



INNOPATHS

Grant agreement no. 730403

INNOPATHS

Innovation pathways, strategies and policies for the Low-Carbon Transition in Europe

H2020-SC5-2016-2017/H2020-SC5-2016-OneStageB

D6.8 Summary Report on Final Conference

Work Package: 6

Due date of deliverable: month 56

Actual submission date: 07/07/2021

Start date of project: December, 01 2016 Duration: 56 months

Lead beneficiary for this deliverable: *UCL*

Contributors: *EUI*

Project co-funded by the European Commission within the H2020 Programme (2014-2020)		
Dissemination Level		
PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	
CI	Classified, as referred to in Commission Decision 2001/844/EC	

Disclaimer

The content of this deliverable does not reflect the official opinion of the European Union. Responsibility for the information and views expressed herein lies entirely with the author(s).

Table of contents

1.	Version log	4
2.	Introduction	5
3.	Summary of Sessions.....	5
3.1	Sectoral transformations towards deep decarbonisation	5
3.2	Technology developments	6
3.3	Innovation dynamics, drivers and co-benefits	6
3.4	Finance for the European energy transition.....	7
3.5	Pathways to net zero	8
3.6	Decarbonisation and equity	9
3.7	Policies toward transformation	9
3.8	Policy for net zero: what do policy makers need to know?.....	10
3.9	Closing remarks	10
4	Annex 1 – Registration list	11
5	Annex 2 – Agenda	15

1. Version log

Version	Date	Released by	Nature of Change
1.0	7 th July 2021	UCL	Report Submission

2. Introduction

The final conference of the INNOPATHS project took place on 31st May and 1st June 2021. It was hosted by the European University Institute (EUI), but was held via Zoom, due to ongoing travel and meeting restrictions across Europe during the Covid-19 pandemic.

This report summarises the sessions across the two days of the meeting. The list of registrations may be found in Annex 1, and the agenda is presented in Annex 2. Recordings of the main public sessions of the conference may be found at [this link](#).

3. Summary of Sessions

The conference was opened by **Jos Delbeke (European University Institute)**. He believed that even through existing pledges under the Paris Agreement are insufficient, there is a new dynamic, which the EU is leading with its early aim for climate-neutrality, and plans for the Green Deal. But, we have to ‘drag in’ other countries to ambition. A key question is, ‘how can Europe be a laboratory for new technologies and policies?’. Developing appropriate policies is central, and the most difficult part of the journey is ahead of us. Carbon pricing is important, but it is part of a package of tools that must be used. EU ETS price developments have been impressive, and it is reducing emissions, particularly in the power sector. But, there are a number of issues that must be addressed (e.g. carbon leakage). The recent EU taxonomy on sustainable finance is potentially revolutionary, and disclosure regulations are also important.

3.1 Sectoral transformations towards deep decarbonisation

The first session of the conference was chaired by **Panagiotis Fragkos (E3-Modelling)** and focused on the sectors hard to decarbonise: transport and industry.

Pelopidas Siskos (E3-Modelling) presented "*Decarbonising the EU transport sector: Options and challenges*". Transport needs to undergo a ground-breaking transformation to reduce its emissions by 90% by 2050. On the one hand, road transport could be decarbonised mostly through electricity and hydrogen. In fact, electro-mobility has already taken off significantly in Northern and Western Europe but the development of recharging infrastructure should become a short-term priority for the EU. On the other hand, aviation and maritime transport greening would rely mainly on bio- and synthetic fuels. For these sectors, mandates and energy efficiency measures would be critical to foster decarbonisation.

The second speaker **Silvia Maddedu (Potsdam Institute for Climate Impact Research)** focused on "*the CO₂ reduction potential for the European industry via direct electrification*". Her paper reviews the technologies, energy savings and decarbonisation potential via the electrification of heat supply for 11 industrial sectors. Silvia concluded that electrification could reduce CO₂ emissions up to 78%, though this would necessitate a doubling or tripling of the industry electricity use. In view of this, to offer a viable solution the electricity would need to be decarbonised and its consumption smart and efficient. In addition, electricity should be competitive with stable scenarios, clear carbon prices, and reduced taxes and levies.

