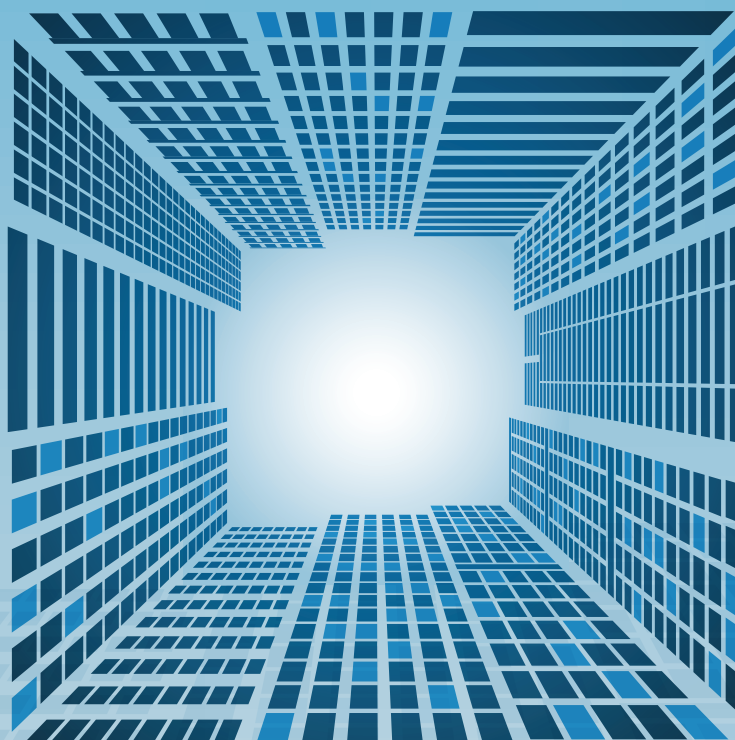

FINANCIAL CENTRES FOR SUSTAINABILITY

REVIEWING G7 FINANCIAL CENTRES IN MOBILIZING
GREEN AND SUSTAINABLE FINANCE



The UN Environment Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme (UN Environment) to advance policy options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy—in other words, sustainable development. Established in January 2014, the Inquiry published its first global report, 'The Financial System We Need' in October 2015, with the second edition launched in October 2016. The Inquiry has worked in around 20 countries and produced a wide array of briefings and reports on sustainable finance.

More information on the Inquiry is at: www.unep.org/inquiry and www.unepinquiry.org or from:

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About this report

This report has been commissioned by Italy's Ministry of the Environment (MATTM) to explore the emerging agenda linking financial centres, climate action and sustainable development. It has been written by Nick Robins and Jeremy McDaniels of UN Environment's Inquiry and Toby Heaps and Fern Ramoutar of Corporate Knights. A first draft was prepared as a background paper for a G7 meeting on Financial Centres for Sustainability held at Borsa Italiana in Milan on 23-24 February 2017.

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The opinions expressed in this report remain those of the authors alone.

Feedback on this report is welcome. Comments should be sent to nick.robins@unep.org.

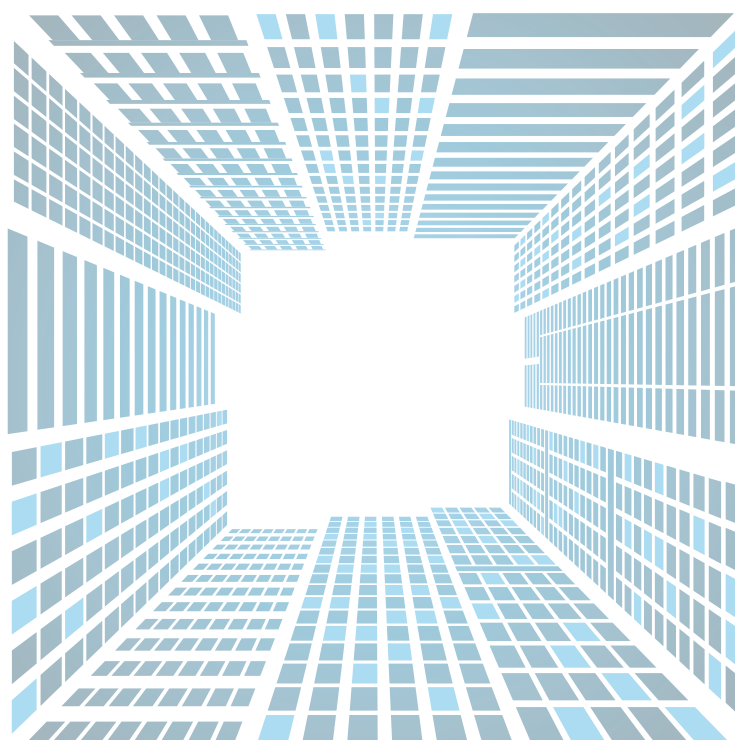
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EXECUTIVE SUMMARY



Achieving sustainable development poses a strategic challenge for the world's financial centres. They are the places where the supply and demand for finance comes together and where action to connect finance and sustainability becomes tangible across banking, capital markets, insurance and institutional investment. This report has been prepared as part of Italy's G7 Environment programme to explore how financial centres can contribute to the delivery of the Sustainable Development Goals (SDGs) and the Paris Climate Agreement. It takes stock of the sustainability agenda that is emerging for financial centres, reviews current practice across leading centres in G7 countries and suggests priorities for further action. This report focuses on green and sustainable finance – in other words finance that delivers environmental benefits within the context of the wider transition to sustainable development.

The momentum in favour of sustainable finance is clearly accelerating. The value of investment assets committed to the Principles for Responsible Investment is now over US\$65 trillion. In debt markets, issuance of green bonds has grown from US\$11 billion in 2013 to US\$81 billion in 2016. However, despite this impressive growth, green bonds still represent less than 1% of global bond issuance. Moreover, a number of strategic challenges continue to constrain the development of sustainable finance, including concerns over clarity and consistency of key definitions, incomplete disclosure, as well as market failures (such as environmental externalities and short-termism). Together, these can result in insufficient demand for sustainable financial services, as well as an inadequate pipeline of green financial assets.

To date, action to promote sustainable finance has mostly focused on separate financial sectors and on national policy frameworks. Now, there is growing realization that sustainability also has strategic implications for the world's more than 100 financial centres. Here, we define financial centres as cities with an intense concentration of financial activity involving an interlocking set of financial sectors and transactions. The case of green bonds illustrates how sustainability is becoming a cross-cutting issue for financial centres as a whole, involving local, national and international issuers, banks as underwriters and analysts, credit rating agencies, portfolio managers, asset owners, stock exchanges, specialist sustainability agencies, standard setters and market authorities, as well as civil society organizations and individual consumers. Importantly, financial centres are not just arenas for financial transactions – but are in many cases the locus of financial regulation as well as of public debate on financial performance, including on social and environmental metrics.

Over the past year, a number of financial centres (such as Casablanca, Frankfurt, Hong Kong, London, Luxembourg and Paris) have launched specific green or sustainable finance initiatives. These and other initiatives are responding to three different imperatives generated by the sustainability agenda:

- Policy: local and national governments are interested in how their financial centres are mobilizing capital to deliver key environmental, climate and sustainable development targets.
- Market: financial centres themselves are interested in how sustainability factors could create new opportunities as well as potential risks.
- Economic: more broadly, there is interest in how financial centres are serving the real economy as it makes its sustainability transition.



A review of the leading G7 financial centres – Toronto, Paris, Frankfurt, Milan, Tokyo, London and New York – and discussions with experts identified 10 key factors that contribute to the sustainability of financial centres. From this, a number of lessons can be drawn about the current state of practice.

- 1 Diverse Drivers at Work:** A wide array of factors are prompting financial centre action, including city ambitions as well as national policy commitments, growing green bond issuance and innovation by institutions operating in the financial centre, including state green banks. Progress often requires the involvement of anchor institutions, such as major pension funds and stock exchanges as well as city authorities, who are willing to take a leadership stance to build momentum.
- 2 Understanding the Financial Ecosystem:** Each centre operates in a distinctive financial ecosystem, with considerable diversity across the G7. For example, federal countries often have a number of different financial centres rather than a single hub. Some centres are more focused on capital markets; others focus more on banking, including financing small and medium enterprises (SMEs). This diversity is a real strength – and clearly illustrates that there is no single template for efforts to develop sustainable financial centres.
- 3 The Clustering Effect:** Financial centres can add real value to the expansion of green finance by being place-specific, generating a cluster effect across sectors and institutions. This can help to ground green finance in the specific needs of the real economy and build long-term relationships. Here, the knowledge agenda is important, embedding green finance in the key professional associations and universities within the financial centre, so that expertise in sustainability becomes increasingly established.
- 4 A Multi-Asset Opportunity:** The growth of the green bond market has certainly catalysed financial centres to start thinking strategically about sustainability. But green bonds are just one part of a much wider trend – starting with listed equities and now extending to bank lending, insurance markets as well as infrastructure, private equity, derivatives and fintech. A key unifying feature is the need for common definitions of financial flows across assets and sectors.
- 5 The Public-Private Dynamic:** Public policy and regulation can play an important role in ensuring good sustainability practice in financial centres, notably through corporate governance, stewardship and disclosure requirements. In addition, policymakers can help to stimulate the growth of sustainable financial services, for example by encouraging public agencies to pump prime markets through the issuance of green bonds or support for green investment trusts. Dedicated initiatives by financial centres on sustainability can also act as focused interlocutors with national governments on policy design.
- 6 From Early Stage Innovation to Transformation:** The greening of financial centres is still, however, at an early stage of development. Most financial centres have yet to consider how sustainability influences their future trajectory and even in those that have launched initiatives, activities are still new and exploratory. An important task for all centres is to explore how sustainability will impact their strategic positioning and develop a transformational agenda showing how financial centres will scale up their work to support local, national and international goals for climate action and sustainable development.
- 7 Competition and Cooperation:** Clearly, financial centres compete, but they also need to cooperate to support stable and open markets – and this imperative applies to the sustainability agenda as well. Financial centres working on green and sustainable finance have shown a clear willingness to share learning, ideas and expertise with the goal of building a wider and deeper global market for green finance. Important cross-border connections between financial centres can be made to encourage the international flow of green finance.

