ENVIRONMENT & NATURAL RESOURCES PROGRAM

Workshop on

Climate Strategies Post-COP21 and Sustainable Economies in Europe

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HARVARD Kennedy School
BELFER CENTER
for Science and International Affairs

POST-WORKSHOP REPORT

FLORENCE, ITALY | 1 JULY 2016

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Design & Layout by Andrew Facini

Cover photo: Florence at night as seen from the Piazzale Michelangelo, Sept. 2011.
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Printed in the United States of America

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Co-organized by the Environment and Natural Resources Program at the Belfer Center for Science and International Affairs, Harvard Kennedy School of Government, Aspen Institute Italia and the Italian Ministry for the Environment, Land and Sea

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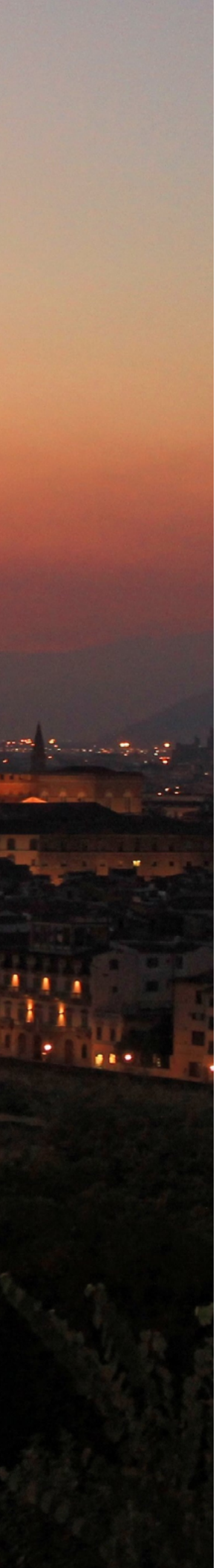
Acknowledgements

This workshop was supported by a gift to the Sustainability Science Program at Harvard University from Italy's Ministry for the Environment, Land and Sea. The authors are grateful to the workshop speakers and participants for their enthusiastic engagement and insightful thoughts. The authors are grateful to the Italian Ministry for the Environment, Land and Sea for their financial support for both this workshop as well as for associated background materials. All responsibility for any errors or misjudgments contained herein rests solely with the authors.

Table of Contents

Florence at night as seen from the Piazzale Michelangelo, Sept. 2011. (Jörg Bittner/CC BY-SA 3.0)



Introduction

In September 2015, the UN adopted its 17 Sustainable Development Goals (SDGs) that aim to solve the world's most pressing problems by 2030. *Affordable and Clean Energy*, *Sustainable Cities and Communities* and *Climate Action* were three of these 17 overarching goals. This commitment to climate action and energy transition by Heads of State around the world was further enhanced by the climate agreement at the 21st Conference of the Parties (COP21) in Paris and subsequent signing of the Paris Agreement on Earth Day April 2016. At the European level, sustainable energy is currently at the forefront of the European agenda with ongoing talks concerning the implementation of ambitious 2030 climate and energy goals and the Energy Union strategy, which aims to provide secure, affordable and climate-friendly energy for Europe.

Building on this momentum and Italy's intent to put forward a national program flowing from these agreements, the Environment and Natural Resources Program at the Harvard Kennedy School, Aspen Institute Italia and the Italian Ministry for the Environment, Land and Sea convened a workshop in Florence, Italy on July 1, 2016 to discuss the Post-COP21 climate strategies and efforts to realize sustainable economies in Europe. The objective of the workshop was to provide a safe environment where policy makers, academics and industry leaders could come together and discuss how Europe could achieve a lower carbon energy transition.

The workshop consisted of three main sessions: (1) How to achieve the EU2030 and 2050 goals; (2) how energy technology innovation can be spurred to create more options; and finally (3) what financial advances are necessary to fund these efforts. The agenda detailing the speakers and moderators of each session can be found in Appendix A.

All sessions were held *off-the-record* to facilitate open and candid discussion. This *not-for-attribution* post-workshop report summarizes the highlights of the discussions, without attributing any views or comments to specific individuals. It is not a consensus document, since no effort was made at the workshop to arrive at a single consensus view. Rather, the report represents a synthesis of the main points and arguments that emerged from the discussion.

