

Summary of the thematic dialogue on industrial energy efficiency and material substitution in carbon intensive sectors

United Nations Campus, Bonn, Germany
29 March 2017

Summary

- The Technology Executive Committee (TEC) held a thematic dialogue on industrial energy efficiency and material substitution in carbon intensive sectors, including financing, training, and co-benefits aspects.
- This document provides a summary of the thematic dialogue, covering the proceedings of the event, a summary of the presentations and ensuing discussions as well as of the work and outcomes of break-out groups.



I. Introduction

A. Background

1. As per decision 1/CP.21 paragraph 109(c) and in line with its rolling workplan for 2016-2018,¹ the Technology Executive Committee (TEC) agreed to conduct work on mitigation technologies, including an analysis of mitigation related policy options from the Technical Examination process (TEP), technology actions plans (TAPs) and requests to the CTCN for technical assistance.²
2. The analysis showed a gap with high interest but low experiences in the envisaged plans and existing policy options, especially for energy efficiency (EE) policies in the industrial sector. Taking forward these findings and building on previous work within the convention, the TEC, at its 13th meeting, requested its taskforce on mitigation to prepare a technical paper and to hold a thematic dialogue at its first meeting in 2017 on industrial energy efficiency and material substitution in carbon intensive sectors, including financing, training, and co-benefits aspects of this sector.
3. As part of its 14th meeting, the TEC held a thematic dialogue on industrial energy efficiency (ind. EE) and material substitution in carbon intensive sectors on 29 March 2017 on the United Nations Campus in Bonn, Germany.³

B. Scope of the document

4. This document provides a summary of the thematic dialogue, covering the proceedings of the event, a summary of the presentations and ensuing discussions as well as of the work and outcomes of break-out groups.
5. In addition to this document, it should be noted that the thematic dialogue can be viewed via recorded webcast ⁴, and all presentations made during the dialogue are available on the TEC webpage of the technology information clearing house (TT:CLEAR).⁵

II. Proceedings

A. Objective and structure

6. The objective of the thematic dialogue was to support the TEC in enhance the understanding on measures and technologies for ind. EE, its potentials and limitations, undertaken by various industries partnerships and programmes; to identify existing policy options, needs, and actions related to the field of ind. EE, with a focus on financing, training, and co-benefit aspects deriving from these measures. Further, to identify lessons learned and best practices and to identify ways to strengthening energy efficiency measures to replicate and upscale the implementation of technologies for EE and enhancing pre- and post-2020 mitigation action.
7. The thematic dialogue consisted of five sessions:
 - (a) Session I: Setting the stage: Overview of state of play;
 - (b) Session II: Case studies: Sharing experiences and lessons learned;
 - (c) Session III: Panel discussion: Upscaling of ind. EE to meet the demand of a low carbon future;
 - (d) Session IV: Break-out groups: Implications and potentials for the work of the TEC;
 - (e) Session V: Follow-up plenary: Conclusion and wrap up.

¹ <<https://goo.gl/fWWCPv>>.

² <<https://goo.gl/YIAxhV>>.

³ <http://unfccc.int/ttclear/events/2017_event1>.

⁴ <<https://unfccc-events.cloud.streamworld.de/ondemand>>.

⁵ <http://unfccc.int/ttclear/events/2017_event1>.

B. Participation

8. The thematic dialogue was attended by members of the TEC, resource persons, observers from Parties, United Nations organizations, intergovernmental and non-governmental organizations, and members of the UNFCCC secretariat. Altogether some seventy participants attended the dialogue.

9. Twelve experts made presentations in the thematic dialogue, representing perspectives from various regions including developed and developing countries and a wide range of expertise, that is academia, implementing agencies, industry, international organizations, and financial institutions.

10. Online stakeholders were able to participate in the discussions via social media by tweeting questions and comments for the consideration of the participants, by using the Twitter hashtag #climatetech.

III. Summary of the sessions

A. Welcome and opening

11. Mr. Michael Rantil, Chair of the TEC, opened the thematic dialogue by welcoming participants and highlighting the importance and relevancy of addressing ind. EE, as previous TEC work had shown a gap, with high interest, but low experiences in envisaged plans and existing policy options.

