

# European Connectivity Update

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EPF Vienna

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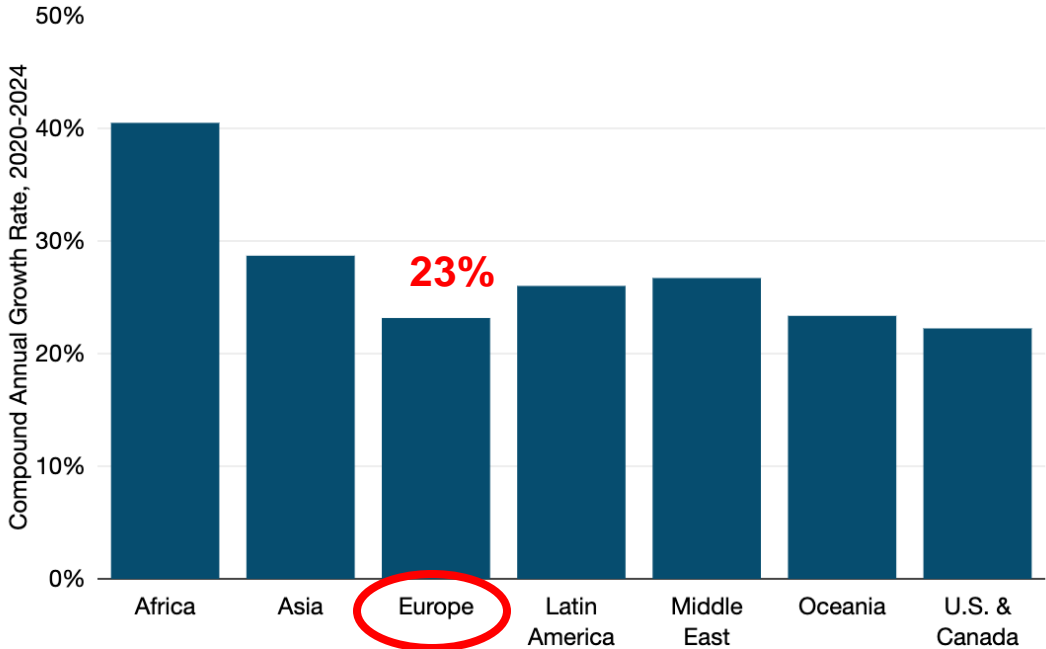
# What we'll cover

- **Global network trends**
  - How fast is int'l IP bandwidth growing globally? Where are sub cables landing?
  - Where are content DCs being built? How fast are global prices falling
- **European network trends**
  - Inter-regional int'l capacity growth
    - Capacity and pricing changes
  - Intra-regional trends
- **Interconnection hub trends**
  - New Metro Connectivity tool
  - Data center and IXP Trends

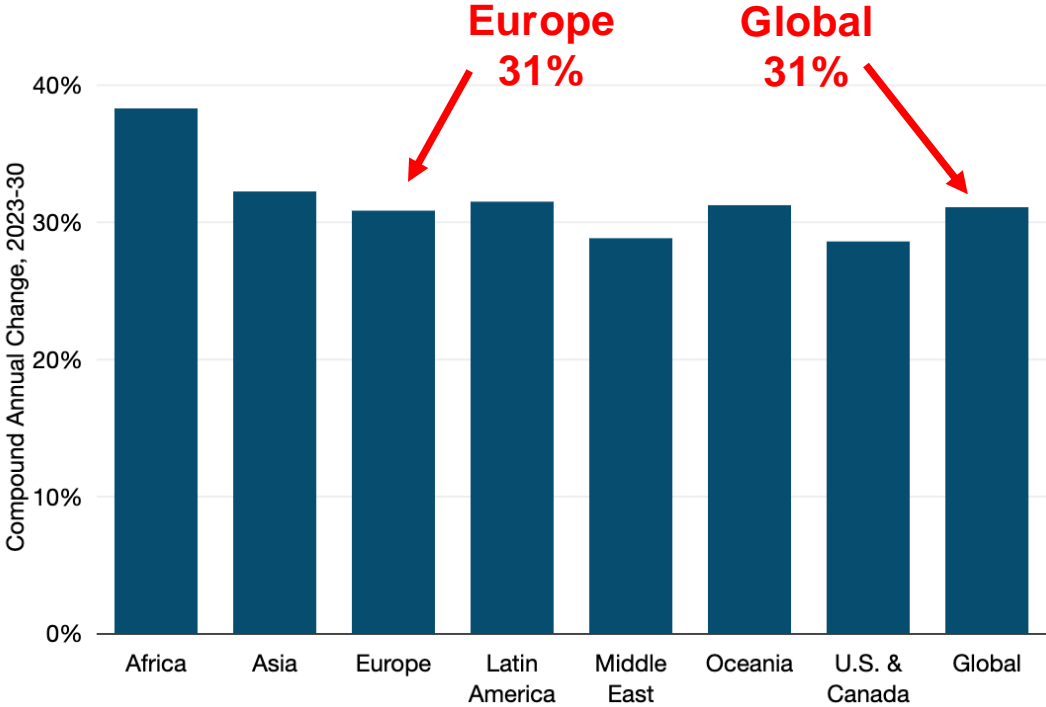
# Global Network Trends

# Int'l used bandwidth growth by region

Past

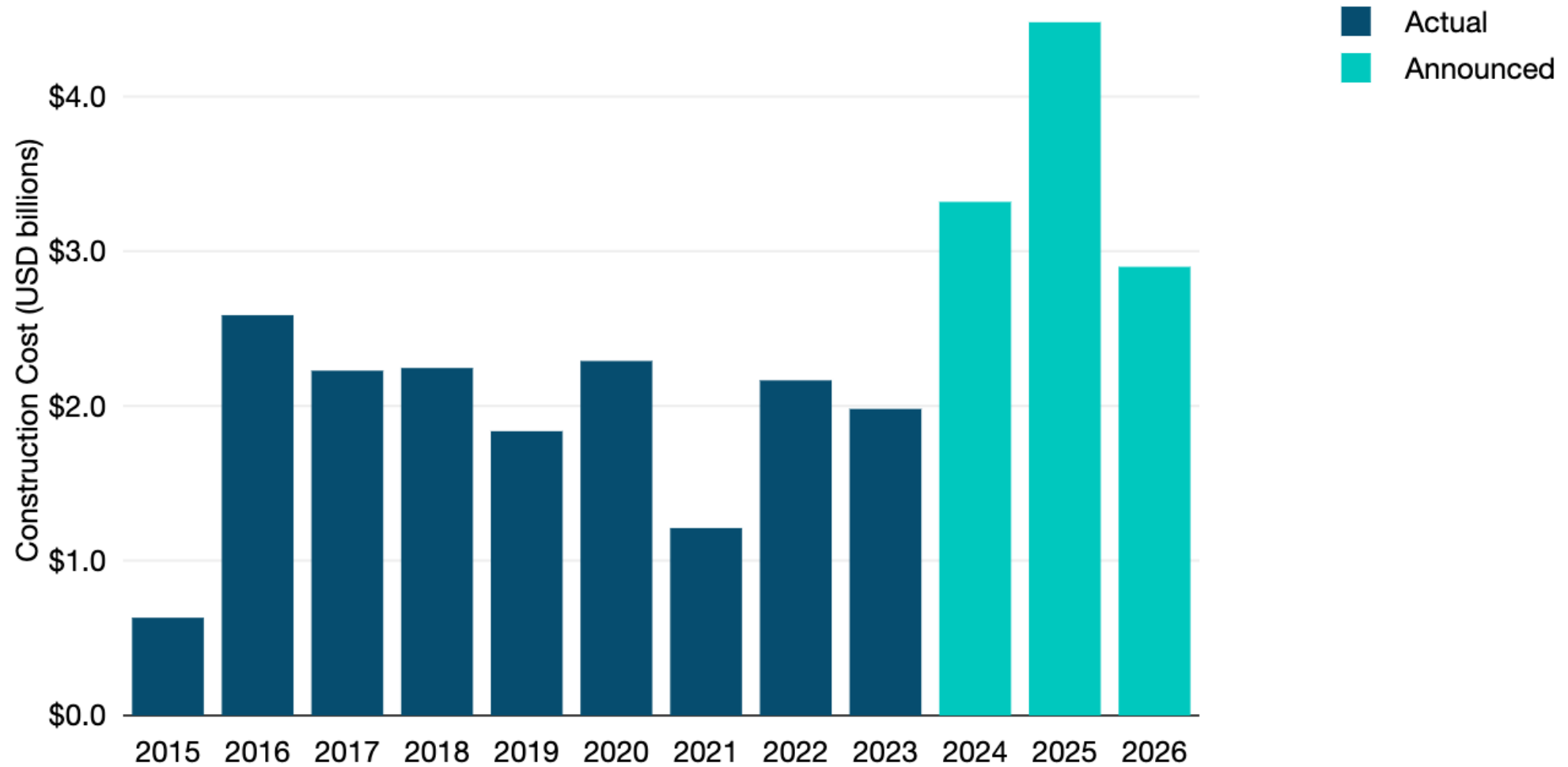


Forecasted



Source: TeleGeography, Transport Networks

# Submarine cable investment



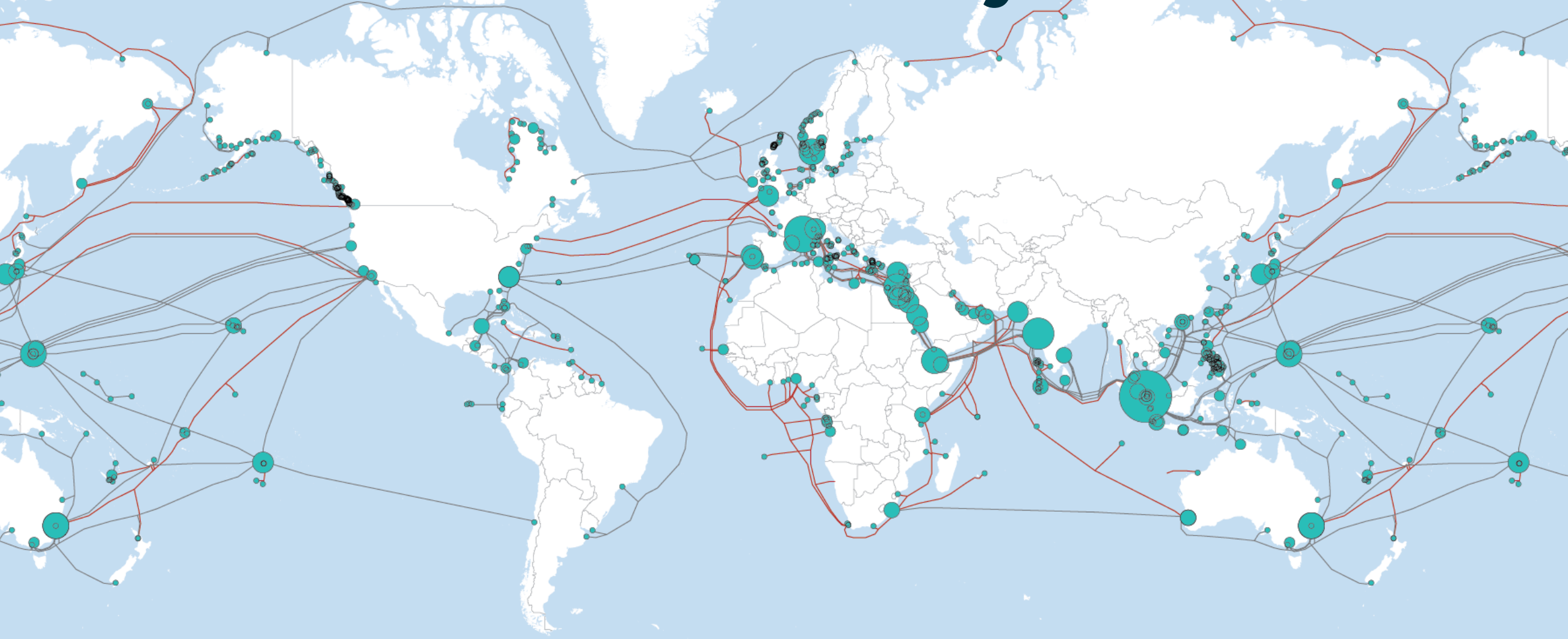
Source: TeleGeography, Transport Networks

