

NORDIC COOL DATA CENTRES

Business meets sustainable
world-class infrastructure



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TELIA - WHO ARE WE?




Founded in 1853. Telia is a word used to express 'happiness and contentment' ('telios' in Greek)

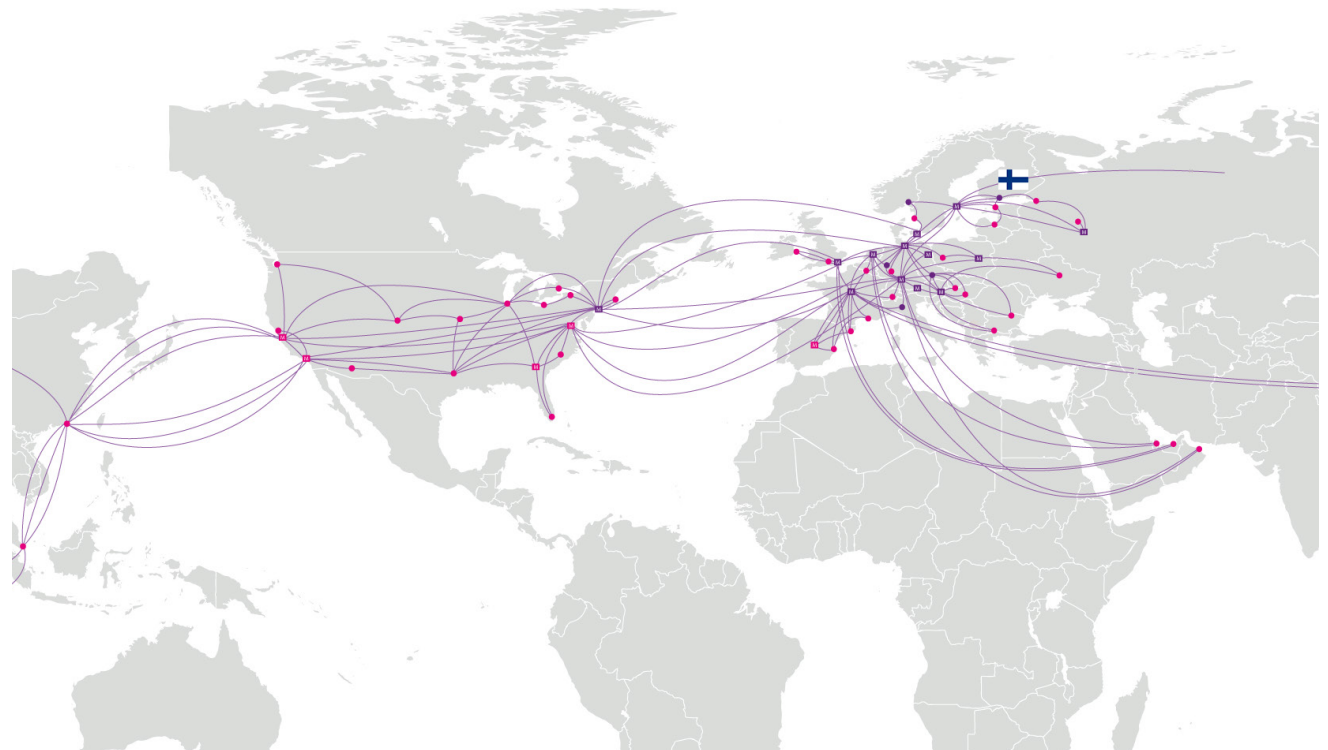
-  Operating in Denmark, Estonia, Finland, Latvia, Lithuania, Norway and Sweden
-  Included in the sustainability indices FTSE4Good and oekomPrime
-  At year-end 2019: turnover SEK 86bn (USD 10bn) Telia Finland Oyj revenue USD 1.3bn
-  20,800 employees

Helsinki world-class data centre

-  34,340 m² footprint, 15,000 m² of white space, up to 5,000 racks with up to 250,000 rack units.
-  Carrier-neutral facility and Arctic Connect inter-continental fibre potential
-  Energy reuse efficiency potential - waste heat supplied to the district heating system. 24 MW capacity.
-  100% renewable electricity and 100% carbon neutral operations
-  Heat recovery and recycling project in progress to warm 20,000 homes or 200,000 MWh per year
-  24 megawatts of IT load capacity. 30+ years design. 100 MW of site power capacity.
-  Certified: LEED Data Center v4 Gold, CEEDA Design Gold.
-  The data centre is designed and built to TIER III and EN50600 standards.