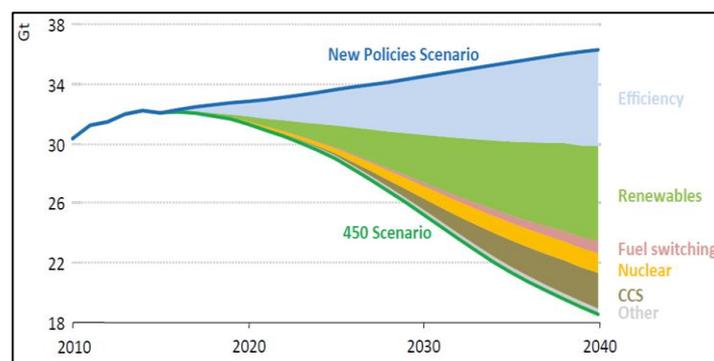
12. The TEC Chair emphasized that the huge potential of energy efficiency measures for mitigation is widely acknowledged and that the TEC sees an opportunity by holding this dialogue to inform and improve awareness among policy and decision-makers to scale up implementation of energy efficiency policies in carbon-intensive sectors. He added the importance of holding this dialogue to further identify enablers and obstacles for the development and transfer of innovative technologies, as well as partnerships and programmes with the potential to maximize the impacts of ind. EE measures.

13. Mr. Rantil thanked the TEC task force on mitigation for its work to organize the thematic dialogue and introduce features such as the use of break-out groups and panel discussions. He further outlined the objective and expected outcomes of the thematic dialogue, encouraging participants to engage in the discussion, including online stakeholders through Twitter.

B. Session I: Setting the scene -Current state of play, issues and fundamentals of ind. EE-

14. The first session was moderated by Mr. Antonio Pflüger, a former TEC member and Head of Division at the Federal Ministry of Economics and Technology, Germany. An introductory presentation was given by Mr. Benoît Lebot, the Executive Director of the Secretariat for International Partnership for Energy Efficiency Cooperation (IPEEC), who underlined the potential of ind. EE measures in the global efforts to reduce GHG emissions, as contained in nationally determined contributions (NDCs) and beyond, to limit the global temperature rise (see figure 1). He also highlighted the potential of general EE measures on the demand rather than supply side, in achieving the necessary reductions.

Figure 1: Global emissions savings potential in 450 Scenario relative to the New Policies Scenario:



15. The second presentation, held by Mr. Lars Nilsson from Lund University, Sweden, shed light on measures to be undertaken for decarbonising the energy intensive basic materials industry by increasing material, energy, and emission efficiency. He identified system innovation, including technology push and market pull, together with building institutional capacity as key policy implications in order to enhance these efforts in the long-term.

16. The third intervention by Mr. Mikael Henzler, managing director of adelphi from Berlin, Germany, summarized main findings of a technical paper commissioned by the TEC to draw an accurate and objective assessment of the development and transfer of technology in ind. EE worldwide, with a special focus on financing, training, and co-benefits aspects. Mr. Henzler complemented the setting-the-scene-session with lessons learned from his analysis and various case studies (see table 1).

Table1: Findings from technical paper: Effective policies to address certain barriers:

Barriers	Suitable Policies		
Lack of Financial Resources / Capital Access, Transaction Costs	Economic Instruments	Financial Incentives	
		Direct Investment	
		Market-based Instruments (e.g. certificates trading)	
Lack of Awareness / Understanding	Information	Information Campaigns Performance Label	
	Deployment	Demonstration Projects	
Lack of Technical Know-How	Education	Professional Training Aid in Implementation	
		Regulatory Instruments	Auditing Codes & Standards Monitoring Obligation Schemes
Deployment	Demonstration Projects		
Energy Price Subsidies	Economic Instruments		Fiscal Instruments (fading out of subsidies / carbon pricing)
			Policy Support
Access to Technology	Economic Instruments	Market-based Instruments (incl. technology transfer)	
	Research & Development	Research Programs	
Equipment Downtimes, Technology Lock-In	Economic Instruments	Financial Incentives	
	Regulatory Instruments	Codes & Standards	

