

PARIS
REINFORCE



PARIS
REINFORCE

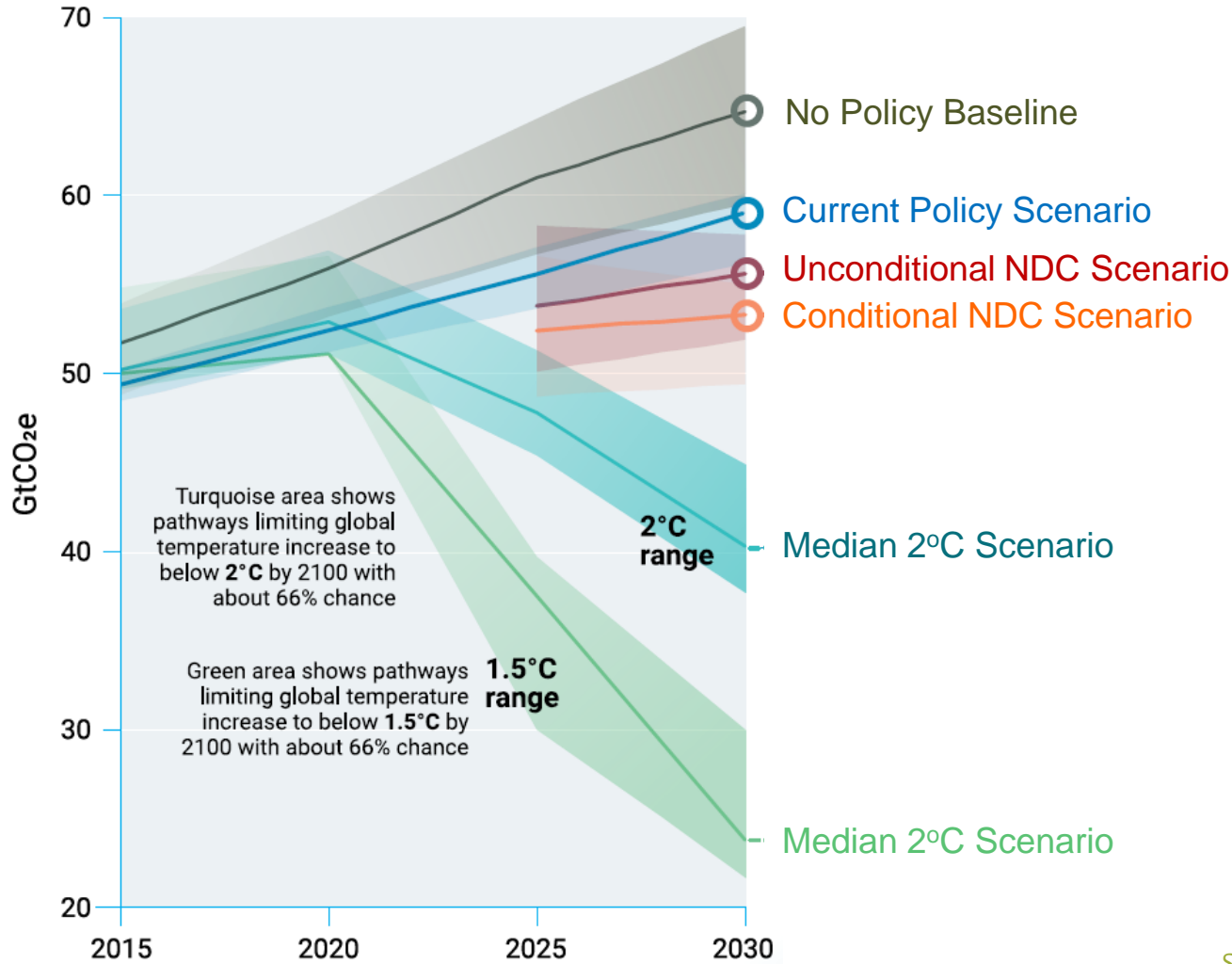
Enhancing climate policy through co-creation

Can our models deliver what you need?

Ajay Gambhir (*Imperial College London*)
Jorge Moreno (*Basque Centre for Climate Change*)
Dirk-Jan van de Ven (*Basque Centre for Climate Change*)
Georg Zachman (*Bruegel*)



