Road Transport and Climate Change

STRC 2017

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Transport emits CO_2 and if global warming crosses the safety threshold of 2°C then the consequences could be anywhere between bad and catastrophic.

Climate change is ‘the greatest and widest-ranging market failure ever seen’

Stern (2006)

Road transport contributes about 20% of total emissions of CO_2.

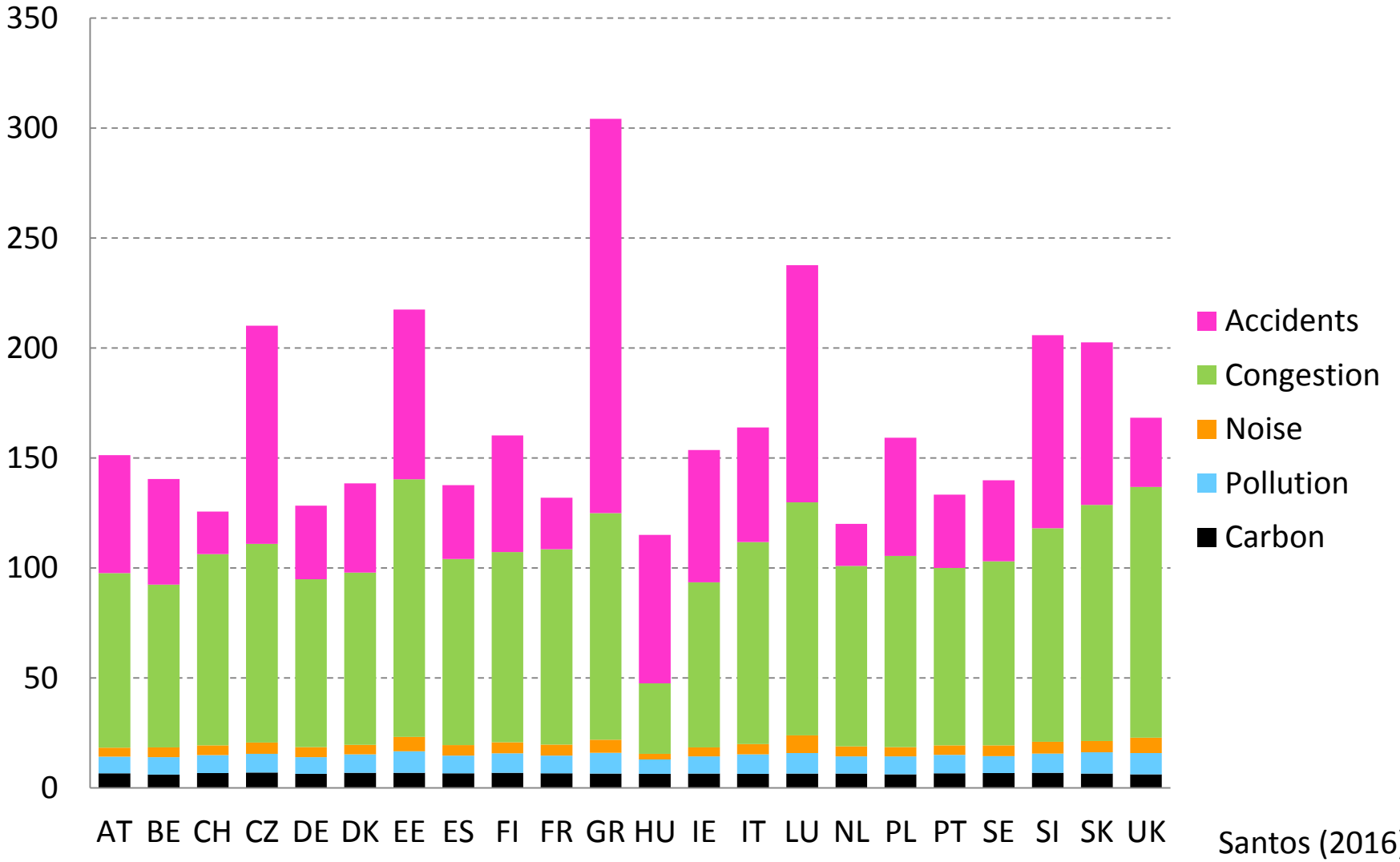
IEA (2009)

