldwide by sector | Statista**).

This represents a significant challenge, but also a fantastic opportunity to deliver positive change. Energy-efficient production saves considerable cost and reduces CO_2 footprint. It is also proven to promote universal collaboration between all parties and facilitates enhanced regulatory compliance.

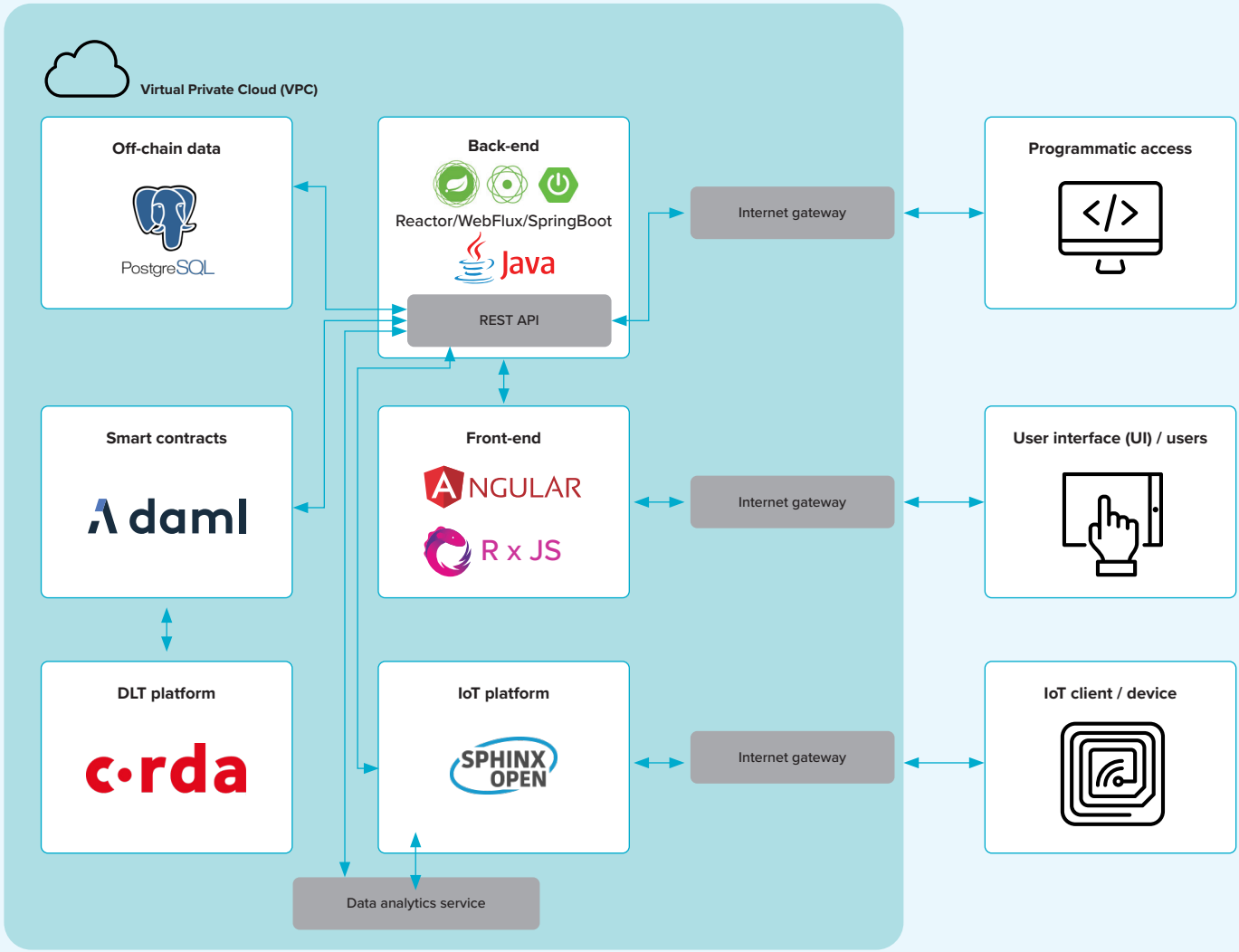
A golden source reducing costs, errors and fraud

The unique design of this solution integrates the entire tokenisation process onto a single platform to significantly improve operational efficiency. It provides a 'golden source' of reliable information about issuances which all parties access simultaneously. New transactions are encrypted, and verified data is presented to the client. If accepted, the data is entered into every ledger simultaneously. The green bond certification system integrates with IoT devices to bind actual data to the sustainability report created for the bond issuer.