www.paris-reinforce.eu



Here
↓
There

Source: UN Emissions Gap Report 2018



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

**Socio-economic
development**

Energy demand

**Technology availability,
performance and cost**

Fuel supply and cost

**Emissions targets and
policies**



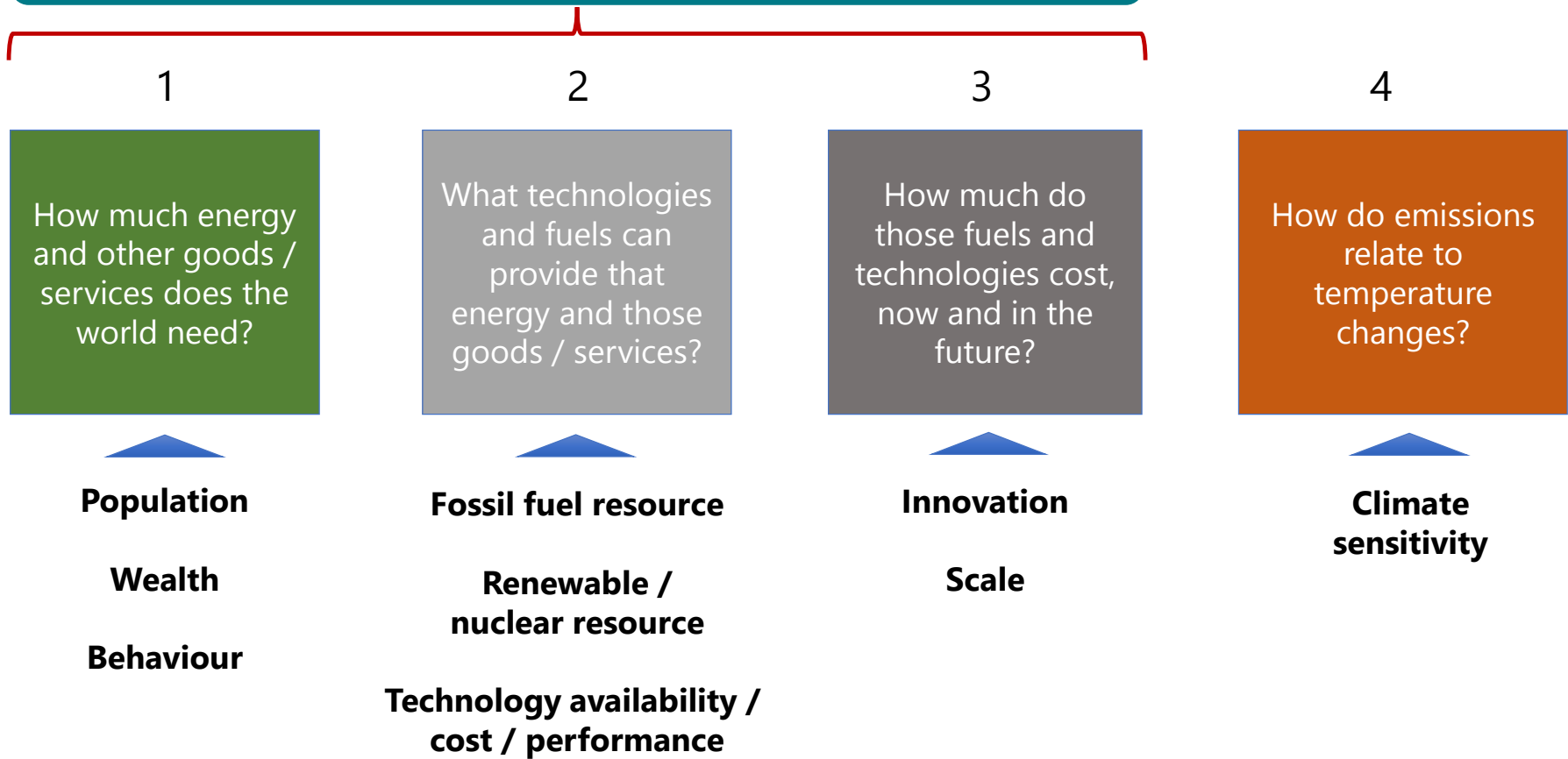
**[Least cost] mix of
technologies, fuels and
behavioural changes that:**

- **Meets energy and socio-economic needs**
- **Accounts for emissions targets and policies**



5

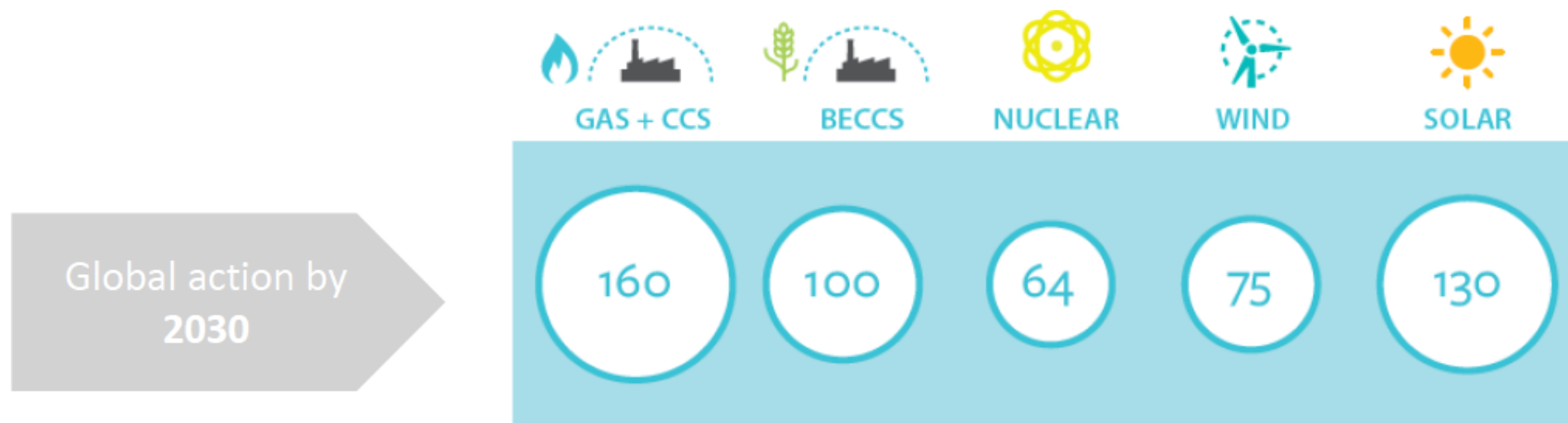
Policies (taxes, subsidies, R&D, targets, regulations, etc)





HOW FAST WILL WE NEED TO DEPLOY KEY TECHNOLOGIES?

