The Global Green Finance Index 9

April 2022

Sustainable Futures

Beginning in March 2018, as part of its Long Finance initiative, Z/Yen published the first five editions of the Global Green Finance Index with the generous support of the MAVA Foundation. Z/Yen continues this work and is pleased to present the ninth edition of the Global Green Finance Index (GGFI 9).

Z/Yen helps organisations make better choices - our clients consider us a commercial think-tank that spots, solves, and acts. Our name combines Zen and Yen - 'a philosophical desire to succeed' - in a ratio, recognising that all decisions are trade-offs. One of Z/Yen's specialisms is the development and publication of research combining factor analysis and professional assessments.

Long Finance is a Z/Yen initiative designed to address the question ***"When would we know our financial system is working?"*** This question underlies Long Finance's goal to improve society's understanding and use of finance over the long-term. In contrast to the short-termism that defines today's economic views the Long Finance time-frame is roughly 100 years.

Within the Long Finance initiative, Z/Yen runs the **Sustainable Futures Programme**, which focuses on ways in which the financial system supports the transition to a sustainable economic model, addressing green finance and environmental, social and governance systems. Alongside the GGFI, the Sustainable Futures Programme supports the **London Accord**, a free to access collection of over 700 environmental, social and governance research reports from more than 120 financial services, NGO, academic, and policy making institutions from around the world.

The authors of this report, Mike Wardle, Simon Mills, and Professor Michael Mainelli, would like to thank Bikash Kharel, Sasha Davis, Charlotte Dawber-Ashley and the rest of the Z/Yen team for their contributions with research, modelling, and ideas. And particular thanks to Djellil Bouzidi**,** Economist and Founder Emena Advisory, for his contribution to the supplement to this report.

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Foreword

I am delighted to welcome you to the ninth edition of the Global Green Finance Index. In midst of unprecedented global events, the efforts being taken by financial institutions across the world to support the UN Sustainable Development Goals is a key area of development, and the index is an important tool to assess the collective progress made by financial centres.

Here in Busan, we are focused on becoming a green smart city. Thanks to the government's designation of Busan as a regulation-free zone, we are leading the charge in researching and developing ammonia fuel as a cleaner alternative to marine fuels. We are also experimenting with the Eco Delta Smart City, collecting data from participating households on their usage of smart home systems and sustainable energy (primarily solar and hydropower) to inform future smart cities.

These efforts are in line with central government policies such as the Korean Green New Deal, a national transformation strategy to move towards a net-zero society. Of relevance to port cities like Busan, Korea plans to promote Emission Control Areas (ECA) under the 1st Comprehensive Plan for Port Air Quality, which aims to reduce air pollutants by reducing ship-driven air pollutants, establishing eco-friendly ports, and creating safe living conditions. In addition, the Green Ship-K Promotion Strategy aims to develop emission-free technology to reduce GHG emissions by up to 70% by 2030, and converting 15% of Korea-flagged ships into greener ships.

Public financial enterprises and private financial firms headquartered in Busan including Korea Housing Finance Corporation, Korea Ocean Business Corporation, and BNK Busan Bank are also working towards ESG initiatives, such as the issuance of ESG bonds.

I am very pleased that Busan's progress has been recognised in GGFI 9 as we rise six places to the 22nd position in the world. We will continue to develop and enhance our green finance opportunities as we address the challenges faced by Asia and the world.

Dr Jong Hwa Kim
President
Busan Finance Center

Summary

Overview

This is the ninth edition of the Global Green Finance Index (GGFI 9). The GGFI is a factor assessment index, based on a range of instrumental factors - quantitative measures - and a worldwide survey of finance professionals' assessments on the quality and depth of green finance offerings in financial centres.

As ESG analytics and other aspects of green finance penetrate mainstream financial activity, there is growing confidence in the development of green finance across all regions.

Western European centres take seven of the top 10 places, with US centres taking the other three places. Six Asia/Pacific centres feature in the top 20, with Sydney moving into a leading position in the region. While Western European centres continue to lead the way, the results for US and Asia/Pacific centres continue to show that the challenge to Western European dominance is intense.

Policy & Regulatory Frameworks continue to be identified as the leading driver in the development of green finance, underlining the reliance of green finance on robust and stable policy frameworks, which require government and regulatory action. Other leading drivers were focused on Public Awareness, Risk Management Frameworks, and Academic Research around climate change. Green Bonds are again identified as the most interesting area of green finance and ESG Analytics retains its strong position, along with Sustainable Infrastructure Finance.

The invasion of Ukraine by the Russian Federation will have a major impact on the world economy and we expect the position of Moscow as a financial centre to be severely affected. In addition, the economic shock that will arise from the war, and the energy insecurity that has already been seen, will slow down the transition away from fossil fuels in the short-term, although it may lead to increased investment in renewable energy over the longer-term.

In the supplement to this edition of the GGFI, we focus on the issuance of the first Sovereign Sustainability–Linked Bond by the Republic of Chile, and the implications of this new product for both the sovereign bond and green bond markets. The concept of policy performance bonds was developed by Z/Yen in 2005 and they have been used in the corporate world in recent years. This is the first example of a sovereign policy performance bond.

Index Results

- London and Amsterdam maintained their first and second positions in GGFI 9, both improving their rating by more than 10 points.
- London may have benefitted from both recent UK government action on green finance, including the issue of the first UK sovereign green bond, and from its position as host of COP 26.
- New York moved into the top 10, taking fifth place.
- The margins separating centres at the top of the index have broadened in GGFI 9. Among the top 10 centres the spread of ratings is 45 out of 1,000, compared to 31 out of 1,000 in GGFI 8.
- We researched 126 financial centres for GGFI 9. The number of centres in the index has increased to 81 (80 in GGFI 8), with the addition of Santiago.

Western Europe

- Seven Western European centres feature in the top 10 in GGFI 9, and all but one of these leading centres in the region maintained or improved their rating.
- Madrid gained 15 rank places, while Berlin and Vienna fell more than 10 places.

North America

- San Francisco maintained its third place in the rankings and New York has again risen notably to move into 5th place—its first time in the top 10.
- All other centres in the North American region fell in the ratings and rankings.

Asia/Pacific

- Sydney has overtaken Beijing to lead the Asia/Pacific region.
- Seoul has risen one place to take third place in the region, and six Asia/Pacific centres feature in the top 20.

Middle East & Africa

- Abu Dhabi has overtaken Dubai to move into first place in the region, with Casablanca in third place and leading in Africa.
- All but two centres in the region fell in the ratings in this edition of the GGFI.

Latin America & The Caribbean

- Mexico City has continued to improve its ratings, overtaking Sao Paulo to take first place in the Latin America & The Caribbean region.
- Only 36 points out of 1,000 separate the ratings of centres in the region.
- Santiago has entered the index for the first time.

Eastern Europe & Central Asia

- Nur-Sultan has a clear lead in the Eastern Europe & Central Asia region, with Warsaw 21 rank places behind in second place.
- The other centres in the region are close behind Warsaw.

GGFI 9

GGFI 9 was compiled using 147 instrumental factors. These quantitative measures are provided by third parties including the World Bank, The Economist Intelligence Unit, the OECD, and the United Nations. Details can be found in Appendix 5.

The instrumental factors were combined with 4,483 financial centre assessments provided by respondents to the GGFI online questionnaire. A breakdown of the 747 respondents is shown in Appendix 3. Further details of the methodology behind GGFI 9 are in Appendix 4.

The 81 centres listed in GGFI 9 are those which received a minimum of 25 assessments from survey respondents located outside of those centres. Assessments of respondents' home centres were excluded from the data, in order to avoid home centre bias.

GGFI 9 Ranks And Ratings

Table 1 | GGFI 9 Ranks And Ratings

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
London	1	586	1	571	► 0	▲ 15
Amsterdam	2	573	2	562	► 0	▲ 11
San Francisco	3	553	3	549	► 0	▲ 4
Stockholm	4	552	7	543	▲ 3	▲ 9
New York	5	551	13	537	▲ 8	▲ 14
Zurich	6	548	4	548	▼ -2	► 0
Luxembourg	7	546	5	545	▼ -2	▲ 1
Oslo	8	545	9	541	▲ 1	▲ 4
Geneva	9	543	6	544	▼ -3	▼ -1
Los Angeles	10	541	8	542	▼ -2	▼ -1
Paris	11	540	10	540	▼ -1	► 0
Copenhagen	12	539	12	538	► 0	▲ 1
Sydney	13	538	20	530	▲ 7	▲ 8
Beijing	14	537	11	539	▼ -3	▼ -2
Seoul	15	536	16	533	▲ 1	▲ 3
Singapore	16	535	16	533	► 0	▲ 2
Wellington	17	534	24	526	▲ 7	▲ 8
Shanghai	18	533	14	536	▼ -4	▼ -3
Washington DC	19	532	15	534	▼ -4	▼ -2
Helsinki	20	531	18	532	▼ -2	▼ -1
Shenzhen	21	530	28	524	▲ 7	▲ 6
Busan	22	528	28	524	▲ 6	▲ 4
Guangzhou	23	527	30	523	▲ 7	▲ 4
Melbourne	24	526	37	518	▲ 13	▲ 8
Tokyo	25	525	22	528	▼ -3	▼ -3
Munich	26	524	19	531	▼ -7	▼ -7
Boston	27	522	25	525	▼ -2	▼ -3
Brussels	28	521	23	527	▼ -5	▼ -6
Madrid	29	520	44	512	▲ 15	▲ 8
Vancouver	30	519	25	525	▼ -5	▼ -6
Montreal	31	518	25	525	▼ -6	▼ -7
Berlin	32	517	21	529	▼ -11	▼ -12
Qingdao	33	516	34	519	▲ 1	▼ -3
Frankfurt	34	514	34	519	► 0	▼ -5
Edinburgh	35	513	39	517	▲ 4	▼ -4
Osaka	36	511	32	521	▼ -4	▼ -10
Toronto	37	510	31	522	▼ -6	▼ -12
Abu Dhabi	38	509	45	511	▲ 7	▼ -2
Hong Kong	39	508	41	515	▲ 2	▼ -7
Hamburg	40	507	34	519	▼ -6	▼ -12

Table 1 (continued) | GGFI 9 Ranks And Ratings

Centre	GGFI 9		GGFI 8		Change In Rank		Change In Rating	
	Rank	Rating	Rank	Rating				
Chicago	41	506	37	518	▼	-4	▼	-12
Lisbon	42	505	43	513	▲	1	▼	-8
Dublin	43	503	50	502	▲	7	▲	1
Dubai	44	502	40	516	▼	-4	▼	-14
Rome	45	501	48	508	▲	3	▼	-7
Casablanca	46	500	42	514	▼	-4	▼	-14
Vienna	47	499	33	520	▼	-14	▼	-21
GIFT City-Gujarat	48	498	47	509	▼	-1	▼	-11
Nur-Sultan	49	497	52	498	▲	3	▼	-1
Kuala Lumpur	50	496	49	506	▼	-1	▼	-10
Glasgow	51	495	53	497	▲	2	▼	-2
Calgary	52	494	46	510	▼	-6	▼	-16
Guernsey	53	493	51	499	▼	-2	▼	-6
Milan	54	492	55	495	▲	1	▼	-3
Mauritius	55	491	58	490	▲	3	▲	1
Jakarta	56	485	59	489	▲	3	▼	-4
Jersey	57	484	60	486	▲	3	▼	-2
Tel Aviv	58	483	54	496	▼	-4	▼	-13
Bangkok	59	481	57	492	▼	-2	▼	-11
Liechtenstein	60	480	66	477	▲	6	▲	3
Doha	61	479	62	484	▲	1	▼	-5
Mexico City	62	478	68	474	▲	6	▲	4
Mumbai	63	477	56	494	▼	-7	▼	-17
Johannesburg	64	476	68	474	▲	4	▲	2
Malta	65	475	61	485	▼	-4	▼	-10
Sao Paulo	66	474	65	480	▼	-1	▼	-6
Santiago	67	473	New	New	▲	New	▲	New
Bahrain	68	472	64	482	▼	-4	▼	-10
British Virgin Islands	69	471	76	464	▲	7	▲	7
Warsaw	70	470	72	468	▲	2	▲	2
New Delhi	71	469	63	483	▼	-8	▼	-14
Cape Town	72	468	67	475	▼	-5	▼	-7
Moscow	73	467	70	472	▼	-3	▼	-5
Almaty	74	466	74	466	►	0	►	0
Rio de Janeiro	75	465	75	465	►	0	►	0
Prague	76	464	71	469	▼	-5	▼	-5
Isle of Man	77	457	78	457	▲	1	►	0
Cayman Islands	78	456	77	458	▼	-1	▼	-2
Istanbul	79	455	73	467	▼	-6	▼	-12
Nairobi	80	452	79	456	▼	-1	▼	-4
Bermuda	81	442	80	441	▼	-1	▲	1

GGFI Dimensions

The GGFI ascertains the green finance performance of international financial centres by asking practitioners to rate them on two dimensions:

- The depth to which green finance has penetrated the business of the financial centre, i.e. the prevalence of green financial services and products within the financial centre in question.
- The quality of the green finance products and services on offer.

The purpose of tracking both aspects is to enable respondents to rate a financial centre independently from its market volumes. Thus, for example, if a centre adopts weak green labelling standards in a bid to boost volumes, this may show up in the GGFI as a lower quality rating.

The additional data generated through this approach increases granularity, allows the identification of trends, and can assist policy makers to track the impacts of their decisions.

The detailed ratings of the dimensions for the top 15 centres are shown in table 2. Additional details are in Appendix 1.

Table 2 | Top 15 Centres - Rating Details For Depth And Quality Dimensions

GGFI 9 Rank	Centre	GGFI Dimensions			
		Green Finance Depth		Green Finance Quality	
		Rank	Rating	Rank	Rating
1	London	1	289	1	297
2	Amsterdam	2	284	2	289
3	San Francisco	3	277	6	276
4	Stockholm	5	274	4	278
5	New York	4	275	6	276
6	Zurich	8	269	3	279
7	Luxembourg	7	272	9	274
8	Oslo	5	274	15	271
9	Geneva	8	269	9	274
10	Los Angeles	13	267	9	274
11	Paris	8	269	15	271
12	Copenhagen	16	265	9	274
13	Sydney	27	260	4	278
14	Beijing	22	261	6	276
15	Seoul	11	268	18	268

Chart 1 shows the relationship between ratings of the depth and quality dimensions in the index and the generally close correlation between the assessments of each factor by respondents. Centres close to the trend line are balanced for depth and quality, centres further away have either a better rating for depth, or for quality. The relative score of Bahrain for green finance quality is highest compared with its score in depth. On the other side of the line, Osaka has the highest relative score for depth.

Chart 1 | Relationship Between Ratings Of Depth And Quality

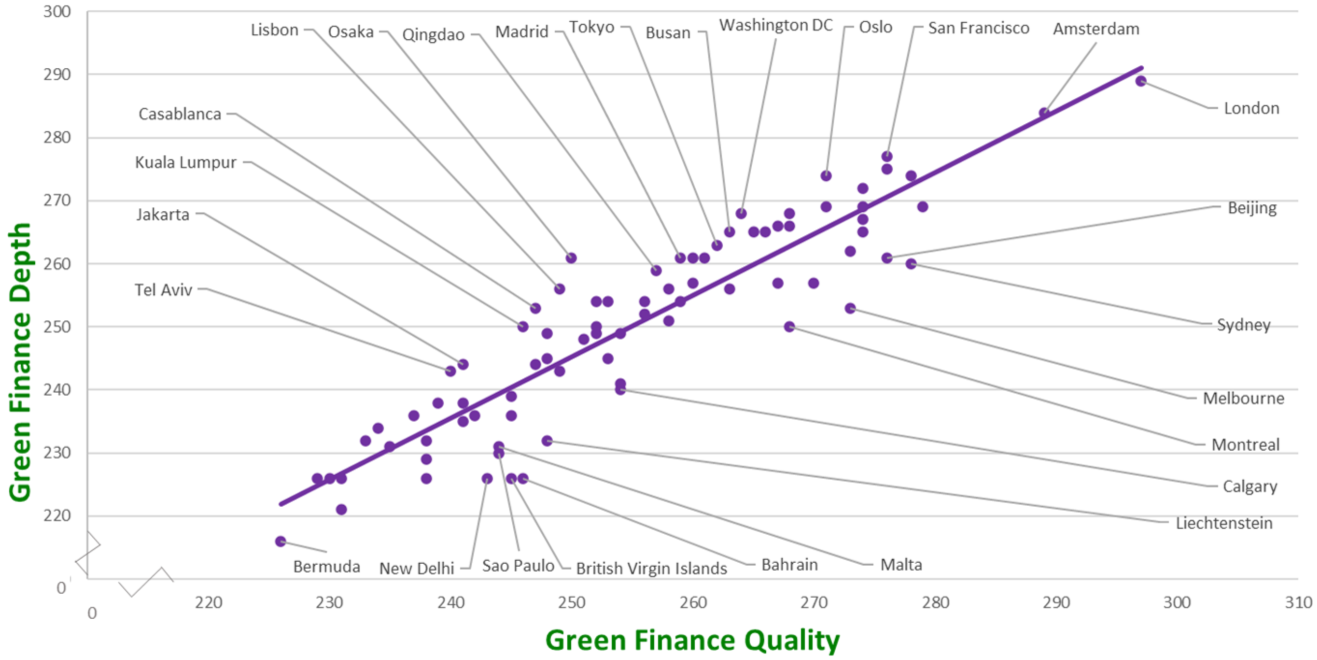
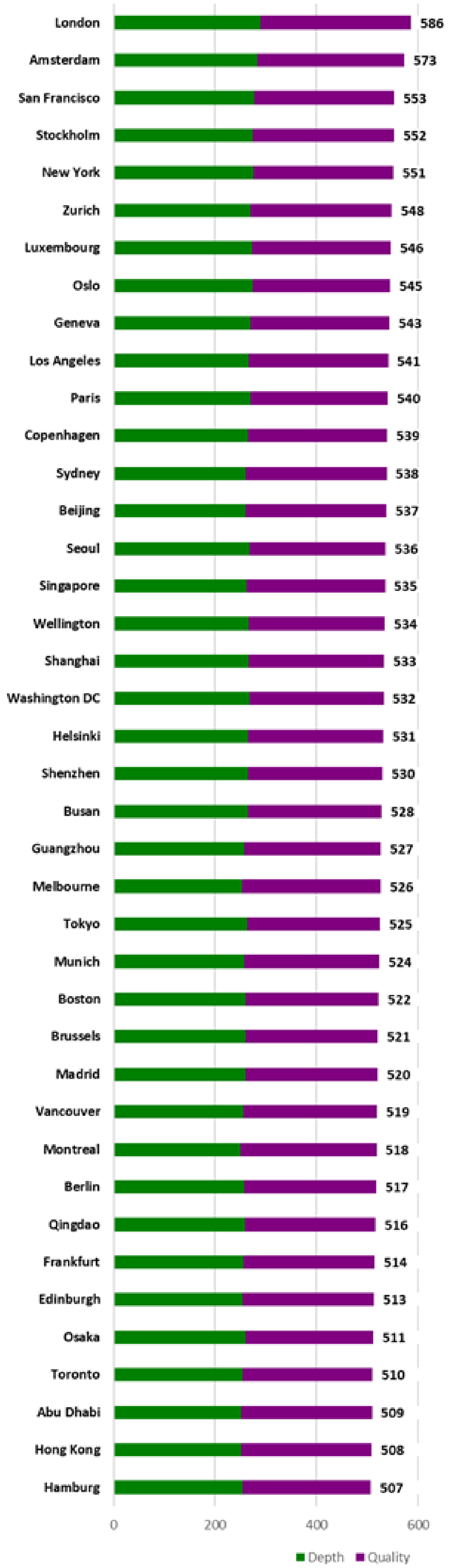


Chart 2 shows the contribution of each of the dimensions to the overall rating for the top 40 centres in the GGFI. London came first for both quality and depth, with Amsterdam second. Successful financial centres focused on green finance need both quality and depth in their green markets to thrive.

"The regulatory environment is key for the improvement of green finance, including mandatory disclosure, a clear taxonomy of green activities, and science-based targets in line with the Paris accord."

Consultant, Green Energy Financing Company, Bratislava

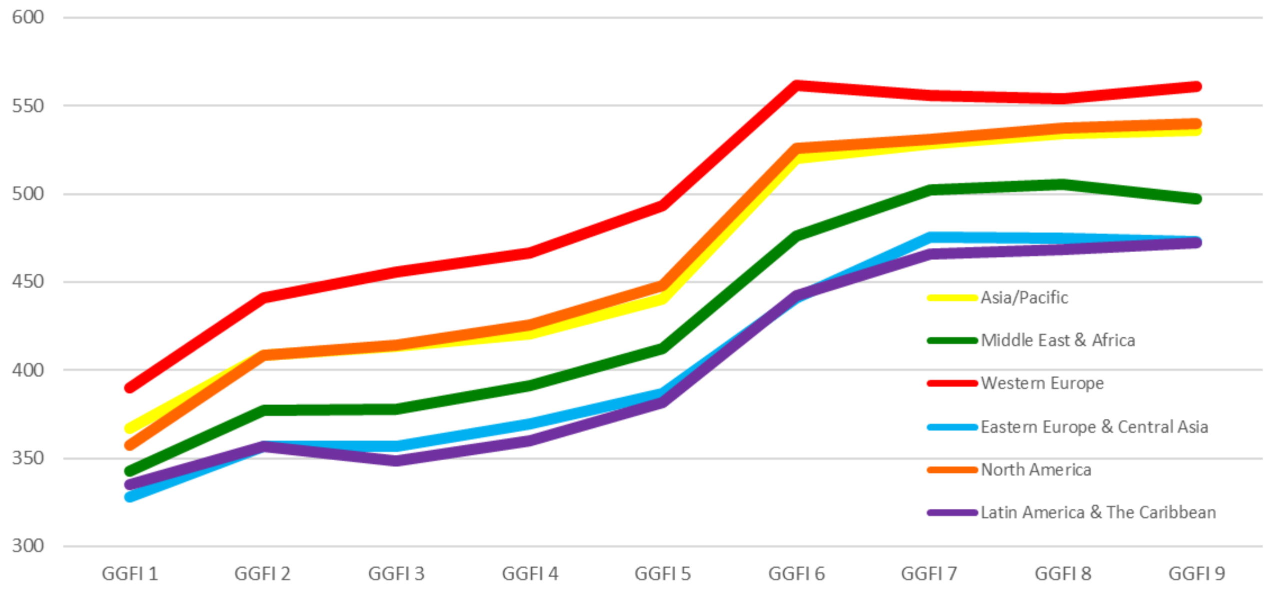
Chart 2 | The Contribution Of The Dimensions To The Overall Rating - GGFI 9 Top 40 Centres



Regional Performance

Reversing a recent trend, the average rating of the top five Western European centres improved slightly. The leading North American centres just maintained their lead over the Asia/Pacific region and, as other regions fell on this measure, the leading centres in Latin America & The Caribbean improved their position.

Chart 3 | Average Ratings Of The Top Five Centres In Each Region



Examination of the quality and depth dimensions demonstrates that while Western Europe is maintaining both the depth and quality of its green finance offering, leading centres in Asia/Pacific and North America have narrowed the gap over time.

Chart 4 | Average Ratings For Depth Of The Top Five Centres In Each Region

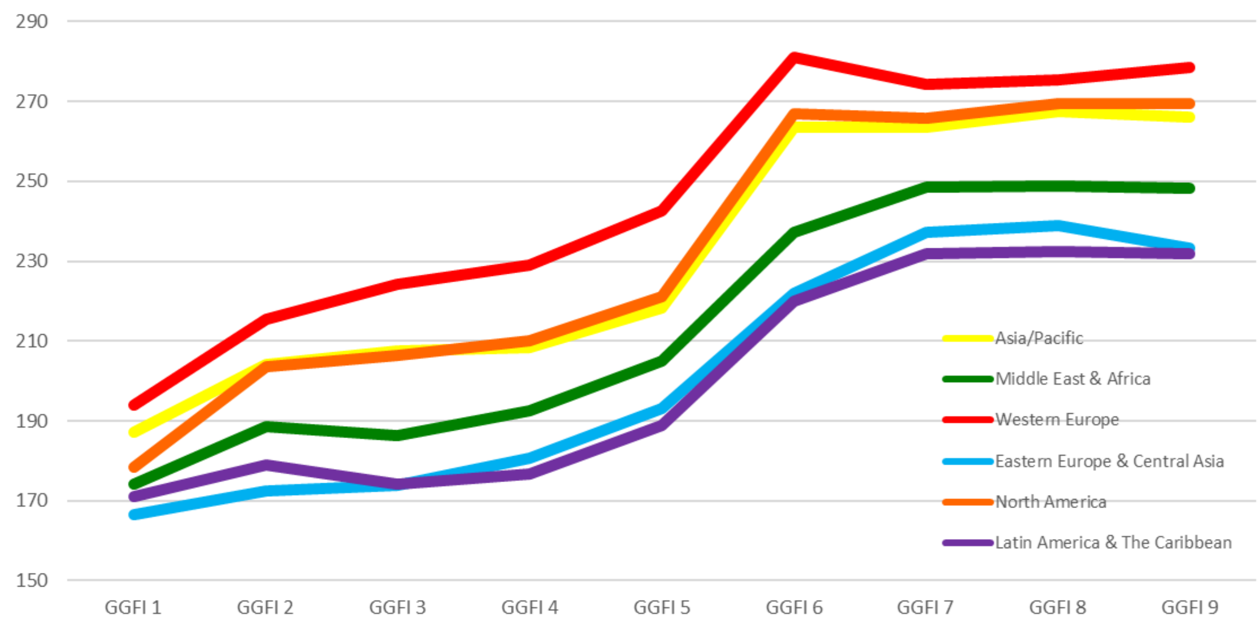
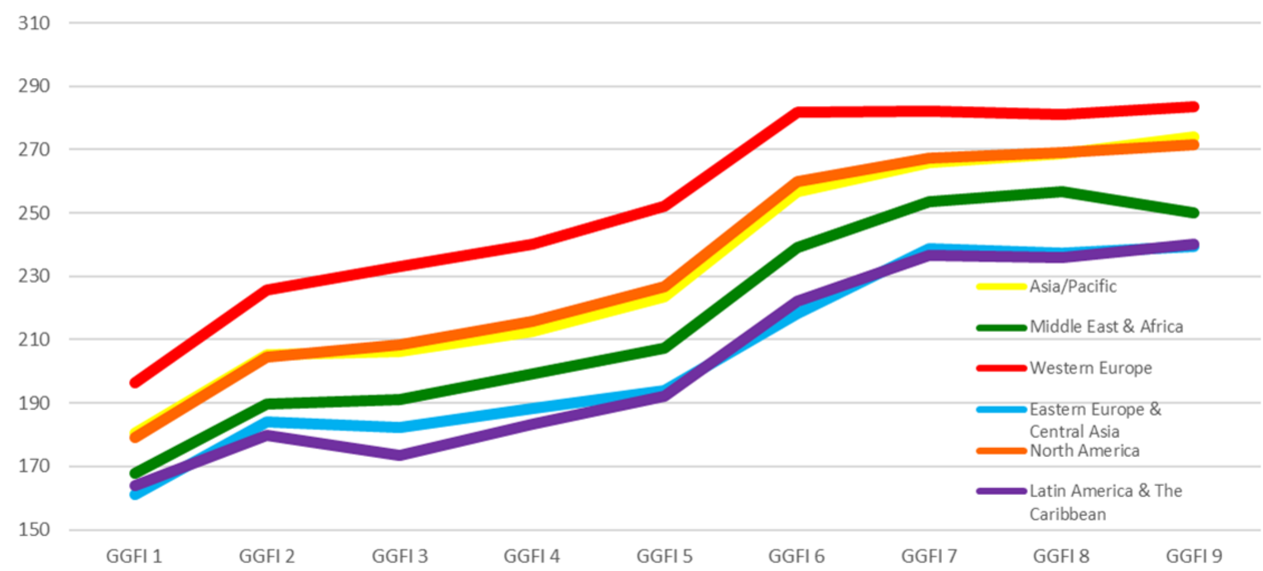


Chart 5 | Average Ratings For Quality Of The Top Five Centres In Each Region



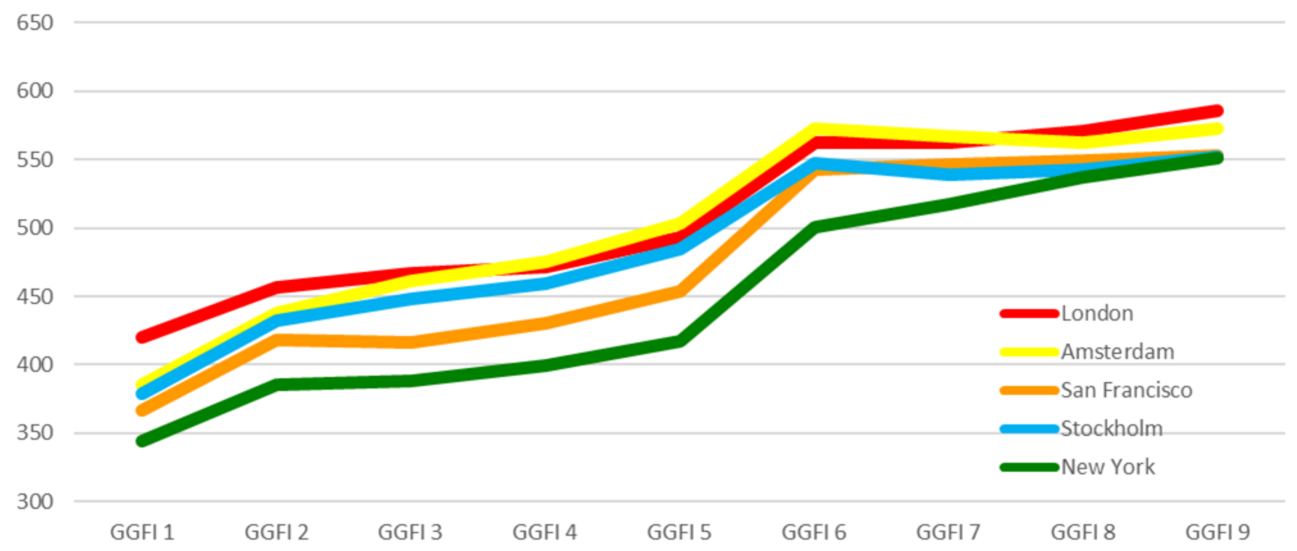
"The EU is definitely on the forefront but a) it will take time to get traction, b) international coordination is key (as investors are investing globally), and c) it must not create an unproductive informational overkill"."

