

Innovation and Climate Change

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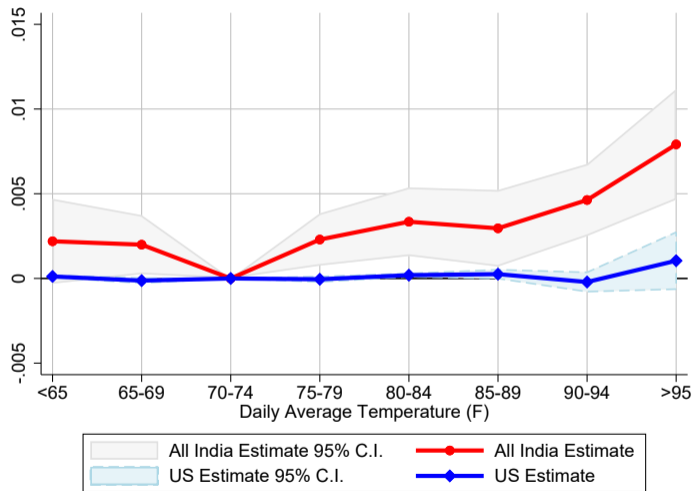
June 23, 2023

Two major global challenges

- ① Eliminating extreme poverty
- ② Confronting climate change
 - The problem is that climate change may make the elimination of extreme poverty more difficult.
 - The global challenge of the century, therefore, is to achieve a balance between growth and the externalities from growth.
 - Today, I will be looking at three areas of policy innovation that might help us achieve this balance:
 - ① Climate justice
 - ② Smart conservation
 - ③ Clean energy

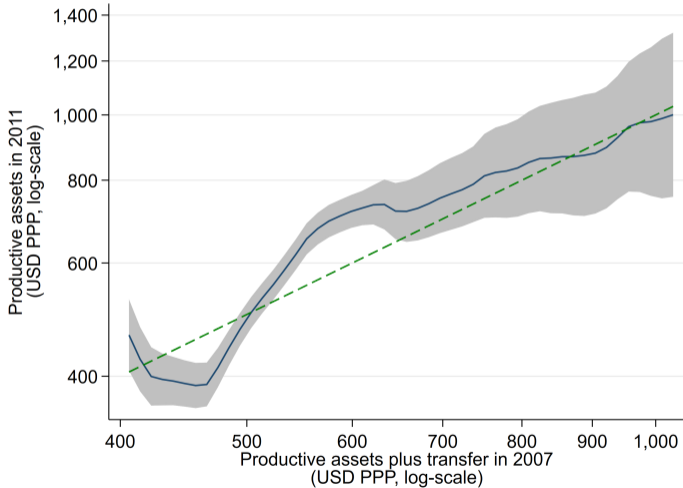
Climate justice

Figure: Estimated Impact of Daily Temperature on Log All-Age Mortality Rates (Burgess et al. 2023)



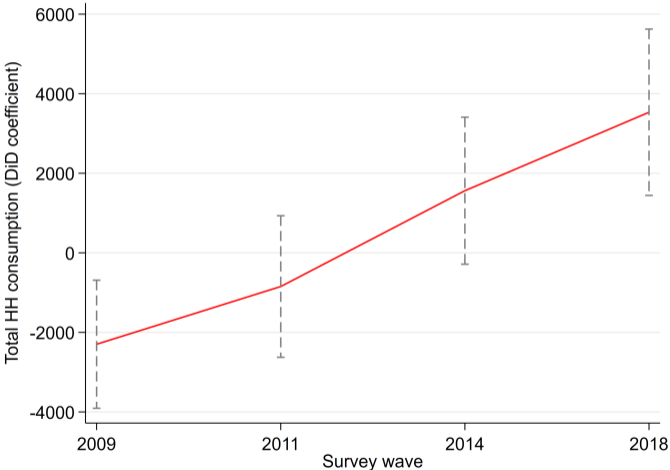
Climate justice

Figure: Estimated Transition Equation (Balboni et al. 2022)



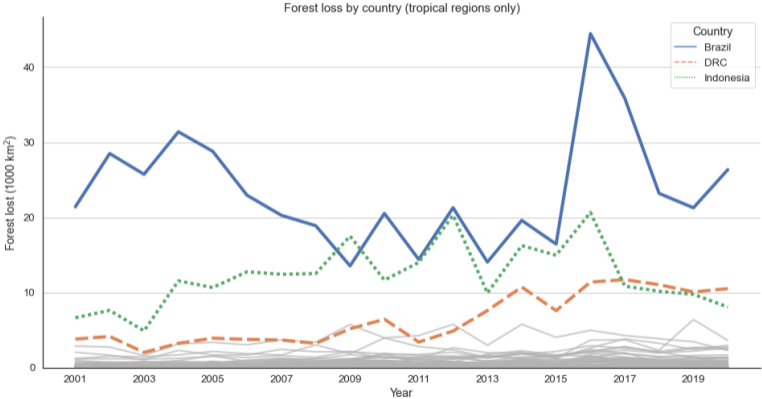
Climate justice

Figure: Estimated Total Consumption in the Long-run (Balboni et al. 2022)



