




# ICELAND

## The Ultimate Location for Data Centers

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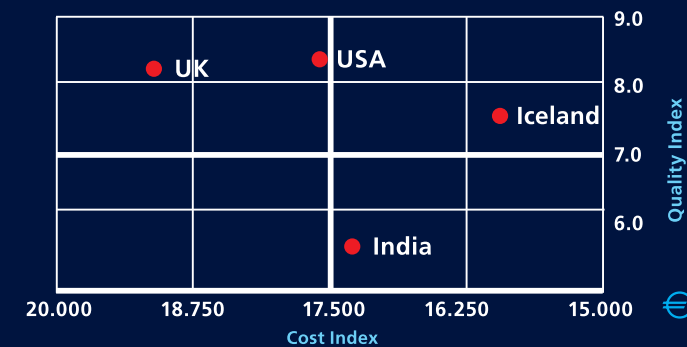
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Invest in Iceland Agency

## PricewaterhouseCoopers benchmarking study

### Cost - Quality Position



Source: PricewaterhouseCoopers, Belgium - Benchmarking Study on Iceland as a Location for Data Centre Activity.

“By almost any international comparative assessment focusing on IT competitiveness of the society and the IT use of the population, Iceland scores best in class.”  
“Iceland provides a clear and attractive offer to the question where the power and cooling issue can be managed at attractive cost and without operational impacts in terms of growth and stability. With Iceland having plentiful supplies of low cost green power, cold air/water as well as hot water, the benefits to large data center operators would soon pay back.”

In May 2007, international team of experts at PricewaterhouseCoopers, Belgium, delivered its report to Invest in Iceland Agency, in which Iceland was benchmarked against the United States, the United Kingdom, and India as a location for Data Center activity. Iceland scored extremely well in the report and was found to be “Best in Class”.

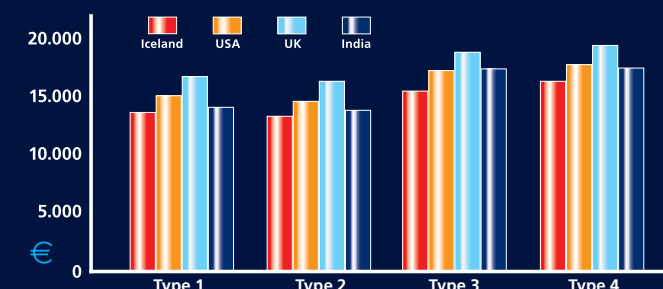
“Existing telecommunications services throughout Iceland are plentiful and reliable. These are in the process of constant improvement and of the highest modern standards.”  
“Regarding energy all three interested companies have the ability to deliver supplies to any part of the island, services including hot and cold water are also abundantly available as part of the required utility supply.”

*PricewaterhouseCoopers, Belgium*

*“In the search for cost attractive locations catering to the power intensive industries, Iceland is the single country in the world that provides best in class environment conditions in combination with attractively priced green power supply.” PricewaterhouseCoopers, Belgium*

### Cost components for the benchmark

The combination of the 4 detailed cost components results in a favourable position for Iceland, especially thanks to the power and rental cost.



Source: PricewaterhouseCoopers, Belgium - Benchmarking Study on Iceland as a Location for Data Centre Activity.

The cost calculations omit that fact that the need for cooling is substantially less in Iceland, due to a cooler climate, and that the price for cooling is considerably lower because of its abundant cold water. Studies have shown that half of the energy cost of a Data Center is for cooling, making Iceland an even more ideal location.

### Average high and low temperature

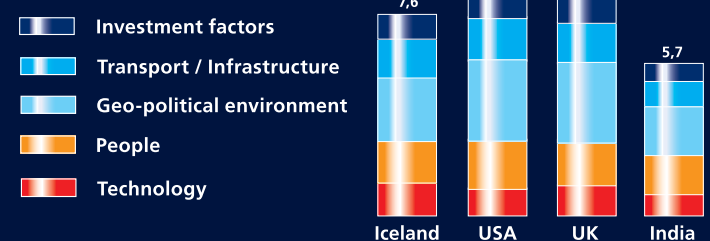


“The ability to reduce the power cost on cooling ... is a clear add-on to the attractively priced and plentiful availability of power as it lowers the total consumption, takes away the risk of meeting the maximum capacity later in time and allows for even further green image building”.  
*- PricewaterhouseCoopers, Belgium*

