# Cool & Charming
# ICELAND

GREENSTONE

# DATA CENTERS IN ICELAND IN THE NEAR FUTURE

**13. maí 2009**

**Grand Hótel**
**Reykjavík**
….
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# BASIC FACTS OF ICELAND

**Within reach**
Iceland is located midway between Europe and North America. Only 5 hours from New York and Boston (as to LA in the US), only 2-3 hours from London, Paris and Berlin.

**Part of EU system**
Iceland is with agreement with EU as Norway and. Switzerland, the EEA agreement. Keflavik is the main international airport and a border point for entering Europe under the Schengen Agreement.

**Roads and Utilities**
Most of main roads in Iceland are fully surfaced and many local district airports both for private jets and larger airplanes.

**Telecom**
Iceland has one of the highest figures in the world for penetration of mobile phones and Internet use. Staying in touch with the rest of the world is easy from Iceland via fibre-optic cables or saterlite.

**Medical services**
Health care in Iceland is state-of-the art and is internationally recognized as a quality service. Hospitals with surgery facilities are located in all parts of the country and doctors are easily accessible in all communities. Iceland has one of the highest number of physicians per capita in the world. Foreigners temporarily staying in Iceland are able to receive medical services at their own cost or through personal or governmental insurance programmes.


**Land area**
Land is 103.000 sqkm (40.000 sqmiles) and 4/5 which is uninhabitable

**Geography**
Iceland is the second largest island in Europe, about midway between New York and Moscow.

**Population**
The Icelandic population is around 320.000 (June 2008).

**Capital**
Reykjavik city

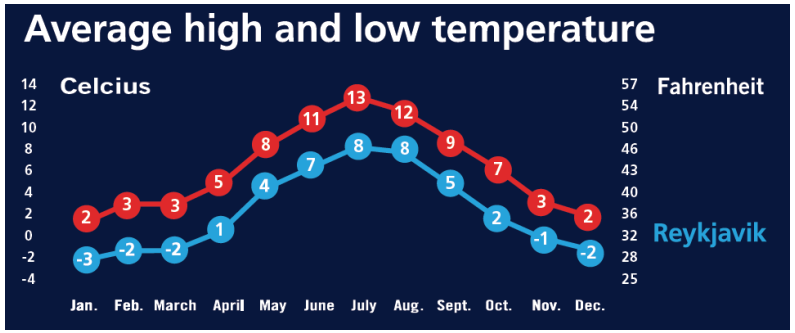
# CLIMATE & SEISMIC

## Climate

As Priwewaterhouse Coopers in Belgium, that made a report for the Icelandic state and Invest in Iceland Agency, stated the following;

“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”.

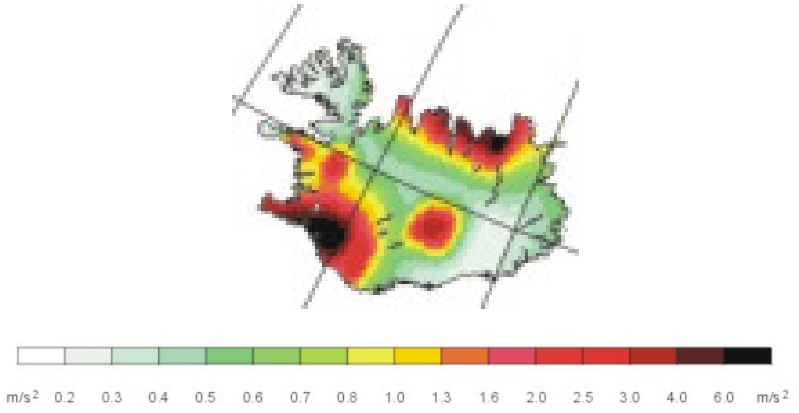
The ground water in Iceland is about 4 to 5 degrees centigrade or about 40 degrees on Fahrenheit. This groundwater can be used for cooling.




## Seismic

Nothing you will get without risk but Iceland has a active volcano areas. In some areas where there have been a lot of research the power plants have been located, especially the geothermal power plants, near to volcanoes that have not been active for centuries. This haven’t been hurting their operation at all and the area is well known of being stable but in a high temperature area where you can get powerful steam to generate energy.

