

Connectivity in Central Asia

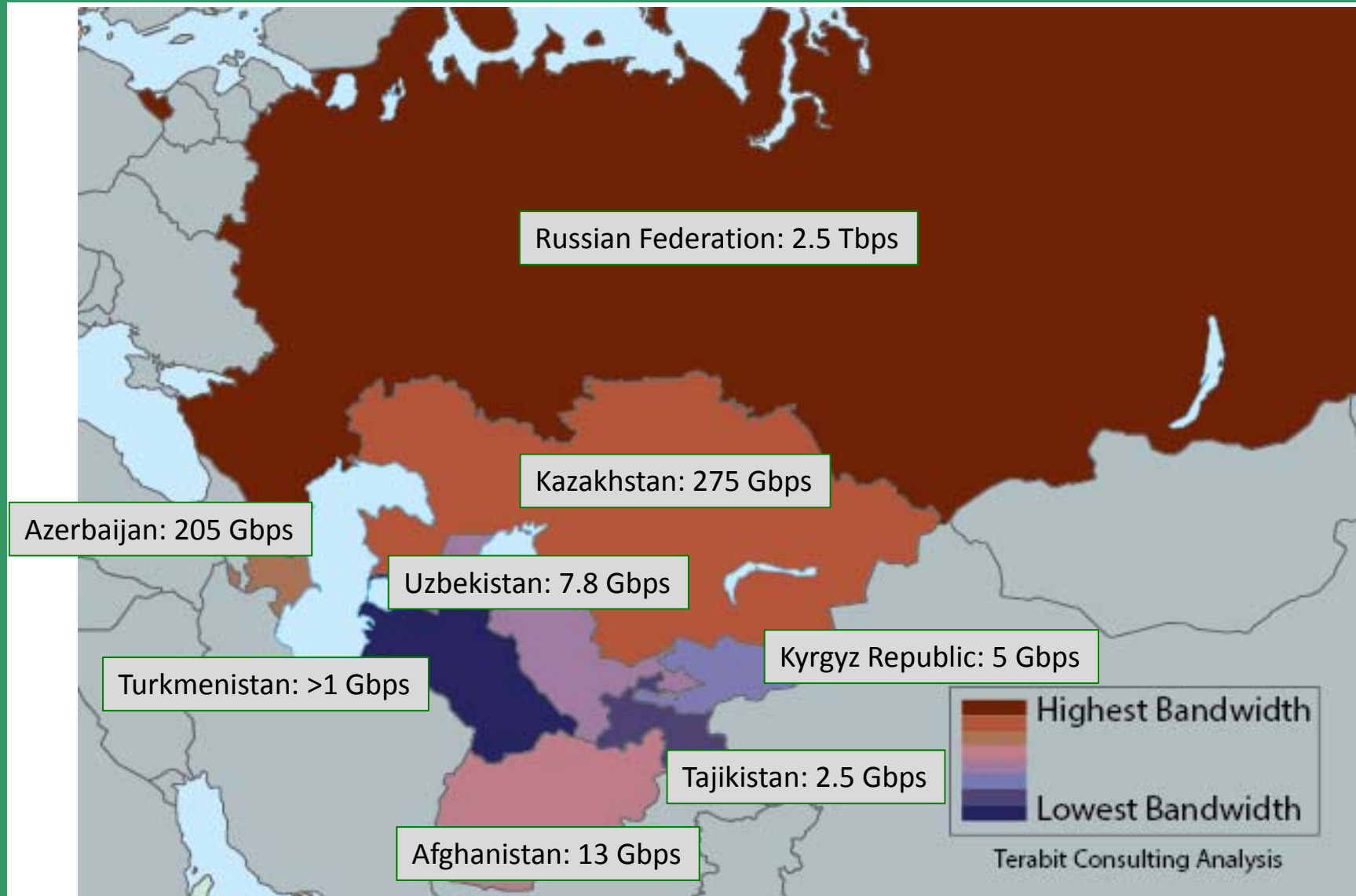
Markets, Infrastructure, and Policy Options for Enhancing Cross-Border Connectivity

