D1.9: STAKEHOLDERS WORKSHOP STRATEGIC PROSPECTS

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FIGURES

Executive summary

Changes with respect to the DoA

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Dissemination and uptake

This paper is based on the third Stakeholder Workshop held on 11th February, 2020 in Brussels.

Short Summary of results

The deliverable D1.9 'Stakeholders Workshop Strategic Prospects' describes the 3rd SUPREMA Workshop 'Strategic Prospects'. It reports on the proceedings of the workshop, describes the interaction with the stakeholders and provides a short report of the main findings of the Workshop.

At the workshop, draft outcomes of selected scenarios developed under the 2nd SUPREMA Stakeholder Workshop 'Narratives' were presented. Additionally draft findings of 'model enhancement and integration' based on the 1st SUPREMA Stakeholder Workshop 'Needs' and first results of 'testing the SUPREMA model family' were presented and discussed. Feedback of participants was captured on the outcomes and selected topics, with a focus on the narratives. Also ideas of participants about future directions for agricultural modelling in the EU were reflected.

Evidence of accomplishment

Milestone 12

Participants list

Deliverable D1.9

Glossary / Acronyms

AECMS	AGRI-ENVIRONMENT-CLIMATE MEASURES
AGMEMOD	AGRICULTURAL MEMBER STATE MODELLING FOR THE EU AND EASTERN EUROPEAN COUNTRIES
AGMIP	AGRICULTURAL MODEL INTERCOMPARISON AND IMPROVEMENT PROJECT
AI	ARTIFICIAL INTELLIGENCE (AI)
BECCS	BIOENERGY WITH CARBON CAPTURE AND STORAGE
BMEL	(GERMAN) FEDERAL MINISTRY OF FOOD AND AGRICULTURE
CAP	COMMON AGRICULTURAL POLICY
CAPRI	COMMON AGRICULTURAL POLICY REGIONALISED IMPACT MODELLING SYSTEM
CC	CLIMATE CHANGE
CGE	COMPUTABLE GENERAL EQUILIBRIUM
DG	DIRECTORATE-GENERAL
DG AGRI	DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT
DG CLIMA	DIRECTORATE-GENERAL FOR CLIMATE ACTION
DG ENV	DIRECTORATE-GENERAL FOR ENVIRONMENT
DG SANCO	DIRECTORATE-GENERAL FOR HEALTH AND CONSUMERS
DNH	DO NOT HARM PRINCIPLES
EAB	EXTERNAL ADVISORY BOARD
EC	EUROPEAN COMMISSION
EFA	ECOLOGICAL FOCUS AREAS
FADN	FARM ACCOUNTANCY DATA NETWORK
FP7	FRAMEWORK PROGRAMME 7
FTA	FREE TRADE AGREEMENT
GDP	GROSS DOMESTIC PRODUCT
GHG	GREENHOUSES GASES

GLOBIOM	GLOBAL BIOSPHERE MANAGEMENT MODEL
GTAP	GLOBAL TRADE ANALYSIS PROJECT
IFM-CAP	INDIVIDUAL FARM MODEL FOR. COMMON AGRICULTURAL POLICY ANALYSIS
IFPRI	INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IIASA	INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
IMAP	INTEGATED MODELLING PLATFORM FOR AGRO-ECONOMIC COMMODITY AND POLICY
IT	INFORMATION TECHNOLOGY
JRC	JOINT RESEARCH CENTRE
LCA	LIFE CYCLE ASSESSMENT
LDC	LEAST DEVELOPED COUNTRIES
LULUCF	LAND USE, LAND USE CHANGE, FORESTRY
MACSUR	MODELING EUROPEAN AGRICULTURE WITH CLIMATE CHANGE FOR FOOD SECURITY
MAGNET	MODULAR APPLIED GENERAL EQUILIBRIUM TOOL
MFF	MULTIANNUAL FINANCIAL FRAMEWORK
MITERRA	INTEGRATED NITROGEN IMPACT ASSESSMENT MODEL ON AN EUROPEAN SCALE
MT	MEDIUM TERM
NDC	NATIONALLY DETERMINED CONTRIBUTIONS
NGO	NON-GOVERNMENTAL ORGANIZATION
NTM	NON TRADE MEASURES
NZ	NEW ZEALAND
NGO	NON-GOVERNMENTAL ORGANIZATION
OECD	ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
PE	PARTIAL EQUILIBRIUM MODEL
SDG	SUSTAINABLE DEVELOPMENT GOAL
SLU	SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES

SSP2	SHARED SOCIOECONOMIC PATHWAY 2
SUPREMA	SUPPORT FOR POLICY RELEVANT MODELLING OF AGRICULTURE
THUENEN	JOHANN HEINRICH VON THÜNEN INSTITUTE
TRQ	TARIFF RATE QUOTAS
UPM	UNIVERSIDAD POLITÉCNICA DE MADRID
UAA	UTILIZED AGRICULTURAL AREA
VC	VALUE CHAIN
VCS	VOLUNTARY COUPLED SUPPORT
WP	WORK PACKAGE
WR	WAGENINGEN RESEARCH

1 Introduction

The 3rd SUPREMA Workshop 'Strategic Prospects' was designed using the outcomes of the two previous Workshops 'Needs' and 'Narratives'. It aimed to capture feedback of Stakeholders on scenarios based on the selected narratives and related outcomes and to define gaps in the current possibilities the SUPREMA models provide. Additionally draft findings of 'model enhancement and integration' and first results of 'testing the SUPREMA model family' were presented and discussed. Discussion outcomes and feedback will be used as input to define the strategic prospects for future model-based support of policies related to European agriculture.

In principle, three main areas were addressed during the Workshop: (i) Selected draft results on long-term baseline and climate related scenarios, (ii) selected draft results on medium-term baseline and stylized CAP related scenarios, and (iii) first insights of model improvements and linkages. In all three slots participant's feedback was captured on flipcharts or in discussion rounds. During a last time slot a running world café took place under the heading 'Ways forward - where are we now, what remains to be developed, and what is missing?' took place. Here, participants wrote down their opinions, proposals and preferences on six posters addressing the following questions:

- Are farmers' decisions and their responses to changes well covered?
- Is demand adequately reflected (with respect to changing diets, product differentiation, societal demand, developing countries Cs, and bio-economy)?
- Supply chains - what is missing in their representation (decision making, market power, structural changes, and competitiveness)?
- Are Sustainable Development Goals (SDGs) efficiently addressed by the available tools
- By concentrating in tests strongly on Common Agricultural Policy (CAP) and climate change - what are we missing?
- What else needs to be covered by the tools?

This report details concept and results of the 3rd SUPREMA Workshop 'Strategic prospects'. It is structured as follows: After the introduction shortly the set-up of the Workshop is described followed by the proceedings and the main findings.

2 Set-up of the Workshop ‘Strategic Prospects’

2.1 Participants

At the 3rd SUPREMA Workshop ‘Strategic Prospects’ in total 120 possible participants have been invited, representing the whole supply chain including farmers, processing and marketing industries, consumers, policy makers, and science. Here, we tried to achieve a balanced regional distribution. In a first attempt, lists of 75 designated stakeholder organizations were invited per email (see Annex A) and - if necessary - a reminder was sent. Additionally organizations and individuals were contacted on a bilateral basis to guarantee broad participation. Participants not based in Brussels were offered some reimbursement of expenses. 31 participants registered to the Workshop, hereof 15 stakeholders and one person from the External Advisory Board (see Annex B: Participant list). Each project partner present at Workshop fulfilled an active or passive role. Although reimbursement was announced participation rate was relatively low whereas a number designated participants claimed that they were very interested but at that specific moment they were bound by daily businesses or participations elsewhere, they are not used to work with models respectively model results, that their knowledge on the specific topics where limited or that discussions in English might be difficult.

