

Data Centre Risk Index

Informing global investment decisions



Data Centre Risk Index

The Data Centre Risk Index ranks twenty countries according to the top risks likely to affect the successful operation of a data centre.

The Index is designed to support companies to make informed investment decisions about where to locate their data centres and to develop strategies to mitigate anticipated risk.

ANTICIPATING RISK

Data centre downtime can potentially cost millions in lost revenue and even threaten the viability of a business. Recent natural disasters in Japan, New Zealand, Iceland, USA and Australia, and political unrest in parts of North Africa and the Middle East, have highlighted the impact that extreme acts of nature and political instability can have on business continuity.

Other factors, however, such as high energy costs, poor international bandwidth and protectionist legislation are also risks that need to be taken into account.

Although the Data Centre Risk Index clearly demonstrates that some countries provide a better overall environment for data centres, commercial considerations are typically a key driver informing location decisions. The need to be in a particular territory will often take precedence over the risks highlighted by the Index.

Research carried out by HurleyPalmerFlatt and Cushman & Wakefield during the development of the Index highlighted a weakness in industry decision-making processes, and a general failing to take into account certain potential risks associated with investing in data centres overseas.

The Index is a unique tool, bringing together all the risks and weighting them to create a balanced and comprehensive risk assessment methodology.

AN EMERGING GLOBAL MARKET

Global technological advances mean it is no longer essential for a data centre to be located close to the end-user. Depending on the function of the data centre, providers and owner-occupiers are now able to consider locating their data centres anywhere in the world – making the data centre industry a truly global phenomenon.

In the past, when deciding where to locate a data centre, there were clear principles and requirements that needed consideration such as access to a reliable energy supply, international bandwidth and security.

As global location options have increased, a broader range of risk criteria needs to be taken into account. The Data Centre Risk Index assesses these risks to facilitate sound investment decisions.



What the Index comprises

THE RISKS

The Data Centre Risk Index identifies the top risks likely to affect the successful operation of a data centre, and applies an individual weighting to create a balanced view and ranking of twenty countries.

Since not all risks carry the same level of threat, hurleypalmerflatt and Cushman & Wakefield have produced a three tier weighting system to reflect the relative importance of these risks. These weightings are illustrated opposite.

THE WEIGHTINGS

If your priorities and approach to risk require a different weighting, the flexibility of the Data Centre Risk Index allows for a different weighting to be applied to your next data centre development.

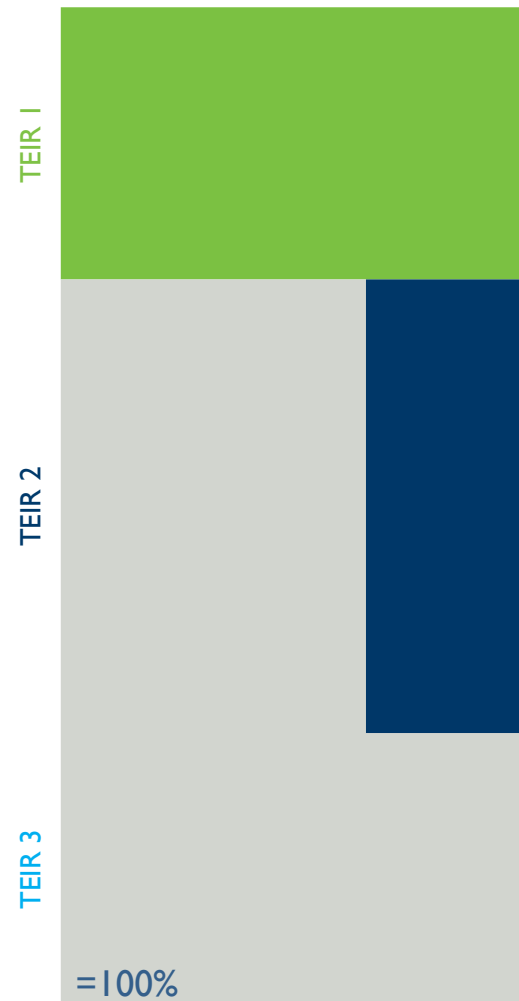
METHODOLOGY AND CONSIDERATIONS

The Data Centre Risk Index identifies risk at a macro/country level. Countries scoring poorly on the Index might be able to offer the ideal environment for a data centre at a micro/local level and should not be discounted. hurleypalmerflatt and Cushman & Wakefield can provide an in-depth country assessment where required.

