

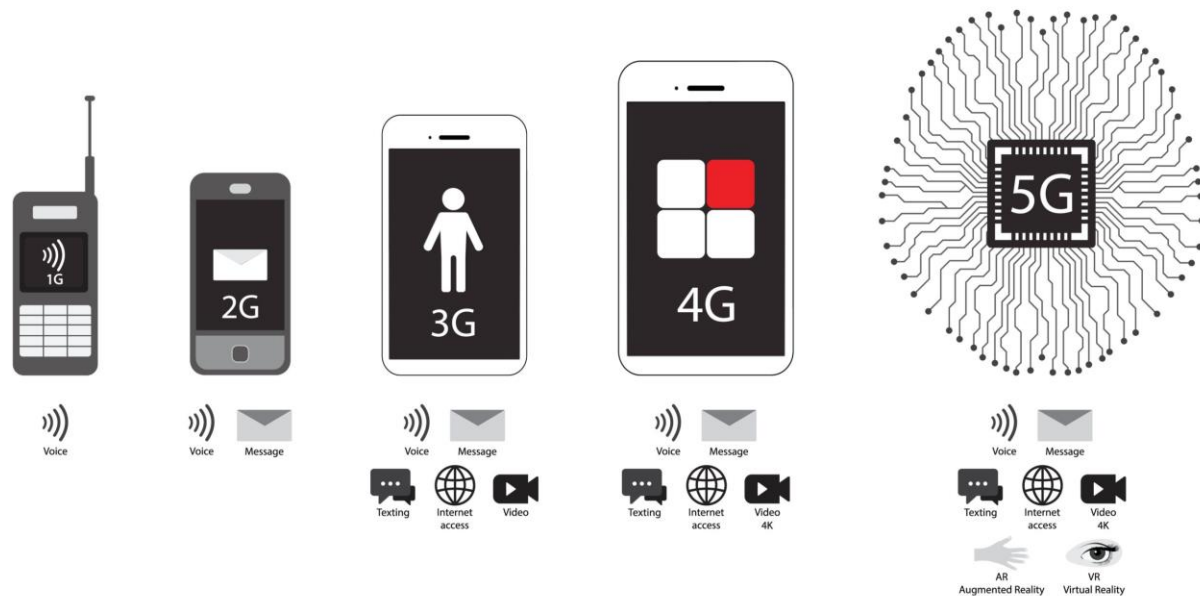
Telecom's supply chain risks - It's about **much more** than mobile networks....



John W. Strand

www.strandreports.com

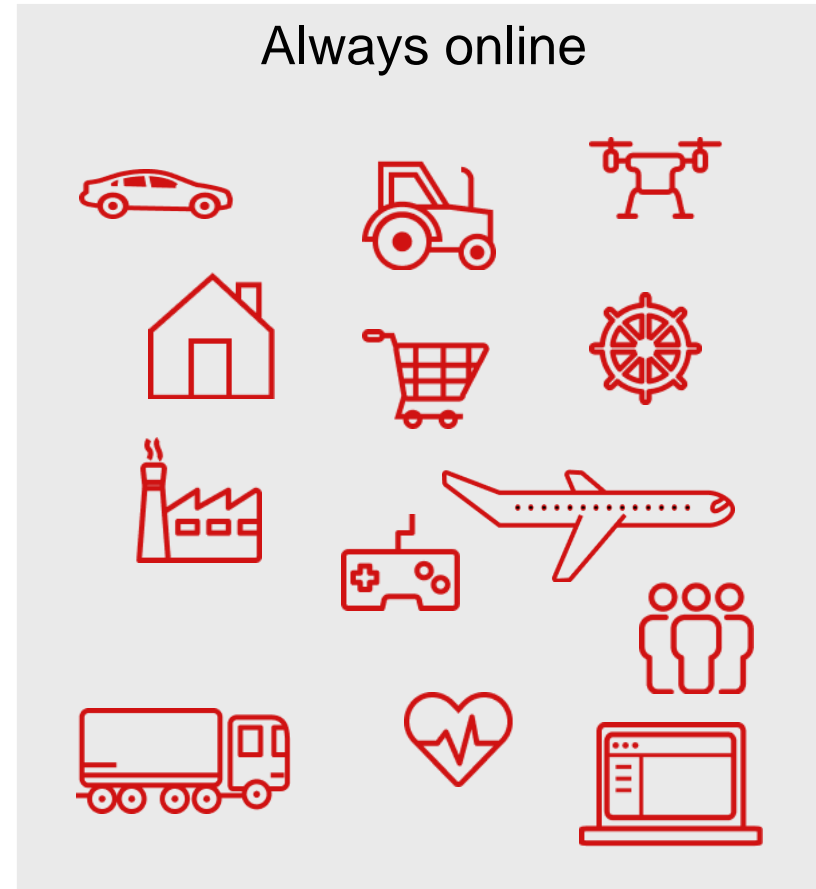
Telecommunication networks are a **horizontal** service and the foundation of the digital society...



