Strengthening capacity for climate technology knowledge transfer & absorption

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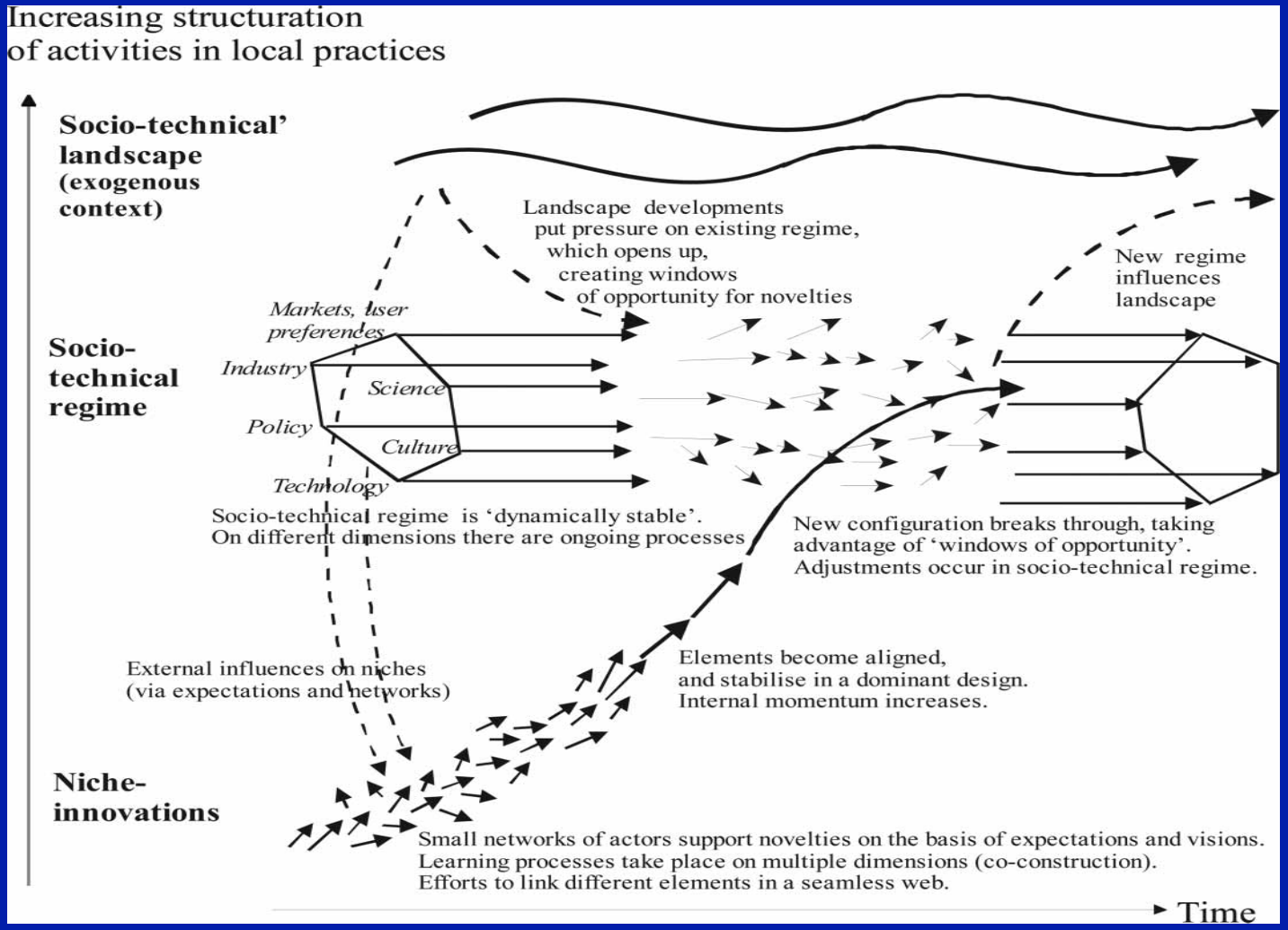
UNFCCC TEC Workshop
"Strengthening national systems of innovation in developing countries"
Bonn, Germany; October 13, 2014