It should also be noted that many risks can be mitigated or managed with the introduction of relevant safeguards. In certain circumstances, the cost of these measures will be outweighed by the commercial need to be in a particular territory.

The analysis has been carried out by a joint hurleypalmerflatt and Cushman & Wakefield research group comprising leading international data centre experts and advisors. The Index has also been informed by interviews with leading data centre developers and operators.

CATEGORY WEIGHTINGS



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SUB-CATEGORY WEIGHTINGS

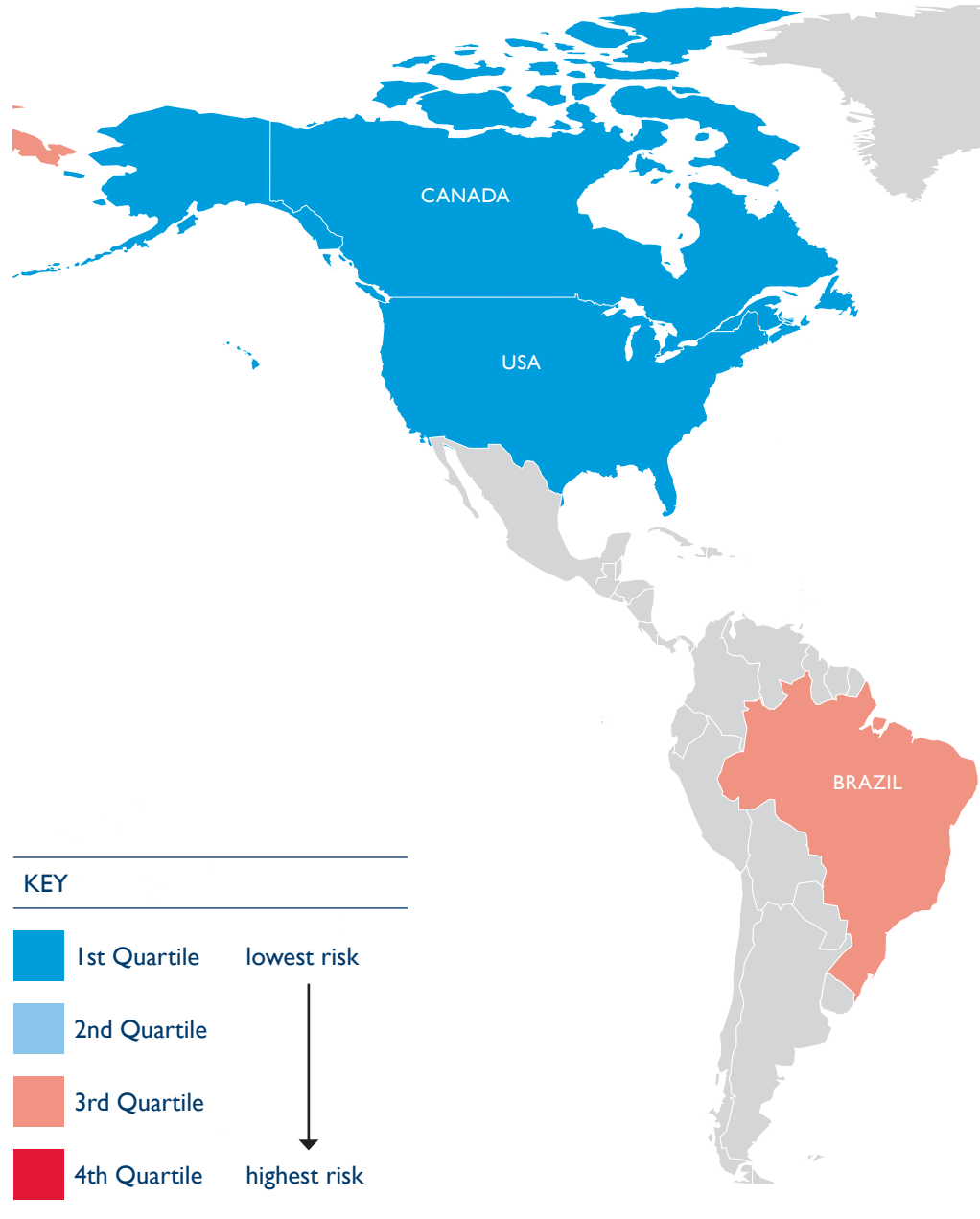
60%	33%	Energy – cost per kWh <i>(source: International Energy Agency / Cushman & Wakefield Research)</i>
	33%	International bandwidth – megabyte per capita <i>(source: ITU)</i>
	33%	Ease of doing business <i>(source: World Bank)</i>
35%	20%	Corporation tax <i>(source: Deloitte)</i>
	20%	Labour – cost of labour/hour <i>(source: EIU)</i>
	20%	Political stability <i>(source: EIU)</i>
	20%	Sustainability – % energy from alternatives <i>(source: International Energy Agency)</i>
	20%	Natural disasters <i>(source: Maplecroft)</i>
5%	25%	GDP per capita <i>(source: EIU)</i>
	25%	Inflation <i>(source: EIU)</i>
	50%	Water – availability per capita <i>(source: Food and Agriculture Organization of the United Nations)</i>