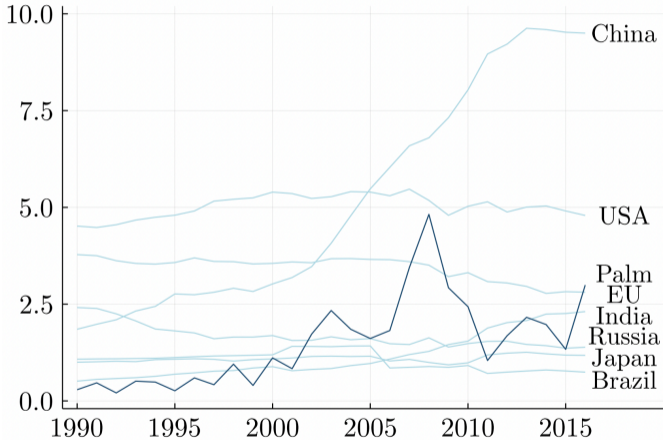
Smart conservation

Figure: Forest loss by country (tropical regions only) (Balboni et al. 2023)



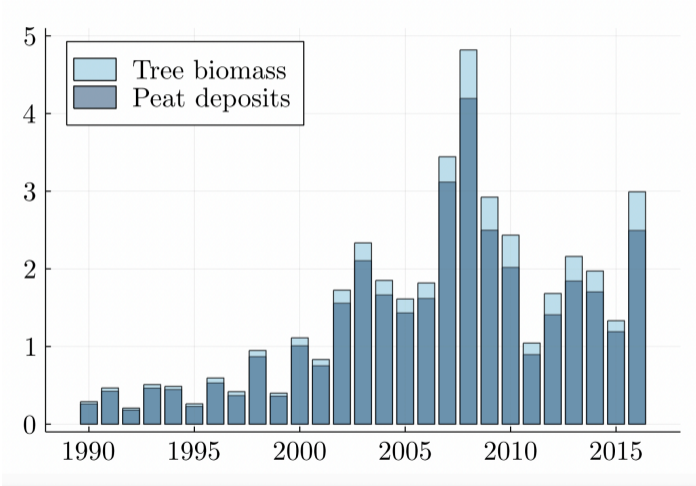
Smart conservation

Figure: Global CO2 emissions (Hsiao 2023)



Smart conservation

Figure: Palm emissions (Hsiao 2023)

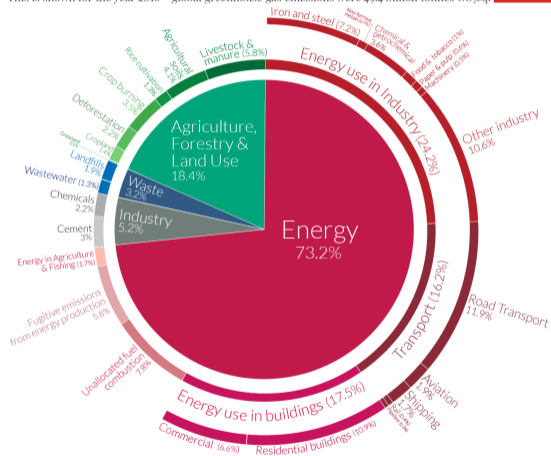


Clean energy

Global greenhouse gas emissions by sector

Our World
in Data

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



OurWorldinData.org – Research and data to make progress against the world's largest problems.

Source: Climate Watch, the World Resources Institute (2020).

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Clean energy

2000

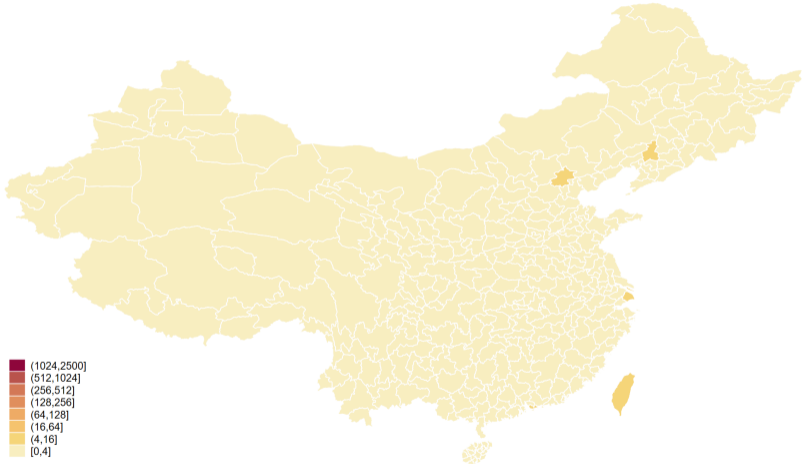


Figure: Patent distribution at city level and policy implementation. Black circled cities are treated by any subsidy policy (Banares-Sanchez et al. 2023)