Head of Competence, Center For Sustainable Investments, Banking, Zurich

Top Five Centres

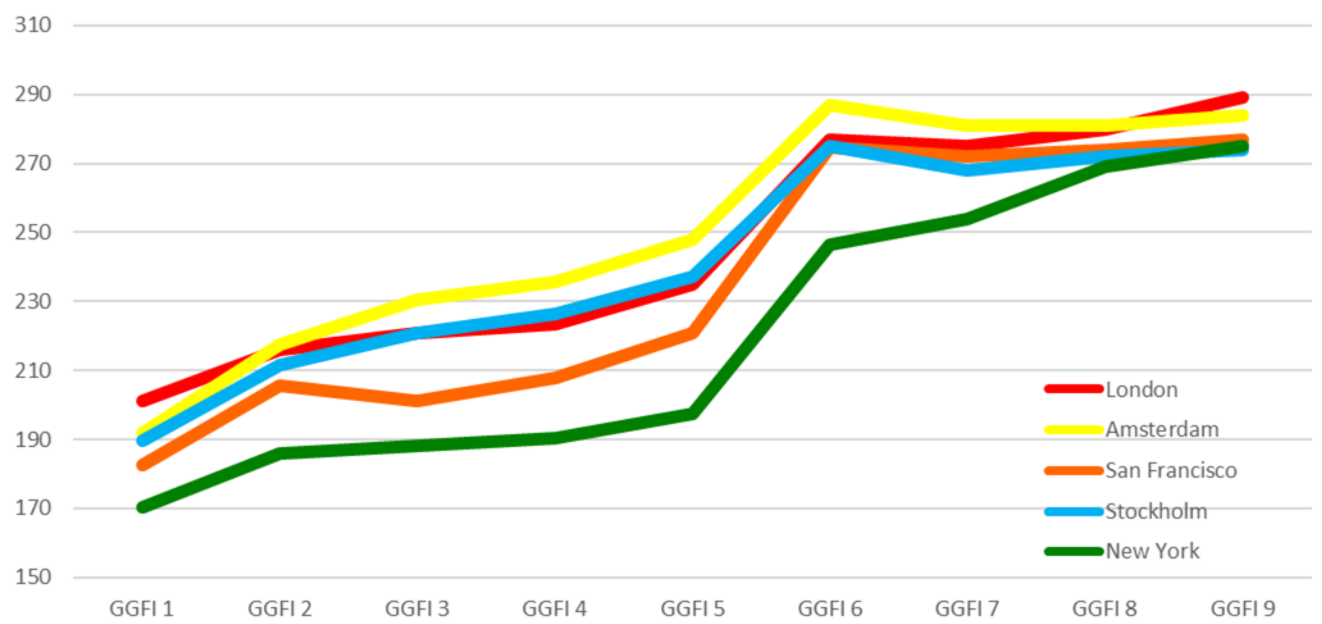
The top five centres in the index illustrated mixed fortunes. London and Amsterdam continued to improve their ratings, and New York performed strongly to enter the top five. San Francisco and Stockholm improved only slightly in the ratings.

Chart 6 | The Top Five Centres Over Time



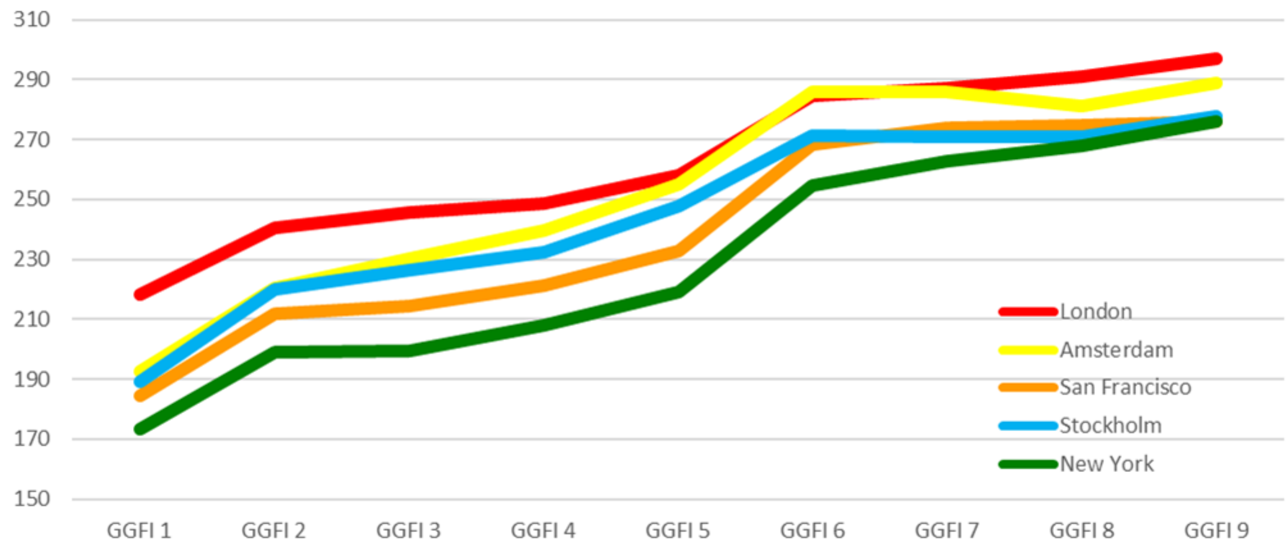
When the depth dimension is examined, the leading centres all maintained or improved their ratings.

Chart 7 | Ratings For The Depth Dimension In The Top Five Centres Over Time



On the quality measure, again, the leading centres generally improved their position, although San Francisco's rating was stable.

Chart 8 | Ratings For The Quality Dimension In The Top Five Centres Over Time



Leading Financial Centres

It is notable that some leading financial centres perform less well than expected in the GGFI, considering their performance in the Global Financial Centres Index (GFCI), which has been measuring financial centre competitiveness since 2007.

We can compare the centres which rank in the top 20 in the GFCI with their performance in the GGFI. This shows some disconnection between the highest performing centres in the GFCI and performance on green finance in the GGFI. In total, 12 centres feature in the top 20 in both measures with London, New York, San Francisco, and Los Angeles, featuring in the top 10 in both indices.

Table 3 | Leading Financial Centres - Comparison of GGFI And GFCI Rankings

Centre	Global Green Finance Index 9	Green Finance Depth	Green Finance Quality	Financial Centre Competitiveness
New York	5	4	6	1
London	1	1	1	2
Hong Kong	39	41	37	3
Shanghai	18	14	21	4
Los Angeles	10	13	9	5
Singapore	16	21	13	6
San Francisco	3	3	6	7
Beijing	14	22	6	8
Tokyo	25	20	28	9
Shenzhen	21	16	24	10
Paris	11	8	15	11
Seoul	15	11	18	12
Chicago	41	35	44	13
Boston	27	22	29	14
Washington DC	19	11	25	15
Frankfurt	34	32	34	16
Dubai	44	43	44	17
Madrid	29	22	32	18
Amsterdam	2	2	2	19
Zurich	6	8	3	20
Source	GGFI 9 Rank	GGFI 9 Depth Rank	GGFI 9 Quality Rank	GFCI 31 Rank

“The whole sector faces a major problem in terms of greenwashing - a large gap between what the industry offers and the asset owner requires. A key example is the current emphasis on climate change rather than the broader issue of biodiversity, or on positive change funds which are merely focused tech funds rather than green or ethical finance.”

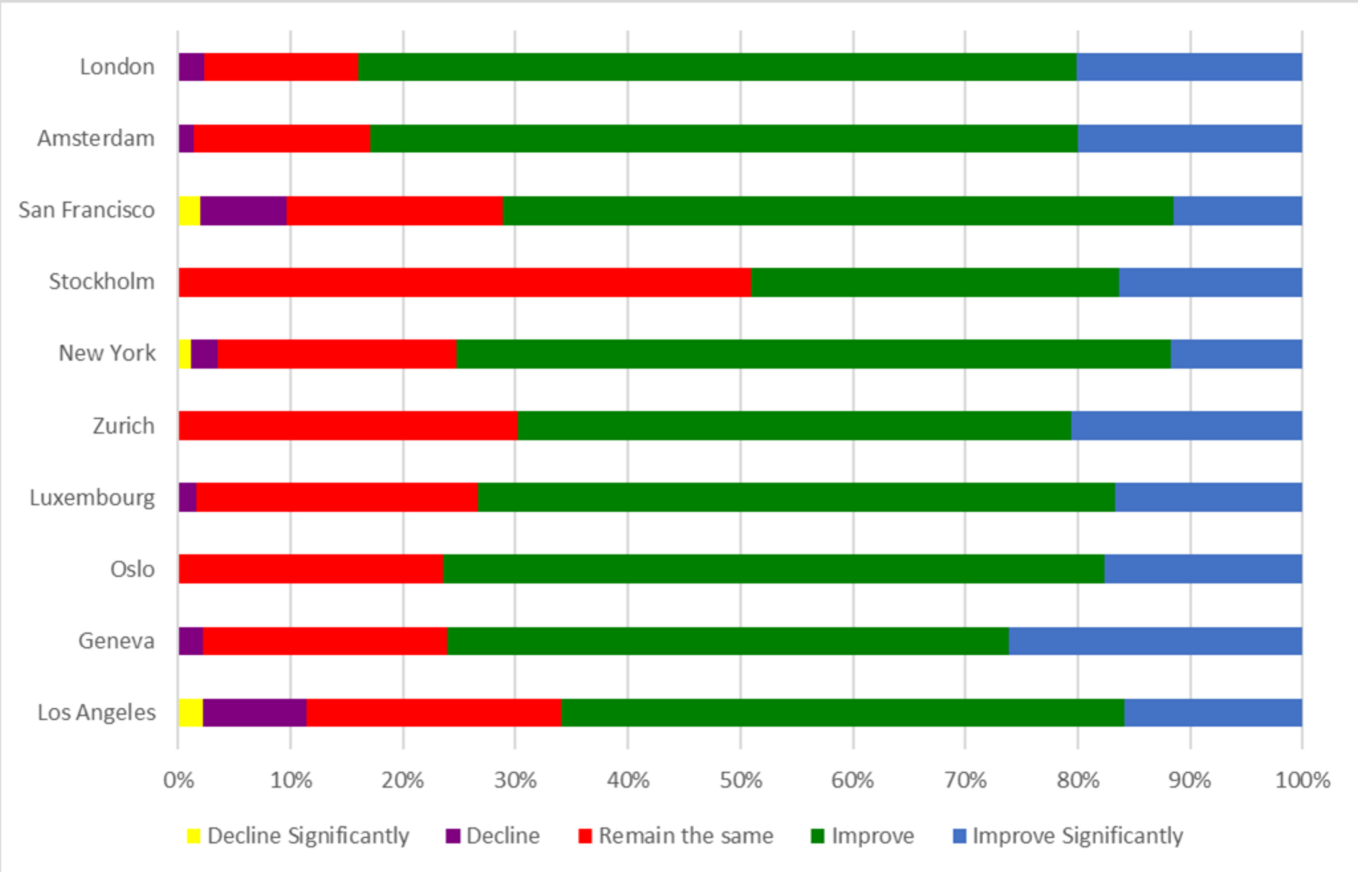
Consultant, Investment Business, Edinburgh

GGFI 9 Further Analysis

Expected Change In Centres

We asked respondents whether the centres they rated would improve, decline, or stay the same in relation to their green finance offering over the next two to three years. The results for the top 10 centres are displayed in Chart 9, showing high levels of confidence, with all centres in this group except Stockholm projected to improve by a majority of respondents, and with very high levels of confidence in London and Amsterdam.

Chart 9 | Top 10 Centres - Expected Change In Green Finance Offering



"Clusters are the only way to encourage the establishment of a green finance sector. The entire eco-system needs to be in place including higher level educational institutions."

Partner, Accountancy Services, Vancouver

Instrumental Factors

The GGFI is a factor assessment index, based on a worldwide survey of finance professionals' assessments on the quality and depth of green finance offerings in financial centres, These assessments are run through a statistical model which uses 147 instrumental factors which relate to a range of aspects of financial centre competitiveness. These include measures of sustainability, the business environment, infrastructure, and human capital.

Table 4 shows the top 15 instrumental factors' correlation with the GGFI ranking. The correlation with the Global Financial Centres Index reinforces that leading financial centres continue to improve their green finance offering. Other factors with the highest correlation tend to be composite indices that reflect a city's functionality. Such metrics capture the local environment in which financial sector workers are operating, and give a picture of the alignment of social and economic policies with the inclusive and green economic outcomes which are prioritised in the UN's Sustainable Development Goals.

Table 4 | Top 15 Instrumental Factors By R-Squared Correlation

Instrumental Factor	R-Squared
The Global Financial Centres Index	0.689
Urban Mobility Readiness Index	0.670
OECD Country Risk Classification	0.648
IESE Cities In Motion Index	0.598
Global Innovation Index	0.584
Safe Cities Index	0.532
Smart City Index	0.491
Sustainable Cities Index	0.478
Networked Society Index	0.477
World Competitiveness Scoreboard	0.475
Cost Of Living City Rankings	0.474
Best Countries For Business	0.463
Adjusted Net National Income Per Capita	0.460
Logistics Performance Index	0.443
Legatum Prosperity Index	0.442

"The Chinese market is committed to the development of green finance in the medium term through the introduction of mandatory green financing."

Chairman, Investment Banking Advisors, Shanghai

Focusing only on the instrumental factors which relate to sustainability, the factors most closely correlated in terms of their R-Squared relationship with the GGFI rankings are set out in Table 5. The leading factors focus on cities as sustainable places and on the development of the green economy.

Table 5 | Top 15 Sustainability Instrumental Factors By R-Squared Correlation

Sustainability Factors	R-Squared
Urban Mobility Readiness Index	0.670
IESE Cities In Motion Index	0.598
Sustainable Cities Index	0.478
Sustainable Economic Development	0.407
Quality of Living City Rankings	0.391
Energy Transition Index	0.316
World Energy Trilemma Index	0.316
Environmental Performance	0.294
Financial Centre Corporate Sustainability Performance	0.279
The Global Green Economy Index	0.265
Global Sustainable Competitiveness Index	0.235
Pollution Index	0.214
Buildings Energy Efficiency Policies Database (Y/N)	0.160
Quality Of Life Index	0.131
Labelled Green Bonds Issued By Country Of Issuer	0.117

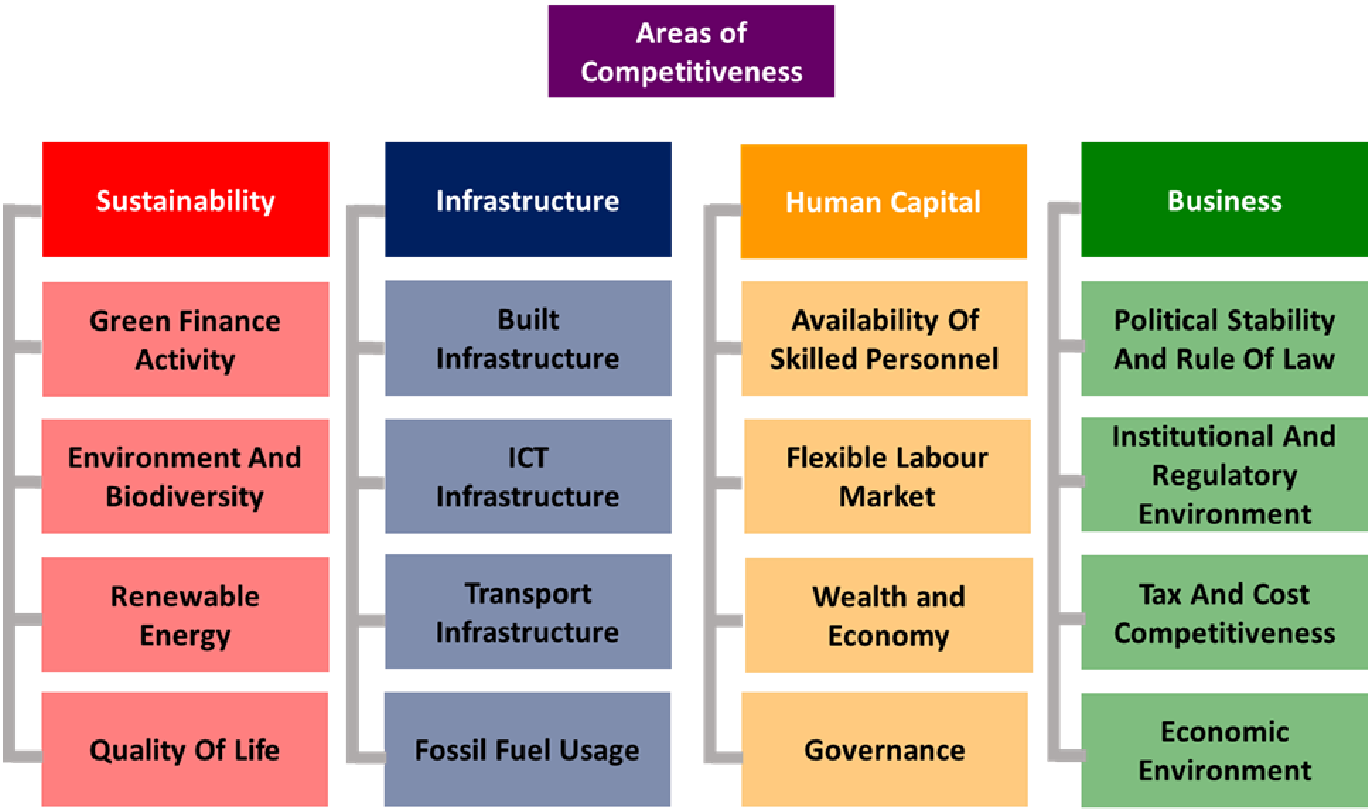
Areas Of Competitiveness

The instrumental factors used in the GGFI model are grouped into four broad areas:

- Sustainability
- Infrastructure
- Human Capital
- Business

These areas, and the instrumental factor themes which comprise each area, are shown in Chart 10.

Chart 10 | GGFI Areas Of Competitiveness



To assess how financial centres' green finance offerings perform against each of these areas, the GGFI statistical model is run for each area of competitiveness separately, allowing a picture to be built of centres' strengths and weaknesses. The performance of the top ranked 15 centres in each of these areas is illustrated in table 6.

The leading centres in the GGFI have strengths across all four areas of competitiveness. Some centres are strong in a particular areas, for example, Seoul in the infrastructure area.

Table 6 | Top 15 Centres By Area Of Competitiveness

Rank	Sustainability	Business	Human Capital	Infrastructure
1	London	London	London	London
2	Amsterdam	Amsterdam	Amsterdam	Seoul
3	New York	Stockholm	Stockholm	New York
4	Helsinki	Copenhagen	Sydney	Amsterdam
5	Zurich	New York	New York	Washington DC
6	Stockholm	Zurich	Luxembourg	Copenhagen
7	Oslo	San Francisco	Geneva	Los Angeles
8	Luxembourg	Los Angeles	Copenhagen	San Francisco
9	Paris	Geneva	Zurich	Stockholm
10	San Francisco	Sydney	Seoul	Frankfurt
11	Washington DC	Seoul	Oslo	Munich
12	Boston	Wellington	San Francisco	Paris
13	Geneva	Luxembourg	Boston	Tokyo
14	Singapore	Washington DC	Los Angeles	Sydney
15	Los Angeles	Beijing	Shenzhen	Helsinki

Index Ranking For Sustainability

We can compare the overall index ranking with the ranking based on the sustainability area of competitiveness, using only the instrumental factors that have a direct relationship to sustainability. This analysis produces slightly different results to the main index, as shown in the comparison in Table 7. The plus and minus figures show the difference between the main index and the index calculated using only sustainability factors.

Where only sustainability factors are included in the analysis, London and Amsterdam retain their positions. Helsinki, Washington DC, and Boston gain significantly while Copenhagen, Sydney, Beijing, and Seoul drop out of the top 15.

Table 7 | Top 15 Centres Using All Factors And Only Sustainability Factors

Rank	All Factors	Sustainability Factors
1	London	London
2	Amsterdam	Amsterdam
3	San Francisco	New York (+2)
4	Stockholm	Helsinki (+16)
5	New York	Zurich (+1)
6	Zurich	Stockholm (-2)
7	Luxembourg	Oslo (+1)
8	Oslo	Luxembourg (-1)
9	Geneva	Paris (+2)
10	Los Angeles	San Francisco (-7)
11	Paris	Washington DC (+8)
12	Copenhagen	Boston (+15)
13	Sydney	Geneva (-4)
14	Beijing	Singapore (+2)
15	Seoul	Los Angeles (-5)

"Regulation should incentivise the right corporate and institutional behaviours, as change is required more quickly than the free market might bring about by itself. Incentives accelerate change and can also help to make them sustainable"

Executive Director, Sustainable Development, Investment Bank, Edinburgh

Commentary On Factors

The GGFI survey asks respondents to comment on factors that affect the uptake of green finance, and in particular on regulation, taxation, and the availability of skills. The responses are summarised in Table 8.

Table 8 | Commentary On Areas Of Competitiveness

Area Of Competitiveness	Number Of Mentions	Main Themes
Regulatory Environment	84	• Disclosure remains important, with full disclosure of climate risk seen as useful. • Regulation should be balanced with market forces to create an environment where green finance can flourish.
The Availability Of Skills In Green Finance	82	• There continues to be a skills gap, with the need both for initial training and re-skilling the existing workforce. • Initiatives such as the Green Finance Institute in London, the Sustainable Finance Skillnet in Dublin and the AIFC Green Finance Centre in Nur-Sultan are making a difference.
Taxation	74	• Several respondents suggested that there is a need to increase taxation on pollution, and carbon use, while providing tax incentives for green finance.
Other	18	• Political risk continues to be identified as a significant drag on the growth of green finance. • Measurement is crucial, with consistent, internationally - recognised metrics.

We also asked respondents to identify interesting initiatives in green finance. These included:

- Energy attribute certificates (EACs) or renewable energy certificates.
- Opening Public Sector Pensions to Impact & ESG investing.
- Online green marketplaces and green credits in retail markets.
- Friends of the Earth (Hong Kong) Green Finance Roadmap and Collaboration.
- Guernsey Reinsurers required to have ESG embedded within regulatory approval.
- Climate Accounting.
- Loan guarantees for green initiatives backed by government agencies.
- SAM Corporate Sustainability Assessment.
- Central bank and international institutional stress testing.
- Linking carbon to trade.

Connectivity

One factor where financial centres' green finance performance differs is the extent to which centres are connected to other financial centres. One way of measuring this connectivity is to look at the number of assessments given to and received from other centres in the GGFI survey. Charts 11 and 12 use Shanghai and Melbourne as examples to contrast the different levels of connectivity that the two centres enjoy. In this example, both cities are seen to be well-connected, but Shanghai has a wider spread of connections across all regions of the world. Melbourne is also well-connected, but with more of a focus on Asia/Pacific and North America.

You can explore the connectivity data using our online tool at https://www.longfinance.net/programmes/financial-centre-futures/global-green-finance-index/ggfi9-explore-data/ggfi-9-connectivity-chart/.

Chart 11 | GGFI 9 Connectivity - Shanghai

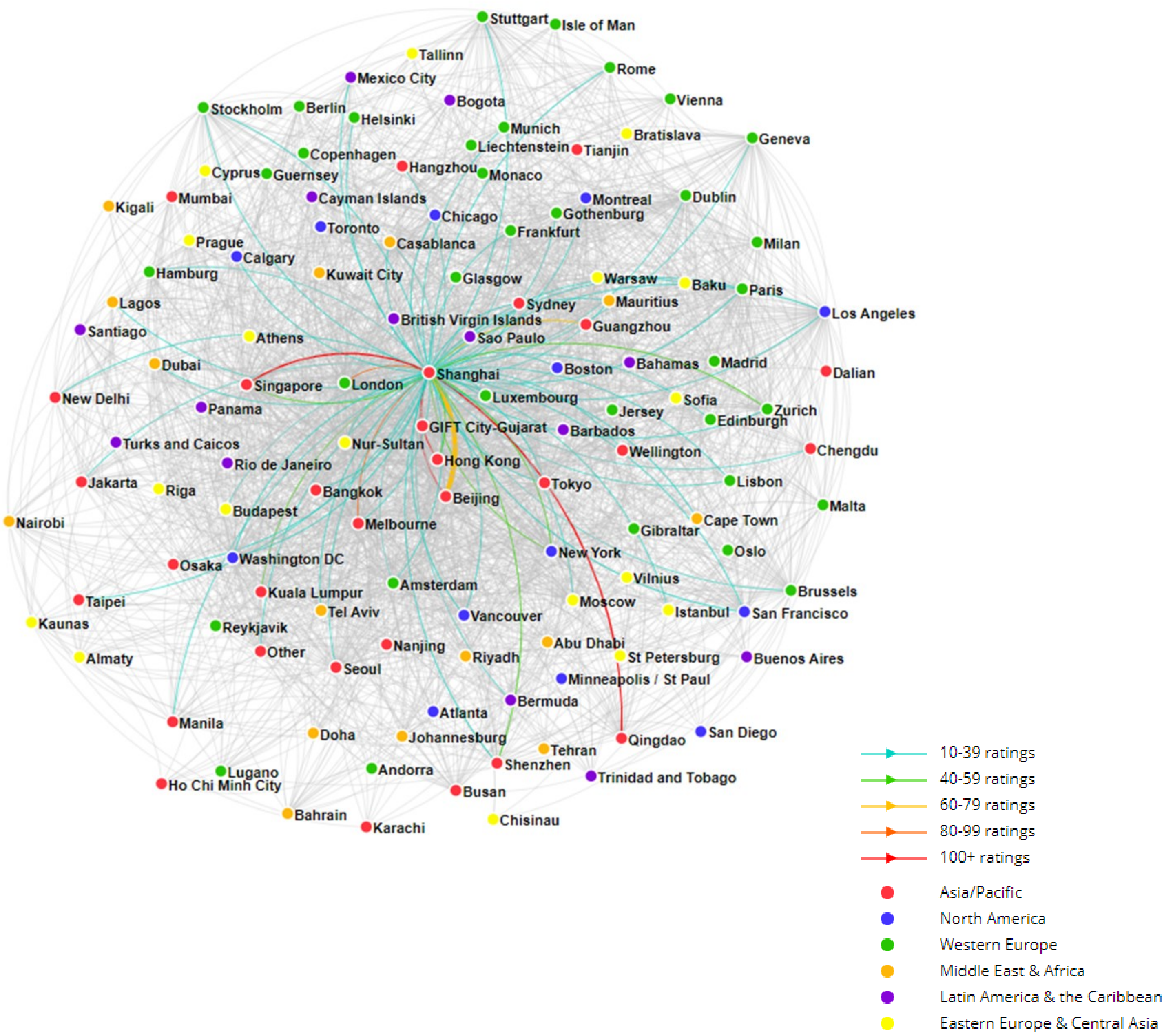
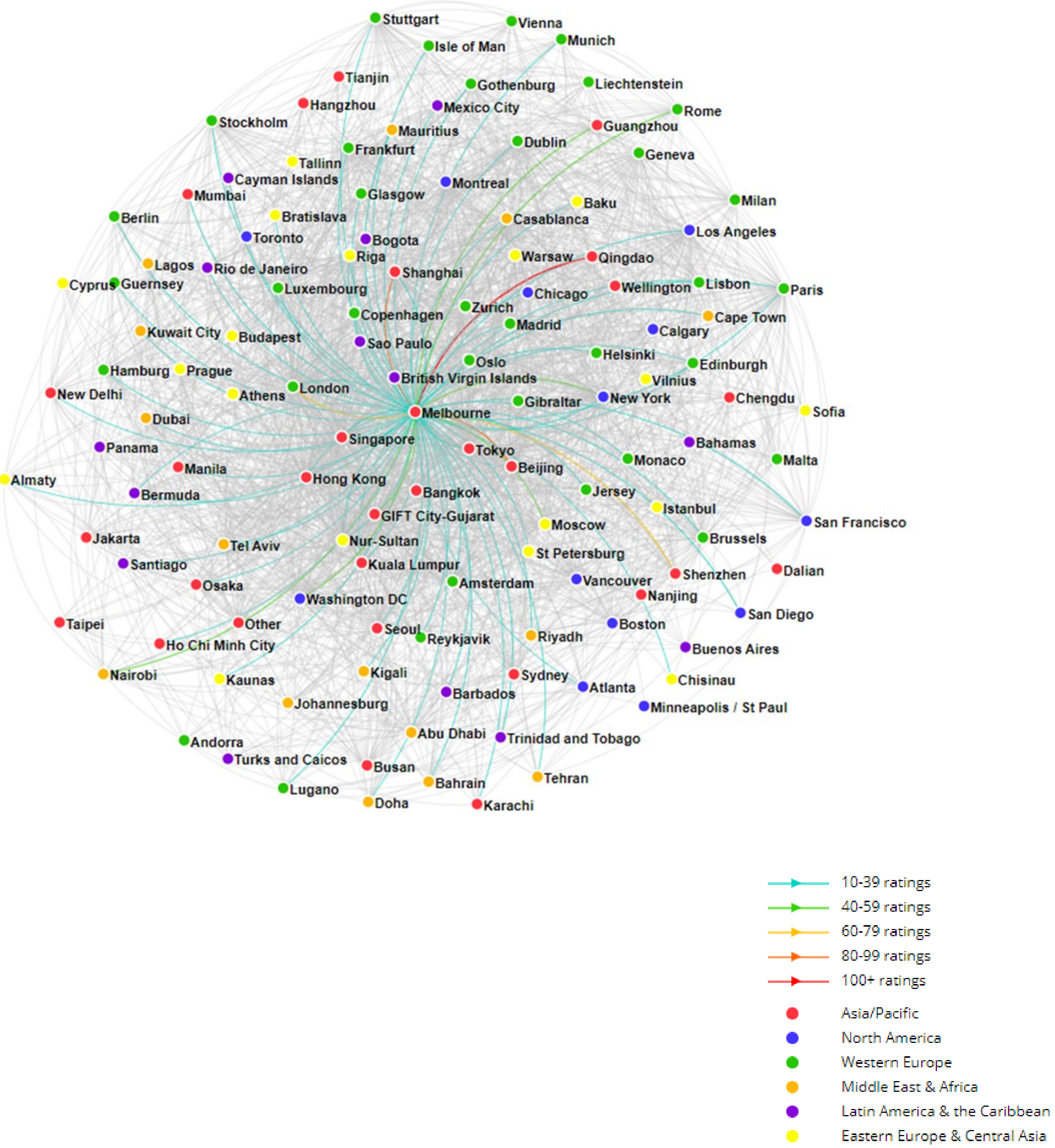


Chart 12 | GGFI 9 Connectivity - Melbourne

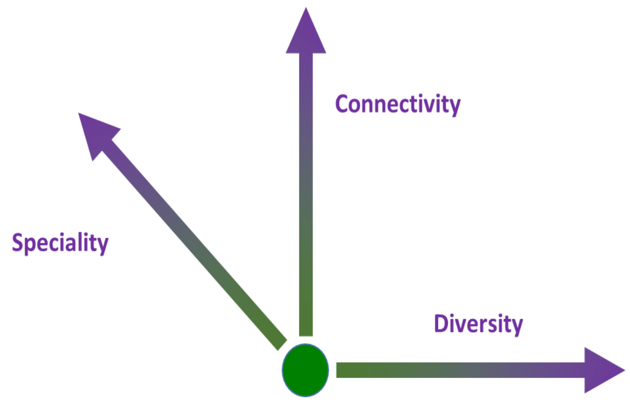


Financial Centre Profiles

We conduct further analyses based on three measures (axes) that determine a financial centre's profile in relation to three different dimensions.

