MARKET OVERVIEW – SATCOM FOR UNIVERSAL BROADBAND ACCESS

DIMITRI BUCHS

UNOOSA / ITU TECH ENVOY OFFICE EVENT ON SATELLITE CONNECTIVITY

JULY 2021

EUROCONSULT – WHO WE ARE

Governmental & international organizations

Financial institutions & insurance

Service providers

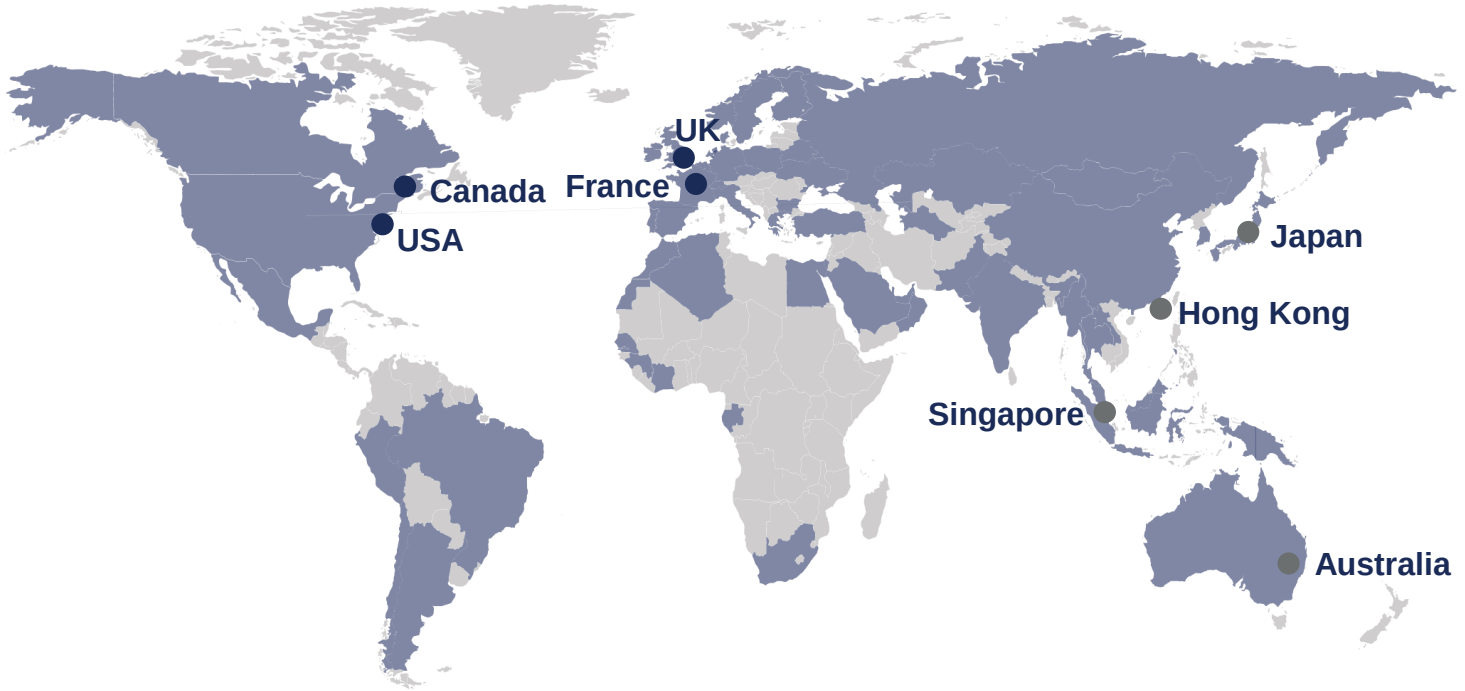
Satellite operators

End users

Satellite & equipment manufacturers

Launch service providers

600 clients in 50 countries – 8 global locations



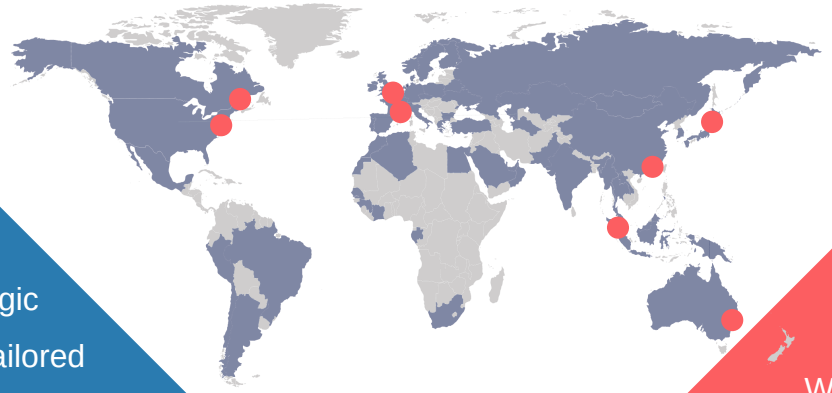
- Countries in which clients are based
- Office locations
- Representatives

EUROCONSULT – WHO WE ARE

CUSTOMIZED CONSULTING SERVICES

- Market studies
- Government programs
- Feasibility studies
- Program monitoring
- Business strategy
- Public policy

600 clients
in **50** countries
8 global locations



MARKET INTELLIGENCE

- Continuous data-gathering
- 25-years historic data
- 10-year forecasts
- Proprietary databases
- Strategic reports

THEMATIC TRAINING

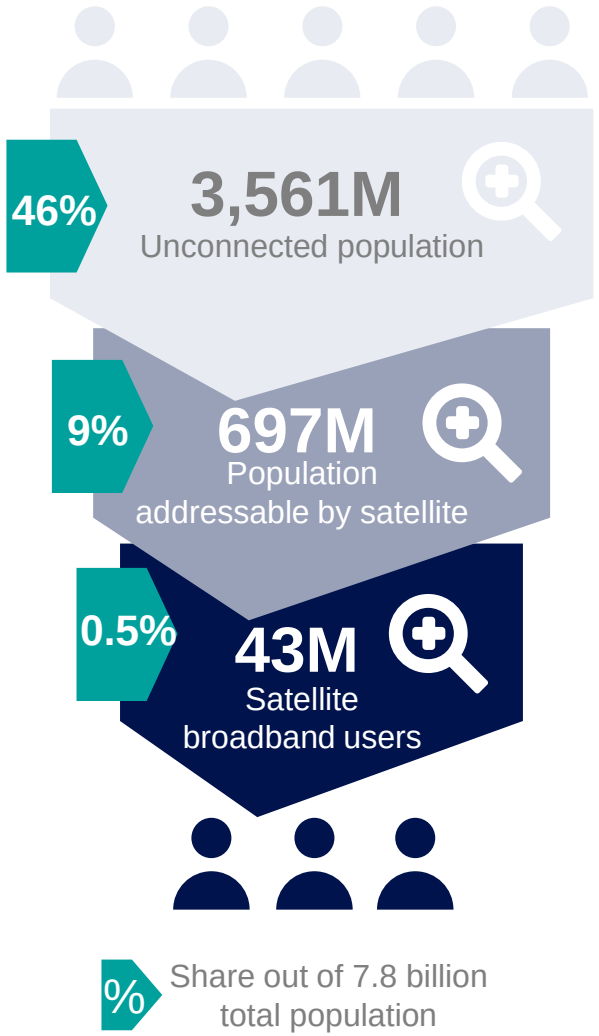
- Deep dives
- Technical or strategic
- Customized & Tailored
- High-level programs
- User driven or guided

EXECUTIVE SUMMITS

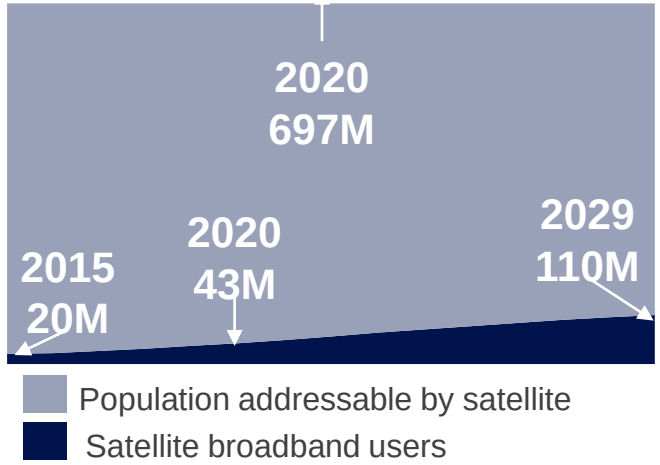
- Market insights
- Business deals
- World-class speakers
- Executive-level networking