Responding to the chicken-and-egg problem of EVs and charging infrastructure raised by the discussant **Oreane Edelenbosch (PBL Netherlands Environmental Assessment)**, Pelopidas explained that increased demand in the market has been a key driver of EV uptake in some

countries. Still, public funding will be needed to develop the infrastructure in Southern and Eastern Europe before the public engages. Reversing Silvia's question, "*is the industry prepared?*", Oreane asked how to ensure both electricity and industry move hand in hand. Silvia argued that electricity should be prioritised, but low hanging fruit in the industry should be seized quickly. The audience raised the question of the land-use assumptions in the modelling for the development of biofuels.

3.2 Technology developments

The session on technology developments was chaired by **Elena Verdolini** (CMCC) and presented two papers under embargo at the time.

The intervention of **Laura Diaz Anadon** (University of Cambridge) "*Comparing expert- and model-based probabilistic energy technology cost forecast*" was commended for being one of the best papers the discussant had read in the last couple of years. It was noted that there is limited knowledge about the relative performance of expert- and model-based methods for energy technology cost forecast. Comparing past predictions showed that model-based forecasts are more likely to include the observed value, and there is an underestimation of the pace of technology change. The paper also identifies differences in future projections, with expert-based predictions generally being more pessimistic. The faster pace of change may result from structural changes in policy, market and actors. This, in turn, could create growth opportunities and imply that decisions do not reflect the economic opportunities that the policy could catalyse.

The second paper, "*Improving the economic feasibility of 2°C and 1.5°C emission pathways through R&D*", was presented by **Lara Aleluia Reis** (CMCC). The modelling exercise shows that drastic action on R&D is needed at the beginning (e.g., energy efficiency, biofuels), and that timing matters often more than the total investment for technologies such as CCS, wind and solar. Geographical differences among countries are also significant. Regions with carbon revenues could invest more in R&D (Asia, Latin America, Africa) even if developed economies have substantial efforts to make in R&D/GDP. In the modelling exercise, carbon tax and GDP loss decrease when R&D is higher. In sum, R&D is not a game-changer but rather an enabler of decarbonisation by lowering carbon prices and total costs.

The discussion led by **Sonia Yeh** (Chalmers University of Technology) concentrated on the relative importance given to explaining the methods compared to the research results. Some of her questions pertained to the definition of optimal investment in R&D and the cost differences between learning by doing and learning by researching (investment in R&D). A participant in the audience inquired as to whether the conclusions on expert- vs model-based energy technology cost forecast could be extended to commercialisation time. Laura acknowledged that the paper did not cover this time-to-market, though it could represent a promising new research project.

3.3 Innovation dynamics, drivers and co-benefits

The afternoon of the first day of the conference started with a session on innovation moderated by Laura Diaz Anadon.

She introduced her colleague **Cristina Penasco** (University of Cambridge), who presented the paper "*Systematic review of the outcomes and trade-offs of ten types of decarbonisation policy instrument*" and its associated tool, [DPET](#). This review of 211 articles focused on ten policy instruments, their efficiency and environmental, innovation, competitiveness and other socio-political outcomes. Overall, the paper identifies a strong level of agreement and positive impacts

of the policies on innovation. However, the picture differs on competitiveness and distributional effects, with higher disagreement and negative impacts. The design of policy instruments is central to overcome trade-offs. For instance, the support schemes should be tailored, predictable and adjustable whereas taxes combined with recycling and compensatory non-environmental exemptions. However, it was underlined that there is no one-size-fits-all approach.

Stijn van Ewijk (Yale University) presented a paper focused on "*Lessons on technology diffusion from global coal power flue gas desulfurisation*". As flue gas desulfurisation (FGD) has many similarities with CCS, the paper aimed to identify the FGD lessons learnt which could help to predict CCS development. The main conclusions were the following: FGD development was stepwise (i.e., not one single s-curve): this trend, illustrative of technologies driven by regulation, reflects a market struggling to meet deadlines. Moreover, its development was characterised by installing new units rather than increasing the capacity of existing units. Finally, CCS scenarios are generally consistent with FGD history. This led to potential implications, including that CCS may materialise fastest for retrofits, require regulatory support, diffuse stepwise and very fast.