Clean energy

2001

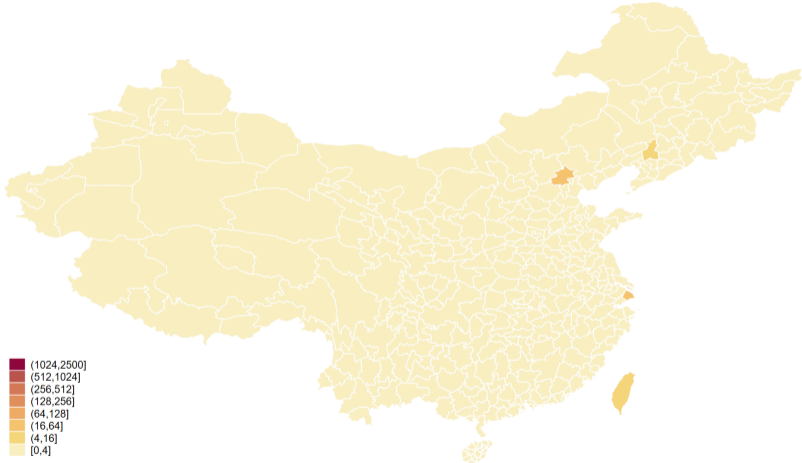


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2002

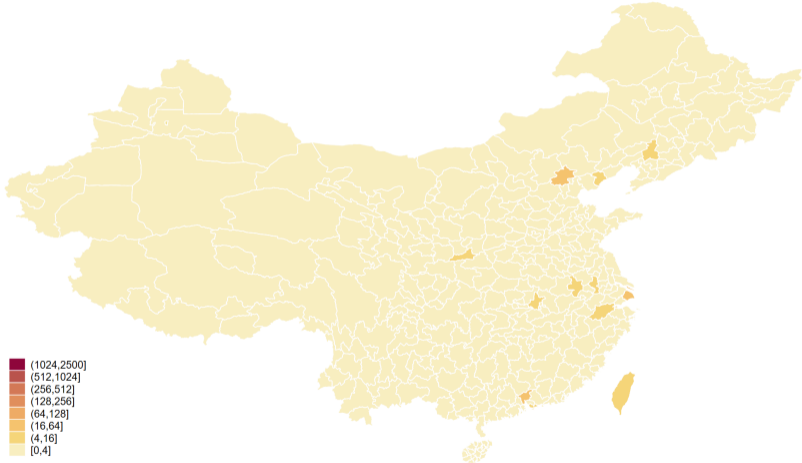


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2003

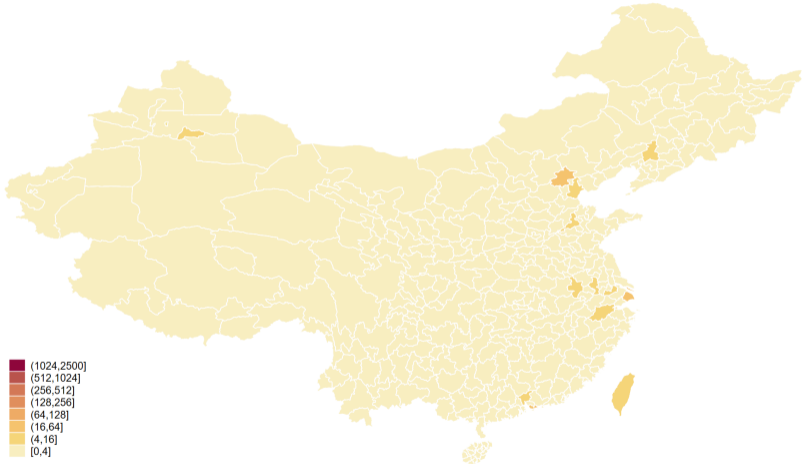


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2004

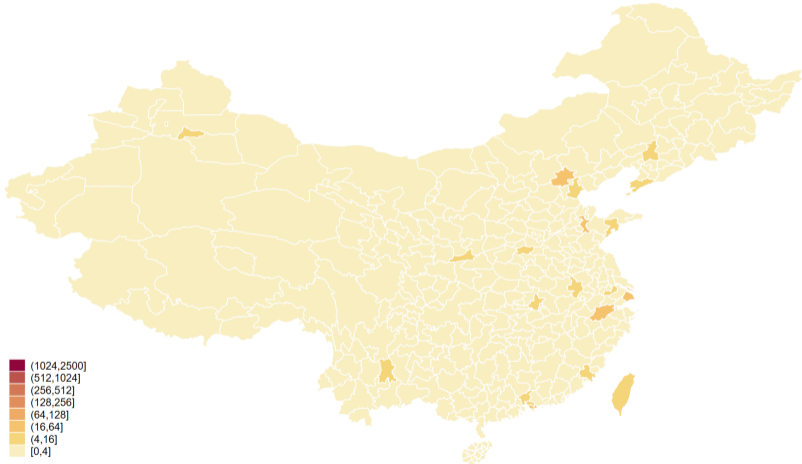


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2005

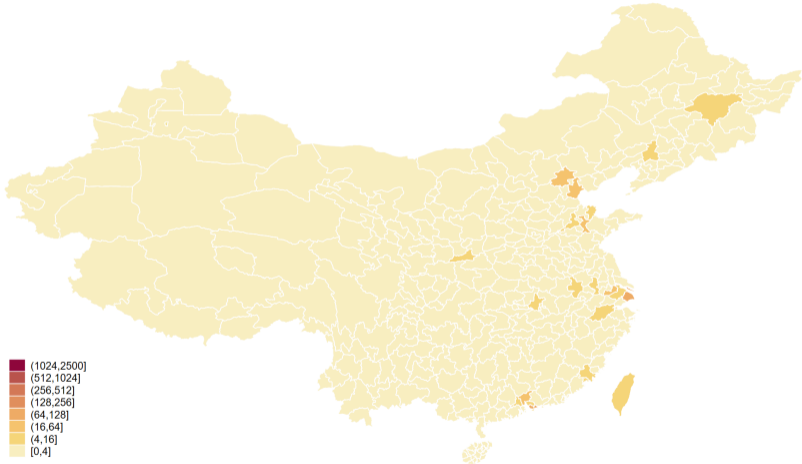


