



COPENHAGEN CENTRE  
ON ENERGY EFFICIENCY



SUSTAINABLE  
ENERGY FOR ALL

SE4ALL Energy Efficiency Hub Workshop

## DOUBLING THE GLOBAL RATE OF IMPROVEMENT IN ENERGY EFFICIENCY BY 2030

Options, Implementation Issues and Way Forward

UN City Copenhagen 16 – 17 June 2014

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# WORKSHOP REPORT



MINISTRY OF FOREIGN AFFAIRS OF DENMARK  
**DANIDA** INTERNATIONAL  
DEVELOPMENT COOPERATION



## Editors

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## About this report

This report summarises the discussions and conclusions from the workshop on ‘Doubling the Global Rate of Improvement in Energy Efficiency by 2030: Options, Implementation Issues and Way Forward’, organised by the Copenhagen Centre on Energy Efficiency (C2E2) on 16-17<sup>th</sup> June, 2014 in the UN City, Copenhagen.

For more information about the workshop, including on the various presentations, visit the C2E2 website at: [www.energyefficiencycentre.org](http://www.energyefficiencycentre.org)

## Copenhagen Centre on Energy Efficiency

Jointly established in September 2013 by the Danish Government, the United Nations Environment Programme (UNEP) and the Technical University of Denmark (DTU), the C2E2 is dedicated to accelerating the uptake of energy efficiency policies and programmes at a global scale. C2E2 is located at the UN City in Copenhagen, Denmark.

C2E2 is institutionally part of the UNEP-DTU Partnership, a UNEP Collaborating Centre operating within the Department of Management Engineering at DTU.

In the context of the United Nations Secretary General’s Sustainable Energy for All (SE4ALL) initiative, C2E2 is the thematic hub for energy efficiency; with the prime responsibility to support action towards the SE4ALL energy efficiency target of doubling the global rate of improvement in energy efficiency by 2030.

**Cover photo:** Group photo with some of the participants in the first day of the workshop (Photo courtesy of Surabhi Goswami).

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## ABBREVIATIONS AND ACRONYMS

<b>C2E2</b>	Copenhagen Centre on Energy Efficiency
<b>CARICOM</b>	Caribbean Community
<b>CHP</b>	Combined Heat and Power
<b>CLASP</b>	Collaborative Labeling and Appliance Standards Program
<b>CSO</b>	Civil Society Organisation
<b>CTCN</b>	Climate Technology Centre and Network
<b>DANIDA</b>	Danish International Development Agency
<b>DTU</b>	Technical University of Denmark
<b>DTU MAN</b>	DTU Department of Management Engineering
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>ECOWAS</b>	Economic Community of West African States
<b>ECREEE</b>	ECOWAS Centre for Renewable Energy and Energy Efficiency
<b>EE</b>	Energy Efficiency
<b>EE Hub</b>	SE4ALL Energy Efficiency Hub
<b>EIB</b>	European Investment Bank
<b>ESCOs</b>	Energy Service Companies
<b>ESMAP</b>	Energy Sector Management Assistance Program
<b>GBPN</b>	Global Buildings Performance Network
<b>GDP</b>	Gross Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GFEI</b>	Global Fuel Economy Initiative
<b>IEA</b>	International Energy Agency
<b>ICLEI</b>	International Council for Local Environmental Initiatives
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRENA</b>	International Renewable Energy Agency
<b>LDC</b>	Least-Developed Countries
<b>NAMA</b>	Nationally Appropriate Mitigation Action
<b>RCREEE</b>	Regional Center for Renewable Energy and Energy Efficiency
<b>SE4ALL</b>	Sustainable Energy for All
<b>TERI</b>	The Energy and Resources Institute
<b>UN</b>	United Nations
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNIDO</b>	United Nations Industrial Development Organization

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## INTRODUCTION

The World Energy Outlook (WEO)<sup>1</sup> highlights the issues related to sustainable development with the observation that "taking all new developments and policies into account, the world is still failing to put the global energy system onto a more sustainable path". Despite progress being made, nearly 1.3 billion people remain without access to electricity and 2.6 billion do not have access to clean cooking facilities. The WEO also emphasises that energy efficiency is recognised as a key option in the hands of policy makers but current efforts fall well short of tapping into its full economic potential. Governments are becoming increasingly aware of the multiple benefits that energy efficiency improvements can deliver. Energy efficiency is critical to achieving sustainable growth and has the potential to reduce global emissions by 1.5 gigatonnes of carbon dioxide in 2020. A steady growth in renewables energy particularly hydro, wind and solar energy are also reducing greenhouse gas emissions and helping the world move towards a sustainable energy future. Contributing to this positive momentum, the UN Secretary-General Ban Ki-Moon launched, in 2011, the Sustainable Energy for All (SE4ALL) global initiative to mobilise action from all sectors of society in support of three interlinked objectives to be achieved by 2030:

- Ensure universal access to modern energy services;
- Double the global rate of improvement in energy efficiency; and
- Double the share of renewable energy in the global energy mix.

Achieving the three objectives together will maximise development benefits and help stabilize climate change over the long run.

The initiative seeks to build a global multi-stakeholder partnership between governments, the private sector, and civil society to achieve the three objectives. The goals, actions, projects and programs of SE4ALL are supported by various stakeholders including development banks, international organisations, private sector and various civil society organizations.

Global investment in the areas covered by the three SE4ALL objectives has been estimated at \$400 billion in 2010. The investments required to achieve the three objectives are tentatively estimated to be at least \$600–800 billion per year over and above existing levels, entailing a doubling or tripling of financial flows over current levels. According to some experts, the bulk of those investments are required to deliver the energy efficiency and renewable energy targets.

Renewable energy has also been a focus area for several years, resulting in a healthy growth globally, with \$318 billion investment in renewables in 2011, though with some decline in 2012 and 2013. In comparison energy efficiency has remained neglected considering its enormous potential, and the focus of this workshop was to advance the energy efficiency agenda of the SE4ALL initiative. Implementing all currently available energy efficiency measures with reasonable payback periods would be enough to meet or even exceed the SE4ALL objective. However, there are currently several barriers hindering the broad adoption of energy efficiency measures.

According to the SE4ALL Global Tracking Framework<sup>2</sup> (WB, 2012), a study led by the World Bank and the IEA with the support of various other institutions, energy intensity decreased at a compound annual growth rate (CAGR) of -1.3 percent over the 20 years between 1990 and 2010, as a result of increased energy efficiency. However, the rate of improvement in energy efficiency slowed considerably during the period 2000–2010, showing a CAGR of -1.0 percent, compared to -1.6 percent per year for 1990–2000. With the starting point for measuring future progress in global energy efficiency under the SE4ALL set as a CAGR for global energy intensity of -1.3 percent, the SE4ALL global

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<sup>1</sup> IEA, *World Energy Outlook 2012* (OECD/IEA: Paris, 2012)

<sup>2</sup> World Bank, 2013 *Global Tracking Framework Report* (World Bank: Washington D.C., 2013). Available for download at: [www.se4all.org](http://www.se4all.org)

objective is therefore a CAGR of -2.6 percent for the period 2010–2030. Energy intensity has been used as proxy for energy efficiency due to constraints in measuring and estimating energy efficiency at macro levels.

Doubling the rate of improvement in energy efficiency is a formidable challenge, as it requires significant mobilization of resources through public-private partnerships (PPPs), and needs to overcome a variety of barriers that impede progress in energy efficiency. Some of these barriers contributing to the lack of uptake of energy efficiency relate to policy, regulatory, financial, technical, institutional, capacity, and subsidies.

