



Focus Group 6 - How can energy modelling tools from H2020 projects contribute to National Energy and Climate Plans?

The objective of this session was to enhance exchanges and discussions between H2020 funded projects and national authorities in charge of National Energy and Climate Plans, regarding “How can EC funded projects support national policy makers”.

1. What are the models needed of national authorities for assessing progress in implementation of measures in their NECPs for the period 2021-2030?
2. What are the models needed of national authorities for development of next generation of NECPs (2031-2040)?
3. What are the available tools from EC funded projects that could be useful for national modelling exercises?

In a first part, Clement Serre from the European Commission (DG ENER) opened the session by talking about "National Energy and Climate Plans: what are they, why they need be built on strong analytical foundation?" He told us that the NECPs are a foundation for the Green Deal. To reach the EU targets for reduction of GHG emissions, coordination and cooperation between the members states are necessary. Trust is important for cooperation. Robust analytic modelling helps a neutral conversation between partners and improves trust. Zhecho Stankov, Deputy Minister of Energy in Bulgaria described the content of the NECP for his country. He also pointed to the challenges for the industries and the possibility for carbon leakages to neighbouring countries that are not EU-Members. This is particularly relevant for steel, cement, and fertiliser industry. Miriam Bueno Lorenzo, Deputy Directorate General of Prospective, Strategy and Regulation on Energy, Ministry for the Ecological Transition and the Demographic Challenge in Spain presented the modelling processes for development of the NCEP in Spain. Her main conclusions related to modelling were:

- Modelling the energy system depends on the exercise and analysis proposed
- In addition to modelling, a process must be put in place to involve the actors in the energy system.

The second part of the session was devoted to presentation of a sample of tools that have been / are implemented within H2020 projects and may be useful for the implementation of National Energy and Climate Plans:

- [GENeSYS-MOD \(OpenENTRANCE\)](#) is a *linear techno-economic framework, ideally suited to analyze medium to long term developments of the energy system. It includes modelling of the electricity, industry, buildings, and transportation sectors, over a flexible geographic and temporal scope. Typical outputs include capacity expansion, emission reductions, as well as dispatch of all considered energies, use of storages, flexibility options and sector coupling.*
- *The [Multi-Carrier Market-Design tool \(Magnitude\)](#) allows to evaluate how market mechanisms and coordination tools may increase and optimize synergies between electricity, gas and heat systems. it includes a Bid generator, an aggregation platform and market simulator that computes cleared*



volumes and prices, for different kinds of market designs (timing, sequence, frequency, products, carriers...), over various scenarios.

- The [Plan4EU](#) modelling suite (plan4res) is focused on the electricity system. It computes an optimal capacity expansion for a given future year (generation mix, storage, interconnection capacities), an operation strategy for seasonal storages (hydro but also demand-response), and an optimal operation schedule for all assets. It accounts for a wide range of technical constraints (power and ancillary services supply, inertia, interconnections, and plants limits and ramps...) and uncertainties. It can be used to assess the cost and feasibility of a given future scenario.
- [OpenTEPES](#) (openENTRANCE) is focused on the electricity system. It computes an optimal generation and transmission expansion plan, while considering detailed system operation via a Unit Commitment which schedules the operation of medium and short-term storages. It can be used for assessing the impact of planning, policy and technology options on the transmission network development.
- [FRESH:COM](#) and [GUSTO](#) (openENTRANCE) are local energy system models focusing on urban neighborhoods and local energy communities. FRESH:COM models local PV-Batteries systems, associated to allocation mechanisms (peer-to-peer trading under the consideration of each prosumer's individual willingness-to-pay); GUSTO computes the optimal energy technology portfolio and technology dispatch of a local community, including different operation strategies for small-scale batteries.
- [EXIMOD](#) (OpenENTRANCE) is a macro-economic model that computes economic consequences of energy transition plans : employment and output per sector, household consumption, prices indices, trades... for given supply and use as well as scenario (GDP, population, electricity mix...) assumptions. It can be used for evaluating the impact of policy measures (eg fuel efficiency, circular economy...).
- [REMES](#) (openENTRANCE) is a regional equilibrium model with focus on energy systems. It computes prices, volumes, import/exports, value added, unemployment for the whole economy, based on complementary conditions. It includes a modeling of policies such as taxes/subsidies, availability of resources, changes in productivity.