Telia Carrier Network

-  #1 global internet backbone (AS1299)
-  IP customers account for 60% of all internet routes
-  2000+ directly connected customer ASNs

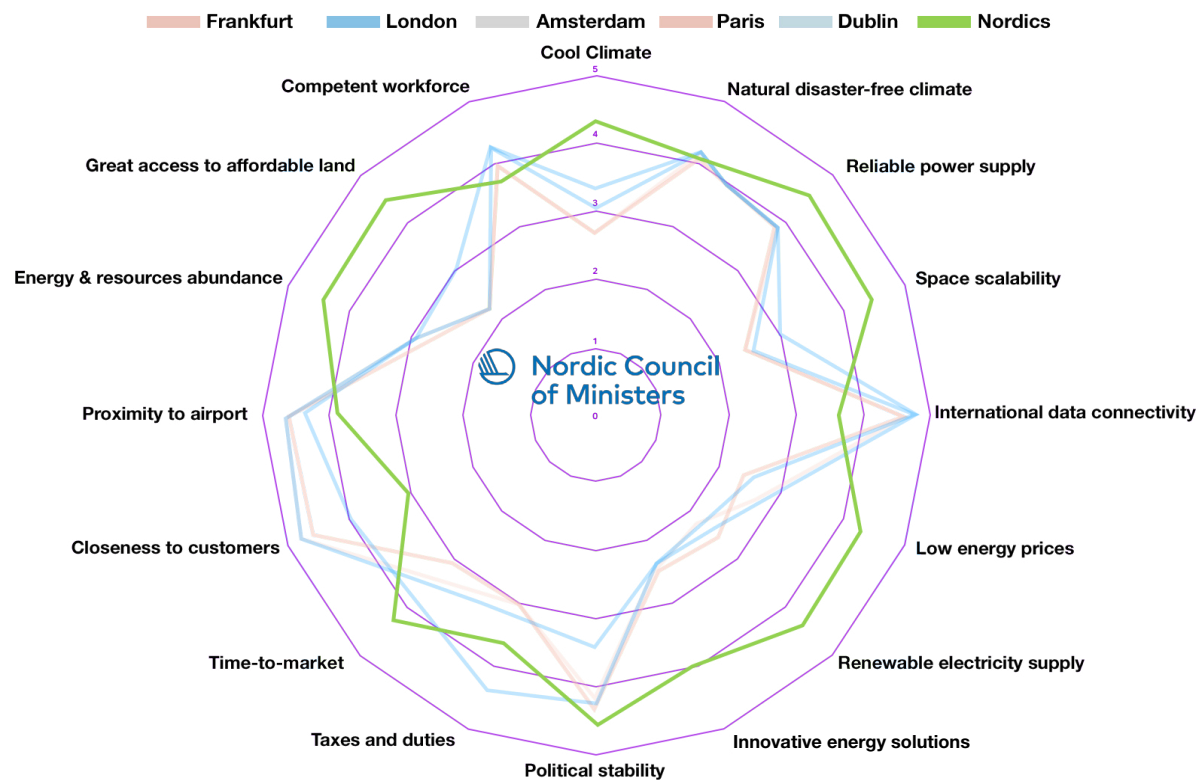


COMPETITIVE ADVANTAGE

How the Nordic region positions itself as a data centre location vs FLAP-D markets.

From the report of the Nordic Council of Ministers: Data Center Opportunities in the Nordics - An Analysis of the Competitive Advantages.

Telia is a world-class global company with solid financial backing and security. We have an excellent, low-cost operational record supporting low-risk infrastructure in a secure location (physically, networks, power, political, P&L). Telia provides lower electricity prices from sustainable low carbon sources (100% renewable) than Frankfurt, London, Amsterdam or Paris (FLAP markets). The Finnish Government supports the digital and data centre sector, which makes it easy to do business with Telia's competitive and leading value-added digital environments.