The discussant **Jessica Jewell** (Chalmers University of Technology) questioned the use of systematic literature review, a tool originating in medicine, in an interdisciplinary climate field. According to Cristina, its relevance was safeguarded by avoiding meta-analysis, focusing on the outcomes and not favouring or ranking different methodologies. Researchers confirmed their intention to enhance the DPET tool, increasing and updating available evidence on existing and new policy tools. The audience asked a question on the competitiveness of CCS. While FGD competed with other technologies, CCS is competing with RES. Current evidence shows it is not hard to deal with the waste, but it is complex to store and utilise CO₂.

3.4 Finance for the European energy transition

Simone Borghesi (European University Institute), co-host of the conference, chaired the last session of the first day of the conference on green finance.

It started with a presentation on "*Mapping demand and supply*" of green finance held by **Friedemann Polzin** (Utrecht University). The INNOPATHS team firstly mapped the demand for finance in the energy transition. In most models, demand originated primarily from investments needed in RES, distribution and storage, although IEA identifies also a strong call for finance on energy efficiency. Though there seems to be sufficient finance overall, the paper shows a qualitative mismatch. In particular, venture capital and funding for small and distributed sources is missing and could limit the scaling-up of new technologies. The policy design plays an integral part in enhancing finance. Beyond adjusting the use and parameters of feed-in tariffs, auctions, and quotas, policymakers should develop public investment banks to co-finance projects, to de-risk investments, lead the way and educate private investors.

Florian Egli (ETH Zurich) showcased "*Dynamics of financing conditions and policy implications*". In principle, for capital-intensive technologies, when the cost of capital increases, the component of the total technology cost that is served for financing increases, so the overall cost grows dramatically. The current situation with low-interest rates gives a competitive advantage for capital-intensive technologies, such as RES, which are also mature and more trusted by the finance sector. Thanks also to models, some policy insights have been identified. Firstly, policies need to be designed so as to enable private capital flow into low-cost project finance. The policy framework can impact costs also negatively (for example, by increasing the exposure to the market). Secondly, current low-interest rates are an excellent opportunity to support the post-COVID recovery and climate objectives. Thirdly, public funds and banks

should provide the correct type of capital. Lastly, The European Green Deal represents an excellent policy framework to integrate finance with sectorial and technology policies.

The discussion was led by **Nadia Ameli** (UCL). She was keen to gain a better understanding of where existing financing sources would need to be scaled up to fill the gaps: demand, category of investors, regions. Lack of finance appears on small tickets with low risk: such as energy efficiency and the scaling up of the first commercial projects too big to be demonstration projects but too small for mainstream projects. A solution could reside in aggregating small projects to make them attractive to big investors. A favourable ecosystem around them needs to thrive. Equity access and development are also geographically diverse: in the UK, equity is generally available, but elsewhere, often less as it depends on the institutional context. The discussion reveals it is hard to quantify drivers of financial learning. To give more predictability to the financing of the energy transition (i.e., reconcile the short term visibility on interest rates with long term ambition to decarbonise the whole EU economy), risk could be socialised. Much on green finance is still not covered by the research, including offshore wind, CCS, and sustainable food systems.

3.5 Pathways to net zero

Robert Pietzcker (Potsdam Institute for Climate Impact Research), chaired the first session of the second and final day of the conference, on ‘Pathways to net zero’.

This session began with a presentation by Robert’s colleague **Roberto Rodrigues** (Potsdam Institute for Climate Impact Research), on ‘Scenarios for climate neutrality: A multi-model assessment’. Roberto first outlined the three main scenario narratives developed by the project; ‘New Players’, ‘Incumbents’, and ‘Efficiency’, and the models used to examine them. Key insights common to all three scenarios is that electrification rates in Europe must increase by at least 2-3 times by 2050, and variable renewable energy must also increase very substantially, and other zero-carbon energy carriers (e.g. hydrogen) must be utilized to some degree in hard-to-electrify end uses. In short, ‘we need a lot of everything’ - although the specifics on each of elements, in addition to factors such as the use of carbon capture and negative emission technologies, varies depending on the narrative examined.