# Recently activated cable systems (2021-2023)



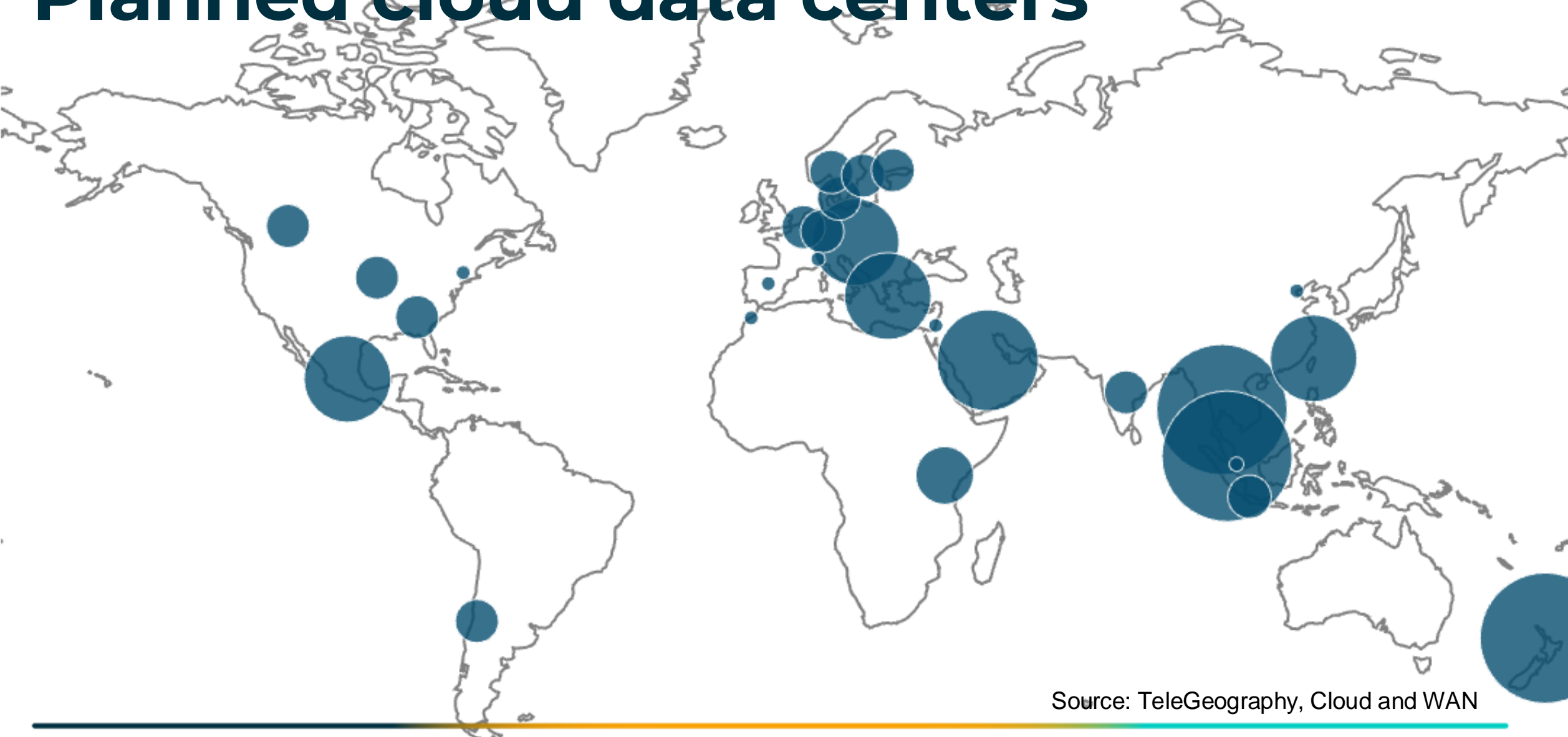
Source: TeleGeography, Transport Networks

# Planned + recent cable systems



Source: TeleGeography, Transport Networks

# Planned cloud data centers



Source: TeleGeography, Cloud and WAN



# IP Transit Prices in Major Global Cities

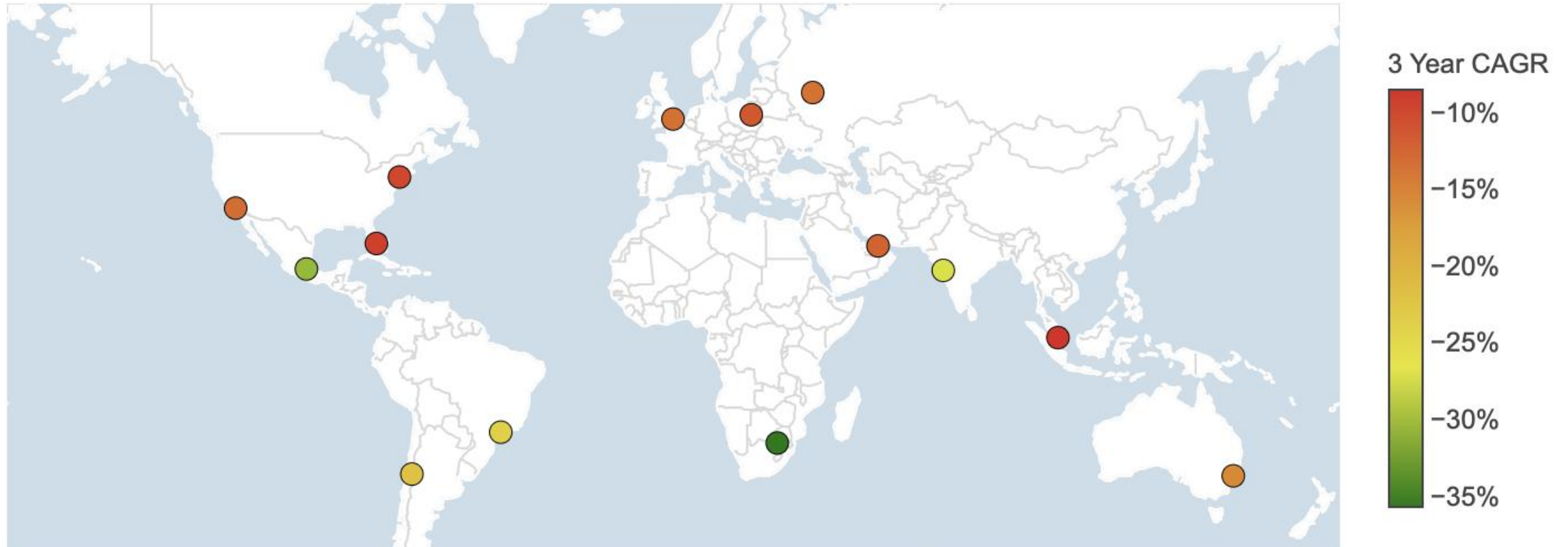
Weighted Median 100 GigE IPT



Source: TeleGeography, IP Networks

# IP Transit Prices in Major Global Cities

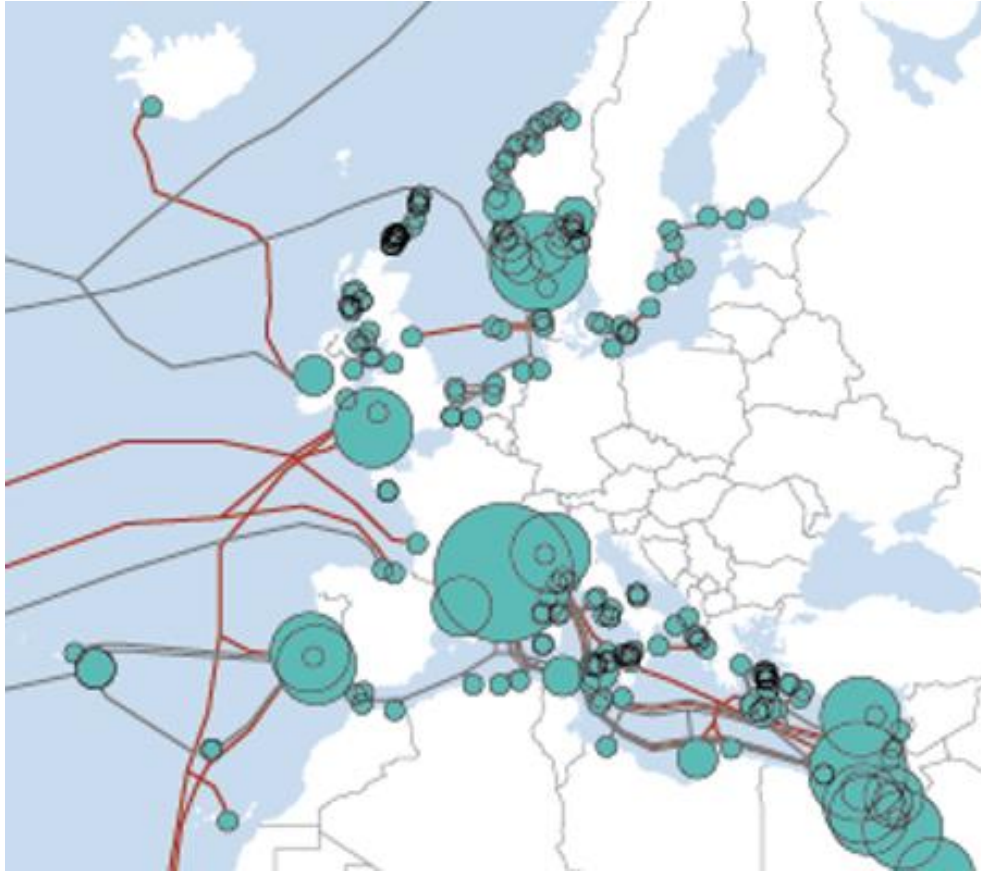
Three Year CAGR Decline in Major Global Cities



Source: TeleGeography, IP Networks

# Europe Inter-Regional Trends

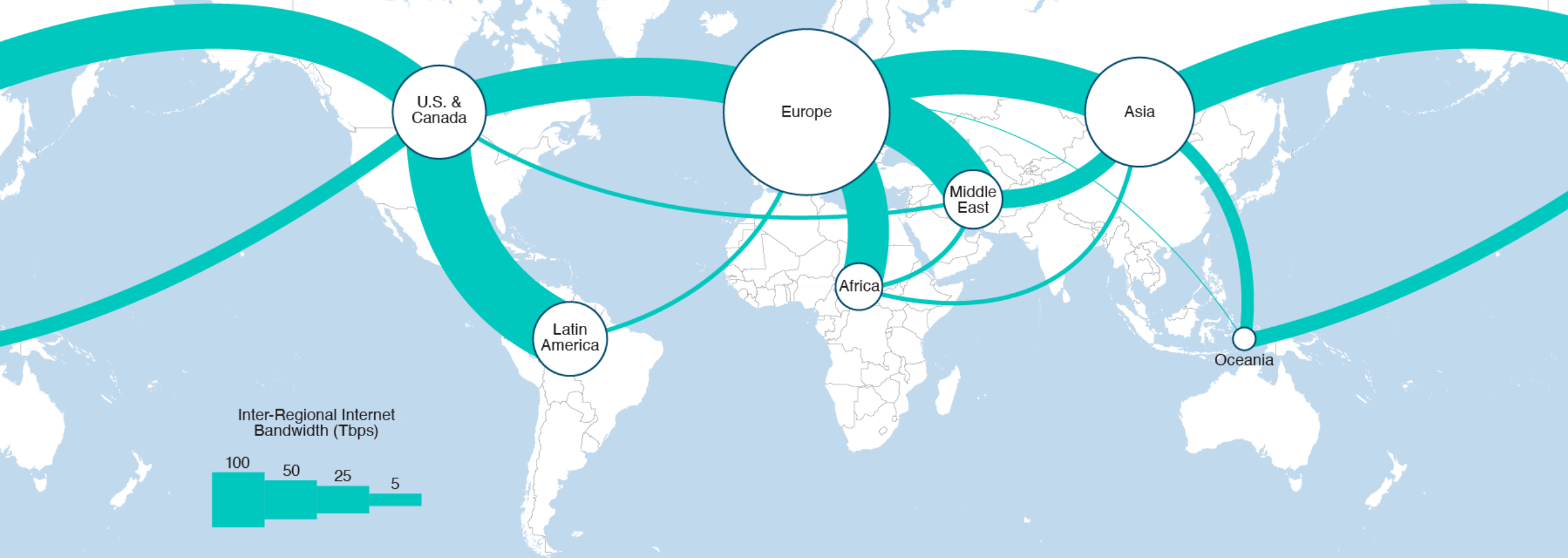
# Planned & recent sub cable landings



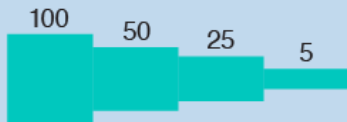
- 11 North Sea/Norwegian Sea/Baltic Sea cables
- 3 English Channel cables
- 6 Mediterranean cables
- 7 Europe-ME-Africa-Asia cable systems planned in coming years