17. The ensuing discussion focussed on how to share best practices and the problem of data availability for initial assessments in ind. EE. Some participants also suggested that key challenges in promoting the energy efficiency in industries include the need for behavioural change in industry. In developed countries, for example, its often a matter of return and investment: industries are not keen to take short-term risks of losing productivity and revenues during major energy efficiency measures' implementation. In contrast in developing countries, participants pointed out that challenges are more diverse: from general energy access and security as a development issue to the lack of awareness of industrial EE potentials for small-medium enterprises (SMEs). Drawn from the experience of conducting the technical paper, the TEC noted that the availability and quality of information on ind. EE measures, including best practice case studies is still somehow hidden and that meta studies, like evaluation reports of EE programmes, are important to capture and disseminate this valuable information.

C. Session II: Sharing experiences and lessons learned -Enablers and challenges from innovative business models-

18. The second session was moderated by Mr. Eric Masanet, head of the Energy Demand Technology Unit at the International Energy Agency (IEA). The session included case studies from industries, like steel and power generation, followed by a regional and national scope on ind. EE measures. The speakers provided insights on enablers and challenges from their specific perspectives.

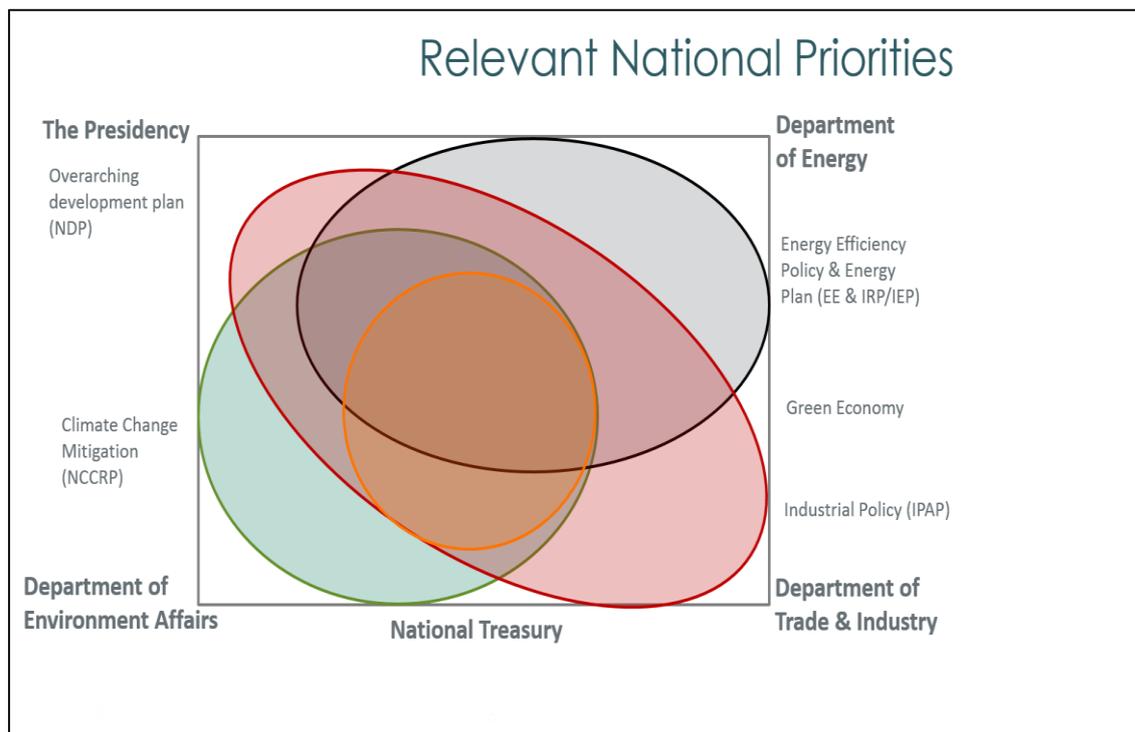
19. A developed country case study was provided by Mr. Hiroyuki Tezuka, in capacity as member of the Japan Iron and Steel Federation, who presented lessons learned in EE in the Japanese steel sector over

the last decades. He reported a 30 percent increase in EE in the Japanese steel sector since the 1970s by promoting various investments for R&D and implementation of other energy saving technologies, which makes the Japanese steel industry the lowest energy intensity (unit energy consumption per ton of crude steel) among the world's major steel producing countries. He further elaborated on an example for technology and knowledge transfer between Indian and Japanese iron and steel industries, which enables the Indian steel industry to achieve a CO₂ emission reduction of 13 megatons per year.

