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Trends in submarine cable industry

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July 10, 2001

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Driving forces in the submarine cable industry

- Telecom liberalization…introducing competition
- Technology advancement:

  (# of fiber pairs) x (# of wavelengths) x (10Gbps)
- Lowered cost and price
- Demand growth: Internet; broadband last mile access
- Supply growth: new cable systems
- Private cables
- (Economic downturn)
- (Burst of dotcom bubble)
- (Difficult to raise money in financial market)

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Asia Pacific… catching up

- High growth of bandwidth demand
- Liberalization: slow but speeding up
- Fragmented markets
- Country by country different regulatory environments:
  - How to obtain landing right?
- Competing for regional telecom hub(s)
- Submarine cable licenses

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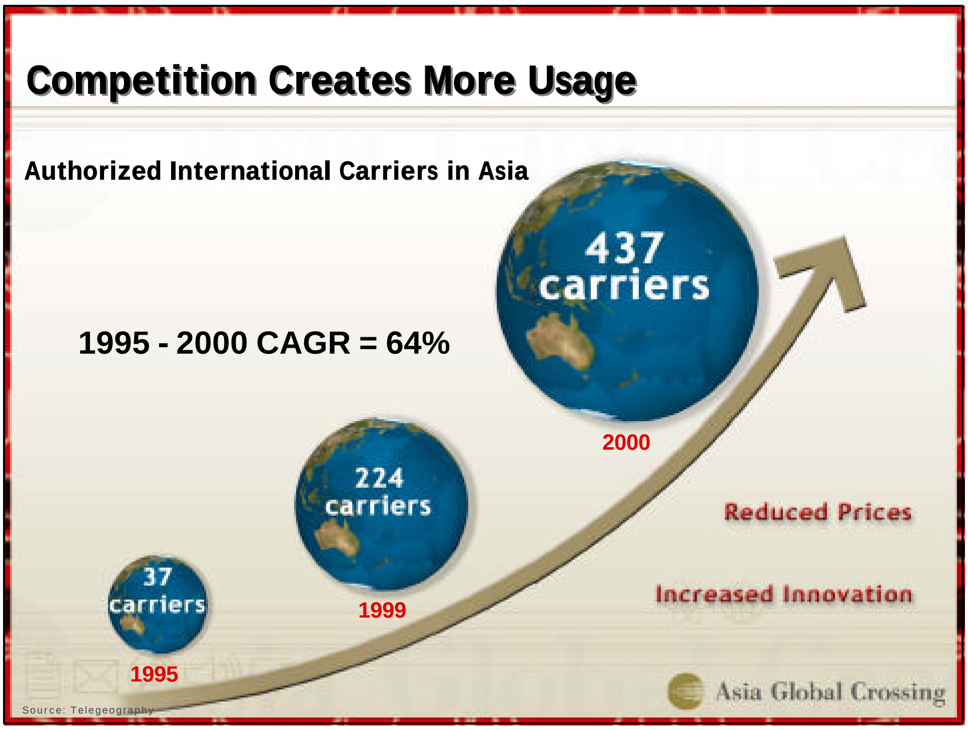
Competition Creates More Usage
Authorized International Carriers in Asia
1995 - 2000 CAGR = 64%
437 carriers
2000
224 carriers
1999
37 carriers
1995
Reduced Prices
Increased Innovation
Source: Telegeography
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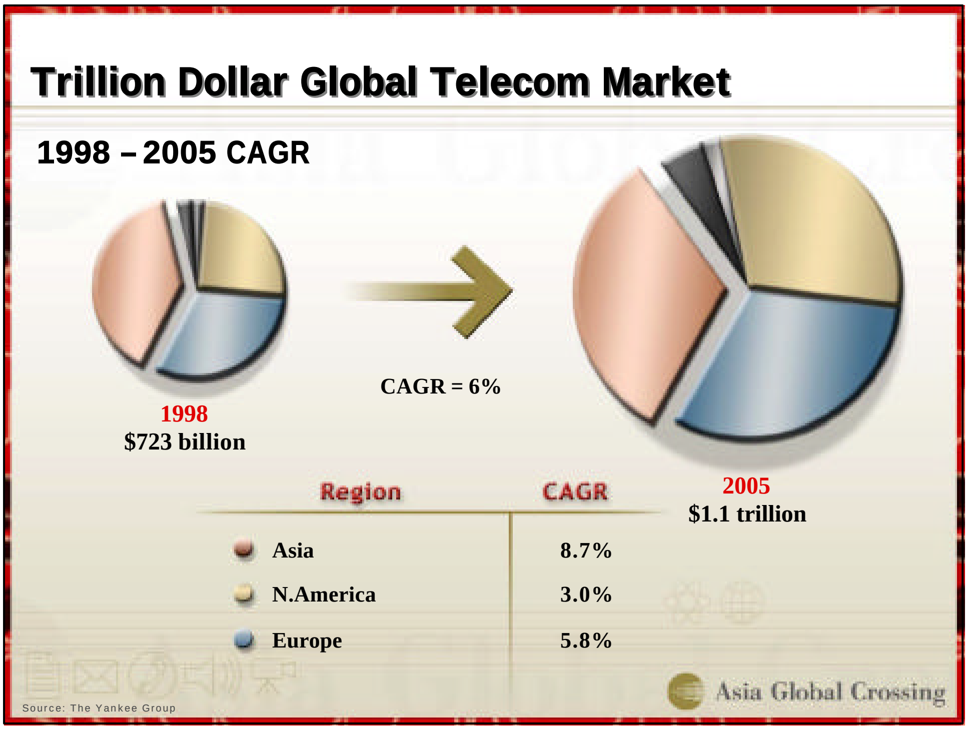
Trillion Dollar Global Telecom Market
1998 – 2005 CAGR
1998
$723 billion
CAGR = 6%
2005
$1.1 trillion
Region
CAGR
Asia
8.7%
N.America
3.0%
Europe
5.8%
Source: The Yankee Group
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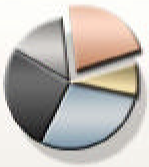
Explosive Internet Usage Growth