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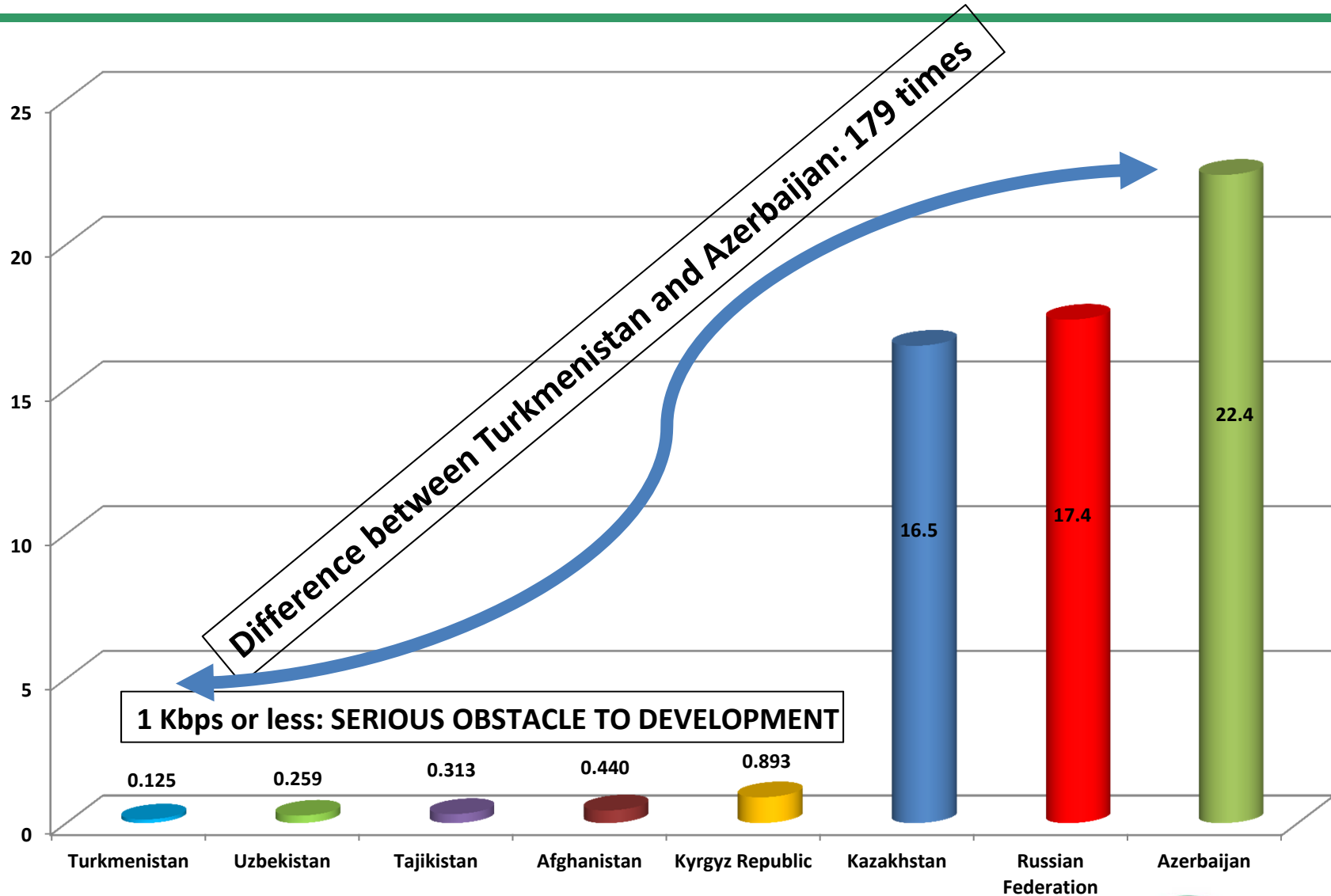
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Int'l Internet Bandwidth Heat Map, YE12



Int'l. Internet Bandwidth per Capita (Kbps)