1

Low opex, TCO, tax

Competitive network pricing, low corporation tax at 20% (2020), power prices 30–40% less than FLAP markets. Ten-year PPAs.

2

Speed and market reach

Speed to market and reach. Low-risk stable location and environment. Networks able to reach 800 million people in 50 ms.

3

Proven ecosystem

Multi-country data centres. Workforce to deliver and operate. Government and municipal support. Tech and ICT heritage.

4

Sustainable and scalable

Sustainable green power from a world-class power grid and infrastructure. Ability to scale, permit, power, people availability.

TELIA HELSINKI DATA CENTER

“One of the greenest open (LEED-certified) data centres in the world...”

“The digital bridge between Europe and Asia”



Finland's largest open data centre



34,340 m² footprint, 15,000 m² of IT white space, up to 5,000 racks, 200,000 server positions



Certifications: ISO 27001, ISO 14001, ISO 9001, ISO 45001, ISO 22301, PCI DSS



The only data centre in Finland with LEED Gold Data Center v4 and CEEA Design and Operate GOLD certification



100% renewable electricity 24-megawatt IT capacity. 30+ years life. 100-megawatt site capacity.



Heat reuse project in progress – waste heat to be recycled into the district heating system (ERE)



Potential ERE heat capacity to warm over 20,000 homes PUE < 1.2 (water cooling) with added heat recovery



2N power distribution with N+1 redundancy. Dual 110 kV grid connection and dedicated 50 MVA main transformers.



Quality - 100% uptime operational record



Carrier-neutral facility

Quality of service capacity
availability with global reach



“WORLD-CLASS DESIGN AND
OPERATIONAL EXCELLENCE”



TELIA CARRIER CONNECTING THE WORLD

67,000 km fibre backbone spans over 120 cities in 35 countries. With 300+ POPs and a unique ecosystem of network service and cloud providers, we deliver digital services to the last mile.

NORDIC DIRECT TO FLAP MARKET ACCESS

The Telia Helsinki Data Center is directly connected to Frankfurt via the 1,173 km C-Lion1 submarine cable: 17 ms at 144 Tbit/s. 25 ms via Telia Carrier.



Our Customers =

65%

of Global
Internet Routes

#1

Internet backbone
since 2017

2000+

Directly connected
Customer ASNs

TELIA HELSINKI DATA CENTER

FROM: Ready now: Pre-installed 12U and 52U racks up to 20 kW with fibre connectivity, PDUs and electronic locking. The Telia Helsinki Data Centre has white space certified by the Finnish Transport and Communications Agency (Traficom). Traficom represents Finland in the International Telecommunications Union (ITU) and the European Telecommunications Standards Institute (ETSI).

