Energising EU Cohesion

Powering up lagging regions in the renewable energy transition

Johannes Többen (GWS & PIK)

Maximilian Banning (GWS)

Katharina Hembach-Stunden (GWS)

Britta Stöver (GWS)

Philip Ulrich (GWS)

Thomas Schwab (Bertelsmann Stiftung)

BertelsmannStiftung

3 Goals of the European Green Deal by 2050

- No net emissions of greenhouse gases (GHG)
- Decoupled economic growth from resource use
- No person and no place left behind

Where are the GHG emissions coming from?

Source: EEA

Renewable energy transition …

Phasing out fossil energy

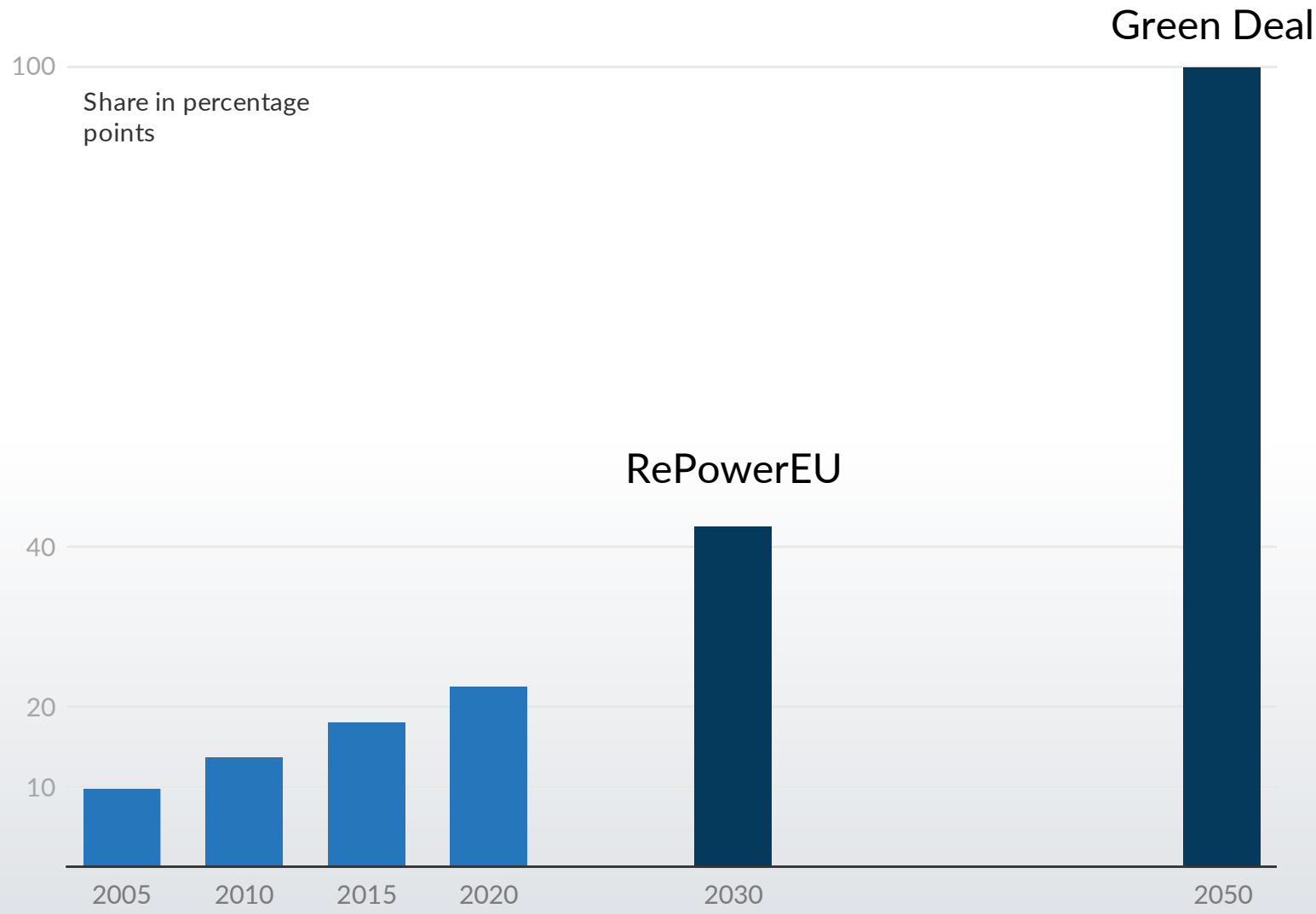
- Electricity generation
- Space heating
- Mobility and transportation