From this review, two priority areas emerge: first, to encourage action by financial centres on sustainability at the national level; and second, to promote international cooperation among financial centres on green and sustainable finance.

National Action

G7 and other countries could encourage their financial centres to develop strategies that scale up green and sustainable finance. These strategies could show how the financial centre will channel its expertise to help deliver local, national and international goals for climate action and sustainable development.

International Cooperation

Building strong and liquid markets for green and sustainable finance will require international cooperation between G7 and other financial centres to develop a level playing field, and encourage a ‘race to the top’. G7 and other countries could encourage the formation of an international network of sustainable financial centres to exchange experience and promote best practice. This network could help to inspire new financial centres to take action and also cooperate on a number of priority areas, such as definitions and measurement, strengthening the pipeline and market development:

- 1 Build convergence on key definitions, principles and measurement:** Financial centres could cooperate to build convergence on key definitions, principles and ways of measuring green and sustainable finance. As part of this focus on measurement, a benchmarking tool to review the contribution of financial centres to the green economy could be developed.
- 2 Strengthen the pipeline of green assets:** Financial centres could work together to expand the pipeline of financial assets from across the green economy including priority segments such as SMEs. A particular focus could be placed on place-based green asset pipelines within urban areas and the financial centres’ host cities, such as buildings and real estate, energy, transport, water and waste.
- 3 Collaborate on developing sustainable financial markets:** Centres could also collaborate on the development of key financial markets, including green bonds, green loans, green equities (such as sustainable infrastructure investment trusts), digital finance (such as crowdfunding), as well as sustainability labelling initiatives for financial products.

All in all, sustainability presents a fresh, necessary and exciting role for the world’s financial centres to pursue over the next decade.

1 WHY SUSTAINABILITY IS SIGNIFICANT FOR FINANCIAL CENTRES



1.1 THE GROWING GLOBAL MOMENTUM

Harnessing the financial system will be essential to make a successful transition to a low-carbon, inclusive and sustainable model of development, which regenerates natural capital. Finance lies at the heart of the three key international policy achievements reached in 2015: the Financing for Development package, the new set of 17 Sustainable Development Goals (SDGs) and the Paris Agreement on climate change.

- **Financing for Development:** The outcome document of the Financing for Development conference (Addis Ababa Action Agenda) focused on steps to increase domestic and international resource mobilization for developing countries, including private capital. One of its conclusions was to “strengthen regulatory frameworks to better align private sector incentives with public goals, including incentivizing the private sector to adopt sustainable practices, and foster long-term quality investment” both from domestic and international institutions.
- **Sustainable Development Goals:** The centrepiece of the 2030 Agenda for Sustainable Development, the 17 SDGs bring together an interlocking set of economic, social and environmental objectives with targets through to 2030, matched by 169 targets. For the financial system, the SDGs set out a high-level roadmap for generating ‘shared value’ – shifting capital away from damaging ‘business as usual’ trends and towards an end to poverty, increased prosperity with social inclusion and environmental regeneration.¹ Estimates suggest that US\$5-7 trillion a year is needed to implement the SDGs globally.²
- **Paris Climate Agreement:** The Paris Agreement agreed to “making financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”.³ The Paris Agreement means aligning capital with the long-term goal of keeping global warming “well below 2°C above pre-industrial levels”, with the aspiration to “limit temperature increase to 1.5°C”. It also gave a higher profile to financing adaptation to growing climate shocks.

Across the world, banks, capital markets, insurers and investors are showing increasing commitment to sustainable finance, notably in terms of responding to key environmental challenges such as climate change.⁴ This shift is reflected in a number of key developments within the G7:

- **Banks:** 12 of the world largest banks by market capitalization are based in G7 countries, and are all active in the green bond market.⁵
- **Equity Markets:** Stock markets in the G7 represent seven of the top 10 exchanges in terms of the level and quality of sustainability disclosure⁶ and are home to the largest value of listed firms with “green” revenues, according to FTSE.
- **Bond Markets:** G7 countries are among the largest issuers and investors in green bonds, which reached US\$81 billion in 2016 (47% of which were issued by G7 countries), up from US\$11 billion in 2013.
- **Investors:** Institutional investors from G7 countries account for over 1,000 of the nearly 1,400 signatories of the Principles for Responsible Investment (PRI), with an even larger share of the US\$65 trillion in assets under management that support the PRI.
- **Insurers:** G7 insurers make up the bulk of signatories of the Principles for Sustainable Insurance, and are leading innovators in new underwriting approaches.



This fast-emerging marketplace is driven by a diversity of approaches, including values-based ethical finance along with the increasing focus on integrating environmental, social, and governance (ESG) factors into mainstream financial decision-making, for example, as part of responsible investment strategies. As well as managing risks, there is a growing emphasis on opportunities and on financial practices that generate a real contribution to sustainable development, as encapsulated in the recently launched Principles for Positive Impact Finance.⁷

In this report, we focus on the interlinked concepts of green and sustainable finance:

- **Green finance** aims to deliver environmental benefits, tackling issues such as air pollution, biodiversity loss, climate change, resource efficiency, sustainable agriculture and forestry, as well as waste and water management. It is often used to describe the environmental character of particular assets (such as green bonds).
- **Sustainable finance** takes a comprehensive approach to the management of the economic, social and environmental dimensions of finance to enable broad-based progress to sustainable development. It is often used to describe the desired performance and impact of financial institutions (eg Principles for Sustainable Insurance).

Across the world, some countries are taking initiatives focused on green finance and others are framed in terms of sustainable finance. But there is a clear connectivity between these various initiatives, with green finance targeting the environmental dimension as part of the broader transition to sustainable development. Importantly, actions from central banks, financial regulators and financial ministries increasingly support and complement market action on green and sustainable finance. Examples include:

- **China:** In September 2016, China's financial authorities issued a 35-point programme for greening its financial system.⁸
- **EU:** In December 2016, the European Commission launched a High-Level Expert Group on sustainable finance "to develop an overarching and comprehensive EU strategy on sustainable finance as part of the Capital Markets Union".⁹
- **France:** In 2015, France introduced its Energy Transition law, which includes a number of finance-focused measures, including the link between climate change and stress testing for banks, as well as extended disclosure requirements.
- **Italy:** In February 2017, Italy released the results of a year-long national dialogue on sustainable finance, which identified 18 options for further action.¹⁰

In total, the UN Environment Inquiry has identified over 200 policy and regulatory measures that have been taken across 60 countries to link finance and sustainability.¹¹ These include measures to promote corporate disclosure, strengthen fiduciary duty, improve investor stewardship, manage climate risks to insurance firms and help develop markets for green assets.

Globally, the G20 has taken a lead through its Green Finance Study Group (GFSG), co-chaired by China and the UK, with UN Environment acting as the secretariat.¹² Its 2016 synthesis report acknowledged the positive momentum, but also recognized that many challenges remained.¹³ These constraints can be summarized as the 3Ds:

- 1 Definitions:** there is concern about a lack of clarity about key definitions and principles related to sustainable finance that could make it difficult both to measure the size of the challenge and opening up risks to market integrity.
- 2 Data:** there is still poor disclosure of material sustainability factors both by companies and by financial institutions, matched by fragmented incorporation into financial analysis.
- 3 Development of financial markets:** a range of market failures (notably environmental externalities and short-term time horizons) means that there may be insufficient demand for green

financial services as well as an inadequate pipeline of green assets, resulting in undeveloped financial markets.

At the 2016 Hangzhou Summit, G20 Heads of State for the first time recognized the need to ‘scale up green finance’ and endorsed a set of options to achieve this goal (see Box).

G20 POLICY OPTIONS TO PROMOTE GREEN FINANCE

- 1 Provide strategic policy signals and frameworks:** Country authorities could provide clearer environmental and economic policy signals for investors regarding the strategic framework for green investment e.g., to pursue the SDGs and the Paris Agreement.
- 2 Promote voluntary principles for green finance:** Country authorities, international organizations and the private sector could work together to develop, improve, and implement voluntary principles for and evaluate progress on sustainable banking, responsible investment and other key areas.
- 3 Expand learning networks for capacity building:** The G20 and country authorities could mobilize support for the expansion of knowledge-based capacity building platforms such as the Sustainable Banking Network (SBN) and the UN-backed Principles for Responsible Investment.
- 4 Support the development of local green bond markets:** On request of countries that are interested in developing local currency green bond markets, international organizations, development banks and specialized market bodies could provide support via data collection, knowledge sharing and capacity building.
- 5 Promote international collaboration to facilitate cross-border investment in green bonds:** Country authorities or market bodies could promote cross-border investment in green bonds, including through bilateral collaboration between different green bond markets, where market participants could explore options for a mutually accepted green bond term sheet.
- 6 Encourage and facilitate knowledge sharing on environmental and financial risk:** To facilitate knowledge exchange, the G20/GFSG could encourage a dialogue, involving the private sector and research institutions, to explore environmental risk, including new methodologies related to environmental risk analysis and management in the finance sector.
- 7 Improve the measurement of green finance activities and their impacts:** Building on G20 and broader experiences, the G20 and country authorities could promote an initiative to work on green finance indicators and associated definitions, and to consider options for the analysis of the economic and broader impacts of green finance.

