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# COP 21 RIPPLES

**RESULTS AND IMPLICATIONS FOR PATHWAYS  
AND POLICIES FOR LOW EMISSIONS EUROPEAN SOCIETIES**

## Insights into country heterogeneity in the EU low-carbon transition

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## Our approach to the question of heterogeneity

- ❑ Heterogeneity is not about ambition, is about the how and when – *the path to get there*. Ambition is defined in the Paris Agreement at global level & at the EC long-term vision at EU level.
- ❑ The need and importance of a clear vision as starting point: EC vision (towards neutrality) is a very useful concrete guide.
- ❑ Critical (for implementation and support) that each country develops a clear understanding of its role in the transition and the possible socio-economic impacts, opportunities and challenges.
  - Trajectories need to be defined at country level, taking into account local circumstances
- ❑ That said, it is essential for the country-level assessments to be embedded in a EU and a global context, to help identify cooperation opportunities and ensuring consistency with the global objective



# What COP21 RIPPLES does, and how it does it, relates to current EU efforts to bring together EC long-term vision and NECPs

- ❑ COP21 RIPPLES research is about connecting dots
  - ❑ Multiple scales (country-level, EU, global)
  - ❑ Short and long term
  - ❑ Physical transformation and socio-economic dimensions
  - ❑ Governance, technology and finance conditions with the physical transformation needs
- ❑ Our method includes:
  - ❑ Global modelling analysis of EU in ambitious global climate action, along with
  - ❑ Analysis of situations in specific EU countries/regions based on disaggregated results, national modeling and case studies for specific EU countries (Poland, Bulgaria, Italy, among others)
  - ❑ Using different tools to investigate different socio-economic dimensions, and multi-disciplinary teams



# Policy insights obtained when considering different time horizons

Illustrative example: **What's the substitute of coal in Poland?**

Now	Long-term
<b>Coal</b>	Decarbonising strategies relying on RE => Show dependency on a <b>single energy source</b> , with risks of delayed deployment or technical problems (i.e. high shares of VRES and transmission lines).
	Decarbonising strategies relying on gas => Increased reliance on a <b>single country (Russia)</b> <b>imports</b> and risk of short-term investment in gas infrastructure becoming <b>stranded assets</b> .



Seeking for a robust and balanced solution in the long term requires taking into consideration that:

1. There are different options, i.e. it is not a binary decision, i.e. coal-to-gas or coal-to-electricity
2. Sequential decisions are possible: take today decisions that leave door open for the options you have



Today's implications at country-level	Today's implications at EU-level
Preparing for accelerated deployment of variable RES	Supporting modernization of grid
Developing portfolio of viable alternative low-carbon options (e.g. biomass, CCS)	Supporting development of alternative low-carbon energy sources
Considering gas infrastructure decisions in light of the long term transition	

## Policy insights obtained when considering different scales (1/2)

### Ill.ex.: How to align decarbonization with Bulgarian socio-economic priorities?

- ❑ Keeping residential and industrial energy prices low has been (and continues to be) a political priority. To date, managed by a combination of price regulation and intra-EU cooperation measures leading to:
  - ❑ Development of gas supply infrastructure and electricity trade with neighbouring countries
  - ❑ Little investment by the domestic industrial sector in low-carbon technologies
- ❑ Bulgaria's position in the context of EU action towards carbon neutrality may face risks, including:
  - ❑ Reduced competitiveness of the Bulgarian industrial sector induced by little historic investment
  - ❑ Reduced support to fossil fuel-based investments and maintenance of related infrastructure
  - ❑ Increased energy prices induced by raising carbon price measures

### ➤ **Priorities for a common agenda between Bulgaria and the EC to support a robust transition**

supporting just transition from coal miners

grid interconnectivity

reducing RE infrastructure and deployment upfront costs

supporting modernisation of energy intensive industries

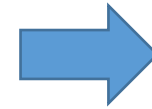
Clear and coherent signal from EU on energy transition to local stakeholders