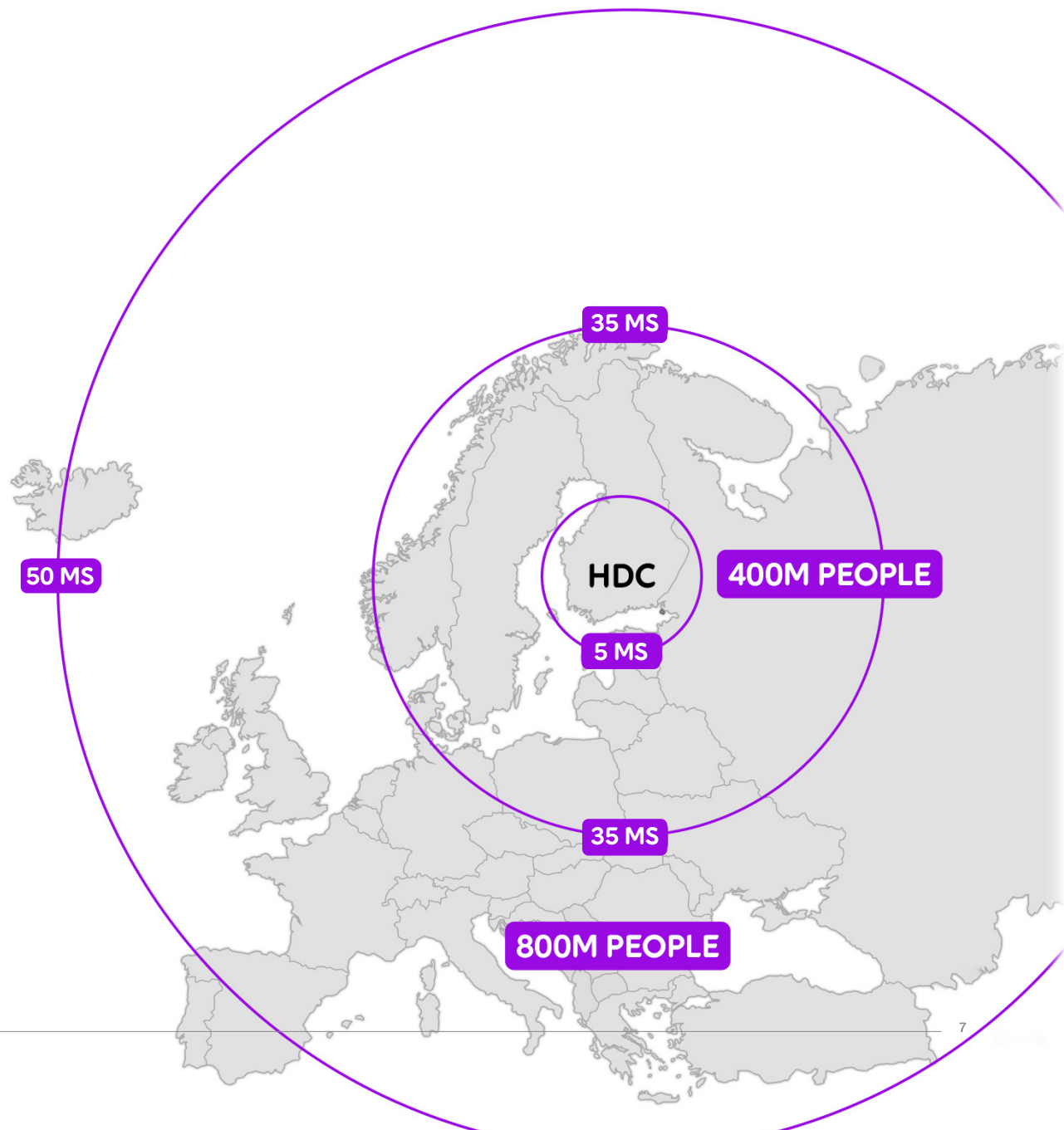
TO: Dedicated client halls - 1 MW - 4 MW outfitted to your requirements, up to two floors with 14 MW.

Data driven driving data

Dedicated interconnect connections: Telia Cloud Connect (Managed Cloud), Megaport, MS Azure, Google Cloud (not routed via Sweden, 5 ms), AWS (Amazon Web Services)
Access to LINX ESPANIX
MSK-IX AMS-IX DE-CIX Net Node

Telia cloud 9 First Finnish IaaS with ISO 27001 security certification. Data is stored and stays in Finland.

Telia Cygate Managed Services Provider (MSP), NaaS, 24/7 monitoring and management.



CONNECTING THE WORLD

INBOUND FIBRE CINIA CONNECTING 3 CONTINENTS: 'ARCTIC CONNECTION'

The newest, fastest and greenest intercontinental route

A new route that makes Helsinki the bridge between Asia and Europe. The 'Arctic Connect' 200 Tbps, 6,500 km submarine fibre will directly connect China, Japan, Russia, North America, Norway and the Telia Helsinki Data Center (HDC). It will be about 100 milliseconds faster than existing routes. Projected cable completion 2023–2024.