On top of these networks we have a series of vertical services. Telecommunications tie things together and send data to the cloud, which is also a horizontal service....

On top of our networks, we connect a lot of devices...

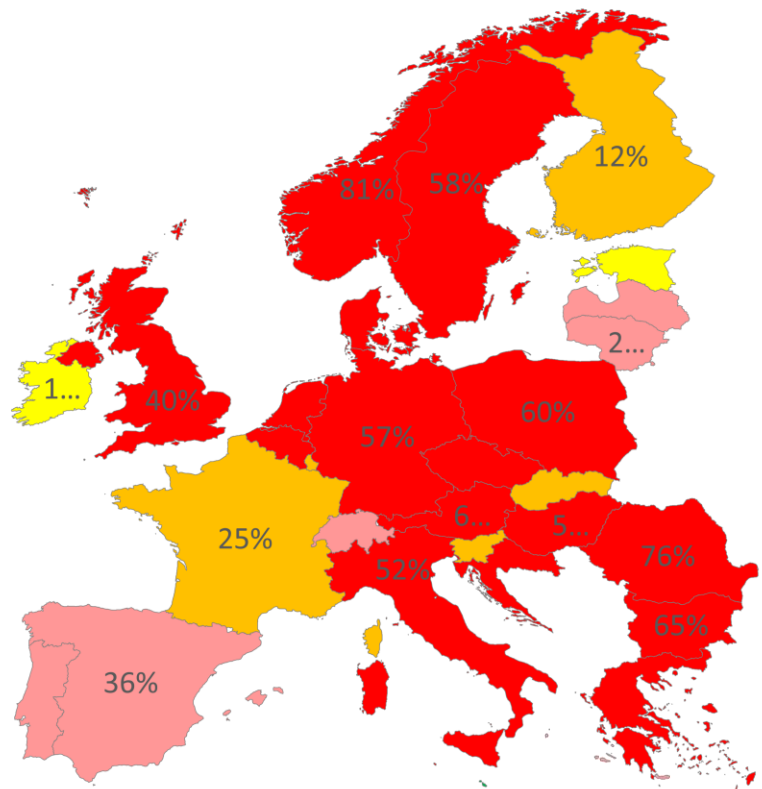
These devices collect data, send it to the cloud – “The second horizontal Platform” - where AI allows us to use data in a smart way...