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2006

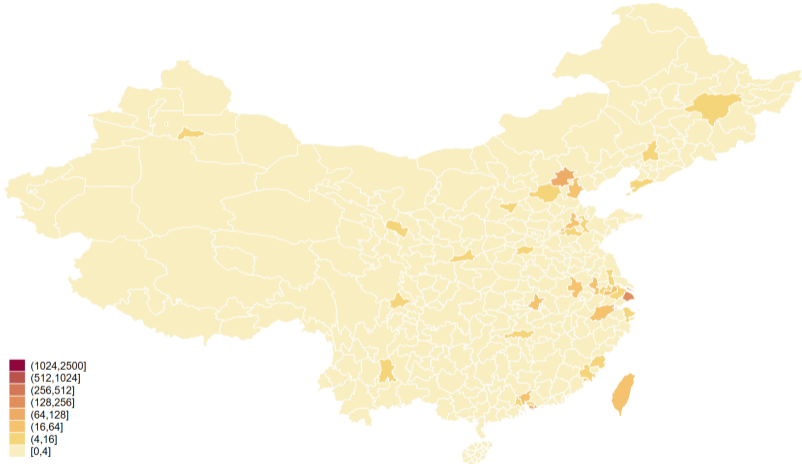


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2007

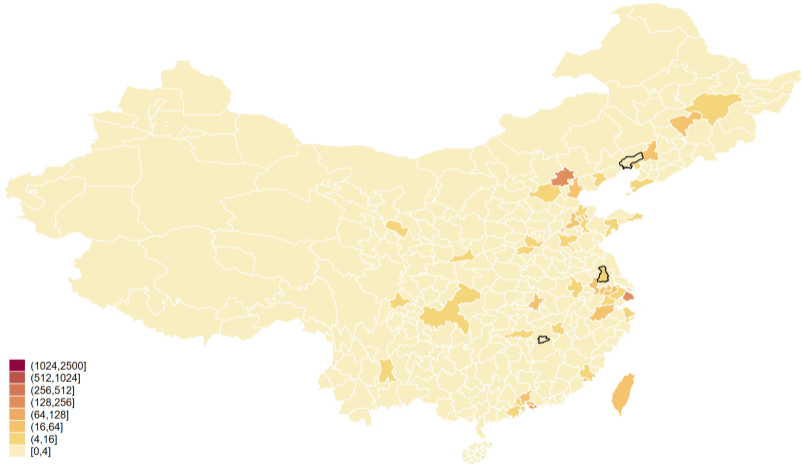


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2008

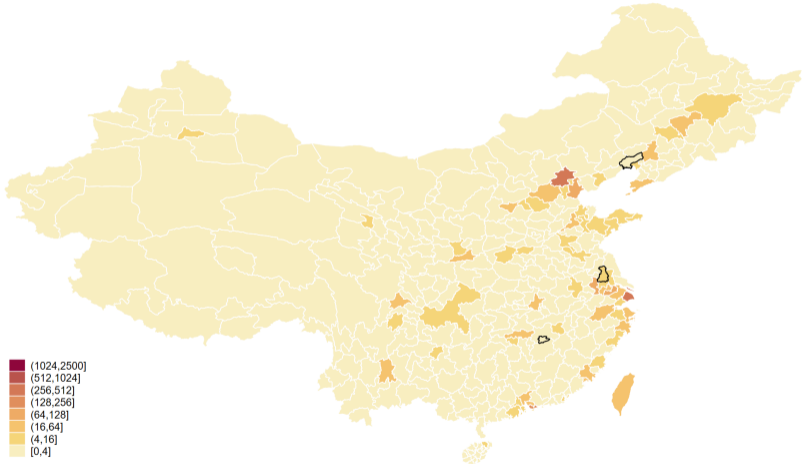


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2009

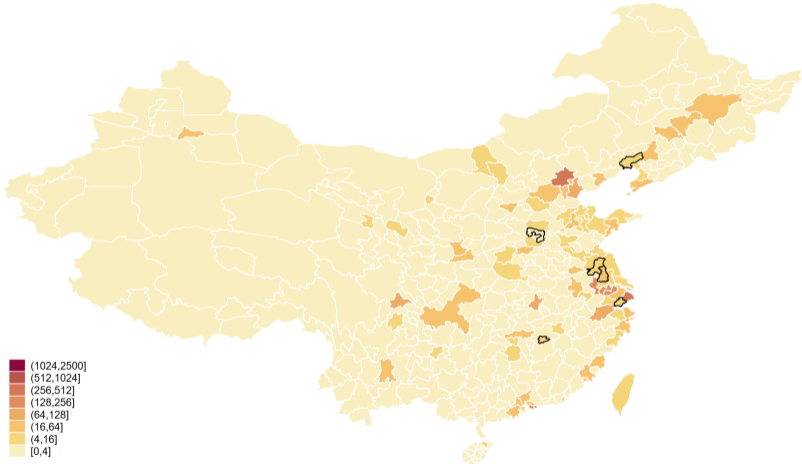


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2010