Session 1
The Roadmap After Paris: Scaling Up Europe's Low-Carbon Transition

The session speakers agreed that the EU can achieve its 2020 and 2030 sustainability goals, but challenges will likely arise with regard to longer-term goals of decarbonization in the period 2040 and beyond. Few concrete plans exist on how to achieve a deep transformation of the energy system beyond this point.

In Europe as well as globally, at least a portion of the financing for the transition will need to come from the private sector. Speakers estimated that additional investment of $650 billion in research and development, mitigation, and adaptation will be needed annually. To arrive at this elevated figure of investment, private sector resources need to be tapped and that in turn requires clear incentives and market signals to guide the private sector to realign its investment decisions. The framework created by the outcome of the UNFCCC COP21 in Paris helps in this regard because it provides a certain degree of investment security. However, the pledges made by countries in the form of Intended Nationally Determined Contributions (INDCs) are not the same as actual policy and implementation.

Some speakers were of the view that the strongest framework for investments would therefore be an international price signal for carbon, which would act as a backdrop for additional measures. The participants' views differed regarding the likelihood, practicality, and political feasibility of pricing carbon. There were divergent views on the feasibility of creating a regime, with more or less uniform carbon prices across vastly heterogeneous countries and regions. In the absence of such global coverage, leakage, or transferring emissions from one jurisdiction to another, could become a problem. A shift to consumption-based emissions accounting was suggested as a way to monitor and contain this issue.

Participants also discussed the need for additional policies to be considered, such as removing fossil fuel subsidies, phasing out coal, and

advancing climate finance. Large investments in renewable energy, especially in Europe, are seen as an encouraging first sign that the transition is underway.

Speakers noted the importance of designing energy transitions that can be sustained over the long term; regardless of changes in political leadership, fluctuating degrees of public support, and the competition for investment between different sectors of the economy. This requires governance frameworks that are stable and flexible at the same time. Plus, the responses to these challenges need to be politically robust, rallying a large number of constituencies.

Support for these policies needs to be earned by highlighting co-benefits, such as improved health or improved productivity from reductions in conventional pollution. Indeed, the growing divide between elites and civil society -demonstrated by events such as the UK "Brexit" referendum- suggests that new forms of civil society involvement in energy and climate policy are needed. The cost of climate disruptions should be communicated more clearly to the public. According to one participant, the damage to the EU environment alone is over $500 billion per year, while the current emissions from energy sources cause premature deaths of more than 400,000 EU citizens annually.

Session speakers discussed the question of whether climate policies should have decarbonization as their sole goal or whether the promotion of specific technologies should be pursued as well. Today many policies are targeted at promoting a specific technology (e.g. biofuels), while few are solely geared towards decarbonization. Some participants flagged this as an obstacle to getting policies aligned towards the overarching goal, namely climate protection, and pointed out potential inefficiencies linked to an approach that is not technology-neutral. Others pushed back on the idea of technology-neutral climate policies, since not all technology options are equally sustainable. They argued that governments have a role to play in choosing which technologies to pursue. However, choosing a specific technology is far from easy due to the tension between finding the optimal technology versus proceeding with the currently known solutions. Speakers noted that the current energy transition must be made over a time

horizon which is significantly shorter than any previous energy transition in history.

From a global perspective, a positive and important development is China's increased ambition to advance international climate efforts. This more proactive stance in international climate negotiations started with the Copenhagen climate summit. Although developments such as the agreement on setting national climate targets -reached between President Obama of the US and President Xi Jinping of China ahead of the 2015 Paris Climate Summit- are encouraging, participants noted that the challenges of implementing climate policies in China should not be underestimated. In particular, tensions between central and local governments, as well as regional disparities are challenging the implementation of climate policies. This issue was identified as being similar to governance challenges in the European Union, where tensions between the central EU institutions and the member states have become visible in recent negotiations for the EU2030 climate and energy framework as well as the Energy Union package.