Source: TeleGeography, Transport Networks

# Global interregional routes, 2024

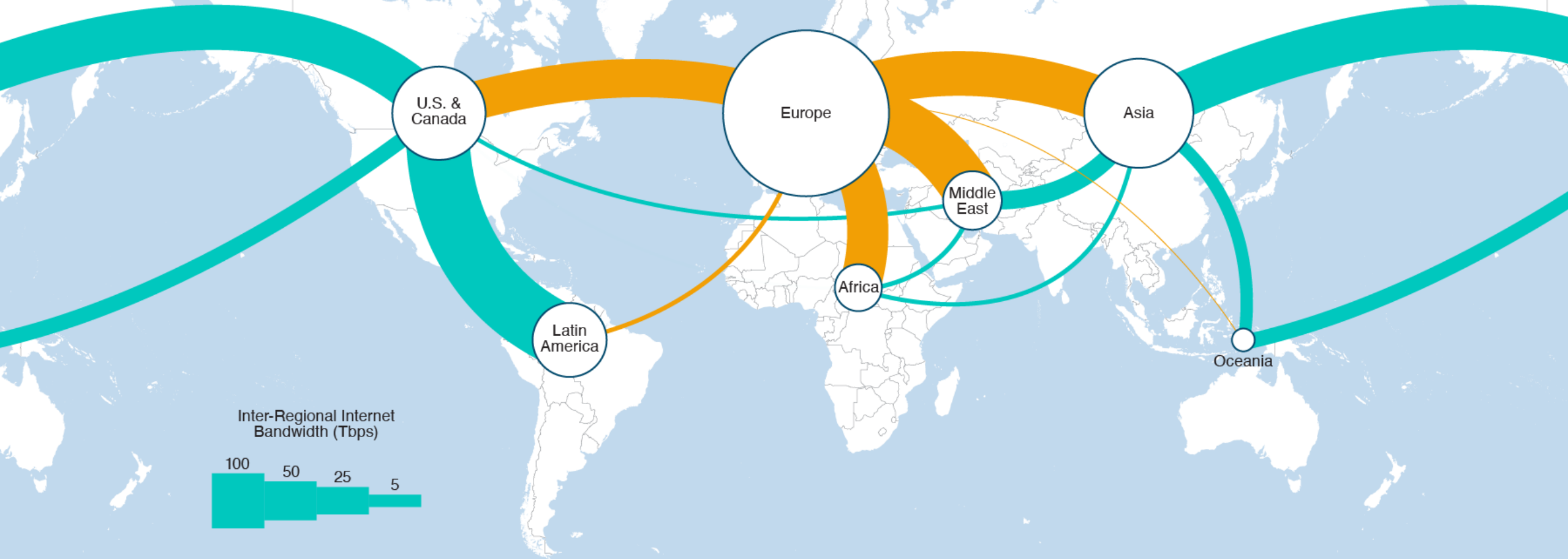


Inter-Regional Internet Bandwidth (Tbps)



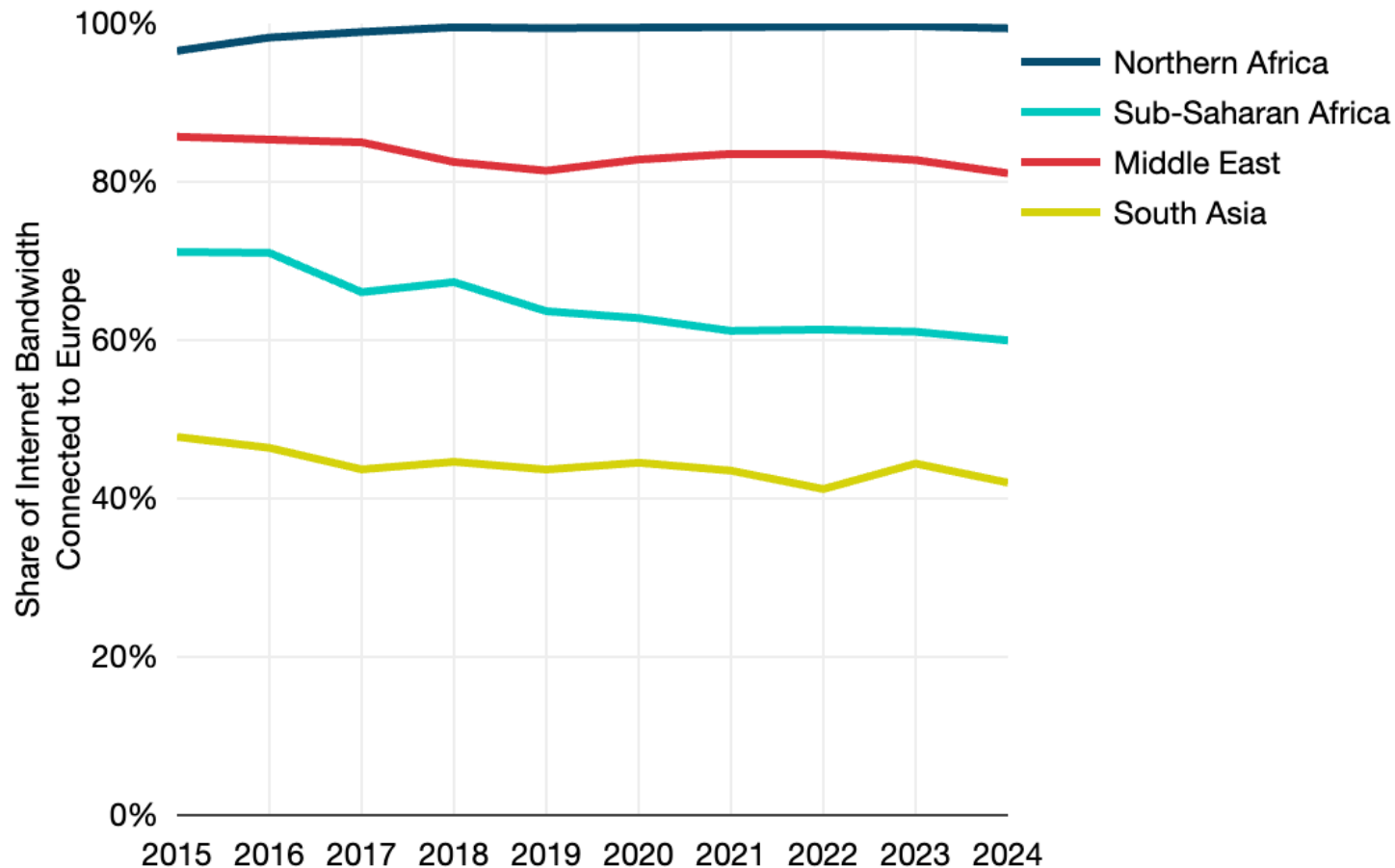
Source: TeleGeography, IP Networks

# Global interregional routes, 2024



Source: TeleGeography, IP Networks

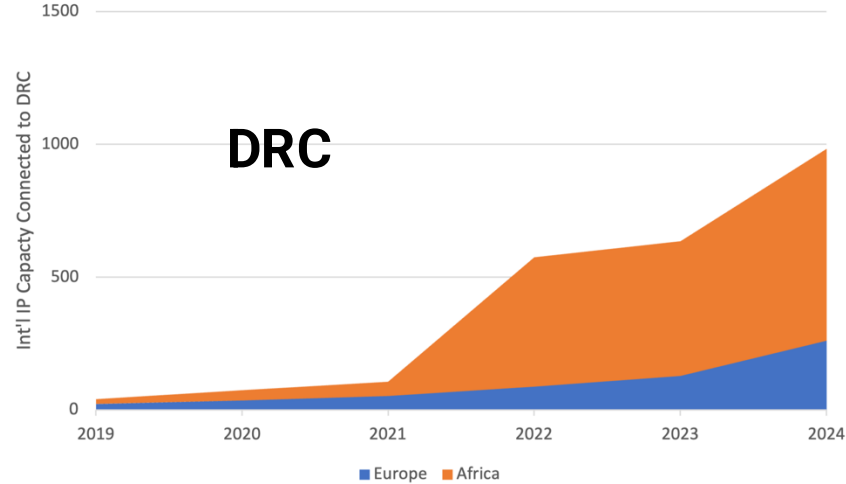
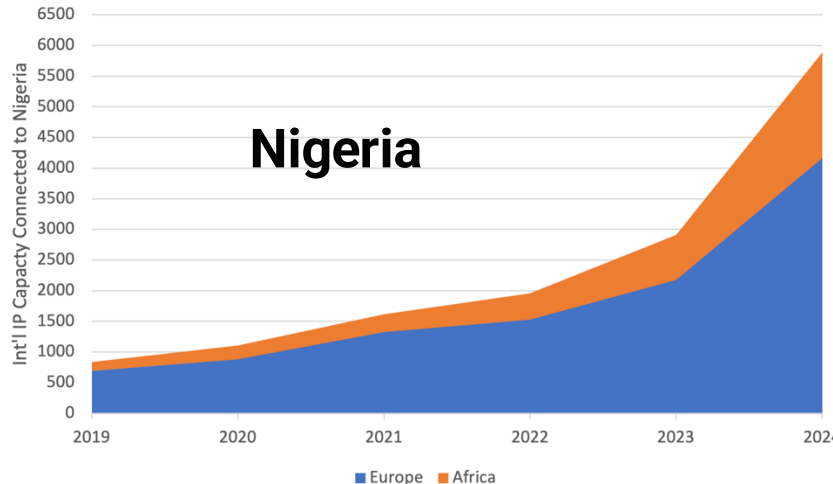
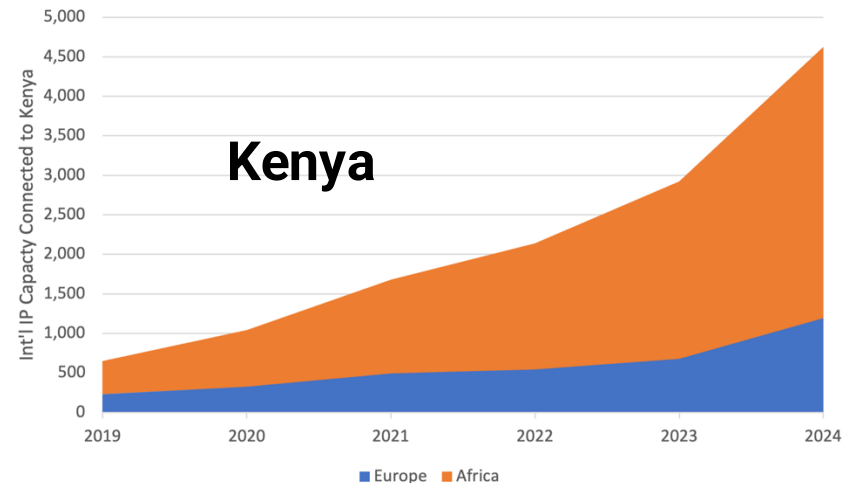
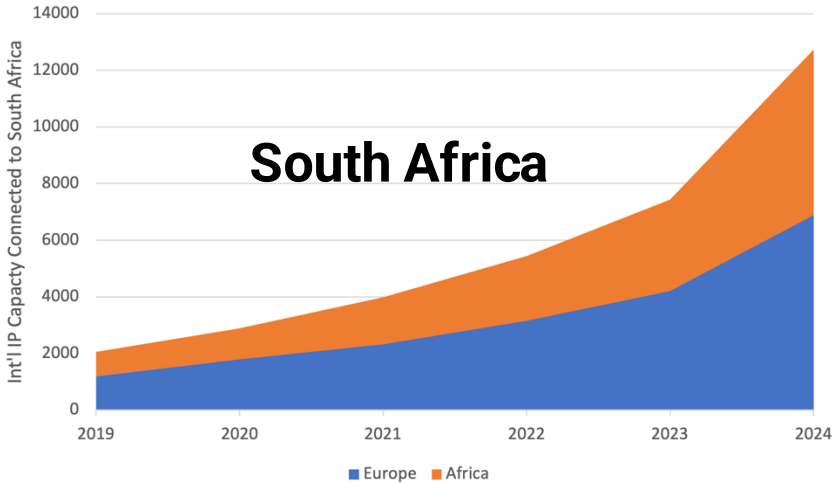
# Europe as a hub



- Top 3: North Africa, Middle East then Sub-Saharan Africa
- Total Africa-Europe connectivity has hovered around 80% for the past 5 years
- North Africa's international connectivity is almost 100% to Europe
- While Sub-Saharan Africa's share of connectivity to Europe has dropped to 60%