Expanding renewable energy

- More wind, solar, hydropower, …
- Electrification of everything
- Storage and adapted grid

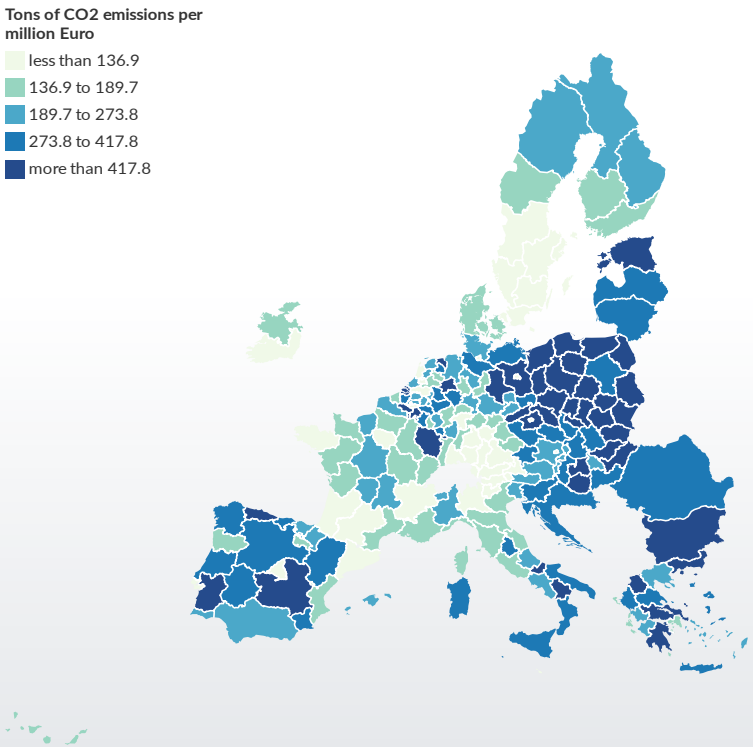
… with substantial impact on the economy

Where do we stand with renewable energy?