Latency and geographic reach

From the **Telia** Helsinki 100 MW Data Center to the world: Americas ↔ Europe ↔ Asia ↔

Stockholm 8 ms	Paris 35 ms
St. Petersburg 7 ms	New York 100 ms St.
Petersburg 7 ms	New York 100 ms
Amsterdam 27 ms	Dublin 44 ms
Moscow 19 ms	San Jose 169 ms
London 31 ms	Madrid 59 ms
Warsaw 35 ms	Singapore 196 ms
Frankfurt 17 ms (CINIA) and 25 ms (Telia Carrier).	
Millisecond (ms) = Round Trip Times (RTT)	



SUSTAINABILITY AND STANDARDS

OUR DARING GOALS - ZERO CO2 & ZERO WASTE BY 2030

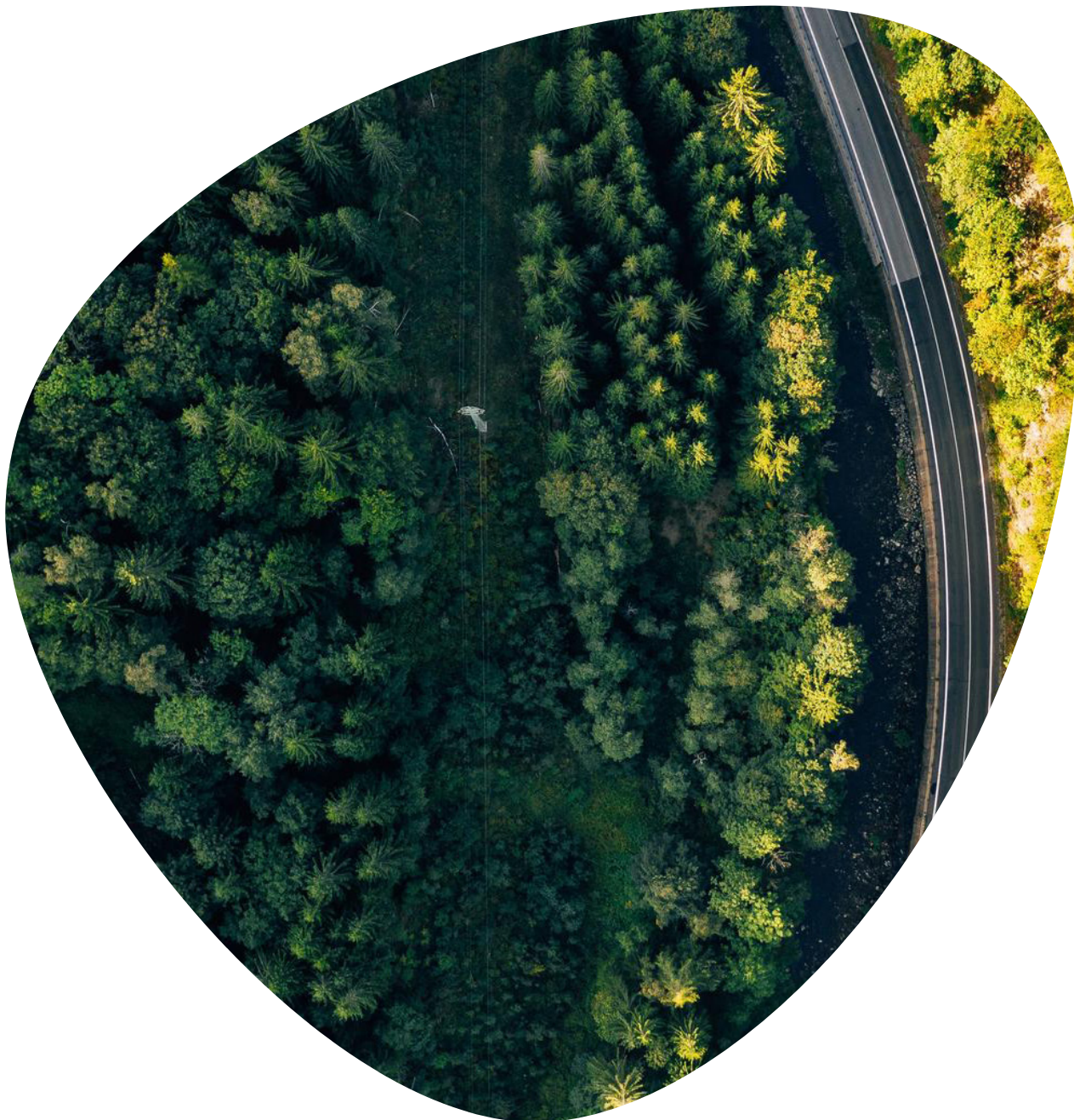
With our ambition of becoming the greenest telco on the planet, we have launched two bold environmental goals. We aim for zero CO2 emissions in the value chain and a circular approach to zero waste in our own operations.