'Climate technology knowledge':

- Knowledge required to absorb/adapt climate technologies and deploy them at scale – innovation AND diffusion
- Successful innovation and diffusion requires addressing not just technology (availability and operation) but also economics, finance, markets/demand, and policy (i.e., supply, demand, and facilitation) – in local context
- Local human, organizational, and institutional capabilities are key

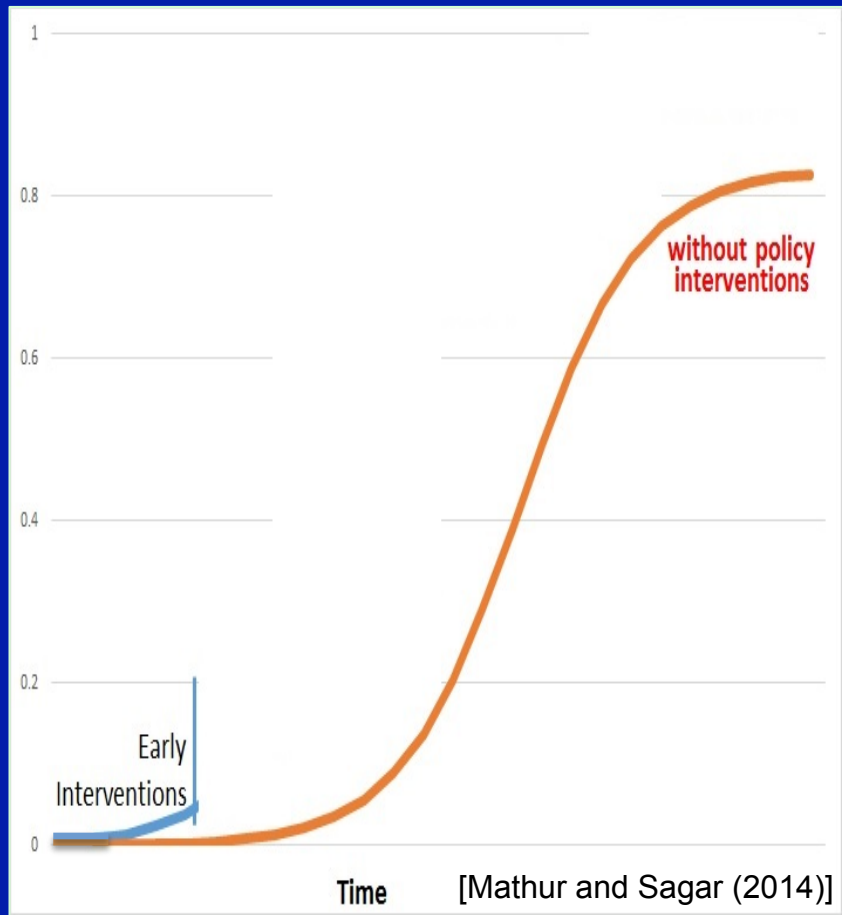
Climate-technology transitions:



[Schot and Geels (2008)]

Technology absorption, adaptation & demonstration: Proof of applicability and utility

- Technology absorbed and adapted for local use conditions and user preferences
- Manufacturers and early adopters willing to consider technology because of its technical performance and/or economic feasibility



