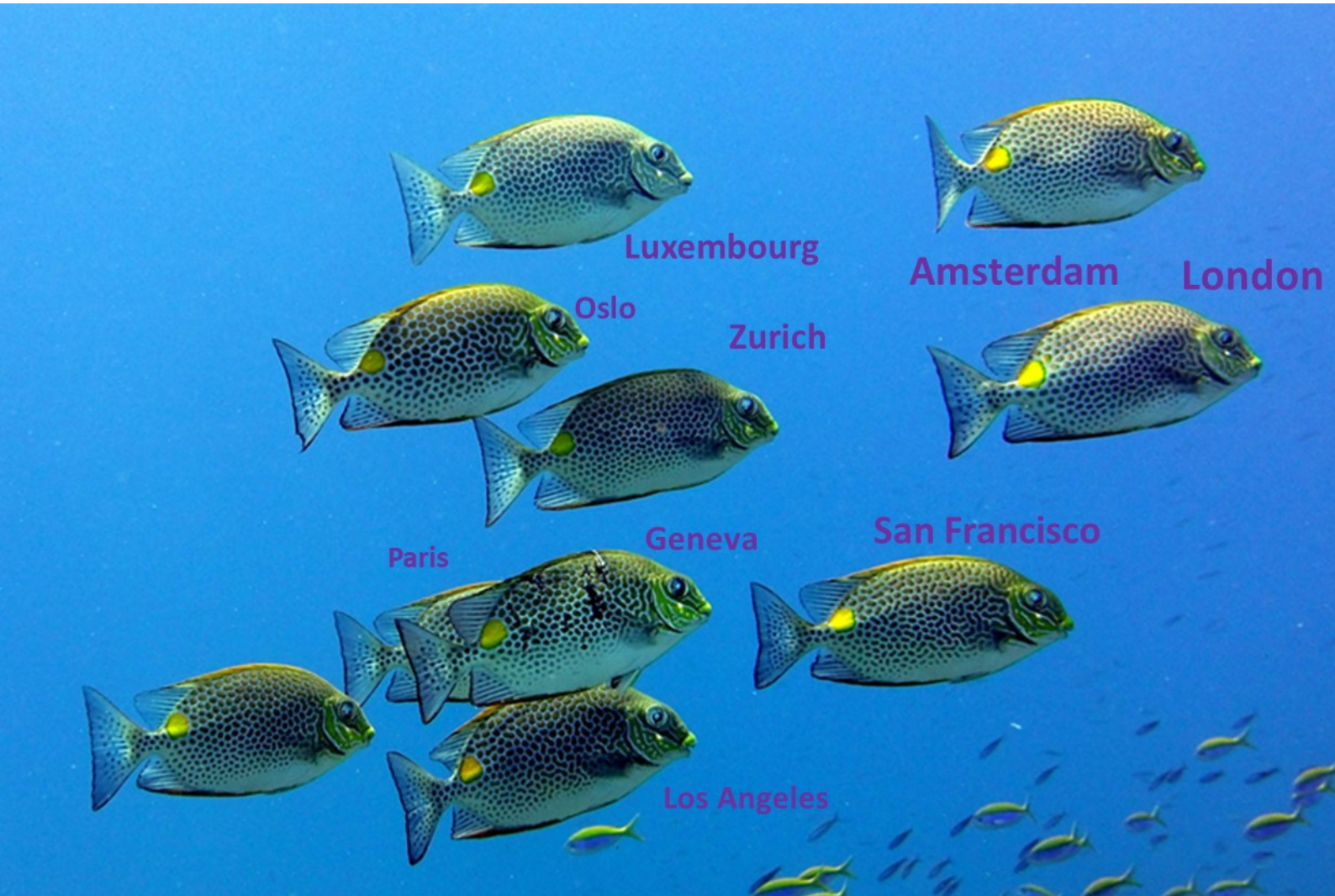


The Global Green Finance Index 8



October 2021



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 eighth edition of the Global Green Finance Index (GGFI 8).

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 650 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, Peter Welch, Charlotte Dawber-Ashley and the rest of the Z/Yen team for their contributions with research, modelling, and ideas.



Contents

Section	Page
Foreword	1
Summary	2
GGFI 7 Ranks And Ratings	4
GGFI Dimensions	6
Regional Performance	9
Top Five Centres	11
Leading Financial Centres	13
GGFI 8 Further Analysis	14
Instrumental Factors	15
Areas Of Competitiveness	17
Commentary On Factors	20
Connectivity	21
Financial Centre Profiles	23
The GGFI 8 World	25
COP 26 & Carbon Pricing – Sticking Plaster Or Key To Progress?	27
Stability	39
Regional Analysis	40
North America	41
Middle East & Africa	43
Eastern Europe & Central Asia	45
Western Europe	47
Latin America & The Caribbean	49
Asia/Pacific	51
Industry Sectors And Green Finance Professionals	53
Interest, Impact, And Drivers of Green Finance	55
Appendix 1: Assessment Details	58
Appendix 2: Interest, Impact, And Drivers Details	60
Appendix 3: Respondents' Details	62
Appendix 4: Methodology	64
Appendix 5: Instrumental Factors	67

Foreword

Sustainable development has become widely applied to building a prosperous economy and is the key topic when discussing the future of financing projects. Such a discussion requires a holistic approach. We must look at all major factors of economic development – climate change, food and energy security, demographics, poverty alleviation, and others – through the lenses of long-term sustainability.

AIFC is a founding member of the UN-led Financial Centres for Sustainability network. It is a solid platform for sharing the experience of financial centres in building infrastructure and favourable conditions for market participants, enabling a regulatory environment, and implementing green finance instruments and ESG standards.

The sustainability agenda and vigorous development of green finance show that businesses should apply climate-related strategies to successfully implement projects because financial institutions already adhere to ESG policies in their investment activities.

Understanding these new requirements led AIFC to become a signee of Green Investment Principles (GIP) for Belt and Road in 2019. And recently, AIFC Green Finance Centre signed an agreement with the Beijing Institute for Finance and Sustainability on establishing the GIP regional office in Central Asia. This office aims to assist Central Asian second-tier banks in greening their activities and create a bridge between green projects of the region and BRI investments, which will supplement AIFC GFC's efforts to develop the green financial system of Kazakhstan and become the green finance hub for the region.

This step is also aligned with the new vision of our country to become carbon neutral by 2060, and the financial sector will play an essential role in reaching this target.

Dr Kairat Kelimbetov
Governor
Astana International Financial Centre



Summary

Overview

This is the eighth edition of the Global Green Finance Index (GGFI 8). 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.

We researched 126 financial centres for GGFI 8. The number of centres in the index has increased to 80 (78 in GGFI 7), with the addition of Berlin and Nairobi.

In the supplement to this edition of the GGFI, we review the role of financial centres in green finance, and explore the contribution of emission trading schemes to the development of sustainable economies.

Commentary

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

Western European centres continue to dominate the top 10 centres in the index, taking eight of the top 10 places. San Francisco and Los Angeles take the other two spots.

In the next group, New York has gained 18 places in the rankings to 13th place - the biggest rise across the index. Beijing, Shanghai, Seoul, Washington DC, and Singapore have improved their rank, displacing centres such as Helsinki and Munich. These changes show the competitive challenge to Western European centres as North American and Asia/Pacific centres focus more intensely on green finance.

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 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.

Index Results

- London has overtaken Amsterdam to take first place in GGFI 8. Amsterdam is second, with San Francisco overtaking Zurich to take third place.
- 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.
- Asia/Pacific centres again performed strongly, with Beijing, Shanghai, Seoul, and Singapore all consolidating gains.
- The margins separating centres at the top of the index continue to tighten. Among the top 10 centres the spread of ratings is 25 out of 1,000, compared to 29 out of 1,000 in GGFI 7.

Western Europe

- While Western European centres dominate the top 10 positions in GGFI 8, a number of centres in the region have lost ground with 19 of the 28 Western European centres dropping in the ranks.
- Paris regained its top 10 position, while Vienna, Lisbon, and Dublin, all fell 10 or more places in the rankings.
- Berlin has entered the index in 21st place.

North America

- US centres continue to gain ground against Canadian centres,
- San Francisco and Los Angeles have improved their ranking within the top 10 and New York rose sharply to 13th place.
- Canadian centres either fell in the rankings or maintained their position.

Asia/Pacific

- Five Asia/Pacific centres feature in the top 20, all of which improved their rating in GGFI 8.
- All but two centres in the region improved their rating and the majority of centres improved in the ranking.

Middle East & Africa

- Dubai has overtaken Casablanca to take the leading position in the region, with Abu Dhabi also performing strongly, overtaking Tel Aviv.
- Nairobi has entered the index for the first time.

Latin America & The Caribbean

- Sao Paulo continues to lead the index in the Latin America & The Caribbean region, with Mexico City taking over the second position in the region.
- Only 39 points out of 1,000 separate the ratings of centres in the region.

Eastern Europe & Central Asia

- Nur-Sultan leads the Eastern Europe & Central Asia region, with Moscow in second place.
- The other centres in the region are close behind Moscow.

GGFI 8

GGFI 8 was compiled using 143 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 4,847 financial centre assessments provided by respondents to the [GGFI online questionnaire](#). A breakdown of the 776 respondents is shown in Appendix 3. Further details of the methodology behind GGFI 8 are in Appendix 4.

The 80 centres listed in GGFI 8 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 8 Ranks And Ratings

Table 1 | GGFI 8 Ranks And Ratings

Centre	GGFI 8		GGFI 7		Change In Rank		Change In Rating	
	Rank	Rating	Rank	Rating				
London	1	571	3	562	▲	2	▲	9
Amsterdam	2	562	1	567	▼	-1	▼	-5
San Francisco	3	549	5	546	▲	2	▲	3
Zurich	4	548	2	563	▼	-2	▼	-15
Luxembourg	5	545	6	542	▲	1	▲	3
Geneva	6	544	7	541	▲	1	▲	3
Stockholm	7	543	9	539	▲	2	▲	4
Los Angeles	8	542	10	538	▲	2	▲	4
Oslo	9	541	4	547	▼	-5	▼	-6
Paris	10	540	11	537	▲	1	▲	3
Beijing	11	539	14	531	▲	3	▲	8
Copenhagen	12	538	8	540	▼	-4	▼	-2
New York	13	537	31	517	▲	18	▲	20
Shanghai	14	536	17	528	▲	3	▲	8
Washington DC	15	534	21	524	▲	6	▲	10
Seoul	16	533	22	523	▲	6	▲	10
Singapore	16	533	20	525	▲	4	▲	8
Helsinki	18	532	12	534	▼	-6	▼	-2
Munich	19	531	15	530	▼	-4	▲	1
Sydney	20	530	18	527	▼	-2	▲	3
Berlin	21	529	New	New	▲	New	▲	New
Tokyo	22	528	13	532	▼	-9	▼	-4
Brussels	23	527	16	529	▼	-7	▼	-2
Wellington	24	526	33	516	▲	9	▲	10
Vancouver	25	525	25	522	▶	0	▲	3
Boston	25	525	25	522	▶	0	▲	3
Montreal	25	525	19	526	▼	-6	▼	-1
Busan	28	524	31	517	▲	3	▲	7
Shenzhen	28	524	28	521	▶	0	▲	3
Guangzhou	30	523	22	523	▼	-8	▶	0
Toronto	31	522	29	519	▼	-2	▲	3
Osaka	32	521	30	518	▼	-2	▲	3
Vienna	33	520	22	523	▼	-11	▼	-3
Qingdao	34	519	38	511	▲	4	▲	8
Hamburg	34	519	25	522	▼	-9	▼	-3
Frankfurt	34	519	42	509	▲	8	▲	10
Chicago	37	518	36	513	▼	-1	▲	5
Melbourne	37	518	46	504	▲	9	▲	14
Edinburgh	39	517	38	511	▼	-1	▲	6
Dubai	40	516	45	505	▲	5	▲	11

Table 1 (continued) | GGFI 8 Ranks And Ratings

Centre	GGFI 8		GGFI 7		Change In Rank		Change In Rating	
	Rank	Rating	Rank	Rating				
Hong Kong	41	515	40	510	▼	-1	▲	5
Casablanca	42	514	33	516	▼	-9	▼	-2
Lisbon	43	513	33	516	▼	-10	▼	-3
Madrid	44	512	37	512	▼	-7	▶	0
Abu Dhabi	45	511	50	496	▲	5	▲	15
Calgary	46	510	42	509	▼	-4	▲	1
GIFT City-Gujarat	47	509	47	503	▶	0	▲	6
Rome	48	508	51	493	▲	3	▲	15
Kuala Lumpur	49	506	52	491	▲	3	▲	15
Dublin	50	502	40	510	▼	-10	▼	-8
Guernsey	51	499	54	487	▲	3	▲	12
Nur-Sultan	52	498	57	485	▲	5	▲	13
Glasgow	53	497	44	507	▼	-9	▼	-10
Tel Aviv	54	496	48	502	▼	-6	▼	-6
Milan	55	495	54	487	▼	-1	▲	8
Mumbai	56	494	60	479	▲	4	▲	15
Bangkok	57	492	49	499	▼	-8	▼	-7
Mauritius	58	490	52	491	▼	-6	▼	-1
Jakarta	59	489	62	478	▲	3	▲	11
Jersey	60	486	54	487	▼	-6	▼	-1
Malta	61	485	58	484	▼	-3	▲	1
Doha	62	484	59	483	▼	-3	▲	1
New Delhi	63	483	69	473	▲	6	▲	10
Bahrain	64	482	67	476	▲	3	▲	6
Sao Paulo	65	480	60	479	▼	-5	▲	1
Liechtenstein	66	477	62	478	▼	-4	▼	-1
Cape Town	67	475	62	478	▼	-5	▼	-3
Johannesburg	68	474	66	477	▼	-2	▼	-3
Mexico City	68	474	73	463	▲	5	▲	11
Moscow	70	472	71	469	▲	1	▲	3
Prague	71	469	67	476	▼	-4	▼	-7
Warsaw	72	468	72	468	▶	0	▶	0
Istanbul	73	467	74	459	▲	1	▲	8
Almaty	74	466	62	478	▼	-12	▼	-12
Rio de Janeiro	75	465	76	458	▲	1	▲	7
British Virgin Islands	76	464	77	456	▲	1	▲	8
Cayman Islands	77	458	69	473	▼	-8	▼	-15
Isle of Man	78	457	74	459	▼	-4	▼	-2
Nairobi	79	456	New	New	▲	New	▲	New
Bermuda	80	441	78	455	▼	-2	▼	-14

GGFI Dimensions

Green financial products and services have been traded for many years, but until relatively recently, volumes were quite small and trade tended to be primarily restricted to niche products and domestic markets. 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 8 Rank	Centre	GGFI Dimensions			
		Green Finance Depth		Green Finance Quality	
		Rank	Rating	Rank	Rating
1	London	2	280	1	291
2	Amsterdam	1	281	3	281
3	San Francisco	3	274	5	275
4	Zurich	17	266	2	282
5	Luxembourg	4	273	7	272
6	Geneva	8	270	6	274
7	Stockholm	5	272	9	271
8	Los Angeles	6	271	9	271
9	Oslo	23	263	4	278
10	Paris	6	271	12	269
11	Beijing	15	267	7	272
12	Copenhagen	8	270	13	268
13	New York	11	269	13	268
14	Shanghai	8	270	17	266
15	Washington DC	11	269	21	265

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.

Chart 1 | Relationship Between Ratings Of Depth And Quality

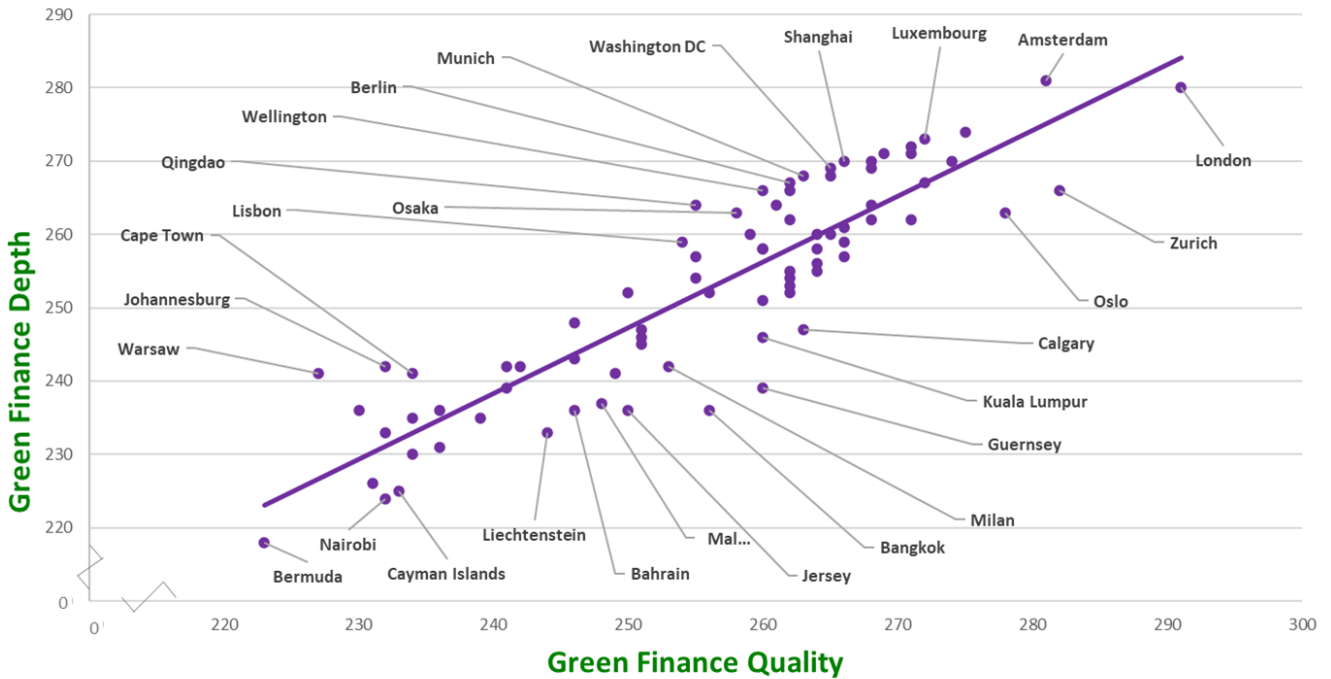
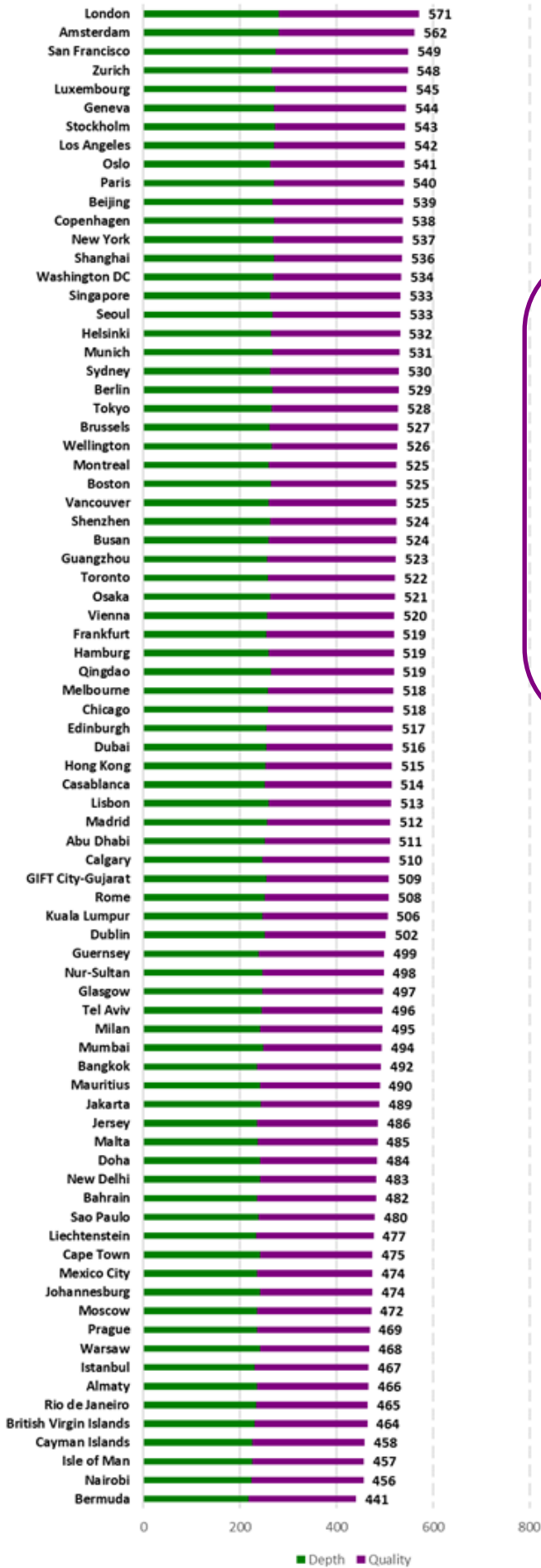


Chart 2 shows the contribution of each of the dimensions to the overall rating. London came first for quality on this analysis, but was beaten by Amsterdam in the depth dimension. Successful financial centres focused on green finance need both quality and depth in their green markets to thrive.

Chart 2 | The Contribution Of The Dimensions To The Overall Rating



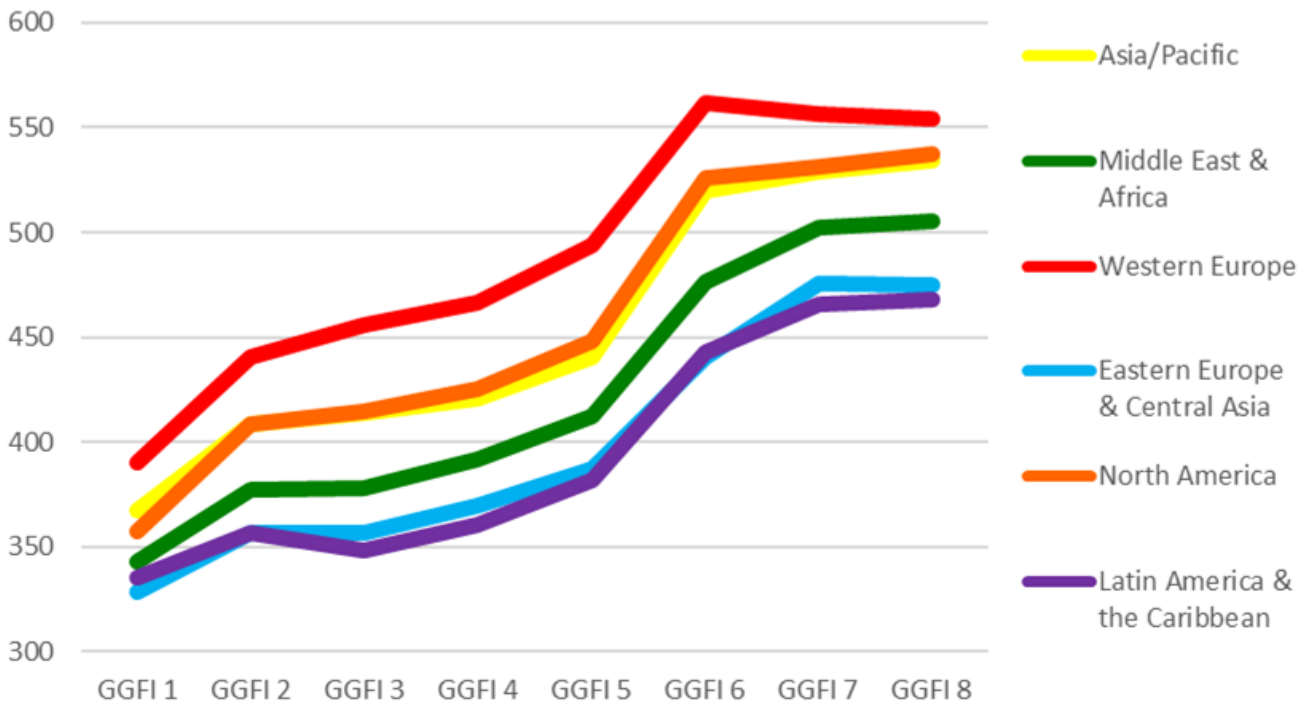
“There is a need to tax all forms of pollution externalities, not just carbon or CO2.”

