

# The Global Submarine Cable Market and Its Impact on Indonesia's Connectivity Needs

Michael Ruddy  
Director of International Research  
Terabit Consulting



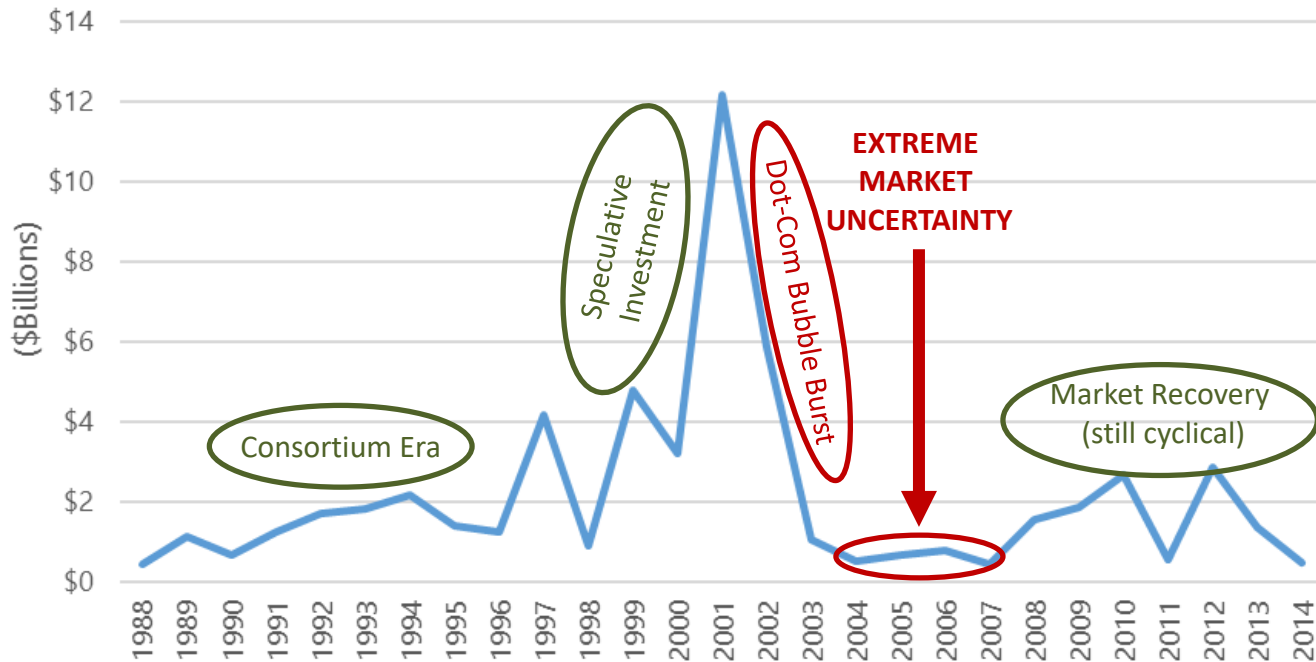
# Emerging and Less-Developed Markets: Key to the Growth of the Submarine Cable Market

- Submarine cables are the dominant means of international communications
  - Satellite only handles 0.5% of international traffic
- It is an optimal time for new investment
  - Unit costs have been constantly driven downward by technological advances
  - The industry's competitive environment has evolved considerably, with more attractive pricing from suppliers