UNIVERSAL BROADBAND ACCESS: ADDRESSABLE MARKET

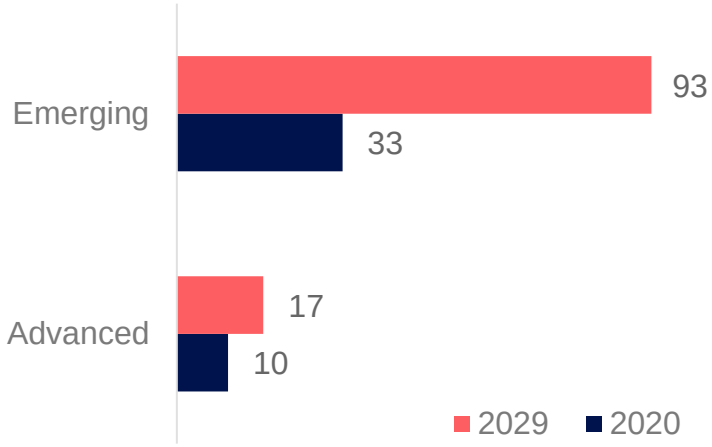
2020 ADDRESSABLE MARKET



GROWTH POTENTIAL SAT. BROADBAND



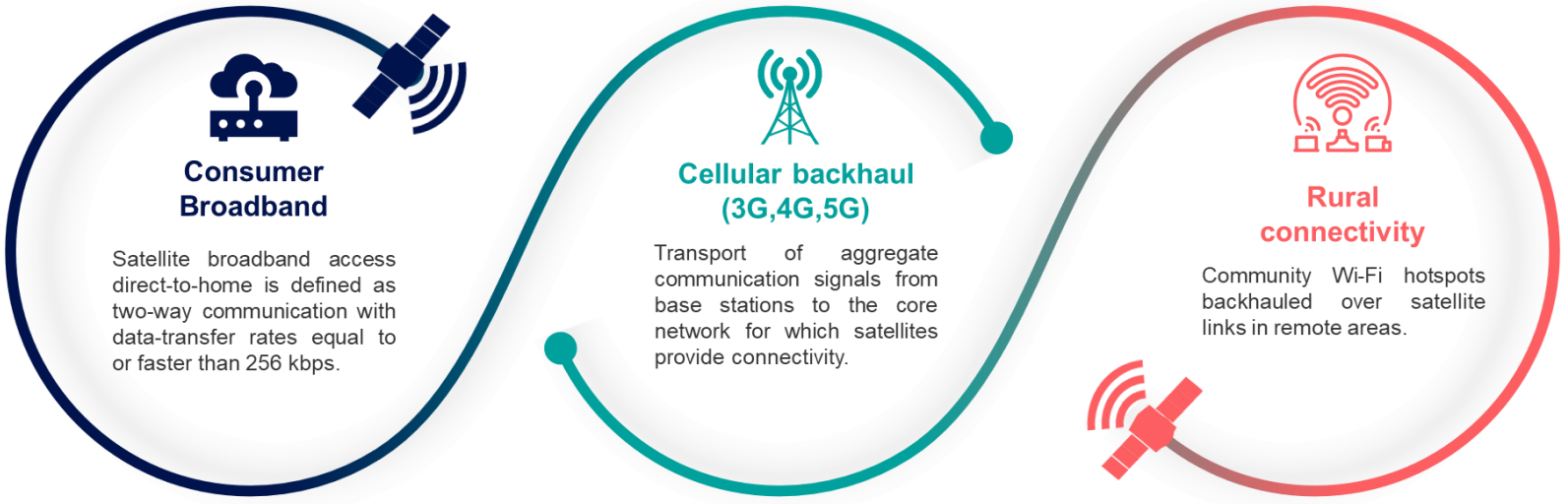
SAT. BROADBAND USERS



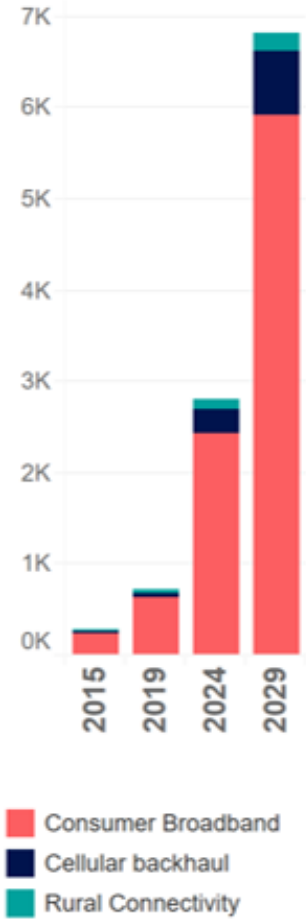
- Of the 7.8 billion world population, 46% remains unconnected, mostly in developing regions;
- Satellite penetration of the addressable market: ~6%.
- 43 million people connected to satellite broadband services via satellite (~1% of the world's connected population).
- Total number of satellite users to be multiplied by 2.5 by 2029; 90% of new satellite users in emerging regions.

UNIVERSAL BROADBAND ACCESS: SATCOM MARKET

SATCOM SOLUTIONS



CAPACITY DEMAND BY APPLICTION (TBPS)



- **Three satellite solutions** are used to address the UBA market;
- Consumer broadband is dominant in advanced economies while Wi-Fi hotspots are most frequently used in less developed regions (lower cost of services, ability to share costs among many users...).
- **Capacity demand** to be multiplied by 8 by 2029 → 7 Tbps
- **Revenues** (service + capacity) to reach > US$17b by the end of the decade.

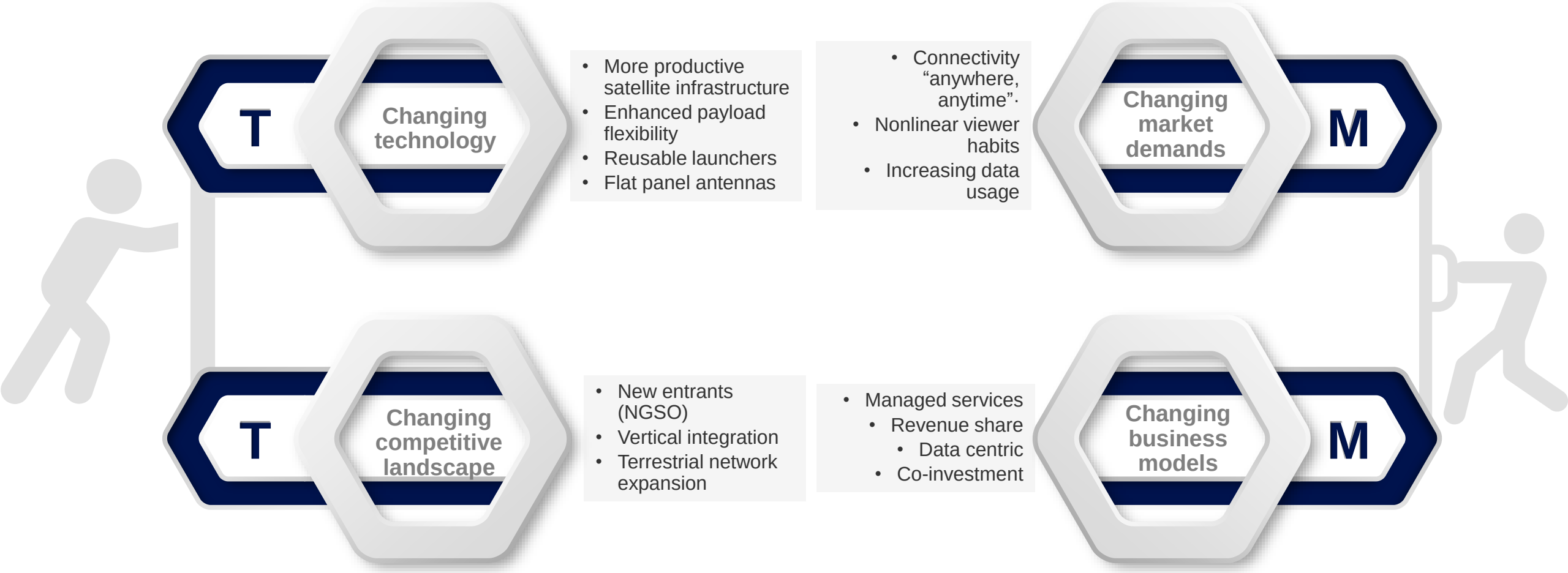
THE NEW SPACE FACTOR

Thinking space business out of the box

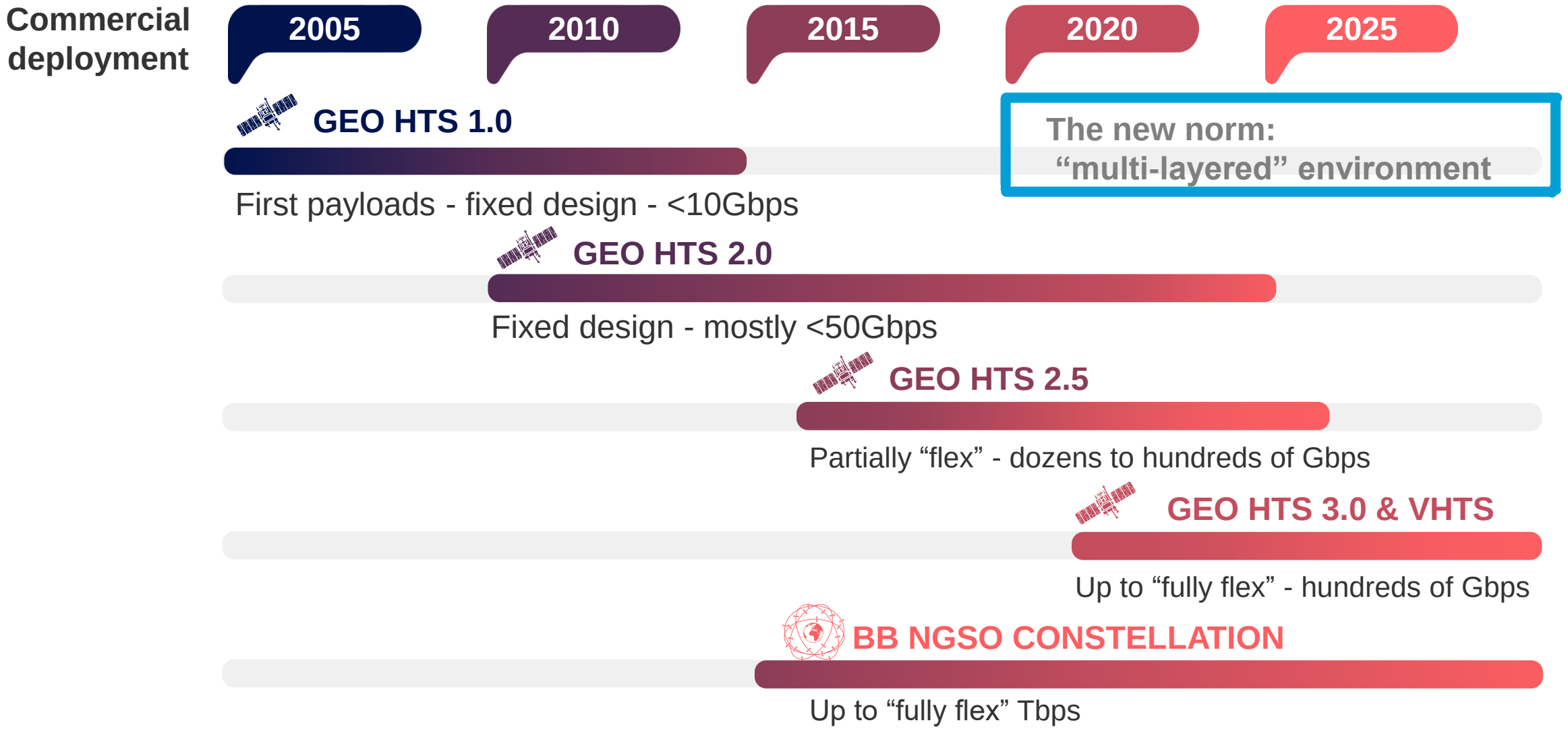
NEW SPACE		TRADITIONAL SPACE
Low-cost Model		High-cost, High-quality
Software Driven		Hardware Driven
Application Oriented	VS.	Techno Push
Standardization		Customization
Higher Tech. and Business Risks		Risk averse

