

1,5°C or 2°C?
Mind the Enabling
Conditions

Higher investment needs

- In the Energy System:
 - the share of energy investment in the GDP should be 2,8% instead of 2% (IAM models)
 - The increase is lower (15%) between now and 2035 (box 4.8)
- In all infrastructure sectors (energy, transportation, buildings, water and telecommunication)
 - Incremental needs representing an annual average of 0.6% of global GDP between 2015 and 2035 (about 0.25% for energy only)
- Caveat about the meaning of incremental needs:
 - the IMF alert to the current infrastructures funding gap
 - Implies that increasing infrastructure investments is needed anyway
 - e.g. more than 60 countries are unrated and do not have access to finance

Estimated annualised mitigation investment needed to meet the 1.5°C target (2015-2035 in trillion 2010 US\$ at Market Exchange Rates)

	Energy investments	Of which demand side	Transport	Other infra-structures	Total	Ratio to MER GDP
IAM Baseline (mean)	1.96	0.24			1.96	1.8%
IAM NDC (mean)	2.04	0.28			2.04	1.9%
IAM 2°C(mean)	2.19	0.38			2.19	2.1%
IAM 1.5°C (mean)	2.32	0.45			2.32	2.2%
IEA NDC	2.40	0.72			2.40	2.3%
IEA 1.5°C	2.76	1.13			2.76	2.7%
Min IAM-IEA, 1.5°C	1.38	0.38			1.38	1.6%
Mean IAM-IEA, 1.5°C	2.38	0.54			2.38	2.3%
Max IAM-IEA, 1.5°C	3.25	1.13			3.25	4.0%
OECD Baseline					5.74	5.4%
OECD 2°C	2.13	0.40	2.73	1.52	6.38	6.0%

How much mitigation investment in energy and other infrastructure? (Source: Box 4.8)

Estimated annualized mitigation investment (2015-2035 in Trillion US\$)

	Energy investments	Of which demand side	Transport	Other infra-structures	Total infrastructure investment
IAM Baseline (mean)	1.96	0.24	2,51		
IAM NDC (mean)			(=1,96*1,28)		
IAM 2°C (mean)					
IAM 1.5°C (mean)	2.32	0.45	2,97		
IEA NDC			(=2,32*1,28)		
IEA 1.5°C					
Mean IAM-IEA, 1.5°C					
Min IAM-IEA, 1.5°C					
Max IAM-IEA, 1.5°C					
<i>OECD Baseline</i>	0.91	0.36	2.46	1.37	
<i>OECD 2°C</i>	2.13	0.40	2.73	1.52	

How much mitigation investment in energy and other infrastructure? (Source: Box 4.8)

Estimated annualized mitigation investment (2015-2035 in Trillion US\$)

	Energy investments	Of which demand side	Transport	Other infra-structures	Total infrastructure investment
IAM Baseline (mean)	1.96	0.24	2,51 (=1,96*1,28)	1,52	
IAM NDC (mean)					
IAM 2°C (mean)					
IAM 1.5°C (mean)	2.32	0.45	2,97 (=2,32*1,28)	1,52	
IEA NDC					
IEA 1.5°C					
Mean IAM-IEA, 1.5°C					
Min IAM-IEA, 1.5°C					
Max IAM-IEA, 1.5°C					
<i>OECD Baseline</i>	0.91	0.36	1.16	1.37	
<i>OECD 2°C</i>	2.13	0.40	2.73	1.52	

