



ADVANCING ESG

Through Innovation in Financial Regulation

A portrait of Nicola Anderson, a woman with short brown hair, smiling. She is wearing a dark jacket over a dark top. The background is blurred with warm, yellowish light.

① ② ③ ④ ⑤

FOREWORD

ESG is fast becoming a well-known term. Whilst the acronym stands for Environment, Social and Governance, the abbreviation ESG has taken on its own meaning, emphasising the relationship and important connection between the three themes. The transition to sustainable practices and the pursuit of ESG goals present one of the most pressing challenges of our time.

Addressing these challenges requires a determined and collaborative approach. Innovation, research, technology and data all have a significant role to play.

Financial Services also has a significant role to play, and innovation in financial regulation is vital in advancing the ESG agenda within this important sector, which plays a critical role in driving the ESG transition for themselves and the whole economy.

As financial institutions navigate this complex landscape, they must align with ever-evolving regulations, meet rising consumer expectations, and deliver meaningful positive impact by supporting our collective climate and environmental objectives.

The scale and urgency of this work demands collective action, innovative thinking, and a commitment to driving long-term systemic and system-wide change.

This report presents an opportunity to take a significant step forward in embracing a different way of working and addressing this need. It builds on the FinTech Research & Innovation Roadmap 2022-31 and the experiences gained through the ESG innovation initiatives in the Financial Regulation Innovation Lab.

This background, along with additional input from industry stakeholders, academia, government and the fintech ecosystem, has helped identify the most pressing needs that, if addressed, would drive positive changes. The insights present an opportunity for innovators and have helped shape a range of practical actions that will advance the ESG agenda.

The analysis underscores the need for stronger data and technology capabilities to advance ESG. It also reaffirms the progress that could be made through greater regulatory alignment and presents views on the evolving cultural shift that is still progressing within organisations to embed ESG at their core.

There is an imperative to foster a system-wide collaboration, learning and innovation environment to achieve our collective goals. By harnessing the innovative potential of fintech and tech entrepreneurs and creating a truly collaborative ecosystem, we can accelerate the transition to a more sustainable and resilient future.

I hope this report not only highlights the importance of the journey we're on together but acts as an invitation to join us in driving the change we all aspire to see.

If this thesis inspires you and you are building, investing or searching for solutions to the ESG challenge, we want to hear from you.

Nicola Anderson
Chief Executive, FinTech Scotland

Creating an ENVIRONMENT *for* INNOVATION *within*
FINANCIAL REGULATION *that accelerates the* ESG TRANSITION.





CONTENTS

- ① EXECUTIVE SUMMARY
- ② A CHANGING LANDSCAPE
- ③ AN ENVIRONMENT FOR INNOVATION IN FINANCIAL REGULATION
- ④ A PATH FORWARD
- ⑤ GET INVOLVED

1 2 3 4 5

EXECUTIVE SUMMARY

The financial sector has a unique opportunity and responsibility to drive ESG transformation. By embracing innovation, fostering collaboration, and leveraging regulatory advancements, we can build a financial system that not only meets compliance standards but also creates lasting environmental and social impact.

The ESG Imperative: A Responsibility for All

Financial Services are central to enabling the broader economy's transition to sustainability. From regulatory compliance to lending policies and risk management, the sector holds significant influence over how businesses and individuals adapt to climate-related and social responsibilities. Addressing ESG is not just a compliance exercise; it is a fundamental shift toward long-term resilience, value creation, and sustainable growth.

The Need for System-Wide Innovation

While individual financial firms must take ownership of their ESG strategies, system-wide collaboration is essential for overcoming sector-wide challenges from fragmented regulations, data inconsistencies, and operational barriers. Fintech innovators play a critical role in building solutions to overcome these challenges. Regulation sits within this system. Regulatory frameworks are designed to accelerate the broader transition to Net Zero. Financial institutions must navigate evolving reporting requirements, mitigate greenwashing risks, and align with international sustainability standards. By embracing innovation in regulatory compliance, the sector can lead the transition rather than react to it.

The Role of Innovation and Innovators

Innovation is central to tackling ESG challenges facing Financial Services. This report highlights how financial technologies such as artificial intelligence and advanced analytics enable greater transparency, accountability, and operational efficiency. These tools are vital for improving ESG data collection, reporting, and compliance while combating risks like greenwashing and regulatory misalignment. Fintech Scotland's Financial Regulation Innovation Lab (FRIL) and the ESG Innovation Call have demonstrated the power of collaboration in addressing these challenges. This report outlines opportunities for fintechs, regulators, and industry leaders to work together to shape a more resilient and responsible financial system.

A Path Forward

Financial Services must adopt a clear, phased approach to ESG transformation to drive real progress together. To support this, we have created a roadmap that sets out a phased approach to achieving systemic ESG change across Financial Services through actionable research and a series of innovation activities.

Phase 1: (1–2 Years): Focus on compliance readiness, improving ESG data systems, and achieving quick wins in regulatory reporting.

Phase 2 (3-5 years): Scale fintech-driven innovation, strengthen cross-sector collaboration and embed ESG principles into corporate strategy.

Phase 3 (6-10 years): Standardise global ESG reporting frameworks and develop system-wide solutions for long-term impact.



① ② ③ ④ ⑤

A CHANGING LANDSCAPE

Within the context of broader global climate ambition to reach Net Zero, the evolving regulatory and consumer landscape is creating an increasingly complex and challenging environment for the Financial Services industry. This is shaping how organisations develop ESG strategies that are fit for purpose today and in the future and meet the broader Net Zero ambitions. As a result, there is a significant opportunity for fintechs and start-ups to support this transition within Financial Services.

A Changing Regulatory Landscape

The global ESG regulatory landscape is evolving rapidly; shaping the priorities and operations of financial institutions as we transition to more sustainable practices.



ESG regulation is a critical element to collectively meet global Net Zero ambitions but can cause additional complexity to Financial Services. As the regulatory landscape around ESG continues to evolve, there is a significant opportunity for fintechs to play a pivotal role in supporting Financial Services during this transition.

Regulators (FCA (UK), SEC (US), and ESMA (EU)) are working to drive consistency and accountability in ESG reporting through the introduction of initiatives such as the Sustainable Finance Disclosure Regulation (SFDR), the Green Finance Strategy, and the Task Force on Climate-related Financial Disclosures (TCFD). Together, these aim to advance the global ESG agenda by mandating transparency around sustainability risks, aligning financial systems with environmental sustainability and global leadership goals, tackling misleading greenwashing claims, enhancing ESG transparency, and pushing for standardised climate-risk reporting.

The issue of fragmentation was one of the key challenges identified in FinTech Scotland's Fintech Research and Innovation Roadmap 2022-31, and addressing this issue must be considered a central tenet of any solutions moving forward.

Our research reinforced that while efforts are underway to standardise and interoperate ESG standards globally, regulatory fragmentation across geographic jurisdictions continues to challenge financial institutions. As highlighted in Scotland's Net Zero Strategy, aligning financial systems with sustainability goals is critical to achieving climate targets, offering fintechs a significant opportunity to innovate and bridge gaps in ESG data, reporting, and compliance. Similarly, the Green Industrial Strategy underscores the need for financial technologies to drive green financing solutions to support the transition and address systemic inefficiencies. And in November 2021, the FCA published that institutions large and small have an opportunity to use their business decisions, innovation and influence to encourage positive change to help tackle issues such as fragmentation and foster innovation within ESG.

