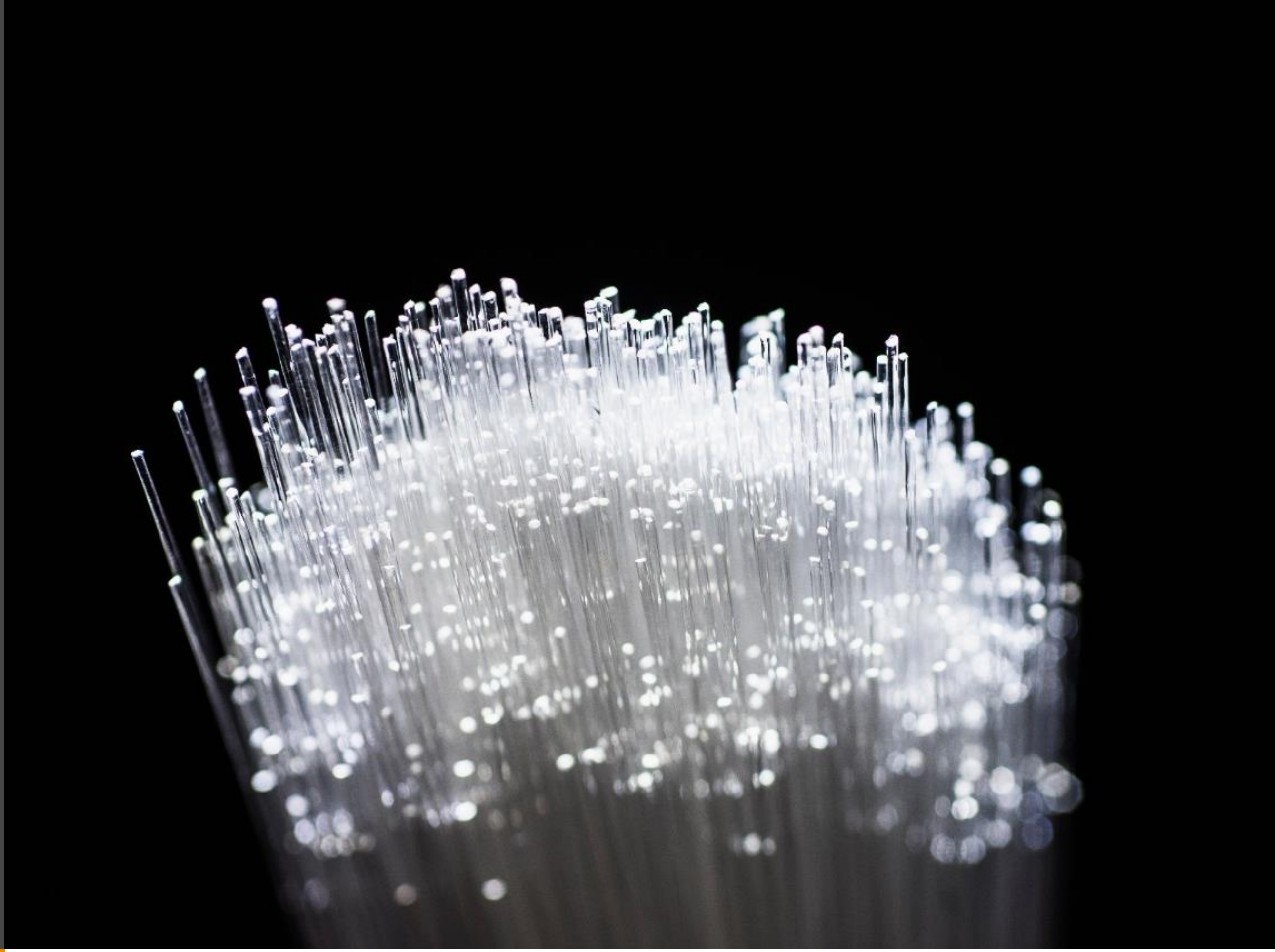
Study to Monitor Connectivity

Connecting the EU to its partners though submarine cables



Evolution of the submarine cable international market and main challenges

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Ciarán Nevin

ciaran.nevin@pwc.com

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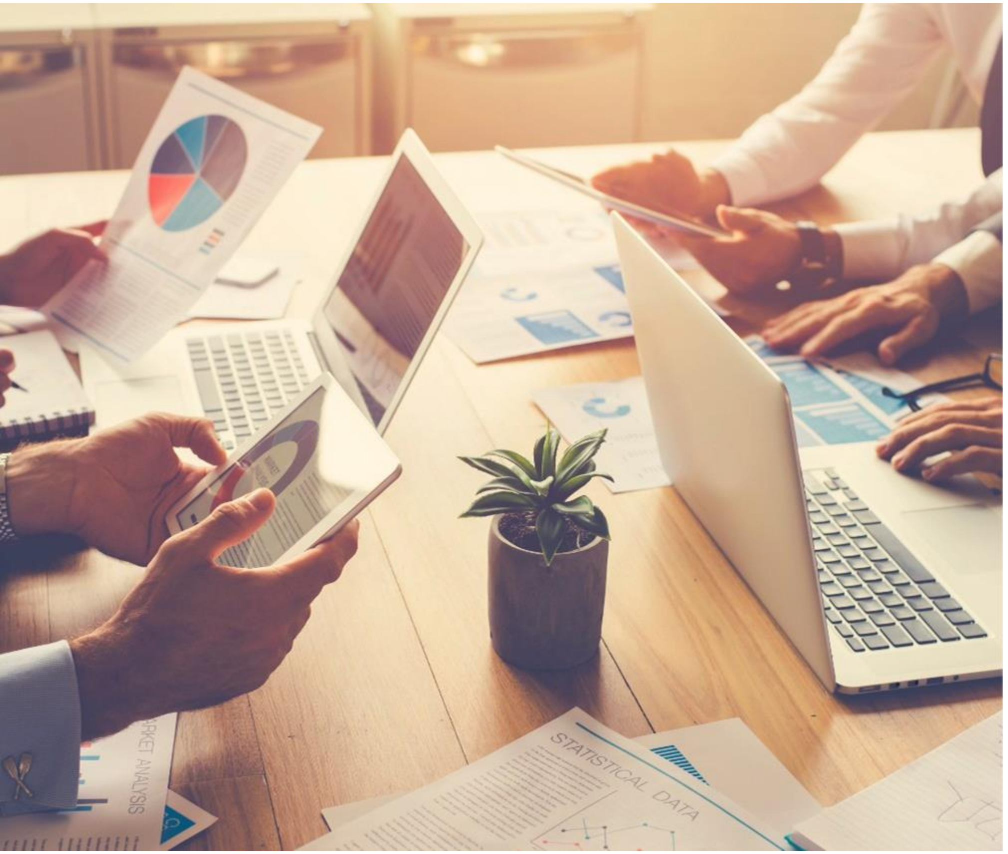
Agenda



1. Background to the project
2. Overview of the results
3. Business model and stakeholder analysis
4. Gaps, risks and recommendations

1

Background to the project

Background

- Part of the EU's goal to ensure:
  - That Europe remains an integral part of the connectivity ecosystem
  - The security of infrastructure and services
  - Establish digital sovereignty
- PwC prepared a report for DG connect, to assess three key factors as part of the outlook to 2030:
  1. Demand factors driving the connectivity needs and developments
  2. Digital connectivity infrastructure
  3. The market mechanisms including major business models and stakeholders
- The report assesses current EU regulatory frameworks and partnerships to identify risks and recommendations.
- The report was published in July 2021*, and is available here.

* The content that follows has not been updated since publication.

Objectives of the project

Drivers of digital connectivity development

Analysis of the demand through two major trends: the persistent growth of IP traffic, and the expansion of data centers, supported by the assessment of key contributing factors.

Forecast traffic demand and expected investments worldwide.

Infrastructure

Mapping of the EU's currently available submarine interconnection with other regions of the world, and examining the capacity and resiliency of the infrastructure.