'Connectivity' – the extent to which a centre is well known among GGFI survey respondents, based on the number of 'inbound' assessment locations (the number of locations from which a particular centre receives assessments) and 'outbound' assessment locations (the number of other centres assessed by respondents from a particular centre).

Chart 13 | GGFI Dimensions



'Diversity'– the instrumental factors used in the GGFI model give an indication of a broad range of factors that influence the richness and evenness of factors that characterise any particular financial centre.

We consider this span of factors to be measurable in a similar way to that of the natural environment. We therefore use a combination of biodiversity indices (calculated on the instrumental factors) to assess a centre's diversity. This takes account of the range of factors against which the centre has been assessed – the 'richness' of the centre's business environment; and the 'evenness' of the distribution of that centre's scores. A high score means that a centre is well diversified; a low diversity score reflects a less rich business environment.

'Speciality' – the depth within a financial centre of green finance and sustainability. A centre's 'speciality' or performance is calculated from the difference between the overall GGFI rating and the ratings when the model is calculated based only on sustainability factors.

In Table 9, 'Diversity' (Breadth) and 'Speciality' (Depth) are combined on one axis to create a two dimensional table of financial centre profiles. The 81 centres in GGFI 9 are assigned a profile on the basis of a set of rules for the three measures: how well connected a centre is, how broad its services are, and how specialised it is.

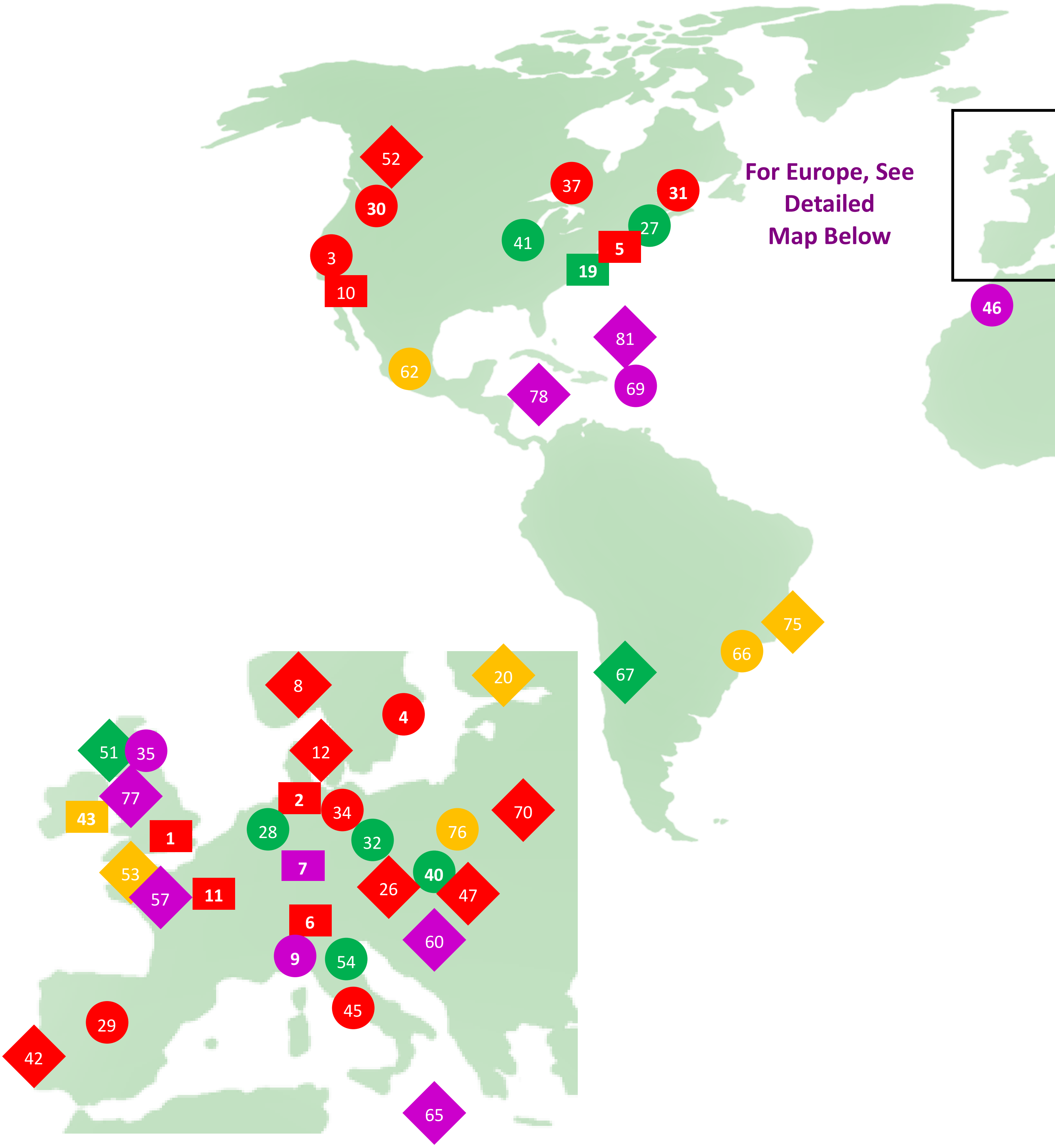
The Global Leaders (in the top left of the table) have both broad and deep green finance activity and are connected with a greater range of other financial centres. Other leading centres are profiled as Established International Centres.

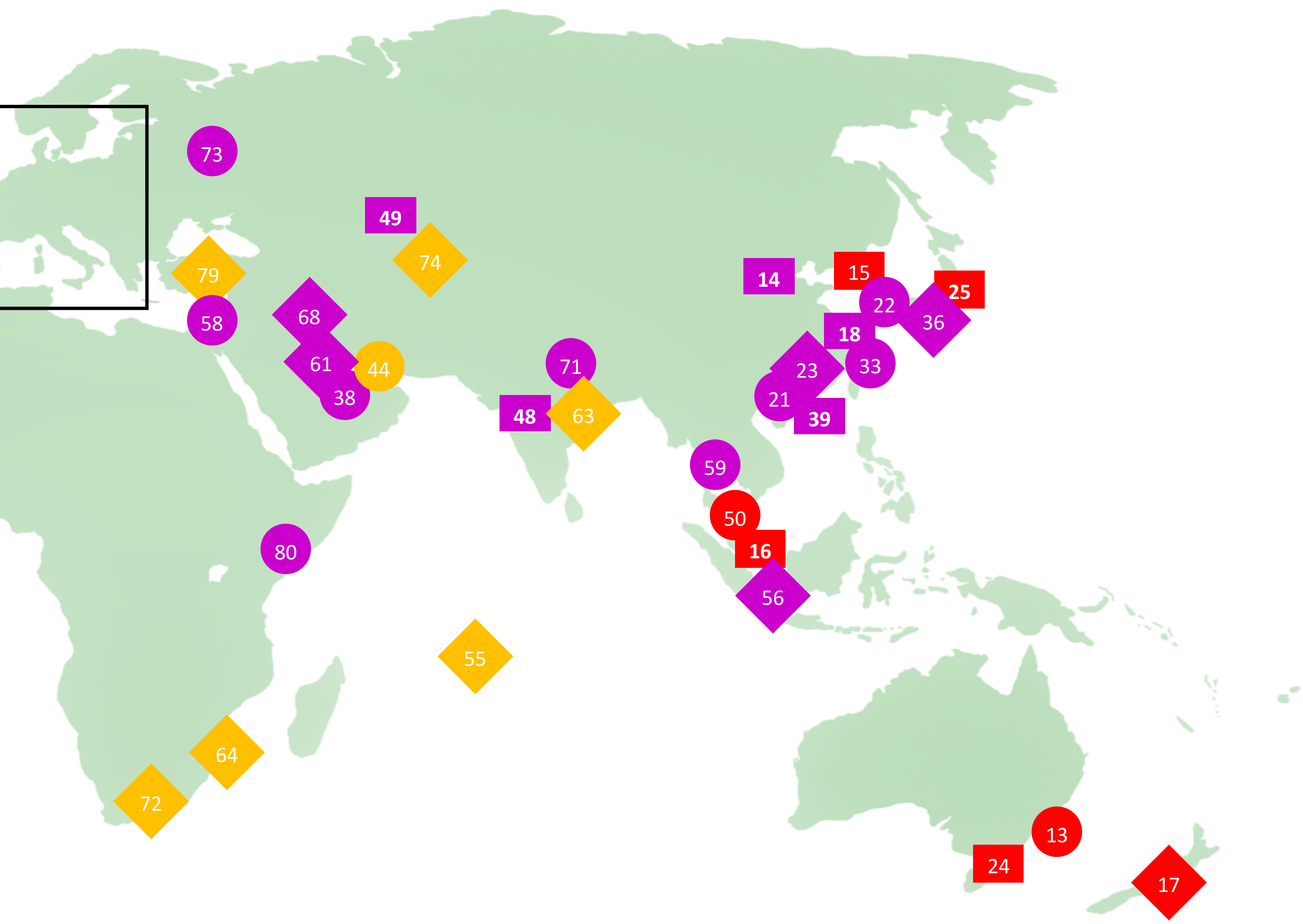
Table 9| Financial Centre Profiling

	Broad and Deep	Relatively Broad	Relatively Deep	Emerging
	Global Leaders	**Global Diversified**	**Global Specialists**	**Global Contenders**
Global	London	Washington DC*	Luxembourg	Dublin*
	Amsterdam	Frankfurt	Beijing	
	New York		Shanghai	
	Zurich		Hong Kong	
	Paris		Nur-Sultan	
	Singapore		GIFT City-Gujarat*	
	Los Angeles*			
	Tokyo			
	Seoul			
	Melbourne			
	Established International	International Diversified	International Specialists	International Contenders
International	Stockholm	Boston	Geneva*	Dubai
	San Francisco	Brussels*	Busan	Mexico City*
	Sydney	Berlin*	Shenzhen	Sao Paulo*
	Montreal*	Chicago	Qingdao	
	Vancouver*	Hamburg	Edinburgh*	
	Toronto	Milan	Abu Dhabi	
	Madrid		Casablanca*	
	Kuala Lumpur		Tel Aviv*	
	Rome*		Bangkok	
			New Delhi*	
			Moscow	
			Prague*	
			British Virgin Islands	
			Nairobi	
	Established Players	Local Diversified	Local Specialists	Evolving Centres
Local	Oslo*	Glasgow	Guangzhou	Helsinki
	Copenhagen*	Santiago (New)	Osaka	Guernsey
	Munich		Jakarta*	Mauritius
	Wellington		Jersey	Johannesburg
	Vienna		Liechtenstein	Mumbai
	Lisbon		Doha	Rio de Janeiro
	Calgary		Malta	Almaty
	Warsaw*		Bermuda	Cape Town
			Isle of Man	Istanbul*
			Bahrain	
			Cayman Islands	

* An asterisk denotes a change since GGFI 8

The GGFI 9 World - Centres In The Index





The numbers on the map indicate the GGFI 9 rankings.

Broad and Deep	Relatively Broad	Relatively Deep	Emerging
Global Leaders	Global Diversified	Global Specialists	Global Contenders
Established International	International Diversified	International Specialists	International Contenders
Established Players	Local Diversified	Local Specialists	Evolving Centres

Sovereign Sustainability-Linked Bonds – Chile Sets A High Bar

Introduction

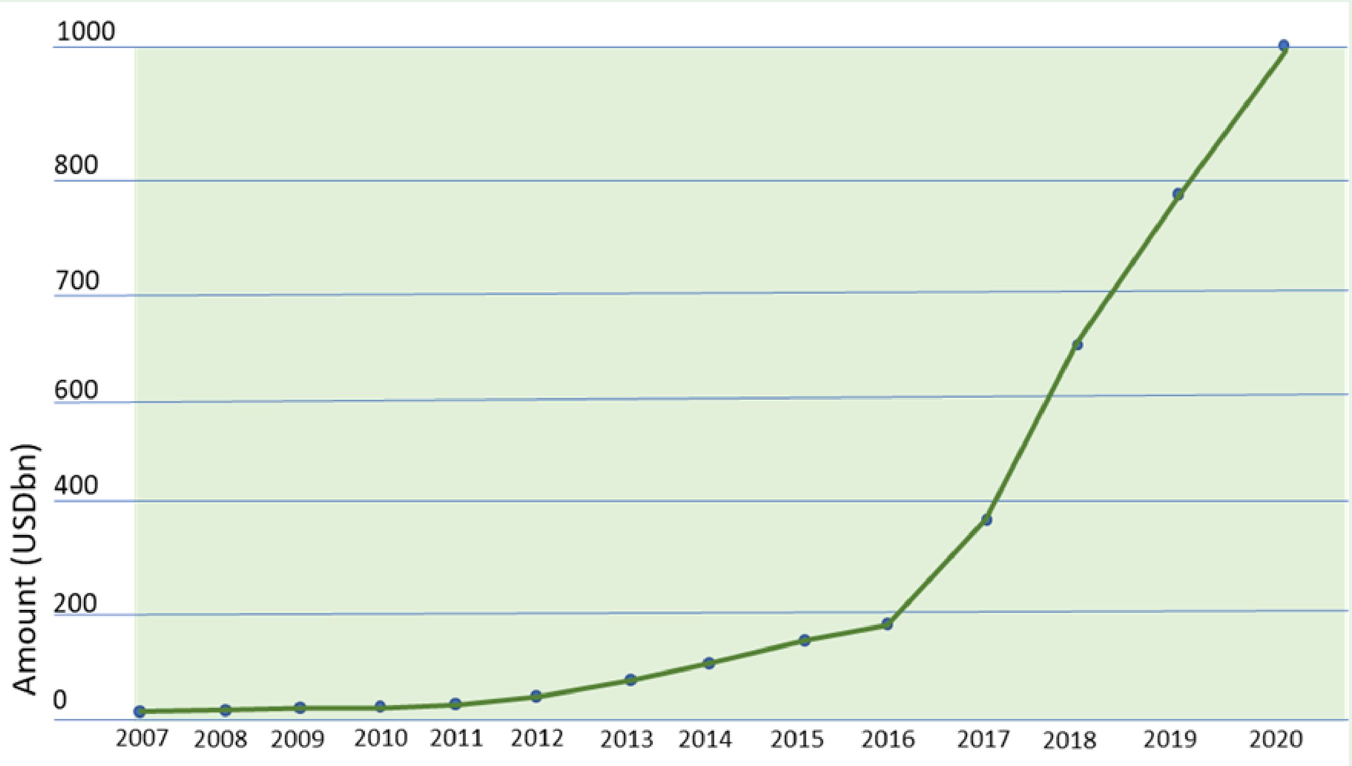
In March 2022, the Republic of Chile priced the first-ever Sovereign Sustainability-Linked Bond (SSLB). This $2 billion 20-year SLB was more than 4 times oversubscribed - a remarkable achievement given the sovereign bond market's volatility and uncertainty. In this short paper Djellil Bouzidi who advised the Chilean Debt Management Office (DMO) of the Ministry of Finance on the establishment of this bond, and Simon Mills, lead consultant at Z/Yen, explore Chile's decision to issue this pioneering product and the potential implications for both the green bond and sovereign bond markets.

In this section we will refer to green bonds and policy performance bonds (or sustainability–linked bonds). The key difference is that green bonds are focused on the use of proceeds, with resources raised to support particular projects. Policy performance bonds are instead linked to outcomes, e.g., the achievement of sustainability or other targets.

Green Bonds

Green bonds are financial instruments that allow issuers to borrow money for investments that have positive environmental impacts. They are the 'rock stars' of the sustainable finance world and ever since their debut in 2007 with the AAA-rated issuance from the European Investment Bank (EIB), the green bond market has seen exponential growth (see figure 1). They have also been consistently rated as the most interesting area of green finance in the GGFI survey.

Figure 1 | The Exponential Growth Of The Green Bonds Market



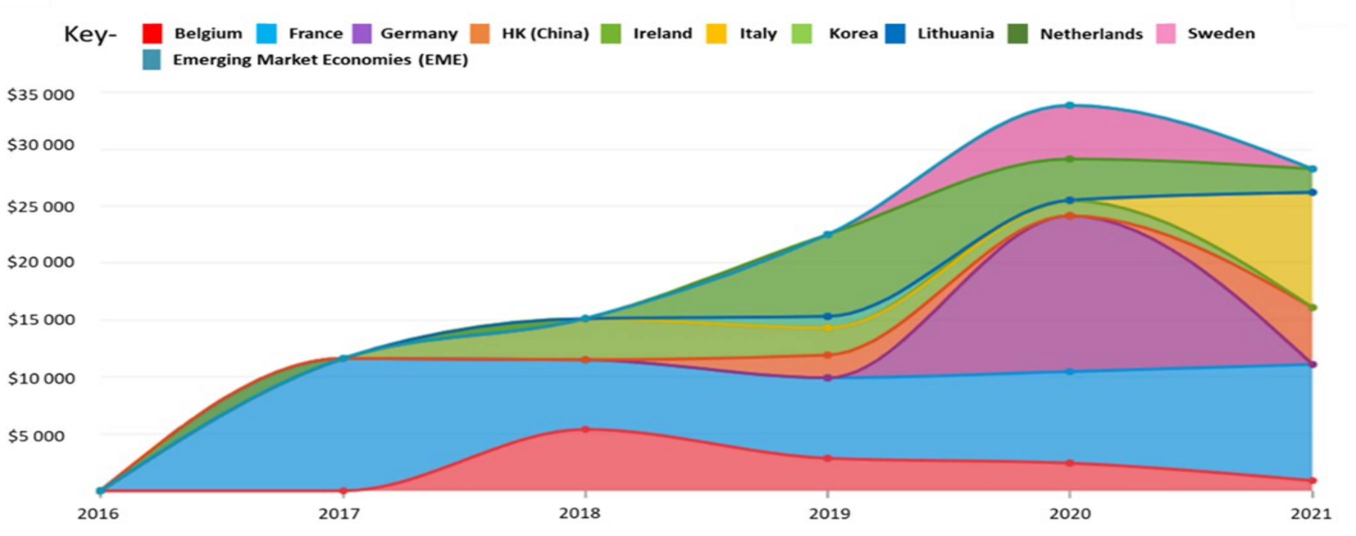
Green bonds are debt issuances where the proceeds must be applied exclusively to finance (in part or in full) projects that promote progress on environmentally sustainable activities, such as reducing waste, enhancing biodiversity, or reducing emissions (through renewables generation, green transport, or energy efficiency programmes). Similar to green bonds, but focused on beneficial societal outcomes are social bonds, with a further subset, sustainability bonds, combining elements of both social and environmentally beneficial outcomes.

Initially, green bond issuance was the exclusive purview of supranational financial institutions - after the EIB issued its equity index-linked bond in 2007[1], the World Bank issued a labelled 'green bond' in 2008[2], and in 2010 the International Finance Corporation issued its first bond.

In 2013, the first corporate green bond was issued by Vasakronan[3], a Swedish real estate company, and the flood gates were opened. December 2020 saw the cumulative issuance of green bonds, worldwide, reach $1 trillion and it is forecast that Green bond investment in a single year is set to double and reach $1 trillion for the first time by the end of Q4 2022[4].

Somewhat slower off the mark, but rapidly gaining momentum has been the issuance of sovereign green bonds (SGBs). Poland was among the first counties to offer an SGB in December 2016 (though it should be noted that France announced its intention to issue an SGB in July 2016), and as of March 2021 nineteen sovereigns had issued green bonds (see figure 2), with the UK coming late to the party in October of the same year - but SGBs still only make up a tiny fraction (0.5% share of the total) of 'vanilla' sovereign debt[5].

Figure 2 | Sovereign Green Bond Issuance 2017-2021



Note: Data as at March 2021, EME include Chile (2019-21), Eygypt (2020), Fiji (2017), Hungary (2020), Indonesia (2018-20), Nigeria (2017,2019), Poland (2016,2018-19), Seychelles (2018) and Thailand (2020).
Source: OECD (2020) OECD Business and Finance Outlook 2021

1 Kreivi E 2017 *Green Bond Market Development and EIB*, EIB https://www.eib.org/attachments/green-bond-market-development-and-eib.pdf
2 World Bank 2022 *The World's First Green Bond* https://youtu.be/i3glJrABLSc
3 Vasakronan 2022 *Green financing* https://vasakronan.se/en/about-vasakronan/financial-information/green-financing/#:~:text=Green%20bonds,with%20Vasakronan's%20other%20EMTN%20bonds
4 CBI 2022 *$1Trillion Annual Green Bond Milestone Tipped for end 2022-$5Trillion Annual by 2025 is new Global Target says CEO Sean Kidney*, CBI Press Release https://www.climatebonds.net/resources/press-releases/2021/10/1trillion-annual-green-bond-milestone-tipped-end-2022-5trillion
5 Fatin L 2021 *Sovereign Green, Social & Sustainability (SGSS) Bonds - How far and how fast could they grow?* CBI https://www.climatebonds.net/2021/03/sovereign-green-social-sustainability-sgss-bonds-how-far-and-how-fast-could-they-grow#:~:text=The%20first%20sovereign%20green%20bond,0.5%25%20share%20of%20the%20total

Policy Performance Bonds

Governments claim they are committed to tackling climate change, but the historical record raises doubts. For example, the EU ETS market Phase 1 (2005 to 2007) carbon price crashed in 2007 when it became apparent that EU governments had jointly issued far too many permits to emit (they clearly weren't committed to reductions). Despite numerous conferences, papers, and communiqués, there is still a lack of confidence that governments are serious about meeting carbon emission reduction targets. This affects investment, particularly when the worsening economic environment leads governments to talk about 'temporary' easing of carbon reduction commitments at the same time as easing demand lowers carbon prices.

For organisations and individuals seeking to invest in a low-carbon future, uncertainty about government commitment manifests itself in three specific risks[6]:

- Government carbon emission targets being missed.
- Fossil fuel prices remaining low.
- Carbon (emissions) prices remaining low.

Missed targets, low fossil fuel prices, and low carbon prices reduce the profitability of clean energy, or cause losses, but how can these risks be hedged?

The concept of policy performance bonds was first developed by Professor Michael Mainelli in 2005 as part of discussions during the formation of the London Accord[7]. Professor Mainelli drew his inspiration from the world's first known inflation-indexed bonds, which were issued by the Massachusetts Bay Company in 1780[8].

These bonds were invented to deal with severe wartime inflation and with discontent among soldiers with the decline in the purchasing power of their pay. The bonds were in effect a promise that the commonwealth would tackle inflation, backed by financial penalties should it fail to do so.

Policy performance bonds were similar in concept, but instead of inflation, they would focus on carbon emissions. The concept was formally presented by Z/Yen at the World Bank Government Borrowers' Forum in Ljubljana in May 2009, was included in the City of London's submission to COP15 in Copenhagen[9], was promoted by the French government in the run-up to COP21 in 2015 and has been the subject of many papers and journal articles[10].

The original idea was directed at governments as a means of delivering on their climate change pledges (though they are equally suited to corporate issuers). In its simplest form, interest payments are linked to the actual greenhouse gas emissions of the issuing country. An investor in this bond receives an

6 Mainelli et al 2009 Index-linked Carbon Bonds: Gilty Green Government https://www.zyen.com/publications/professional-articles/index-linked-carbon-bonds-gilty-green-government/

7 Z/Yen et al 2007 The London Accord https://www.longfinance.net/programmes/sustainable-futures/london-accord/london-accord-2007/

8 Shiller R 2003 The Invention Of Inflation-Indexed Bonds In Early America NEBR Working Paper 10183 http://www.nber.org/papers/w10183

9 Bosley L et al 2009 *Delivering Copenhagen,* City of London https://www.longfinance.net/media/documents/delivering.pdf

10 Z/Yen 2005 Policy Performance Bonds https://www.zyen.com/research/research/sustainability/policy-performance-bonds/

excess return if the issuing country's emissions are above the government's published target. This type of financial instrument provides a hedge against the issuing country's government (or a corporate organisation) not delivering on its commitments or targets[11]. The ability to hedge facilitates investment in projects or technologies that will pay off in a low-carbon future since, if the low-carbon future fails to arrive, due to changes in policy (such as subsidies or tax breaks) the government bears some of the direct costs by having to pay higher interest rates on government debt.

Policy performance bonds can be issued against a range of social or environmental issues which are policy dependent, including education, deforestation, and housing. Those focused on sustainability are also called sustainability-linked bonds.

Green Policy Performance Bonds (also known as Sustainability-Linked Bonds)

Green Policy Performance Bonds or Sustainability-linked bonds (SLBs) are a subset of green bonds however, they differ from green bonds, social bonds, or sustainability bonds in several crucial ways:

- First, and most importantly the funds raised are not tied to a specific project, but a corporate (or national) objective – for example improving literacy rates, recycling rates, or absolute reductions in carbon emissions (scope 1 2, or 3). Liberating the proceeds from a specific project frees the issuer to deliver sustainability improvements using a wide range of means – this may include education and training, the recruitment of specialist staff, and the reorganisation of procurement systems as well as more traditional avenues such as the purchase of plant, machinery, intellectual property, or land.
- Second, SLBs are issued with specific sustainability performance targets (SPTs), which contain key performance indicators (KPIs), for example: *"A 10% reduction in 16-20-year-olds not in employment education or training by 2030"*.
- Third, if the SPT is missed the bond is subject to a "step-up" clause, meaning the bond interest increases.

Khazanah Nasional Berhad, the sovereign wealth fund of Malaysia, was the first entity to issue a policy performance bond in 2017 when it raised RM100 million from the second tranche of Sustainable and Responsible Investment (SRI) Sukuks tied to educational attainment[12].

Corporates initially followed their lead through sustainability-linked loans: Danone in 2018[13], Louis Dreyfus in 2019[14], and Nokia in 2019[15]. One of the first true SLBs was issued by Eni in 2019, with Schneider Electric following in 2020[16]. This bond is designed to pay up to 0.5% of its nominal value if they fail to meet their sustainability performance targets.

11 Bouzidi A & Mainelli M 2017, L'Innovation Financière Au Service Du Climat: Les Obligations Á Impact Environnemental ISBN 978-2-86-325784-5

12 Khazanah 2017 Khazanah raises RM100 million from second tranche of Sustainable and Responsible Investment (SRI) Sukuk https://www.khazanah.com.my/news_press_releases/khazanah-raises-rm100-million-from-second-tranche-of-sustainable-and-responsible-investment-sri-sukuk/

13 PNB Paribas 2018 Danone's Positive Incentive Financing Strategy https://cib.bnpparibas.com/sustain/danone-s-positive-incentive-financing-strategy_a-3-2238.html

14 Holder M 2019 Louis Dreyfus Company links interest on $750m loan to green performance https://www.businessgreen.com/bg/news/3076513/louis-dreyfus-company-agrees-usd750m-green-loan-repayment-deal

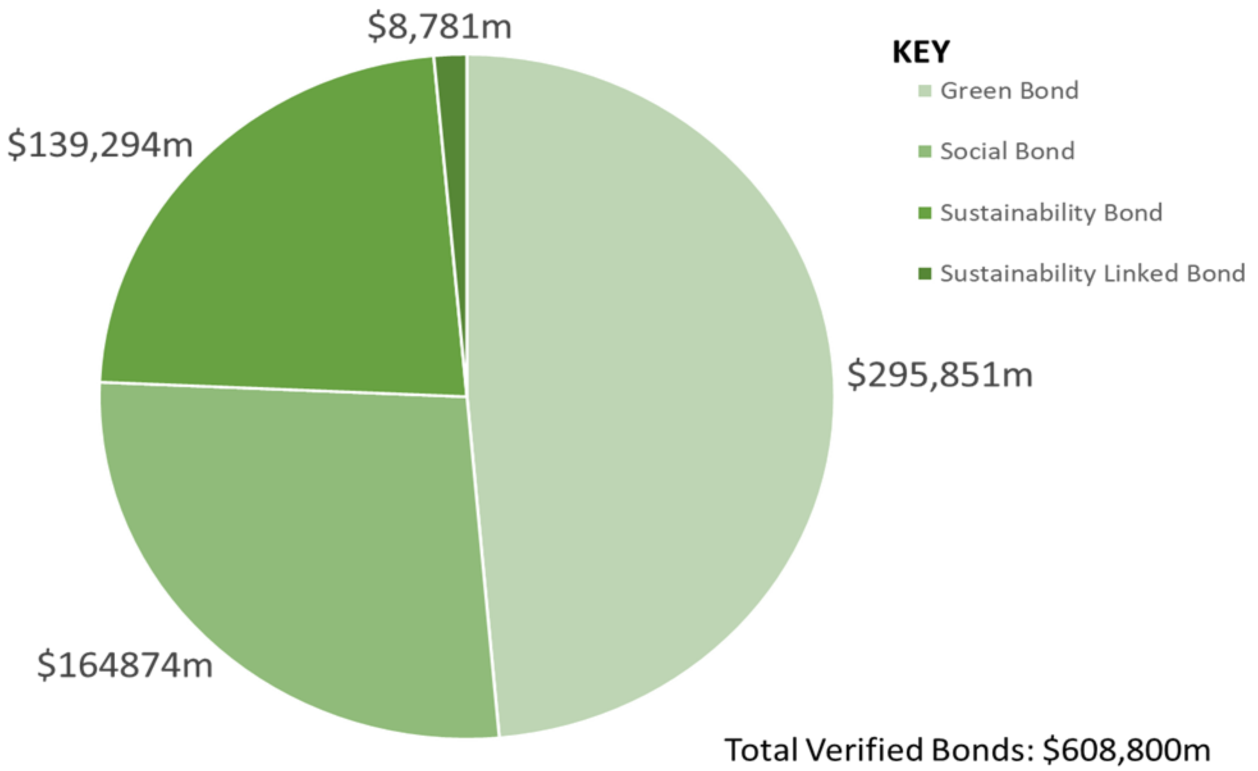
15 Financial Times 2019 Nokia signs €1.5bn loan linked to greenhouse gas emissions https://www.ft.com/content/6a41a968-9265-11e9-aea1-2b1d33ac3271

16 Schneider Electric 2020 Schneider Electric launches its first sustainability-linked Bonds https://www.se.com/ww/en/assets/564/document/174193/release-sustainability-linked-bonds.pdf

SLBs are a small, but rapidly growing sector of the green bonds market (see figure 3). This may be set to change as Chile issued the world's first sovereign sustainability-linked bond in March 2022.

The $2 billion sustainability-linked bond was issued on 2 March, carrying a 4.346% rate or 200 basis points above 20-year U.S. Treasury notes. Demand for the bond reached more than $8 billion, or 4.1 times the original placed amount, spread across investors in Europe, Asia, and the Americas. Finance Minister, Rodrigo Cerda, noted this was a sign of confidence in the Chilean economy. The bond adheres to the Paris Agreement on climate change, including that the country emits no more than 95 metric tons of carbon dioxide and equivalent by 2030 and that 60% of electricity production be derived from renewable energy by 2032.

Figure 3 | Breakdown Of Finance Instruments By Product Type 2020



Issuers

There are several drivers behind the explosive growth of the green bonds market. For the companies issuing them, green debt instruments hold a triple advantage:

First, they enhance company reputation and underscore sustainability commitments – both Apple[17] and Starbucks[18] received significant positive press when they issued sustainability bonds (respectively) associated with cutting carbon emissions and promoting sustainable agriculture. Issuing a green bond conveys leadership and a commitment to sustainability.