Telia Company maintains strong Environmental Social Governance (ESG):

- AAA rating in MSCI ESG
- FTSE4Good inclusion
- “Gold Supplier” in EcoVadis
- ISS-oekomPrime

All Telia companies are 100% hydro-powered

It is Telia Company's firm belief that integrating sustainable and responsible business practices in all aspects of business and strategy is a prerequisite for sustainable growth and profitability, which in turn creates long-term value for shareholders and supports sustainable development.



OUR APPROACH TO SUSTAINABILITY

TELIA COMPANY'S STATEMENT OF MATERIALITY

Green bond framework: A green bond framework was released across Telia companies in October 2019, supporting the company's ambitions to realise its environmental goals by supporting internal investments. The framework includes four investment categories:

- Renewable energy
- Green digital solutions
- Energy efficiency
- Green buildings

United Nations Sustainable Development Goals:

As part of the UN Sustainable Development Goals (SDG), Telia Company sees strong links to creating stakeholder value in these primary categories: SDG9: Industry, innovation and infrastructure SDG 11: Sustainable cities and communities SDG 12: Responsible consumption and production SDG 13: Climate Action SDG16: Peace,

SUPPLIERS

We source suppliers from all over the world. Our relationship model allows us to engage with smaller suppliers with high efficiency and focus on qualitative engagement with strategic suppliers. Our Supplier Code of Conduct puts stringent requirements on suppliers regarding business ethics, environmental responsibility, labour rights and human rights.



FINLAND'S WORLD-CLASS ECOSYSTEMS

Skilled workforce and operations: Telia successfully operates a number of data centres in Europe in addition to its 95 telecom infrastructure sites and high technology real estate properties. Finland's world-class education system and ICT heritage provide a pool of highly educated and skilled employees. Finland's education system is ranked as one of the best in the world (PISA).

Sustainable Helsinki ecosystem: the Telia Helsinki Data Centre is supported by Helsinki City Council, which has adopted a policy of being a 'zero carbon city' by 2035 under its Carbon Neutral Helsinki Action Plan. The Helsinki metropolitan area is undergoing significant urban development, and it is the Nordic startup hub for ITC, cleantech, fintech and gaming. Helsinki has an interim objective of cutting greenhouse gas emissions by 60% by 2030. Helsinki has already reduced its greenhouse emissions by 28% from 1990 to 2018 despite an increasing population.

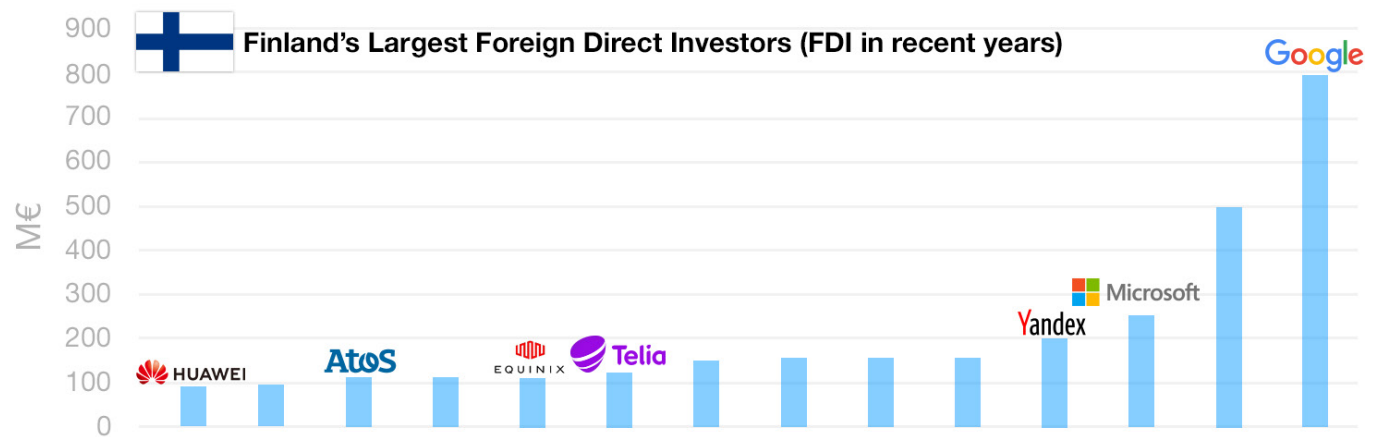
Finland's political and economic development with China and Russia