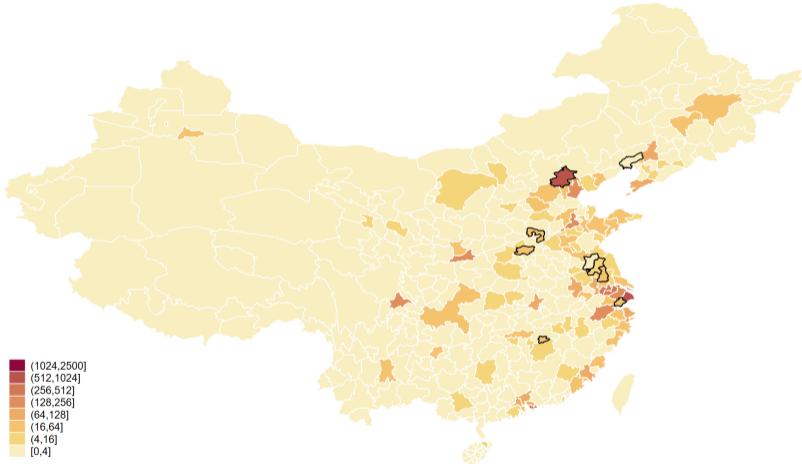


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Clean energy

2011

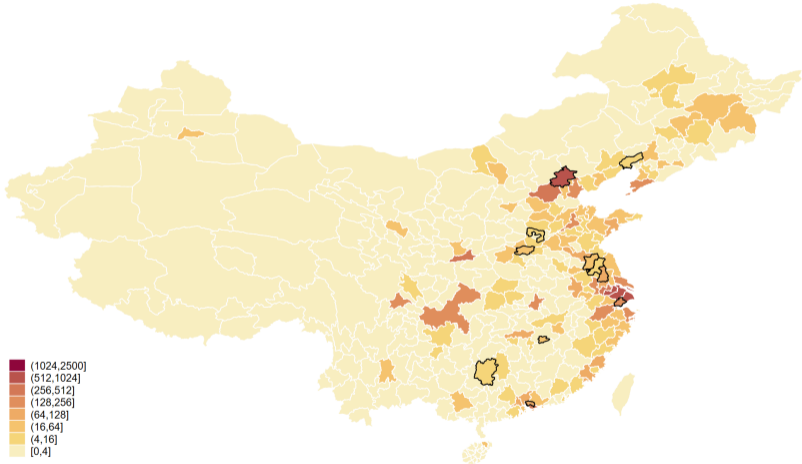


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Clean energy

2012

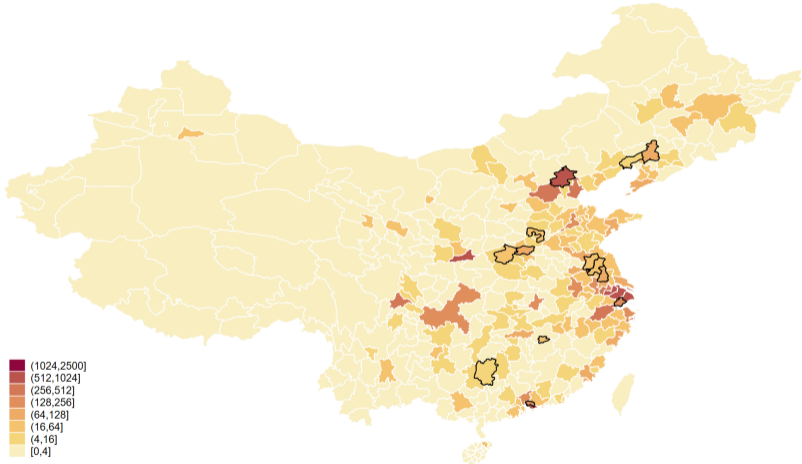


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Clean energy

2013

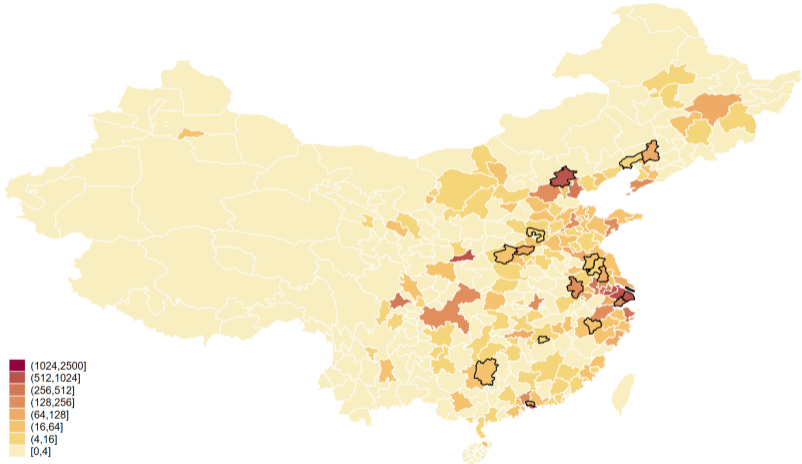


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2014