Iceland is moving to east and to west a 1 cm in average a year as the North America plate and the European plate go in separate directions. This creates motions but in Iceland is a lot of experience to design critical facilities away from such motions. The risk is then fairly low but the risk is there.

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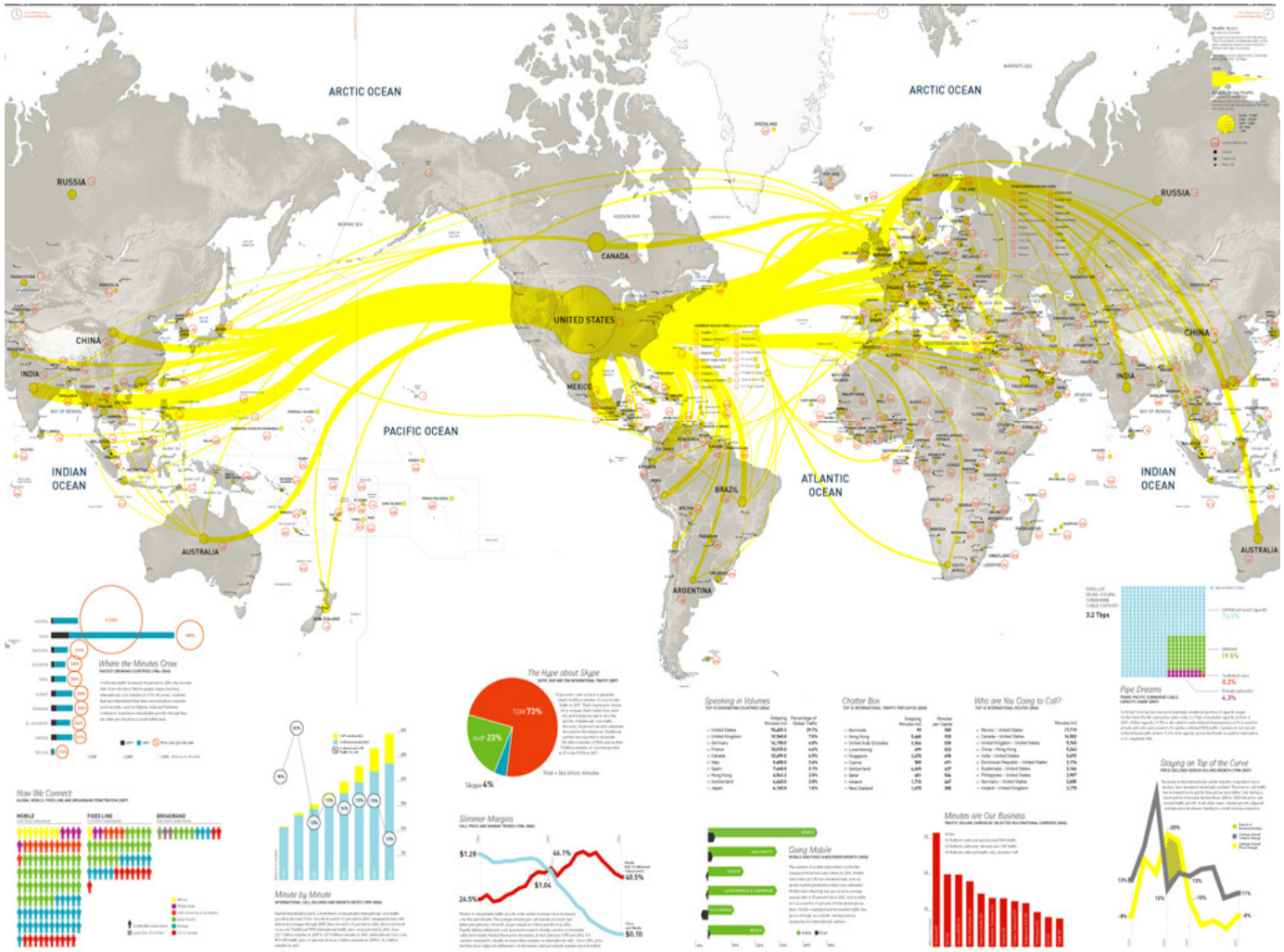
# THE CONNECTED WORLD

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## MORE EFFECTIVE AND GREENER WORLD