17 Judge P 2021 *Apple says its $4.7bn Green Bonds will create 1.2GW* of *renewable power*, Data Centre Dynamics https://www.datacenterdynamics.com/en/news/apple-says-its-47bn-green-bonds-will-create-12gw-renewable-power/

18 Brown N *2019 Starbucks Issues $1 Billion Sustainability Bond for Supply and Retail*, Daily Coffee News https://dailycoffeenews.com/2019/05/20/starbucks-issues-1-billion-sustainability-bond-for-supply-and-retail/

Second, sustainability teams (and the authors are speaking from experience) are rarely generously funded and a financial gulf often exists between ambition and delivery. Low carbon transition and systemic sustainability programmes often require significant upfront investment and yield results over a longer time horizon than traditional investments. Green bonds not only help to bridge this gulf, but the disclosure requirements[19] associated with them not only help communicate the sustainability narrative but firmly place sustainability performance on companies' balance sheets.

Third, green bonds are an effective way to diversify debt and raise funds. Demand for green bonds remains high from investors[20] with green bond issuances remaining significantly oversubscribed[21]. For sovereign issuers, performance-linked sovereign debt encourages a multiplicity of positive outcomes, such as incentivising targeted, performance-based policy action, reducing the cost of capital (if performance is achieved), and increasing the availability of public funds to support performance-related actions[22]. Other benefits include:

- For smaller nations, SGBs offer an opportunity to diversify their investor base. Much of the demand for green bonds comes from institutional investors seeking to 'green' their portfolios and using green bonds as a hedging tool against climate risk. Many of these institutions are based in Europe and United States, where interest rates are still at historically low levels. The release of a sovereign green bond can "*attract a significant number of international investors who are investing for the first time in the country, and that can create an excess demand driving down the interest the country has to offer*"[23].
- The issuance of SGBs allows governments to tap directly into capital markets to finance specific policy measures such as projects, subsidies, or fiscal incentives, which otherwise would struggle to receive funding. Furthermore, the requirement for close cooperation and dialogue between finance ministries and environment and social ministries in the design and development of performance indicators for the bond can break down barriers and encourage collaboration.

Investors

From an investor's perspective, green bonds are an extremely useful product that allows them to green their portfolios without taking on additional risk. There is even some evidence that despite their lower yields green bonds may outperform vanilla bonds[24].

19 Franklin A et al 2020 Green Bond Impact Reporting Under Securities Law Bloomberg Law https://www.lw.com/thoughtLeadership/green-bond-impact-reporting-under-securities-law

20 Petheram R 2022 Notes from the Investment Floor: Demand for green bonds to remain high, Jupiter https://www.jupiteram.com/uk/en/professional/insights/notes-from-the-investment-floor-demand-for-green-bonds-to-remain-high/

21 Harrison H 2020 Green Bond Pricing In The Primary Market: January - June 2020 CBI https://www.climatebonds.net/files/reports/cbi-pricing-h1-2020-21092020.pdf

22 Finance For Biodiversity Initiative 2022 Greening Sovereign Debt Performance - Shared Risk and Rewards in Financing the Transition https://www.f4b-initiative.net/_files/ugd/643e85_530450f90a2d4ea0bb062c3ad801d107.pdf

23 Frisari G 2019 Sovereign Green Bonds: 4 reasons to pay attention in LAC, IDB https://blogs.iadb.org/sostenibilidad/en/sovereign-green-bonds-5-reasons-to-pay-attention-in-lac/

24 Nordea 2020 Do green bonds outperform in 'risk-off' periods? Yes, but beware the nuances https://www.nordea.com/en/news/do-green-bonds-outperform-in-risk-off-periods-yes-but-beware-the-nuances

Beyond their tight yield curves, green bonds have a deeper significance. In Albert Hirschman's seminal text *Exit, Voice, and Loyalty - Responses to Decline in Firms, Organizations, and States*[25], Hirschman proposes three responses to underperforming organisations – withdrawal of support, lobbying for improvement, or acquiescence to the status quo. The first two of these – focusing on environmental and social performance - have been an integral part of the socially responsible investment (SRI) playbook since its inception. However, withdrawal (disinvestment) and lobbying (active shareholding) come with built-in costs. Green bonds have built-in performance metrics and third-party auditing, making them a lower-cost green investment option.

Criticisms Of Green And Sustainability Linked Bonds

Green and sustainability-linked bonds are an extremely valuable addition to the armoury of green finance products designed to fight climate change and deliver sustainable growth however, two major issues can undermine their effectiveness:

- ***Standards*** - The absence of a commonly agreed definition and a unique reference framework are major issues in the green bond market[26]. Currently, issuers can choose to issue green bonds which comply with the Climate Bonds Standard[27], Green Bond Principles[28], ASEAN Green Bond Standards[29], Sustainability Linked Bond Standards[30], or, as all these standards are voluntary, no standard at all (see figure 4). Development Banks, such as the Asian Development Bank, the International Finance Corporation, and the Nordic Investment Bank even have their own standards.

  Currently, some bonds are described as green (by their issuers) despite not actually complying with any use of proceeds/reporting requirements. With no single global standard or recognised legal definition, and market criteria based on voluntary compliance investors must ensure that a green bond[31]:
  (a) complies with one of the recognised standards listed above;
  (b) is included in a green bond index[32] and/or;
  (c) has been verified as green by a third-party review.

25 Hirschman A 1970 *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*, Harvard University Press ISBN-10: 0674276507

26 Deschryver P & de Mariz F 2020 *What Future for the Green Bond Market? How Can Policymakers, Companies, and Investors Unlock the Potential of the Green Bond Market?* Journal Of Risk And Financial Management https://www.mdpi.com/1911-8074/13/3/61

27 CBI 2022 Climate *Bonds Standard V3.0* https://www.climatebonds.net/files/files/climate-bonds-standard-v3-20191210.pdf

28 ICMA 2021 Green Bond *Principles* https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf

29 ACMF 2018 ASEAN Green Bond Standards https://www.theacmf.org/images/downloads/pdf/AGBS2018.pdf

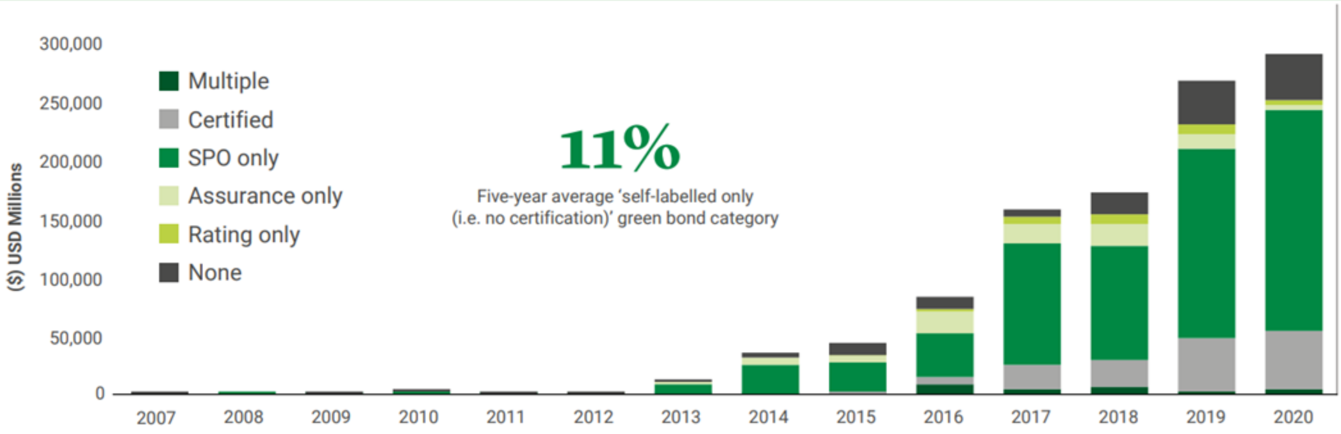
30 ICMA 2020 Sustainability *Linked Bond Standard* https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp/

31 Baker McKenzie 2019 *Critical challenges facing the green bond market* https://www.bakermckenzie.com/-/media/files/insight/publications/2019/09/iflr--green-bonds-(002).pdf?la=en

32 S&P Green Bond Index https://www.spglobal.com/spdji/en/indices/esg/sp-green-bond-index/#overview

The forthcoming European green bond standard (EUGBS)[33], may attempt to cut through this log jam by making EU GBS designation mandatory however, there are concerns that this may have unintended consequences such as fragmentation of the international green bond market[34] (due to the EU following different rules to the rest of the international capital markets).

Figure 4 | Market Share Of Externally Verified Bonds 2007-2020



Source: LGIM[35]

- ***Greenwashing*** – This is a charge that has been levelled (often unfairly) at the green bonds market since its inception. Companies can not only gain a reputational advantage by showing "green leadership" in issuing bonds, but both companies and countries "*are pushing the boundaries of what might be considered a green bond because the savings on debt interest can be significant. Demand has led green bonds to be priced at a premium — or "greenium" — to the price of conventional bonds, which gives issuers slightly lower interest-rate costs*"[36].

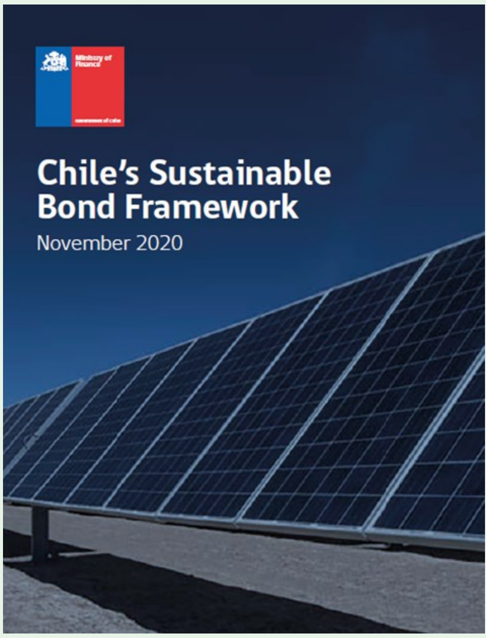
  In this context greenwashing can take two forms:
  - **Issuing a bond (labelled or unlabelled) that supports unsustainable activity** – Repsol, the Spanish fossil fuel multinational, issued the oil and gas sector's first green bond in May 2017. The bond was issued with the claim that the funds raised would cut carbon emissions by 1.2 million tonnes over three years. Whilst this was true, and the bond was supported by a solid green bond framework that complied with the Green Bond Principles, the money was used to upgrade the efficiency of existing fossil fuel refineries. With sovereign green bonds, there is a high risk that the debt is not ring-fenced, which means that it could be serviced by environmentally destructive activities. For example, whilst the revenue from the green bond could be invested in public transport or renewable energy, the funds used to service the debt could come from the sale of licenses for oil and gas exploration.

33 European Commission 2020 *European Green Bond Standard* https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/european-green-bond-standard_en
34 ICMA 2022 *Analysis of the amendments to the EuGB Regulation proposed by the Rapporteur of the EU Parliament* https://www.icmagroup.org/News/news-in-brief/analysis-of-the-amendments-to-the-eugb-regulation-proposed-by-the-rapporteur-of-the-eu-parliament/
35 King D et al 2021 The Green Bond Market Is the fixed income fulcrum tilting green? https://www.lgim.com/landg-assets/lgimetf/files/green-bond-market---collaboration-lgim--cbi.pdf
36 Temple-West P 2021 Green bonds face new questions over authenticity, Financial Times https://www.ft.com/content/d797800b-fb07-40c7-8386-a22de312cd35

- **Issuing a bond that does not enhance the sustainability performance of the issuer** - In June 2021, JBS, the Brazilian meat company, announced it had sold $1 billion worth of "sustainability-linked" bonds. The company had been under fire for several years for an alleged charge sheet that included deforestation, slave labour, violating Indigenous and local community rights, and major corruption. The bond it issued made no mention of deforestation and did not cover Scope 3 emissions (90% of the company's emissions).

Other less egregious examples abound – Tesco issued green bonds in January and November 2021 which were criticized for emissions KPIs that it had largely already achieved, which covered less than 2% of its total carbon footprint[37]. Regardless, with the bond three times oversubscribed, Tesco benefitted from enhanced interest rates, even if there was little green benefit.

Chile Breaks The Mould



In March 2022, the Republic of Chile priced the first-ever Sovereign Sustainability-Linked Bond (SSLB)[38]. This $2 billion 20 years SSLB has generated a strong appetite from more than 230 investors and was more than four times oversubscribed.

Chile was motivated to take this pioneering approach following the issuance of its first Sovereign Green Bond in 2019. As a result of this issuance, the cost of debt was reduced, and the investor base was diversified in line with the Chilean Debt Management Office's general strategy of obtaining budget financing at the lowest possible cost in the medium term (taking into consideration the risk associated with refinancing) - maintaining an average term of maturity close to 11 years.

Having demonstrated that a government could obtain a lower cost while achieving climate and social objectives, labelled bonds (such as Sovereign Green Bonds (SGB), Sovereign Sustainability-Linked Bonds (SSLB), and Sovereign Social Bonds (SSB) have become fundamental to Chile's financing and are totally integrated into the general debt management strategy.

With the issuance of the world's first SSLB, Chile aimed to embed green and financial incentives across several political cycles, while mitigating some of the limitations of existing sovereign green, social and sustainability instruments. One of those limitations is linked to the limited pipeline of green projects that could lower the interest of green bonds after a certain threshold.

37 Bloomberg 2021 *Tesco's Ethical Bond Won't Do Much For the Planet, Again* https://www.bloombergquint.com/onweb/tesco-s-esg-bonds-show-challenge-of-relying-on-market-to-cut-co2

38 Rust S 2022 *Chile prices first sovereign sustainability-linked bond*, IPE https://www.ipe.com/news/chile-prices-first-sovereign-sustainability-linked-bond/10058440.article

The two KPIs associated with the bond are an absolute reduction in greenhouse gas emissions (from 112.3mt/pa in 2018 to 95mt/pa by 2030) and an increase in renewable energy generation (60% from renewables by 2032)[39]. Sustainalytics, which provided the second party opinion rated the targets as 'very strong' and 'strong' respectively[40].

> "*Another interesting and sometimes misunderstood feature of Chile's SLB is its long maturity of 20 years. The Sustainability Performance Targets will be verified in 2030 and 2032 and the potential step-up would be paid until 2042. This automatically ties several governments and administrations to the structure and climate actions. It is really a huge step that is, in our view, a game-changer*." Patricio Sepúlveda, head of DMO at the Ministry of Finance (Chile)[41].

This success story highlights the advantages for a sovereign issuer in leveraging the SLB market: Sovereign SLBs can potentially attract a large investor base, especially those with ESG-focused criteria, resulting in enhanced foreign investment, and reduced funding costs, sending strong signals of efficient and effective public policy.

Chile chose a mix of Sovereign Green, Social, and Sustainability bonds (SGSSB) and SSLBs to leverage the advantages of each one of those instruments. SGSSBs are an effective tool for large-scale projects which require expenditure. However, there is a range of actions that can be taken by governments without direct investment and/or expenditure - these include regulation, legislation, and private partnerships. As SSLBs do not require use of proceeds, they provide a stable pipeline of funding for green or social projects.

A further benefit is the fostering of inter-ministerial collaboration between treasury and Debt Management Offices and other governmental departments. *"The key thing being that greening Chile's debt is a core strategy and not a communication objective. With around 29% of the public debt being green/social (labelled bonds: green, social, sustainable, and sustainability-linked bonds), Chile is probably the world leader." Patricio Sepúlveda*

From an investor perspective, particularly insurance companies, sovereign, or pension funds, SLBs offer the opportunity to hedge environmental risks - and potentially profit from the opportunities linked to low-carbon markets. Sovereign SLBs can be viewed as a climate hedge because they include a contingent outcome that includes an option with a value that cannot be worth less than zero. If investors are willing to pay for this insurance, then the issuer benefits from a lower cost of debt.

SSLBs are not the only instruments allowing such a hedge, but they offer assurance to investors that green investment will occur and a strong incentive (through "step-up" clauses) to governments to achieve their targets. For sovereign issuers, the alignment of the incentives is an effective way to achieve ESG objectives while signaling to the market their credibility and thus leveraging this 'intangible' advantage.

39 Minesterio de Hacienda 2022 *Chile's Sustainable Bond Framework* https://www.hacienda.cl/english/work-areas/international-finance/public-debt-office/sustainable-bonds/chile-s-sustainable-bond-framework

40 Sustainalytics 2022 *Second-Party Opinion - Government of Chile Sustainability-Linked Bond Framework* https://www.sustainalytics.com/corporate-solutions/sustainable-finance-and-lending/published-projects/project/government-of-chile/government-of-chile-sustainability-linked-bond-framework-second-party-opinion-(2022)/government-of-chile-sustainability-linked-bond-framework-second-party-opinion-(2022)

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This financial innovation could allow Debt Management Offices (DMOs) to obtain better funding so long as Sustainability Performance Targets (SPTs) are achieved, and investors' appetites for these products remain strong.

SSLBs are perfectly adapted for countries that lack large-scale green projects to fund – large-scale renewable energy or public transport projects are not always appropriate for transition economies. However, some investors may perceive this as a risk as they may prefer the classic use-of-proceeds approach. This wariness may be compounded if the SSLB is structured with unambitious sustainability targets, questionable KPIs, and low penalties for non-performance. However, as the market develops, economists and investors will be able to derive sustainability risk premium estimates based on a comparison between SSLBs and classic sovereign debt. Countries could also be compared on the scale and certainty of their commitments by examining the quantity of bonds issued alongside market prices.

SSLBs - Potential Problems And Pitfalls

To issue sovereign SGBs and SSLBs, Chile published a Green Bond Framework as well as a Sustainability -Linked Bond framework. These policies were prepared and led by the Ministry of Finance) and other sectoral ministries (and did not require any legal changes. The DMO at the Ministry of Finance, in coordination with the Ministry of the Environment, developed a Financial Strategy on Climate Change, which included the creation of the Public-Private Green Finance Table, workshops to scope implications and enhance capacities, research to generate data, and analysis (including Green Growth Opportunities for the Decarbonisation Goal for Chile[42]), and the promotion of financial instruments to fund these green initiatives, such as Green Bonds.

From a governmental perspective three challenges must be met to make a sovereign SLB issue successful:

- First, the sustainability and financial structures must be easy to understand, ambitious, creative, credible, and constructed in consultation with potential investors.
- Second, DMOs should aim to create ambitious, but achievable, KPIs and SPTs to ensure that the SSLB is a credible green product. DMOs should engage in early discussions with the Second Party Opinion (SPO) agencies to detail and explain the structure so that the SPOs in charge of the verification of performance against SPTs can detail their monitoring and control mechanisms.
- Third, given the number of stakeholders in the process, the issuance of an SSLB is a complex process. The intragovernmental communications channels and processes must be carefully established, mapped, and communicated to ensure that there are no legal pitfalls or challenges once the process is started.

From the author's experience, DMOs should follow these first steps (structuring, communicating, and executing) meticulously to successfully deliver an SSLB.

42 Ministry of Finance, Chile 2020 *Green growth opportunities for the decarbonization goal for Chile* https://documents1.worldbank.org/curated/en/968161596832092399/pdf/Green-Growth-Opportunities-for-the-Decarbonization-Goal-for-Chile-Report-on-the-Macroeconomic-Effects-of-Implementing-Climate-Change-Mitigation-Policies-in-Chile-2020.pdf

Discussions with asset managers and asset owners weighing up the benefits of investment in Sovereign SLBs highlight some key issues that require careful consideration.

- ***Political Cycles*** **-** Some investors highlighted the fact that sovereign SLBs mature across multiple electoral cycles. Depending on the maturity of the bond, several governments could be tied to the delivery of SPTs and KPIs. This raises the issue of the risks associated with government transitions. New parties taking charge may have different policy priorities - potentially at odds with the commitments embedded in the SSLB.

  However, Sustainability-Linked Bonds are designed to hedge precisely this type of risk, regardless of whether the issuer is a corporate, a financial institution, or a government: A corporate issuing a 10-year SLB is facing the same challenge given the average CEO turnover is 3.7 years[43]. There is no reason to treat a government differently than a CEO. In addition, inflation-linked bonds for maturities larger than 10 years are already issued and engaging several governments without raising investors' or issuers' worries.

- ***Shorting The* Government's *ESG Performance*** - Some investors do not want to "short" the sustainability performance of a government and are worried to make the situation of a potentially vulnerable issuer harder and more complex if a target is missed. By issuing an SSLB a government, is shouldering the risk of sustainability policy volatility however, this seems fair given that the government is creating this risk in the first place and therefore must be accountable and responsible to provide means for investors to protect their investments – literally a case of politicians putting their money where their mouths are!

  SSLBs are a hedge against the risk of a government not keeping its promises. The investor receives the penalty with certainty. This is a straightforward reallocation of sustainability policy risk from the investor to the issuer and ESG investors will not be hoping that the government fails: The credit spread and the yield to the SSLB will be affected by a missed sustainability target. The credit spread will probably be widened. If the SSLB is priced correctly, the penalty should compensate for the exact amount of widening. If the failure to meet sustainability objectives has a stronger impact on the credit risk, the required yield by investors will be impacted and credit spreads could widen by more than the penalty.

  Other potential options include the use of a payment-in-kind toggle feature for the exact amount of the penalty, or a compensation mechanism (built around well-recognised International Financial Institutions to mitigate corruption risks). The main argument in favor of SSLBs is the strengthening of the credibility and commitment to sustainability policy. The penalty is a simple but powerful incentive to help sovereigns to enhance the credibility of their policies and to signal a strong incentives alignment.

43 Smyth L 2020 *Adapt or die': Why being a CEO is more challenging than ever* The CEO Magazine https://www.theceomagazine.com/business/management-leadership/ceo-turnover/

- ***Choosing the right maturity*** - The maturity should provide the right balance between the time needed to complete a sustainability target and the ALM (Assets and Liabilities Management) of a DMO. Maturity represents the time over which companies can choose projects, make investments and experiment with new ways of generating sustainability results. Unlike a corporate or financial institution, for a sovereign, the connection between assets and liabilities is not straightforward. A Government's balance sheets are much more complex, large, and diversified and debt is generally issued for financing the overall budget deficit. Furthermore, it is complicated to identify the financial characteristics of all the assets and liabilities of a government and to value them correctly.

  DMOs are driven by a reduction in the funding costs for a country. Therefore, funding strategies aim to minimize the cost of borrowing.

  As SLBs are not tied to a specific project, this instrument can be used to mitigate the different balance sheet risks a government could face. SLBs could be used to reduce maturity and currency mismatches on the balance sheet. The chosen maturity should be chosen in relation to the balance sheet risk factors of a government.

- ***ESG data availability and transparency* -** For SSLBs to be successful, investors need to trust the data used for the KPIs' and SPTs' computation and progression monitoring. SPO (Second Party Opinion) firms, external auditors, and national statistics authorities should be used to establish a strong MRV (Monitoring, Reporting, and Verification) framework regarding SPTs.

  National official statistics used for an SSLB must rely on reliable data sources, sound methods, and assured quality, for example: Inflation-linked bonds are based on strong CPI (Consumer Price Index) statistics published by national statistics authorities.

  Countries seeking to issue SLBs must meet the key technical preconditions for the introduction of SLBs: firstly, suitable KPIs that meet international best practices must exist, which are compiled by independent statistical agencies that are free from political influence (National independent Statistics Authorities are a good indicator of this); secondly, the government debt management strategy must be transparent.

- ***Private Sector Responsibility For Meeting Targets* -** Some sustainability performance targets, for example, linked to GHG emissions reduction rely, in large part, on private sector cooperation. Less than 100 companies are responsible for 71% of world GHG emissions according to a CDP report. As a result, some DMOs do not feel comfortable with a target that is largely not controlled by them.

  The answer to this key point is that government action has a vital enabling role in delivering private sector action on GHG reductions. According to the Carbon Disclosure Project, "*32% of emissions come from public investor-owned companies, making their investors a key agent in the transition to a sustainable economy*"[44]. Such investors could make their economic support conditional on the companies committing to the decarbonization of the energy sector. This could be facilitated if these companies themselves issue SLBs!

44 CDP 2017 The Carbon Majors Database https://cdn.cdp.net/cdp-production/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf?1501833772

Economists agree that putting a price on carbon is a strong tool that could help reduce emissions. Thus, even if governments are not directly responsible for emissions, they could increase the carbon price if they are anticipating that an environmental SPT will not be met. However, to avoid high inflation and social unrest, governments must consider the social impact and redistributive options to implement before implementing such a price increase.

Conclusions

We expect innovative and agile countries to start issuing SSLBs following Chile's lead. In Latin America, Asia, and Africa, several countries are currently considering SSLBs. Based on the corporate SLBs market development, one could imagine that SSLBs will represent 10% of the green government issuance in a few years and as a result, SSLBs issuers will be under pressure to exhibit higher standards to differentiate their offerings.

In the current context of rising inflation and interest rates, SSLBs could even be more attractive than classic debt. If SPTs and KPIs are bold enough, the cost of funding should be a persuasive argument to convince governments to engage in such instruments.

However, governments should be careful when structuring SSLBs. Indeed, SSLBs structuring is like Blowfish cooking: the smallest mistake in preparation could be (financially) deadly! With fugu, a chef could face the loss of his license, a fine, litigation, or prison as a penalty for bad preparation. For a country issuing a badly-structured SSLB, missing a target could not only be met by an additional coupon (step-up) but could also face credit risk. Disappointed investors, especially those with strict sustainability mandates, could create selling pressure. It is in the interest of both issuers and investors to anticipate such a risk.

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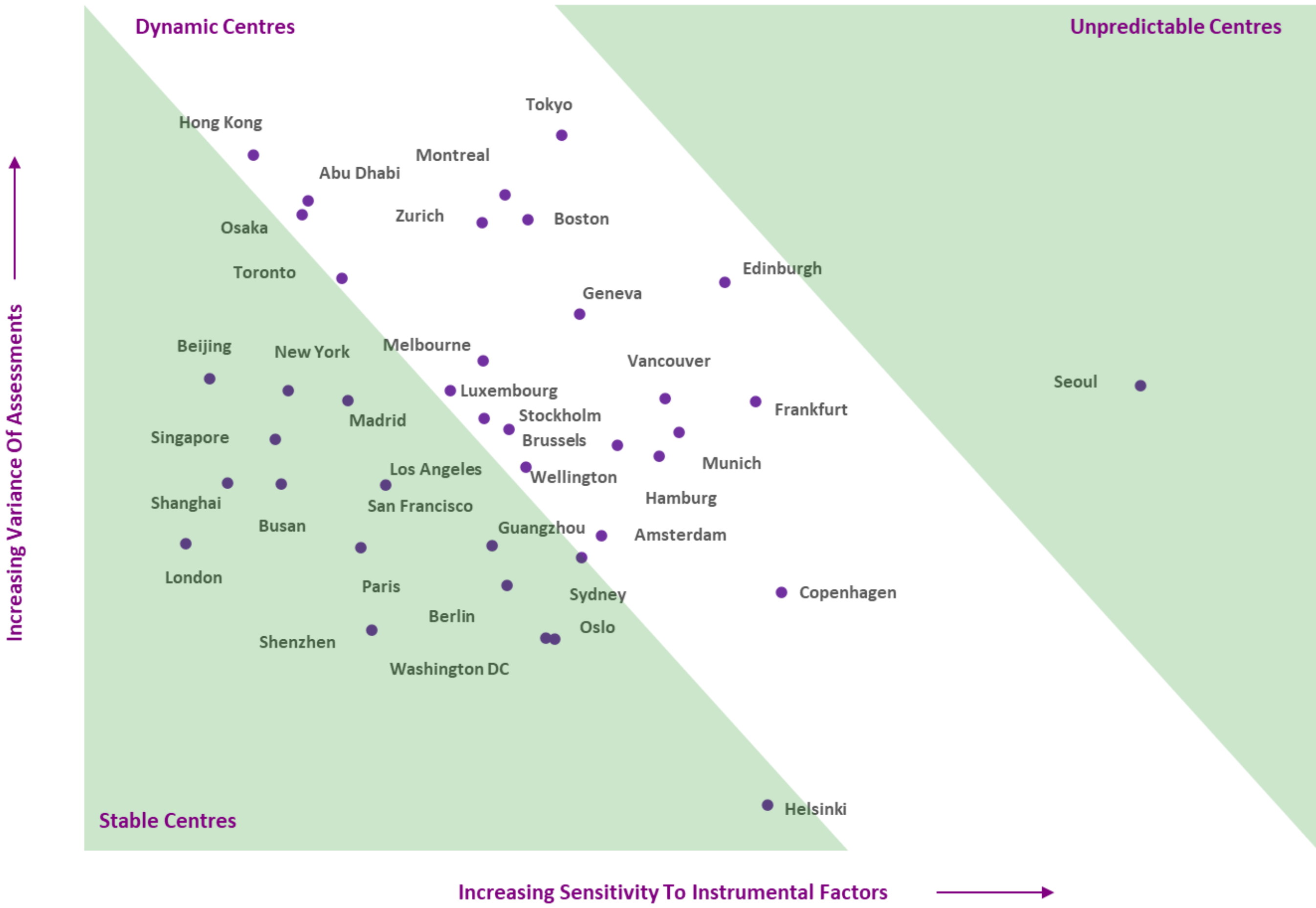
Stability

The GGFI model allows for an analysis of the stability of financial centres in the index, which can be useful for centres when assessing their development strategies. Chart 14 contrasts the 'spread' or variance of the individual assessments given to the top 40 centres in GGFI 9, with the sensitivity to changes in the instrumental factors.

The chart shows three bands of financial centres. In the top right segment, Seoul has a higher sensitivity to changes in the instrumental factors and a higher variance of assessments. Than other centres and centres in this area have the highest potential for future movement. The stable centres in the bottom left have a lower sensitivity to change and demonstrate greater consistency in their GGFI ratings.

Chart 14 | Stability In Assessments And Instrumental Factors



Regional Analysis

In our analysis of the GGFI data, we look at six regions of the world to explore their financial centres' green finance depth and quality.

Alongside the ranks and ratings of centres, we investigate the average assessments received by regions and centres in more detail.