Finland's position as a regional bridge is clear: China's developing railway connection with Finland is a significant part of the Belt & Road Initiative (BRI) – a massive infrastructure project to boost trade between two continents. The geography makes Finland the bridge between the EU and Russia, and Finland has a good relationship and regularly arranges top-level meetings with the administrations of its neighbouring countries.

Finland's involvement in the 'Arctic Connect' submarine telecommunication cable connecting China and Russia to Finland has been significant and demonstrates the potential future cooperation of this Asian-European regional bridge.

World's first internet relay chat: the IRC protocol was invented in 1988 at the University of Oulu
World's first wind-powered turbine: invented by Finnish engineer Sigurd Savonius in 1922, Finland's proven innovation is moving towards renewable energy sources

Proven investment location: Finland has seen a significant portion of digital and data centre investments in recent years



WORLD-CLASS FINLAND

WORLD GOVERNANCE INDICATORS (WGI) 2019 by percentile rank among all countries (0 = lowest 100 = highest)

- Voice and accountability: 99%
- Regulatory quality: 98%
- Political stability: 79%
- Rule of law: 100%
- Government effectiveness: 98%
- Control of corruption: 99%

THE WORLD'S HAPPIEST COUNTRY

World competitiveness index Finland #11 (2019)

World risk index Finland 172 lowest/180 (2019)

Finland ranks #1 in availability of the latest technologies in the EU Digital Competitiveness Finland #1 (Digital Economy and Society Index 2019) **WORLD'S FASTEST DATA CONNECTIONS**

The ultra-fast fibre-optic cable connection to Europe enables the world's fastest data connections to global networks.

The forthcoming Arctic Cable, connecting Europe with northern Asia, will further solidify Finland as the ideal location for data centre and cloud service companies, hyperscalers and colocation service providers.

STABILITY IN EVERY SENSE

Superior digital infrastructure with strong internet connectivity, a reliable power grid, a steady economy and favourable policies ensure safe operations for data centres in Finland.

SUSTAINABLE AND INNOVATIVE SOLUTIONS

Finland is also committed to combatting climate change. Reusing excess heat from data centres for district heating makes perfect environmental sense.

POWERFUL FINLAND

Finland has one of the most reliable electric grids in the world – grid stability is 99.99998% along transmission lines. Finland also has some of the lowest electricity prices in Europe, and data centres using more than 5 MW of power also enjoy a lower energy tax rate. The combination of low-priced power and rock-solid reliability makes Finland the location of choice for cost-effective data centres.

WORLD ENERGY TRILEMMA

– WORLD ENERGY COUNCIL

Finland is ranked #4 internationally in overall graded AAAa energy. It is ranked #2 in security. This ranking is based on energy security, energy equity and environmental sustainability, calculated based on 32 indicators aggregated up to 11 categories.

FINLAND IS THE COOLEST PLACE FOR YOUR DATA

In addition to the cool climate, solid bedrock and uniquely stable society, Finland offers the most cost-efficient and lowest latency location for digital platforms between Europe, the USA and Asia.



**BUSINESS
FINLAND**



**WORLD
ENERGY
COUNCIL**



NORDIC DATA CENTER LOCATION WITH GLOBAL REACH

Telia Helsinki Data Center

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