interxion™

SELECTING THE BEST EUROPEAN LOCATIONS FOR YOUR IT INFRASTRUCTURE

Risk and opportunity analysis for European investment decisions

INTRODUCTION

Whether considering the European Union, the euro area or the European Free Trade Association (EFTA), the size of the European market is similar to the US. To illustrate, in 2012 the population of the US was 312.8m[*] while the euro area was 333.3m and the European Union 507.6m.[†] GDP was $15.65bn for the US vs $12bn for the euro area and $16.4bn for the EU.[‡]

The question, if you're expanding your operations to serve developed and/or emerging markets in Europe, is: where to base your offices and data centres? Choosing the right country for your IT infrastructure deployment is crucial. Assessing the relative strengths of the major European business centres and investigating potential risk factors is a vital step in identifying the most appropriate location (or locations) for your data centre investments.

In this paper we consider a number of criteria that affect IT infrastructure deployment decisions. We've identified these criteria as being of particular importance based on:

- An extensive review of independent information sources that look at criteria for investment decisions
- Our own extensive experience building data centres in Europe
- The deliberations of our customers when considering where to locate their IT infrastructure.

From natural disaster risk and the availability of sustainable energy to market potential and tax rate, we look at criteria that affect both the successful operation of a data centre and a country's appeal as a location to do business. We've grouped these criteria into three categories: generic market characteristics, specific country differentiators and local risk profiles.

We've analysed 11 European countries, all of which make attractive IT and business centres. In our experience, different companies value different metrics, so our intention is not to create an overall ranking but to provide the insight you need when weighing the options for your choice of data centre location(s) in Europe. This paper provides value even when your decision for a particular location has already been made, giving you an insight into factors you should consider when you deploy within a particular country.

United States Census, 01/01/2012
† Eurostat 2012 figures, 01/01/2012
‡ IMF World Economic Outlook Database, 2012

CONNECTIONS INTO EUROPE

As the diagram shows, each of the countries we discuss in this paper (shown in blue) is well connected within Europe and beyond. Many of these business centres are well-positioned to serve as a central hub to distribute data and/or applications to the European market as well as emerging markets such as Russia, Central & Eastern Europe, Turkey, Middle-East and North Africa.

Indicative round trip delays from a central European location are:

- Within Europe: 30-60ms
- Russia (Moscow): 30-40ms
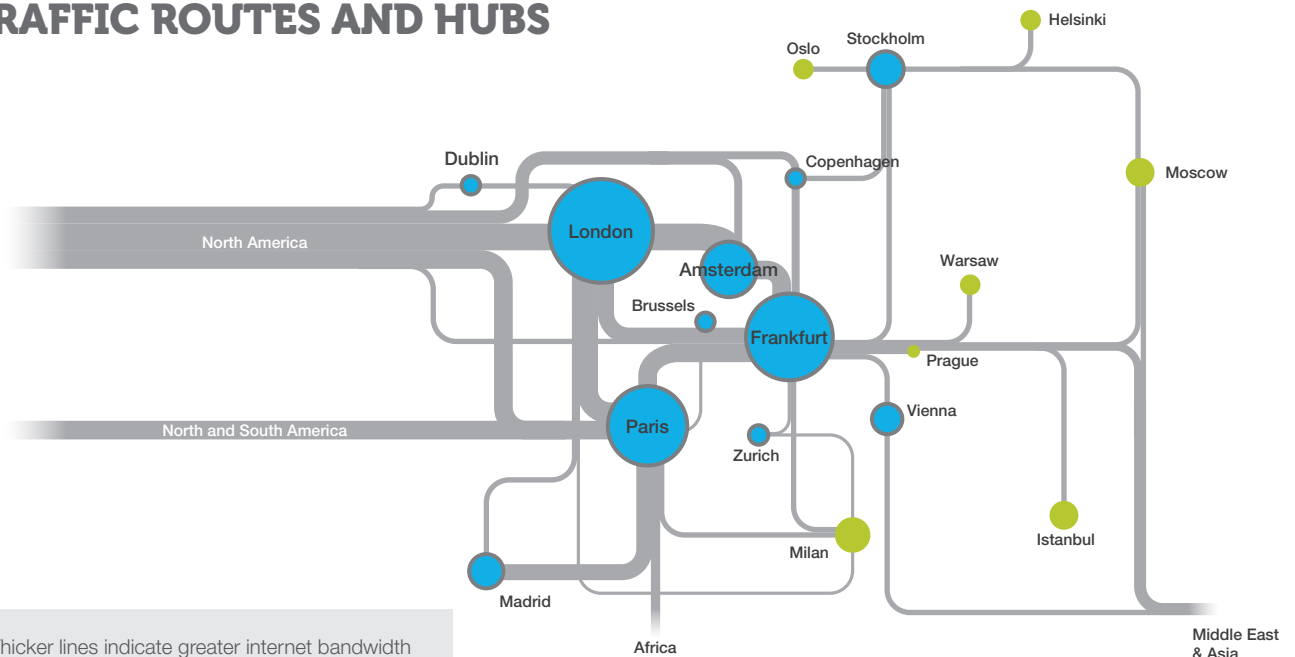- North Africa: 30-60ms
- Middle East: 110-140ms

