



Presentation

# Internet global growth: lessons for the future



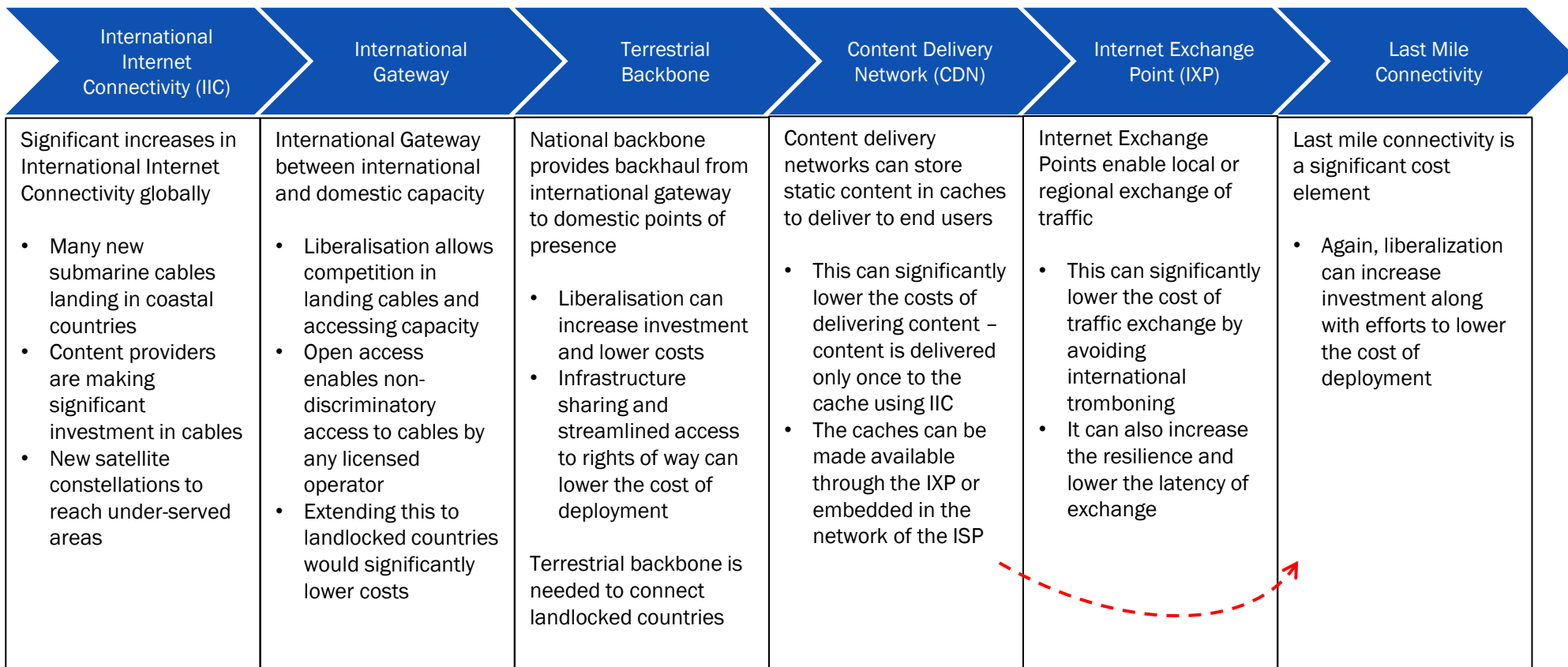
## The cost of International Internet Connectivity has been an issue for many years

- ITU-T Study Group 3 has been examining this issue since the 1990s
  - Issues included tromboning of traffic and the high cost of international transit
  - Recommendation ITU-T D.50 in 2000 that Administrations negotiating international Internet arrangements account for the possible need for compensation
- In 2012 the ITU held the World Conference on International Telecommunications (WCIT)
  - Some countries sought to impose the accounting rate regime for voice calls on Internet traffic
  - The European Telecommunications Network Operators (ETNO) was one of the proponents of this change
- In 2022 the ‘fair share’ debate began in Europe and has spread to other countries
  - The goal is to regulate payments from large content providers to ISPs for delivering traffic
  - ETNO is once again one of the main proponents of this change
- To date, none of these proposals have been implemented, while the Internet keeps evolving to address new issues