Source Euroconsult

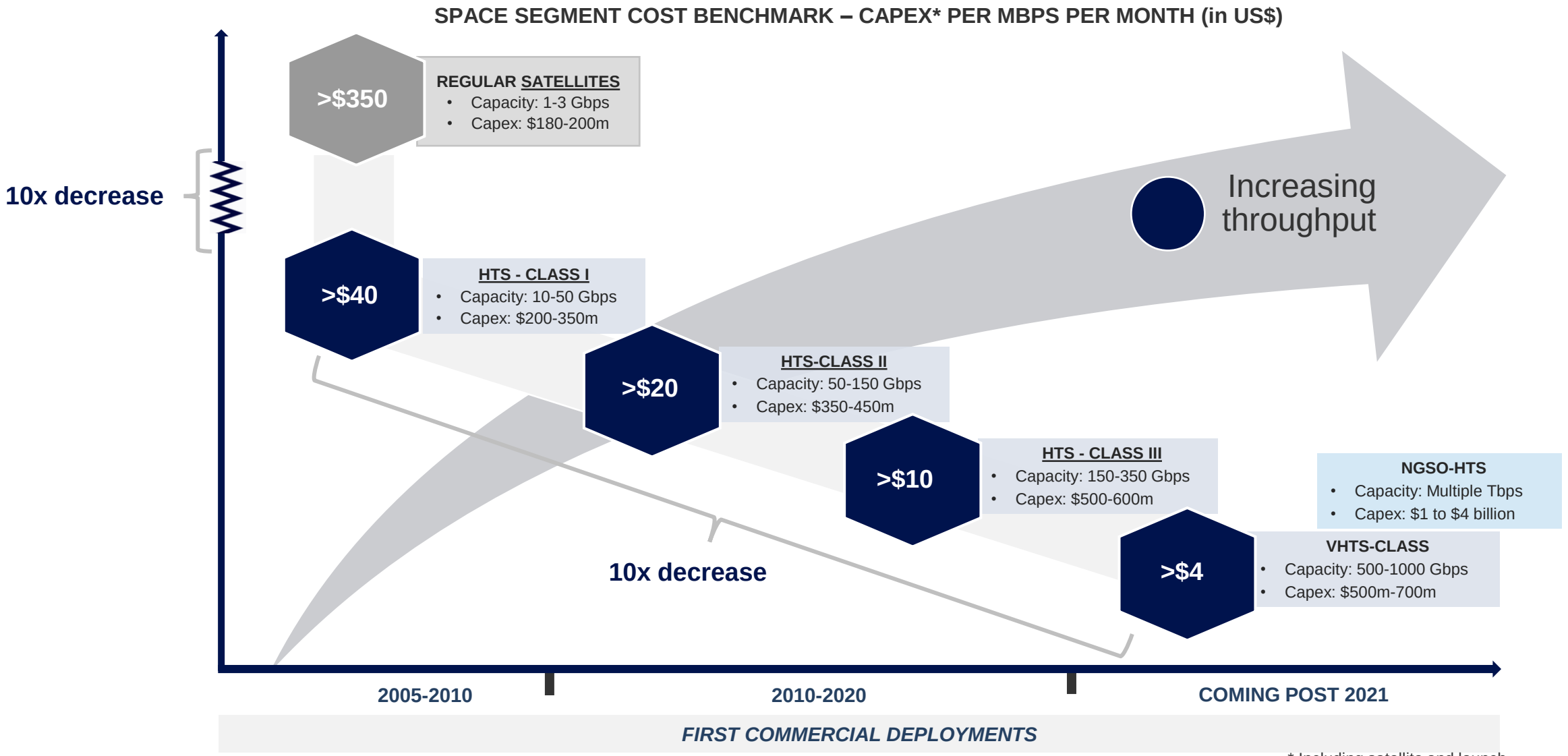
STRUCTURAL DRIVERS: TECHNOLOGY PUSH VS MARKET PULL



ACCELERATED CHANGES IN THE ECOSYSTEM

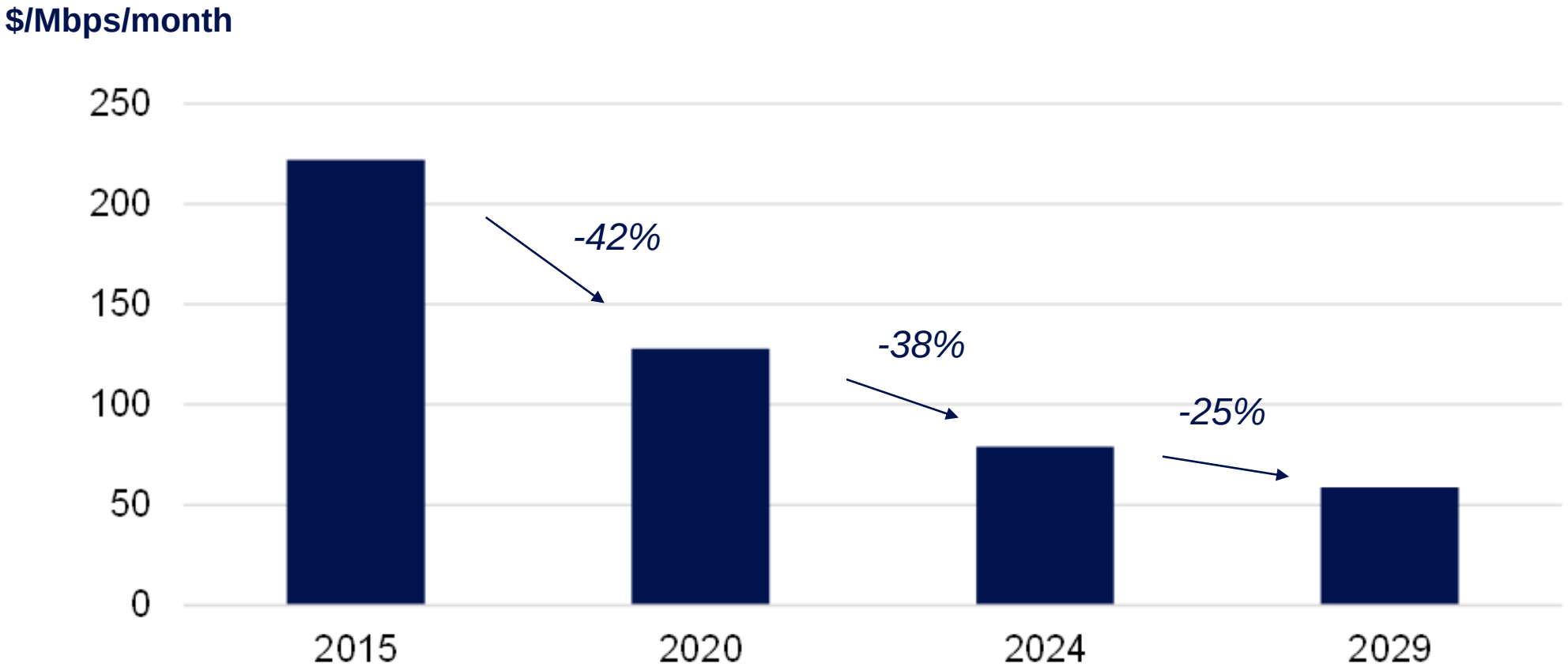


ENABLING LOW COST AND HIGH THROUGHPUT CAPABILITY



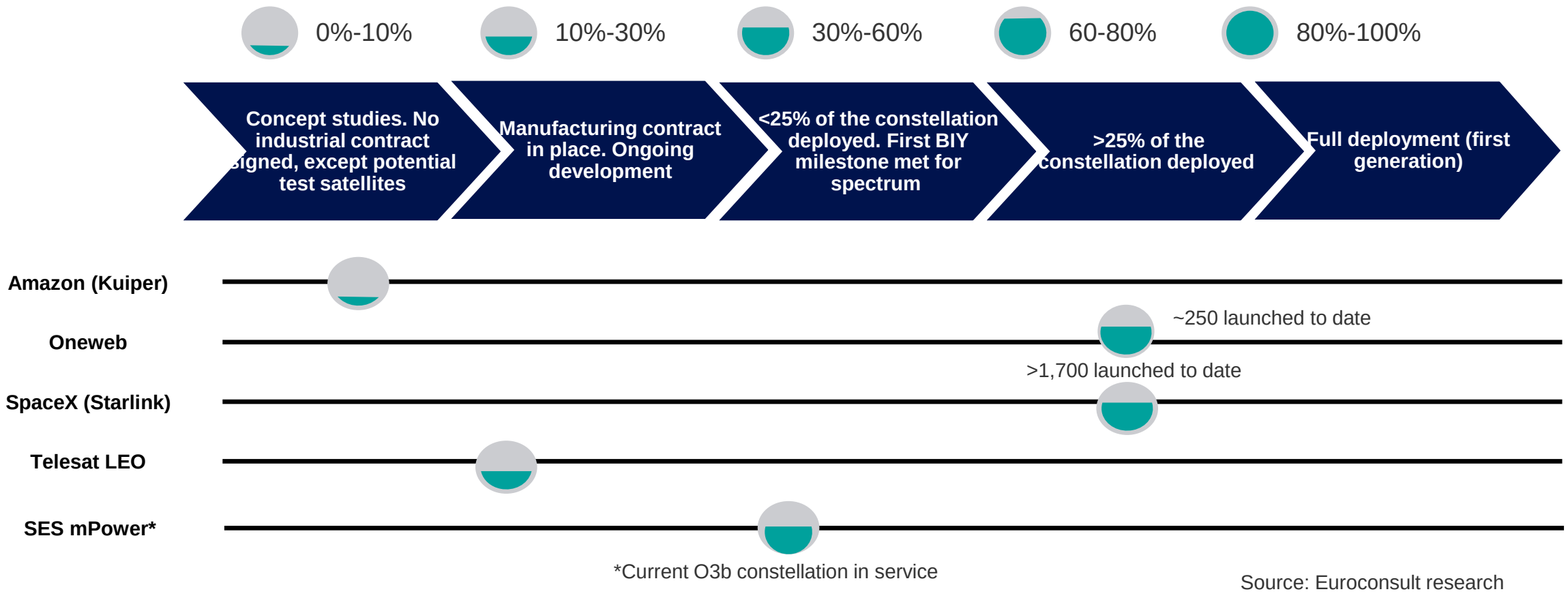
* Including satellite and launch

CAPACITY ARPU TREND FOR UNIVERSAL BROADBAND ACCESS



NGSO CONSTELLATIONS: DEPLOYMENT STATUS

CONSTELLATION DEPLOYMENT STATUS



Source: Euroconsult research

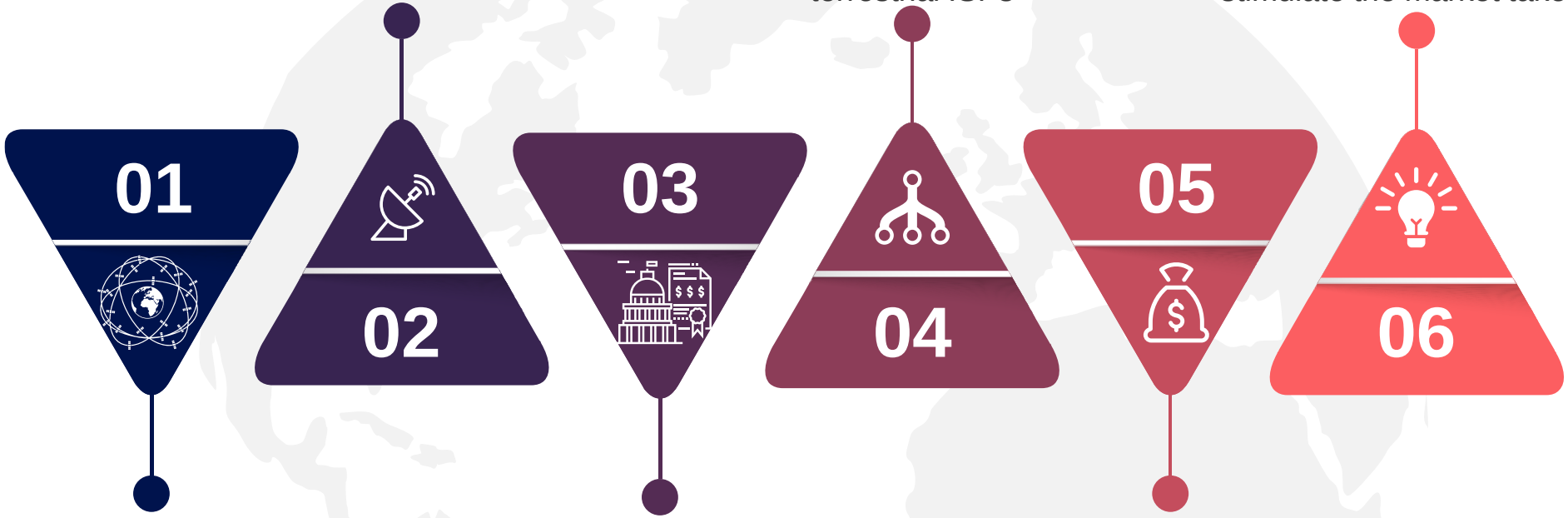
SATELLITE ON A MISSION: BRIDGE THE DIGITAL DIVIDE

TOP 5 CONDITIONS TO UNLOCK THE BROADBAND OPPORTUNITY

TERMINAL ENABLER
Advances in user terminal technology and cost points

NETWORK INTEGRATION
Closer integration of satellite connectivity in the networks and distribution channels of terrestrial ISPs

ADOPTION OF NEW SALES MODEL
Operators to use new sales models (subsidize equipment, revenue share, co-investment) to stimulate the market take-up



SUCCESS OF NGSO PROJECTS
Multiple NGSO broadband constellations reaching full operational status

SUSTAINABILITY IN USO MISSIONS
Continued growth in government support through USO funding/initiatives

LOWER COST BASE
Drops in the cost base of satellite capacity to be translated into lower capacity price

Muchas Gracias

Дякую

Danke

Merci

谢谢

شكرا

Thank you

спасибо

Շնորհակալություն

ありがとうございました

Euroconsult

France · USA · Canada · Japan · Singapore

reports@euroconsult-na.com

July 9th, 2021

CHINA SATCOM
PROFILE

- China Satcom (China Satellite Communications Co. Ltd.), subsidiary of China Aerospace Science and Technology Corporation (CASC)
- Satellite Operator with 14 Satellites in orbit

CHINA SATCOM
中国卫通
China Satcom
Connecting you with the world!

By: Chen Wensheng
Vice President
China Satellite Communications Co., Ltd.

Airborne and Maritime Service

In-Flight Network Connection

Internet Service for Passenger

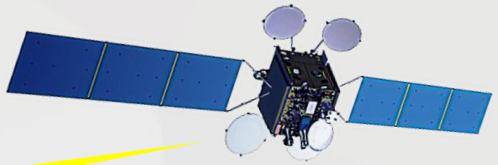
Cockpit Communication

E-Commerce and Entertainment Platform

Flight Management Platform

Providing enterprise customers with various services via maritime management platform : Vessel status, track, location, IP traffic, hull and cabin monitoring and other IoT services.

Emergency Communication



Emergency Communication Platform

Aero Terminal

Satcom Terminal

Fixed

Bag-pack

Vehicle based in mobile and fix

Terrestrial Terminal

Opportunity for Satellite Connectivity

- Technology Innovation bring satellite more flexibility
- From Space Capacity Only to Vertical Application
- Satellite Business Platform based design connect people easier
- Create product differentiation