Theory of externalities

Internalisation through economic instruments

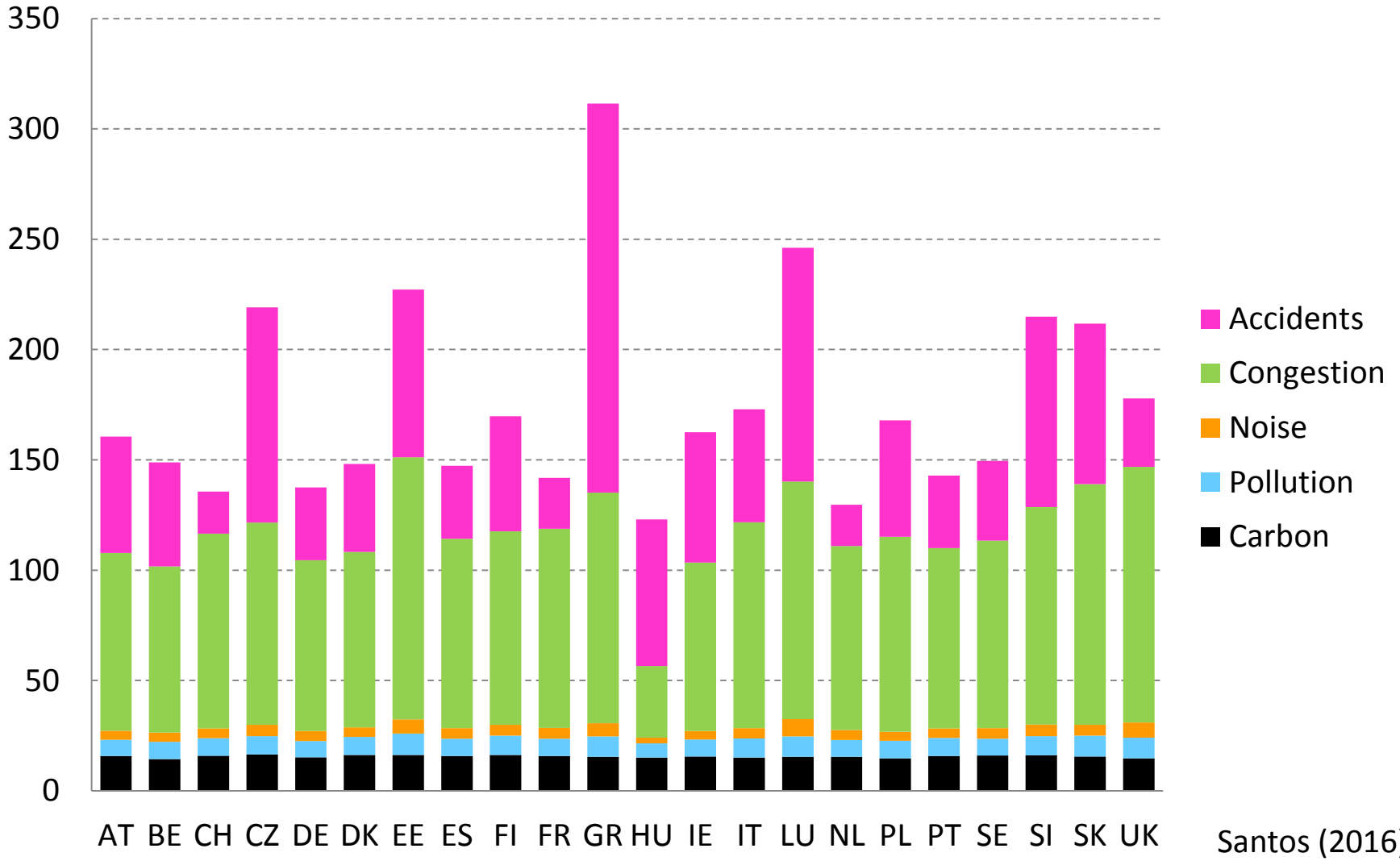
Price controls
Quantity controls

Decomposition of the marginal external cost of petrol cars, in €ct/L (2008 values and 2010 prices)