Alessia De Vita (**E3 Modelling**) then presented on work examining the impacts of ‘upscaling targets to 2030 and the path dependence to 2050 carbon neutrality’, specifically on the increase of the EU 2030 target for GHG reduction to 55% from 1990 levels. Alessia first introduced the PRIMES model, and the improvements made to it, which were then used to examine the impacts of this increased target. A key result is that although the supply side of the energy system is decarbonising relatively rapidly, action on the demand-side must substantially increase. However, the power sector must reach carbon-neutrality by 2040, driven by improved price signals and regulatory infrastructure. On the demand-side, renovation rates of existing buildings must double from 1% to 2% per year, which is a particular challenge, and must be driven by broad and deep policy to reduce market and non-market barriers to this end.

The discussion was led by **Ilkka Keppo** (Aalto University). He believed these presentations were very timely in examining critical issues of what is required now to achieve these medium- and longer-term targets. However, one thing that cuts across all these issues is ‘feasibility. Models look at technical and in some cases economic feasibility, but they are less suited for examining political feasibility, for example, with such things usually externalised from the analysis. He also found it interesting that there were certain elements that were central to all scenarios, particularly electrification, and the deployment of substantial levels of renewables and CO₂ removal or CO₂-negative technologies. Care needs to be taken over assumptions used in models; an example is the rapid reduction in cost in solar PV, which for many years was

underestimated, and meant that scenarios did not deploy them as much as they are now likely to be deployed on economic competitiveness alone.

3.6 *Decarbonisation and equity*

Cristina Peñasco (University of Cambridge), chaired the second session of the day, on ‘Decarbonisation and equity’.

The first presentation in this session was delivered by **Benjamin Sovacool** (University of Sussex), focussing on ‘the ethics and justice of low-carbon transitions’. He outlined that issues of equity in the drive for decarbonisation are multifaceted and international, with many low-carbon technologies (and those they displace) having many different impacts. ‘Energy justice’, including issues of costs, benefits, procedures and recognition, which must be taken into account in decarbonisation pathways and choices. Research on key cases around Europe found 128 different types of co-benefits and 120 different types of injustices. In other case studies, various macro-, meso- and micro-injustices were identified around the world, many of which often affect the most vulnerable groups. More sophisticated research approaches are needed to examine these issues in more detail, but political and policy analysis must also capture and appropriately recognise and deal with these issues.

The second presentation was delivered by **Francesco Vona** (Science Po), on ‘climate policies, green stimulus and labour market outcomes’. He highlighted that there is a highly polarised debate on the labour market impacts of decarbonisation. There are some known facts: the aggregate effects of carbon pricing on employment are small, but although it may reduce jobs in polluting sectors, the creation of new employment opportunities is not ensured. The level of reallocation from polluting to green sectors is the key metric, with ‘skill distance’ between ‘brown’ and ‘green’ is highly deterministic (the smaller the distance, the easier the reallocation). The job multiplier of ‘green’ jobs is much higher than ‘brown’ jobs, giving evidence that this is where economic stimulus packages should focus in future.

Jim Skea (Imperial College London) led the subsequent discussion, particularly from his perspective as Chair of the Scottish Government’s Just Transition Commission. There are a few themes that are particularly important to bear in mind. The first is on the scope of what a ‘just transition’ is – is it sector focussed, or more broad (including demand-side)? On the demand-side, energy poverty and its association with electrification is very interesting, particularly as the costs of low-carbon policies are often added to electricity prices. Issues of high upfront costs for e.g. electric vehicles may also be an increasing issue. Issues of ‘place’ is key, but quite subtle. The transition process itself is an important consideration, particularly issues of timing of emergence of new jobs and the decline of others.

3.7 *Policies toward transformation*

Paul Drummond (University College London), chaired the penultimate session of the day, on ‘Policies toward transformation’.

The first presentation in this session was delivered by **Robert Pietzcker** (Potsdam Institute for Climate Impact Research), focussing on ‘strengthening the EU ETS’, and other supporting policy instruments under increased EU targets for 2030. Robert outlined the model that was used to analyse the role of the EU ETS in the power sector under these conditions. A key result was that the EU ETS cap must become tighter and prices rise substantially (to above €100/tCO₂), to drive a strong expansion of solar PV and wind, with fossil fuel almost completely phased out. The economic impacts would be minor, with small increases in total system costs, and marginal

increases of electricity prices. However, to achieve this, expectations of high carbon prices must be established, principal-agent and chicken and egg problems must be overcome, workers must be trained to deliver the transition, and consumer inertia must be addressed. Various measures are available to tackle these problems.

