



European  
Commission

# JRC CONFERENCE AND WORKSHOP REPORT

## Report on the workshop “Modelling sustainable development and SDGs”

*How JRC modelling can  
contribute to the SDGs  
framework*

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2020



**SUSTAINABLE  
DEVELOPMENT  
GOALS**

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# 1 Introduction and objectives of the workshop

## 1.1 Background and structure

In July 2019, JRC units D.1, I.2, D.4 and D.6 jointly organised a workshop on “SDGs in JRC modelling support to the EU policy cycle”. That workshop, bringing together more than 40 scientists from six JRC directorates, one colleague from SG.A.2 and Prof. E. Giovannini from University of Rome Tor Vergata, was the starting point to initiate a dialogue within the JRC modelling community and raised awareness about Sustainable Development Goals (SDGs) context and priorities. In particular, it allowed taking stock of JRC modelling activities that may be relevant for the overarching SDGs context.

This second workshop, organised in Brussels on 28th of November 2019, is a follow-up to that initiative, aiming at further increasing the understanding of the SDGs framework implications for different models in use at the JRC and supporting JRC integrated approaches and responses to sustainable development. It will be targeted to JRC in-house on-going modelling activities which are already quite advanced in addressing and supporting indicators related to SDGs, identified by policy areas: environment, energy and climate, territorial and cohesion policies, agro-economic and food security, macro-economic and financial policies.

This workshop addressed two main themes:

1. **Mapping JRC models**, and understanding how they integrate SDGs (Session 1): outcomes from the previous workshop in July <sup>(1)</sup>, and results from the subsequent work carried out in the last months to complete the modelling mapping have been presented (L. Marelli). The open discussion after the introductory presentation helped to get a final understanding of how models integrate SDGs, how their outputs can be directly or indirectly linked to EU/UN SDGs indicators, and how trade-offs and interplays are assessed.
2. **Integrated assessment of sustainable development** (Session 2). This session was introduced by a presentation by Prof. Enrico Giovannini on “Statistical and modelling tools to assess the implementation of SDGs: the experience of ASviS”. The objective of the session was to exchange among modellers the lessons learned when modelling sustainable development, which policy needs linked to SDGs have been already addressed, how multiple dimensions of sustainable development have been integrated, for instance the lessons learned and difficulties encountered when linking with other models etc.

As preparatory work before this workshop, a mapping exercise to link JRC models to SDGs, targets and indicators was launched. Units D.1 and I.2 carried out an analysis of all JRC models based on the information and models' descriptions available in MIDAS, and on the inputs received through the JRC July's workshop. JRC modellers were requested to validate this analysis, confirming the links identified, explaining how each model can contribute to each SDG target/indicator, and eventually proposing additional links. In addition, modellers were asked to respond to an on-line survey, designed to collect additional information for this mapping exercise, focusing on broad categories of model types and the models' spatial and temporal dimensions. Initial results of this work have been presented at the workshop and served as the basis for discussions in Session 1.

## 1.2 Welcome and opening of the meeting by DG Charlina Vitcheva

The meeting was opened by our DG C, Vitcheva, who welcomed all participants and, highlighting the importance of this mapping exercise, expressed her gratitude to all modellers for their contribution to it and for the high participation to the event. She emphasised the increased importance of SDGs for the New Commission, differently from the previous one which was more focussed on priorities to overcome the economic crisis. SDGs will be a top priority for all Commissioners (as clearly indicated in the mission letters received by all commissioners by the president U. Von Del Leyen), and increased demands will come to the JRC.

She stressed the concept of proportionality, using our available knowledge at best to minimise efforts to reach knowledge integration with a holistic perspective. Models are among the most sophisticated tools to capture holistic aspects, and the JRC, hosting the Competence Centre on Modelling, is certainly well positioned to achieve this goal. The DG suggested three priorities to keep in mind:

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<sup>1</sup> Report on the workshop “SDGs in JRC modelling support to the EU policy cycle: How adopting the SDG framework in JRC modelling work can contribute to better coordinating EU economic, social, and environmental policies” available online at JRC KnowSDGs platform <https://knowsdgs.jrc.ec.europa.eu/>

- 1) Development of a holistic framework to mainstream SDGs into policy and pursue policy coherence.
- 2) Foresight and future proofing of legislation: this is extremely important in the new Commission and there are high expectations on how models can contribute to this.
- 3) Assessing Feasibility of targets, in particular in a landscape of big emergencies such as extreme weather events and other “game-changers”. Related to this, we need to address questions like which are the pathways to follow and implement to reach targets, taking into consideration limitation of resources? How to cast pathways and what is the potential of modelling to cast the future?

