

# Countries' comparative advantages in low-carbon technologies

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# A green industrial policy

- 2°C – target requires drastic reduction in global emissions
- Need technologies that are (almost) competitive with fossil fuels (otherwise incentive to deviate)
- Markets underinvest in:
  - Innovation *per se*
  - Technologies that make domestic decarbonisation cheaper
  - Technologies that make foreign decarbonisation cheaper
- Resilient decarbonisation requires a portfolio of technologies -> difficulty of choice

# Technology choice

Learning curves: specialization is necessary

Choice of “right” technologies

(Regional) policies to enable technology development and deployment

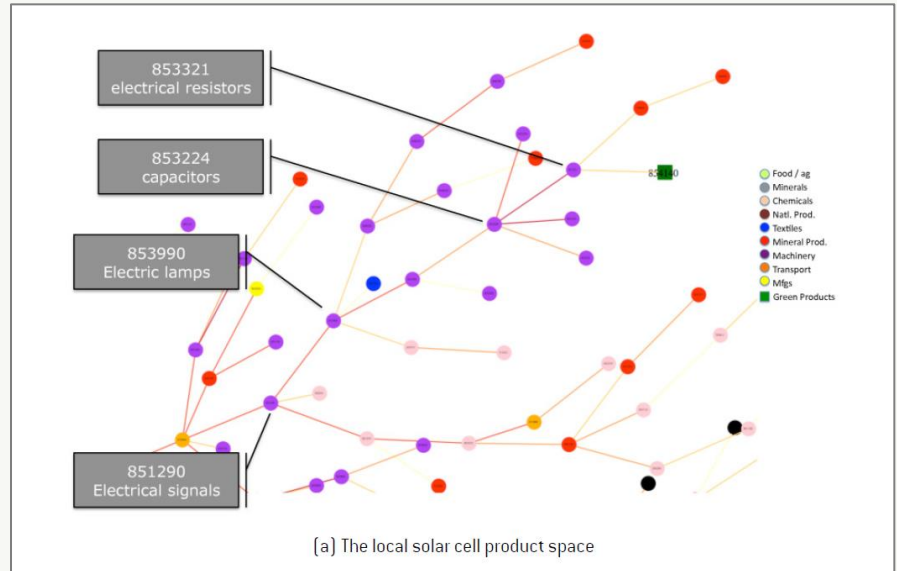


# Identifying potential strength

- Not all countries have potential to grow in all low-carbon technologies
- Potential can be assessed through:
  - Current export specialisation
  - Specialisation in related products
  - Current research specialisation
  - Specialisation in nearby technologies
  - Regional powerhouses

# Specialization in nearby technologies

- Latent factors
  - Factor cost
  - Infrastructure
  - Geography
  - Domestic market size
  - ....
- Technological links
  - Similar value chain
  - Tech spill-over
  - Education
  - ...



Mark Huberty and Georg Zachmann (2011), *Green exports and the global product space: prospects for EU industrial policy*