TO BUY OR BUILD?

Your decision to invest in deploying IT infrastructure in Europe can take one of two forms: renting space in an existing, operational data centre ('buying') or establishing your own in the country of your choice ('building'). Both options still require you to choose which country (or countries) you want to be based in. All of the countries covered in our analysis have excellent third-party colocation and hosting options.

If building your own data centre is the right choice for your business, one thing to consider is how long it's likely to take to get the facility operational. In our experience – and we've built a lot of data centres – obtaining all the necessary permissions and building an operational data centre can take anywhere from 6 to 36 months. The large range is down to the specifics of the particular location as well as the regulations and processes of individual countries.

In comparison, assuming available space, moving into existing facilities is a matter of days or weeks, depending on your requirements.

EUROPEAN INTERNET TRAFFIC ROUTES AND HUBS

Thicker lines indicate greater internet bandwidth capacity while the size of each circle represents the total international internet bandwidth connected to the specified city, showing you at a glance both the diversity and relative capacity of the major routes into, out of and around Europe.

Source: Based on a number of public sources including Telegeography

CHOOSING A EUROPEAN LOCATION:
MARKET CHARACTERISTICS, DIFFERENTIATORS AND RISK PROFILES

We've used eighteen criteria to evaluate the attractiveness of the locations included in this comparison. The criteria have been divided into three groups:

- Market characteristics – set of criteria describing the demographics of each country
- Market differentiators – set of criteria indicating the impact of policy choices
- Risk profile – set of criteria indicating the main risk factors

See the appendix for details on the sources and figures.

CRITERION	MARKET CHARACTERISTICS						MARKET DIFFERENTIATORS		
	GDP	Internet penetration	Smartphone penetration	Population	Metropolitan area size	Average salary	Ease of doing business	Global innovation	Corporate tax rate
METRIC	USD bn	%	%	# people	# inhabitants	Euros	Ranking out of 185	Index score (/100)	% of commercial profits
SOURCE	World Bank (2011)	World Bank (2011)	Wired (2011)	Worldatlas (2012E)	Eurostat (2012)	Eurostat (2011)	ICF and World Bank (2012)	INSEAD (2012)	World Bank (2012)
AUSTRIA	418	79.8%	36%	8,372,930	2,635,990	22,384	29	53.10	53%
BELGIUM	514	78.0%	28%	10,827,519	2,922,678	21,210	33	54.29	58%
DENMARK	332	90.0%	44%	5,540,241	1,909,612	24,204	5	59.93	28%
FRANCE	2,778	79.6%	30%	65,447,374	11,914,812	23,987	34	51.75	66%
GERMANY	3,607	83.0%	28%	81,757,600	2,574,812	22,729	20	56.25	47%
IRELAND	221	76.8%	35%	4,459,300	1,801,089	20,971	15	58.68	26%
NETHERLANDS	838	92.3%	38%	16,609,518	2,405,533	21,876	31	60.55	40%
SPAIN	1,479	67.6%	46%	46,951,532	6,387,824	12,613	44	47.25	39%
SWEDEN	544	94.0%	52%	9,366,092	2,091,473	22,941	13	64.77	53%
SWITZERLAND	660	85.2%	30%	7,782,900	1,392,396	41,890	28	68.24	30%
UNITED KINGDOM	2,431	86.8%	40%	62,041,708	13,614,409	21,311	7	61.25	36%