Annual deployment rate of power sector techs, GW per year, 2030-2040

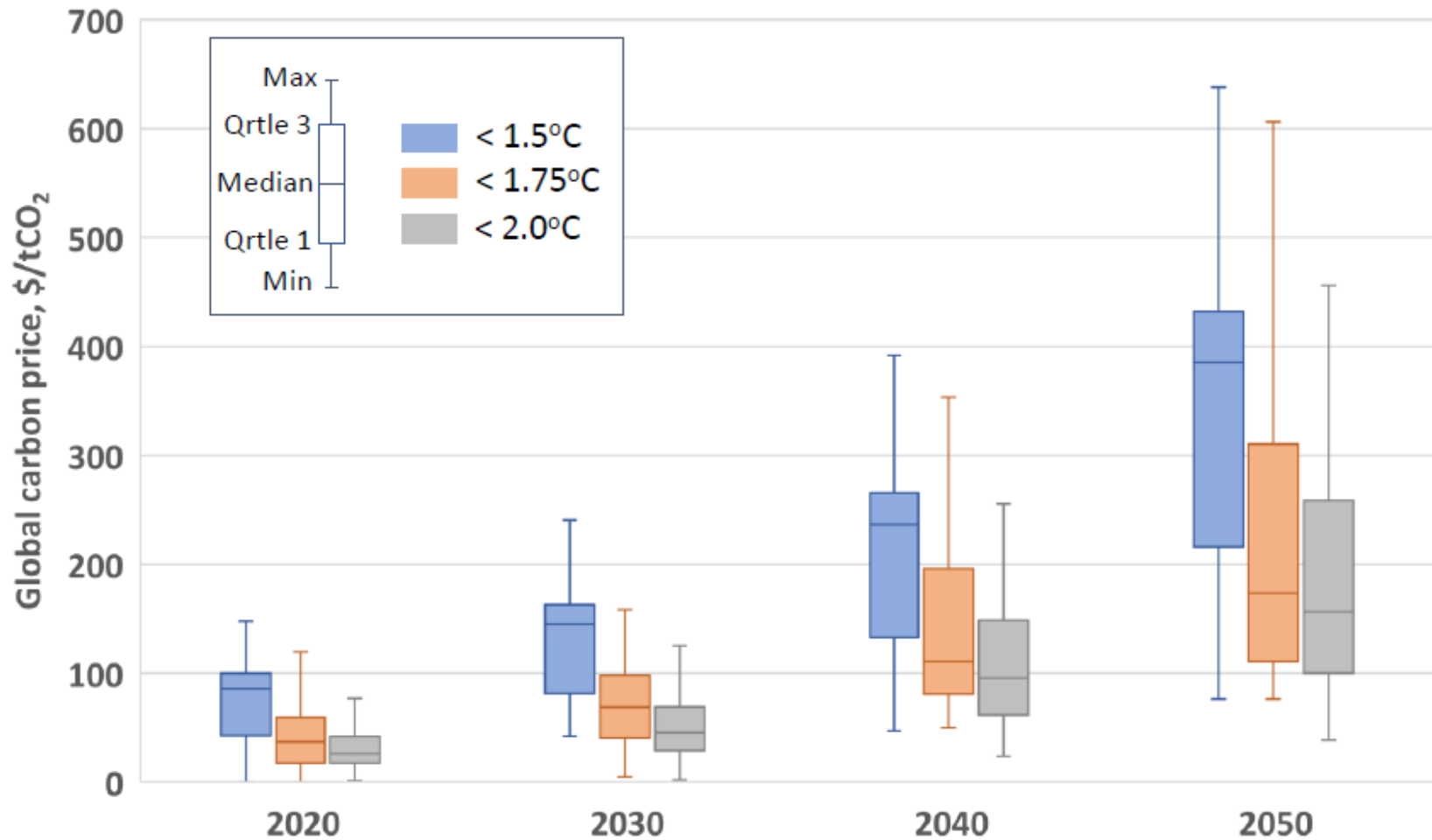


Historical deployment rate of power sector techs, GW per year, 2000-2010



Source: AVOID2: Can we avoid dangerous climate change? Infographic





Source: Dietz et al. (2018), *The economics 1.5-2.0C climate change*. *Annual Review of Environmental Resources*, 43, 455-480.



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.



For example, TIMES-CAC (Central Asian Caspian), has been used to analyse trade-offs between:

- Energy system costs
- Energy export quantities and revenues
- Emissions reductions ambitions

Source: De Miglio et al. (2014). *Cooperation benefits of Caspian countries in their energy sector development*. *Energy Strategy Reviews*, 4, 52-60.