CEO, Editor In Chief, Ethical Media Company, New York

Regional Performance

For the second edition of the GGFI in a row, the average rating of the top five Western European centres saw a decline. The average for the top five centres in other regions generally increased, with the exception of Eastern Europe & Central Asia. The leading North American centres just maintained their lead over the Asia/Pacific region. Competition among the leading centres looks as though it will intensify as Asia Pacific and North American centres make progress.

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 a reputation for quality, the development of green finance in leading centres in Asia/Pacific And North America has enhanced the depth of the green finance in these centres. At the same time, as their experience in this sector grows, these regions along with the Middle East & Africa are improving the quality of their green finance offering.

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

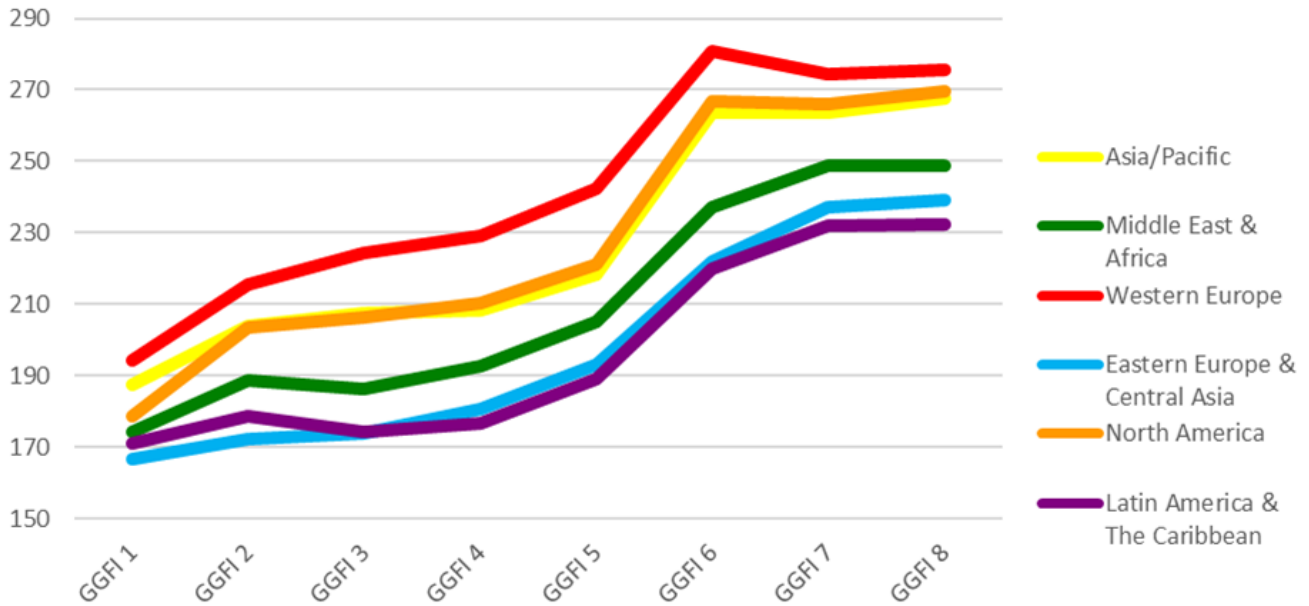
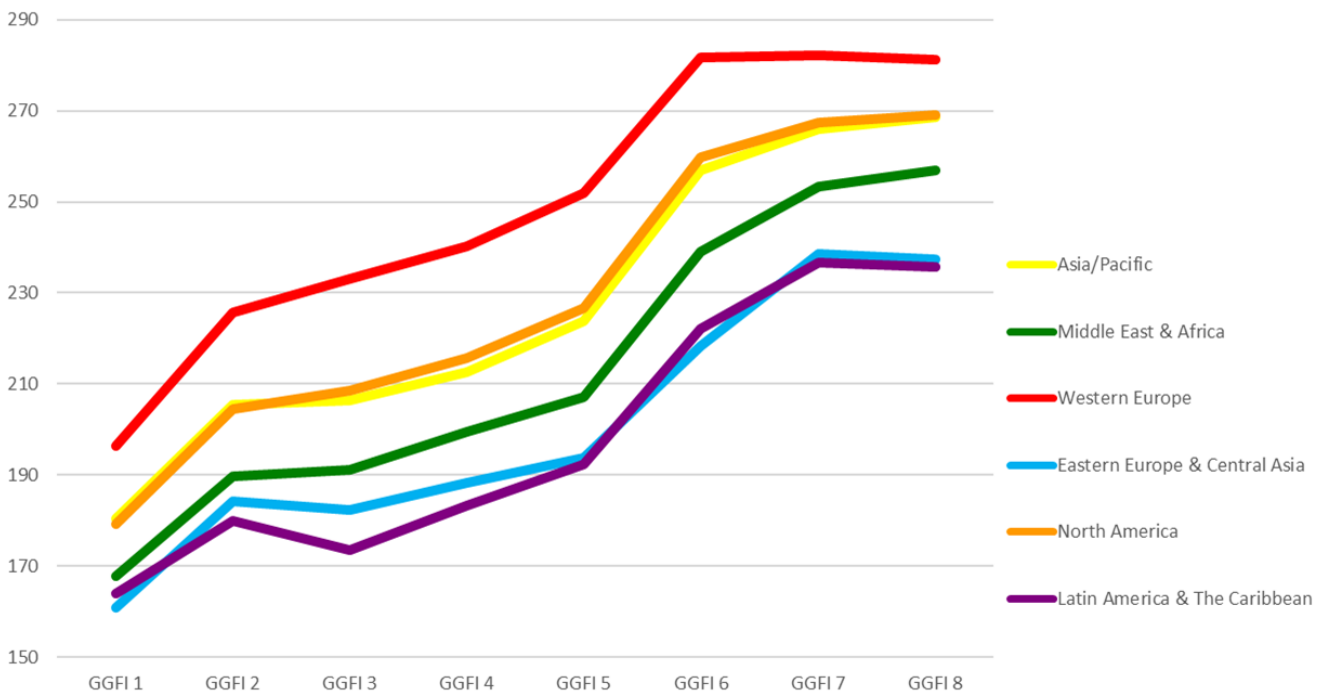


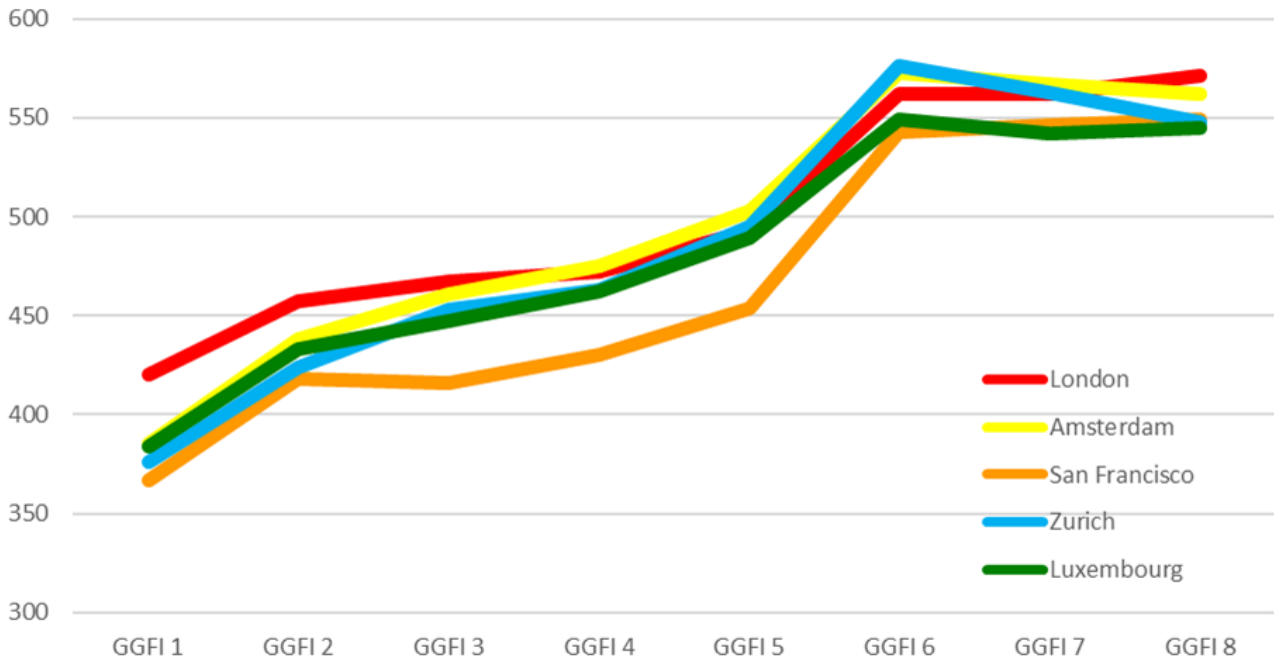
Chart 5 | Average Ratings For Quality Of The Top Five Centres In Each Region



Top Five Centres

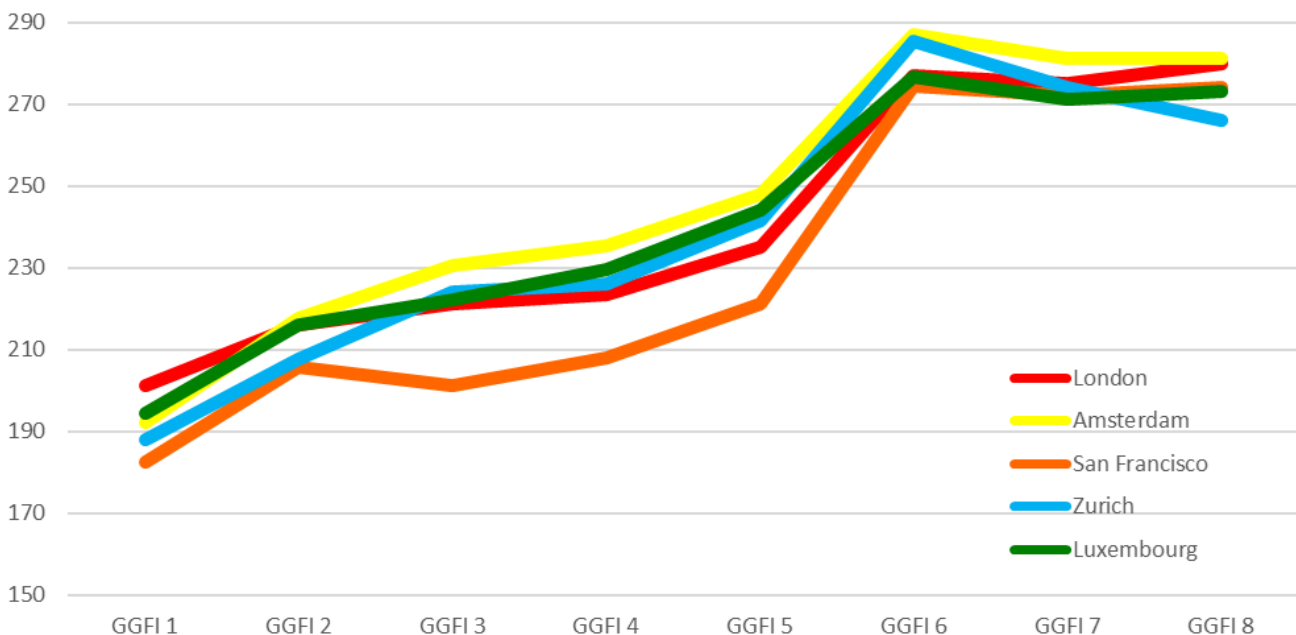
The top five centres in the index illustrated mixed fortunes. London’s improvement saw it overtake Amsterdam, while Zurich fell back against other leading centres.

Chart 6 | The Top Five Centres Over Time



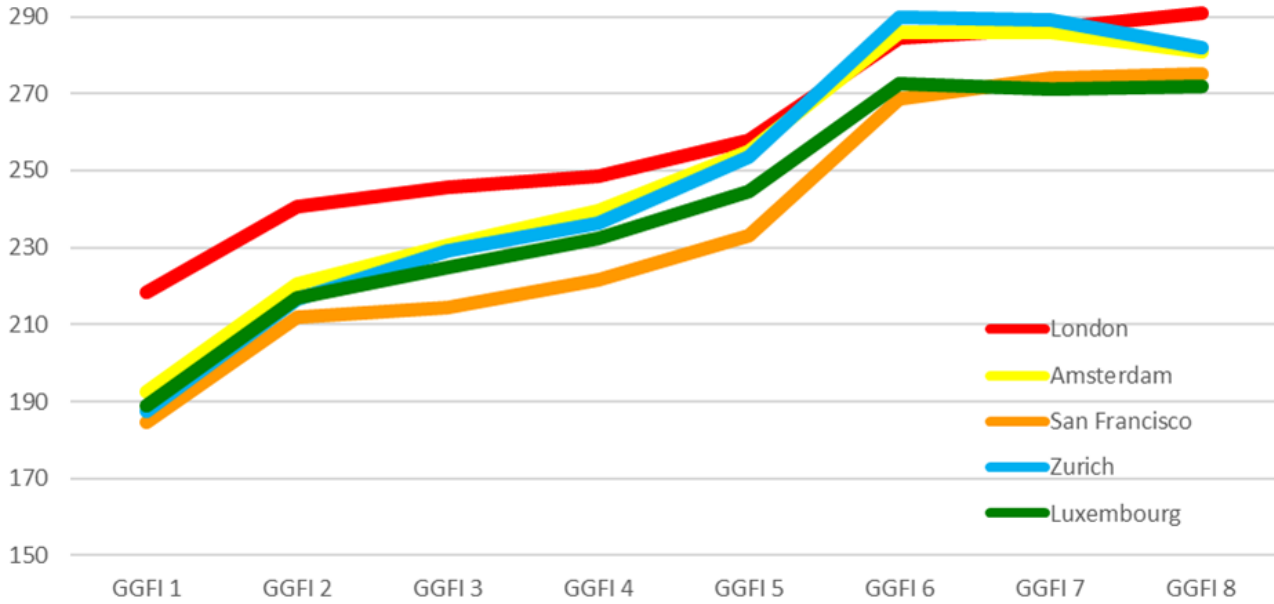
When the depth dimension is examined, the leading centres generally maintained or improved their ratings, with the exception of Zurich.

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



On the quality measure, London improved the most in this group, with Amsterdam and Zurich falling and San Francisco and Luxembourg 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, San Francisco, Los Angeles, and Paris featuring in the top 10 in both indices.

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

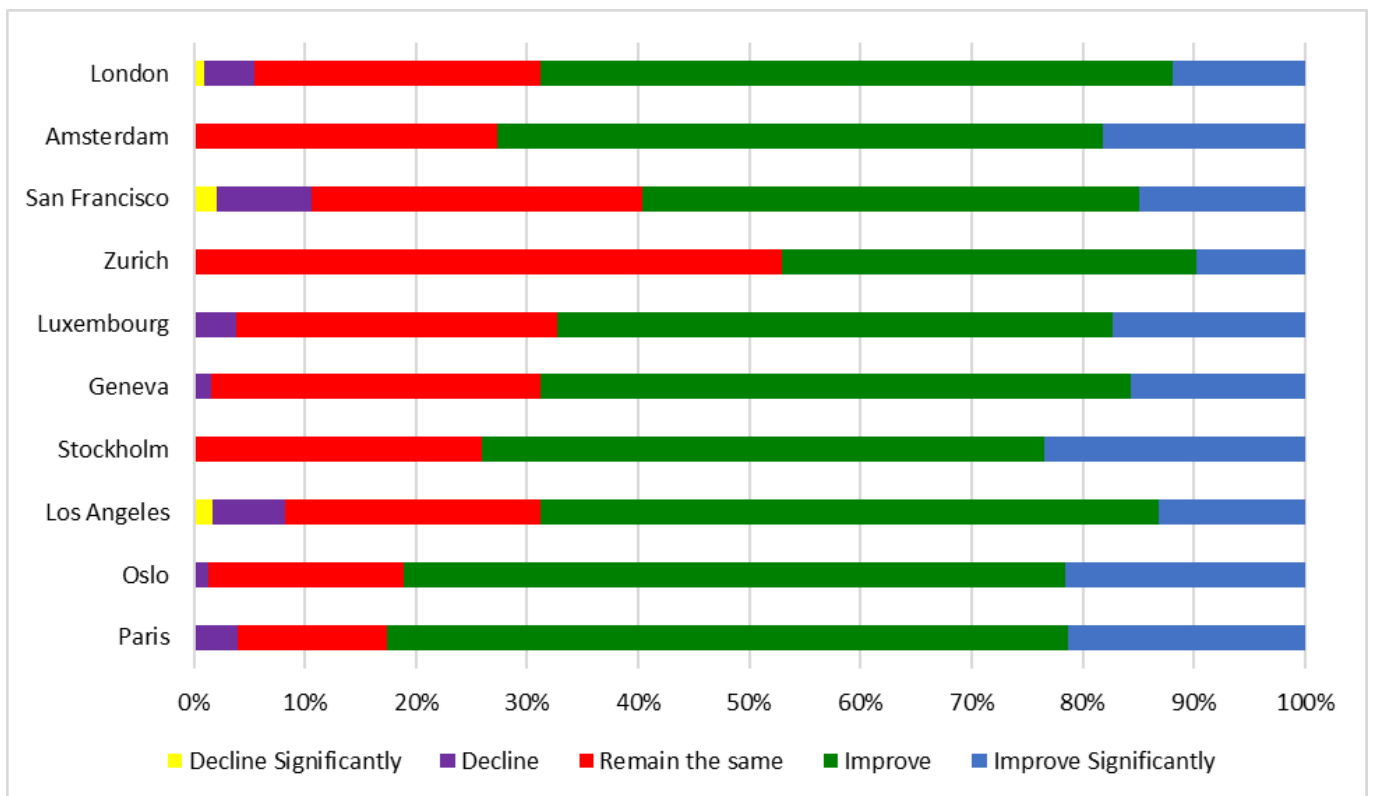
Centre	Green Finance Index 8	Green Finance Depth	Green Finance Quality	Financial Centre Competitiveness
New York	13	11	13	1
London	1	2	1	2
Hong Kong	41	44	30	3
Singapore	16	25	9	4
San Francisco	3	3	5	5
Shanghai	14	8	17	6
Los Angeles	8	6	9	7
Beijing	11	15	7	8
Tokyo	22	17	30	9
Paris	10	6	12	10
Chicago	37	34	38	11
Boston	25	20	37	12
Seoul	16	13	21	13
Frankfurt	34	40	24	14
Washington DC	15	11	21	15
Shenzhen	28	25	30	16
Amsterdam	2	1	3	17
Dubai	40	42	30	18
Toronto	31	34	24	19
Geneva	6	8	6	20
Source	GGFI 8 Rank	GGFI 8 Depth Rank	GGFI 8 Quality Rank	GFCI 30 Rank

GGFI 8 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.

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



The regulatory environment should create a level-playing field and gradually internalise externalities and stop providing direct and indirect subsidies to the fossil fuel industry.

Chairman, Financial Centre Authority, Nur-Sultan

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 143 instrumental factors which relate to a range of aspects of centre competitiveness. These include measures of sustainability, the business environment, infrastructure and human capital.

Table 4 shows the top 15 instrumental factors in terms of their correlation with the GGFI ranking.

Those 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
OECD Country Risk Classification	0.622
Domestic Credit Provided By Banking Sector (% Of GDP)	0.611
IESE Cities In Motion Index	0.580
Global Innovation Index	0.573
The Global Financial Centres Index	0.564
World Competitiveness Scoreboard	0.550
Cost of Living City Rankings	0.512
Sustainable Cities Index	0.492
Safe Cities Index	0.490
Best Countries For Business	0.477
Adjusted net national income per capita	0.467
World Talent Rankings	0.463
Corruption Perception Index	0.455
Smart City Index	0.453
Business Environment Rankings	0.448

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. Water quality ranks highly, along with a range of composite indices, which aim to measure sustainability performance across a range of social, economic and environmental factors.

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

Sustainability Factors	R-Squared
IESE Cities In Motion Index	0.580
Sustainable Cities Index	0.492
Quality of Living City Rankings	0.429
Sustainable Economic Development	0.389
Energy Transition Index	0.337
Environmental Performance	0.301
Financial Centre Corporate Sustainability Performance	0.251
World Energy Trilemma Index	0.226
Buildings Energy Efficiency Policies Database (Y/N)	0.164
Proportion of population using safely-managed drinking-water services (%)	0.154
Global Sustainable Competitiveness Index	0.129
Total Issuance Of Labelled Green Bonds To December 2018, USDm	0.120
Quality of Life Index	0.120
Total Number Of Labelled Green Bonds Issued To December 2018	0.117
Stock Exchanges With A Green Bond Segment (Y/N)	0.116

The instrumental factors that have the closest correlation with the index results in terms of sustainability measures are:

- The IESE Cities In Motion Index, which assesses several socioeconomic aspects of development, including human capital, social cohesion (which includes employment, female participation in the workforce, etc.), governance, sustainable development, mobility and transportation, urban planning, international outreach, and technology.
- The Arcadis Sustainable Cities Index: this index ranks 100 global cities on three dimensions of sustainability: people, planet, and profit. These represent social, environmental, and economic sustainability and offer an indicative picture of the health and wealth of cities for the present and the future.
- The Mercer Quality Of Living City Rankings: this index ranks cities taking account of a range of factors including political, economic, environmental, personal safety, health, education, transportation, and public service factors.

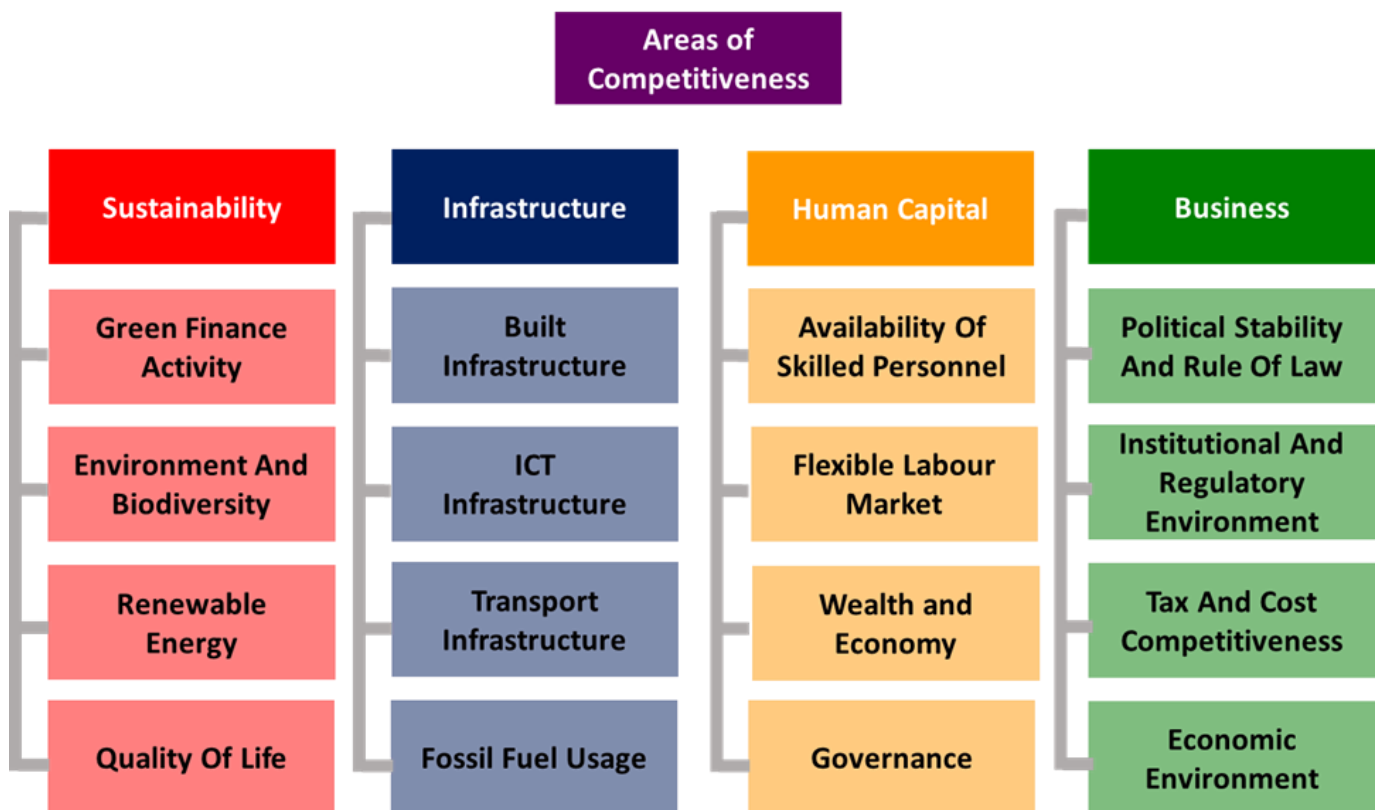
Areas Of Competitiveness

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.