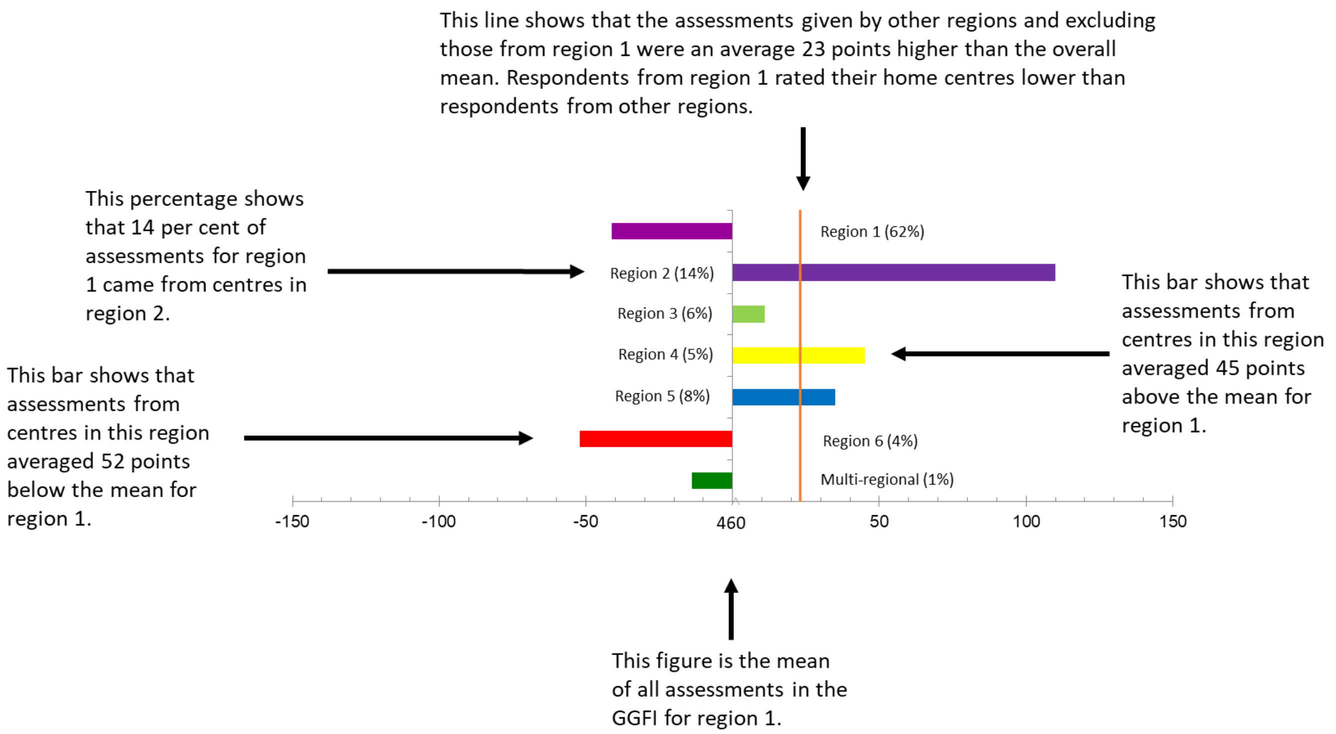
We display this analysis in charts, either for a region or an individual centre. These charts show:

- the mean assessment provided to that region or centre;
- the difference in the mean assessment when home region assessments are removed from the analysis;
- the difference between the mean and the assessments provided by other regional centres; and
- the proportion of assessments provided by each region.

Chart 15 shows an example of this analysis. Coloured bars to the left of the vertical axis indicate that respondents from that region gave lower than average assessments. Bars to the right indicate respondents from that region gave higher than average assessments. Assessments given to a centre by people based in that centre are excluded to remove 'home' bias.

The additional vertical axis (in red) shows the mean of assessments when assessments from the home region are removed. The percentage figure noted by each region indicates the percentage of the total number of assessments that are from that region.

Chart 15 | Example: Assessments Compared With The Mean For A Region



North America

- Other than San Francisco and New York, US centres have fallen back in GGFI 9.
- New York rose 8 ranking places to join San Francisco and Los Angeles in the world top 10.
- North American centres were rated significantly above average by people from the Asia/Pacific region and below average by people in all other regions.

Table 10 | North American Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
San Francisco	3	553	3	549	0	4
New York	5	551	13	537	8	14
Los Angeles	10	541	8	542	-2	-1
Washington DC	19	532	15	534	-4	-2
Boston	27	522	25	525	-2	-3
Vancouver	30	519	25	525	-5	-6
Montreal	31	518	25	525	-6	-7
Toronto	37	510	31	522	-6	-12
Chicago	41	506	37	518	-4	-12
Calgary	52	494	46	510	-6	-16

Chart 16 | Top Five North American Centres Ratings Over Time

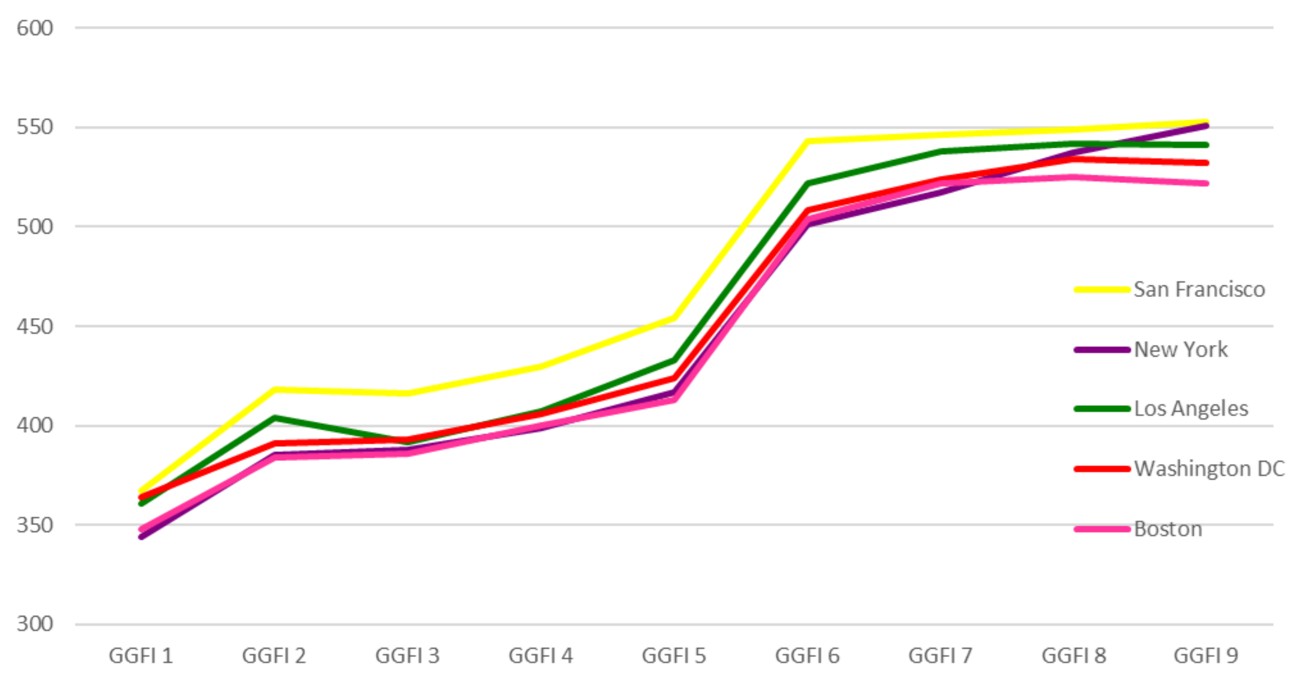


Chart 17 | North American Regional Assessments - Difference From The Mean

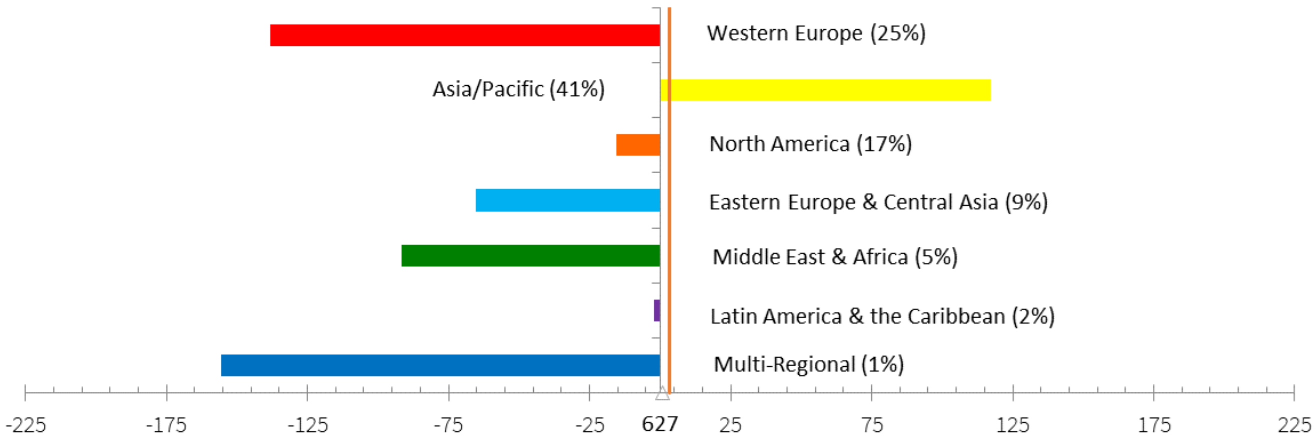


Chart 18 | Regional Assessments For San Francisco - Difference From The Mean

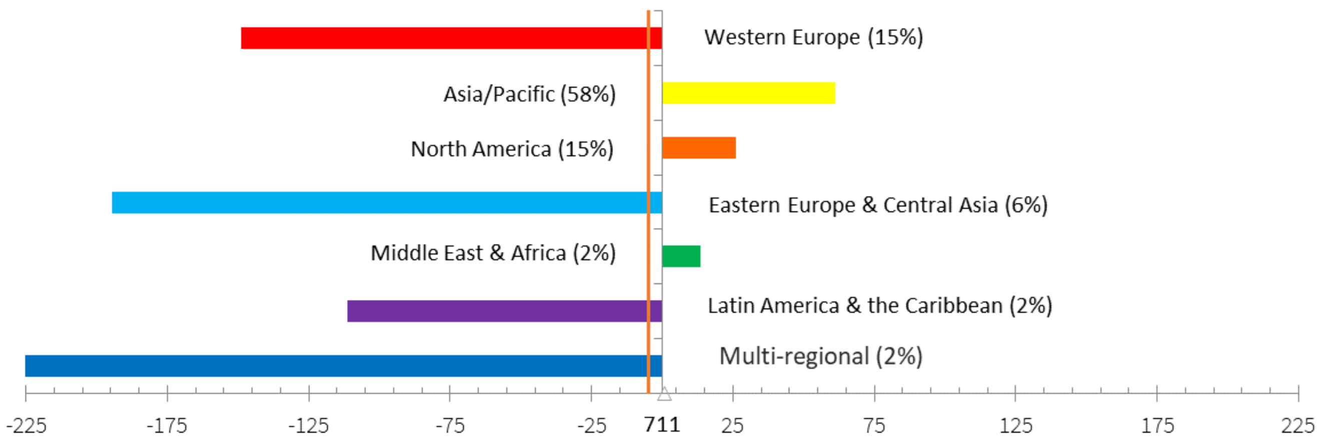
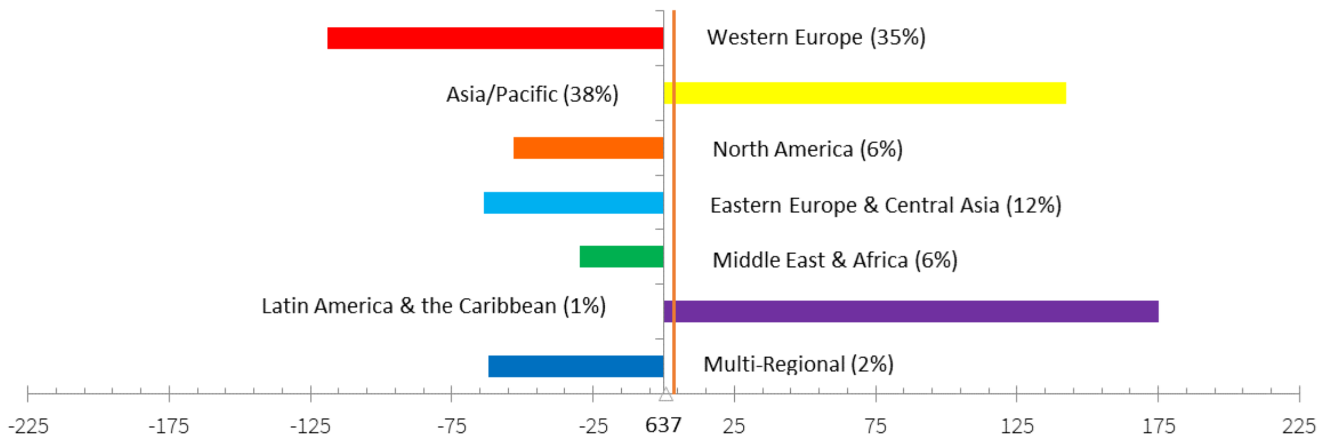


Chart 19 | Regional Assessments For New York - Difference From The Mean



Middle East & Africa

- Abu Dhabi overtook Dubai in GGFI 9 to move into the leading position in the region with Casablanca the leading African centre.
- Respondents from Western Europe, North America, and Latin America & The Caribbean rated Middle East & African centres lower than average.

Table 11 | Middle Eastern & African Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Abu Dhabi	38	509	45	511	7	-2
Dubai	44	502	40	516	-4	-14
Casablanca	46	500	42	514	-4	-14
Mauritius	55	491	58	490	3	1
Tel Aviv	58	483	54	496	-4	-13
Doha	61	479	62	484	1	-5
Johannesburg	64	476	68	474	4	2
Bahrain	68	472	64	482	-4	-10
Cape Town	72	468	67	475	-5	-7
Nairobi	80	452	79	456	-1	-4

Chart 20 | Top Five Middle East & Africa Centre Ratings Over Time

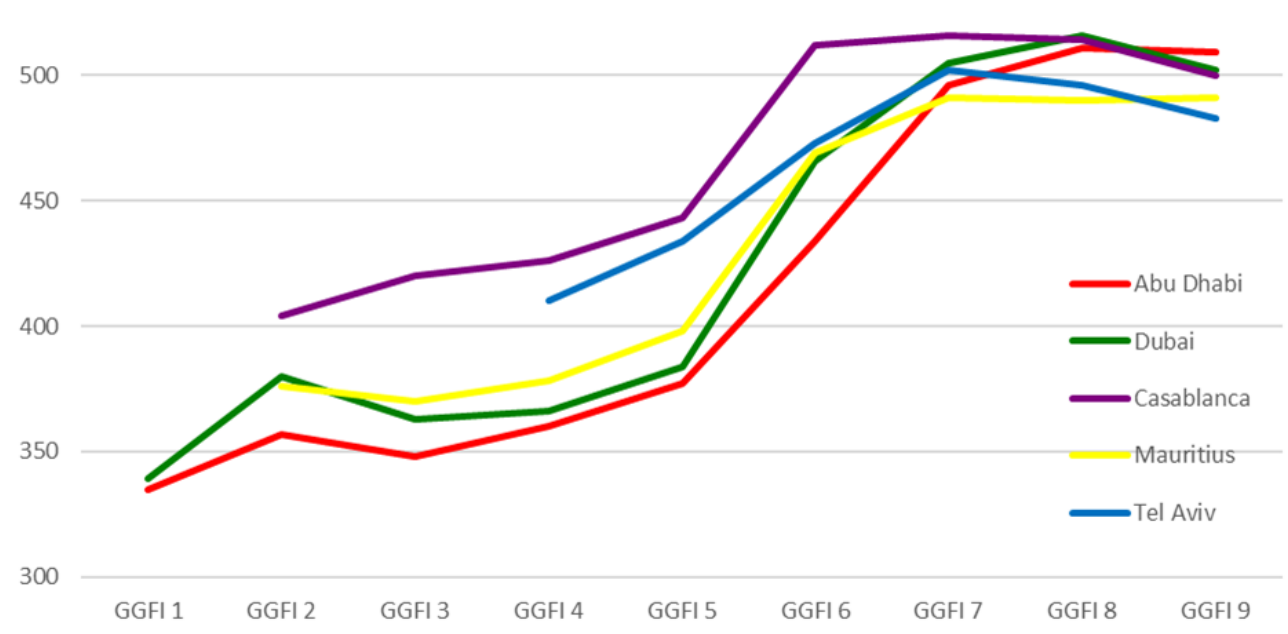


Chart 21 | Middle East & Africa Regional Assessments - Difference From The Mean

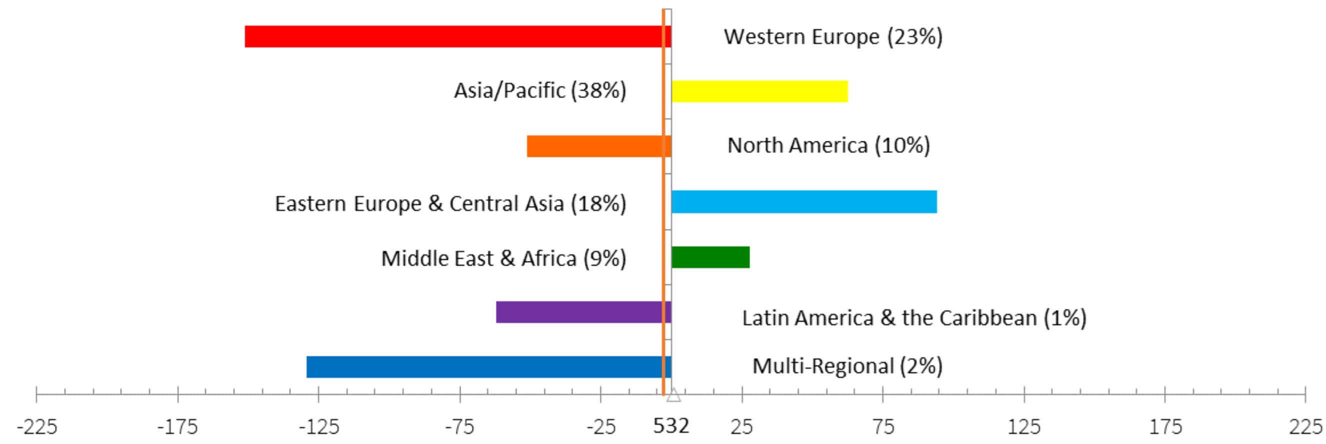


Chart 22 | Regional Assessments For Abu Dhabi - Difference From The Mean

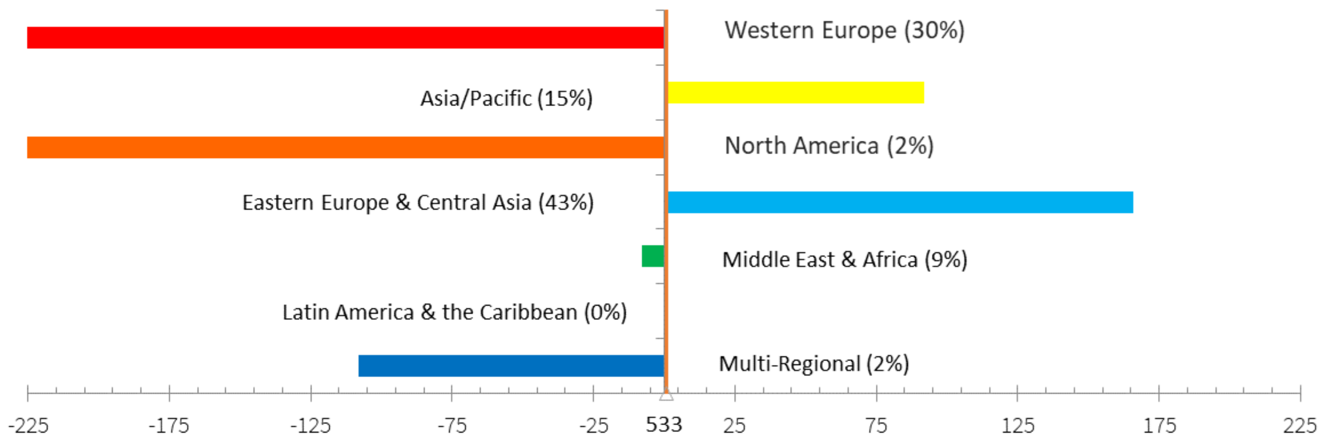
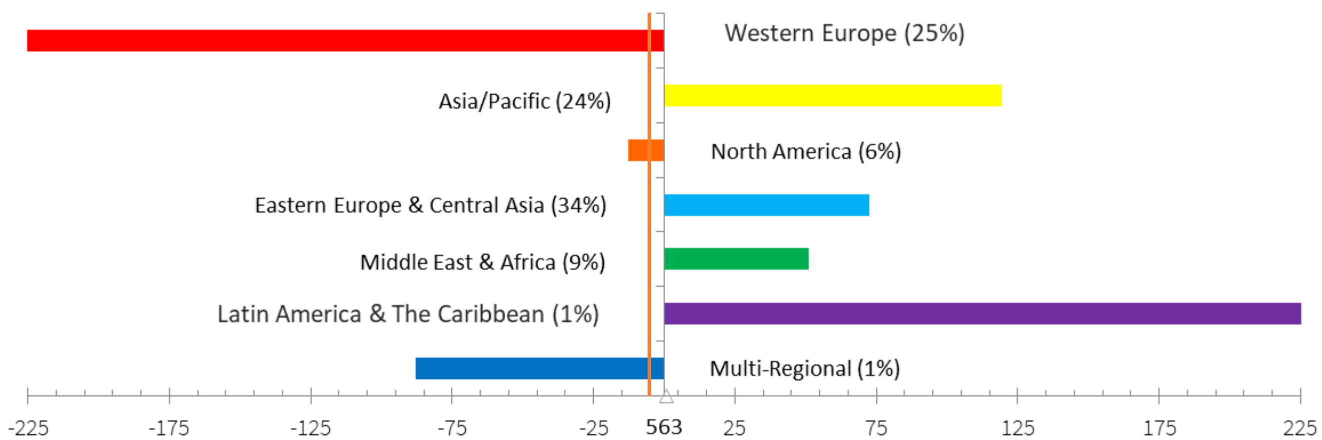


Chart 23 | Regional Assessments For Dubai - Difference From The Mean



Eastern Europe & Central Asia

- Nur-Sultan consolidated its position as the leading green finance centre in the region, ranking 21 places above Warsaw in second place.
- Respondents from Western Europe, North America, and Latin America & The Caribbean rate these centres lower than average while those from all other regions rate them higher than average.

Table 12 | Eastern European & Central Asian Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Nur-Sultan	49	497	52	498	3	-1
Warsaw	70	470	72	468	2	2
Moscow	73	467	70	472	-3	-5
Almaty	74	466	74	466	0	0
Prague	76	464	71	469	-5	-5
Istanbul	79	455	73	467	-6	-12

Chart 24 | Top Five Eastern Europe & Central Asia Centre Ratings Over Time

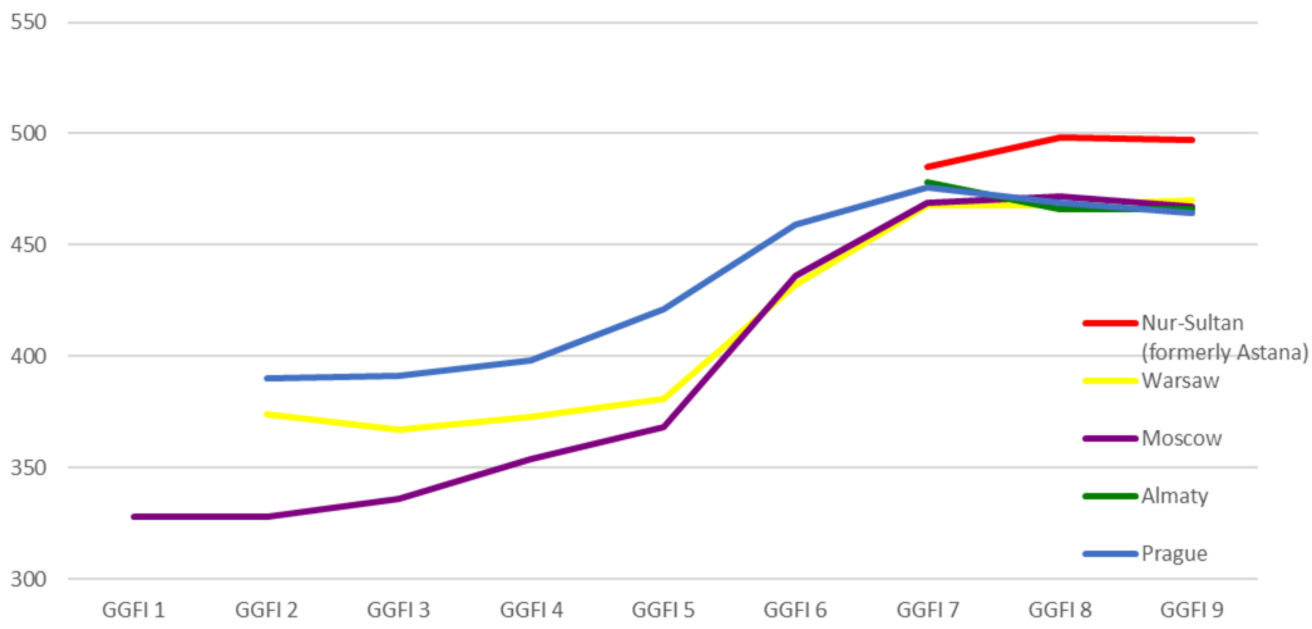


Chart 25 | Eastern Europe & Central Asia Regional Assessments - Difference From The Mean

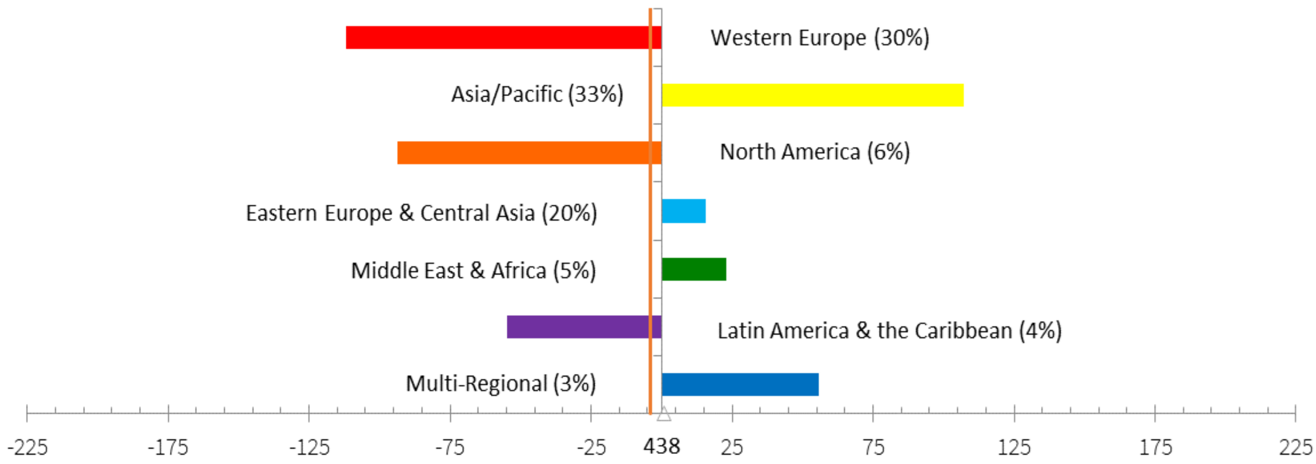


Chart 26 | Regional Assessments For Nur-Sultan - Difference From The Mean

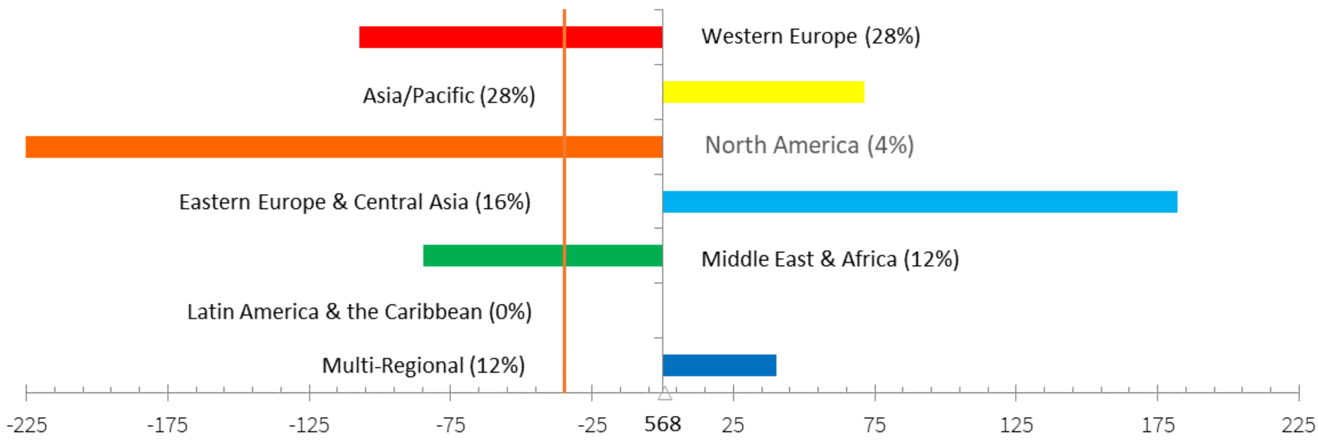
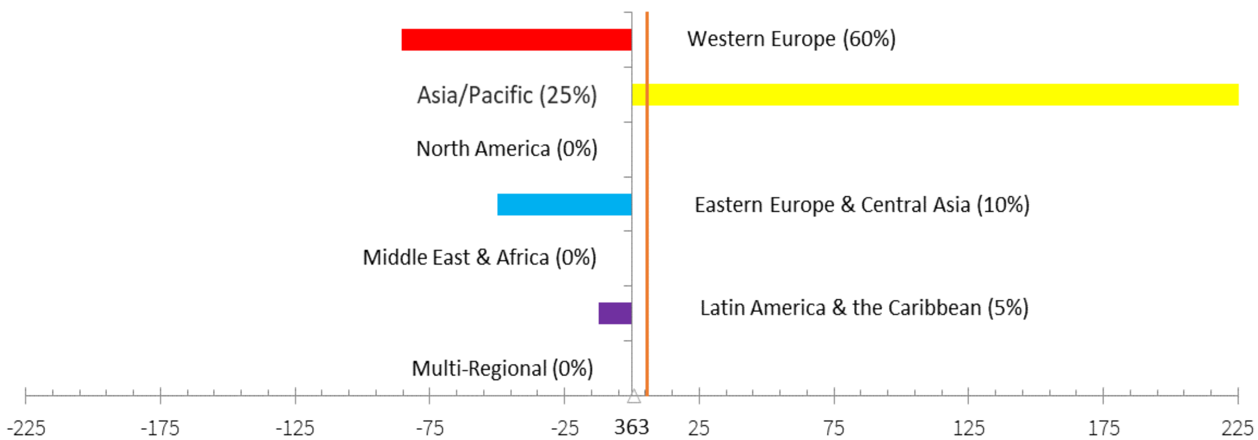


Chart 27 | Regional Assessments For Warsaw - Difference From The Mean



Western Europe

- London and Amsterdam remained in first and second place in GGFI 9 overall. Stockholm overtook Zurich to take the third place in the region.
- Only respondents from Asia/Pacific rated Western European centres higher than average.