As an overarching theme, speakers in this session saw international cooperation as essential to achieving progress in global climate protection efforts. While the Paris Agreement was seen as having laid a solid foundation, its successful implementation will depend on each country's ability to carry out their commitments and to cooperate in the absence of a strict top-down climate regime. The EU's role in such a climate architecture was briefly discussed as well. In particular, some participants suggested that Europe's longstanding climate leadership could be leveraged within "clubs of the willing". These clubs of countries which are ready to implement ambitious climate policies, could benefit their members through technology transfer and exclusive cooperation in research and development, which would facilitate a much larger cross-country and public-private cooperation than currently available. However, the question of how these clubs could remain attractive, and more or less exclusive, in an open global economy was raised. Participants acknowledged that it would be challenging to limit benefits through trade restrictions and tariffs, as suggested in some scientific proposals on climate clubs.

Session 2:
Innovation and Technology for Sustainable Energy: Comparing Best Practices

In the field of innovation, both Italy and the EU need to do more. In Italy, the intensity of all R&D activities is merely 1.3% of GDP, low in the ranking of EU countries. The overall EU figure is stable just above 2% of GDP, and still well below the 3% goal set by Europe for 2020.

More resources and funding are needed to address the energy technology innovation gap. Even though the cost of renewables has decreased significantly in recent decades, the existing rate of investment in clean energy technologies is not sufficient to realize the target set by the Paris Agreement (i.e. to limit the global average temperature increase to below 2°C above pre-industrial levels). One participant pointed out that in the OECD countries, share of energy has declined from 12% of public R&D spending in 1980s to around 3-3.5% today. Current low oil prices also pose challenges for renewable technology innovation, particularly in sectors such as transportation. Long-term investment is required to support EU's renewable energy target.

Apart from the need to increase the funding, there is debate on what should be done with the funds currently available. Some participants pointed out that, given the short time frame available to complete a low carbon energy transition, these funds should be spent on proven technologies that can make an impact in the short run. While others argued that current energy technologies will not get us to the climate targets established in the Paris Agreement, and hence more early stage research is needed to stimulate greater innovation.

Participants also raised questions about the level of government –central, regional or local- at which innovation policy could effectively be implemented. In the context of the EU, competencies and resource endowments vary between countries. This makes it hard for a single EU innovation

policy to be effective, since much of the capability to innovate remains at the member state level.

Many participants stated that cooperation at different stages of innovation, among different actors and sectors is crucial for innovation. Cross-sectoral cooperation between energy and infrastructure will allow power systems to be interconnected from Europe to North Africa. It would also allow Europe to scale up its clean energy technologies, such as Electrical Vehicles (EVs), which are heavily dependent on the availability of charging infrastructure -a prerequisite for consumers to purchase EVs.

Cross-country cooperation was discussed at some length. This type of cooperation was seen as a way to exchange experiences among countries and incentivize domestic innovation. Policies adopted by China in scaling up its EV market were cited as an example. Others pointed to the rapid increase in both scientific publications and value of intellectual property in China in the past ten years. In order to maintain its edge, EU needs to accelerate its rate of clean energy innovation, especially with renewables. Cooperation with China -a relationship that is currently not fulfilling its potential- was seen as a way to stimulate that.

Public-private sector cooperation was also cited as critical by many participants. There were calls for involving the private sector more in the design of public programs and allowing government funds to be managed by private organizations to increase their cost-effectiveness. However, there were also calls for caution in such engagements. Past experiences with the agriculture and pharma sectors yielded excessive control to the private sector on R&D funding decisions. The result was that the needs of certain factions of the society were ignored –particularly factions (e.g. young generations, lower income populations etc.) who had no means of influencing the direction of private investment. This produced an array of systematic unintended consequences such as, neglected diseases or crops that needed further study and investment. Some participants asserted the importance of giving both the public and private sector significant roles in the innovation process. The exact division of these roles was not clear, but a strong preference emerged for government involvement in the earlier stages of

innovation and over longer time frames, along with private sector lead in demonstration and deployment of more mature technologies.

Finally, cooperation between academia and policy makers was strongly encouraged, as data from ongoing government projects could help answer questions in the field of innovation; such as what projects need to be supported at which stage and by which amount. Insights from these studies could shorten the innovation lifecycles, bringing new technology options to bear on climate change problem, faster.