2.2 Design of the Workshop ‘Strategic Prospects’

The Workshop was planned as an interactive approach with active participation of each attendee. The design included the following components which were in principle supplemented by wrap-ups (details see Annex C: Agenda)

i. Introduction of the project by the SUPREMA partners and of all participants.

ii. A presentation of selected draft results on long-term baseline and climate related scenarios, followed by a round of questions by attendees linked to the content of the presentation and an interactive session in two parallel groups dealing with aspects whether relevant questions are covered, what improvements could be made, which caveats would be seen and which relevant needs for the future policy support should be covered in future. Each participant got a set of cards to write down comments and to pin them on two flipchart. Participants were asked to explain their contributions.

iii. A presentation of selected draft results on medium-term baseline and stylized CAP related scenarios which was followed by a round of content related questions by participants and an interactive feedback session into two parallel groups covering aspects whether relevant questions are covered, what improvements could be made, which caveats would be seen and which relevant needs for the future policy support should be covered in future. Again each participant received cards to note comments and to pin them on flipcharts. Participants were motivated to detail their contributions. Additionally an attempt was made to gain insights and to share ideas on how participants’ country specific implementation of the Green Deal may look like.

iv. A last presentation addressed first insights into conducted model improvement and linkages followed by a round of content related questions from the participants and then later opened up to gain insights into possible future improvements from the stakeholder perspective.

v. To compile ideas and to gain insights into stakeholders needs for future improvements in modelling policy support and stakeholders along the supply chain a Running World Café session was organised involving all attendees. Six different posters were provided and the participants were asked to go from poster to poster and to note directly on each poster

comments on additional needs, missing elements and necessary improvements. Participants were also motivated to provide some explanation hereon. Six different posters were available:

- Are famers' decision and their reactions to a changing environment captured well? What is missing? What needs to be improved?
- Is the demand side adequately reflected in model results (changing diets, product differentiation, societal demand, demand in Developing Countries, bio-economy). Where do we need to put an emphasis on?
- The supply chain plays an important role for the production systems. To what extent a detailed supply chain representation is missing and what should be covered most prominently (decision taking, market power, structural changes, competitiveness)?
- SDGs are important objectives. Do we have tools to address the question at hand efficiently? What is missing and what needs further research?
- We concentrate in our testing strongly on CAP and climate change policies. Do we leave a big gap and what are we missing from your perspective?
- Additional issues missing in modelling.

vi. Summary of Workshop results and first conclusions

Given that under the Chatham House rules no recordings of any part of the Workshop 'Strategic Prospects' were taken, a moderator and a rapporteur were allocated to each group. Rapporteurs took notes of the discussions which provide the base for this Deliverable.

3 Proceedings of the Workshop

3.1 Long-term baseline and climate related scenarios

3.1.1 Overview presentation

Some selected draft results on long-term baseline and climate mitigation scenarios were presented (see Annex D). Climate mitigation is a challenge; to stabilize global warming at 1.5°C degree temperature increase with no or low overshoot, global CO_2 emissions need to be reduced by 45% in 2030 compared to 2010 and EU greenhouse gas (GHG) emissions by 40% until 2030 (compared to 1990, -30% compared to 2005). In non-ETS (EU Emissions Trading System) sectors, GHG emissions are required be reduced by 80-95% in 2050 compared to 1990.

To evaluate the land-based contribution to global warming, the reference scenario shows that emissions of CO_2 from land use are decreasing. However, non-CO_2 emissions such as methane are not declining, but even depict a slight increase. Therefore, in total, only a slight decrease in emissions from land use is projected. A mitigation scenario evaluates the land-based contribution to keep the global warming at 1.5°C, requires cutting the CO_2 emissions by half until 2050. In this scenario, carbon capture storage for biomass use is considered and expected to increase slightly until 2030, but with higher impact until 2050.

EU climate mitigation policies regarded for the next decades are:

- 2020 targets: 20 % GHG reduction, promoting bioenergy and energy efficiency
- 2030 targets: 40 % GHG reduction which probably will be probably revised up to 70 % for 2070, although the latter is still under consideration. There should be a reduction of 43% in ETS for power plants and large industrial installations, 30% in non-ETS for smaller industries and transport; and a limited access to LULUCF credits
- 2050 targets: reaching GHG neutrality, with a Long-Term Strategy 'A clean planet for all'

Trade can also be considered as a measure for mitigation. Under a coordinated climate policy, a uniform carbon tax should be established. Beef is one of the most GHG-emission intensive products. The share of EU livestock emissions in global emissions is around 8%, while EU livestock production is 16% of the global production. As the EU agricultural sector is highly efficient regarding GHG emissions, production shifts towards other countries through measures in beef trade need to be carefully validated. With trade liberalization by abolition of taxes would increase GHG emissions. Therefore, trade needs to be framed differently to generate positive mitigation effects. One way could be to implement the carbon tax also as a tax on agricultural non-CO_2 emissions which would foster an implementation of emission reduction technologies.

After the adoption of the Paris Agreement, the RCP1.9 represents mitigation pathways compatible with the 1.5 °C target. As trade policy is not sufficient for reducing GHG emissions the SUPREMA long-term narratives additionally addresses the following issues:

- EU and global emissions in the scenarios are focused on non-CO_2 emissions whereas the carbon price on non-CO_2 emissions is stepwise increased from 2020 to 2050;
- A Buy-in of the carbon price on non-CO_2 emissions in the RoW is depicted by several steps from 0% via 25% up to until 100 % of the EU carbon price;
- Assumptions on trade policies including trade liberalization with tariff eliminations on agricultural commodities by 2030;

- Mitigation strategies by consumers including changes in diets and with respect to food waste.

In order to assess that narrative, the SUPREMA toolbox uses three of the available models in the toolbox: GLOBIOM, CAPRI, and MAGNET. These models interact in the following way:

- GLOBIOM provides input on forest and energy plant areas to CAPRI and MAGNET;
- MAGNET provides energy prices and GDP to CAPRI and GLOBIOM.

The motivation for the scenarios was to investigate the leakage effect of an ambitious EU28 climate policy for the agricultural sector to the RoW. In the analysis no specific assumptions are taken with respect to the sustainable development goals (SDGs).

First preliminary results indicate that, depending on the model, a unilateral effort of the EU28 to limit agricultural GHG (agGHG) emissions with a 0 % Buy-in in the RoW would lead to a leakage effect of almost 45 % towards the RoW. In contrast a global full Buy-in of 100 %, would lead to a global mitigation 30 times higher than in the 0 % Buy-in case. However, already a smaller and more realistic participation of the RoW will result in a decline in global agGHG emissions about 70 % compared to the 100 % Buy-in scenario.

Looking at the EU livestock sector, a unilateral mitigation approach of the EU in order to reduce beef and dairy emissions would be largely compensated by the RoW. A unilateral mitigation effort of the EU without any participation in the RoW will mainly reduce ruminant production in the EU compared to the reference but in contrast, the RoW farmers will benefit and increase their production. Thus, 45% of the mitigation effect will leak to the RoW. In a global mitigation action, a 25 % Buy-in in the RoW will lead to a reduction in ruminant production shared by almost all countries, including the EU28, but except the USA and Canada.

With respect to consumer prices for ruminant meat, the results depict that a EU28 unilateral action to reduce agGHG emissions does not have any significant effect on global meat prices. However, in case of a global 100 % Buy-in of all countries a huge increase can be observed whereas consumers in least developed countries would suffer most. Such a 100 % Buy-in could have enormous negative effects on food availability globally. Here, the models still simulate negative effects on food availability at the 25 % global Buy-in level, but less severe. A carbon tax would also yield in co-benefits for the environment as forest areas or natural vegetation areas will increase and fertilizer use will decrease.

A unilateral action ignores the comparative advantage of EU farmers in terms of GHG efficiency and thus on their competitiveness, at a global action, is negatively affected. It was claimed that regionally differentiated climate policies are more effective to reach the desired climate outcomes while reducing trade-offs with other SDGs. In general, one has to bear in mind that all results are preliminary and also differ from model to model.

3.1.2 Results of interactive groups

The presentation was followed by a general open discussion and an interactive session in two parallel group discussions. In the following, arguments raised during both interactions are summarized. Participants focused their interests and concerns on a number of topics:

i. Definition and implementation of scenarios, comparability

Participants perceived that definitions and implementations of scenarios would require careful handling and communication. They agreed that deforestation and afforestation would be important issues which should to be reflected in simulation results. Currently not all models cover deforestation or afforestation so that models would need some harmonisation. As at the moment GLOBIOM is the only one which integrates deforestation and afforestation or the net-effect respectively. In linked model runs, GLOBIOM provides input to the other models. Latest analysis indicated that afforestation

might be higher than deforestation and previous results did not depict high deforestation rates. Assumptions on afforestation and on bio-energy demand of the EU were based on the SSP2 while for the rest of the world they are results of integrated assessment where the agricultural land use models were coupled with energy models.

For stakeholders it was important to describe scenarios in some detail und especially there, descriptions of baseline scenarios plays a crucial role. E.g. it was relevant to clarify whether ETS and non-ETS are reflected in the Baseline and that scenario outcomes primarily addressed non-CO_2 emissions, as e.g. mitigation of methane is important with respect to land use and land use change, but that model results also cover CO_2 emissions.

Participants raised the issue about a distinction between long-term GHG emissions and short-term biogenic methane emissions. The differentiations would become more important. They expressed their interest in further analysis pursuing the topic despite the fact that the presented scenarios already concentrated strongly on non-carbon emissions.

Although narratives were addressed at the previous Workshop 'Narratives' participants relived the discussion on scenarios. It was especially addressed whether it would not make sense to conduct a separate scenario which would simulate a -55% or a -50% reduction in CO_2 emissions by 2025.