Table 6 | Top 15 Centres By Area Of Competitiveness

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

“The Sustainable Finance Skillnet (SFS) upskills Irish-located financial services professionals in sustainable finance. offering 50 - 60% discounts on course prices, the employer then pays the balance. Discounts can be availed for on the CFA certificate in ESG investing, GARP Sustainability and Climate Risk Certificate, and PRI Academy courses. The SFS supported 1,400 professionals through courses in 2020.”

Leader, Sustainable Finance Partnership, Dublin

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, Amsterdam, and Luxembourg retain their positions. Paris, New York, Berlin, and Sydney gain significantly, while Beijing, Shanghai, and Washington DC 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	Paris (+7)
4	Zurich	San Francisco (-1)
5	Luxembourg	Luxembourg
6	Geneva	New York (+7)
7	Stockholm	Berlin (+14)
8	Los Angeles	Oslo (+1)
9	Oslo	Copenhagen (+3)
10	Paris	Zurich (-6)
11	Beijing	Los Angeles (-3)
12	Copenhagen	Sydney (+8)
13	New York	Stockholm (-6)
14	Shanghai	Munich (+5)
15	Washington DC	Geneva (-9)

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	109	<ul style="list-style-type: none"> • Disclosure remains important, with full disclosure of climate risk seen as useful. • It was suggested that the regulatory environment should create a level-playing field and stop providing direct and indirect subsidies to the fossil fuel industry.
The Availability Of Skills In Green Finance	90	<ul style="list-style-type: none"> • Many respondents identified significant gaps in training provision and expertise as critical factors in reducing the capacity of the sector to maximise growth. • There is the potential for this to be addressed in schools and higher education and to develop both competence and an appropriate mindset.
Taxation	86	<ul style="list-style-type: none"> • Several respondents suggested that there is a need to increase taxation on 'brown' assets. • No consensus exists on the issue of taxation, and it is suggested that this is not an area where financial centres should seek to build advantage.
Other	32	<ul style="list-style-type: none"> • Political risk continues to be identified as a significant drag on the growth of green finance. • Capital is available but there is an absence of bankable 'cross-border' projects.

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

- Energy attribute certificates (EACs) or renewable energy certificates.
- Green pensions.
- ESG linked bonds.
- Carbon markets.
- Green finance in its own ecosystem in the blockchain, coupled to a separate stock market index and listings.
- Friends of the Earth (Hong Kong) Green Finance Roadmap and collaboration.
- Green Sukuk and the role of Islamic Finance in supporting the transformation.
- 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. Charts 11 and 12 use San Francisco and Chicago as examples to contrast the different levels of connectivity that the two centres enjoy. In this example, the wider spread of San Francisco's connections in terms of all regions of the world is shown. Although Chicago is also well-connected, it is less widely connected than San Francisco.

You can explore the connectivity data using our online tool at <https://www.longfinance.net/programmes/financial-centre-futures/global-green-finance-index/ggfi8-explore-data/ggfi-8-connectivity-chart/>.

Chart 11 | GGFI 8 Connectivity - San Francisco

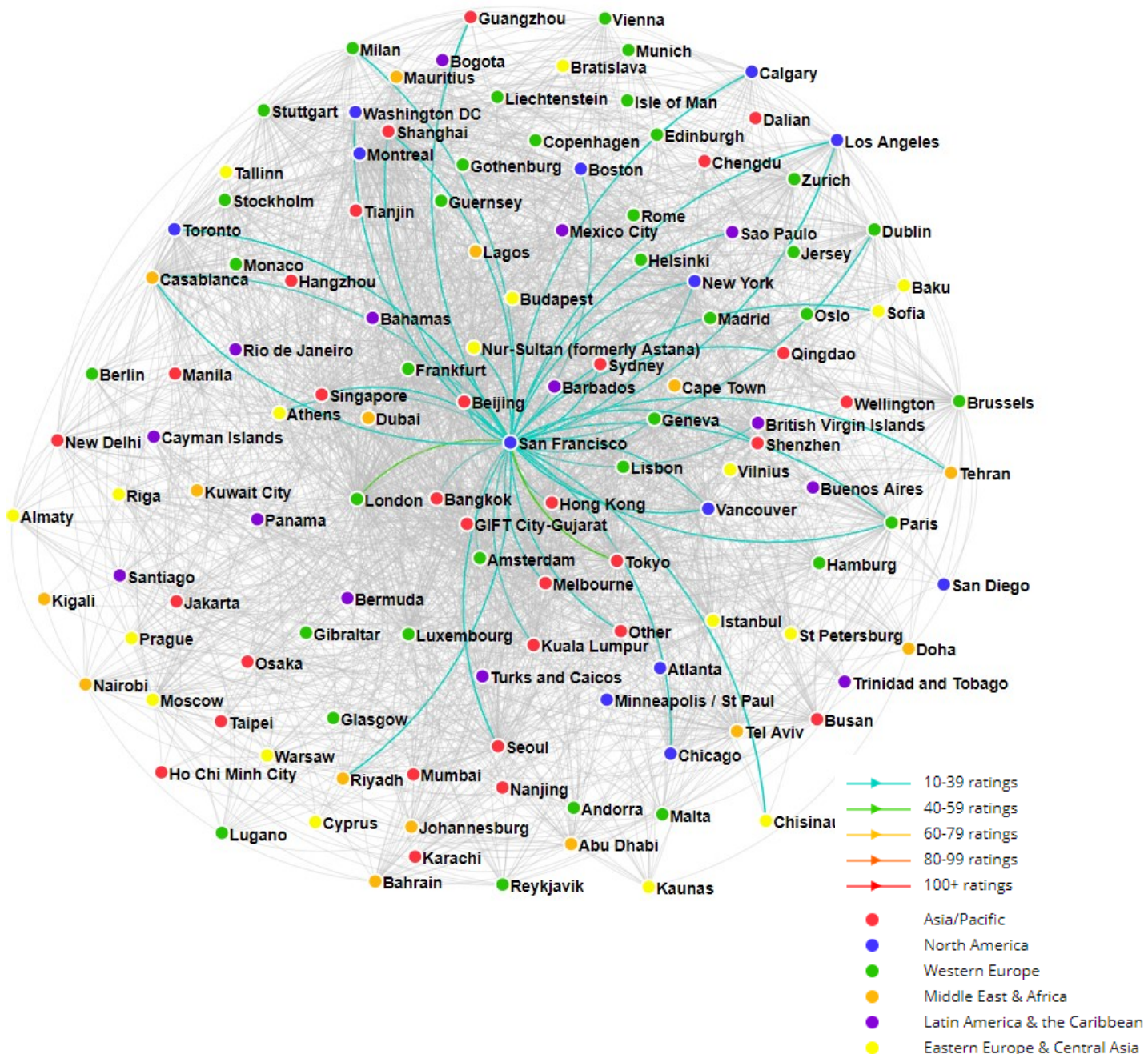
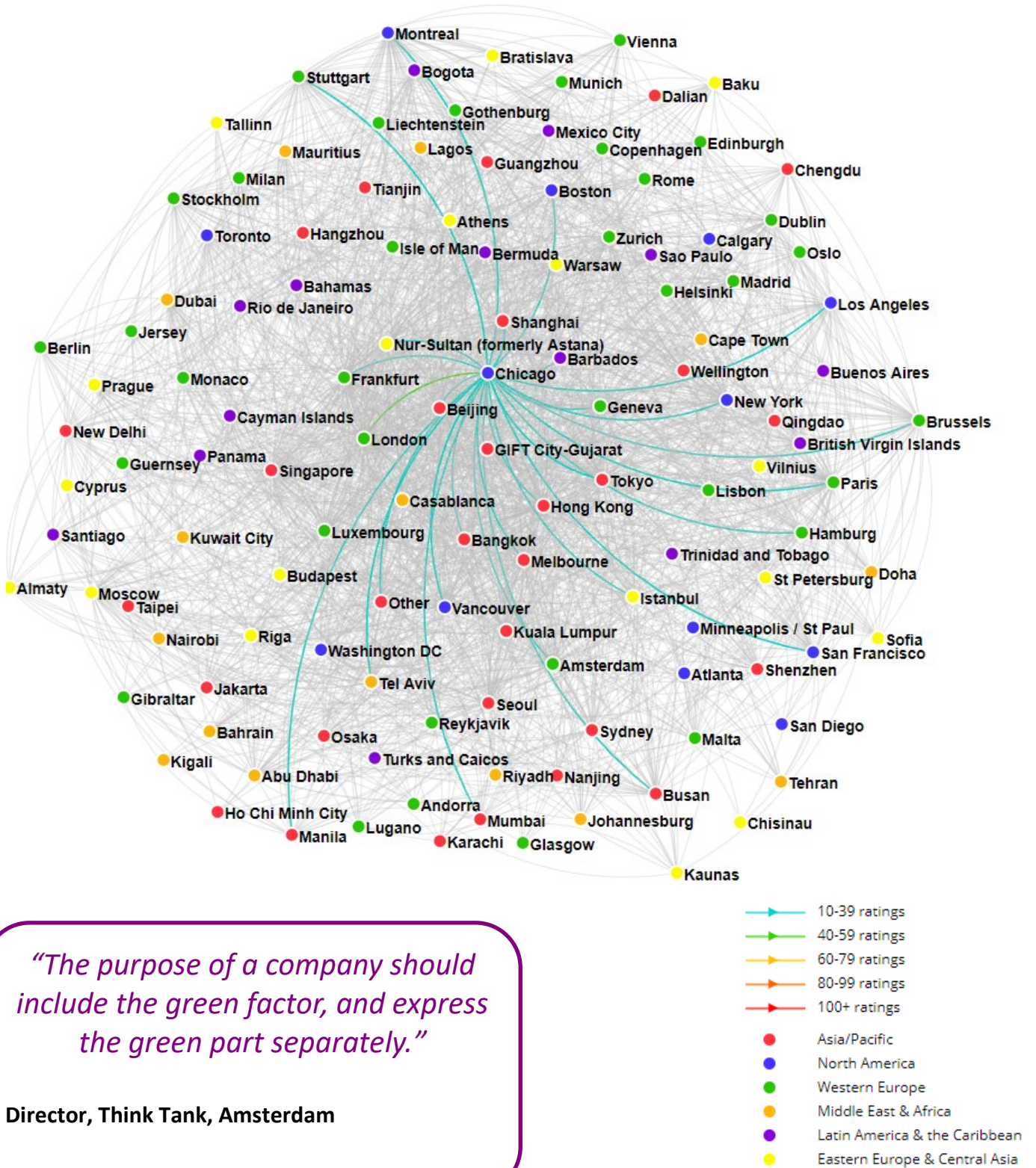


Chart 12 | GGFI 8 Connectivity - Chicago



“The purpose of a company should include the green factor, and express the green part separately.”

Director, Think Tank, Amsterdam

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).

'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 80 centres in GGFI 8 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.

Chart 13 | GGFI Dimensions

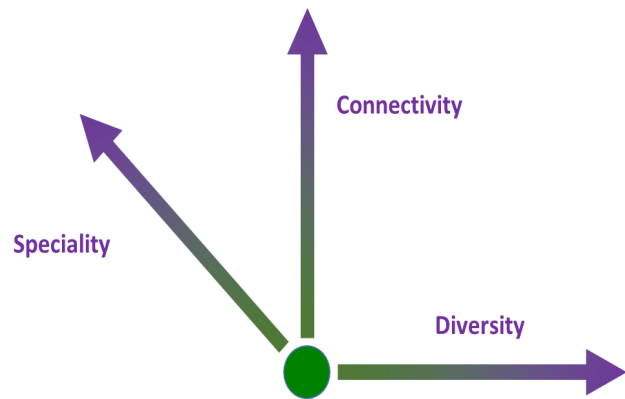
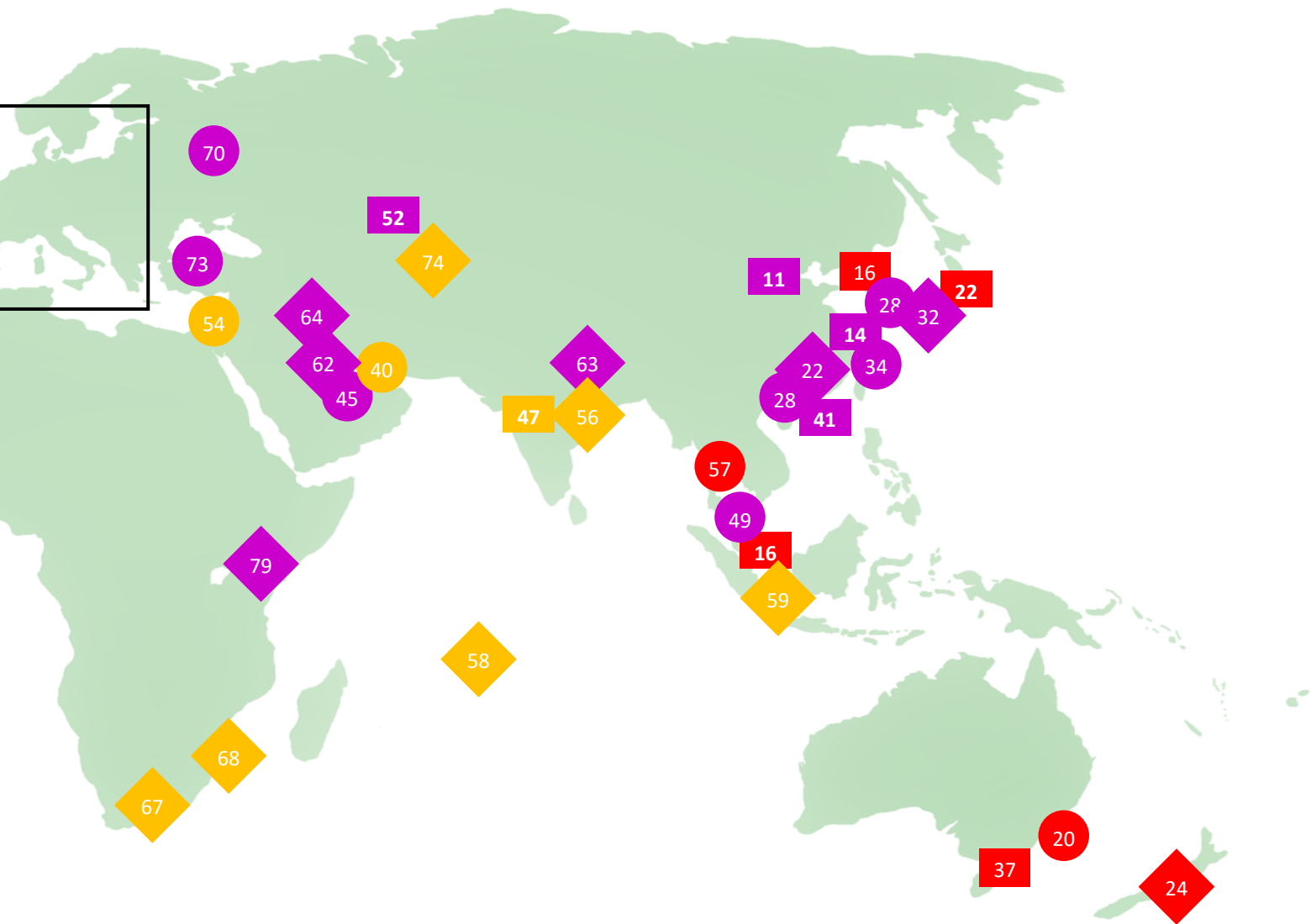


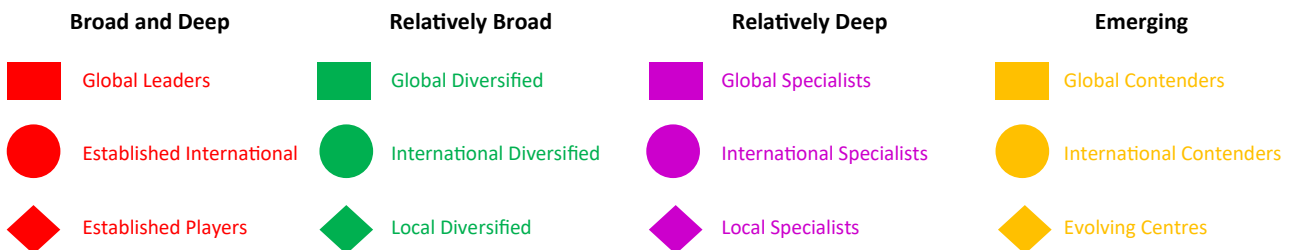
Table 9 | Financial Centre Profiling

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

* An asterisk denotes a change since GGFI 7



The numbers on the map indicate the GGFI 8 rankings.



COP 26 & Carbon Pricing – Sticking Plaster Or Key To Progress?

Introduction

In July 2021, Z/Yen held a webclave for international financial centres to discuss approaches to sustainable finance and delivering the UN Sustainable Development Goals (SDGs). The group discussed:

- The scope for local action, recognising the role that financial centres have in bringing together key players, supporting market access, developing standards and regulatory approaches, enabling a focus on priority areas of the economy, and financial inclusion measures.
- Disclosure and reporting, including metrics and taxonomies, access to data, and transparency.
- The move to digitisation and embedded finance.

The group recognised a number of challenges, including carbon risk exposure, improving the skills base, connecting policy with practical tools, and climate change risk adaptation.

In addition, a number of participants raised the contribution of emissions trading schemes in delivering change.

This supplement traces developments in emissions and carbon trading schemes in the lead in to COP 26 in Glasgow.

Background

The United Nations Framework Convention on Climate Change (UNFCCC¹) was an international environmental treaty adopted at the first Earth Summit in Rio in 1992 and signed by all UN member states.

In those days George H Bush was US president, Boris Yeltsin was the Russian president and John Major was the UK prime minister. The Berlin wall had not long come down, the cold war was over and the world was full of optimism.

The UNFCCC aimed to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous climate change.

Although it did not contain binding limits on greenhouse gas emissions for individual countries (nor have any enforcement mechanisms), it did lay down a framework for the development of international treaties (called 'Protocols' or 'Agreements') that would develop binding targets.

These protocols or agreements are developed through annual Conferences Of The Parties or COPs. COP26 is the twenty-sixth Conference of the Parties that signed the original convention and is taking place in Glasgow from 31 October to 12 November 2021².

1 <https://unfccc.int/>

2 <https://ukcop26.org/>



George H. W. Bush and Boris Yeltsin 1993 – Photographer Susan Biddle

Thirty Years Of Slow Progress

Only two COPs out of the preceding 25 stand out as having made substantive progress in tackling anthropomorphic climate change: COP 3 in Kyoto which resulted in the Kyoto Protocol³, and COP 21 in Paris, resulting in the Paris Agreement⁴.

The reason for this glacial pace is that there is no agreed voting rule for COPs - almost all decisions must be adopted by consensus⁵.

Consensus does not mean that all parties must agree, just that there is no stated objection to a decision (For example, a country may choose not to object formally to a decision, but to ask for its concerns to be noted in the report on the session).

The result is an enormous amount of ‘horse trading’ as blocs of smaller countries form to negotiate concessions (often having little to do with climate change) from major participants such as the US, Russia, and China.

The process is further complicated by the domestic politics of participants, who may find themselves under fire from opposition groups for giving away the family silver⁶. This is particularly well illustrated in the two ‘successful’ COPs mentioned earlier (see box 1).

3 https://unfccc.int/kyoto_protocol

4 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

5 <https://unfccc.int/resource/process/guideprocess-p.pdf>

6 <https://www.spglobal.com/platts/en/market-insights/latest-news/energy-transition/081321-biden-administration-needs-climate-wins-in-congress-for-strong-momentum-into-cop26>

International events can also influence the outcomes of COPs. In the thirty years since the UNFCCC, a new player has come to dominate the global stage.

China's rapid industrialisation and stellar economic growth have led it to become the world's largest emitter of greenhouse gases⁷. The Chinese leadership has recognised that this needs to be tackled as a matter of urgency, but whilst efforts to reduce the nation's reliance on coal⁸ and increase its uptake of renewables⁹ are beginning to bear fruit, and a new carbon trading scheme is gathering momentum,

Box 1: Domestic Issues

In 1997 COP 3 met in Kyoto, and the result was the Kyoto Protocol. The protocol outlined greenhouse gas emissions reduction obligations for developed countries, along with what came to be known as Kyoto Mechanisms such as emissions trading, clean development mechanism and joint implementation.

The US was instrumental in forging the protocol, and initially agreed to sign it under President Clinton, but this was never ratified by the US senate. On the election of President George W Bush in 2000, US policy changed, and by 2016 the US was the only nation in the world not to have signed.

In 2015, COP 21 met in Paris, and the result was the Paris Agreement.

The Paris Agreement's goal is to keep the increase in global average temperature to below 2 °C. To achieve this each country must determine, plan, and regularly report on the contribution that it undertakes to mitigate global warming.

The Obama administration agreed to sign up, and this time the treaty was ratified by the senate. However, the COP meeting took place shortly before the US election and in June 2017, U.S. President Donald Trump announced his intention to withdraw the United States from the agreement.

This formally occurred on 4th November 2020 (ironically the day after he lost the presidential election) and President Biden made it one of the first acts of his presidency to re-join. This took place in February of this year.

However, with a wafer-thin majority in the US Senate, the Biden administration still faces a significant challenge in following through any promises made in Glasgow.

7 <https://www.icos-cp.eu/science-and-impact/global-carbon-budget/2020>

8 <https://www.theguardian.com/world/2021/sep/22/china-climate-no-new-coal-fired-power-projects-abroad-xi-jinping>

9 <https://www.csis.org/east-green-chinas-global-leadership-renewable-energy>

China is coming under pressure to achieve its net-zero target far earlier than its 2060 goal. Although the US has indicated it will take a leadership position at COP26¹⁰, recent geopolitical events have cooled relations between China and western nations¹¹. As of 4 October, there had not been confirmation that the Chinese premier will attend the COP.

As a result, it is still uncertain whether the necessary alliances can be forged to drive the COP26 agenda forward.

What Is On The Agenda For COP 26?

The headline goals of COP 26 are in box 2 below.

Box 2: COP 26 Goals

1. Secure global net zero by mid-century and keep 1.5 degrees within reach.
2. Adapt to protect communities and natural habitats.
3. Mobilise finance.
4. Work together to finalise the Paris Agreement and encourage collaboration with business and civil society.

The first of these - securing global net-zero by mid-century and keeping 1.5 degrees within reach - is extremely ambitious. Countries are being asked to come forward with 2030 emissions reductions targets that align with reaching net zero by the middle of the century.

To deliver on these stretching targets, countries will need to:

- accelerate the phase-out of coal
- curtail deforestation
- speed up the switch to electric vehicles
- encourage investment in renewables.

Developing countries, and those who are reliant on the export of fossil fuels, see climate change as the consequence of centuries of economic and living standards progress by developed countries. They are naturally wary of any measures which could curtail their growth.

The second goal, adaptation to protect communities and natural habitats, through protecting and restoring ecosystems, building defences, warning systems, and resilient infrastructure and agriculture - may seem less contentious, but even here some nations balk at the costs of dealing with issues they believe to be caused by developed countries.

