

# CFA Alternative Investments Event 2009

## Infrastructure

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Breukelen, June 2009



SECTION 1

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## Infrastructure Investment Attributes

# What is infrastructure?

Infrastructure assets are essential for the orderly operation of an economy

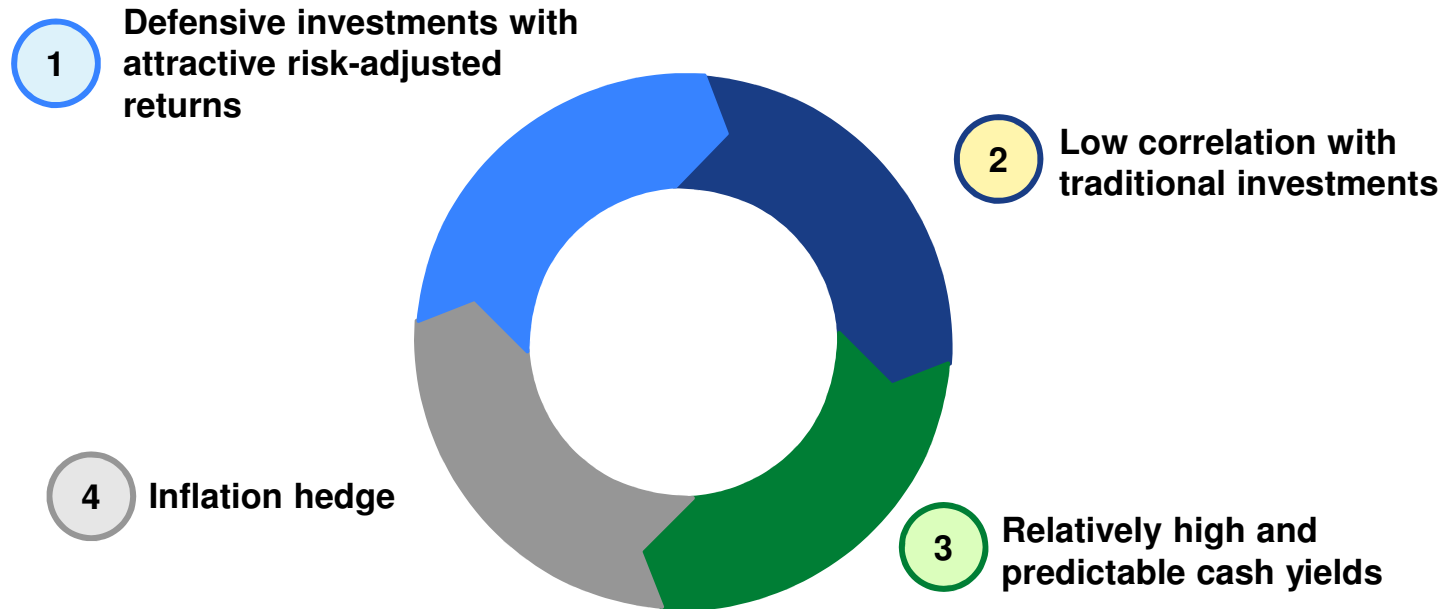
Examples of infrastructure assets by sub-sector and revenue / business driver

Sub-sectors	Low / Medium risk - Key focus for typical infrastructure funds			Medium / high risk
	<b>Transportation</b>	Toll roads Airport, Ports Rail	Airports Rail Ports	Roads, Rail (availability based payments)
<b>Utilities / Energy</b>	Pipelines	Water Gas Electricity	Transmission towers, Satellites LNG terminals, pipelines, Fuel storage	Competitive power generation Telecoms service providers
<b>Social infrastructure</b>	Major recreational facilities (e.g. stadiums)	Waste management	Education / Healthcare facilities Social housing	Retirement housing
<b>Key revenue / business drivers</b>				
	<b>Patronage</b>	<b>Regulated</b>	<b>Contracted</b>	<b>Competitive</b>
	<ul style="list-style-type: none"> <li>Revenue depends primarily on usage</li> <li>High barriers to entry, limited competition</li> </ul>	<ul style="list-style-type: none"> <li>Revenue determined by an economic regulator</li> <li>Natural monopolies</li> </ul>	<ul style="list-style-type: none"> <li>Long-term service contracts governing service charges</li> </ul>	<ul style="list-style-type: none"> <li>Exposed to competition for sale of services</li> </ul>