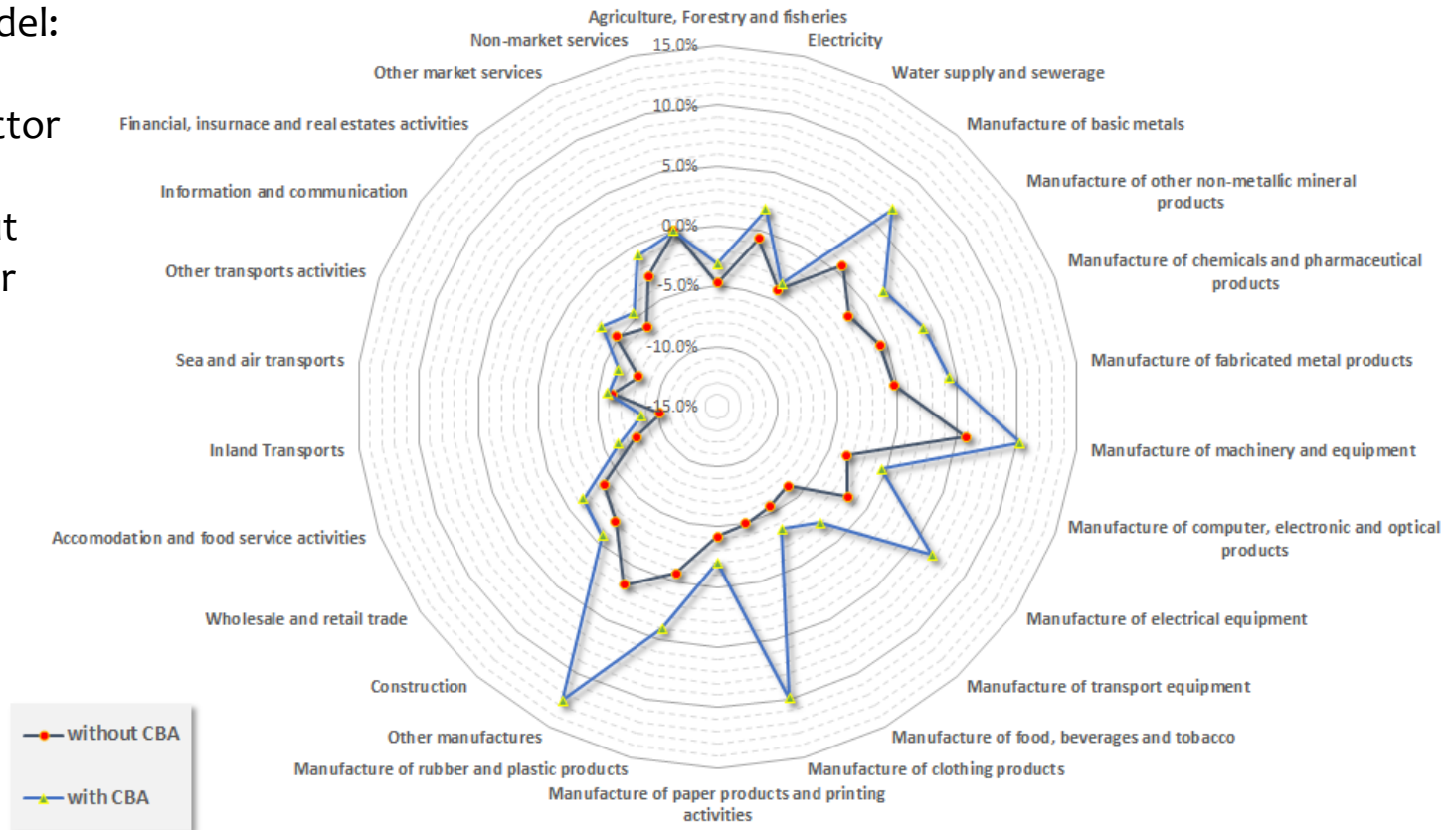


Production deviation by economic activity in EU in 2040 (% w.r.t. reference scenario)

Scenarios: in EU -65% of CO₂ emissions (from FFC) compared to 1990 and without or with Carbon Border Adjustments

Analysis from the EU NEMESIS model:

- Change in sector output
- With / without carbon border adjustments (CBA)



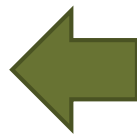
Source: Mueller et al. (forthcoming). *L'empreinte carbone de la demande finale intérieure et des importations de la France*. IODA project report



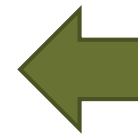
The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

