



COPENHAGEN CENTRE
ON ENERGY EFFICIENCY



SUSTAINABLE
ENERGY FOR ALL

Copenhagen Centre on Energy Efficiency
**Global Workshop to Accelerate Energy Efficiency:
Challenges, Opportunities and Roadmaps**

UN City Copenhagen 9-12 November 2015

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 to ‘Accelerate Energy Efficiency: Challenges, Opportunities and Roadmaps’, organised by the Copenhagen Centre on Energy Efficiency (C2E2) on 9-12 November, 2015 in the UN City, Copenhagen.

For more information about the workshop, including on the various presentations, visit the C2E2 website at: 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 participants on the first day of the workshop.

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Figure 1: © [CopCap](#)

ABBREVIATIONS AND ACRONYMS

BAU	Business as Usual
BIEE	Base Indicator Energy Efficiency
CDP	Carbon Disclosure Project
CIS	Commonwealth of Independent States
COP	Conference of the Parties
DEA	Danish Energy Agency
DTU	Danmarks Tekniske Universitet
ECE	Economic Commission for Europe
EE	Energy Efficiency
EEF	Energy Efficiency Facility
EESP	Energy Efficient Stoves Programme
EMS	Environmental Management System
EU	European Union
GBPN	Global Building Performance Network
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
IADB	Inter-American Development Bank
IEA	International Energy Agency
IFC	International Finance Network
IFU	Investment Fund for Developing Countries
IIP	Institute for Industrial Productivity
INDC	Intended Nationally Determined Contributions
INPO	International Not for Profit Organization
IPEEC	International Partnership for Energy Efficiency Cooperation
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
KIF	Danish Climate Investment Fund
LAC	Latin American Countries
LED	Light-emitting diode
MEM	Ministry of Energy and Minerals (Tanzania)
MEPS	Minimum Energy Performance Standards
MRV	Measurement, Reporting and Verification
MVE	Monitoring, Verification and Enforcement
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnerships
SDG	Sustainable Development Goal
SE4LL	Sustainable Energy for All
SME	Small and Medium-sized Enterprises
UDP	UNEP DTU Partnership

UN	United Nations
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar
WRI	World Resources Institute
ECCJ	Energy Conservation Centre, Japan
ESCO	Energy Service Company
EV	Electric Vehicles

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INTRODUCTION

Energy efficiency is widely accepted as a fundamental factor for improving energy security and making it affordable and accessible to all. It is also a key option for global climate change mitigation. In addition, the UN Sustainable Energy for ALL (SE4ALL) initiative's objective of doubling the global energy efficiency improvement rate by 2030 requires action on various fronts and involvement of countries, cities, policy makers, the private sector, financial institutions and a variety of other stakeholders.

Copenhagen Centre for Energy Efficiency (C2E2), as the energy efficiency hub for SE4ALL is committed to providing technical and analytical support to global, national and city level actions in speeding up energy efficiency improvement. As part of its country level initiatives, C2E2 had engaged four regional partners to review the status of existing energy efficiency policies and priorities in countries within each region. The four regions and the regional partners included:

- Bariloche Foundation in Argentina - for the Latin America and Caribbean Region;
- Asian Institute of Technology in Thailand - for the Asian Region;
- Centre for Energy Efficiency (CENEf) in Moscow - for the Commonwealth of Independent States Region; and
- The Energy Research Centre at the University of Cape Town in South Africa - for African Region

A total of twelve countries, four from each region, were studied in the initial phase of this initiative, and a consolidated report on the status of energy efficiency in each region was prepared by the respective regional partner. C2E2 envisages providing support to the chosen twelve countries in accelerating energy efficiency. As a first step in this direction, it was decided to hold a capacity building workshop - **Global Workshop to Accelerate Energy Efficiency: Challenges, Opportunities and Roadmaps** from 9-12 November, 2015 at UN City in Copenhagen, Denmark.

The Workshop brought together energy officials and experts from the chosen twelve countries, representatives from development banks and leading businesses, as well as international and regional energy research institutions. It included presentations and discussions on innovative strategies adopted by countries, businesses and financial institutions to implement energy efficiency measures. It also provided opportunity for countries to engage with the SE4All Global Energy Efficiency Accelerator Platform, which is a public-private partnership (PPP) programme that aims to scale-up energy efficiency activities and investments worldwide. The Platform provides governments with a clear path for a multi-stakeholder engagement on critical energy efficiency goals across various sectors. In addition, the findings of four regional energy efficiency studies were presented and disseminated. The Workshop also had capacity building sessions on energy efficiency measures, instruments, policies and programs for core economic sectors. In the break-out sessions that followed, the focus was on arriving at the broad contours of a roadmap for capturing the available energy efficiency potential in respective countries. In particular, by the end of the Workshop, each

participating country had not only prepared a skeleton draft of their roadmap for enhancing energy efficiency, but had also identified the nature and scope of the possible technical assistance and support that the countries would like to have in their quest for improving energy efficiency in respective countries.

A detailed Workshop agenda can be found in Annex I.

PARTICIPATION

The Workshop was attended by 80 professionals from government, business, financial institutions, international organisations and civil society organisations, as well as energy efficiency experts. A detailed list of participants can be found on the C2E2 website.

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

SUMMARY OF SESSIONS

Session 1: Inaugural

Date: 9 Nov., 2015

Time: 09:00 to 10:45

Moderator

John M Christensen

Speakers

- **John M Christensen**, Director, UNEP-DTU Partnership
- **Søren Salomo**, Head of Department, Department of Management Engineering, DTU
- **Henriette Ellermann-Kingombe**, Deputy Head of Department of Green Growth, Ministry of Foreign Affairs, Denmark
- **Regis Meyer**, COP 21, Team, Government of France
- **Djaheezah Subratty**, Head of Policy Unit, UNEP, Paris
- **Monika Froehler**, Communications Officer, SE4All
- **Jyoti P Painuly**, Head, Copenhagen Centre on Energy Efficiency

Key Messages

- Energy efficiency has to be mainstreamed in development policies
- There is a greater role that private sector has to play
- There is ample scope for enhancing the potential of Energy Efficiency
- The workshop touches on various aspects of EE and aims for greater collaboration with partners
- Lot of barriers but so are the opportunities many trend setting examples
- Practical information COP sessions

Session Summary:

1. **John M. Christensen** welcomed the participants and panellists of the 'Global Workshop to Accelerate Energy Efficiency'. He briefly oriented the participants with the broad goals of the workshop, which also included preparation for COP. He mentioned that the second part of the workshop focusses on working with country participants to seek work synergies and possible linkages with global efforts. He also gave a brief of the energy efficiency in practice in design of the UN City building.
2. **Søren Salomo** welcomed the participants. He provided an overview of DTU and the specialized role of UNEP-DTU Partnership. He mentioned that DTU is hosting the workshop together with ministry of foreign affairs in Denmark. He emphasized that though the agenda was specifically looking at energy efficiency the underlying idea of resources being used more efficiently (in this case energy) was principally a good idea. Talking about DTU, he said that DTU is a prominent technical university of Scandinavia and has worked on many issues related to energy efficiency. DTU has also collaborated with the private sector for many research projects. To conclude he

hoped that the workshop goes beyond the agenda and also that the participants get an opportunity to seek work related synergies with all the partner institutes / countries in the workshop.