Session 3:
Financing Renewables: the Role of Institutional and Private Capital

Global investments in clean energy and energy efficiency are growing, but not quickly enough to get the world on track to achieve its ambitious long term carbon reduction goals. Europe's once world-leading clean technology industry has fallen into a decline, with investment in low-carbon energy last year reaching its lowest level in a decade.

Participants noted that the reluctance of global investors has been influenced by the currency crises, and by the prolonged political and economic uncertainty in the months before the "Brexit" referendum. However, it is the regulatory uncertainty about future policies that seems to play a crucial role in reducing the private investments in renewables. Companies and investors demand a predictable policy framework, if they are to assume the risks inherent in renewable energy options in an era of low cost fossil fuels. Consequently, participants noted that to reinvigorate investments in renewables, European countries and institutions should establish stable and long-term oriented regulatory frameworks. Several participants also suggested that policymakers should work towards the establishment of a true single energy market.

In this perspective, mobilizing private investments will be essential to relaunch investments in renewables and to meet climate change goals. Speakers highlighted that governments should leverage available public funding to mobilize much larger pools of private capital. One option would be to create 'green investment banks'. Such banks are established specifically to facilitate private investment into domestic and international low-carbon, climate-resilient infrastructure. Using innovative transaction structures, risk-reduction techniques, and local and market expertise, these banks can channel private investment into low-carbon projects. Green investment banks can reduce regulatory uncertainty and facilitate funding of smaller sized clean energy projects. In particular, they can: aggregate projects thus reducing the risk profile and hence, the cost of capital; they can securitize pooled green assets by issuing bonds; and they can play the role of anchor investors in financing of novel renewable energy technologies.

While green investments banks and green bonds can play an important role in the transition of the economy towards low-carbon standards, some speakers agreed that the changes needed by the financial system to advance such transitions should be wider and more profound. New market instruments have to be created to foster capital allocation in a sustainable way. The awareness of climate change risks should be promoted along with new metrics to quantify the impact of such risks on financial assets (the proposed climate change stress tests were put forward as an interesting innovation to that end). The managers and ultimate owners of financial assets should be held responsible for the climate change footprint of their assets. Shareholders' resolutions submitted in many countries to enhance the sustainability profile of companies, are a powerful example of climate changes issues gaining momentum. However, the stewardship of financial assets by institutional investors has to be promoted, especially in less developed countries where the enforcement of environmental rules is more lax, mostly due to a lack of capacity. Transparent reporting about corporate environmental footprints is pivotal in enhancing the dialogue between financial markets and companies. A speaker pointed to the Financial Stability Board's new task force on climate-related financial disclosures as an example of such an effort.

Some speakers reckoned that carbon pricing within a cap-and-trade system or a carbon tax could be a key factor in encouraging investments in renewables, and low carbon technologies generally. However, effective carbon pricing has faced some major difficulties so far; such as the apparent over-allocation of permits in the EU Emissions Trading System (ETS), the tendency to leave out key emitter sectors from these frameworks, and the issue of leakage to other jurisdictions without the availability of a global framework. Some speakers also raised a cautious note about the feasibility and effectiveness of proposed carbon pricing mechanisms. Their implementation appears extremely problematic from a political standpoint and may not ultimately help reach the goal.

Speakers agreed that government intervention in the financial sector plays an important role in the solution to the climate change problem. This is especially due to the presence of natural monopolies and the long investment payback times that characterize the energy sector, where only one actor needs to take on a large scale investment project with large upfront costs. These characteristics tend to lead to 'market failures' that call for state intervention or regulation. One such proposed intervention was aggregating projects and mobilizing private funds to create bigger, more unified markets that help steer private capital. Several participants pointed out that public-private partnerships were considered crucial in encouraging private investors. Participants also noted that public grants may not be sufficient to generate the amount of financing for clean energy needed over the next few decades due to the growing constraints on national budgets. This is particularly true for Europe where many countries are experiencing a downsizing of public investments because of severe fiscal austerity. As a result, there is currently a large gap between the investments being made on clean energy infrastructure with those that are needed to solve the climate challenge (up to a trillion dollars annually according to one participant's estimate). The financial transition currently underway needs to be scaled up and the cost of this scale up process will be enormous.