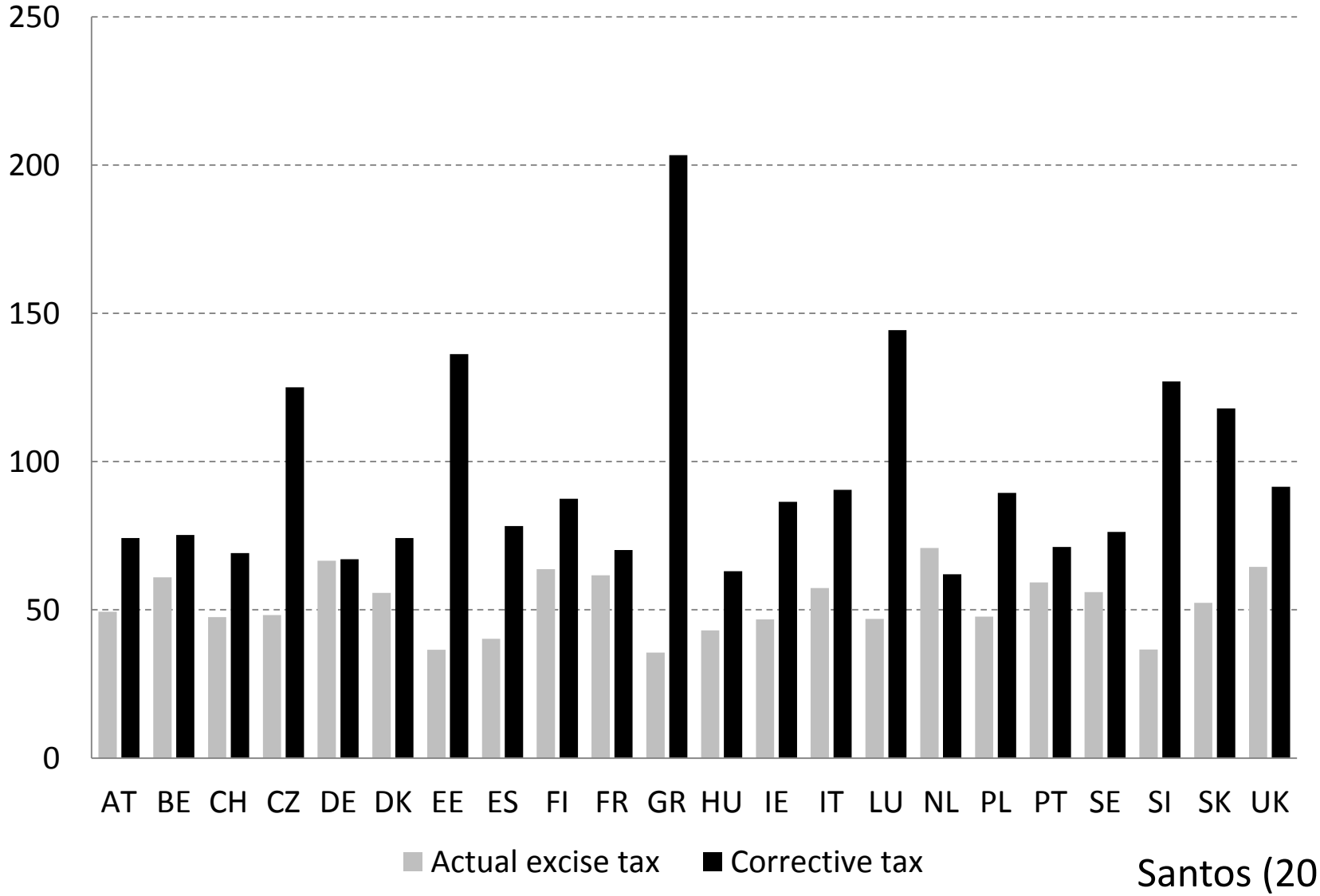
Santos (2016)

Decomposition of the marginal external cost of petrol cars, in €ct/L (2008 values and 2010 prices)



Santos (2016)

‘Corrective’ and actual excise petrol taxes, in €ct/L (2008 values and 2010 prices)



Santos (2016)

Economic instruments for climate change Problems

a) Free-riders

b) Cost of clean technologies

c) R&D externalities

Free-riders

Free ride or join coalition?

A small coalition controls only part of world emissions.

Collier and Venables (2014)

Global deal

COP21, Paris, Nov 30 to Dec 13, 2015

Legally binding and universal agreement on climate

Cost of clean technologies

More expensive

Carbon prices not enough to tip the balance in transport (neither is the SCC)

PVC in the US (2010-2020) 2009 US dollars

Diesel car	38,414
Petrol car	38,614
GI HEV	39,195
E90	39,627
GC HEV	42,121
Biodiesel car	43,202
CNG car	45,479
EV	49,475
FCV on methane	72,803