3. **Henriette Ellermann-Kingombe** welcomed all the participants. Speaking on the importance of energy efficiency, she said that energy being included as one of the goals in 'Sustainable Development Goal (SDG 7)' gives a good starting point for the workshop and to find practical solutions for energy efficiency thereby making it a part of the development is the way forward. Sustainability is the only pathway in future also from the financial perspective. She mentioned about the recent announcement by Goldman Sachs to invest USD 150 billion in clean energy, which is not to save the planet but also because there is a business potential in clean energy and energy efficiency. Putting forward the Danish perspective, she mentioned that to make sustainable energy available for citizens of Denmark has been the government's priority, which is also one of the reasons for sponsoring the SE4ALL centre. She mentioned that we need such partnerships and in Denmark, they are instrumental in helping us pursue our energy efficiency goals. She highlighted that they have established the 'Copenhagen Centre for Energy Efficiency' as a one-stop shop for advice on energy efficiency. Highlighting the importance of non-governmental bodies, she mentioned that governments are not (and should not) be the only ones to invest in energy efficiency. Private sector has a major role to play and SE4ALL demonstrates this. SE4ALL has set an important goal for doubling the rate of energy efficiency, which is also reflected in the SDG 7. She mentioned that energy efficiency has a transformational potential and role of the accelerators would be discussed in the upcoming sessions in the workshop.
4. **Regis Meyer** provided an overview of energy efficiency in COP 21. He mentioned that the COP 21 would set a new climate regime based on the commitments from all the parties and stakeholders. The stakeholders were advised to formulate energy efficiency policies and integrate them into the development agenda. He appreciated the efforts by the French government and mentioned that the government and the Inter-ministerial team at work is aiming to deliver its best for the COP. He mentioned that there are four special ambassadors for climate to represent the COP 21 presidency around the world.

Talking about the COP 21, he mentioned that the success of Paris would depend on COP 21 meeting its objectives. These objectives include coming up with a legally binding agreement that is universal, ambitious, lasting and dynamic, flexible i.e. as both mitigation and adaptation, and significant i.e. has an noteworthy impact on supporting the global vision of keep the global temperature rise below 2°C. In terms of national contribution, more than 155 countries until date have expressed interest in acting against climate change by submitting their INDC, which covers about 87% of GHG emissions. Fulfilling the commitment of Copenhagen with developed countries mobilizing 100 billion USD per year would entail working on the financing and account mechanisms, reorienting global finance flow engaging the financial transition towards a low carbon and resilient economy. He mentioned that success on these fronts will determine the success of COP and the mechanics need to be discussed and negotiated. He also emphasized on the need to accelerate climate action on ground pre-2020 and beyond.

Talking about non-state commitments, he mentioned that non-state actors were also being encouraged to make commitments before Paris alongside the states and to register them in the

NAZCA platform. As a result of these, about 1700 sub-national commitments from 582 cities 98 regions covering 15% of the world's population where energy efficiency represents 40% of emission reductions and more than 2000 commitments from 1150 business of which 60% can be quantified. He also talked about the thematic focus of COP 21 and Lima Paris Action Agenda initiatives. Finally he mentioned that there is a gap in the ambition and the contribution but stressed on the fact that this was definitely a step ahead than before towards the agreement.

5. **Monika Froehler** oriented the audience on the journey of SE4ALL and the events of the year. She mentioned that year was incredible and had some significant events that also brought the initiative into focus. The first event for the SE4ALL forum and it was important because of multi-stakeholder engagements and it hosted the first ministerial gathering and committed with their country and to progress towards achieving the three sustainable energy targets. These three targets, namely, ensuring universal access to modern energy services; doubling the global rate of improvement in energy efficiency and doubling the share of renewable energy in the global energy mix drive the agenda at SE4ALL. At the Vienna Forum, the focus was on energy efficiency but also on industrial development and getting industry on board in a collaborative effort. SE4All also launched a report at the Financing for Development (FfD) conference on 'Scaling Up Finance for Sustainable Energy Investments', which identifies the potential for catalysing \$120 billion of incremental annual investment in sustainable energy by 2020

She talked about the SDG forum whereby adopting energy efficiency as one of the goals has highlighted its importance in sustainable development. She also expressed how energy efficiency was an enabler goal or a front loading goal and important for achieving for many other sustainable development goals for e.g. poverty, gender balance, health care etc. She sees that sustainable energy needs to perform well and show that it has impact on other goals. She mentioned that they are working towards filling a void from 2016-2020 without agreement. The indicators are subject to discussion till March 2016.

She congratulated all the partners and their efforts in putting SE4all targets into practice. She mentioned that to achieve the three goals of sustainable energy we have to work on the 3 'S' i.e. Smart, Speedy and Scale. She emphasized that it is also important to look into the value addition for the partners and quantifiable and verifiable aspects of activities. This, she mentioned, is also dependent on a steady financial flow and therefore they are collaborating with banks like National banks, World Bank and keeping room for private partners. She mentioned that their next objective is to transit into an International Not for Profit Organization (INPO), while still being deeply entrenched in UN work.

She explains that her expectations from COP21 were high considering that energy efficiency was mentioned in almost three fourths of the INDC submissions. She mentioned that pre-COP 21, their target was to deliver the 100-100-100 i.e. 100 Jurisdictions, 100 banks and 100 companies and she was happy to announce that they achieved much more than this till date. She mentioned that their team was working hard and on the energy day on 7th Dec they have events on energy access and energy efficiency in partnership with other institutions like IRENA.