CHINA
SATCOM
THANK YOU

Opportunities of Satellite Connectivity

Moderated by

Jorge Ciccorossi

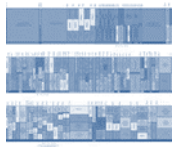
Space Systems Coordination - ITU

Facts and Figures on Space Services - 2021

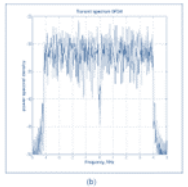
50+ years of Space Regulation

68 Members States with access to Space Resources

1700 Satellite Networks Operating



4 THz Global Spectrum Coordinated and Recorded



99.94% Spectrum Free of Harmful Interference Reported to ITU

< 0.1 % Interference Variation per year

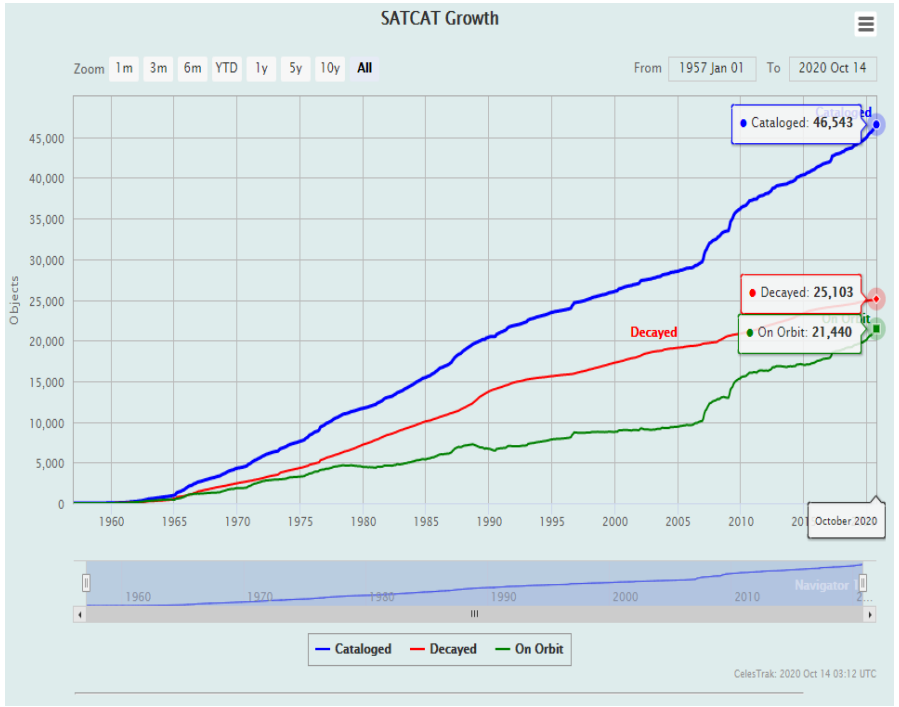
$ Space Economy

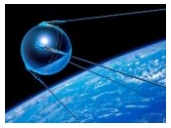
400 Billions Today

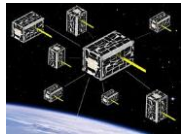
Source: spacefoundation.org

1.1 Trillions by 2040

Source : Morgan and Stanley

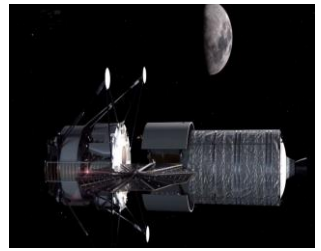






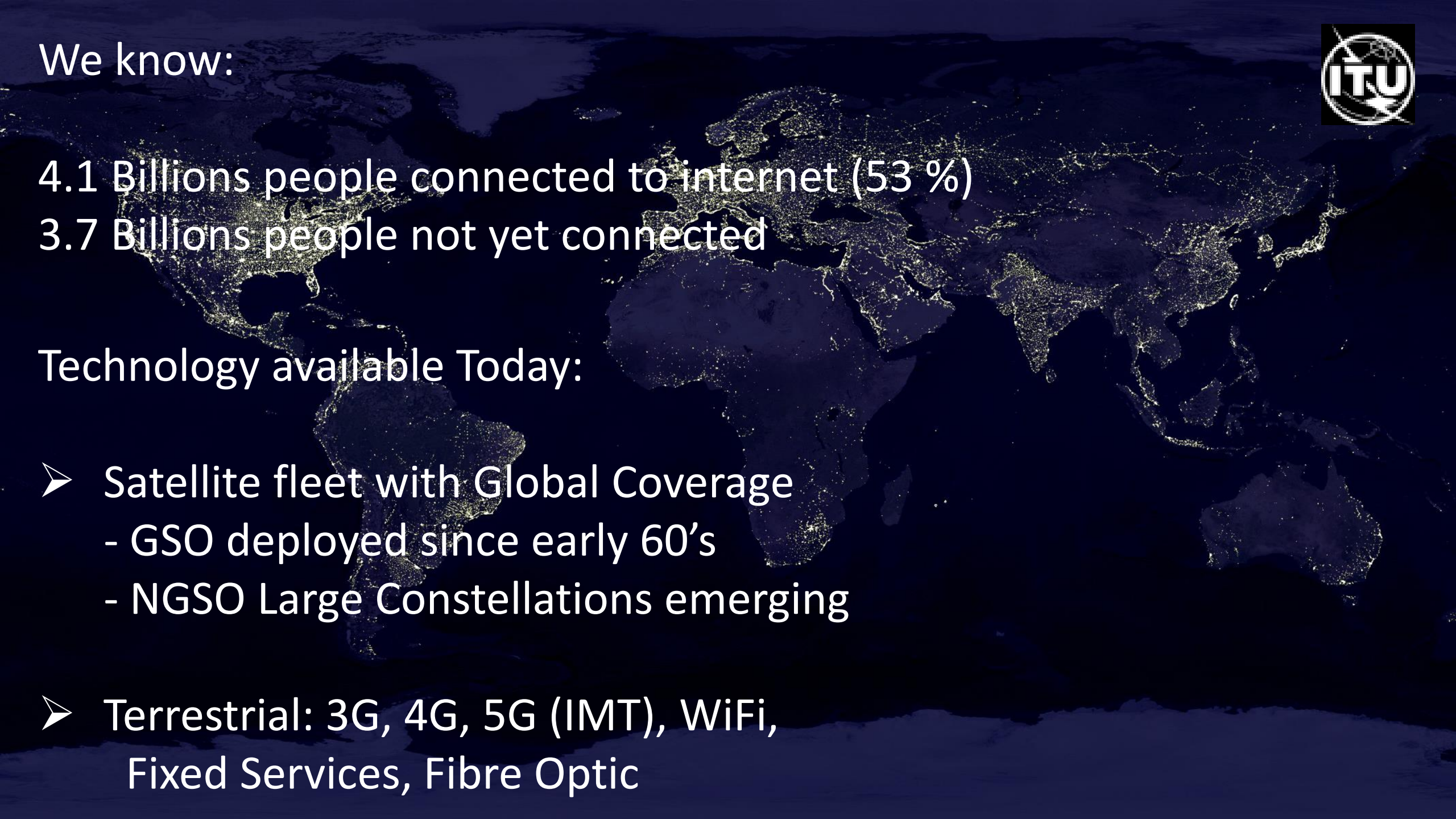
Sputnik-1 (URRS) Telstar-1 (USA) HTS GSO Cubesats

1957 2021



Multicountry Projects to the Moon and Beyond

NGSO Large Constellations for Broadband Applications



We know:

4.1 Billions people connected to internet (53 %)
3.7 Billions people not yet connected

Technology available Today:

- Satellite fleet with Global Coverage
  - GSO deployed since early 60’s
  - NGSO Large Constellations emerging

- Terrestrial: 3G, 4G, 5G (IMT), WiFi,
  Fixed Services, Fibre Optic

We'll discuss:

4.1 Billions people connected to internet (53 %)
3.7 Billions people not yet connected

Technology available Today:

- Satellite fleet with Global Coverage
  - GSO deployed since early 60's
  - NGSO Large Constellations emerging

- Terrestrial: 3G, 4G, 5G (IMT), WiFi, Fixed Services, Fibre Optic

Why ?

What else can we do to connect the unconnected?

- Spectrum availability
- New Technologies
- Licensing
- Policies
- Regulations
- Incentives
- Investment
- Affordability

Emerging technology for connectivity

Accelerating digital transformation in LDCs, LLDCs and SIDS

Dominic HAYES
EUROPEAN COMMISSION
European Union Space Programme

09 July 2021

EU Secure Space-based Connectivity System

Europe must launch a third major space project: a connectivity project through a constellation in low orbit making it possible to put an end to coverage dead zones in Europe

Ensure European strategic autonomy, resilience and technological sovereignty

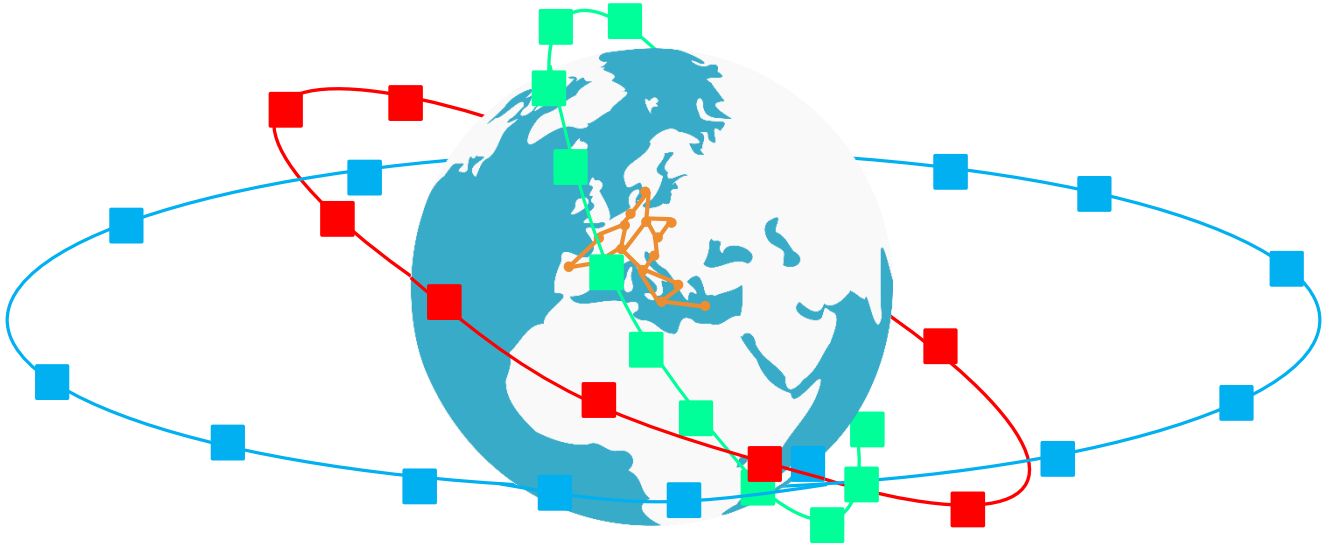
Strengthen Europe's ability to be a global leader