Data centre risk map

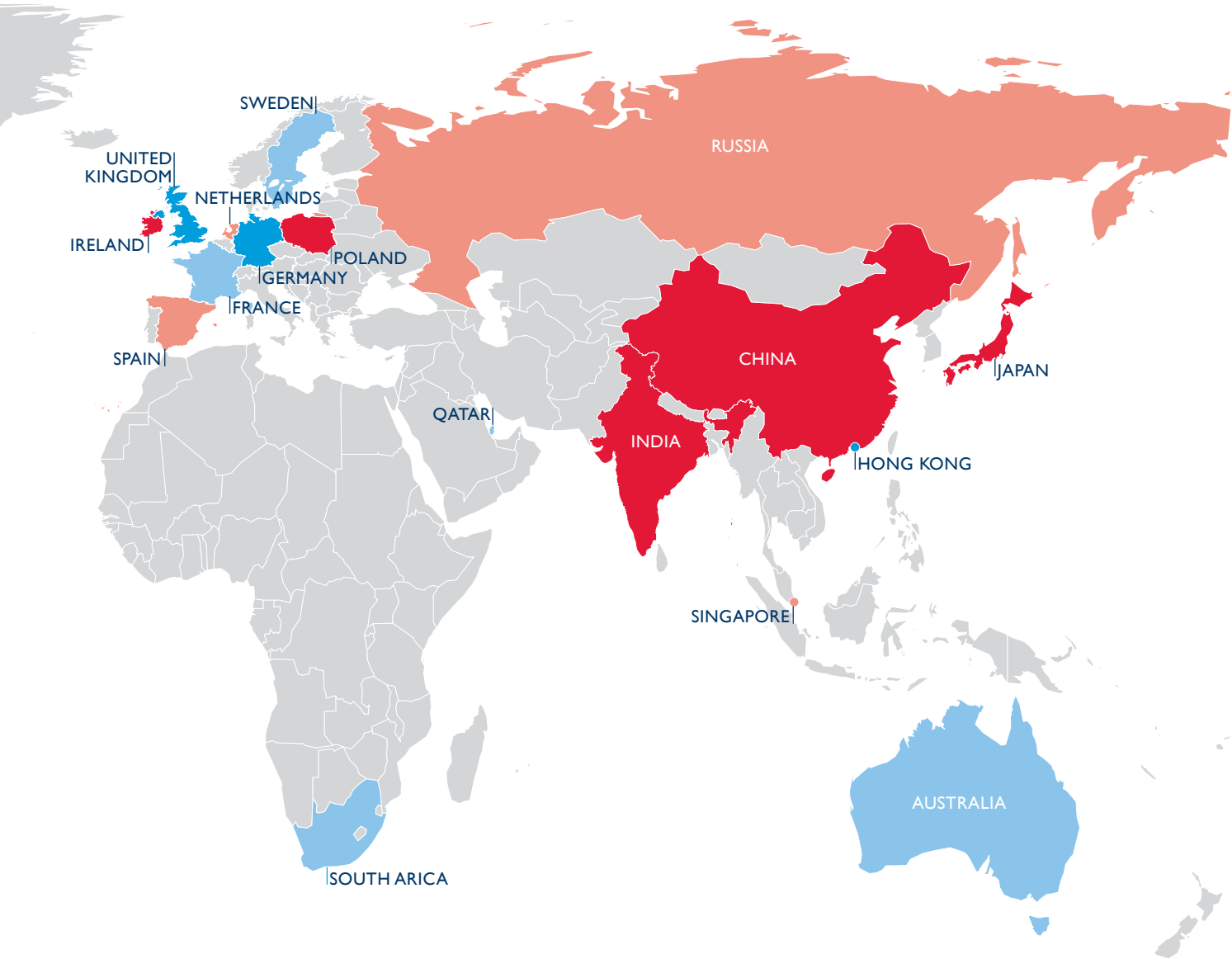
THE COUNTRIES

hurleypalmerflatt and Cushman & Wakefield have selected twenty countries for the Data Centre Risk Index, representing established data centre locations, emerging markets and a mix of key regional centres.

The Index is based on a flexible risk assessment methodology and it can be applied to any country in the world.



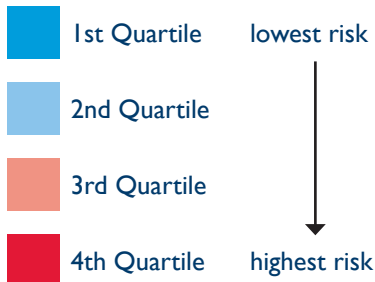
Data Centre Risk Index



The Index ranking by country

The Data Centre Risk Index shows country ranking according to the risks likely to affect successful data centre operations.

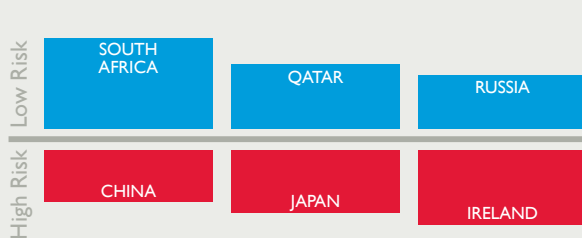
KEY