Finally, the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (TCFD) – launched in 2015 – is the first time that the FSB has addressed an environmental issue. Its recommendations were published in December 2016, and broke new ground by underscoring the critical importance of forward-looking disclosures in addition to reporting on past performance landmarks.¹⁴

Importantly, scaling up green finance can be seen as a strategy that reconnects the environmental agenda with wider macro-economic challenges for addressing lacklustre global growth rates. As Bank of England Governor Mark Carney described in his 2016 speech, *Resolving the Climate Paradox*: “green finance is a major opportunity. By ensuring that capital flows finance long-term projects in countries where growth is most carbon intensive, financial stability can be promoted. By absorbing excess global saving, equilibrium interest rates can be raised and macroeconomic stability enhanced. And by allocating capital to green technologies, the prospects for an environmentally sustainable recovery in global growth will increase.”¹⁵

1.2 FINANCIAL CENTRES: WHERE GREEN AND SUSTAINABLE FINANCE BECOMES TANGIBLE

Ten years ago, sustainability factors were generally addressed in a ‘siloes’ fashion within each financial sector and had limited impact on key financial decisions. Now, sustainability factors are increasingly recognized as fundamentally material for financial decision-making, with strategic implications across financial sector activity, including for the world’s more than 100 financial centres.¹⁶

Financial centres can be described as locations where there is “an intense concentration of a wide variety of financial businesses and transactions”.¹⁷ Financial centres generate a powerful clustering effect by concentrating a number of interlocking financial activities – banking, capital markets, investing, insurance, professional services (law, accountancy) as well as regulation. By definition, they are the primary delivery agents for the majority of productive financial initiatives within regions and countries. Through regulatory and investment channels, financial centres can fundamentally shape the incentives of individual firms to integrate aspects of sustainable development into regular business, capital markets and supply chain activities. Financial centres are not just places for financial business, however. They are also the locus of financial regulation as well as of public debate on financial performance, including on social and environmental metrics.

The ecosystem of activities in financial centres creates a cluster effect that can also be used to encourage more systematic action to scale up sustainable finance – going beyond action by individual institutions, markets or countries. Indeed, the challenge of climate change and sustainable development is now emerging as a strategic dimension of financial centre success and competitiveness. The case of green bonds illustrates how sustainability is becoming a cross-cutting issue for financial centres as a whole, involving issuers, banks as underwriters and analysts, credit rating agencies, portfolio managers, asset owners, stock exchanges, specialist sustainability agencies, standard-setters, market authorities, civil society organizations as well as individual citizens and consumers.

Over the past year, a number of financial centres have launched specific initiatives to explore how best to respond to the challenge of sustainability.¹⁸ These include:

- **London:** In January 2016, the City of London Corporation launched its Green Finance Initiative in partnership with the UK Treasury and Department for Business, Energy and Industrial Strategy to promote London’s role as a global hub for green finance.¹⁹
- **Paris:** Following France’s successful hosting of COP21, Paris EUROPLACE launched its Paris Green and Sustainable Finance Initiative in May 2016 to “strengthen synergies and collaborations in order to develop its ecosystem”.²⁰
- **Hong Kong:** In May 2016, the Hong Kong Financial Services Development Council launched a report on Hong Kong as a regional green finance hub, arguing “if it does not seize this opportunity, others will do so.”²¹
- **Luxembourg:** In September 2016, the Luxembourg Stock Exchange (LuxSE) launched the world’s first ever Green Stock Exchange, a platform for green financial instruments that is dedicated to raising funds for green investments.²²
- **Casablanca:** As part of Morocco’s roadmap for sustainable finance announced in November 2016 at COP22, the Casablanca Finance City Authority (CFC) aims to become a Pan-African “climate finance” hub.
- **Frankfurt:** In March 2017, Deutsche Börse launched a new Sustainable Finance Initiative in Frankfurt to act as a dialogue platform, bringing together key participants in the financial centre.²³

Many other financial centres are at various stages of developing their own initiatives including Dublin, Nairobi, Shanghai, Singapore and Stockholm.

These initiatives are responding to three different imperatives generated by the sustainability agenda:

- Policy: governments are interested in how their financial centres are mobilizing capital to deliver key environmental, climate and sustainable development targets.
- Market: financial centres themselves are interested in how sustainability factors could create new opportunities as well as potential risks.
- Economic: more broadly, there is interest in how financial centres are serving the real economy as it makes its sustainability transition.

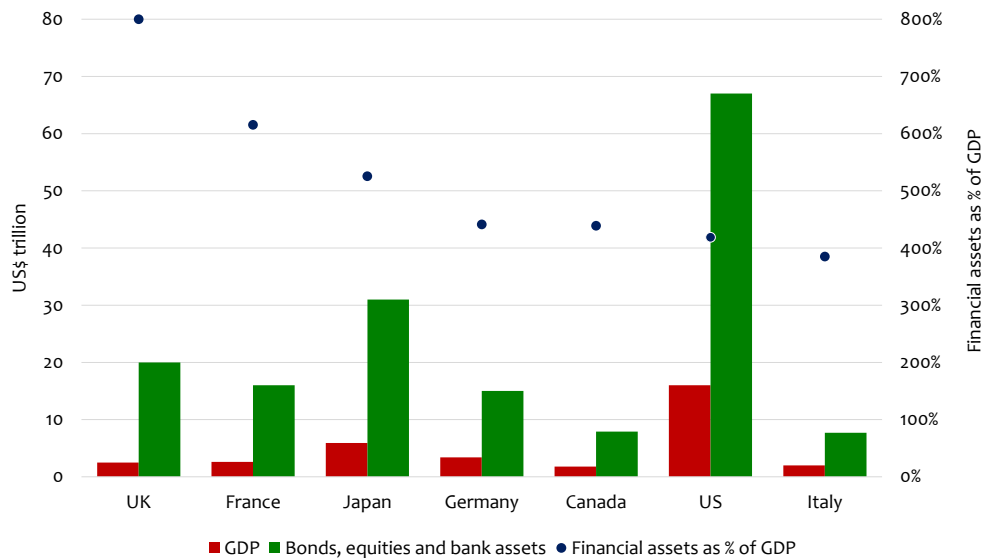
To understand how sustainability is impacting the development of financial centres in the G7, the next section reviews in more detail the green finance momentum in seven leading financial centres.

2 GREEN AND SUSTAINABLE FINANCE ACROSS LEADING G7 FINANCIAL CENTRES

2.1 MAPPING PRACTICE ACROSS THE G7

G7 financial systems vary significantly in their size, structure and composition. One measure of this is the relationship between the financial system and the broader economy, as illustrated in Figure 1.

FIGURE 1: FINANCIAL SYSTEM SIZE (ASSETS UNDER MANAGEMENT) VS. GDP



Source: World Bank Data

Currently, there is not a common set of metrics to measure green and sustainable finance at the country or financial centre level. To give a sense of the range of factors that could be considered, Table 1 provides a quantitative picture of some of the key dimensions at the country and centre level. The key indicators are as follows:

- **Market Size:** Market capitalization of stock exchange(s) in financial centre as of January 2016 from the World Federation of Stock Exchanges.
- **Sustainability Disclosure:** Stock market sustainability disclosure score out of 100 in 2016 from Corporate Knights Sustainable Stock Exchanges Ranking.
- **Stock Market Green Revenues:** New energy (renewable, energy storage, energy efficiency) revenue as portion to total revenues earned by all companies on the stock exchange from Bloomberg as of October 2016.
- **Country Renewable Power Financing:** The percentage of asset power financing in the country for renewable power as of January 2016 from Bloomberg Quarterly Asset Power Finance Report.
- **Green Bond Issuance:** Green labelled domestic green bond issuance by country for 2016 from the Climate Bonds Initiative.²⁴

The indicators show a wide range of performance, with no clear correlation between performance on one factor (e.g. sustainability disclosure levels) and another (e.g. issuance of green bonds).

TABLE 1: G7 GREEN AND SUSTAINABLE FINANCE IN NUMBERS

Country	Financial Centre	Market Capitalization of Stock Exchange(s) <small>25,26,27</small>	Sustainability Disclosure Score (max=100) ²⁸	Stock Market % Green Revenue ²⁹	Country Renewable Power Financing ³⁰	Domestic Green Bond Issuance (2016) ³¹
Canada	Toronto	US\$1.6 trillion	73	0.68%	88.8%	US\$537 million
France	Paris	US\$2 trillion	88	0.66%	96.4%	US\$4.9 billion
Germany	Frankfurt	US\$1.6 trillion	82	1.31%	93.2%	US\$4.3 billion
Italy	Milan	US\$0.6 trillion	73	2.35%	99.1%	US\$250 million
Japan	Tokyo	US\$4.5 trillion	68	2.01%	39.5%	US\$1.1 billion
UK	London	US\$3.3 trillion	83	0.38%	87.8%	US\$0
US	New York	US\$26 trillion	70	0.72%	74.9%	US\$15.5 billion

2.2 GREEN AND SUSTAINABLE FINANCE ACROSS LEADING G7 FINANCIAL CENTRES

The Z/Yen Global Financial Centre Index identifies over 100 financial centres around the world, of which 21 are located in the G7 countries. Of these, we have focused on the leading financial centre within each country: Toronto (Canada), Paris (France), Frankfurt (Germany), Milan (Italy), Tokyo (Japan), London (UK) and New York (USA). The review focuses primarily on financing and investment activities, drawing in insurance where relevant.