6. **Djaheezah Subratty** focussed on information on energy efficiency events at COP 21. On 7th Dec there are two dedicated sessions on energy efficiency centred around the thematic accelerators. UNEP would be co-leading these sessions. The session coordinator thanked all the partners who worked on the accelerators without the partners. Apart from these, there will be two open

sessions on energy efficiency and a campaign on power. She mentioned that they were working closely with their partners to define good success stories around thematic accelerators and highlight the significant achievements. The building day on day 3, transport and Action day will also have components on energy efficiency. A brief summary for the events will be made available for the workshop participants.

7. **Jyoti Painuly** welcomed all the participants. Orienting the participants with the workshop, he said that the workshop has a twin theme of deliberating on the challenges and opportunities, as well as sharing experiences with private sector, which can then help overcome some challenges. During the workshop, there is also an opportunity to explore the possibilities of collaborative work with the countries. He briefed the audience on the work of SE4ALL. SE4ALL, a unique global initiative brings together leadership from all sectors of the civil society and business in pursuit to manage energy resources efficiently. Governments of 106 countries and the EU have participated with SE4All to advance its 3 core objectives for which governments, private sector, and multilateral agencies are trying to mobilise the resources.

He mentioned that the overall progress for the tracking period 2010-12 (Global tracking framework) is short of all the three objectives, though in 2014 the energy intensity of global economy dropped by 2.3%. Among the important challenges, he mentioned that financing was a big one. Transforming commitment to visible target by the '80%+ club' i.e. 20 developed and emerging economies that account for 80% emissions is need for the hour. Another important challenge mentioned by Jyoti was on that of indicators making tracking of energy efficiency progress a very difficult task. He cited an example of how shifting goalposts also changes the metrics such as market rate or PPP rate or with a base year of 2015 or 2010 etc. While modelling studies show reductions in energy intensity in BAU, researchers have found carbon tax to be better in order to achieve goals. On an average, it is estimated that the transit from traditional to low carbon and efficient means would require 1.6 trillion USD per year in 2030-50. Global tracking framework suggestions annual global investments of 1-1.2 trillion are required until 2020 to meet all the objectives. He questioned if having 100 companies on board would solve the issues because the underlying need was to work on fundable projects.

While providing an overview of Global Energy Efficiency Accelerator Platform, he mentioned that the 100-100-100 was being mobilized to drive the platform at COP 21. He mentioned some exemplary global commitments such as; Japan is committed to have all new public sector buildings as zero energy ones by 2020 and European Union has put forth similar commitments. Falling cost of technologies has made it possible to replace traditional technologies with the efficient ones. LEDs procurement cost reduced by 74% and government of India has decided to replace all public lights in the next 3 years. Cities are also taking responsibilities for e.g. Copenhagen is targeting to be carbon neutral by 2025. In Copenhagen, since 1990, carbon emissions have reduced by 40% while economic growth was at 50%. It is a biking city with almost 50% of commuters using bicycles. 63% of all members of parliament commute by bike and are good leadership examples. For finance facilitation, he mentioned that the EU has mobilized 600 million euros for investments in the initiative till 2020 and another 4.5 billion euros are being planned for future.

Talking about the activities at the hub, he talked about the support that the hub provides at various levels. At a global level, the hub has worked on modelling pathways, collaborated to

support GTF and serves as a knowledge management platform to support energy efficiency stakeholders. At regional level, it collaborates with its regional partners and recently released four regional studies on Africa, Asia, Latin America, and CIS countries. At national level, Jyoti hoped to work with the country participants. The hub also provides analytical and technical support for accelerators on need basis and serves as secretariat for SE4ALL.

Session 2: Energy Efficiency: Potential and Multiple Benefits (IEA); Special presentation on Energy Efficiency initiatives (IKEA); Global Energy Efficiency Accelerator Platform (C2E2); Global Energy Efficiency Accelerators: Targets, Strategies and Engagement at the local level (Panel)

Date: 9 Nov. 2015

Time: 11:05 to 12:45

Moderator

Zitouni Ould-Dada (UNEP)

Speakers:

Melanie Slade (IEA), **Jonas Engberg** (IKEA), **Mark Lister** (C2E2), **Harry Verhaar** (Philips Lighting), **Steve Kukoda** (International Copper Association)

Key Messages:

- Retailers are discovering value in vending energy efficient goods and appliances, demand for which, especially energy efficient lighting products, is seeing steady increase.
- For corporations, sustainability makes business sense, and is not simply green marketing. IKEA pursues sustainability via energy efficient products (LED lighting and efficient cooking products).
- Energy efficiency will make up 49% of the gap between INDCs and the 2°C targets.
- A major element in energy efficiency uptake is the SE4ALL Energy Efficiency Accelerator platform, which sits with C2E2, and engages companies, financing institutions and municipalities to foster high impact opportunities.
- Most developing countries do not currently have policies in place to leapfrog to efficient products. Accelerator platform partners on lighting, appliances, hardware and other areas play an essential role (e.g. through the **en.lighten** initiative which aims to phase-out incandescent lamps) in availing these opportunities globally by phasing out inefficient sources and products.

Session Summary:

- 1 Using examples of Thailand and Indonesia, **Melanie Slade (IEA)** showed how data and analysis can identify EE opportunities in economies with large—and increasing—energy demand.
- 2 Pointing out that sustainability is one of the important cornerstones of IKEA's long term strategy, **Mr. Jonas Engberg** highlighted 'better life at home' and 'energy and resource independence' as main sustainability initiatives being pursued by IKEA. Under these initiatives, IKEA is promoting the sale of energy efficient products and appliances (e.g. from September 2015, IKEA now sells LED lamps only), and is also progressing well towards achieving energy independence by 2020 through renewable energy capacity and energy efficiency in operations, wherein IKEA had managed to save Euro 40 million worth of energy consumption since 2010. Besides, IKEA is also working with its supply chain entities to bring sustainability in their respective production facilities and aims to improve energy efficiency of its supply chain by 30%. Mr. Engberg also pointed out that, IKEA applies very liberal threshold limits for payback periods for investments in energy efficiency and sustainability initiatives with payback periods of as high as eight years being the standard norm in IKEA.