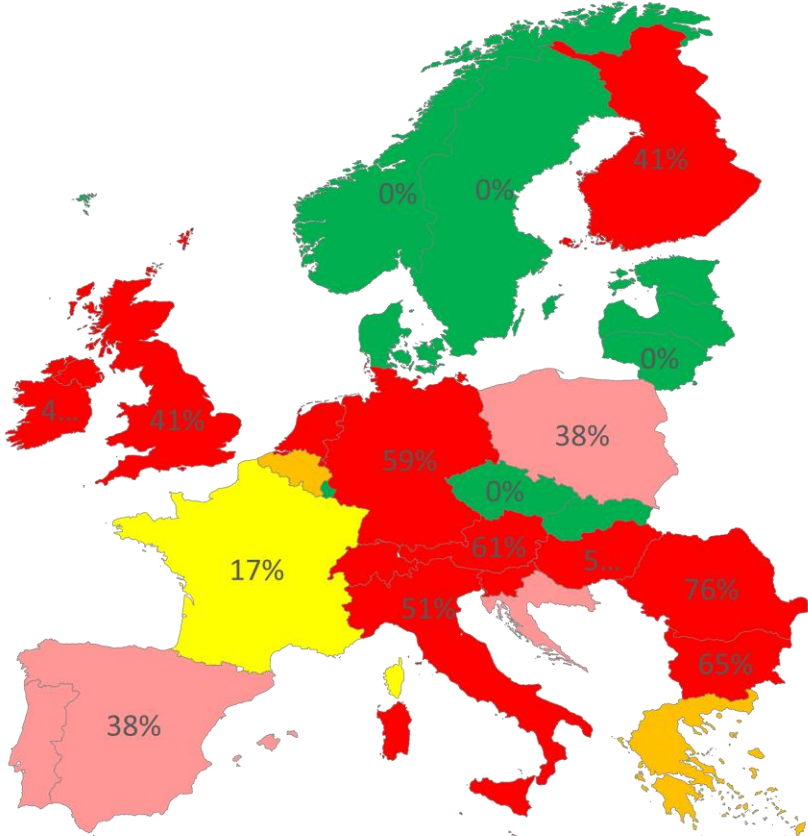
Can you separate **hot** water into cold and hot water...



Comparison – Served by Chinese 5G RAN 4G VS 5G



2020



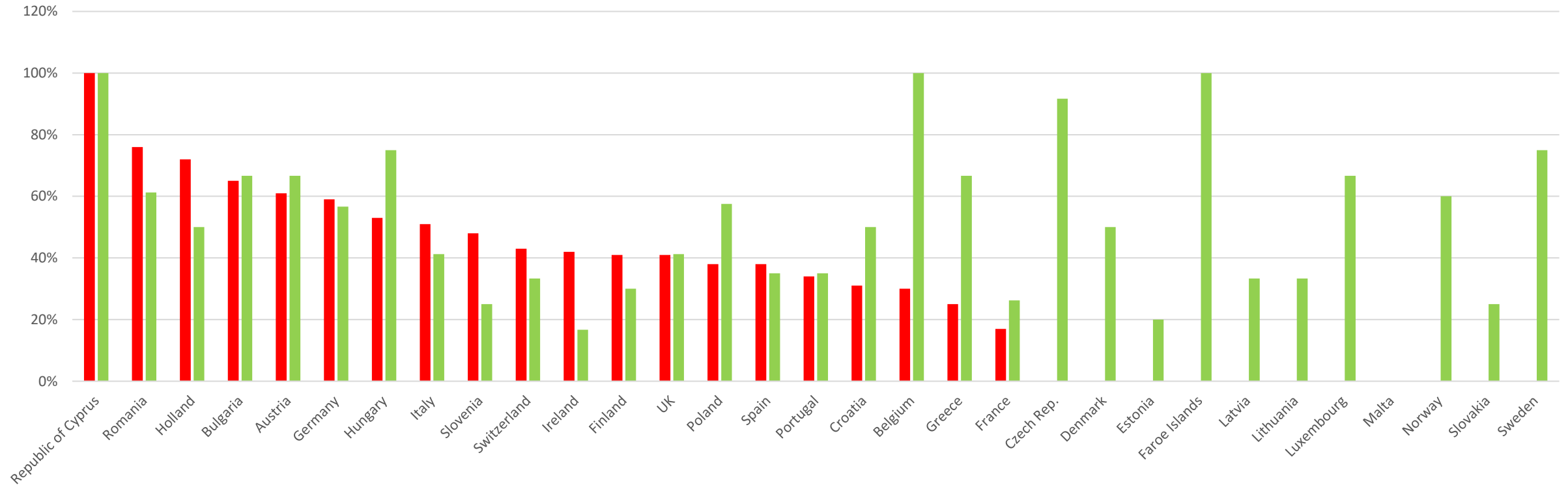
2022

Comparison: 4G (2020) VS 5G (2022): Percentage of installed 5G RAN that is Chinese