The second presentation was delivered by **Panagiotis Fragkos** (E3 Modelling), on ‘socioeconomic and industrial impacts of decarbonisation: the role of CBAM’. A key insight is that the total costs of the transition will be low, but the issue will be on issues of structural change. Policies must be in place to minimise the negative economic impacts of the transition. The model used to analyse this question was described. Key options are effective recycling of EU ETS revenues to R&D and worker retraining, and a carbon border adjustment mechanism can prevent carbon leakage, but implementation barriers can remain.

Toon Vandyk (European Commission) led the subsequent discussion. He believed the insights generated are closely aligned with questions currently only on the table in the EU policy cycle. Important point that both carbon pricing and other supporting policies are needed. But, issues of equity and justice are very important when implementing such policies.

3.8 Policy for net zero: what do policy makers need to know?

The final session of the conference was a panel session, Chaired by **Paul Ekins** (University College London) with **Elizabeth Press** (IRENA) and **Peter Vis** (European University Institute) presenting their thoughts on what they have heard over the day, and attempting to answer the question posed in the session title. **Maja Goepel** (The New Institute) was also scheduled to speak, but was unable to attend at the last minute.

Peter Vis sought to highlight five key problem areas. These were: (1) The finalisation of the European Climate Law, which reopened previously closed issues; (2) the CBAM proposal, which is a new innovative approach, which will take time to ‘bed-in’, with a risk of turbulence from third-country opposition; (3) the EU ETS extension to buildings and transport, which will bring much greater issues of justice and equity than has previously been induced; (4) the stringency of the EU ETS, which must become tighter through some mechanism to achieve new 2030 targets; and (5) LULUCF regulation, which at the moment is not very stringent, and must move to encourage or require net negative emissions.

Elizabeth Press agreed with many of the points that Peter Vis raised, but had a few other reflections. She highlighted that the energy transition is beyond simple fuel replacement – it is instead a whole new system. She also highlighted that in general, although there are some specific areas of uncertainty, we know where we are going in broad terms with regard to technology, and that this breaks down ultimately into six renewable energy resources. This can completely change the perception of energy security, in a positive way, as every country has renewable resources of some manner. A further point is that sectoral divisions are becoming blurred, with various deep interactions, which needs cross-sectoral policy making that many countries are currently lacking. It is also very important to consider how to overcome the practical issues with implementing effective policy frameworks for the low-carbon transition.

3.9 Closing remarks

Simone Borghesi (European University Institute) offered some final thoughts to close the conference. He believed that as the stringency of European targets and ambition increased as the project advanced, this posed challenges, but was encouraging. He believed the depth and breadth of research on the project on different aspects was impressive, with many great ideas to

learn from. He suggested that communication is absolutely key to achieving our climate goals, that equity is essential to consider, and high carbon prices are important – but feasibility considerations must be addressed. It would be interesting to arrange a conference in a few years time, to understand the impact the INNOPATHS project and research will have had.

4 Annex 1 – Registration list

First Name	English name of Institution	Country
Oluwaseun	Powerchina Huadong Nigeria Limited	Nigeria
Bertrand	Council of the Environment for the Brussels-Capital Region	Belgium
Mario	Consulting	Austria
Ilham	Trans Adriatic Pipeline AG	Switzerland
Helene	University College of London	United Kingdom
Lara	RFF-CMCC EIEE	Italy
Pia Lovengreen	World Access to Modern Energy	Italy
Nadia	University College London	United Kingdom
Sofie	Nordic Innovation	Norway
Robin Phillip	University of Basel	Switzerland
Sergio	Florence School of Regulation	Italy
Rainer	BACHER ENERGY LTD	Switzerland
Rossella	University of Florence	Italy
Alexander	Alexander Barnes	United Kingdom
Simone	University of Siena	Italy
Francois	Agency for the cooperation of energy regulators	Slovenia
Sławomir	Warsaw University of Technology	Poland
Arielle	University of Bologna	Italy
Robert	Energy Regulatory Office	Poland
Elena	Florence School of Regulation	Italy
Simone	European University Institute	Italy
Charlotte	SYSTEMIQ, Technical University of Munich	Germany
Joanna	Energy Regulatory Office (Poland)	Poland
Mariaester	Euro-mediterranean center on climate change (CMCC)	Italy
Diego	Centrale Supelec	France
Fatma Cigdem	Istanbul Okan University	Turkey
Yiqun	GAZPROM Germania	Germany
Pierre-jean	escpe	France
Metehan	University College London	United Kingdom
Enrico Luca	University of Verona	Italy
Luis	Potsdam Institute for Climate Impact Research	Germany
Edoardo	Bocconi	Italy
Daniel	International Energy Agency	France
Carlos M	Cuervo Abogados	Argentina
Vaclav	RWE Gas Storage	Czech Republic
Francisco	Enagas SA	Spain
Alonso	University of Strasbourg	France
Alessia	E3Modelling	Greece
Aurelie	Belgian Petrol Fed	Belgium
Jos	EUI	Italy