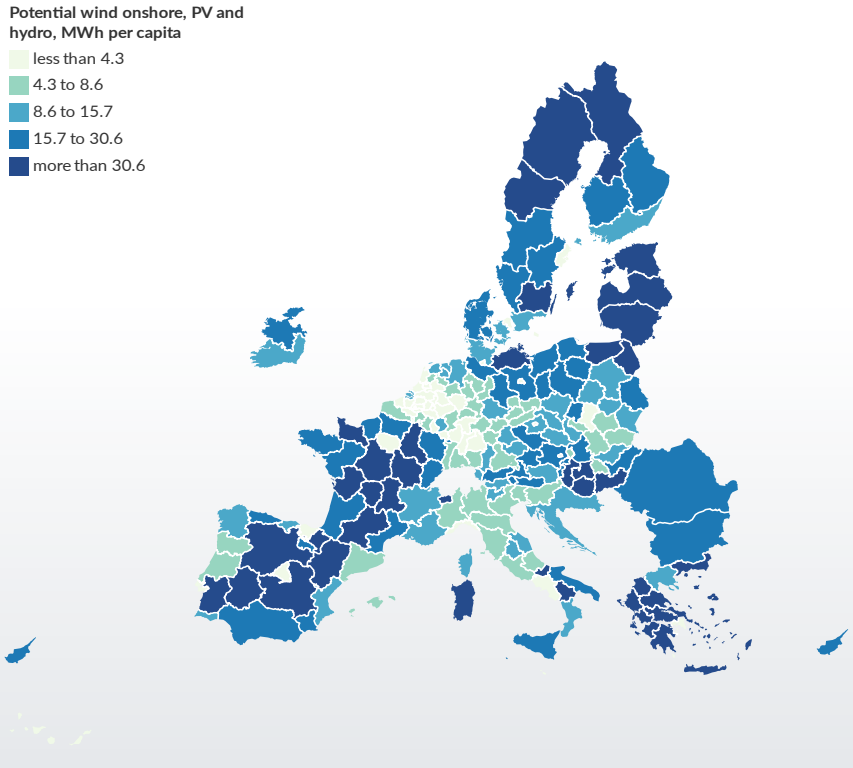


Different regional starting positions

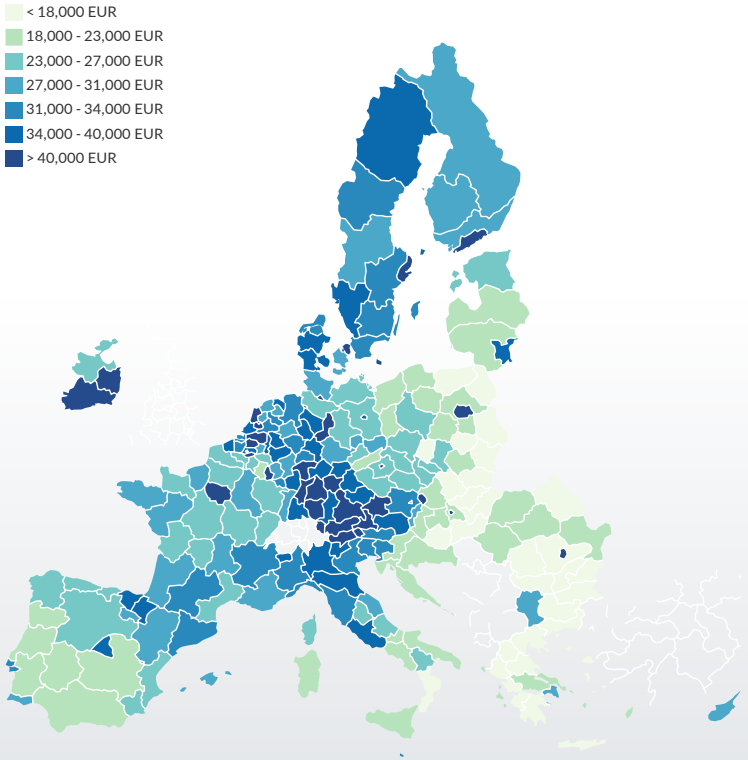
CO_2 intensity (2019)



Renewable potential



GDP (per capita, 2019)



This study

- What are the economic effects of the renewable energy transition?
- Which regions are likely to gain?
- What does this mean for economic cohesion in Europe?