Assessment of existing international and intercontinental connectivity infrastructure, distinguishing different connectivity media.

Projection of infrastructure growth in the next ten years (2021-2030).

Business model and stakeholder analysis

Presenting the value chain and assessing the **current and future key submarine cable market players'** activities globally. Identifying the **existing and planned financing models.**

Present the evolution of business models and services, and map the main stakeholders shaping them.

Regulatory environment and international partnerships

High level analysis and forecast of the regulatory and strategic perspectives of the EU related to submarine cable infrastructures and EU sovereignty.

Gap analysis and recommendations

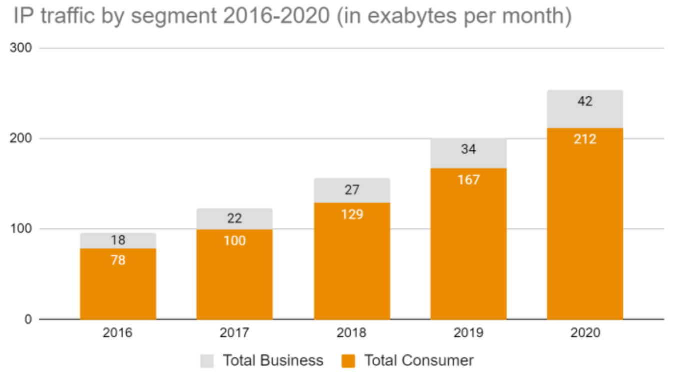
Gap analysis of digital connectivity infrastructure needs, with special attention on digital connectivity infrastructure between EU and Africa, Latin America, the Far East, and the EU Neighbourhood respectively. **Reflection on risks and recommendations** regarding digital autonomy and the independence of EU services.

2 Overview of the results

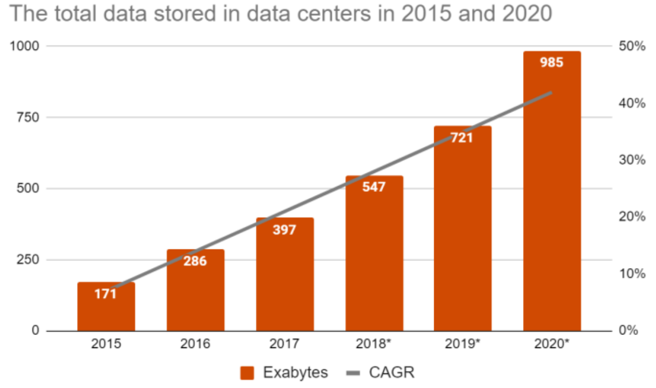
Drivers of digital connectivity development

- Global internet traffic is expected to grow more than sixfold in the next decade (equal to 22% CAGR).
- Machine-to-Machine connections will contribute to a significant internet traffic increase.
- The hyperscale data centre market is forecast to grow continuously, which will be driven mainly by cloud service providers / Over-the-Top providers.
- **Key recommendation:** need to strengthen the EU's own infrastructure and create legal frameworks that
  - ensure security of services, and
  - minimize the dependence on non-EU players.