- 3 Both **Zitouni Ould-Dada** (UNEP) and **Mark Lister** (C2E2) described how the EE accelerator is about turning commitment into action in order to achieve the SE4ALL target of doubling the global rate of improvement in energy efficiency by 2030.
- 4 The harmonization of efficient lighting is a critical deliverable within the Accelerator. This was noted by **Harry Verhaar** (Philips Lighting). It can help reduce energy import, reduce the needs for energy supply, and also crucial for consumers and cities. If we can double the energy efficiency improvement, it can also create many jobs.
- 5 Accelerator activities are also about building and centralising knowledge and expertise in order to drive transformation to efficient products and the elements that go into them. This has multiple benefits, according to Steve Kukoda (International Copper Association), such as administering market analyses, leveraging opportunities and harmonising standards across regions.

Session 3: Global Energy Efficiency Accelerators: Targets, Strategies and Engagement at the Local Level

Date: 9 Nov. 2015

Time: 14:00 to 15:00

Moderator:

Djaheezah Subratty (UNEP)

Speakers:

Julia Panzer (Danfoss), **Sheila Watson** (FIA Foundation), **Jennifer Layke** (World Resources Inst), **Jigar Shah** (Inst of Industrial Productivity), **Rana Ghoneim** (UNIDO)

Key Messages

- SE4ALL Accelerators fill a critical role in cross-sectoral engagement—bringing together firms active in energy efficiency with cities and markets that provide opportunities.
- A key aspect of the Accelerator model is knowledge sharing which features content capture and distribution.
- Accelerator engagement with stakeholders (markets, municipalities, opportunities) occurs through interventions that range from light touches to deep dives, depending on the contours of the intervention.

Summary

- 1 **Djaheezah Subratty** (Moderator) gave an overview of the SE4ALL EE Accelerator and then, along with **Julia Panzer** (Danfoss) went through the details of the district energy in cities accelerator such as reducing barriers by increasing awareness through a portfolio of workshops, regional efforts and targeting cities.
- 2 **Sheila Watson** from the Global Fuel Economy Initiative reviewed the track of GFEI's in-country policy support and leveraging that globally.
- 3 For building efficiency, **Jennifer Layke** (WRI) reviewed a comprehensive menu of policies and mechanisms required to enhance building performance.
- 4 In industrial energy efficiency, **Jigar Shah** (Institute of Industrial Productivity/IIP) drew on examples of knowledge exchange and peer-to-peer learning to facilitate information transfer. This included a focus on IIP's collaboration with CDP. **Rana Ghoneim** added to this in her profile of the industrial EE accelerator and its focus on mainstreaming financing solutions into standard loan operations.

Session 4: Capturing Energy Efficiency Potential: Business and Supply Chains

Date: 9 Nov. 2015

Time: 15:00 to 16:00

Moderator

Kristoffer Hvidsteen, Accenture, Denmark

Speakers

Julia Panzer (Danfoss), **Jigar Shah** (Institute of Industrial Productivity), **Harry Verhaar** (Philips Lighting), **Kim Jonas** (Velux Group)

Key Messages

- Businesses in pursuit of sustainability in their operations are according considerable importance to energy efficiency, not only in their own factories and premises but also in their supply chains.
- Retailors are discovering value in vending energy efficient goods and appliances, demand for whom, especially energy efficient lighting products, is seeing steady increase.

Summary

The session was initiated with the moderator, Kristoffer Hvidsteen, providing context on energy efficiency's place in the overall global economy and, specifically, its active opportunities for businesses. Specifically, Kristoffer, walked the audience through the global transition to a circular economy and the financial and economic gains that can be generated by incorporating its principals. These include the fundamental principal of efficient use of energy as a resource, and that these benefits are realised directly and not simply indirectly.

- 1 As a manufacturer of energy efficient heating and cooling systems, components and equipment, including district heating and cooling systems, **Ms. Julia Panzer** of Danfoss highlighted the energy efficiency improvements captured by Danfoss in their clients' premises and processes. In particular, Ms. Panzer, mentioned about the on-going district energy project in the Chinese city of Anshan, which is expected to reduce coal consumption and CO₂ emissions by 60-90% when fully implemented. Ms. Panzer also mentioned about the waste heat recovery project in a supermarket, where excess heat from refrigeration plant was used to heat water and save gas (that was being used for heating water) to the extent of Euro 30,000 per year. Ms. Panzer also presented statistics that showed the extent of energy efficiency potential that remains to be captured in components and applications where Danfoss has presence, such as electronic thermostats (98% remaining), variable speed drives (70-80% remaining), heat pumps (70-85% remaining), food refrigeration (60 remains), district energy (78-80% remaining), and control valves (95% remaining).
- 2 Mentioning about typical supply chain energy efficiency enhancement initiatives, **Mr. Jiger Shah** identified—reporting and monitoring, subsidized audits, capacity building and training, implementation support, purchasing approach (procurement tool (Netherland—PRORAIL) which

uses CO₂ performance ladder—scale of 1 to 5), energy efficiency labelling, mandatory supplier requirement (sustainability criteria, ISO 1400 series, ISO 50000 series)—as some of the reliable interventions and policies being used by Companies to optimize energy efficiency in their supply chains. Mr. Shah also discussed the supply chain and circular economy initiatives undertaken by the Institute for Industrial Productivity (IIP) on behalf of various businesses in their supply chains in Bangladesh, China, and India.

- 3 **Mr. Harry Verhaar** pointed out that Philips Lighting had set a goal to reduce its own carbon footprint by 40% by 2015, compared to baseline year 2007. With 36% reduction having been achieved till 2014, Mr. Verhaar pointed out that Philips Lighting was well on it's to achieve its goal. Mr. Verhaar also pointed out that on the downstream end, Philips Lighting has a goal to improve product energy efficiency by 50% by 2015, compared to baseline year 2009. He further pointed out that Philips Lighting was near to achieving their goal may not do so by 2015.

- 4 Referring to Velux's climate strategy, **Mr. Kim Jonas**, pointed out that the overall thrust is to supply products that can help customers to save energy – thus contributing to Sustainable Living in Buildings, and saving energy as a company by improving our (Velux's) energy efficiency in operations and reduce our carbon footprint. Mr. Jonas pointed out that, in concrete terms, VELUX has set the goal of reducing the Group's 2007 global CO₂ emissions by 50% by 2020. Mr. Jonas further said that, Velux envisages to achieve the goal is by: Implementing certified ISO 50001 energy management, targeting significant investments in energy efficiency, and providing green electricity to fill any remaining CO₂ reduction gap to reach our 2020 goal. Mr. Jonas also pointed out that by 2014, Velux had managed to reduce their CO₂ emissions by 29%.

