

## Decarbonisation innovation

*What it could bring?*

***How to make it work?***

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High Level Workshop: R&I contribution to the strategy for long term EU greenhouse gas emissions reduction



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730403

# Main Messages

Three main messages will emerge from my presentation:

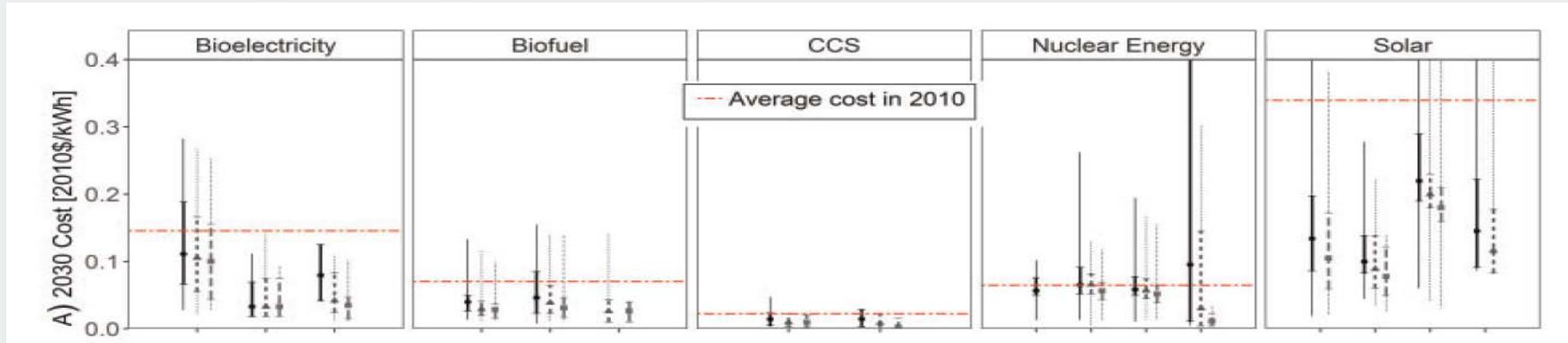
- **Need to develop a portfolio of technologies rather than picking winners**
- **Uncertainty and transitional costs needs to be managed**
- **Policy mixes need to be tailored to the capability of a given country**

# Intro

- **Key premise 1: market failures make policy necessary to promote innovation**
- **Key premise 2: innovation responds to different policy instruments (direct vs indirect effect)**

# What could it bring?

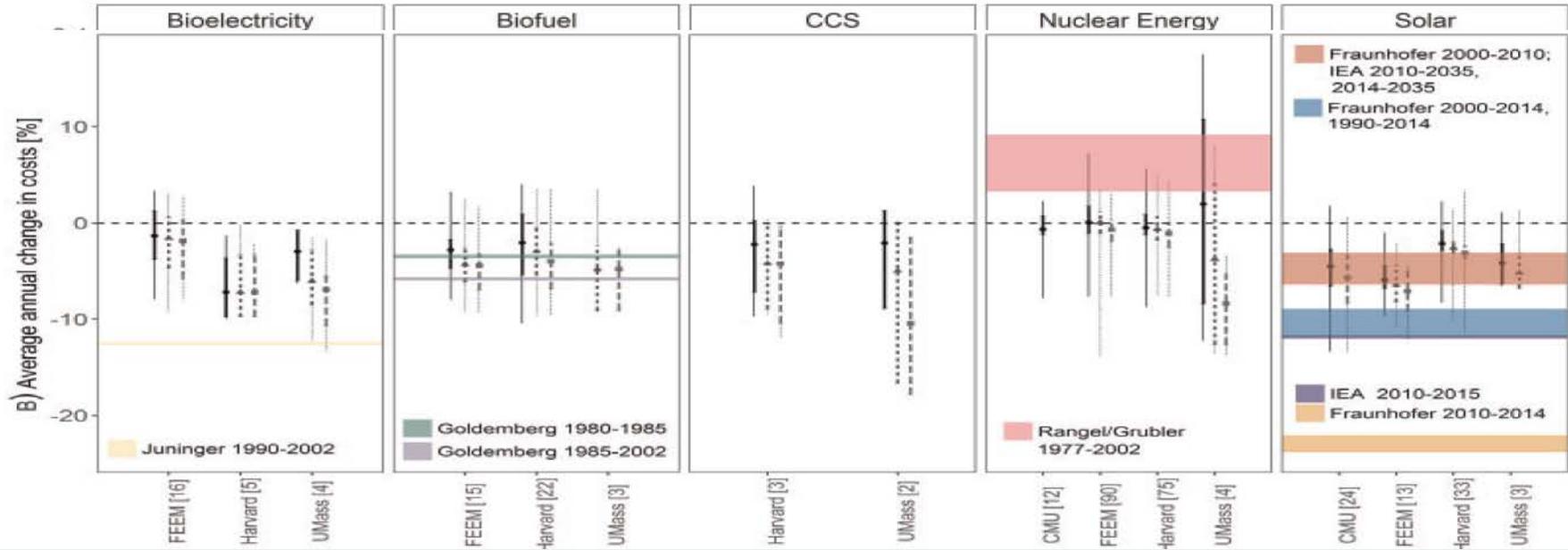
- Investing in R&D will lower the cost of (most) technologies on average, but high uncertainty



Source: Verdolini et al. (2018) REEP

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# What could it bring?