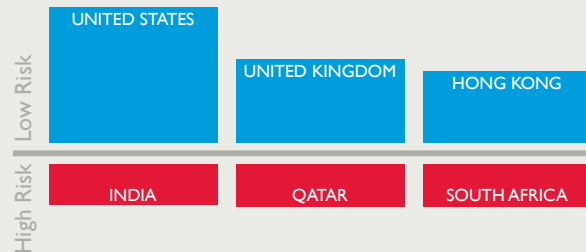
RANK	INDEX SCORE 1ST = 100	COUNTRY	ENERGY COST	INT'L BANDWIDTH	EASE OF DOING BUSINESS
1	100	UNITED STATES	7	1	4
2	91	CANADA	6	7	5
3	86	GERMANY	11	4	10
4	85	HONG KONG	16	3	2
5	82	UNITED KINGDOM	15	2	3
6	81	SWEDEN	8	10	8
7	80	QATAR	2	19	15
8	78	SOUTH AFRICA	1	20	13
9	76	FRANCE	12	5	11
10	73	AUSTRALIA	5	13	7
11	71	SINGAPORE	14	15	1
12	70	BRAZIL	4	12	19
13	67	NETHERLANDS	17	6	12
14	64	SPAIN	9	8	14
15	62	RUSSIA	3	16	18
16	61	POLAND	13	14	16
17	60	IRELAND	20	17	6
18	56	CHINA	18	11	17
19	54	JAPAN	19	9	9
20	51	INDIA	10	18	20

Four primary risks are highlighted below, showing the three lowest risk and three highest risk countries for each category.