Table 13 | Top 15 Western European Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
London	1	586	1	571	0	15
Amsterdam	2	573	2	562	0	11
Stockholm	4	552	7	543	3	9
Zurich	6	548	4	548	-2	0
Luxembourg	7	546	5	545	-2	1
Oslo	8	545	9	541	1	4
Geneva	9	543	6	544	-3	-1
Paris	11	540	10	540	-1	0
Copenhagen	12	539	12	538	0	1
Helsinki	20	531	18	532	-2	-1
Munich	26	524	19	531	-7	-7
Brussels	28	521	23	527	-5	-6
Madrid	29	520	44	512	15	8
Berlin	32	517	21	529	-11	-12
Frankfurt	34	514	34	519	0	-5

Chart 28 | Top Five Western European Centre Ratings Over Time

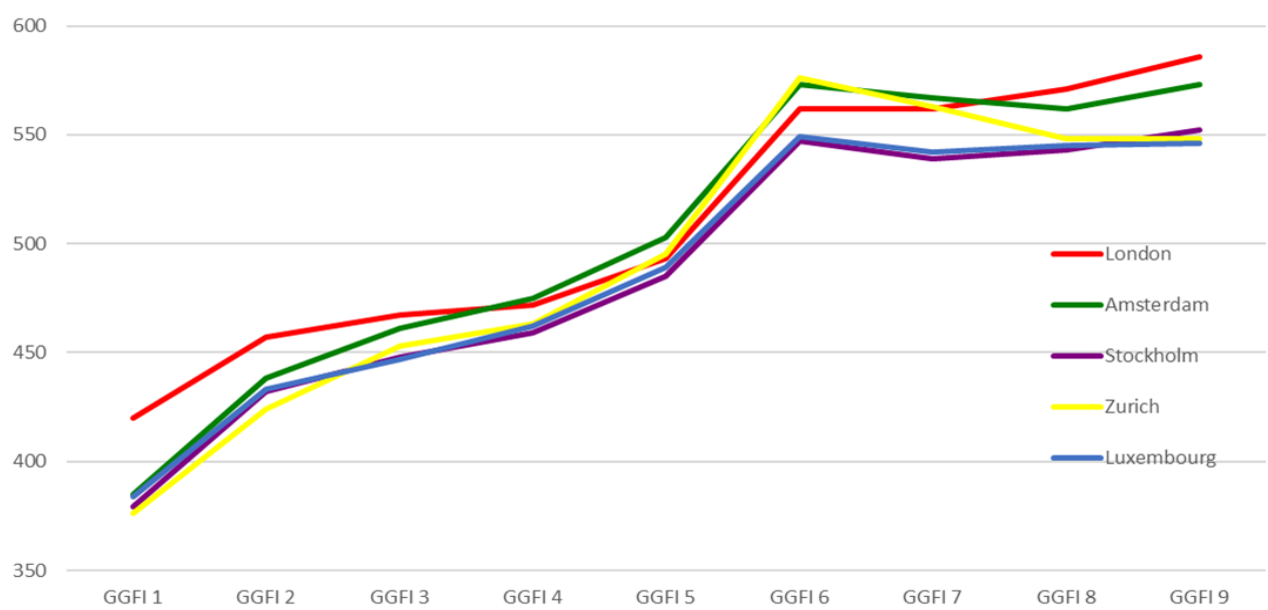


Chart 29 | Western Europe Regional Assessments - Difference From The Mean

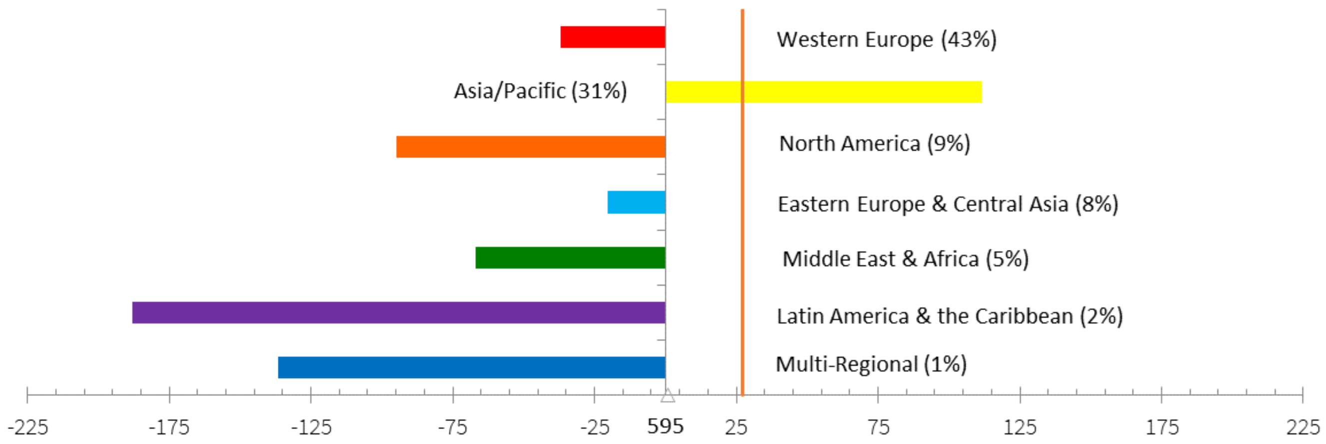


Chart 30 | Regional Assessments For London - Difference From The Mean

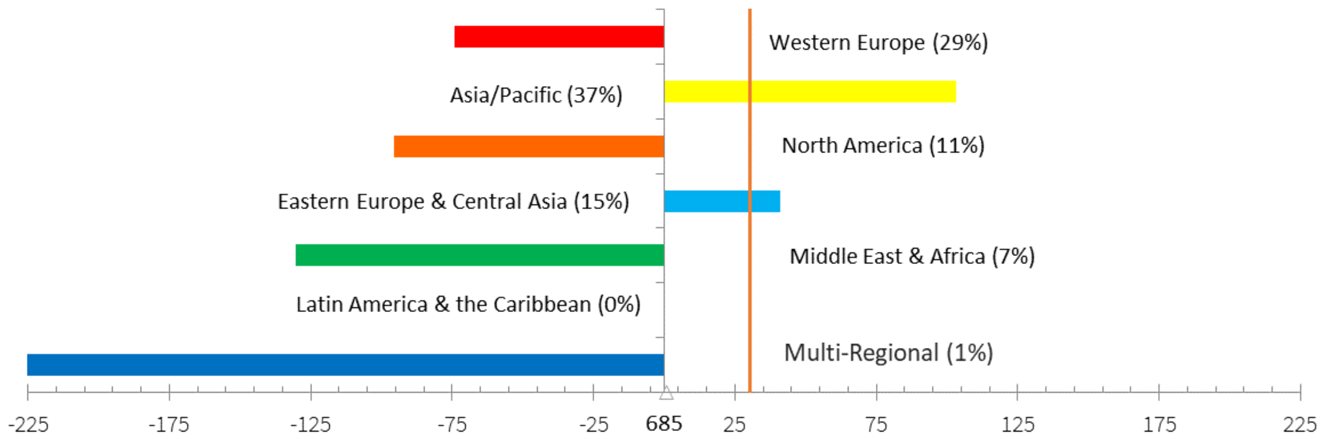
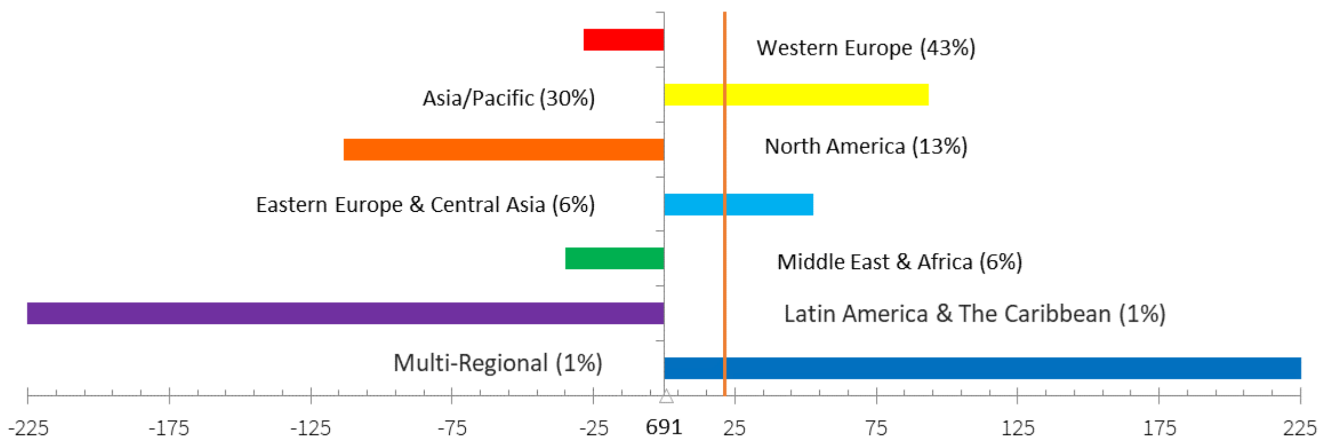


Chart 31 | Regional Assessments For Amsterdam - Difference From The Mean



Latin America & The Caribbean

- Mexico City overtook Sao Paulo to take the leading position in the region.
- Santiago entered the index for the first time, ranking 67th.
- Respondents from Asia/Pacific and Middle East & Africa centres rated centres in this region particularly highly.

Table 14 | Latin American & Caribbean Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Mexico City	62	478	68	474	6	4
Sao Paulo	66	474	65	480	-1	-6
Santiago	67	473	New	New	New	New
British Virgin Islands	69	471	76	464	7	7
Rio de Janeiro	75	465	75	465	0	0
Cayman Islands	78	456	77	458	-1	-2
Bermuda	81	442	80	441	-1	1

Chart 32 | Top Five Latin American & Caribbean Centre Ratings Over Time

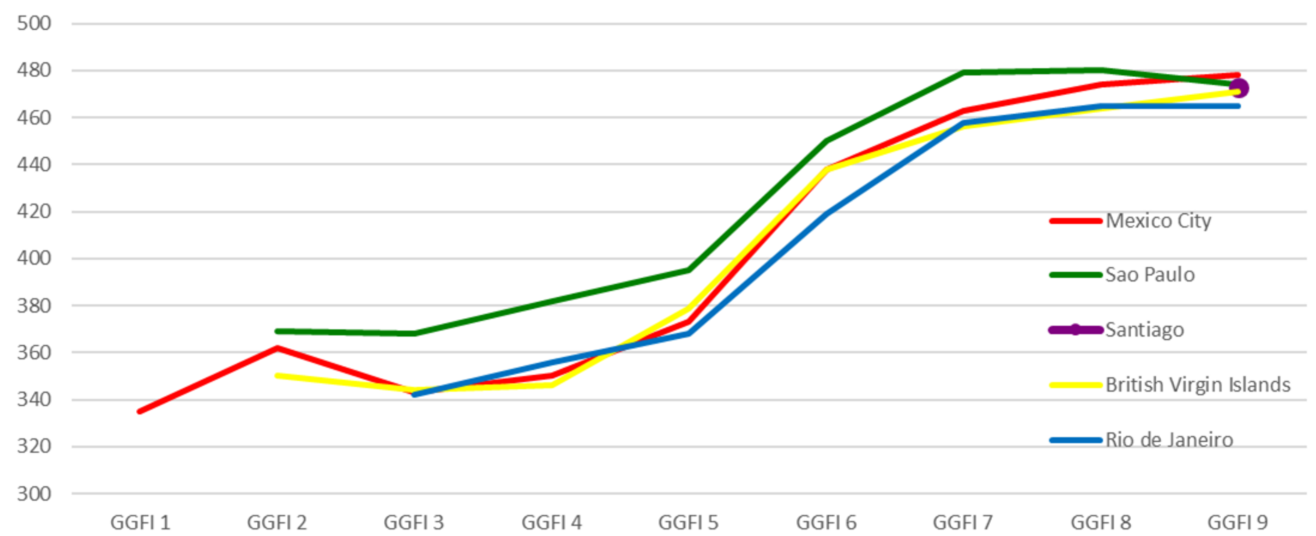


Chart 33 | Latin America & The Caribbean Regional Assessments - Difference From The Mean

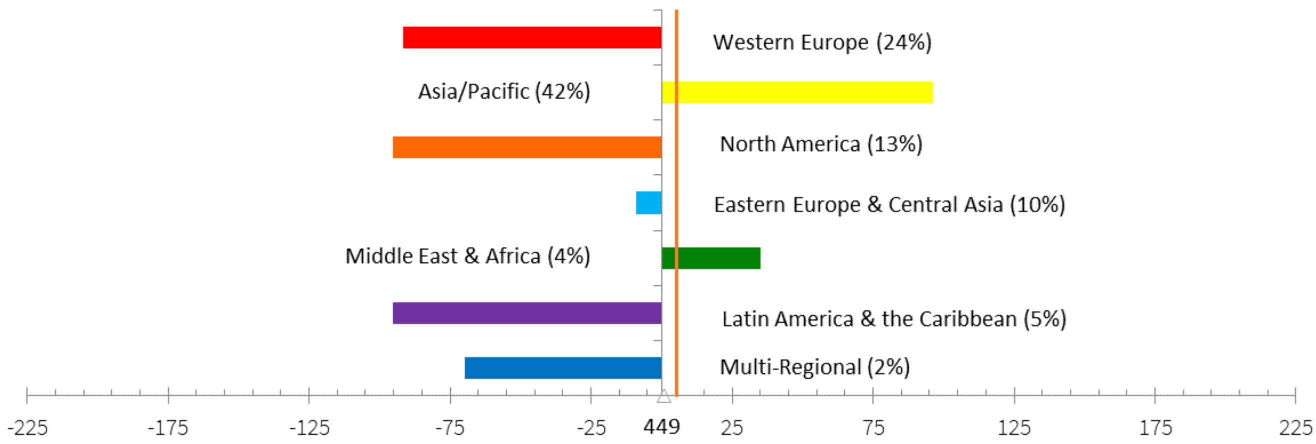


Chart 34 | Regional Assessments For Mexico City - Difference From The Mean

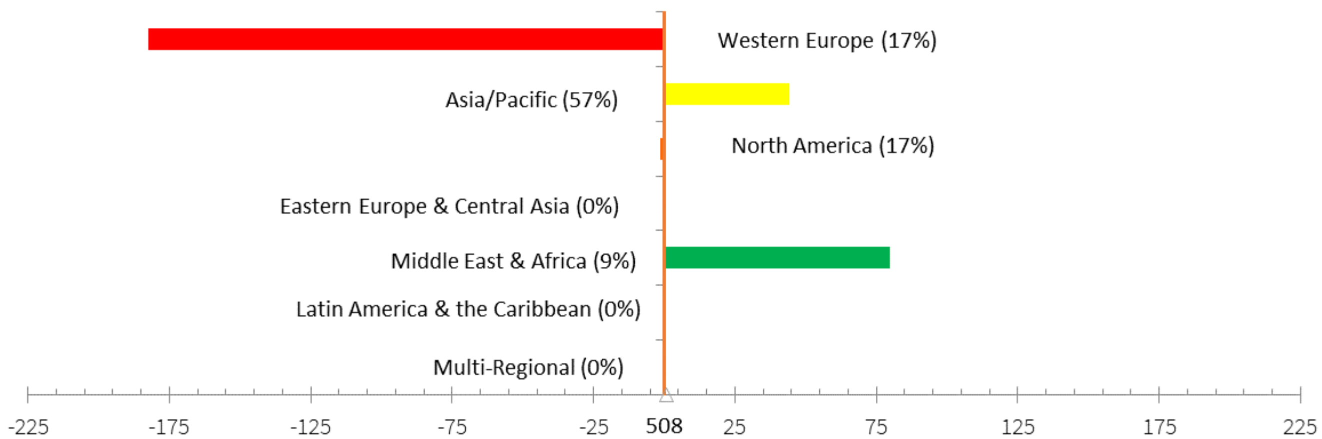
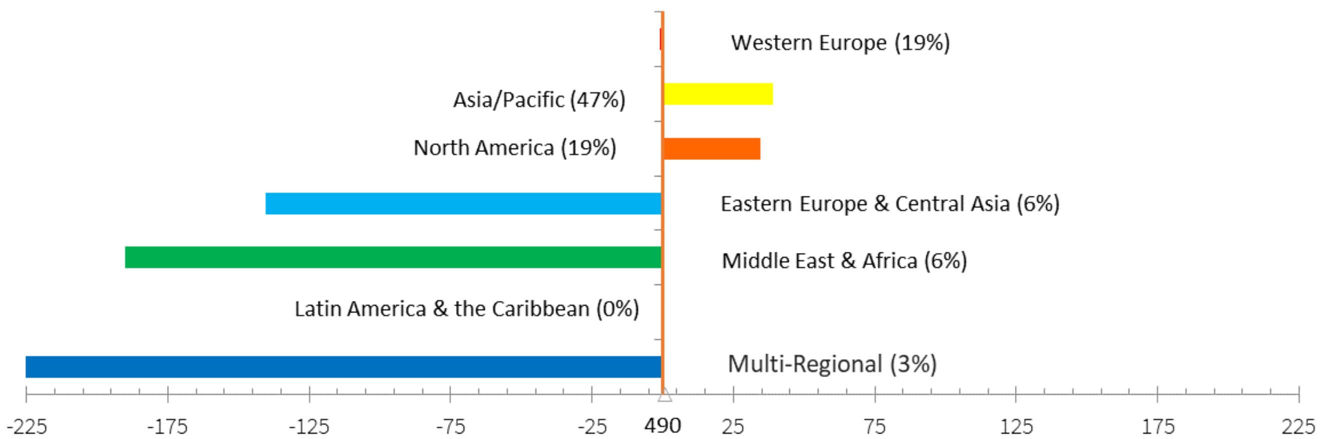


Chart 35 | Regional Assessments For Sao Paulo - Difference From The Mean



Asia/Pacific

- Sydney overtook Beijing in this edition of the index, with Wellington and Melbourne also improving their ranking significantly.
- Beijing took second place in the region, with Seoul rising to take third place in Asia/Pacific.
- Respondents from Asia/Pacific and Latin America & The Caribbean rated these centres above average, with other regions rating them lower than average.

Table 15 | Top 15 Asia/Pacific Centres In GGFI 9

Centre	GGFI 9		GGFI 8		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Sydney	13	538	20	530	7	8
Beijing	14	537	11	539	-3	-2
Seoul	15	536	16	533	1	3
Singapore	16	535	16	533	0	2
Wellington	17	534	24	526	7	8
Shanghai	18	533	14	536	-4	-3
Shenzhen	21	530	28	524	7	6
Busan	22	528	28	524	6	4
Guangzhou	23	527	30	523	7	4
Melbourne	24	526	37	518	13	8
Tokyo	25	525	22	528	-3	-3
Qingdao	33	516	34	519	1	-3
Osaka	36	511	32	521	-4	-10
Hong Kong	39	508	41	515	2	-7
GIFT City-Gujarat	48	498	47	509	-1	-11

Chart 36 | Top Five Asia/Pacific Centre Ratings Over Time

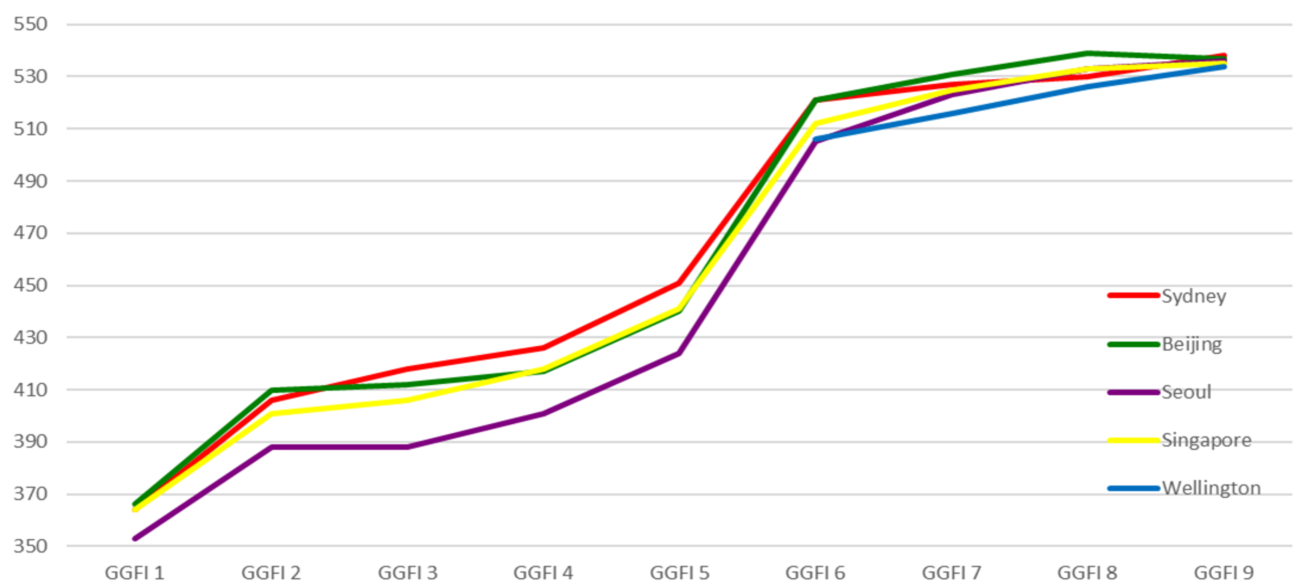


Chart 37 | Asia/Pacific Regional Assessments - Difference From The Mean

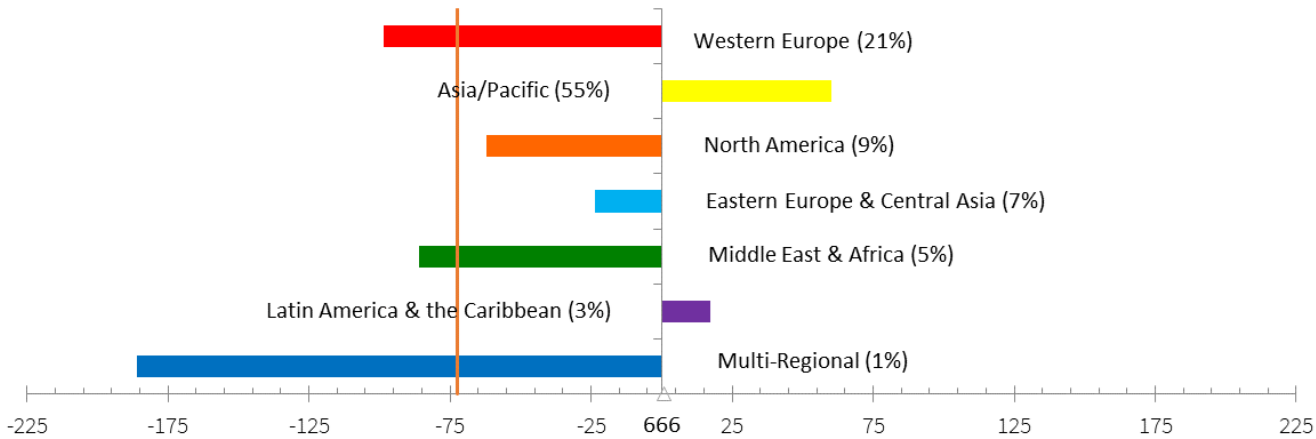


Chart 38 | Regional Assessments For Sydney - Difference From The Mean

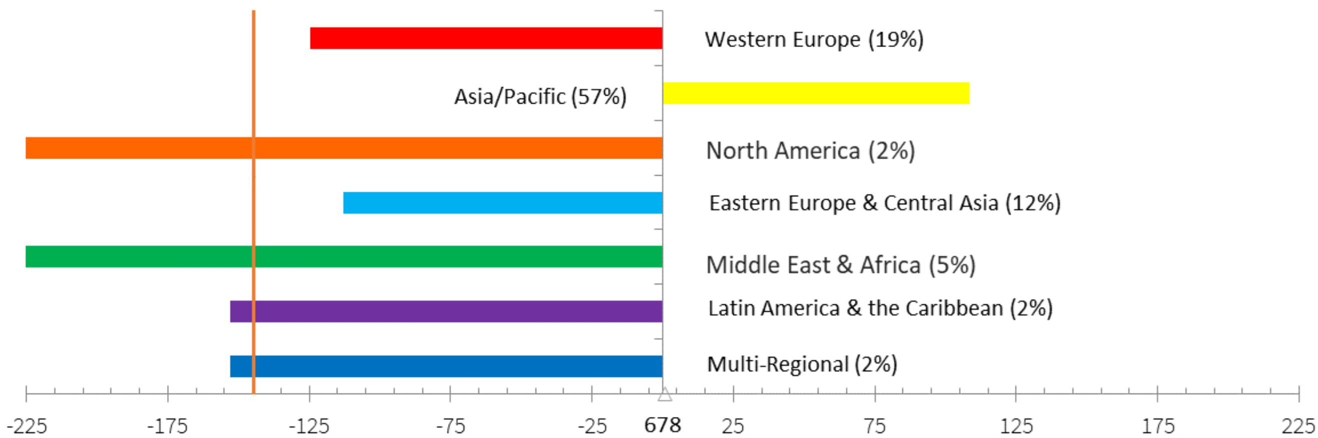
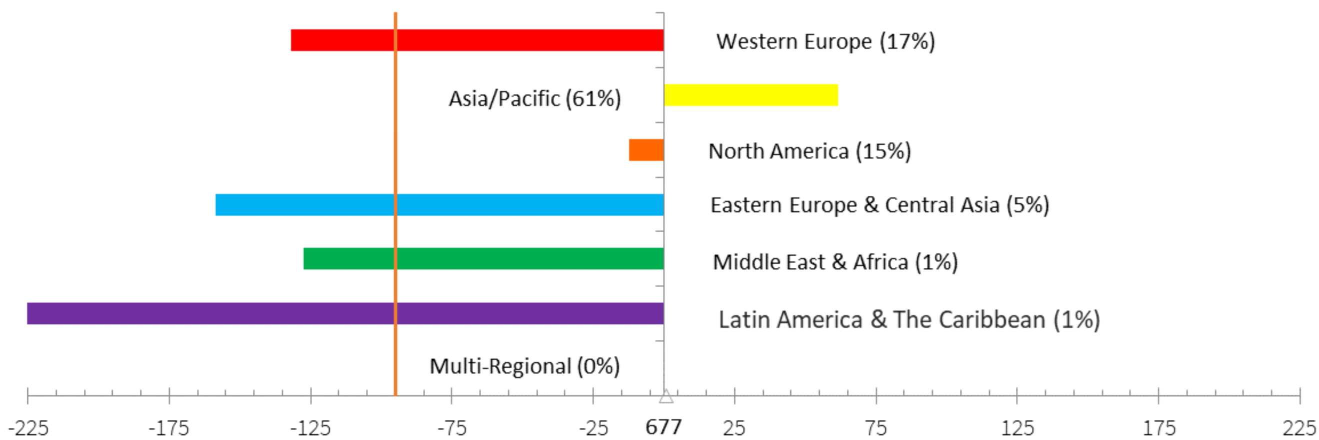


Chart 39 | Regional Assessments For Beijing - Difference From The Mean



Industry Sectors

We can analyse the differing assessments provided by respondents working in various industry sectors by building the index separately using the responses provided only from those industries. This analysis allows a relative measure of the sectoral strengths and weaknesses for each centre.

Table 16 illustrates separate sub-indices for the Policy, Knowledge (incorporating universities and NGOs), Banking, Investment, and Trading sectors. The table shows how the index ranking varies according to industry sector. The leading centres in the index generally feature in the higher ranks of the industry sector sub-indices, although there are interesting strengths and weaknesses. For example, while Zurich comes top in the banking sub-index, London does not appear in the top 15 in this measure.

Table 16 | GGFI 9 Industry Sector Sub-Indices - Top 15

Rank	Industry Sub-Sector				
	Policy	Knowledge	Banking	Investment	Trading
1	London	London	Zurich	London	New York
2	Zurich	Amsterdam	Los Angeles	Amsterdam	Los Angeles
3	Geneva	New York	Shanghai	Geneva	San Francisco
4	Luxembourg	San Francisco	Geneva	Singapore	Washington DC
5	Amsterdam	Copenhagen	Beijing	Luxembourg	Beijing
6	Singapore	Seoul	Sydney	Zurich	Shenzhen
7	Berlin	Paris	Washington DC	Beijing	Shanghai
8	Oslo	Shenzhen	San Francisco	San Francisco	Boston
9	Paris	Los Angeles	Singapore	Seoul	Guangzhou
10	Stockholm	Zurich	New York	Shanghai	London
11	Copenhagen	Stockholm	Seoul	Boston	Paris
12	Munich	Luxembourg	Shenzhen	Sydney	Amsterdam
13	New York	Sydney	Stockholm	Busan	Luxembourg
14	Sydney	Berlin	Boston	Stockholm	Geneva
15	Madrid	Washington DC	Amsterdam	Wellington	Edinburgh

“There is a shortage of Green Finance experts, if not in its finance aspect then in terms of technical expertise in environmental regulations and standards, carbon calculations, and industrial transformation ecosystems, as well as modelling skills required to translate climate/environmental inputs into ready tools for risk management and strategy."

Senior Economist, Green Finance Centre, Nur-Sultan

Taking the sectoral analysis further, we can also calculate the index using the responses only from those working directly in green finance in financial services organisations. The results are shown in table 17.

