

Long-term impacts of 2020 COVID-19 pandemic on EU energy dimension



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2020 COVID-19 pandemic in EU:

- Rapid mutation of the demand of services and **impacts** on the **energy dimension**: general reduction of energy services demand, different response across and within sectors.
- Response of the EU Commission: **2020 Next Generation EU**, a stimulus package aiming to support the economic recovery of countries.
- 2020 Next Generation EU supposed to boost the climate action foreseen in the **European Green Deal**
- Potential to **reinforce transformations** already in pace and modify the economic structure of the EU. Possible **deviation** of future energy consumption pathway from **pre COVID-19 scenarios**

Questions to answer:

- How could European energy system respond to COVID-19 economic impact and develop to 2030?
- Focus on citizen behaviour changes and 2050 EU net-zero target: what impulse?
- 2020 Next Generation EU: what contribution in energy transformation?

Paris Reinforce Project

Title:

Delivering on the Paris Agreement: A demand-driven, integrated assessment modelling approach (PARIS REINFORCE)

Funding:

European Union's Horizon 2020 Research and Innovation Programme (H2020)

Lifetime:

June 2019 - May 2022 (36 months)

Coordination:

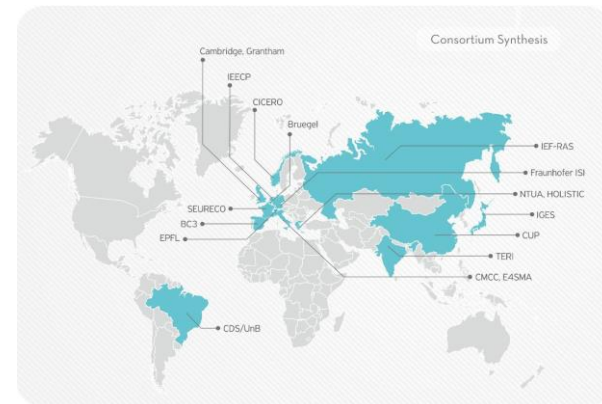
NTUA, Energy Policy Unit, National Technical University of Athens

Participants:

13 European partners; 5 international partners

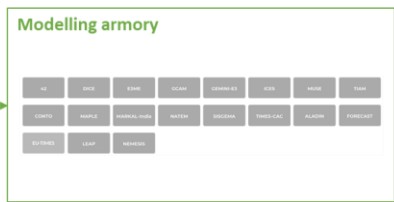
Call/Grant:

H2020-LC-CLA-01-2018/820846



Creating a common ground:
harmonisation of exogenous variables between models

Design of common scenario protocol:
"Where are we heading" scenarios to allow the interlinkage and comparison



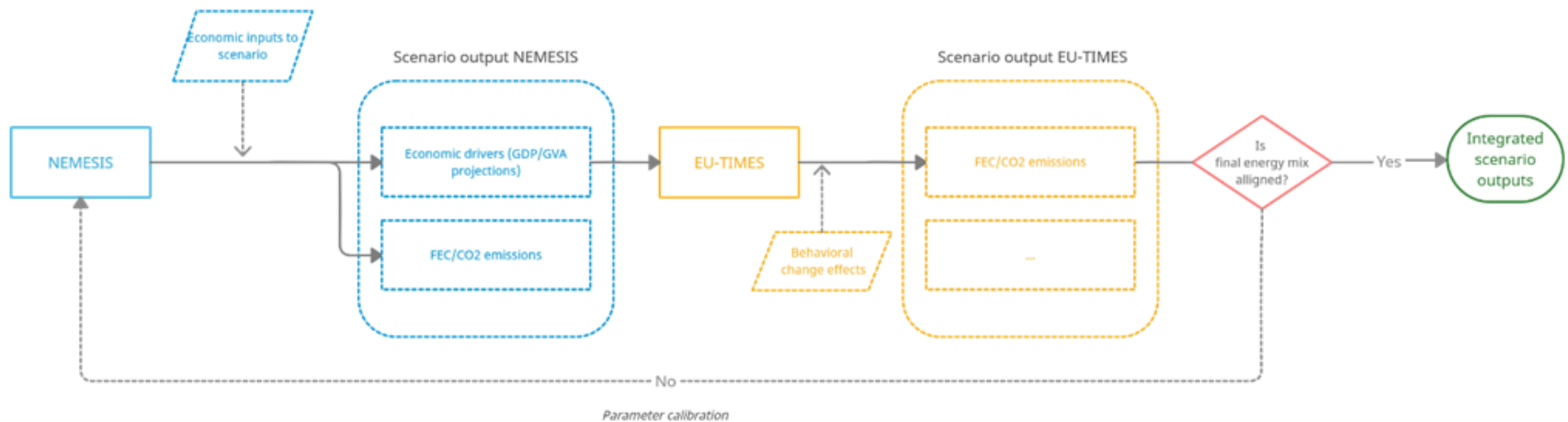
Outputs intercomparison:
common findings and robustification (ongoing)