The world can benefit greatly from the initiative, if the targets are achieved. According to a study<sup>3</sup> carried by IIASA, achievement of targets can help contain the global temperature rise to 2 degrees Celsius - a target widely espoused by climate scientists, Intergovernmental Panel on Climate Change (IPCC) and others to prevent serious damage from climate change.

The Danish government has supported the SE4ALL initiative since its inception and in 2012 partnered with the United Nations Environment Program (UNEP) to establish the SE4ALL Energy Efficiency Hub (EE Hub) to support the energy efficiency objective of the SE4ALL.

The EE Hub is now institutionally a part of the Copenhagen Centre on Energy Efficiency (C2E2).

In its early efforts to engage with various stakeholders on energy efficiency, and discuss options, implementation issues and ways forward to reach the SE4ALL energy efficiency target, the C2E2 convened this first technical workshop on 16-17 June, 2014 in the UN City, Copenhagen.

The workshop was organised in various thematic sessions covering key energy efficiency sectors including district heating, lighting and appliances, buildings, transport, and finance (a cross-cutting theme), identified by energy efficiency committee of the SE4ALL as starting point for action on energy efficiency. In addition to this, regional overviews on energy efficiency were also covered.

A detailed workshop agenda can be found in Annex I.

## **WORKSHOP OBJECTIVES**

The objectives of the workshop were:

- Creating awareness among stakeholders on challenges associated with the energy efficiency target of the SE4ALL and advance the agenda of the energy efficiency objective of the SE4ALL through expert inputs on energy efficiency potential and opportunities, and sharing of experiences among stakeholders
- Bringing together a varied audience from developed and developing countries governments, businesses, international and other civil society organisations to deliberate on implementation issues, possible actions and synergies with other international initiatives with a view to identify a way forward to achieve the energy efficiency target of the SE4ALL initiative
- Informing about the C2E2 work programme with a view to get feedback and explore potential collaboration opportunities in the context of energy efficiency target of the SE4ALL.

## **PARTICIPATION**

The workshop was attended by 55 experts (including 4 from the C2E2) from government, business, international organisations and other civil society organisations. A detailed list of participants can be found in Annex II.

A summary of the various sessions is provided below, and should be read together with the respective presentations.

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<sup>3</sup> GEA, 2012: Global Energy Assessment - Toward a Sustainable Future, Cambridge University Press, Cambridge, UK and New York, NY, USA and the International Institute for Applied Systems Analysis, Laxenburg, Austria.

## SESSION 1.1: OPENING SESSION AND WORKSHOP OVERVIEW

### Moderator

John Christensen, Head, UNEP-DTU Partnership

### Speakers

- Jakob Jakobsen, Head of Section, Danish International Development Agency (DANIDA)
- Søren Salomo, Director, Department of Management Engineering, Technical University of Denmark (DTU)
- Rahel Steinbach, Programme Officer, UNEP-C2E2Partnership Coordinator, United Nations Environment Programme (UNEP)
- John Christensen, Head, UNEP-DTU Partnership

### KEY MESSAGES

- Energy Efficiency has high visibility and received high-level political attention.
- There are multiple players who are working on energy efficiency at the global level (e.g. ESMAP and IEA) and the C2E2 should collaborate with these various institutions.
- Energy efficiency is receiving a greater attention under the current international climate change negotiations.
- Energy efficiency can deliver multiple benefits such as energy security and jobs.

### SUMMARY

- 1) **Mr. Jakob Jakobsen** highlighted DANIDA's strategic framework on energy and climate change, and that the C2E2 establishment is a strategic commitment of the Danish Government to the SE4ALL energy efficiency objective. He also alluded to a shift in focus from developing countries to a more global focus on energy efficiency.
- 2) Mr Jakobsen highlighted three reasons to focus on improving energy efficiency, namely, the ability to free resources, climate benefits and advantages for the domestic industry, giving an example of Denmark, where energy efficiency products contribute to 10% of the export.
- 3) **Ms. Rahel Steinbach** highlighted the strong partnership of more than 20 years between UNEP and the Danish Government on sustainable development, clean energy and climate change, and added that the C2E2 is the most recent example of that ongoing cooperation. She also noted that UNEP is supporting the energy efficiency objective of the SE4ALL initiative through various other initiatives, such as the *en.lighten* initiative.
- 4) **Mr. Søren Salomo** highlighted that DTU maintains a strong collaboration with the Danish Industry and has research capability in energy system analysis, climate research, shipping, transport, and other areas relevant to energy efficiency. The expertise will be available to C2E2 in its work.
- 5) **Mr. John Christensen** outlined the SE4ALL initiative. He noted that countries joining the SE4ALL initiative have no legally-binding targets. He highlighted the benefits energy efficiency can deliver including reductions in energy imports (or alternatively surplus energy for export), jobs growth and increased competitiveness. He also mentioned that 50% of the 2°C climate target can be delivered by energy efficiency (e.g. in buildings, industry, transport, heating and cooling) as per the UNEP Gap Report.<sup>4</sup>
- 6) Mr. Christensen also highlighted the ongoing work on developing an 'Energy Efficiency Accelerator Platform', intended to mobilise various stakeholders in different sectors on energy efficiency.
- 7) He concluded by stressing that increased pressure on climate change action means that SE4ALL activities should increase at a much faster pace, rather than focusing on reaching the targets only by 2030.<sup>5</sup>

<sup>4</sup> The report can be downloaded at: <http://www.unep.org/pdf/UNEPemissionsGapReport2013.pdf>

## SESSION 1.2: ENERGY EFFICIENCY SE4ALL TARGETS AND CHALLENGES

### Moderator

Rahel Steinbach, Programme Officer, UNEP

### Speakers

- Jyoti Prasad Painuly, Head, Copenhagen Centre on Energy Efficiency
- Melanie Slade, Programme Manager, International Energy Agency

### KEY MESSAGES

- C2E2 as SE4ALL's Energy Efficiency Hub will support UNEP as a global champion for promoting energy efficiency.
- Indicators for energy efficiency need to be disaggregated to avoid misinterpretation.
- Financing requirements for energy efficiency are large and hence more investment is required.
- There are multiple benefits of the energy efficiency but little information on that has been so far made available to stakeholders.

## SUMMARY

*Overview of SE4ALL energy efficiency target, opportunities and challenges (Jyoti Painuly)*

- 1) **Mr. Jyoti Painuly** highlighted various challenges that SE4ALL target of doubling the energy efficiency improvement rate faces in terms of current lack of active involvement of the key players in the initiative, issues related to measurement of energy efficiency improvement, and high level of financial flows needed to meet the target. He also mentioned that factors such as the rebound effect and a variety of barriers that energy efficiency faces, makes it all the more challenging.
- 2) He further highlighted the fact that though large financing has been committed for energy efficiency (around USD 50 billion) as per the information available in public domain, it is nowhere near the need; an investment level of USD 48 billion every year.

*Energy Efficiency Indicators (Melanie Slade)*

- 3) **Ms. Melanie Slade** informed that the IEA is focusing its efforts in some of the larger emerging economies – e.g. China and India in addition to OECD countries
- 4) She further mentioned that IEA has created tools for policy makers and statisticians on disaggregated energy efficiency indicators.
- 5) IEA is also developing methodologies to quantify various co-benefits arising from energy efficiency improvements.

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<sup>5</sup> 2030 is the year in which the three objectives of the SE4ALL initiative should be achieved.