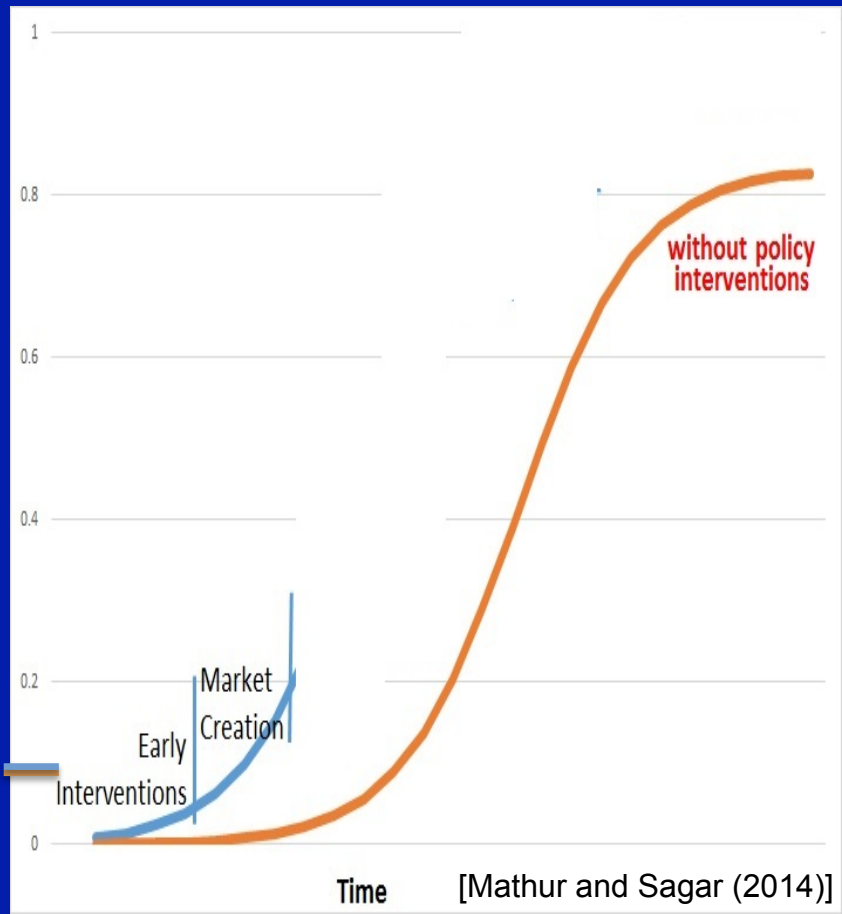
[Mathur and Sagar (2014)]

Technology absorption, adaptation & demonstration: Proof of applicability and utility

- Technology absorption/adaptation
  - *Suzlon licensing arrangement with Südwind for wind turbines; BHEL licensing from Siemens for supercritical boilers*
  - *Moser Baer technology partnership with Applied Materials for solar PV; assistance from TI for LED heat sink design and integration*
  - *MNC subsidiaries adapting refrigerators for local conditions*
  - *Suzlon purchase of REPower; Moser Baer investment in Solaria*
- Demonstration programs
  - *BEE voluntary appliance label program*

Early market: Proof of deployment model(s)

- Establishment of commercial potential
- Standardization of
  - technical designs
  - contracting procedures, financing approaches
  - operation of technology



[Mathur and Sagar (2014)]

Early market: Proof of deployment model(s)