Source: TeleGeography, IP Networks

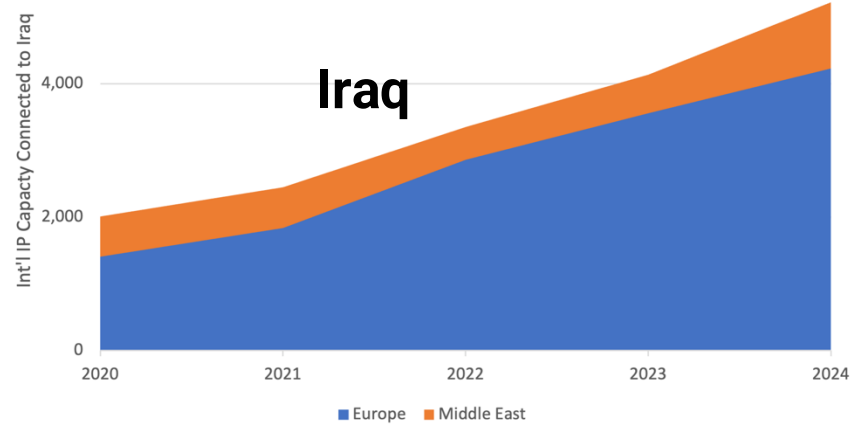
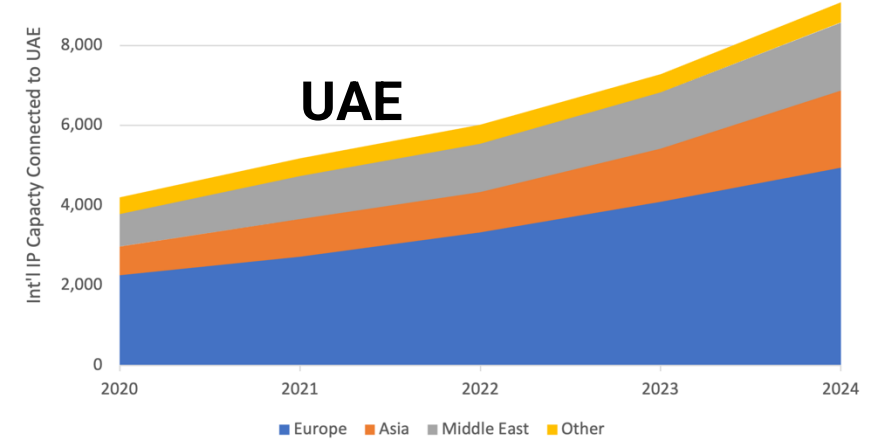
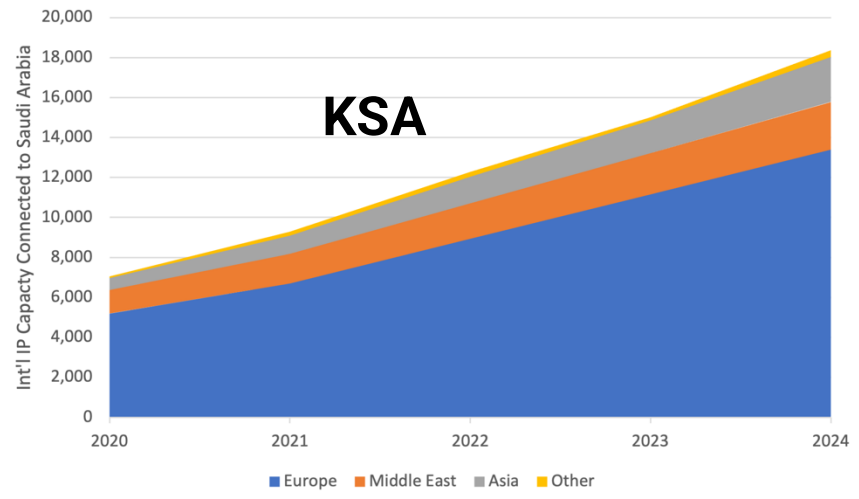
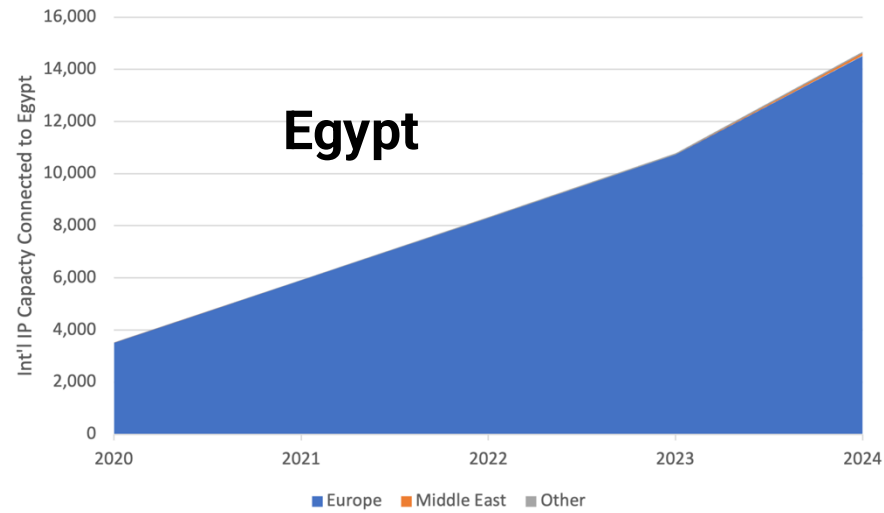
# Int'l IP capacity connected to ZA, Kenya, Nigeria & DRC