In addition to detailed descriptions of scenarios for a number of participants harmonisation of model and model outcomes play a crucial role especially when models are linked. In this context it would be necessary either to reconcile differences or explain differences. With respect to linkages between models and exchange of model results which may serve as input to other model it was questioned how the different units of variables would be transferred so that they could be comparable; e.g. MAGNET uses primarily values (in US-Dollars) and GLOBIOM volumes (in metric t) and how the exchange between models would be harmonized.

As scenario results indicated leakage rates of about 45% participants inquired whether alternative production would be replaced by similar emissions intensive production systems (e.g., North America Australia) and that led to the request that, for policy impact assessments, other regions of the world should be included as well. However, it was perceived as unrealistic that other regions of the world would apply similar the policies as the EU, unless the EU will reach the plan of a 25% GHG reduction until 2050.

Although a carbon prices were mentioned as likely policy instruments, some participants perceived that carbon prices were not explicitly implemented in the models. There are several difficulties in the implementation with respect to operational cost in industries and comparative advantages across industries. In the end it would be easier when industries pay for higher energy cost.

ii. Heterogeneity and harmonisation across models

When conducting impact analysis with a suit of models differences of outcomes among applied models are often an issue. Differences in units and in the database applied cause significant differences; hence a harmonisation across the models is difficult to achieve as they are at the very core of the models. Also trade flows would be required to be harmonised across models, desirable representation of bilateral trade flows face special challenges for harmonisation. Likewise, representation of the demand side would require harmonisation.

As further sources of limited comparability between models when comparing policy scenarios and results differences in definitions of mitigation were discussed. For example, when considering the GHG emissions, there are difficulties on how to integrate them in models as methane does not stay long-term in the atmosphere because it is decomposed while CO2 remains there long-term. In this context some ideas were expressed recommending to e.g., establish a methane trade board. In general, a differentiated representation of specific emissions and their impacts were favoured.

With respect to model-linkages, participants named insufficient harmonisation of macroeconomic assumptions for EU countries and the RoW was mentioned as a likely cause for diverting model outcomes. Those differences in assumption may affect also results of model linkages when one model provides input to a second model with a different set of macroeconomic assumptions. There were also participants who requested a multidisciplinary model language, which would also consider biophysical models, may reduce the high variation among the models and would ease model linkages.

Further topic discussed was the question how to integrate Partial Equilibrium (PE) and Computable General Equilibrium (CGE) models in a bottom-up approach. Also the integration of agent based models (ABM) to provide more detailed insights into decision making of agents with respect to the adoption of certain measures was proposed. In a preparing step the models involved would need to be reconciled and the sources of differences would require to be explained. Then a better interaction and integration between biophysical and socio-economic models could be expected. Such an approach would facilitate capturing all dimensions of the sustainable developments goals (SDGs) and linkages between agricultural and non-agricultural sectors in climate change mitigation.

In addition, model linkages and implemented interactions between agricultural and energy models were mentioned a possibility to improve impact assessment.

iii. Diets and consumer representation in models

Because scenarios outcomes indicated significant reduction in food availability participants were interested to what extent substitutions between products avoiding greenhouse gases intensive produce would be captured. Handling of demand substitution differs across the models. GLOBIOM does not include substitution possibilities; in MAGNET, substitution it is not very pronounced, while in CAPRI demand substitution is stronger. Mitigation scenarios with CAPRI indicated a shift towards slightly higher intake in calories. However, there are several commodities which are not considered in land use, especially commodities such as fruits, vegetables and nuts.

Consumer diets and preferences are rapidly changing in EU Member States and will keep on changing in the long term. New consumer patterns and preferences towards more plant based diets (flexitarian, vegetarian, and vegan), search for new protein sources, preferences for regional products, and reduction in the demand of imported products are important issues for analysing the demand in the long term. It was requested that such types of changes should be reflected in models, so that non-classical market would be represented. Especially changes in preferences should be considered in models although it remains an open question how preference changes could be anticipated. Currently, protein supply in EU agriculture is livestock dominated. Models should be able to capture and to reflect impacts of moves from highly livestock protein based food demand to more alternative protein sources. To what degree consumers will adjust their demand and whether they will depict willingness-to-pay for changes should be considered as well. Additionally it is required to see consumer behaviour in context of its influence on climate change. In order to know whether consumer behaviour can be changed, to what extent and how it can be adjusted modellers should work in collaboration with other scientific areas like sociology and psychology.

iv. Integration and representation of SDGs, dietary substitutions and food security in models

There are links and trade-offs between dietary substitutions, food security and other SDGs. In general, models should enable differentiated implementation of policies and strategies between developed countries, emerging countries and least developed countries. Participants asked, in principle, to integrate all SDGs in the models, and to calculate indicator to reflect the economic, environmental and the social dimension. However, integration should be achieved in a stepwise approach due to their complexity, interaction and divers targets.

In order to capture all dimensions of sustainable development in models it is necessary pursue more multidisciplinary approaches. It is also relevant to differentiate between developed economies, emerging countries and least developed countries with regard to food security and carbon prices to

gain better insights into differentiated mitigation packages for different countries. It is seen as a requirement to run scenarios that will consider possible co-operations among countries and across continents to cover climate change mitigation strategies.

Additionally, models should be able reflect dietary substitutions and to derive impacts based on substitution between animal or plant-based proteins (e.g.: nuts or vegetables). Participants perceived the integration of sustainability as an important aspects which would also allow to consider additional co-benefits of CO_2 reduction on other environmental indications, and especially reflect trade-offs between feed reduction and crop prices (relation of animal product prices vs of crops prices).

Some models do not cover product substitutability in demand for all agro-food commodities. Participants highlighted the importance to cover fruits, vegetables, nuts and other commodities, as they play an important role in nutrition Therefore, in future more researched is needed with respect to their prospects in combination with their impact on GHG emissions.

v. Policy options, measures and their implementation

Participants stated some important issues would not yet be fully addressed by policies measures and consequently reflected in impact analysis based here on, among others e.g., improved biodiversity, sustainable financing, climate friendly trade agreements, or carbon-free trade. As helpful were seen detailed policies and feedbacks between land use change, emissions and agricultural market. It would be worthwhile to analyse different strategies for different countries within the same scenario. Differentiated and regionalized approaches would lead to more realistic scenarios for impact. For the EU, some participants requested to analyse adaptation, mitigation, and taxonomy with respect to sustainable finance and sustainable contribution to the society following the Do Not Harm principles (DNH). Future research should not only pursue assumptions based on the shared socioeconomic pathway 2 (SSP2) as those assumptions would be highly rigorous and would only allow limited options for endogenous model adjustments. Finally, the question was raised why the relative high GHG efficiency of EU meat production would not be addressed and discussed although meat production is very relevant in GHG emissions for the EU.

vi. Climate impact and policies

To derive climate change impacts, it is an enormous challenge for the models as environmental, economic and social issues will need to be tackled. Also potential consequences on the risk management of farmers and on the agricultural structure will have to be considered. Therefore, participants perceived it as necessary that models are to be more explicit when integrating land use and land use change. Sequestration of carbon and afforestation planting should be also included. Also developing countries would be prepared to take actions. However, it should be taken into account that in many scenarios developing countries are not able to achieve policy goals like a reduction of e.g., -50%.

Participants proposed that modelling should also include the impact of CO_2 on crop production itself e.g. on photosynthesis, nutrients, and vitamins, as well as consider the CO_2 pollution from agricultural machinery use and the shorter lifespan of methane. The latter should also be regarded in life cycle assessments based on models for 2030 and 2050. Finally, it was suggested to: (i) to differentiate the impact by degree of intensification (e.g. grass based/grain-protein based livestock systems), (ii) to compare a total carbon tax to plan the multiannual financial framework (MFF) budget for climate action and (iii) to define approaches that link models to participate in milestone projects.

The help of stakeholders is needed to draft national indicators for long term Nationally Determined Contributions (NDCs). Next to others indicators should cover welfare effects of 'climate friendly policies' as well as other social aspects of climate policies such as changes in prices and in agricultural sector incomes, employment and creation of jobs.