MARKET DIFFERENTIATORS			RISK PROFILE							
Industrial electricity kW/h	Renewable energy	Internet capacity	Political stability	Perception of corruption	Natural disaster risk	Difficulty of redundancy	Strength of labour union	Data protection legislation		CRITERION
€	% of energy consumption	# worldwide ranking	# index	# CP index		# index	union density	Qualitative		METRIC
energy.eu (May 2013)	energy.eu (2020 target)	Telegeography (2012)	World Bank (2012)	Transparency International (2012)	Maplecroft (2010)	World Bank (2010)	SUNY Buffalo Law School (2011)	EC 2013 (2013)		SOURCE
0.09312	34%	15	95.7	69	Low	40	36%	Medium		AUSTRIA
0.09714	13%	30	74.4	75	Medium	0	42%	High		BELGIUM
0.09434	30%	16	74.9	90	Low	0	42%	High		DENMARK
0.07761	23%	3	63.5	71	High	30	67%	Medium		FRANCE
0.11567	18%	2	71.1	79	Medium	40	61%	High		GERMANY
0.10583	16%	48	77.3	69	Low	20	46%	Moderate		IRELAND
0.08852	14%	4	90.5	84	Medium	70	46%	High		NETHERLANDS
0.10220	20%	10	43.1	65	High	30	58%	Moderate		SPAIN
0.07197	49%	7	90.0	88	Low	40	54%	Moderate		SWEDEN
NA	NA	36	98.1	86	Medium	0	42%	Moderate		SWITZERLAND
0.10284	15%	1	60.2	74	Low	0	18%	Moderate		UNITED KINGDOM

COUNTRY
HIGHLIGHTS

In summary, Europe offers many excellent locations for IT infrastructure deployment. With all of the countries analysed offering particular benefits, the next step is to assess your priorities to identify which locations are right for you.

AUSTRIA

Ranked as one of the most politically stable countries, and with a low risk profile for corruption and natural disaster, Austria's low unemployment and strong international ties make it an attractive business destination. Austria stands at the crossroads of western, central and Eastern Europe. More than 15 countries are within a 500km radius of the capital city – ranging from mature economies such as France, Germany and Italy, to emerging powerhouses like Poland, the Czech Republic, Russia and Turkey.

FRANCE

France boasts the second largest European economy and is a G8 member. A landing point for international telecoms backbones, it's ranked third in the world for internet capacity and has low energy costs due to widespread use of nuclear power, making it an attractive data centre location. With 12 million inhabitants, the Paris region has one of the highest GDPs in Europe, and more than 70% of France's IT spend occurs in this region.

BELGIUM

Belgium is an important economic and business hub in Europe, and is home to the heart of European government and NATO. Around one-third of the country's population lives in the larger urban zone around Brussels, which is one of Europe's most commercially attractive cities thanks to its central location and excellent infrastructure connecting it to all major European cities.

GERMANY

Bordering nine other EU member states, G8 member Germany is the largest economy in Europe and is known for its highly developed economic, legal and political frameworks. Combined with a large, well-educated population this makes it an excellent operational base. Germany is home to one of the best connected cities globally (Frankfurt) and is a gateway to central and eastern Europe as well as Russia and the Far East.

DENMARK

Ranked by the World Bank as one of the best countries in the world to conduct business, Denmark boasts a forward-thinking culture, ecological commitment and one of the world's top ten most competitive economies. It has one of the world's most e-ready populations, with 90% internet penetration and 44% for smartphones. As well as being a world leader in clean tech, ICT and life sciences, Denmark is a very stable, risk-free environment for doing business.

IRELAND

The only English-speaking member of the Eurozone, Ireland boasts an attractive tax regime, relatively low labour costs in a highly educated workforce, a high rating for ease of doing business and a low risk profile. Transatlantic cables hit Ireland before the UK or continental Europe, making it a prime location for many international IT organisations. With first-rate infrastructure and stable and reliable energy supplies and communication services, Ireland is a thriving ICT hub.

