Working Group on System Dynamics for System Innovation

Third meeting, 12 November 2024, 9:00-18:00, Hybrid (Brussels and online)

Venue: Room INTPA 011A

Address: Rue Joseph II 54, 1000 Bruxxelles / Brussel, Belgium

You will have to show valid ID at the building reception

WEBEX link for online participants: Join the meeting

About the JRC project "System Dynamics for System Innovation"

There is mounting interest in transformative innovation policy and in new forms of industrial policy intended to bring about system-level innovation. These theoretical developments have inspired widespread experimentation by policy practitioners. However, policy makers currently lack measurement frameworks and tools suitable for evaluating their impact. Existing tools for measuring, modelling and evaluating policy inputs and outcomes are unable to capture crucial features of transformative innovation policy, including synergies, tipping points, sequences, multi-level interactions and rebound effects. A new exploratory project by the European Commission's Joint Research Centre (JRC) aims to test the feasibility and demonstrate the potential policy applications of a System Dynamics (SD) model suitable for the *ex ante* impact assessment of transformative innovation policy scenarios. The overall aim is to develop a framework suitable for the *conceptualisation*, *measurement*, *modelling* and *evaluation* of transformative innovation policies.

Meeting purpose and scope

The Working Group brings together academic experts and policy practitioners interested in systems thinking, measurement, modelling and their applications to transformative societal outcomes in Europe. It provides a space for collective learning, reflection, and co-creation. The aim of the third meeting of the Working Group is to present, discuss and validate an early working version of the POLYTRoPOS (POLYvalent model for the ex ante evaluation of TRansformative Policy Scenarios) System Dynamics model by the JRC, applied to the case of renewable energy in the EU27. In its current form the model is suitable for the exploration of policy scenarios that seek to couple the effective deployment of renewables in Europe with the parallel development of domestic production capabilities in associated value chains (e.g. for renewables, batteries, electric vehicles etc.) through innovation. The meeting will also discuss further policy applications and possible improvements and extensions of the model in the following phase of the JRC project.

AGENDA, 12 November 2024

Webex link

09:00-09:05 **Welcome address (online)**

- Mikel LANDABASO, Director JRC B, *Fair and Sustainable Economy, Joint Research Centre (JRC), European Commission*

09:05-09:10 **Introduction to the workshop (online)**

- Carlos TORRECILLA, Head of Unit B7, *Innovation Policies and Economic Impact, JRC, European Commission*

KEYNOTE ADDRESS

09:10-9:40 **Development of Productive Capabilities - Theories and Empirics (online)**
Prof. Ha-Joon CHANG, *Department of Economics, SOAS, University of London and Co-Director of the Centre for Sustainable Structural Transformation (CSST)*.

SESSION 1 – Unveiling an early prototype: POLYTRoPOS in renewables and complementary value chains

09:40-11:00 **POLYTRoPOS: towards an archetype**

This session will be devoted to the presentation, review and validation of an early working version of the model. The JRC will present progress along different aspects of the model and pose a series of questions to working group participants meant to collect structured feedback.

- **JRC project and process update,** Dimitrios PONTIKAKIS, JRC B7, European Commission
- **An updated causal loop diagram,** Georgios PAPACHRISTOS, *JRC B7, European Commission*
- **Parameterising the model**, Hedvig NORLEN, *Urbanstat*
- **A computer simulation of productive capability development**, Georgios PAPACHRISTOS, *JRC B7*

11:00-11:30 **COFFEE BREAK**

SESSION 2 – Learning from other models

11:30-12:00 **Policy insights from an evolutionary model of technology transformations: The Future Technology Transformations (FTT) Model**
Presenter: Femke NIJSSE, *University of Exeter* (UK) [20 mins]
Discussant: Matthias WEBER, *Austrian Institute of Technology* (AT) [10 mins]

12:00 -12:30 **Key learnings from a system dynamics-based ex-ante evaluation exercise for FP10**
Presenter: Igor CZERMAINSKI DE OLIVEIRA, Millenium Institute (PT) [20 mins]
Discussant: Mauricio URIONA, *Universidade Federal de Santa Catarina* (BR) [10 mins]