Session 5: Energy Efficiency Finance: Public and Private Sector Investment

Date: 9 Nov. 2015

Time: 16:15 to 17:15

Moderator:

Thom. Thorsch Krader (C2E2)

Speakers:

Ashok Sarkar (World Bank), **Torben Huss** (IFU – Danish Investment Fund for Developing Countries), **Patrick Doyle** (Inter-American Development Bank), **Corinne Figueredo** (International Finance Corporation), **Florence Ventura** (African Development Bank) – via video link, **Binu Parthan** (Green Climate Fund) – via video link

Key Messages:

- Energy efficiency finance is a dynamic ecosystem comprising project investment, de-risking activities and interventions in bankable projects.
- A key constraint for investment is the high cost of capital in many emerging market projects—the challenge is to reduce those costs without engendering (or enhancing) risks.
- Aligning interests of investors—and accommodating risk thresholds—can unblock capital flows.
- Tools such as partial risk guarantees, first loss cover and technical assistance help to bring projects directly in-line with investor financing parameters.

Session Summary:

- 1 Energy efficiency projects are not confined to large-scale and smaller SME-style initiatives should be considered for portfolios. **Florence Ventura** (AfDB) cited this discussed the energy efficiency interventions being considered in the (SE4ALL, AfDB) Action Agendas for Rwanda and Tanzania and outlined instruments such as Lines of Credit currently being offered by the African Development Bank to finance energy efficiency.
- 2 EE financing requires private sector involvement and should focus on sub-national projects, i.e. city-level interventions, according to **Ashok Sarkar** (World Bank), who illustrated investment using a ‘Public Finance Step Ladder’ model. He highlighted a range of financial instruments available for energy efficiency depending on market readiness. Mr Sarkar said that public finance helps de-risk private sector investment and drew on a diverse number of financing models that have been successful in implementing energy efficiency programs in Mexico, India and China.
- 3 From the Denmark perspective, **Torben Huss** (IFU) summarised the challenges associated with setting up the Danish Climate Investment Fund (KIF), which is a Public Private Partnership that provides risk capital for climate investments and climate-related projects (i.e. where there is a CO₂ component) such as those where Danish companies are investing. Mr Huss reviewed risk categories such as country risk, political risk and mitigating factors including long-term power purchase agreements (PPAs).

Challenges brought forward by Mr Huss included lack of supply of good projects, right political framework, cost of capital and the need for competent technical partners, particularly in the energy efficiency space.

- 4 Covering the Latin America experience, **Patrick Doyle (IADB)** summarised some of his bank's energy efficiency investments primarily in industrial and commercial buildings and green lines for banks and private equity funds. In detail, Mr Doyle reviewed tools for creating bankable opportunities i.e., leveraging concessional debt, first loss guarantees, off-take agreements, co-financing, e.g. an off-balance sheet municipal lighting upgrade (savings from lighting transactions can be big). He also discussed replicable projects IADB has undertaken such as energy efficiency cogeneration.
- 5 South Africa's Residential Greening Programme is a list of technical measures that when implemented will reduce embodied energy of construction materials, energy, water by 20 percent as well as the operational or transaction costs of a building. This concept was introduced by **Corinne Figueredo (IFC)** through a video.
- 6 **Binu Parthan** accounted for the Green Climate Fund's main vision of promoting a paradigm shift towards low-emission and climate resilient development where energy efficiency (EE) is to be considered a part of day-to-day efforts to achieve this. Mr. Parthan explained that GCF is different from other funds in that it ensures direct access from developing countries and that decision-making is devoted to country-level to maximise ownership. Additionally, a range of instruments will be deployed and the private sector will be involved so that a wide number of accredited partners are drawn upon in this fund. Activities such as the implementation of national Measurement, Reporting and Verification (MRV) frameworks are part of the GCF focus.

Session 6: Energy Efficiency Progress: Examples from Developed and Emerging Economies

Date: 9 Nov. 2015

Time: 16:15 to 17:15

Moderator:

Benoît Lebot (International Partnership for Energy Efficiency Cooperation)

Speakers:

Ulla Vestergaard Rasmussen (Danish Energy Agency), **Gabrielle Dreyfus** (US Department of Energy), **Igor Bashmakov** (Centre for Energy Efficiency (CENEf) – Russia), **Zhang Xiliang** (Institute of Energy, Environment and Economy, Tsinghua University - China), **Daniel Boule** (Bariloche Foundation - LAC), **Andrew Hebbard** (Energy Research Centre, University of Cape town - South Africa), **Koshy Cherail** (Alliance for Energy Efficient Economy - India)

Key Messages

- Success stories around country strategies for EE policy development, application and horizontal scale abound. These cases provide distinct roadmaps and insight for emerging markets to construct their energy efficiency strategies.
- Applying best practices in energy efficiency from different economies can have effective results but requires capacity to account for context differentials

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• **Session Summary**

- 1 Discussing about Denmark's clean energy economy—which began when the country started decoupling energy consumption and economic growth more than 30 years ago— **Ulla Vestergaard Rasmussen** mentioned that Denmark remains a world leader with aggressive goals (from 2020 all new buildings should be 'nearly' zero energy), going forward. Energy efficiency plays a critical role in the Danish Energy Agency's (DEA) clean energy portfolio. The DEA assists emerging economies in reducing their greenhouse gas emissions and thereby their global carbon footprint via data, strategic planning and awareness campaigns.
- 2 **Gabrielle Dreyfus** presented examples of the Clean Energy Ministerial's initiatives including the Efficiency for Access (E4A) Coalition, a collaboration between the Global Lighting and Energy Access Partnership and SE4All to mobilize support for the development and deployment of super-efficient end-use technologies.
- 3 Russia is pipelining a range of pro-active EE activities from methodological support (e.g. MRV) to soft-term financing for public sector energy efficiency projects to energy audit market development. **Igor Bashmakov** also detailed key trends in the Russian context including growth of metering-based energy billing and EE classification and labelling (borrowed from EU system).
- 4 Through a series of milestone-oriented graphs, **Zhang Xiliang** illustrated the drop in China's energy intensity marked by, among other things, a reduction in energy consumption per unit of industrial product—a drop of 10%-30% between 2000 and 2013. This was broken down into

decentralised profile across provinces where half have achieved energy intensity reduction targets ahead of plan.