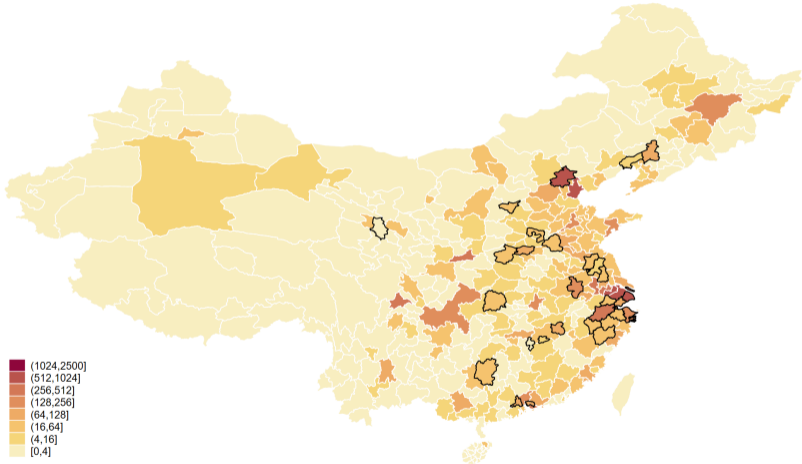


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2015

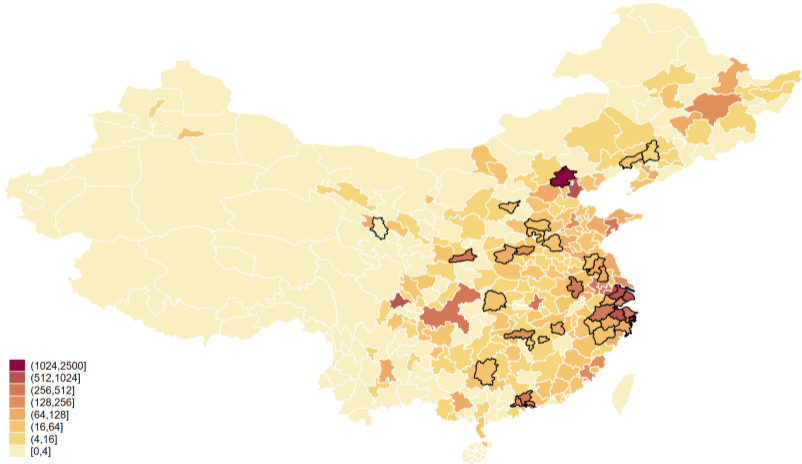


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2016

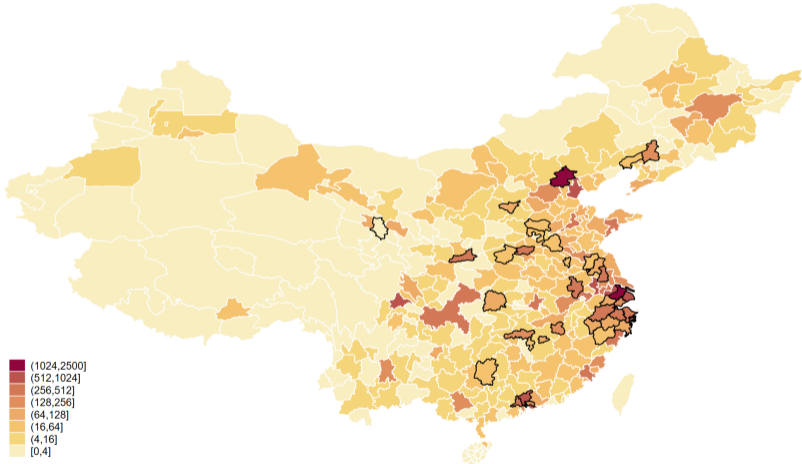


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2017

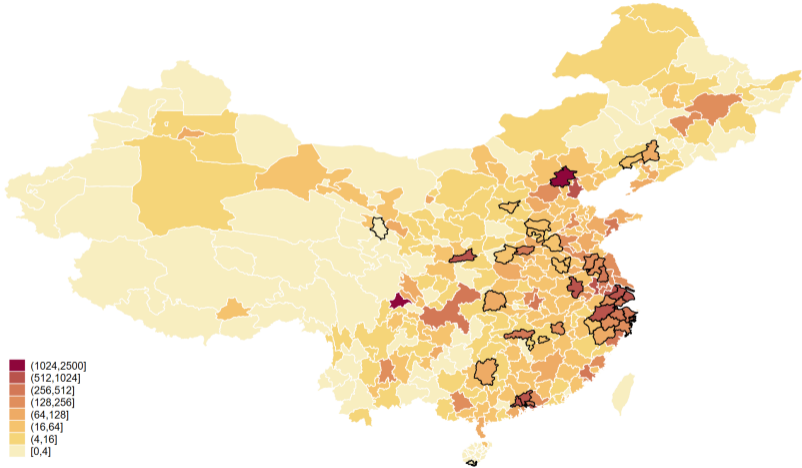


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2018

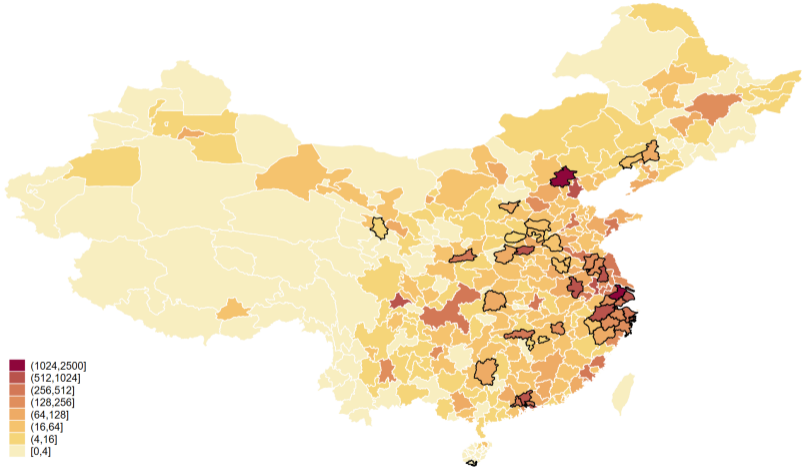