Ranking by Energy cost



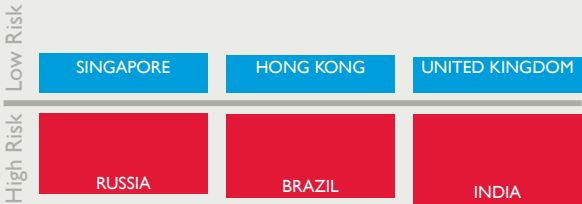
Ranking by International bandwidth



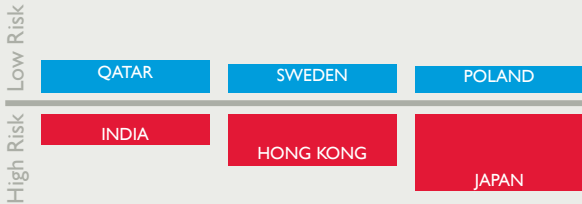
Data Centre Risk Index

CORPORATION TAX	COST OF LABOUR	POLITICAL STABILITY	SUSTAINABILITY	NATURAL DISASTER	GDP PER CAPITA	INFLATION	WATER AVAILABILITY
19	13	15	13	17	5	4	7
4	15	1	4	9	7	10	1
3	20	4	7	7	11	5	17
4	4	6	18	19	13	13	13
12	11	11	17	14	12	14	12
11	18	2	2	2	3	6	5
1	8	8	19	1	1	3	20
12	8	20	6	5	18	17	18
17	14	15	9	12	10	8	10
14	19	3	12	11	2	11	4
6	6	13	20	13	8	16	19
18	5	17	1	6	17	18	2
9	17	6	11	10	6	8	8
14	10	18	8	8	14	7	11
8	3	19	16	15	16	20	3
7	7	9	10	3	15	12	16
2	16	11	14	4	4	1	6
9	1	14	5	16	19	15	13
14	12	4	15	20	9	2	9
19	2	9	3	18	20	19	15

Ranking by Ease of doing business



Ranking by Natural disaster



Country highlights

The Data Centre Risk Index ranks twenty countries according to the top risks likely to affect data centre operations. Here is a selection of the highlights.



AUSTRALIA (Ranked 10th)

A market with significant commercial opportunities and a booming data centre industry. Lack of international bandwidth is the single biggest risk. This is expected to improve over time as investment in infrastructure increases to meet business demand.



CHINA (Ranked 18th)

Remains a restrictive market with significant regulatory control. Energy is also an issue as the transmission system is regional and under development. Large scale infrastructure investment is required to support the rapid growth of the data centre market.



BRAZIL (Ranked 12th)

A key emerging market, enjoying substantial growth and attention from foreign investors. With improvements in international bandwidth and infrastructure, and tax reforms for non-domiciled companies, Brazil could emerge as a Latin American technology powerhouse.



FRANCE (Ranked 9th)

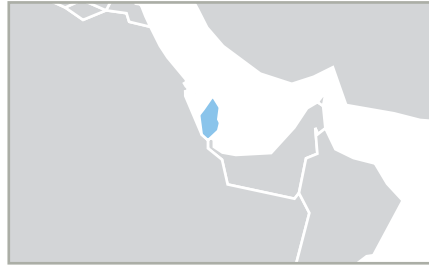
An important European economy and an established data centre location. High corporation tax, energy and labour costs are a risk, particularly when combined with relatively high levels of industrial action and political instability in comparison to other western nations.

Data Centre Risk Index



INDIA (Ranked 20th)

At the centre of the global outsourcing revolution, India is now home to a number of data centres in strategic cities. Power quality and outages still represent a challenge in many locations and increasing IT loads are also a risk and a disincentive to investment in the country.



QATAR (Ranked 7th)

An emerging market with potential but mixed risk levels. Benefits include low energy prices and very favourable corporation tax rates. The ease of doing business, international bandwidth, sustainability and water availability are very high risk and the unrest in the region is a concern.



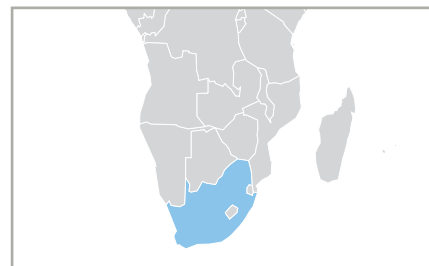
UK (Ranked 5th)

A major world economy and an important financial hub. Taxation, energy and labour costs are high and there is a risk that owners and operators could begin to look elsewhere to reduce overheads. The UK has a poor sustainability score, although this is likely to improve in the future.