Country	Installed Chinese 4G RAN 2020	Installed Chinese 5G RAN December 2022
Austria	67%	61%
Belgium	100%	30%
Bulgaria	67%	65%
Croatia	50%	31%
Czech Rep.	92%	0%
Denmark	50%	0%
Estonia	20%	0%
Faroe Islands	100%	0%
Finland	30%	41%
France	26%	17%
Germany	57%	59%
Greece	67%	25%
Holland	50%	72%
Hungary	75%	53%
Ireland	17%	42%
Italy	41%	51%

Country	Installed Chinese 4G RAN 2020	Installed Chinese 5G RAN December 2022
Latvia	33%	0%
Lithuania	33%	0%
Luxembourg	67%	0%
Malta	0%	0%
Norway	60%	0%
Poland	58%	38%
Portugal	35%	34%
Republic of Cyprus	100%	100%
Romania	61%	76%
Slovakia	25%	0%
Slovenia	25%	48%
Spain	35%	38%
Sweden	75%	0%
Switzerland	33%	43%
UK	41%	41%

Comparison 4G (2020) VS 5G (2022): Percentage of installed RAN that is Chinese



TDC Net have to rip and replace there Huawei WDM network **no later** than January 1, 2027...

1. WDM is the technology used when you make the 1 – 0 that make up data into light sent through a fiber cable.
2. In practice, a fiber cable consists of a lots of fiber straws, when you send and receive data in such a cable. You use two fibers for communication – a fiber to send data one way and a fiber to send data the other way.
3. With WDM, you can send 400 - 800 GB of data through the fiber every second on two fiber straw (up and down). The advantage is that you can improve the capacity of a fiber cable and thus postpone the time when you need to put more fiber in the ground or in the sea.
4. You could say that WDM is the technology that can turn an ordinary road into a 12 lane highways
5. The market for such equipment including services is approximately 9.5 billion Euro, of which 8.5 billion euros is the market for equipment and services for land-based cables, while the remaining 1.4 billion euros is the market for equipment and services for sub-sea cables.
6. This equipment is used in many networks. This applies to everything from telecommunications networks to other communication networks such as enterprise like Railways and energy companies, webscalers like Google, Microsoft, AWS, Meta for Data Center Interconnect and the Defense / military.
7. The market for land-based equipment is very fragmented, the primary suppliers are: Huawei, Ciena, Nokia, Cisco, ZTE etc. When it comes to sub sea cables, Huawei and Nokia dominate the market.
8. The Global market share Q4 2022, rolling 4 quarters: Huawei 32%, Ciena 15% (US based), Nokia 12% and ZTE 10%. Remaining is on is split between several smaller vendors.