Table 17 | GGFI 9 Using Responses Only From Respondents Working Directly In Green Finance

Centre	Rating	Adjusted Rank	GGFI 9 Rank	Difference
London	570	1	1	0
Amsterdam	561	2	2	0
Geneva	548	3	9	6
Singapore	540	4	16	12
Luxembourg	538	5	7	2
Zurich	535	6	6	0
Beijing	534	7	14	7
San Francisco	533	8	3	-5
Seoul	532	9	15	6
Shanghai	531	10	18	8
Boston	530	11	27	16
Sydney	529	12	13	1
Busan	528	13	22	9
Stockholm	527	14	4	-10
Wellington	526	15	17	2
Copenhagen	525	16	12	-4
Tokyo	524	17	25	8
Oslo	523	18	8	-10
Los Angeles	523	18	10	-8
Melbourne	523	18	24	6
Helsinki	522	21	20	-1
Osaka	522	21	36	15
Abu Dhabi	522	21	38	17
Dubai	522	21	44	23
Chicago	520	25	41	16
New York	519	26	5	-21
Washington DC	519	26	19	-7
Brussels	519	26	28	2
Casablanca	519	26	46	20
Mauritius	519	26	55	29
Shenzhen	518	31	21	-10
Edinburgh	518	31	35	4
Dublin	518	31	43	12
Vienna	518	31	47	16
Kuala Lumpur	518	31	50	19
Jakarta	518	31	56	25
Doha	518	31	61	30
Paris	517	38	11	-27
Munich	517	38	26	-12
Madrid	517	38	29	-9
Montreal	516	41	31	-10

Centre	Rating	Adjusted Rank	GGFI 9 Rank	Difference
Nur-Sultan	516	41	49	8
Milan	516	41	54	13
Bahrain	516	41	68	27
Guangzhou	515	45	23	-22
Vancouver	515	45	30	-15
Frankfurt	515	45	34	-11
Lisbon	515	45	42	-3
Tel Aviv	515	45	58	13
Bangkok	515	45	59	14
Hamburg	514	51	40	-11
GIFT City-Gujarat	514	51	48	-3
Hong Kong	513	53	39	-14
British Virgin Islands	513	53	69	16
Johannesburg	512	55	64	9
Almaty	512	55	74	19
Toronto	511	57	37	-20
Calgary	511	57	52	-5
Jersey	511	57	57	0
Mexico City	511	57	62	5
Berlin	510	61	32	-29
Rome	509	62	45	-17
Glasgow	509	62	51	-11
Guernsey	509	62	53	-9
Mumbai	509	62	63	1
Malta	509	62	65	3
Prague	509	62	76	14
Santiago	508	68	67	-1
Cape Town	508	68	72	4
Nairobi	508	68	80	12
Qingdao	507	71	33	-38
Istanbul	507	71	79	8
Sao Paulo	506	73	66	-7
Isle of Man	504	74	77	3
Liechtenstein	503	75	60	-15
Warsaw	503	75	70	-5
Rio de Janeiro	503	75	75	0
Cayman Islands	503	75	78	3
Moscow	501	79	73	-6
Bermuda	495	80	81	1
New Delhi	493	81	71	-10

GGFI 9 Interest, Impact, And Drivers Of Green Finance

In addition to requesting ratings of depth and quality for financial centres, the GGFI questionnaire asks additional questions concerning the development of green finance. Amongst the topics covered are:

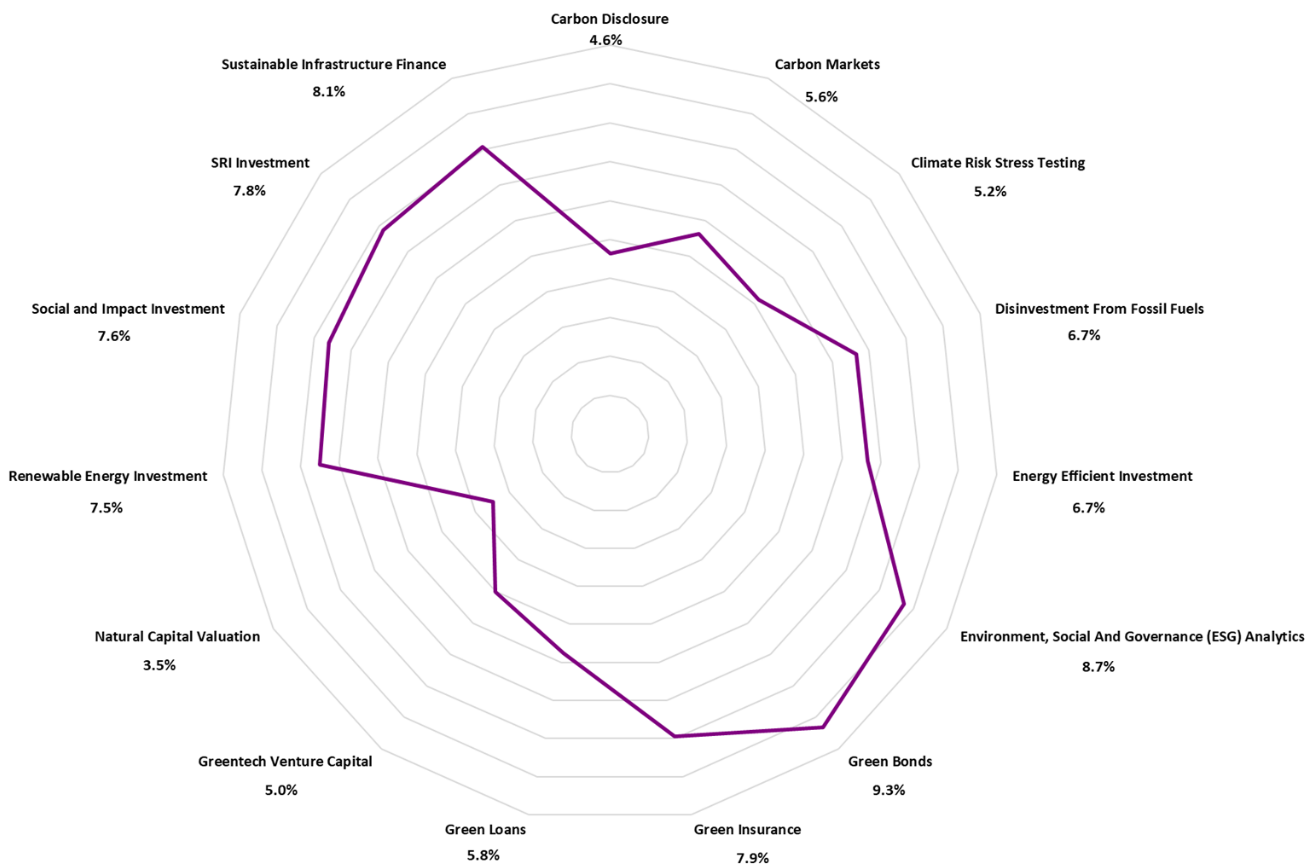
- The areas of green finance considered most interesting by respondents;
- The areas of green finance which respondents consider to have the greatest impact on sustainability; and
- Factors driving the development of green finance.

Areas Of Interest In Green Finance And Areas With The Most Impact

We asked respondents to identify the areas of green finance which they considered most interesting and separately the areas of green finance that they consider have most impact on sustainability. The results are shown in Charts 40 and 41.

With respect to interest, the leading areas remain Green Bonds, ESG Analytics, and Sustainable Infrastructure Finance as in GGFI 8. This mirrors the increased volumes of activity in these areas. The area considered least interesting remains natural capital valuation, which is likely to reflect the lack of products which relate to this area of finance.

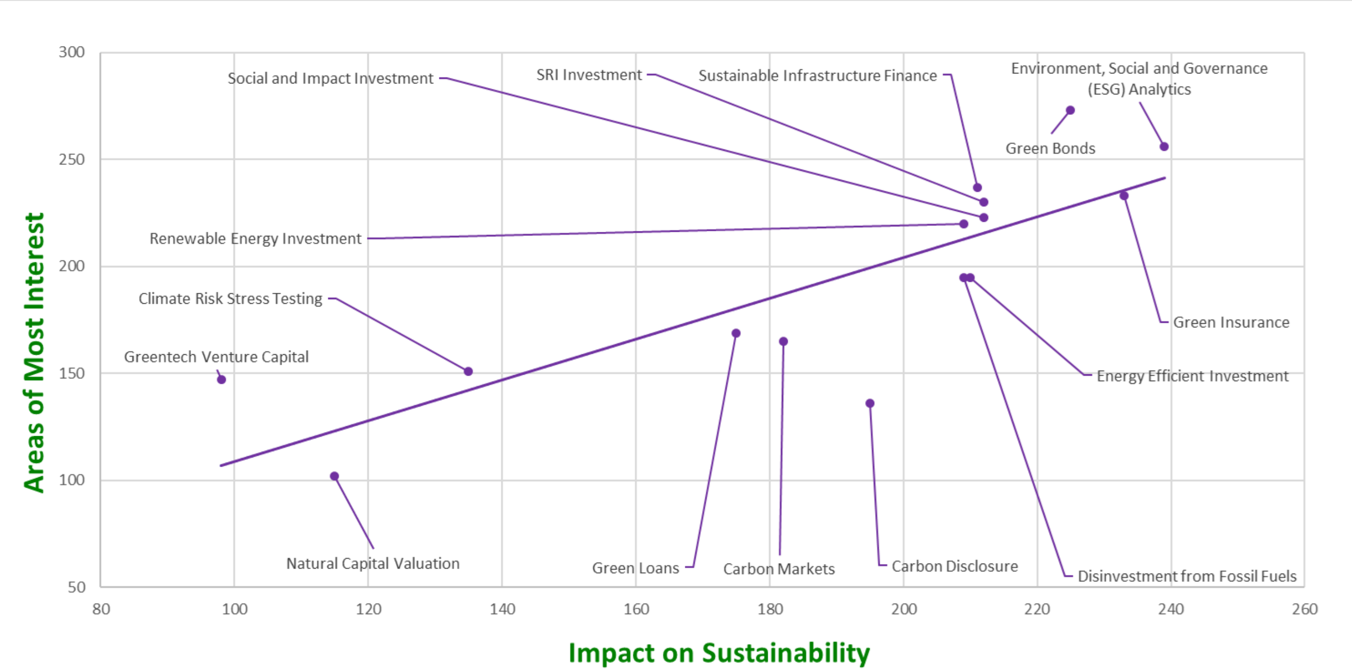
Chart 40 | Interest - Percentage Of Total Mentions



With respect to impact, ESG Analytics, Green Insurance, and Green Bonds are rated as the areas of green finance with the most impact. Natural Capital Valuation and GreenTech Venture Capital are ranked lowest on this measure by our respondents.

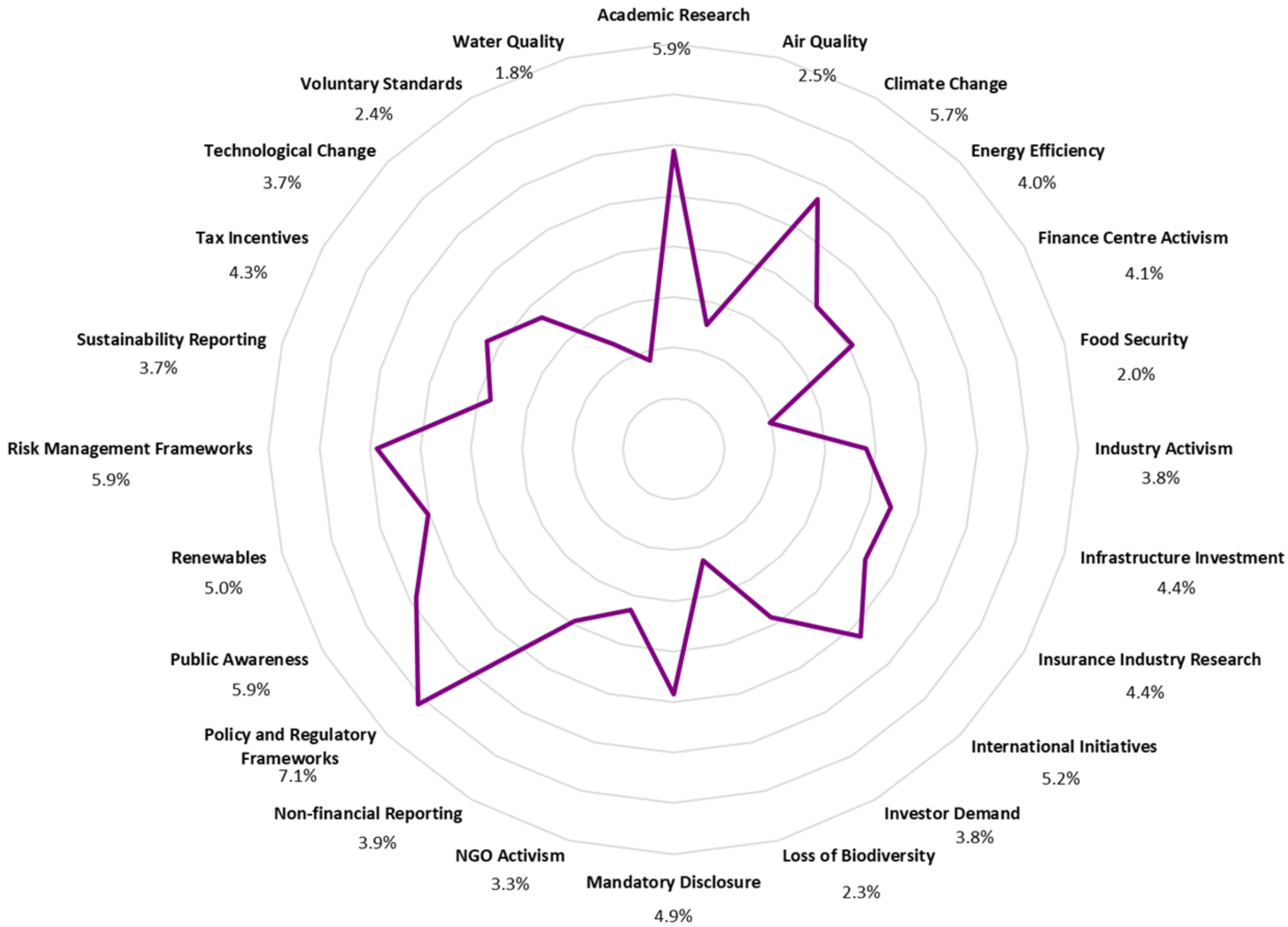
Chart 41 | Impact - Percentage Of Total Mentions

Chart 42 | The Correlation Between Interest And Impact



With respect to drivers, Policy & Regulatory Frameworks continues to be rated as the most important driver of green finance, followed by Academic Research. Risk Management Frameworks and Public Awareness have overtaken Climate Change in the ranking in GGFI 9. Food Security and Water Quality continue to rank lowest. These results underline the continuing importance of policy and regulation in the development of green finance.

Chart 43 | Drivers - Percentage Of Total Mentions



Appendix 1: Assessment Details

Table 18 | Details Of GGFI 9 Assessments By Centre

Centre	GGFI 9		Assessments		
	Rank	Rating	Number	Average	Std Dev
London	1	586	169	685	201
Amsterdam	2	573	70	691	202
San Francisco	3	553	53	711	211
Stockholm	4	552	50	589	223
New York	5	551	172	637	228
Zurich	6	548	74	619	263
Luxembourg	7	546	61	613	228
Oslo	8	545	17	641	184
Geneva	9	543	46	609	241
Los Angeles	10	541	44	684	214
Paris	11	540	91	611	200
Copenhagen	12	539	25	638	192
Sydney	13	538	42	678	198
Beijing	14	537	158	677	230
Seoul	15	536	43	645	229
Singapore	16	535	93	616	219
Wellington	17	534	20	684	218
Shanghai	18	533	185	628	211
Washington DC	19	532	67	662	184
Helsinki	20	531	27	644	154
Shenzhen	21	530	94	657	186
Busan	22	528	29	753	211
Guangzhou	23	527	103	693	200
Melbourne	24	526	25	695	233
Tokyo	25	525	74	625	273
Munich	26	524	25	587	220
Boston	27	522	44	641	258
Brussels	28	521	48	611	221
Madrid	29	520	35	560	226
Vancouver	30	519	30	608	226
Montreal	31	518	24	540	258
Berlin	32	517	37	576	193
Qingdao	33	516	200	801	138
Frankfurt	34	514	75	554	226
Edinburgh	35	513	43	596	247
Osaka	36	511	26	674	259
Toronto	37	510	42	543	248
Abu Dhabi	38	509	47	533	261
Hong Kong	39	508	106	553	269
Hamburg	40	507	37	633	216
Chicago	41	506	41	570	221
Lisbon	42	505	22	622	225
Dublin	43	503	32	512	225
Dubai	44	502	100	563	248
Rome	45	501	40	544	201
Casablanca	46	500	19	671	176
Vienna	47	499	22	465	197
GIFT City-Gujarat	48	498	201	793	202
Nur-Sultan	49	497	25	568	231
Kuala Lumpur	50	496	21	600	209
Glasgow	51	495	28	498	257
Calgary	52	494	21	523	265
Guernsey	53	493	24	591	266
Milan	54	492	26	482	205
Mauritius	55	491	33	553	175
Jakarta	56	485	12	619	205
Jersey	57	484	21	521	263
Tel Aviv	58	483	23	502	241
Bangkok	59	481	17	482	215
Liechtenstein	60	480	15	520	186
Doha	61	479	17	506	198
Mexico City	62	478	23	508	198
Mumbai	63	477	29	366	288
Johannesburg	64	476	17	506	179
Malta	65	475	22	417	185
Sao Paulo	66	474	36	490	197
Santiago	67	473	25	458	185
Bahrain	68	472	22	460	237
British Virgin Islands	69	471	27	467	227
Warsaw	70	470	20	363	216
New Delhi	71	469	29	348	293
Cape Town	72	468	22	492	172
Moscow	73	467	72	454	199
Almaty	74	466	35	420	251
Rio de Janeiro	75	465	20	440	172
Prague	76	464	24	427	204
Isle of Man	77	457	13	444	242
Cayman Islands	78	456	28	371	215
Istanbul	79	455	25	403	218
Nairobi	80	452	27	469	172
Bermuda	81	442	21	369	150

Table 19 | Details Of Assessments Of GGFI Dimensions By Centre

Centre	Overall Rank	Depth Rating	Quality Rating
London	1	289	297
Amsterdam	2	284	289
San Francisco	3	277	276
Stockholm	4	274	278
New York	5	275	276
Zurich	6	269	279
Luxembourg	7	272	274
Oslo	8	274	271
Geneva	9	269	274
Los Angeles	10	267	274
Paris	11	269	271
Copenhagen	12	265	274
Sydney	13	260	278
Beijing	14	261	276
Seoul	15	268	268
Singapore	16	262	273
Wellington	17	266	268
Shanghai	18	266	267
Washington DC	19	268	264
Helsinki	20	265	266
Shenzhen	21	265	265
Busan	22	265	263
Guangzhou	23	257	270
Melbourne	24	253	273
Tokyo	25	263	262
Munich	26	257	267
Boston	27	261	261
Brussels	28	261	260
Madrid	29	261	259
Vancouver	30	256	263
Montreal	31	250	268
Berlin	32	257	260
Qingdao	33	259	257
Frankfurt	34	256	258
Edinburgh	35	254	259
Osaka	36	261	250
Toronto	37	254	256
Abu Dhabi	38	251	258
Hong Kong	39	252	256
Hamburg	40	254	253

Centre	Overall Rank	Depth Rating	Quality Rating
Chicago	41	254	252
Lisbon	42	256	249
Dublin	43	249	254
Dubai	44	250	252
Rome	45	249	252
Casablanca	46	253	247
Vienna	47	248	251
GIFT City-Gujarat	48	245	253
Nur-Sultan	49	249	248
Kuala Lumpur	50	250	246
Glasgow	51	241	254
Calgary	52	240	254
Guernsey	53	245	248
Milan	54	243	249
Mauritius	55	244	247
Jakarta	56	244	241
Jersey	57	239	245
Tel Aviv	58	243	240
Bangkok	59	236	245
Liechtenstein	60	232	248
Doha	61	238	241
Mexico City	62	236	242
Mumbai	63	238	239
Johannesburg	64	235	241
Malta	65	231	244
Sao Paulo	66	230	244
Santiago	67	236	237
Bahrain	68	226	246
British Virgin Islands	69	226	245
Warsaw	70	232	238
New Delhi	71	226	243
Cape Town	72	234	234
Moscow	73	229	238
Almaty	74	231	235
Rio de Janeiro	75	232	233
Prague	76	226	238
Isle of Man	77	226	231
Cayman Islands	78	226	230
Istanbul	79	226	229
Nairobi	80	221	231
Bermuda	81	216	226

Appendix 2: Interest, Impact, And Drivers Details

Table 20 | Areas Of Green Finance Of Most Interest To Respondents

Area of Green Finance	Number Of Mentions	Percentage Of Total
Green Bonds	273	9.3%
Environment, Social And Governance (ESG) Analytics	256	8.7%
Sustainable Infrastructure Finance	237	8.1%
Green Insurance	233	7.9%
SRI Investment	230	7.8%
Social And Impact Investment	223	7.6%
Renewable Energy Investment	220	7.5%
Energy Efficient Investment	195	6.7%
Disinvestment From Fossil Fuels	195	6.7%
Green Loans	169	5.8%
Carbon Markets	165	5.6%
Climate Risk Stress Testing	151	5.2%
Greentech Venture Capital	147	5.0%
Carbon Disclosure	136	4.6%
Natural Capital Valuation	102	3.5%
Totals	**2,932**	**100.00%**

Table 21 | Areas Of Green Finance With The Greatest Impact

Area of Green Finance	Number Of Mentions	Percentage Of Total
Environment, Social And Governance (ESG) Analytics	239	8.4%
Green Insurance	233	8.1%
Green Bonds	225	7.9%
SRI Investment	212	7.4%
Social And Impact Investment	212	7.4%
Sustainable Infrastructure	211	7.4%
Energy Efficient Investment	210	7.3%
Disinvestment From Fossil Fuels	209	7.3%
Renewable Energy Investment	209	7.3%
Carbon Disclosure	195	6.8%
Carbon Markets	182	6.4%
Green Loans	175	6.1%
Climate Risk Stress Testing	135	4.7%
Natural Capital Valuation	115	4.0%
Greentech Venture Capital	98	3.4%
Totals	**2,860**	**100.0%**

Table 22 | Drivers Of Green Finance

Driver	Number of Mentions	Percentage Of Total
Policy And Regulatory Frameworks	206	7.1%
Academic Research	170	5.9%
Risk Management Frameworks	169	5.9%
Public Awareness	169	5.9%
Climate Change	164	5.7%
International Initiatives	151	5.2%
Renewables	145	5.0%
Mandatory Disclosure	140	4.9%
Infrastructure Investment	128	4.4%
Insurance Industry Research	126	4.4%
Tax Incentives	123	4.3%
Finance Centre Activism	118	4.1%
Energy Efficiency	115	4.0%
Non-financial Reporting	113	3.9%
Investor Demand	111	3.8%
Industry Activism	110	3.8%
Sustainability Reporting	108	3.7%
Technological Change	106	3.7%
NGO Activism	95	3.3%
Air Quality	73	2.5%
Voluntary Standards	69	2.4%
Loss of Biodiversity	66	2.3%
Food Security	57	2.0%
Water Quality	52	1.8%
Totals	**2,884**	**100.0%**

Appendix 3: Respondents' Details

Table 23 | Respondents By Industry Sector

Industry Sector	Number Of Respondents	Percentage Of Respondents
Banking	55	7.36%
Debt Capital Market	55	7.36%
Equity Capital	62	8.30%
Insurance	29	3.88%
Investment	73	9.77%
Knowledge	75	10.04%
Local Green	33	4.42%
Policy and Public	77	10.31%
Professional Services	147	19.68%
Trading	95	12.72%
Other	46	6.16%
Total	**747**	**100.00%**

Table 24 | Respondents By Engagement In Green Finance

Engagement In Green Finance	Number Of Respondents	Percentage Of Respondents
Working Full-time On Green Finance	268	35.88%
Working Part-time On Green Finance	139	18.61%
Interested in Green Finance	301	40.29%
Other/not given	39	5.22%
Total	**747**	**100.00%**

Table 25 | Respondents By Region

Region	Number Of Respondents	Percentage Of Respondents
Asia/Pacific	295	39.49%
Western Europe	194	25.97%
Eastern Europe & Central Asia	107	14.32%
North America	58	7.76%
Middle East & Africa	46	6.16%
Latin America & The Caribbean	39	5.22%
Multi-Regional	8	1.07%
Total	**747**	**100.00%**

Table 26 | Respondents By Size Of Organisation

Size of Organisation	Number Of Respondents	Percentage Of Respondents
<100	314	42.03%
100-500	86	11.51%
500-1000	72	9.64%
1000-2000	64	8.57%
2000-5000	56	7.50%
>5000	102	13.65%
Other/not given	53	7.10%
Total	**747**	**100.00%**

Table 27 | Respondents By Gender

Gender	Number Of Respondents	Percentage Of Respondents
Female	263	35.21%
Male	446	59.71%
Other	2	0.27%
Prefer not to say/not given	36	4.82%
Total	**747**	**100.00%**

Table 28 | Respondents By Age

Age Band	Number Of Respondents	Percentage Of Respondents
18-30	282	37.75%
30-45	240	32.13%
45-60	132	17.67%
60+	60	8.03%
Other/not given	33	4.42%
Total	**747**	**100.00%**

Appendix 4: Methodology

The GGFI provides ratings of the green finance offering of financial centres. The process involves taking two sets of ratings – one from survey respondents and one generated by a statistical model – and combining them into a single ranking.

For the first set of ratings, the financial centre assessments, respondents use an online questionnaire to rate the depth and quality of each financial centre's green finance offering, using a 10 point scale ranging from little depth/very poor to mainstream/excellent. Responses are sought from a range of individuals drawn from the financial services sector, non-governmental organisations, regulators, universities, and trade bodies.

For the second set of ratings, we use a database of indicators, or Instrumental Factors, that contains quantitative data about each financial centre. We use a machine learning algorithm to investigate the correlation between the financial centre assessments and these Instrumental Factors to predict how each respondent would have rated the financial centres they do not know. These 147 instrumental factors draw on data from a range of different sources covering sustainability, business, human capital, and infrastructure, including telecommunications and public transport. A full list of the instrumental factors used in the model is in Appendix 5.

The respondents' actual ratings as well as their predicted ratings for the centres they did not rate, are then combined into a single table to produce the ranking. We add the results for depth and quality to produce the GGFI.

Factors Affecting The Inclusion Of Centres In The GGFI

The questionnaire lists a total of 126 financial centres which can be rated by respondents. The questionnaire also asks whether there are financial centres that will improve their green finance offering significantly over the next two to three years. Centres which are not currently within the questionnaire and which receive a number of mentions in response to this question will be added to the questionnaire for future editions.

We give a financial centre a GGFI rating and ranking if it receives a statistically significant minimum number of assessments from individuals based in other geographical locations - at least 25 in GGFI 9. This means that not all 126 centres in the questionnaire receive a ranking.

We will also develop rules as successive indices are published as to when a centre may be removed from the rankings, for example, if over a 24 month period, a centre has not received a minimum number of assessments.

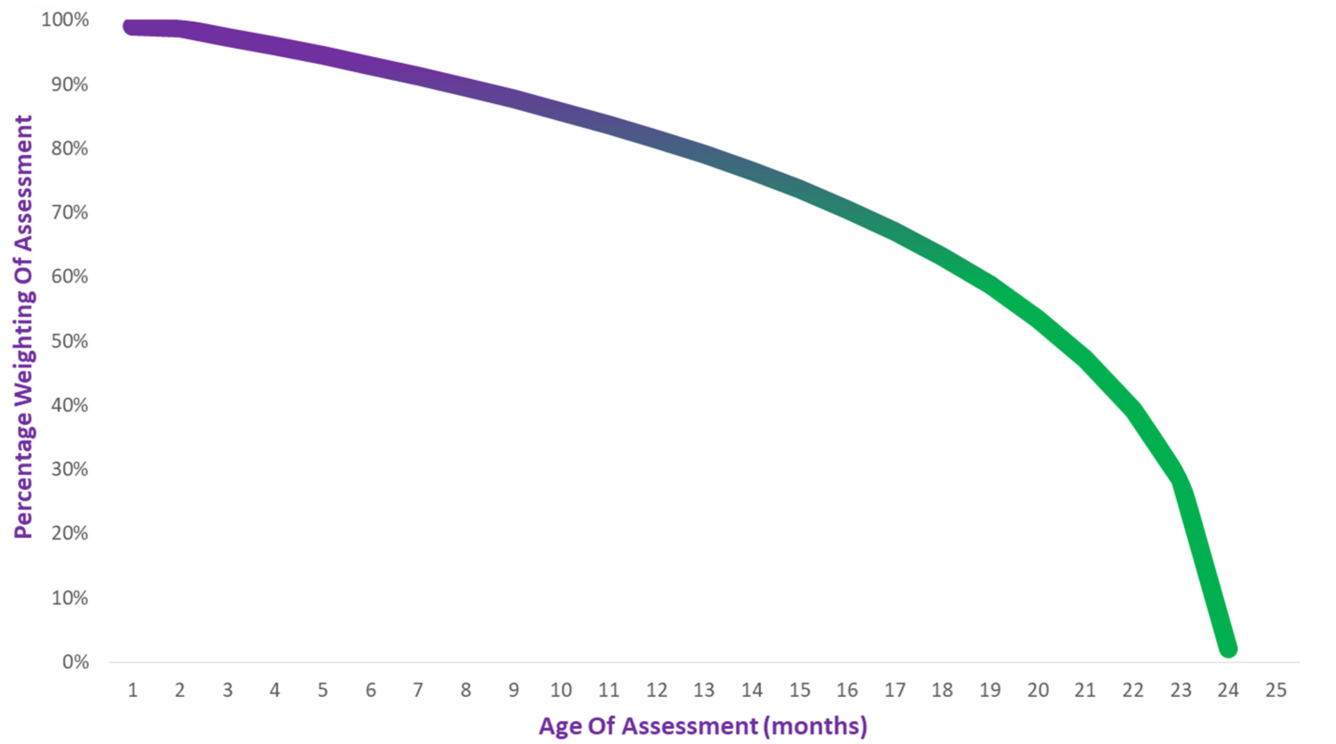
Financial Centre Assessments

Financial centre assessments are collected via an online questionnaire which runs continuously and which is at greenfinanceindex.net/survey/. A link to this questionnaire is emailed to a target list of respondents at regular intervals. Other interested parties can complete the questionnaire by following the link given in GGFI publications.

In calculating the GGFI:

- the score given by a respondent to their home centre, and scores from respondents who do not specify a home centre, are excluded from the model – this is designed to prevent home bias;
- financial centre assessments are included in the GGFI model for 24 months after they have been received – we consider that this is a period during which assessments maintain their validity; and
- financial centre assessments from the month when the GGFI is created will be given full weighting with earlier responses given a reduced weighting on a logarithmic scale as shown in Chart 44 - this recognises that older ratings, while still valid, are less likely to be up-to-date.

Chart 44 | Reduction In Weighting As Assessments Get Older



Instrumental Factor Data

For the instrumental factors, we have the following data requirements:

- data series should come from a reputable body and be derived by a sound methodology; and
- data series should be readily available (ideally in the public domain) and be regularly updated.

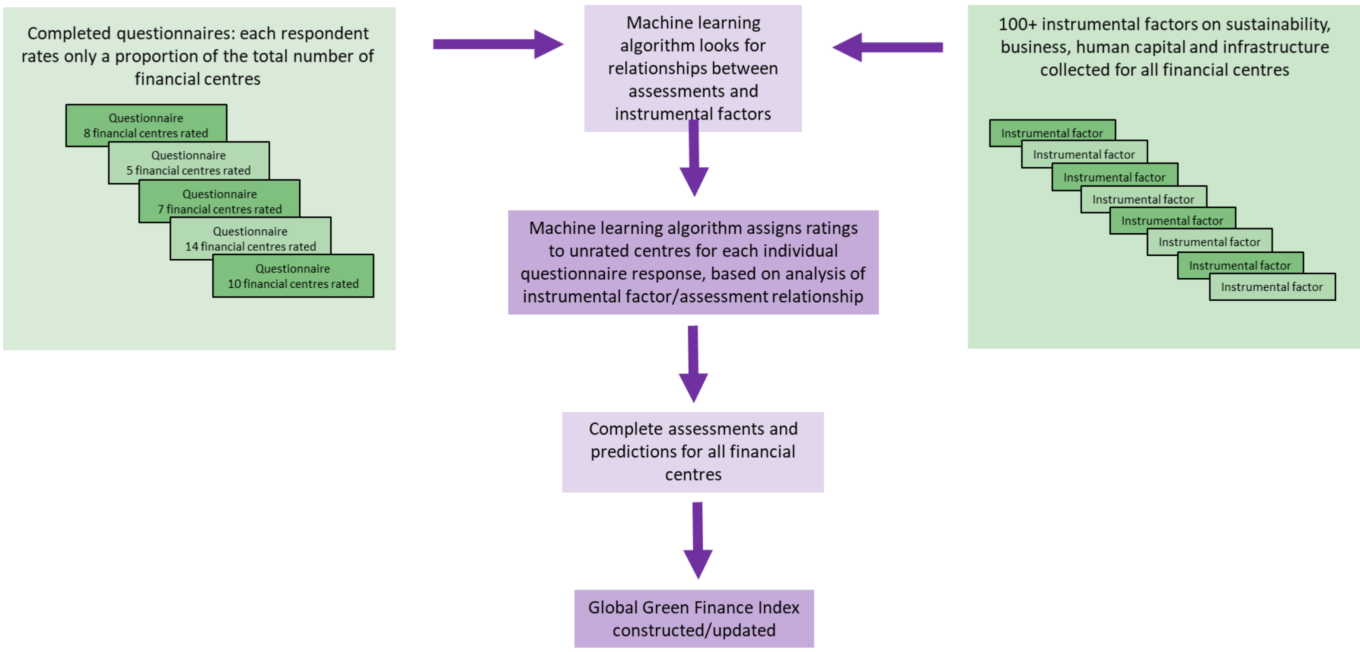
The rules on the use of instrumental factor data in the model are as follows:

- updates to the indices are collected and collated every six months;
- no weightings are applied to indices;
- indices are entered into the GGFI model as directly as possible, whether this is a rank, a derived score, a value, a distribution around a mean or a distribution around a benchmark;
- if a factor is at a national level, the score will be used for all centres in that country; nation-based factors will be avoided if financial centre (city)-based factors are available;
- if an index has multiple values for a city or nation, the most relevant value is used;
- if an index is at a regional level, the most relevant allocation of scores to each centre is made (and the method for judging relevance is noted); and
- if an index does not contain a value for a particular financial centre, a blank is entered against that centre (no average or mean is used)

The details of the methodology can be accessed at https://www.longfinance.net/programmes/financial-centre-futures/global-green-finance-index/ggfi-methodology/.