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2019

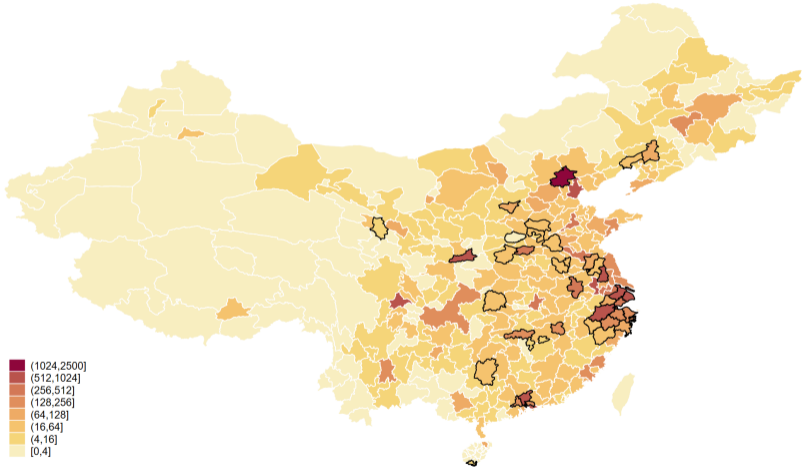
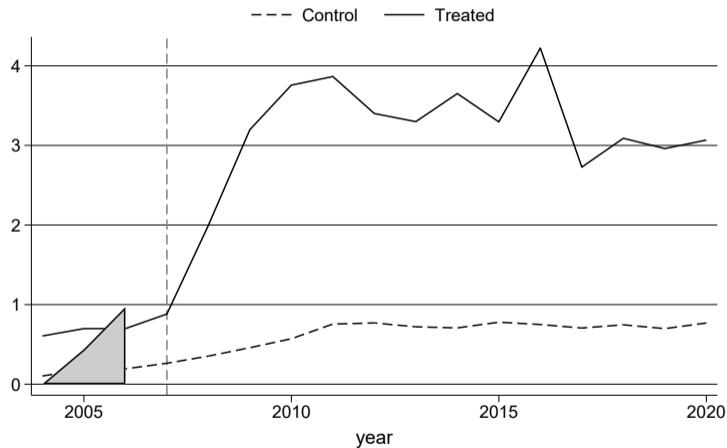


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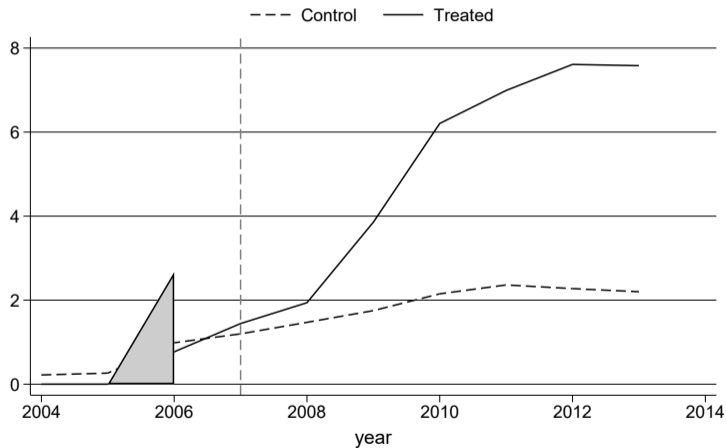
City-level industrial policy and patenting

Figure: Estimated patenting effect from any subsidy, 2007 cohort. (Banares-Sanchez et al. 2023)



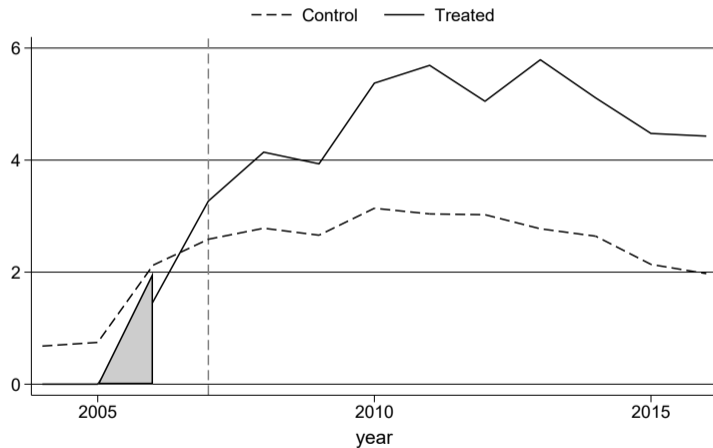
City-level industrial policy and production