2.2.1 CANADA – TORONTO

Situated in the province of Ontario, Toronto is Canada’s largest finance centre and has the second largest employment in finance and insurance in North America. Toronto has a number of distinguishing features in terms of green and sustainable finance: long-term commitment to responsible investment among leading asset owners, a large number of cleantech companies,³² a nascent green bond market anchored with leadership from the provincial government, and a national government keen to leverage US\$180 billion of mostly private sector infrastructure funding over the next 12 years. In addition, there is growing interest in the financial services required to underpin Canada’s new carbon market. As a federal country, Canada has a range of financial centres beyond Toronto, including Montreal, Vancouver and Calgary.

KEY DEVELOPMENTS

- 2013: Ontario green bond programme launched; US\$1.5 billion issued as of February 2017.
- 2016: Ontario government legislation amendment requires pension plans to disclose how ESG factors are addressed in their Statement of Investment Policies and Procedures (SIP&Ps).
- 2016: Five largest Toronto-based banks join World Bank Carbon Pricing Leadership Coalition.
- 2017: Ontario ‘green bank’ to be launched.

The Toronto Stock Exchange, traditionally known for its companies in the natural resource sector, is not only home to the largest number of mining companies in the world, but is also home to the largest number (112) of cleantech and renewable energy listings in the world with a total value of US\$20 billion.³³ The ecosystem of legal, financing and accounting infrastructure that makes Toronto an attractive place to raise funds for capital-intensive mines (with a speculative long-term payback) is well suited to finance cleantech companies that have similar capital requirements and return timelines.

In 2013, Ontario's Premier announced that it would be the first province to issue green bonds.³⁴ The Ontario Green Bond Framework set out five categories of eligible types of projects to be funded by green bonds: clean transportation; energy efficiency and conservation; clean energy and technology; forestry, agriculture and land management; climate adaptation and resilience.³⁵ The province has made three green bond issues to date. The latest, at CAD\$800 million, brought total issuance by the province up to CAD\$2.05 billion for clean transportation and energy efficiency and conservation projects.³⁶ In December 2015, off of the strength of its own inaugural green bond issue, Export Development Canada (EDC) issued a second US\$300 million 1.25% fixed rate green bond.³⁷ In February 2016, CoPower, an online platform for clean energy investing, issued its first green bond for Canadian investors.³⁸ As a catalyst for investment and information sharing, and in accordance with its role as lead manager on "a number of green bond issues with The World Bank and the European Investment Bank and [...] the Province of Ontario", RBC Capital Markets hosts an annual Green Bond Conference in Toronto.³⁹

According to Responsible Investment Association of Canada, assets managed using one or more sustainable and responsible investment (SRI) strategies increased from US\$729 billion to US\$1.09 trillion from 2014 to 2016. This market-driven trend is also supported by policy and regulation.⁴⁰ For example, in November 2016, the Ontario government amended legislation requiring pension plans to disclose how ESG factors are addressed in their Statement of Investment Policies and Procedures (SIP&Ps). The move is the first of its kind in Canada, and was broadly supported by large Ontario pension funds, and encouraged a broader, societal reconsideration of the importance of ESG factors in pension investments.

A more recent development in green infrastructure development occurred in June 2016, when the Ontario Climate Change Action Plan announced that the province would establish a Green Bank "to deploy and finance readily available low-carbon energy technologies to reduce carbon pollution from Ontario buildings."⁴¹ Ontario has also introduced a 'cap and trade' programme to provide incentives for the reduction of greenhouse gas emissions, with the first auction in March 2017. At a city level, Toronto has launched the Home Energy Loan Project (HELP). Through HELP, the city loans money to individual property owners for energy projects, which is paid back through an additional payment on tax bills.

The Canadian government announced in November 2016 that it will launch the Canada Infrastructure Bank which will be provided with CAD\$35 billion in capital over the next eleven years in order to attract private and institutional investment into infrastructure. This will provide another driver for investment into green infrastructure across Canada.

2.2.2 FRANCE – PARIS

As well as the capital of France, Paris is also the headquarters of the Ile-de-France, or Paris region. Paris has developed a rich 'ecosystem' around green and sustainable finance.⁴² This is marked by the rapid growth in SRI assets under management to over €3 trillion, over a quarter of the European total, according to Eurosif.⁴³ Other key features include the role of 'anchor' investors in the public and private sectors, a diversity of green bond issuers from leading French corporations headquartered in Paris and the market creating role of sustainability disclosure requirements for both financial institutions and products.

Action on green and sustainable finance in Paris stretches back more than a decade, but was accelerated by hosting the COP21 climate conference in December 2015. This generated an unprecedented mobilization of both the French and international financial communities, as well as the introduction of world-leading requirements on investors to disclose their approach to climate change. Article 173 of the Energy Transition law requires investors to report how they integrate ESG issues into their investment policies and how they contribute to the Sustainable Development Goals and international climate targets. In addition, an Energy and Ecological Transition label (TEEC) was introduced for investment products to increase transparency for consumers.⁴⁴ This has now been granted to 13 funds representing around

KEY DEVELOPMENTS

2001: First ESG disclosure requirements introduced for Employees Savings Funds and the Pension Reserve Fund (FRR).

2008: Launch of a charter on responsible investment by the Paris financial marketplace.

2010: Grenelle II law introduces expanded ESG reporting requirements for asset managers.

2013: Paris EUROPLACE publishes “Responsible Finance: 10 proposals for Europe”, along with a new definition of responsible investing.

2014: Ile-de-France issues €600 million green bond.

2015: Paris issues €300 million green bond.

2015: Energy Transition Law includes Article 173 requiring investor reporting on ESG and climate change. Energy Transition (TEEC) label introduced for investment funds.

2016: French government introduces new public label for SRI funds.

2016: Paris EUROPLACE launches ‘Paris Green and Sustainable Finance Initiative’.

2017: France issues €7 billion sovereign green bond.

€2 billion in assets.⁴⁵ An additional label for SRI funds was introduced in January 2016 to promote ESG integration; roughly 60 funds hold this label, together comprising around €10 billion in assets.⁴⁶

Paris EUROPLACE, which is charged with promoting and developing Paris as a financial centre, has been working on sustainability issues since 2013 when it published “Responsible Finance: 10 proposals for Europe”. This discussed the need for improved dialogue between investors and issuers and methods of distributing SRI products. In 2016, Paris EUROPLACE launched the ‘Paris Green and Sustainable Finance Initiative’ to make the Paris a major player in the financing of sustainable development. This includes taking steps to “differentiate the Paris marketplace by the quality of its green products and its expertise in green and sustainable finance”.⁴⁷

This trend has been anchored by the role of a growing number of Paris-based financial institutions. The Euronext Paris Stock Exchange ranked second overall in the 2016 Sustainable Stock Exchanges (SSE) Initiative ranking. It had the lowest carbon intensity and is ranked first among G7 financial centres in terms of overall sustainability disclosure.

Public pension funds Fonds de Réserve pour les Retraites (FRR) and French Public Service Additional Pension Scheme (ERAFP) have been at the vanguard of integrating ESG factors into their requests for proposals and were both founder members of the Portfolio Decarbonization Coalition along with asset manager Amundi.⁴⁸ As part of the Coalition, members pledge to take measurable action to reduce the carbon footprint of portfolios. In the run-up to COP21, AXA announced a series of measures to align its activities with climate action, including divesting from companies most exposed to coal and doubling allocations to green assets. France’s long-standing public financial institution, Caisse des Dépôts, also committed €15 billion over a two-year period to address climate change and the ecological transition.⁴⁹ The principal function of public financial institutions such as the Caisse des Dépôts and Bpifrance is to “leverage regulated savings accounts (Livret A) and other public and private sources of capital to provide financing in line with public sustainability mandates in areas where other market actors are not able or willing to do so.”⁵⁰

France ranked second among G7 countries in terms of the absolute value of labelled green bonds issued in 2016, but was highest in terms of the percentage of overall issuance. Paris-based Crédit Agricole CIB (CACIB) was one of the original group of investment banks that designed the Green Bond Principles, a set of voluntary guidelines that “recommend transparency and disclosure and promote integrity” in developing green bond issues. Two out of the top 10 banks from the 2015 Climate Bonds Initiative Green Bond Underwriters ranking – Crédit Agricole and BNP Paribas – are headquartered in Paris. The

French Banking Federation has also proposed the introduction of lower capital requirements for green investments – a ‘green supporting factor’ – to reflect the macro-prudential benefits of decarbonization in terms of reducing climate risks to the financial system.⁵¹

An early and significant contribution to the overall green bond market in Paris was the Ile-de-France €600 million bond issue in September 2014, the largest amount raised by a region at the time. Paris itself has also issued a €300 million green bond at COP21. Most recently, in January 2017, France issued a record €7 billion green sovereign bond to finance investments in clean energy.⁵²

The Paris green finance ‘ecosystem’ is also home to influential NGOs and think tanks such as Novethic, the Institute for Climate Economics (I4CE) and the 2 Degrees Investing Initiative. In 2009, for example, Novethic launched the first European SRI label for Responsible Investment funds that take environmental, social and governance criteria into account. In addition, two other public agencies in Paris, the Paris Development Agency and Paris Climate Agency, created Paris Green: Invest for the Future. An online web platform, Paris Green, serves as a skills incubator and funding programme for education, research and development around Paris’ green economy.⁵³

2.2.3 GERMANY – FRANKFURT

Situated in the German state of Hessen, Frankfurt is Germany’s leading financial centre. Germany’s financial system is bank-based, which has underpinned the rapid expansion of renewable energy through the Energiewende (energy transition). In Frankfurt, the locus of sustainable and green finance activity has occurred at the stock exchange. Apart from Frankfurt, Germany’s other major financial centre is Munich.