Global internet traffic

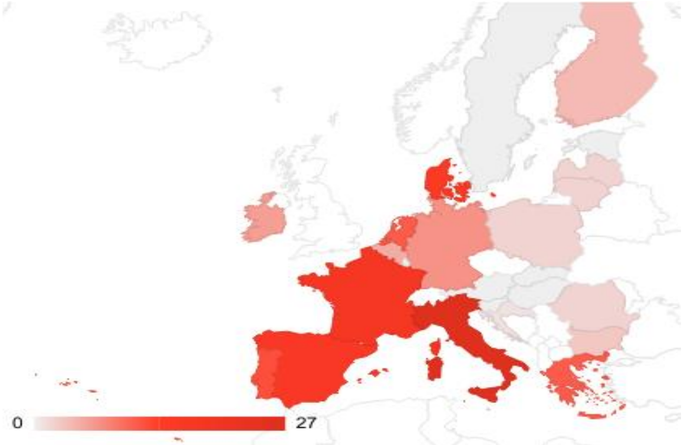


Data Centers



Infrastructure

70% of EU countries have cables



- 99% of the world's communications traffic is served by submarine cables.
- Overall design capacity is expected to more than double by 2025.
- The Arctic region will see a lot of activity.
- Recognised need for new cables on routes like the EU - Latin America
  - This is now being addressed by projects such as EllaLink and BELLA, which are in operation.
- In the 5 years to 2021, content providers accounted for 36% of new capacity.
- 140 cables need to be installed between 2021-2030.
- **Key recommendation:** The EU should define target coverage levels and monitor infrastructure gaps continuously and should drive and support technological advancements to
  - maintain its leading position, and
  - facilitate the use of encryption to mitigate security risks.

Regulatory environment and international partnerships

- Need policy actions to create a comprehensive, common EU approach towards the regulation around submarine cable landing and accessibility rights to ensure:
  - integration into the global ecosystem,
  - the security of services and infrastructure, and
  - maintain the EU Digital Single Market and sovereignty.
- **Key recommendation:** to classify submarine cables as critical infrastructure and define incident reporting requirements and cybersecurity guidelines

3

Business model and stakeholder analysis

2016-2020 and beyond

Strategic actors in the value chain are system suppliers, installers and owners

I. Surveyors | II. System Suppliers | III. Installers | IV. Owners | V. Maintenance providers | VI. Customers

VII. Other stakeholders

I. Surveyors

- **EGS** (~50% market share)
- **Fugro** (~15% market share)
- Elettra, IT International Telecom, Gardline, ASN, Ocean Engineering and the US government

II. System Suppliers

- **Alcatel Submarine Network (ASN)** (18 cables)
- **Huawei Marine** (8 cables. In 2015 only 5 cables)
- **NEC** (8 cables)
- **SubCom** (8 cables)

III. Installers

- **ASN** (19 cables)
- **SubCom** (7 cables)
- Global Marine, IT International Telecom, Orange

IV. Owners

- **Orange** (28 cabes)
- **Telecom Italia Sparkle** (27 cables)
- **TATA Communications** (25 cables)
- **Google** (16 cables)

V. Maintenance providers

- The two common forms of maintenance agreements are **club and private.**
- **Orange** - private maintenance provider
- **SubCom and ASN** - private maintenance agreements.

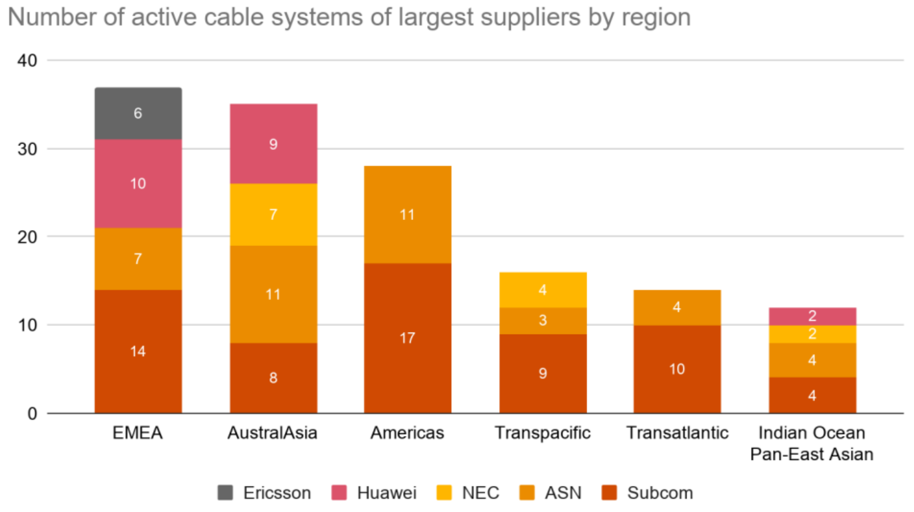
VI. Customers

- Traditionally national backbone providers are the ones purchasing capacity from submarine cable owners.