- CO2 emission ICT industry > CO2 emission Aviation industrie
- 40%  of these emissions are from personal computers and cell phones

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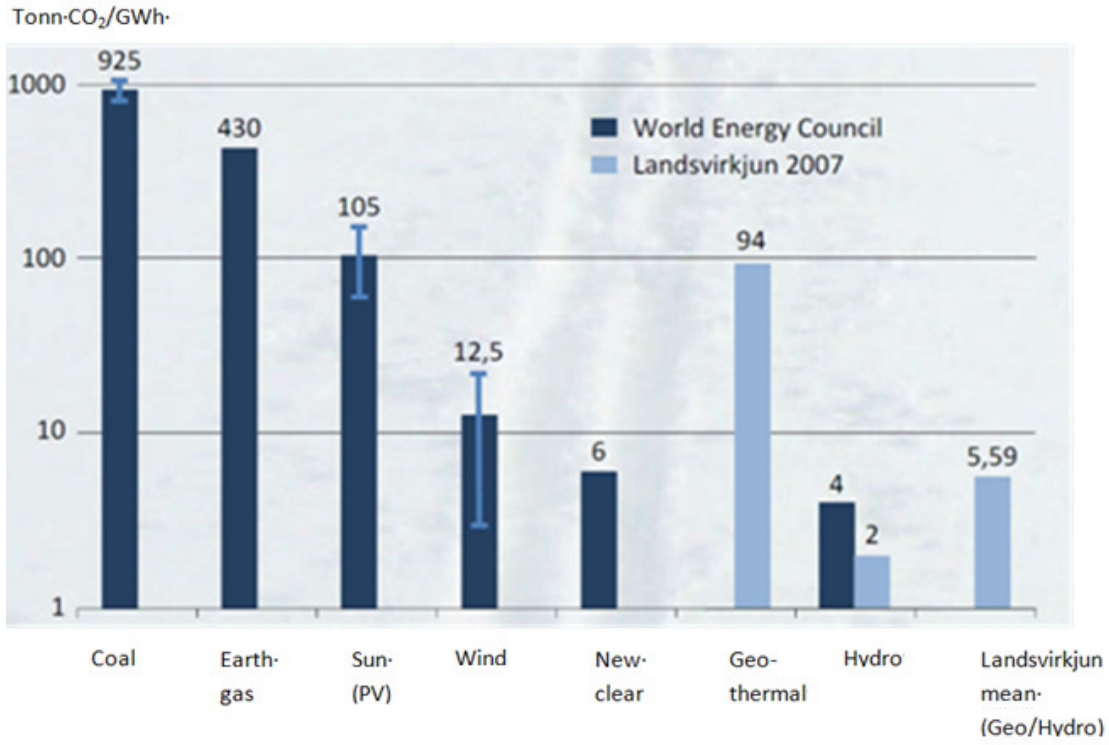
## $CO_2$ emissions and Iceland

Referring to $CO_2$ emission of electric energy production we can see that the production of Landsvirkjun, Greenstone main power supplier, is very low.

The main idea to bring this forward is to show how electrical energy produced in Iceland is environmental friendly.

Landsvirkjun has now over 75% market share in electric engineering production in Iceland. Majority production is with hydro power plants.

See more at www.os.is



## NEW IDEAS

- Datacenter capacity doubles every 4 years
- PC's and laptop's will disappear more and more
- New devices will be introduced
- Datacenters take over server and storage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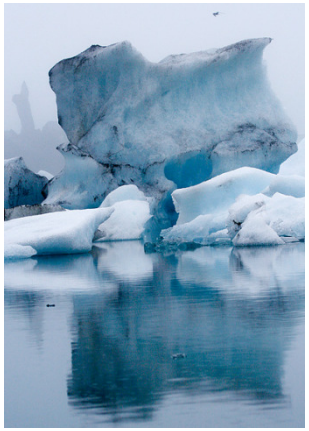
## THE MOST IMPORTANT TOPICS OF INTEREST FOR ICELAND



- Renewable green energy & energy price
- Natural free cooling
- Strategic location

[ USA-east cost / EU-west coast / East Asia (via north pole) ]