NETHERLANDS

With a ranking among the top five nations globally for international bandwidth and one of the best connected cities worldwide (Amsterdam), the Netherlands is an excellent location for European operations. As well as being a gateway to Europe it has a developed local market with a significant GDP, a high innovation ranking, a top-five world ranking in terms of average Internet connection speed[§], and the second highest internet penetration in our analysis.

SWITZERLAND

A member of EFTA, Switzerland maintains strong trading links with the EU and is bordered by three of its largest market economies. It's all about stability and neutrality in Switzerland, illustrated by the very low risk profile and a favourable corporate tax rate. In addition, the country's approach to data protection makes it one of the safest havens in the world for privacy.

SPAIN

Spain has a highly developed infrastructure and communications network, and an ICT sector that has experienced strong development with a high level of cloud adoption. Innovation is strong, with start-up businesses accounting for 73% of GDP and generating 65% of employment. A large metropolitan population in Madrid, traditional links to Latin America and low labour costs contribute to its potential as a key business location.

UNITED KINGDOM

The third largest economy in Europe and a G8 member, our analysis shows the UK is also one of Europe's most innovative and easiest countries to do business. It's a landing place for transatlantic cable systems and the world's highest ranked country for Internet capacity. London is one of Europe's best-connected cities and a location of choice for financial firms, digital entrepreneurs and technology innovators.

§ According to Akamai figures published by Statista and Mashable (mashable.com/2013/08/22/fastest-internet-world/).

SWEDEN

Sweden is a prime location for centralised operations in Northern Europe, well connected to rest of Scandinavia, mainland Europe and Russia. A frontrunner in adopting new technologies and setting new consumer trends, our analysis also shows it as being one of the easiest places to do business. The availability of free cooling makes it a highly sustainable and cost-effective location for IT infrastructure and it also has very low energy costs.

If you'd like to take advantage of Interxion's experience in these countries to discuss your requirements, please contact us. Over the past 15 years Interxion has designed and built more data centres in Europe than anybody else and we currently operate more than 30 facilities across the continent. This extensive experience gives us important insights into the key differences between countries, the strengths of each, and the factors to consider when choosing a European location for your IT infrastructure.

INTERXION – A SHORT INTRODUCTION

Interxion is a leading provider of cloud and carrier-neutral colocation data centre services in Europe. More than 1,300 businesses rely on us to host their mission-critical systems and data, drawn by the quality of service, security and choice of connectivity we provide.

We have more than 30 data centres in 13 European cities to support your IT services. More than 450 fixed and mobile carriers and ISPs and 19 Internet exchanges provide connectivity services in our data centres. We host communities of interest that bring customers together to create valuable business relationships and minimise networking costs and latency through direct cross connects. By colocating with us, organisations are able to reduce investment and operating costs, improve application performance, increase flexibility, and create new business opportunities.

In the past 15 years we've designed and built more data centres in Europe than anybody else, and in doing so have pioneered many of today's key design approaches, such as modular design and build, designing for PUE, and cold aisle containment. Many of our data centres use 100% renewable energy, and many 'green' innovations are now standard practice for us, setting standards in sustainability. Because we use a common design, operating, management and customer service framework across all of our data centres, customers get the same high level of service in each location.