# The Historical Evolution of the Global Submarine Cable Market

## New Submarine Cable Investment by RFS Date

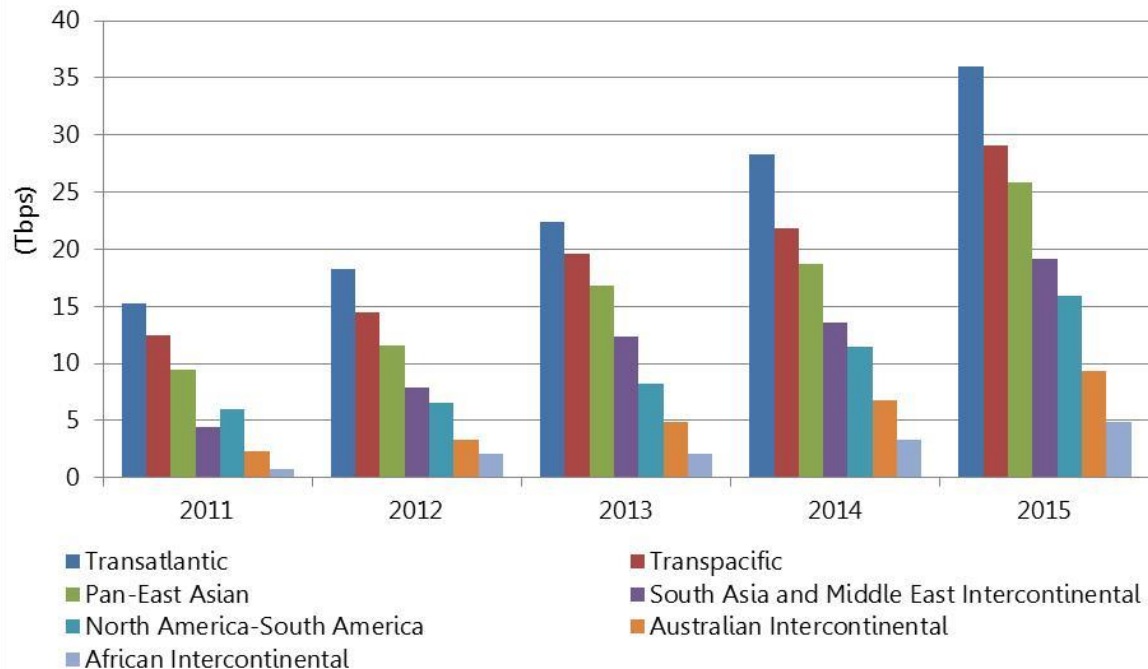
Source: 2016 Undersea Cable Report (Terabit Consulting)



# Global Bandwidth Demand, 2011-2015

## Intercontinental Bandwidth Demand, 2011-2015

Source: 2016 Undersea Cable Report, Terabit Consulting



Intercontinental submarine cable bandwidth has increased from ~50 Tbps in 2011 to ~ 140 Tbps in 2015 (30% CAGR)

Growth is highest in:

- South Asia & ME
- Southeast Asia
- Australia
- Latin America
- Africa

# Emerging and Less-Developed Markets: Key to the Growth of the Submarine Cable Market

- The submarine communications market is strong
  - Direct investment in new systems now averages \$1.5-\$2 bil & 35k km/yr.
  - Upgrade market exceeds \$100 mil/yr.
- The recovery of the submarine industry has been driven largely by investment in developing markets and greenfield routes
  - driven by a new “development-oriented model of international fiber investment”

# A New Development-Oriented Model of International Fiber Investment

Private Investors

Governments

Multilateral  
Development  
Banks and Other  
IFIs

System and  
Equipment  
Suppliers

Network  
Developers

Fixed &  
Mobile  
Operators

ISPs

Content  
Providers

## PPP Structures

- SPV w/ Gov't. Sharehold
- SPV w/ Gov't Contribution
- BOT Concessions
- Project Mgmt. Contracts



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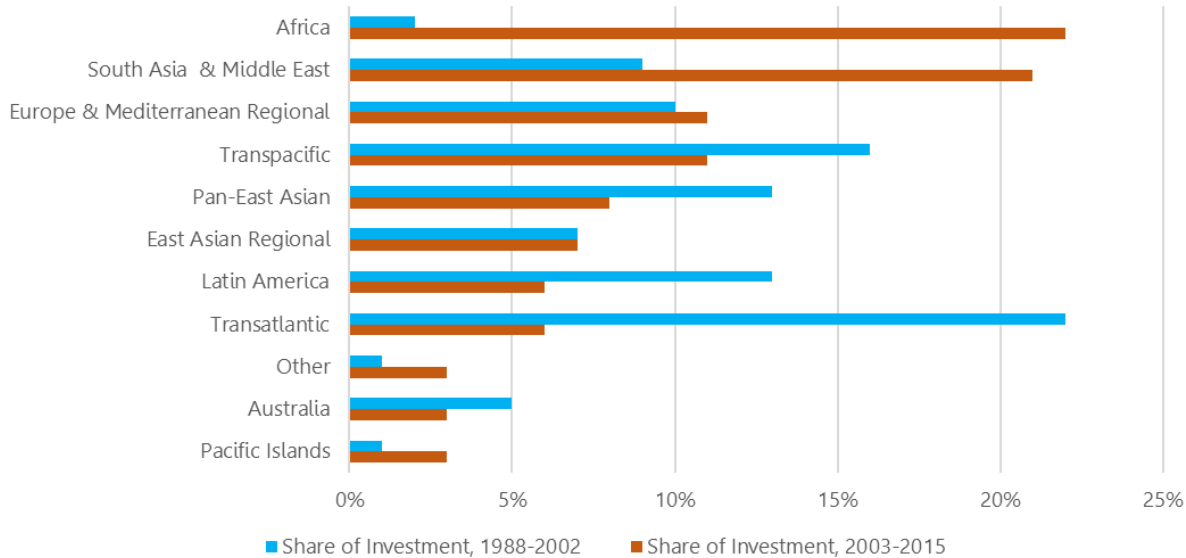
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Appropriate  
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Sensitive  
Solutions