Main project outcomes:

- Proposal of a set policy-relevant **Paris Reinforce** scenarios, including top priority EU challenges:
 - Assessment of impacts of COVID-19
 - Increasing the ambition towards the Green new deal
- **Co-design process and stakeholder engagement**

Modelling exercise

- Study is based on a set of scenarios for the EU designed to assess the potential **long term impact** of the COVID-19 pandemic on the European energy system
- Soft-link of two different modelling tools for the EU, a macro-sector detailed economic model, NEMESIS, and an energy-system model for the EU, the E4SMA's version of the EU-TIMES.

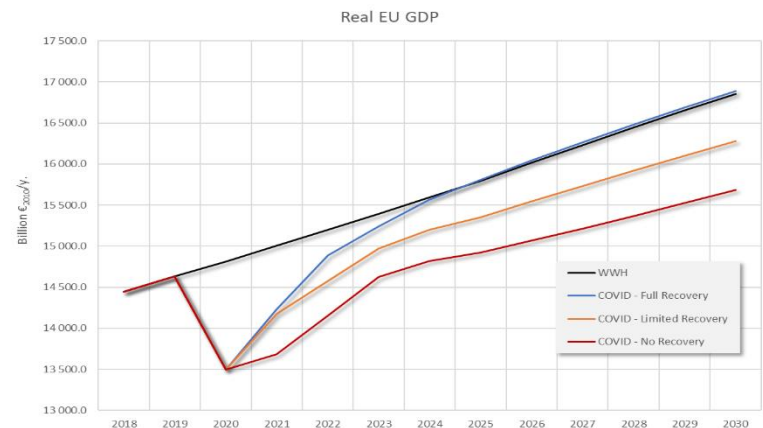


Scenario implementation

- Three main **layers**:
 - the economic situation in EU before and after the COVID19 pandemic,
 - the intensity of the EU climate action and
 - the potential long term transformations in terms of behavioural changes induced by environmental concerns and by the COVID-19 pandemic that could impact the EU energy system

First layer: economic impact of COVID19 pandemic

- Where are We Heading? (WWH): pre-COVID-19 case
- Post-COVID-19 case with full economic recovery (COVIDF)
- Post-COVID-19 case with limited economic recovery (COVIDL)



For 2020, the economic impact of the COVID-19 pandemic is based on the **DG ECFIN interim economic forecast for Winter for GDP and GDP counterparts**

Scenario implementation

Second layer: EU climate action

- a. A current policy case that includes all the measures and policies included in the EU 2030 Climate and Energy Framework to date
- b. A more ambitious context that refers to the European Green Deal and particularly the 2030 Climate Target Plan: GHG emission reduction by at least 55% in 2030 in comparison to 1990.

ETS emissions 2030	Non-ETS 2030	Ren FEC 2030	Energy Efficiency 2030	Nuclear techs	Coal techs	CCS
Current policy (-43%)	ESR2030 (National Targets)	Current policy EU (-32% at 2030)	Current policy EU (-32.5% at 2030)	National current plants and planning to phase out or renewing	National phase-out plans	National current planning storage capacities