# Why infrastructure?

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## Key investment attributes



- ◆ In general, infrastructure should provide a set of cash flows with very long duration
- ◆ Inflation hedging and relatively low exposure to the business cycle result in predictable returns on investments

# Defensive investment with attractive risk-adjusted returns

Moderate risk due to limited competition and provision of essential services

## Key business characteristics

### High barriers to entry / limited competition

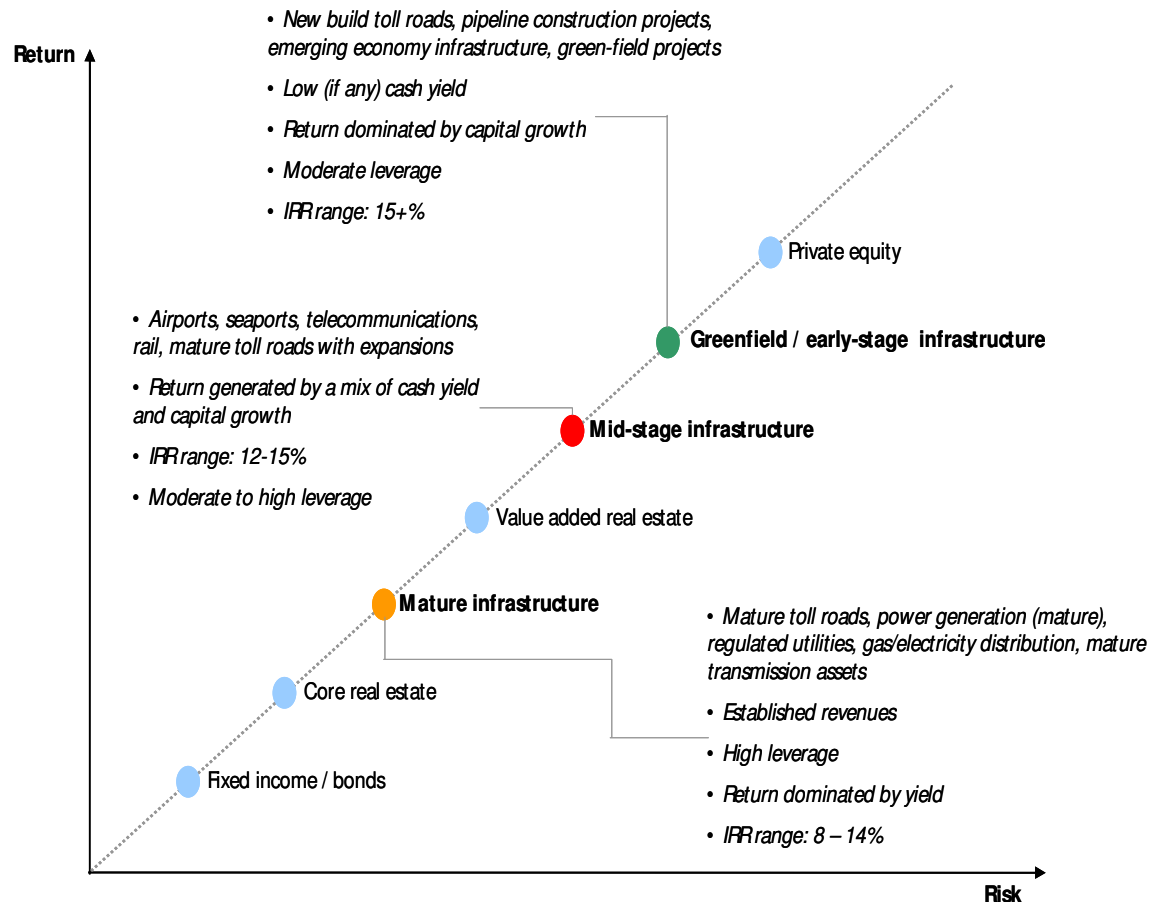
- ◆ Capital intensive assets
- ◆ Natural or legislative monopoly
- ◆ Regulatory or contractual protection

