



Focus Group: **Energy Modelling and the Water-Energy-Food Nexus Conundrum**

Energy Modelling Platform for Europe (EMP-E) 2018 – Modelling Clean Energy Pathways

25 -26 September 2018

Introduction

The water-energy-food (WEF) or resource nexus represents an anticlimactic narrative in the debate over sustainability. Whereas the master narrative about sustainability claims that with more and smarter technology and the market 'yes we can' achieve sustainability, the nexus narrative reports 'Houston, we have a problem,' sustainability will require important re-adjustments in the pattern of production and consumption of goods and services. Also in the sphere of scientific inquiry the nexus flags an important shortcoming of existing quantitative approaches: governance of the nexus requires the consideration of multiple relevant attributes that can only be observed across different dimensions and scales of analysis. The simplifications typical of reductionism, which reduce the nexus to a series of problems addressed one at the time, make the nexus by default invisible to the analyst. The resource nexus calls for an overhaul of the existing theoretic and analytic tool-kits. Such a novel approach is explored and tested in the EU H2020 project 'Moving towards adaptive governance in complexity: Informing nexus security' (MAGIC), the results of which will be used to stir the discussions in this focus group.

Objective of the focus group

This focus group aims at placing energy modelling in a broader context, by linking energy to other elements of the resource nexus and moving the analysis beyond specific energy policies to the broader sustainable development goals.

Format of the focus group (duration 1h 45m)

The focus group will take the form of a world café: three twenty-minute rounds of small group conversation around three tables. Each table will be presented with a specific set of questions (primers) around one of three controversial narratives: outsourcing challenge, energy efficiency, and decarbonization in the transition to renewable energies, which will be briefly introduced prior to the table discussions.

1. *Outsourcing challenge.* Many productive activities in the EU energy, agricultural and manufacturing sectors are externalized to other social-ecological systems. This solution hides the existence of external constraints, posing serious problems of future security (would it be possible to internalize the production of all imported goods?), and transfers the associated environmental and socio-economic impacts to other countries. Can energy models properly address the implications of externalization with regard to SDGs and climate goals? How to address the issue of boundary definition?

2. *Energy efficiency narrative.* The validity of this narrative is currently uncontested and used to provide crisp targets for developing and implementing policies. However, it is impossible to simplify the complexity of the metabolic process of a society into a single quantitative output/input ratio, and efficiency targets have shown to be impractical. Can current quantitative models generate an integrated assessment of energy performance across scales?

3. *Decarbonization in the transition to renewable energies.* The 2050 Energy strategy boldly states that decarbonizing the energy system is technically and economically feasible. What type of quantitative analysis has been carried out to support this statement? The low-carbon economy roadmap predicts a monotonic dramatic reduction of GHG emissions from the present to 2050. However, the quick transition envisioned in this strategy involves a new energy matrix both in terms of both production (new power plants, distribution lines, storage devices) and consumption (a new fleet of cars, new appliances and infrastructures). Do we have quantitative models that look into the implications of the activities and structural changes taking place during this transition?

Time schedule

Welcome & introduction	Mario Giampietro (MAGIC, UAB)	5 mins
Brief primer presentations on: <ul style="list-style-type: none"> • Externalization • Energy efficiency • Decarbonization 	Maddalena Ripa, Raúl Velasco, Mario Giampietro (MAGIC, UAB)	30 mins (10 min each)
World Café	All participants	60 mins (3 rounds of 20 mins each)
Wrap-up session	Table moderators	10 mins

Organizers and contact information:

Mario Giampietro (mario.giampietro@uab.cat); Maddalena Ripa (maddalena.ripa@uab.cat); Raúl Velasco Fernández (raul.velasco@uab.cat)

Invited participants to foster discussions:

We aim to invite three policy-makers from the European Commission, European Agencies and/or European Parliament or other stakeholders to foster the discussion around the three selected topics at the different tables.

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