“Increasing complexity for practitioners”

ESG disclosure requirements continue to develop across the globe. Where these regimes differ, there is increasing complexity for analysts and investors, particularly as regulatory guidance continues to evolve, with high-quality ESG data remaining scarce and greenwashing risks absolutely top-of-mind.

Darren Pirie
Head of Accelerator, NatWest

”

Three emergent themes that Financial Services organisations are addressing:

Embedding ESG for Resilience and Risk Mitigation

Financial regulation is helping to drive the adoption of ESG through disclosure and compliance, with financial and reputational risks becoming critical concerns for financial institutions. To navigate this, organisations are shifting from viewing ESG as a compliance requirement to embedding ESG frameworks across their operations and product offerings, ensuring they stay ahead of regulatory pressures and maintain competitive advantage.

Adapting to Evolving Expectations

Compliance timelines are pushing financial institutions to adapt rapidly, requiring strategic investment in ESG systems, processes, technology, and frameworks. Organisations are prioritising agility and innovation to meet increasing demands while aligning evolving regulatory expectations and sustainability goals.

Building Reputation Through Accountability

Regulators increasingly scrutinise greenwashing, compelling Financial Services companies to substantiate their ESG claims with robust, evidence-backed data. Organisations are prioritising transparency, accountability, and integrity in their ESG strategies to maintain trust and mitigate financial and reputational risks.

Shifting Consumer Expectations

Consumer attitudes have also shifted fundamentally, significantly influencing how the Financial Services industry approaches its ESG strategy and looks for opportunities.



A growing awareness of environmental and social issues has made ESG considerations central to consumer decision-making, with the current emphasis on Environmental vs. Social & Governance. Ethical alignment, environmental responsibility, and corporate transparency are now driving forces behind purchasing behaviours and investment choices.

Millennials and Generation Z lead this demand, actively seeking financial products and services that align with their values and long-term societal goals. There is also a growing number of people prioritising sustainable investments. Many of them view ESG investments as a legacy-building opportunity. Deloitte's 2024 Gen Z and Millennial Survey found that 64% of Gen Zs and 63% of millennials are willing to pay more to purchase environmentally sustainable products or services. Additionally, 46% of Gen Zs and 42% of millennials have changed jobs or industries due to environmental impact concerns or plan to do so in the future.

Sectors such as technology and consumer goods have been early adopters of ESG principles, driven by pressure from increasingly discerning consumers. However, the same pressure is now being felt by Financial Services organisations. The FCA's Financial Lives 2022 Survey stated that 79% of consumers were of the view that businesses have a wider social responsibility than simply to make a short-term profit. As a result, there is a clear opportunity for the fintech community and wider entrepreneurs and innovators to step up and help Financial Services drive towards their ESG ambitions.

Three main considerations for businesses to address these shifts:

Transparency Builds Trust

This shift has also made transparency more critical than ever. Consumers are scrutinising ESG claims to avoid falling victim to greenwashing. As a result, third-party certifications, independent verifications, and comprehensive disclosures have become essential tools for building trust and credibility with consumers.

ESG Related Opportunities

Forward-thinking financial institutions are responding to evolving demands from consumers and businesses by striving to meet regulatory and compliance requirements and offering tailored ESG-aligned investment products that balance financial returns with sustainability goals.

Ecosystem-Wide Responsibility

Organisations can no longer simply focus on the areas that exist within the immediate bounds of their own businesses and must instead take an ecosystem-wide view when considering their ESG implications and requirements of their business operations and supply chain.

These significant cultural and consumer shifts are being felt system-wide and remain at the top of businesses' minds across all sectors as they seek to understand the impact and opportunity that ESG presents. As a result, Financial Services organisations must continue to consider the changing needs of both consumers and businesses as they develop their ESG strategies.

These changes are also reflected in Government and Policy and how we, as the UK, drive economic development and growth in a way that aligns with and supports the Green Industrial Strategy and the strategy for Net Zero, which sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050.

ESG Challenges Within Financial Services

The Financial Services sector shows strong appetite for change, but many organisations face system-wide challenges in achieving ESG ambitions and keeping pace with evolving regulations.

Our research and conversation with financial institutions have helped to highlight the challenges faced by the industry as a result of the shifting regulatory and consumer landscapes and, through this work, have identified six opportunity areas where innovators in Financial Services and ESG can look to provide strategic support.

1

ESG Data Collection and Reporting

Collection, quality, validation and integration of ESG data remain critical hurdles for financial institutions. Organisations can struggle to meet reporting obligations and make informed decisions without standardised, reliable data.

Key Challenges

- **Data Availability and Quality**
Incomplete, inconsistent, and unreliable third-party data limits effective ESG reporting.
- **Complex Data Sources**
ESG information is fragmented across multiple platforms, complicating aggregation and analysis.
- **Fragmented Regulatory Compliance**
Navigating diverse and evolving reporting frameworks creates operational challenges.

2

Non-Standardised ESG Reporting

The absence of universal ESG reporting standards leads to inconsistencies, this increases the operational burden for financial institutions. Benchmarking performance becomes challenging without comparability, undermining stakeholder trust in ESG claims.

Key Challenges

- **Comparability and Interoperability Issues**
Inconsistent frameworks and language hinder performance assessments across global markets.
- **Reputational Risks**
Managing overlapping or region-specific reporting requirements is resource-intensive.
- **Stakeholder Trust**
Unclear or inconsistent reporting damages confidence in an institution's ESG commitments.

3

Technology Gaps in ESG Compliance

Outdated IT systems and a lack of advanced analytical tools limit financial institutions' ability to automate ESG processes. Integrating diverse data sources and deploying predictive analytics also remain significant challenges.

Key Challenges

- **Legacy Systems**
Existing technology infrastructure makes handling new and complex ESG data and reporting difficult.
- **Data Integration Challenge**
Combining ESG data from multiple, often global, sources into a unified system remains complex.
- **Insufficient Analytical Tooling**
Limited tools are available for analysing ESG risks and generating actionable insights.

ESG Challenges Within Financial Services

“Closing the skills gap”

Many Financial Services firms face challenges addressing the skills gaps in ESG due to the typically small size of ESG teams and often lack of necessary expertise or training across all teams to keep up with the pace of change. As ESG regulations and expectations continue to evolve, investing in knowledge and development has become more crucial than ever.

Zebunisa Ahmed
Sustainability Manager, Virgin Money



4

Operational Barriers to ESG Integration

Embedding ESG principles into large organisations often requires significant cultural and operational shifts. Resistance to change, resource constraints, and skill gaps may impede progress toward effective ESG adoption.

Key Challenges

- **Organisational Resistance**
Entrenched cultural & operational practices & structures may conflict with ESG principles.
- **Resource Allocation**
Competing commercial priorities limit budget and focus on strategic ESG initiatives.
- **Skill Gaps**
Insufficient in-house ESG expertise necessitates external support or significant upskilling efforts.

5

Greenwashing Concerns

Greenwashing, where ESG claims are exaggerated or misleading, poses significant reputational and regulatory risks. Institutions must substantiate sustainability claims to avoid penalties and maintain trust.

Key Challenges

- **Regulatory Scrutiny**
Regulators are tightening controls to ensure ESG claims are evidence-based, penalising non-compliance.
- **Reputational Risks**
Allegations of greenwashing erode customer and investor trust.
- **Transparency Demand**
Stakeholders expect clear, verifiable data to validate ESG commitments.