10 <https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/15/president-biden-to-host-leader-level-meeting-of-the-major-economies-forum-on-energy-and-climate/>

11 <https://www.thestar.com.my/aseanplus/aseanplus-news/2021/10/01/china-draws-contrast-with-aucus-as-it-rallies-support-to-join-cptpp>

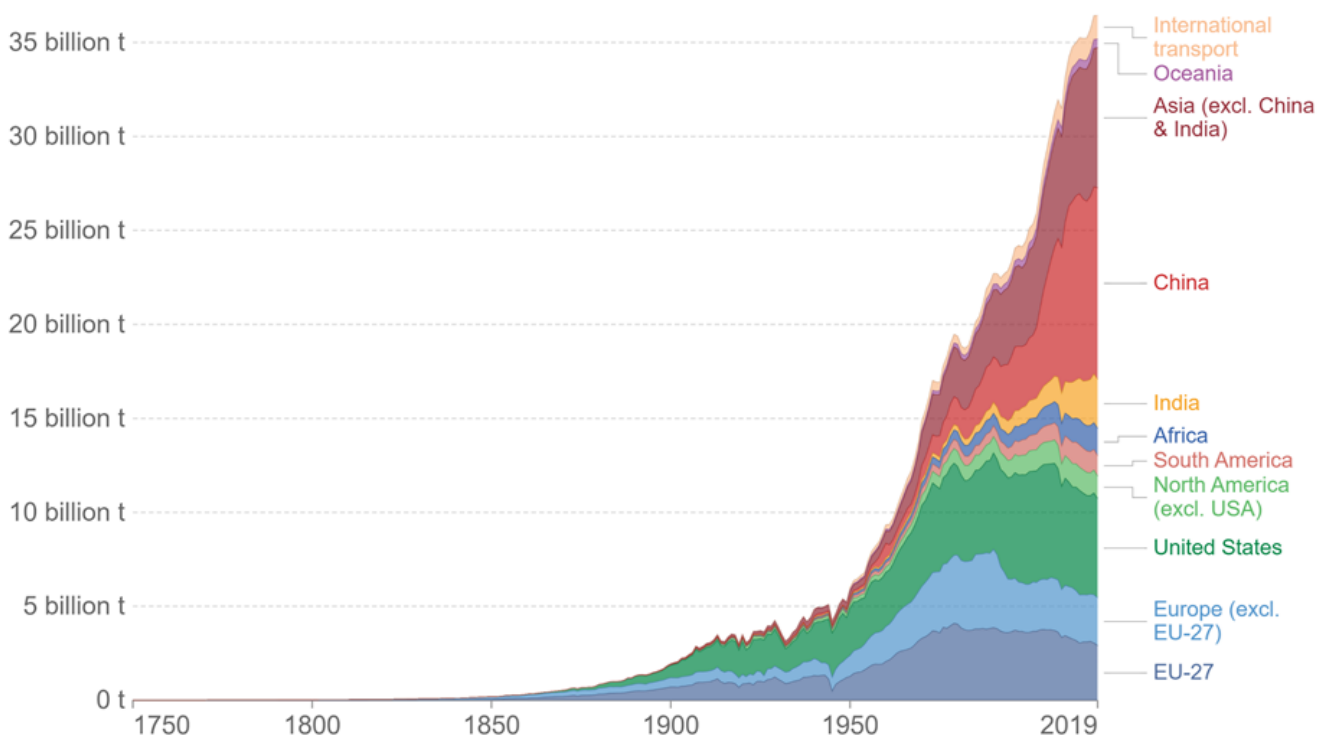
Mobilising finance is one area where parties can agree. Trillions of dollars are needed to achieve global net-zero. Unfortunately, where this money will come from is a somewhat more fraught question as developed countries have yet to make good on their promise to mobilise at least \$100bn in climate finance per year by 2020¹².

The final goal of COP 26 is to agree on a framework for international action. This element has two parts:

- Finalising the Paris Rulebook (the detailed rules that make the Paris Agreement operational) is critical. The rulebook determines how Nationally Determined Contributions (NDCs) - effectively, national carbon budgets – will be set, how they will be reported, and how compliance will be assured. This is likely to be contentious, with developing nations expecting developed nations to shoulder the lion's share of the burden, whilst fossil fuel exporting nations, will keep an eagle eye on accounting rules and weigh up the costs of reduced use to their economies.
- Accelerating action to tackle the climate crisis through collaboration between governments, businesses, and civil society – although this may be seen by some as the froth on the cappuccino, the developments of international and regional partnerships (with concomitant funding) is part of the business used to cement voting blocs at the COP and can be critical in reaching a consensus.

Figure 1 | Annual CO2 Emissions

Annual Total CO2 Emissions By Region



Source: Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

Note: This measures CO₂ emissions from fossil fuels and cement production only – land use change is not included. 'Statistical differences' (included in the GCP dataset) are not included here.

12 <https://grist.org/politics/a-100-billion-promise-holds-the-paris-agreement-green-climate-fund/>

Where Does Carbon Pricing Fit In This Picture?

How do you solve pollution problems? One way is to pass laws setting limits on the amount of a pollutant that can be discharged. This forces businesses to comply and applies penalties to those that do not.

However, prohibition can be a blunt instrument:

1. It can't be applied overnight as many firms would be driven out of business.
2. It favours large firms, who can afford abatement technology over small firms who can't.
3. Laws stop at national boundaries, whereas pollution does not, and firms in neighbouring countries without the financial burdens of pollution control can undercut those covered by prohibitions.
4. Finally, the burden of the enforcement of prohibition falls entirely on the public sector, and when this applies to atmospheric pollution, the costs of monitoring are not inconsiderable.

With respect to the first issue, laws can be created which stage the limits of pollutants over several years, giving businesses time to adjust. However, this encourages compliance rather than performance.

Focussing on large emitters may seem logical, but with pollution, the whole may be greater than the sum of individual parts and this may incentivise large businesses to outsource parts of their production process to smaller firms not covered by the legislation.

One way of tackling the issue of unfair competition is to place a price on carbon. For example, border taxes can be imposed which reflect the increased costs of production for compliant firms. However, imposing taxes can be risky – loopholes can always be found and they can also risk opening up trade disputes with neighbouring countries.

One alternative approach to these problems is to apply market disciplines to pollution control, in other words, to establish a market for emissions allowances that incentivises firms to profit through emissions reduction.

This works as follows:

- A central authority establishes a national cap on the amount of a pollutant that can be emitted. The authority then issues emissions allowances (either free of charge or by auction) to polluters. The total number of permits issued is less than the national cap.
- Firms are legally bound to measure their own emissions, and their actions have to be audited by an accredited third party. They then have a choice.
 - I. They can cut production to emit less pollution;
 - II. They can invest in technology to reduce pollution or;
 - III. They can buy surplus permits from those firms that have done I. or II.

Proof of concept of 'cap and trade' was first demonstrated following the U.S. Clean Air Act Amendments of 1990, which initiated an emissions trading program for sulphur dioxide (SO_x) emissions. Later that decade the second large trading program began for control of nitrogen oxide (NO_x) emissions.

Although initially viewed as controversial, numerous studies have concluded that cap-and-trade worked well in achieving its stated goals of achieving emissions targets, resulting in substantial environmental and public health benefits¹³.

13 Burtraw D & Szambelan S 2009 *U.S. Emissions Trading Markets for SO₂ and NO_x Resources For The Future* <https://media.rff.org/documents/RFF-DP-09-40.pdf>

A detailed analysis of the merits of cap and trade system versus carbon taxes was explored in the 2007 London Accord¹⁴, the 780 page report into the economics of climate change that preceded the Stern Review. The conclusion was that whilst there was room for both approaches, a cap and trade system was favoured by businesspeople and the investment community. However, setting a cap for cap and trade is a political process and many considerations need to be taken into account.

A Lightbulb Moment

It was as a result of the success of its NOx and SOx trading scheme, that the US pushed for market instruments to be agreed at COP 3 in 1997. The result was the Kyoto Protocol.

A cap was imposed on 39 'Annex B' countries (developed nations) who were required to achieve a designated percentage reduction in their emissions over 1990 levels, and three mechanisms were created to help achieve this:

1. The Clean Development Mechanism (CDM) allowed Certified Emissions Reductions' (CERs) to be claimed by Annex B countries who invested in emissions reduction projects in developing countries.
2. Joint implementation (JI) allowed developed countries to claim Emissions Reduction Units (ERUs) by investing in emissions reduction projects in transition economies (mainly former soviet bloc nations).
3. International Emissions Trading (IET) allowed countries that exceeded their emissions reduction targets to sell unused allowances to countries likely to exceed their allowances.

On paper, this looked like a brilliant solution, curbing greenhouse gas production whilst funding clean growth in developing economies.

Unfortunately, the reality was that almost from the start the protocol was flawed and although a number of CDM and JI projects were established, the scheme was heavily criticised for funding heavy industrial development which ran against the principles for which these schemes were founded. This was termed 'carbon leakage' – the displacement of carbon-intensive activity from developed nations to developing nations, with no net benefit to the planet (and concomitant economic damage to the developed nations involved). By 2012 Kyoto was dead.

Kyoto's faults lay in three areas:

- A lack of international trading arrangements;
- A lack of emissions reductions targets for emerging economies;
- Developed nations' failure to stick to their agreed reduction targets, compounded by a lack of sanctions for non-compliance.

14 <https://www.longfinance.net/media/documents/e4.pdf>

National Action

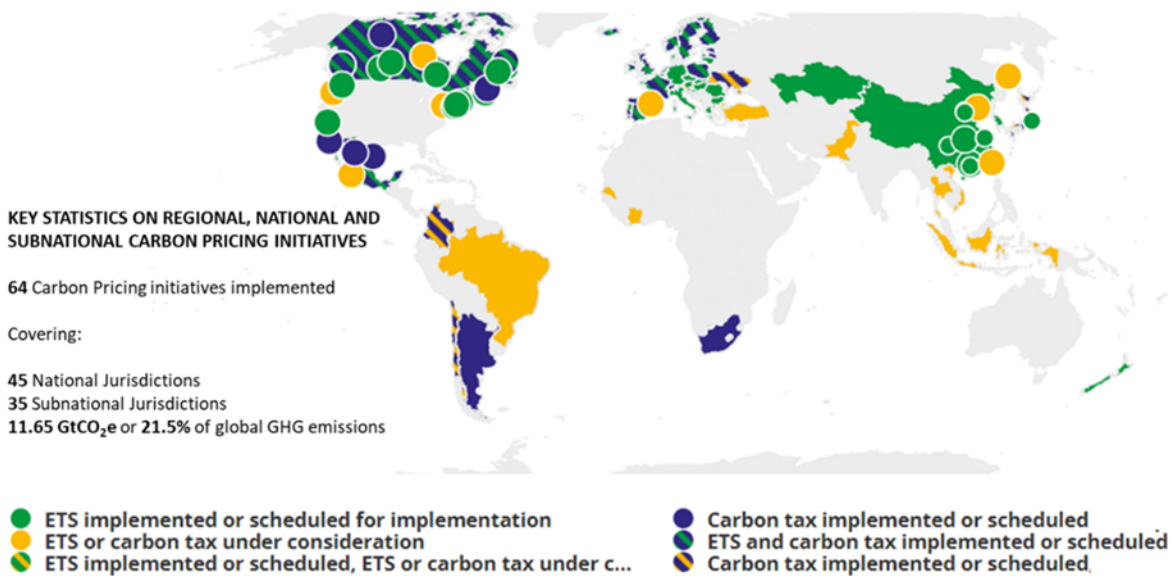
Although Kyoto ultimately failed, the concepts behind it took root and national and regional carbon pricing schemes blossomed. The EU was the first with the EU Emissions Trading Scheme (EUETS) in 2005. This scheme covered 15 member states and sought to achieve an 8% reduction in EU emissions in line with Kyoto. The EUETS is still extant and now covers 28 EU Member States plus Iceland, Liechtenstein, and Norway, as well as aviation activities in these countries. In total, around 45% of total EU greenhouse gas emissions are regulated by the EUETS.

On 14 July 2021, the Commission adopted a proposal for a new 'Carbon Border Adjustment Mechanism'¹⁵ (Tax) which will put a carbon price on imports of certain products so that European businesses covered by the EUETS (and other climate focussed regulations) do not suffer from the effects of 'carbon leakage'.

Other nations and regions followed Europe's lead (see Figure 2), and today there are 65 carbon pricing schemes around the world. One of the most notable is China's national carbon trading scheme (see Box 3) which launched in July 2021.

Figure 2 | Global Progress On Carbon Pricing

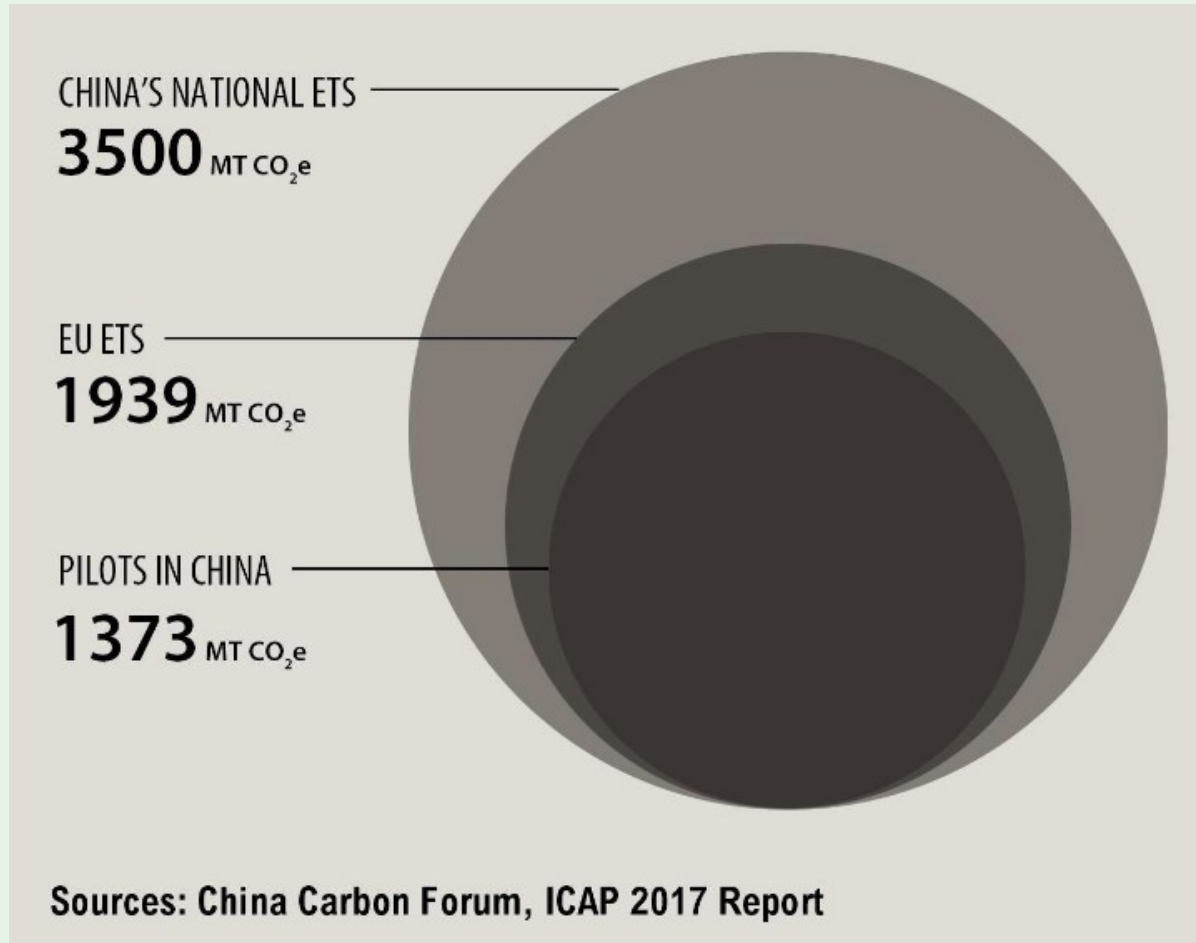
Regional, National & Sub-national Carbon Pricing Initiatives



Source: World Bank <https://carbonpricingdashboard.worldbank.org/>

Box 3 China's Trading Scheme

China's emissions trading scheme which launched nationwide in July 2021, following regional pilot schemes which began in 2012, is the world's largest.



The scheme initially covers coal and gas fired energy plants but it is planned to extend to construction, oil and chemicals in coming years. It accounts for four billion tCO₂e, or approximately 40% of national carbon emissions, and is designed to assist the nation in reaching its target of net-zero by 2060.

The scheme has faced some criticism due to its focus on efficiency of production rather than absolute emissions. Absolute emissions can still increase as energy output increases, provided companies are reducing the volume of emissions per Kwh.

China has chosen this route to accommodate predicted economic growth of 5% per year, as although China is now the world's largest emitter of greenhouse gases, its per capita emissions are still half those of the US.

How Could COP 26 Deliver Effective Action On Carbon Pricing?

In the dying hours of COP 21 in Paris, the thorny issue of international carbon trading made its way back onto the agenda. Keen to avoid the mistakes of Kyoto, Article 6 of the Paris Agreement covers in principle (but not in detail) how countries can reduce their emissions using international carbon markets. The three key sections of Article 6 are:

- Article 6.2 - an accounting framework for international cooperation (enabling the linking of emissions-trading schemes and the international transfer of carbon credits between countries).
- Article 6.4 - a central UN mechanism to trade credits from emissions reductions generated through specific projects.
- Article 6.8 - a work program for non-market approaches, such as applying taxes to discourage emissions.

No progress was made on Article 6 at COP 25 but there are signs that COP 26 may provide a breakthrough¹⁶. However, even if mechanisms are agreed one further piece of the jigsaw is required to deliver a complete solution to emissions reduction: effective carbon pricing.

Currently, although carbon pricing is almost universally agreed to be an effective way of tackling climate change (the OECD estimates that each €1 increase in the cost of carbon results in an average 0.73% reduction in emissions¹⁷), several issues hamper its effectiveness:

1. **The Price** - The criticism most often cited is the price itself¹⁸, which varies massively around the world (see OECD.Stat¹⁹). Opinions vary on what price should be set for a tonne of CO₂e in order to meet the Paris Goals: The High-Level Commission on Carbon Prices²⁰ believes the price should be between €40 and €80 (\$47 to \$94) per metric tonne today and between €50 to €100 per metric ton by 2030. The IMF²¹ recommends prices around €75 per metric tonne, while a French government commission²² recommends a carbon price of €250 by 2030 (and €775 in 2050) if technology forecasts do not turn out as optimistic as expected.

Establishing a global carbon 'floor price' for large emitters would reinforce the Paris Agreement by encouraging reductions whilst reducing the mounting pressure for border carbon adjustments. The World Bank developed the FASTER principles²³ for carbon pricing immediately before the COP25 meeting in Paris, but they failed to make traction at the time, and it could be time to revisit these.

16 <https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/080621-resolution-to-article-6-of-paris-accord-high-on-markets-list-before-cop26>

17 <https://www.oecd.org/tax/tax-policy/effective-carbon-rates-2021-brochure.pdf>

18 <https://www.oecd.org/tax/tax-policy/effective-carbon-rates-2021-0e8e24f5-en.htm>

19 https://stats.oecd.org/Index.aspx?DataSetCode=ECR&_ga=2.199903977.656584819.1633601296-713418632.1633601296#

20 <https://www.carbonpricingleadership.org/report-of-the-highlevel-commission-on-carbon-prices>

21 <https://www.imf.org/en/Publications/staff-climate-notes/Issues/2021/06/15/Proposal-for-an-International-Carbon-Price-Floor-Among-Large-Emitters-460468>

22 <https://www.strategie.gouv.fr/english-articles/value-climate-action>

23 <https://documents1.worldbank.org/curated/en/901041467995665361/pdf/99570-WP-PUBLIC-DISCLOSE-SUNDAY-SEPT-20-4PM-CarbonPricingPrinciples-1518724-Web.pdf>

2. **Net-zero** – Although it is broadly agreed that ‘Net Zero’ refers to a state in which carbon dioxide going into the atmosphere is balanced by removal from the atmosphere, no universally agreed definition of net-zero has yet been agreed. Should offsetting and sequestration be included in calculations? What about other (more potent) greenhouse gases? Nailing down a definition of net-zero may seem a trivial task, but it could be essential to ensuring that the Paris goals are met²⁴.
3. **The Cap** - Setting an effective cap is a critical part of carbon pricing. The EUETS was dogged by problems in its first phase²⁵ as the cap was too high. In theory, COP 26 should secure a commitment by participants to set emissions reductions targets that align with reaching net zero by the middle of the century. However, if these targets are not ambitious enough, setting an effective cap will be difficult.
4. **Grandfathering** - This means that allowances are calculated on a percentage reduction of past emissions, rather than an absolute percentage of the total allowances available. For example, a low population industrialised nation may commit to reduce its absolute emissions by 30% (over 1990 levels) by 2030, and to do this it will require an allowance of 10 gigatonnes of CO₂ equivalent. A populous developing nation may commit to the same reduction, but as it has less industrial capacity, it will only require 2 gigatonnes. However, despite having a lower standard of living the population of the developing nation (who still emit far lower CO₂ per capita than the developed nation) will be cutting their per capita emission more than the populous of the developed nation, potentially stifling economic growth. Needless to say, the concept of grandfathering is contentious²⁶ and likely to be a bone of contention at the COP.
5. **Fungibility** - There are a growing number of regional, national and sub-national trading schemes. At present these schemes are incompatible (especially so with China’s scheme, which uses the efficiency of production rather than absolute emissions, as the basis for its allowances). Agreeing on global standards and developing the market mechanisms to link these schemes would obviate the need for border carbon taxes in participating nations, enhance the liquidity of these markets and enable an increase in the price of carbon which would begin to bite.
6. **Scope 3 emissions** – Under the Green House Gas protocol²⁷ the world's most widely used greenhouse gas accounting standard, emissions are divided into three groups or 'Scopes'.
 - Scope 1 emissions arise from the direct combustion of fossil fuels, for example, the Scope 1 emissions of an airline arise from the use of jet fuel.
 - Scope 2 emissions arise from purchased energy, such as electricity, steam or heat.
 - Scope 3 emissions are caused by everything else – staff and business travel, procurement, waste disposal, investments, *and the use and disposal by customers of finished products*.

Scope 3 emissions are the elephant in the room at COP26.

24 <https://www.nature.com/articles/d41586-021-00864-9>

25 <http://www.eprg.group.cam.ac.uk/wp-content/uploads/2014/01/emissionstradinglessonslearned.pdf>

26 <https://www.tandfonline.com/doi/pdf/10.1080/09644016.2012.740937>

27 <https://ghgprotocol.org/about-us>

For a country such as China, which produces and exports high volumes of consumer goods, accepting responsibility for Scope 3 emissions would be politically unacceptable, and it could be argued, unfair. However, certain elements of scope three, such as carbon accounting for investments are a critical component of effective carbon pricing.

Could the time have come to reassess the Green House Gas protocol from a geopolitical perspective? Should Scope 3 be amended and responsibility for the use and disposal of finished products by consumers be shifted away from corporations and firmly onto the governments of the nations where those consumers live?

7. **Offsetting Schemes** – In the wake of Kyoto, a plethora of carbon offsetting schemes sprang up which sought to salve the consciences of corporations and consumers anxious to reduce their impacts on global warming. Some were founded with the best of motives and sought to use scientific principles to calculate their impact. Many were of dubious provenance and were little more than greenwashing. Most were discontinued following the 2008 financial crisis. As global anxiety on the impacts of climate change continues to grow these schemes are once again growing in popularity. COP 26 presents an opportunity to address the issue of offsetting schemes through the establishment of standards. This type of activity could even be brought into the mainstream if it were linked to an updated version of the CDM.

Conclusions

COP26 launches on 26 October buoyed by the hopes of billions. The impacts of anthropogenic climate change are beginning to be felt through extreme weather events around the world. Public awareness of climate change and the importance of the COP are at an all-time high.

In the rarefied atmosphere of the conference however, things are not as straightforward, and already developing countries are lamenting the imbalance of the topics under discussion: although progress may well be made on the Paris Rulebook, other topics including delivery of the \$100-billion climate finance goal, a new post-2025 finance target, and the global goal on adaptation are not on the agenda. Financial centres around the world will be viewing the outcomes of COP 26 with some trepidation. It is generally agreed that it would be politically unacceptable for China, Europe and the US to see the can kicked down the road once again. As a minimum, we can expect the Paris Rulebook to be agreed on, NDCs set, and reporting and compliance assured.