The DG also recommended to concentrate our efforts on the following aspects:

- Given the urgency to deliver first 100 days of Commission, focus on “low-hanging fruits” and results that can be easily achieved.
- Structure our work and plan resources properly, focussing on the integrated assessment framework, the European Semester, etc. Resources can be allocated further based on these priorities.
- Prioritise: indeed our focus is on mainstreaming SDGs in EU policies, however global impacts and the global dimension are also very important, and Africa in particular remains on top priorities for the EU.
- Ranking of important and fast delivery. Roadmap need to be done very quickly.

### **1.3 Scope and objectives of the workshop (S. Sala)**

This workshop was organised with the main objective to improve the use of models for sustainability assessment of EU policies in the SDGs framework, identifying strengths in JRC modelling with respect to SDGs, as well as potential gaps in current modelling capabilities. Taking stock on how JRC models are or may contribute to SDGs monitoring and assessment, the goal is to understand how to better evaluate the impact of policy options on one or multiple SDGs.

Measuring progress towards SDGs is challenging, and requires more and more integrated assessment and integration of different dimensions of sustainability, breaking silos across disciplines and possibly including aspects of sustainability science.

Models are essential to assess trade-offs quantitatively and unveil where solutions are needed. They are fundamental to understand the complexity of sustainability and development challenges, which often lie in multidisciplinary domains. Achieving sustainable development requires a good understanding of the interlinkages (synergies and trade-offs) among the goals, and modelling can provide a concrete contribution towards this goal.

### **1.4 Main outcomes from the first workshop “SDGs in JRC modelling support to the EU policy cycle” (L. Marelli)**

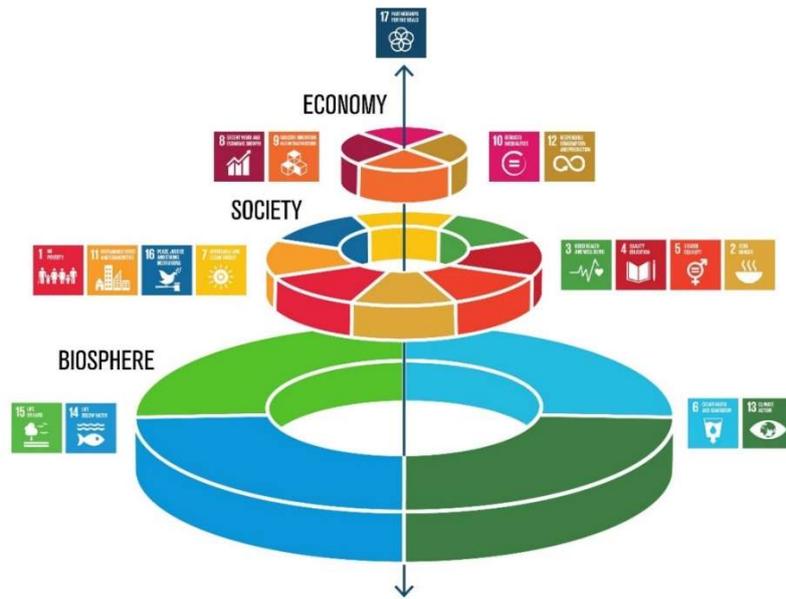
In July 2019, units D.1, I.2, D.4 and D.6 jointly organised a first workshop on **“SDGs in JRC modelling support to the EU policy cycle”**<sup>Error! Bookmark not defined.</sup>. That workshop, bringing together more than 40 scientists from six JRC directorates, was the starting point to initiate a dialogue within the JRC modelling community and raised awareness about SDGs context and priorities. In particular, it allowed taking stock of JRC modelling activities that may be relevant for the overarching SDGs context.

The workshop was structured along four main sessions:

- Presenting the broader picture on the SDGs framework for EU policies, focusing in particular on how SDGs can be mainstreamed in EU policymaking
- Showing two case studies illustrating how JRC's activities are currently contributing to assess potential impacts on SDG-related indicators or targets
- Mapping of JRC models supporting SDGs
- Analysing models' interactions. Understanding synergies and trade-offs.

During two breakout sessions organised in working groups, modellers were asked to map their models outputs against UN targets and EU/ESTAT indicators for each SDG, grouped by the biophysical, economic and social components (following the “wedding cake approach” developed by the Stockholm Resilience Centre (Figure 1).