### Provision of essential services

- ◆ Critical to modern economies
- ◆ Low demand elasticity

Predictable revenues, earnings and cash flows

## Infrastructure asset risk-return spectrum



Source: UBS 2008

# Historical infrastructure risk-adjusted returns

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	Q3: 1995 – Q4: 2000			Q1: 2001 – Q2: 2006		
Asset class	Average annual return	Annual volatility	Sharpe Ratio	Average annual return	Annual volatility	Sharpe Ratio
Unlisted infrastructure	16.57%	6.37%	1.68	11.71%	5.13%	1.27
Utilities (listed)	29.49%	19.58%	1.21	14.82%	9.63%	1.00
Toll Roads (listed)	39.98%	30.16%	1.13	12.78%	14.88%	0.51
Stocks	12.63%	9.50%	0.71	13.20%	12.50%	0.64
Bonds	9.02%	4.71%	0.67	5.41%	3.69%	0.06

Source: Peng & Newell (2007), UBS

Past performance is not an indication of future performance.

# Infrastructure correlations

## Inter-asset correlation matrix (1995-2006)

	Listed infrastructure	Toll Roads	Airports	Utilities	Unlisted infrastructure	Stocks	Bonds
Listed infrastructure	1.00						
Toll Roads	0.99	1.00					
Airports	0.40	0.26	1.00				
Utilities	0.42	0.42	0.14	1.00			
Unlisted infrastructure	0.36	0.36	0.26	0.16	1.00		
Stocks	0.21	0.14	0.54	0.01	0.06	1.00	
Bonds	0.38	0.38	-0.03	0.57	0.17	-0.21	1.00

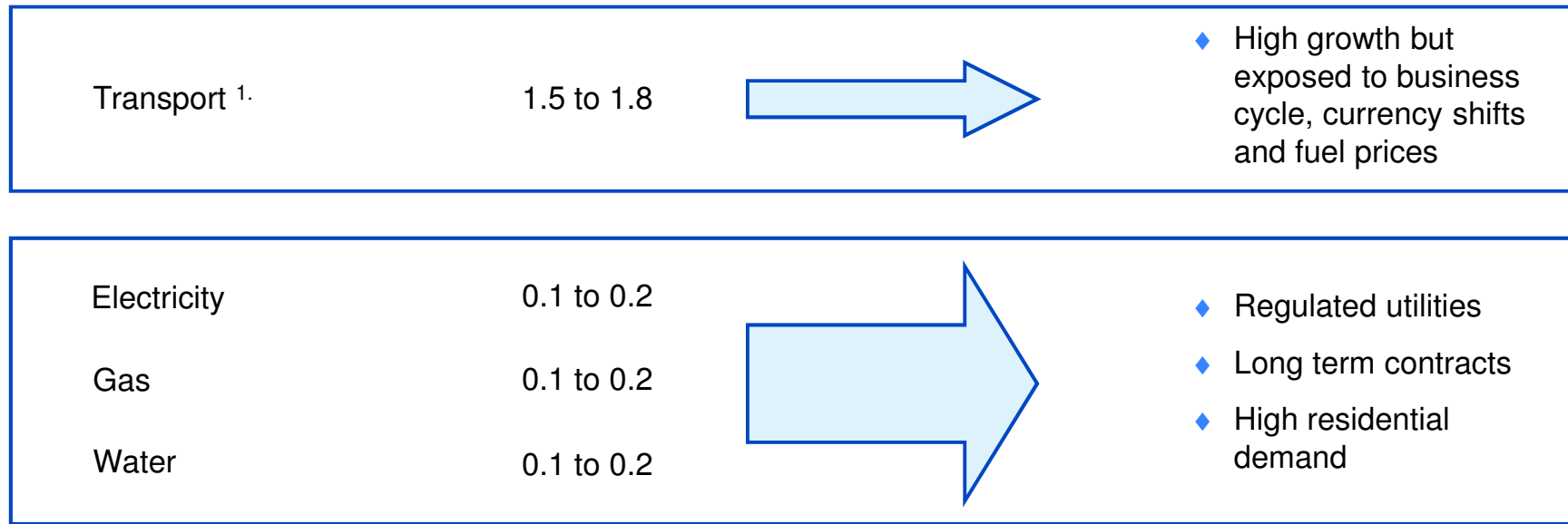
Source: Peng and Newell (2007), UBS

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# What drives the correlations in the real economy?

