Overview of East Asia Infrastructure Trends and Challenges

Christian Delvoie. Director, Knowledge Strategy Group, The World Bank
Until September 2008: Director, Sustainable Development, East Asia and Pacific Region
East Asia Infrastructure: An Evolving Environment

• The growth story.
  – Strong growth and significant progress in poverty reduction, supported by clear focus on infrastructure investments
  – Rapid urbanization and rising incomes
  – Increasing regional integration

• The development challenges.
  – Growing social inequality with Rural-urban and Coastal-inland divide
  – New governance models, with increased decentralization
  – Increasing pressures on natural resources and the environment

• Financing.
  – Large needs but global financing is not the binding constraint

• Involving the need for a new sustainable development model
The Story

Strong aggregate growth, supporting impressive poverty reduction

250 million lifted out of poverty in the last 5 years

Average annual growth (%), 1994-2005

Population weighted average 7.7

Source: World Development Indicators, 2005

Source: Source: Connecting East Asia: A New Framework for Infrastructure, The World Bank
Urbanization as a new driver for productivity and infrastructure

... in 20 years, East Asia will be an urban region

Urban population (% total population)

Source: World Development Indicators; United Nations World Urbanization Prospects

Growth in number of cities over one million inhabitants

Source: United Nations World Urbanization Prospects
Increased regional interdependence

East Asian development model has been based on global and regional integration

Interdependence of auto-manufacturing in ASEAN

Emerging East Asia (China, ASEAN, newly industrializing economies, Mongolia), share of world exports (%)

Source: Nomura Research Institute, Reprinted in Connecting East Asia: A New Framework for Infrastructure, The World Bank

Source: IMF, Direction of Trade Statistics
The Challenges

Inequality – A contrasted picture…

Poor provinces in the hinterland, but concentration of the poor along the coast
Making the next challenge one of domestic integration

Source: Poverty Reduction and Economic Management Unit, The World Bank, 2004
And inequality is high and growing

Sources: World Development Report, 2006; Ravallion and Chen (2004); World Bank estimates from NBS household data.
…with significant variation in infrastructure service access

Service Access (Bars in blue = outcomes above low and middle income country average)

Source: World Development Indicators; IEA; Connecting East Asia: A New Framework for Infrastructure, The World Bank
The governance challenge

A host of new actors are coming to the fore...

Key issues:

- Democratization
- Increased complexity in service delivery
- Corruption
- Decentralization

Corruption Perception Index 2004

Source: Transparency International

Note: The CPI score ranges between 10 (highly clean) to 0 (highly corrupt).
...with increased decentralization as a key trend

Key challenges:

- Fragmentation
- The missing middle
- Implementation of integrated vision
- Capacity & leadership at local level
- Unclear regulation frameworks

Expenditure decentralization – sub-national expenditure (% total national expenditure)

Source: East Asia Decentralizes—Making Local Government Work, The World Bank
Increasing pressure on natural resources and the environment

Business as usual will result in doubling energy consumption by 2020

China's momentous energy demand growth

40-year periods of primary energy growth

Million tons coal equivalent (Mtce)

Source: East Asia Energy Unit, The World Bank

Projected no. of automobiles, China
2000 - 2020

Source: International Energy Agency, 2005; World Bank Staff Estimates
With severe negative consequences on...

...air quality

and climate change

- Of the 30 most air-polluted cities in the world, 20 are in China

- EAP accounts for 18% of the world total greenhouse gas (GHG) emissions, with China alone contributing 15%.

Source: ERI

**PM Concentrations (ug/m³)**

**Countries’ and Country Groups’ Share in Global GHG Emissions, 2000**

*Source: World Resources Institute*
The Financing

East Asia’s infrastructure needs are large and increasing...

East Asia, estimated infrastructure expenditure, actual and projected, 1996 – 2010 ($ billion / year)

- Based on econometric simulations consistent with projected regional growth, and efficiency prices. Due to data limitations, the simulation excludes a number of key infrastructure services, notably ports and airports, and all but major roads.