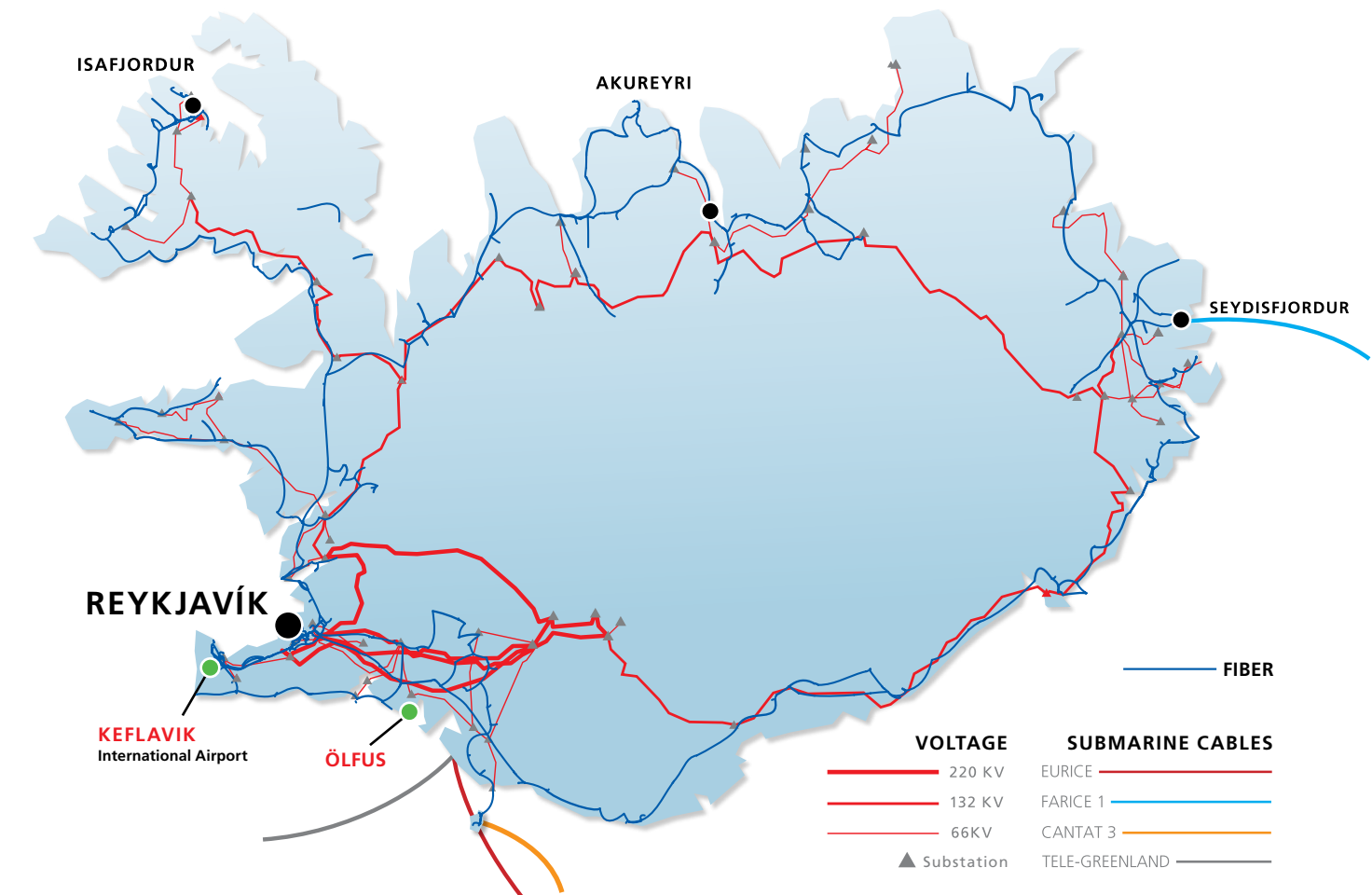
While Iceland received a lower score than the U.S.A. and the U.K. due to a need for additional secure connections to Europe and the U.S.A., this issue is already being addressed and remedies are being developed. The Government stated in its Policy Declaration that a new telecommunications cable will be operational in late 2008.

“The board of Farice has decided to auction off the research and installment of the cable this fall, so that a new cable will be operational come fall 2008.” Kristján Möller, Minister of Communications, Transport and Tourism.