In the past, agricultural policies were designed with a focus on economic and social dimensions and at the expense of ecology while, currently, it might happen, that the environmental dimension becomes

more dominant, possibly at the expense of social aspects. Therefore, in future an integration of social together with environmental\climate change related aspects in models for assessments will likely become important.

vii. Technical options and technical progress

Technologies, innovation processes and adoption play an important role in adjusting to climate change; hence, they differ from country to country. Better technology and technical progress can help to reduce emissions and even reach negative levels. Therefore, stakeholders requested that models should consider adjustments due to innovation in inputs, input use and in production systems with respect to climate change. Land use could also contribute by negative emissions (bioenergy, afforestation). And more, different pathways of development in technical progress and their impacts could be featured in assessments. Some participants also questioned why biogenic methane should be treated differently compared to long-living GHG emissions with respect to reach long term climate targets.

viii. Trade and regionalised demand

Changes in consumer behaviour may lead to non-classical market effects like increased demand for local produce (short supply chains). Participants emphasized that models should reflect impacts of such behaviour and its effects on trade which would require an improvement of trade representation in models to capture product attributes. A further regionalization would enable an improved connection between consumers and global markets and it would allow analysing strategies of different countries in the same scenario. Differentiated and regionalized approaches will lead to more realistic scenarios.

Another important point to consider is the potential role of trade wars in further analysis. Hence, in general it was perceived as to be better explored as a part of a sensitivity analysis.

3.2 Medium-term baseline and CAP related scenarios

3.2.1 Overview presentation

In the medium-term assessment Common Agricultural Policy (CAP) related scenarios were addressed with a focus on climate and environment, production, consumer preferences The presentation depicted 2 medium term scenarios and their respective simulation results for (i) on EU meat consumption scenario and (ii) a EU CAP scenario. The first considers a shift in meat consumption due to ageing population, concerns on ecological footprints, preference shift of youngsters and preferences towards a healthier consumption termed the 'More healthy and modern' (MHM) scenario. It assumes an increase in numbers of vegetarians until 2030 by 0.25% per annum for Germany, Sweden, Austria, Italy and Poland (slow increase group), and by 0.5% per annum for the other EU MS (strong increase group).

Concerning the red meat per capita consumption, an average was defined. Based on the average, the scenario assumes different declining levels of red meat consumption depending on the current situation of meat consumption (average or above average meat consumption) for EU MS. The approach resulted in a decrease in per capita consumption of red meat and pork for most of the EU MS until 2030. However, in some countries, such as Croatia, Lithuania and Poland, an increase of circa 20% for the same period was assumed; and Bulgaria is the only country where both, pork and meat consumption will increase by up to 20 %. Market reactions were dominated by price changes and a combined effect of increased vegetarian population.

Preference shifts in consumption affect the demand negatively and thus, price will drop. Negative price effects overshadow production decreases since an inelastic supply curve was depicted. Effects on farm revenues overshoot impacts farm sales. Scenario results depicted differences across the models especially significant with respect to pork meat whereas a stronger price decrease is simulated by AGMEMOD compared to CAPRI. Further, the price for beef will also drop, but only in CAPRI. In general, beef price decline is low because reductions in beef consumption are small in contrast to pork. Therefore, a higher impact on pork consumption and prices could be expected. Generally, the results showed a slight substitution to poultry meat. The latter production and prices only change marginally for both models. In total, the scenario results projected a huge consumption decline.

Effects on change in area and income per ha had also been calculated. Generally, CAPRI projected small negative effects on income indicators. For almost all crop varieties the income per ha was projected to decline in 2030 compared to the baseline. Except for pulses and sugar beet the EU28 area for all other crops is projected to decrease in 2030 compared to the baseline. A map showed the income effects distributed over Europe in 2030 compared to the baseline indicating that southern EU income per ha will decline more than in the north due to the changing consumption patterns.

Under the consumption scenario 'More healthy and modern' outcomes showed that emissions in the livestock sector will decrease. Changes in emissions compared to the baseline scenario differ depending on the models. CAPRI shows higher changes in CH4, N2O, GHG, NH3 emissions than AGMEMOD-MITERRA.

The second scenario dealt with the CAP and potential changes in measures regarding climate protection. Thus, the scenario was termed 'More green value for less money' (MVLM). It is characterised by:

- Additional CAP budget reduction by 9% will be applied to all direct payments including voluntary coupled support (VCS) and as a consequence, greening measures will be relatively improved. According to these assumptions MS will not pay any VCS payments on dairy and meat cows and sugar production.
- An improvement of the greening measure, which is moved into now so-called enhanced conditionality as well as Eco-schemes. Therefore, the greening areas will increase by 2 % due to buffer strips, and Ecological Focus Areas (EFA) will increase from 3.5 to 5%.For several MS effective EFA rates will be above the 5 % level with the expansion of EFAs.

Increase in the EFAs and a reduction in available crop land, will lead to a reduced supply. Additionally, the budget reduction and decline or abolishment in VCS lowers farmers' incentive prices for supported crops and animal products will reduce quantities produced and thus, market prices will increase. Hence, results depict only marginal effects for beef, dairy and sugar (VCS coupled support products) in 2030 compared to the baseline. When it comes to area and income effects, due to an additional budget reduction considered in this CAP scenario, the VCS decreases and therefore, the negative effects on income per ha for activities dependent on VCS are higher, especially for sugar beets. Impacts on agricultural area however, are moderate. In the end, the income effects across Europe are projected to be negative for all regions in 2030 compared to the baseline.

The last topic presented concerned the environmental indicators again. In general, positive environmental effects were calculated, but at a very low scale. Impacts on single gas emissions differ only marginally across the two models MITERRA-Europe and CAPRI. Is needs to be noticed, that the results deliver only a first insight and do not cover possible positive effects for the biodiversity e.g. through the increased EFA area. According to the map presented most positive mitigation results in 2030 are projected for France and Hungary. Summarizing the CAP scenario it can be stated that the reduced budget as well as an increased EFA area are expected to only have minor effects on the markets.

3.2.2 Results of interactive groups

Like in the first session the presentation was succeed by general open discussion on the content and an interactive session in two parallel group discussions which were focused on the questions 'what do you like' and 'what do you not like' with respect to the scenarios, 'what are you missing in the results' and 'what would you like to see for future results. In the following, arguments raised during both interactions are summarized.

i. Scenarios and CAP implementation

Participants pointed out that the modelling of EFA´s and the modelling of Eco-schemes should be improved. Especially it would be necessary being able to distinguish between voluntary from mandatory measures. In particular the adoption of voluntary measures by farmers should be given quite some emphasis, as the actual adoptions rate would be strongly influenced by the fact whether the opportunity cost would be covered. The model outcomes should provide details on a variety of Eco-scheme measures adapted to different agricultural systems such as permanent crops and grassland. Clarifications were requested to what extent innovation would be included in the models. A boosts in digitalization might increase ecological efficiency, so that considering such an innovation within the models then, might indicate that e.g. EFAs won't be needed any longer.

The implementation of CAP related scenarios should depict inter-dependencies between Eco-schemes and Pillar II Agra-environment-climate Measures (AECMs) in an improved approach, as currently Eco-schemes will fund some measures which will be funded by AEcMs in the future. Due to existing interactions, the participant mentioned that the following topics should be considered when modelling Eco-schemes:

- Impact of Green Deal with respect to pesticide and fertilizer use, applications of antibiotics, organic production, non-productive set-aside, impacts on natural areas;
- Linkages and interaction between Eco-schemes and agro-environmental measures (AEM);
- With respect to the budget cuts it should be elaborated whether a cut should be applied to all measures or whether the approach of the proposed MFF should be followed;
- Further scenarios: an ambitious scenario with environmental rotation with winter cover crops and less ambitious with several options;
- Sensitivity analysis should be conducted applying different assumptions as most details of the CAP are unclear;
- GHG and environmental effects on diets;
- External effects of the new CAP should be modelled respectively modelling alternatives to the CAP reform with a completely new CAP approach should be developed; whereas both, positive or negative effects should be internalized by taxing or subsidizing.

Participants asked to clarify some questions:

- Would an increase in the CAP budget reduce the GHG emissions significantly?
- Agri-environmental measures seemed to be very different across MS in the period 2021-2027. Will the different schemes be reflected in the country models in the future?
- Local and regional implementation schemes are not yet defined. Under those conditions, how can model cover impacts on biodiversity?
- What will be the link between the Paris Agreement and the CAP and to what extent can the linkage be implemented?

Furthermore, participants would welcome a differentiation between organic production and land use in the model representation and outcomes.

ii. Research questions for future modelling

Participants raised a number of topics which depict general considerations in modelling. So they would like to see analysed the meaning of uncertainty in more detail. Further the models should be validated and differences between the models should be registered and assessed. Also the interaction of agricultural models with the rest of the economy were emphasised: Agricultural modes should be linked closer to other sector models to capture e.g., cohesions policy on a global perspective or to general economic models to cover the impact of economic development on environment and agriculture in an international context. Also the implementation of a food system approach was proposed.