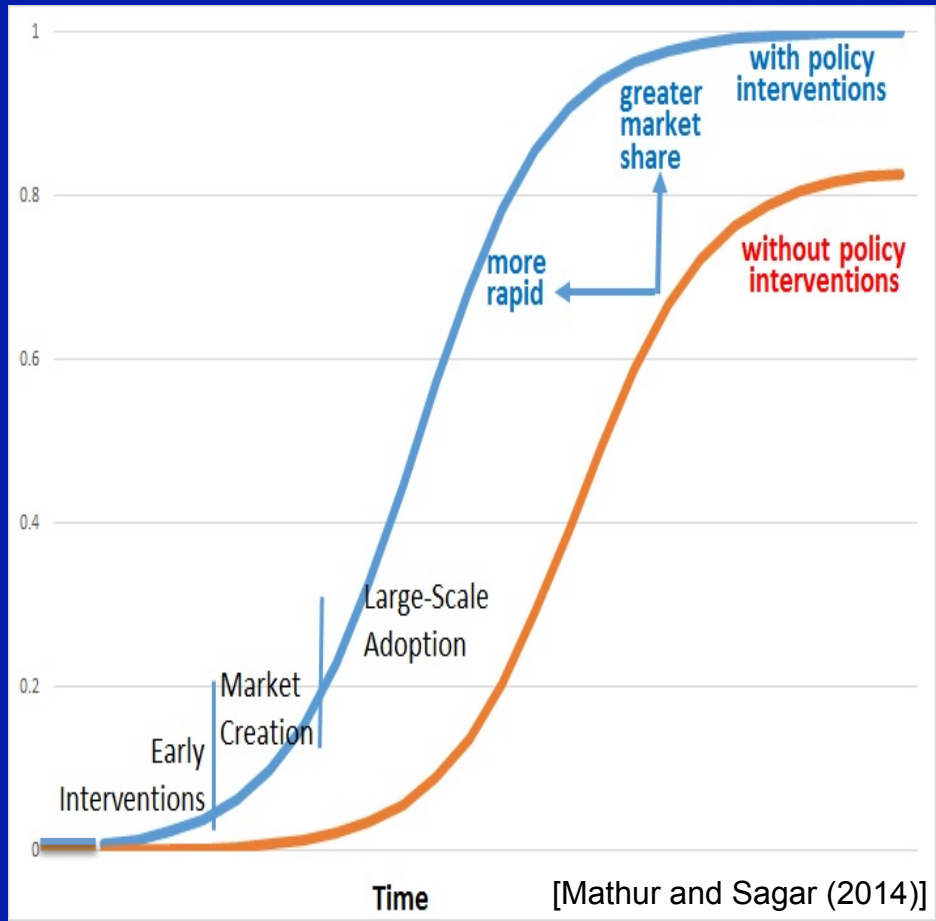
- Illustration of deployment approaches
  - *Suzlon's captive generation/buy-back projects*
- Policies to help create markets/exploit niche markets
  - *Capital subsidy for wind-turbine; Feed-in tariff for solar*
  - *Performance risk guarantee for commercial energy-efficient equipment loans (with GEF)*
- Support for business and technical activities
  - *CLASP and SEAD assistance for designing energy-efficient appliance labeling and standards program*
  - *Japanese assistance for design of RFPs for supercritical boiler tenders*

Large-scale adoption

- Technology established in market
- Manufacturing at scale; supply chains; full operations and maintenance support

Policy support for large-scale diffusion (e.g., standards, regulations)

Capital for establishing manufacturing plants



[Mathur and Sagar (2014)]

Knowledge transfer and absorption:

- Happens in many dimensions through many routes
  - *Firm –> firm (licensing, collaboration, joint ventures on technical issues)*
  - *Govt agency –> govt agency (collaborative programs)*
  - *Think tanks/research organizations/intermediary organizations –> govt agencies (knowledge sharing of policy experiences and program design)*