This will mean a increased focus on reporting requirements and a rise in the importance of regional standards, such as the EU Taxonomy Regulation and the Non-Financial Reporting Directive (NFRD). It is also likely that momentum will continue to grow on disinvestment and stranded assets, compounding the woes for fossil fuel companies and raising the issue of the exposure of stock exchanges to Carbon Risk.

Article 6 is one of the least glamorous, obscure, and complex concepts on the table at COP26. Resolving it will not be greeted with global headlines that the planet is saved, yet getting these rules right is critical.

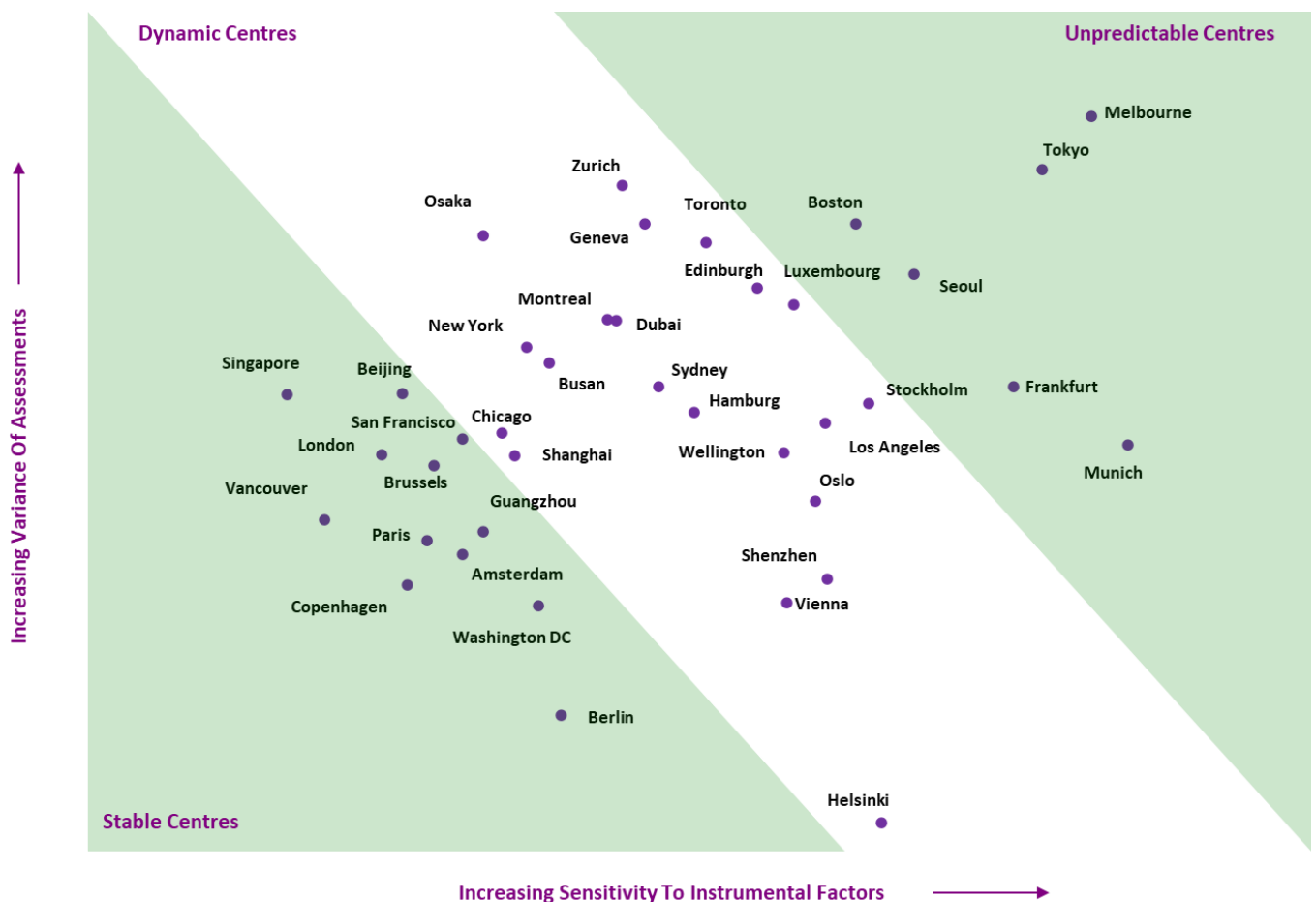
Effectively structured international markets and mechanisms could help the world avoid dangerous levels of global warming and financial centres can play a critical role in developing the infrastructure, system and services needed to help deliver this essential tool in managing our emissions before it is too late.

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 8, with the sensitivity to changes in the instrumental factors: first for depth and second for quality assessments.

The chart shows three bands of financial centres. The unpredictable centres in the top right of the chart have a higher sensitivity to changes in the instrumental factors and a higher variance of assessments. These centres 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.

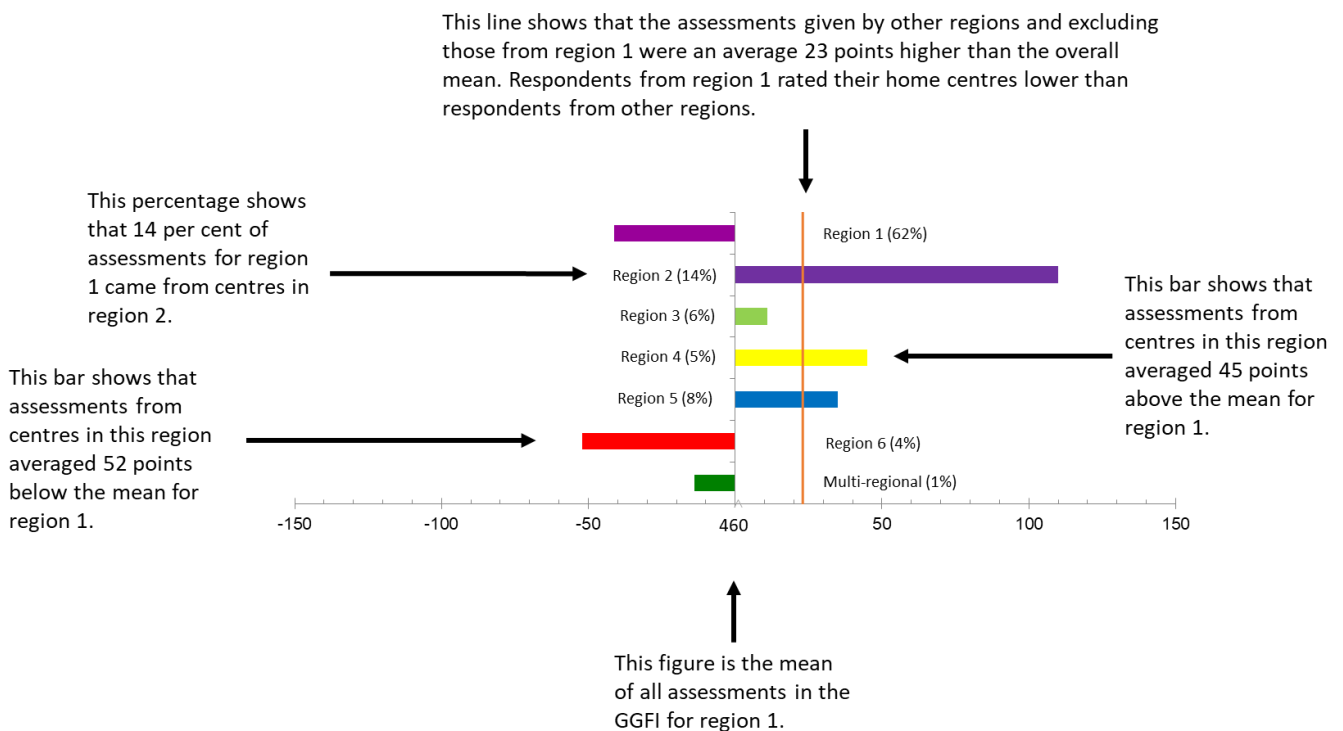
We display this analysis in charts, either for a region or an individual centre. These charts show:

- 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

- US centres continued to improve their position.
- San Francisco and Los Angeles retained their position in the top two places for the region, with New York gaining substantially.
- North America was rated significantly above average by people from the Asia/Pacific region.

Table 10 | North American Centres In GGFI 8

Centre	GGFI 8		GGFI 7		Change in Rank	Change In Rating
	Rank	Rating	Rank	Rating		
San Francisco	3	549	5	546	2	3
Los Angeles	8	542	10	538	2	4
New York	13	537	31	517	18	20
Washington DC	15	534	21	524	6	10
Vancouver	25	525	25	522	0	3
Boston	25	525	25	522	0	3
Montreal	25	525	19	526	-6	-1
Toronto	31	522	29	519	-2	3
Chicago	37	518	36	513	-1	5
Calgary	46	510	42	509	-4	1

Chart 16 | Top Five North American Centres Ratings Over Time

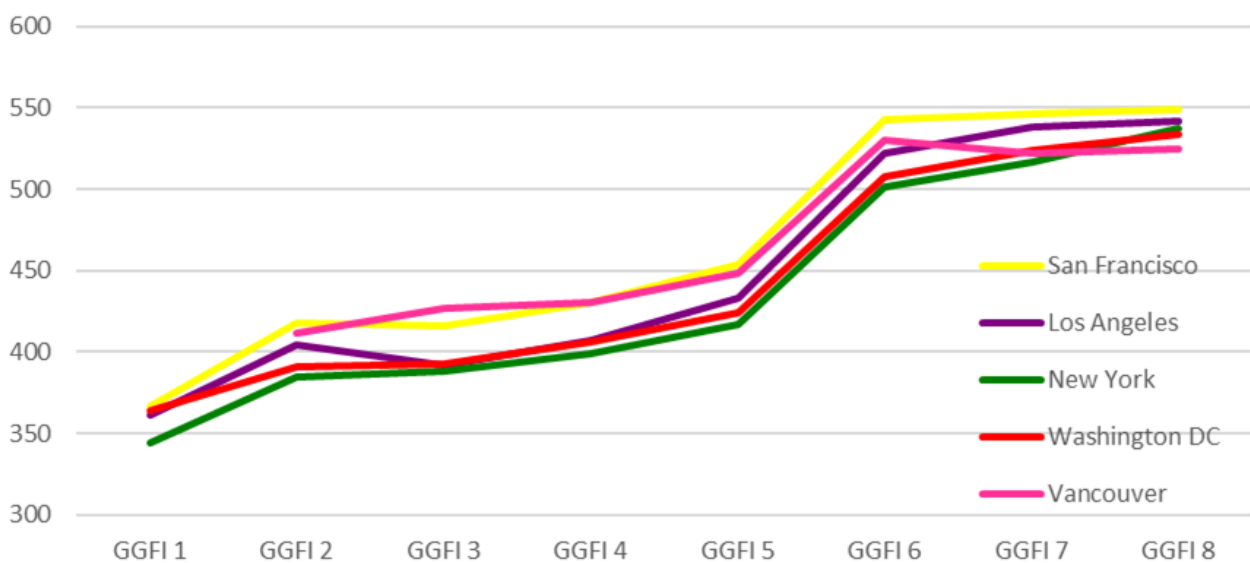


Chart 17 | North American Regional Assessments - Difference From The Mean

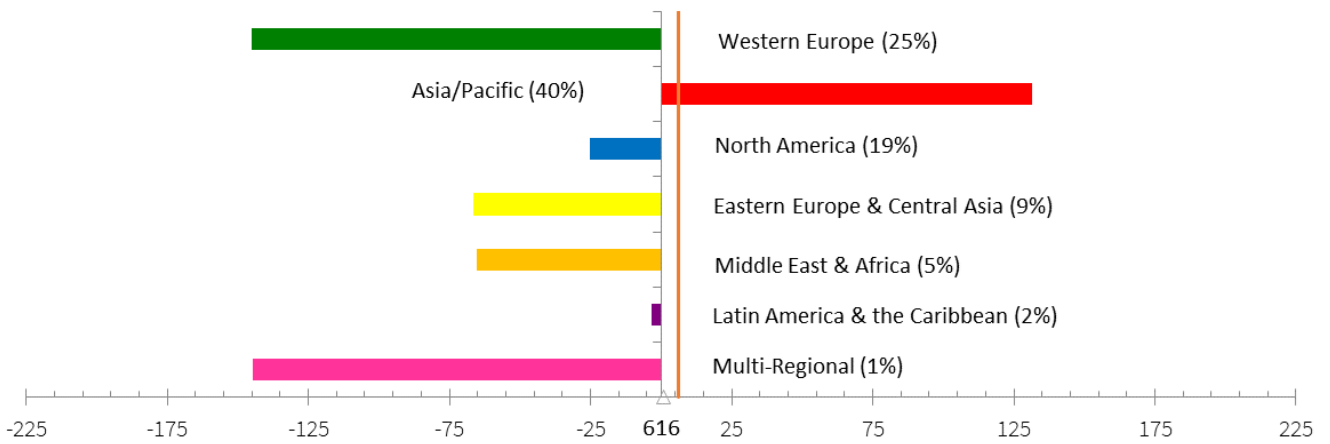


Chart 18 | Regional Assessments For San Francisco - Difference From The Mean

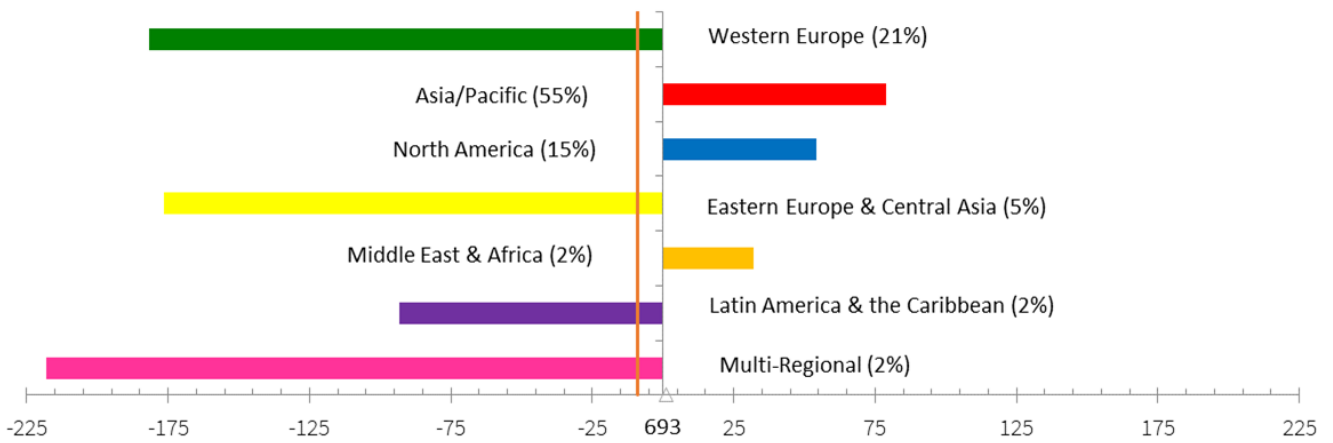
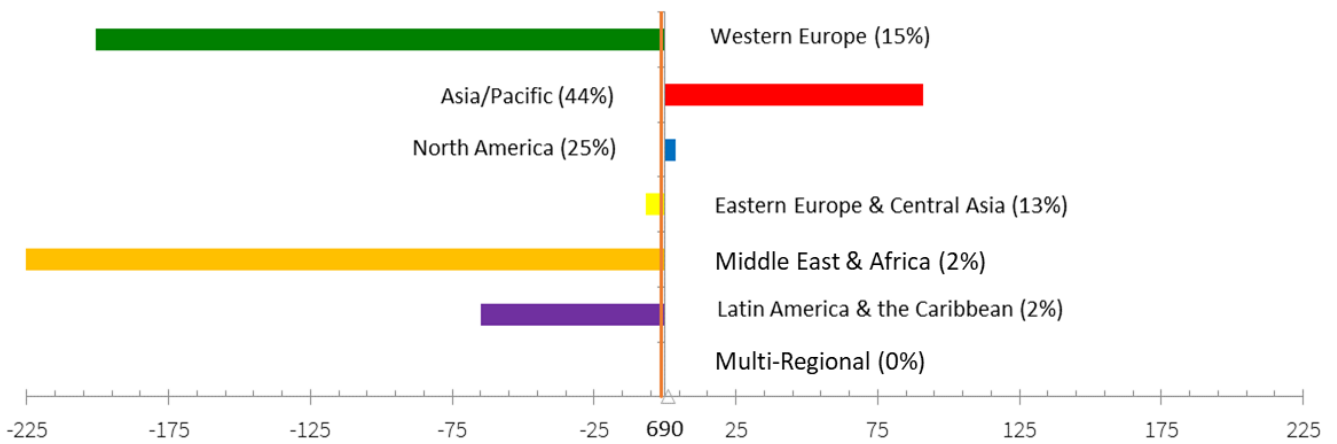


Chart 19 | Regional Assessments For Los Angeles - Difference From The Mean



Middle East & Africa

- Nairobi entered the GGFI for the first time.
- Dubai moved into the leading position in the region.
- Respondents from Western Europe and Latin America & The Caribbean rated Middle East & African centres lower than average.

Table 11 | Middle East & Africa Centres In GGFI 8

Centre	GGFI 8		GGFI 7		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Dubai	40	516	45	505	5	11
Casablanca	42	514	33	516	-9	-2
Abu Dhabi	45	511	50	496	5	15
Tel Aviv	54	496	48	502	-6	-6
Mauritius	58	490	52	491	-6	-1
Doha	62	484	59	483	-3	1
Bahrain	64	482	67	476	3	6
Cape Town	67	475	62	478	-5	-3
Johannesburg	68	474	66	477	-2	-3
Nairobi	79	456	New	New	New	New

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

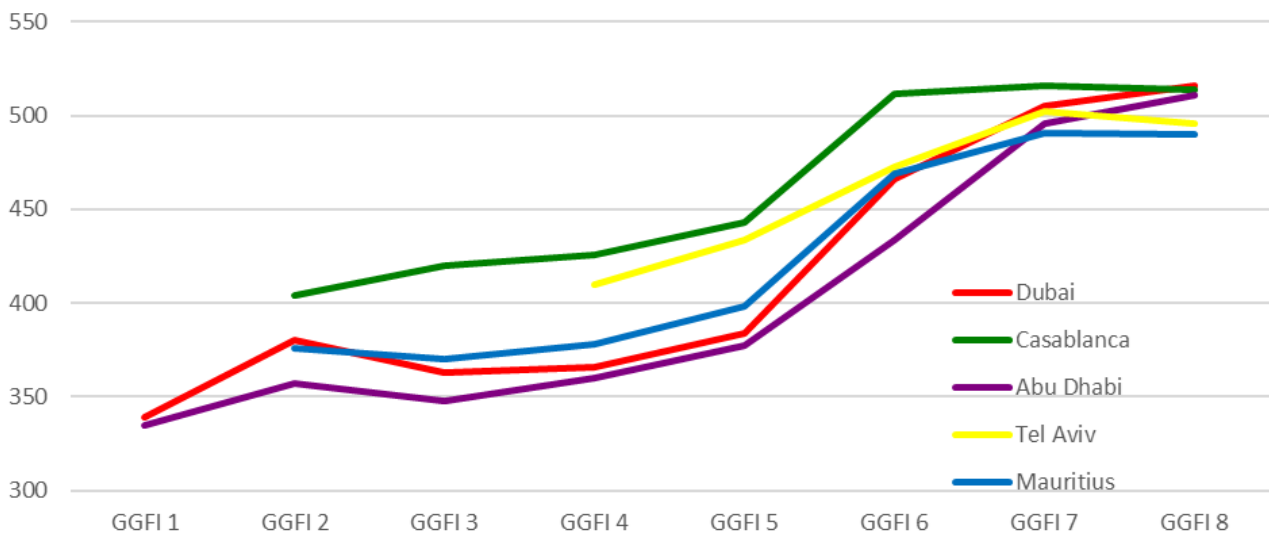


Chart 21 | Middle East & Africa Regional Assessments - Difference From The Mean

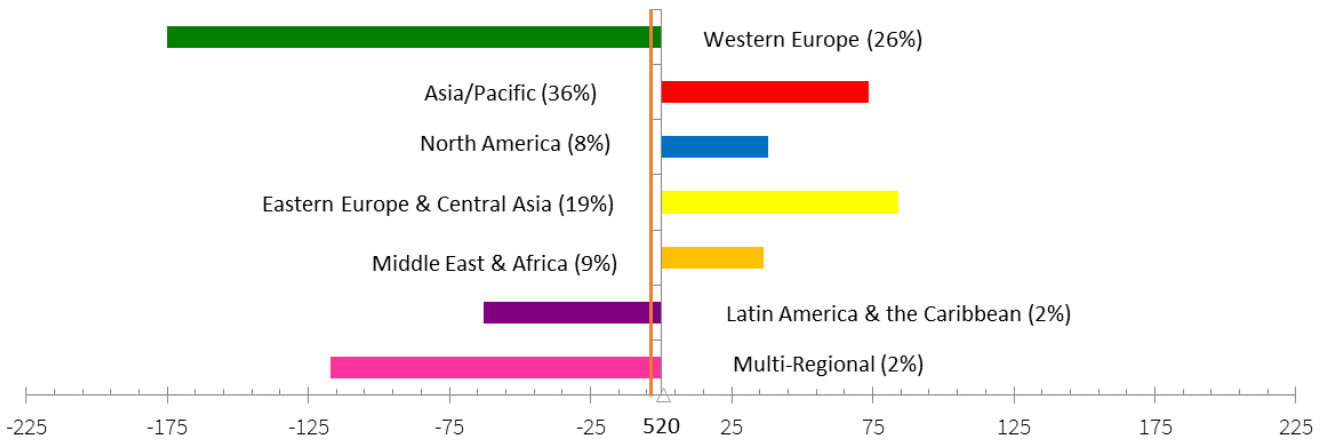


Chart 22 | Regional Assessments For Dubai - Difference From The Mean

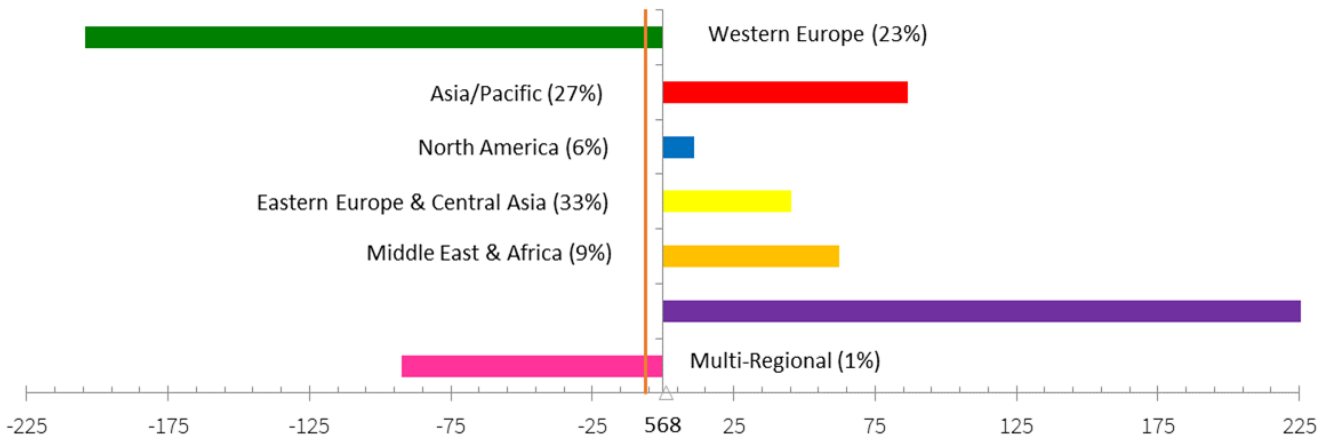
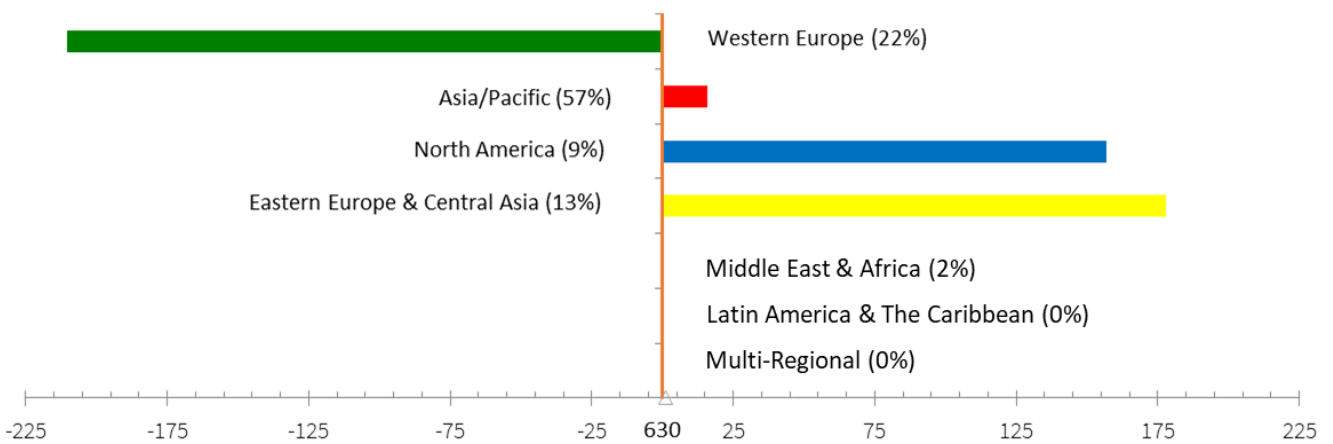