6

ESG Risk Assessment and Reporting

Accurately assessing and reporting ESG risks remains challenging due to fragmented standards and inconsistent data quality. Integrating ESG risks into traditional risk models is still an emerging practice that requires investment and focus.

Key Challenges

- **Data Quality and Standardisation**
Poor-quality data undermines the ability to perform risk assessments with the required confidence level.
- **Integration with Financial Metrics**
ESG risks are often excluded from financial models and leadership priorities.
- **Evolving Requirement**
New disclosure mandates demand constant adaptation and introduce new risks.



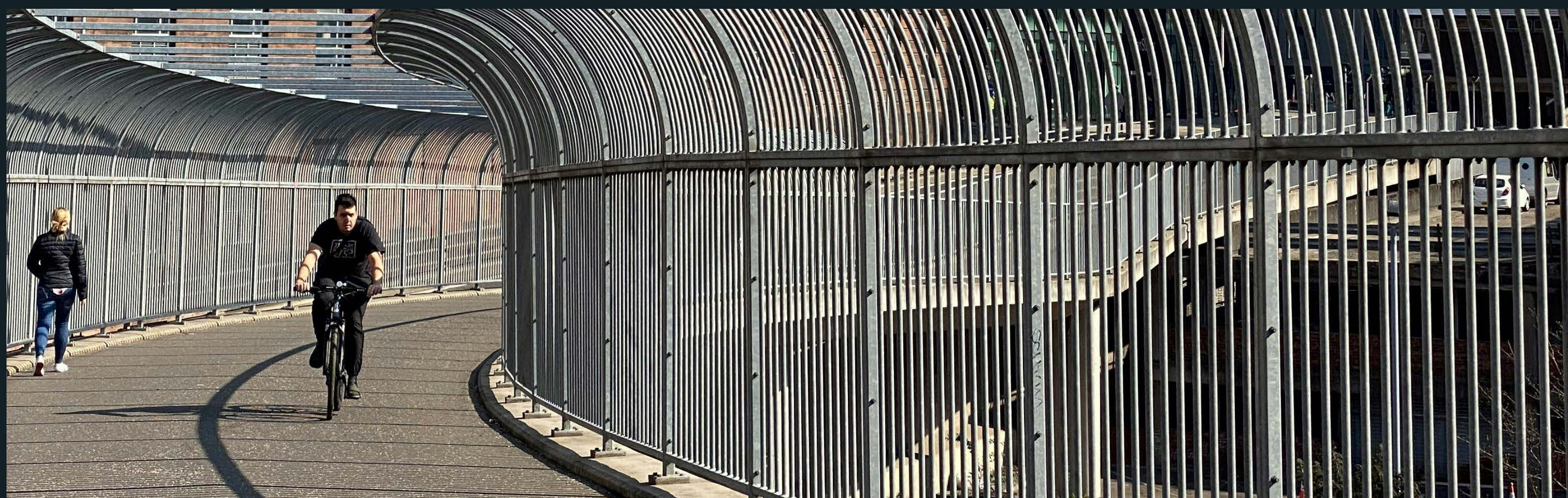
① ② ③ ④ ⑤

CREATING AN ENVIRONMENT FOR INNOVATION IN FINANCIAL REGULATION

Ecosystem opportunity: Overcoming these complex ESG challenges requires a systematic and system-wide collaborative approach that brings together industry, academia, financial technology companies, investors, policymakers and regulators to drive innovation within financial regulation in the UK in a way that acts as a catalyst for change in helping the ESG transition.

A System-Wide Collaborative Approach to Driving Change

The scale of the ESG challenge and its impact on financial institutions means that systematic change is needed to capitalise on this opportunity.



The challenges facing Financial Services institutions are sector-wide and cannot be addressed in isolation by any single organisation or part of the regulatory ecosystem. KPMG’s Voices on 2030 report highlights that the Financial Services sector is set to undergo systemic change within the next decade, driven by ESG activities. Similarly, Bain & Company’s How Financial Services Firms Are Wrestling with ESG Challenges and Opportunities report underscores the complexities and uncertainties institutions face in embedding ESG principles, reinforcing the need for greater collaboration.

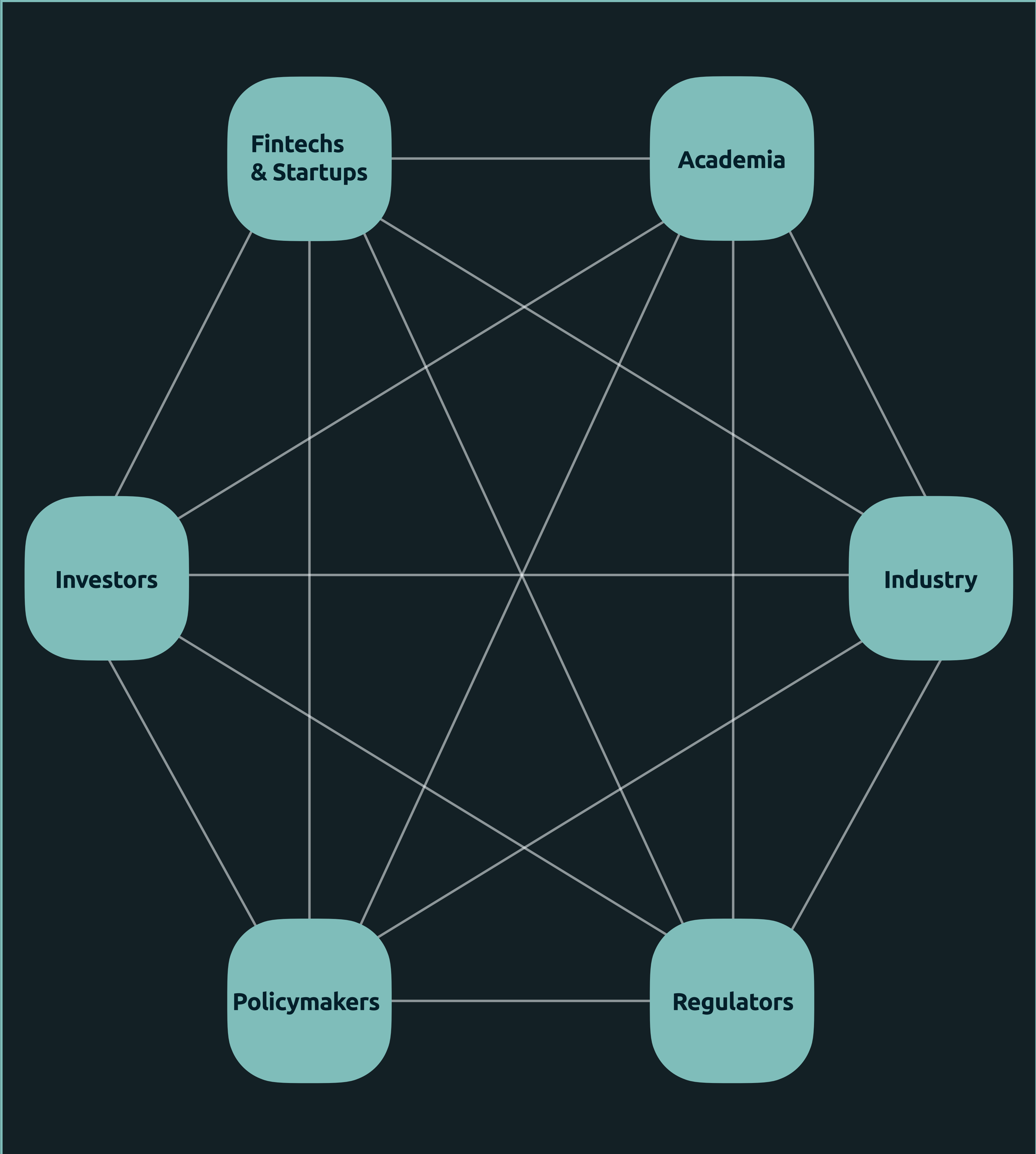
By adopting a systematic and system-wide collaborative approach to applied research and innovation, we can break down barriers between industry and regulators, strengthen connections with academia and fintech, and create the conditions for shared learning and innovation.