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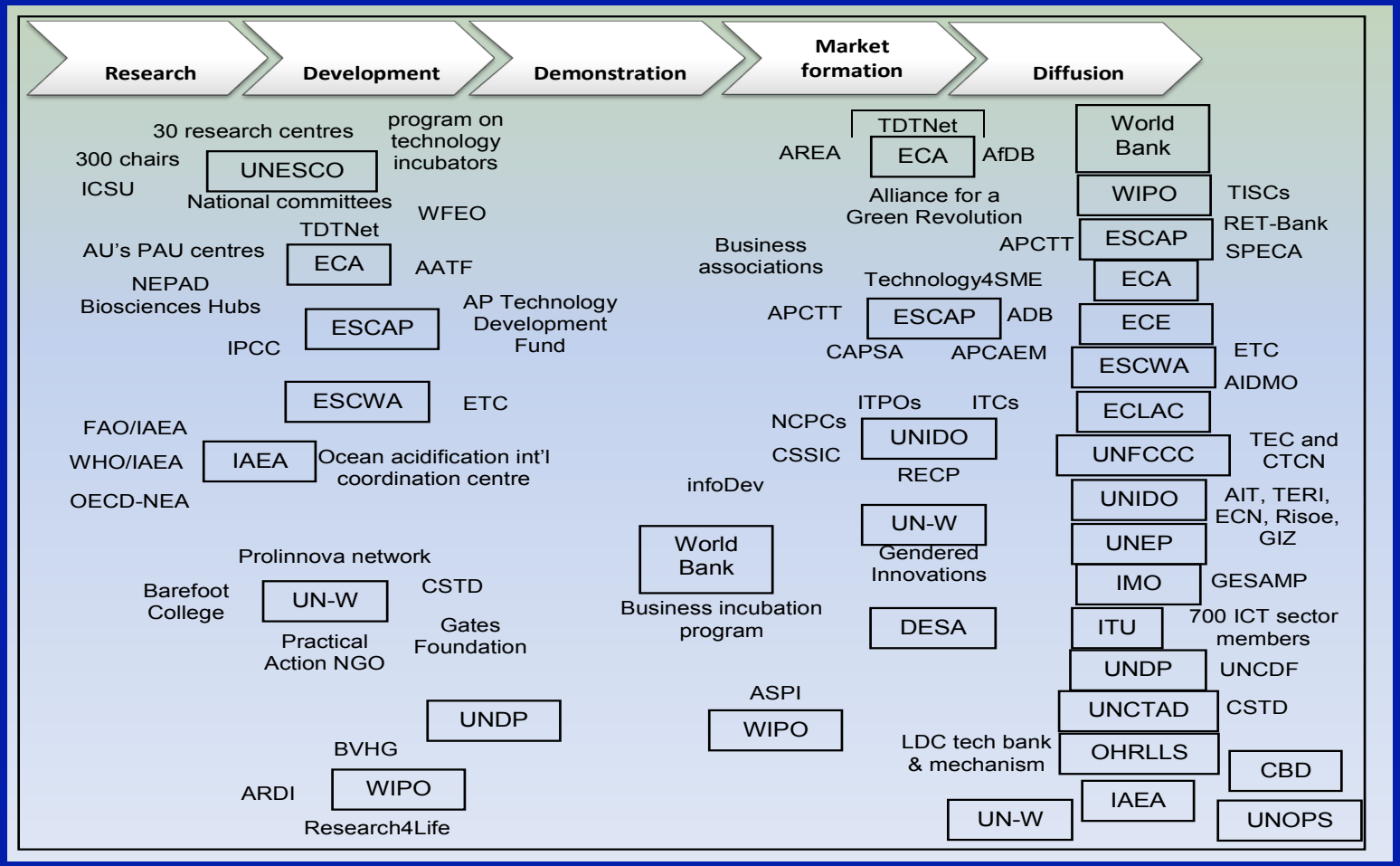
Strengthening national capacity:

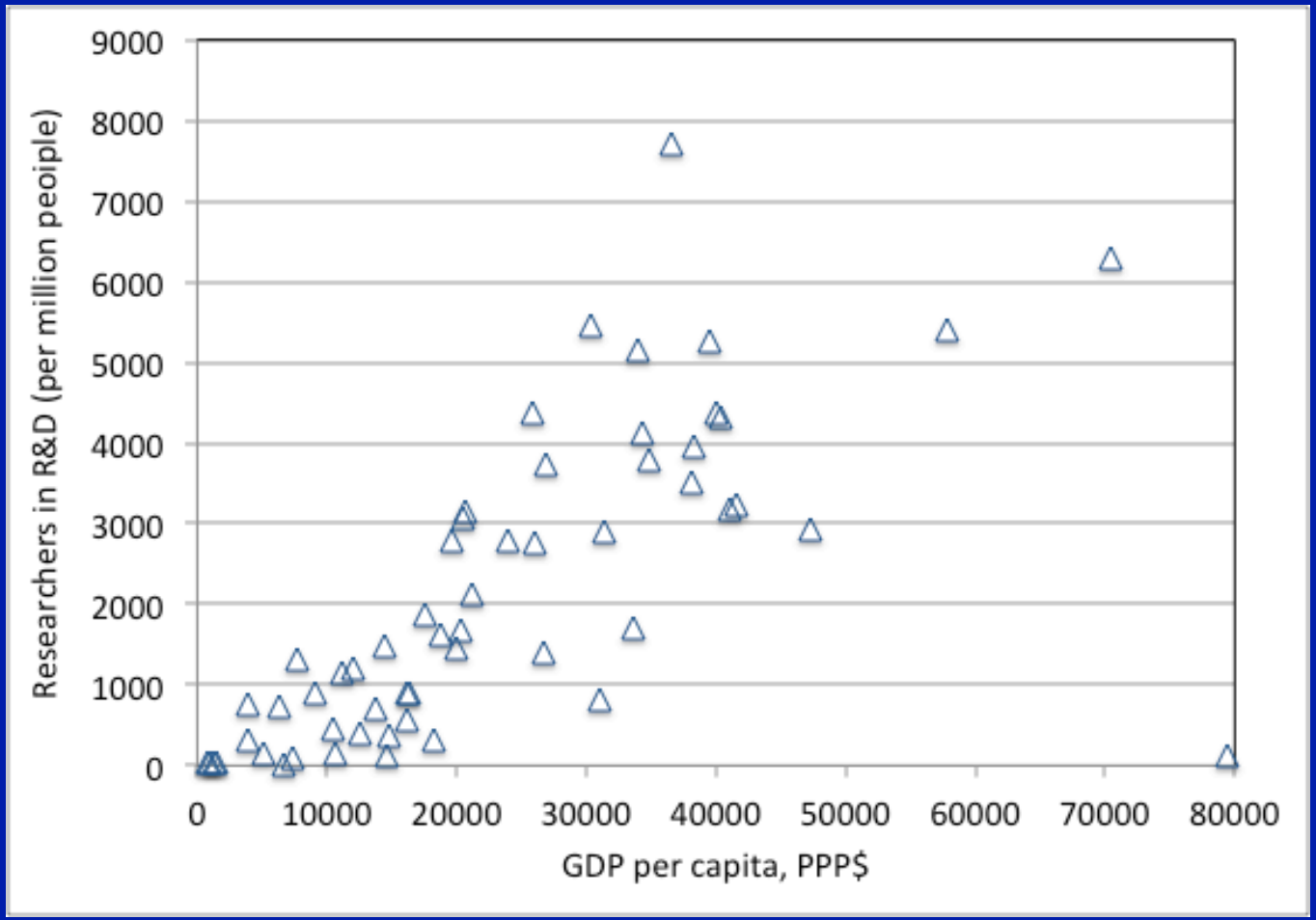
- National systems of innovation: actors with linkages embedded in institutional context
- Strengthening needed on multiple dimensions (actors, linkages, and institutions)
  - *technical, business model development, appropriate policy support, human resources – technical capabilities key (new forms of international collaboration)*
  - *Coordination between various activities and actors for various stages of innovation (CIC approach)*
  - *Actors with 'systems' perspective and coordination role ('systems operators') – industrialized & developing countries*
  - *Strategic approach to climate technology deployment*
  - *Policy design and implementation*