Energy transition impacting the economy

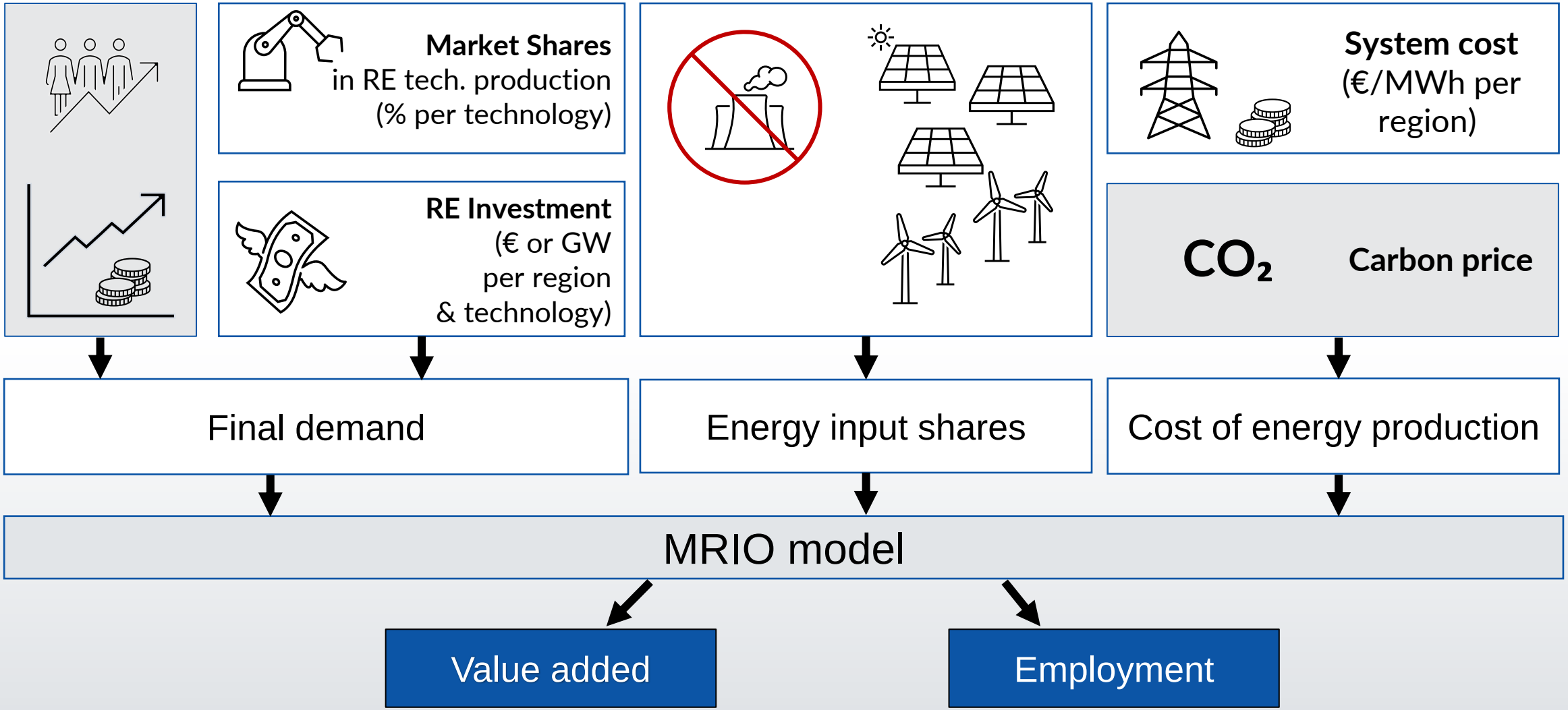
Phasing out fossil energy

- Reduction in mining and exploration activities
- Less processing of fossil materials
- End of power generation from coal and gas

Phasing in renewable energy

- Producing more solar panels, wind turbines, …
- Installing panels and turbines
- Maintenance of panels and turbines

Economic model for assessing the impact



New Multiregional Input Output model (MRIO)