- Investing in R&D will lower the cost of (most) technologies on average, but high uncertainty
  - Diminishing marginal returns
  - R&D investment DOES NOT reduce uncertainty
- Cost-competitive low-carbon technologies will diffuse
  - Note: system integration issues (complementarities)
  - Multiplier effect: virtuous circle

*Sources: Verdolini et al. (2018) REEP, Verdolini (2018)*

# What could it bring?

- Investing in innovation will boost the role of the EU in green knowledge creation, increasing EU integration in the knowledge space
- Impact of environmental policy and innovation on competitiveness and jobs is less clear-cut
  - Countries are very heterogeneous (skills, policies, sectors)
  - Analysis of French data confirms the presence of TRANSITIONAL COSTS: loss of “dirty/low-skilled” jobs, esp. for energy intensive industries; offsetting with high-skilled green jobs
- Impacts on trade patterns and embedded emissions poorly understood

# How to make it work?

- Focus on technology portfolios as opposed to picking winners
  - Large uncertainty regarding future technology costs
  - Complementarities of different technology options: systemic view
  - But also: heterogeneity in (EU) countries
- Currently, hurdle is in financing the energy transition
  - Mobilize private capital
  - Sustainable finance

# How to make it work?

- **Importance of policy mix has been discussed: combination of policy instruments is superior to the use of a single instrument**
- **Recent evidence suggests that the policy mix has to be tailored to the capability/specialization of each country**
  - **Combining R&D investments, command-and-control and market-based policies in the proper way and sequence increases inducement effect**
  - **But also industrial policies for transitional costs and trade-related policies [fast diffusion necessary, innovation policies alone not sufficient]**

# How to make it work?

- The outcome of the innovation process emerges from the interaction of technology with actors, policies and institutions
  - Co-design of decarbonization pathways
  - Innovation system analysis
  - Acceptability

*Sources: INNOPATHS T2.1*

# Main Messages

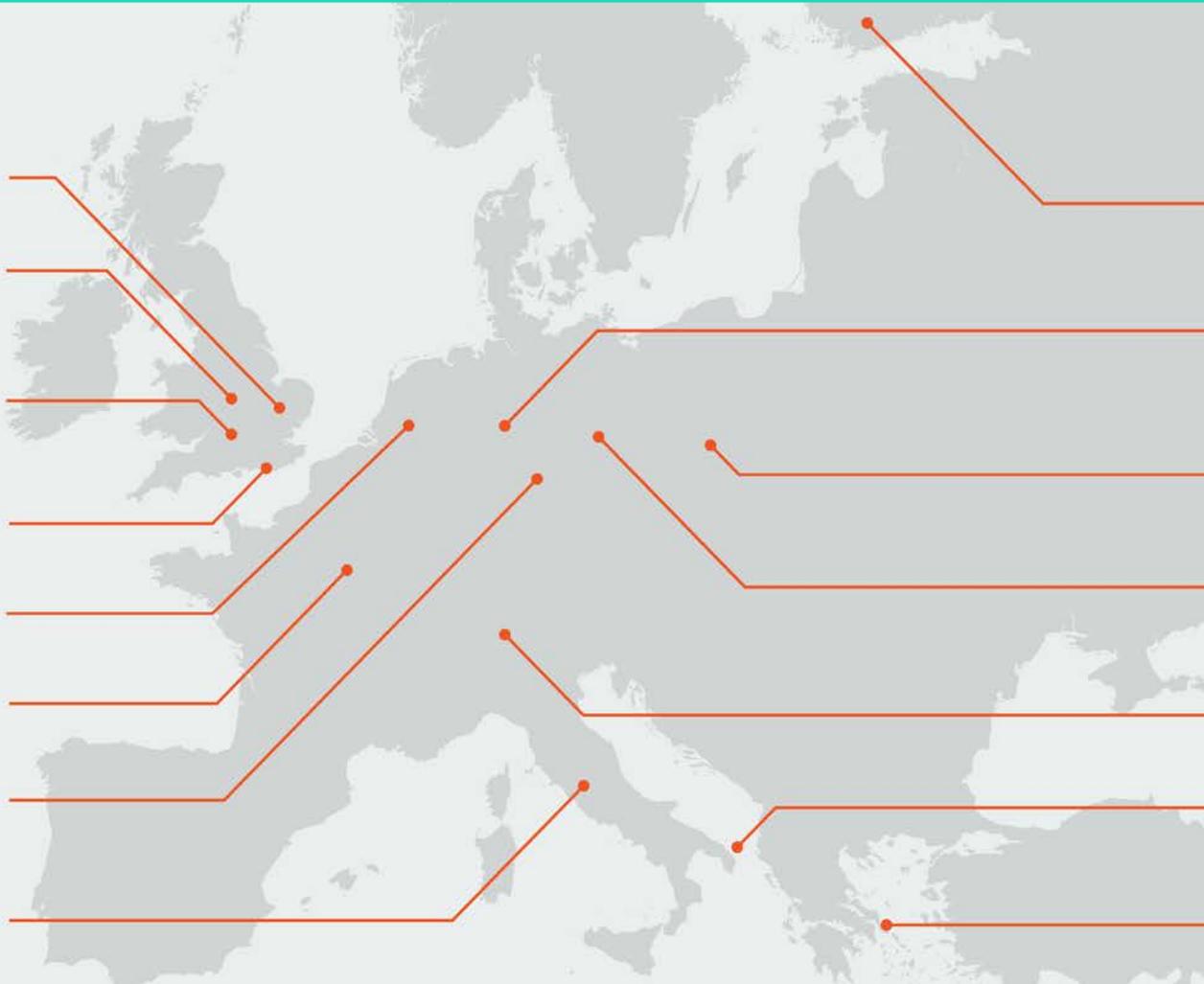
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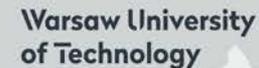
# Key unresolved issues

- How to pick the best technology and policy portfolios
- The role of the EU in fostering global commitment to emission reduction
- Need evidence-based policy suggestions for trade and industrial policies

# Partners



# INNOPATHS



# INNPATHS

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Thank you

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