Other recommendations given focussed the CAP, its measures and their modelling implementation. So it was proposed to conduct research on an alternative CAP which would internalize external effects. A focus, participants suggested, should be on a political move from direct payments to payments compensating externalities in environment which might be partly balanced by innovations. Some requested a move from a social oriented policy to an environmental policy while others asked to analysed consequences of climate change and greening on the EU food and feed supply. In turn, they asked to extend the models so that the point could be depicted when policy would need to decide between 'greening' and 'eating'. Participants would also be interest to learn more about impacts of budget cuts on farm level.

In the interactive discussions a number of specific model developments and analysis was asked for:

- Impact assessment on reopening of the Russian market on EU meat production, income, environment, and climate
- Stronger representation of alternative protein produce with respect to supply and use
- Impact of act of organic farming on climate and environment

iii. Farmers behaviour

Participants asked to improve the implemented behaviour of farmers. Adoption rates of voluntary measures would differ across the EU MS which, in turn, would affect GHG emissions di. There would be a lack of information to sufficiently account for and represent farmers' decisions in modelling systems. In future scenarios it would necessary to include effects of direct payments on agricultural structural change and the concentration in the agricultural sector. The concentration might affect significantly production cost and impacts on environment and climate. The increase in demand of ecological friendly produce would lead to higher prices. That effect should be represented in the models and scenarios.

iv. Changes in diet

In parts of the EU consumption food preferences are hanging and consumption pattern as well whereas most the discussion is about meat consumption. Consumption changes are more present within the EU MS than in other countries. Hence, participants expressed the desire to look into the driving forces which explain changes in patters and also in the convergences between the different MS. Additionally, they stated an importance to consider non-EU countries when assessing diets and consumption patterns and evaluating the effect of the changes in meat consumption trends in non-EU countries for future scenarios. With respect to sustainable consumptions model results should cover impacts on environment and health.

To improve results, it would be necessary to go beyond changes in consumption patterns and reflect different quality levels as well as to capture impacts on environment of intensive and extensive activities not only on GHG emissions but also on environmental indicator, e.g. biodiversity on grassland. When looking into meat quality levels such research should also consider different levels of processing e.g. processed meat products and fresh meat. Consequently quality of food, willingness to

pay, higher prices for higher quality and market segmentation should be addressed within the models. Additionally, it would be helpful to study impacts of a tax on meat consumption.

3.3 Model improvement and linkages

In the third session, on overview on the model improvements and linkages were given. Main objective of was to improve the capacity of the existing modelling network and to improve existing and new linkages between models to narrow the gaps to the identified challenges and needs in the Workshop 'Needs'. The presentation concentrated on the linkages between MAGNET, GLOBIOM, IFM-CAP and CAPRI (see Figure 1):

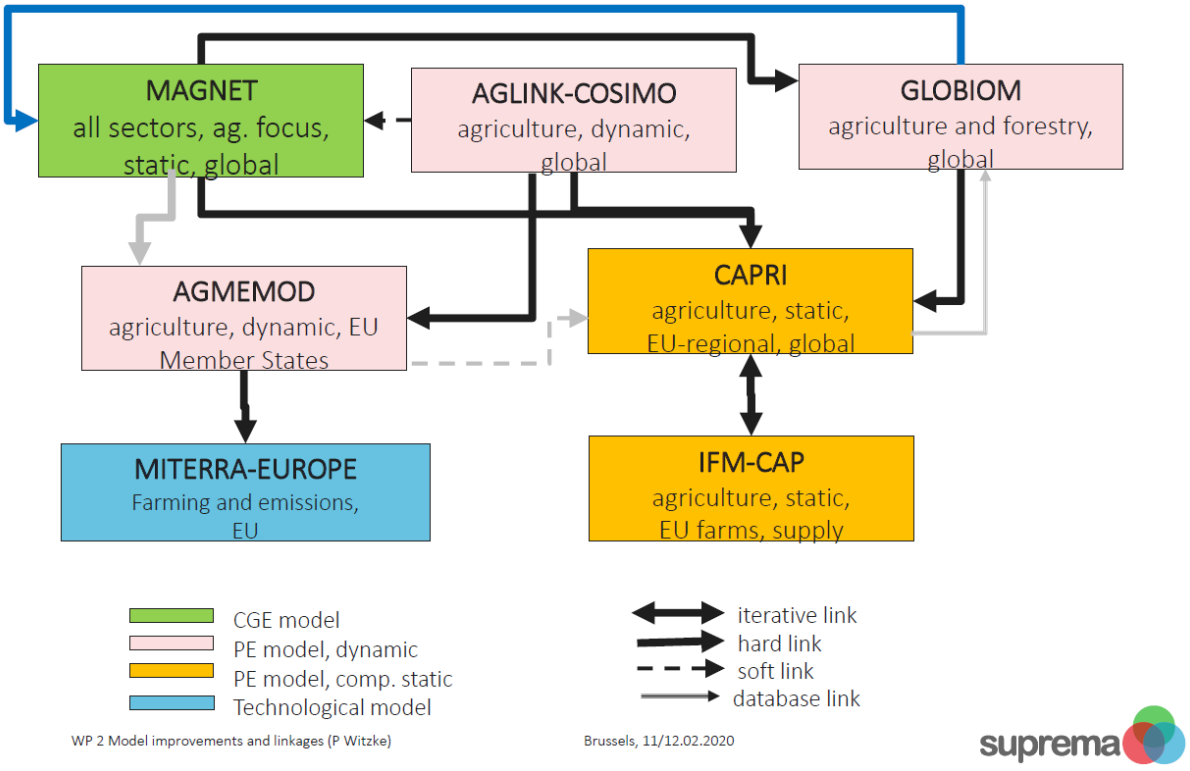

Figure 1: Linkages between the models

Source: WP 2 Model improvements and linkages, Peter Witzke. Brussels, 11/12.02.2020

i. Linkage 1: IFM-CAP – CAPRI

IFM-CAP is based on individual farms of the FADN data and PMP methodology. Recently, in the context of SUPREMA, the execution time for the whole EU was reduced. To make a relevant test of the model at the EU level, a scenario focused on organic transformation of farms occurred, since IFM-CAP represents organic farms. The model linkage with CAPRI was conducted to feed yield drop of organic farms compared to conventional farms into CAPRI which price effects which in turn, fed into IFM-CAP. Thus, the iterative procedure will provide market equilibrium when the market convergence is achieved. Otherwise, IFM-CAP model is only based of supply effects at a given prices, which would not be calculated endogenously. The advantage of IFM-CAP is the possibility to represent the agricultural sector by individual farms. IFM-CAP CAPRI linkage still is still work in progress.

ii. Linkage of GLOBIOM – MAGNET – CAPRI and its communication

The linkage between GLOBIOM to MAGNET has already been applied in the past. In the current case development in afforestation was implemented. First results showed a reduction in agricultural land, higher prices and implications on food security. Now the link has also been applied to CAPRI, as well; changes in area allocation due to afforestation are transferred from GLOBIOM to CAPRI. A test

scenario covered a 10 % increase in forest area. Results depicted for Indonesia indicated that the additional forest area is sourced from crop- and grassland in about equal size. Additionally, according to the results, a reduced deforestation from forest needs to take place as well. The latter is important for Indonesia, since palm oil plantations, which can be counted as forest, have been accounted as farmland in one of the models. Thus, a linkage helped here as well.

A further linkage of all three models is planned by test linkages of three models. Therefore, first an independent carbon price scenario will be run for MAGNET, GLOBIOM and CAPRI for the agricultural and LULUCF sector. In a second step the results of GLOBIOM on forest and bioenergy areas will be fed into MAGNET and CAPRI. Then MAGNET re-runs with GLOBIOM's data and outputs effects on GDP and energy prices generated. In the fourth step the results from MAGNET are implemented into GLOBIOM and CAPRI again. An analysis of differences compared to the results of the independent runs will show the effect of the model linkage. Thus, the higher consistency of linked models can be proven.

During the project phase many new soft linkages between models have also been developed. This is a key step to ease the implementation of 'hard linkages' between models. Here, new indicators between models, new options to compare bilateral trade flows as well as new options to compare MS level results had been made possible to link the models in more detail.

In the end main improvements of SUPREMA for the single models had been presented briefly:

- AGMEMOD: consolidation of market network
- GLOBIOM and MAGNET: Focus on SDGs
- CAPRI: Land use and carbon in non-European regions
- MITERRA: Update of LULUCF accounting rules
- IFM-CAP: Reduction of execution time

A number of topics came up during discussion about the presentation:

i. Difficulties in linking models

Discussion addressed the question how differences in units between models were overcome. They played a role during soft linkages, when outcomes from one model were transferred to one or several other models. Additionally difficulties were faced when units differed during comparison of outcomes, e.g. when one model offered results as quantities while the other provided only volumes or values. Here development of improved methods would be helpful especially when also biophysical models are linked. A complicated conversion also includes MAGNET which provides prices not for physical units but as a change from the numeraire in real prices.