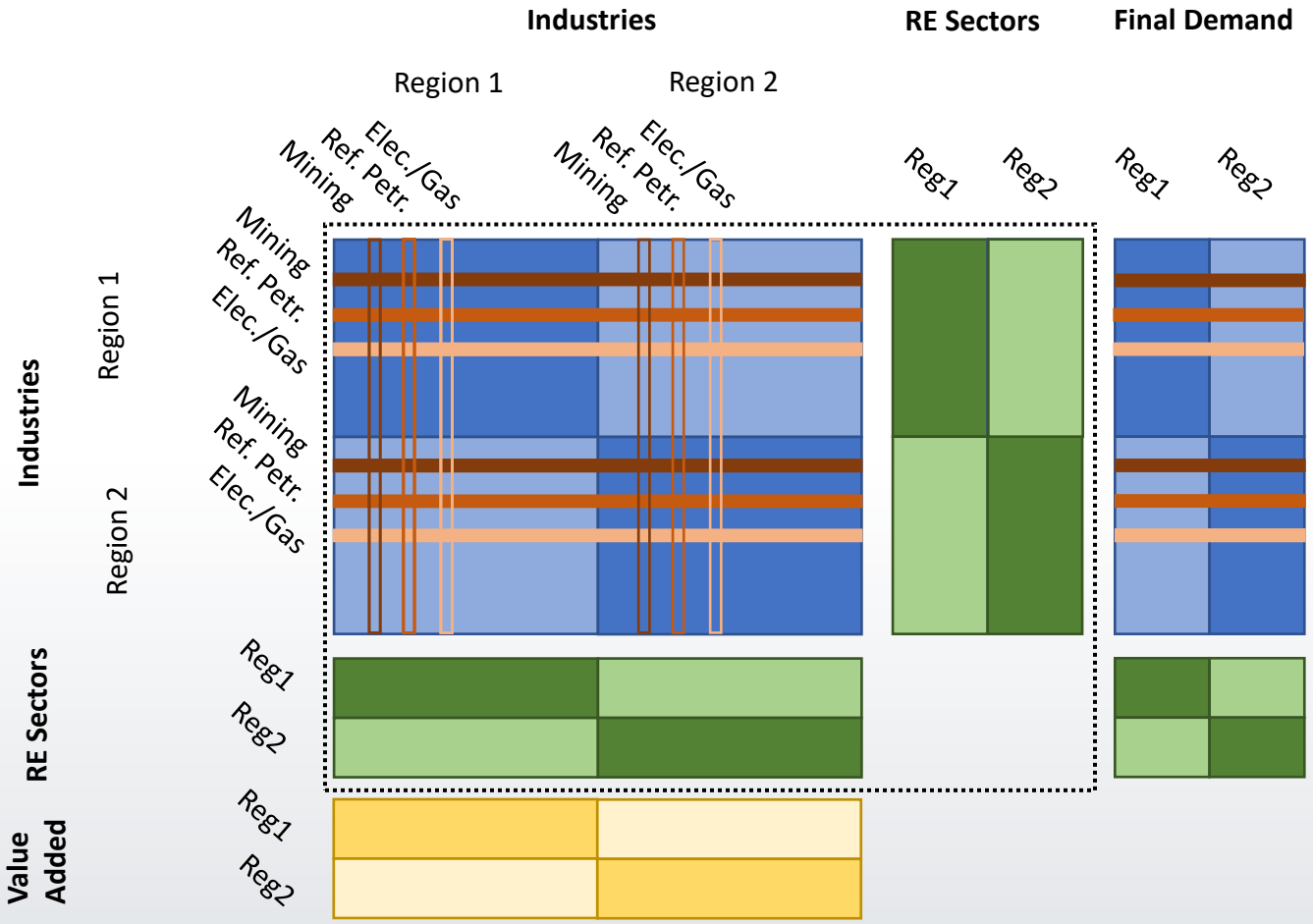
Model framework

- Regional economic accounts data based on FIGARO MRIO
- Interregional trade flows from EUREGIO database
- Extension with cost structures of production and operation of 10 RE technologies (O'Sullivan and Edler 2020)
- Scenarios based on EU Reference Scenario 2020 (European Commission 2021)

Key facts

- Base year: 2019
- 214 regions (211 NUTS-2 + BG, RO, HR)
- 13 major non-EU economies
- 53 industries
- 10 renewable energy technologies
  - on- and offshore wind
  - hydropower
  - photovoltaic and solar thermal
  - small-scale and large-scale biomass fired plants
  - biogas
  - deep geothermal
  - heat pumps

New Multiregional Input Output model (MRIO)



Coupled demand-pull and cost-push model

$$\mathbf{x} = \mathbf{f}\left(\mathbf{I} - \mathbf{AT}\right)^{-1}\mathbf{y}$$

“Demand-pull” quantity model

- Effect of changes in final demand on employment and value added

“Cost push” price model

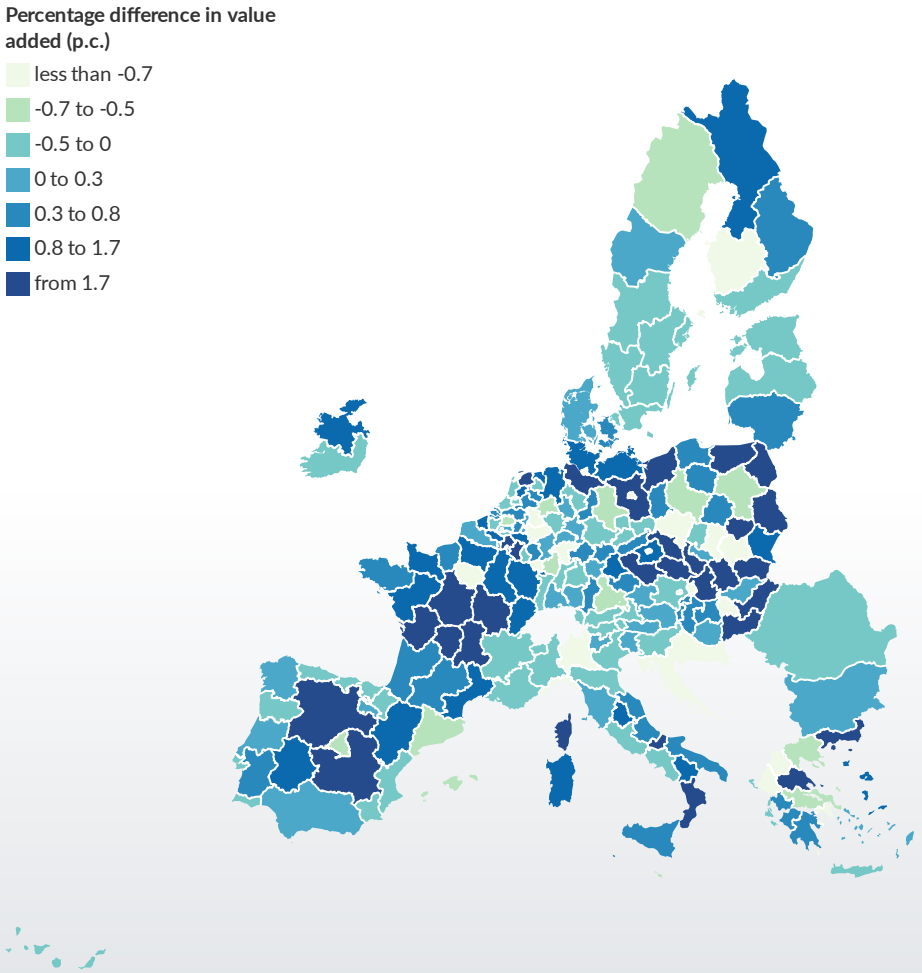
- Changes in production cost passed on to consumers via changes in consumer prices
- Demand responses of intermediate and final consumers using price and trade elasticities