## Income elasticity of demand

## Business cycle exposure



Source: NERA, UBS

(2008)

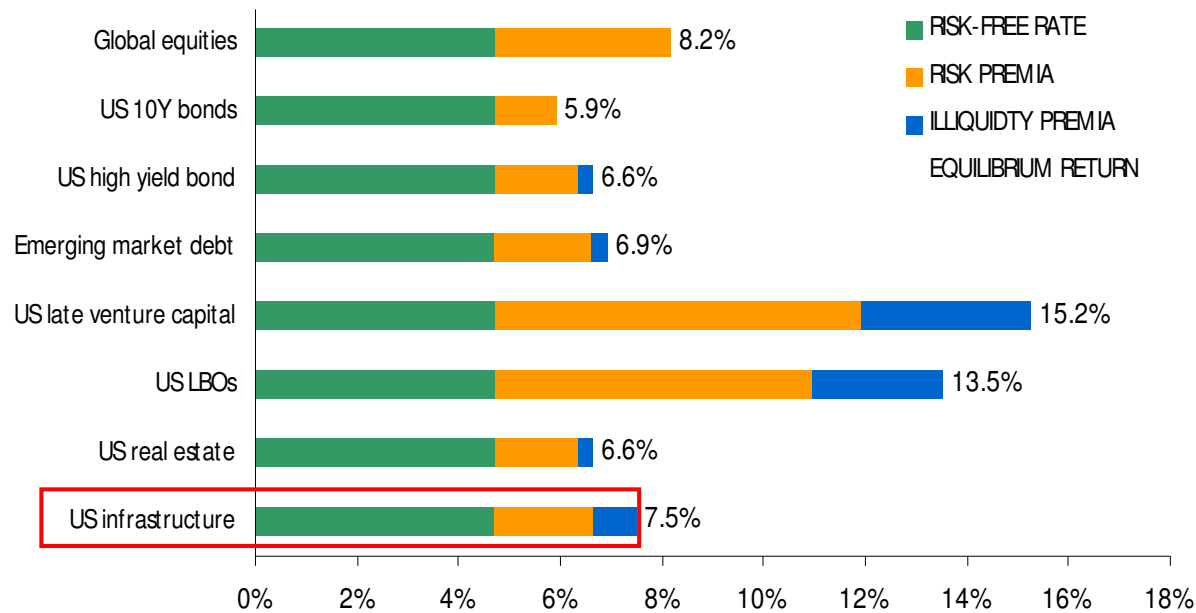
<sup>1</sup>. Air transport

...the higher the proportion of industrial demand for a particular asset the greater the exposure to the business cycle

# What to expect in the long term?

- ◆ Focus on the relative returns of each asset class
  - The required long-term return on infrastructure assets sits between real estate and global equities

**Risk premia, illiquidity premia and required returns of selected assets**



Source: Global Investment Solutions, UBS Global Asset Management, 2008

## GIS methodology background

- ◆ Global Investment Solutions (GIS) incorporates the asset allocation and risk management capabilities of UBS Global Asset Management
- ◆ GIS uses the principles of portfolio theory for portfolio analysis and construction
- ◆ GIS's capital market analysis covers over 400 asset categories estimating their risk and correlation with a multi-layer factor approach
  - factors include asset classes, regions, countries and currencies
  - risk estimates on a forward looking basis
- ◆ Adjustments for integration / segmentation of markets as well as the illiquidity of investments
- ◆ Long-term equilibrium rates of return are derived based on the overall covariance matrix