Figure: Estimated production effect from any subsidy, 2007 cohort. (Banares-Sanchez et al. 2023)



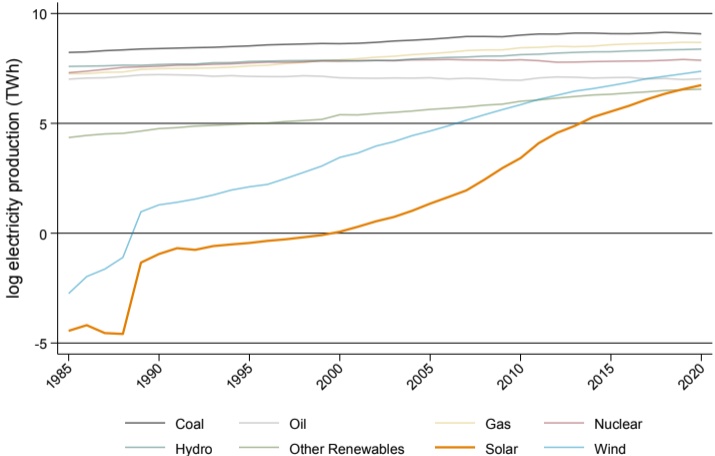
City-level industrial policy and exports

Figure: Estimated exporting effect from any subsidy, 2007 cohort. (Banares-Sanchez et al. 2023)



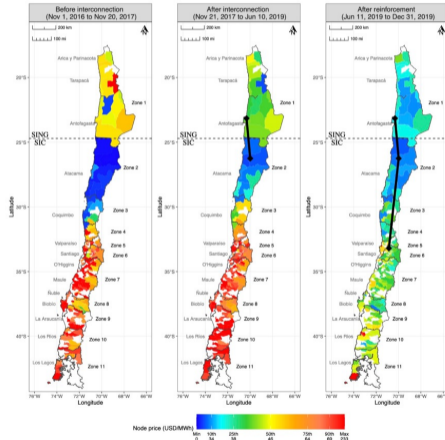
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Figure: World Electricity Production by source (International Energy Agency)



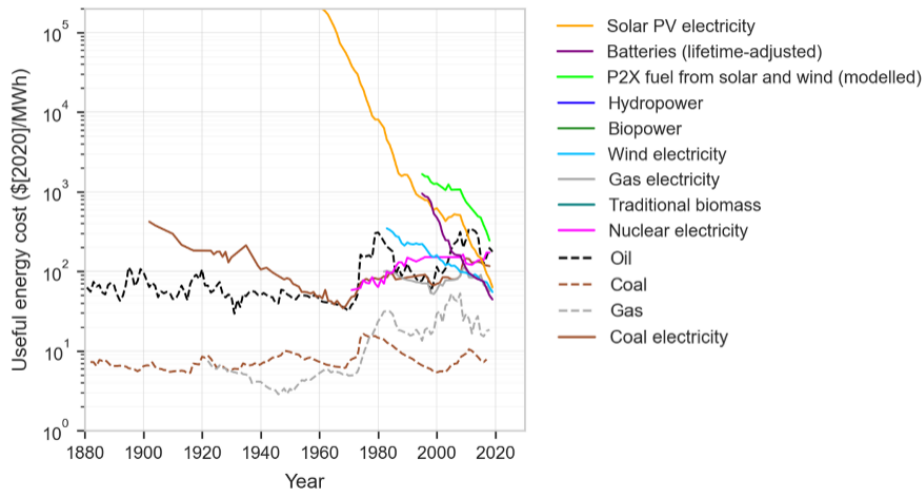
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Figure: Market Integration and Spatial Variation in Electricity Prices (Gonzales et al. 2023)



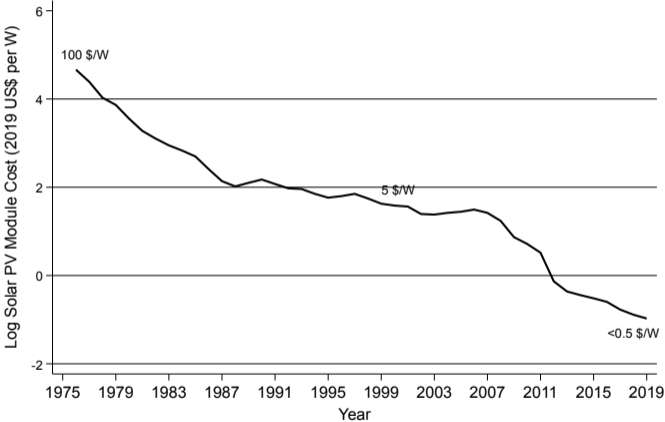
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Figure: Historical energy costs (Way et al. 2021)

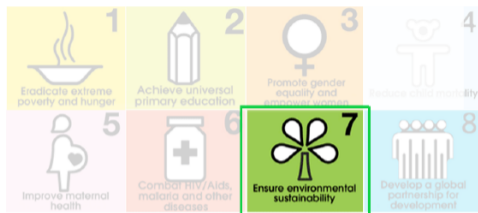


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Figure: Solar PV Module Costs (IRENA Database)



Conclusion



MDGs
2000



SDGs
2015