Fuel an innovative and competitive European industrial ecosystem

European Commission | DEFIS

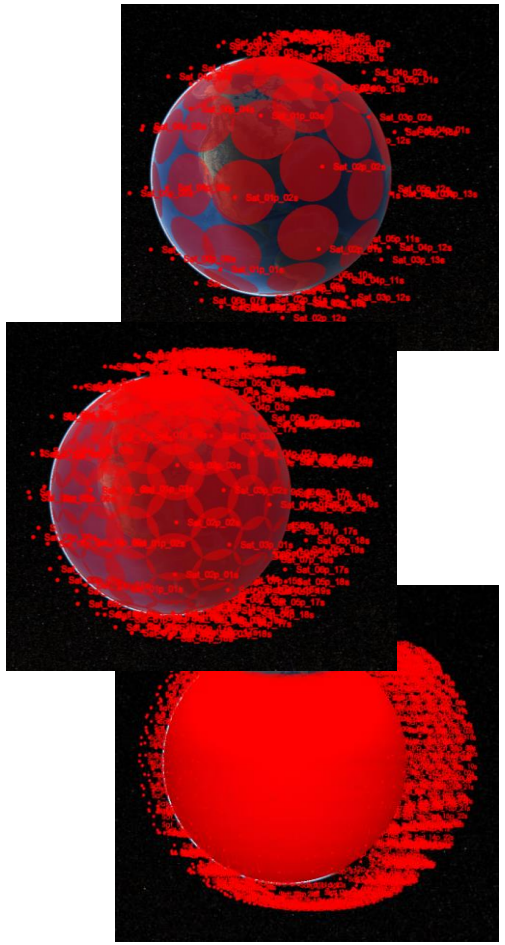
A Multi-orbital Architecture

- Based on existing EU GEO capabilities
- Adds LEO/MEO components
- Governmental and Commercial applications
- Initially European and African coverage, then global
- Emphasis on security
  - Designed-in, not add-on
  - Quantum technologies



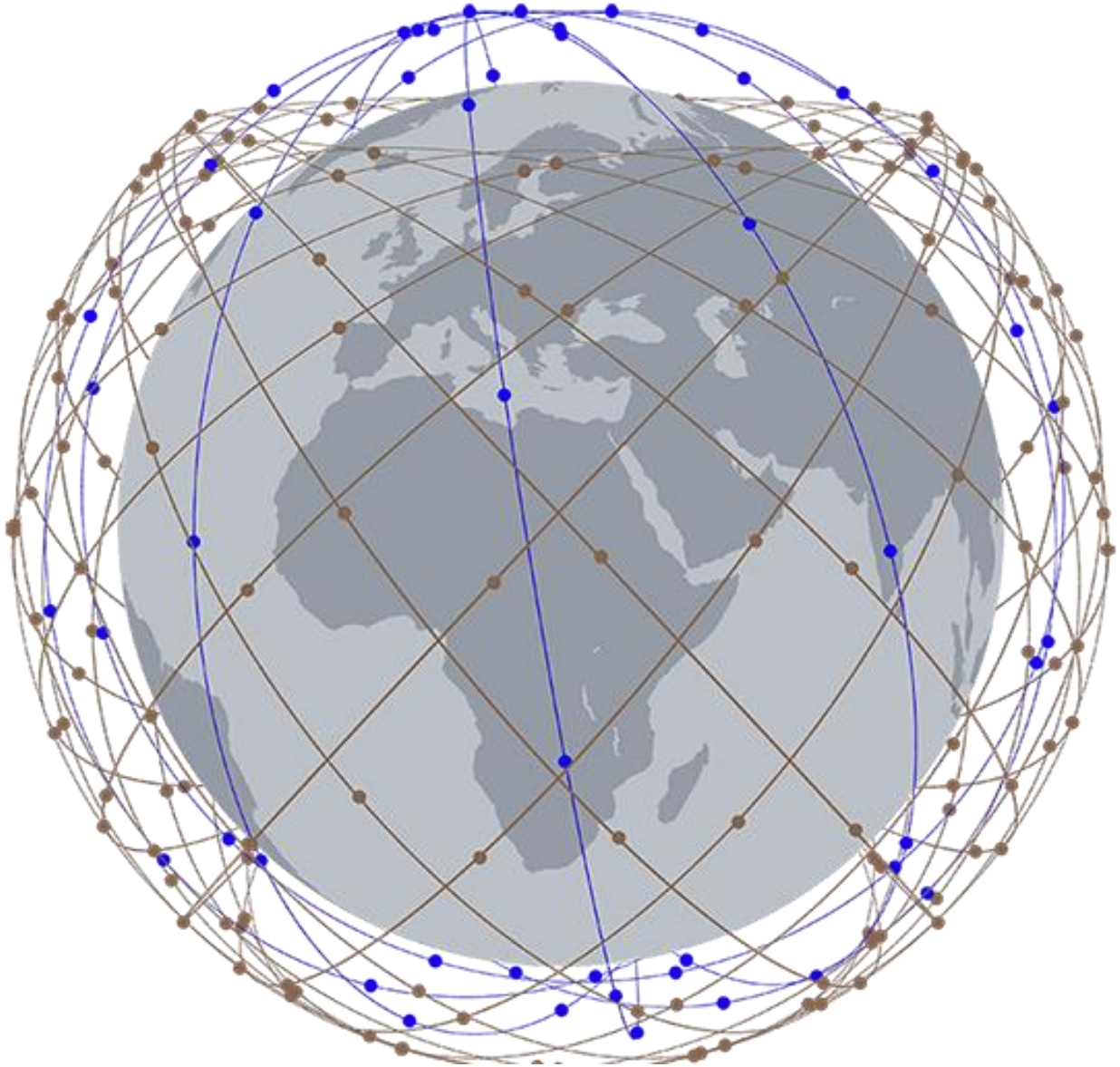
Helping to Ease Connectivity Gaps

- Even though focussed on European markets and users, the European system will have spare global capacity
- Adds to growing list of space assets serving internet access markets
- GEO component proven cost effective solution for internet access
- MEO/LEO adds low latency/capacity enhancements
  - Not needed for all requirements
- Receiver cost critical to success
  - Currently large GEO – MEO/LEO cost gap
- Regulators can help by easing access for satellite signal ‘landing rights’



City quality Internet everywhere

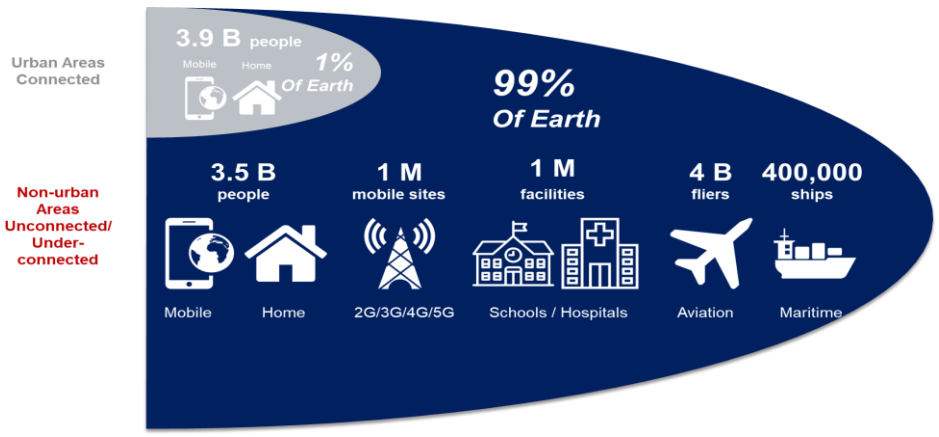
TELESAT LIGHTSPEED™



9th July 2021

Connectivity gap and the LEO (Low Earth Orbit) satellite solution

Half of the World's population and key market verticals lack high-speed internet*



Optimal solution with global LEO satellite coverage offering terrestrial fiber quality

High Speed
Gbps links

Low Latency
sub-50 msec

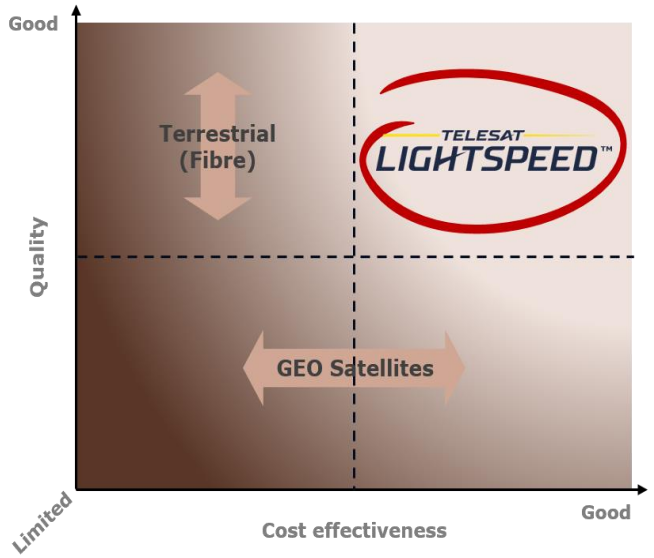
High Capacity
10s of Gbps to demand hotspots

Global
'Anywhere, Anytime'

Reliable
Unmatched Resilience, Interference resistance

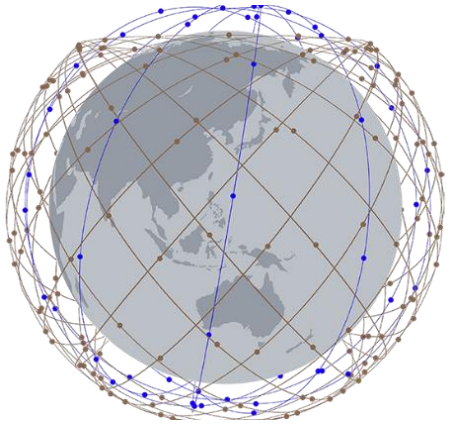
Ease of use
Quick service deployments, Programmable