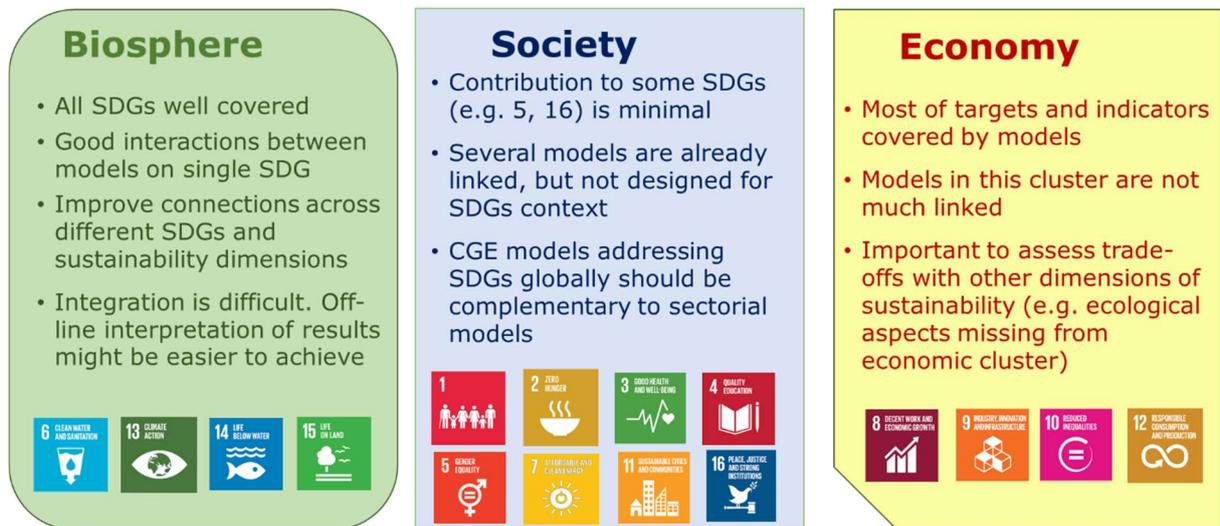
**Figure 1.** 'Wedding cake' representation of SDGs. *Source:* Stockholm Resilience Centre, 2016



*Source:* Stockholm Resilience Centre, 2016. (²)

The main outcomes of the break-out sessions for each of the three sustainability pillars are summarized in the scheme in Figure 2.

**Figure 2.** Outcomes of break-out sessions of the first workshop



*Source:* JRC, own elaboration.

Overall, the workshop contributed greatly to our understanding of the SDGs framework implications for different models in use at the JRC and identified the way forward for an integrated impact assessment necessary for mainstreaming the SDGs in policy making. The event was also an opportunity to effectively present the broader policy context to JRC modellers, and thus to highlight their essential contributions to EU policymaking. Such Networking initiatives are very important to identify potential synergies among models and Opportunities for model linkage and integration.

(²) Rockström, J., Sukhdev, P., *How food connects all the SDGs.* opening keynote speech at the 2016 EAT Forum.

Discussions evidenced that data sharing is still an issue, but also recognised the need for integrated assessment models to evaluate trade-offs and unveil solutions. In this regard, the development of meta-models is recommended, as it might be easier to achieve.

## 2 Mapping JRC models and understanding how they integrate SDGs

### 2.1 Mapping JRC models against SDGs: first results (G. Barbero Vignola and S. Acs)

During 2019, JRC units D.1 and I.2 carried out mapping exercise to link JRC models to SDGs, targets and indicators, based on the information and models' descriptions available in **MIDAS**, the Modelling Inventory and Knowledge Management System of the European Commission<sup>3</sup>. Initial results of the mapping were discussed directly with modellers in the workshop organized by the two units in July 2019 on “SDGs in JRC modelling support to the EU policy cycle”.

From MIDAS portal, 120 JRC models, toolboxes and platforms were selected (only the ones actually in use and maintained were included in the analysis). For each of them, the online description available in MIDAS was analyzed, focusing on the aim, contents, main outputs, policy role and impact areas that the model is addressing. The scope was to identify **links between models' outputs and SDGs** at targets and indicators' level, considering both UN and ESTAT indicators frameworks.

Modellers were further requested to validate this first assessment, confirming the links identified and eventually proposing additional ones. They were also asked to explain in detail how their models could contribute to each SDG target/indicator.

**First results of this mapping** were presented during the workshop. At the time of the meeting, 73% of modellers (88 models) had confirmed our first assessment regarding links with SDGs targets and indicators, providing details about how the model can contribute to each SDG. 69% of modellers had also answered the online survey providing the additional information requested therein. Considering the complexity of the topic and the tight deadlines, the rate of responses is certainly to be considered a success<sup>4</sup>. The preliminary analysis carried out for the workshop indicates that most of the models (118 out of 120, 98% of the total) are linked to the SDGs and could be used to address one or more goals and targets. Figure 3 shows an overview of how models contribute to each goal.

The goal with a greater number of models associated is Goal 13 “Take urgent action to combat climate change and its impacts”. In 63 out of 120 models (52%) there is a connection with this area of intervention, especially with regard to greenhouse gas emission. The second most widespread is Goal 7, “Affordable and clean energy” (45 out of 120 models, 38%). The third is Goal 11: “Make cities and human settlements inclusive, safe, resilient and sustainable” (39 out of 120, 33%).