Scenario implementation

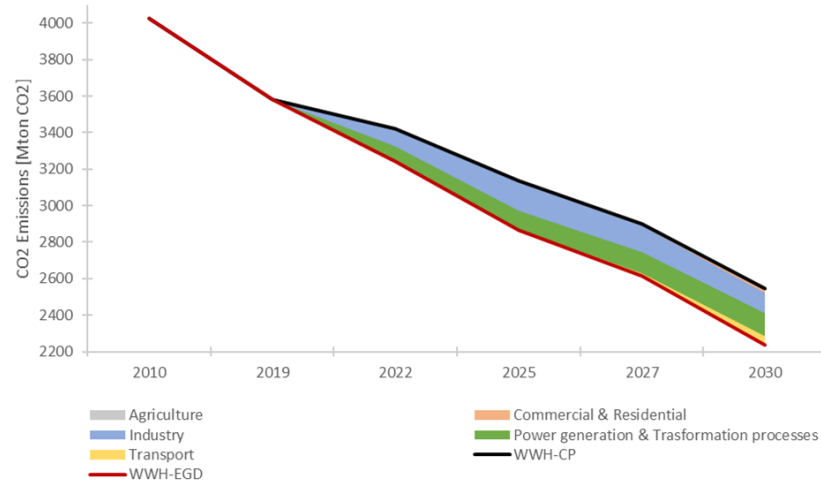
Third layer: citizen behaviour change

- a. Behaviour changes due to environmental concerns
 - Remote working: 2% higher energy demand in the residential sector, 6% less private car commutes in the transportation sector. Workforce considered is 25%, the share of commutes to work is 40% of total passenger journeys for 3 days per week. Increase in residential sector is one third of decrease in transport sector. Same increase is accounted to electric consumption and to space heating demand (IEA, 2020).
 - Environmental concern and increase of prices in aviation sector: 34% lower demand in the aviation sector in 2030.

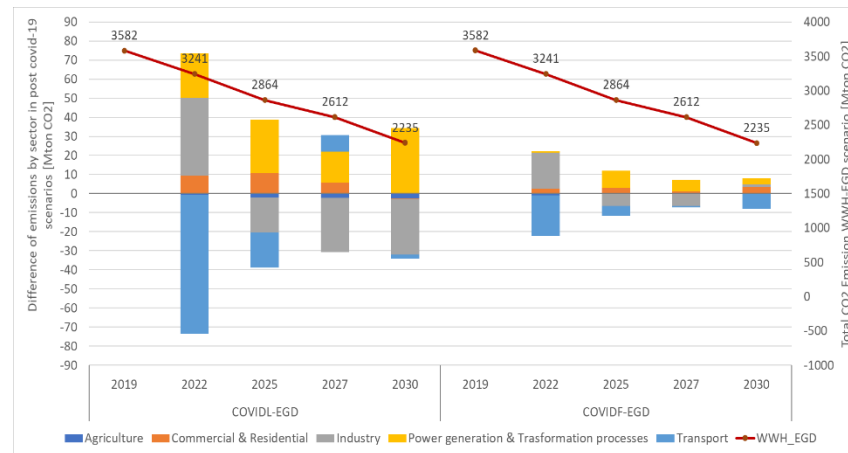
- b. Behaviour changes due to COVID-19 pandemic
 - Remote working: 3.3% higher energy demand in the residential sector, 10% less private car commutes in the transportation sector. Workforce considered is 40%, the share of commutes to work is 40% of total passenger journeys for 3 days per week.
 - Teleconferences: additional 10% lower energy demand in the aviation sector in 2030 compared to the reduction due to environmental concern.

Q1: How could European energy system respond to COVID-19 economic impact and develop to 2030?