20. A case study from developing country was given by Ms. Jing Ding from the International Cooperation and Overseas Business Development of China. She talked about EE measures in the power generation sector for coal-fired power plants. In her presentation, Ms. Ding highlighted the policy measures being taken in order to enhance EE, like the Action Plan for Efficiency Upgrading of Power Plant for 2014-2020, which endorses a number of energy-saving technologies as reference for the energy service industry. Main challenges, in her view, remain the need for capacity building among employees, the implementation of standards, and energy management aspects. She also introduced the case study of Guodian Taizhou Project, one of the most efficient coal-fired power plants worldwide.

21. An example of national policy measures was provided by Mr. Alfred Hartzenburg, a National Project Manager of the Ind. EE Project in South Africa, who talked about experiences on the implementation of South Africa's Ind. EE Program. He further presented national circumstances of a growing energy demand and rising electricity prices, which makes EE even more relevant. Mr. Hartzenburg illustrated the role of ind. EE in the nexus of overarching national plans for development, energy, climate change and trade (see figure 2). In addition, he highlighted successful projects on ind. EE with the support of the United Nations Industrial Development Organization (UNIDO), and highlighted the importance of behavior change in driving and sustaining these measurements.

Figure 2: Nexus of ind. EE in the context of national policies in South Africa:



The session was further enriched with regional experiences from Latin America and the Caribbean, Europe and Central Asia, and South-East Asia, presented by Mr. Marco Matteini from the UNIDO Department of Energy. Drawing on UNIDO's rich experience in implementing ind. EE projects worldwide, he identified challenges, like a lack of leadership, a need for training, a lack of tools and technical knowledge, as key barriers to overcome in all regions and all industry sectors. Mr. Matteini also indicated the need for medium and long-term financial appraisals to address uncertainties and risks by integrating technical and financial knowledge within the industry.

22. After having heard from various experiences worldwide, the ensuing discussion focused on the benefits of specific approaches tailored for a country (or industrial sector), versus the need for global standards and how to enhance their implementation. Several TEC members emphasized the example of technology transfer and cooperation between the Japanese and Indian steel sector.

D. Session III: Panel discussion: Promoting and upscaling ind. EE -Meeting the demand of a low carbon future-

23. This session was set up as two subsequent panel discussions, with short interventions by each panellist, followed by a moderated discussion, facilitated by Mr. Benoît Lebot, executive director of IPEEC. The first panel focussed on how to catalyse innovative approaches, partnerships and initiatives to successfully upscale ind. EE measures and policy options to enhance technology development and transfer, whereas the second panel shed light on innovative financing options by existing financing mechanisms and the role of private sector (co)financing.

24. The panellists provided initial interventions on their experiences and fields of work. The panel consisted of Mr. Eric Masanet from IEA, Ms Kanako Tanaka from the Center for Low Carbon Society Strategy Japan, and Mr. Peter Therkelsen from the Energy Management Working Group (EMWG). Ms Tanaka provided an overview of policy characteristics, including criteria of their impacts on industrial EE (see table 2).

25. Major points from the discussion were the lack of awareness and understanding between policymakers on the one hand and decision makers in industry on the other hand, who are mutually not fully aware of implications and restrictions on the other side.

26. A second take away from the discussion was the lack of data, and the related question for industry what a sufficient level of data would be for a successful implementation of EE measures.

27. The panellists further discussed the need for training of decision makers and workforce in order to meet multiple barriers related to organizational, behavioural and facility aspects.