KEY DEVELOPMENTS

- 2011: German Sustainability Code initiated by German Council for Sustainable Development.
- 2015: KfW planned €1 billion green bond portfolio “to expand its promotional activities for climate protection with a capital market instrument.”⁵⁴
- 2016: Deutsche Börse 10th in ranking of sustainability disclosure on 45 stock exchanges; contains 35 sustainable indices in 2016.
- 2017: Hessen Finance Minister gives support for Frankfurt to be a green finance hub.
- 2017: Deutsche Börse launched a new Sustainable Finance Initiative.⁵⁵

All three pillars of the German banking industry – public-owned as well as private and cooperative banks – are active with regard to sustainability.⁵⁶ According to the latest estimates from the country’s sustainable investment forum (FNG), Germany’s 13 clerical and alternative banks lead the way in terms of climate-friendly banking.⁵⁷

Germany’s policy bank, KfW, is headquartered in Frankfurt and is one of the largest financers of climate and environmental protection worldwide. In 2015 alone, KfW invested €29.5 billion for projects related to environmental protection and climate change mitigation.⁵⁸ KfW also actively supports the development of the Green Bond market. As an investor, it started in 2015 to build up a €1 billion Green Bond portfolio backed by the Federal Ministry of the Environment “to expand its promotional activities for climate protection with a capital market instrument”. KfW is also one of the largest issuers, issuing 11 Green Bonds totalling €11.5 billion since 2014. Other public banks (such as NRW Bank) have also issued green bonds. Together, the Association of German Public Banks (VÖB) has started the “Green Bond Initiative Deutschland” to raise awareness and support capacity building and knowledge sharing.

The Deutsche Börse Group has developed a number of sustainability-related initiatives, aimed at improving transparency and performance on ESG issues and sustainable investment.⁵⁹ Through its

transparency initiatives, all companies of DAX, MDAX, SDAX, TechDAX disclose sustainability information and “inform on their ESG reporting channels”. In March 2017, it launched a new Sustainable Finance Initiative in Frankfurt. The aim is to establish a new dialogue platform with the Frankfurt financial centre’s key participants, including financial institutions as well as representatives from academia and NGOs.⁶⁰

By focusing on ESG standardization, the Deutsche Börse Group has accelerated the capacity of listed, private sector companies to systematically develop and adopt sustainability strategies. The exchange contains 35 distinct sustainability indices and a comprehensive set of ESG indicators for disclosure purposes. Since 2011, the exchange has also encouraged the adoption of the German Sustainability Code, an instrument that “aims at rendering companies’ sustainability efforts transparent and comparable”.⁶¹ Deutsche Börse has the third highest percentage of green revenue from listings among the G7 stock exchanges.

Germany’s investment market has Europe’s second largest amount of SRI funds under management at €1.8 trillion.⁶² Leading German insurance companies, such as Allianz and MunichRe, have become significant investors in the growing renewable infrastructure asset class.

Within the state of Hessen, the government has launched an initiative to develop Frankfurt as a fintech hub, officially the “Digital Hub for Financial Services and FinTech”. The hub falls within the Digital Hubs Initiative, set up by the Federal Ministry for Economic Affairs and Energy, and represents a significant effort by national and regional public finance institutions in Germany to coordinate sustainable financial and technological investment across the public and private sector actors.

In addition, Hessen Economics Minister Tarek Al-Wazir has underscored the need for “a massive reallocation of investment to restructure the economy towards low-carbon business: green finance opens up enormous opportunities”. On the back of this, he announced in January 2017 that he wanted “Frankfurt to be the green finance hub in continental Europe”.⁶³

2.2.4 ITALY – MILAN

Milan is Italy’s main financial centre. Recently, the engagement of Italy’s financial sector with environmental drivers of value (such as climate change) has risen up the agenda, notably through the recent National Dialogue on Sustainable Finance.⁶⁴ Launched by the Ministry of the Environment in 2016, the Dialogue brought together banks, capital markets, investors, insurers as well as public authorities to identify options that would improve the integration of sustainability factors across Italy’s financial sector. This found that reforms to green the finance sector can help to identify new growth areas, new ways of ensuring the soundness of financial institutions and new ways to serve clients. In Italy, a key challenge is how to improve access to green finance for the country’s four million SMEs. For Milan, “green finance as just one element of the bigger attraction strategy for foreign investment”, building on its record in the areas of green start-ups and angel investors, according to the city’s Budget Assessor Roberto Tasca.⁶⁵

Italy’s financial sector exhibits a number of signs of positive momentum towards green and sustainable finance. In 2007, the country established a transparency regulation for all SRI products, requiring financial institutions selling financial products labelled as “green” or “sustainable” or “responsible” to provide further information on what criteria, processes and controls are applied to prevent any abuse of public trust. Italy was one of the first developed countries to introduce a disclosure obligation for pension funds on how ESG concerns are integrated into their investment policies. In the banking sector, according to the *Banks and Green Economy* report (led by ABI), Italy’s banks have lent €27 billion between 2007 and 2014 for renewable energy, including €18 billion for solar. Investment in energy efficiency, notably in the building sector, has high potential, but faces a number of barriers. Cassa Depositi e Prestiti (CDP), Italy’s national promotional bank, has placed sustainable development at the heart of its new business plan. At a national level, the Banca d’Italia has undertaken an initial analysis of the exposure of the banking sector to flooding, whose impacts could be intensified in the future through climate change. Over 22% of Italy’s

KEY DEVELOPMENTS

2014: Italian SIF Forum per la Finanza Sostenibile (FFS) launched first Italian edition of pension benchmark.

2015: Italian Corporate Governance Committee including ESG risks and in its review of the Italian Corporate Governance Code.

2016: Borsa Italiana has largest percentage of green revenues from its listed companies among G7 exchanges.

2017: Publication of the results of Italy's National Dialogue on Sustainable Finance.

2017: Borsa Italiana launches a new segment on its ExtraMOT PRO market dedicated to the issuance of green and social bonds.⁶⁶

insurance market is covered by signatories to the Principles for Sustainable Insurance, including Generali and the Italian Federation of Banks, Insurers and Finance (FeBAF).

Milan is home to the Borsa Italiana, which has demonstrated a growing commitment to sustainability. In the 2016 ranking of sustainability disclosure on 45 stock exchanges, the Borsa Italiana climbed 11 places to 19th position. In a more recent 2017 assessment of the quantitative ESG data disclosure rate by country, Italy ranked first in the G7 and fifth overall, according to FTSE.⁶⁷ In terms of revenues from listed companies involved in the green economy, it ranks 10th among all stock exchanges and has the highest percentage of green revenue from listings among the G7 financial centres. Notably, 31 Italian companies are listed in the FTSE Europe Green Revenues Index and 9 green ETFs (Exchange Traded Funds tracking sustainability-themed indices) listed on the Borsa. In July 2015, the Italian Corporate Governance Committee, promoted by Borsa Italiana, included ESG risks and governance considerations in its review of the Italian Corporate Governance Code.

In March 2017, Borsa Italiana added a new segment on its ExtraMOT PRO market dedicated to the issuance of green and social bonds.⁶⁸ This covers €1.2 billion in certified green bonds from large issuers such as ENEL as well as an estimated €590 million in climate-aligned bonds from smaller issuers. Some foreign supranational issuers have also entered the Italian market issuing green bonds listed on the Italian Stock Exchange (MOT and EuroMOT). Recently, the World Bank issued two sustainable bonds listed on the EuroMOT, targeted to Italian retail investors: one in Chinese renminbi and one in Indian rupees.

A strategic task for Italy's financial system is to diversify the sources of funding for SMEs, which form the backbone of the economy. One solution is the emergence of capital market financing for SMEs, for example, through the use of "mini-bonds" (i.e. corporate bonds of small size, with simplified administrative procedures). The market for mini-bonds was promoted and facilitated by a government decree providing tax incentives for the instrument: from 2013 to 2016, 292 issues came from listed and private large companies and SMEs, including commercial paper totalling more than €11.5 billion, of which 245 issues raised less than €50 million each and 89 raised between €2-5 million each. Interestingly, the Italian mini-green bond market is more developed than for larger issuers.⁶⁹ The VedoGreen observatory has been detecting an increasing trend by listed SME of the green economy to use the debt instrument to raise funds for their business growth. One of the recommendations of the National Dialogue was to establish a green bond development committee including public and private entities to deliver the critical steps needed to develop the market, particularly the provision of access for small issuers and savings opportunities for retail investors.