# Realignment of Regional Submarine Investment toward Emerging and Less-Developed Markets

Regional Share of Total Investment in New Submarine Systems

Source: 2016 Undersea Cable Report (Terabit Consulting)



Since 2003, the share of investment serving less-developed and emerging markets has increased from 33% to more than 60%.

The largest gainers:

Africa

South Asia/Middle East

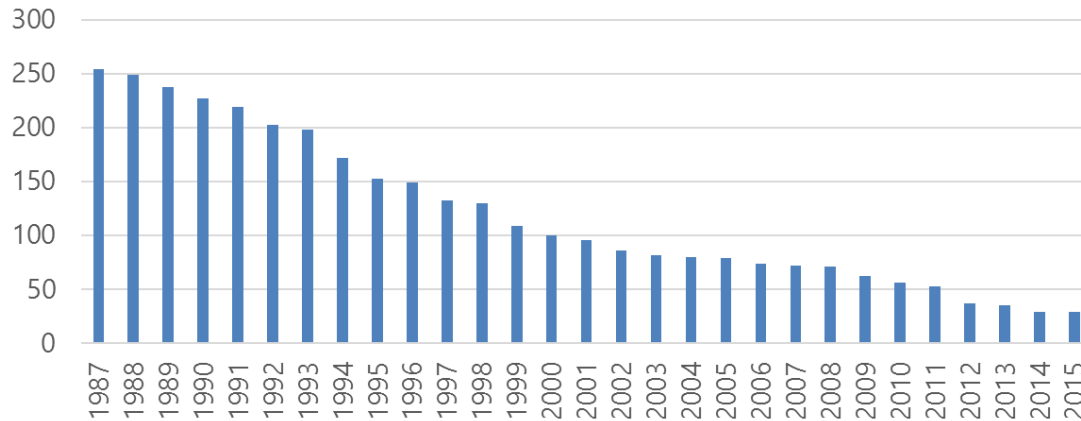
Caribbean

South Pacific

# Progress in the Expansion of International Fiber Connectivity to Unserved Countries

Countries & Territories without International Fiber Connectivity

Source: 2016 International Telecommunications Infrastructure Analysis (Terabit Consulting)



In nominal terms, the industry's efforts to connect the unconnected have been impressive.

Civilian-inhabited countries and territories unserved by fiber:

- 79 in 2005
- 29 in 2015

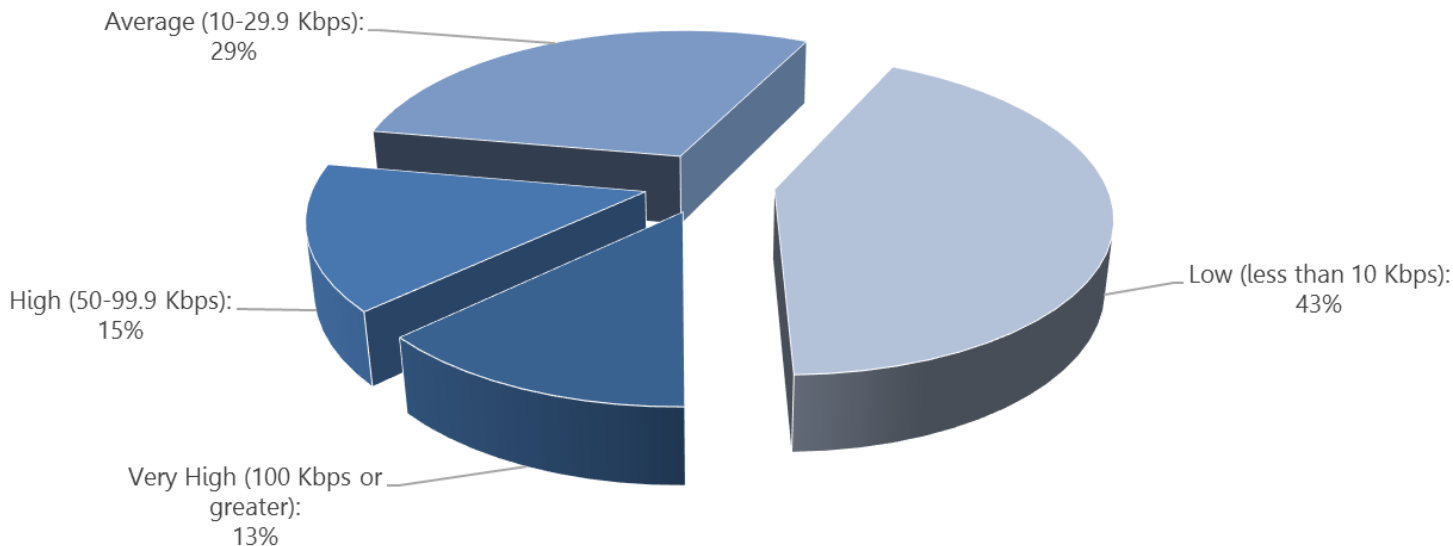
(0.5% of population)



# The Bandwidth Divide: 43% of Countries Have Insufficient Bandwidth

## Classification of Countries and Territories by International Bandwidth per Capita, 2015

Source: Terabit Consulting International Bandwidth Databank



## Average Per-Capita GDP of Countries and Territories in Each International Bandwidth Classification, 2015

Terabit Consulting International Bandwidth Classification, 2015	Average GDP per Capita, 2015 (PPP terms)
Very High (100+ Kbps)	\$45,776
High (50-99.9 Kbps)	\$38,582
Average (10-29.9 Kbps)	\$22,126
Low (<10 Kbps)	\$6,839

Source: Terabit Consulting International Bandwidth Databank

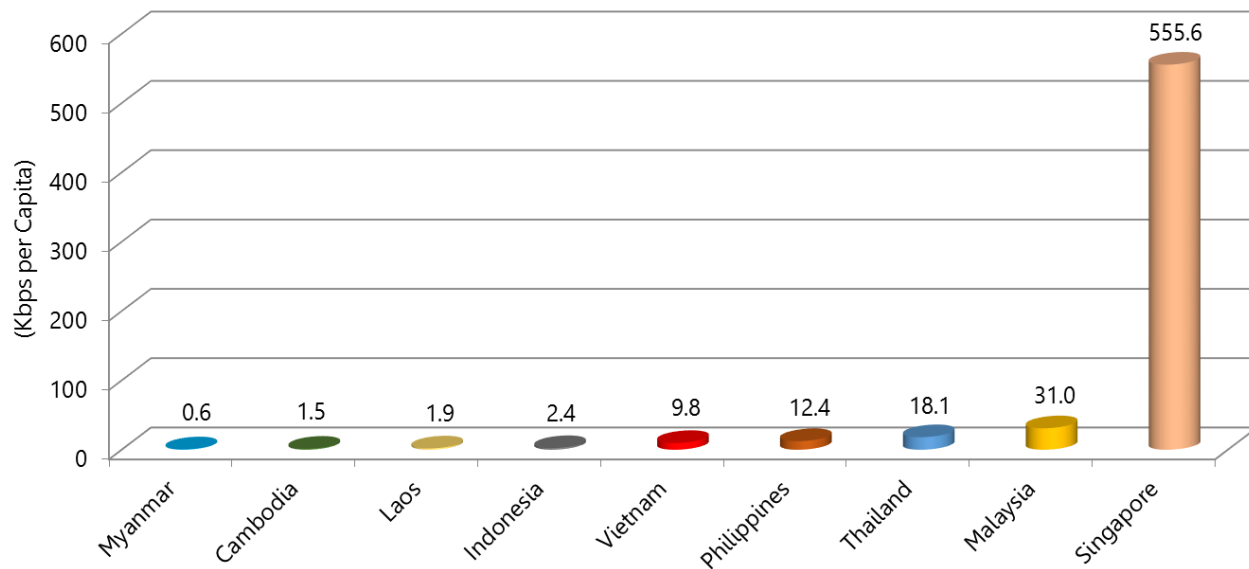
# The Economic Impacts of Weak Submarine Connectivity & Weak International Bandwidth