So far, the development of new clean energy technologies in Europe seems to be carried out mostly thanks to large corporate and government investments, while venture capital and private equity play a very limited role. In contrast, in the US, venture capital and private equity has been leading

the charge, pointing to an innovation financing ecosystem in the US far more developed than the European one. Although this gap is unlikely to be closed in the foreseeable future, some speakers highlighted that it is still necessary to consider interventions to stimulate the innovation financing landscape for clean technologies in Europe.

Concluding Observations

The workshop concluded with remarks from several participants on the timeliness of this discussion given the national climate plan Italy will have to put forward in the next year, and the need to reconcile efforts with those that are envisioned at the EU level. The day long discussion boiled down to several important observations and tensions that the policy makers will have to resolve going forward if the world is to have a chance of transitioning to a low carbon economy in time.

Two constraints that bind all proposed actions and potential solutions to the climate issue are limited time and limited financial resources. The urgency of the climate issue and the continuous competition for funds from other societal priorities shaped the workshop discussions. From government to private sector, to different administrative levels within and among governments, the question of who will bear the responsibility of oversight and funding remained open.

Reframing climate issues in terms of other societal priorities was seen as a potential way forward to break the competition for funds. By demonstrating the co-benefits climate action can have in various areas, such as public health and economic development, factions of the society that currently do not view climate change as a high priority issue can be engaged and political support can be augmented. Such a framing can also help policy makers design more flexible policies that can endure through changing leadership and create the lasting change that is necessary.

There was also an ongoing tension about making investments today with well-established technologies versus investing in further research

to potentially come up with better technologies that are more efficient in achieving the end goals. The trade-off stems from the uncertainty that lies at the heart of the innovation process. The success of such an experiment is not a given. Hence, an appeal was made for governments to share more data with academia to better understand innovation processes.

Finally, financing was seen as a critical enabling mechanism, both for innovation and deployment of well-established clean energy technologies. Certain interventions by the governments, such as the establishment of green investment banks, aggregation of projects and creation of bigger and more unified markets, were proposed to mend the market failures in this area. The EU was also encouraged to follow in the footsteps of the US financial services industry and enlarge its venture capital and private equity capacity.

Appendix A: Workshop Agenda

Friday, 1 July
Working sessions to be held at the Westin Excelsior hotel – piazza Ognissanti, 1

11:00am-11.30am Welcome coffee

11:30am-1:00pm First Session

The Roadmap after Paris: Scaling up Europe's Low-Carbon Transition

- What are the implications of the Paris Agreement for Europe's low carbon energy strategy?
- What needs to be done to scale up Europe's ambitions beyond the EU2030 goals, towards 80-95% de-carbonization?
- What are challenges for the implementation of the EU2030 renewables strategy and what additional efforts are needed to get to at least 55% renewables by 2050 as suggested by the EU2050 Roadmap?
- How can Europe's low-carbon transition be linked to its partners', in particular the US and China? What lessons can be drawn from different approaches?
- What is Europe's strategy for encouraging transitions in developing countries, in particular related to the 100 billion USD pledge agreed in Paris?
- Can we achieve the ambitious Paris goals without the use of efficient and effective carbon pricing and without removing energy harmful subsidies, as suggested by OECD, WB and IMF?

Chair and introduction

Henry Lee, Senior Lecturer in Public Policy and Jassim M. Jaidah Family Director, Environment and Natural Resources Program, Belfer Center for Science and International Affairs, Harvard Kennedy School, Cambridge, MA

Marta Dassù, Senior Director European Affairs, The Aspen Institute

Kick-off speakers

Carlo Carraro, President Emeritus, University of Venice; Professor of Environmental Economics, Ca' Foscari University of Venice; Scientific Director, Fondazione Eni Enrico Mattei (FEEM), Venice

Cao Hui, Researcher, Institute of European Studies, Chinese Academy of Social Sciences, Beijing

William C. Clark, Harvey Brooks Professor of International Science, Public Policy and Human Development, John F. Kennedy School of Government, Harvard University, Cambridge MA