The results of Italy's National Dialogue were launched in February 2017 by the Environment and Finance Ministers. The Dialogue identified a number of steps that could be taken in terms of the policy framework, financial innovation, market infrastructure and capacity building. A National Observatory on Sustainable Finance could be established to assure the continuation of the work started by the Dialogue, particularly

through the promotion, coordination and monitoring of suggested options. It would also encourage all actors in the financial community to make the Italian financial market more dynamic, innovative and attractive in terms of sustainability. The Observatory could also promote the launch of a Green Financial Initiative, based on the experience of the London and Paris markets.

2.2.5 JAPAN – TOKYO

The capital of Japan, Tokyo is one of Asia's largest financial centres, serving as the headquarters for a significant concentration of major financial institutions. Many Japanese banks, insurers and investors have long track records in addressing different sustainability priorities in operations and strategies. Recently, there has been a significant upswing in institutional investor commitments to responsible investment. Alongside this, the Tokyo metropolitan government is launched an initiative to strengthen Tokyo's role as a financial centre and has announced plans to issue a green bond. As well as Tokyo, Osaka is another leading financial centre in Japan.

KEY DEVELOPMENTS

- 2010: Tokyo Stock Exchange (TSE) launches Carbon market.
- 2011: Launch of Principles for Financial Action for the 21st Century.
- 2014: Establishment of Stewardship Code.
- 2015: Launch of TSE Infrastructure Fund Market for sustainable infrastructure.
- 2015: Government Pension Investment Fund sets up Stewardship & ESG division.
- 2016: Japan government to introduce green bond guidelines.
- 2016: Tokyo Metropolitan Government establishes Advisory Panel for Global Finance City Tokyo.
- 2016: Guidelines for Japan's implementation of the SDGs were approved by the Sustainable Development Goals (SDGs) Promotion Headquarters.
- 2017: Tokyo Metropolitan Government to issue municipal Green Bond (expected).

Recent years have seen increasing market growth and instances of leadership on sustainability priorities by Japanese financial institutions. The Tokyo Stock Exchange (TSE) has been active in promoting the creation of new environmental markets, starting with the launch of the first Asian carbon market in 2010. Recently, the TSE has taken action to mobilize private capital for long-term investments in infrastructure. A new Infrastructure Fund Market was established in April 2015, for listing funds that invest in infrastructure assets including renewable energy facilities, power grids and transport and transmission networks.⁷⁰ However, while the TSE has the lowest percentage of grey revenue from listings, it is ranked last among the G7 financial centres in overall sustainability disclosure score.⁷¹

Japanese banks, headquartered in Tokyo, are now some of the world's largest private lenders and intermediary institutions for financing green assets. According to BNEF, three of the top five lead asset finance arrangers for clean energy and energy smart technologies in 2016 were Japanese institutions: with Mitsubishi UFJ Financial (US\$2.9 billion), Sumitomo Mitsui Financial Group (US\$2.2 billion) and Mizuho Financial (US\$1.6 billion) in 1st, 2nd, and 5th place globally.⁷²

Since 2014, major Japanese financial institutions have started issuing green bonds in various currencies, including DBJ,⁷³ SMBC,⁷⁴ MUFG,⁷⁵ Nomura Research Institute (NRI)⁷⁶ and Shinsei Trust Bank.⁷⁷ Currently, Japan's green bond market remains comparatively small, valued by the Climate Bonds Initiative at US\$2.6 billion in 2016.⁷⁸ Japanese Post Insurance Co., in partnership with the World Bank, released a 'Green Shogun' bond in 2016. The Japanese domestic bond is denominated in US dollars and dedicated to financing climate change mitigation and adaptation activities.⁷⁹ International corporations have started targeted Japanese investors through the issuance of 'Green Samurai' bonds denominated in Japanese yen, such as French utility EDF.⁸⁰ Japanese financial institutions have recently become active as purchasers

of green bonds, including those issued by international development finance institutions as well as sovereign entities (such as the recent French government green bond).⁸¹ Recently, other market actors have undertaken action to promote the development of the Japanese green bond market – including domestic rating agency R&I releasing a green bond assessment methodology in 2016.⁸²

Major Japanese insurers have significant experience in the consideration of sustainability issues within insurance underwriting practices, including the assessment of natural catastrophe risks. Japanese insurers, working alongside the Japanese government, have been active in international efforts to improve disaster resilience, including the Pacific Catastrophe Risk Assessment and Financing Initiative.⁸³ Leading insurers such as Tokio Marine, Sompo, and MS&AD are members of the Principles for Sustainable Insurance. In 2016, Tokio Marine participated as a member of the FSB Task Force on Climate-related Financial Disclosures, which released its interim recommendations for corporate and financial institution disclosure in December 2016.

According to the Japan Sustainable Investment Forum (JSIF), the total sustainable investment market in Japan reached US\$473.6 billion in 2016, up from just US\$7.0 billion in 2014.⁸⁴ Furthermore, in September 2015, Japan's Government Pension Investment Fund (GPIF), the world's largest public pension fund, became a signatory of the Principles for Responsible Investment.⁸⁵ In October 2016, the GPIF established a specific Stewardship and ESG division, with the aim of advancing ESG activities and supporting the broader uptake of responsible investment practices in Japan.⁸⁶

Policy action to support sustainable finance has been under way for over a decade, starting with the establishment of an environmentally rated loan portfolio by DBJ in 2004. The Principles for Financial Action for the 21st Century, launched in 2011 by the Ministry of Environment and a group of leading financial institutions, aimed to shift towards a strategic vision of engagement between the financial sector and environment.⁸⁷ At the national level, Japan's stewardship and corporate governance codes have contributed to increasing the profile of environmental issues for Japanese financial institutions. Guidelines for Japan's implementation of the SDGs were approved by the Sustainable Development Goals (SDGs) Promotion Headquarters in 2016.⁸⁸ Most recently, the Japanese government announced its intention to introduce green bond guidelines to boost long-term growth in the bonds market following a six-month working group within the Ministry of Environment.

Recently, the Tokyo Metropolitan Government has expanded its activities to promote Tokyo as a leading global financial centre. In November 2016, the Tokyo Metropolitan Government launched the Advisory Panel for Global Financial City Tokyo with the aim of investigating issues hindering the revitalization of Tokyo's financial sector and possible solutions. Parallel to this, Tokyo's Governor Yuriko Koike has announced that the Metropolitan Government plans to issue green bonds; its first municipal green bond is expected in 2017. Tokyo also has its own 'cap and trade' programme, which was introduced in 2007 and has contributed to a 25% reduction in emissions⁸⁹ for 1,400 of the city's large buildings.

2.2.6 THE UK – LONDON

London's steps towards green and sustainable finance have been driven by a powerful dynamic between market, policy, and civil society action – with a critical mass of leading institutions undertaking strategic action to enhance risk management and drive forward new green opportunities.⁹⁰

London's engagement with sustainability has grown out of an initial focus on ethical investment, moving through the mainstreaming of ESG factors into institutional portfolios and on to a current focus on climate and carbon risk. This has emerged from a dynamic between social activism, market leadership and policy frameworks. Beyond London, other financial centres in the UK include Edinburgh.

In the decade after the 2000 Pension Act, which included sustainability factors for the first time, London built up a strong focus in sustainable and responsible investment, led by a number of institutions

KEY DEVELOPMENTS

2000: The Pensions Act sets out requirements for pension funds to disclose how investment policies integrated ESG issues.

2011: Launch of first 'carbon bubble' report from London-based Carbon Tracker.

2012: Establishment of UK Green Investment Bank.

2013: Mandatory disclosure of GHG emissions for listed companies.

2015: Bank of England Prudential Regulatory Authority assessment of climate change and the UK insurance sector.

2016: City of London Green Finance Initiative launched.

such as Aviva, the Church of England, the Environment Agency Pension Fund and Hermes, as well as boutiques such as Generation. Leading international banks based in London were also influential in the establishment of the Equator Principles in 2004, and have subsequently introduced sector policies and environmental frameworks. The UK is Europe's third largest location for SRI assets at €1.6 trillion, with funds managed in both London and Edinburgh.⁹¹

The UK has the world's third largest insurance sector,⁹² with the highly internationalized London market centred around Lloyd's of London.⁹³ London-based global insurers and reinsurers are leading in the assessment of new and emerging risks, including those posed by climate change. Notable here are WillisTowersWatson's '1 in 100 initiative', aiming to encourage the use of insurance stress testing techniques for environmental risks across the financial system,⁹⁴ and the work of Lloyd's of London on how interrelated environmental risks – such as a food system shock – could affect the insurance market.⁹⁵

Following from mandatory requirements for listed companies to disclose GHG emissions in 2013, the London Stock Exchange (LSE) has expanded green service offerings to support investor efforts to identify green equities – including its Green Revenues model released in 2016.⁹⁶ The LSE has the second lowest carbon intensity among the G7 financial centres and is ranked second among the G7 in sustainability disclosure. The LSE has played an important role in supporting the development of an international green bonds market and was the first global exchange to join the Climate Bonds Partnership Programme.⁹⁷ In 2016, India's first internationally listed certified green bond raised US\$500 million through the LSE and the IFC's first renminbi-denominated green bond was issued, the first green bond by a multilateral institution in offshore Chinese markets.^{98,99}

London is host to a range of international sustainable finance initiatives, including on responsible investment (Principles for Responsible Investment), green bonds (Climate Bonds Initiative) and disclosure (CDP, IIRC). A notable example of this clustering effect is the evolving debate on carbon asset risk, pioneered by NGOs such as the Carbon Tracker Initiative and subsequently advanced by leading financial institutions and considered by regulatory bodies including the Bank of England.