The biggest owners are still traditional telecommunications service providers, however content providers gain significant role

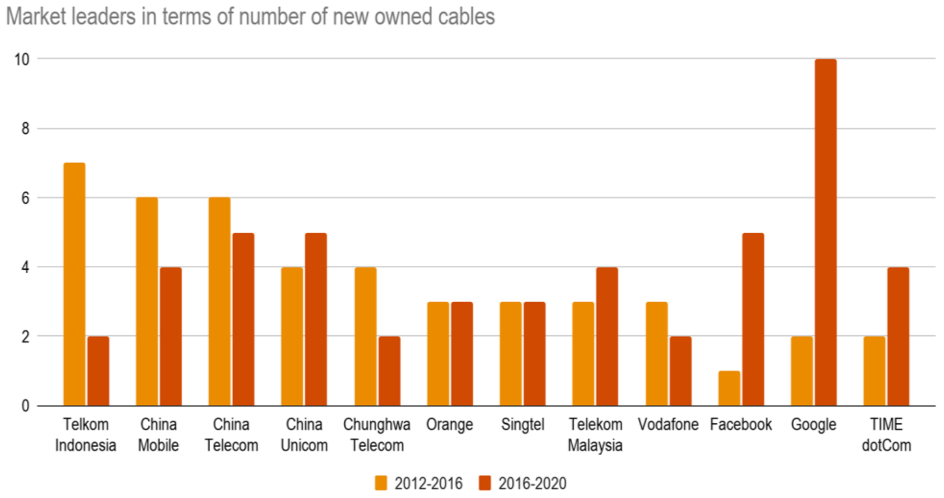
Suppliers' activity

- **The two market leaders are the EU based Alcatel Submarine Network** and the **US based SubCom** (both active in all six regions)
- **Japanese NEC** (mostly focusing on the AustralAsia, the Transpacific and the Indian Ocean Pan-East Asian regions) and the **Chinese Huawei Marine** (active in AustralAsia, EMEA and the Indian Ocean Pan-East Asian regions) **are also key players.**



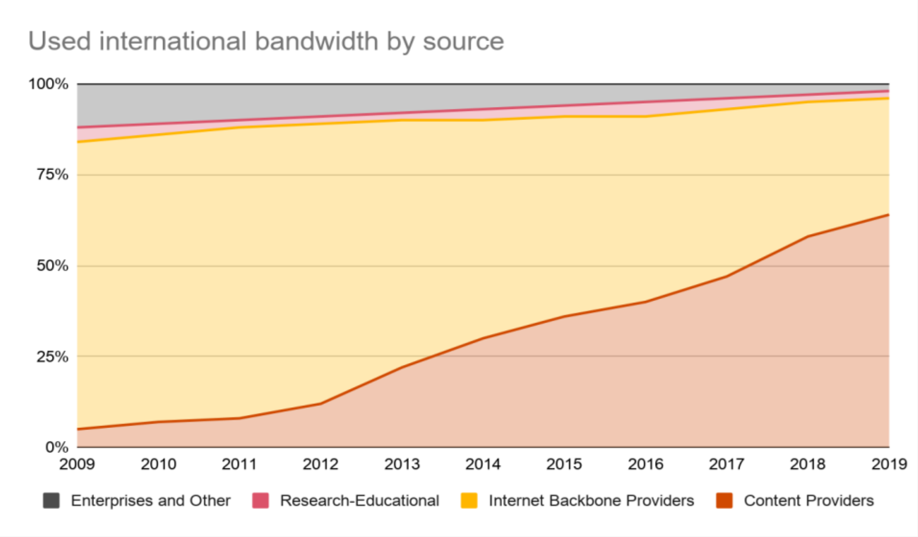
The top owners of the world

- From 2016 to 2020, the **market leaders** have been mainly **content providers** and **Far Eastern-owned telecommunications service providers,** especially from **China.**
- In the period of **2012-2016 content providers were not** in the top 10 owners of the world, **but in the past 5 years Google became top 1**, followed by **Facebook**, China Telecom and China Unicom