In doing so, we unlock new opportunities for Financial Services institutions to meet ESG regulatory and compliance requirements, support the growth of Scotland’s fintech sector, and drive real-world economic and commercial impact. Together, this presents us with the opportunity to work together to tackle the most pressing challenges through shared learning and innovation.

“Fostering collaboration and community”

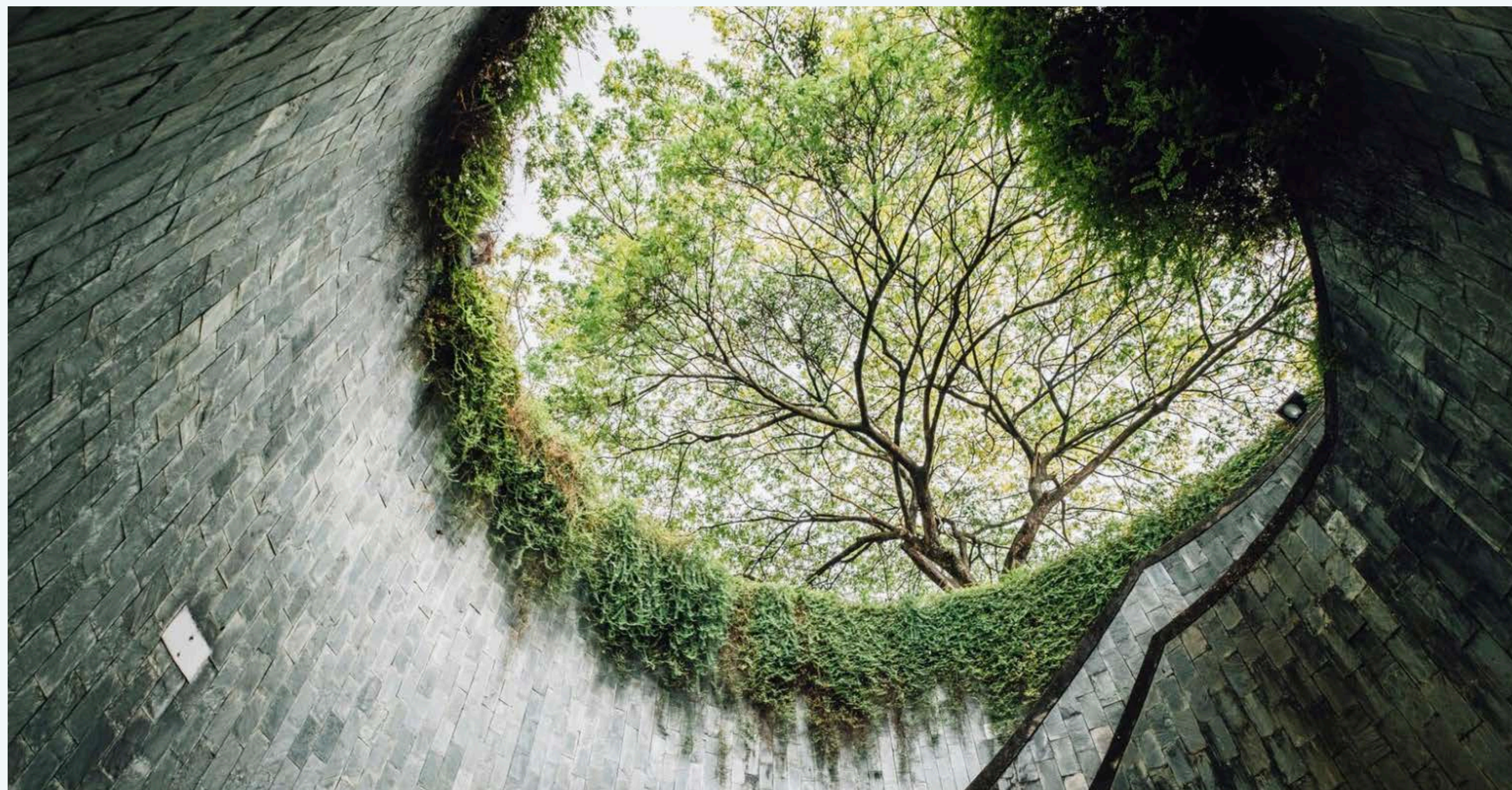
There is huge potential for an innovative environment that drives collaboration and knowledge sharing by bringing together a breadth of perspectives views from across the market. We are proud to play a role in creating a strong community, fostering a sense of belonging and openness to help solve real industry issues. Being part of that has genuinely been a real privilege.

Tom McFarlane
Partner, EY



The Benefits of Adopting a Systems Thinking Approach

This symbiotic and collaborative approach creates several benefits through valuable partnerships and opportunities that will help drive the ESG transition.



Adopting a systems-thinking approach can help organisations better understand the complexity of ESG challenges and identify opportunities for more effective collaboration and innovation.

The UK Government's Systems Thinking for Civil Servants guide provides useful insights into this approach, offering a framework for recognising the interconnected nature of policies, stakeholders, and broader societal outcomes. While originally developed for civil servants, its principles are equally relevant to industry, innovators, regulators, and leaders looking to take a more holistic and adaptive approach to ESG regulation. By embedding systems thinking, organisations can navigate regulatory complexity more effectively, strengthen cross-sector collaboration, and support a more coordinated and sustainable transition for Financial Services.

“Enhancing ESG transparency together”

Fintechs bring advanced data analytics capabilities, enabling improved collection, analysis, and reporting of ESG metrics for greater transparency. Collaborations can also enhance customer engagement on sustainability issues whilst supporting compliance with complex global and local ESG regulations, ensuring adherence across jurisdictions. These partnerships strengthen institutions' sustainability efforts and help meet ever-evolving stakeholder expectations.

Rebecca McCarthy,
Senior Sustainability Consultant, Fujitsu



Enhanced Technology Capability and Innovation

Fintechs provide real-time ESG data validation and compliance, integration of regulatory standards and tailored solutions that ensure proactive compliance, whilst academic institutions offer insight into the frontier of new research and the application of emerging technology within the industry.

Scalability and Global Reach

Financial Services companies provide solutions, insights and learnings across global markets that can support the ecosystem to adapt to changes in regulatory frameworks and respond to new challenges.

Operational Efficiency and Cost Savings

Fintechs can automate compliance processes and ESG reporting to free up resources for strategic ESG initiatives and reduce unnecessary manual audits, potentially helping to manage operational costs.

Influence and Access

By actively involving national governments and regulators, we help connect the ecosystem directly with national policy to influence how we collectively move our ESG commitments forward.