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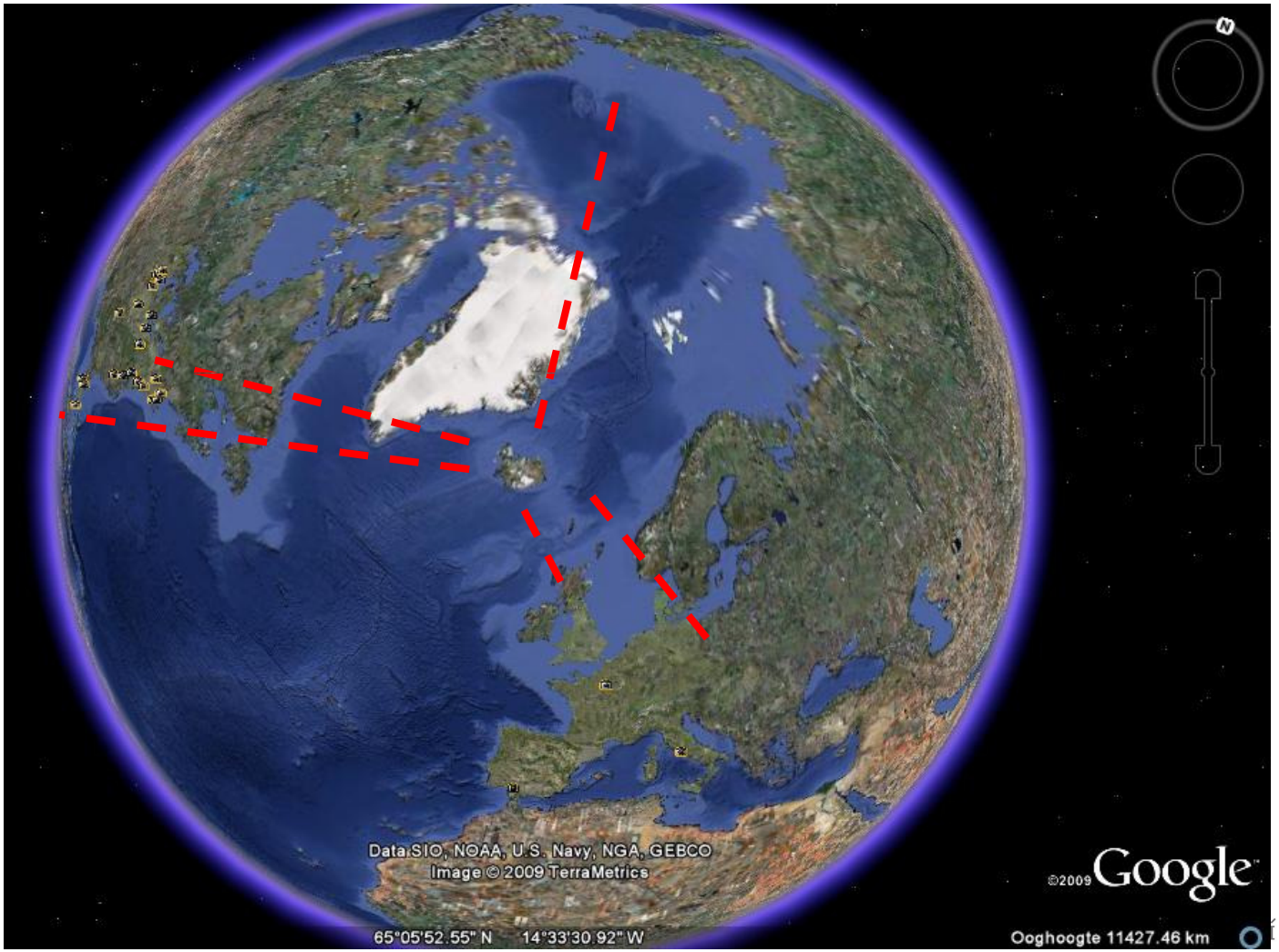
# ICELAND, A GROWING HUB IN THE IP WORLD



# THE COMPETITIVE ADVANTAGE

Any market place, i.e. "Iceland"

Energy solution:

- Package price advantage
- Diversity

**Commentary:**
If the box represents the market place (i.e. Iceland) then if Iceland has the same items as all the globe and no major advantage (i.e. 1, 2 or 3) then the customer with full choice will go to the larger population box.

