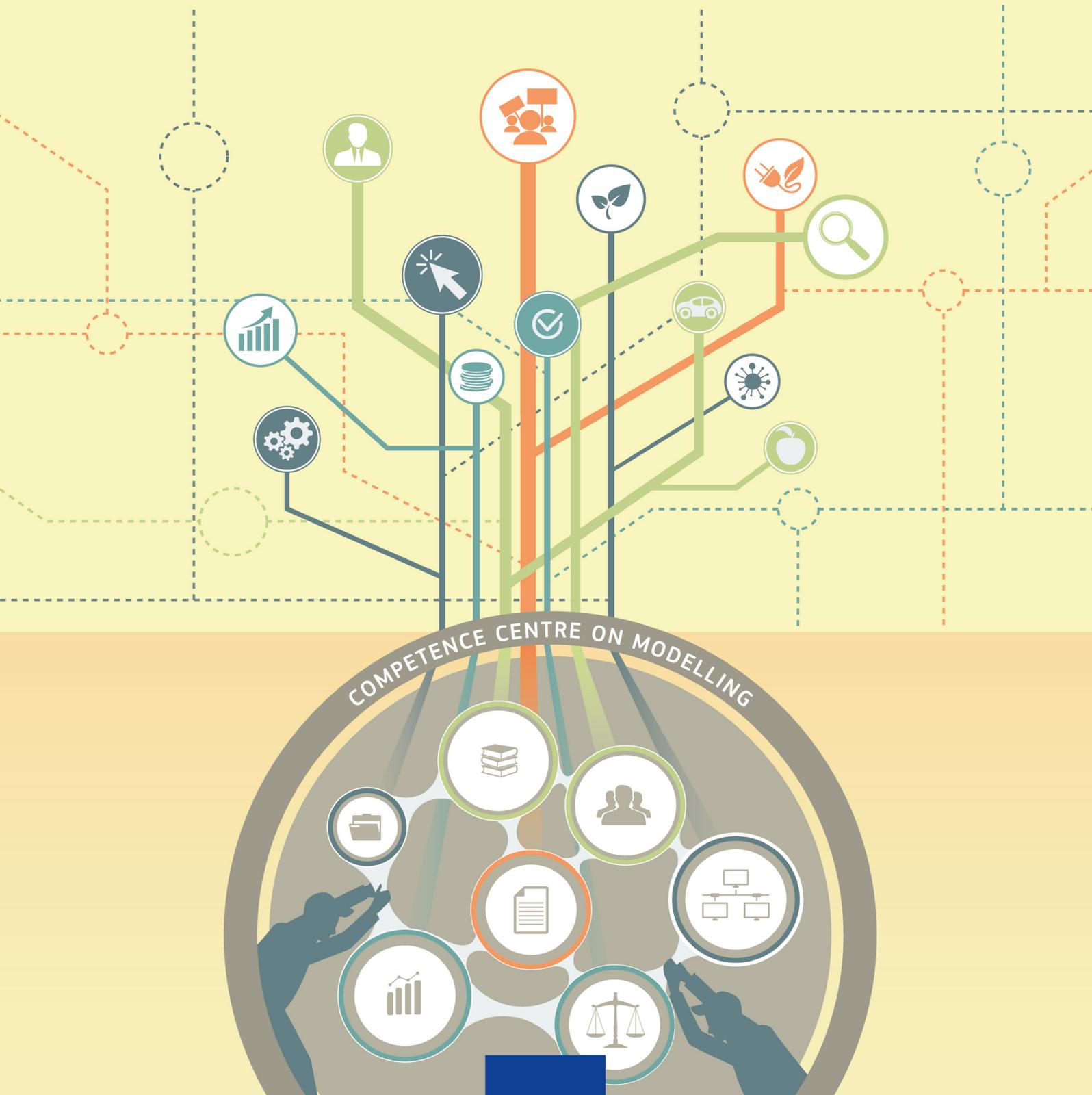




The European Commission's Competence Centre on Modelling



What	The Competence Centre on Modelling promotes a responsible, coherent and transparent use of modelling to underpin the evidence base for EU policies.
Why	The transparency and coherence of evidence used to support EU policy decisions – including, but not limited to, impact assessments and evaluations – are vital for the credibility of the Commission’s policy analysis. The Commission makes extensive use of models for impact assessments and evaluations, for working documents and reports, and to underpin its position in international negotiations.
How	The Competence Centre leverages the modelling capacity and competences across the Commission and beyond. Starting with the Commission-wide modelling inventory (MIDAS), it supports a proper documentation, use, and reuse of models. It further helps identifying common approaches to quality and transparency of model use, and establishes a Community of Practice on Modelling.
Who	The Community of Practice on Modelling, in which model developers and users in the Commission are invited to participate, is the forum for the exchange of modelling-related knowledge and best practices. In collaboration with the Community of Practice, the Competence Centre will promote the use of multi-disciplinary and integrated modelling approaches to cater for the increasing overlap between different policy areas. The Inter-Service Group on Modelling is the steering group of the activities of the Competence Centre and the Community of Practice.

The main planned activities of the Competence Centre for the period 2018-2019 are outlined below.

Community of Practice (CoP) on Modelling

The **CoP on Modelling** brings together modellers and policymakers to promote a responsible and coherent use of simulation models, underpinning the evidence base for EU policies. Its mission is “Sharing and promoting best practices for modelling in support of the EU policy cycle”.

The CoP facilitates collaboration and dialogue both between the modelling teams and with policymakers; acts as a Think Tank for modelling related issues; and offers a point of contact for the users of modelling services, as well as a link

to other modelling-related networks. The CoP can also act as a facilitator for the organisation of working groups, seminars and trainings.

The nucleus of the CoP on Modelling is **the Inter-Service Group on Modelling (ISG-MOD)**, which brings together Commission Services involved or interested in modelling activities.