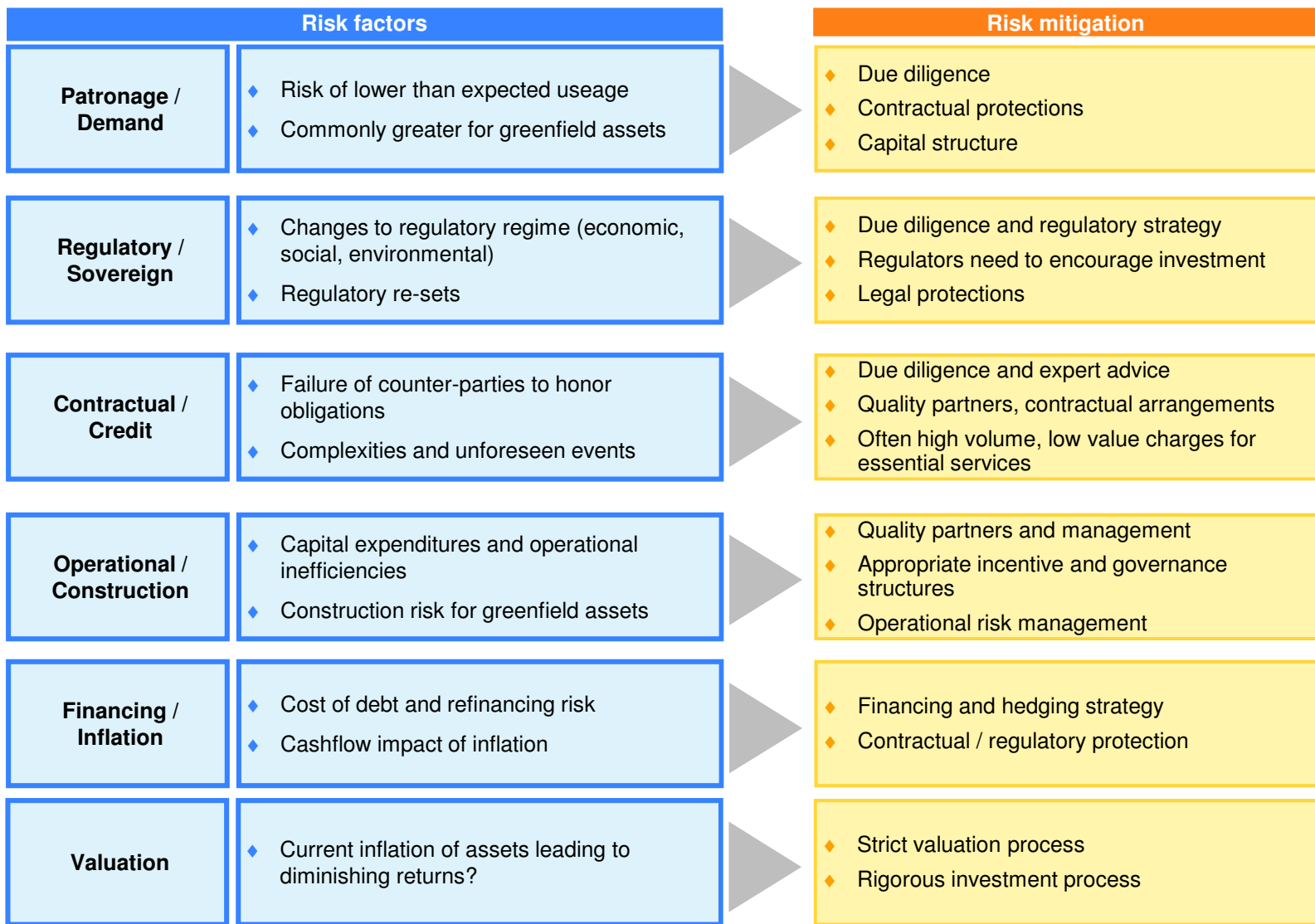
# How does infrastructure compare with other asset classes?