### Overall Quality Score



Source: PricewaterhouseCoopers, Belgium - Benchmarking Study on Iceland as a Location for Data Centre Activity.



## LOCATIONS

In today's technological landscape the driving forces for identifying locations for Data Centers are space and power restrictions, according to PricewaterhouseCoopers, Belgium. Iceland has an abundance of available space, three capable power suppliers with the ability to deliver electricity to any part of the country, and reliable telecommunications services of the highest modern standards. Brownfield development sites are ample and greenfield development poses no problems to power or telecommunications companies. If needed, infrastructure can be in place within months. The south-west corner of Iceland has vast areas suitable for

Data Centers. There one can get the unique feeling of being secluded and isolated, but still within easy access to the state-of-the-art power grid and reliable fiber-optic services, and all within an hour's ride from the first class infrastructure and labor market of Reykjavík.

There are numerous other possible locations for Data Centers throughout Iceland. The power and fiber grid follows the entire coast line, and it can be beneficial for companies to locate Data Centers outside the capital area where local municipalities are likely to give special incentives to new businesses.

## EXAMPLES OF POSSIBLE LOCATIONS



### KEFLAVÍK AIRPORT

With the existing infrastructure at Keflavík Airport, a superb opportunity exists for readily available back-up power, UPS housing, and highly secure archive facilities. A complete building and road infrastructure with power and fiberoptic utilities on site, located on an international airport five minutes from a fully functional harbor and only a 40-minute drive to the capital, makes Keflavík Airport facilities an ideal location for Data Centers.



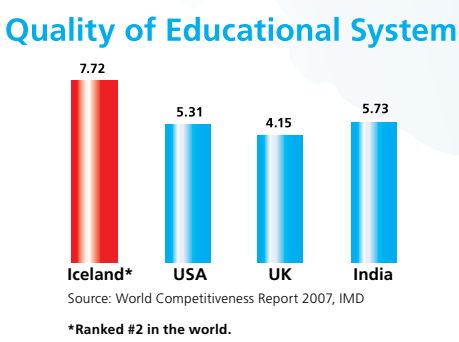
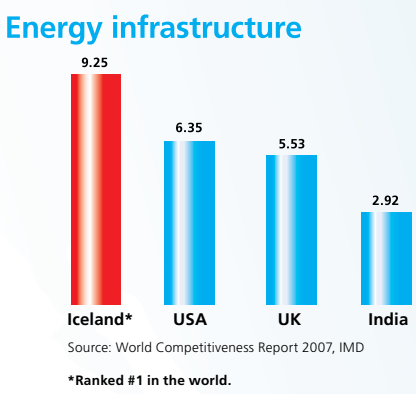
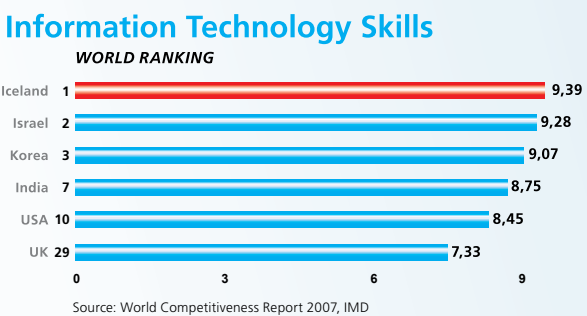
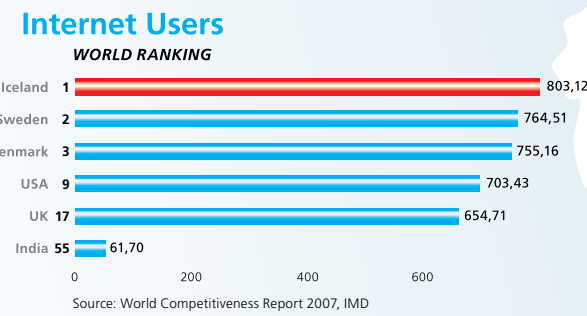
### ÖLFUS

Sitting on the fiber grid, Ölfus municipality is a model location for greenfield development. Ölfus is close to power plants and an abundant supply of hot and cold water and offers easy access to educated labor as Reykjavík is only 50 km away. The region has excellent infrastructure and favorable pricing on buildings and land and there is great enthusiasm within the community - both among residents and officials - towards Data Center development.