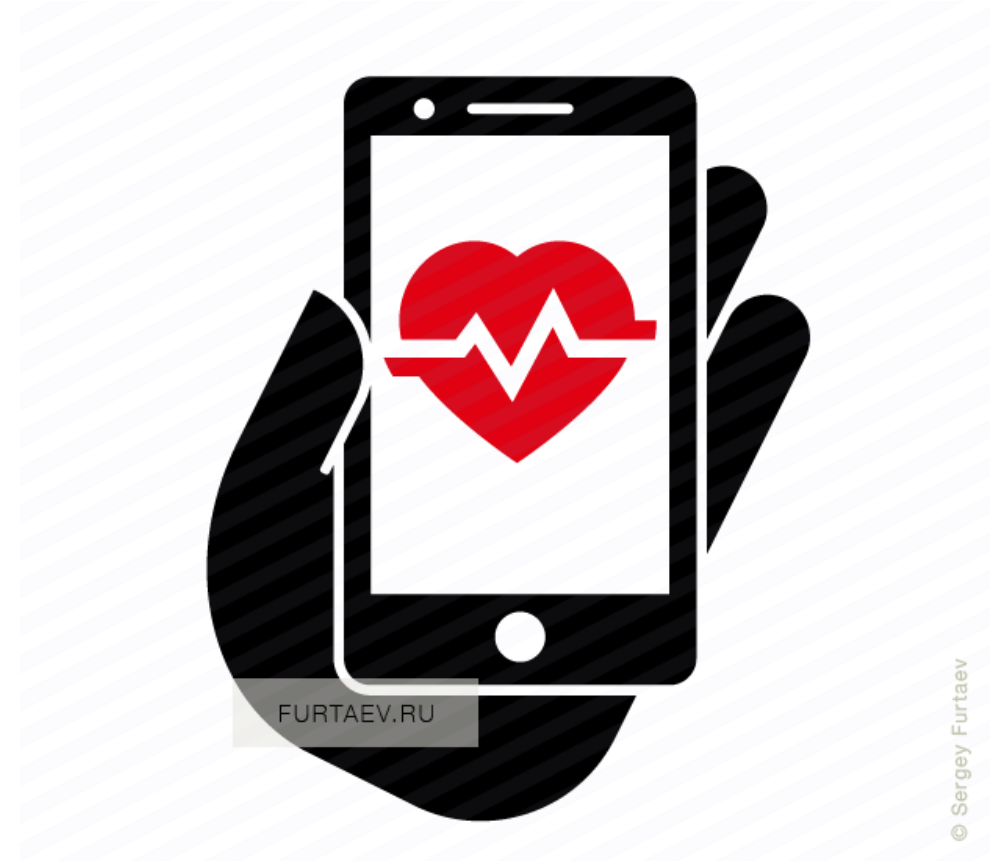
Danish law <https://businessindenmark.virk.dk/guidance/erst-activities-covered-by-the-investment-screening-act/Particularly-sensitive-sectors-and-activities/>

Germany is **probably** the biggest challenge for Europe right now

- If 25% of mobile customers, 20% of the population in Europe are German, then it is a problem if the German government doesn't take the threat from non trusted vendors seriously.
- Germany represent 29% of EU' GDP
- 57% of Germany's 4G RAN in 2020 was from non trusted vendors. Today 59% of the 5G RAN installed in Germany is from non trusted vendors
- There are indications that Germany has not taken the security threat that China poses seriously. It looks like Nord Stream 2, just for communications
- The silver lining is that Germany is a slow adopter of digitization. The country still uses cash and fax.
- Huawei enjoys a higher market share in Berlin versus Beijing where they share the market with ZTE.

Health **applications** are becoming more and more advanced.....

While at the same time making it easier to exchange and use data. From patient to the doctor, from the doctor to the hospital across the many hospitals – Patient data can make more intelligent R&D in the pharmaceutical industry....



Case 2019: 45 Chinese EV Auto Startup Companies – Spies on wheels....



Where is the software developed, what data does the car collect, where is this data sent (to a Chinese cloud or to a local cloud), who does the car manufacturers share the data with.....

Data centers **collect data** in local or regional clouds – The many datasets from multiple sources make it possible to use data in a more intelligent way....



Microsoft has filed plans for a USD317 M data center development in Santiago, Chile. The company has a single Latin America Azure cloud region in Sao Paulo, and has planned another one in Rio de Janeiro, Brazil, and in Mexico's Queretaro region



After opening its local region in Mexico, Oracle, through an agreement with Claro, will start offering the Oracle cloud infrastructure (OCI) service in Colombia



The company announced in July, that it will implement a new region in Mexico. The company already has one in Sao Paulo [Brazil] and another in Santiago de Chile



The company has a Cloudfront Edge location in Santiago and plans to launch a local Zone in the country. Also plans to extend its local Zones to Argentina (Buenos Aires), Colombia (Bogota), Peru (Lima), Mexico (Queretaro), and Brazil (Rio), though it has not shared timelines