Presentation in the context of the 2012 WCIT



## While regulation of IIC has been discussed, the value chain has evolved



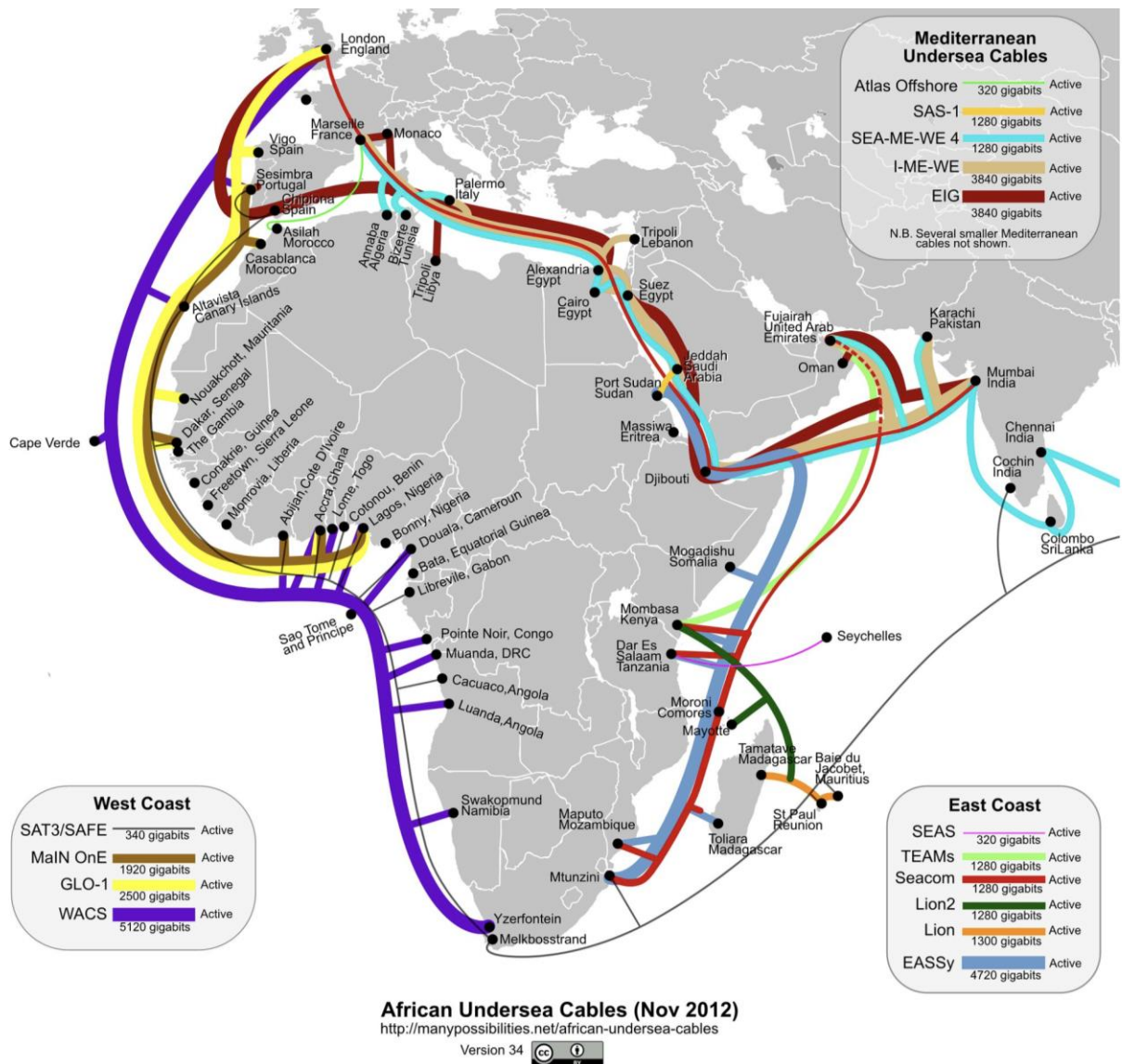
The only constant is that peering and transit are still commercially negotiated, without regulation