- 5 **Mr. Andrew Hibberd** presented the progress on energy efficiency in South Africa where three initiatives have been started of which the first deals with separating fact from fiction through a process of measurement and verification to quantify how much energy is being saved from the efforts. Secondly, drawing out successful case studies is used for demonstrating what is possible to achieve through EE. Thirdly, regulating intent through the Department of Energy mandating that organizations of a certain size report energy use and provide energy consumption and production data. Additionally, some very large organizations are even required to submit an Energy Management Plan, however the results of this regulation is yet to be seen.
- 6 **Mr. Daniel Bouille** commented on the state of EE in the region of Latin America where there have been improvements in the focus on EE with several countries increasingly taking it into account. Especially Mexico and Brazil are making great efforts and achieving results, which is mainly due to their climate change-related international obligations. Mr. Bouille stressed the need for facilitating technology transfer by making relevant technology available at a reasonable price and ensuring that the right national framework is in place. Overall, there are positive trends with new legislation on the subject in many countries and training and capacity building increasingly being emphasized. However, there is still a gap between policy and actual implementation. Mr. Bouille highlighted four elements that are critical for successfully expanding EE: the political support of government, the continuity of the project in the longer term, the ability to access available capital, and capacity to report what can be achieved within different sectors.
- 7 Mentioning about the legal framework and institutional set-up for energy efficiency promotion in India, **Dr. Koshy Cherail** highlighted various on-going energy efficiency initiatives in industry (Perform Achieve and Trade Scheme), appliances, lighting end-use, agriculture and building sectors. The mention was also made about the World Bank financed partial risk sharing facility for energy efficiency projects, which is specifically directed at small and medium enterprises. Dr. Koshy observed that, overall, the energy efficiency is improving considerably, but huge potential still remains. Buildings and transport sectors were specifically mentioned by Dr. Koshy.

Session 7: Copenhagen Centre on Energy Efficiency's Four Regional Reports

Date: 10 Nov. 2015

Time: 09:00 – 11:00

Moderator:

Tim Farrell (C2E2)

Speakers: **Daniel Bouille** (Bariloche Foundation, Argentina), **Andrew Hebbard** (Energy Research Centre, University of Cape town, South Africa), **Igor Bashmakov** (Centre for Energy Efficiency (CENEf) – Russia), **Abdul Salam** (Asian Institute of Technology, Bangkok, Thailand)

Key Messages:

- The reports identify the barriers and opportunities for the four regions of Latin America, Africa, South Asia, and CIS countries and across 53 countries.
- The Latin America region report proposes criteria for countries for adopting and actively pursuing energy efficiency measures.
- The Africa region though quite diverse could benefit with more collaborative efforts. Facilitation in the engagement areas of energy efficiency and energy access with countries in each of the regions through a hub could be beneficial.
- The CIS region report developed an indicator system for identifying the good performers and the poor performers that needed technical support.
- The Asia region report focussed on prioritizing the sectors for energy efficiency effort and suggests targeted tail made sectoral efforts to deal with barriers.
- Challenges in the regions common: lack of relevant data, lack of finance, poor implementation, and policy support etc.
- Opportunities for tapping the potential are very high if barriers are overcome.

Session Summary:

1. Regional report on Countries from Latin American and the Caribbean (LAC) region – Daniel Bouille

Introducing the report, Dr. Bouille mentioned that the objective of the report was to assess contribution of energy efficiency measures towards sustainable development and to postpose a set of criteria important for accelerating energy efficiency in the LAC region.

Daniel highlighted the cultural, social and economic diversity of the LAC region (For e.g. Mexico is an OECD country, Brazil is an emerging economy and Bolivia is one of the poor ones in the LAC). He then stated that, this diversity poses a challenge of enabling conditions, some of which are unique to the country and region. Some of the challenges to the region are vulnerability in energy systems; high fuel costs relative to income; price volatility; poor supply infrastructure; high technical losses in the power sector; low load factor; high demand growth and restrictions in investments capacity; high production cost; relatively low level of access to modern energy system etc. There are 30 million (8%) of people in Latin America with no access to electricity and because of this, issues of

access have to be taken into account as a part of the energy policy. Talking about barriers to energy efficiency *per se*, some of the important identified barriers were: lack of institutional performance; inefficient knowledge on opportunities; not a top issue in the energy agenda; upfront costs as the key point in the education, no regulation of existing laws; non-oriented sub subsidies apart from socio-cultural problems that many times facilitates entry of inefficient energy equipment. Apart from these, he mentioned that financing was a big issue because of reluctance to provide funds for efficiency projects. Measurability was another challenge due to absence of a set of indicators that highlight progress. The energy efficiency market has not developed fully in the LAC and information is another hurdle.

Another outcome of the report was the criteria proposed for accelerating energy efficiency in LAC that include criteria like institutional issues; legal and regulatory framework; financing resources; scarcity of resources; sectors or uses of significant magnitude and weight; milestones of structural changes in energy policy; potential technological niche development; replicating actions in other countries; degrees of progress and local capacity; Lack of favourable policy environment; and abundance of energy resources.

He mentioned that the study also found some potential for cooperation. There is also scope for capacity building and reinforcement; developing a database for energy efficiency indicators; institutional and legal and regulatory development; In the industry for energy management system implementation; design and implementation effective policies strategies and instruments like labelling EMS, standards, audits etc.; efficiency centres development like that of Chile; information awareness and guidelines development.

2. Regional report on African Countries – Andrew Hibberd

Andrew provided the highlights of the Africa report. The report covers 24 Countries. He set the context by stating that Africa is the second most populous continent of the world but consumes only 6% of the primary energy and therefore the continent is poor in energy. The share of population without electricity can be as high as 75% of the population in countries like Ethiopia, South Sudan, Niger, Mauritania, etc. He cited that on an average 60% of African population does not have access clean and reliable energy and almost 80% use traditional biomass for cooking. He mentioned that growth in energy consumption was rooted in the need for improved access to energy, where there is a lot of potential for consumption to increase in Africa. He emphasized that these conceptions of 'energy efficiency' and 'energy access' were linked inextricably and one could not talk about them independently. In the African context, providing access in an efficient manner was more cost effective than retrofitting at a larger stage.