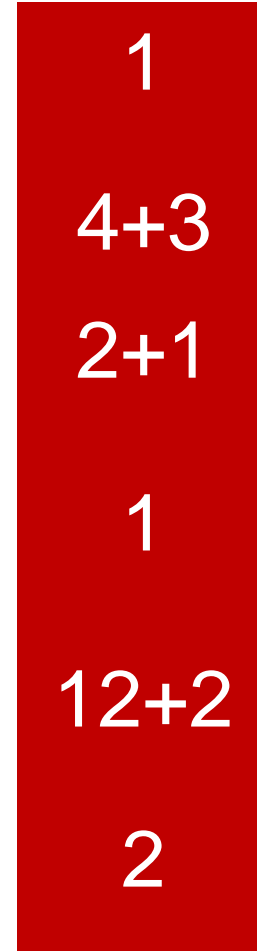


Huawei leads in number of regional datacentres and availability zones in Latam. The company most recently announced the launch of two new availability zones in Mexico for 2023 that would add to their existing 12 zones



IBM's executive president for Latin America, Tommy Martins, announced that the company is studying expanding its infrastructure in Latin America. IBM currently has a multizone region in Brazil and a data center in Mexico

Local zones in Latam



Key Latam executives

Rodrigo Kede Lima
President for the Latin America and corporate Vice President of Microsoft



Luis Meisler
Exec vice president in Oracle



Eduardo Lopez
President



Jaime Valles
Vice President



Fernando Liu
President of Huawei Cloud for Latin America



Tommy Martins
Exec President

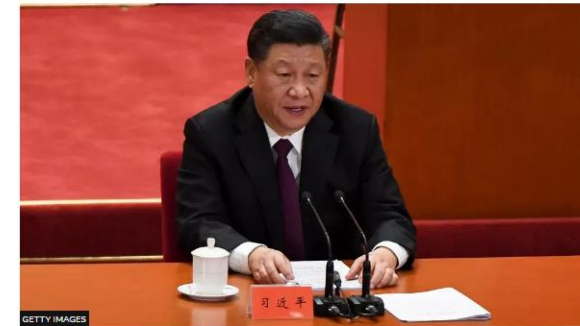
Is your telecom infrastructure **ready for General Secretary Xi** to deliver on his Taiwan promise?

The situation in Taiwan should leave no doubt that People's Republic of China (PRC) General Secretary Xi intends to deliver on his promise: join the PRC or else. He underscored the point by sending dozens of military jets into Taiwan airspace....

However the PRC's main form of intrusion is via telecom networks. Taiwan's Ministry of Foreign Affairs reports that cyberattacks by the PRC increased 40-fold in 2020 from 2018. It has recorded 778,000 intrusions in 2020, or 2,100 per day....

China-Taiwan tensions: Xi Jinping says 'reunification' must be fulfilled

© 9 October 2021



China's President Xi Jinping has said that "reunification" with Taiwan "must be fulfilled", as heightened tensions over the island continue.

Mr Xi said unification should be achieved peacefully, but warned that the Chinese people had a "glorious tradition" of opposing separatism.

In response, Taiwan said its future lay in the hands of its people.

Taiwan considers itself a sovereign state, while China views it as a breakaway province.

Beijing has not ruled out the possible use of force to achieve unification.

Mr Xi's intervention comes after **China sent a record number of military jets into Taiwan's air defence zone** in recent days. Some analysts say the flights could be seen as a warning to Taiwan's president ahead of the island's national day on Sunday.

Taiwan's defence minister has said that tensions with China are at their worst in 40 years.

• EXPLAINER: [What's behind the China-Taiwan divide?](#)