- A constrained telecom environment
  - High wholesale and consumer prices
  - Lower broadband penetration rates
  - Compromised services and applications with lower reliability and utility
- More importantly, at the macro level:  
a major obstacle to economic and human development
  - Detachment from the digital economy
  - Continued economic inefficiencies and restrained growth
  - Impediment to regional integration  
(submarine connectivity is crucial for ASEAN Single Telecommunications Market)
  - Lack of access to critical social development tools  
(telemedicine, distance learning, scientific/research networks)

# The ASEAN Bandwidth Divide

Per-Capita Bandwidth in ASEAN Countries, YE 2014

Source: An In-Depth Study on the Broadband Infrastructure in the ASEAN-9 Region (Terabit Consulting for UN ESCAP)

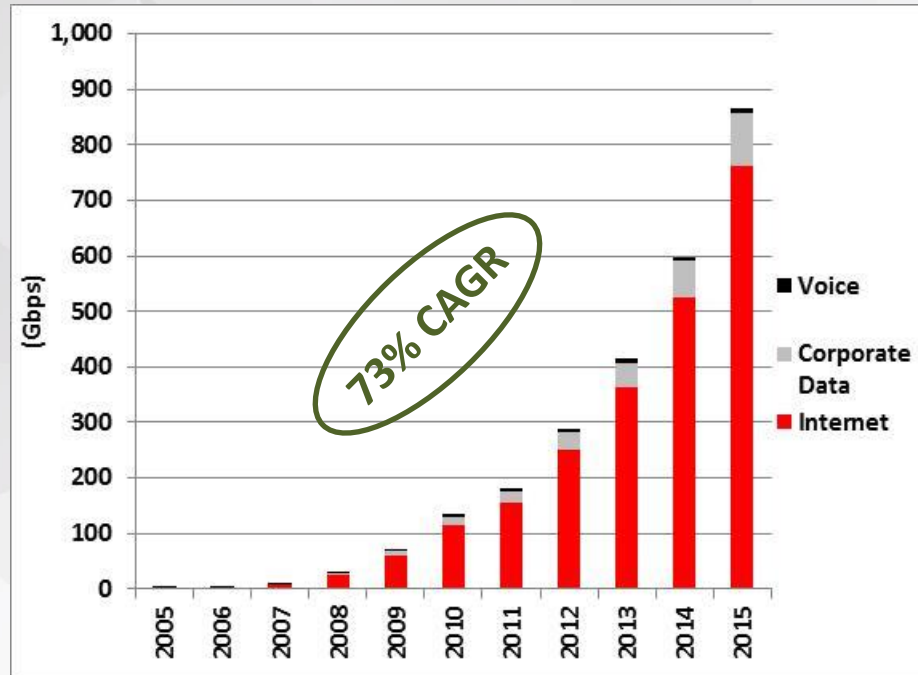


In the ASEAN region, the difference between the “bandwidth-richest” country and the “bandwidth poorest” country is 925x.

In more than half of countries, bandwidth is so low as to be a serious obstacle to overall development.

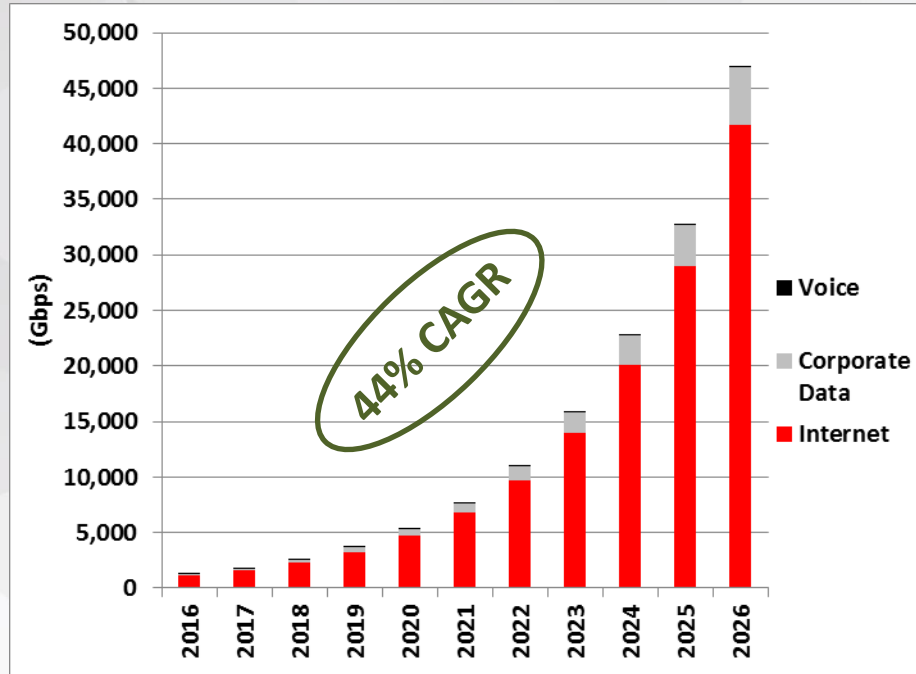
(based on Terabit Consulting threshold of <10 Kbps YE14)