Source: TeleGeography, IP Networks



# Int'l IP capacity connected to Egypt, KSA, UAE & Iraq

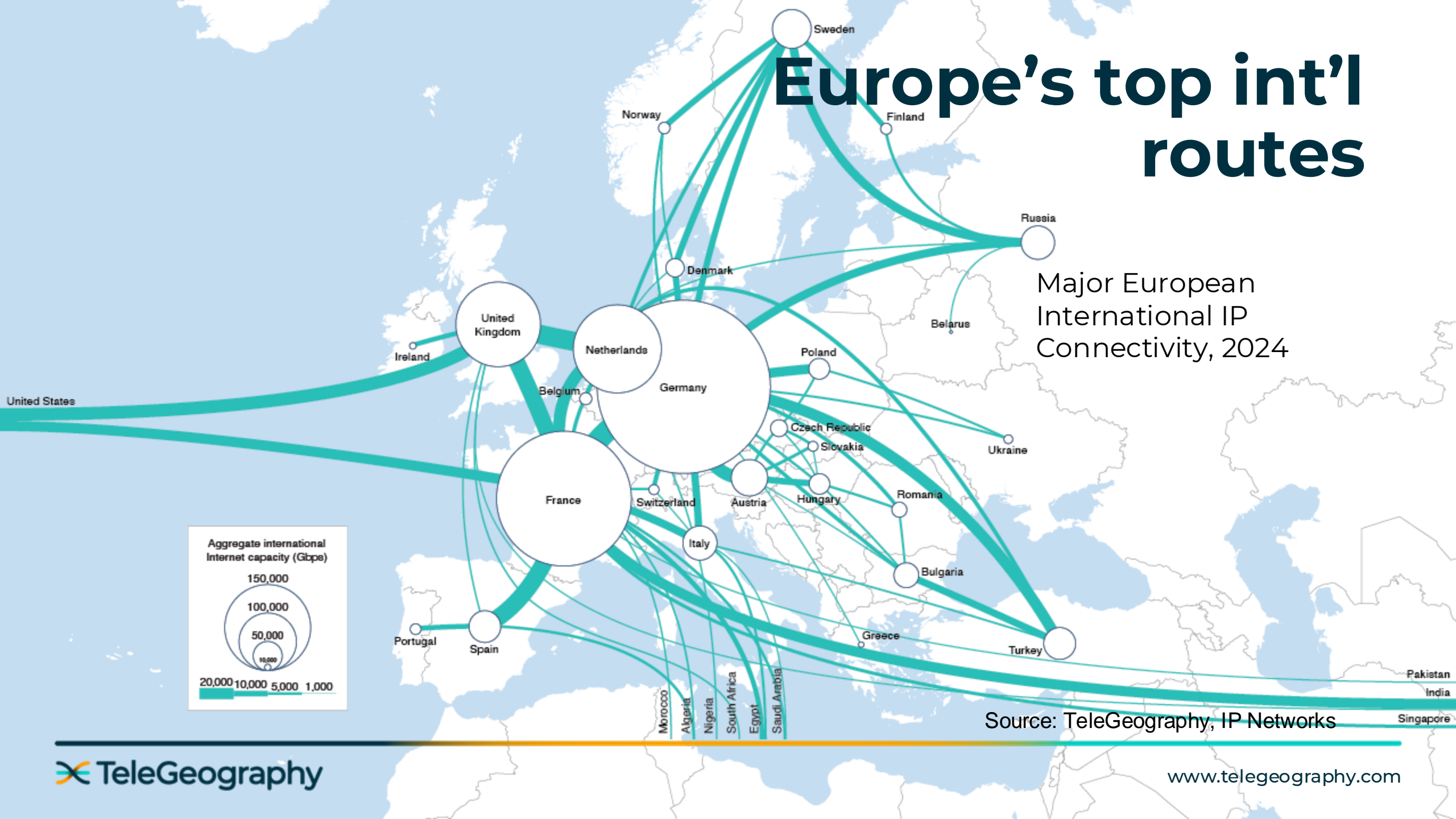


Source: TeleGeography, IP Networks

# Europe Intra-Regional Trends

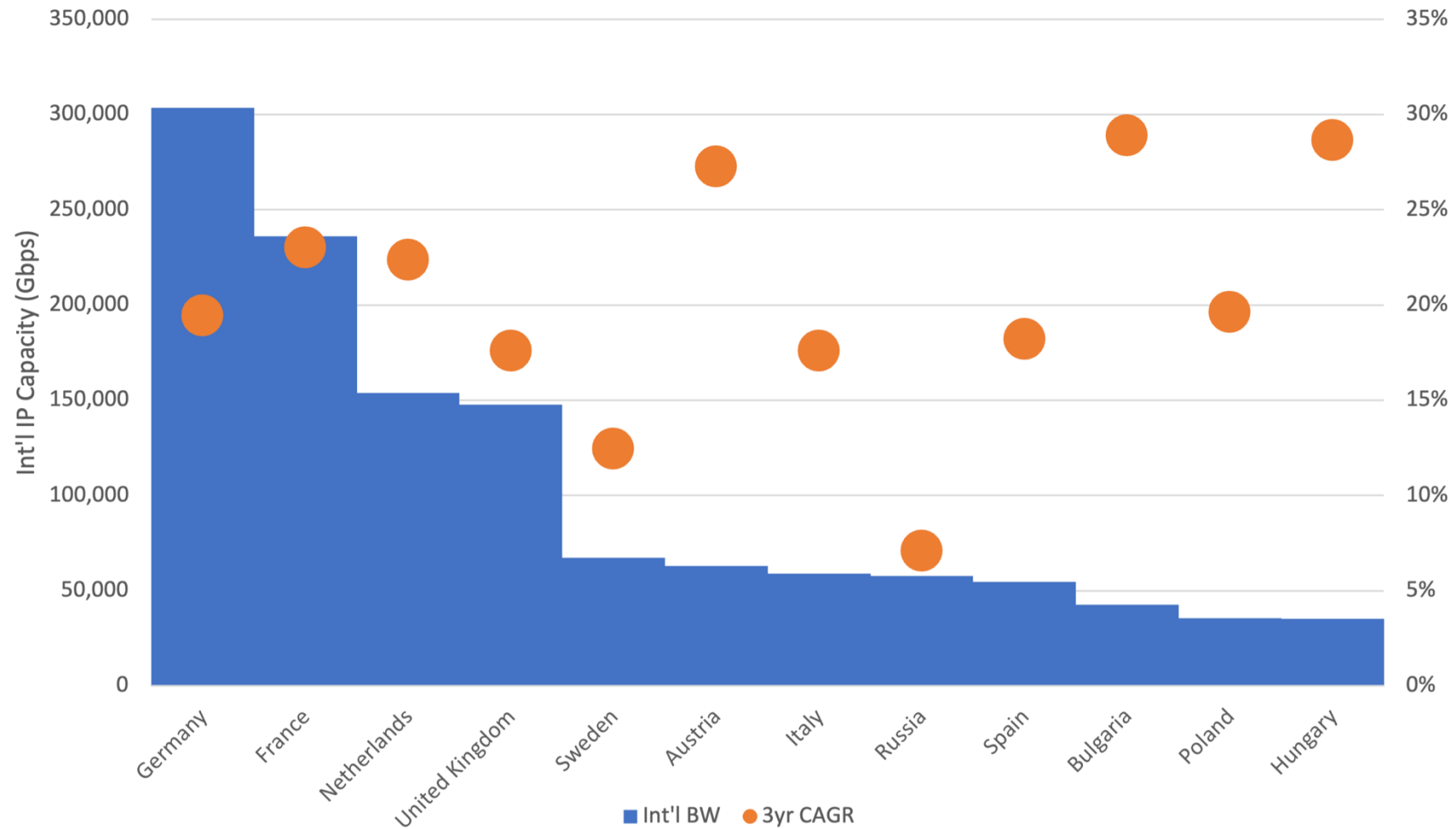
# Europe's top int'l routes

Major European International IP Connectivity, 2024



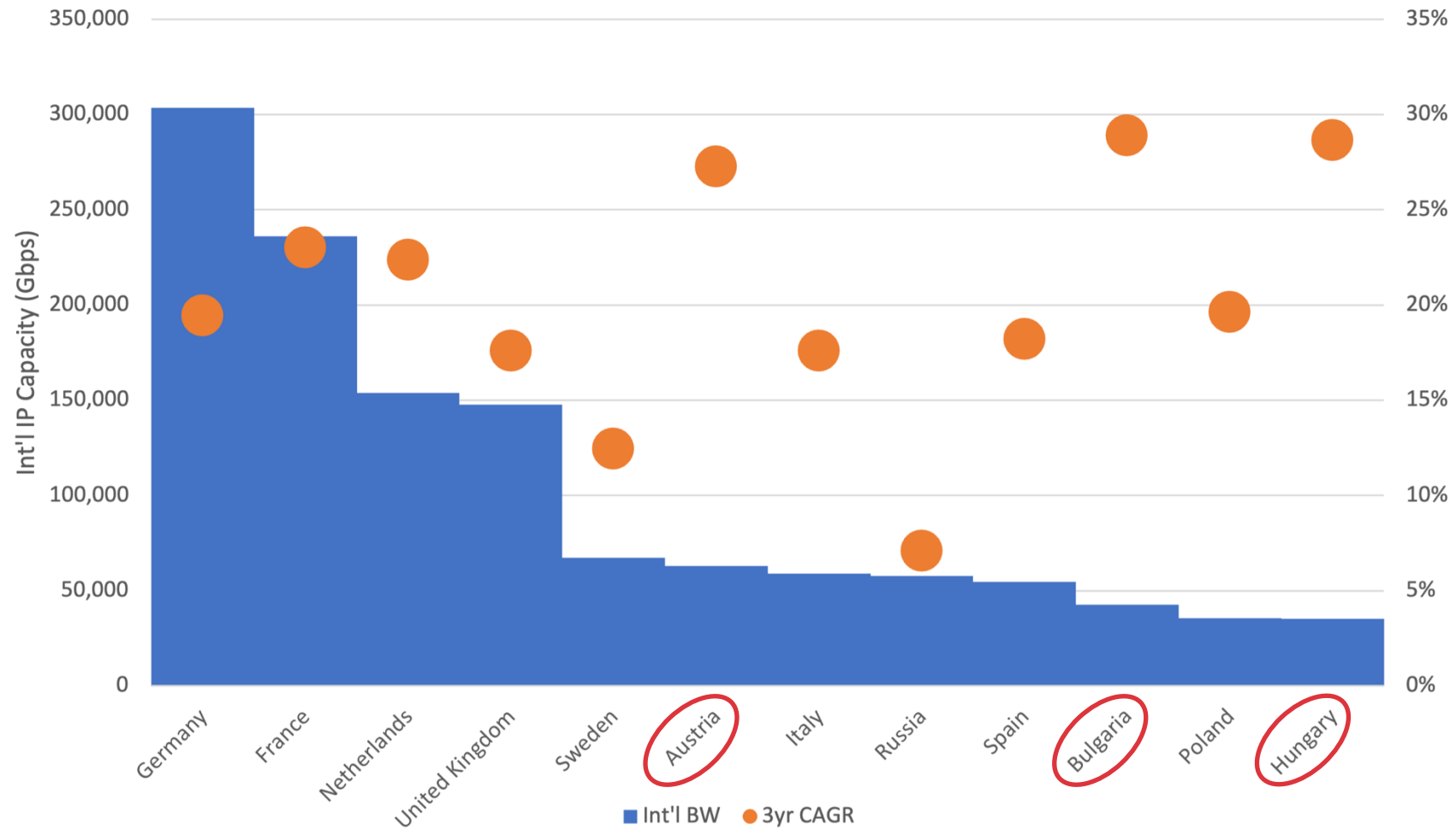
Source: TeleGeography, IP Networks

# Top countries int'l IP capacity in Europe



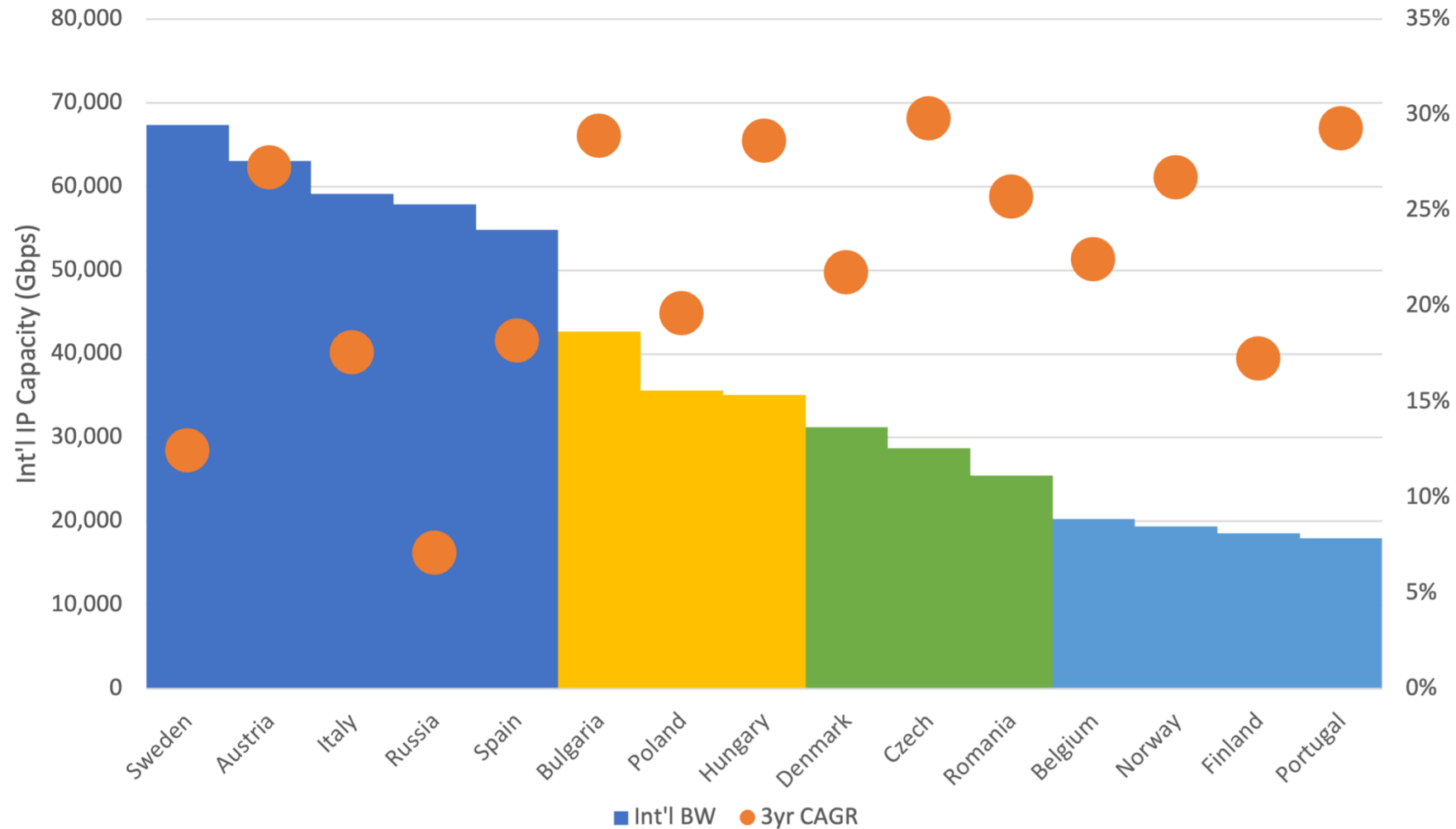
Source: TeleGeography, IP Networks

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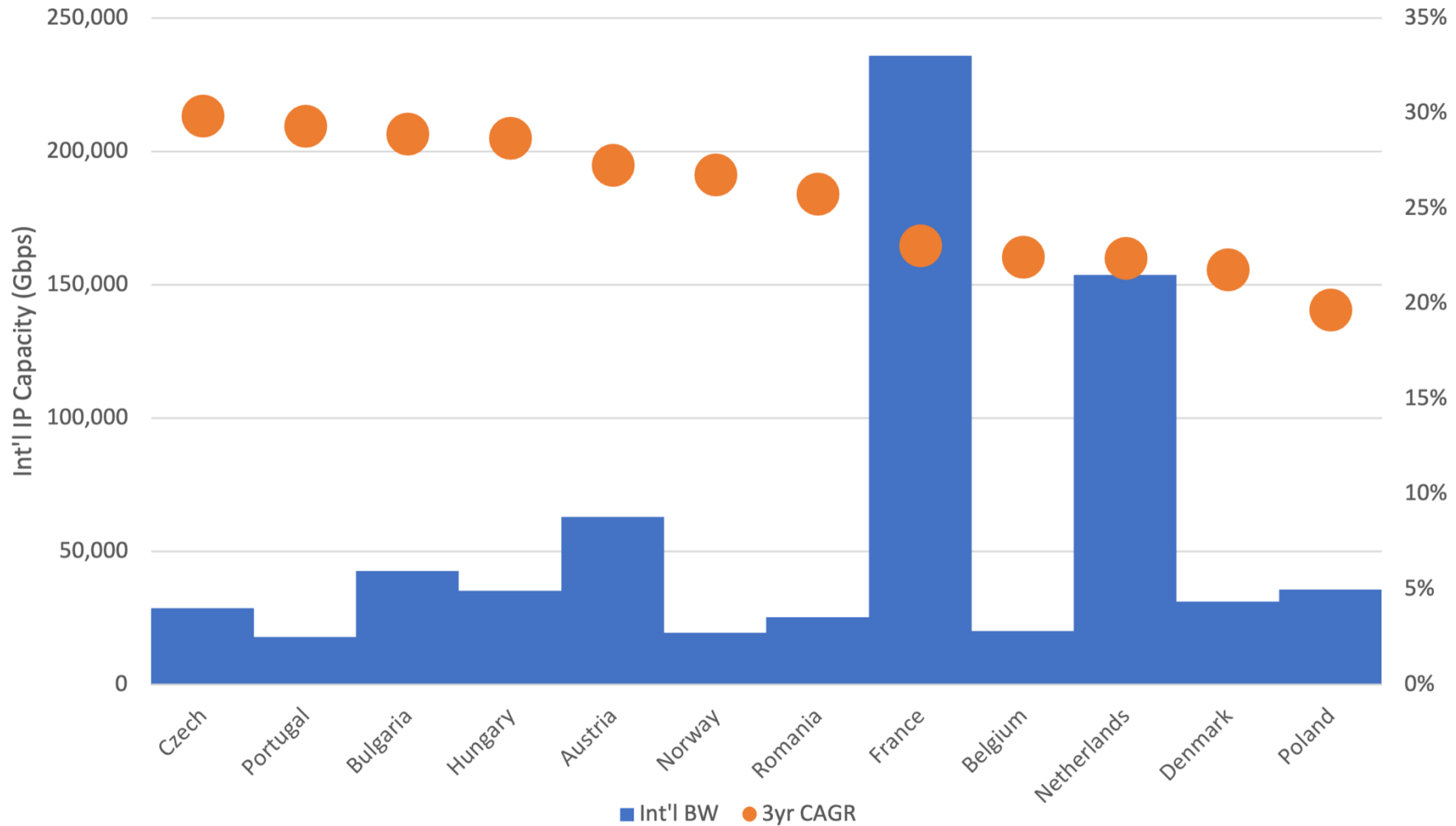
Source: TeleGeography, IP Networks