For these SDGs a lot of information provided by the models are available. On the other side, for other goals (e.g. goal 4 about education, or 5 on gender equality, or 16 peace, justice and strong institutions) lack of information is evident, and very few models are linked to these goals.

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<sup>3</sup> Ostlaender, N., Acs, S., Listorti, G., Hardy, M., Ghirimoldi, G., Hradec, J. and Smits, P. (2019), *Modelling Inventory and Knowledge Management System of the European Commission (MIDAS)*, EUR 29729 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-02852-9, doi:10.2760/900056, JRC116242.

<sup>4</sup> The survey was fully finalized and completed with contributions from all modellers after the workshop.

**Figure 3.** Number of models linked to each goal general issues

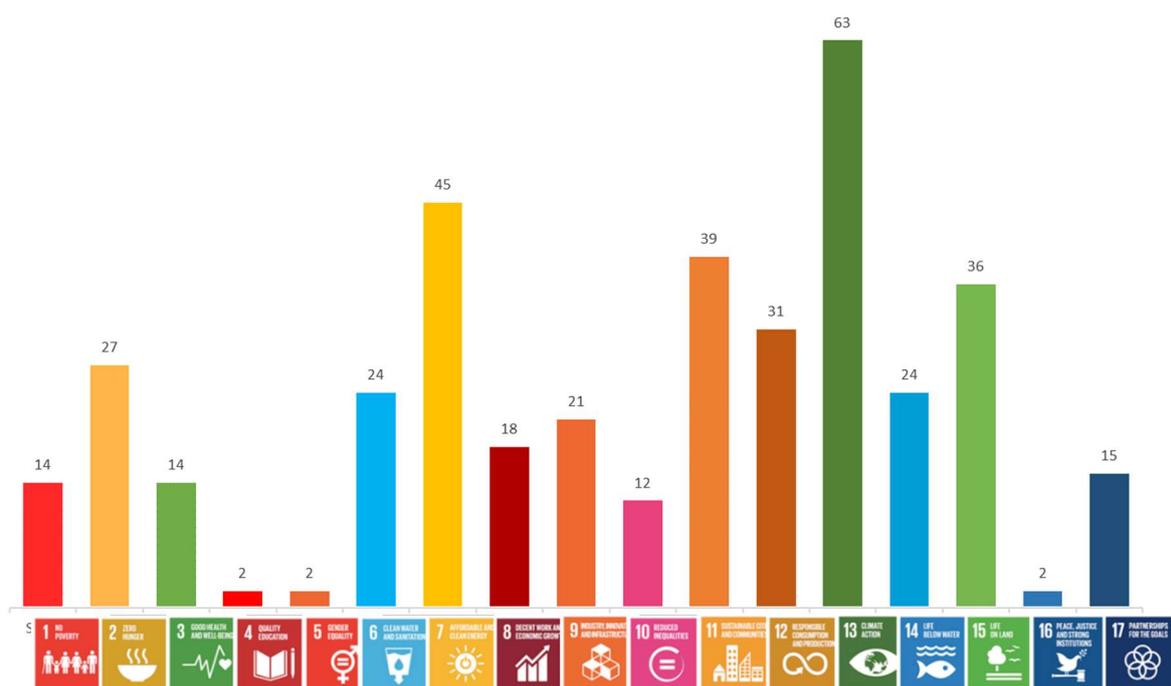


Figure 4 below shows a sample of the models (validated by modellers, extracted from the full list) which are linked to every goal. The mapping is available also at target level, with the additional information regarding the indicators they can measure.

**Figure 4.** Extract from the mapping of JRC models against SDGs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
a4a														●			
ABAQUS							●		●								
AGMEMOD		●													●		●
AIMSUN							●		●			●	●				
ASTEC			●				●		●		●		●		●		
Baltic Power System	●						●		●								
BioMA		●											●		●		
BSEM													●	●			
CAPRI		●				●						●	●		●		●
Cast3M											●		●				
Cement Model 2							●		●				●				
CENTURY		●					●					●	●		●		
CESM						●					●		●	●	●		
CLM						●							●		●		
CMB											●						
CO2MPAS							●				●	●	●				
COPERT							●				●	●	●				
CORTAX								●									●