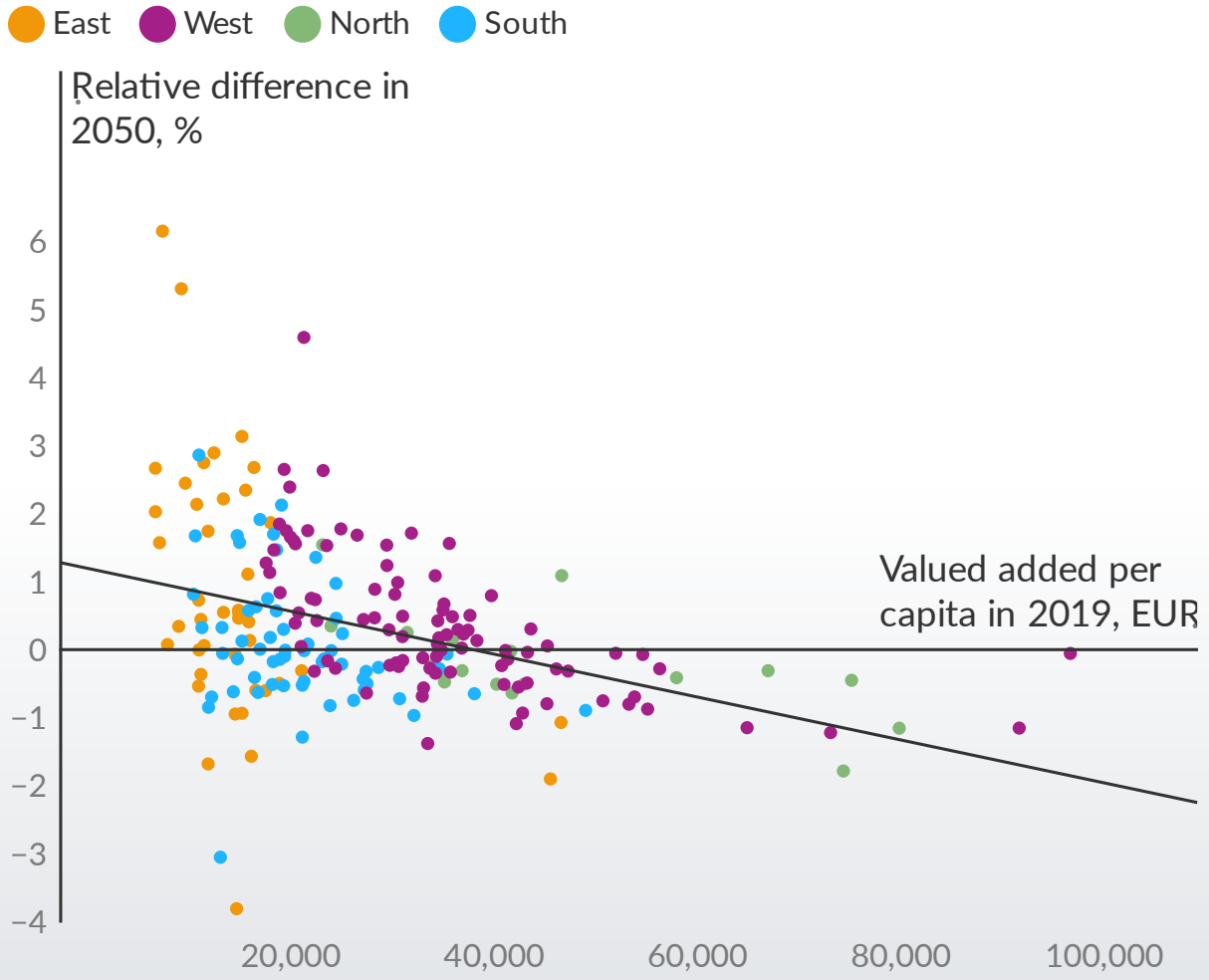
No change on overall economic performance …