# Top countries int'l IP capacity in Europe



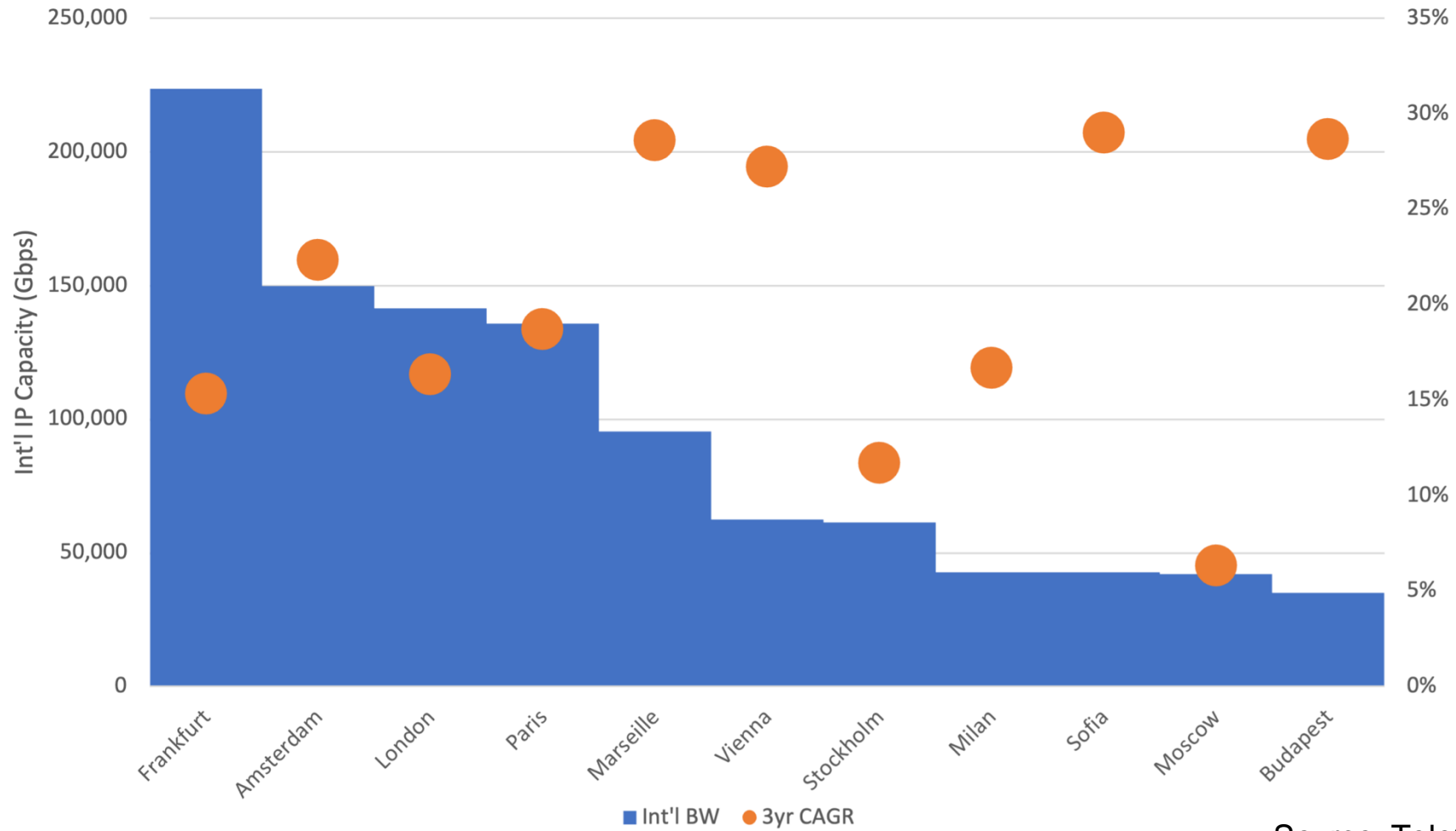
Source: TeleGeography, IP Networks

# Top countries in Europe by growth



Source: TeleGeography, IP Networks

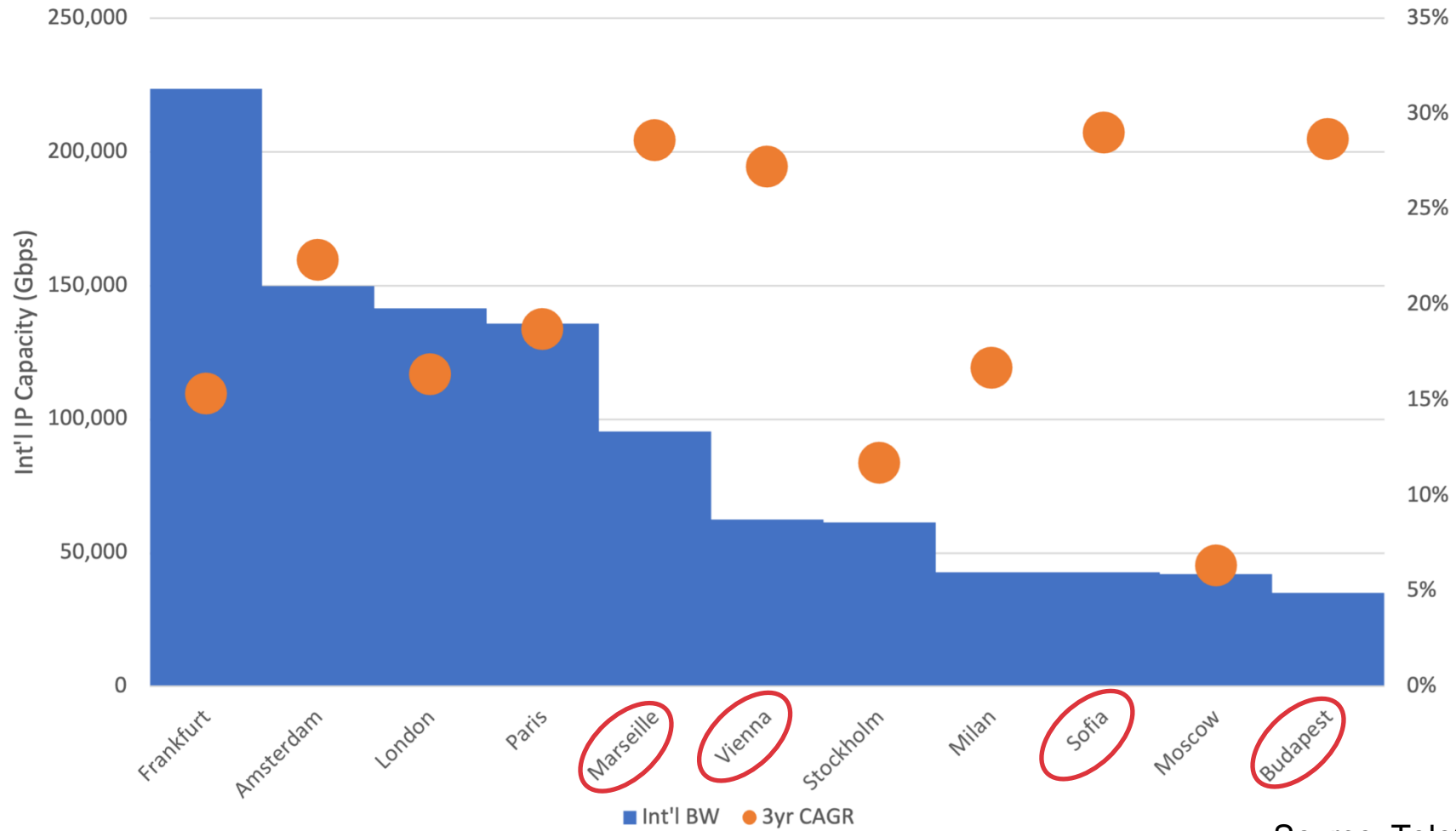
# Top metros int'l IP capacity in Europe



