



Report on the Final Conference of ADVANCE project “Deep decarbonisation towards 1.5°C – 2°C stabilisation”

The final conference of the European Commission-funded ADVANCE project took place on 24 October 2016 in Brussels. The conference brought together stakeholders, climate policy experts and ADVANCE scientists to present the results of the project and discuss implications for climate and energy policies, as well as priorities for future research. It primarily focused on policy findings relevant for the implementation of the Paris Agreement, which reinforced the objective of keeping global temperature rise well below 2°C, and of pursuing efforts to limit the temperature increase even further to 1.5°C above pre-industrial levels, and thus called for an almost full-scale decarbonization of energy systems worldwide.

Setting the scene

Andrea Tilche, Head of Unit at DG for Research and Innovation welcomed the participants and introduced the conference. He pointed at one of the greatest achievements of the ADVANCE project, namely the increased transparency of Integrated Assessment Modelling tools. He stressed the importance of EU research funding for the drafting of the IPCC AR5, which provided high quality scientific input to the negotiation of the Paris Agreement at the COP21 in Paris. The Horizon 2020 Work Program 2018-20 on Climate Action will have the implementation of the post-Paris process at its heart. EU-funded research will continue playing an important role in the IPCC process and EU-funded research projects need to contribute to this process with peer-reviewed publications. He warmly invited the ADVANCE consortium to precede publishing scientific papers on the basis of data gathered during the project.

In his keynote speech **Artur Runge-Metzger**, Director for Climate Strategy, Governance and Emissions from Non-trading Sectors at DG for Climate Action stressed that after the conclusion of EU and international agreements (most prominently, the Paris Agreement, but also other agreements, such as the agreement by the ICAO on a new global market-based measure to control CO₂ emissions from international aviation or the Kigali agreement to phase out production and consumption of hydrofluorocarbons), efforts should now center on implementation. To this aim science needs to go beyond academia and reach out to citizens and businesses. He also stressed the importance of an ex-post policy evaluation, especially in view of developing a mid-century strategy. Such strategy will need to go beyond the energy sector and look into LULUCF. It will also need to go into negative emissions and the related technological uncertainty as well as the contribution of lifestyle changes to the decarbonisation agenda.

The ADVANCE project: Overview and key insights

Following the keynote speech, representatives of the ADVANCE consortium presented key project insights. **Gunnar Luderer** (PIK) gave a talk on the challenges of limiting warming to 1.5-2°C. He concluded that most ADVANCE models find limiting warming to below 1.5°C by 2100 technically feasible, if mitigation ambition is scaled up drastically after 2020. Also, results show that key elements of the energy sector transformation are the rapid decarbonization of power supply as well as an accelerated phase-out of fossil fuels in energy demand sectors. Results also show the importance of carbon dioxide removal, e.g. via BECCS, to compensate for residual fossil emissions. **Detlef van Vuuren** (PBL) gave a talk on the transformation of main demand side sectors, i.e. transport, industry and buildings. He concluded that the introduction of efficiency, electrification and low carbon fuel use is essential to the low carbon transition. However in addition to technology, behavioral change needs to be triggered. Also, as energy-services are not substantially influenced by price instruments, other policies affecting energy services could complement technology transition. **Keywan Riahi** (IIASA) presented findings on the implications of climate policy on sustainable development. He highlighted that climate policies need to be complemented by energy access



policies to shield the poor, that climate policy has major impacts on energy-related thermal water pollution and that a rapid renewable deployment (solar PV, wind) has multiple environmental benefits.

Panel discussion: From research results to real-world transformation

In the panel discussion stakeholders from business, NGO and policy provided their view on the ADVANCE findings. **Maria Mendiluce** (World Business Council for Sustainable Development) pointed at the fact that there is a need to translate modelling results into business opportunities. **Xavier Garcia Casals** (Greenpeace International) highlighted that models do not perfectly represent social reality and that modelling results should be taken up with caution. **Laura Cozzi** (International Energy Agency) stressed the substantial difference between the 2°C and 1.5°C targets as being two completely different worlds. She expressed her appreciation of the ADVANCE work in providing input to the analysis of the Paris outcomes and especially the requirements of the 1.5°C target.

Climate and energy policy

Bert Saveyn and Zoi Vrontisi (European Commission, DG JRC) gave a talk on the implications of the Paris outcomes. They highlighted the emissions gap for 1.5°C and 2°C, the still needed mitigation effort by sectors and power system transformations as well as the related economy-wide policy costs. **Jessica Jewell** (IIASA) presented the results on the analysis of energy subsidies in relation to climate objectives. She concluded that subsidy removal does curb ‘wasteful consumption’ but does not support renewable energy growth. Also, subsidy removal does not deliver significant CO₂ emission reductions at the global level. However, regionally subsidy removal delivers more than Paris climate commitments in major oil and gas exporters and less than Paris climate commitments for developing regions. The discussant **Bert Metz** (European Climate Foundation) triggered a discussion on whether models may be too optimistic with reference to the achievability of 1.5°C and the heavy contribution of renewables to power supply.

Energy transformation pathways

Robert Pietzcker (PIK) gave a talk on sustainable power supply and the role of wind and solar, highlighting that the updated models show substantially more wind and solar in cost-optimal climate mitigation scenarios – on average 63% more. Models also show that refraining from nuclear and power sector CCS results in low additional costs and brings substantial advantages in most sustainability indicators. **Oreane Edelenbosch** (PBL) presented possible low-carbon pathways for the transportation sector based on IAM results. IAMs indicate that radical decarbonization of passenger transport can occur through technological innovations and especially efficiency, electrification and fuel switching. However this will depend on techno-economic development as well consumer behavior. As a result, sectoral strategies and policies explicitly targeting consumer attitudes toward alternative fuel vehicles are necessary. In addition, policy directed to mode shift or activity reduction may be needed to complement the radical technology change required. The discussant **Pietro Menna** (European Commission, DG for Energy) stressed the relevance of electrification of road transport as it provides opportunities for cross-fertilization between the power supply and transportation sectors.

Transparency and Robustness

The last conference session addressed the question of how to increase confidence in modelling tools for policy advice. **Volker Krey** (IIASA) pointed at the contribution of ADVANCE to transparency and evaluation of energy-economy models by means of harmonized documentation and automated diagnostic tests. **Massimo Tavoni** (FEEM) gave a presentation on structured uncertainty analysis as a means to ensure generation of robust insights for policy-making. The discussant **Evelina Trutnevyte** (ETH Zürich) identified two groups of users of model results that she called “divers” (modellers) and “sailors” (not modellers). She concluded that ADVANCE successfully increased credibility of models for the divers but also opened a discussion on the need to further address sailors in search for simple storylines.