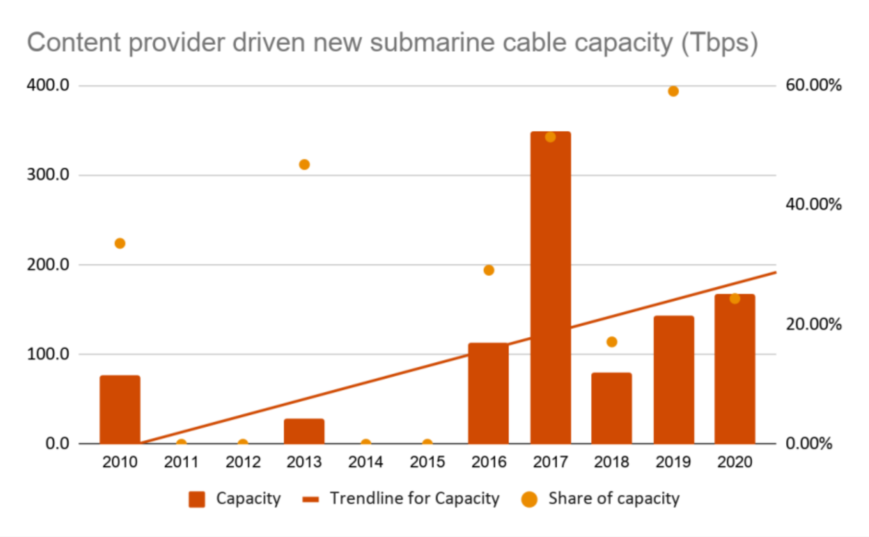


Content providers have become very important players, by the constantly growing capacity deployed year by year

- Between 2012 and 2019, **content providers' share of total use of international bandwidth** increased from **less than 10% to 64%.**
- For this reason, content providers started **building their own cables** which meant a **shift** from the **traditional business model.**
- By **2017**, content providers had **surpassed internet backbone providers** as the **largest users of international capacity.**



- **Content providers** deploy **growing amount** of **capacity** year by year.
- They were sole or partial **owners** of **cables responsible for almost 17-59% of newly deployed capacity** introduced in the **last 5 years** which is **likely to increase** in the upcoming years.
- They install cables with **significantly higher capacity** than traditional telecommunications service providers.



The biggest changes are expected in the ownership structure, which is also related to the change in the financing models

I. Surveyors

EGS (followed by Fugro) will stay the most dominant market player.

The greatest challenge of the surveyor market is the **timely completion of the planned surveys.**

II. System Suppliers

No remarkable change is expected, but it is a conceivable scenario that either large suppliers will acquire smaller ones or content providers enter the market.

The most cables will be supplied globally and EU-wise as well **by EU-based companies.**

III. Installers

50% of cables will be supplied globally by EU-based companies, US-based companies will account for 25%.

The greatest challenge of the installer market is the capacity of cableships.

IV. Owners

It is likely that **the role of content providers will be further strengthened,** while the role of telco companies will shrink. Globally content providers will be the key leaders, **especially Facebook and Amazon will speed up their investments.**

In terms of EU connected cables European owned companies are planning to build the most cables.

V. Maintenance providers

No remarkable change in key players can be expected.

There is an increased challenge of providers in **being able to perform the required volume of maintenance activities.**

Financing

Investments show a **significant increase in the upcoming years.**

Proportion of private and hybrid financing will grow.

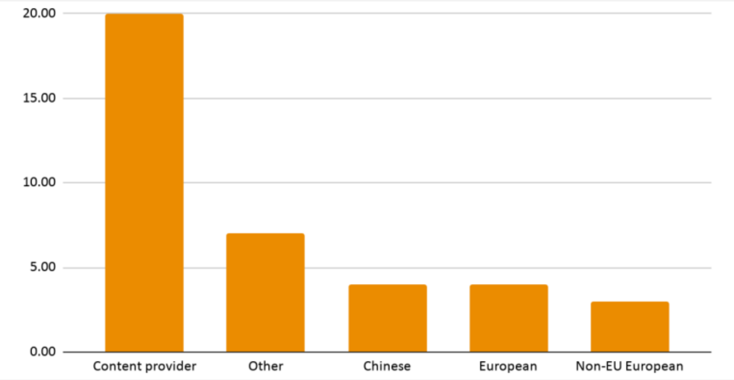
Multilateral Development Banks will focus on less developed regions.