Source: TeleGeography, IP Networks

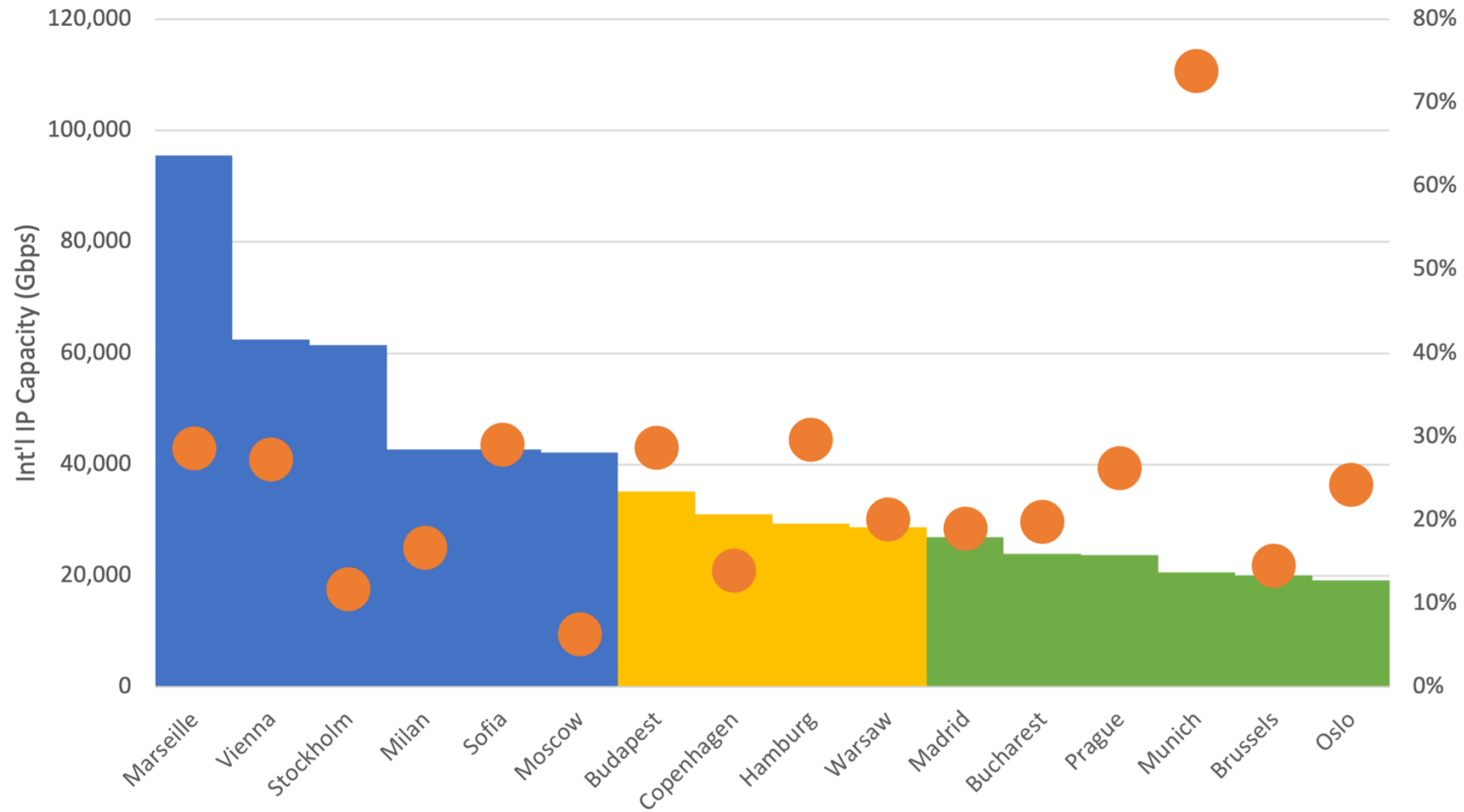


# Top metros int'l IP capacity in Europe



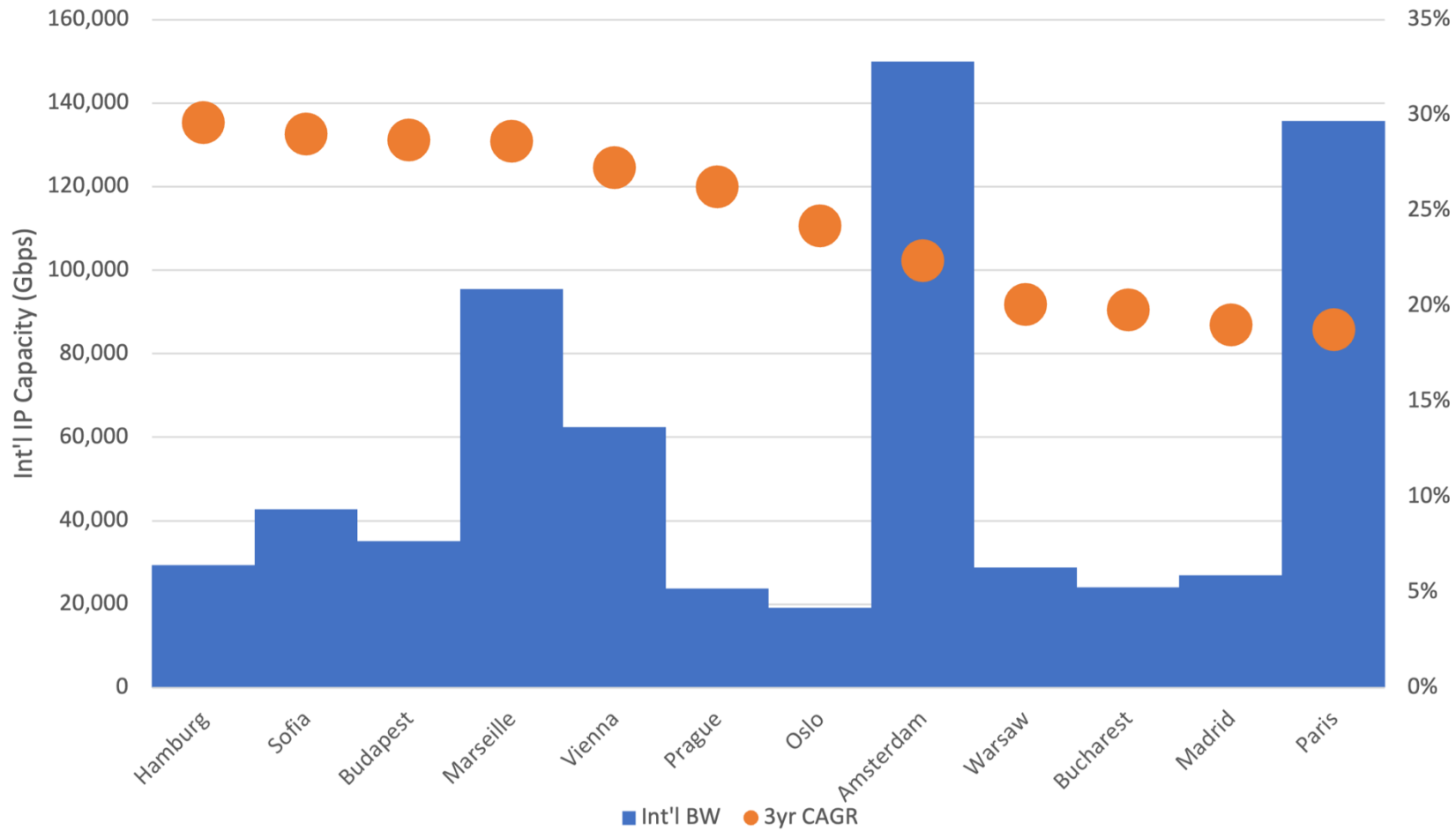
Source: TeleGeography, IP Networks

# Top metros int'l IP capacity in Europe



Source: TeleGeography, IP Networks

# Top metros in Europe by growth



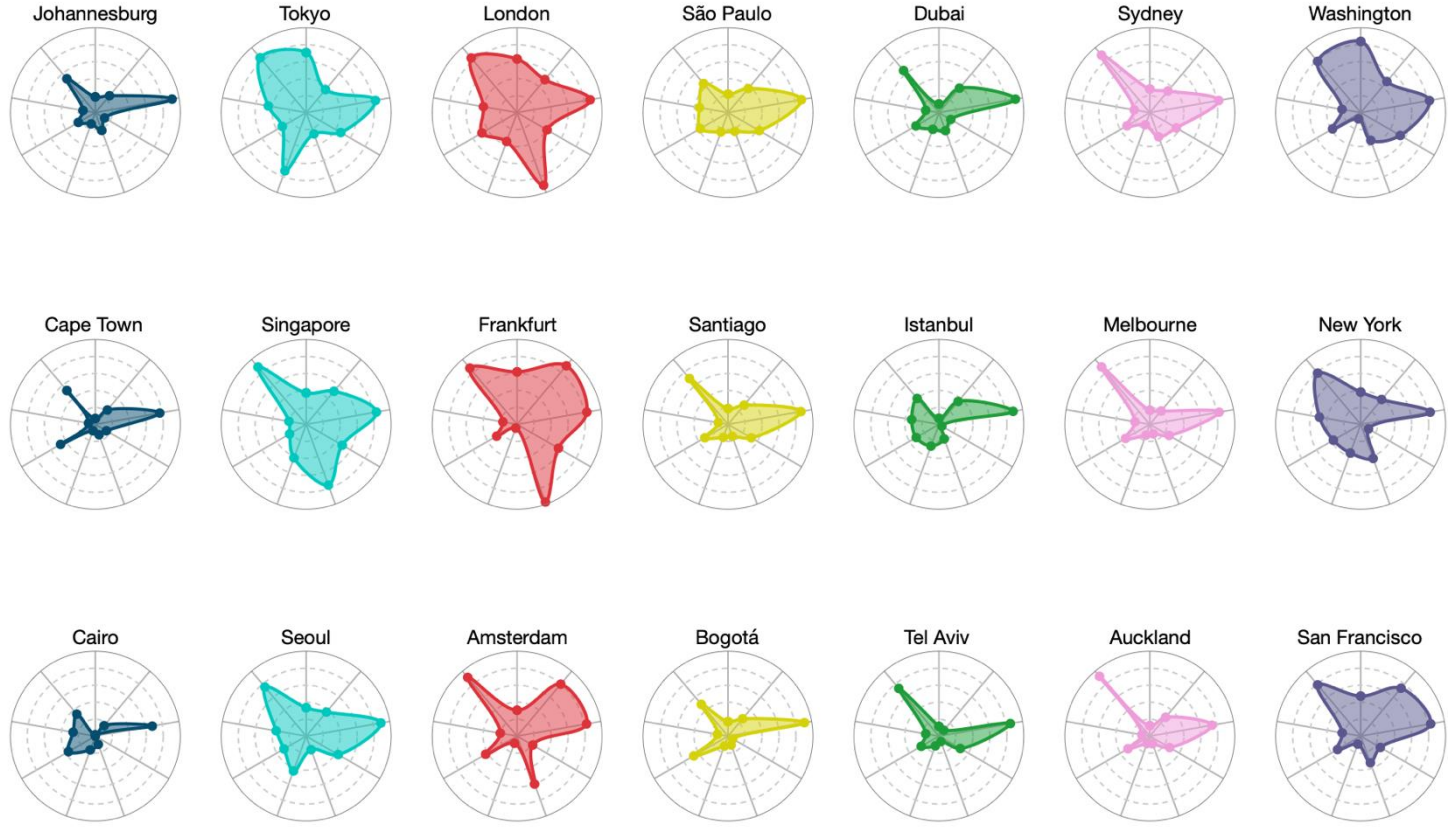
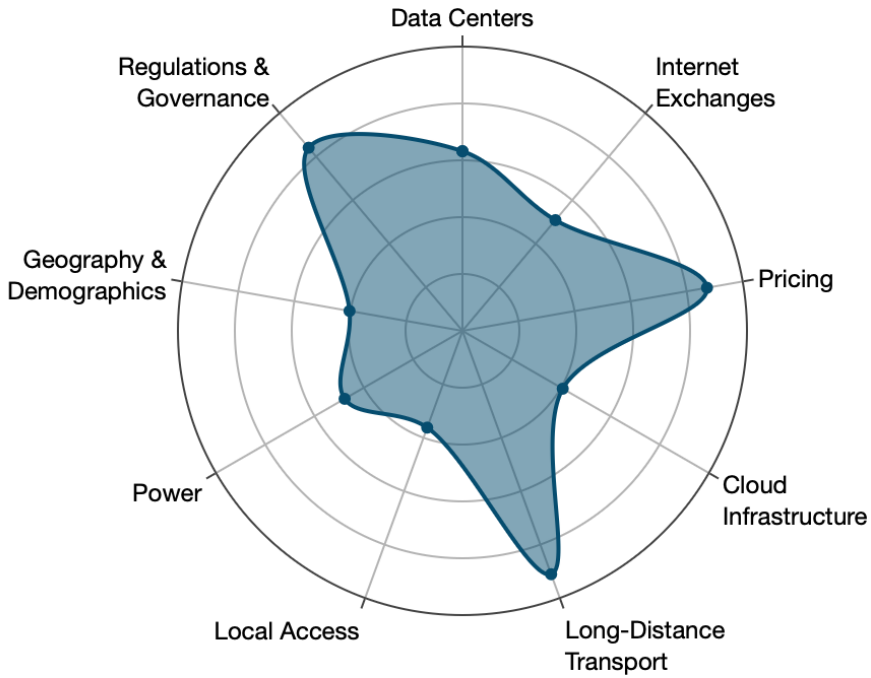
Source: TeleGeography, IP Networks

# Market Connectivity Score

# Data sets for each interconnection hub

- Data Centers
  - Data center infrastructure
  - Internet exchange infrastructure
- Network Connectivity
  - Cloud infrastructure
  - Long-distance transport
  - Pricing
- Market Potential
  - Geography and demographics
  - Local access
  - Power
  - Regulations and governance