## SESSION 1.3: LIGHTING AND APPLIANCES – OPTIONS AND IMPLEMENTATION ISSUES

### Moderator

Tim Farrell, Senior Advisor, Copenhagen Centre on Energy Efficiency (C2E2)

### Speakers

- Zitouni Ould-Dada, Head of Technology Unit, United Nations Environment Programme (UNEP)
- Kofi Adu Agyarko, Chief/Head of Division, Ghana Energy Commission
- Corinne Schneider, Director of Communications, Collaborative Labeling and Appliance Standards Program (CLASP)
- Tim Farrell, Senior Advisor, C2E2
- Martin Bachler, Director - Consumer Lighting Legislation Strategy & Communication, OSRAM

### KEY MESSAGES

- The global expansion of standards and labelling programs means that they are well placed to deliver further improvements in energy efficiency.
- It is vital to have political will to accept the evidence, and to adopt integrated policy packages.
- First movers on energy efficiency actions are well-positioned to drive further activity in their regions.
- Public-private partnerships are a way to accelerate the market penetration of more efficient appliances.

### SUMMARY

The session moderator, **Mr. Tim Farrell**, launched the session by emphasizing the important role that appliances and lighting can play in improving energy efficiency. He summarized some preliminary analysis of a report that is soon to be released on standards and labelling programs globally. Some key findings of this report are:

- The number of countries with a standards and labelling program has grown from 50 countries in 2004 to 81 countries in 2013; and
- The number of different products subject to mandatory energy performance standard measures has grown from 42 in 2004 to 55 product in 2013.

*Lighting and Appliances: Opportunity, Status, Potentials and Challenges (Zitouni Ould-Dada)*

- 1) **Mr. Zitouni Ould-Dada** emphasised the global increase in energy demand, and warned that immediate action needs to be taken to avoid technological lock-in of inefficient products, such as room air conditioners and distribution transformers. Demand for these products will mainly rise from non-OECD countries.
- 2) He further stressed the importance to have the political will to accept the evidence and adopt integrated policy packages.
- 3) The UNEP en.lighten initiative was also highlighted as an example of a public-private partnership that has mobilized action by various stakeholders, and already achieved significant results in phasing-out inefficient incandescent lamps. Mr. Ould-Dada informed that another global initiative, the 'Efficient Appliances & Equipment Global Partnership Programme' is under preparation.

*Case Study of Ghana (Kofi Adu Agyarko)*

- 4) **Mr. Kofi Adu Agyarko** presented some of the programmes and policies that the Government of Ghana has adopted to improve the energy efficiency of appliances and lighting. He noted that the Government of Ghana is committed to ensuring energy efficiency improvement across all sectors of the economy.
- 5) Key challenges exist in the promotion of energy efficiency as well as in the financing of related activities, including mobilising the private sector investment to ensure the sustainability of action.
- 6) He stressed the role of setting standards and public education, among others, to create an enabling framework to drive adoption of more efficient technologies. The importance of cross-ministerial work was also highlighted.

*Super-efficient Equipment and Appliance Deployment (SEAD) Initiative (Corinne Schneider)*

- 7) **Ms. Corinne Schneider** presented the SEAD initiative that brings together various governments to accelerate the pace of market transformation for energy efficiency products. She also described the support the initiative is providing to many countries including Mexico, Canada and India.

*Energy Efficiency Initiatives in the Pacific (Tim Farrell)*

- 8) **Mr. Tim Farrell** presented a range of energy efficiency initiatives being carried out in the Pacific. He highlighted the success of the Pacific Appliance Labelling and Standards (PALS) Programme, which is helping to deliver legislation and capacity building activities in Pacific.
- 9) Mr. Farrell also identified some of the lessons learnt including the importance of generating good data and success stories to serve as proof and example for other countries. He also highlighted the importance of having front-runners to build momentum and drive similar action in other countries in various regions.
- 10) Mr. Farrell also mentioned the importance of seeking commitments from senior officials and ministers, delivering capacity building activities through regional centres and the existence of a single label to allow for comparison of appliances.

*Public-Private Partnership for Lighting and Appliances - Opportunities and challenges for private sector (Martin Bachler)*

- 11) **Mr. Martin Bachler** pointed out the multi-dimensionality of lighting, as an enabler for various other activities. He further stressed the need to adopt holistic approaches, not only policy-based but also taking into account the process.
- 12) Mr Bachler opined that public-private partnerships are a means to achieve momentum and market penetration, and in order to scale-up efforts, a mix of various mechanisms such as, appropriate policies, risk transfer and management, dedicated procurement, the right electricity tariff structures and establishment of safe disposal facilities are required. He also mentioned that synergies amongst the various accelerators could be explored as a way to accelerate action.

## SESSION 1.4: TRANSPORT – OPTIONS AND IMPLEMENTATION ISSUES

### Moderator

Subash Dhar, Senior Economist, UNEP-DTU Partnership

### Speakers

- Lew Fulton, Co-Director, UC Davis, Institute of Transportation Studies
- Subash Dhar, Senior Economist, UNEP-DTU Partnership
- Toshinori Ariga, Researcher, National Institute for Environmental Studies

### KEY MESSAGES

- Fuel efficiency for all transportation can be improved by 50%.
- Strong policies are required to make fuel efficiency happen.
- Energy efficiency in the transport sector is influenced by policies, incentives, education and infrastructure.

### SUMMARY

*Transport: opportunity, status, potentials, challenges and Public-Private Partnerships (PPP) (Lew Fulton)*

- 1) **Mr. Lew Fulton** highlighted that fuel efficiency for all transportation can be improved by 50%, but that strong policies are required to achieve this level of improvement.
- 2) He also noted that the world is heading towards 2 billion cars, and demand growth is mainly in the developing world and emerging economies - China and India will contribute the strongest to this increase in demand.
- 3) The Global Fuel Economy Initiative (GFEI) helps facilitate fuel efficiency and targets doubling fuel efficiency in all new cars by 2030; aiming for 4L/100km by 2050 for average cars. The initiative is focused on policy support, awareness and consensus building, data and analysis
- 4) Fuel economy standards, fiscal incentives, as well as education and awareness campaigns are needed. Cost-effectiveness potential of ships, planes and cars is not at all exploited sufficiently; and huge savings are possible.
- 5) Electric vehicles can contribute to the solution and help to decarbonize transport sector.

*Case study - India: Comprehensive Mobility Planning (CMP) and efficiency improvement in urban transport (S. Dhar)*

- 6) **Mr. Subash Dhar** reported that urbanization trends in India are increasing at a fast rate leading to increased trip lengths coupled with population growth and increased ownership of vehicles, including two-wheelers.
- 7) A 'Sustainable Low Carbon Transport' scenario was also presented, showing the opportunity to decrease CO<sub>2</sub> emissions, halve fuel use, and increase the use of renewable energy.

*Case study of Japan (Toshinori Ariga)*

- 8) **Mr. Toshinori Ariga** reported that the rail network is widely used in the greater Tokyo region: this is where efficiency can be gained and further interventions would be effective.
- 9) Transit-Oriented Development (TOD) policies have worked well in Japan and there is less of a reliance on cars. Bicycle ownership is high in Japan.
- 10) Tax and financial incentives could be further strengthen energy use in the Japanese transport system.

## SESSION 1.5: INDUSTRIAL ENERGY EFFICIENCY – RECENT DEVELOPMENTS

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### Moderator

Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency

### Speaker

Rana Ghoneim, Industrial Development Officer, Energy and Climate Change Branch, United Nations Industrial Development Organization (UNIDO)

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### KEY MESSAGES

- UNIDO has been working in several countries across various regions, and now places a special focus on Least-Developed Countries (LDCs).
- UNIDO is also expanding its global network of Regional Sustainable Energy Centres owned by the regional economic communities (e.g. RCREEE, ECREEE, CARICOM). The Centres can play a prominent role as hubs to promote energy efficiency under the SE4ALL initiative.
- Energy management systems, energy systems optimisation and standards are key areas in tackling energy consumption in industry.