The 1st Commission internal gathering of the CoP on Modelling took place in December 2018. The first open conference on modelling to support policymaking will be organized in 2019.

Corporate Modelling Inventory and Knowledge Management

MIDAS is the Modelling Inventory and Knowledge Management System of the European Commission and a key component of the European Commission's Competence Centre on Modelling.

MIDAS allows anyone working on the Commission network to find models in use for policy making in any Commission Service, and to assess their use for specific policy purposes.

Through access to related data, modelling exercises, past and ongoing policy contributions and related publications, MIDAS furthermore enhances the transparency of models and traceability of their results, and our understanding of the ongoing support within and across different domains.

MIDAS also captures the links and dependencies between models. Especially in ex-ante IAs, when a set of models is used to answer complex policy questions, identifying these links early in the process is to lead to synergies, greater efficiency and better, more consistent results for policy making.

Starting in 2017, MIDAS is a tool of the Better Regulation Toolbox, and from 2019 onwards parts of the system will be open to the European Parliamentary Research Service under the umbrella of the Inter-Institutional Agreement of Better Law-Making. This makes MIDAS an important corporate tool to use, reuse and document models in a proper way, leading

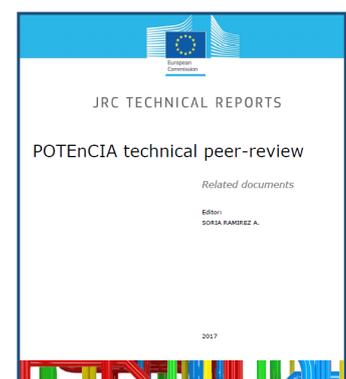


to the propagation of sound methodology underpinning the Commission's Better Regulation policy.

The Competence Centre promotes good practices in data management and facilitates the use of the EU Open Data Portal and the JRC Data Catalogue by modelling teams.

Quality, transparency and sensitivity analysis of models

The aim of this work is to help improving the quality and transparency of models that are being used for EU policy making.



This involves the organisation of peer-reviews of the model quality and transparency. The model review is done by external experts with the involvement of the Commission staff. The selection of models to be reviewed is done in collaboration with the Inter-Service Group on Modelling Inventory and

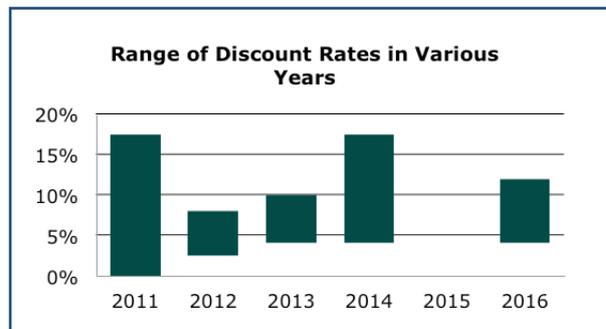
the modelling teams. The model review will result in a report on the model quality and transparency.