The UK government has developed a range of innovative investment structures to leverage the large pools of private capital in London towards domestic low-carbon priorities. In 2012, the UK established the world's first Green Investment Bank (GIB), headquartered in both London and Edinburgh. Since then, the GIB has mobilized private sector capital to 85 green infrastructure projects, which committed £2.7 billion to the UK's green economy. The subsequent privatization of the Bank, announced in June 2016, is intended to allow the bank to double the size of its business, expand into new parts of the UK green economy and deliver a growing green impact.¹⁰⁰ The GIB has also helped to underpin the growth in renewable investment trusts,¹⁰¹ which now hold roughly £3 billion in total assets.¹⁰²

Recently, under the leadership of Mark Carney, the Bank of England has taken a leading role in advancing the debate on climate change, green finance and financial stability. In September 2015, the Bank of

England released an assessment of the impact of climate change on the UK insurance sector, setting out a framework of how climate change may pose a range of physical and transition risks to firm and sector level stability.¹⁰³ In 2016, the Bank of England, alongside the People's Bank of China, served as the co-chairs of the G20 Green Finance Study Group, which has continued into 2017 under the German G20 Presidency. This focus on climate change, combined with clarification that the integration of material sustainability factors was part investor fiduciary duties, has helped to stimulate product innovation by leading London-based index providers and passive investment managers, such as Legal & General.

Building on these trends, London became the first city to launch a financial centre initiative organized around green finance. The Green Finance Initiative (GFI) represented the city's direct effort to coordinate support for and enhance transparency and accreditation of green financial products.¹⁰⁴ One new area of focus is the link between fintech and green finance – UK crowdfunding initiatives have raised over £2 billion for investment in green projects, including platforms such as Abundance.

2.2.7 THE US – NEW YORK

New York is the leading financial centre in the United States. New York City's two major stock exchanges list firms with over US\$27 trillion in market capitalization as of April 2017, more than the total market capitalization of the other six G7 financial centres' major exchanges combined.¹⁰⁵ New York's financial institutions are highly internationalized, with Wall Street a predominant global capital markets hub and the green finance activities of these institutions are similarly global in their reach. In the US, policy action to support green and sustainable finance has tended to emerge from the city and state levels. In addition, as a large federal country, the US has a diversity of financial centres beyond New York, notably San Francisco, Boston, Chicago, Washington, D.C. and Los Angeles.

KEY DEVELOPMENTS

- 2013: NYSE joins Sustainable Stock Exchanges Initiative.
- 2014: New York State Green Bank established.
- 2014: Five New York City-based banks join the Green Bond Principles consortium.
- 2015: NYSCRF and Goldman Sachs form US\$2 billion low-carbon fund.
- 2016: New York's Metropolitan Transportation Authority (MTA) issues first green bond (US\$500 million).
- 2017: NYSCRF becomes first major US pension fund to join Portfolio Decarbonization Coalition.

To date, the momentum on green finance in New York has in part been due to leadership from city- and state-level green finance efforts and the activities of public financial institutions, such as public pension funds. New York has a long history of public institutions operating at city and state levels financing social investment, with the focus now turning to low-carbon investment opportunities. In 2009, the Community Preservation Corporation set forward a US\$1 billion Green Financing Initiative to support construction and mortgage loans for energy efficient upgrades and property retrofits.¹⁰⁶ A state-level New York Green Bank was established in 2014 to increase the availability of capital for projects deploying proven clean energy.¹⁰⁷ In 2016, Governor Cuomo announced the approval of a further US\$5 billion Clean Energy Fund to advance innovation and facilitate public-private partnerships focused on energy efficiency and renewable energy.¹⁰⁸

The city has also developed a number of public and private sector policies designed to incentivize greater uptake in local, small-scale energy efficiency projects. Legislation from 2008 provided four years of tax abatement on solar panel-related expenditures up to US\$62,500.¹⁰⁹ Currently, the Energy Improvement Corporation (EIC) offers Property Assessed Clean Energy (PACE)¹¹⁰ loans for New York state energy projects, and publicly sponsored Fannie Mae provides lower interest rate loans to green multi-residential buildings. New York City is also home to a rapidly growing cleantech industry, supported by public

mechanisms to bring innovations to scale. Notable here are ACRE, New York City's premier cleantech incubator and NYSERDA Clean Energy Business Partners, which supports cleantech entrepreneurs.¹¹¹

Across the US, sustainable, responsible and impact investing continues to rise, with total SRI assets at the beginning of 2016 at US\$8.72 trillion, up 33 percent from US\$6.57 trillion in 2014.¹¹² Institutions in New York have been at the vanguard of this trend: both New York City and New York state pension funds are actively integrating environmental, social and governance factors. In December 2015, the New York State Common Retirement Fund (NYSCRF) partnered with Goldman Sachs to divest US\$2 billion of its holdings away from business with high levels of greenhouse gas emissions and into low-pollution investments.¹¹³ More recently, the NYSCRF became the first major US pension fund to join the Portfolio Decarbonization Coalition, when it pledged to gradually decarbonize a total of US\$600 billion through designing investment portfolios with a smaller climate change impact.¹¹⁴ This action set a national precedent in acknowledging the risk that climate change poses for portfolio performance, including through the potential for stranded assets.¹¹⁵

Turning to Wall Street, New York's concentration of major global banks, investors, insurers and key intermediaries such as credit rating agencies have increasingly exhibited market leadership on product innovation and low-carbon investments. For example, New York-based investment banks, Citigroup, Bank of America ML, Goldman Sachs and JP Morgan, have actively promoted and served on the drafting committee of the Green Bond Principles, a set of voluntary guidelines that "recommend transparency and disclosure and promote integrity" in developing green bond issues.¹¹⁶ Five out of top 10 banks from the 2015 Climate Bonds Initiative Green Bond Underwriters ranking are headquartered in New York. As in other cities, New York-based institutions have contributed to and benefited substantially from the expanding green bonds market. Most notably, in February 2016, the New York Metropolitan Transportation Authority (MTA) announced a US\$500 million green bond offer, "a milestone in the inclusion of rail transport in the burgeoning green bond market".¹¹⁷ All three of the New York-headquartered credit rating agencies – Fitch, Moody's and Standard & Poor's – have issued research on environmental factors, notably around climate change and green bonds.¹¹⁸

New York-based stock exchanges have begun embedding several, essential sustainability-related features, boosting the relevance of green finance in New York's positioning as a national (and international) financial hub. The NYSE is a member of the Sustainable Stock Exchanges Initiative and is the only carbon neutral global exchange group.¹¹⁹ It ranked 26th in the SSE Initiative 2016 ranking on sustainability disclosure of 45 stock exchanges. The NYSE has the second lowest percentage of grey revenue from listings among the G7 financial centres. The NASDAQ has played a leadership role in the World Federation of Exchanges' development of the Enhanced Sustainability Guidance and Recommendations, which "identifies ESG metrics that exchanges can voluntarily incorporate into disclosure guidance to companies listed on their markets".¹²⁰ The emergence of several renewable energy YieldCos¹²¹ on the NYSE and the NASDAQ, such as NRG Yield and TerraForm Power, represents a positive evolution towards a tradeable green asset class that other exchanges have sought to emulate.

3 LESSONS AND NEXT STEPS



3.1 FINANCIAL CENTRES AND SUSTAINABILITY – IDENTIFYING THE KEY FEATURES

Drawing on this review of current practice, there appear to be at least 10 factors that could be considered when examining how financial centres can contribute towards sustainability. These are set out in Figure 2.

FIGURE 2: KEY FACTORS FOR FINANCIAL CENTRES AND SUSTAINABILITY



Source: UN Environment Inquiry, 2017



3.2 LESSONS FROM PRACTICE

As well as helping to identify the key features of a sustainable financial centre, this review along with discussions with experts yielded seven key insights about the current state of play.