# COMPETITIVENESS

- INTERNET
- INFORMATION TECHNOLOGY
- RENEWABLE ENERGY
- EDUCATION
- SECURITY



According to the IMD World Competitiveness Yearbook, 2007, Iceland has built up a large-scale infrastructure that is very well suited to meeting the new technological requirements of enterprises. This infrastructure has served as a major support for fast growth in the ICT industry and the rapid adoption of technological solutions throughout society. Mobile phone and Internet penetration is very high, Iceland sits on a large future energy supply, and Reykjavík is becoming the first fully fiber-optic connected capital in the world.

## INTERNET

The availability of broadband access creates possibilities for developing novel services. The development of broadband access to the internet has been quicker in Iceland than in most countries and Iceland currently leads the world in both broadband subscribers and internet users. More than 80% of Icelanders use the Internet on a regular bases.

## INFORMATION TECHNOLOGY

In the past few years there has been a great emphasis on technological development in Iceland, leading to the creation of an advanced technology infrastructure. University education is highly rated, R&D spending is 2,83% of GDP, there are numerous qualified engineers, and communications technology is world class. This helps Iceland top the IMD rating for Information Technology Skills.

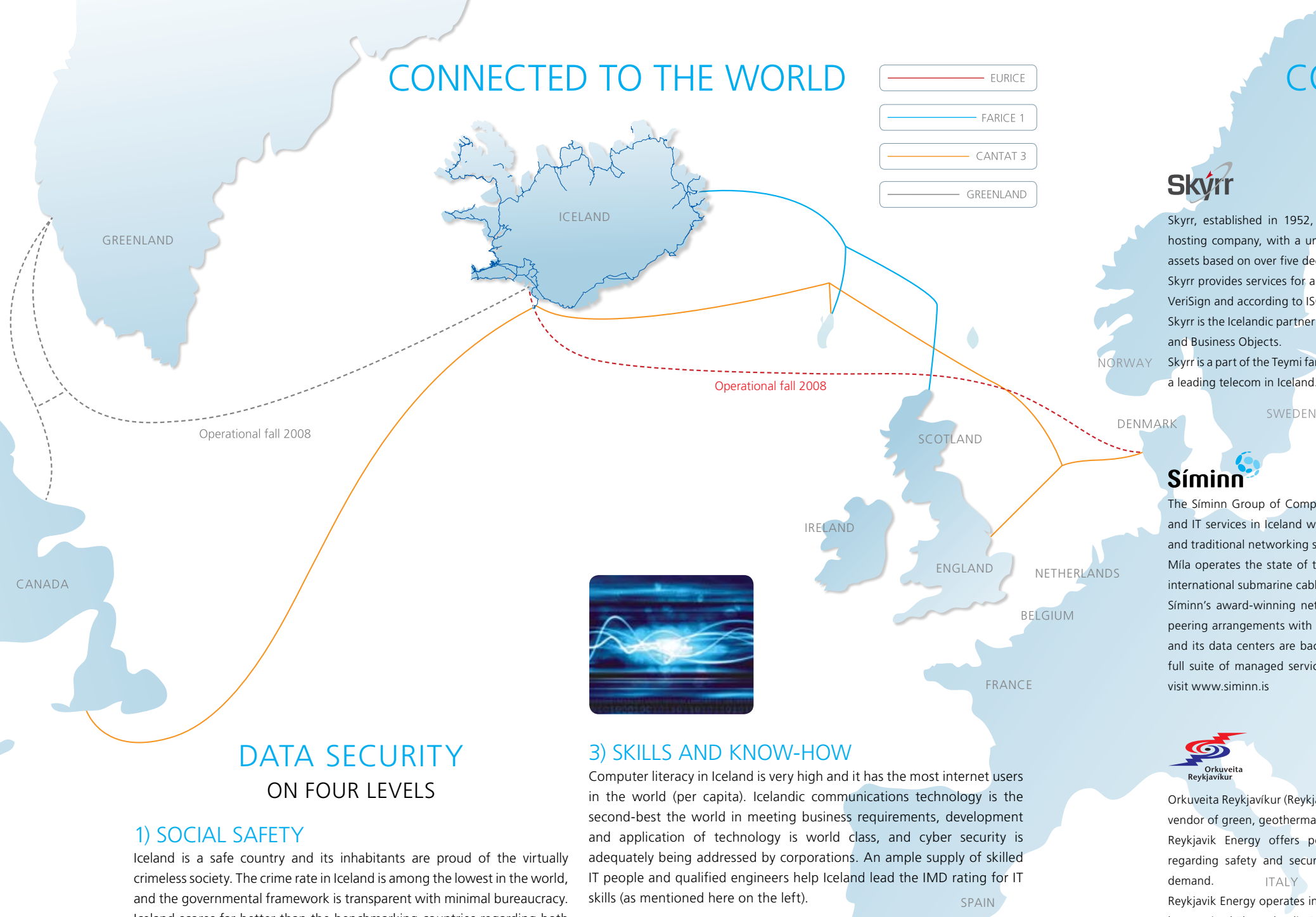
## RENEWABLE ENERGY

Iceland is the only country in Western Europe that still has large quantities of competitively priced, renewable energy remaining to be harnessed. It is estimated that by 2010 only a third of the country's energy potential (50TWh/yr) will be tapped. Setting Iceland apart from most, if not all other countries, is that its electricity is produced using exclusively hydropower- and geothermal energy. These are sustainable, environmentally-friendly "green" resources, without the atmospheric emissions of fossil fuel. The energy infrastructure is state-of-the-art, using the latest technology, with great reliability and efficiency, and is ranked #1 in the world according to IMD.

## EDUCATION

Iceland is an educated society. The total public expenditure on education is the second highest in the world, literacy is near 100%, language skills are good, financial education is top class, and economic literacy tops the IMD world ranking. University education meets the needs of a competitive economy, knowledge transfer between universities and companies is excellent, and the education system is the second best in the world, according to IMD, exceeding that of the U.S.A., the U.K., and India - *PricewaterhouseCoopers, Belgium*.