APPENDIX: CRITERIA USED IN THIS COMPARISON

Criterion	Source	Source URL	Definition
GDP	IMF World Economic Outlook Database (October 2012)	http://tinyurl.com/ov88zml	Total annual GDP in billions of dollars (US)
Global innovation	INSEAD Global Innovation Index (2012)	http://tinyurl.com/alnjjzf	Data collected from World Bank, and collated by INSEAD from the Innovation Input Sub-Index and the Innovation Output Sub-Index. Switzerland, with a score of 68.2, was the highest ranked country out of 141 countries. All 11 of the countries we cover are in the top 30
Internet penetration	World Bank DataBank (2011)	http://tinyurl.com/npowzhp	% of population with access to the Internet
Smartphone Penetration	Wired article (2011)	http://tinyurl.com/nge28mf	% of population with a smartphone
Population	Worldatlas (2012E)	http://tinyurl.com/oglzrsu	2012 estimated population figures
Size of metropolitan area	Eurostat (2012)	http://tinyurl.com/p4k8ng **	2012 population (some provisional) of the major metropolitan business area of each country
Ease of doing business	IFC and World Bank: Doing Business Economy Rankings (2013 edition, giving 2012 rankings)	http://www.doingbusiness.org/rankings	Ranking is the average of the percentile rankings across 10 topics: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency
Political stability	World Bank DataBank (2011)	http://tinyurl.com/ppj9aft ††	Measures perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. 0 = perceived very unstable; 100 = perceived very stable
Perception of corruption	Transparency International: Corruption Perceptions Index (2012)	http://www.transparency.org/cpi2012/results	Scores are based on how corrupt the public sector is perceived to be on a scale of 0-100, (0 meaning highly corrupt, 100 meaning very clean)
Natural disaster risk	Maplecroft: Natural disasters Risk Index (2010)	http://tinyurl.com/nsjepup	The index takes into account the major natural hazards worldwide, including: seismic activity, tsunamis, volcanoes, landslides, flooding, tropical storms and cyclones, storm surges, severe storms, extra-tropical cyclones, wildfires and drought

** Search for ' met_pjanaggr3' and follow the data-tree arrows.

† In the Worldwide Governance Indicators database, select desired countries, then under SERIES select 'Political Stability and Absence of Violence/Terrorism: Percentile Rank', under TIME select 2012, then select 'TABLE' at top right.

‡ Search for 'income by broad group of citizenship' and follow the data-tree arrows, then set INDIC_IL to mean instead of median.

Criterion	Source	Source URL	Definition
Corporate tax rate	World Bank: Total tax rate (2012)	http://data.worldbank.org/indicator/IC.TAX.TOTL.CP.ZS	The amount of taxes and mandatory contributions payable by businesses, after accounting for allowable deductions and exemptions, as a share (%) of commercial profits
Average salary per capita	Eurostat	http://tinyurl.com/p4k8ng ‡‡	Mean income by broad group of citizenship (population aged 18 and over) in Euros
Costs of redundancy dismissal	IFC and World Bank: Doing Business (2010)	http://tinyurl.com/lxdoqgx	Ranking of redundancy cost and notice period, indicating labour flexibility. 0 = low difficulty; 100 = high
Strength of labour union	SUNY Buffalo Law School, "Labor Law and Union Strength in 21 OECD Countries" (July 2011)	http://tinyurl.com/pv7hljc	Union density used as the measure of union strength
Industrial electricity kW/h	energy.eu (May 2013)	http://energy.eu	Industrial electricity pricing in euros, based on an annual consumption of 2GWh/year. The figures are from May 2013; they may have been updated since
Renewable energy	energy.eu (2020 target)	http://energy.eu	Share (%) of gross final energy consumption that is from renewable sources, comprising direct use of renewables (eg, biofuels) plus energy produced from renewables (eg, wind, hydro). The figures are country targets for 2020
Internet capacity	Telegeography (2012)	http://global-internet-map-2012.telegeography.com	Global ranking of internet capacity hubs in terms of connected internet capacity in Tbps (zoom in on the map to see the rankings)
Data protection legislation	Forrester, Privacy and data protection by country, global heat map (2013)	http://heatmap.forrestertools.com	Strength of current data protection legislation

Interxion is compliant with the internationally recognised ISO/IEC 27001 certification for Information Security Management and ISO 22301 for Business Continuity Management across all our European operations. © Copyright 2013 Interxion.

INDUSTRY ASSOCIATIONS

Cofounder: Uptime Institute EMEA chapter

Founding member: European Data Centre Association

Patron: European Internet Exchange Association

Member: The Green Grid, with role on Advisory Council and Technical Committee

Contributor: EC Joint Research Centre on Sustainability

Member: EuroCloud

ACCREDITATIONS

ISO 22301 Business Continuity Management

ISO/IEC 27001 Information Security Management

ITILv3-certified Service Centre Members and Facilities Managers

BCMS 560099

IS 537141

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