## Infrastructure has unique & compelling attributes in its own right

	Similarities	Differences
<b>Private Equity</b>	<ul style="list-style-type: none"> <li>Management control over investee companies</li> <li>Legal structures for unlisted funds are similar</li> <li>Investment techniques are converging</li> </ul>	<ul style="list-style-type: none"> <li>Different risk-return objective and lower exposure to economic cycle</li> <li>Longer investment horizon, return not driven by exit strategy</li> <li>Strong cash yield and lower capital growth</li> </ul>
<b>Real Estate</b>	<ul style="list-style-type: none"> <li>Cash yield is significant part of return</li> <li>Absolute return objective focus and low market risk</li> <li>Importance of location</li> </ul>	<ul style="list-style-type: none"> <li>Control over operating companies</li> <li>Barriers to entry, less exposure to property cycle</li> <li>Longer cash flow predictability, higher gearing</li> <li>Normally larger individual asset size</li> </ul>
<b>Equities</b>	<ul style="list-style-type: none"> <li>Equity ownership</li> <li>Upside return potential</li> <li>Market risk</li> </ul>	<ul style="list-style-type: none"> <li>Less mature, depth and breadth of research coverage is lower</li> <li>Lower level of securitisation / liquidity</li> <li>Low correlation with business cycle</li> <li>Predictable and high cash yield</li> </ul>
<b>Fixed Income</b>	<ul style="list-style-type: none"> <li>Long-term, well predictable cash yield</li> <li>Long duration asset</li> <li>Low market risk</li> </ul>	<ul style="list-style-type: none"> <li>Ownership of assets as opposed to credit exposure</li> <li>Growth / upside potential</li> <li>Inflation hedge features</li> <li>Indirect exposure to interest rate risk</li> </ul>

# What are the investment risks?

Risk management, at the asset level, is fundamental to this asset class



SECTION 2

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## Investment Trends

# Investment Trends

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- ◆ A long term trend worldwide to increasing private sector ownership and operation of infrastructure assets
- ◆ An emerging institutional investment class
  - Institutional investors looking for assets to match long term liabilities
  - Institutional investors like low correlations and the risk adjusted returns provided by infrastructure
  - Pioneers were Australian and Canadian pension funds but institutional investor appetite has now spread
    - European institutional investors particularly in Scandinavia and the Netherlands are major investors in the sector
    - Institutional investors in Asia and the United States are entering the market in increasing numbers
    - Singapore is a lead investor
  - For institutional investors target asset allocations to infrastructure are in the range of 3% to 7%
- ◆ Investment vehicles
  - Closed end funds
  - Open end funds
  - Listed infrastructure funds
  - Infrastructure listed securities funds

## SECTION 3

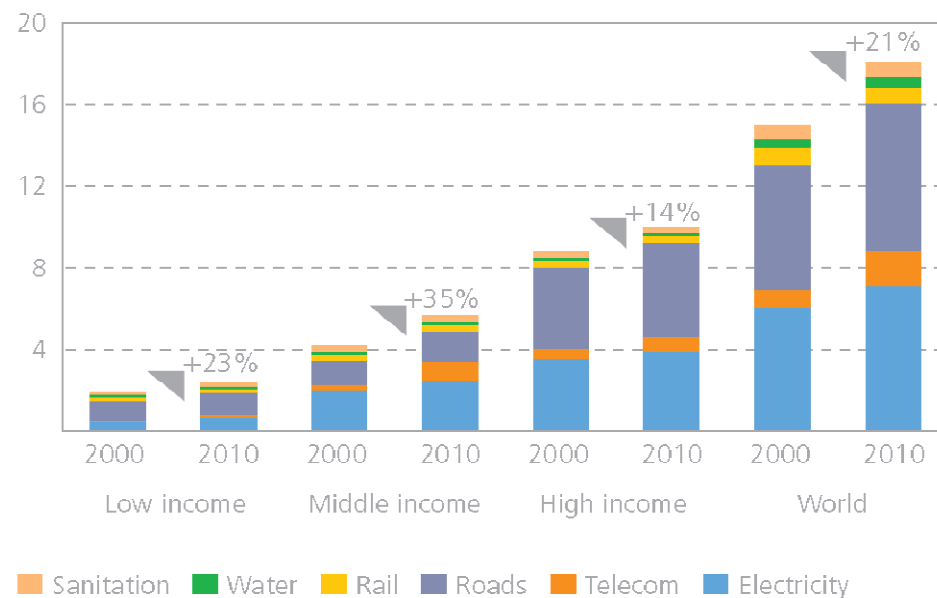
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# Growth outlook for the sector