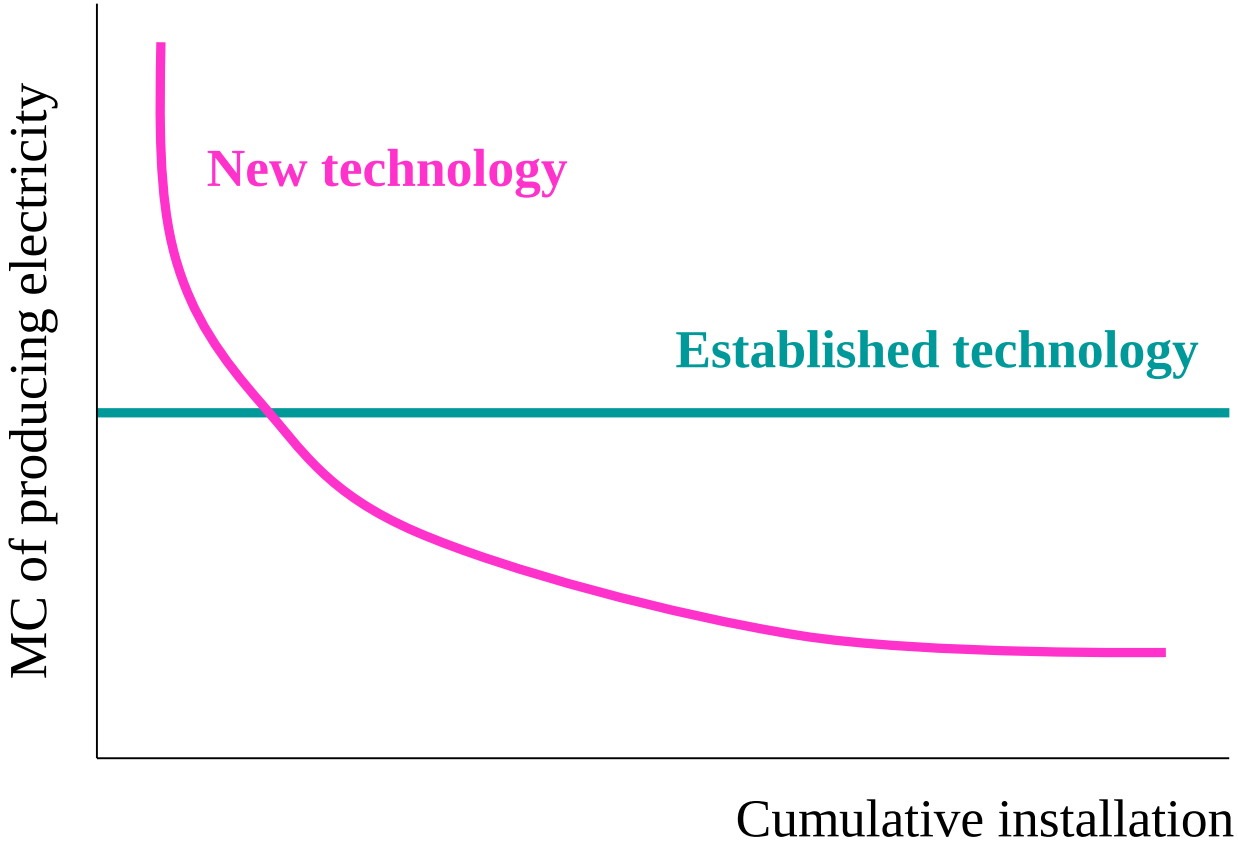
SCC
$22/tCO$_2$ (2010)
$27/tCO$_2$ (2020)

SCC
$81/tC (2010)
$100/tC (2020)

r = 6%

Liu and Santos (2015)

The costs of clean technologies are likely to fall over time



Source: Stern Review (2006, Fig. 5, p. xx)

Taxes and subsidies

In the meantime taxes and subsidies seem to be in order on political and environmental grounds.

Liu and Santos (2015)

R&D externalities

R&D is very risky

Anyone can take the knowledge away and reproduce it

New Climate Economy Report 2014

Knowledge spillovers from clean and dirty technologies

Clean technologies generate knowledge spillovers which are 43% higher than those generated by dirty technologies.

Dechezleprêtre et al (2014)

Government subsidies for R&D focusing on clean technologies may be warranted.

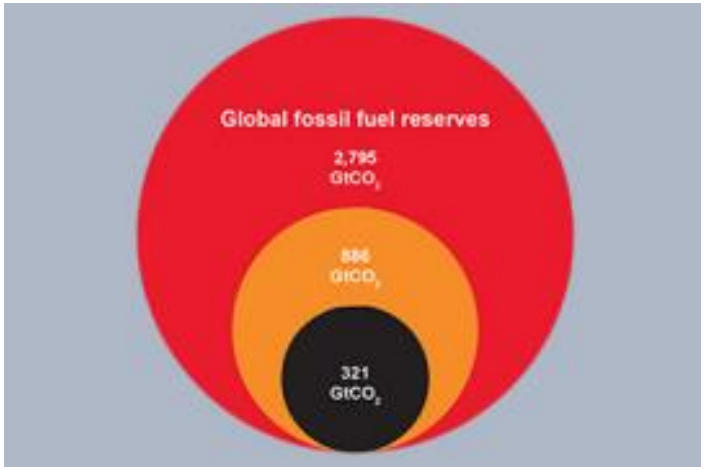
Dechezleprêtre et al (2014)

Governments across the G20 countries spend US$88 billion per year subsidising exploration for fossil fuels.