The activity also provides services and tools related to sensitivity analysis and uncertainty quantification. These tools are increasingly – worldwide – employed by practitioners in any field of science for the assessment, validation and verification of simulation models and computer codes in the presence of uncertainty. The JRC is a leader in this subject, contributing with its competences to the methodological development and the diffusion of the discipline worldwide. Staff of the Competence Centre will support and train interested modelling teams in the setting up and execution of uncertainty and sensitivity analyses, and will further provide ad-hoc support to Policy DGs on model quality assurance.



Training on Sensitivity Analysis. JRC, June 2017.

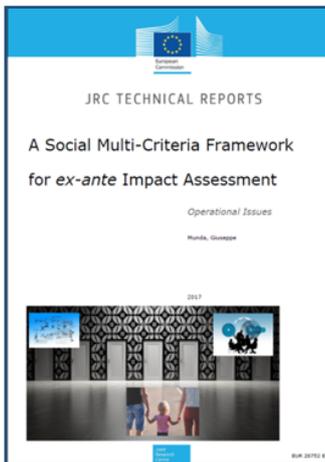
Transparency and coherence of baseline scenarios for EU long-term integrated policy assessments



The objective of this activity is to improve the quality and consistency of baseline scenarios used for the policy modelling at the Commission. In close collaboration with modelling teams and the relevant policy DGs, currently used baseline scenarios in the modelling support for policy have been mapped and compared across models. Based on these insights, a number of recommendations will be put forward that aim at facilitating the documentation of baseline assumption, increasing transparency and improving the quantification of baseline assumptions in EU impact assessments. The latter also includes efforts to further integrate foresight methodologies and baseline development.

Social Multi-Criteria Evaluation of Policy Options

Social Multi-Criteria Evaluation (SMCE) builds on formal modelling techniques serving the purposes of decision and policy making; in the policy cycle, it refers to the policy formulation step. SMCE is



useful for helping the Commission to integrate a plurality of technical aspects and social views into its impact assessment in a coherent and transparent manner.

SMCE can provide a methodology which is:

Inter/multi-disciplinary, since the various criterion scores can assess a wide range of impacts for example, by using results of economic, environmental, energy, and other simulation models.

Participatory, since fairness in the policy process is seen as an ethical obligation to take a plurality of social values, perspectives and interests into account.

Transparent, since all criteria are presented in their original form without any transformations in money, energy or whatever common measurement rod. The importance of mathematical approaches in SMCE is their ability to allow a *consistent aggregation* of the diverse information. Otherwise, the standard objection might be that the aggregation of apples and oranges is impossible. Multi-criteria mathematics does answer to this objection in a definitive way.

The Competence Centre offers training on SMCE and ad-hoc support to DGs for Impact Assessments.

Recent events

June 2017: Sensitivity Analysis for Modellers – Training course – Ispra.

22-23 November 2017: Training on Ex-ante Impact Assessment: a Social Multi-Criteria Evaluation Framework, Brussels.

April 2018: Sensitivity Analysis for Impact Assessment for Policy officers – Training course for EC/EP staff – Brussels.

June 2018: 10th Summer School on Sensitivity Analysis of Model Output – Ranco.

Upcoming

2019, Trainings on Ex-ante Impact Assessment: a Social Multi-Criteria Evaluation Framework, Brussels, for EC and EP staff.

February 2019: Opening of the Inter-Institutional version of MIDAS to the European Parliament, during the Science meets Parliament week.

October 2019: 9th International Conference on Sensitivity Analysis of Model Output – Barcelona.

November 2019: 1st Open Conference of the CoP on Modelling.

Further reading

Becker W. (2017). Sensitivity Analysis in European Commission Impact Assessments, JRC Technical Report (JRC106312).

Mara T. A., Kopustinskas V., Rosati R., Stakelytė G., Praks P. (2017). Security of gas supply with the

ProGasNet simulator: an uncertainty and sensitivity analysis exercise, EUR 28953 EN, Publications Office of the European Union, Luxembourg, 2017, ISBN 978-92-79-77155-2, doi:10.2760/818537, JRC109751.