The perfect environment

The underlying technology platform fits the requirements for green bond issuance perfectly. The GFT green bond reference architecture fully automates secure workflows and certifies bonds using real issuer data. The platform increases the efficiency of the bond issuance and redemption process whilst ensuring an absolute trust in the sustainability of the underlying asset. Daml smart contracts manage complex multiparty flows such as those represented in a bond lifecycle. The Corda Enterprise DLT platform is scalable and supports a peer-to-peer privacy system to facilitate the secure sharing of network data on a need-to-know basis. The solution provides a permanent, chronological record of all transactions and a comprehensive sustainability report that is secure and tamper-proof.

Green bonds – technology stack



A world-class platform for green bond issuance

The partnership between GFT, Digital Asset, Corda Enterprise and Sphinx Open creates a new world of opportunity for green bond issuance. The platform is highly scalable and adaptable across many industries, including financial services, manufacturing, energy, pharmaceutical, and beyond.

Digital technologies enable bonds to be issued securely, efficiently, and faster than ever.

Get in touch to get started on your Green Bond Issuance programme today.

About Sphinx Open and GFT

The IoT Sphinx Open platform from GFT is highly scalable and adaptable to many different industries, including manufacturing, energy, pharma etc. and also supports high quality visualisations of IoT workflows. Sphinx Open provides superlative support in the integration, visualisation and optimisation of processes in a production environment. The open IoT platform makes child's play of linking and networking machinery, which is necessary when dealing with all types of issuers whilst also allowing you to connect production planning and Enterprise Resource Planning applications – not only in the factory itself, but also across the entire company. This is important in the case of a multi-tiered company that wants to understand its total energy usage as it allows you to collect, connect and analyse data in an instant. In addition, our integrated Model in the Middle concept lays a solid foundation for linking all kinds of data and coordinating tasks. Not only does this enable your systems to make more decisions autonomously, it also ensures that operators intervene at exactly the right moment, for example, when the issuance of a green bond is being certified. GFT is a global technology partner focused on digital transformation in financial services, manufacturing, insurance and other sectors. Founded in 1987, GFT employs 7,000 people in more than 15 countries. To learn more about Sphinx Open,

To learn more about Sphinx Open, please visit **gft/spinx-open**. To learn more about GFT, please visit **gft.com.**

About Daml and Digital Asset

Created by Digital Asset, Daml is the development framework that enables financial institutions to build interconnected economic networks that cross data boundaries. Through Daml's smart contract language, interoperability protocol and runtime, clients are able to digitise the issuance and servicing of green bonds by coding the green bond certification criteria, compliance mechanisms, and monitoring directly into the issuance workflow. Green bond solutions that leverage Daml's smart contract framework receive the following benefits:

- Clearly defined rights and obligations between multiple stakeholders in the issuance workflow
- Transparency across green bond issuers and investors, providing them with the information they need to make data-driven decisions
- Data consistency and privacy ensured across different nodes and networks
- Green bond solutions with sustainability certification rules in the code itself
- Ability to monitor issuers' compliance towards ESG standards
- Real-time multiparty workflows between issuers, CSDs, exchanges, custodians and agents where reviews, verifications, confirmations, and approvals are sent instantaneously to the right party at the right time
- Rapid development/test deployment on databases and/or integration into legacy systems with the ability to move to distributed ledgers without any code loss to reduce project risk and improve time-to-market delivery.

Digital Asset is a leading provider of DLT for building smarter applications that solve real-world business challenges. Founded in 2014, the company serves global clients from New York, London, Budapest, Zurich, Hong Kong, and Sydney.

To learn more about Daml, please visit **daml.com**. To learn more about Digital Asset, please visit **digitalasset.com**.

About Corda Enterprise and R3

The Corda Enterprise platform from R3 is scalable and supports a peer-to-peer privacy system that facilitates secure sharing of network data on a need-to-know basis. This heightened level of security is essential for a system like bonds emission where you do not want all network participants to have access to all the data on the network. Corda Enterprise is also a scalable solution that unlike traditional distributed ledger technologies can scale as the network grows (the maximum amount of transactions is a per node limit rather than network wide). This is a huge benefit when looking at complicated multiparty solutions such as these that could be opened up to a high number of participants; the quantity of issuers' nodes could be relatively high in this case. Corda Enterprise projects are also extensible meaning that this system could be integrated with other Cordapps that any of the network participants want to take to market (promoting interoperability across companies and departments).

To learn more about Corda Enterprise, please visit r3.com/corda-enterprise. To learn more about R3, please visit r3.com.

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