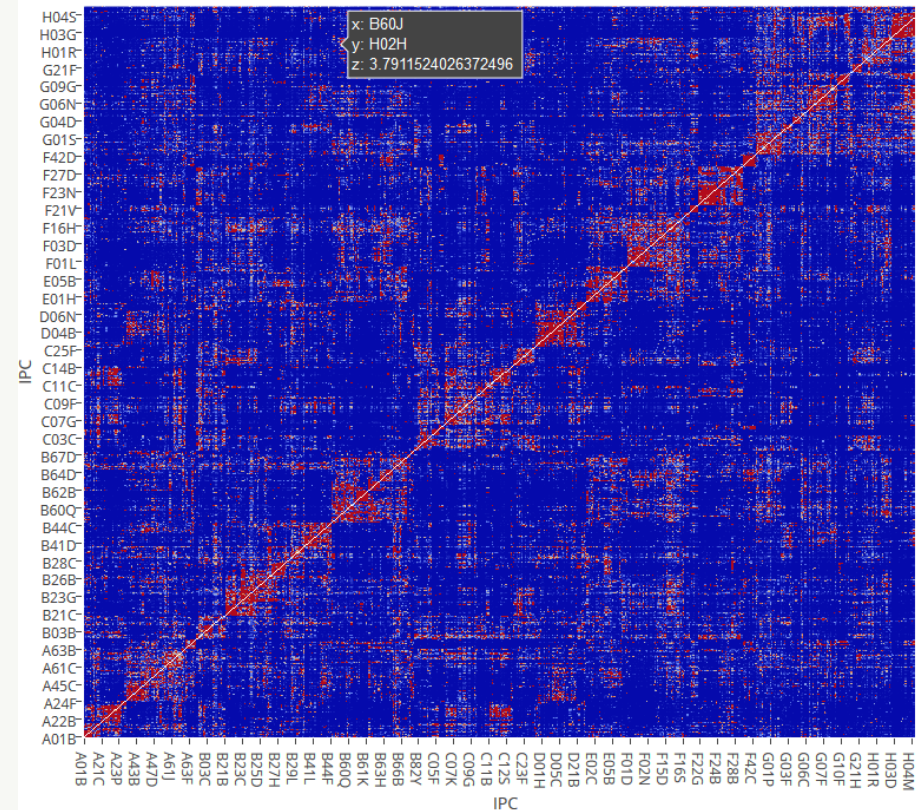
**=> All informative about potential**

# Technological Proximity

- Related technologies identified by technology proximity
- Different measures/technological networks can be used

## Example: *Electric vehicles*

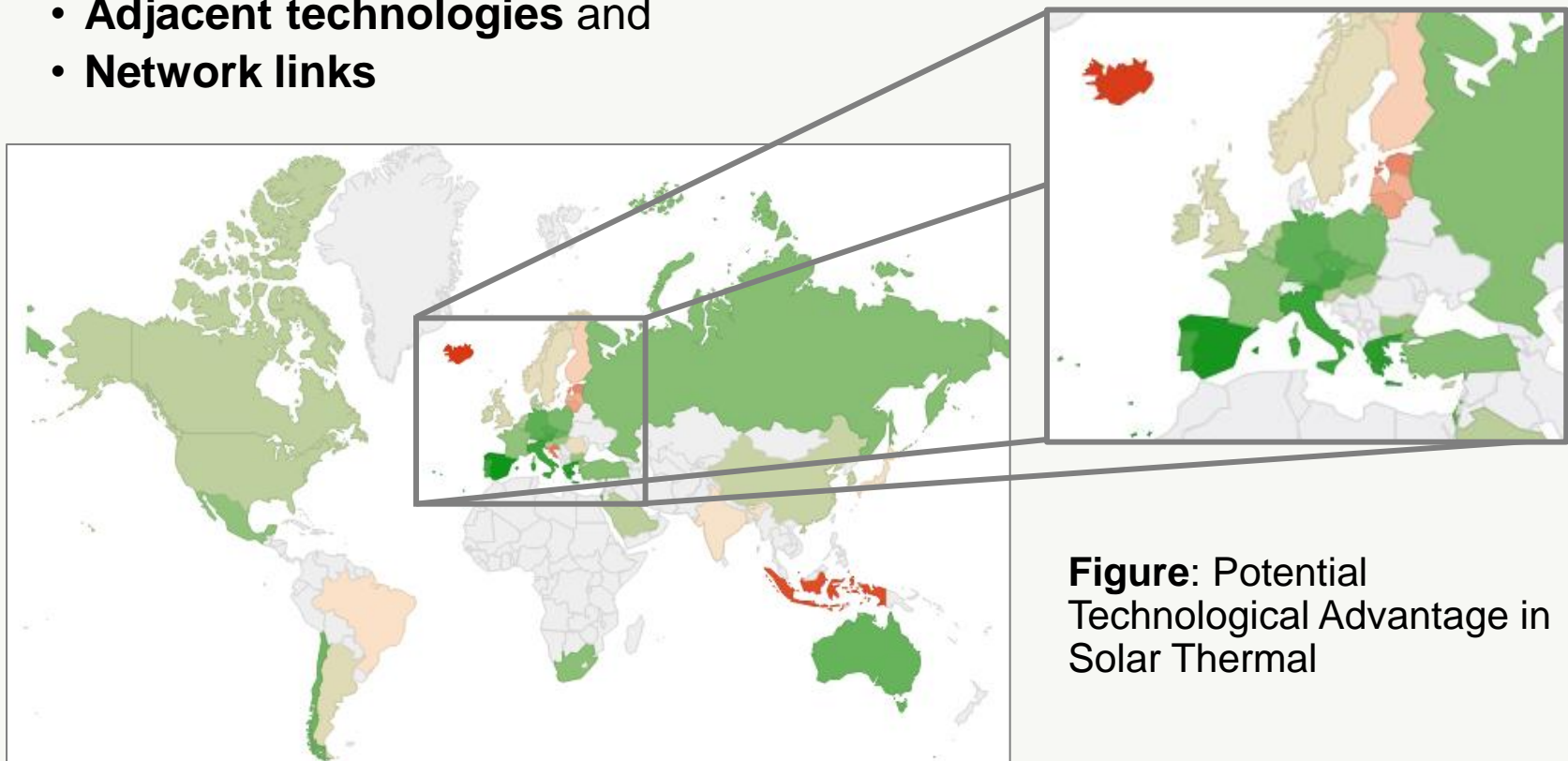
- ✓ Power lines
- ✓ Motor railcars
- ✓ Electric power conversion (AC, DC)
- ✓ ...