Participants discussed also the fact that under a model linkage models would function under a 'symbiosis' where one would not run without the other model. So they would function as database or calibration point for the other model. But as a consequence of integration one would lose history respectively the rationality behind the outcomes. Additionally as CGE models would consider investments model linkage along a whole time period would be difficult to achieve.

ii. Data availability

Participant agreed the scarcity of information is a major problem while all models need their distinct data which may often differ between models. Modellers have to be flexible in the use of available information but in linkage the use of different data face a problem in harmonisation and aligning of model outcomes.

In this context also the issues of representing farmers' adoption of policy measures were discussed. A major limitation in the implementation of farmers' adoption rates is limited information availability.

Here data will have to be collected and has to be analysed by different approaches, e.g. econometric approach to extract the key findings and then implement them into the aggregate models. Currently there is only empirical information around which has to be used in a simplified way.

iii. Type of model linkage

Participants stated that model linkages would be required in future research since policies and policy measures tend to get more complex over time. The complexity would further increase by the fact that policy areas increasingly overlap so that other policies strongly affect the agricultural sector. Defining the type of linkage used between the models is an issue but whether soft or hard linkage is the most relevant distinction is debatable. Instead, models should put more emphasis on the degree of linkage, or whether it is one way or two ways, or circular linkage.

iv. Special topics

The linkage between models covering developments of organic area induced some discussions. An Important question was how the shares respectively individual conventional farms that are converting into organic farms are treated and the other way around. Currently the conventional and organic farms are differentiated in yield differences. Therefore, it would be better how farms convert from conventional to organic farms and determine a conversion rate. On the longer run, it might be more helpful to consider two types of products: conventional and organic allowing differences yields, but also in cost of production. When one or both element change the production function can adjust and changes in the price (premium) will be depicted. Such an approach would also allow that the price for organics produce can adjust, if the production is strongly expanded or the demand increases significantly.

A comparable issue was discussed with respect to forestry. Extension of models to cover forestry would require to model deforestation and afforestation explicitly, both important topics. Hence, in both cases impacts on yield impacts should be reflected.

4 Main Findings

4.1 Long-term baseline and climate related scenarios

Concerning the modelling and selected draft results on long-term baseline and climate related scenarios first conclusions can be summarized as following:

1. Modellers face high challenges when addressing economic, environmental and social issues, while linkages across farming and other sectors also need to be considered.
2. It is perceived as necessary to consider consumer behaviour in more detail, and more emphasis should be put on possible adjustments of consumers' behaviour towards a more climate friendly food diet, and how that could be achieved (price driven and other incentives (information, nudging)). This type of questions requires collaboration with other scientific areas like sociology and psychology (behavioural economics).
3. For climate scenario design, modellers should think more out of the box and should consider quite different economic systems. In particular, social and environmental externalities should be internalized (true pricing).
4. Ways to represent SDGs should be implemented in the models so that the achievement of different targets can be captured; however, due to their complexity integration can only be achieved in a stepwise procedure.
5. Model linkages can improve model outcomes, and multidisciplinary approaches as well as links to biophysical and household models should be pursued whereas those linkages have to consider different terminologies within sciences and need to overcome that language issue.
6. Technology and innovation processes are until now mostly exogenous in models, while both are also connected with changes in climate and offer opportunities to address changes in climate (e.g. mitigation options).
7. In the past, agricultural policies were designed with a focus on economic and social dimensions and at the expense of ecology while, currently, it might happen, that the environmental dimension becomes more dominant, possibly at the expense of social aspects. Therefore, in future an integration of social together with environmental\climate change related aspects in models for assessments will likely become important.

4.2 Medium-term baseline and CAP related scenarios

With regard to modelling and selected draft results on medium-term baseline and stylized CAP related scenarios the following daft conclusions can be outlined:

1. With respect to dietary adjustments some concrete proposals were made:
    a. The scenario is quite focused on EU countries; however, it could also include changes in diets and in preferences in non-EU countries.
    b. This type of assessments should be able to also consider the impact of taxes on meat.
    c. Consumption pattern are changing, whereas consumer preferences could also change by buying less products of better quality.
    d. Consumers can also pursue buying products with environmental consciences.
2. Future models improvements can be provided by
    a. Internalize external effects; and
    b. The inclusion of innovations and uncertainties.
3. Considering CAP-related issues:

a. The adoption of eco-schemes is difficult to include as schemes are voluntary for farmers and a lack of data and heterogeneity of farmer's decisions does not enable an easy implementation of farmers' adoption so that a sensitivity analysis might alleviate the problem.
b. An assessment of impacts on biodiversity is seen as helpful.

4.3 Model improvement and linkages

Draft conclusions from the first insights of model improvement and linkages within the SUPREMA model family can be found below:

1. When linking MAGNET and GLOBIOM it remains unclear how outcomes are translated and transferred between the models. One model provides results for quantities while the other expresses the same items in values.
2. It is important with respect to forestry at afforestation and its respective impacts on yield are covered.
3. Replication of e.g. organic farms of IFM-CAP in CAPRI is quite significant.
4. Defining the type of linkage used between the models is an issue but whether soft or hard linkage is the most relevant distinction is debatable. A stronger focus could be put on other ways to characterize linkages like e.g. the degree of linkage, or whether it is one way, two ways, or circular.
5. Harmonisation between models is perceived as an area for further research especially if models are linked. Hence, as models, due to their differences in nature and structure, are often based on different databases attempts of harmonisation face limitations. Nevertheless, models should be harmonised as far as possible.
6. Linking different types of models will be also a strong point in future because policies will get more complex.

4.4 "Way forward – where are we, what do we need and what is missing"

The running world café provided outcomes of the elements 'Way forward: where are we, what do we need and what is missing', which are characterized through each poster:

Poster 1: Famers' decision and their reactions to changing environment?

Stakeholders mentioned that models were not representing individual behaviour and that agent based models may reflect better the heterogeneity of farmers across different EU MS and their response to policies. The representation of alternative technologies and the structural changes may need some improvements. Also the risk aversion of farmers towards volatile EU policies should be reflected. In general the coverage of heterogeneity among farmers across the EU MS requires more emphasis.

Poster 2: Demand side adequately reflected?

Participants asked for a better representation of the whole bio-economy, including bio-materials as well as bio-energy referring also to the fact that innovations in the bio-economy were not considered. New outlets for bio-based products were perceived as still missing. It was also highlighted that consumer behavior in models should reflect both changes in preferences for products and qualities, next to effects of economic behavior. Although green CAP is cover as scenario, this does not include the voice of voters nor consumer response on green CAP and their potential backlash.

Poster 3: Supply chain - what is missing (decision, market power, and structure)

The participants considered that price transmission is not very well reflected along the supply chain. The model design should capture the material flows of products and also product quality should be

taken into account. Another topic is to reflect properly the coordination within the supply chain and impacts of market power on the different levels. Some attention should also be given to contracting, all three affecting the market outcomes.

Poster 4: Are SDGs addressed efficiently?

It was stated that many SDGs indicators would need a higher resolution than currently available and that to cover SDGs in more detail more biophysical and household level models should be employed. SDGs that address inequality and which deal with poverty, food security and gender issues are underrepresented in the current models. For the better integration of SDGs in models a matrix on SDGs, indicators, sectors and their respective importance would be required.

Poster 5: Testing on CAP and climate change policies - what are we missing?

The representation of biodiversity, ecosystem services and the topic of the CAP budget are regarded as only marginally pursued. Also the employment and job creation, technology adoption and volatility aspects are perceived as missing. Modelling the circular economy includes residues and waste and to represent the food system perspective are seen as not really covered.

Poster 6: Additional issues

The participants considered that although CAP policies are included in the models, it does not consider its whole complexity. As an example the modelling of uptake/participation decisions of farmers with respect to eco-schemes and other voluntary measures needs more research and better representation in models. Important considerations about consumers such as the health impacts of diets are still missing, and how health is reflected in consumer preferences. Also social issues as inequality are not captured. With respect to the farmers, the models do not cover the land use markets, investment required and the finance channels used. Also permanent crops and minor commodities should be represented better.

5 References

- SUPREMA Deliverable 4.1

Annex A: Information Consent Form for Stakeholder engagement, communication and outreach

Your involvement as a participant is entirely voluntary and you may withdraw your participation at any given time. SUPREMA research includes the involvement of natural persons through participatory events like today's event. With respect to the nature of the activities to be conducted, these will involve group discussions of different sorts. SUPREMA anticipates providing both immediate and long-term benefits for the involved participants and their associated networks.