1999 – 2005 CAGR



1999

202 million Internet users

CAGR = 24%

2005

743 million Internet users

Region	CAGR
Asia (ex-Japan)	49 %
Other	22 %
U.S.	16 %
Japan	13 %
Europe	29 %

Source: The Yankee Group

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Internet Traffic Flows are International

Bandwidth Total for 1998

Trans Pacific

255Gbps

Intra-Asia

234Gbps

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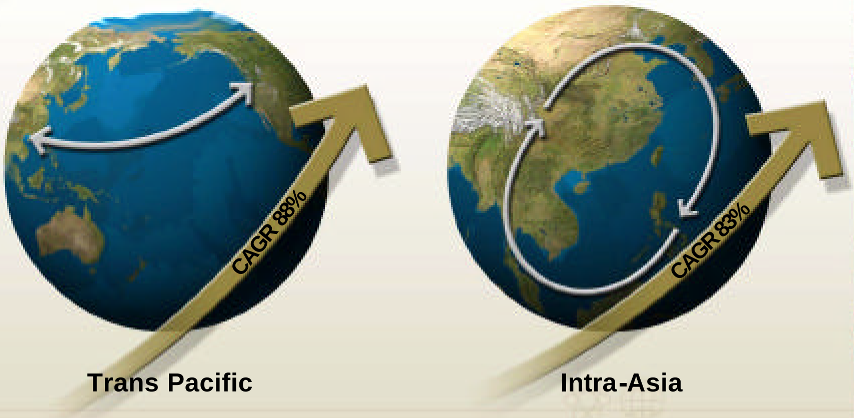
International Traffic Flows

Bandwidth Total for 2003



Trans Pacific	Intra-Asia
4,483Gbps	3,636Gbps

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Developments in Taiwan

- Introducing competitions: new fixed network operators and submarine cable operators
- Incumbent slashed IPLC prices [by 50% on April 1, 2001]
- Introducing IRU (Indefeasible Right of Use) or long term lease in addition to IPLC (International Private Lease Circuit)
- City to city full circuit vs. traditional half circuits
- Abundant capacity supply: customer has choices
- Cost based pricing
- Price zoning

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Private cable vs. traditional club cable

- A legal entity owning the submarine cable system(s)
- Financed by equity, loans and supplier financing
- Possibility of capital gain
- Customer pays as you go; just in time inventory
- No restriction on capacity transfer
- City to city connectivity vs. shore to shore
- Full circuit vs. bilateral matching half circuits
- Decision process involving single company vs. committees or work groups of many operators
- Operational process involving single company vs. more than one operators

Demand and supply

- Capacity defined:
  - Design capacity:
  - Available capacity
  - Activated capacity
  - Transit capacity
- Supply side:
  - Is it real?
  - RFS when?
- Demand side:
  - Forecast of Internet growth is difficult
  - Price elasticity
- Bandwidth glut? Or bandwidth famine?

Customer requirements

- Price
- Quality
- Customer service
- SLA (Service Level Agreement)
- One stop shopping
- Restoration plan; ring structure
- Diversity
- Selecting specific submarine cable system and specific route
- An issue of national security (!?) [e.g. In China-US, Fangshan is connected to Chongming and Shantou]

Differentiations among submarine cable systems

- Private cable system
- Ring structure [vs. China-US 1-link to Taiwan]
- City to city connectivity
- IRU (Indefeasible Right of Use) offer
- Global coverage
- Seamless network
- Carrier neutrality
- Fully funded business plan
- RFS (Ready For Service) date
- First mover advantage

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Expectations on this new industry

- Industry norms to be established
- Cooperation and competition
- Creating a bigger pie; becoming a regional telecom hub
- Common issues need to be resolved:
  - **Concession fee on Type-1 operator's revenue**

    Double taxing on revenue of Submarine Cable Operators who are restricted to sell through Integrated Fixed Network Operators
  - **Withholding tax on international capacity outside of Taiwaan**

    Income tax for foreign entity's revenue from providing telecom service outside of Taiwan territory
- Benefits passed to the end customers
- End customers are the ultimate winners

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