Chart 23 | Regional Assessments For Casablanca - Difference From The Mean



Eastern Europe & Central Asia

- Nur-Sultan consolidated its position as the leading green finance centre in the region.
- Respondents from Western Europe 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 Europe & Central Asian Centres In GGFI 8

Centre	GGFI 8		GGFI 7		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Nur-Sultan	52	498	57	485	5	13
Moscow	70	472	71	469	1	3
Prague	71	469	67	476	-4	-7
Warsaw	72	468	72	468	0	0
Istanbul	73	467	74	459	1	8
Almaty	74	466	62	478	-12	-12

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

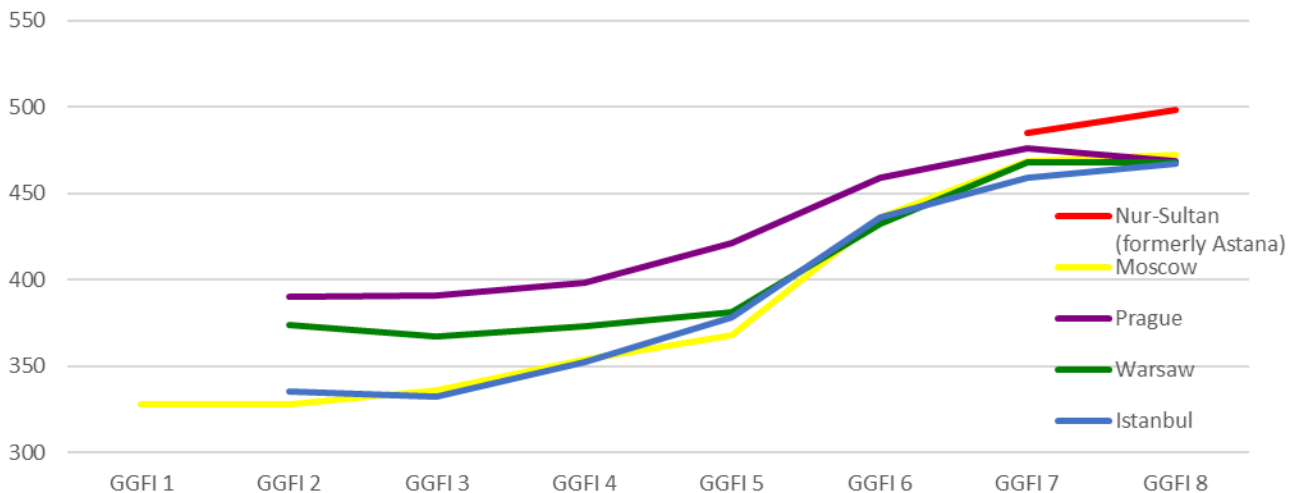


Chart 25 | Eastern Europe & Central Asia Regional Assessments - Difference From The Mean

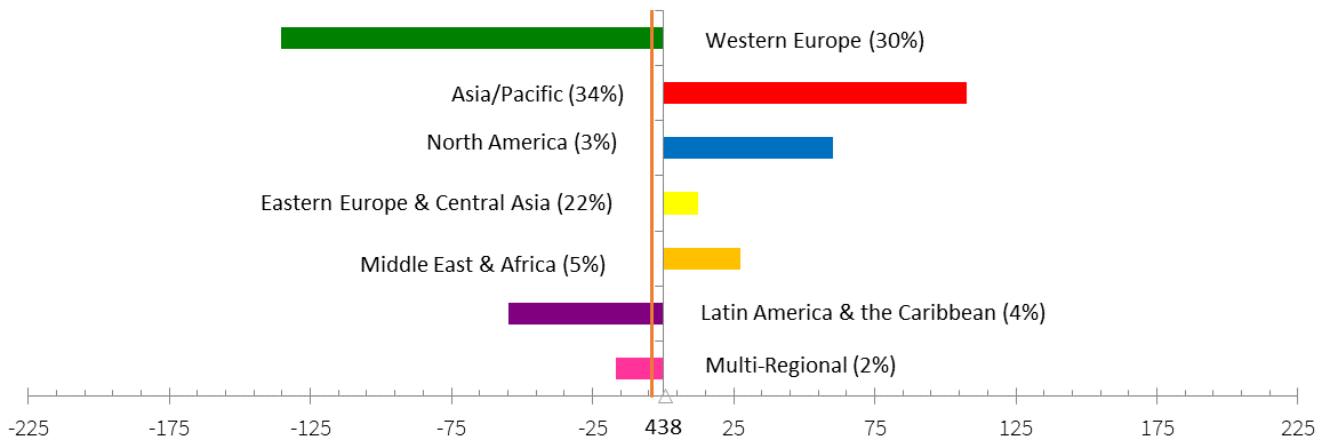


Chart 26 | Regional Assessments For Nur-Sultan - Difference From The Mean

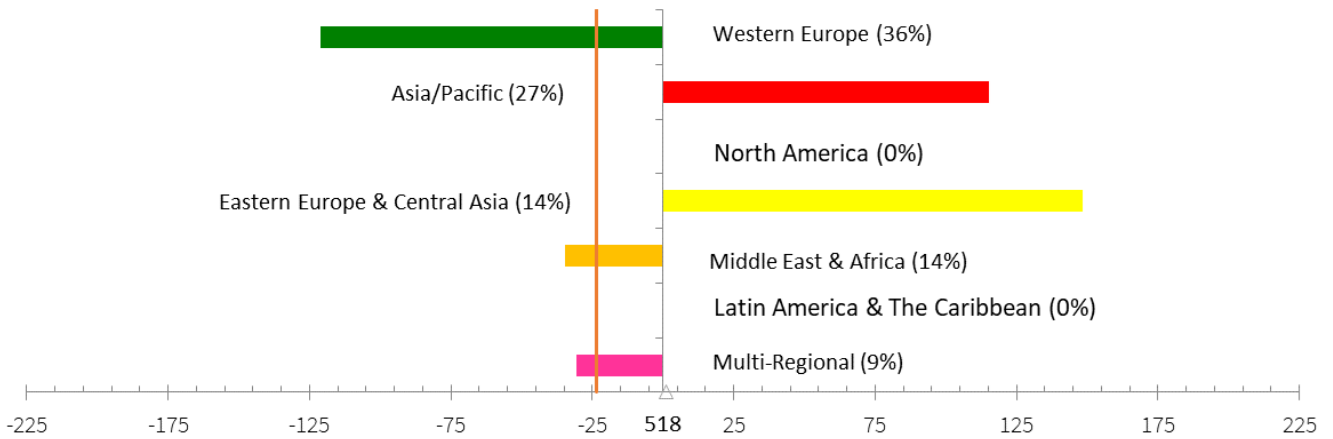
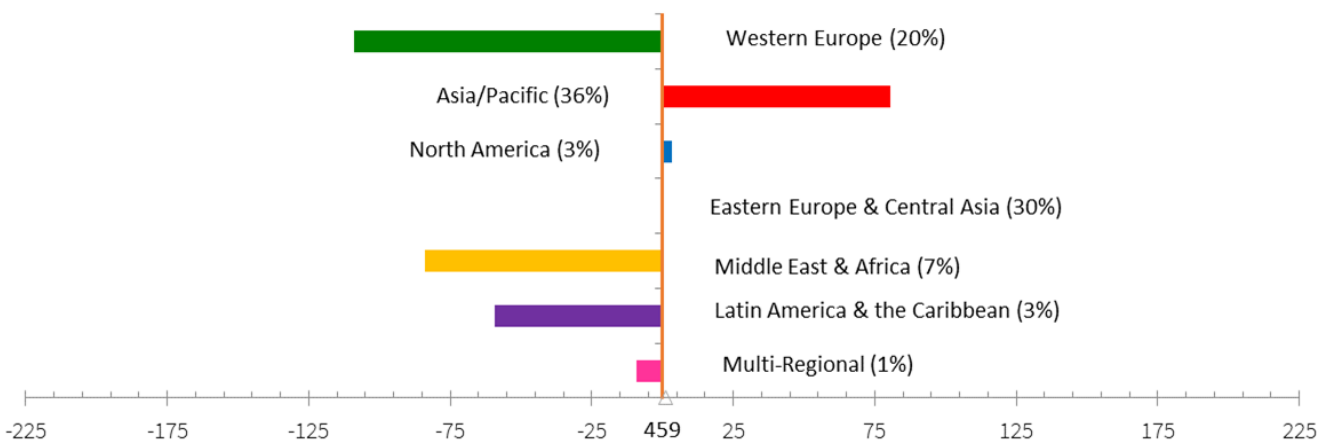


Chart 27 | Regional Assessments For Moscow - Difference From The Mean



Western Europe

- Berlin entered the GGFI for the first time, ranking 21st globally.
- London has overtaken Amsterdam and Zurich to take the leading position.
- Only respondents from Asia/Pacific rated Western European centres higher than average.

Table 13 | Top 15 Western European Centres In GGFI 8

Centre	GGFI 8		GGFI 7		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
London	1	571	3	562	2	9
Amsterdam	2	562	1	567	-1	-5
Zurich	4	548	2	563	-2	-15
Luxembourg	5	545	6	542	1	3
Geneva	6	544	7	541	1	3
Stockholm	7	543	9	539	2	4
Oslo	9	541	4	547	-5	-6
Paris	10	540	11	537	1	3
Copenhagen	12	538	8	540	-4	-2
Helsinki	18	532	12	534	-6	-2
Munich	19	531	15	530	-4	1
Berlin	21	529	New	New	New	New
Brussels	23	527	16	529	-7	-2
Vienna	33	520	22	523	-11	-3
Hamburg	34	519	25	522	-9	-3

Chart 28 | Top Five Western European Centre Ratings Over Time

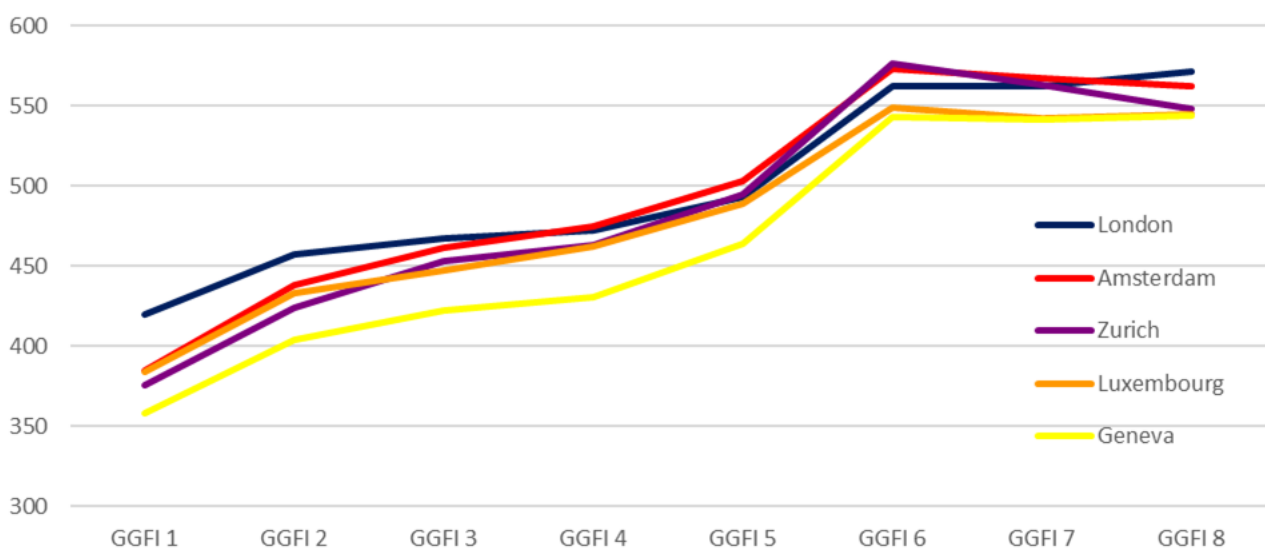


Chart 29 | Western Europe Regional Assessments - Difference From The Mean

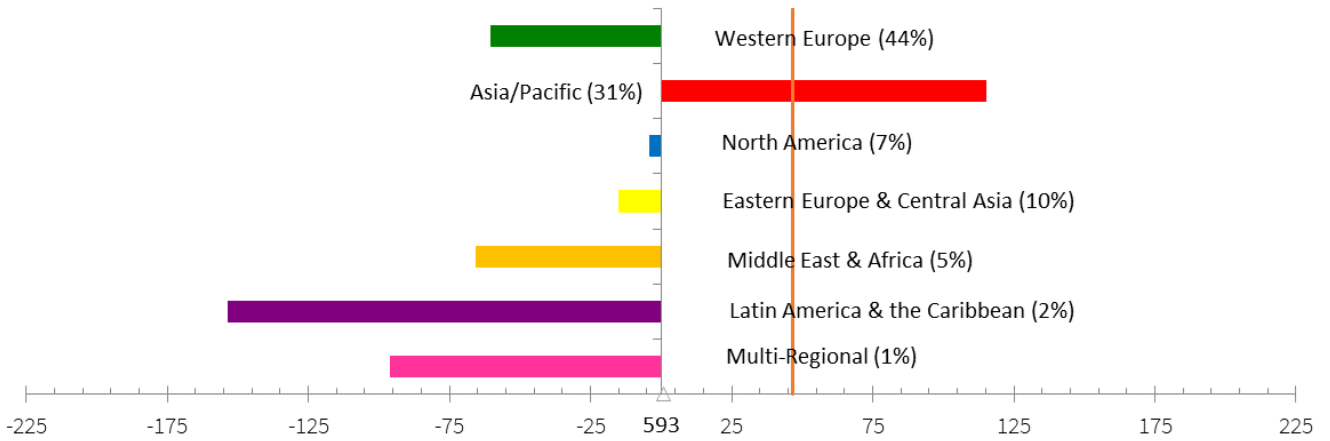


Chart 30 | Regional Assessments For London - Difference From The Mean

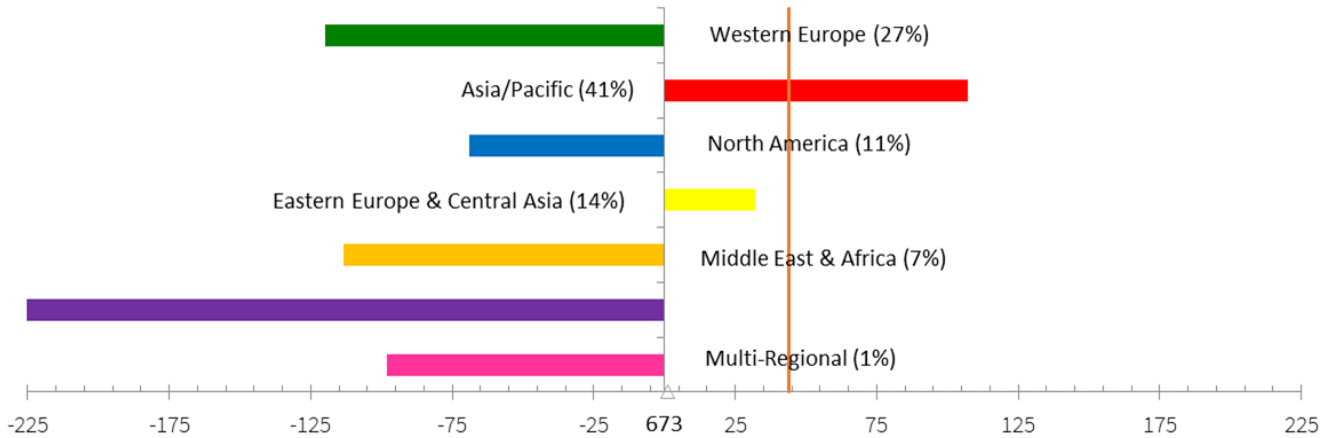
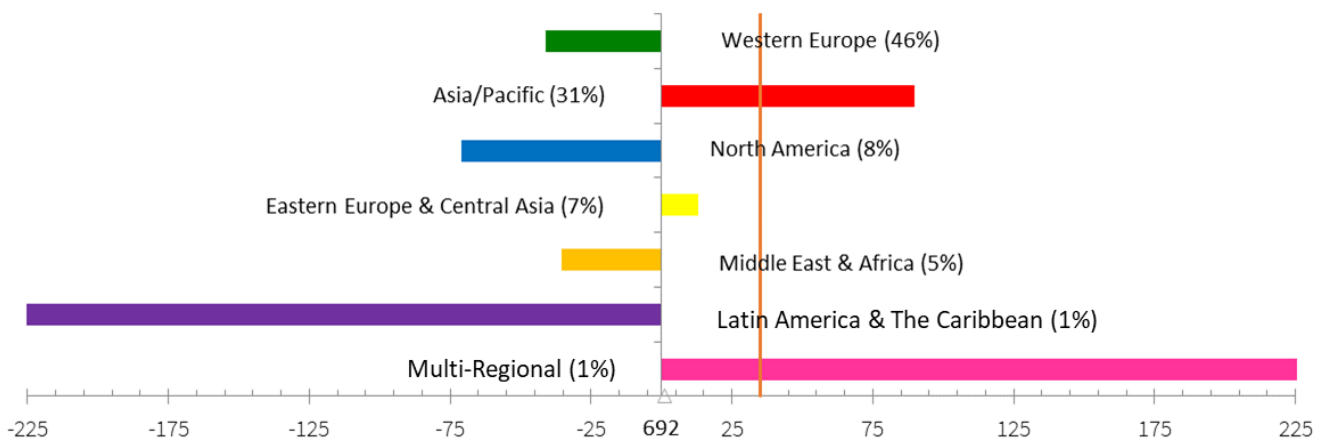


Chart 31 | Regional Assessments For Amsterdam - Difference From The Mean



Latin America & The Caribbean

- Sao Paulo continues to lead in the region, although it fell 5 ranking places in the index.
- Bermuda and the Cayman Islands fell in the rankings and ratings.
- Respondents from Asia/Pacific and Middle East & Africa centres rated centres in this region particularly highly.

Table 14 | Latin American & Caribbean Centres In GGFI 8

Centre	GGFI 8		GGFI 7		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Sao Paulo	65	480	60	479	-5	1
Mexico City	68	474	73	463	5	11
Rio de Janeiro	75	465	76	458	1	7
British Virgin Islands	76	464	77	456	1	8
Cayman Islands	77	458	69	473	-8	-15
Bermuda	80	441	78	455	-2	-14

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

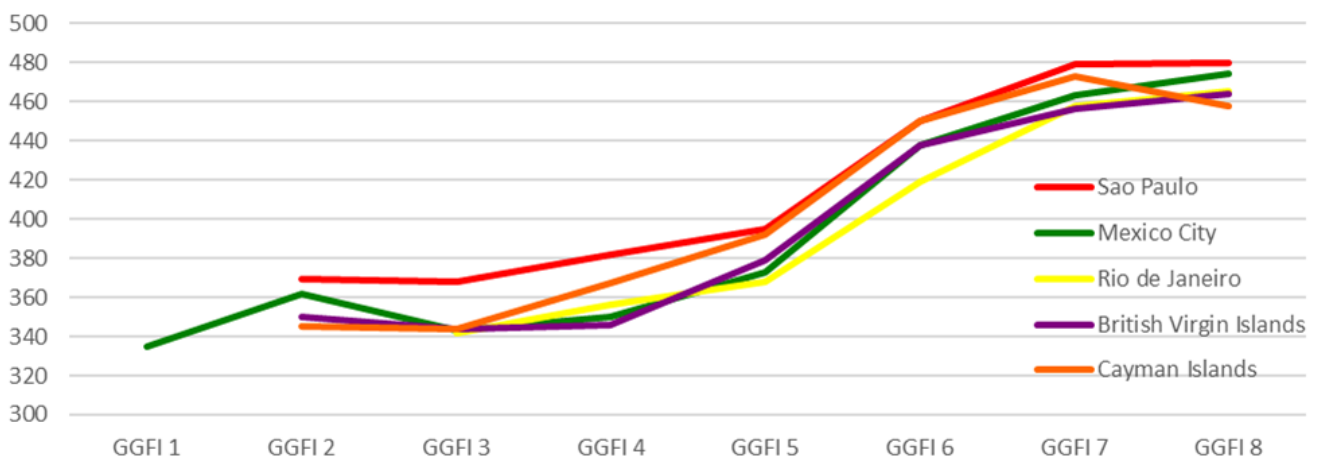


Chart 33 | Latin America & The Caribbean Regional Assessments - Difference From The Mean