To organise it, SUPREMA partners may have collected some personal data which could be for instance your name, your professional/personal email address or your professional/personal telephone number (most often from publicly available sources). Furthermore SUPREMA research activities may indirectly result in collecting other personal data information as part of the wider consultation process, e.g. through interviews.

It should be noted that the collection of personal data per se is not the main purpose of SUPREMA, but personal data may be information necessary to the research (e.g. the Member State/region in which you are located) or to carry out mandatory communication activities (e.g. publication of an attendance list). As part of the research project, we will need to be able to attribute your position/view to the organisation you are representing or to you as an independent expert - depending on what capacity you have been invited to contribute to this event.

If you do not wish your contact details to be made available to other participants, please let the event organiser know in advance.

During this event, photos and/or videos may be taken to contribute to the communication objectives of this Horizon 2020 research project. During the performance of these activities, care will be taken to minimise the potential collection of personal data such as name tags.

The collection and processing (e.g. creating a list of invitees for future events) of any personal data will otherwise remain strictly confidential - unless it is relevant for this study, in which case it will be anonymised, unless specifically discussed and agreed with you in advance.

As a general rule, the SUPREMA team will ensure that all presentations and reports are made available to all of those attending workshops and participating in the research.

Source: SUPREMA Deliverable 4.1

Annex: Legal Basis

1. Legal Basis

The Thuenen Institute processes the personal data about you on the basis of your consent in accordance with Art. 6 para. 1 sentence 1 lit. a GDPR. If special categories of personal data are involved, the Thuenen-Institute will process the personal data collected about you on the basis of your consent in accordance with Art. 9 (2) lit. a GDPR.

2. Recipients or categories of recipients

The data will only be used in the context of the project unless explicitly agreed otherwise.

3. Type of data processing

During this event, photos may be taken to contribute to the communication objectives of this Horizon 2020 research project. During the performance of these activities, care will be taken to minimise the potential collection of personal data such as name tags. Your name and contact details will be saved separately for data protection documentation. Access is only available to the project team. Individual pseudonymous citations can be reproduced in publications.

No processing of your personal data for the purpose of automated decision-making (including profiling) according to Art. 22 para. 1 and para. 4 GDPR takes place.

4. Duration for which the personal data are stored / Criteria for determining the duration

Subject to your consent to secondary use, the data will be kept pseudonymous and locked for ten years on the basis of 'good scientific practice'.

5. Your rights

Within the scope of the legal requirements, you are in principle entitled to the Thuenen Institute for:

- Revocation;
- Right to information about the use (or transfer) of the data;
- Confirmation as to whether the personal data concerned is being processed by the Thuenen Institute;
- Information about this data and the circumstances of the processing;
- Correction, in so far as this data is incorrect;
- Cancellation;
- Restriction of processing in specific statutory cases;
- Providing your personal information - if you have provided it - to you or a third party in a structured, common and machine-readable format;
- Complaints to the official data protection officer or the responsible supervisory authority (Federal Commissioner for Data Protection and Information Security - BfDI -);

6. Contact details of the responsible data protection officer

Data Protection Officer of the Thuenen Institute

Horst Schwartz

Bundesallee 38

38116 Braunschweig (Germany)

Tel.: 0531 / 596-1218

E-Mail: datenschutz@thuenen.de

Annex B: Participant list

Table 1. List of Participating Institutions and Members of the EBA

ORGANISATION	NUMBER OF PERSONS
Agricultural and Fisheries Management Agency of Andalusia (AGAPA)	1
BMEL (German Federal Ministry Agriculture)	1
DG AGRI	3
DG research	1
IDENER	1
IHS markit/ f.o. Licht Gmbh	1
Kiel Institute for the world economy	1
Lithuanian Institute of agrarian economics (LT)	1
MAPA (Ministry of Agriculture Spain)	2
Trinity College	1
University of Crete	1
University of Leeds	1

Participants list

For the Third SUPREMA Stakeholder Workshop
'Defining the Strategic Prospects for Future Model-based Support of Policies related to European Agriculture'

Date: Tuesday, 11 February 2020, 9:30 - 16:30
Location: Representation of Lower Saxony to the European Union, Rue Montoyer 61, B-1000 Brussels

N°	Surname	Name	Institution	Signature
1	Angulo	Laura	Thünen Institute	
2	Anson Navarro	Nieves	MAPAMA - SG de Productos Ganaderos	
3	Antimiani	Alessandro	European Commission	
4	Banse	Martin	Thünen Institute	
5	Blanco	Maria	Universidad Politecnica de Madrid	
6	Bogonos	Mariia	European Commission -JRC	
7	Brouwer	Floor	Wageningen Economic Research	
8	Buchholzer	Florence	European Commission	
9	Burose	Christoph	Regierungsdirektor -BMEL	
10	Chantret	François	European Commission - DG AGRI	
11	Delzeit	Ruth	Kiel Institute for the World Economy	
12	Di Virgilio	Nicola	European Commission - DG AGRI	
13	Fuertes	Antonio	Ministry of Agriculture	
14	Galnaityte	Aiste	Lithuanian Institute of Agrarian Economics (LT)	
15	Gonzalez-Martinez	Ana Rosa	Wageningen Economic Research	

N°	Surname	Name	Institution	Signature
16	Granado Díaz	Rubén	AGAPA	
17	Grzegorzweska	Magdalena	European Commission - DG AGRI	
18	Havlik	Petr	IIASA	
19	Helming	John	Wageningen Economic Research	
20	Jongeneel	Roel	Wageningen Economic Research	
21	Keller	Claus	IHS Markit/F.O. Licht GmbH	
22	Leyva Guerrero	Carlos	IDENER - Coordinator AGRICORE	
23	Matthews	Alan	Trinity College Dublin, Ireland	
24	Perez Dominguez	Ignacio	European Commission -JRC	
25	Salamon	Petra	Thünen Institute	
26	van Meijl	Hans	Wageningen Economic Research,	
27	Weissteiner	Christof	European Commission - Research Executive Agency	
28	Witzke	Peter	EuroCARE	
29	Zirngibl	Max	Thünen Institute	
30	Ziv	Guy	University of Leeds - Coordinator BESTMAP	
31	Tsagris	Michail	University of Crete	
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Annex C: Agenda

Programme

Defining the Strategic Prospects for Future Model-based Support of Policies related to European Agriculture

An interactive stakeholder workshop

Date: Tuesday, 11 February 2020, 9:30 - 16:30

Location: Representation of Lower Saxony to the European Union, Rue Montoyer 61, B-1000 Brussels

The workshop will present draft outcomes of selected narratives developed under the 2nd SUPREMA Stakeholder Workshop "Narratives" and will address the spread between the 1st SUPREMA Stakeholder Workshop "Needs" and conducted model enhancements. For both, feedback of participants will be captured, but a stronger focus will be on the narratives and related outcomes. Also ideas of participants about future directions for agricultural modelling in the EU will be discussed. See also: https://www.suprema-project.eu/

9:30 – 10:00: Welcome coffee and registration

10:00 – 10:05: Opening (Martin Banse, Thünen Institute)

10:05 – 10:10: Welcome by Christof Weissteiner (Research Executive Agency)

10:10 – 10:15: Short introduction into SUPREMA (Floor Brouwer, Wageningen Economic Research)

10:15 – 10:30: Introducing the SUPREMA Workshops (Petra Salamon, Thünen Institute)

10:30 – 10:45: Introducing participants

10:45 – 11:15: Selected draft results on long-term baseline and climate related scenarios (Petr Havlik, IIASA)

11:15 – 12:00: Interactive feedback (by stakeholders)

12:00 – 12:15: Wrap-up of discussion on long-term results (Andrzej Tabeau, Wageningen Economic Research)

12:15 – 13:00: LUNCH BREAK - A sandwich lunch will be offered

13:00 – 13:30: Selected draft results on medium-term baseline and CAP related scenarios (Roel Jongeneel, Wageningen Economic Research)

13:30 – 14:15: Interactive feedback (by stakeholders)

14:15 – 14:30: Wrap- up of discussion on CAP related results (Martin Banse, Thünen Institute)

14:30 – 14:45: Model improvement and linkages – first insights (Hans-Peter Witzke, Eurocare)

14:45 – 15:00: Interactive feedback (by stakeholders)

15:00 – 15:30: Ways forward – where are we, what do we need and what is missing - Running World Café (all partners)

15:30 – 16:00: Summary and first conclusions (Hans van Meijl, Wageningen Economic Research)