## In 2000 there was only one cable landing in three African countries



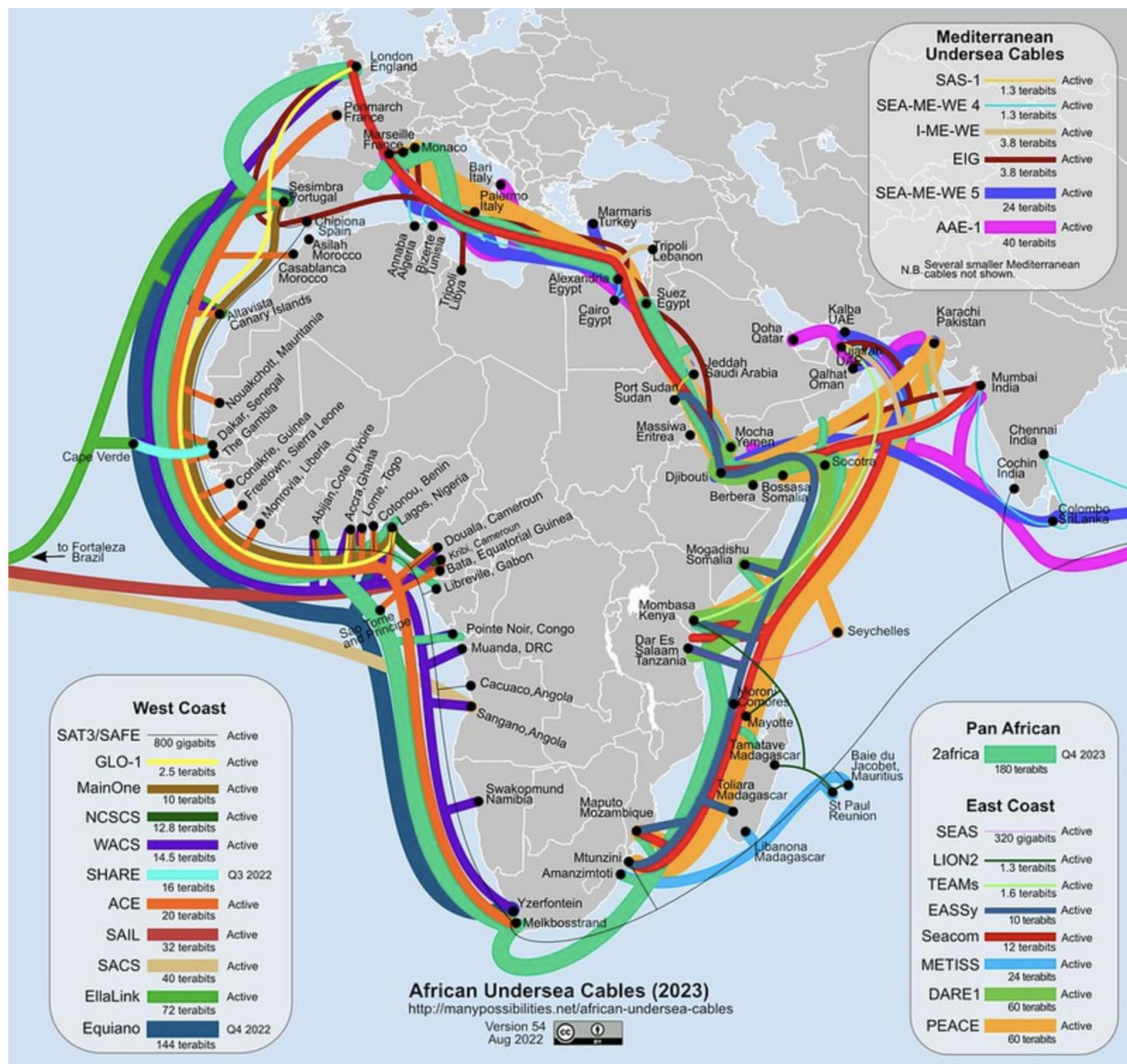
- SeaMeWe-3 was ready for service in September 1999
  - The capacity was 40 gigabits
  - The landing points were in Djibouti, Egypt (2), and Morocco

## By 2012 there were 15 cables landing in Africa



- The capacity increased significantly
  - 9,880 gigabits landing on West Coast
  - 10,180 gigabits landing on East Coast
  - 10,560 gigabits landing in Mediterranean
  - 30,620 gigabits total
- Landing in 37 of 38 coastal countries (including islands)

## A number of new cables have landed, along with other advances



- The capacity increased significantly
  - 364.6 terabits landing on West Coast
  - 169.22 terabits landing on East Coast
  - 74.2 terabits landing in Mediterranean
  - 180 terabits pan African
  - 788.02 terabits total
- Owners include Meta (2africa) and Google (Equiano)
- Exponential increase in capacity submarine cable capacity:
  - .040 terabits in 2000
  - 30.62 terabits in 2012
  - 788.02 terabits in 2023

## Many CDNs have begun to place caches in Africa



- Content providers including Google (at left), Meta, and Netflix have developed their own CDNs
- 18 3rd party CDNs have edge servers in 33 countries in Africa (CDN Planet)
- Regional Hubs are beginning to develop, in South Africa, Kenya, Senegal, Nigeria, and Ghana