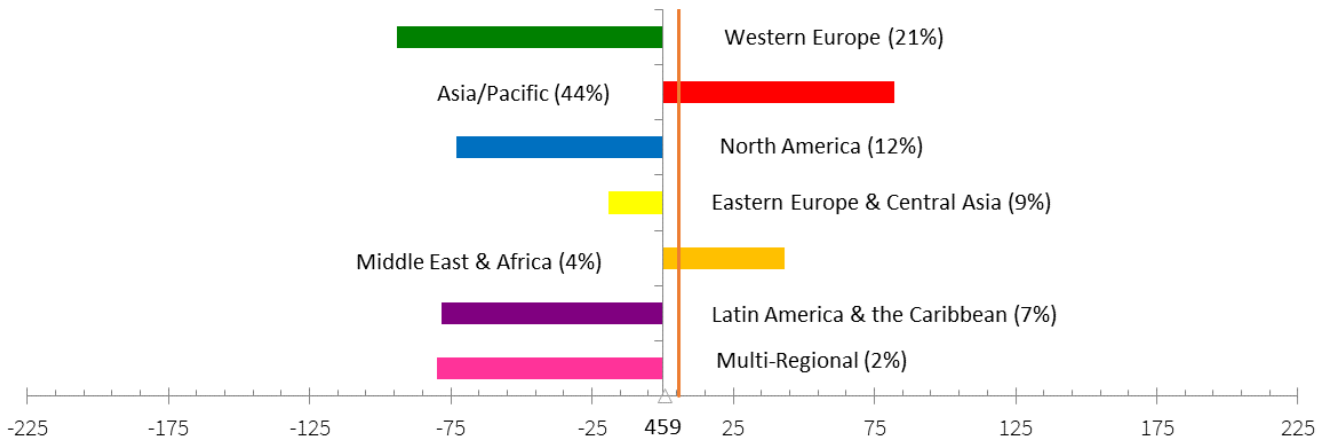


Chart 34 | Regional Assessments For Sao Paulo - Difference From The Mean

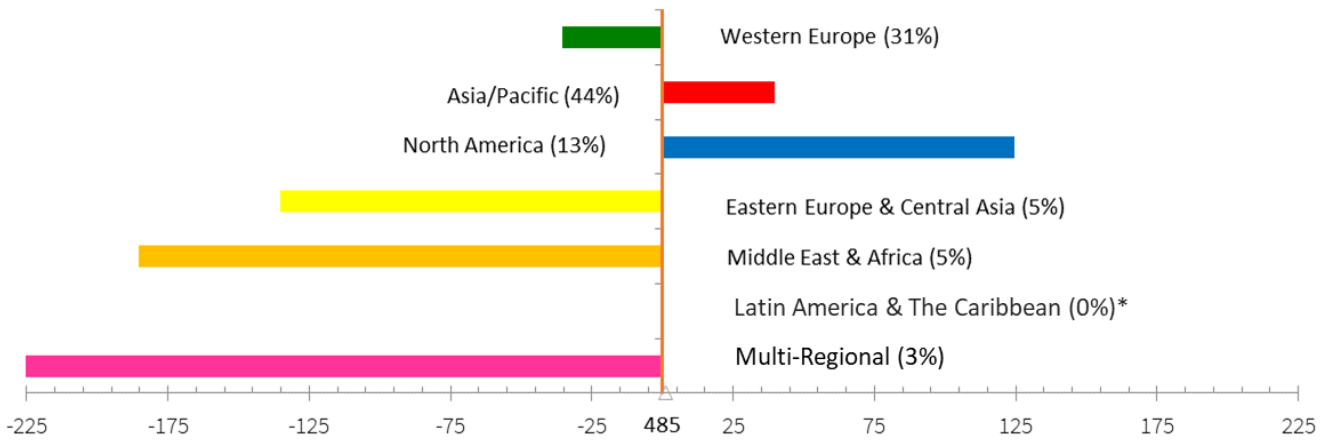
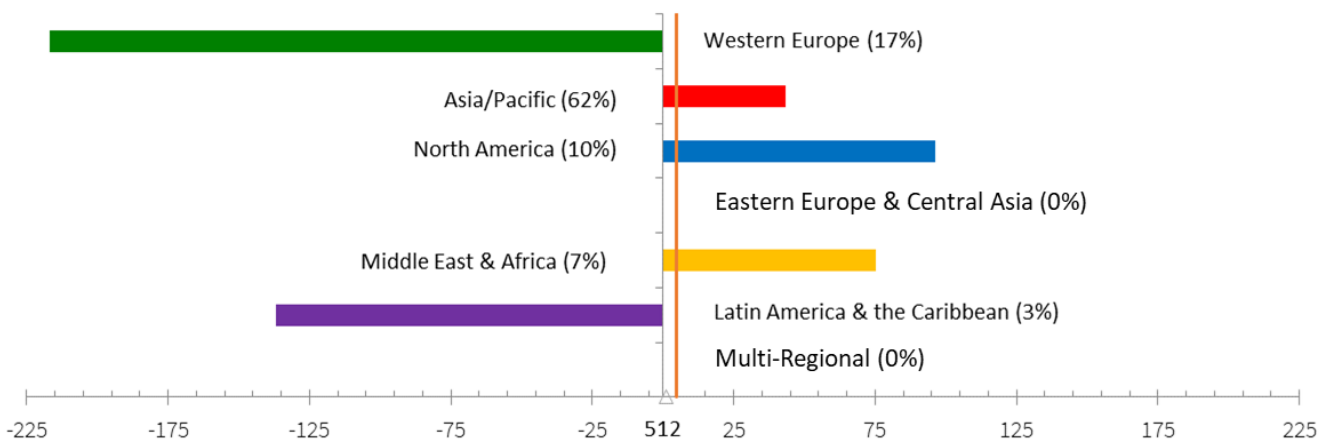


Chart 35 | Regional Assessments For Mexico City - Difference From The Mean



Asia/Pacific

- Continuing the trend from GGFI 7, The majority of Asia/Pacific centres saw gains in ranking in the overall index.
- Beijing took first place in the region, with Shanghai close behind.
- 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 8

Centre	GGFI 8		GGFI 7		Change In Rank	Change In Rating
	Rank	Rating	Rank	Rating		
Beijing	11	539	14	531	3	8
Shanghai	14	536	17	528	3	8
Seoul	16	533	22	523	6	10
Singapore	16	533	20	525	4	8
Sydney	20	530	18	527	-2	3
Tokyo	22	528	13	532	-9	-4
Wellington	24	526	33	516	9	10
Busan	28	524	31	517	3	7
Shenzhen	28	524	28	521	0	3
Guangzhou	30	523	22	523	-8	0
Osaka	32	521	30	518	-2	3
Qingdao	34	519	38	511	4	8
Melbourne	37	518	46	504	9	14
Hong Kong	41	515	40	510	-1	5
GIFT City-Gujarat	47	509	47	503	0	6

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

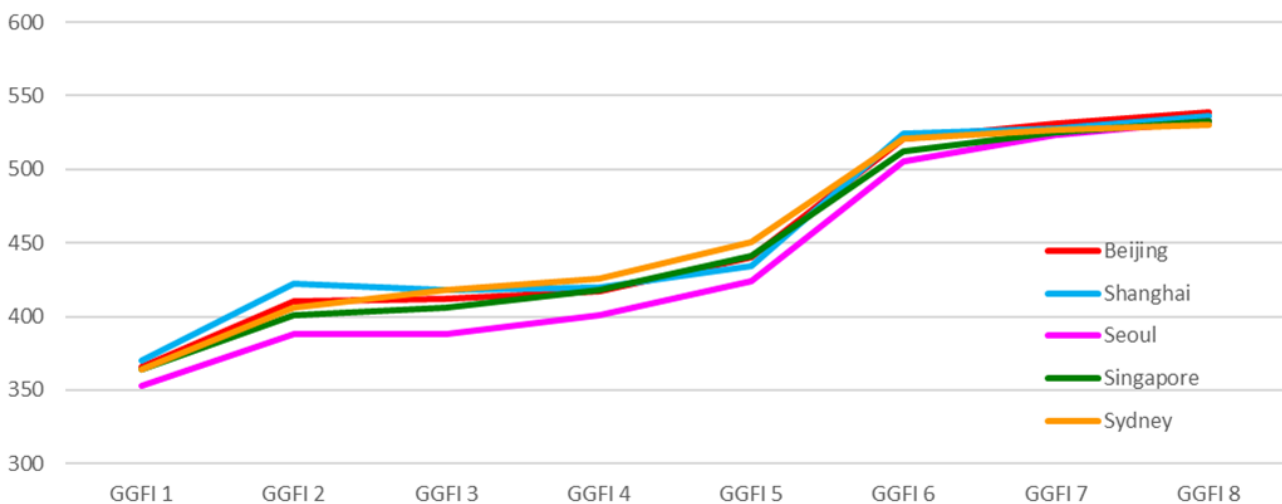


Chart 37 | Asia Pacific Regional Assessments - Difference From The Mean

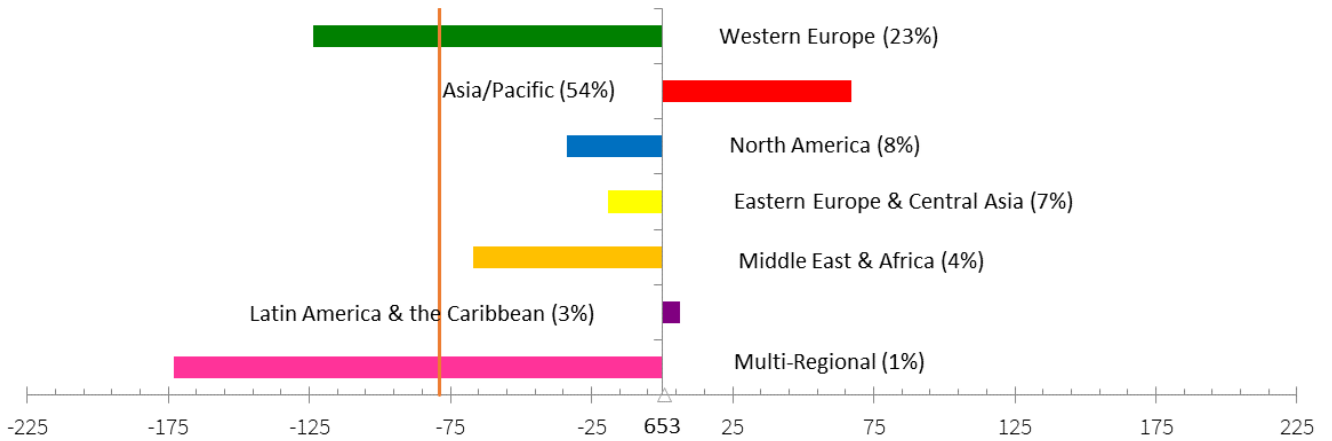


Chart 38 | Regional Assessments For Beijing - Difference From The Mean

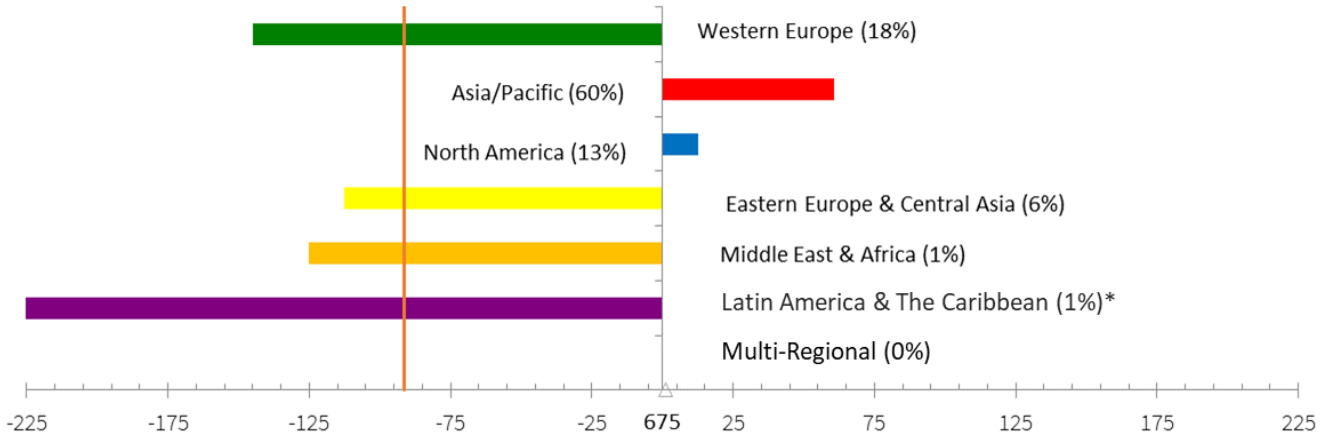
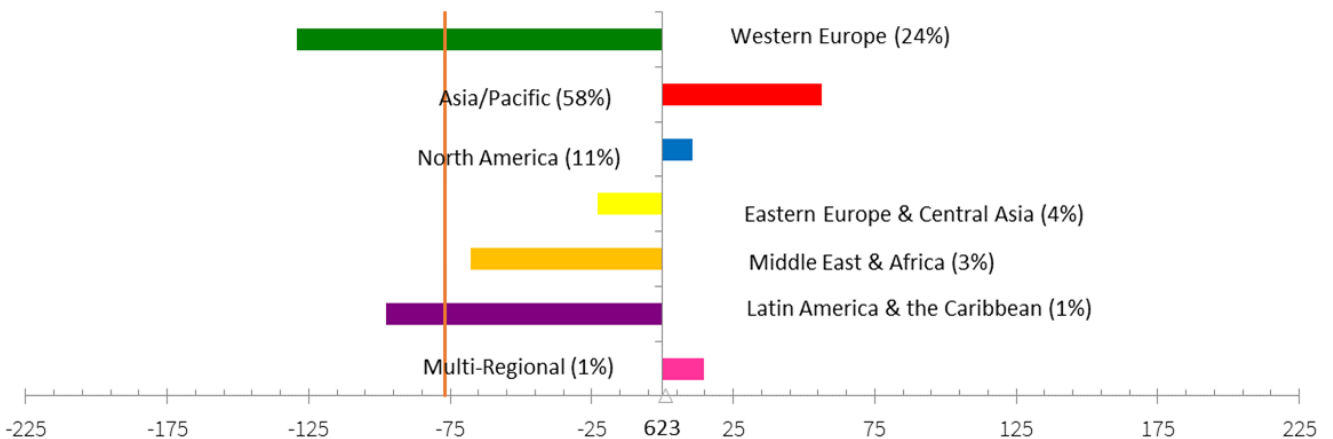


Chart 39 | Regional Assessments For Shanghai - Difference From The Mean



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 Professional Services, Knowledge (incorporating universities and NGOs), Banking, Investment, and other sectors. The table shows how the index ranking varies according to industry sector.

Table 16 | GGFI 8 Industry Sector Sub-Indices - Top 15

Rank	Industry Sub-Sector				
	Policy	Knowledge	Banking	Investment	Trading
1	London	London	Beijing	London	Beijing
2	Geneva	Amsterdam	Shanghai	Amsterdam	San Francisco
3	Zurich	Paris	Guangzhou	New York	Guangzhou
4	Edinburgh	New York	Singapore	Shanghai	New York
5	Los Angeles	Los Angeles	Sydney	Dubai	Los Angeles
6	Shenzhen	San Francisco	Hong Kong	Tokyo	Boston
7	Amsterdam	Berlin	Shenzhen	Beijing	Washington DC
8	San Francisco	Frankfurt	New York	Singapore	Shenzhen
9	Melbourne	Copenhagen	Seoul	Osaka	Shanghai
10	Abu Dhabi	Shenzhen	Boston	San Francisco	Chicago
11	Luxembourg	Luxembourg	Washington DC	Seoul	Nur-Sultan
12	Singapore	Seoul	Montreal	Boston	Edinburgh
13	Beijing	Brussels	Los Angeles	Malta	Doha
14	Berlin	Singapore	Tokyo	Hong Kong	Abu Dhabi
15	Guangzhou	Beijing	Melbourne	British Virgin Islands	Melbourne

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 8 Using Responses Only From Respondents Working Directly In Green Finance

Centre	Rating	Adjusted Rank	GGFI 8 Rank	Difference	Centre	Rating	Adjusted Rank	GGFI 8 Rank	Difference
London	521	1	1	0	Rome	450	41	48	7
Amsterdam	509	2	2	0	Calgary	449	42	46	4
Paris	507	3	10	7	Milan	448	43	55	12
San Francisco	502	4	3	-1	Dubai	447	44	40	-4
Luxembourg	501	5	5	0	Melbourne	446	45	37	-8
New York	496	6	13	7	GIFT City-Gujarat	443	46	47	1
Berlin	491	7	21	14	Sao Paulo	442	47	65	18
Oslo	490	8	9	1	Mexico City	442	47	68	21
Copenhagen	486	9	12	3	Jakarta	441	49	59	10
Zurich	485	10	4	-6	Malta	440	50	61	11
Los Angeles	484	11	8	-3	Qingdao	439	51	34	-17
Sydney	483	12	20	8	Nur-Sultan	439	51	52	1
Stockholm	482	13	7	-6	Glasgow	435	53	53	0
Munich	480	14	19	5	Mumbai	435	53	56	3
Geneva	478	15	6	-9	Johannesburg	434	55	68	13
Washington DC	477	16	15	-1	Warsaw	433	56	72	16
Vienna	477	16	33	17	Istanbul	433	56	73	17
Brussels	475	18	23	5	Casablanca	429	58	42	-16
Wellington	474	19	24	5	New Delhi	425	59	63	4
Beijing	473	20	11	-9	Osaka	423	60	32	-28
Boston	473	20	25	5	Kuala Lumpur	423	60	49	-11
Montreal	473	20	25	5	Jersey	423	60	60	0
Shenzhen	471	23	28	5	Mauritius	422	63	58	-5
Singapore	470	24	16	-8	Doha	422	63	62	-1
Shanghai	467	25	14	-11	Prague	422	63	71	8
Seoul	466	26	16	-10	Liechtenstein	421	66	66	0
Tokyo	466	26	22	-4	Tel Aviv	419	67	54	-13
Frankfurt	466	26	34	8	British Virgin Islands	416	68	76	8
Dublin	464	29	50	21	Guernsey	415	69	51	-18
Lisbon	463	30	43	13	Rio de Janeiro	413	70	75	5
Helsinki	461	31	18	-13	Bangkok	412	71	57	-14
Chicago	459	32	37	5	Almaty	411	72	74	2
Toronto	457	33	31	-2	Cayman Islands	411	72	77	5
Guangzhou	454	34	30	-4	Nairobi	411	72	79	7
Vancouver	452	35	25	-10	Abu Dhabi	410	75	45	-30
Edinburgh	452	35	39	4	Cape Town	407	76	67	-9
Madrid	452	35	44	9	Moscow	405	77	70	-7
Busan	451	38	28	-10	Isle of Man	400	78	78	0
Hamburg	451	38	34	-4	Bermuda	400	78	80	2
Hong Kong	451	38	41	3	Bahrain	397	80	64	-16

GGFI 8 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:

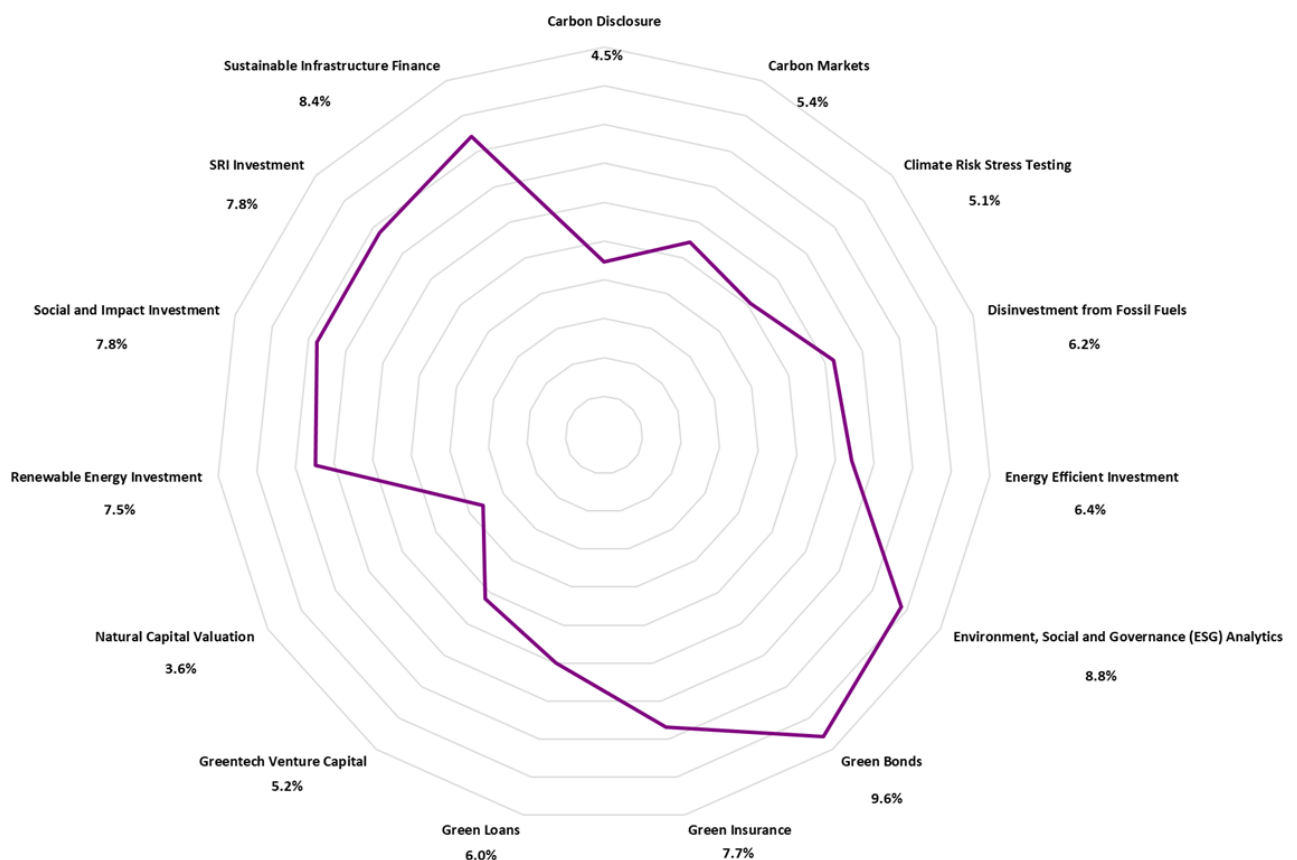
- The areas of green finance considered most interesting by respondents;
- The areas of green finance which respondents consider to have the greatest impact on sustainability; and
- Factors driving the development of green finance.

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 are Green Bonds, ESG Analytics, and Sustainable Infrastructure Finance. This mirrors the increased volumes of activity in these areas. The area considered least interesting remains natural capital valuation, possibly reflecting the lack of products, tools and techniques in this field.

Chart 40 | Interest - Percentage Of Total Mentions

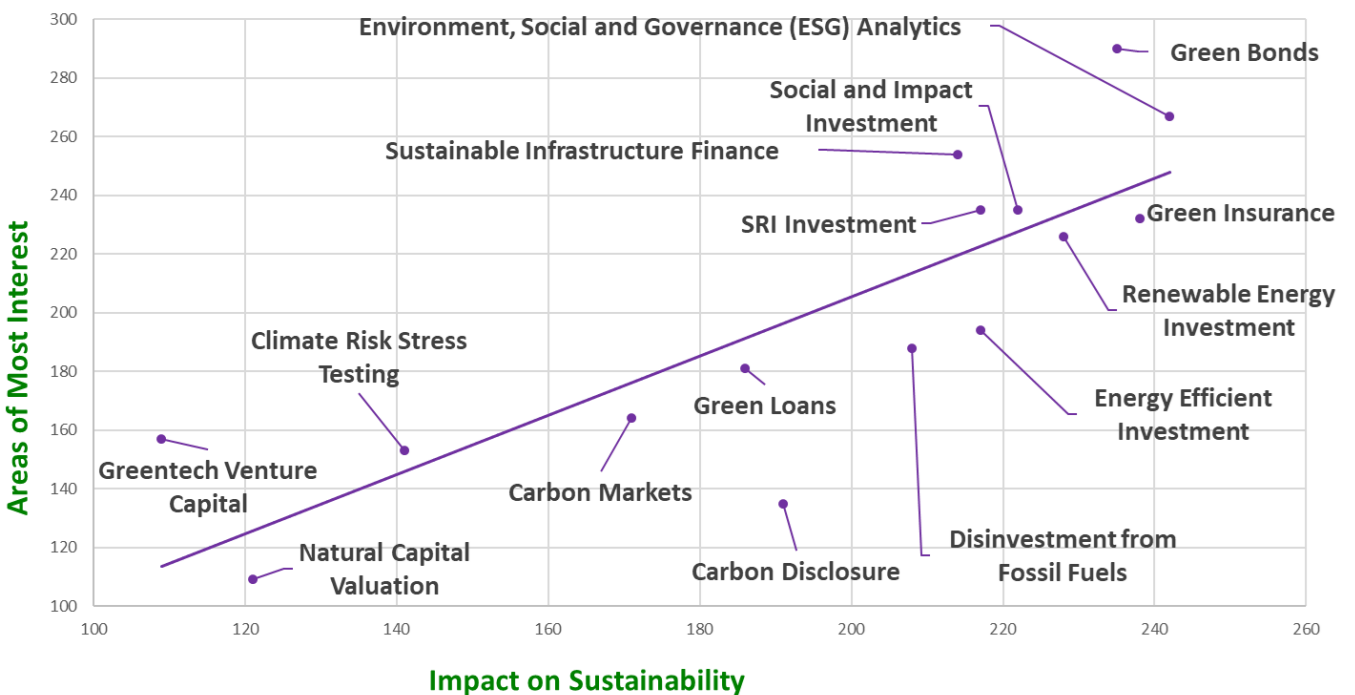


With respect to impact, ESG Analytics, Green Insurance, and Green Bonds are rated as the areas of green finance with the most impact. Natural Capital Valuation and Green Tech Venture Capital are ranked lowest by our respondents.