# Trends in infrastructure investments

- ◆ Global infrastructure investments represent roughly 2% of world GDP
  - Infrastructure endowment is around 50% of world GDP
- ◆ Economic data and research supports the positive macroeconomic impact of public infrastructure in both developed and emerging markets
  - Boosts private sector productivity and stimulates trade and economic growth
- ◆ Investment levels can change materially over time
  - Water and energy sector investment has been in decline as a portion of economic activity since the 1970s
  - Transport, storage and communication infrastructure investment has been increasing since the 1980s
- ◆ Private investment stimulated by fiscal stress

Infrastructure stocks, 2000–2010 (USD trillions)



Source: Fav and Yepes (2003)

Past performance is not an indication of future performance.

# OECD infrastructure investment needs to 2030

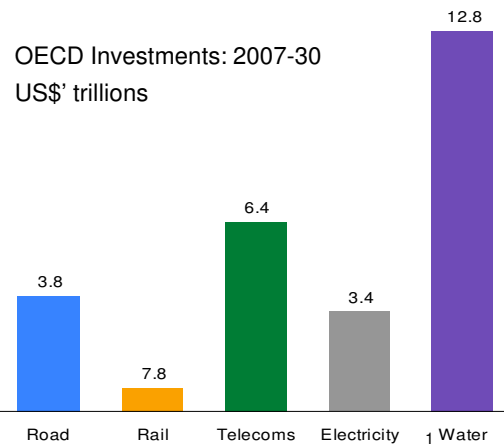
Significant investment opportunities anticipated in OECD countries more than US\$ 27 trillion. Further opportunities from fiscal stimulus packages

## Road

- ◆ Annual investments of US\$ 100bn, growing to US\$ 170bn by 2030
- ◆ More than half of the world's road investments will be in OECD countries
- ◆ Most investment requirements to:
  - Maintain and upgrade existing roads
  - Increase road quality, efficiency, and reduce congestion

## Telecoms

- ◆ Annual investments of US\$ 400+ bn, and slowly decreasing to US\$ 240bn by 2020, then US\$ 60bn by 2030.
- ◆ Strong expenditures in telecommunications infrastructure up to the 2020, due to rapid expansion in capacity requirements
- ◆ More than half of the world's telecommunications infrastructure investment will be in OECD countries



## Rail

- ◆ Steady annual investments of US\$ 30+ bn on rail to 2030
- ◆ Two thirds of the world's rail investments will be in OECD countries

## Electricity

- ◆ Annual investments of US\$ 30+ bn, growing to US\$ 80+ bn by 2030<sup>1</sup>
- ◆ Growing investment need due to:
  - Continued increase in demand for electricity
  - Maintenance and replacement of existing infrastructure

## Water & Wastewater Services

- ◆ Annual investments of US\$ 430bn, growing to US\$ 620bn by 2025.
- ◆ Mostly for maintenance and repairs, due to poor conditions of ageing existing infrastructure

Source: Infrastructure to 2030, OECD 2006  
1. Generation, transmission and distribution

## Emerging market infrastructure indicators

- ◆ Infrastructure services in emerging markets are well below OECD service levels

	World Regions					
	EAP	LAC	MNA	SAR	SSA	OECD
Delay in obtaining an electrical connection (days)	19.4	32.9	53.7	<b>56.3</b>	43.8	9.7
Number of electrical outages (days)	9.3	17.8	46.1	<b>121.5</b>	56.4	1.5
Value lost due to electrical outages (% of sales)	2.5	3.6	4.2	5.6	<b>5.7</b>	2.3
Number of water supply failures (days)	3.5	14.5	41.7	12.0	<b>37.2</b>	0.3
Delay in obtaining a mainline telephone connection (days)	15.8	45.1	49.9	<b>66.3</b>	58.4	9.0