- 1 Diverse Drivers at Work:** A wide array of factors is prompting financial centre action, including city ambitions as well as national policy commitments, growing green bond issuance and innovation by institutions operating in the financial centre, including state green banks. Progress often requires the involvement of anchor institutions, such as major pension funds and stock exchanges as well as city authorities, who are willing to take a leadership stance to build momentum.
- 2 Understanding the Financial Ecosystem:** Each centre operates in a distinctive financial ecosystem, with considerable diversity across the G7. For example, federal countries often have a number of different financial centres rather than a single hub. Only in a few cases is the leading financial centre in the same location as the country's capital city. In some cities, dedicated agencies promote the financial centre, but this is by no means universal, while some financial centres are located in city-regions that have active local green finance programmes. Some centres are more capital markets-focused; others focus more on banking – including financing SMEs. This diversity is a real strength and means that there is no single template for greening financial centres.
- 3 The Clustering Effect:** Financial centres can add real value to the expansion of green finance by being place-based, generating a cluster effect across sectors and institutions. This can help to ground green finance in the specific needs of the real economy and build long-term relationships. Here, the knowledge agenda is important, embedding green finance in the key professional associations and universities within the financial centre, so that expertise in sustainability becomes increasingly established.
- 4 A Multi-Asset Opportunity:** The growth of the green bond market has certainly catalysed financial centres to start thinking strategically about sustainability. But green bonds are just one part of a much wider trend. Indeed, sustainable finance first started on listed equity markets, where there is now considerable innovation in terms of low-cost sustainability indices as well as the development of green investment trust vehicles (such as YieldCos in the US). Green finance also increasingly extends to the core lending books of banks through the 'green tagging' of housing loans and mortgages.¹²² Beyond this lie insurance markets, infrastructure and private equity, as well as derivatives (such as currency hedging mechanisms) and fintech. A key unifying feature is the need for common definitions of financial flows across assets and sectors.
- 5 The Public-Private Dynamic:** Public policy and regulation can play an important role in ensuring good sustainability practice in financial centres, notably through corporate governance, stewardship and disclosure requirements. Here, it is important to focus on simplicity, clarity and materiality. For example, the introduction of sustainability disclosure requirements for institutional investors, such as in France, does not just provide greater transparency to clients and contribute to financial stability, but it can also help drive market innovation in terms of new investment strategies. Similarly, green bond issuance by city and state authorities does not just provide capital to finance critical environmental priorities, but also helps to seed the wider green bond market and generate commercial interest within the financial centre itself for other mechanisms, such as green investment trusts. Dedicated green finance initiatives can also act as focused interlocutors with governments on policy design.
- 6 From Early Stage Innovation to Transformation:** The greening of financial centres is still, however, at an early stage of development. Most financial centres have yet to consider how sustainability influences their future trajectory and even in those that have launched initiatives, activities are still new and exploratory. An important task for all centres is to explore how sustainability will impact their strategic positioning, and develop a transformational agenda

showing they will scale up their work to support local, national and international goals for climate action and sustainable development. Here, an important consideration is how to identify and nurture potential ‘anchor’ institutions, such as major pension funds and stock exchanges as well as city authorities, who are willing to take a leadership stance and generate the positive spillover effects of collective action.

- 7 Competition and Cooperation:** Clearly, financial centres compete and the competitive dynamic can be a positive asset for progress on sustainable finance. But they also need to cooperate to support stable and open markets – and this applies to the sustainability agenda as well. Financial centres working on green finance have shown a clear willingness to share learning, ideas and expertise with the goal of building a wider and deeper global market for green finance. Important cross-border connections between financial centres can be made to encourage the international flow of green finance.

3.3 NEXT STEPS

From this review, two priority areas emerge for action: first, to encourage action by financial centres on sustainability at the national level; and second, to promote international cooperation among financial centres on sustainable finance.

3.3.1 NATIONAL ACTION

G7 and other countries could encourage their financial centres to develop strategies that scale up green and sustainable finance. These strategies could show how the financial centre will channel its expertise to help deliver local, national and international goals for climate action and sustainable development.

In each financial centre, a starting point would be to bring together the relevant institutions in the city and construct a work programme that would identify priorities for collective action at the financial centre level. These could include: raising awareness; promoting innovation on priority issues; boosting capacity and skills; strengthening relations with clients and customers in the real economy; and building links with policy and regulation.

As well as encouraging the success of the financial centre itself, these strategies could have a positive impact at the regional level. A growing number of cities have made commitments to sustainability and climate action. Indeed, cities and regions were identified as a major non-state actor at COP21 and a number of alliances are mobilizing action. For example, the C40 Cities Climate Leadership Group represents 80 of the world’s leading cities and is focusing on driving urban action that reduces greenhouse gas emissions. As yet, the potential of harnessing the financial centres within these cities for sustainability has yet to be fully explored or realized. Bringing these two agendas together could help to accelerate practical action.

3.3.2 INTERNATIONAL COOPERATION

Building strong and liquid markets for sustainable finance will require cooperation between G7 and other financial centres to develop a level playing field and encourage a race to the top. G7 and other countries could encourage the formation of an international network of financial centres working on sustainable finance. This network could help to inspire new financial centres to take action and also cooperate on three priority areas: definitions and measurement, strengthening the pipeline and market development.

a. Build convergence on key definitions, principles and measurement: Financial centres could cooperate to build convergence on key definitions, principles and ways of measuring green finance. To date, G7 countries have successfully adopted a market-led approach to the development of principles and standards exemplified by the Principles for Responsible Investment, the Principles for Sustainable Insurance, the Green Bond Principles as well as the Positive Impact Investment Principles. In each case,

these market-led approaches have often been supported and in some cases accelerated by policy and regulation (for example on disclosure and fiduciary duty).

Two areas for focus in the area of measurement could include:

- **Revenues Disclosure:** Investors increasingly want to understand the exposure of the companies they invest in to green and sustainable products and services – and some are allocating additional capital to issuers with higher green revenues. Currently, however, there is no common approach to measuring such revenues, a priority highlighted in the recent reporting guidance released by the London Stock Exchange Group.¹²³
- **Financial Centre Benchmarking:** The relative performance of financial centres in terms of sustainability could also be measured. To encourage financial centres to take a systematic approach to sustainable finance, Climate KIC and the Institute for Climate Economics (I4CE) are launching a Green Financial Centres benchmarking project with a number of international partners. The project will develop an objective and neutral framework for reviewing financial centres' contribution to the greening of the economy. The intention is not to produce an index or ranking but rather to showcase best practices. The aim is to produce the first version of the benchmark for the COP23 climate conference in late 2017. This benchmark could review progress across the 10 key features identified above as well as other factors.

b. Strengthen the pipeline of green financial assets: Financial centres could work together to strengthen the pipeline of high quality assets from across the green economy including priority segments such as SMEs. With the Paris Agreement now in force, for example, the focus will shift to how the Nationally Determined Contributions (NDCs) that set out each country's goals can be turned into clear investment pipelines. These 'capital raising plans'¹²⁴ could help to make the bridge between high-level national targets and regional investment needs, as well as the technical details of how money actually flows across banking, capital markets, insurance and investment.

- **Place-based Finance:** A particular focus could be placed on strengthening green asset pipelines within urban areas and the host cities of financial centres, such as buildings and real estate, energy, transport, water and waste, thus reinforcing the environmental dynamics at regional level. Real estate and infrastructure investors, such as Hermes, have recognized that the way to future-proof buildings that they invest in is to make sure they are located within a sustainable, socially inclusive environment. Experience has shown that it is not the individual building itself that is important, but the broader amenity value associated with its location in terms of the accessibility to infrastructure and public realm.¹²⁵ This is what could be called place-based green finance, understanding the overall package of sustainability factors linked to real estate and infrastructure investment.

c. Collaborate on developing sustainable financial markets: Financial centres could collaborate on the development of key financial markets. These would include green bonds, green loans, equities (including sustainable infrastructure investment trusts), digital finance (such as crowdfunding), as well as product labelling initiatives. The key here would be to focus on sharing information at an early stage so that the market as a whole can expand. For example:

- **Green loans:** Building on the success of green bonds, a next step is to go 'upstream' and identify loans on bank balance sheets that are consistent with established green and sustainable finance standards. Known as tagging, this could start with mortgage finance and apply energy performance labels for buildings that now exist in 20 countries (including the EU as one unit).¹²⁶ This is important as energy efficiency finance is not a separate asset class and is often hidden within existing taxonomies. Identifying these hidden opportunities requires better improve identification and tagging of investments. Here, the G20's energy efficiency finance toolkit provides a starting point.¹²⁷

- ⊙ **Sustainability labelling of financial products:** In addition to the new government-backed labels for investment products introduced in France, a number of other countries are introducing voluntary labelling schemes (including the Luxembourg-based LuxFlag labels for ESG, climate and microfinance¹²⁸). Achieving common standards for these labels could be hard to achieve, but sharing experience on underlying principles would be useful to avoid market confusion.

It would be important for a new network to complement and add value on existing initiatives. One of these is the Sustainable Stock Exchanges Initiative, a peer-to-peer learning platform for exploring how exchanges – in collaboration with investors, regulators, and companies – can encourage sustainable investment and enhance corporate transparency. At the end of 2016, the SSE had 62 partner exchanges, representing 70% of global market capitalization, up from 48 at the end of 2015.¹²⁹ Stock exchanges often play the role of anchor institutions for promoting sustainability in financial centres – and a new network could usefully build on the SSE's track record, taking a broader ecosystem approach across different financial centres.

3.4 LOOKING TO THE FUTURE

Ultimately, a green and sustainable financial centre will be distinguished by the delivery of benefits across four axes:

- 1 Clients:** Financial centres are service functions – and a sustainable financial centre would deliver cost-effective, safe and secure financial services that enable their customers and clients locally and internationally to make the transition to sustainability as smoothly as possible.
- 2 Regions:** Financial centres are embedded in their locality – and through its expertise and innovation, a sustainable financial centre would help to accelerate the transition to sustainable development in their host cities and regions.
- 3 Financial institutions:** Financial centres are also places where financial institutions thrive – and a sustainable financial centre would offer domestic and international institutions the opportunity to grow and generate attractive returns by responding to the environmental imperative.
- 4 Financial Professionals:** Financial centres are also great places of human interaction – and where tens of thousands of professionals pursue their careers. A sustainable financial centre would be distinguished by the way they enabled financial professionals to achieve purpose and generate fulfilment in their careers.

This is a fresh, necessary and exciting role for the world's financial centres to pursue over the next decade.

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