### SUMMARY

- 1) **Ms. Rana Ghoneim** outlined UNIDO's portfolio of energy partnerships with the private sector, non-governmental organisations and banks.
- 2) Ms. Ghoneim stressed two of the core focus areas: energy management systems and energy systems optimization; highlighting their importance in tackling energy consumption in enterprises and in other sectors. As also emphasized in other sessions of the workshop, it is important to account for the various co-benefits arising from improving energy efficiency, such as job creation, competitiveness, innovation and productivity.
- 3) It was also highlighted the importance of choosing the right energy efficiency indicators to track performance.
- 4) UNIDO has been working across the various regions and today places a special focus on Least-Developed Countries (LDCs). As an example, Ms. Ghoneim highlighted a new Global Environment Facility (GEF) -funded project in the Republic of Chad.
- 5) Ms. Ghoneim also reported on the global network that UNIDO is creating, and which encompasses various 'Regional Sustainable Energy Centres' owned by the respective regional economic communities (e.g. RCREEE, ECREEE, CARICOM).
- 6) In conclusion, Ms. Ghoneim reported on the progress of the SE4ALL Industrial Energy Efficiency Accelerator, which is currently at the design stage, and bringing together various stakeholders. She stressed that the 'Regional Sustainable Energy Centres' can play a prominent role as hubs to promote energy efficiency under the SE4ALL initiative.

## SESSION 1.6: BUILDINGS – OPTIONS AND IMPLEMENTATION ISSUES

### Moderator

Mark Hopkins, Director of International Energy Efficiency, UN Foundation

### Speakers

- Peter Graham, Executive Director, Global Buildings Performance Network (GBPN) (Live video stream)
- Eduardo Torres Villanueva, Deputy General Manager of Housing Analysis, Foresight and Sustainability, CONAVI
- Mili Majumdar, Director Sustainable Habitat Division, The Energy and Resources Institute (TERI)
- Jesper Ditlefsen, Advisor, Danish Energy Agency
- Mark Hopkins, Director of International Energy Efficiency, UN Foundation

### KEY MESSAGES

- The building sector offers a great cost-effective energy saving and mitigation potential.
- This potential is accompanied by a number of co-benefits, both financial and non-financial.
- Realization of this potential can allow developing countries to leapfrog to a more sustainable development path and developed countries to significantly reduce their emissions.
- Ambitious and well-enforced policy mixes are urgently needed to realize this potential and take advantage of the co-benefits.

### SUMMARY

*Status, potential, challenges (Peter Graham)*

- 1) **Mr. Peter Graham** highlighted the great energy saving potential of the building sector and also the challenge to its realization.
- 2) He also noted that actions in developing countries are particularly important, as most of the future growth in population, floor area and energy demand will happen in these regions. They demonstrate a significant energy savings potential in new construction, shifting from energy-consuming to energy efficient appliances, meeting cooling demand, and so on. He highlighted that requirements for net-zero energy and positive buildings offer a real opportunity to fast growing regions to ‘leapfrog’ to a more sustainable path.
- 3) Policy efforts should have a comprehensive approach and include well-enforced building codes, ambitious energy performance targets, industry standards, social entrepreneurship and public-private partnerships.
- 4) It was also mentioned that non-monetary benefits for energy efficiency are often the real drivers for improvement of building energy performance.

*Case of Mexico (Eduardo Torres Villanueva)*

- 5) **Mr. Eduardo Torres Villanueva** presented the Mexican NAMA<sup>6</sup> in Sustainable Housing and indicated that national policies provide guidelines, and that the real action and implementation takes place at the local level.
- 6) He also stressed on the need to move from a technology-based to a performance-based approach when designing and implementing policies in the building sector.

<sup>6</sup> Nationally Appropriate Mitigation Action (NAMA), as used under the UNFCCC.

- 7) In relation to the NAMA in Sustainable Housing, he noted that the goal of the initiative is to move from the current building standard to the NAMA standard under three scenarios: (1) 20% reduction in energy consumption, (2) 40% reduction in energy consumption, and (3) energy use reduction to achieve the passive-house level. He stated that nearly 20,000 homes have been built under the program, and that there is a plan to increase the number of buildings, after NAMA standards are established.
- 8) It was also mentioned that there are a number of other energy efficiency initiatives in Mexico, which include work on energy efficiency database, energy efficiency calculators, loan programs for residential building retrofit with payment for the interest rate from the energy cost savings, smart gridlines and emerging market for solar panels.

*Case of India (Mili Majumdar)*

- 9) **Ms. Mili Majumdar** from TERI reported that most policies in India are focused on commercial buildings and that there are no current regulations for residential buildings.
- 10) Forecasted economic growth in the country will require three times more energy by 2020 in comparison to the current level. Such growth has to be accompanied by energy efficiency policies in order to realize the energy savings potential of the sector.
- 11) She also noted issues with the implementation and enforcement of the policies in the country; Building Energy Code 2007 for example was not mandated.
- 12) Further, there are a number of existing energy efficiency initiatives in India, such as the star energy labeling program for appliances, the green rating GRIHA (in the partnership between government and TERI, partly mandated), the solar and renewable energy programs, and the refinancing of energy efficient homes with support from the German government.
- 13) It was also noted that there is a need for good institutional frameworks, public-private partnerships, making energy efficiency somewhat tangible, building capacity and providing trainings for the construction industry stakeholders.

*Case of Denmark (Jesper Ditlefsen)*

- 14) **Mr. Jesper Ditlefsen** from the Danish Ministry of Climate, Energy and Building mentioned that Denmark has a long history of energy efficiency efforts, initially driven by the oil crisis and energy security issues.
- 15) He also reported that energy demand in buildings has been coming down since 1960s and this process is expected to continue in the future. In 1961, maximum allowed energy demand from buildings in Denmark was 350 kWh/m<sup>2</sup>/year. In 2010 this limit was reduced by 63.5%. In 2008, it was decided to reduce this limit further as follows: by 2015 – 36.7 kWh/m<sup>2</sup>/year, and by 2020 – 20 kWh/m<sup>2</sup>/year. However, 30% of new buildings in 2013 were built according to the 2015 standards as people prefer to live in energy efficient homes.
- 16) In order to achieve these targets strong policies are needed, which include among others combining regulation, financial incentives and awareness. Regulation has been an effective instrument that has helped to overcome market failures, provide long-term cost-efficiency and spur innovation.
- 17) Overall energy efficiency requirements for buildings are supplemented by more detailed requirements for different components of the building to ensure that no parts are neglected and, at the same time, allow for innovation.
- 18) He also highlighted the fact that energy savings potential in buildings is actually 100%. Zero-energy buildings already exist, and technology is already available.

*Public-private partnership (Mark Hopkins)*

- 19) **Mr. Mark Hopkins** from the UN Foundation presented the ongoing work on the 'buildings energy efficiency accelerator'. The idea of the accelerator is to build the actions around governmental institution, who are already undertaking energy efficiency actions, and that can be accelerated through establishment of partnerships and access to finance.
- 20) Mr. Hopkins suggested the need to focus on cities as they are already taking actions.
- 21) There is also a need to change the energy markets rules. Correct policies need to be in place for efficiency to flourish.

## SESSION 1.7: SE4ALL GLOBAL TRACKING FRAMEWORK

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### Moderator

Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency

### Speaker

Jonathan Sinton, Senior Energy Efficiency Specialist, World Bank

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### KEY MESSAGES

- Data quality and availability will be fundamental to track progress towards achieving the SE4ALL targets.
- Capacity building for collecting energy demand and associated output and activity data will be essential.