Xavier Labandeira, Director of FSR Climate, European University Institute, Florence

Simone Mori, Head of European Affairs, Enel; Chairman Assoelettrica

Discussion

1:00pm-2:30pm Lunch

2:30pm-4:00pm Second Session

Innovation and technology for sustainable energy: comparing best practices

- What is the scale of the technological change needed and what are the technological options for high-renewables scenarios in Europe? Do we need new technologies to get the European energy transition on the ground?
- Will we even need utilities in the future, when virtual power plants, prosumers and super-smart grids replace the functions of traditional utilities?
- What are the main obstacles to technological innovation and deployment in the renewable energy sector in Europe today?
- What international best practices can be taken into account to foster R&DD in sustainable energy in Europe?
- Are best practices sufficient? How can we guarantee that the top 5% firms, cities and consumers, are followed by the 95% of the economy?
- How can we guarantee that technological innovation reaches diffusion in time for respecting climate change targets and planetary boundaries?

Chair & introduction

Jean-Michel Glachant, Director, Florence School of Regulation; Holder, Loyola de Palacio Chair, European University Institute, Florence

Kick-off speakers

Carlo Maria Medaglia, Chief Scientist, Ministry of Environment Land & Sea, Rome

Laura Diaz Anadon, Assistant Professor of Public Policy, Harvard Kennedy School of Government, Cambridge, MA, Visiting Senior Lecturer in Science, Technology, Innovation and Public Policy, University College, London

Kamel Ben Naceur, Director for Sustainability, Technology and Outlooks, International Energy Agency, Paris

Marzena Rogalska, Head of Sustainable Industrial Policy and Construction Unit, Directorate General of Enterprise and Industry, European Commission; Fellow Harvard University - Weatherhead Center for International Affairs, Cambridge, MA

Discussion

4:00pm-4:15pm Coffee break

4:15pm-5:30pm Third Session

Financing renewables: the role of institutional and private capitals

- Why is there no Silicon Valley for clean-tech in Europe? What are the opportunities for Venture Capital and alternative financing sources in renewables-related technologies?
- Is the risk/return profile of financial products related to climate change adequate? What are the evidences across the various financing instruments?

- What are the challenges for carbon finance?
- What is the role of institutional and private capital investments in renewables and what regulatory/ policy interventions are needed?
- The role of energy regulation.
- Is circular economy a viable response? Can resource efficiency, the analysis of energy and material flows and sustainable materials management concepts help?

Chair & introduction

Alessandro Profumo, President, Equita SIM, Milan

Kick-off speakers

Beatrice Lamonica, ICEG Sustainability Lead, Accenture Strategy, Rome

Rob Youngs, Program Director, Coalition for Green Capital, Washington, DC

Nick Robins, Co-Director, Inquiry into the Design of a Sustainable Financial System at UNEP, Geneva

Garrett Blaney, Chairperson , Commission for Energy Regulation, Dublin

Pasquale Salzano, Executive Vice President Government Affairs, Eni, Rome

Discussion

5:30pm Concluding remarks

7:00pm *Transfer from the hotel to Badia Fiesolana (Via Roccettini 9 – San Domenico di Fiesole)*

Cocktails and dinner hosted by the European University Institute EUI

7:30pm Welcome

Vincenzo Schioppa Narrante, Secretary General, European University Institute

Dinner debate

- The energy union: project or reality?

Special guest speakers

Monica Frassoni, President, European Alliance to Save Energy, Brussels

Matteo Del Fante, Vice President, Entso-E European Network of Transmission System Operators for Electricity; Chief Executive Officer, Terna, Rome

Moderated by

Mircea Dan Geoana, President, Aspen Institute Romania, Bucharest

Closing dinner

Appendix B: List of Participants

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European Alliance to Save Energy
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Mircea Dan Geoana
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Jean Michel Glachant
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Florence School of Regulation;
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European University Institute
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Federico Golla
Chairman and CEO
Siemens
Milan

Ivan Hodac
President
Aspen Institute Prague
Prague

Andrea Innamorati
Senior Policy Advisor
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Non Executive Director
Carbon Trust
London

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