Peak Materials Demand

Evidence on the Saturation Effect

Raimund Bleischwitz

Contribution to:
SustEcon Conference
The contribution of a sustainable economy to achieving the SDGs
25–26 September 2017, Berlin
Global Shifts

- **Go East:** High growth rates in China and India and other Asian economies over the last 15 years
- **Nexus:** Energy, materials and other resources are inter-linked – SDG 12 cross-cutting
- **Dynamics of disruption:** Schumpeterian dynamics for REN and other CleanTech

**BUT:** Is future demand for resources characterized by insatiable growth?

Source: UNEP IRP 2016: 33
Peak...for demand!

• ‘Peaks’ have been discussed for oil and other resources – with little evidence of running out of supply
• Markets are driven by Demand! Over time, countries consume fewer resources as physical infrastructures and basic industries are built.
• The broader picture: The saturation effect – an Environmental Kuznets Curve for materials
• Resource saturation levels for China indicate that appetite for materials is likely to flatten after physical infrastructures and basic industries have been set up
China's future demand for resources: insatiable or saturated?

Forecasts suggest China will double its demand for resources by 2040. However, the evidence also indicates a future saturation effect – a stage in development when the intensity in the per capita use of materials decreases. This suggests China will lower its demand for resources by the year 2030-2040.
Two scenarios for China: growth as usual or saturation?

Apparent domestic steel consumption: kg/capita

Gross Domestic Product: Constant $1990/capita

- China
- USA
- UK
- Japan
- Germany
What about Built-up Stocks?
More evidence on the saturation effect
A Macro-Economic Modeling Perspective with CGE

- Relevant to analyse the role of minerals in economies nationally and at an international scale, value added during production and consumption, and assess socio-economic impacts of changes in markets and policies
- Surprisingly little experience
  - Most macro-economic models do neither capture physical data nor disaggregate relevant sectors
  - Extensions to energy better developed, as well as energy system modelling
- Few models used to analyse RE/CE (GINFORS / Pantha Rhei, E3ME, EXIOMOD)
- Computable General Equilibrium models (CGE) advantageous in representing advanced standard economics, used to model policy impacts, can apply GTAP database on international trade - OECD
Steel demand outlook till 2030

- 2014: 1,537MT (finished steel basis)
- 2030: 1,992 MT (finished steel basis)

- Steady saturation in China
- India and ASO emerge as fast growing regions
- WSA 30% (ENGAGE 23%) growth to 2030
- To model secondary steel routes based on REN

Outlook

• Consumption-based saturation levels (t/cap/income) can be estimated for main materials in industrialized countries. China seems to have reached a saturation level

• Stocks are relevant development pathways for materials and energy => possibly opening up new sustainable supply streams of secondary materials

• Good news: all measures for resource efficiency and circular economy, technical and social eco-innovations come on top of such revised trends

• New BaU scenarios needed, as well as more detailed comparative case studies

• Get ready for a global green shift!
Thank you

r.bleischwitz@ucl.ac.uk

www.bartlett.ucl.ac.uk/sustainable

New MSc at: http://www.bartlett.ucl.ac.uk/sustainable/programmes/msc-sres