- 0.3% less value added in 2050
- 0.1% less employment in 2050

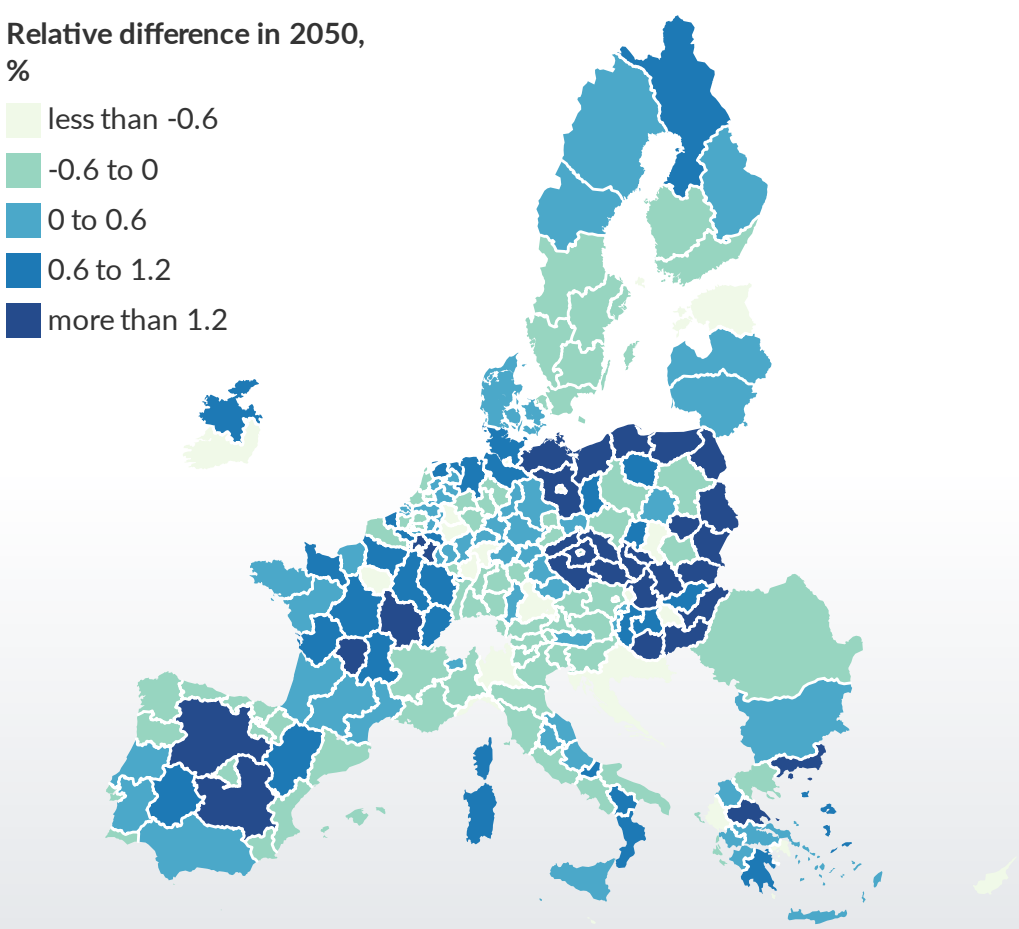
… but substantial variation across regions!