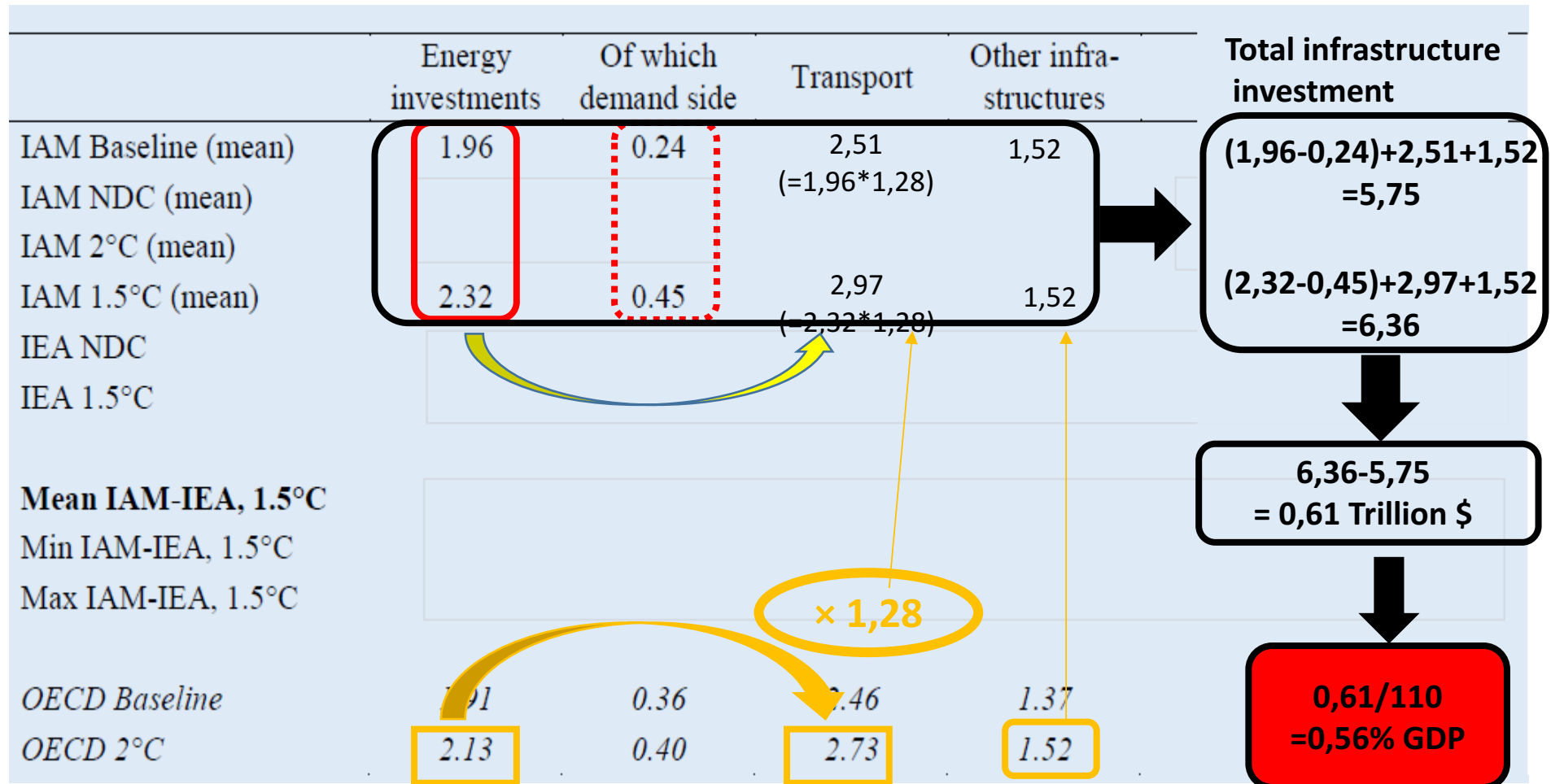
How much mitigation investment in energy and other infrastructure? (Source: Box 4.8)

Estimated annualized mitigation investment (2015-2035 in Trillion US\$)

	Energy investments	Of which demand side	Transport	Other infra-structures	Total infrastructure investment
IAM Baseline (mean)	1.96	0.24	2,51 (=1,96*1,28)	1,52	$(1,96-0,24)+2,51+1,52$ =5,75
IAM NDC (mean)					
IAM 2°C (mean)					
IAM 1.5°C (mean)	2.32	0.45	2,97 (=2,32*1,28)	1,52	$(2,32-0,45)+2,97+1,52$ =6,36
IEA NDC					
IEA 1.5°C					
Mean IAM-IEA, 1.5°C					
Min IAM-IEA, 1.5°C					
Max IAM-IEA, 1.5°C					
<i>OECD Baseline</i>	0.91	0.36	2.46	1.37	
<i>OECD 2°C</i>	2.13	0.40	2.73	1.52	

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Estimated annualized mitigation investment (2015-2035 in Trillion US\$)



FROM INVESTMENTS TO FINANCE, *the quantitative challenge*

- Funding *incremental needs on LC infrastructures demands to redirect 2.5% of world savings* up to 2035: *if 'you' earn 800 and save 200, you redirect 5 for example from real estates to low carbon investments*
- **Redirecting** investments *within* the infrastructure sectors is between 2 and 3 times higher: e.g. doubling of inv in LC energies + energy efficiency and a **36%** decrease of investments in conventional fuels supply chains
- This implies:
 - to *dedicate to low carbon investments between 5 % and 12% of the yearly capital revenues* (increase of the value of capital + interests + rents
 - and to *reduce the sectoral and geographic mismatch between capital flows and financial needs*

Meeting the financial quantitative challenge

- needs to mobilise both **public finance and private investors**, the later representing 75% of overall world investments (China excluded)

- **De-risking** low-emission investments through appropriate instruments consistent with public budget balances is key to:

 - facilitate the **involvement of the actors of the financial system** (banks, asset managers, pension funds, insurance) that manage private savings

 - facilitate the **access** of mitigation activities **to capital markets at low interest rates and the emergence of new classes of assets**

- **Reducing the infrastructure funding gap on is key for upgrading adaptation capacities however** adaptation and the provision of basic needs, because they are not 'bankable' will require a higher amount of **grants and overseas assistance**

Finance and overall public policies

- integrated *fiscal and financial policy packages* needed to enhance the efficacy to the investment shifts and mitigate the adverse welfare and growth impacts of a 3-4 times higher marginal cost of abated emissions, *mind the 'propagation effect'!!!!*

- these fiscal and financial policies may *include* carbon pricing, reduction of fossil fuel subsidies, and other synergistic policies (including real estate and land pricing) and de-risking instruments (public guarantees, feed-in tariffs etc...)

- they will *reinforce the efficacy of performance standards*, R&D policies and technology transfers

- they should include *compensating transfers* (direct and indirect) and facilitation of the *access to new low-carbon asset classes*

- Some of these policy packages depend upon *sovereign decisions of countries* however *sub-sovereign initiatives* are needed and *international coordination/cooperation* is critical to enhance their overall efficacy