Talking about the results, Andrew mentioned that half of 24 countries did not have any strategy on energy efficiency, of those that did have some strategy or policy they either were under review or were outdated. For standards and labelling, there was very low implementation rate in the countries. The barriers are similar in categories to those faced by LAC for e.g. lack of testing facilities etc. In mass rollouts of technology, success was being achieved like energy efficient lights and most countries had some programme in place or something prominent coming up. Controlling for quality was a difficult task as poor quality technology is often implemented. There are legislations in place in some places like those on energy efficient lighting but people cannot afford them. Citing another

problem, he mentioned that subsidized energy audits were quite popular and achieved success in some countries but were mostly funded from external resources. In many cases, there are 100% subsidies for organizations to conduct these audits. Financing soft loan schemes was an issue in most countries. Many countries have also implemented awareness programmes and schemes for users to make efficient choices but sometimes the prices of electricity are too low for these efficient choices. Most countries also stated that access to energy for increased proportion of the population was still a priority item when considering interventions. Renewable energy distributed generation and energy efficiency measures are all considered as contributors to this goal. In addition, efficient cooking methods are associated with improved health and safety as well as reduced impact on environment. Initiatives in east Africa on efficient cook stoves have proved to be successful.

Talking about the gaps, Andrew mentioned that countries require assistance in raising awareness, technology, finance, capacity building, and MRV (monitoring, reporting and verification). In conclusion, Andrew emphasised that facilitation in the engagement areas of energy efficiency and energy access with countries in each of the regions was needed.

3. Regional report on CIS Countries – Igor Bashmakov

Igor presented the regional report on CIS countries that covered 10 transition economies. The regional report, apart from highlighting past successful energy efficiency initiatives, has also assessed energy efficiency potential in various sectors. In addition, the report also describes the existing institutional structures, suggests potential initiatives by the governments, and identifies the assistance required to enhance energy efficiency initiatives. Based on the information collected, the countries were ranked in terms of their energy efficiency levels and efforts using the scoring system. This scoring system developed by Center for Energy Efficiency, Russia (which was also the lead research organization in the study. Based on the scores, the countries were classified into three major groups the champions (Kazakhstan and Belarus); Middle performing group (Kyrgyzstan, Armenia, Georgia, Uzbekistan, Tajikistan, and Moldova); and the underperformers (Azerbaijan and Turkmenistan).

Talking about the retrospective analysis, he mentioned that the performance is different in three periods starting from 1990s when the economic situation deteriorated significantly. The 2000-2009 restorative growth went alongside with substantial energy intensity reduction. After 2000, the GHG emission growth trend is observed in 8 of the 10 countries. Much of this GDP energy intensity decline was driven by structural shifts and growing capacity load. He mentioned that after 2009, GDP energy intensity showed some decline slowdown or even started growing in many countries. On an average annual contribution of the technology factor to GDP, energy intensity reduction is close to 1% and there was still a large technological gap with the advanced economies.

He mentioned that one important task was to estimate the energy efficiency potential. He then presented the results of technical energy efficiency potential and energy efficiency distribution curves. Estimates of technical, market and economic energy efficiency potential of 80 typical technologies was also presented.

Talking about the problems and barriers, he mentioned four broad categories of barriers, which were lack of information (scarce and low quality data among other issues), lack of motivation, poor coordination and lack of access to financial resources.

4. Regional report on Asian Countries – Abdul Salam

Prof. Salam presented the Asia Region report. He began by giving a brief introduction of AIT and its role in the regional report. Giving a context to report and how Asia flared in the past decade, he mentioned that there was an unprecedented growth in energy demand the last one decade and it was expected to increase over 80% between today and 2035. As Asia is a very big continent with two prominent countries like India and China, five countries were studied which were Indonesia, Malaysia, Philippines, Thailand and Vietnam.

The methodology involved studying the current energy efficiency status, assessing the barriers and opportunities for energy efficiency and concluding with the type of interventions that were needed. Questionnaires and personal interviews were used during the study to get expert inputs on energy efficiency initiatives, policy instruments etc. and for collecting data. An in country stakeholder workshop was organized (except in Malaysia) to assess the types of assistance required, and existing and perceived barriers.

Prof. Salam presented some of the results from the report on energy outlook, energy efficiency policy drivers, and energy efficiency programmes for the five countries. Most of the countries already had some policies in place like those on reducing GHG emissions, labelling, efficient building, etc. He also talked about many barriers to implementation of energy efficiency such as lack of coherent policy, lack of capacity, lack of finances and financing mechanisms, socio-cultural and technological issues.

He talked about a potential action plan for the countries, which included targeted capacity building support for various stakeholders such as top management, government employees, energy managers, energy auditors, energy companies etc. Technical and financial support in the form of modern energy efficient technologies, programme development for various energy intensive sectors, etc. Support for developing supportive policy environment to ensure continuity of efforts in energy efficiency was also emphasised. Finally, need for support to develop a central repository of information on Energy Efficiency and for quality-testing infrastructure was highlighted.

Session 8: Regional Energy Efficiency Policy Recommendations

Date: 10 Nov. 2015

Time: 12:15-12:45

Presenter:

Melanie Slade (IEA)

Key Messages

- End-user awareness, low energy prices, financing, and implementation capacity are commonly cited as barriers to energy efficiency
- The ideal energy efficiency policy package consists of: regulation, information, incentives all underpinned by data collection and analysis to target policy and monitor effectiveness

Session Summary

While discussing the main barriers and ideal policy package to accelerate energy efficiency, **Ms. Melanie Slade** highlighted the IEA's 25 policy recommendations for promoting energy efficiency. She also dwelt on the regional energy efficiency policy recommendations that are customized to suit regional political, social, economic and climatic conditions. **Ms. Slade** also drew attention of the participants to various IEA publications on energy efficiency policy, regional energy efficiency policies, IEA energy pathways, energy efficiency governance, IEA technology roadmaps, policies and measures data base and energy efficiency resources.

Session 9: Lighting and Appliances—Instruments, policies, schemes/programmes, innovations

Date: 10 Nov. 2015

Time: 13:30 to 14:30

Moderator:

Tim Farrell (C2E2)

Speakers:

Benoît Lebot (International Partnership for Energy Efficiency Cooperation/IPEEC), **Melanie Slade** (International Energy Agency/IEA)

Key Messages:

- Minimum energy performance standards work as a stick in which products below standards (using comparative labels, endorsement labels) are not allowed on the market.
- Factors to consider when selecting products to prioritise: significant share of total energy consumption, rapidly rising energy consumption, dumping of poor quality products, available test methods and appropriate performance thresholds.
- Monitoring, verification and enforcement is a critical element for compliance.
- The future is mobile. Smartphone apps allow consumers to compare running costs of different appliances when they shop.