Content providers have high CAPEX budgets thus they can put pressure on the market.

Working capital finance as an alternative funding mechanism could be introduced

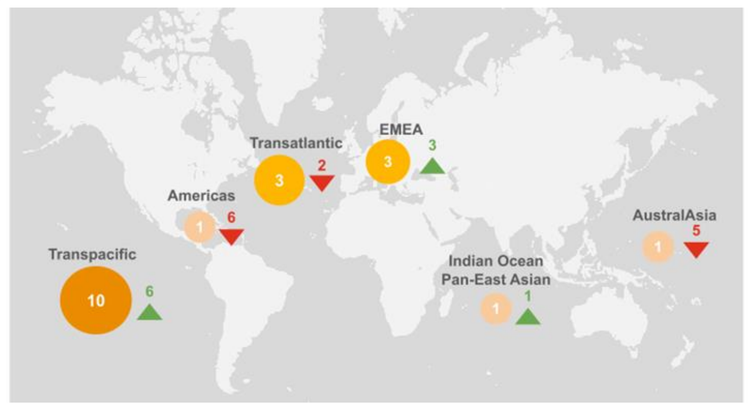
The role of content providers is expected to grow significantly, especially in the Transpacific region

Global role



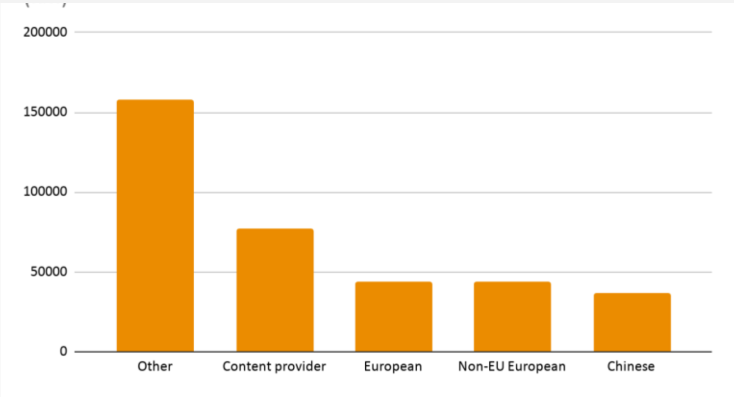
- **Examining the largest global owners, content providers are the clear market leaders.** This is significant growth compared to the previous periods.
- Content providers have announced 20 cables - and in total more than 200,000 km of cables - thereby **gaining half of the market.**

Regional activity



- A change in content providers' regional focus can be observed.
- Significant **growth is expected in the Transpacific regions (+150%).**
- Content providers **will appear in the EMEA and the Indian Ocean Pan-East Asian regions** as well.
- The other regions will most likely decrease.

EU connected cables



- **In terms of EU connected cables**, content providers have announced 77,000 km of cables, and this will make them **the second most important players.**
- Regarding the number of cables, content providers are the third most significant (with announced 5 cables).

4

Gaps, risks and recommendations

Several gaps and risks have been identified

- The growing number of cables may cause further capacity issues in the surveyor, system supplier, installer and maintenance market.
- Content providers are putting pressure on the entire value chain:
  - They are squeezing system suppliers for lower prices.
  - The customer base of traditional actors is disappearing.
  - Even though they own a significant part of the infrastructure, it is not clear yet what role they want to play in the market.
  - Their financial strength is a considerable risk for investments.
- The strengthening role of Chinese companies may also pose risks.
- Appearance of new entrants or vertical integration are also conceivable.

Thank you

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