Product Innovation and Competitive Differentiation

Fintechs help create ESG focused financial products that enhance market offerings and demonstrate an organisation's commitment to sustainable goals.

Reputation and Market Leadership

Research and fintech partnerships help Financial Services companies enhance their own capability and reputation through the introduction of new thinking and demonstrating their commitment to solving ESG challenges.

How Emerging Technology Can Support the ESG Agenda

Alongside creating and fostering the right environment for innovation, the FinTech Research and Innovation Roadmap cited technology and research as critical enablers of change across the ESG agenda.

As a nation with a thriving fintech ecosystem, Scotland is uniquely positioned to support system-wide innovation, enabling Financial Services to access and implement cutting-edge technologies. Through academic clusters, partner innovation labs, and regulatory collaboration, Scotland continues to build an environment where fintech innovation drives ESG progress and financial sector resilience.

Similarly, the FinTech Research and Innovation Roadmap identifies technology and research as fundamental drivers of change across the ESG agenda. FinTech Scotland recognises that collaborative partnerships between fintechs, financial institutions, academia, and regulators are essential to fostering innovation, sustainable growth, and broader economic impact.

The World Economic Forum's AI Governance Alliance launched a nine-report series in January 2025, highlighting how AI and emerging technologies act as key enablers in driving innovation, enhancing competitiveness, and fostering sustainable growth industries. This global initiative underscores the vital role of technological advancement in shaping regulatory frameworks and accelerating ESG-led transformation.

“Earth intelligence insights”

Emerging technology and research play a vital role in addressing the challenges around ESG and regulatory compliance. One area of particular interest we have been looking at is the idea of Earth Intelligence and using Earth observation data, coupled with geospatial technology data and AI to deliver insights that can be leveraged to provide more meaningful and accurate reporting.

Professor Mark Cummins

Professor of Financial Technology, University of Strathclyde

”

AI and Advanced Analytics

AI-powered tools transform ESG management by analysing vast data in real time to identify trends, automate compliance, and forecast risks. They combat greenwashing by detecting inconsistencies in corporate claims, while sentiment analysis gauges stakeholder perceptions. Adopting AI and advanced analytics helps organisations maximise ESG data value.

Cloud and Quantum Computing

Cloud and quantum computing enhance ESG data management with efficiency and scalability. Cloud platforms centralise data storage and reporting, reducing costs and enabling global collaboration. Quantum computing accelerates climate risk assessments and portfolio optimisation. These technologies help organisations unlock insights and drive sustainable investment tracks supply chains, green energy credits, and carbon offsets, enhancing trust.

Satellite and Space Technology

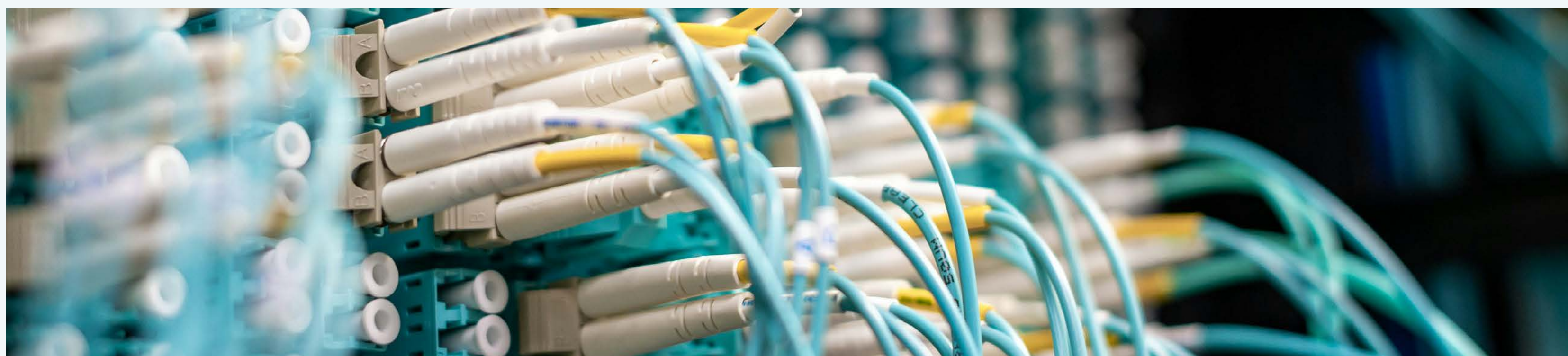
Satellite technology provides real-time data on environmental changes like deforestation and emissions. Advanced sensors enable precise carbon monitoring, supporting climate action. These tools enhance supply chain transparency, ensuring ESG commitments. Integrating satellite data improves reporting accuracy and strengthens sustainability efforts.

Blockchain Technology

Blockchain ensures transparency and traceability in ESG initiatives with secure, immutable records. It tracks supply chains, green energy credits, and carbon offsets, enhancing trust. Blockchain simplifies ESG compliance with tamper-proof records, streamlining reporting and demonstrating measurable progress.

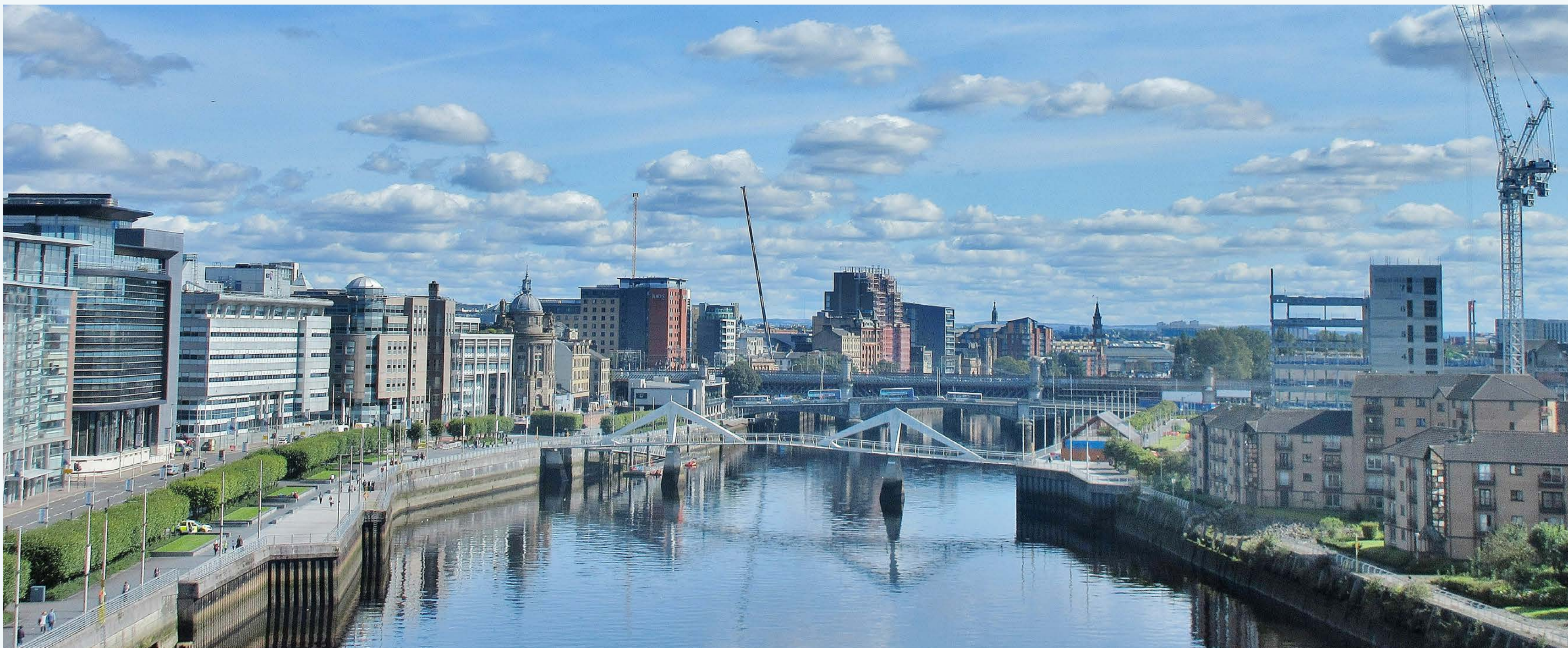
Digital Twins and IoT

Digital Twins and IoT improve ESG performance through simulation, monitoring, and transparency. Digital twins model interventions and assess climate risks, while IoT devices track energy use, emissions, and water quality. These tools help organisations monitor, predict, and optimise ESG outcomes effectively.