Bast et al (2014)

BUT we are not running out of fossil fuels!

Unburnable carbon



Source: http://www.worldbank.org/en/events/2015/03/20/managing-carbon-bubble-how-to-transition-to-low-carbon-economy

The challenge is urgent.

Narrow time window for making the right choices

- Lock-in of capital and technology
- Shrinking carbon budget

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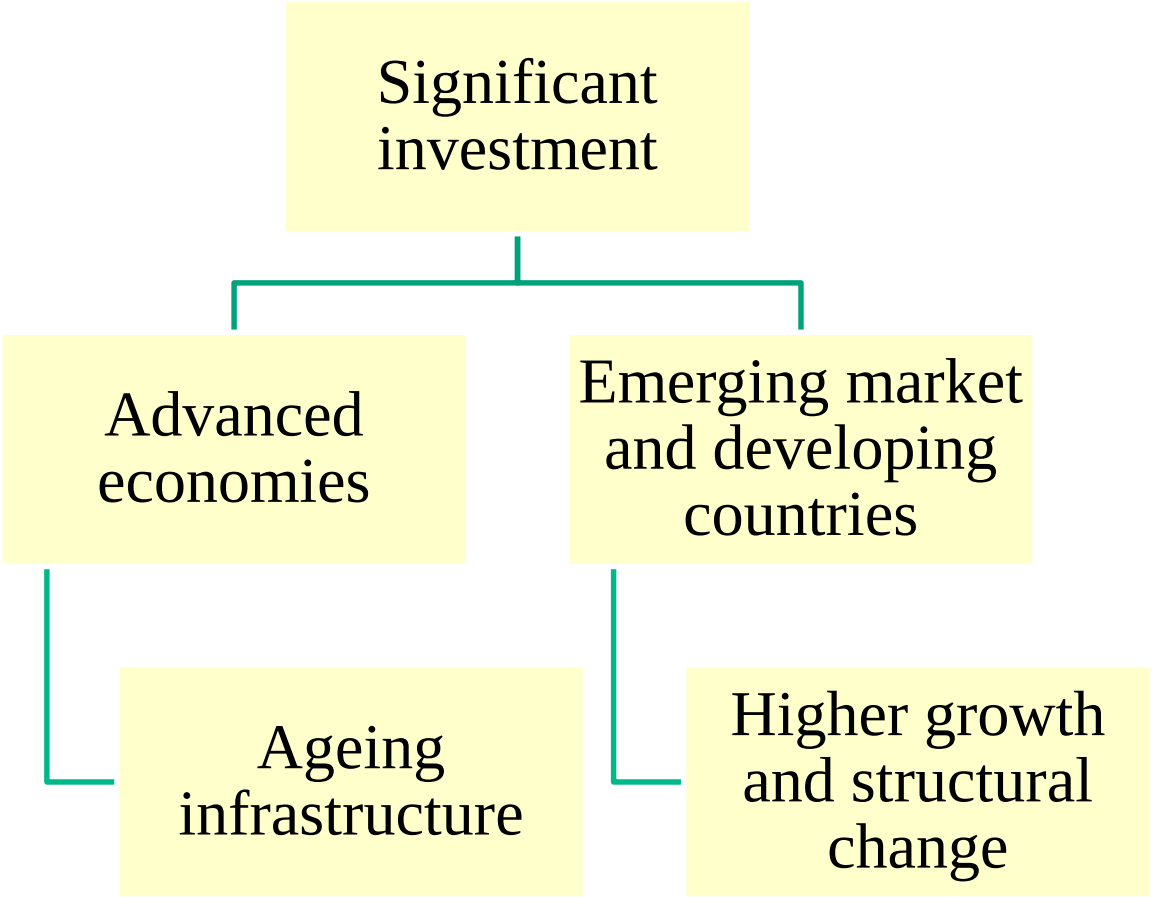
Infrastructure



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Economic instruments for climate change

Problems (?)

a) Free-riders ✓

b) Cost of clean technologies ✓

c) R&D externalities ✓

Free-riders

COP21, Paris 2015

Global deal

High cost of clean technologies

Taxes and subsidies to tip the balance

R&D externalities

Subsidies to R&D on clean technologies

We can have a safe climate and a prosperous future.

New Climate Economy Report 2014

Thank you!

Gracias!