BUT: Models are **not** crystal balls

Their
outputs



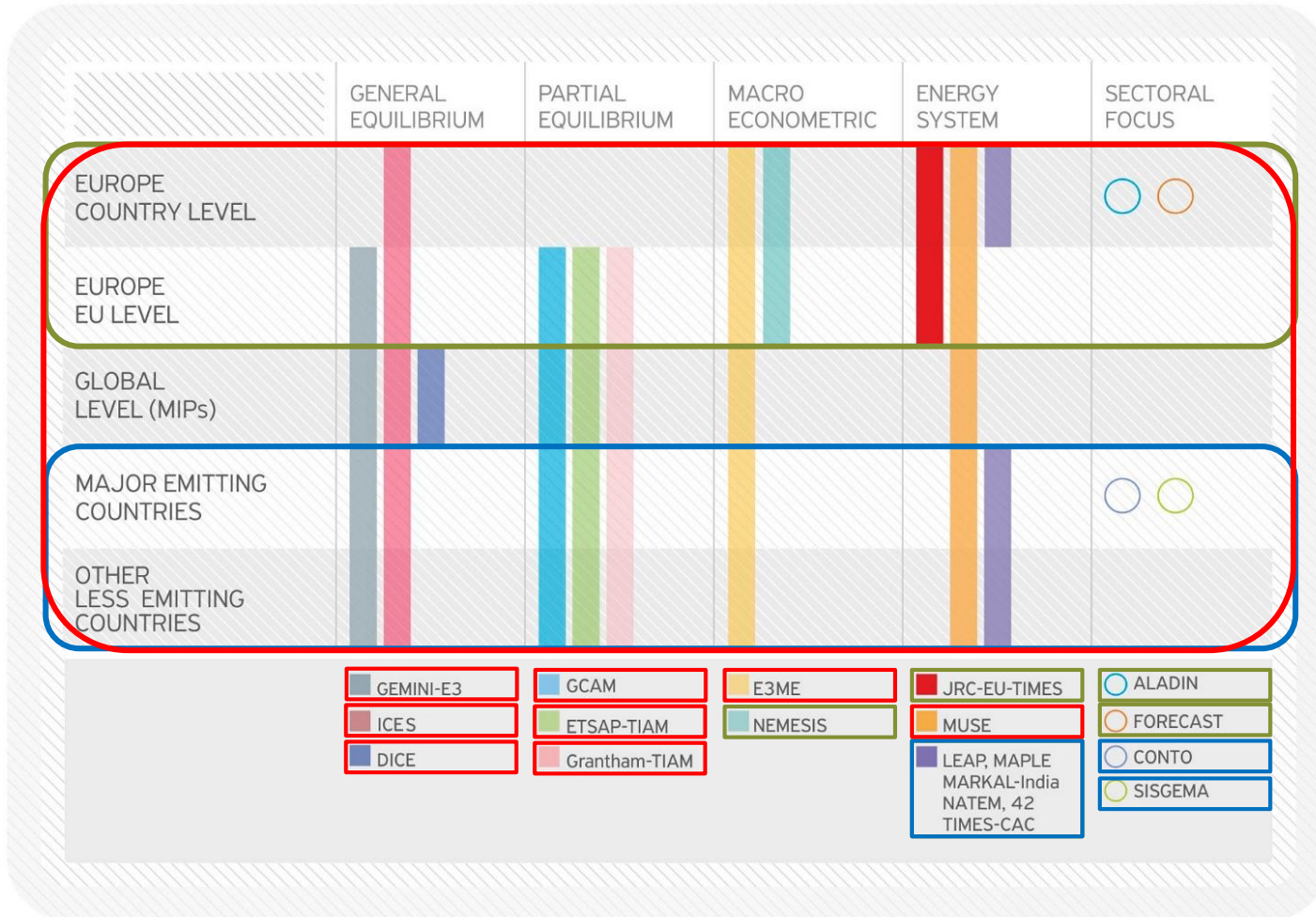
Depend on
their inputs



**This is why co-creation of scenario choices (inputs)
is so critical**

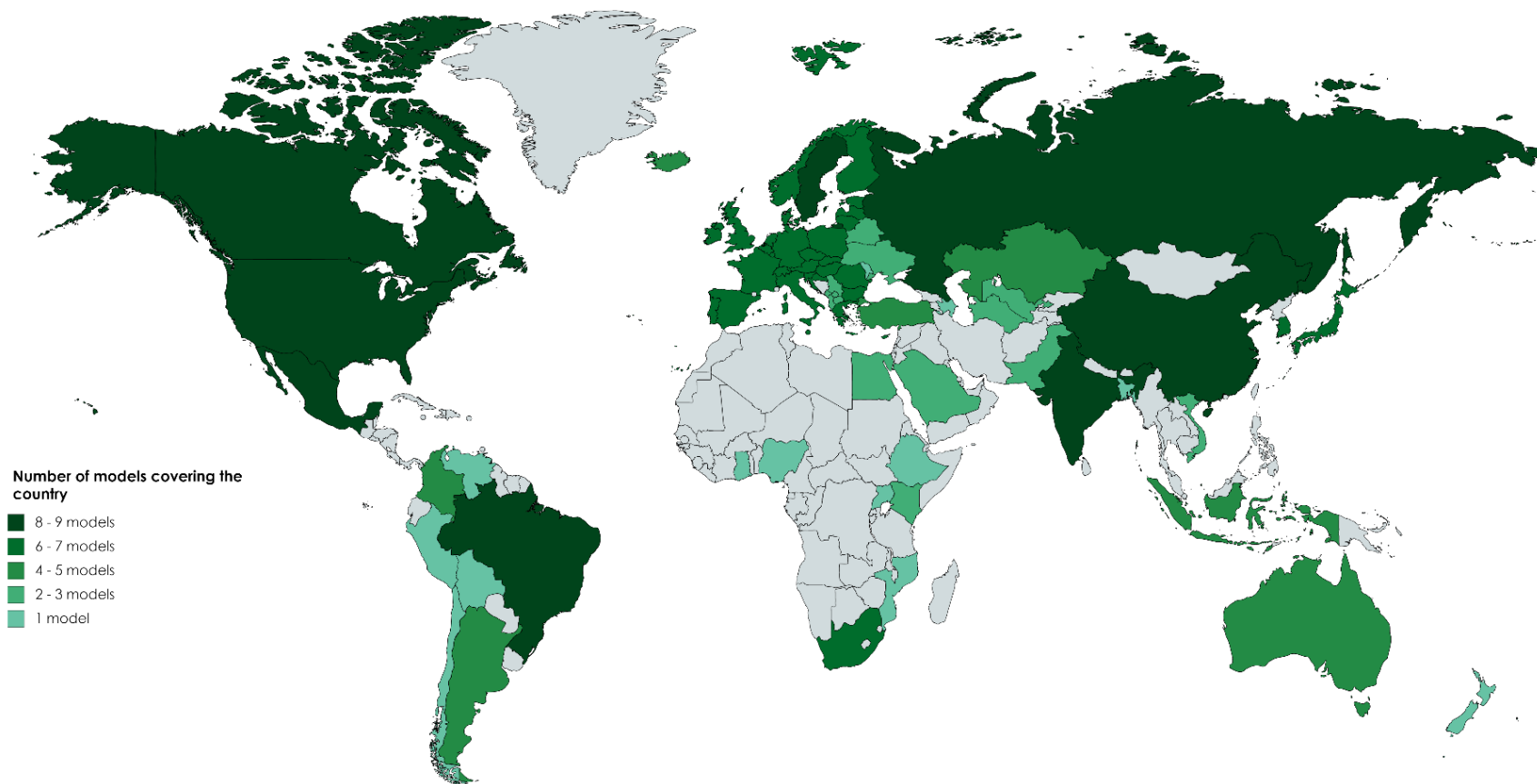


The PARIS REINFORCE modelling ensemble



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

What can our models do (geographic coverage)?

