PARIS REINFORCE

Enhancing climate policy through co-creation

A Paris-consistent Europe:

Aligning national, regional and global action

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www.paris-reinforce.eu

During this session, there will be **discussion on Europe-relevant policy areas**. These areas have been identified for investigation following bilateral meetings with key policymakers.

The discussion will centre around perceived importance of investigating the following six topics, based on the audience's interests:

1. **Carbon border adjustment**
2. **EU internal taxation policy**
3. **Robustness of NECPs**
4. **Electrification**
5. **Non-energy CO_2 sources**
6. **Hydrogen**

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

(1) Carbon boarder adjustment

- **Policy Area:**
  - Do models provide economic justification for the implementation of CBA?
  - Can losses/leakages be mitigated effectively by CBA? What are alternative measures?
  - What would the impact of CBA be on EU countries?

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(2) EU internal taxation policies

- **Policy Area:**
  - What is the scope for increasing ambition in terms of coverage of the ETS (incl. non-ETS, reduction of permits)?
  - What are the potential implications of expanding the harmonisation of taxation across the EU in non-ETS sectors?

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(3) Robustness of NECPs

- **Policy Area:**
  - Are the individual NECPs realistic?
  - Do they hold true when imposing different assumptions or models?
  - Do the individual NECPs add up and conform to EU targets?

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(4) Electrification

- **Policy Area:**
  - How can we provide enough RE generation, storage and distribution capacity in an extreme electrification scenario?
  - Under which conditions can electricity grids be able to manage this?
  - What is the role for flexibility options in such a scenario?

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(5) Non-energy CO2 sources

- **Policy Area:** What kind of mitigation options exist for the reduction of non-energy CO2 sources?

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(6) Hydrogen

- **Policy Area:**
  - Can models investigate a scenario in which hydrogen plays a big role in the future?
  - What would this mean for industry, transport, energy?

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- Please open the **sli.do** website and enter the code: **PR19**.
- We are interested to hear your opinion:
- ***"Which of the topics just introduced do you find relevant to discuss today****, because you deem important, need further clarifications, or want to comment on?"*
- You may select/prioritise 3 topics for discussion
- Based on these results, a discussion of the most popular topics will follow shortly.

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- Please re-open the **sli.do** website and enter the code: **PR19**.
- We would like to receive your opinion on which of the proposed research questions PARIS REINFORCE should look to further investigate.
- There is a **2-minute survey** to be completed:
- A ranking system will allow you to rate (between 1 and 5 stars) each of the eight proposed topics, according to the following question:

"How important and relevant do you consider it for the PARIS REINFORCE project to take on and try to address this topic?"

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Thank you!

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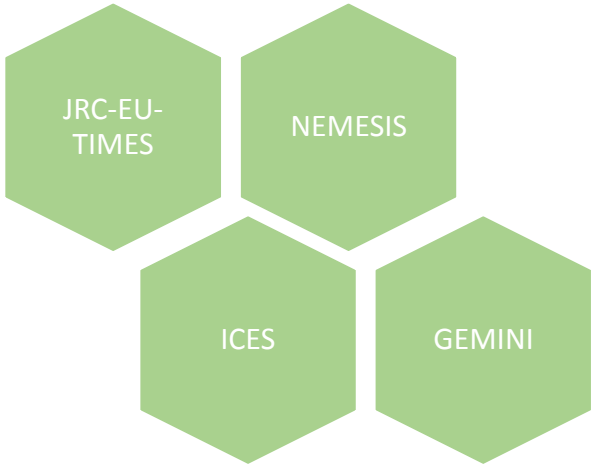
(1) CARBON BOARDER ADJUSTMENT

Paris Reinforce – Model-based responses:

Pan-European

- Policy-specific analyses → *specific PaMs representation / linking*
- Sensitivity analysis (key uncertainty / what-if) → *multiple explorations / comparative analysis*



GEMINI: Simulate scenarios where a CBA is introduced in Europe with some regions implement no mitigation policy

NEMESIS: a) the model can capture competition effects within EU as well as vis-à-vis of the Rest of the World, if providing assumptions on the Rest-of-the World (a linkage with sectoral models would enhance the assessment). b) different sets of policy options can be assessed such as CBA, free carbon allowances for some EU-ETS sectors, etc. (a linkage with sectoral models would enhance the assessment). c) the model can provide results for all EU MS following the implementation of a CBA in EU. Such work has already been done.

ICES: can perform mitigation scenarios with Border Tax Adjustments.

JRC-EU-TIMES: it covers energy commodities and some non-energy materials.

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(2) EU internal taxation policies

Policy Area: What is the scope for increasing ambition in terms of coverage of the ETS (incl. non-ETS, reduction of permits)? What are the potential implications of expanding the harmonisation of taxation across the EU in non-ETS sectors?

Modelling Proposal:

A set of **model experiments** can be carried out, including **different design scenarios of the EU-ETS** and **CO2-taxation,** which will allow to analyse its impact on the energy system.