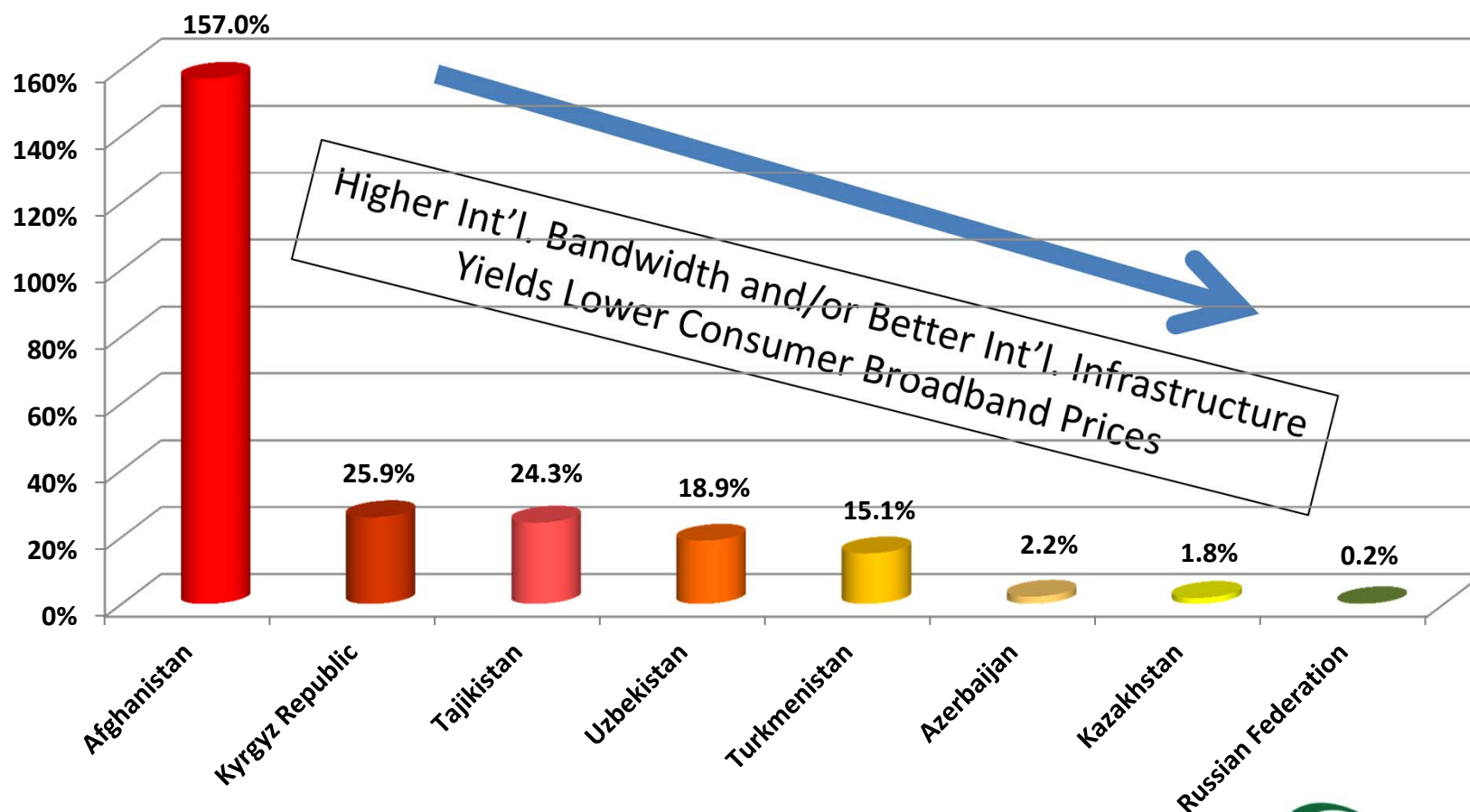
Why a Coherent, Open-Access, Cost-Effective Pan-Asian Fiber Infrastructure Would Benefit the Entire Region

Reason #1

In Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan, and Afghanistan the development of telecommunications and Internet services, as well as each country's overall economy, has been restrained as a result of weak international infrastructure.

Weak Int'l. Bandwidth Impacts Consumer Pricing

1 Mbps Broadband Connection: Annual Subscription + Installation as a % of Per-Capita GDP



Reason #2

Despite their developed international connectivity, the three wealthiest markets in the study (Azerbaijan, Kazakhstan, and Russia) would greatly benefit from improved pan-regional terrestrial fiber.