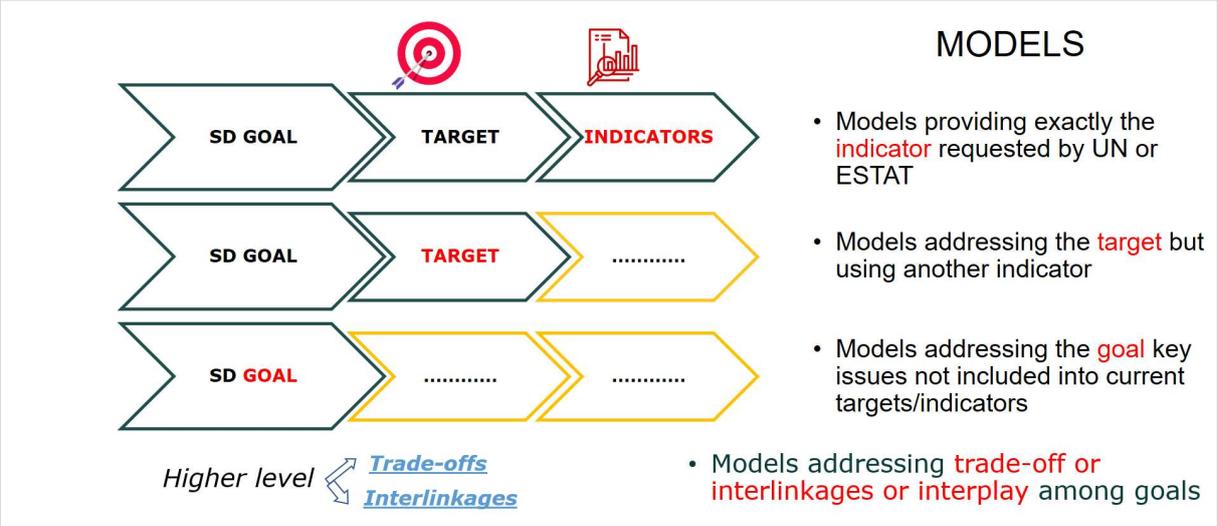
Source: JRC, own elaboration.

Modellers were also asked to provide information regarding how their models can contribute to the SDGs in concrete terms, and which are the main model outputs that could be relevant for the assessment.

Every model can contribute in a different way (Figure 5): mirroring exactly indicators defined in UN or ESTAT framework; addressing a target but using different indicators; addressing a goal but not a specific target or indicator. Finally, some models are also addressing trade-off or interlinkages among goals.

The mapping allows to identify which models are linked to which goals, but also to know the targets addressed, and if the model can provide quantitative estimate of the achievement of a goal and how (through the UN or ESTAT indicators, or through other indicators). The final output of the mapping will be a catalog of all the indicators that models are capable to measure for each goal and target. The mapping will become a tool able to link each SDG target to a set of instruments (the models), which can help to understand and to identify the interlinkages among SDGs, addressing as far as possible synergies and trade-off.

**Figure 5.** Structure for matching models output and SDGs



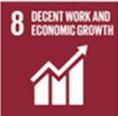
Source: JRC, own elaboration.

Finally, additional important information was obtained through an online survey distributed to all modellers before the workshop. The survey was designed to collect additional information for the mapping exercise, focusing on broad categories of model types and the models’ spatial and temporal dimensions. In fact, a commonly agreed taxonomy to categorise different models by types, or by their spatial and temporal extents is currently missing in MIDAs, while developing **taxonomies on model types** (e.g. top down CGE, bottom-up PE etc.), and **spatial** (e.g. spatial coverage and resolution of the model) and **temporal** (e.g. short, medium or long-term forecasting) dimensions relevant for JRC models would be very useful and can largely help in the SDG exercise.

An example of results extracted from the survey is shown in Figure 6, for Target 8.1 regarding economic growth and GDP.

More specifically, synergies between the models can be explored and complementarities assessed when looking into the details on the characteristics of each model.