More value added in lagging rural regions



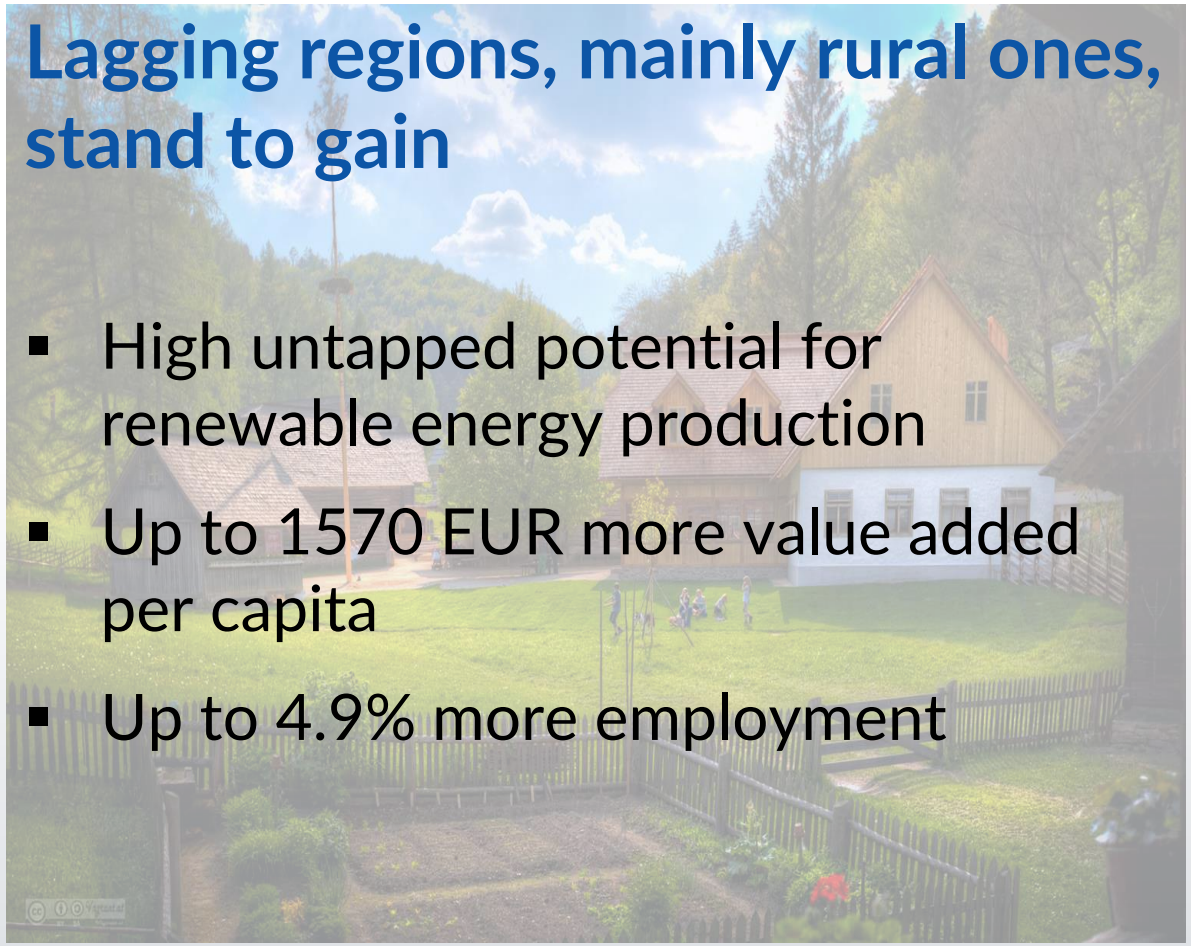


More employment lagging rural regions by 2050



BertelsmannStiftung

Rural regions to catch up



Lagging regions, mainly rural ones, stand to gain

- High untapped potential for renewable energy production
- Up to 1570 EUR more value added per capita
- Up to 4.9% more employment

Urban regions, many economically leading, will be challenged

- Limited renewable energy potential while high energy demand
- Up to 2450 EUR less value added per capita
- Up to 2.1% less employment

Cohesion Policy needs to adapt

Lagging rural regions

- Help to realise potential: Knowledge exchange, technical support, investment
- Capitalising synergies between cohesion policy and energy policy
- Ensuring that value added remains in regions (Energy communities)

Leading urban regions

- Risk of ending support for renewable energy transition and, thus, the Green Deal
- Proactive management to maintain current economic prosperity
- Collaborations with rural regions is key (Renewable Energy Partnerships)

Inspiring People.
Shaping the Future.