FRIL: An Environment for Collaboration and Innovation

The Financial Regulation Innovation Lab (FRIL) was established to help realise this opportunity and to build successful cross-industry partnerships that unlock the value they bring.



FRIL is helping to create an innovative, neutral environment for learning and collaboration across financial regulation and, to date, has focused on tackling challenges around Financial Crime, Simplifying Compliance using AI. FRIL allows participants to engage and collaborate on the dynamic demands of financial regulation, explore, test and experiment with new technologies, build confidence in solutions and demonstrate their ability to meet regulatory standards worldwide.

FRIL engages industry participants, including large established financial institutions, innovators, academics, and regulators in four inter-related programmes of action:

Innovation Challenge Calls	Applied Actionable Research
Skills Development	Knowledge Sharing

The FRIL ESG Innovation Call was launched to build cross-sector and industry partnerships that change how we look at regulation to shape government policy and industry action as we tackle the challenges around ESG and the transition to a sustainable future.

With funding from Innovate UK on behalf of UK Research and Innovation grant awards of £50,000 have been awarded to eight fintechs who have participated in the FRIL ESG Innovation Call.

“Shaping responsive regulation together”

FRIL has established a groundbreaking space that helps facilitate meaningful industry-led conversations around complex challenges like ESG. This collaborative approach allows us to shift the focus from compliance to exploring opportunities for innovation, ultimately helping regulators and industry to work together to shape a more responsive and effective regulatory landscape.

Nick McGruer
Joint Head of Scotland, The Financial Conduct Authority

”

"Stimulating new products and services"

The response to the ‘Shaping the Future of ESG in Financial Services’ Innovation Call has been outstanding. The level of engagement from both the fintech community and our Challenge Partners highlights the importance of collaboration in driving meaningful change. We are excited to see how the winning solutions will shape the future of ESG in Financial Services.
















Nicola Anderson
Chief Executive, FinTech Scotland

”

Building Successful Partnerships

The FRIL ESG Innovation Call has already helped build several successful collaborations to tackle today's most pressing ESG and regulatory challenges as we take practical steps towards our collective climate and environmental goals.

We recognise the size and scale of the ESG challenge highlighted earlier in this report and in the FinTech Research and Innovation Roadmap and have begun taking actionable and practical steps to help address and make progress through the FRIL ESG Innovation Call, where the Financial Services industry have come together to tackle seven challenges:

1	2	3	4	5	6	7
ESG Regulatory Scoping	ESG Data & Analytics	Climate Science	Digital Sustainability	Enhanced ESG Decision Making	Transparency & Accessibility	Greenwashing & Quality Assurance
<p>The Challenge</p> <p>How can Financial Services firms address the complex ESG laws and regulations from global regulators that make adhering to ever-changing regulations difficult?</p>	<p>The Challenge</p> <p>How can Financial Services firms address ESG regulations that ask firms to source increasing volumes and complexity of data from multiple sources?</p>	<p>The Challenge</p> <p>How can Financial Services firms demonstrate that sustainability benefits are aligned with the latest climate science and remain up to date?</p>	<p>The Challenge</p> <p>How can Financial Services firms optimise digital operations and address the growing challenge of digital sustainability and the impact of technology?</p>	<p>The Challenge</p> <p>How can Financial Services firms tackle fragmented, incomplete, and inaccurate ESG data to continue to meet the challenge of regulatory reporting?</p>	<p>The Challenge</p> <p>How can Financial Services firms promote corporate responsibility, improve sustainable practices and support informed decision-making through ESG data?</p>	<p>The Challenge</p> <p>How can Financial Services firms promote corporate responsibility, improve sustainable practices and support informed decision-making through ESG data?</p>
Industry Partners	Industry Partners	Industry Partners	Industry Partners	Industry Partners	Industry Partners	Industry Partners
<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div></div>	<div><div></div><div></div></div>	<div><div></div><div></div></div>	<div></div>

FRIL ESG Innovation Call grant award winners

FinTech Scotland is proud to support the vibrant and growing ecosystem of fintechs that are already making a real impact in helping Financial Services unlock system-wide opportunities for collaboration within ESG.

Through the FRIL Innovation Call, FinTech Scotland is actively supporting the fintech community in the UK through industry partnerships and grant funding that is helping businesses to make actionable progress and have a real-world impact in some of the most important ESG transition challenges within Financial Services.



Siccar is a data collaboration platform that enables organisations to share their most sensitive data securely and privately.

www.siccar.net



CienDos empowers financial institutions and corporates to understand the environmental impact of every Pound, Euro, or Dollar invested, lent, or spent. By delivering regulatory-grade, robust and actionable corporate environmental data, we underpin financial flows and validates sustainable commitments, driving the transition to a greener, more sustainable economy.

www.ciendos.com



ESG Disclose empowers organisations to achieve ESG excellence and operational sustainability through expert advisory, cutting-edge technology, and bespoke solutions. We ensure compliance with regulatory standards, strengthen supply chain resilience, and mitigate greenwashing risks.

www.esg-disclose.com



GaiaLens is an AI-powered sustainability analysis platform for institutional investors and Financial Services companies. Our platform acts as a digital ESG analyst, supporting investors throughout the ESG investment lifecycle and saving them significant time.

www.gaia-lens.com



Scott Logic is a software consultancy with an extensive history in developing technology solutions for Financial Services businesses, including eight of the ten biggest investment banks and three of the top five UK retail banks.

www.scottlogic.com



TEXpert AI empowers corporates and asset managers to measure and report social and governance (S&G) factors in ESG portfolios. Leveraging Generative AI, they extract and trace data from diverse sources to provide actionable metrics on diversity, human rights, and labour standards to help automate reporting and embed fair practices into decision-making.

www.texpert.ai



Verifoxx enables companies to share verified insights or answers about their data, without any data leaving its owner, using multiple Privacy Enhancing Technologies.

www.verifoxx.com



ESG360 integrates AI technology with expert-led support to automate and optimise ESG data collection, governance, and reporting, providing a single source of truth of ESG data for enterprises. This reduces manual work, improves accuracy, and ensures readiness for evolving regulations, all while enabling businesses to create value from their ESG initiatives.

www.esg360.io



① ② ③ ④ ⑤

A PATH FORWARD

Significant progress has been and continues to be made around ESG across the Financial Services industry. However, as we move towards transition, we must build on the momentum, challenge the barriers that stand in the way of progress, and continue to place ESG at the top of the agenda through an actionable roadmap for change.