# CONNECTED TO THE WORLD



## DATA SECURITY ON FOUR LEVELS

### 1) SOCIAL SAFETY

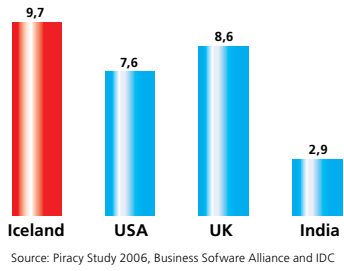
Iceland is a safe country and its inhabitants are proud of the virtually crimeless society. The crime rate in Iceland is among the lowest in the world, and the governmental framework is transparent with minimal bureaucracy. Iceland scores far better than the benchmarking countries regarding both corruption and political stability.

### 2) PHYSICAL SAFETY

Iceland is a non-military island with one major point of entry. Both the main energy and fiber grids are circular and all major connections are via loops to ensure maximum reliability and efficiency. The Post and Telecom Administration in Iceland, oversees security, efficiency and safety standards in operating the communications nets, with strict safety demands on all Internet Service Providers in Iceland.

### Corruption perception index

The index indicates the degree to which corruption is perceived to exist among public officials and politicians (10 = best score)



### 3) SKILLS AND KNOW-HOW

Computer literacy in Iceland is very high and it has the most internet users in the world (per capita). Icelandic communications technology is the second-best the world in meeting business requirements, development and application of technology is world class, and cyber security is adequately being addressed by corporations. An ample supply of skilled IT people and qualified engineers help Iceland lead the IMD rating for IT skills (as mentioned here on the left).

### 4) "WEAKEST LINKS"

**STANDARDS APPLIED AND GENERAL AWARENESS OF POSSIBLE CYBER CRIMES AND CORPORATE GUIDELINES REGARDING DATA SECURITY**  
This level is supported by the third, i.e. skills and know-how. The Post and Telecom Administration has a special website dedicated to data security with educational material, info and advice; all service providers are forced by law to adhere to best practices in save IP communications; special procedures in cases of emergency or successful cyber crimes are in place; and financial institutions were among the first to use the internet for B2B and business-client, making data security a determining factor from the onset.