Munda G. (2017). On the use of Cost-Benefit Analysis and Multi-Criteria Evaluation in ex-ante Impact Assessment, EUR 28768 EN, Luxembourg (Luxembourg): Publications Office of the European Union. doi 10.2760/311199.

Munda G. (2017). A social multi-criteria framework for ex-ante impact assessment, EUR 28752 EN, Luxembourg (Luxembourg): Publications Office of the European Union doi 10.2760/909528.

Munda G. (2017). Dealing with fairness in public policy analysis, EUR 28751 EN, Luxembourg (Luxembourg): Publications Office of the European Union. doi 10.2760/75185.

Pisoni, E., Albrecht, D., Mara, T. A., Rosati, R., Tarantola, S., & Thunis, P. (2018). Application of uncertainty and sensitivity analysis to the air quality SHERPA modelling tool. Atmospheric Environment, 183, 84-93.

Kopustinskas, V., Praks, P., Mara, T., & Rosati, R. (2018). Application of PCE sensitivity analysis method to gas transmission network. In Safety and Reliability–Safe Societies in a Changing World (pp. 2693-2700). CRC Press.

Becker, W. (2018). Exploring the limits of meta-models for sensitivity analysis at low sample sizes. In EGU General Assembly Conference Abstracts (Vol. 20, p. 19803).

Worden, K., Becker, W. E., Rogers, T. J., & Cross, E. J. (2018). On the confidence bounds of Gaussian process NARX models and their higher-order frequency response functions. Mechanical Systems and Signal Processing, 104, 188-223.

Albrecht, D., Mara, T.A., Pisoni, E., Rosati, R., Tarantola, S. (2018). Sensitivity Analysis of the SHERPA Air Quality Model, EUR 29122 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-79935-8, doi: 10.2760/78023, JRC110322 (submitted)

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Useful links

Competence Centre on Modelling – Science Hub:

<https://ec.europa.eu/jrc/en/modelling>

SAMO Hub: <https://ec.europa.eu/jrc/en/samo>

Modelling Inventory and Knowledge Management System of the European Commission (COM version, EC-internal): <http://midas.jrc.ec.eu.int/>

Modelling Inventory and Knowledge Management System of the European Commission (Inter-Institutional version, accessible for EC and EP): <https://webgate.ec.testa.eu/midas-ii>

Connected (EC-internal):

CC MOD: <https://connected.cnect.ec.eu.int/groups/cc-mod>

CoP: <https://connected.cnect.ec.eu.int/community/cross-commission-collaboration/community-of-practice-on-modelling>

SAMO: <https://connected.cnect.ec.eu.int/groups/sensitivity-analysis-of-model-output>

EU Open Data Portal: <http://data.europa.eu>

JRC Data Catalogue: <https://data.jrc.ec.europa.eu/>

People

Name	Competence and activities
Szvetlana ACS	MIDAS quality control, analysis of model use in policy making, gap analysis
Daniel ALBRECHT	Team leader, Uncertainty and sensitivity analysis, model quality
Ivano AZZINI	Uncertainty and sensitivity analysis/Social multi criteria evaluation
Egle BASYTE FERRARI	Trainee, quantitative and qualitative approaches, transparency and baseline scenarios
William BECKER	Uncertainty and sensitivity analysis
Gabriele GHIRIMOLDI	MIDAS architect, technical development, DB design and editor development & links to EC and international Databases
Matthew HARDY	MIDAS architect, technical development & interface, lead of the development of the Inter-Institutional version of MIDAS
Leen HORDIJK	Former JRC Director, strategic advice and model reviews
Maya LAMANNA	Secretarial support
Giulia LISTORTI	Community of Practice, policy analyst, analysis of model use in policy making
Giuseppe MUNDA	Team leader, Social multi-criteria evaluation
Nicole OSTLAENDER	Team leader, MIDAS development, data management, strategic analysis, data mining & visualisation, Social multi-criteria evaluation
Maurizio PESINO	Web developer, multi-criteria analysis tools
Rossana ROSATI	Statistics, uncertainty and sensitivity analysis
Eckehard ROSENBAUM	Team leader, Economic and environmental modelling, baseline scenarios
Mikhail SIMONOV	Statistics, uncertainty and sensitivity analysis
Paul SMITS	Head of Competence Centre on Modelling

Science meets Parliaments: What role for science in 21st century policy-making

6-7 February 2019, Brussels (BE)