Ian	European University Institute	Italy
Danielle	Federal Planning Bureau	Belgium
Martina	European Regions Airline Association	United Kingdom
Laura	University of Cambridge	United Kingdom
Francisco	University College London	United Kingdom
Elena	Council of European Energy Regulators	Belgium
Piero Carlo	Florence School of Regulation	Italy
Katarzyna	European Commission	Belgium
Paul	University College London	United Kingdom
Oreane	PBL Netherlands Environmental Assessment Agency	Netherlands
Florian	ETH Zurich	Switzerland
Paul	University College London	United Kingdom
Silvia	S&P Global Platts	United Kingdom
Christopher	Mitsubishi Heavy Industries	Belgium
Albert	European University Institute - FSR Climate	Italy
Maria Evangelina	University of Bristol	United Kingdom
Carolyn	VU Amsterdam, U Ottawa, and RFF	Netherlands
Panagiotis	E3Modelling	Greece
Rachel	University College London	United Kingdom
Francesco	University of Hamburg	Germany
Frank	Federal Environmental Agency (UBA)	Germany
Giulio	Florence School of Regulation - Climate	Italy
Jose	University of Barcelona	Spain
Mona	Ghalayini for Trade & Turnkey	Lebanon
Francesco	Politecnico di Torino	Italy
Kirsten	E.DSO for smart grids	Belgium
Laure	United Nations	Burkina Faso
Maja	THE NEW INSTITUTE	Germany
Daniel	VU Amsterdam	Netherlands
Bojan	Autonomous University of Madrid	Spain
Azhan	UTP Malaysia and FFU FU Berlin Germany	Malaysia
Lukas	Wuppertal Institute	Germany
Anne	SciencesPo, Paris	France
Xiao	Swedish University of Agricultural Sciences	Sweden
Weiming	European University Institute	Italy
Omar	Elia Grid International	Belgium
Elia	Janina Ionescu Law Firm	Romania
Nick	University of Brighton	United Kingdom
Lilia	The European Network of Transmission System Operators for Gas	Belgium
Zivile	Agency for Cooperation of the Energy Regulators	Slovenia
Ara	Swiss Federal Institute of Technology	Switzerland
Bhargav	DTU	Denmark
Thomas	E3Modelling	Greece
Rozeta	Energy Community Secretariat	Austria
Ilkka	Aalto University	Finland
Javad	Tallinn University of Technology	
Yeong Jae	RFF-CMCC European Institute on Economics and the Environment	Italy
Ferenc	Central European University	Austria
Olga	University of Warsaw	Poland