Total CO2 emissions

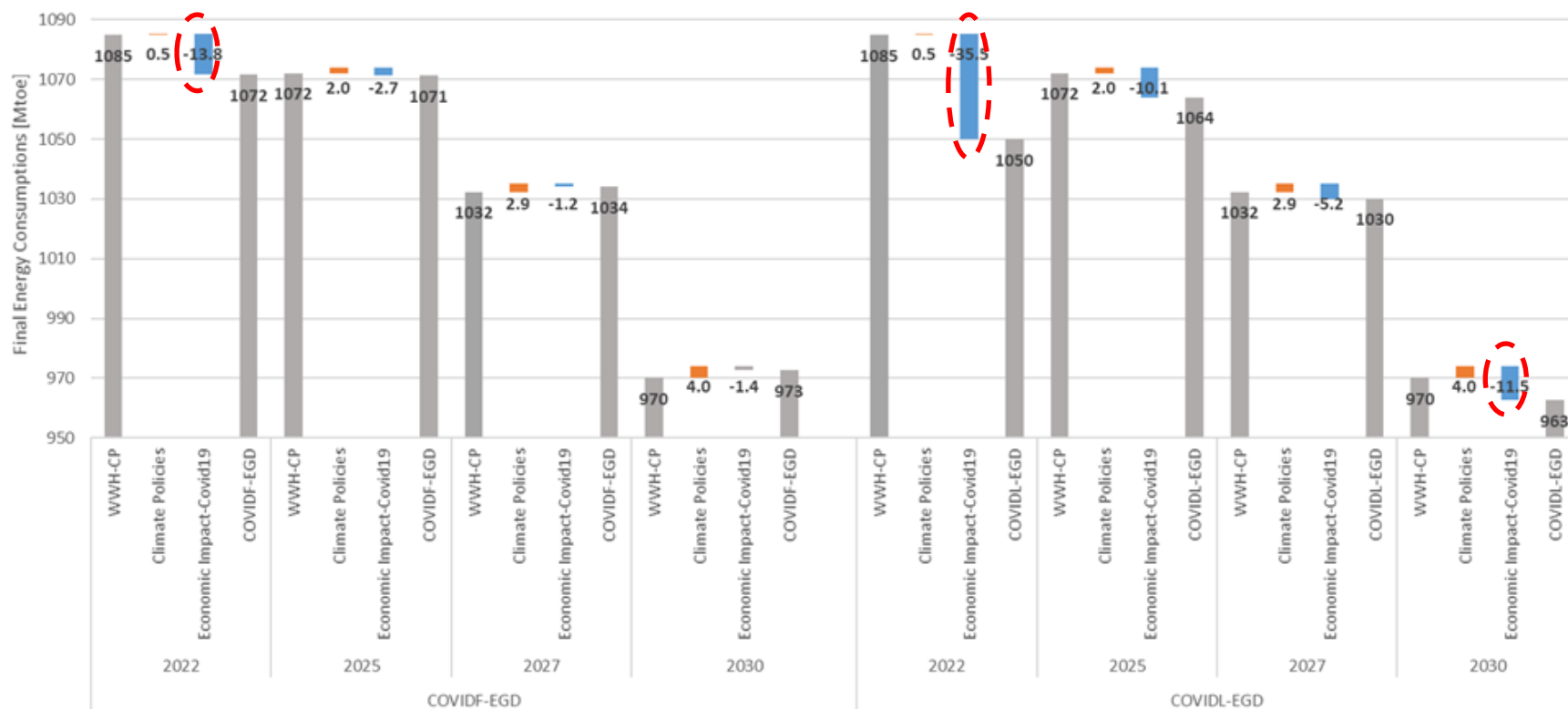


Sectoral CO2 emissions



Q1: How could European energy system respond to COVID-19 economic impact and develop to 2030?

Variation of FEC caused by climate policies and covid economic impact



Q2: Focus on citizen behaviour changes and 2050 EU net-zero target: what impulse?

Variation of FEC by inputs highlighting behavioural changes due to covid



Q3: 2020 Next Generation EU: what contribution?

Total power generation investment costs from 2019 to 2030

Lump Sum Investment Costs [BEuro 2010]							
Scenario	2019	2022	2025	2027	2030	Total	Allocated renewables to
COVIDF_EGD + Beh	17	73	142	149	192	572	55%
WWH_EGD + Beh	17	99	150	127	210	604	57%
COVIDF_EGD	17	89	192	126	287	712	60%
WWH_CP	17	90	147	116	258	629	57%
WWH_EGD	17	106	196	124	299	742	62%
COVIDL_EGD	17	70	147	141	249	623	58%

- NGEU stimulus amounts to 750 B€ to the date of this study. It integrates the 2021-2027 Multiyear Financial Framework (MFF) of EU Commission (1075 B€)
- NGEU foresees at least **37%** of the financing programs addressed to **climate action**.
- By considering only the NGEU stimulus, the 37% corresponds to 277.5 B€, including **grants and loans**.
- Comparing to investments obtained in COVIDF_EGD + Beh for power generation, this amount represents the **48%**, increasing to **88%** by considering the renewable investments only.

- Values change if a more correct destination of NGEU funds is considered. The programs considered to allocate grants in line with the EGD are the **Recovery and Resiliency Facility** and the **Just Transition Fund**.
- The amount of grants ranges from **10 B€ of the Just Transition Fund** (only for low/medium income EU countries) and **322.5 B€**, when the 312.5 B€ of grants of the **Recovery and Resiliency Facility** are considered.
- The higher bound of the share is comparable with the amount of renewable investments obtained in COVIDF_EGD + Beh. (314.6 B€).

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Thank you!



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