International technology facilitation landscape



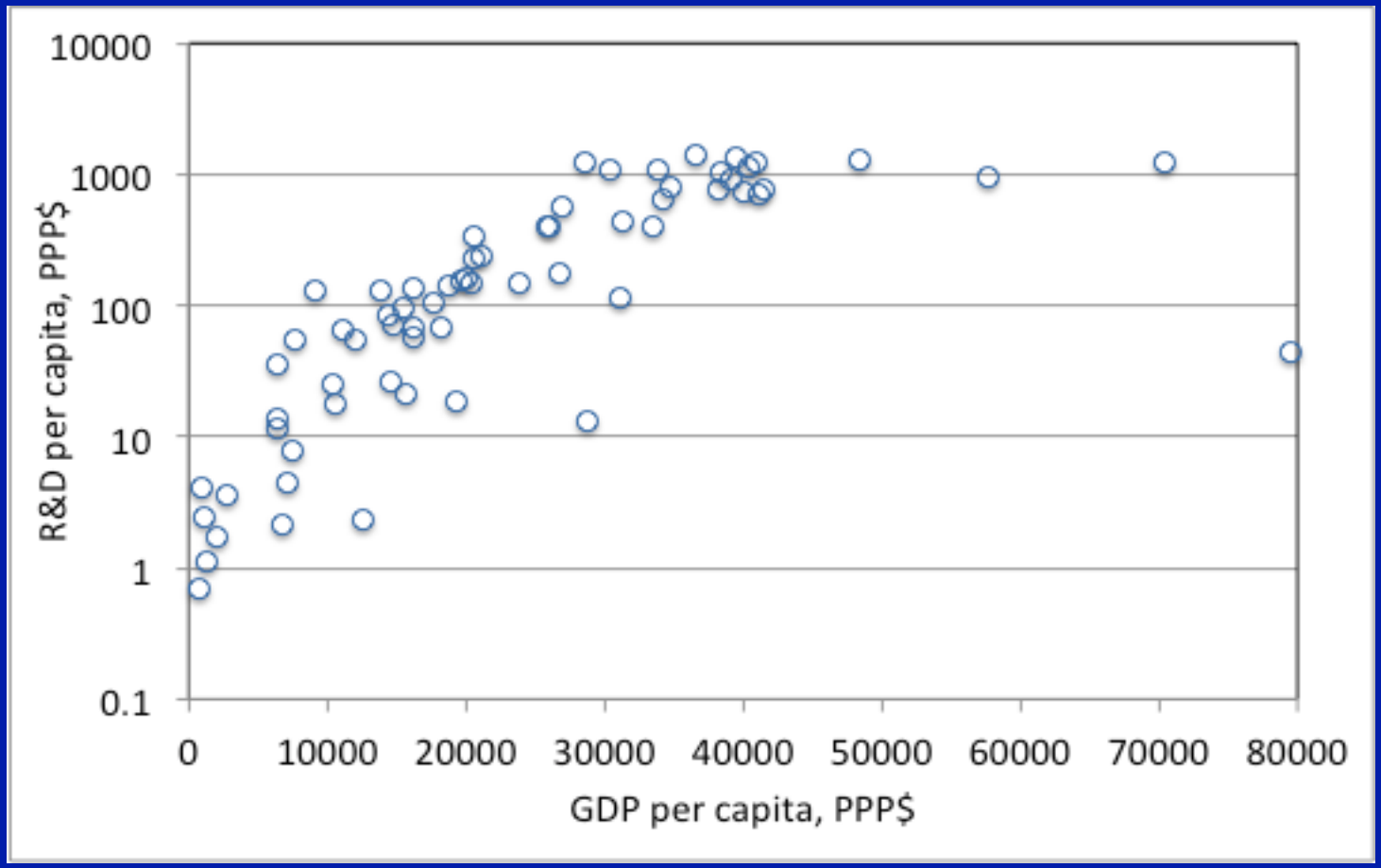
[UN (2012)]

International technology capability landscape



World Development Indicators database

International technology capability landscape



World Development Indicators database; UNESCO

Strengthening national capacity:

- National systems of innovation: actors with linkages embedded in institutional context
- Strengthening on multiple dimensions
  - *technical, business model development, appropriate policy support, human resources – technical capabilities key (new forms of international collaboration?)*
  - *Coordination between various activities and actors for various stages of innovation (CIC approach)*
  - *Actors with 'systems' perspective and coordination role ('systems operators')*
  - *Strategic approach to climate technology deployment*
  - *Policy design and implementation*
- Strengthening in developing and industrialized countries

Comments/Suggestions/Questions:

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