### SUMMARY

- 1) **Mr. Jonathan Sinton** presented an overview of the work being carried out to update the first edition of the SE4ALL Global Tracking Framework. Mr. Sinton guided participants through the various chapters of the upcoming edition of the report, which stresses the importance of building capacity to track progress, in terms of collecting energy demand and associated output and activity data.
- 2) The report will also address the issue of financing energy efficiency investments, and take into account the work being carried out under the strategic guidance of the SE4ALL Finance Committee, and others.
- 3) The new edition of the report is expected to be completed by May 2015. An early draft is expected to be completed by August 2014.



## SESSION 2.1: DISTRICT ENERGY – OPTIONS AND IMPLEMENTATION ISSUES

### Moderator

Maryke van Staden, Low Carbon Cities Program Manager / Director of the carbon Center, ICLEI

### Speakers

- Paul Voss, Managing Director, Euroheat and Power
- Roberto Gagliardi la Gala, Senior Project Officer-Transport and Environment, Greater London
- Johan Saltin, Project Manager Heat and Power, Växjö Energy AB
- Fleming Voetmann, Head of Public Affairs & Leadership Communication, Danfoss
- Mia Nordström, Business Strategy, Regional Development Lead, Vattenfall

### KEY MESSAGES

- More renewables need to be implemented in district energy systems to achieve sustainability, ensure a secure and reliable energy supply, and promote green heating and cooling in cities.
- To enhance the development of district energy, local authorities can form public-private partnerships, develop supportive policies and remove barriers to greater adoption (e.g. high taxes, energy prices).
- Mapping potential of district energy as a sustainable and energy efficient solution and promoting demonstration projects in cities combined with greater education and awareness could contribute to achieving a higher uptake in the future.

## SUMMARY

### *District Energy: Opportunity, Status, Potentials and challenges (Paul Voss)*

1. **Mr. Paul Voss** from Euroheat and Power stated that the district energy sector continues to evolve with twin goals of integrating more renewable and surplus energy, and lowering the temperatures of the system, thereby making it more efficient.
2. He noted that district energy is not only about delivering efficient heat but to organise the energy system as a whole; for example providing an opportunity to store energy.
3. Due to its high energy intensity, the heat sector should have a more prominent role in policy frameworks, which have so far been giving more emphasis to transport and electricity.
4. It was highlighted that some of the barriers that district energy faces are due to public perceptions rather than facts, for example believing that heat demand will disappear as buildings become more efficient, or thinking of district heating/cooling as a local issue which hinders policy discussion at a higher level.
5. However, there has been a growing interest in district heating and cooling, from cities in several countries. A combination of district heating (in cities), heat pumps (in rural areas) and energy savings (everywhere) could help achieve great financial savings and help reduce CO<sub>2</sub> emissions, besides contributing to a range of other benefits.

*Case Study of London (Roberto Gagliardi la Gala)*

6. **Mr. Roberto Gagliardi la Gala** presented climate change and energy plans, and strategies of the Greater London Authority.
7. He listed some of the measures necessary to unlock and develop the district energy market in London, including removing delivery barriers, identifying and exploiting district energy opportunities and forming public-private partnerships.

*Case Study of Växjö (Johan Saltin)*

8. **Mr. Johan Saltin** presented the success of the city of Växjö in expanding their district energy network, from a small oil-based system in the beginning, to an almost fully biomass-based system.
9. He highlighted the various benefits of using bio-energy in district energy networks, including, the creation of new jobs, energy security, low heating price, and also environmental tourism.

*Public-Private Partnership for District Heating-Opportunities and Challenges for Private Sector*

Technology supplier perspective (Fleming Voetmann)

10. **Mr. Fleming Voetmann** presented Danfoss's experience in China. China's Five-year Plan has the ambition to reduce energy usage, CO<sub>2</sub> emissions and promote clean energy production and energy-saving technologies. Also, another reason to promote energy efficiency in China is to reduce local air pollution, which is a concern in many cities.
11. Mr. Voetmann presented the case study of the city of Anshan, and stressed the need for local initiatives to provide the drive to de-carbonise the energy system. In the case of Anshan, the goal was to increase cooperation between the private and public sectors; supply energy by recovering waste energy; increase energy efficiency and reduce CO<sub>2</sub> emissions; have a stable heat supply; and cleaner air and improved indoor climate.
12. He also emphasised some of the challenges including sub-national lending, and deciding how the energy savings will be distributed among the consumers, the companies and the state.
13. It was mentioned that most of the district energy systems focus on heat, but district cooling should also be emphasized (e.g. United Arab Emirates).

Energy utility perspective (Mia Nordström)

14. **Ms. Mia Nordström** presented the energy utility perspective to district energy systems, which in their case generates more revenue than electricity. There is an incentive for such companies to integrate various energy sources and create holistic energy systems.
15. She stated that some of the challenges hindering the adoption of district energy systems include low electricity prices, strong competition from heat pumps, the fact that electricity production potential from combined heat and power (CHP) is not being fully captured by utilities (and which requires political action to reverse this situation), a general lack of knowledge about energy systems as a whole (including among governments).
16. Future opportunities for the sector were highlighted that included capitalising on the expertise of the production units and the municipalities owning them, an intensified fuel switch from fossil fuels to renewable, sharing know-how (e.g. procurement criteria for state-of-the-art CHP plants), and opportunities for city and business partnerships.

## SESSION 2.2: FINANCING ENERGY EFFICIENCY

### Moderator

Martin Cremer, Senior Project Manager, Frankfurt School UNEP Collaborating Centre for Climate & Sustainable Energy Finance

### Speakers

- Jan-Willem van de Ven, Senior Carbon Manager, European Bank for Reconstruction and Development (EBRD)
- Chris Knowles, Head of Division - Climate Change and Environment, European Investment Bank (EIB)
- Walter Vergara, Senior Fellow, World Resource Institute (WRI)
- Ivan Gerginov, Business Development Financial Sector, Econoler

### KEY MESSAGES

- Financial investment in energy efficiency is strengthened through a suitable regulatory environment and provision of technical assistance.
- To promote energy efficiency investment by businesses it is important to highlight the contribution of energy efficiency to improving and growing their business.
- Layered risk funds were a concept to building initial capital investment in energy efficiency and then scaled-up by mobilising private sector investment.
- Attracting investor interest in energy efficiency has been challenging due to the perception that it is high risk.

## SUMMARY

### *Finance for Sustainable Energy (Jan-Willem van de Ven)*

- 1) **Mr. Jan-Willem van de Ven** outlined the six business areas of the Sustainable Business Initiative, which has invested a significant proportion of the € 13.4 billion investment between 2006 and 2013, and has delivered emissions savings of 62 million tonnes of CO<sub>2</sub>-e each year. Over one-third of this investment has been in energy efficiency.
- 2) The EBRD supports the development of strong institutional and regulatory frameworks that create an enabling environment for investment in sustainable energy projects.

### *European Energy Efficiency Fund and the Green for Growth Fund (Chris Knowles)*

- 3) **Mr. Chris Knowles** highlighted the fact that EIB lending for energy efficiency and renewable energy was 38 Billion Euros between 2008 and 2013, accounting for about one-third of climate change lending.
- 4) Debt for Energy Efficiency Projects (DEEP) Platform aims at developing a suite of new financial products for four groups of EIB customers that include banks, public sector, Energy Service Companies (ESCOs) and Utilities. New products under DEEP Green will target aggregation and de-risking of energy efficiency projects to allow for debt financing.