Pramod	Central Electricity Board	Mauritius
Sergey	University of Cambridge	United Kingdom
Katarzyna	Warsaw University of Technology	Poland
Malgorzata	Energy Regulatory Office	Poland
Maximilian	Gazprom Germania	Germany
Marta	Ecorys	Belgium
Antonia	Tinbergen Institute	Netherlands
Madalena	Portuguese Renewable Energy Association	Portugal
Francesca	Euro-Mediterranean Center on Climate Change	Italy
Deyu	University of Cambridge	United Kingdom
Elena	Basque Centre for Climate Change	Spain
Lorenzo	University College of London	United Kingdom
Nicole	Swiss Federal Office of Energy	Switzerland
Júlia Terra	National University of Ireland Galway	Ireland
Silvia	Potsdam Institute for Climate Impact Research	Germany
Tomas	EirGrid	Ireland
Igor	Edison	Italy
Carolina	Redes Energeticas Nacionais	Portugal
Miguel	ACER	Slovenia
Hiroyuki	Marubeni Europe plc	United Kingdom
Elena	E3Modelling	Greece
Elisa	University of Florence	Italy
Jing	UCL	United Kingdom
Laurie-anne	European Investment Bank	Luxembourg
Melanie	UW-Madison	United States
Claire	International Emissions Trading Association	Switzerland
Daniel	University of Cambridge	United Kingdom
Eva	University of Bologna	Italy
Marie	Sibelga	Belgium
Inês	Center for Management Studies of IST	Portugal
Ronan	Independent researcher	Belgium
Julia	SYSTEMIQ	United Kingdom
Sara	University of Valladolid	Spain
Michael	Potsdam Institute for Climate Impact Research	Germany
Luis Ignacio	Enagas, S.A.	Spain
Cristina	University of Cambridge	United Kingdom
Bartłomiej	Energy Regulatory Office	Poland
Milan	SYSTEMIQ	Germany
Chiara	Italian Authority for Energy Networks and Environment	Italy
Robert	Potsdam Institute for Climate Impacts	Germany
Pablo	European Parliament	Belgium
Martin	ZSSK CARGO	Slovakia
Friedemann	Utrecht University	Netherlands
Elizabeth	International Renewable Energy Agency	United Arab Emirates
Giorgia	University of Bologna	Italy
Emilien	CentraleSupelec, CIRED	France
Filippo	Hera Group S.p.A.	Italy
Heidi	GRTgaz	
Luiz	University of Lisbon	Portugal

Luis Fernando	LIKEN CARBON HUB	Spain
Hannelore	Eni Spa	Italy
Renato	Potsdam Institute for Climate Impact Research	Germany
Marta	Institute of Environmental Protection – National Research Institute The National Centre for Emissions Management	Poland
Olena	DTEK	Ukraine
Eirik	Skagerak Kraft AS	Norway
Manuela	Paprika Consulting	Belgium
Francis	Dunelm Society	United Kingdom
Daniel	University College London, Energy Institute	United Kingdom
Tobias	ETH Zurich	Switzerland
Joachim	Allianz Climate Solutions GmbH	Germany
Rafael	International Air transport association	Spain
Fernanda	ENI	Italy
Teodora	European University Institute, Florence School of Regulation – Transport	Italy
Ronaldo	State University of Rio de Janeiro	Brazil
Joao	European Commission	Belgium
Ana	Galp	Portugal
Pelopidas	E3-Modelling	Greece
Tadeusz	Warsaw University of Technology	Poland
Sławomir	Energy Market Agency	Poland
Emilia	University College London	United Kingdom
Christos	European Investment Bank	Luxembourg
Saša	Consultant	Sweden
Benjamin	University of Sussex	United Kingdom
Marc	European Commission	Netherlands
Bjarne	ETH Zurich - Swiss Federal Institute of Technology	Switzerland
Fred	University of Westminster	United Kingdom
Richard	Institute for Advanced Sustainability Studies	Germany
Zeljko	University of Zagreb Faculty of Electrical Engineering and Computing	Croatia
Raphael	Rexecode	France
Lidia Natalia	Marie Curie Alumni Association	Belgium
Adilkhan	Court of the Eurasian Economic Union	Kazakhstan
Richard	Nebula 42	Hungary
Yuliya	Federal State Autonomous Body' Research Institute' Environmental Industrial Policy Centre'	Russia
Alena	Ormazabal Corporate Technology	Spain
Michaela	Czech Technical University in Prague	Czech Republic
Stijn	Yale University	United States
Jens	EUI	Italy
Jana	Energy Regulatory Office	Czech Republic
Stefano	EUI	Italy
Elena	University of Brescia and RFF-CMCC European Institute on Economics and the Environmenta	Italy
María	International Renewable Energy Agency	Germany
Pekka	Fortum Power and Heat Oy	Finland
Peter	European University Institute	Italy
Francesco	OFCE SciencesPo	France
Samuel	Environment for Development	Sweden

Izabela	Energy Regulatory Office	Poland
JØrgen	The Fridtjof Nansen Institute	Norway
David	CoF Limited	United Kingdom
Sonia	Chalmers University of Technology	Sweden
Daria	MIREA - Russian Technological University	Russia

5 Annex 2 – Agenda