## Policy insights obtained when considering different scales (2/2)

### Ill.ex: What may be the Italian position on the emerging world of e-mobility?

#### Italy decarbonising in isolation

- Low competitive and technological advantage, with only a weak development potential for e-mobility components.
- Net importing trade position on e-vehicles (with few exceptions).
- No long term industrial strategic vision nor a coherent and integrated set of policy measures to accompany the transition towards e-mobility.
- Serious vulnerability for the entire segments of its value chain to become obsolete and disappear, mostly SMEs



#### Italy embedded in a decarbonising world

- High dependency on large transnational companies strategy
- High dependency (particularly for SMEs) on EU demand for vehicle components
- Opportunities to pursue particular specialisation and access economies of scale, e.g 'Airbus of batteries'



#### Italy

**How to reduce vulnerability of this sector (esp SMEs)?** R&D investments with a broader scope (i.e. robotics), dialogue with transnational companies?

#### EU

How to build a competitive EU e-mobility industry across value chains and across countries based on MS's strengths and weaknesses?

## Policy insights obtained when considering socio-economic aspects

### III.ex: What is affordability for countries that are coal dependent, have much less energy-efficient stock (especially buildings) and lower GDP?

- ❑ Historic trends show that certain countries (Hungary, Slovakia, Slovenia, Poland, Estonia, Czech Rep) experienced dramatic spikes (reaching 14%-17% energy bill over GDP in 2008), whilst other countries largely remain within the usually boundaries. => Some countries have (still today) higher exposure and sensitivity to fuel price shocks.
- ❑ At national-level, the share of final energy consumption over GDP increases in 2020-30 for a number of decarbonizing scenarios in most countries. => This raises concerns on affordability for these vulnerable countries that currently have a high ratio
- ❑ At household-level, model results on energy bill are heterogeneous across countries (low and growing in East vs. high and decreasing in West). => which may affect acceptability of the transition in specific countries/regions and concerns on increasing inequalities



### Priorities: country- and EU-level measures to absorb price shocks in vulnerable countries

- ❑ By embarking on pathways that
  - ❑ Reduce energy import bill relative to GDP to zero
  - ❑ Bring household energy bill in dwellings below BAU scenario, all over the period
  - ❑ See lower international energy prices
- ❑ With necessary policy packages and accompanying measures at different scales

## Summary (I): Policy implications of heterogeneity

- ❑ **Actions on demand-side** (efficiency, moderation of demand) that can enable smooth transition require dedicated strategy at EU level, in support to national-level action
- ❑ EU-level investments, cooperation strategies and solidarity mechanisms can increase robustness of country and EU transitions if
  - they are tailored to the needs of each country
  - they take into account countries' exposure to different forms of risks and emerging economic opportunities
  - they help absorb the challenges of the short-term transition and anticipate the risks of long-term lock-ins

This is particularly relevant for:

- ❑ **Industrial roadmap** framework
- ❑ **EU energy market** development: Infrastructure (interconnection), regulation (gas market) and investments
- ❑ **Research and innovation agenda**





## Summary (II): Policy implications of heterogeneity

- Capturing country heterogeneities in the EU low-carbon transition is important to help the assessment of countries' capacity for actual transformation on the ground, and support implementation.
  - For the **evaluation of NECPs and national LTS** this would require checking:
    - Alignment between short- and long-term, providing the space to align NECPs and national LTS
    - Integration of the local socio-economic implications of the transition
    - Embedding into an evolving EU and World that moves towards carbon neutrality, where opportunities emerging from cooperative approaches are considered
    - Securing the incorporation of demand-side policies and actions at national-level
- ↪ To provide sufficient guarantees for countries to be equipped to define their own role in the EU transformation towards neutrality, and ensuring this role is consistent with this long-term goal.



Thank you for your attention,  
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On behalf of the COP21 RIPPLES Consortium



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This briefs mainly builds on:

- D3.2 Energy Security (CNRS-led)
- D3.3 Technology Innovation Implications of NDCs, Technology Portfolio Choices, and International Competitiveness in Clean Technologies (Bruegel-led)
- Modeled scenarios at country- and global-level by: UCL (TIAM-ENGAGE), CNRS (POLES), ICES (ICES), WiseEuropa (MEWA), ENEA (TIMES)