Building the Foundations for Success

Our future innovation activities must be build upon a solid foundation that will help our industry overcome the most significant barriers to progress and align our collective actions.



Creating a strong understanding of the regulatory landscape.

Financial institutions must continue to develop a clear understanding of the evolving ESG regulatory landscape, stay ahead of new regulations and regional differences, align with global reporting frameworks, and enhance internal capabilities to interpret as well as implement complex requirements.

Investing in building a solid data and technology capability.

Effective ESG strategies depend on high-quality and trustworthy data and the technology to leverage it. Reliable, transparent, and standardised ESG data is the cornerstone of informed decision-making. Addressing data availability, quality, and integration challenges is critical for accurate ESG performance measurement, risk assessment, and compliance reporting.

Aligning culture, operational, and leadership commitments.

For ESG to be effective, it must become part of an organisation's core identity. This requires strong leadership commitment to champion ESG goals and embed sustainability into decision-making processes. Cultural alignment ensures that ESG principles are considered integral to long-term success, not just an ancillary responsibility.

Accessing and fostering ESG talent and skills.

Delivering on ESG commitments requires access to the right expertise. Developing ESG-specific capabilities such as ESG strategy, data analytics, and regulatory compliance through targeted recruitment, upskilling, and collaboration with academia is fundamental to bridging the skills gap and ensuring long-term success.

“Potential for cross-sector collaboration”

Green Financial Services are identified as a major growth opportunity in the Scottish Government's Green Industrial Strategy. Through collaborative working, we can better understand the potential offered by technology and develop the skills and knowledge required to realise that opportunity and then take our learning beyond Financial Services into other regulated areas

Colin Cook

Director of Economic Development, The Scottish Government



Innovators and industry leaders looking to explore future innovation activities and develop real-world solutions for the ESG transition can access the FCA's Digital Sandbox and Innovation Hub. This sandbox, made permanent in 2023 after a series of pilots, provides a safe testing environment, regulatory insights, and access to synthetic data. This initiative has enabled fintechs and financial institutions to test solutions and drive progress towards a more transparent and standardised approach to ESG data.

By not building these foundations, we risk creating significant inefficiencies and increasing the already challenging burden placed on Financial Services organisation that could potentially put progress towards our collective ESG ambitions at risk.

An Actionable Roadmap
for Change

As an industry, we must lean into the positive progress
being made and continue investing in the research and
innovation activities that will move us forward.

Through conversations with the Financial Services industry and fintech ecosystem, we’ve created an actionable roadmap for change that outlines the critical actionable research and future innovation activities that we, as an industry, should be looking to explore in our collective ambition to transition to a more sustainable future.

This roadmap aligns with the findings of the FinTech Scotland Research & Innovation Roadmap 2022-23 and builds upon its recommendations around simplifying compliance in financial regulation and the role of ESG data in Climate Finance. The roadmap is also underpinned by FinTech Scotland’s ongoing commitment to support the Financial Services industry and fintech community through its knowledge Exchange, Education and Skills, Innovation Calls and Actionable Research workstreams.

Foundational Theme	Type	Actions	Phase
Understanding the ESG Regulatory Landscape	Actionable Research	Investigate models for unified ESG reporting frameworks and regulatory harmonisation to streamline compliance.	2
		Explore how the applied technology and research being undertaken within Financial Services regulation can be applied across other sectors.	3
	Innovation Activities	Develop tools for real-time monitoring of evolving ESG policies across jurisdictions, providing automated updates and insights.	1
		Build an “interoperability platform” that integrates compliance across regional reporting standards.	2
		Enhance AI capabilities to create a globally interoperable, transparent, and efficient ESG data ecosystem to support reporting & data standardisation.	3
Building Technology, Data and Tooling Capabilities	Actionable Research	Explore the use of IoT and satellite technologies to enable real-time monitoring of environmental impacts (e.g., carbon emissions, biodiversity loss).	1
		Investigate the role of Natural Language Processing tools for automating the analysis of unstructured ESG data (e.g., sustainability reports, media coverage).	1
	Innovation Activities	Replace manual, time-intensive ESG data processes with automated solutions that ensure compliance and drive efficiency.	1
		Create a blockchain-based ESG data exchange to enhance traceability and enable tamper-proof, auditable ESG reporting.	2
		Build advanced predictive analytics tools to forecast ESG performance, risks, and opportunities across investment portfolios.	3
Aligning Culture, Operations and Leadership Commitments	Actionable Research	Study examples of board-level ESG integration and leadership incentives that drive cultural transformation across organisations.	1
		Investigate the relationship between ESG-aligned leadership incentives and long-term financial performance to identify best practices.	2
	Innovation Activities	Launch AI-driven leadership training platforms to enhance ESG literacy and build leadership capabilities that champion sustainability.	1
		Measure and benchmark ESG cultural adoption across organisations using behavioural analytics to track progress and engagement.	2
Fostering ESG Talent, Skills and Knowledge	Actionable Research	Model the cultural impact of ESG strategies using simulation tools to visualise long-term organisational alignment outcomes.	3
		Conduct a workforce analysis to identify ESG talent gaps and emerging job roles (e.g., ESG analysts, climate risk modellers, compliance specialists).	1
		Explore integrating ESG-specific competencies into existing financial education programs and professional certifications.	2
	Innovation Activities	Investigate the long-term opportunities for AI and automation to bridge ESG knowledge and skills gaps across organisations.	3
		Create a digital ESG skills marketplace to connect financial institutions with ESG specialists in ESG strategy, data analytics, and regulatory compliance.	2
		Develop AI-powered virtual ESG ‘agents’ to provide ongoing support and real-time learning for employees worldwide.	3

Phase 1: 1-2 Years

Phase 2: 3-5 Years

Phase 3: 6-10 Years

Skills and Knowledge Development

In partnership with our innovative academic partners, FinTech Scotland offers a range of skills development courses that will help deliver the skills and knowledge required to support the roadmap.



To address the current knowledge gap, the FRIL Skills Workstream, in partnership with the University of Strathclyde and Glasgow University, has already created nine different skills development courses.

These FRIL skills courses have been established with a demand-led principle, after analysis of skills deficiencies in the wider ecosystem, with particular focus on skills to support financial regulation innovation.

We have created a portfolio of microcredentials to meet stakeholder demands in supporting up-skilling and re-skilling in the ecosystem. Microcredentials are short, accredited programmes that can be completed in person, blended or fully online.

“Building trust through expertise”

We have a significant opportunity to create a trusted status here as a sector, and we have a responsibility to gain expertise drawn through underlying scientific knowledge, research, and education and drive that into practice.

Professor John Finch
University of Glasgow’s Adam Smith Business School



University of Strathclyde

Digital Transformation

Assisting industry practitioners to develop their understanding of digital transformation and consider the role technological advancements, such as AI, are playing in disrupting risk and compliance in the finance industry.

Grand Challenges of ESG For Executives

This course considers the challenges from a strategic perspective and the role of the board in understanding and mitigating a wide range of risks in relation to risk and regulatory compliance.

AI Literacy Suite

There are five courses available in the suite [*AI Curious, AI Explorer, AI Enthusiast, AI Expert, AI for Executives*]. Designed to develop knowledge and capability from foundation to expert level for participants to develop an understanding of the origins of AI, recent technological developments and the risks and controls required when integrating AI into business systems.