This exercise will compare **fragmented sectoral perspectives** (e.g. industry) with the **overall energy system** and **macroeconomic perspective**.
Models to be used: **NEMESIS, FORECAST, JET, ICES,..**

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(3) Robustness of NECPs

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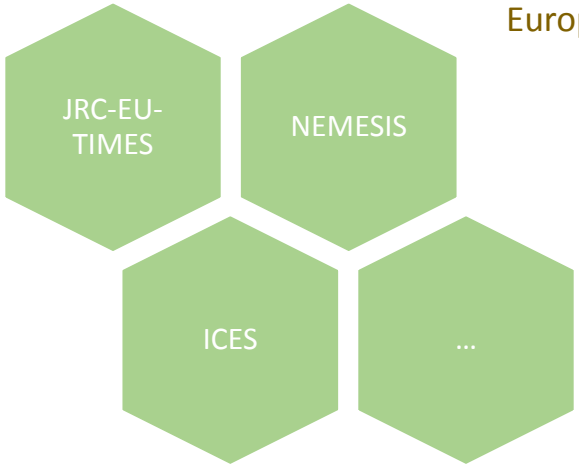
Paris Reinforce – Model-based responses:

- Sensitivity analysis (key uncertainty / what-if) → *multiple explorations / comparative analysis*
- Robustification of energy/climate projections through impact / multicriteria assessment (economic, other criteria/impacts, ...) → *linking / iteration / comparative analysis*
- Policy-specific analyses in the European context → *country focus / specific PaMs representation / extensions / goal-oriented analysis*

Individual MS and/or Pan-European



JRC-EU-TIMES: Can explore individual MS NECPs (maintaining an EU perspective), including sensitivities to assess impacts of uncertainties.

NEMESIS: the model can be used to assess MS NECPs, a linkage with others modelling tools (energy system model, and/or sectoral models) would reinforce the robustness of the results. Such modelling exercises (with linkage) have already been done for French NECP.

ICES: policy scenarios combining EU mitigation efforts with some other NECP targets (efficiency improvements and RD investments in clean energy) can be performed.

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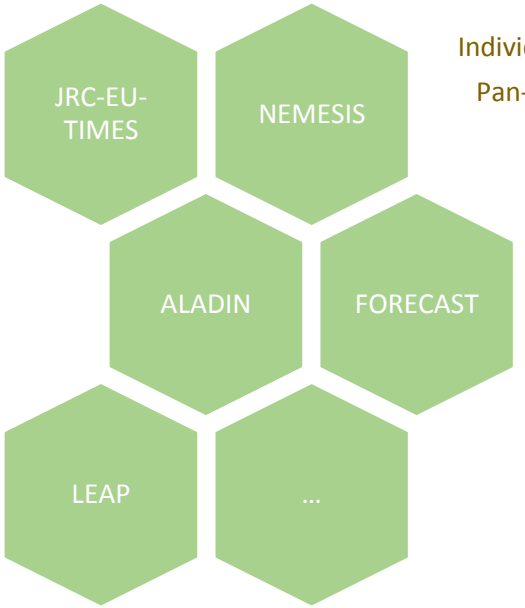
(4) ELECTRIFICATION

Paris Reinforce – Model-based responses:

- Technology-specific / Sectoral-specific outlook (eg automotive) → *comparative analyses*

- Robustification of energy/climate projections through ex-post multicriteria assessment (power-system specific issues) → *linking / iteration / trade-off analysis*

- Sensitivity analysis (key uncertainty / what-if) → *multiple explorations*



Individual and/or Pan-European

Challenge: Technology representation and intra-annual resolution (granularity)

JRC-EU-TIMES: can explore high electrification scenarios and its driving forces (technology involved, storage requirement, costs, associated emissions, etc.). Although limited capability to assess grid flexibility and stability issues, due to the limited intra-annual resolution.

ALADIN: can calculate electricity demand for electrification of all road transport modes, including direct electrification, hydrogen, and synthetic fuels….

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(5) Non-energy CO2 emissions

Policy Area: What kind of mitigation options exist for the reduction of non-energy CO2 sources?

Modelling Proposal:

A **detailed sectoral analysis** of **industrial process emissions** can be carried out using a bottom-up simulation approach.

Innovative mitigation options (e.g. CCS, new-cement types, H2 feedstock) could be analysed. However, innovative technologies differ in maturity and distance to market.

Potential mitigation pathways for industrial process emissions until 2050 could be analysed under differing framework conditions.
Models to be used: **FORECAST & JET**

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(6) Hydrogen

- **Policy Area:** Can models investigate a scenario in which hydrogen plays a big role in the future? What would this mean for industry, transport, energy?

- **Modelling Proposal:**

  A **scenario analysis focussing on H2** as main mitigation option (where possible) could be carried out. E.g. **H2 feedstock use** and **H2 based steel** production in industry, massive diffusion of **FECV**, etc. on the demand side.

  Energy system models could analyse **different supply scenarios** (e.g. blue vs. green hydrogen, European vs. Non-European production).

  Macro and **sectoral socio-economic impacts** could be analyzed.

  Several models to be used. Link to global modelling of interest.

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