Table 2: Overview of policy characteristics:

Criteria	Prescriptive policies			Economic policies		Supportive policies
	Regulations on equipment; process	Regulations on EM	Negotiated agreements	Energy taxes	Tax reductions; subsidies, loans, & R&D funds	Opportunity Identification; capacity building, public disclosure; cooperative measures
Potential to reduce energy use cost-efficiently						
Industry coverage	High	High	High	High	High	High
Motivational power	High	High	High	High	High	High
Compliance flexibility	High	High	High	High	High	High
Ease of policy development, execution and assessment						
Technical design convenience	High	High	High	High	High	High
Quantifiability of results	High	High	High	High	High	High
Ancillary societal effects						
Acceleration effects of long-term R&D	High	High	High	High	High	High



28. The second panel introduced various ways of funding for projects in ind. EE by a representative from the Global Environment Facility (GEF) Ms. Masako Ogawa and Mr. Jan-Willem van de Ven from the European Bank for Reconstruction and Development (EBRD). Both panellists outlined their experience with different funding schemes for ind. EE and highlighted the need for a transforming of policy and regulatory environments to successfully deploy innovative financial instruments. Experiences show that convening multi-stakeholder alliances for strengthening institutional capacity and decision-making processes are key to access funds available.

29. Mr. Hiroyuki Tezuka, in capacity as member of the Japan Iron and Steel Federation, provided further insights from a private sector perspective. He emphasized the need for a structured transaction of development finance and private capita for an adequate risk-adjustment and respective financial returns for the private investor.

30. Mr. Tezuka further explained that most EE investments in the private sector are restricted by short-term revenue expectations from the management, so even highly profitable EE measures might be prioritized lower than other investments, due to the longer amortization period. This shortcoming could be met by smart policies that encourage to tackle these long-term measures by adequate risk management and financial incentives, like tax and tariff reductions for EE goods.

31. During the discussion that followed, a TEC member reported on energy as being a sustainable development issues rather than a climate change issue; especially for small island states, energy access is a main constraint. He raised the question how the rather small-scale projects on EE needed in these regions could get adequate financial support besides the existing large-schemes funds available.

E. Session IV: Work in break-out groups: Potential role for the TEC

32. Three parallel break-out groups⁶ discussed the potential role the TEC can play to enhance the development and transfer of technologies for energy efficiency in industries and to identify relevant policy work and recommendation areas for the TEC, in accordance with its functions, to bring added-value to this sector.

33. The groups were composed of any of the participants in the thematic dialogue, and included the expert who provided the related expert intervention. Each group were facilitated by a member of the TEC task force on mitigation, and was tasked to respond to common guiding questions. The outcomes of the discussions from the break-out groups were reported back to the audience by the three facilitators along the guiding questions:

- **What specific role can the TEC play to enhance the development and transfer of technologies for EE in industries?**

34. The issue of enhancing the communication of benefits in ind. EE, including outreach and advocacy were highlighted by all three groups. The groups suggested that the TEC could enhance its efforts to reach out to various stakeholders, like relevant departments in governments and decision makers in business and industries, disseminating best practices and experiences from its work. These outreach efforts could include an enhanced cooperation between the TEC and the CTCN, using the network of the CTC to reach out to relevant stakeholders; the business and industry non-governmental organizations (BINGO) could be another important constituency to get relevant messages to the target audience.

35. The break-out groups further suggested the TEC should convey outcomes of its work in this area, using its ties to: the operating entities of the financial mechanism, the Paris Committee on Capacity building, the High-level Champions through their COP event, and during its engagement in future Technical Expert Meetings, as appropriate.

36. Another suggestion mentioned the TEC could emphasize the need to put more resources to knowledge, competency, capacity building, trainings, and information transfer, to enhance and reinforce the continuous investment efforts in ind. EE in the future. Especially the provision of relevant data to interested stakeholders were seen as a key requirement for implementing EE measures.

⁶ Break-out groups facilitated by TEC Chair Michael Rantil, and TEC members Ms. Claudia Octaviano and Mr. Ian Lloyd

37. In addition, the concept of more “rescaling than upscaling” was discussed, implying the supporting of small and medium enterprises (SMEs) in their EE efforts, including rescaling the challenges to the level of developing countries.