Source: Bruegel based on Patstat

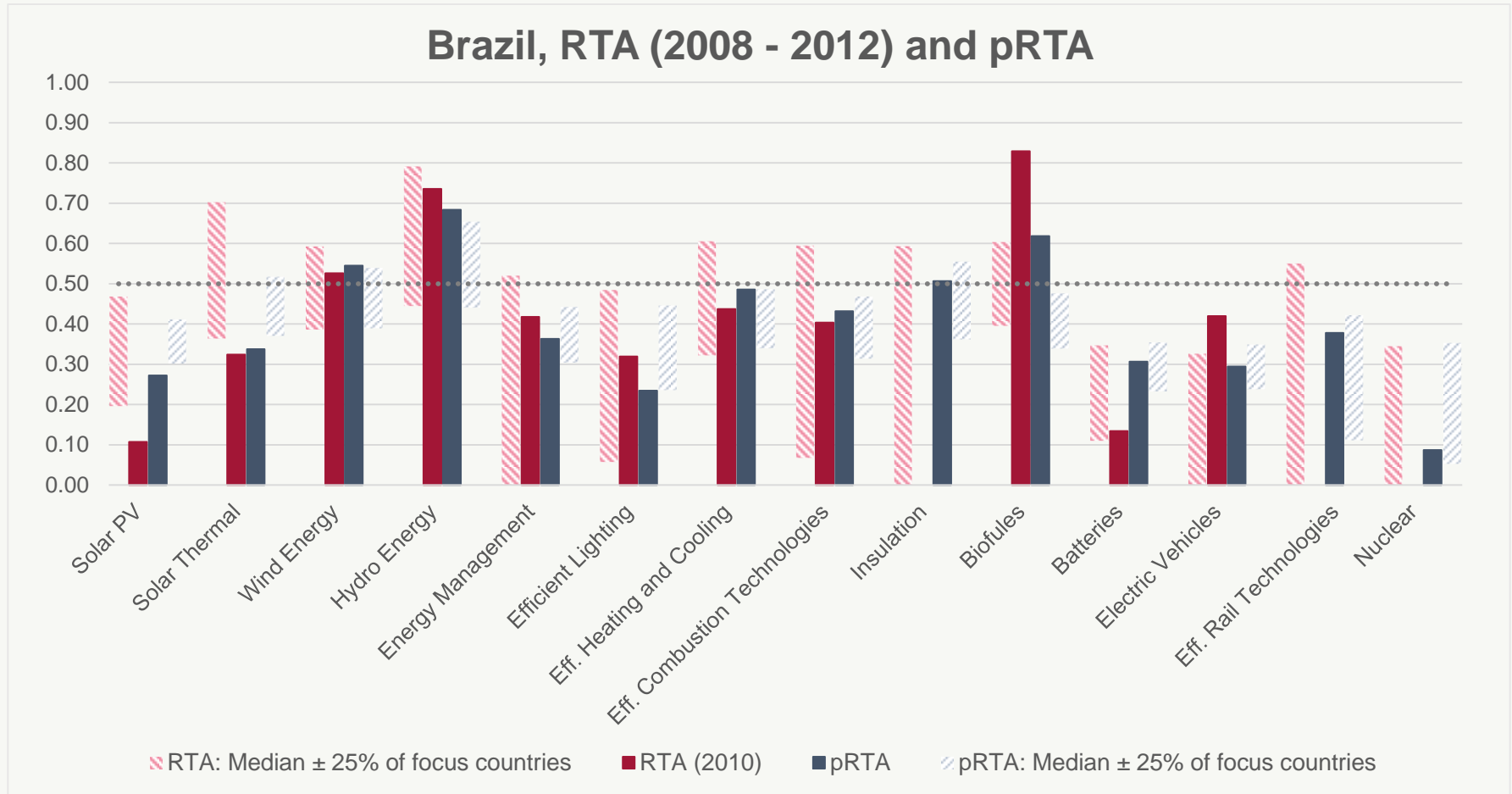
# Potential Strength in Technology

- Potential strength is a combination of the
  - **Adjacent technologies** and
  - **Network links**