*Energy Efficiency Financing in Latin America & Caribbean (Walter Vergara)*

- 5) **Mr. Walter Vergara** outlined the financial instruments used for energy efficiency programs in Latin America such as technical assistance, equity participation, loans, leases and performance contracts.
- 6) While successful energy efficiency investments were described in the Dominican Republic, Nicaragua, Barbados and Brazil, barriers to further expansion still exist. Latin America is well placed to improve energy efficiency and is ready for major shifts in technology and efficient use of resources.

*Bulgarian Energy Efficiency Fund (Ivan Gerginov)*

- 7) **Mr. Ivan Gerginov** made presentation on the fund, established as a public-private partnership to develop Bulgarian energy efficiency market.
- 8) In response to the high demand for portfolio guarantees, the fund launched its most sophisticated instrument: a 5% first-loss portfolio guarantee for ESCOs and banks. Informed by lessons learned from previous European Bank for Reconstruction and Development (EBRD) programs and a similar fund facility in Romania, the implementation of the fund was rated by the EBRD as “best practice operation whose design and implementation should be disseminated internationally”.
- 9) After the fund had been operating for five years, a market impact evaluation was conducted. The conclusion was that the fund contributed to the emergence of a competitive, self-sustainable national energy efficiency market. The fund’s design has enabled flexible funding operations over time and proved critical to its success in the changing market environment in Bulgaria. One of the key elements of the design was the underlying market study conducted before introducing the instrument in the market to determine the basic assumptions regarding why and under what circumstances the fund should operate.

## SESSION 2.3: REGIONAL OVERVIEW OF ENERGY EFFICIENCY IN DEVELOPING COUNTRIES

### Moderator

Daniel Bouille, Executive President, Fundación Bariloche, Argentina

### Speakers

- Sivanappan Kumar, Professor, Asian Institute of Technology, Thailand
- Andrew Hibberd, Group Leader – Energy Efficiency, Energy Research Centre, University of Cape Town, South Africa
- Mahama Kappiah, Executive Director, ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
- Daniel Bouille, Executive President, Fundación Bariloche, Argentina
- George Abulashvili, Key Expert, Covenant of Mayors

### KEY MESSAGES

- It is important to consider the linkages between the three SE4ALL targets: energy efficiency, renewable energy and energy access.
- There are various regional institutions already active in the regions, whose resources and political reach could be leveraged.
- Those institutions could play a key role in enhancing regional collaboration in energy efficiency.
- Action at the local government level will also be essential in tackling climate change and improving energy security.

### SUMMARY

#### *Energy efficiency initiatives and issues in Asia (Sivanappan Kumar)*

- 1) **Mr. Sivanappan Kumar** noted that energy efficiency policies are already being implemented across the region (e.g. standards and labels), and several other policies have been proposed. Mr. Kumar highlighted the large potential for implementing energy efficiency measures in the short-term, especially energy supply efficiency measures, lighting and cooking at end-user side, and demand-side management for electricity.
- 2) On barriers, Mr. Kumar mentioned that in general policies are focused on voluntary measures (e.g. demonstration projects), and that high fuel subsidies create a disincentive to invest in energy efficiency. Subsidy spending reached a level of USD 51m in 2012, of which 68% was directed to oil, and 24% for electricity. Institutional frameworks are under-developed in the region, and enforcement is a problem.
- 3) On opportunities, Mr. Kumar noted that countries have identified various energy efficiency technologies in their Technology Needs Assessments (for the UNFCCC), including efficient cook stoves and appliances.
- 4) Co-benefits and the linkages between the energy sector and other sectors need to be highlighted to bring out the case for energy efficiency. Social aspects such as equity, gender and well-being need to be integrated in decision making. A mix of policy instruments is necessary to address some of the barriers highlighted during the session.

*Energy efficiency initiatives and issues in Africa (Andrew Hibberd)*

- 1) **Mr. Andrew Hibberd** noted that Africa accounts for a very small share of the total energy consumption globally, and that electrification rates are very low ; on an average, around 60% of the population in the continent does not have access to clean, reliable energy. Access levels to clean cooking fuels are even lower and around 80% of the population still uses traditional biomass.
- 2) Energy access should be addressed together with energy efficiency, and cooperation and sharing learnings are important to overcome some of the barriers hindering energy efficiency. These barriers are, for example, access to funding, poverty and behavioural issues.
- 3) Various sectors with a considerable potential for energy efficiency improvements were highlighted and included the industrial sector (e.g. mining, agriculture and food processing), the commercial sector (e.g. tourism and education); and the domestic sector (depending on level of energy access).

*Energy efficiency in the ECOWAS (Mahama Kappiah)*

- 4) **Mr. Mahama Kappiah** presented the mission and work of ECREEE highlighting the support the centre provides to the development of sustainable energy in ECOWAS region.
- 5) Mr. Kappiah mentioned that a regional energy efficiency policy has been adopted by the ECOWAS governments. The policy includes the phase-out of incandescent bulbs, reduction of electricity distribution losses, and the adoption of region-wide standards and labels. In addition, he reported that national energy efficiency action plans are being developed in parallel to the SE4ALL Action Agendas and Investment Prospectus framework.
- 6) He also reported on the various priority initiatives being developed under the ECOWAS Energy Efficiency Programme: Efficient Lighting, High performance of Distribution of Electricity, Standards & Labeling, Energy Efficiency in Buildings, Sustainable and Clean Cooking, and Financing Sustainable Energy.
- 7) An additional Industrial Energy Efficiency initiative supported by UNIDO was also highlighted. Several member states have agreed to go ahead with the initiative, and resources are currently being mobilized to start the initiative.
- 8) Importance of first movers to drive action by other countries, as exemplified by the case of Ghana for energy efficiency standards and labels, was also highlighted.

*Energy efficiency initiatives and issues in Latin America (Daniel Bouille)*

- 9) **Mr. Daniel Bouille** mentioned that action on energy efficiency is varied in Latin America with Brazil and Mexico demonstrating the most activity.
- 10) Many countries have established National Energy Efficiency Programmes and new legislation has been adopted in several countries (e.g. Uruguay and Venezuela), and the region also witnessed the consolidation or creation of institutions involved in energy efficiency (e.g. Bolivia, Chile and Cuba).
- 11) Public sector is still the sole actor to drive energy efficiency. The private sector and civil society are not very active.
- 12) Some ideas were presented to improve energy efficiency in Latin America that included coherence and convergence in efficiency and energy policies, regional agreement to unify criteria on labelling and standards, short, medium and long-term target quantification, implementation of energy audit recommendations, identification and monitoring of energy efficiency indicators to track progress, regional integration to overcome the barrier of market size, and training and capacity building.

*Municipal Energy Efficiency Initiatives in the Covenant of Mayors for Eastern Partnership Countries (George Abulashvili)*

- 13) **Mr. George Abulashvili** presented the work being carried out by the Covenant of Mayors with various municipalities in Eastern Europe. Around 5,740 local governments and self-governments have committed to the Covenant of Mayors (COM) and, in particular, the Eastern Partnership Countries count with 130 signatories. Under the COM, municipalities are committed to developing local sustainable energy and climate protection policy, and sustainable energy action plans with feedback from citizens and other stakeholders.
- 14) The greatest source of greenhouse gas emissions in municipalities includes buildings, equipment, and transport.
- 15) Energy efficiency is one of the key areas to reduce these emissions, and there are various options at the municipal level such as, rehabilitation of public buildings, municipal heat supply, municipal public transport or street lighting.
- 16) Overall, COM is an initiative that is being welcomed by the municipalities, and synergies with the SE4ALL initiative could be further explored at the municipal level.