# Indonesian International Bandwidth Demand, 2005-2015



Source: Terabit Consulting

# Indonesian International Bandwidth Demand, 2016-2026

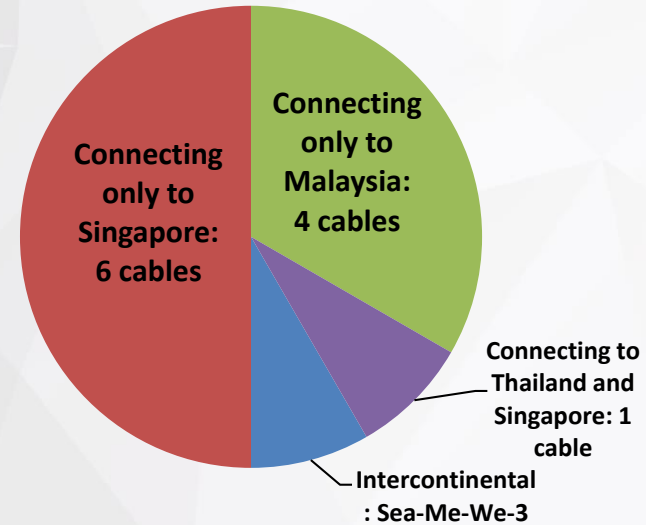


Source: Terabit Consulting

# Indonesian Int'l. Submarine Cable Connectivity

- 12 existing international cables, but only SMW3 provides intercontinental connectivity

Destination of Indonesian International Submarine Connectivity



- Of the remaining 11 cables:

- Six connect only to Singapore
- Four connect only to Malaysia
- One connects to Thailand and Singapore

- PT Telkom has historically been the country's leading submarine cable investor

- Operates cable stations for Sea-Me-We-3, TIS, DMCS, and BSCS
- PT Telkom is a major investor in AAG, but access is via BSCS in Singapore

- Six other Indonesian operators have submarine connectivity to Singapore and/or Malaysia

- PT XL Axiata, PT NAP Info Lintas Nusa, PT Mora Telematika, PT Indosat, PGASCOM, PT Ketrosden Triasmitra, (also Sacofa of Malaysia)