- Source: Connecting East Asia, A New Framework for Infrastructure, ADB/JBIC/World Bank Report, 2005
At the macro level, financing is not a constraint in East Asia …

Selected macroeconomic indicators (US$ billion)

<table>
<thead>
<tr>
<th></th>
<th>Foreign exchange Reserves 2007</th>
<th>Current a/c Surplus 2006</th>
<th>Gross domestic savings 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1333</td>
<td>160*</td>
<td>1096</td>
</tr>
<tr>
<td>Japan</td>
<td>893</td>
<td>170</td>
<td>1094**</td>
</tr>
<tr>
<td>S. Korea</td>
<td>250</td>
<td>6.09</td>
<td>257</td>
</tr>
<tr>
<td>Malaysia</td>
<td>91</td>
<td>19.9*</td>
<td>57</td>
</tr>
</tbody>
</table>

- In June 2007, China’s foreign-exchange reserves had reached US$1.3trn
- By 2008, they exceeded US$2.0trn

Source: IMF International Financial Statistics database

Source:
Foreign exchange reserves - IMF International Financial Statistics database
Current a/c surplus - World Economic Outlook database
Gross domestic savings - World Development Indicators
* Numbers for 2005
** Numbers for 2003
... supported by a virtuous cycle of savings, investment and infrastructure expenditures

Savings and investment (% GDP)
1993-2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Investment</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mongolia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: World Development Indicators, 2004

Infrastructure investment (% GDP)

<table>
<thead>
<tr>
<th>Region</th>
<th>0-3%</th>
<th>4-7%</th>
<th>Over 7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lao PDR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mongolia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Connecting East Asia: A New Framework for Infrastructure, The World Bank

Expansion of infrastructure stocks, 1990 – 2000

<table>
<thead>
<tr>
<th>Region</th>
<th>Total road network</th>
<th>Electricity generation capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lao PDR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Connecting East Asia: A New Framework for Infrastructure, The World Bank
... but, infrastructure needs vary significantly across countries

Infrastructure financing needs over 2005-2015 in select EAP countries (US$ billion)

<table>
<thead>
<tr>
<th>Country</th>
<th>Energy</th>
<th>Water</th>
<th>Transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>32</td>
<td>7.2</td>
<td>14.3</td>
<td>54</td>
</tr>
<tr>
<td>Philippines</td>
<td>11</td>
<td>6.4</td>
<td>6.9*</td>
<td>24</td>
</tr>
<tr>
<td>Indonesia</td>
<td>25</td>
<td>8</td>
<td>10</td>
<td>43</td>
</tr>
<tr>
<td>Mongolia</td>
<td>1.7</td>
<td>1.4</td>
<td>0.89</td>
<td>4</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.3**</td>
<td>1.4*</td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>

Source: World Bank Country Infrastructure Strategies; Cambodia: Enhancing Service Delivery through Improved Resource Allocation and Institutional Reform

* Includes only road transport
** Includes only urban water sector
Infrastructure finance: Spotlight on Vietnam

Investment Needs

<table>
<thead>
<tr>
<th>Year</th>
<th>Transport</th>
<th>Electricity</th>
<th>Telecoms</th>
<th>WSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Infrastructure Financing Sources

<table>
<thead>
<tr>
<th>Year</th>
<th>Private</th>
<th>Users</th>
<th>Government</th>
<th>ODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Potential financing gap of around 5% of GDP by 2010
  – If ODA stays at roughly the same level, and user tariffs and government finance increase with GDP (7% growth)

• 2010 “needs” based on: Sept 2005 Min of Transport MTEF; Financial model used by EVN; Target of 35 telecoms lines per 100 people by 2010; Targets of 85% access to urban water and sanitation and 75% for rural water and sanitation
• “Government” financing includes budget, government bonds & State-Owned Commercial Banks
• 2010 financing requirement based on: Total of sectoral investment needs; ODA grows at 2% p.a. from 2002 level; Government and user payments grow at GDP growth rate (7%); Private sector provides the remainder
Critical to make multiple sources of infrastructure finance work together

Private sector investment in infrastructure ($ billion)

Public Sector – incl. budget funding, government bonds, State Owned Commercial Banks; but need to create fiscal space and incentive framework for decentralized entities

International Donors – play a small financing role in most of the region, but provide catalytic role, leverage, innovation and policy advice

Private Sector – great potential, but cyclical; financing is available but regulatory frameworks still missing in most countries

Source: World Bank PPI Database
General Business Implications

Diverse region; diverse needs, but general trends:

- High sustained growth
  - Sustained regional potential
  - Move from exports to domestic markets
  - Increased sophistication as revenues move up

- Increased Regional integration
  - Competitiveness and logistics
  - Hard competitive environment: efficiency
• Fast urbanization and decentralization
  – Messy business and policy environment
  – More demanding civil society (environment, corruption)
  – Local champions
  – Local knowledge and partnerships

• Financing not binding constraint (at regional level)
  – Value added and technology transfer
  – Institutional development and management practices
  – Diversified instruments
  – Leverage

• Increasing focus on balanced and sustainable growth and on climate change