12:30-12:45 **Q&A**

12:45-13:45 **LUNCH (self-paid)**

SESSION 3 - Co-creation exercise

13:45 – 15:00 **Co-creating EU, national and regional policy scenarios to simulate**

The aim of this session is to leverage the expertise of Working Group participants to collectively imagine, discuss, reflect and co-create ambitious policy scenarios that POLYTRoPOS could eventually simulate. This activity will begin in this meeting and will be continued in future meetings. We will split into 3 parallel discussion groups, which will be introduced by a lead coordinator. A rapporteur will document the main ideas proposed in the discussion, using the online tool Miro and report back to the plenary. Online participants can choose to join the group that most closely matches their interests. For each scenario, the three groups will discuss:

- *Objectives*: What goals/timelines to set?
- *Policy interventions and their sequence*: What interventions? Which are most important? In which order?
- *Operationalising the simulation*: Changes/additions to the CLD? What data on stocks, parameters?

EU scenarios	**National policy scenarios**	**Regional policy scenarios**
Lead: Fabienne CORVERS, EC-SG	*Lead*: Göran MARKLUND, VINNOVA (SE)	*Lead*: Tatiana FERNANDEZ, Generalitat de Catalunya (ES)
Rapporteur: Michal MIEDZINSKI, JRC	*Rapporteur*: Georgios PAPACHRISTOS, JRC	*Rapporteur*: Dimitrios PONTIKAKIS, JRC
Contributors: Bianca Cavicchi, *DG R&I* Pål Ingebrigt Davidsen, *U. Bergen* Matthijs Janssen, *U. Utrecht* Henrik Larsen, *EEA* Femke Nijsse, *U. Exeter* Steve Smith, *U. Exeter* (online) Mauricio Uriona, *UFSC* Matthias Weber, *AIT*	*Contributors*: Antonio Andreoni, *SOAS* Erik Arnold, *Technopolis* Ian Hughes, *UCC* (online) Amber Geurts, *TNO* Hedvig Norlen, *Urbanstat* Wolfgang Polt Carolina Resende, *OECD*	*Contributors*: Luis Goñi Edurne Magro, *U. Deusto* (online) Lois Labrianidis, *U. Macedonia* (online) Igor Oliveira, *Millennium Institute* Erika Palmer, *Cornell U.* Slavo Radosevic, *UCL* Christian Saublens Elvira Uyarra, *U. Manchester* (online)

15:00-15:15 **COFFEE BREAK**

SESSION 4 - Roundtable discussion

15:15-16:25 **Policy roundtable:**
"System dynamics as a tool of strategic policy intelligence in an age of transformations"

Chair: Fabienne CORVERS, *European Commission, Secretariat General*
Rapporteur: Michal MIEDZINSKI, *JRC B3, Territorial Development*

The aim of this session is to highlight new and emerging needs for strategic policy intelligence in an age of deep transformations and to identity the current and potential role of system dynamics. It is meant to inform the future development of modelling tools and to familiarise policy practitioners with their uses.

Discussants:

Antonio ANDREONI, *SOAS University of London* (UK)
Ian HUGHES, *University College Cork* (Ireland)
Göran MARKLUND, *VINNOVA* (Sweden)
Femke NIJSSE, *University of Exeter* (UK)
Erika PALMER, *Cornell University* (USA)
Slavo RADOSEVIC, *UCL* (UK)
Julien RAVET, *European Commission, DG R&I*
Carolina RESENDE, *OECD, STI Directorate*

+ Plenary Q&A and discussion

16:25-16:30 **Workshop Closing remarks**: Dimitrios PONTIKAKIS, JRC B7
(agenda continues on the next page)

16:30-18:00 **Advisory Board meeting *(by invitation only)***
Moderator: Dimitrios PONTIKAKIS
Rapporteur: Georgios PAPACHRISTOS

Setting the specifications for a feature-complete POLYTRoPOS:

- Dealing with risk *and also uncertainty*
- Levels of governance (EU, national, regional)
- Perimeter of impacts (economy, society, environment)

18:00 **END**