## SESSION 2.4: PANEL DISCUSSIONS – WAY FORWARD FOR SE4ALL ENERGY EFFICIENCY

### Moderator

Zitouni Ould-Dada, Head of Technology Unit, United Nations Environment Programme

### Panelists

- Kofi Adu Agyarko, Chief/Head of Division, Ghana Energy Commission
- Martin Bachler, Director - Consumer Lighting Legislation Strategy & Communication, OSRAM
- John Christensen, Head, UNEP-DTU Partnership
- Hans Jakob Eriksen, Ministry of Climate, Energy and Building of Denmark
- Mark Hopkins, Director of International Energy Efficiency, UN Foundation
- Sivanappan Kumar, Professor, Asian Institute of Technology, Thailand
- Zitouni Ould-Dada, Head of Technology Unit, United Nations Environment Programme (UNEP)
- Katia Simeonova, Manager, United Nations Framework Convention on Climate Change (UNFCCC)
- Melanie Slade, Programme Manager, International Energy Agency (IEA)
- Jan-Willem van de Ven, Senior Carbon Manager, European Bank for Reconstruction and Development (EBRD)
- Walter Vergara, Senior Fellow, World Resource Institute (WRI)

### KEY MESSAGES

- It is essential to improve the narrative on energy efficiency, which includes highlighting the interlinkages between the SE4ALL targets and other co-benefits (e.g. health and social benefits, job creation, energy security). As mentioned by one of the panelists, “energy efficiency is a product on the shelf, which needs good marketing”.
- There is a strong need for C2E2 to be established as an international knowledge centre to facilitate the exchange of information and experiences on energy efficiency.
- Strong leadership is necessary for scaling up action; As mentioned by one of the panelists, “it is a long walk to energy efficiency - you need tough guys to keep going”.
- Enabling private sector investment will be necessary to leverage public funding for energy efficiency.
- Awareness raising, capacity building and education will be important in reaching the SE4ALL target of doubling energy efficiency improvement by 2030.

### SUMMARY

The panel discussion was guided by two questions:

1. What is needed to scale-up action on energy efficiency?
2. What would you like the Copenhagen Centre on Energy Efficiency (C2E2) as SE4ALL's Energy Efficiency Hub to do to help achieve this scaled-up effort?



**Question 1: What is needed to scale-up action on energy efficiency?**

- 1) Find ways to demonstrate political leadership, and adopt holistic approaches involving the finance and private sectors, and governments at all levels.
- 2) There is a need for strong leadership and for energy efficiency champions – institutions, individuals.
- 3) Awareness, capacity building and education are the most important.
- 4) A better narrative and sales pitch for promoting energy efficiency is needed – one that explores the multiple benefits and highlights the economic growth opportunities. It is important to demystify energy efficiency, and make common people understand what it feels to save energy.
- 5) Tap the potential social networking to bring advocates together and create awareness about energy efficiency at a massive scale.
- 6) Provide technical assistance to increase information levels at the various levels.
- 7) Building large-scale business cases for energy efficiency investments in different areas is important.
- 8) Enabling private sector investment is required.
- 9) Accelerate widespread adoption of LEDs and controls in commercial and residential sector, and give open access to funding sources.

**Question 2: What would you like the Copenhagen Centre on Energy Efficiency as SE4ALL's Energy Efficiency Hub to do to help achieve this scaled-up effort?**

- 10) Mobilise global action on energy efficiency.
- 11) Become a platform for international cooperation and knowledge sharing.
- 12) Explore collaboration with the various regional institutions working on energy efficiency.
- 13) Engage with countries to promote energy efficiency, and help them tailor solutions to their needs.
- 14) Dedicate efforts to capacity building and training, advocacy and outreach, together with other institutions.
- 15) Be a global voice for energy efficiency through flagship publications, and develop analysis of compelling cases for why energy efficiency is important.
- 16) Improve data quality and availability.
- 17) Explore synergies and inter-dependencies between various accelerators/sectors, including lighting systems and energy efficiency in buildings.
- 18) Analyse the risk of investments in energy efficiency.
- 19) Analyse the impact of carbon pricing to spur energy efficiency, as well as, the impact of reforming fossil fuel subsidies.

**ANNEX I – WORKSHOP AGENDA**

<b>DAY 1: Monday, 16 June 2014</b>		
<b>TIME</b>	<b>PRESENTATION</b>	<b>RESOURCE PERSON</b>
08:30 – 09:00	<b>Registration and Coffee</b>	
09:00 – 09:50	<b>Session 1.1: Opening Session and Workshop Overview</b> <ul style="list-style-type: none"> <li>• <b>Introductory Statements (15 min)</b> Jakob Jakobsen, Head of Section, DANIDA Søren Salomo, Director, DTU Management Engineering Rahel Steinbach, Programme Officer, UNEP</li> <li>• <b>Sustainable Energy for All (SE4ALL) initiative (20 min)</b> Luis Gomez Echeverri, Senior Advisor to the Special Representative of the UN Secretary General, SE4ALL, Global Facilitation Team</li> <li>• <b>Workshop Objectives and Overview (15 min)</b> John Christensen, Head of Centre, UNEP-DTU Partnership</li> </ul>	<b>Moderator:</b> John Christensen, Head of Centre, UNEP-DTU Partnership
09.50 – 10.40	<b>Session 1.2: Energy efficiency SE4ALL Targets and Challenges</b> <ul style="list-style-type: none"> <li>• <b>Overview of SE4ALL energy efficiency target, opportunities and challenges (20 min)</b> Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency</li> <li>• <b>Energy Efficiency Indicators (20 min)</b> Melanie Slade, International Energy Agency</li> <li>• <b>Discussion (10 min)</b></li> </ul>	<b>Moderator:</b> Rahel Steinbach, Programme Officer, UNEP
10.40 – 10.55	<b>Coffee Break</b>	
10.55 – 12.55	<b>Session 1.3: Lighting and Appliances - Options and Implementation Issues</b> <ul style="list-style-type: none"> <li>• <b>Lighting and Appliances: Opportunity, Status, Potentials and challenges (20 min)</b> Zitouni Ould-Dada, Head of Technology Unit, UNEP</li> <li>• <b>Case study of Ghana (20 min)</b> Kofi Adu Agyarko, Chief/Head of Division, Ghana Energy Commission</li> <li>• <b>Super-efficient Equipment and Appliance Deployment Initiative (SEAD) (20 min)</b> Corinne Schneider, Director of Communications, CLASP</li> <li>• <b>Energy efficiency initiatives in the Pacific (20 min)</b> Tim Farrell, Senior Advisor, Copenhagen Centre on Energy Efficiency</li> <li>• <b>Public-Private Partnership for Lighting and Appliances - Opportunities and challenges for private sector (20 min)</b> Martin Bachler, Director - Consumer Lighting Legislation Strategy &amp; Communication, OSRAM</li> <li>• <b>Q&amp;A and way forward by presenters (20 min)</b></li> </ul>	<b>Moderator:</b> Tim Farrell, Senior Advisor, Copenhagen Centre on Energy Efficiency