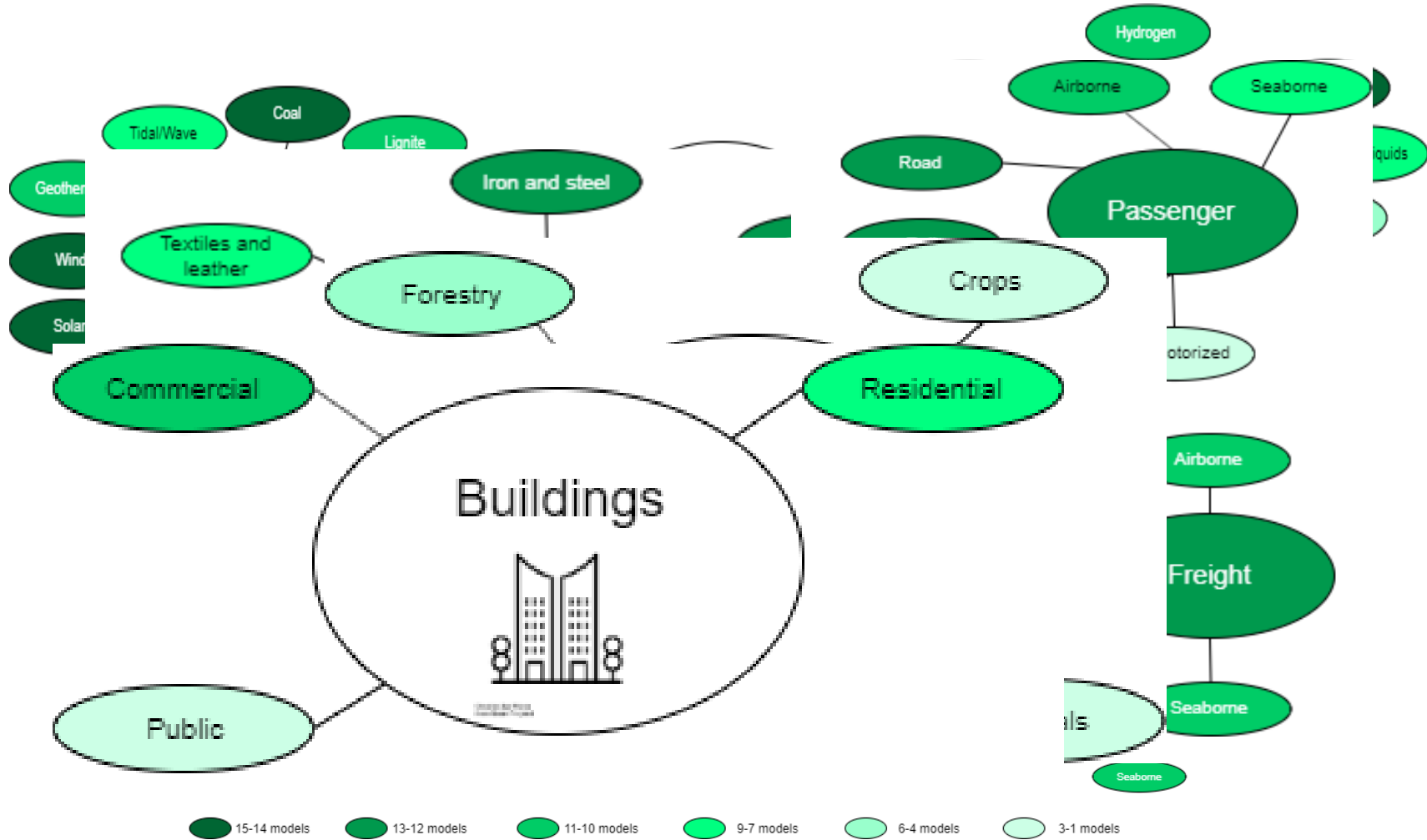


Created with mapchart.net ©



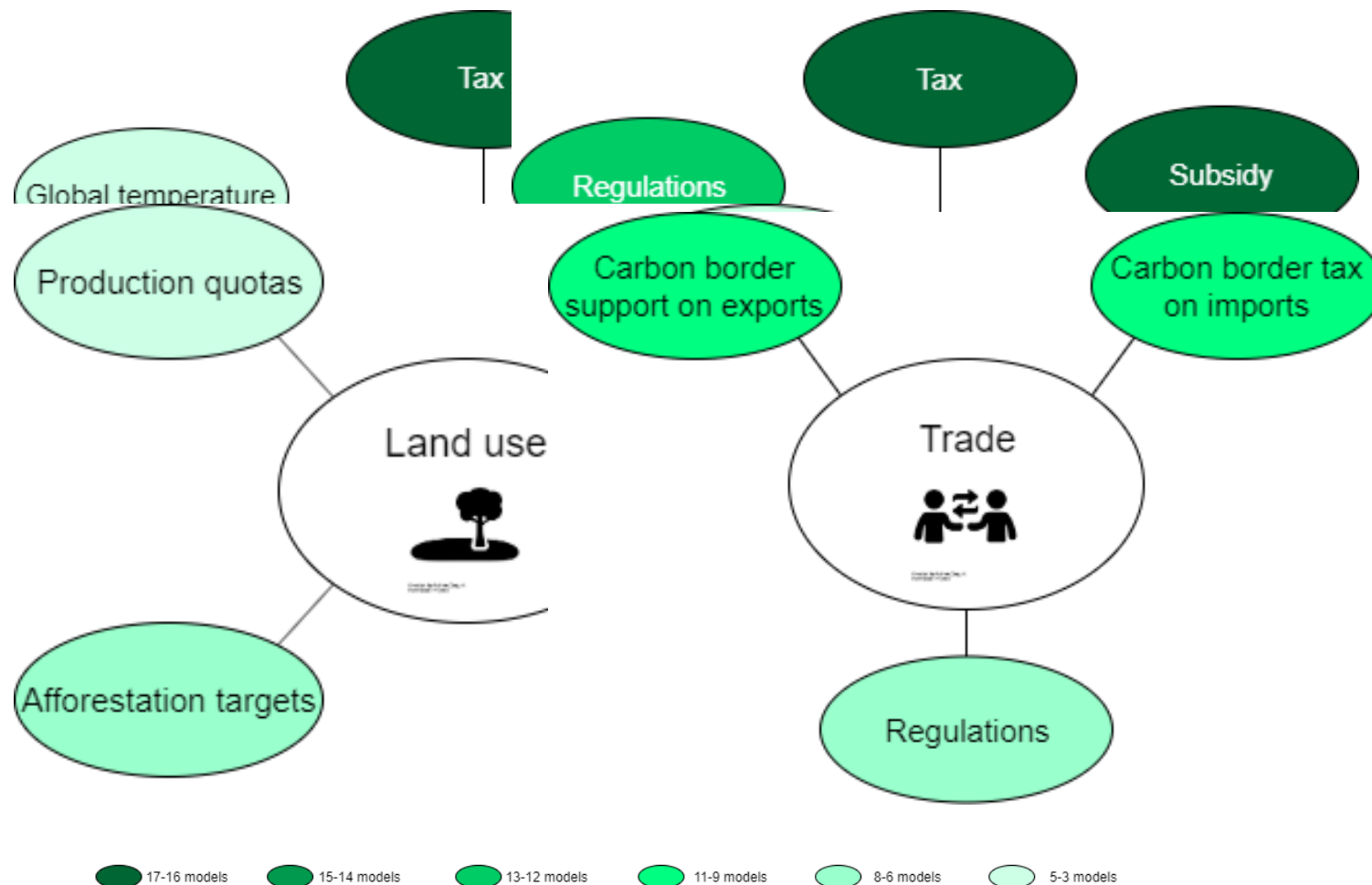
The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

What can our models do (sectoral coverage)?



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

What can our models do (**policy coverage**)?



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

What can our models do (SDG coverage)?

	SDG 1 No Poverty	SDG 2 Zero Hunger	SDG 3 Good Health Well-Being	SDG 4 Quality Education	SDG 5 Gender Equality	SDG 6 Clean Water Sanitation	SDG 7 Affordable Clean Energy	SDG 8 Decent Work Growth	SDG 9 Innovation Infrastruct.	SDG 10 Reduced Inequalities	SDG 11 Sustainable Communities	SDG 12 Responsible Cons./Prod.	SDG 13 Climate Action	SDG 14 Life Below Water	SDG 15 Life on Land	SDG 16 Peace, Justice Institutions
National/regional models for Europe						✓	✓	✓	✓	✓	✓	✓	✓			
National models outside Europe	✓		✓	✓			✓	✓	✓		✓	✓	✓		✓	
Global models	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	