1

3

2

Subcable to USA+EU+ASIA Diversity Terrestrial to sites Diversity

N+1 type Data Centers

To USA

To EU

To ASIA

# ICELAND CONNECTED

The old agreement (Gamli Sattmali from 1262/1264) where Hakon, the kind of Norway became the king over Iceland and got taxes from icelanders but was obligated to send at least 6 ships every year.

An official announcement from King Kristjan 7th of Denmark of an establishment of a post institution in Iceland was informed 13th of May 1776 but didn't come into power until 10th of February 1782.

The year 1905 many farmers went on horses to Reykjavik from S-Iceland to protest against the telephone to support their leader Mr. Einar Benediktsson who wanted more signal through air than cable. A opening of the landline cable around Iceland was the year 1906.

The first telephone call was though through air the year 1935.

The first submarine cable from Iceland to Faroe Islands and to the United Kingdom 1962 (SCOTICE).

The Cantat-3 (the third Canadian transatlantic telephone cable) was laid and in operation 1994. Initially carrying 7,5 Gbit/s between Canada and Europe.

The Farice-1 was laid and in operation from March 2004, investment of total 45 m EUR, total 1.407 km and with capacity of 720 Gbit/s.

The Danice is being laid and shall be in operation from June 2009, investment of estimated 77 m EUR, total 2.300 km and with capacity of 5.120 Gbit/s.

The Greenland Connect cable laid from Iceland, to Greenland and then to Nova Scotia. Total capacity of 1.900 Gbit/s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# ICELAND FUTURE CONNECTIONS

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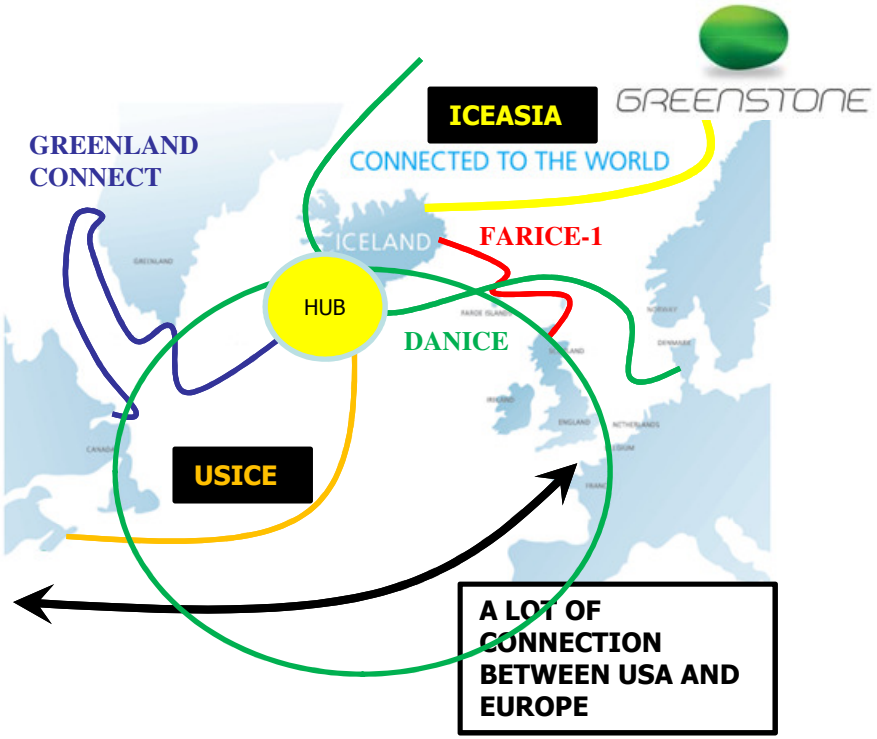
The future aim is to arrange finance of a new cable to USA (USICE) that will be operational in around 5 years with a capacity of 5.120 Gbit/s

The future aim is to arrange finance of a new cable to ASIA (ICEASIA) that will be operational in around 5 years with a capacity of 5.120 Gbit/s

Trans Atlantic connections. Why all these connections?

The answer is security and more security, diversity and redundancy that is the main and most important issue regarding data center operations. No outfall is allowed ! The main aim is to build up a new green industry in Iceland where Iceland can deliver a secure redundant connection trans Atlantic and trans North Pole. Iceland will be an international Hub.