Help to Grow Management Course

Designed to help leaders of SMEs to develop, enhance participants management and strategic capabilities, build resilience, develop their value proposition and reach into growth markets whilst supported by academics, and experienced business owners.

Glasgow University

AI and RegTech: Legal, Regulatory, and Governance Perspectives

This course offers an in-depth introduction to the role of Artificial Intelligence (AI) in financial regulatory compliance within the evolving landscape of RegTech. It aims to deepen understanding of AI, RegTech, and their integration into corporate compliance strategies and operations.

ESG Leadership: Leveraging ESG to Achieve Organisational Competitive Advantage

This course takes a practical-application approach to Environmental, Social, and Governance (ESG) integration into organisational practice. It introduces regulatory compliance, supply chain auditing, ESG data and analytics, and leadership and innovation practices

① ② ③ ④ ⑤

Ways To Get Involved

Discover FRIL Research and White Papers

FRIL undertakes groundbreaking industry led research that helps participants engage and collaborate on the dynamic demands of financial regulation. A programme of applied actionable research is underway. FRIL has integrated academic study with an industry relevant agenda focused on enabling knowledge sharing on cutting-edge topics such as generative and explainable AI, advanced analytics, advanced computing, and earth-intelligent data as applied to financial regulation.

FRIL applied actionable research white papers are designed to frame complex problems, identify new perspectives and discover new insights, create frameworks for solutions and highlight potential industry applications, and utilise testing environments that enable further collaboration and understanding. The following White Papers are available:

Simplifying Compliance with AI

Explainable AI For Financial Risk Management

Simplifying Compliance Through Explainable Intelligent Automation

Shaping the Future of ESG in Financial Services

ESG Greenwashing and Applications of AI for Measurement

Open Finance and Carbon Neutral Banking: Leveraging Financial Transaction Data for Consumers

Carbon Footprint Measurement

Systems in the Making: the Role of Companies in Implementing Sustainability Policy and Reporting

Fighting Financial Crime Through Emerging Technologies

Using Automation and AI to Combat Money Laundering

Enhancing Financial Crime Detection By Implementing End-to-end AI Frameworks

Ethics and Fairness

Promoting Fairness and Exploring Algorithmic Discrimination in Financial Decision Making Through Explainable Artificial Intelligence

Fairness and Discrimination in Lending Decisions: Multiple Protected Characteristics Analysis

www.fintechscotland.com/what-we-do/financial-regulation-innovation-lab/research/

Join the FinTech Scotland community to access a dynamic ecosystem of innovation, collaboration, and tailored support, driving growth, partnerships, and opportunities in the UK's thriving fintech and regulatory landscape.

Join FinTech Scotland Community

Fintech Scotland has been established to secure Scotland's place as a top five global fintech centre.

We develop and enable collaborative innovation across the fintech ecosystem. We encourage relationships between large established Financial Services institutions and fintech firms, as well as facilitating the connections with the universities, technology and services providers, public body agencies and regulators such as the Financial Conduct Authority (FCA).

The benefits for fintechs and start-ups joining the community are:

Access to a Thriving Ecosystem. Gain entry to one of the UK's most dynamic fintech hubs, offering opportunities to connect with industry peers, investors, academic partners, and regulators to drive innovation and growth.

Enhanced Visibility and Collaboration. Benefit from networking events, conferences, and promotional platforms that amplify your brand and foster collaborations with key players across Financial Services, technology, and academia.

Tailored Support for Growth. Receive guidance on scaling your business through resources, mentorship, and access to research and development opportunities within Scotland's world-class financial and tech ecosystem.

<https://www.fintechscotland.com/what-we-do>

Future FRIL Innovation Calls

The Financial Regulation Innovation Lab (FRIL), a partnership between FinTech Scotland, University of Strathclyde and University of Glasgow, is an industry-led collaborative research and innovation programme focused on leveraging new technologies to respond to, shape, and help evolve the future regulatory landscape in the UK and globally, helping to create new employment and business opportunities, and enabling the future talent.

www.fintechscotland.com/what-we-do/financial-regulation-innovation-lab

Further Information

Research and Analysis

As part of the development of this report, a range of desk-based research and analysis was conducted, along with a series of stakeholder interviews with industry partners.

The analysis is built upon the research and work done during the FRIL ESG Innovation Call and the analysis and recommendations within the FinTech Research & Innovation Roadmap 2022-31, authored by FinTech Scotland.

The analysis focused on several key areas, including the core challenges Financial Services face regarding ESG and regulatory reporting, the opportunities they see in fintech partnerships, the key barriers to progress, and recommendations for future innovation challenge calls.

Methodology

16+, 1:1 FRIL partner stakeholder interviews.

An online questionnaire, with responses from 8 fintech businesses.

Desk based research.

Participating Organisations

Four overarching stakeholder groups were identified as key voices and contributors to this report. Without them, this report would not be possible, and we thank them for their invaluable contribution and continued support.

Government and Regulators

Scottish Government

The Financial Conduct Authority

Universities

University of Strathclyde

University of Glasgow

Industry Partners

Morgan Stanley	Equifax
Barclays	EY
HSBC	Sopra Steria
Phoenix Group	NatWest
Lloyds Banking Group	Fujitsu
Virgin Money	abrdn

Fintech Partners

Siccar	TextPert AI
ScottLogic	GaiaLens
ESG360	ESG Disclose
Verifoxx	Ciendos

Further Reading

This report aims to create economic, environmental, and societal value through Fintech research and innovation. The findings are designed to align with existing FinTech and ESG-related strategies across Scotland and the rest of the UK, including:

FinTech R&I Roadmap 2022-3. This roadmap outlines the strategic priorities for research and innovation in fintech, aiming to position the sector as a global leader by fostering collaboration, enhancing skills, and driving sustainable growth over the next decade.

Green Industrial Strategy. The strategy focuses on promoting sustainable economic growth by supporting green industries, accelerating the transition to net zero, and fostering innovation in clean technologies to create jobs and reduce environmental impact.

Scotland's Net Zero Strategy. This strategy sets out Scotland's pathway to achieving net zero emissions by 2045, emphasising renewable energy, energy efficiency, and collaboration across sectors to tackle climate change while supporting a just economic transition.

Scotland's Financial Services Strategy. This strategy aims to strengthen Scotland's Financial Services sector by fostering innovation, promoting sustainable finance, and enhancing global competitiveness while driving positive societal and economic outcomes.

UK Government Innovation Strategy. This strategy outlines the UK government's vision to become a global leader in innovation, focusing on investments in technology, skills development, and collaboration to drive economic growth and address societal challenges.

UK Innovation Strategy: Leading the Future By Creating It. The strategy builds on the UK's ambition to lead global innovation efforts by investing in transformative technologies, fostering a skilled workforce, and creating an ecosystem that supports growth, competitiveness, and resilience.

FCA Financial Lives 2022 Survey. This survey provides information about consumers' attitudes towards managing their money, the financial products they have and their experiences of engaging with Financial Services firms. A total of 19,145 respondents completed the 2022 survey.

Systems Thinking for Civil Servants 2022. This guide, published by the UK Government, explores how systems thinking can be utilised to drive improved outcomes in complex situations. It provides insights into applying systems thinking within governmental frameworks, which can be instrumental in developing innovative ESG regulations.



ADVANCING ESG
Through Innovation in Financial Regulation