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 Climate Change and Academic research, whereas Food Security and Water Quality are ranked the lowest, illustrating the continued 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 8 Assessments By Centre

Centre	GGFI 8		Assessments			Centre	GGFI 8		Assessments		
	Rank	Rating	Number	Average	Std Dev		Rank	Rating	Number	Average	Std Dev
London	1	571	179	673	217	Hong Kong	41	515	127	542	260
Amsterdam	2	562	74	692	199	Casablanca	42	514	23	630	190
San Francisco	3	549	62	693	220	Lisbon	43	513	23	590	243
Zurich	4	548	82	633	265	Madrid	44	512	42	558	214
Luxembourg	5	545	66	618	244	Abu Dhabi	45	511	55	513	269
Geneva	6	544	52	562	258	Calgary	46	510	26	487	282
Stockholm	7	543	53	594	226	GIFT City-Gujarat	47	509	200	794	201
Los Angeles	8	542	48	690	223	Rome	48	508	42	542	193
Oslo	9	541	23	655	209	Kuala Lumpur	49	506	32	542	224
Paris	10	540	110	611	202	Dublin	50	502	41	474	233
Beijing	11	539	168	675	228	Guernsey	51	499	29	549	275
Copenhagen	12	538	26	647	194	Nur-Sultan	52	498	22	518	227
New York	13	537	190	622	236	Glasgow	53	497	24	464	258
Shanghai	14	536	194	623	217	Tel Aviv	54	496	25	473	244
Washington DC	15	534	71	650	190	Milan	55	495	28	470	199
Seoul	16	533	46	615	249	Mumbai	56	494	31	360	290
Singapore	16	533	106	618	228	Bangkok	57	492	17	469	232
Helsinki	18	532	26	638	152	Mauritius	58	490	34	543	176
Munich	19	531	30	609	219	Jakarta	59	489	17	541	237
Sydney	20	530	48	630	229	Jersey	60	486	20	538	249
Berlin	21	529	29	591	171	Malta	61	485	21	432	171
Tokyo	22	528	83	633	268	Doha	62	484	22	502	200
Brussels	23	527	53	611	215	New Delhi	63	483	31	338	293
Wellington	24	526	21	663	217	Bahrain	64	482	28	442	233
Vancouver	25	525	35	642	205	Sao Paulo	65	480	39	485	197
Boston	25	525	51	616	258	Liechtenstein	66	477	13	462	127
Montreal	25	525	33	523	241	Cape Town	67	475	21	493	180
Busan	28	524	36	699	233	Johannesburg	68	474	25	451	218
Shenzhen	28	524	104	645	195	Mexico City	68	474	29	512	175
Guangzhou	30	523	107	686	203	Moscow	70	472	74	459	201
Toronto	31	522	49	530	255	Prague	71	469	26	432	203
Osaka	32	521	34	632	256	Warsaw	72	468	22	351	236
Vienna	33	520	26	499	191	Istanbul	73	467	32	438	225
Qingdao	34	519	201	799	139	Almaty	74	466	31	427	261
Hamburg	34	519	44	639	225	Rio de Janeiro	75	465	23	417	178
Frankfurt	34	519	85	558	229	British Virgin Islands	76	464	25	463	218
Chicago	37	518	52	567	221	Cayman Islands	77	458	28	410	237
Melbourne	37	518	26	629	277	Isle of Man	78	457	13	442	224
Edinburgh	39	517	47	586	247	Nairobi	79	456	26	462	168
Dubai	40	516	111	568	241	Bermuda	80	441	19	379	214

Table 19 | Details Of Assessments Of GGFI Dimensions By Centre

Centre	Overall Rank	Depth Rating	Quality Rating	Centre	Overall Rank	Depth Rating	Quality Rating
London	1	280	291	Hong Kong	41	253	262
Amsterdam	2	281	281	Casablanca	42	252	262
San Francisco	3	274	275	Lisbon	43	259	254
Zurich	4	266	282	Madrid	44	257	255
Luxembourg	5	273	272	Abu Dhabi	45	251	260
Geneva	6	270	274	Calgary	46	247	263
Stockholm	7	272	271	GIFT City-Gujarat	47	254	255
Los Angeles	8	271	271	Rome	48	252	256
Oslo	9	263	278	Kuala Lumpur	49	246	260
Paris	10	271	269	Dublin	50	252	250
Beijing	11	267	272	Guernsey	51	239	260
Copenhagen	12	270	268	Nur-Sultan (formerly Astana)	52	247	251
New York	13	269	268	Glasgow	53	246	251
Shanghai	14	270	266	Tel Aviv	54	245	251
Washington DC	15	269	265	Milan	55	242	253
Seoul	16	268	265	Mumbai	56	248	246
Singapore	16	262	271	Bangkok	57	236	256
Helsinki	18	264	268	Mauritius	58	241	249
Munich	19	268	263	Jakarta	59	243	246
Sydney	20	262	268	Jersey	60	236	250
Berlin	21	267	262	Malta	61	237	248
Tokyo	22	266	262	Doha	62	242	242
Brussels	23	261	266	New Delhi	63	242	241
Wellington	24	266	260	Bahrain	64	236	246
Vancouver	25	259	266	Sao Paulo	65	239	241
Boston	25	264	261	Liechtenstein	66	233	244
Montreal	25	260	265	Cape Town	67	241	234
Busan	28	260	264	Johannesburg	68	242	232
Shenzhen	28	262	262	Mexico City	68	235	239
Guangzhou	30	257	266	Moscow	70	236	236
Toronto	31	258	264	Prague	71	235	234
Osaka	32	263	258	Warsaw	72	241	227
Vienna	33	256	264	Istanbul	73	231	236
Qingdao	34	264	255	Almaty	74	236	230
Hamburg	34	260	259	Rio de Janeiro	75	233	232
Frankfurt	34	255	264	British Virgin Islands	76	230	234
Chicago	37	258	260	Cayman Islands	77	225	233
Melbourne	37	258	260	Isle of Man	78	226	231
Edinburgh	39	255	262	Nairobi	79	224	232
Dubai	40	254	262	Bermuda	80	218	223

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	290	9.6%
Environment, Social and Governance (ESG) Analytics	267	8.8%
Sustainable Infrastructure Finance	254	8.4%
Social and Impact Investment	235	7.8%
SRI Investment	235	7.8%
Green Insurance	232	7.7%
Renewable Energy Investment	226	7.5%
Energy Efficient Investment	194	6.4%
Disinvestment from Fossil Fuels	188	6.2%
Green Loans	181	6.0%
Carbon Markets	164	5.4%
Greentech Venture Capital	157	5.2%
Climate Risk Stress Testing	153	5.1%
Carbon Disclosure	135	4.5%
Natural Capital Valuation	109	3.6%
Totals	3,020	100.0%

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	242	8.2%
Green Insurance	238	8.1%
Green Bonds	235	8.0%
Renewable Energy Investment	228	7.8%
Social and Impact Investment	222	7.6%
Energy Efficient Investment	217	7.4%
SRI Investment	217	7.4%
Sustainable Infrastructure Finance	214	7.3%
Disinvestment from Fossil Fuels	208	7.1%
Carbon Disclosure	191	6.5%
Green Loans	186	6.3%
Carbon Markets	171	5.8%
Climate Risk Stress Testing	141	4.8%
Natural Capital Valuation	121	4.1%
Greentech Venture Capital	109	3.7%
Totals	2,940	100.0%

Table 22 | Drivers Of Green Finance

Driver	Number of Mentions	Percentage Of Total
Policy and Regulatory Frameworks	228	7.7%
Climate Change	180	6.1%
Academic Research	169	5.7%
Risk Management Frameworks	169	5.7%
Public Awareness	168	5.7%
International Initiatives	152	5.1%
Renewables	149	5.0%
Mandatory Disclosure	148	5.0%
Infrastructure Investment	131	4.4%
Tax Incentives	127	4.3%
Insurance Industry Research	123	4.1%
Finance Centre Activism	122	4.1%
Energy Efficiency	120	4.0%
Investor Demand	119	4.0%
Non-financial Reporting	114	3.8%
Sustainability Reporting	112	3.8%
Technological Change	112	3.8%
Industry Activism	106	3.6%
NGO Activism	101	3.4%
Air Quality	75	2.5%
Voluntary Standards	70	2.4%
Loss of Biodiversity	65	2.2%
Food Security	57	1.9%
Water Quality	55	1.9%
Totals	2,972	100.0%

Appendix 3: Respondents' Details

Table 23 | Respondents By Industry Sector

Industry Sector	Number Of Respondents	Percentage Of Respondents
Banking	57	7.35%
Debt Capital Market	59	7.60%
Equity Capital Markets	65	8.38%
Insurance	33	4.25%
Investment	72	9.28%
Knowledge	89	11.47%
Local Green Initiatives	34	4.38%
Other	44	5.67%
Policy and Public Finance	76	9.79%
Professional Services	153	19.72%
Trading	94	12.11%
Total	776	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	280	36.08%
Working Part-time On Green Finance	153	19.72%
Interested In Green Finance	303	39.05%
Other/Not Given	40	5.15%
Total	776	100.00%

Table 25 | Respondents By Region

Region	Number Of Respondents	Percentage Of Respondents
Asia/Pacific	305	39.30%
Western Europe	205	26.42%
Eastern Europe & Central Asia	107	13.79%
North America	62	7.99%
Middle East & Africa	48	6.19%
Latin America & The Caribbean	43	5.54%
Other	6	0.77%
Total	776	100.00%

Table 26 | Respondents By Size Of Organisation

Size of Organisation	Number Of Respondents	Percentage Of Respondents
<100	334	43.04%
100-500	87	11.21%
500-1000	71	9.15%
1000-2000	71	9.15%
2000-5000	57	7.35%
>5000	102	13.14%
Other/Not Given	54	6.96%
Total	776	100.00%

Table 27 | Respondents By Gender

Gender	Number Of Respondents	Percentage Of Respondents
Male	271	34.92%
Female	468	60.31%
Other	2	0.26%
Prefer Not To Say/Not Given	35	4.51%
Total	776	100.00%

Table 28 | Respondents By Age

Age Band	Number Of Respondents	Percentage Of Respondents
18-30	298	38.40%
30-45	242	31.19%
45-60	141	18.17%
60+	63	8.12%
Other/Not Given	32	4.12%
Total	776	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 143 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 8. 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.

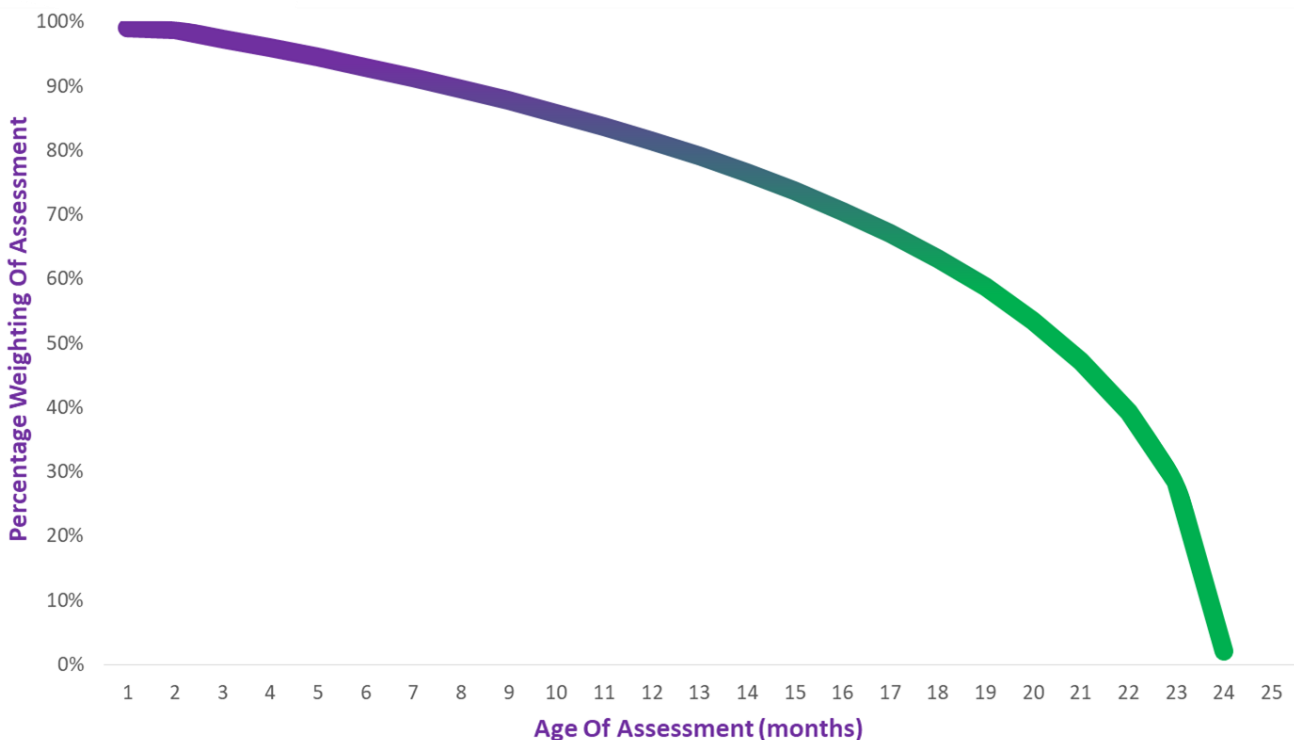
Financial Centre Assessments

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.

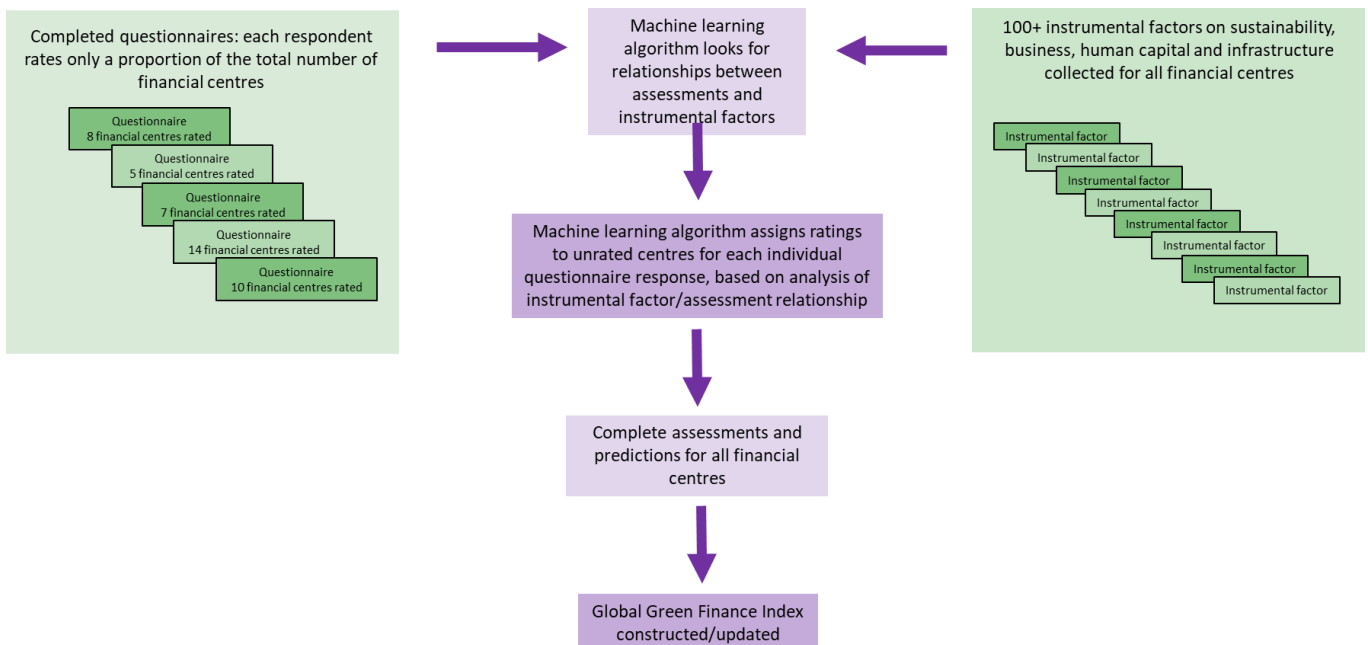
The rules on the use of instrumental factor data in the model are as follows:

- 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
IESE Cities In Motion Index	0.580
Sustainable Cities Index	0.492
Quality of Living City Rankings	0.429
Sustainable Economic Development	0.389
Energy Transition Index	0.337
Environmental Performance	0.301
Financial Centre Corporate Sustainability Performance	0.251
World Energy Trilemma Index	0.226
Buildings Energy Efficiency Policies Database (Y/N)	0.164
Proportion of population using safely-managed drinking-water services (%)	0.154
Global Sustainable Competitiveness Index	0.129
Total Issuance Of Labelled Green Bonds To December 2018, USDm	0.120
Quality of Life Index	0.120
Total Number Of Labelled Green Bonds Issued To December 2018	0.117
Stock Exchanges With A Green Bond Segment (Y/N)	0.116

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

Instrumental Factors	R-squared
OECD Country Risk Classification	0.622
Domestic Credit Provided By Banking Sector (% Of GDP)	0.611
IESE Cities In Motion Index	0.580
Global Innovation Index	0.573
The Global Financial Centres Index	0.564
World Competitiveness Scoreboard	0.550
Cost of Living City Rankings	0.512
Sustainable Cities Index	0.492
Safe Cities Index	0.490
Best Countries For Business	0.477
Adjusted net national income per capita	0.467
World Talent Rankings	0.463
Corruption Perception Index	0.455
Smart City Index	0.453
Business Environment Rankings	0.448

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.PRPC.MM	N
Buildings Energy Efficiency Policies Database (Y/N)	IEA	https://www.iea.org/policies	Y
Certified Climate Bonds Issued To December 2018, % Of Centre Total	CBI	https://www.finance-watch.org/publication/global-green-finance-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-green-finance-index-3/	N
CO2 Emissions Per Capita	World Bank	https://databank.worldbank.org/reports.aspx?source=2&series=EN.ATM.CO2E.PC&country=#	Y
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/	Y
Energy Transition Index	World Economic Forum	https://www.weforum.org/reports/1edb4488-deb4-4151-9d4f-ff355eec499a/in-full/rankings	New
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-green-finance-index-3/	N
Financial Centre Carbon Intensity	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centre Clean To Fossil-Fuel Related Revenue (Clean Revenue)	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centre Clean To Fossil-Fuel Related Revenue (Dirty Revenue)	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centre Corporate Sustainability Performance	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centre Sustainability Disclosure	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centres Green Alignment - Non-Regulatory Actors	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Financial Centres Green Alignment - Regulators And Stock Exchanges	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-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	https://solability.com/the-global-sustainable-competitiveness-index/the-index	N
GRESB Green Real Estate And Infrastructure Investment Score	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-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-green-finance-index-3/	N
Not-Externally-Reviewed Labelled Green Bonds Issued To December 2018, % of centre total	CBI	https://www.finance-watch.org/publication/global-green-finance-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	New
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-green-finance-index-3/	N
Ratio Labelled Green Bonds To Total Debt Securities By Issuer Location	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-index-3/	N
Share Of Renewables In Electricity Production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/	Y
Share Of Wind And Solar In Electricity Production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/	Y
Stock Exchanges With A Green Bond Segment (Y/N)	CBI	https://www.climatebonds.net/green-bond-segments-stock-exchanges	Y
Sum Of GHG Emissions	Corporate Knights	https://www.finance-watch.org/publication/global-green-finance-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/2019/seda-measuring-well-being.aspx	N
Sustainable Stock Exchanges (Y/N)	UN Sustainable Stock Exchange Initiative	https://sseinitiative.org/members/	Y
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/	N

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	Y
Corruption Perception Index	Transparency International	https://www.transparency.org/en/cpi/2020/	Y
Cost of Living City Rankings	Mercer	https://www.mercer.com/our-thinking/career/cost-of-living.html	Y
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	New
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.atkearney.com/global-cities/2020	N
Global Innovation Index	INSEAD	http://www.globalinnovationindex.org/content.aspx?page=GII-Home	N
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
Good Country Index	Good Country Party	https://www.goodcountry.org/index/results	N
Government Effectiveness	The World Bank	http://info.worldbank.org/governance/wgi/	N

Table 32 | (Continued) Human Capital Factors

Instrumental Factor	Source	Website	Updated
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	Y
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	New
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/di/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	Y
Innovation Cities Global Index	2ThinkNow Innovation Cities	https://www.innovation-cities.com/city-rankings-2021/	Y
Legatum Prosperity Index	Legatum Institute	http://www.prosperity.com/#!/ranking	N
Life expectancy at birth, total	The World Bank	https://data.worldbank.org/indicator/SP.DYN.LE00.IN	New
Linguistic Diversity	Ethnologue	https://www.ethnologue.com/	N
Lloyd's City Risk Index 2015-2025	Lloyd's	https://cityriskindex.lloyds.com/about/	N
Number Of High Net Worth Individuals	Capgemini	https://www.worldwealthreport.com/	Y
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	N
Henley Passport Index	Henley Partners	https://www.henleypassportindex.com/passport	Y
Personal Tax Rates	OECD	https://stats.oecd.org/index.aspx?DataSetCode=TABLE_I6	Y
Political Stability And Absence Of Violence/ Terrorism	The World Bank	http://info.worldbank.org/governance/wgi/	N
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	Y
Regulatory Quality	The World Bank	http://info.worldbank.org/governance/wgi/	N
Tax Revenue as Percentage of GDP	The World Bank	https://databank.worldbank.org/reports.aspx?source=2&series=GC.TAX.TOTL.GD.ZS&country=#	Y
Top Tourism Destinations	Euromonitor	https://go.euromonitor.com/white-paper-travel-2019-100-cities.html	N
Average Wages	OECD	https://data.oecd.org/earnwage/average-wages.htm	Y
World Talent Rankings	IMD	https://www.imd.org/wcc/world-competitiveness-center-rankings/world-talent-ranking-2019/	N
People Near Services	ITDP	https://pedestriansfirst.itdp.org/	N

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/taxinformationexchangeagreements.htm	N
Broad Stock Index Levels	The World Federation of Stock Exchanges	https://focus.world-exchanges.org/issue/august-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/august-2021/market-statistics	Y
Common Law Countries	CIA	https://www.cia.gov/the-world-factbook/countries/	N
Corporate Tax Rates	PWC	https://www.pwc.com/payingtaxes	N
Democracy Index	The Economist	https://www.eiu.com/topic/democracy-index	Y
Domestic Credit Provided By Banking Sector (% Of GDP)	The World Bank	http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators&series=FS.AST.DOMS.GD.ZS	Y
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	New
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	Y
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	N
Global Business Complexity Index	TMF Group	https://www.tmf-group.com/en/news-insights/publications/2021/global-business-complexity-index/	New
Global Connectedness Index	DHL	https://www.dhl.com/global-en/home/press/press-archive/2020/dhl-global-connectedness-index-2020.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	Y
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	Y
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	Y
Safe Cities Index	Economist	https://safecities.economist.com/safe-cities-index-2019/	New

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/	Y
Total Net Assets Of Regulated Open-End Funds	Investment Company Institute	http://www.icifactbook.org/	Y
TRACE Bribery Risk Matrix	Trace International	https://matrixbrowser.traceinternational.org/	N
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/august-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/	Y
FATF AML Effectiveness	FATF	http://www.fatf-gafi.org/media/fatf/documents/4th-Round-Ratings.pdf	New

Table 34 | Infrastructure Factors

Instrumental Factor	Source	Website	Updated
Refined oil products production	Enerdata Statistical Yearbook	https://yearbook.enerdata.net/	Y
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	Y
Roadways Per Land Area	CIA	https://www.cia.gov/the-world-factbook/field/roadways/country-comparison	Y
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/	N

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.



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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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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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](https://twitter.com/DIFC)
www.difc.ae



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

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



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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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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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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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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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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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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THE GOVERNMENT OF MOSCOW

The Department for External Economic and International Relations of Moscow

Moscow International Financial Centre (MIFC) is a community effort launched in 2008 by the business, the market mega-regulator and all branches of state power – including the President, the Government and the Government of Moscow.

Effective regulatory regime, high level of financial innovation, vibrant urban environment and talent pool give MIFC very strong competitive advantage across Eurasia and beyond. MIFC plays a key role in creating the necessary conditions for making effective access to the neighboring markets with over 280 million consumers.

MIFC is evolving and assuming a greater role as the centre of excellence with a strong current focus on financial technologies and ESGs. Moscow has always been paying a lot of attention to international cooperation. Therefore, the World Alliance of International Financial Centers (WAIFC) was formed under the initiative of Moscow in July 2018.

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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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www.seoul.go.kr/main/index.jsp

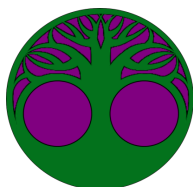
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THE GLOBAL GREEN FINANCE INDEX



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 650 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.