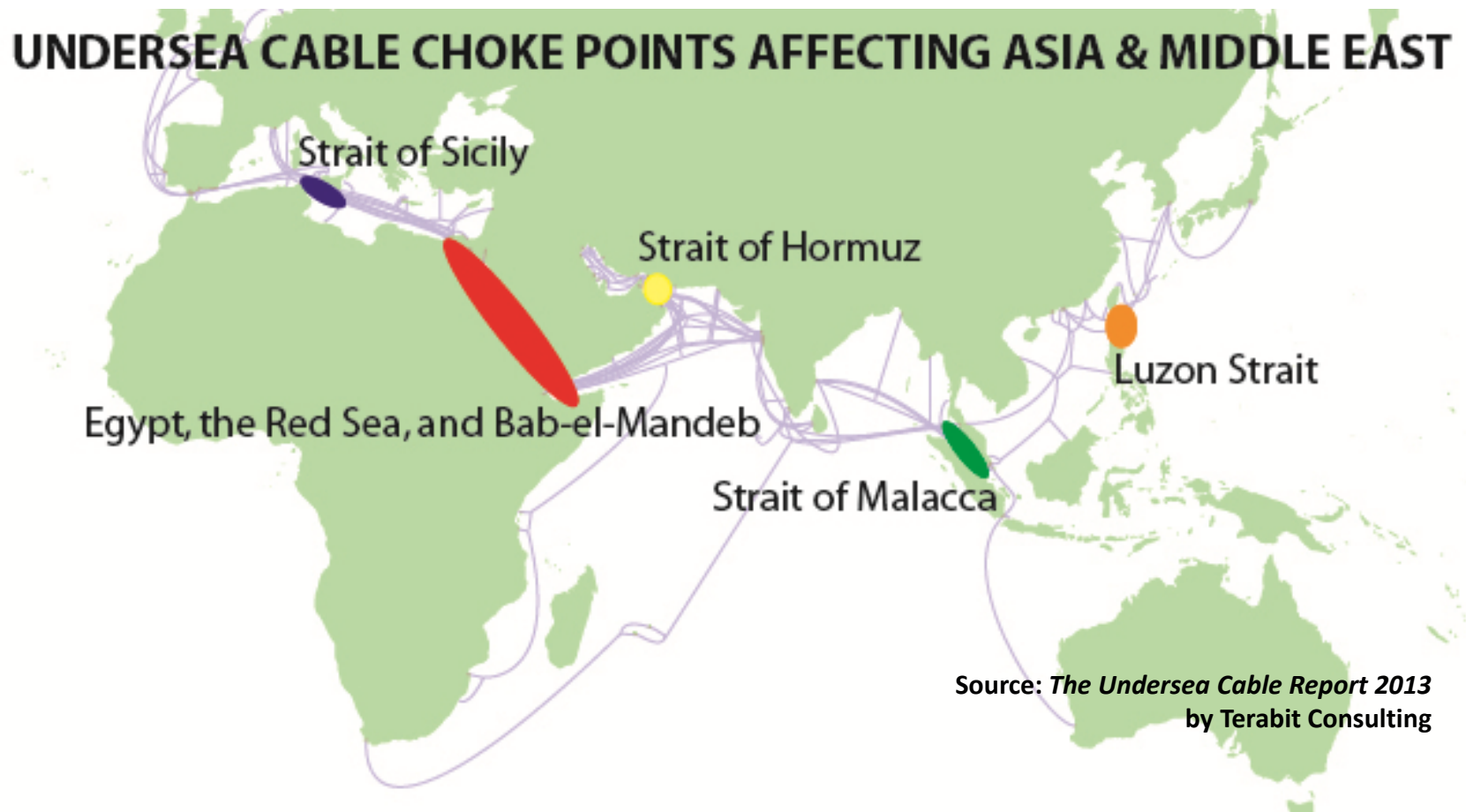
Why a Coherent Pan-Asian Infrastructure Would Benefit the Region

Reason #3

Coherent pan-Asian terrestrial fiber optic infrastructure would help address one of the international bandwidth industry's most pressing concerns, namely the lack of reliable, cost-effective Europe-to-Asia bandwidth.