# Existing Int'l. Submarine Cable Connectivity in Indonesia

	RFS	Route Km	Financing Type	Owner(s)	Cost (\$Mil)	Lit. Capac. (Tbps)	Design Capac. (Tbps)
Sea-Me-We-3 (SMW3)	1999	39,000	Consortium	International consortium of carriers	\$1,300	0.480	1.920
Thailand-Indonesia-Singapore (TIS)	2003	1,077	Consortium	Communications Authority of Thailand (CAT) / PT Telekomikasi (PT Telkom) / Singtel	\$33	0.160	1.280
East-West Submarine Cable System (Indonesia-Malaysia)	2004	969	Government / Carrier	Sacofa Sdn Bhd (Sarawak State Gov't. / Celcom Malaysia)	\$30	0.160	9.600
Dumai-Melaka Cable System (DMCS)	2005	160	Bilateral carrier	PT Telekomunikasi (PT Telkom) / Telekom Malaysia	\$9	0.640	3.200
Batam-Rengit Cable System (BRCS) (Indonesia-Malaysia)	2007	63	Bilateral carrier	Telekom Malaysia / PT Excelcomindo (changed name to PT XL Axiata)	\$10	0.640	38.400
Matrix Cable System (Singapore-Indonesia)	2008	1,055	Investor	PT NAP Info Lintas Nusa (Indonesia) / Matrix Networks (Brantwood Int'l. / Causeway Bay Investments)	\$35	0.500	6.400
Moratelindo International Cable System-1 (MIC-1): Batam-Singapore	2008	42	Investor	PT Mora Telematika (also known as PT Moratel Indonesia or Moratelindo) / ViewQwest (Singapore)	\$12	0.600	1.280
Batam-Singapore Cable System(BSCS)	2009	70	Carrier	PT Telekomunikasi Indonesia (PT Telkom)	\$13	0.640	7.200
Jakabare (Java-Kalimantan-Batam-Singapore)	2009	1,330	Carrier	PT Indosat	\$40	0.160	3.200
PGASCOM Java-Sumatra-Batam-Singapore	2010	347	Hydro-carbon Industry	PGASCOM (PT PGAS Telekomikasi Nusantara) (subsidiary of Indonesian Gov't.-controlled PT Perusahaan Gas Negara)	\$20	0.160	38.400
Batam-Dumai-Malacca Cable System (BDM) (also known as Batam-Dumai-Melaka) (integrating plans for MoratelindoBatam-Dumai Cable (MBDC))	2011	380	Consortium	Telekom Malaysia / PT XL Axiata / PT Mora Telematika (also known as PT Moratel Indonesia or Moratelindo)	\$15	0.640	3.200
B2JS (Jakarta-Bangka-Batam-Singapore) (including PT Moratel's B3JS and PT Telkom's 3rd Route)	2012	761	Investor	PT Ketrosden Triasmitra	\$55	0.400	9.600

Source: Terabit Consulting

# Planned Int'l. Submarine Cable Connectivity in Indonesia

	Route Km	Financing Type	Owner(s)	Cost (\$Mil)	Design Capac. (Tbps)
Sea-Me-We-5 (SMW5)	20,000	Consortium	BSCCL / China Mobile / China Telecom / China Unicom / Etisalat / du / France Telecom-Orange / Myanmar Post and Telecommunication / Saudi Telecom Company (STC) / Singtel / SLT / Telekom Malaysia / Telecom Italia / Telin / TeleYemen / Trans World Associates (TWA) / Turk Telekom	\$422	24.000
SEA-US	15,000	Consortium	Globe Telecom, GTI Corporation, Hawaiian Telcom, PT Telekomunikasi, RAM Telecom International, Teleguam Holdings (GTA Teleguam)	\$250	20.000
Asia Pacific Express West (APX-West) (formerly Australia-Indonesia-Singapore Cable)	4,600	Investor	SubPartners	\$200	32.000
Australia-Singapore Cable (ASC)	4,800	Investor	Leighton Contractors Telecommunications (Australia-Singapore Cable Ltd.)	\$150	36.000
BIMP-EAGA Submarine and Terrestrial (BEST) Cable Project (also known as BES; formerly known as BIMP-EAGA Rink)	4,000	Government / Carrier / Investor	BEST Cable Corporation Pte Ltd (Brunei International Gateway Sdn Bhd / EA Trilink / Sabah Economic Development Corporation (Sabah State Gov't.), via its S.COMM subsidiary) / China National Technical Import and Export Corporation (CNTIC) / NMV Development (Canada)	\$353	24.000
Trident Subsea Cable	4,287	Investor	Trident Subsea Cable Pty Ltd.	\$360	8.600



# Indonesian Submarine Cable Market: Overview

- Total construction value of Indonesian international submarine cables to date: **\$1.6 billion**
- Planned construction value of Indonesian international submarine cables: **\$1.7 billion**
- Total value of domestic submarine cable investment in Indonesia: **\$700 million**

# Keys to the Continued Success of the Indonesian Submarine Cable Market

1. Public and private efforts to provide broadband connectivity to the entire archipelago
2. Healthy competition and appropriate regulation in broadband, telephony, and managed bandwidth markets
3. Leveraging of Indonesian submarine cable operators' extensive expertise
4. Ability of submarine suppliers to offer innovative, appropriate, and cost-effective solutions

# THANK YOU



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**Michael Ruddy**

Director of International Research

Cambridge Riverview Center  
245 First Street, 18th Floor  
Cambridge, Massachusetts 02142 USA

Tel.: +1 617 444 8605  
Fax: +1 617 444 8405  
mruddy@terabitconsulting.com

**[www.terabitconsulting.com](http://www.terabitconsulting.com)**