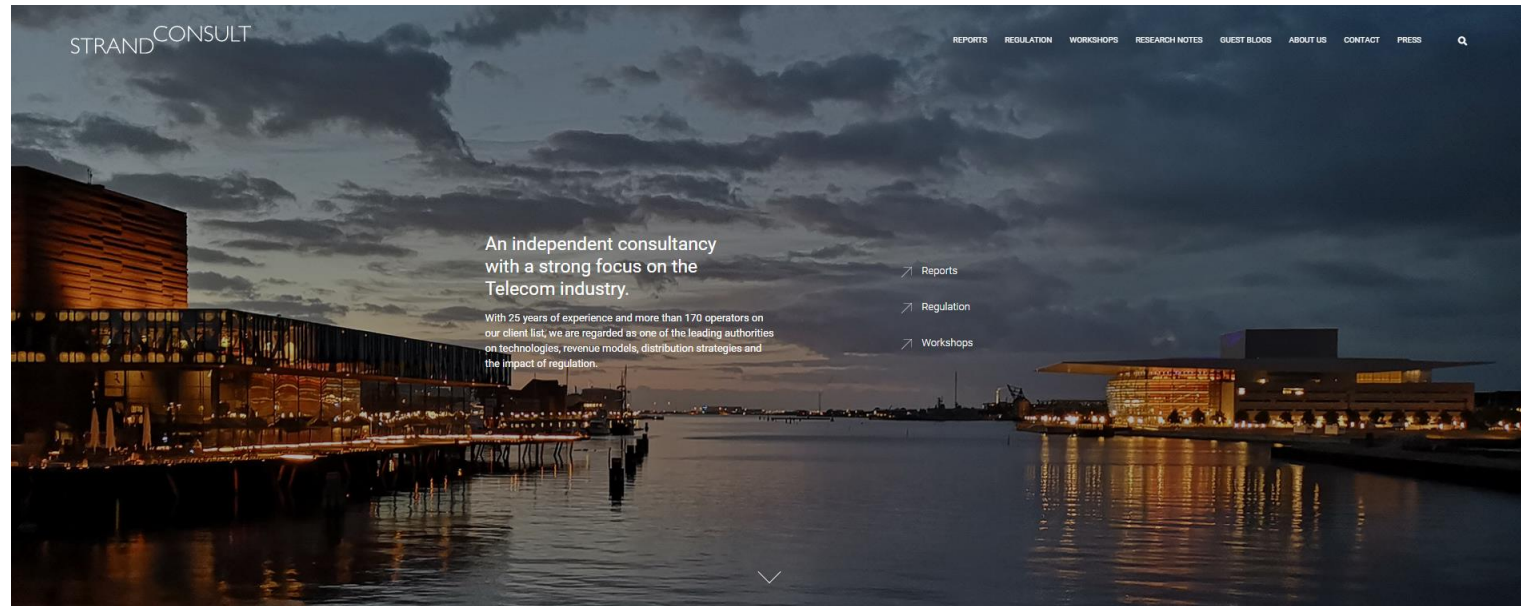
But Mr Xi's remarks on Saturday were more conciliatory than his last major intervention on Taiwan in July, where he pledged to "smash" any attempts at formal Taiwanese independence.




Speaking at an event marking the 110th anniversary of the revolution that

My 10 Recommendations.....

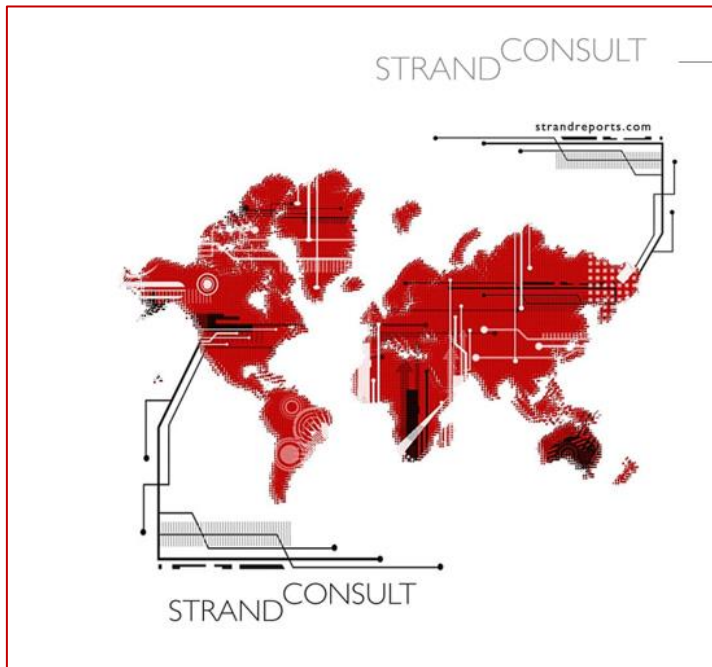
1. We must distinguish between trade policy and security policy
2. Understand that commercial companies have more focus on this quarter's profit than national security – they have a right to have an opinion but...
3. Do not compromise on security - Strengthen the cybersecurity of critical national infrastructures.
4. Trustworthiness is a pre-condition – No security without trust
5. OpenRAN is under Chinese influence = don't trust
6. More supplier does not mean more security but more complexity
7. Promote the development of a strong national business network in cyber security, as a reference for the region.
8. Develop a culture of cybersecurity through training, innovation and adoption of standards.
9. Improve cybersecurity and incident response capability of public institutions.
10. Right now EU's 5G Toolbox is a great role model