12.55 – 13.55	<b>Lunch Break</b>	
13.55 – 15.15	<p><b>Session 1.4: Transport - Options and Implementation Issues</b></p> <ul style="list-style-type: none"> <li>• <b>Transport: Opportunity, Status, Potentials, Challenges and Public-Private Partnerships (25 min)</b> Lew Fulton, Co-Director, UC Davis, Institute of Transportation Studies</li> <li>• <b>Case study of India: Comprehensive Mobility Planning (CMP) and efficiency improvement in Urban Transport (20 min)</b> Subash Dhar, Senior Economist, UNEP-DTU Partnership</li> <li>• <b>Case study of Japan (20 min)</b> Ariga Toshinori, Researcher, National Institute for Environmental Studies</li> <li>• <b>Q&amp;A and way forward by presenters (15 min)</b></li> </ul>	<p><b>Moderator:</b> Subash Dhar, Senior Economist, UNEP-DTU Partnership</p>
15.15 – 15.30	<p><b>Session 1.5: Industrial Energy Efficiency – Recent Developments (15 min)</b> Rana Ghoneim, Industrial Development Officer, Energy and Climate Change Branch, United Nations Industrial Development Organization</p>	<p><b>Moderator:</b> Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency</p>
15.30 - 15.45	<b>Coffee Break</b>	
15.45 – 17.45	<p><b>Session 1.6: Buildings - Options and Implementation Issues</b></p> <ul style="list-style-type: none"> <li>• <b>Buildings: Opportunity, Status, Potentials and challenges (20 min)</b> Peter Graham, Executive Director, Global Buildings Performance Network (Live video stream)</li> <li>• <b>Case Study - Mexico (20 min)</b> Eduardo Torres Villanueva, Deputy General Manager of Housing Analysis, Foresight and Sustainability, CONAVI</li> <li>• <b>Case Study – India (20 min)</b> Mili Majumdar, Director Sustainable Habitat Division, TERI</li> <li>• <b>Case Study - Denmark (20 min)</b> Jesper Ditlefsen, Adviser, Danish Energy Agency</li> <li>• <b>Public-Private Partnership for Buildings- Opportunities and challenges for private sector (20 min)</b> Mark Hopkins, Director of International Energy Efficiency, UN Foundation</li> <li>• <b>Q&amp;A and way forward by presenters (20 min)</b></li> </ul>	<p><b>Moderator:</b> Mark Hopkins, Director of International Energy Efficiency, UN Foundation</p>
17.45 – 18.05	<p><b>Session 1.7: SE4ALL Global Tracking Framework (20 min) (Live video stream)</b> Jonathan Sinton, Senior Energy Efficiency Specialist, World Bank</p>	<p><b>Moderator:</b> Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency</p>
18.30	<b>Reception</b>	

DAY 2- Tuesday, 17 June 2014		
TIME	PRESENTATION	RESOURCE PERSON
08:30 – 09:00	<b>Arrival of Participants and Coffee</b>	
09:00 – 10.55	<p><b>Session 2.1: District Energy- Options and Implementation Issues</b></p> <ul style="list-style-type: none"> <li>• <b>District Energy: Opportunity, Status, Potentials and challenges (20 min)</b> Paul Voss, Managing Director, Euroheat and Power</li> <li>• <b>Case study of London (20min)</b> Roberto Gagliardi la Gala, Senior Project Officer - Transport and Environment, Greater London Authority</li> <li>• <b>Case study of Vaxjo (Sweden) (20 min)</b> Johan Saltin, Project Manager Heat and Power, Växjö Energy AB (Live Video Streaming)</li> <li>• <b>Public-Private Partnership for District Heating- Opportunities and challenges for private sector (40 min)</b> <ul style="list-style-type: none"> <li>- <b>Technology supplier perspective (20 min):</b> Fleming Voetmann, Head of Public Affairs &amp; Leadership Communication, Danfoss</li> <li>- <b>Energy utility perspective (20 min):</b> Mia Nordström, Business Strategy, Regional Development Lead, Vattenfall</li> </ul> </li> <li>• <b>Q&amp;A and way forward by presenters (15 min)</b></li> </ul>	<p><b>Moderator:</b> Maryke van Staden Low Carbon Cities Program Manager / Director of the carbon Center, ICLEI</p>
10.55 – 11.05	<b>Coffee Break</b>	
11.05 – 12.45	<p><b>Session 2.2: Financing Energy Efficiency</b></p> <ul style="list-style-type: none"> <li>• <b>Finance: Opportunity, Status, Potentials and challenges (20 min)</b> Jan-Willem van de Ven, Senior Carbon Manager, EBRD</li> <li>• <b>Case Study: European Energy Efficiency Fund and the Green for Growth Fund (20 min)</b> Chris Knowles, Head of Division - Climate Change and Environment, EIB (Live video stream)</li> <li>• <b>Case Study: Energy Efficiency financing in Latin America &amp; Caribbean (20 min)</b> Walter Vergara, Senior Fellow, World Resource Institute</li> <li>• <b>Case Study: Bulgarian Energy Efficiency Fund (20 min)</b> Ivan Gerginov, Business Development Financial Sector, Econoler</li> <li>• <b>Q&amp;A (20 min)</b></li> </ul>	<p><b>Moderator:</b> Martin Cremer, Senior Project Manager, Frankfurt School UNEP Collaborating Centre for Climate &amp; Sustainable Energy Finance</p>
12.45 – 13.45	<b>Lunch Break</b>	
13.45 - 15.35	<b>Session 2.3: Regional overview of Energy Efficiency in developing countries</b>	<p><b>Moderator:</b> Daniel Bouille, Executive President, Fundación</p>

	<ul style="list-style-type: none"> <li>• <b>Energy efficiency initiatives and issues in Asia (20 min)</b> Sivanappan Kumar, Professor, Asian Institute of Technology, Thailand</li> <li>• <b>Energy efficiency initiatives and issues in Africa (20 min)</b> Andrew Hibberd, Group Leader - Energy Efficiency, Energy Research Centre, South Africa</li> <li>• <b>Energy efficiency in the ECOWAS (20 min)</b> Mahama Kappiah, Executive Director, ECOWAS Regional Centre for Renewable Energy and Energy Efficiency</li> <li>• <b>Energy efficiency initiatives and issues in Latin America (20 min)</b> Daniel Bouille, Executive President, Fundación Bariloche, Argentina</li> <li>• <b>Municipal energy efficiency initiatives under the Covenant of Mayors for Eastern Partnership Countries (20 min)</b> George Abulashvili, Key Expert, Covenant of Mayors Regional Office</li> <li>• <b>Q&amp;A (10 min)</b></li> </ul>	Bariloche, Argentina
15.35 – 15.50	<b>Coffee Break</b>	
15.50 – 17.00	<p><b>Session 2.4: Panel Discussions: Way Forward for SE4ALL Energy Efficiency</b></p> <ul style="list-style-type: none"> <li>• Kofi Adu Agyarko, Chief/Head of Division, Ghana Energy Commission</li> <li>• Martin Bachler, Director - Consumer Lighting Legislation Strategy &amp; Communication, OSRAM</li> <li>• John Christensen, Head of Centre, UNEP-DTU Partnership</li> <li>• Hans Jakob Eriksen, Ministry of Climate, Energy and Building of Denmark</li> <li>• Mark Hopkins, Director of International Energy Efficiency, UN Foundation</li> <li>• Sivanappan Kumar, Professor, Asian Institute of Technology, Thailand</li> <li>• Zitouni Ould-Dada, Head of Technology Unit, UNEP</li> <li>• Melanie Slade, International Energy Agency</li> <li>• Jan-Willem van de Ven, Senior Carbon Manager, EBRD</li> <li>• Walter Vergara, Senior Fellow, World Resource Institute</li> </ul>	<b>Moderator:</b> Zitouni Ould-Dada, Head of Technology Unit, UNEP
17.00-17.15	<p><b>Closing Remarks</b> John Christensen, Head of Centre, UNEP-DTU Partnership</p> <p><b>Vote of Thanks</b> Jyoti Painuly, Head, Copenhagen Centre on Energy Efficiency</p>	

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