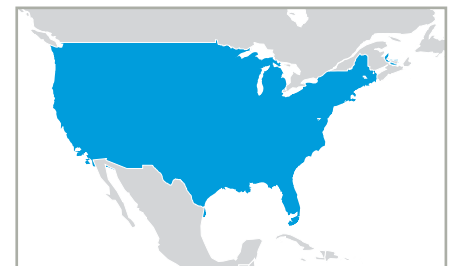
JAPAN (Ranked 19th)

Ranked as high risk due to its exposure to natural disasters. During the recent earthquake and tsunami, data centres in the country remained impressively resilient – although connectivity was affected. High energy, taxation, labour and construction costs are also a factor in Japan's poor score.



SOUTH AFRICA (Ranked 8th)

A gateway to the African continent and an opportunity market. Despite concerns on political stability and infrastructure quality, South Africa is a low-cost option. Energy and labour is cheap but the market will require continued investment in international bandwidth to become an established data centre location.



UNITED STATES (Ranked 1st)

The leading data centre market continues to grow its international bandwidth. Energy is relatively cheap and the US has an excellent reputation as a place to do business. Despite high corporation tax, the US is expected to remain the top choice for companies seeking a low risk location.

The way forward

ENERGY IMPACTS

Data centres are energy intensive facilities and the cost of energy is the single largest operational expense. With the opportunity to consider multiple locations, it is important to factor in the unit cost of power and horizon scan for the introduction of government carbon tax levies which will push the price of energy up still higher.



Sustainability is an increasingly important risk – it has been reported that data centres account for approximately 2% of global carbon emissions.

In future it is likely that greater numbers of end-users will want to energy generated from hydro, wind, wave and solar sources. Countries where governments embrace an increase in power generated from sustainable sources may, over time, see increased investment in their data centre industry.

OPPORTUNITY MARKETS

The Data Centre Risk Index has highlighted a number of locations which can be considered untapped markets – such as Qatar, South Africa or Sweden. Operations based in these markets have arguably established first-mover advantage. However for these countries to remain attractive, further investment in international bandwidth and energy generation capacity will be needed.

There is considerable scope for non-traditional and under-developed countries to attract foreign investment and improve their Index score with infrastructure improvements and relaxing protectionist legislation.



China and India are opportunity markets and engines of global growth but score poorly as a result of strict foreign ownership regulations and other barriers to investment.

FUTURE DEVELOPMENTS

hurleypalmerflatt and Cushman & Wakefield will revise the Index annually, adding more countries and providing more detail for larger countries. But what factors are likely to affect the Index and country rankings?

Carbon taxes are likely to increase energy costs. With diminishing resources some countries may even use these as pricing mechanisms to reduce demand. A move from carbon to renewable sources is likely to favour countries like Sweden, Brazil and Canada.

The reliability and security of power supply is already a major issue, with Germany declaring a move from nuclear to renewable and Japan from nuclear to imported gas and other sources. This in turn is likely to impact on energy costs.

International bandwidth is a very fast moving factor within the Index. Emerging markets are likely to enjoy faster growth, reducing their risk profile as a result. This may well include South Africa and certainly Qatar with its high-speed national fibre optic network due to go live in the second half of 2011.



Contacts

hurleypalmerflatt are leading engineering consultants who deliver outstanding services to the built environment, worldwide. The firm is recognised as market leaders in mission critical engineering and innovators in energy and sustainability.

hurleypalmerflatt design complex environments that are business critical, such as data centres, trading floors and operational control centres. The company has been integral to the development of data centres throughout Asia Pacific, EMEA and the Americas, with clients including major global banks and international data centre developers and operators.

Global real estate consultant Cushman & Wakefield has 234 offices in 61 countries and more than 13,000 employees. The firm offers a complete range of services to a diverse customer base ranging from small businesses to Fortune 500 companies.

The Cushman & Wakefield Data Centre Advisory Group (DCAG) provides real estate services and strategies relating to data centres, telecom switches, network providers, disaster recovery sites, and critical operations centres, in the EMEA markets. It comprises some of the most experienced advisors within this highly specialised sector and asset class, including real estate and financial consultants, transaction specialists, appraisers, and project and facility management professionals.

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