Poverty prevalence



Groundwater depletion



Palma ratio



Prevalence of undernourishment



Access to electricity
Renewable electricity share



Material productivity



Mortality due to air pollutants
Health Life Expectancy



GDP growth
Employment to population ratio



CO² emissions
Global Mean Temperature



Literacy rate



R&D Expenditure
Energy-related costs and investment needs

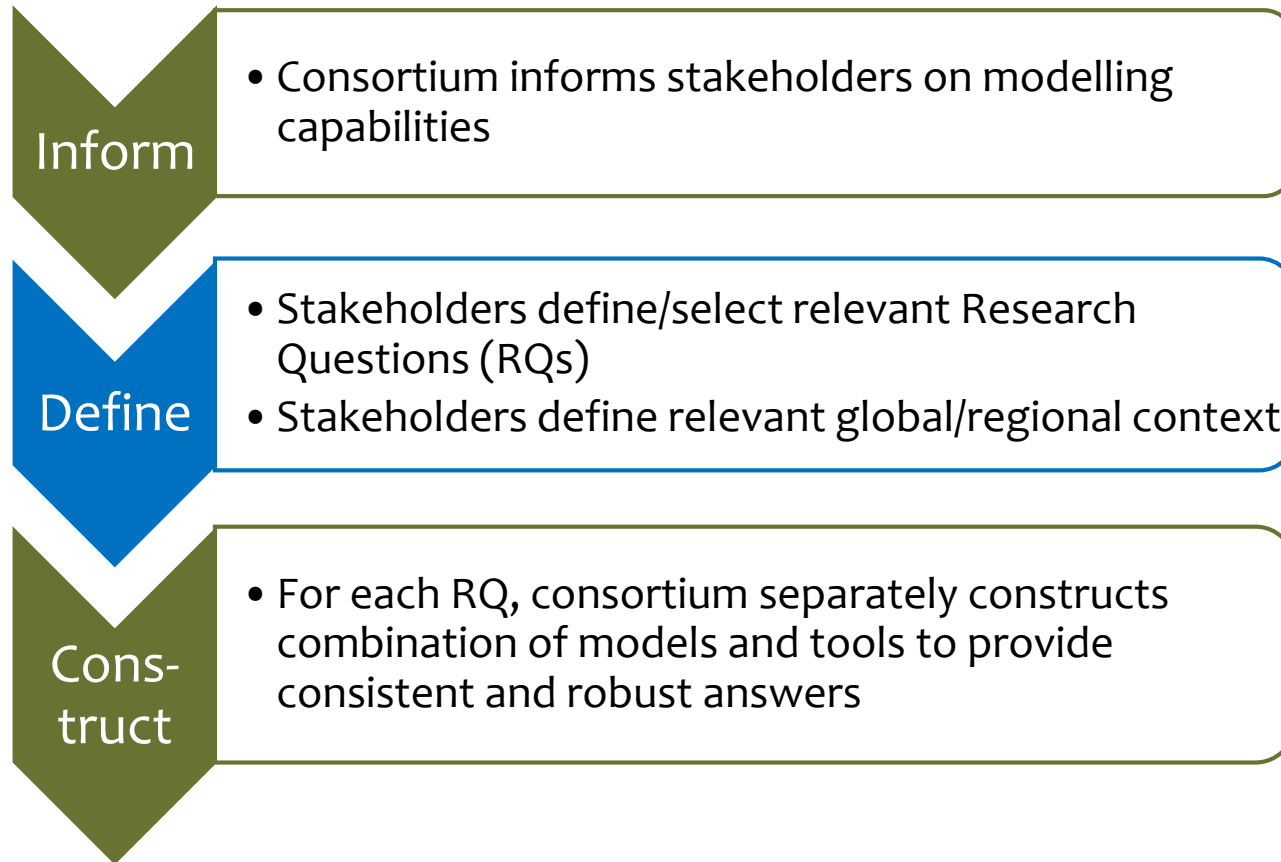


Change in forest area

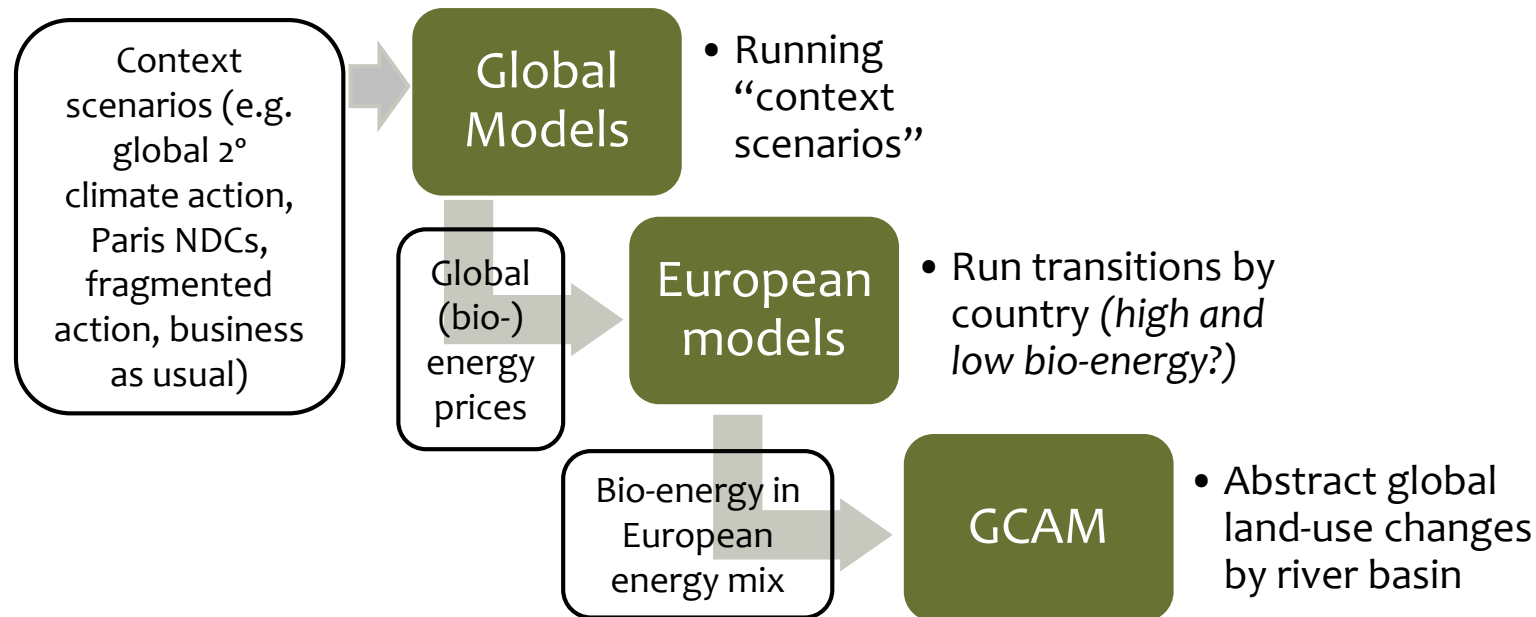


The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.

Model utilisation in PARIS REINFORCE based on co-creation:



Example RQ: *What is the impact of bio-energy use in Europe for LULUCF impacts within and outside Europe?*



Models in consortium:

- Wide coverage of regions, sectors, policies
- Good complementarity: suitability for harmonisation & interlinkage

Usage of models depending on stakeholder inputs

- Relevant research questions to answer
- Relevant context scenarios, influencing each outcome

→ Next sessions serve to gather your inputs, research questions and overall views on climate policy





Thank you!

Ajay Gambhir a.gambhir@imperial.ac.uk
Jorge Moreno jorge.moreno@bc3research.org
Dirk-Jan van de Ven dj.vandeven@bc3research.org
Georg Zachmann georg.Zachmann@bruegel.org

#parisreinforce



ParisReinforce



paris-reinforce



parisreinforce



The PARIS REINFORCE project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 820846.