For more **info**, go to StrandConsult.dk



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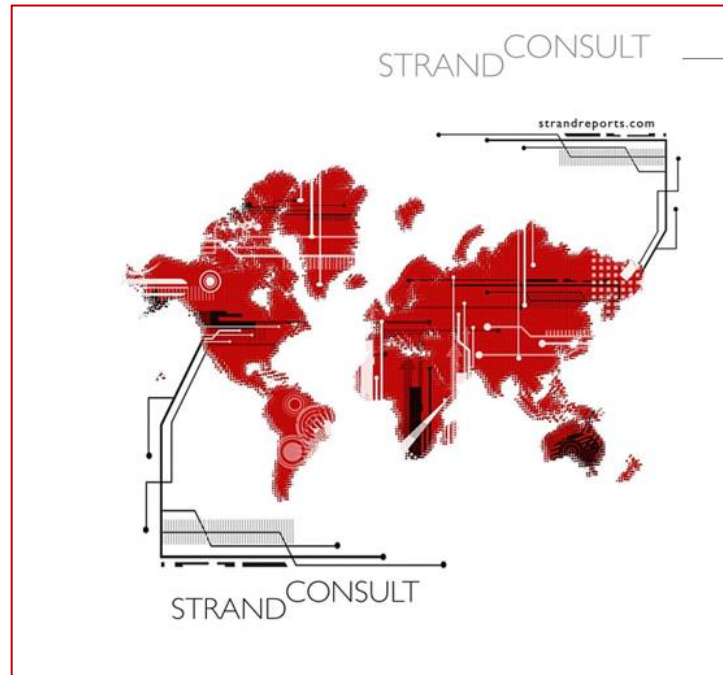
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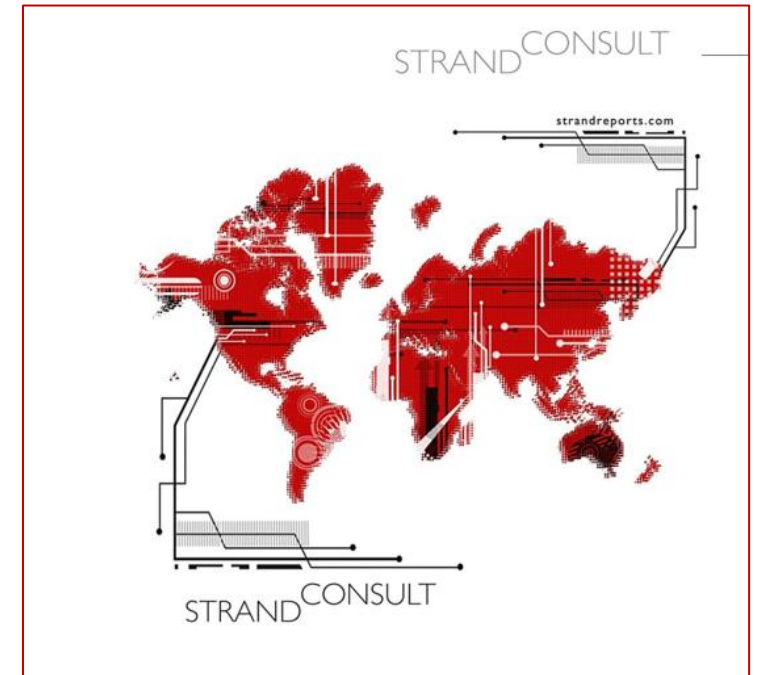
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