Cost Effective
Transformational economics, Efficient usage



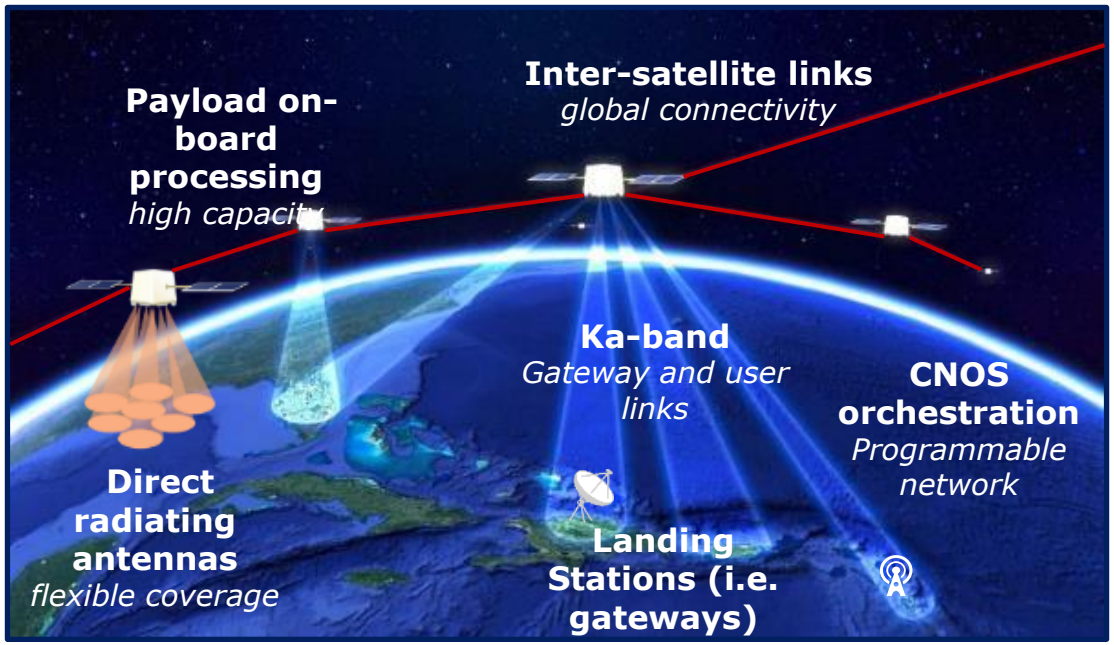
***Source:** UN, Global Rural Urban Mapping Project, GAMA, Marine Traffic, Cisco Virtual Network Index, 2017; Statista, ITU, GSMA, NSR, Telesat analysis; Note: 'Urban areas' have 300,000 or more inhabitants

Telesat Lightspeed: a highly innovative LEO global system



Polar Orbit

Inclined Orbit



- √ **298 satellite constellation** with optical inter-satellite links, full global coverage from pole to pole
- √ **78 polar satellites** in 6 orbit planes at 1,015 km and **220 inclined satellites** in 20 orbit planes at 1,325 km
- √ ~35 times closer to Earth than traditional satellites for **fibre-quality low latency**
- √ **~4 GHz Ka-band spectrum** (both user terminals and gateways) and ~135,000 agile beams to flexibly connect small to very large sites (few Mbps to multiple Gbps links)
- √ Multiple satellites and ground nodes for **resilient, always-on, quick and economic** connectivity to rural and remote areas
- √ **Flexible, state-of-the-art design** delivers most competitive unit economics
- √ **Scalable architecture,** addition of satellites will increase capacity deliverable by the network
- √ Orchestration via **Constellation Network Operating System (CNOS)**

How to facilitate and incentivize deployment of satellite systems

- **Governmental support schemes** towards universal connectivity via satellite
- **Streamline the licensing process** – no artificial barriers to entry
- **Blanket license** for user terminals with similar technical/operational characteristics (ubiquitous VSATs and ESIM – Earth Stations In Motion): i.e. no terminal-by-terminal licenses
- **Reasonable spectrum prices** (potential use of +4GHz of spectrum in Ka-band)
- Allow circulation of duly licensed **foreign visiting terminals** on a non-interference, non-protection basis
- **Availability of sufficient spectrum** (e.g. 28GHz band)
- **Support for related WRC-23 Agenda Items** that will facilitate the deployment of these emerging satellite technologies (e.g. WRC-23 AI 1.16)