38. Another common point deriving from the discussions was the need to avoid duplications. The TEC should keep in mind exiting initiatives and platform working on information gathering and sharing in ind. EE during any further work, highlighting specific lessons learned deriving from these examples.

○ **What can be relevant policy work and recommendation areas for the TEC, in accordance with its functions, to bring added-value to this specific sector?**

39. Summarizing the discussions of the three break-out groups on policy work and recommendations, the facilitators reported on various idea for TEC products.

40. In order to condense the substantial information resulting from its work the TEC could issue a TEC Brief with an emphasis on various aspects, like emphasizing the need for enhanced capacity-building, training, and information transfer; including success stories and lessons learned from efficient technologies in ind. EE; highlighting the potentials of EE for SMEs, especially for developing countries; emphasizing on co-benefits and related social impacts of ind. EE; and highlighting the opportunities of material substitution and inherent policy challenges.

41. This publication could further include high-level findings and recommendations and various focus areas, that could be conveyed as key messages to COP 23.

42. In addition, building on the TEC Brief, some specific executive summaries could be distilled to reach out to more tailored audiences.

43. These initial outcomes of the three break out groups were compiled by the secretariat and incorporated into a post dialogue discussion on follow-up activities for the TEC, facilitated by the TEC task force on mitigation and open to all interested TEC members. The group considered several suggestions deriving from the break-out groups discussions, including the deepening of the issue by preparing a TEC Brief, taking into account previous work of the TEC and outcomes of the thematic dialogue, the possibility to convey the results of its work to relevant stakeholders, as well as potential key messages to the Conference of the Parties in November 2017.

F. Session V: Conclusion and wrap-up

44. This session started with a brief recap and wrap-up of the previous sessions by TEC Vice-Chair Ms. Duduzile Nhlengethwa-Masina.⁷ She recognized the richness of discussions, presentations and mentioned that all this information and views will be very useful for the TEC in taking forward its work in this area.

45. She emphasized EE as the *invisible fuel* for mitigation efforts with huge potential, especially on the demand side demand side, like industries. The dialogue has shown that ind. EE includes some *low hanging fruits*, but huge parts *remain in the fog*, as one speaker phrased it. Ms. Nhlengethwa-Masina further underlined the relevance of EE for other processes within the United Nations system, like the sustainable development goals (SDGs), where eight out of seventeen SDGs are interlinked with measures of EE.

46. The conclusion acknowledged some main barriers for the enhancement and upscale of ind. EE, like the lack of data availability for a structural survey within the industry sector, as well as other organizational and behavioral barriers. The barriers to access and utilize adequate financing, especially for long-term measures for industries was highlighted, in particular by industry representatives. Another hurdle in the respect of adequate policy measures is the remaining lack of awareness and understanding between policy makers and industry.

47. The dialogue carved out some main enablers for more effective and extended measures in ind. EE, namely the transformation of policy and regulatory environments, the improved outreach to decision makers in industries, the demonstration and upscaling of existing innovative approaches (including NSC and SSC projects), the usage of innovative, tailored financing, including the accelerated financing for SMEs.

⁷ <<https://goo.gl/iMuzMd>>.

48. Another focus of the dialogue was on the capacity-building and training nexus: Participants agreed that an effective, integrated approach of EE measures combined with training and capacity-building parts, would improve any measures in ind. EE. Co-benefits were identified as an important tool for increasing the acceptance of EE policies and to rephrase the story from pure emission reduction to the various co-benefits of industrial EE.

49. Ms. Nhlengethwa-Masina added that a summary of the thematic dialogue will be prepared and made available in due time. She thanked all speakers and participants, including online viewers, for their active participation and contribution.

50. The outcomes of the discussions from the break-out groups were further considered and the TEC decided on follow-up decisions under *agenda item 5.c) i*, in the course of the TEC meeting.⁸

⁸ See TEC meeting page for the full report and follow-up decisions, as agreed by the TEC: <<http://unfccc.int/ttclear/tec/meetings.html>>