The process of creating the GGFI is outlined in Chart 45.

Chart 45 | The GGFI Process



Appendix 5: Instrumental Factors

Table 29 | Sustainability Instrumental Factor Correlation With GGFI Ratings - Highest 15 Factors

Instrumental Factors	R-squared
Urban Mobility Readiness Index	0.670
IESE Cities In Motion Index	0.598
Sustainable Cities Index	0.478
Sustainable Economic Development	0.407
Quality Of Living City Rankings	0.391
Energy Transition Index	0.316
World Energy Trilemma Index	0.316
Environmental Performance	0.294
Financial Centre Corporate Sustainability Performance	0.279
The Global Green Economy Index	0.265
Global Sustainable Competitiveness Index	0.235
Pollution Index	0.214
Buildings Energy Efficiency Policies Database (Y/N)	0.160
Quality Of Life Index	0.131
Labelled Green Bonds Issued By Country Of Issuer	0.117

Table 30 | All Instrumental Factor Correlation With GGFI Ratings - Highest 15 Factors

Instrumental Factors	R-squared
The Global Financial Centres Index	0.689
Urban Mobility Readiness Index	0.670
OECD Country Risk Classification	0.648
IESE Cities In Motion Index	0.598
Global Innovation Index	0.584
Safe Cities Index	0.532
Smart City Index	0.491
Sustainable Cities Index	0.478
Networked Society Index	0.477
World Competitiveness Scoreboard	0.475
Cost Of Living City Rankings	0.474
Best Countries For Business	0.463
Adjusted Net National Income Per Capita	0.460
Logistics Performance Index	0.443
Legatum Prosperity Index	0.442

Table 31 | Sustainability Factors

Instrumental Factor	Source	Website	Updated
Average Precipitation In Depth (mm Per Year)	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators&series=AG.LND.PRCP.MM	N
Buildings Energy Efficiency Policies Database (Y/N)	IEA	https://www.iea.org/policies	N
Certified Climate Bonds Issued To December 2018, % Of Centre Total	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
City Commitment To Carbon Reduction (Cooperative Action)	UNFCCC	http://climateaction.unfccc.int/views/stakeholders.html?type=cities	Y
City Commitment To Carbon Reduction (Individual Action)	UNFCCC	http://climateaction.unfccc.int/views/stakeholders.html?type=cities	Y
Climate Change Performance Index	Germanwatch, NewClimate Institute & Climate Action Network	https://ccpi.org/download/the-climate-change-performance-index-2021/	N
Climate-Aligned Bonds Outstanding by Country Of Issuer	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
CO2 Emissions Per Capita	World Bank	https://databank.worldbank.org/reports.aspx?source=2&series=EN.ATM.CO2E.PC&country=#	N
Concentrations of fine particulate matter (PM2.5)	WHO	https://www.who.int/data/gho/data/indicators/indicator-details/GHO/concentrations-of-fine-particulate-matter-(pm2-5)	N
Energy Intensity Of GDP	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/download/	N
Energy Transition Index	World Economic Forum	https://www.weforum.org/reports/1edb4488-deb4-4151-9d4f-ff355eec499a/in-full/rankings	N
Environmental Performance	Yale University	https://epi.yale.edu/epi-results/2020/component/epi	N
Externally-Reviewed (excl CCB) Labelled Green Bonds Issued To December 2018, % of centre total	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centre Carbon Intensity	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centre Clean To Fossil-Fuel Related Revenue (Clean Revenue)	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centre Clean To Fossil-Fuel Related Revenue (Dirty Revenue)	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centre Corporate Sustainability Performance	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centre Sustainability Disclosure	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centres Green Alignment - Non-Regulatory Actors	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Financial Centres Green Alignment - Regulators And Stock Exchanges	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Forestry Area	World Bank	http://databank.worldbank.org/data/reports.aspx?source=2&series=AG.LND.FRST.ZS&country=	Y
Global Sustainable Competitiveness Index	Solability	http://solability.com/the-global-sustainable-competitiveness-index/the-index	Y
GRESB Green Real Estate And Infrastructure Investment Score	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
IESE Cities In Motion Index	IESE	http://citiesinmotion.iese.edu/indicecim/?lang=en	N
Labelled Green Bonds Issued By Country Of Issuer	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Not-Externally-Reviewed Labelled Green Bonds Issued To December 2018, % of centre total	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Pollution Index	Numbeo	https://www.numbeo.com/pollution/rankings.jsp	Y

Table 31 | (Continued) Sustainability Factors

Instrumental Factor	Source	Website	Updated
Proportion of population using safely-managed drinking-water services (%)	WHO	https://www.who.int/data/gho/publications/world-health-statistics	N
Protected Land Area % Of Land Area	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=2&series=ER.LND.PTLD.ZS&country=	N
Quality of Life Index	Numbeo	http://www.numbeo.com/quality-of-life/rankings.jsp	Y
Quality of Living City Rankings	Mercer	https://mobilityexchange.mercer.com/Insights/quality-of-living-rankings	N
Ratio Climate-Aligned Bonds To Total Debt Securities By Issuer Location	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Ratio Labelled Green Bonds To Total Debt Securities By Issuer Location	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Share Of Renewables In Electricity Production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/download/	N
Share Of Wind And Solar In Electricity Production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/download/	N
Stock Exchanges With A Green Bond Segment (Y/N)	CBI	https://www.climatebonds.net/green-bond-segments-stock-exchanges	N
Sum Of GHG Emissions	Corporate Knights	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Sustainable Cities Index	Arcadis	https://www.arcadis.com/en/global/our-perspectives/sustainable-cities-index-2018/citizen-centric-cities/	N
Sustainable Economic Development	Boston Consulting Group	https://www.bcg.com/en-gb/publications/2021/prioritizing-societal-well-being-seda-report	Y
Sustainable Stock Exchanges (Y/N)	UN Sustainable Stock Exchange Initiative	https://sseinitiative.org/members/	N
Total Issuance Of Labelled Green Bonds To December 2018, USDm	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
Total Number Of Labelled Green Bonds Issued To December 2018	CBI	https://www.finance-watch.org/publication/global-greenfinance-index-3/	N
World Energy Trilemma Index	World Energy Council	https://trilemma.worldenergy.org/	Y
Urban Mobility Readiness Index	Oliver Wyman	https://www.oliverwymanforum.com/mobility/urban-mobility-readiness-index/rankings.html	New
The Green Future Index	MIT Technology Review	https://www.technologyreview.com/2021/01/25/1016648/green-future-index/	New
The Global Green Economy Index	Dual Citizen	https://dualcitizeninc.com/global-green-economy-index/	New

Table 32 | Human Capital Factors

Instrumental Factor	Source	Website	Updated
Purchasing Power Index	Numbeo	https://www.numbeo.com/quality-of-life/rankings.jsp?title=2021-mid&displayColumn=1	N
Corruption Perception Index	Transparency International	https://www.transparency.org/en/cpi/2020/	N
Cost of Living City Rankings	Mercer	https://www.mercer.com/our-thinking/career/cost-of-living.html	N
Crime Index	Numbeo	http://www.numbeo.com/crime/rankings.jsp#	Y
Educational Attainment, At Least Bachelor's Or Equivalent, Population 25+, Total (%)	The World Bank	https://data.worldbank.org/indicator/SE.TER.CUAT.BA.ZS	Y
Employees Working Very Long Hours	OECD	https://stats.oecd.org/Index.aspx?DataSetCode=BLI	N
GDP per Person Employed (constant 2017 PPP $)	The World Bank	https://databank.worldbank.org/reports.aspx?source=world-development-indicators&series=SL.GDP.PCAP.EM.KD	Y
Global Cities Index	AT Kearney	https://www.kearney.com/global-cities/2021	Y
Global Innovation Index	INSEAD	http://www.globalinnovationindex.org/content.aspx?	Y
International IP Index	GIPC	https://www.theglobalipcenter.com/ipindex2020/	N
Global Peace Index	Institute for Economics & Peace	https://www.visionofhumanity.org/maps/#/	Y
Global Skills Index	Hays	http://www.hays-index.com/	N
Global Terrorism Index	Institute for Economics & Peace	https://www.visionofhumanity.org/wp-content/uploads/2020/11/GTI-2020-web-2.pdf	N

Table 32 | (Continued) Human Capital Factors

Instrumental Factor	Source	Website	Updated
Good Country Index	Good Country Party	https://www.goodcountry.org/index/results	N
Government Effectiveness	The World Bank	http://info.worldbank.org/governance/wgi/	Y
Graduates In Social Science, Business And Law (As % Of Total Graduates)	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=Education%20Statistics&series=UIS.FOSGP.5T8.F400	N
Gross Tertiary Graduation Ratio	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=Education%20Statistics&series=SE.TER.CMPL.ZS	N
Health Care Index	Numbeo	http://www.numbeo.com/health-care/rankings.jsp	Y
Homicide Rates	UN Office of Drugs & Crime	https://dataunodc.un.org/content/data/homicide/homicide-rate	N
Adjusted Net National Income Per Capita	The World Bank	https://data.worldbank.org/indicator/NY.ADJ.NNTY.PC.CD	N
Household Net Financial Wealth	OECD	https://stats.oecd.org/Index.aspx?DataSetCode=BLI	N
Human Development Index	UN Development Programme	http://hdr.undp.org/en/2020-report/download	N
Human Freedom Index	Cato Institute	https://www.cato.org/human-freedom-index	Y
ICT Development Index	United Nations	http://www.itu.int/net4/ITU-D/idi/2017/index.html	N
Individual Income Tax Rates	KPMG	https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/individual-income-tax-rates-table.html	N
Innovation Cities Global Index	2ThinkNow Innovation Cities	https://www.innovation-cities.com/city-rankings-2021/	N
Legatum Prosperity Index	Legatum Institute	http://www.prosperity.com/#!/ranking	Y
Life Expectancy At Birth, Total	The World Bank	https://data.worldbank.org/indicator/SP.DYN.LE00.IN	N
Linguistic Diversity	Ethnologue	https://www.ethnologue.com/guides/countries-most-languages	N
Lloyd's City Risk Index 2015-2025	Lloyd's	https://lloyds.spub7.com/locations	Y
Number Of High Net Worth Individuals	Capgemini	https://www.worldwealthreport.com/	N
Number Of International Association Meetings	World Economic Forum	http://reports.weforum.org/travel-and-tourism-competitiveness-report-2019/rankings/#series=NRFAIREX	N
OECD Country Risk Classification	OECD	http://www.oecd.org/trade/topics/export-credits/documents/cre-crc-current-english.pdf	Y
Open Data Barometer	World Wide Web Foundation	https://opendatabarometer.org/4thedition/?_year=2016&indicator=ODB	N
Open Government	World Justice Project	http://worldjusticeproject.org/rule-of-law-index	Y
Henley Passport Index	Henley Partners	https://www.henleypassportindex.com/passport	Y
Personal Tax Rates	OECD	https://stats.oecd.org/index.aspx?DataSetCode=TABLE_I6	N
Political Stability And Absence Of Violence/ Terrorism	The World Bank	http://info.worldbank.org/governance/wgi/	Y
Press Freedom Index	Reporters Without Borders (RSF)	https://rsf.org/en/ranking/2021	Y
Prime International Residential Index	Knight Frank	https://www.knightfrank.com/research/report-library/the-wealth-report-2021-7865.aspx	N
Regulatory Quality	The World Bank	http://info.worldbank.org/governance/wgi/	Y
Tax Revenue As Percentage Of GDP	The World Bank	https://databank.worldbank.org/reports.aspx?source=2&series=GC.TAX.TOTL.GD.ZS&country=#	N
Top Tourism Destinations	Euromonitor	https://go.euromonitor.com/white-paper-travel-211202-top-100-city-destinations-index.html	Y
Average Wages	OECD	https://data.oecd.org/earnwage/average-wages.htm	N
World Talent Rankings	IMD	https://www.imd.org/centers/world-competitiveness-center/rankings/	Y
People Near Services	ITDP	https://pedestriansfirst.itdp.org/	N
Global Health Security Index	Nuclear Threat Initiative, Johns Hopkins Center for Health Security, and Economist Impact	https://www.ghsindex.org/	New

Table 33 | Business Factors

Instrumental Factor	Source	Website	Updated
Best Countries For Business	Forbes	https://www.forbes.com/best-countries-for-business/list/	N
Bilateral Tax Information Exchange Agreements	OECD	http://www.oecd.org/ctp/exchange-of-tax-information/taxinformationexchangeagreementstieas.htm	N
Broad Stock Index Levels	The World Federation of Stock Exchanges	https://focus.world-exchanges.org/issue/december-2021/market-statistics	Y
Business Environment Rankings	EIU	http://country.eiu.com/All	Y
Capitalisation Of Stock Exchanges	The World Federation of Stock Exchanges	https://focus.world-exchanges.org/issue/december-2021/market-statistics	Y
Common Law Countries	CIA	https://www.cia.gov/the-world-factbook/countries/	N
Corporate Tax Rates	KPMG	https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html	New
Democracy Index	The Economist	https://www.eiu.com/topic/democracy-index	N
Domestic Credit to private sector (% of GDP)	The World Bank	https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS?most_recent_value_desc=false	New
Ease Of Doing Business Index	The World Bank	https://www.doingbusiness.org/en/reports/global-reports/doing-business-2020	N
Economic Freedom	The Heritage Foundation	https://www.heritage.org/index/ranking	N
Economic Performance Index	The Brookings Institution	https://www.brookings.edu/research/global-metro-monitor-2018/#rank	N
External Positions Of Central Banks As A Share Of GDP	The Bank for International Settlements	http://www.bis.org/statistics/annex_map.htm	Y
FATF AML Effectiveness	FATF	http://www.fatf-gafi.org/publications/mutualevaluations/documents/assessment-ratings.html	Y
FDI Inward Stock (in million dollars)	UNCTAD	https://unctad.org/webflyer/world-investment-report-2021	N
Financial Secrecy Index	Tax Justice Network	http://www.financialsecrecyindex.com/	N
Foreign Direct Investment Inflows	UNCTAD	http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96740	Y
Global Business Complexity Index	TMF Group	https://www.tmf-group.com/en/news-insights/publications/2021/global-business-complexity-index/	N
Global Connectedness Index	DHL	https://www.dhl.com/global-en/spotlight/globalization/global-connectedness-index.html	N
Global Enabling Trade Report	World Economic Forum	https://www.weforum.org/focus/global-enabling-trade-report-2016	N
Global Services Location	AT Kearney	https://www.kearney.com/digital/article/?/a/the-2021-kearney-global-services-location-index	N
Government Debt as % of GDP	CIA	https://www.cia.gov/the-world-factbook/field/public-debt/country-comparison	Y
Jurisdictions Participating In The Convention On Mutual Administrative Assistance In Tax Matters	OECD	https://www.oecd.org/ctp/exchange-of-tax-information/Status_of_convention.pdf	N
Net External Positions Of Banks	The Bank for International Settlements	http://www.bis.org/statistics/annex_map.htm	Y
Office Occupancy Cost	CBRE Research	https://www.cbre.com/research-and-reports/Global-Prime-Office-Occupancy-Costs-2019	N
Open Budget Survey	International Budget Partnership	http://survey.internationalbudget.org/#download	N
Operational Risk Rating	EIU	http://viewswire.eiu.com/site_info.asp?info_name=VW2_RISK_nib&page=rk&page_title=Risk%20table	Y
Percentage Of Firms Using Banks To Finance Investment	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators&series=IC.FRM.BNKS.ZS	Y
Real Interest Rate	The World Bank	https://databank.worldbank.org/reports.aspx?source=world-development-indicators&series=FR.INR.RINR	N
Safe Cities Index	Economist	https://safecities.economist.com/	Y

Table 33 | (Continued) Business Factors

Instrumental Factor	Source	Website	Updated
The Global Financial Centres Index	Z/Yen	https://www.longfinance.net/programmes/financial-centre-futures/global-financial-centres-index/	Y
The Global Fintech Index	Findexable	https://findexable.com/	N
Total Net Assets Of Regulated Open-End Funds	Investment Company Institute	http://www.icifactbook.org/	N
TRACE Bribery Risk Matrix	Trace International	https://matrixbrowser.traceinternational.org/	Y
Value Of Bond Trading	The World Federation of Stock Exchanges	https://statistics.world-exchanges.org/ReportGenerator/Generator#	Y
Value Of Share Trading	The World Federation of Stock Exchanges	https://focus.world-exchanges.org/issue/december-2021/market-statistics	Y
Volume Of Share Trading	The World Federation of Stock Exchanges	https://statistics.world-exchanges.org/ReportGenerator/Generator#	Y
World Competitiveness Scoreboard	IMD	https://www.imd.org/wcc/world-competitiveness-center-rankings/world-competitiveness-ranking-2020/	N

Table 34 | Infrastructure Factors

Instrumental Factor	Source	Website	Updated
Refined Oil Products Production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/download/	N
Global Competitiveness Index	World Economic Forum	http://reports.weforum.org/global-competitiveness-report-2019/competitiveness-rankings/	N
INRIX Traffic Scorecard	INRIX	http://inrix.com/scorecard/	Y
JLL Real Estate Transparency Index	Jones Lang LaSalle	https://www.jll.co.uk/en/trends-and-insights/research/global-real-estate-transparency-index	N
Liner Shipping Connectivity Index	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=2&series=IS.SHP.GCNW.XQ	N
Logistics Performance Index	The World Bank	http://lpi.worldbank.org/international/global	N
Metro Network Length	Metro Bits	http://mic-ro.com/metro/table.html	Y
Networked Readiness Index	World Economic Forum	http://reports.weforum.org/global-information-technology-report-2016/	N
Networked Society Index	Ericsson	https://www.ericsson.com/en/reports-and-papers/networked-society-insights/city-index	N
Quality Of Domestic Transport Network	World Economic Forum	http://reports.weforum.org/travel-and-tourism-competitiveness-report-2019/rankings/#series=TRSPEFFICY	N
Quality Of Road Infrastructure	World Economic Forum	http://reports.weforum.org/travel-and-tourism-competitiveness-report-2019/rankings/#series=EOSQ057	N
Railways Per Land Area	CIA	https://www.cia.gov/the-world-factbook/field/railways/country-comparison	N
Roadways Per Land Area	CIA	https://www.cia.gov/the-world-factbook/field/roadways/country-comparison	N
Telecommunication Infrastructure Index	United Nations	https://publicadministration.un.org/egovkb/en-us/Data-Center	N
TomTom Traffic Index	TomTom	https://www.tomtom.com/en_gb/traffic-index/ranking/	N
Smart City Index	IMD	https://www.imd.org/smart-city-observatory/smart-city-index/	Y

Vantage
Financial Centres

Vantage Financial Centres is an exclusive network of financial centres around the world looking for a deeper understanding of financial centre competitiveness. Members receive enhanced access to GGFI and GFCI data, marketing opportunities, and training for centres seeking to enhance their profile and reputation.

LUXEMBOURG FOR FINANCE
THE FINANCIAL CENTRE DEVELOPMENT AGENCY

Luxembourg for Finance (LFF) is the Agency for the Development of the Financial Centre. It is a public-private partnership between the Luxembourg Government and the Luxembourg Financial Industry Federation (PROFIL). Founded in 2008, its objective is to develop Luxembourg's financial services industry and identify new business opportunities. LFF connects international investors to the range of financial services provided in Luxembourg, such as investment funds, wealth management, capital market operations or advisory services. In addition to being the first port of call for foreign journalists, LFF cooperates with the various professional associations and monitors global trends in finance, providing the necessary material on products and services available in Luxembourg. Furthermore, LFF manages multiple communication channels, organises seminars in international business locations, and takes part in selected world-class trade fairs and congresses.

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AIFC

AIFC is an all-around financial centre located in Nur-Sultan, the capital of Kazakhstan, which offers ample opportunities for businesses to grow. AIFC provides greater access to world-class capital markets and the asset management industry. It also promotes financial technology and drives the development of niche markets such as Islamic and green finance in the region.

AIFC provides unprecedented conditions and opportunities for its participants and investors: legal system based on the principles of English law, independent judicial system, regulatory framework consistent with internationally recognised standards, wide range of financial services and instruments, simplified visa and labour regimes, zero corporate tax rate, and English as a working language.

Located in the heart of Eurasia, AIFC is striving to become the gateway to the Eurasian Economic Union, Central Asia and Caucasus, and play a key role in the Belt and Road Initiative. AIFC is already gaining tremendous recognition as a leading financial hub in the region: recently, Asiamoney Awards recognised it as the best Belt and Road Initiative project of 2019.

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FINANCIAL SERVICES DEVELOPMENT COUNCIL
香港金融發展局

Supported by the industry, the Financial Services Development Council (FSDC) is a high-level, cross-sectoral advisory body to the Hong Kong Special Administrative Region Government.

FSDC formulates proposals to promote the further development of Hong Kong's financial services industry and to map out the strategic direction for the development. As of March 2020, 110 of the 137 policy recommendations had been adopted by the Government and relevant regulators since FSDC's inception in 2013. On top of research, FSDC also carries out market promotion and human capital development functions.

Among others, FSDC focuses on topics including Mainland and international connectivity, green and sustainable finance, FinTech, as well as asset and wealth management.

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CASABLANCA FINANCE CITY
القطب المالي للدار البيضاء

Casablanca Finance City is an African financial and business hub located at the crossroads of continents. Recognized as the leading financial center in Africa, and partner of the largest financial centers in the world, CFC has built a strong and thriving community of members across four major categories: financial companies, regional headquarters of multinationals, service providers and holdings.

CFC offers its members an attractive value proposition and a premium "Doing Business" support that fosters the deployment of their activities in Africa. Driven by the ambition to cater to its community, CFC is committed to promoting its members expertise across the continent, while enabling fruitful business and partnership synergies through its networking platform.

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Vantage Financial Centres

Please find out more at: www.vantagefinancialcentres.net or by contacting Mike Wardle at mike_wardle@zyen.com

DIFC

Dubai International Financial Centre (DIFC) is one of the world's most advanced financial centres, and the leading financial hub for the Middle East, Africa and South Asia (MEASA) region, which comprises 72 countries with an approximate population of 3 billion and a nominal GDP of US$ 7.7 trillion.

DIFC is home to an internationally recognised, independent regulator and a proven judicial system with an English common law framework, as well as the region's largest financial ecosystem of more than 24,000 professionals working across over 2,300 active registered companies – making up the largest and most diverse pool of industry talent in the region. The Centre's vision is to drive the future of finance. Today, it offers one of the region's most comprehensive FinTech and venture capital environments, including cost-effective licensing solutions, fit-for-purpose regulation, innovative accelerator programmes, and funding for growth-stage start-ups.

Comprising a variety of world-renowned retail and dining venues, a dynamic art and culture scene, residential apartments, hotels and public spaces, DIFC continues to be one of Dubai's most sought-after business and lifestyle destinations.

Twitter @DIFC
www.difc.ae

Approved by the China's State Council, China Development Institute (CDI) was founded in 1989 with 116 representatives from the government, academia and business in China. Being an independent think tank, CDI is committed to develop policy solutions via research and debates that help to advance China's reform and opening-up. After years of development, CDI has become one of the leading think tanks in China. CDI focuses on the studies of open economy and innovation-driven development, regional economy and regional development, industrial policies and industrial development, urbanization and urban development, business strategies and investment decision-making. Via conducting research, CDI provides policy recommendations for the Chinese governments at various levels and develops consultation for corporate sectors at home and abroad. CDI organizes events in different formats that evokes dialogue among scholars, government officials, business people and civil society members around the globe. Based in Shenzhen, Southern China, CDI has one hundred and sixty staff, with an affiliated network that consists of renowned experts from different fields.

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Busan Finance Center

Since 2009 Busan Metropolitan City has been developing a financial hub specialising in maritime finance and derivatives. With its strategic location in the center of the southeast economic block of Korea and the crossroads of a global logistics route, Busan envisions growing into an international financial city in Northeast Asia. Busan Finance Center (BFC) will continue to develop and implement measures to promote Busan as the financial hub and bolster the local financial industry, while working together with various local economic players to pursue sustainable growth of the financial sector including FinTech. These efforts will enable BFC to play a leading role in taking Busan to the next level and become the international financial center and maritime capital of Northeast Asia.

BFC offers an attractive incentive package to global financial leaders and cooperation network of Busan Metropolitan City, and Busan Finance Center will support you to identify opportunities in Busan, one of the fastest developing cities in Asia.

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SEOUL METROPOLITAN GOVERNMENT

Seoul is a rising star among the financial cities of the world. It is already one of the top 10 cities in the world based on various indices, and it has many more opportunities to offer as a financial hub and great growth potential. Seoul believes global financial companies are our true partners for growth. There are many incentives provided to global financial companies that enter into Seoul, such as the financial incentives provided when moving into IFC, so that we can all jointly work towards the growth and development of the financial market.

It is sure that Seoul will become a top star of global financial hubs in the near future! Pay close attention to Seoul's potentials and pre-emptively gain a foothold in the Seoul financial hub. Seoul is the gateway to Northeast Asia and the world.

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Vantage Financial Centres

Vantage Financial Centres is an exclusive network of financial centres around the world looking for a deeper understanding of financial centre competitiveness. Members receive enhanced access to GGFI and GFCI data, marketing opportunities, and training for centres seeking to enhance their profile and reputation.

FINANCE MONTRÉAL

Finance Montréal's mandate is to promote Montréal as a world-class financial hub and foster cooperation among its member institutions to accelerate the industry's growth. With renowned research capacities in artificial intelligence and a booming fintech sector, Montréal offers an experienced, diversified and innovative pool of talent as well as a stable, low cost and dynamic business environment.

For financial institutions searching for an ideal location to set up an intelligent service centre and operationalize their digital transformation, Finance Montréal can advise on the advantageous tax incentives aimed at facilitating the establishment and development of financial services corporations in the city.

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LONG FINANCE

The Long Finance initiative grew out of the London Accord, a 2005 agreement among investment researchers to share environmental, social and governance research with policy-makers and the public. Long Finance was established more formally by Z/Yen Group and Gresham College from 2007 with the aim of exploring long-term thinking across a global network of people.

We work on researching innovative ways of building a more sustainable financial system. In so doing, we try to operate openly and emulate scientific ideals. At the same time, we are looking to create a supportive and caring community where people can truly question the accepted paradigms of risk and reward.

www.longfinance.net

ABU DHABI GLOBAL MARKET
سوق أبوظبي العالمي

Abu Dhabi Global Market (ADGM), an award-winning financial centre in the capital of the UAE, opened for business in October 2015, consisting of three independent authorities: the Registration Authority (RA); the Financial Services Regulatory Authority (FSRA); and ADGM Courts. Comprised of the three independent authorities where Common English Law is directly applicable, ADGM plays an essential role in the diversification of the economy in the UAE and is committed to providing a comprehensive business ecosystem operating with the highest standards of integrity and is renowned for its ease of doing business.

Strategically situated in Abu Dhabi, home to one of the world's largest sovereign wealth funds, ADGM plays a vital role in positioning Abu Dhabi as a global trade and business hub and serves as a link between the growing economies of the Middle East, Africa and South Asia to the rest of the world. ADGM has earned industry recognition as the Financial Centre of the Year (MENA) four years in a row as well as being recognized as the leading FinTech Hub in the region.

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G T
Global Times Consulting

Global Times Consulting Co. is a strategic consultancy with a focus on China. We help Chinese (local) governments at all levels to build their reputation globally, providing strategic counsel, stakeholder outreach and communications to support their sustainable development. We also partner with multinational companies operating in this dynamic but challenging market, serving as a gateway to China. In addition, we help Chinese companies extend their reach overseas.

Global Times Consulting Co. adopts a research and knowledge-based approach. With extensive contacts and deep insights into China's political and economic landscape, we develop and execute integrated programs for stakeholder relations and reputation management. Our extensive relationship with media and government organizations in China and worldwide helps us successfully execute programs and achieve desired goals.

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PRODUCED BY Z/YEN GROUP

www.zyen.com
Z/Yen helps organisations make better choices - our clients consider us a commercial think-tank that spots, solves and acts. Our name combines Zen and Yen - 'a philosophical desire to succeed' - in a ratio, recognising that all decisions are trade-offs. One of Z/Yen's specialisms is the development and publication of research combining factor analysis and perception surveys.

THE GLOBAL GREEN FINANCE INDEX

www.greenfinanceindex.net
The Global Green Finance Index provides a measure of how financial centres are responding to the challenge of developing a sustainable economy, enabling centres to compare their performance with their peers, improve policy makers' understanding of the drivers of green growth, and assist them in shaping the financial system to support sustainability goals.

SUSTAINABLE FUTURES

https://www.longfinance.net/programmes/sustainable-futures/
The sustainable futures programme focuses on ways in which the financial system supports the transition to a sustainable economic model. Alongside the GGFI, the programme supports the **London Accord**, a free to access collection of over 700 environmental social and governance research reports from over 120 financial services, NGO, academic and policy making institutions.

PUBLISHED BY LONG FINANCE AND FINANCIAL CENTRE FUTURES

www.longfinance.net

Long Finance is a Z/Yen initiative designed to address the question **"When would we know our financial system is working?"** This question underlies Long Finance's goal to improve society's understanding and use of finance over the long-term. In contrast to the short-termism that defines today's economic views the Long Finance timeframe is roughly 100 years.

www.financialcentrefutures.net

Financial Centre Futures is a programme within the Long Finance initiative that initiates discussion on the changing landscape of global finance. Financial Centre Futures comprises the Global Green Finance Index and other research publications that explore major changes to the way we will live and work in the financial system of the future.