Laura Roberti

Director, Spectrum and Market Access

lroberti@telesat.com
+41 798332996

9 July 2021

Telesat

160 Elgin Street, Suite 2100
Ottawa, Ontario, Canada
K2P 2P7
tel: +1 613 748 0123

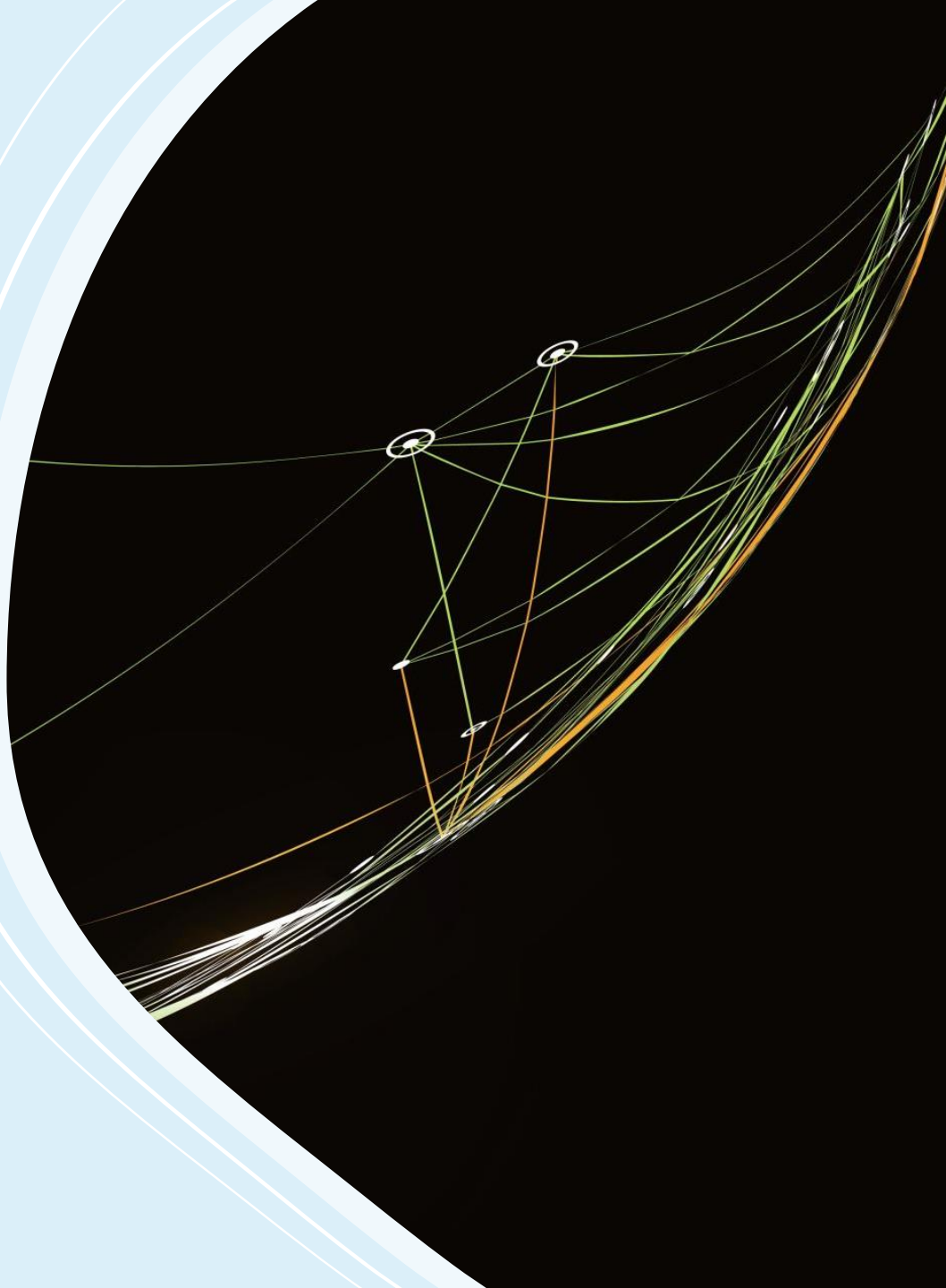
www.telesat.com

How to facilitate and incentivise deployment of satellite systems