# Top 3 hubs in each region



Source: TeleGeography, Data Centers

# European connectivity hubs

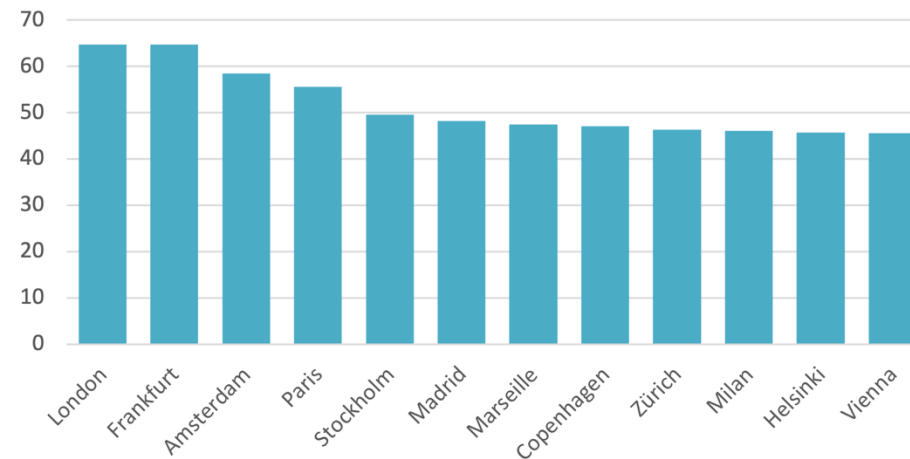
## Top ranking

- London
- Frankfurt
- Amsterdam
- Paris
- Stockholm

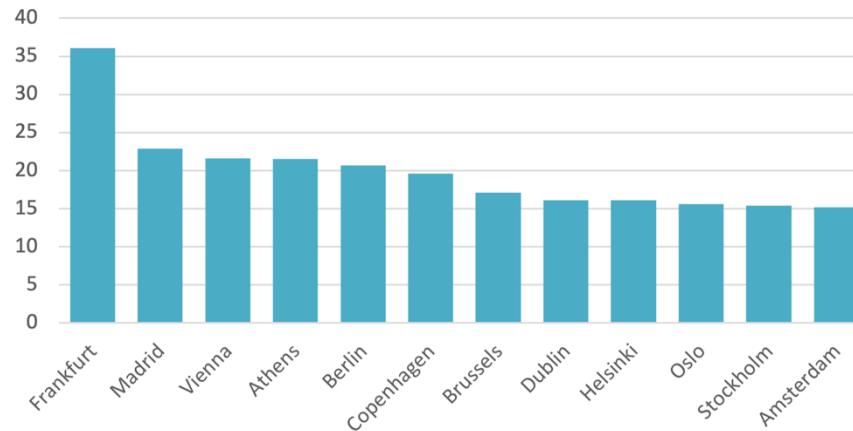
## Biggest gainers

- Frankfurt
- Madrid
- Vienna
- Athens
- Berlin

Overall Market Score



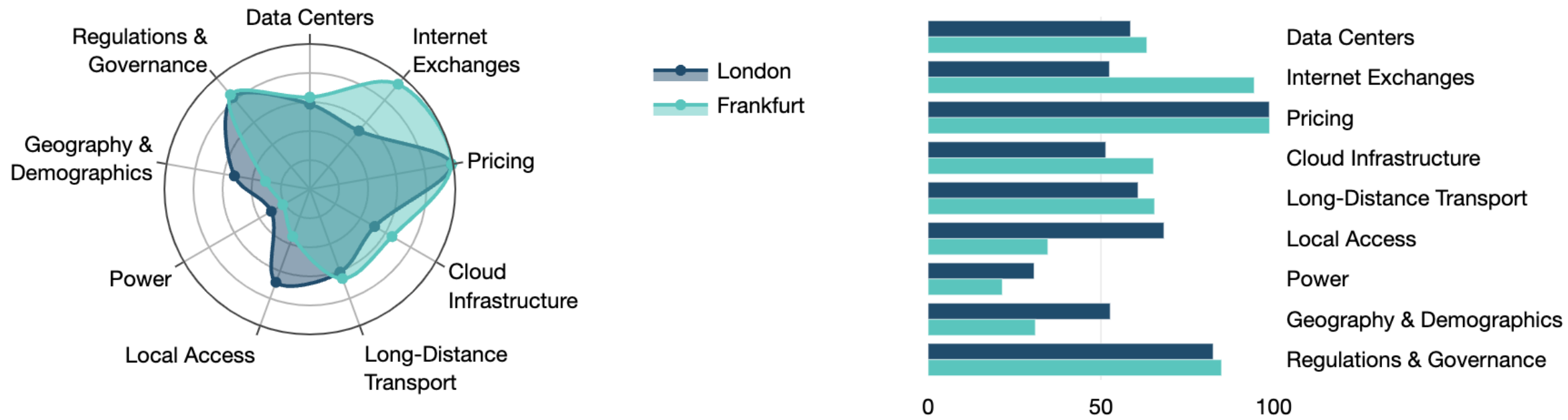
Biggest Gainers Markets



Source: TeleGeography, Data Centers

# European interconnection hubs

## Frankfurt vs. London

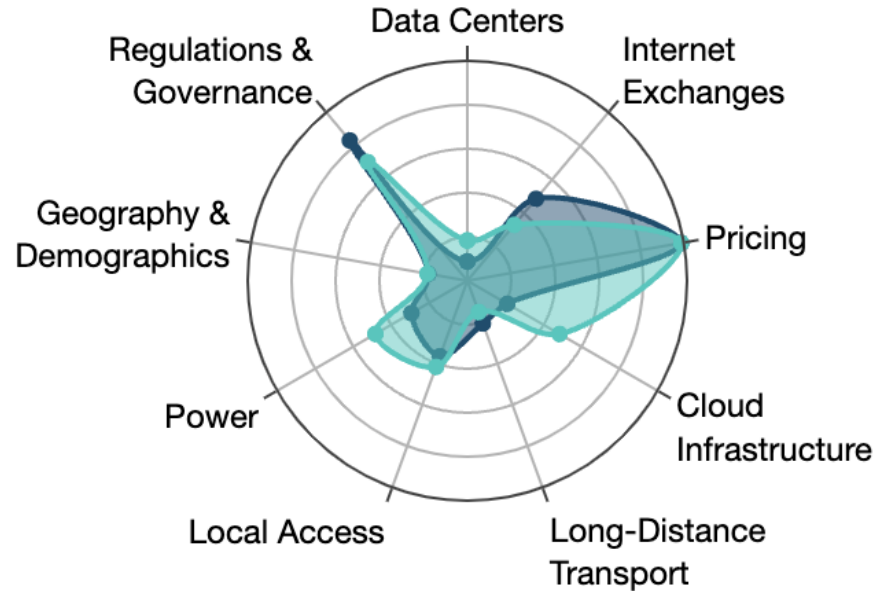


Source: TeleGeography, Data Centers

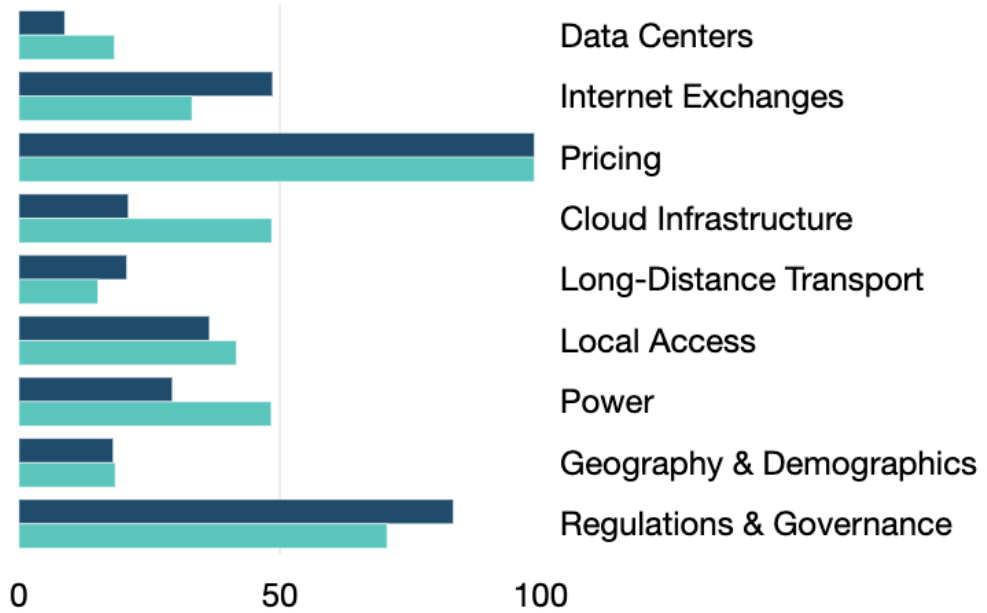


# European interconnection hubs

## Vienna vs. Madrid

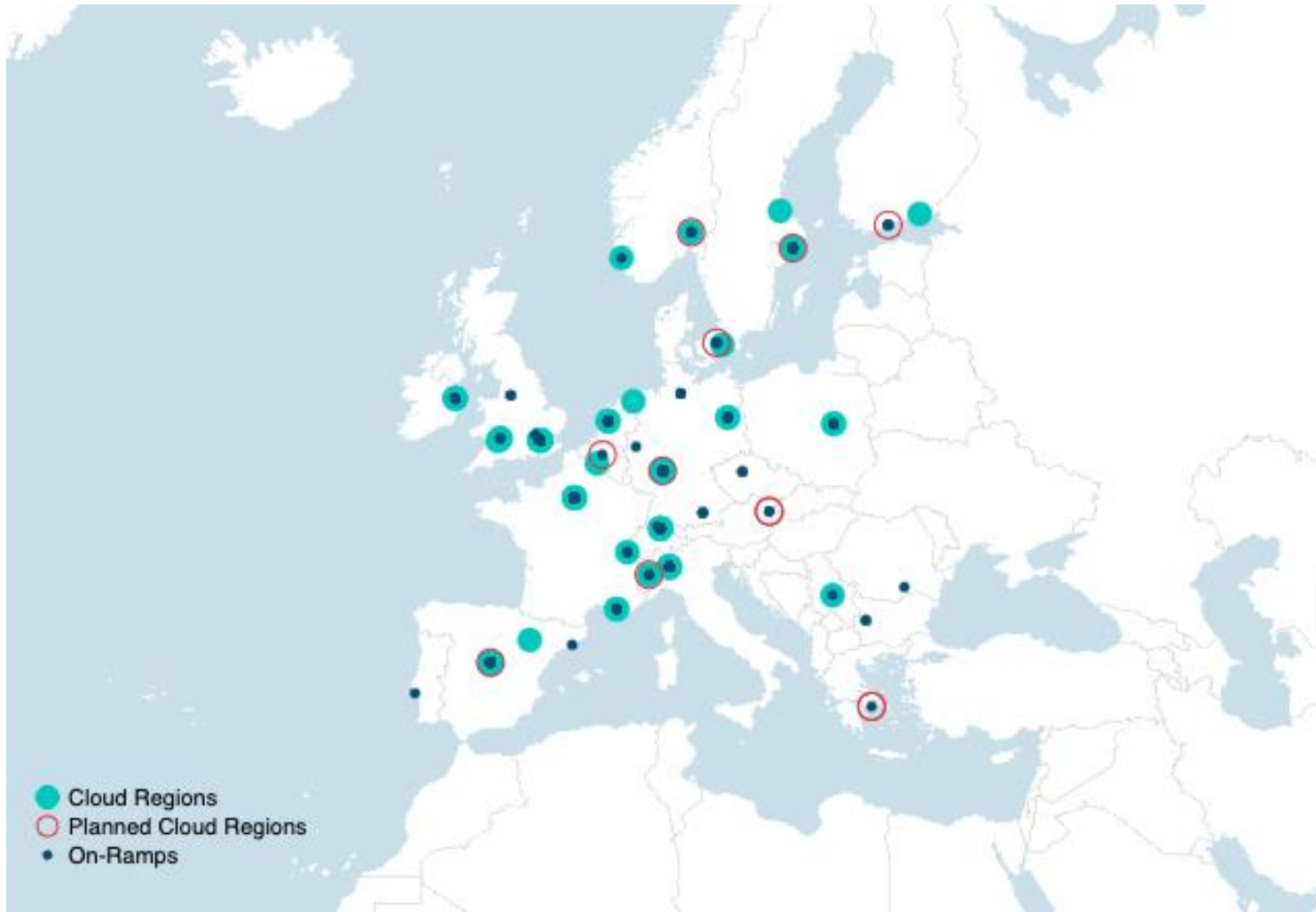


● Vienna  
● Madrid



Source: TeleGeography, Data Centers

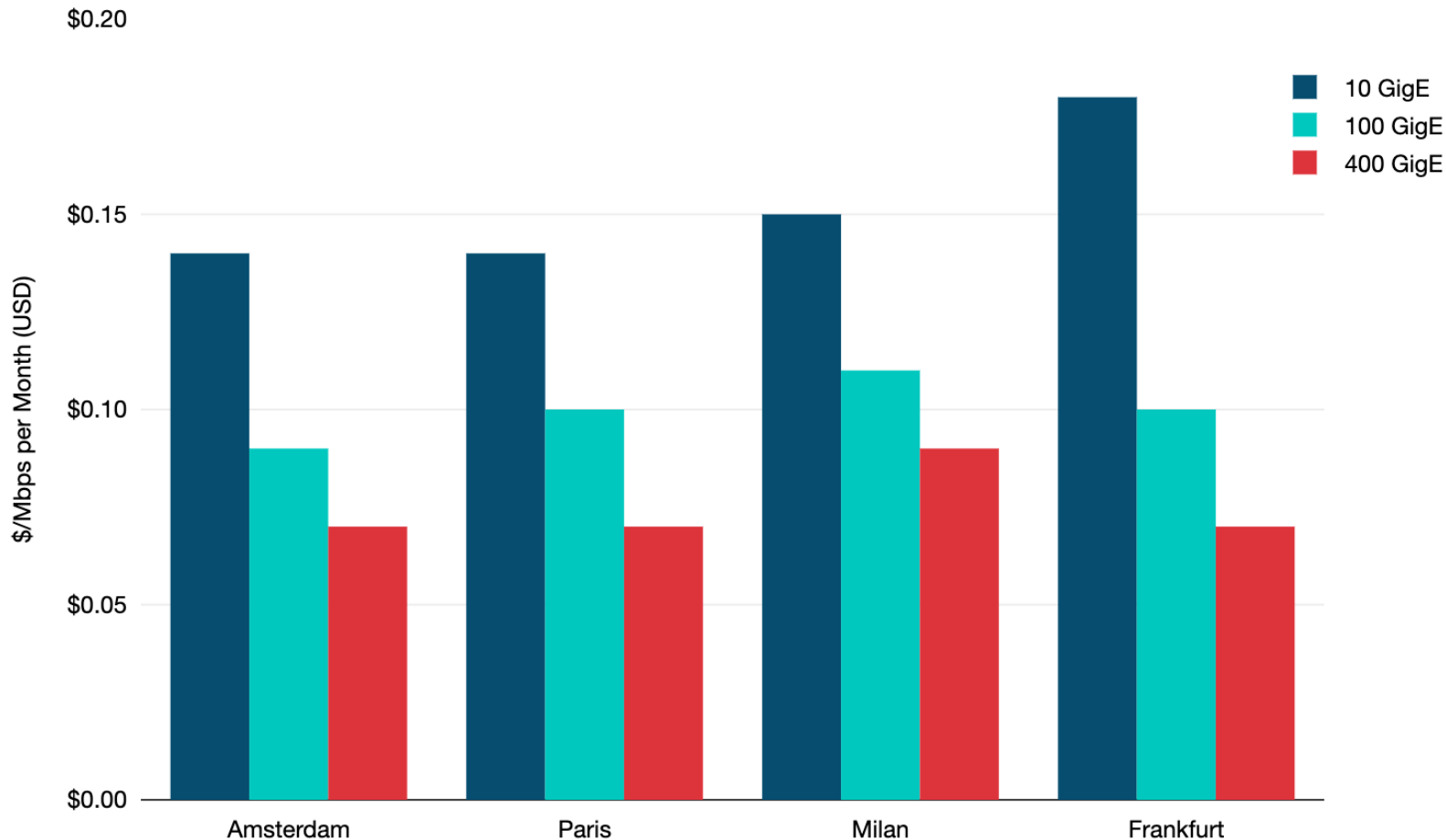
# Europe's cloud landscape



- 57 live and 12 planned cloud regions
- Germany has the most regions – 11 live and 1 planned
- UK is #2 with 11 live
- Europe added the most new cloud regions in 2023, with 8 being launched (up from 7 in 2022)

Source: TeleGeography, Cloud and WAN

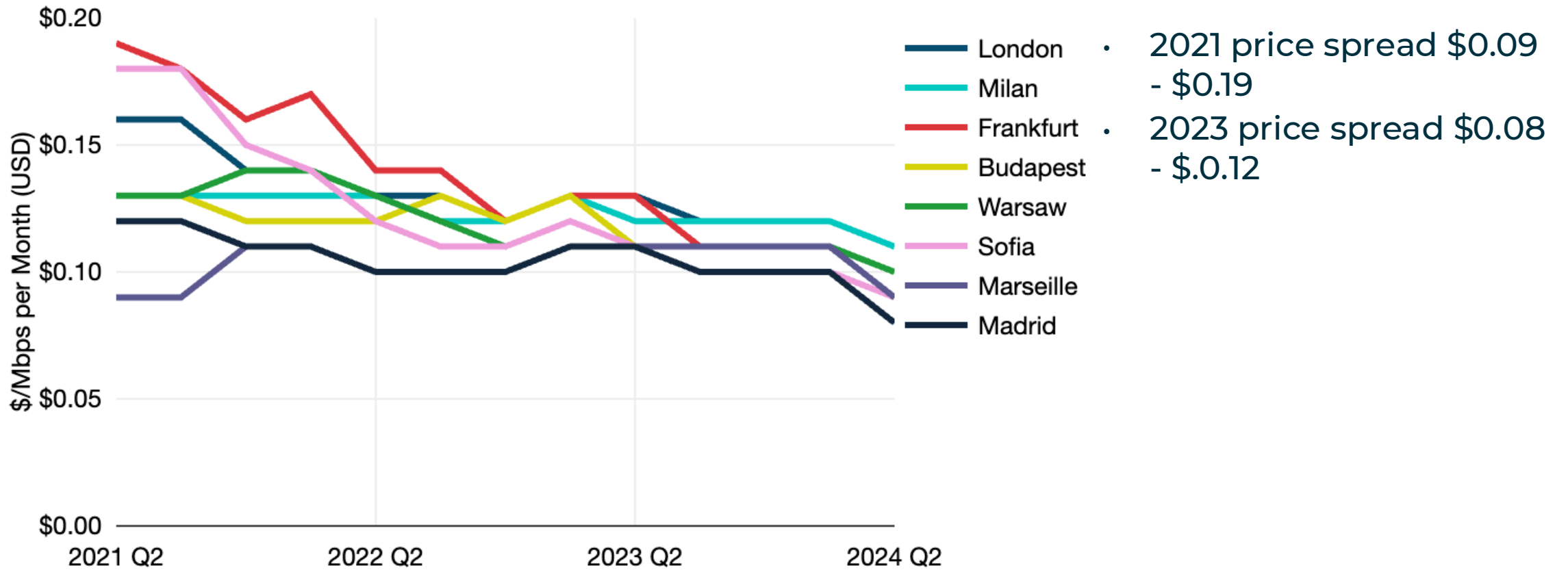
# 100 GigE IP Transit Prices in Europe



- Trend is pretty clear: the larger the port, the greater the price advantage per unit
- 400 GigE demand has just begun to unfold slowly
- 100 GigE ports are the predominant product in Europe, but it's worth noting that 10 GigE is still relevant in the sales mix

Source: TeleGeography, IP Networks

# 100 GigE Price Erosion




Source: TeleGeography, IP Networks

# Looking ahead

- **Within Europe – Increased growth eastward overtaking southern growth**
  - East (Bulgaria, Austria ...) connecting west to east faster growth
    - Spain & Italy slower than east Portugal still high growth
  - North we see slowed but continued growth
- **Europe continues to grow as a hub (in capacity if not share)**
  - Middle East is top connected region in terms of total intl IP capacity
    - Although there is a slight increase of intra-ME connectivity, the vast majority of ME intl connectivity is still to Europe
  - Africa is split
    - North Africa continues to have the high share of intl IP capacity to Europe, while sub-Saharan Africa's share is dropping

# Have you seen the Cloud Infrastructure Map yet?

TeleGeography | Cloud Infrastructure Map



**Cloud Services**

mapbox Last updated March 22, 2023 | © Mapbox © OpenStreetMap | © Mapbox © OpenStreetMap

Cloud Service Providers

- Amazon Web Services
- Google Cloud
- IBM Cloud
- Microsoft Azure
- Oracle Cloud
- Alibaba Cloud
- Tencent Cloud
- Huawei Cloud

Cloud Services

- Cloud Regions
- Local Zones
- On-Ramps

Cloud Regions Local Zones On-Ramps

Feedback

Metro Area	Cloud Service Provider, Cloud Region
<b>Buenos Aires</b> Argentina	Huawei Cloud, LA Buenos Aires (1 Zones) sa-argentina-1
<b>Canberra</b> Australia	Microsoft Azure, Australia Central (Canberra) (1 Zones) australiacentral Microsoft Azure, Australia Central 2 (Canberra) (1 Zones) australiacentral2

<https://www.cloudinfrastructuremap.com>  
<https://www.submarinecablemap.com> (yeah, you know this one)

# Thank you!

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