### Political stability index

The political stability index measures a country's political risk (0 = high political risk, 1 = no risk)



# COMPREHENSIVE INFRASTRUCTURE

## ICT AND ENERGY



Skýrr, established in 1952, is Iceland's largest dedicated data center and hosting company, with a unique knowledge base and a suite of consulting assets based on over five decades of experience and service. Skýrr provides services for all major hosting environments and is certified by VeriSign and according to ISO 9001. Skýrr is the Icelandic partner and representative of Microsoft, Oracle, VeriSign and Business Objects. Skýrr is a part of the Teymi family of enterprises, which also includes Vodafone, a leading telecom in Iceland. For more information please visit [www.skyrr.is](http://www.skyrr.is)



The Síminn Group of Companies sets the standard for telecommunications and IT services in Iceland with an industry-leading portfolio of advanced IP and traditional networking solutions. Míla operates the state of the art nation-wide fiber optic network and the international submarine cable systems to Europe and North America. Síminn's award-winning network uses next-generation infrastructure, with peering arrangements with major global ISPs in Europe and North America, and its data centers are backed by globally certified IT expertise offering a full suite of managed services for businesses. For more information please visit [www.siminn.is](http://www.siminn.is)



Orkuveita Reykjavíkur (Reykjavik Energy) is a leading producer, distributor and vendor of green, geothermal energy in Iceland. Reykjavik Energy offers power intensive customers complete solutions regarding safety and security and can operate auxiliary power units on demand. Reykjavik Energy operates in accordance with strictest quality standards and has received The Icelandic Environmental Company of the Year Award and is certified green by TÜV. Reykjavik Energy owns Gagnaveita Reykjavíkur, a network service provider with an elaborate fiber-optic network in the Reykjavik area. For more information please visit [www.or.is](http://www.or.is)



The FARICE-1 fiber optic submarine cable, owned and operated by Farice hf, is the vital communications link for Iceland and the Faroe Islands. Farice hf. strives to ensure continuous and secure connectivity to its clients, is committed to excellence in its services, and follows a proactive growth strategy that anticipates the future of the North Atlantic economies. A new submarine cable between Iceland and Central Europe will be operational in late 2008, giving Iceland a fully redundant high capacity fiber optic connection to Europe. For more information please visit [www.farice.is](http://www.farice.is)



Landsnet hf., the power grid operator, was founded in the spring of 2005. Its role is to provide for the transmission of electricity, operate an electricity market and manage the transmission system, which includes all transmission facilities operating at 66 kV and higher. The owners of Landsnet hf. are Landsvirkjun, Rarik Iceland State Electricity and Westford Power Company. All of Iceland's utilities and power intensive consumers are connected to Landsnet's transmission system. For more information please visit [www.landsnet.is](http://www.landsnet.is)



Landsvirkjun is the largest electricity producer in Iceland, and the major holder of Landsnet, the system operator. Landsvirkjun produces and sells wholesale electricity to local utilities and power-intensive industries. At present, Landsvirkjun has a total installed capacity of 1,900 MW in hydro and geothermal power stations, making it the largest electricity producer with about 75 % of Iceland's total production. Landsvirkjun welcomes potential new clients and can offer secure delivery of green and emission-free electricity at competitive prices. For more information please visit [www.lv.is](http://www.lv.is)



Hitaveita Suðurnesja hf (HS) is located on the Reykjanes peninsula near Keflavik airport. Built on research of geothermal energy from the 1960s, HS was established in 1974 as a central heating company, and has since then developed into a producer of five different products: electricity production, geothermal house heating, fresh water distribution (hot and cold), and The Blue Lagoon spa. The future of the company is bright with ongoing R&D in geothermal energy resources. For more information, please visit [www.hs.is](http://www.hs.is)

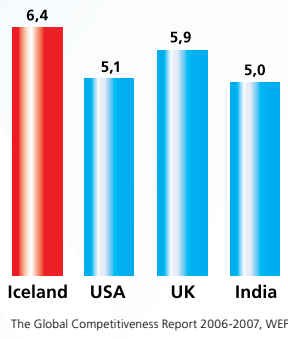
## Iceland - Low Risk of Natural Disasters

Iceland is perhaps perceived by some to have high natural disaster risk and is still regarded by many as the land of ice and fire. Fact remains that the risk of natural disaster is considerably lower in Iceland than in the USA, UK or India, and the risk is isolated to specific unpopulated areas far away from all major infrastructure.

### Potential disasters

- Earthquake and volcano activity
- Tsunamis, volcanoes, earthquakes, hurricanes, tornadoes, mud slides, forest fires, flooding and permafrost
- Winter windstorms and floods
- Drought, flash floods and earthquakes

Source: CIA Factbook 2006



The incidence of environmental disasters such as floods, droughts or severe storms significantly impact companies operations on expanding local business activities (1 = strongly agree, 7 = strongly disagree)