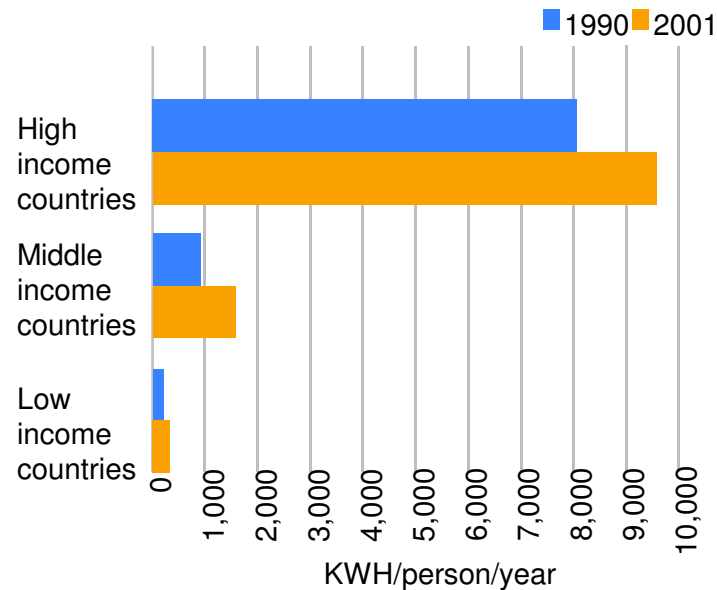
Source: World Bank ICA database, 2008

Note: EAP = East Asia and the Pacific; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia Region; SSA = Sub-Saharan Africa; OECD = Organisation for Economic Co-operation and Development

# Emerging markets – infrastructure indicators

- ◆ Per capita energy consumption in emerging markets is a fraction of developed countries average

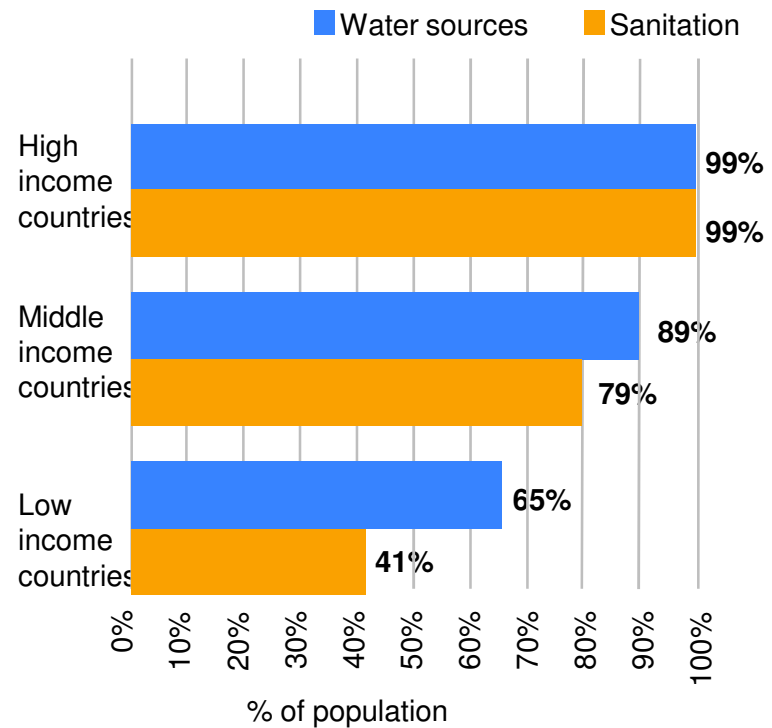
## Energy Consumption



Source: International Energy Agency (IEA), 2003

Past performance is not an indication of future performance.

## Water and Sanitation



Source: Estache and Goicoechea. A "Research" Database on Infrastructure Economic Performance, World Bank Policy Research

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