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## MOST IMPORTANT FOR THE MAIN TENANTS


- ✓ **Green Energy** for sake of **image building**
- ✓ Reduction of **operational costs**
- ✓ **Redundancy** in energy supply
- ✓ **Redundancy** in fiber optic capacity
- ✓ **Little latency**, shortest distances

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## CABLES OVER THE N-ATLANTIC OCEAN

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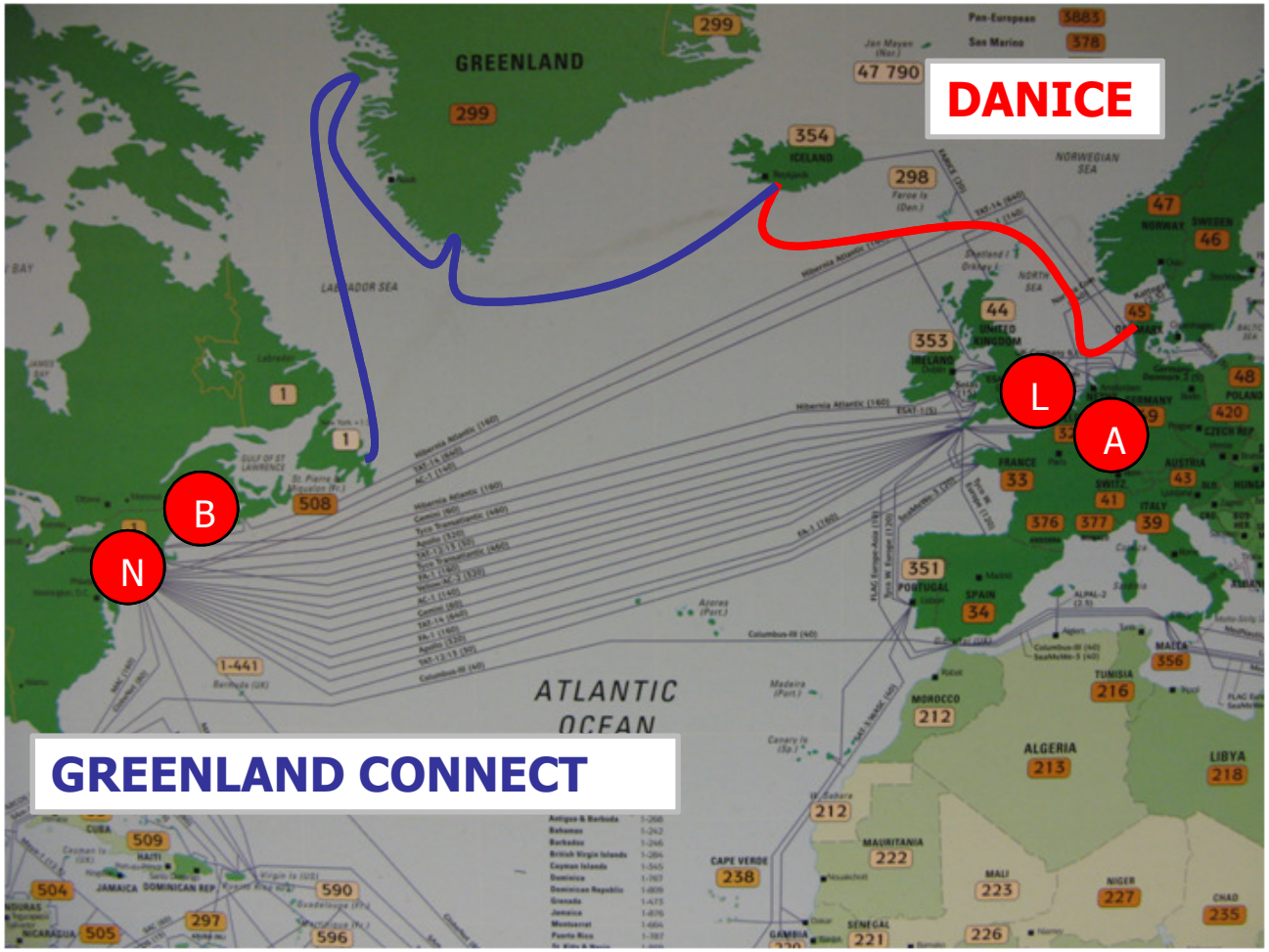
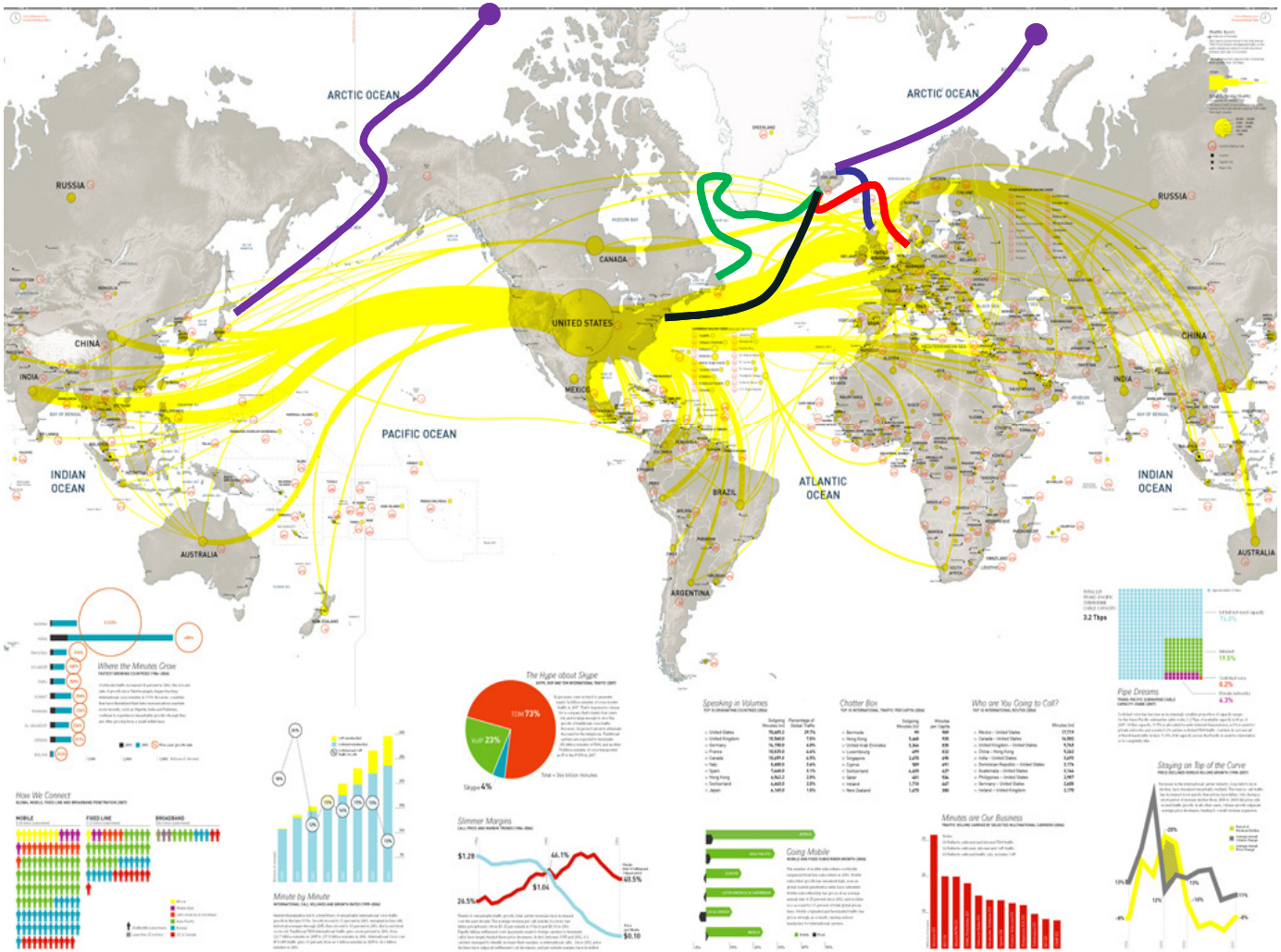


## CABLES OF THE WORLD

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## LETS STORE SOME DATA – IT IS NOW OR ...?

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