Figure 6. Example of models which contribute to the target 8.1

	<b>CORTAX</b>	<b>EUROMOD</b>	<b>RHOMOLO</b>	<b>QUEST</b>	<b>GM</b>	<b>GEM-E3</b>	<b>MAGNET</b>
 <b>Target 8.1</b> <b>Sustain per capita economic growth</b> in accordance with national circumstances and, in particular, at least 7 per cent <b>gross domestic product</b> growth per annum in the least developed countries.							
<b>PURPOSE</b>	Medium-to long term scenario	Other (static effect)	Short, medium and long term scenario	Medium-to long term scenario + backcasting	Short term forecasting + Medium-to long term scenario	Medium-to long term scenario	Medium-to long term scenario
<b>MODEL TYPE</b>	Top-down CGE model	Bottom-up Micro-simulation	Top-down CGE model + Top-down Input-output	Top-down Dynamic Stochastic General Equilibrium (DSGE)	Top-down Dynamic Stochastic General Equilibrium (DSGE)	Top-down CGE model	Top-down CGE model
<b>MODEL SOLUTION</b>	Optimisation	Simulation	Optimisation Simulation*	Optimisation Simulation	Optimisation Simulation	Optimisation	Simulation
<b>TIME DIMENSION</b>	Static	Static	Dynamic	Dynamic	Dynamic	Dynamic	Static Dynamic
<b>MODELLING APPROACH</b>	Deterministic	Deterministic	Deterministic	Deterministic Stochastic	Deterministic Stochastic	Deterministic	Deterministic
<b>Economic Geography</b>	EU28	EU28	EU28	EU28	EU12 OECD	EU28 OECD EFTA ASEAN NAFTA BRICS ...	EU28 OECD EFTA ASEAN NAFTA BRICS APEC ...
<b>Other countries</b>	America, Asia			All Europe, America	All Europe, America	All Europe, America, Africa, Asia, Oceania	All Europe, America
<b>Spatial resolution</b>	National	National, NUTS2	National, NUTS2	World region, National	World region, National	World region, National	World region, National
<b>Temporal extent</b>	Long-term (>15 years)	Medium-term (5-15 years)	V Short term (< 1 year), Short term (1-5 years), Medium-term (5-15 years), Long-term (>15 years)	Short term (1-5 years), Medium-term (5-15 years), Long-term (>15 years)	Short term (1-5 years), Medium-term (5-15 years), Long-term (>15 years)	Long-term (>15 years)	Short term (1-5 years), Medium-term (5-15 years), Long-term (>15 years)
<b>Temporal resolution</b>	Years	Minutes	Years	Quarterly	Quarterly	Multiple years	Years
<b>How the model can contribute</b>	Aggregate GDP responses to corporate tax reforms are an output of the model.	EUROMOD can assess the labour supply responses to changes in the tax and benefit system.	Analysis of economic growth, productivity growth. Results of the simulations are reported with a focus on the policy macroeconomic impact on economic growth.	The model used real GDP series as observables and can be used to analyse its drivers as well as the drivers of GDP components.	The model used real GDP series as observables and can be used to analyse its drivers as well as the drivers of GDP components.	GEM-E3 analyses the macro-economic impacts (inc. GDP and Employment)	Annual growth rate of real GDP per capita is an available indicator.

Source: JRC, own elaboration.

## 2.2 Open discussion on the first results of the mapping

During the discussion the following issues were brought up:

- This mapping is a ground-breaking work for the JRC/EC, which is a first step towards an overarching modelling framework for SDGs. It helped to unveil great potentials of JRC modelling capabilities and forward looking/anticipatory analysis. Making information on our in-house models available to policy makers is also extremely important.
- When addressing SDGs, qualitative approaches should also be considered and complemented by quantitative ones (e.g. including via collaboration with other institutes/organisations).
- Sometimes, ESTAT indicators are only a proxy for sustainability. Therefore, if we want to really understand progress towards sustainability, we need to provide better indicators capable to address the complexity of the issues. The Competence Centre on Composite Indicators (CC-COIN) can also offer an important contribution.
- We need to reflect on the wider SDG framework, e.g. considering also UN Addis Abeba agenda on financing for development, or the SENDAI framework on disaster risks reduction, as well as legally-binding frameworks such as the Paris Agreement etc.).
- An important outcome of these discussions would also be the consensual development of a Roadmap to mainstream SDGs into our modelling work, either by answering specific policy questions, or assessing SDG pathways actively (e.g. by backcasting or choosing suitable models to assess SDGs and running baseline scenarios).
- Mainstreaming SDGs into all models is a big challenge, but the real novelty and added value of our work would be to bring the “wedding cake” layers (Biosphere, Society, Economy) together and address them in a coherent way.
- Identifying new policy demands from different DGs and relabelling indicators accordingly is a first and quick response to new policy priorities.
- JRC work should focus on Impact Assessment of policies, facilitating more systematic use of models, and better addressing sustainability assessment with improved SDG indicators.

### **3 Integrated assessment of sustainable development: lessons learned**

#### **3.1 Development of modelling tools to assess SDGs: the experience of ASviS**

(E. Giovannini, University of Tor Vergata)

Prof. E. Giovannini made a presentation on the main outcomes of a work carried out by the Italian Alliance for Sustainable Development (ASviS), which was recently published. <sup>(5)</sup> He explained the APPS index, a composite indicator which provides an estimate of present well-being and future sustainability combining 28 indicators representative of 16 goals. The policy impact of the Apps index is evaluated with a macroeconomic model, integrated with social and environmental components, which covers 45 countries/macro-regions and 22 sectors. The Apps index offers a general estimate of the gap (distance analysis) of each country towards achievement of SDGs. This exercise proved to be very complex (several technical issues to be solved, data collection etc.), but it is an extremely useful analysis for policy makers.

In his presentation, Prof. Giovannini highlighted several opportunities for the JRC to contribute to SDGs with modelling, such as:

- cooperation with ESTAT on the development of specific indicators, for example: forecasting (or now-casting) of indicators that are not updated or available on time for the European Semester: social and environmental data often arrive much later than economic data. Data on poverty and inequality are available only in June, too late to be reported in the EU semester. These are areas where JRC models could anticipate data availability, providing a very important support
- The JRC can also produce early estimates – now-casting for those indicators that are difficult to estimate.
- Policy coherence is definitely a big challenge, and modelling can have a key role to play. Policy proposals must be addressed in an integrated way, as the interrelations of SDGs are key.
- The use of composite indicators is often very useful way to communicate to the policy makers, and should be further exploited.