In financial terms, the viability of constructing coherent pan-Asian terrestrial fiber optic connectivity can likely be guaranteed by capturing even a small portion of bandwidth demand between Asia and Western Europe.

Terrestrial as a Solution for Submarine



The global telecommunications industry is desperate for a cost-effective solution that would avoid undersea choke points.

Europe-Asia submarine cables carry >10 Tbps

The Case for Installing a Terrestrial Pan-Asian Fiber Optic Network Along Linear Rights-of-Way

International Highway & Rail Infrastructure



- In the near-term, many of the countries in the region will be upgrading existing highway and rail infrastructure and installing new links
- Simultaneous installation of high-capacity fiber and ducts would be a negligible marginal cost in most projects

Principles to Guide Network Development

Principles to Guide Future Network Development

1. Fully integrated and coherent

- Mesh configuration to allow for in-network healing in the event of physical cable outages or political instability affecting connectivity in specific countries.

2. Functioning and monitored as single, uniform network

- Existing multi-national terrestrial networks cannot offer uniform quality-of-service guarantees between endpoints (as good as “weakest link” or “weakest operator”).

3. Leveraging existing linear infrastructure

- Right-of-way procurement and uniform construction techniques would be enabled through the use of the Asian Highway network, Pan-Asian Railway project, or power transmission networks.

Principles to Guide Future Network Development

(Continued)

4. Cost-effective

- With suitable transmission capacity and fiber count, a pan-regional terrestrial fiber network could compete effectively with submarine cable on both a regional and intercontinental basis.

5. Open access and non-discriminatory pricing

- In order to achieve development and policy goals, as well as to serve the region's consumers, all purchasers of capacity must be able to access the network on an equal, non-discriminatory basis.

6. Developed and managed by a Special Purpose Vehicle (SPV)

- SPV shareholding would ensure the neutrality and efficiency of the network
- Allows participation by all stakeholders while still maintaining arm's-length terms over all capacity sales and leases.

Gaining Traction for the Project

Convincing Governments of the Project's Advantages

1. Benefits to consumers

- Better, more cost-effective connectivity in the region will greatly reduce consumer prices in less developed markets and improve broadband reliability throughout the region.

2. Economic growth

- Improvement in ICT infrastructure yields:
 - Increased demand for the output of other industries (demand multiplier)
 - New opportunities for production in other industries (supply multiplier)
 - New goods and services for consumers (final demand)
- It also increases firms' innovation capabilities and increases the probability of new products, innovations, and organizations

Convincing Governments of the Project's Advantages

(Continued)

3. Increased government revenue

- Growth in economic output from ICT investment results in greater tax revenue
- Increased employment in the telecommunications sector
- Greater collections from telecom licenses and excise

4. Regional stability through better international and intercultural relations

- More efficient routing of trans-border traffic would encourage trans-border initiatives in the education, healthcare, and research sectors that would not otherwise be possible.

Specific Policy Recommendations

- 1. Identify and involve key international, public-sector, and private-sector stakeholders early on**
- 2. Encourage greater regional cooperation in the telecommunications and Internet sectors**
 - with specific focus on the coordination of fiber optic network development and investment, as well as pan-regional harmonization of telecommunications and Internet regulation and markets
- 3. Harness the potential of international connectivity by eliminating competitive and technological obstacles that may hinder its full exploitation**
 - e.g. unfair control of international gateways, backhaul, and access networks
- 4. Leverage the efficiencies of linear infrastructure for fiber network development**

Specific Policy Recommendations (Cont'd.)

- 5. Urgent need to synchronize fiber deployment with improvements in linear (highway/rail) infrastructure**
 - Using ESCAP to amend the Asian Highway and Trans-Asian Railway Agreements
- 6. Ensure that trans-border fiber infrastructure promotes competitive markets, open access, and non-discriminatory pricing**
- 7. Improve the collection of and access to statistics and intelligence and encourage more detailed analysis in order to ensure that policy decisions can be based on the most authoritative research available.**

Ракмет!



**Intelligence, Analysis, and Forecasting
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