# There have been significant gains across the value chain

International Internet Connectivity (IIC)	International Gateway	Terrestrial Backbone	Content Delivery Network (CDN)	Internet Exchange Point (IXP)	Last Mile Connectivity
<p>International bandwidth usage per user (kbit/s)</p> <ul style="list-style-type: none"> <li>• Has grown in Africa from 11.1 in 2015 to 84.9 in 2022</li> <li>• The global average is 232.6</li> </ul> <p>Africa has the fastest growth rate in the world, followed by Asia</p> <p>Transit and capacity prices in Africa are falling faster than elsewhere, but still higher</p>	<p>There are still regulatory challenges for IIC</p> <ul style="list-style-type: none"> <li>• In Africa, of the countries reporting, 9 have an international gateway monopoly, 6 have only partial competition, and 25 have full competition</li> <li>• This helps to keep IIC prices high, particularly for land-locked countries</li> </ul>	<p>The amount of terrestrial backbone is increasing to provide backhaul and cross-border connectivity</p> <p>The number of intra-African routes is increasing, with more capacity</p>	<p>CDN caches are increasing in Africa, and can lead to further investment</p> <ul style="list-style-type: none"> <li>• Points of presence (PoPs) connect a network to the rest of the Internet, often with peering</li> <li>• Data centers are where content and services are stored and processed</li> </ul>	<p>IXPs grew from 1 in 2000, to 24 in 2012, to 59 today (Packet Clearing House)</p> <p>These become magnets for CDNs and can become regional hubs like AMS-IX is in Europe</p>	<p>Population covered by at least a 3G mobile network</p> <ul style="list-style-type: none"> <li>• Has grown in Africa from 22.2% in 2010 to 82.4% in 2022</li> <li>• The global average is 94.8%</li> </ul> <p>Active mobile broadband subscriptions</p> <ul style="list-style-type: none"> <li>• Has grown in Africa from 1.7% in 2010 to 42% in 2022</li> <li>• The global average is 67.4%</li> </ul>

Increased international capacity and localized content will lower IIC prices in Africa



## Regulating IIC is not the solution to the remaining challenges

- Internet users
  - Has grown in Africa from 2.0% in 2005 to 37.1% in 2023
  - The global average is 67.4%
- Affordability
  - 2GB of data cost 5% of income for Africa
  - 1.5% of income for the global average
- All developing country categories lag similar to Africa, in spite of significant efforts to achieve universal and meaningful connectivity
- Imposing cost regulations on international capacity (transit or traffic) will not solve the problems
  - It could lead to less investment in new international capacity if the returns are decreased through regulation
  - It could also raise the cost of services delivered using international capacity if traffic is taxed
- Other ways to lower price and increase traffic
  - Liberalize international gateways and ensure open access is possible at borders
  - Harmonize regional regulations to create a single market for transit and traffic to promote development of hubs
  - Ensure an enabling regulatory environment for data centers and CDN and cloud servers

# Contact details

## Michael Kende

Senior Advisor

Michael.Kende@analysismason.com

### Bonn

Tel: +49 176 1154 2109  
bonn@analysismason.com

### Cambridge

Tel: +44 (0)1223 460600  
cambridge@analysismason.com

### Dubai

Tel: +971 (0)4 446 7473  
dubai@analysismason.com

### Dublin

Tel: +353 (0)1 602 4755  
dublin@analysismason.com

### Hong Kong

hongkong@analysismason.com

### Kolkata

Tel: +91 33 4084 5700  
kolkata@analysismason.com

### London

Tel: +44 (0)20 7395 9000  
london@analysismason.com

### Lund

Tel: +46 8 587 120 00  
lund@analysismason.com

### Madrid

Tel: +34 91 399 5016  
madrid@analysismason.com

### Manchester

Tel: +44 (0)161 877 7808  
manchester@analysismason.com

### Milan

Tel: +39 02 76 31 88 34  
milan@analysismason.com

### New Delhi

Tel: +91 124 4501860  
newdelhi@analysismason.com

### New York

Tel: +1 212 944 5100  
newyork@analysismason.com

### Oslo

Tel: +47 905 59 075  
oslo@analysismason.com

### Paris

Tel: +33 (0)1 72 71 96 96  
paris@analysismason.com

### Singapore

Tel: +65 6493 6038  
singapore@analysismason.com

### Stockholm

Tel: +46 8 587 120 00  
stockholm@analysismason.com