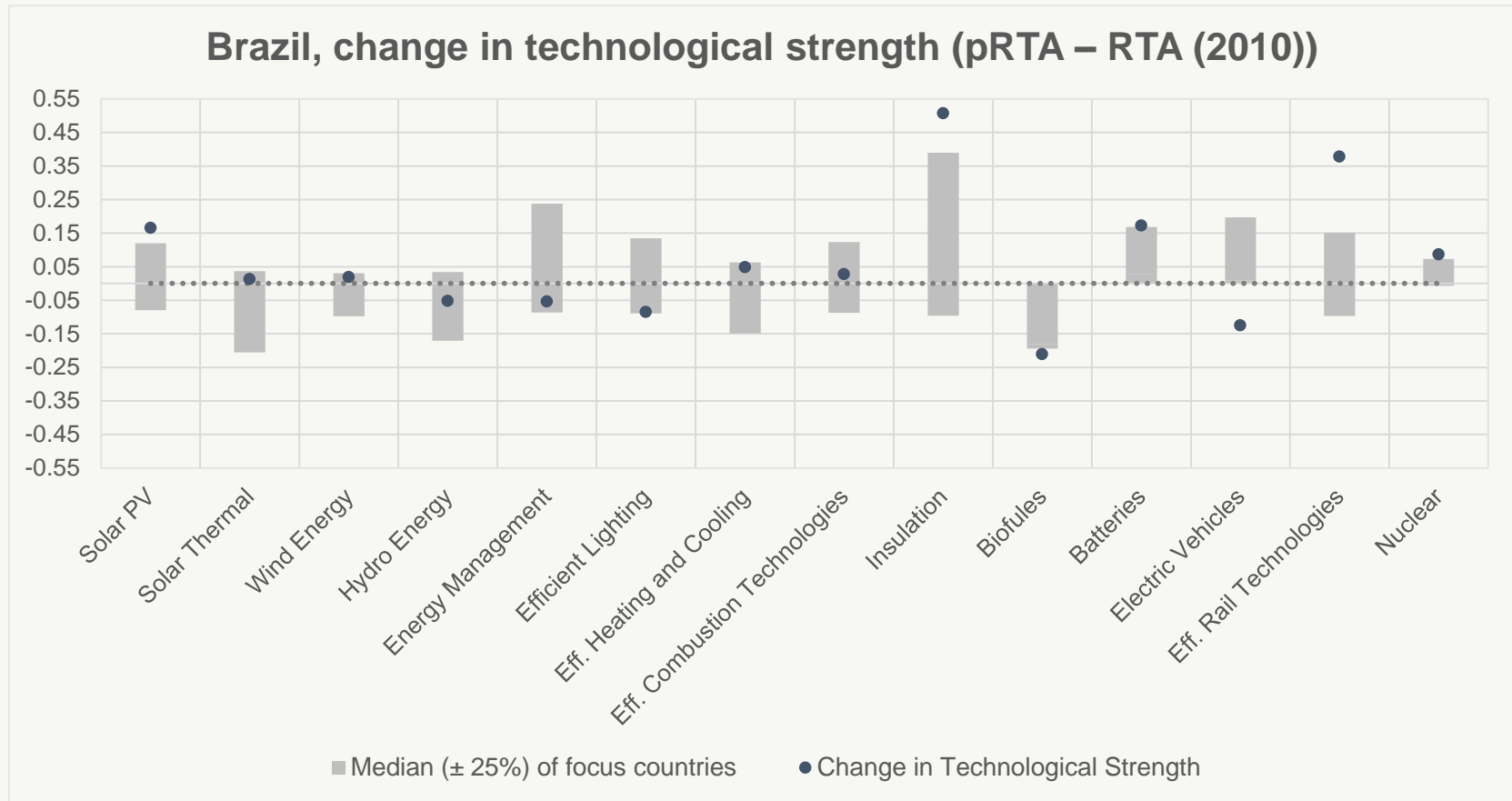
**Figure:** Potential Technological Advantage in Solar Thermal

# Country Example (1)





# Country Example (2)



# Conclusion

- Need for development in low-carbon techs
- Need for specialization
  - Choice can be determined by many variables
  - One option: strength in adjacent technologies
- Need for (regionally) targeted policies