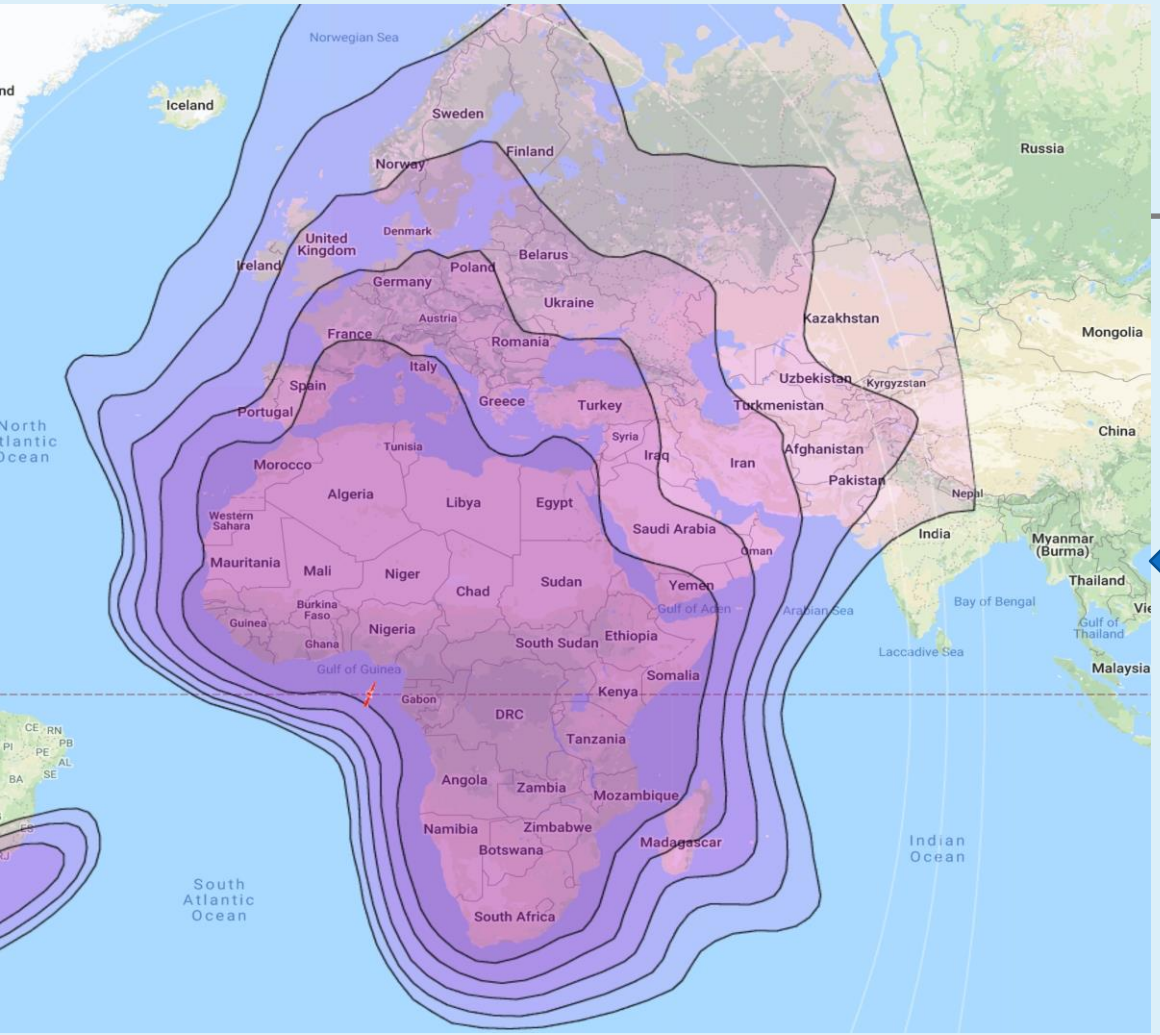
By

Georges kwizera

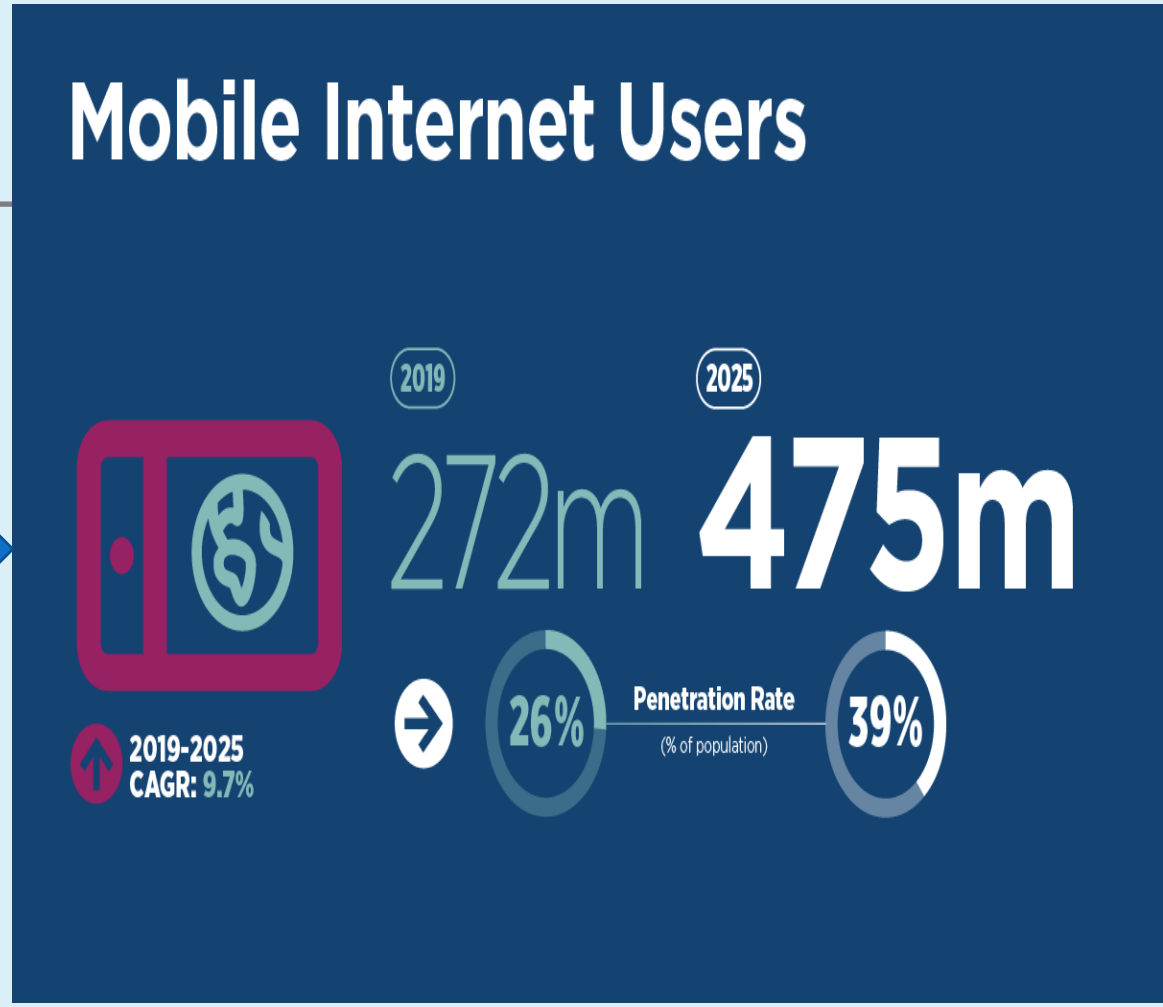
CTO-Rwanda Space Agency



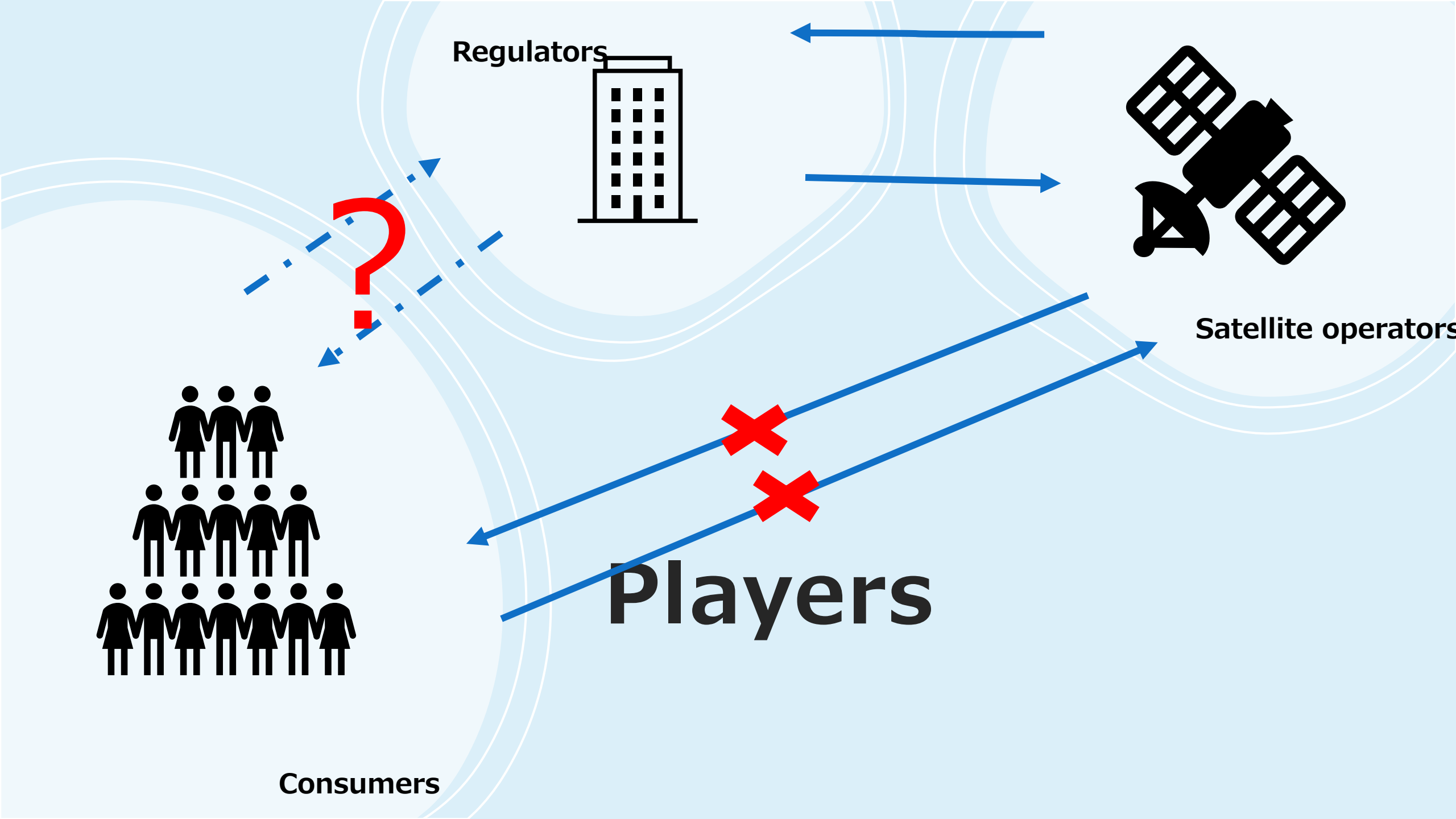
GAP



One SES sat coverage map



Source: GSMA Report


Regulators
Satellite operators
Players
Consumers

Looking forward to our discussions