In general, prof. Giovannini highlighted that the JRC should support the EC and also Member States in mainstreaming SDGs in policies, and help them to design the EU Semester in the SDGs framework.

The lesson learnt indicated that the use of models in policy making is complex but feasible, and would provide valuable support to policy makers, provided that experts are involved at very early stages of the policy cycle.

#### **3.2 Contribution of the modellers according to five identified “clusters”**

The organisers identified five clusters based on policy areas:

- Energy and Climate policy (POTENCIA, POLES, GEM-E3, etc.)
- Territorial and cohesion policy (LUISA, RHOMOLO etc.)
- Agro-economic and Food security (MAGNET, CAPRI, IFM-CAP etc.)
- Macro-economic and financial policy (QUEST, GM, SYMBOL, CORTAX, EUROMOD etc.)
- WEF Nexus (LISFLOOD, DISPA-SET, BIOMA, MAGNET, DEMETRA, CAPRI, GREEN etc.).

The modellers were invited to share their lessons learned when modelling sustainable development. The discussion was centred on the following questions:

- 1) Which policy demands have you received from partner-DGs concerning modelling for SDGs?
- 2) Have you already integrated your model with other models in the same cluster to achieve assessment across different sustainability pillars (environmental, social and economic)? And with models in other clusters? If yes, how did you do it? What was the rationale behind the choice? What lessons have you learned?

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<sup>(5)</sup> Asvis, *L'Italia e gli Obiettivi di Sviluppo Sostenibile*. Rapporto 2019. [https://asvis.it/public/asvis2/files/REPORT\\_ASviS\\_2019.pdf](https://asvis.it/public/asvis2/files/REPORT_ASviS_2019.pdf)

- 3) What difficulties have you encountered, and which visualization tools have you used to effectively represent all the dimensions of SDGs relevant to your cluster, including their trade-offs and synergies?

The outcomes of this discussion are summarised below:

### **Policy demands**

- Some JRC modellers have already received specific requests from partner DGs to link the model with SDGs framework (e.g. DG ECFIN asked to include energy and environmental indicators into macroeconomic model GM for the European Semester.)
- The EU Green Deal covers many SDGs, which can be a common guideline for the next 5 years for both modellers and policy makers. Common vision helps collaboration, however, coordination between policy DGs concerning modelling demands would be important.
- Potentials for future requests can be also created at the JRC (e.g. MAGNET could for example be used also for DG DEVCO to address food access and poverty in the developing world)

### **Model integration**

- While collaboration is already in place between some modelling teams, there is a high potential for improving collaboration in relation to integrated sustainability assessment to address synergies and trade-offs. This would be also an opportunity for the modellers to learn from each other and improve their models.
- There are some overlaps and synergies between models for the same SDG, however assumptions behind and goals for the analysis are generally different.
- Analysis of trade-offs is very important; some models can already address them (e.g. MAGNET, GEM-E3). However, improved model linkages (e.g. energy and climate policy modelling framework) would allow to assess different trade-offs at a different level of disaggregation.
- Energy and climate modelling framework is highly relevant in policy and the most prominent in all discussions. However, specific SDG work has not been carried out, and the JRC is not running all relevant models in this area (e.g. CAPRI is outsourced, PRIMES, GLOBIOM are not EC models).
- Compatibility of highly aggregated models with disaggregated ones is very complex and challenging, in some cases it is easier to adjust the model and include additional indicators needed, rather than linking them to more disaggregated ones (e.g. GM to CGE models), also due to the (stochastic) nature of the model.
- Single SDGs have been looked at in the context of WEFE (SDG2, 6&13, which has been presented as a very loose coupling of some models with some interactions taking place and much room for improvement).
- There are some potential model linkages that could be explored, for example:
  - Natural link could be between CORTAX and QUEST for the European Semester.
  - Include forestry and economic climate models into WEFE nexus
  - Link between METIS and LISFLOOD could be interesting to explore
  - Collaboration between MAGNET and land use and soil models could be investigated
  - Marine models of JRC have great potential, they do not really have external competitors.

### **Difficulties**

- Data awareness and sharing is important, especially when it comes to high level of disaggregation, to avoid repeating the same data collection exercises again.

**Other**

- Most models produce indicators which are related to SDGs, however, still not really directly addressing the SDGs itself, with some exceptions like MAGNET.
- Highly aggregated SDG indicator can be useful for policy makers; however, its reliability is questionable due to its underlying effects.