16:00 – 16:10: Closing by Floor Brouwer

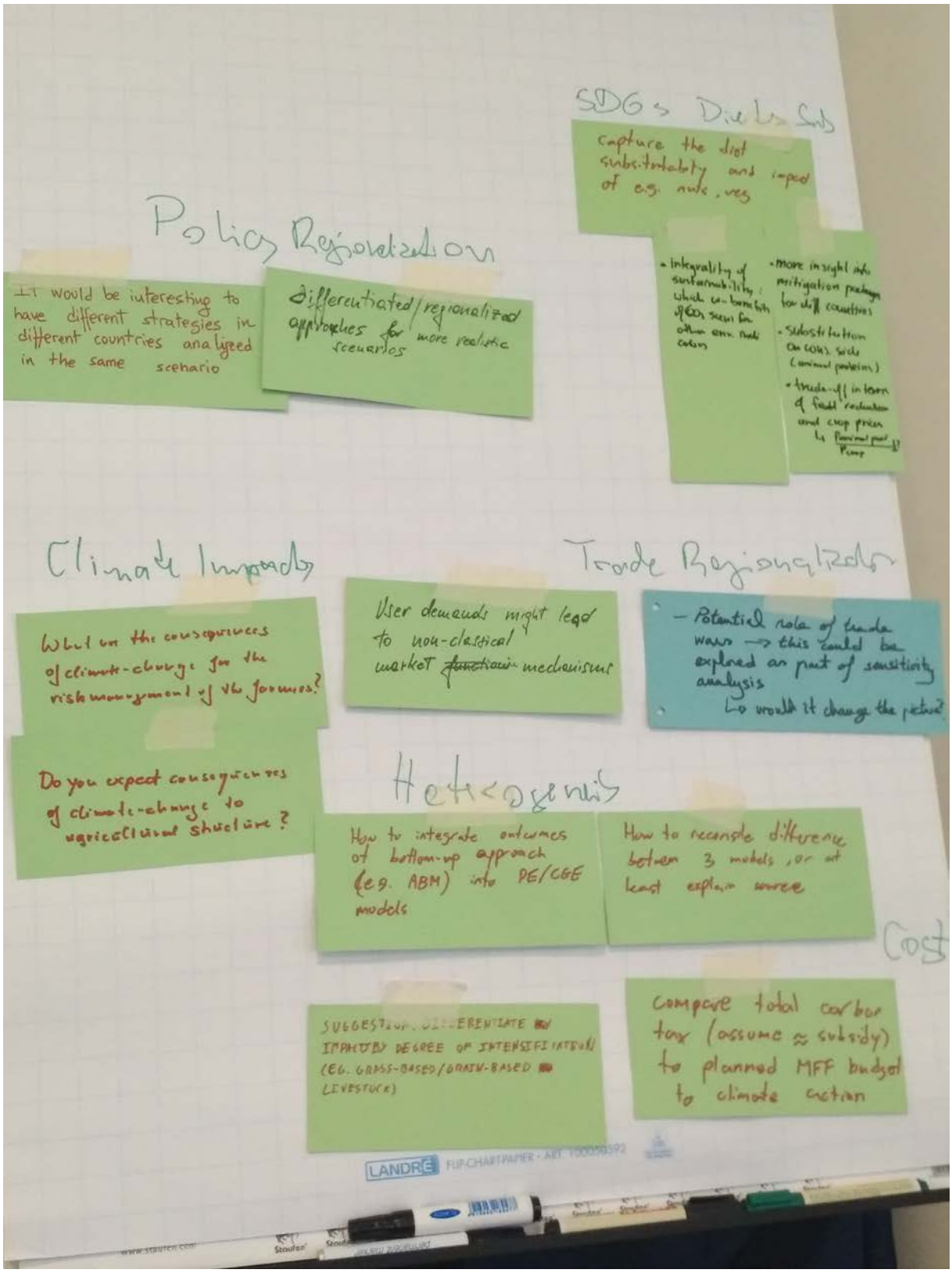
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773499 SUPREMA.

Annex D: Pictures of the Workshop

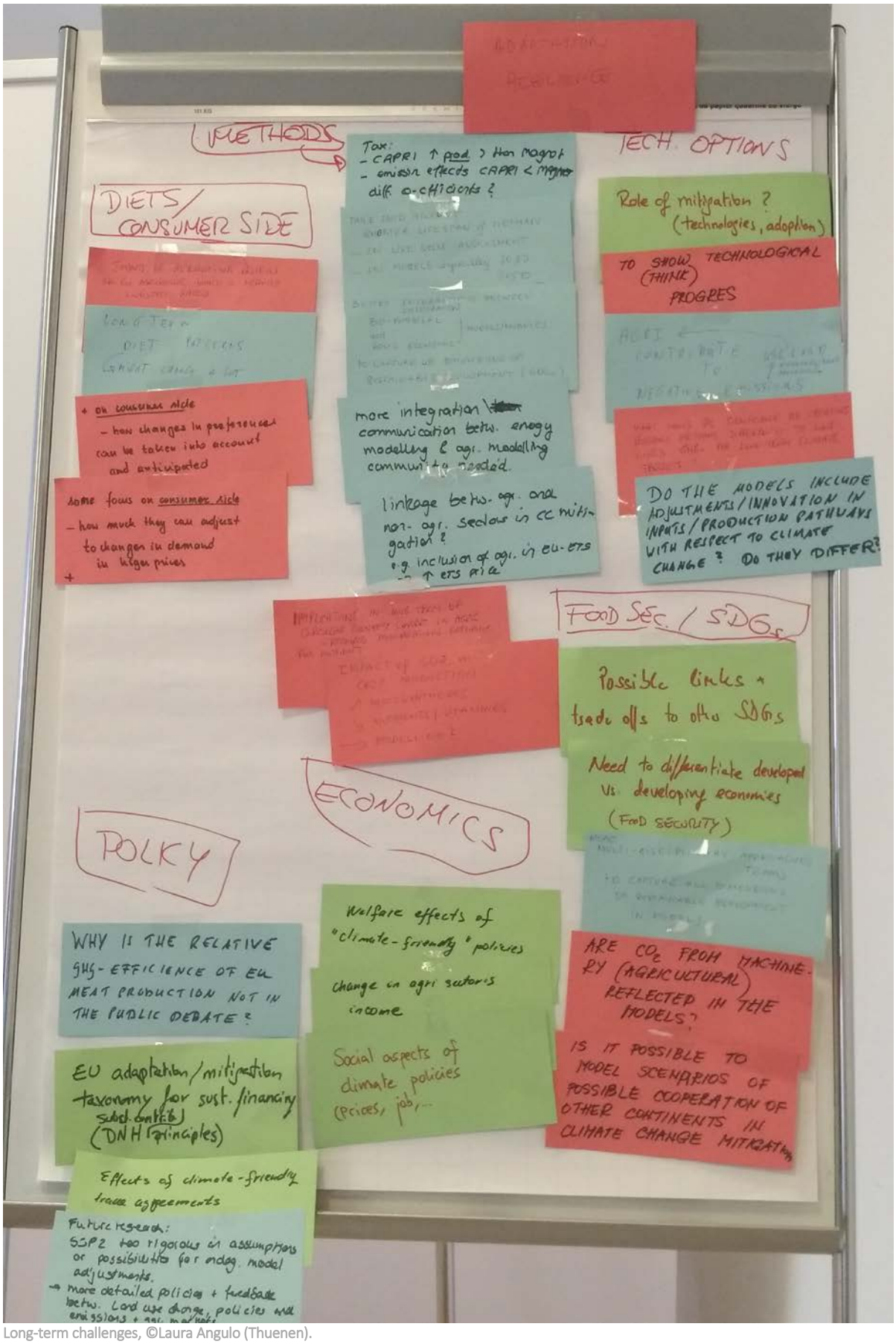
Presentation: Long-term baseline and climate based scenarios, ©Laura Angulo (Thuenen).

Round of questions and discussion: Long-term baseline and climate based scenarios, ©Laura Angulo (Thuenen).

Discussion group: Long-term baseline and climate based scenarios, ©Petra Salamon (Thuenen).



Long-term challenges, ©Laura Angulo (Thuenen).



Long-term challenges, ©Laura Angulo (Thuenen).

Discussion group: Medium-term baseline and CAP based scenarios, ©Petra Salamon (Thuenen).

Medium-term challenges, ©Petra Salamon (Thuenen).

Medium-term challenges, ©Laura Angulo (Thuenen).

Round of questions and discussion: Model improvements and linkages, ©Petra Salamon (Thuenen).

Poster: Farmer's decisions and reactions to changing environment, ©Petra Salamon (Thuenen).

Poster: Demand side, ©Petra Salamon (Thuenen).

Poster: Supply chain, ©Petra Salamon (Thuenen).

Poster: SDGs, ©Petra Salamon (Thuenen).

Annex E: Presenations

AE-1: Presentation on the introduction of the SUPREMA Workshops

AE-2: Presentation on long-term climate mitigation

AE-3: Presentation on medium-term baseline and CAP related scenarios

AE-4: Presentation on model improvements and linkages