## 4 Conclusions, take-home messages and way forward

The main “take-home” messages from the discussion can be summarised as follows

- This mapping exercise provide a picture of how JRC internal models can contribute to the SDGs framework. Models are very important to tackle the complexity of the SDGs, looking at interlinkages (synergies and trade-off) among goals, highlight spill over and transboundary effects.
- The complexity of the problems we face today is reflected in the cross-cutting nature of policies and clearly highlights the need for multi-disciplinary approaches to modelling for policymaking. Multi-disciplinary and integrated approaches are necessary also to take into account various aspects – economic, social, and environmental – of sustainable development.
- In many situations, modelling is a key part of sustainability governance, such as for exploring the impacts of potential policy options, but also to construct indicators for monitoring policy efforts and evaluation.
- Achieving sustainable development requires a good understanding of the interlinkages (synergies and trade-offs) among the goals, and modelling can provide a concrete contribution to this. A systemic approach needs to be adopted in dealing with this aspect and requires integrated assessment.
- Furthermore, to contribute to better informed policy responses, robustness and legitimacy of model used in policymaking are key, as well as transparency and coherence. Therefore, the dialogue within and between modelling communities is more needed than ever.
- Consider “low hanging fruits”: models that have proven their values, and model linkages already established (such as WEFE, Energy/Climate model framework, MAGNET, LCA). Most models need to add a focus on SDGs. Mapping of models to SDGs is very important.
- Data are of major concern: data sharing, availability, reliability, where to find data. The need for established dataset that everybody can use and find – without duplicating work that has been done already) – has been largely discussed.
- Consistencies across analysis (models) is essential.

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## Annexes

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Name	Unit
ACS Szvetlana	I.2
AURAMBOUT Jean Philippe	B.3
BARBERO VIGNOLA Giulia	D.6
BARRIOS Salvador	B.2
CALENBUHR Vera	I.2
CAMPOLONGO Francesca	B.1
CIMMARUSTI Ylenia	A.2
CONTE Andrea	B.3
DE ROO Arie	D.2
DI GIROLAMO Francesca	B.1
FLACHENECKER Florian	B.7
FERRARI Emanuele	D.4
GIOVANNINI Enrico	University Tor Vergata
GIUNTOLI Jacopo	D.1
HORDIJK Leen	I.2
KANCS D'Artis	I.2
KERAMIDAS Kimon	C.6
LEIP Adrian	D.5
MANTZOS Leonidas	C.6
M'BAREK Robert	D.4
MENTASCHI Lorenzo	E.1
MUBAREKA Sarah	D.1
MARELLI Luisa	D.1
RATTO Marco	B.1
SALA Serenella	D.1
SAVEYN Bert	C.6
SZIMANSKI Piotr	C
SMITS Paul	I.2
TOTH Tibor	Ext
WEISS Franz	D.5
WOJTOWICZ Krzysztof	C.6

## **Annex 2. Workshop Agenda**

### **Chair: L. Hordijk**

09:00 – 09:10 Opening (L. Hordijk)

09:10 – 09:20, introduction and main outcomes from the first workshop on JRC models (July 2019) (L. Marelli)

09:20 – 09:30 Scope and objectives of the workshop (S. Sala)

### **Session 1: Mapping JRC models and understanding how they integrate SDGs**

09:30 – 10:00 Mapping JRC models against SDGs: first results from the survey and mapping exercise  
(G. Barbero-Vignola and S. Acs)

10:00 – 10:30 Open discussion. Moderator: L. Marelli

10:30 – 11:00 Welcome to participants by **DG C. Vitcheva**

### **Session 2: Integrated assessment of sustainable development: lessons learned**

11:00 – 11:30 Development of modelling tools to assess SDGs: the experience of ASviS  
(E. Giovannini, University Tor Vergata)

11:30 – 13:00 Contribution of the modellers according to the five identified “clusters” based on policy areas

- Energy and Climate policy (POTENCIA, POLES, GEM-E3, etc.)
- Territorial and cohesion policy (LUISA, RHOMOLO etc.)
- Agro-economic and Food security (MAGNET, CAPRI, IFM-CAP etc.)
- Macro-economic and financial policy (QUEST, GM, SYMBOL, CORTAX, EUROMOD etc.)
- WEF Nexus (LISFLOOD, DISPA-SET, BIOMA, MAGNET, DEMETRA, CAPRI, GREEN etc.)

14:00 – 15:30 Open discussion. Moderator: L. Hordijk

The modellers in each of the groups are invited to share their lessons learned when modelling sustainable development, answering the following questions:

1. Which policy demands have you received from partner-DGs concerning modelling for SDGs?
2. Have you already integrated your model with other models in the same cluster to achieve assessment across different sustainability pillars (environmental, social and economic)? And with models in other clusters? If yes, how did you do it? What was the rationale behind the choice? What lessons have you learned?
3. What difficulties have you encountered, and which visualization tools have you used to effectively represent all the dimensions of SDGs relevant to your cluster, including their trade-offs and synergies?

15:30 – 16:00 **Conclusions**, take-home messages and way forward

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