Session Summary:

- 1 The economics of Minimum Performance Standards work, exemplified by refrigerators in Australia become more efficient via standards, prices drop over time and volume of units shifted increases was overviewed by Tim Farrell (C2E2).
- 2 Key points for standards and labelling are to solidify and coordinate databases (for the benefit of both suppliers and consumers), according to Melanie Slade (IEA). This will streamline regulatory work, improve transparency and facilitate compliance.
- 3 There is massive leveragability of EE products, noted Benoît Lebot (IPEEC). USD 150 of investment in energy efficient products leads to USD 600 in energy savings

Session 10: Buildings and District Energy – Instruments, Policies, Programmes

Date: 10 Nov. 2015

Time: 14:30 – 15:30

Moderator:

Ksenia Petrichenko (C2E2)

Speakers:

Peter Graham (Global Buildings Performance Network), **Jennifer Layke** (World Resources Institute), **Julia Panzer** (Danfoss), **Djaheezah Subratty** (UNEP)

Key Messages

- District energy system is a highly efficient way for providing locally generated thermal energy for buildings and industrial processes.
- Over time EE policies and codes lead to energy savings.
- With respect to the status of building energy codes for new residential buildings: some are mandatory, some are voluntary, some are mixed. Policy priorities for new buildings – minimum energy efficiency standards. Necessary to try to develop a policy package that incorporates key functions to improve EE.
- There is evolution of building targets, mandatory and voluntary, and how to provide incentives upfront. Many countries focus on targets; and targets can create a market shift.
- Baselines play an integral role in building energy efficiency policy. It is important to improve data and quality, but there is enough proxy data and structure data if you have the right support, to start the policy process.

Session Summary

- 1 Peter Graham (GBPN) noted the challenge facing the buildings sector: doubling the level of investments and doubling the level of energy efficiency in half the time taken by the majority of advanced jurisdictions—it takes around 20 years for EE codes to generate effect. A crucial element is effective policy that integrates design and planning.
- 2 Also, consideration for the scope of codes: in many countries, there are still prescriptive codes, not performance codes. And it is necessary to focus on life-cycle energy efficiency consumption. There are different codes and it is necessary make sure the codes are adapted to a country's specific situations.
- 3 Using urban examples including Tokyo and Buenos Aires, Jennifer Layke (WRI) talked through the opportunities at all stages of the building life cycle and the composite EE assets in buildings.
- 4 A best practice report (Danfoss/UNEP) that built on 45 champion cities from around the world provided the groundwork for (technology options, city policies, business models, national policies) developing modern District Energy Systems—Julia Panzer (Danfoss) presented this effort.
- 5 Elements of the Danfoss/UNEP report were detailed by Djaheezah Subratty (UNEP) including target-setting in Dubai; new strategy in Anshan, China that incorporated renewables,

transmission, waste heat; public private partnerships; roles of local governments; and the benefits of private sector actions such as risk reduction.

Session 11: Industry – Instruments, Policies & Programmes

Date: 10 Nov. 2015

Time: 16:00 – 17:00

Moderator:

Thomas Thorsch Krader (C2E2)

Speakers:

Jigar Shah (Institute of Industrial Productivity), Yasushi Tanaka and Yoshitaka Ushio (The Energy Conservation Centre, Japan, SE4ALL Energy Efficiency Facilitating Hub)

Key Messages

- Best practices, opportunities and challenges in the sector are in some cases explicit, e.g. ISO 50,001 or Energy Management Systems and more implicit, e.g. transparency, disclosure and benchmarking of performance.
- A key tool for improving energy efficiency performance is the capture and benchmarking of data.
- Energy management—through a range of tools—carries direct benefits to industrial firms, both large and smaller scale.

Session Summary

- 1 Tools—specific ones such as regulation, tax, incentives, capacity building, direct investment—can online and upscale energy efficiency measures in the industrial context, according to Jigar Shah (IIP). Some tools in particular, like benchmarking, can benefit many segments of Industry including equipment, process, facility and company.
- 2 Yasushi Tanaka of the ECCJ built on this by outlining the efforts of his organisation in engaging countries around the world in opportunities to adopt more energy efficient technologies and practices. Key drivers include interventions that target cities, information sharing and public/private collaborations. Tools include a comprehensive matrix employed by ECCJ to structure an EE improvement project using combinations of applied software, hardware, data and capacity.
- 3 The head of ECCJ, Yoshitaka Ushio, applied the experience of Japan (which improved EE by approx. 40% since the 1970s primarily through positive industrial action) to discourse. Assigning energy management responsibility within firms yields discrete benefits to industrial EE performance. This responsibility benefits from ‘standards for the rational use of energy’, i.e. adjusting activities in order to institute comprehensive energy management. Such an intervention can be varied to be applied to large-scale factories, small-scale factories, warehouses and offices. The periodical reports that are generated provide valuable inputs to knowledge-sharing platforms.

Session 12: Roadmap for Capturing Energy Efficiency Potential

Date: 11 Nov. 2015

Time: 09:00 – 09:30

Moderator

Thomas Thorsch Krader, C2E2

Presenter

Vijay M Deshpande, (C2E2)

Key Messages

- Roadmap steps consist of elaboration of: present situation (where you are), what are your objectives (where you want to reach), which are your priority areas/sectors, what instruments, policies and schemes you propose to use to meet the objectives in identified priority sector, and assessment of prerequisites in terms of capacity, infrastructure and resources
- Left to market forces, energy efficiency will not happen or will not happen at speed and scale necessary
- Government intervention is therefore necessary, and it is simultaneously required on the demand side—consumers of energy, and on the supply side—financiers/bankers, and supply chain entities such as ESCOs, energy auditors, energy efficiency measurement and verification specialists, etc.
- Governments have been using regulatory, economic and information/educational instruments to promote energy efficiency. What mix of instruments to use to on macro-environment (socio-cultural, legal, political, economic & technology) and pre-requisites in terms of capacity, infrastructure and resources

Session Summary

Mr. Vijay Deshpande discussed the roadmap steps and roadmap contents. Elaborating on the need for government intervention in fostering energy efficiency, Mr. Deshpande provided examples of types and nature of instruments, policies, and programs that governments use to capture energy efficiency potential in different target segments, sectors or end-uses. Mr. Deshpande also discussed the need for data base development and having an institutional set-up for successful design, development, implementation and monitoring of governmental interventions for capturing the available energy efficiency potential. The presentation by Mr. Deshpande also contained examples of elements to be included in any energy efficiency initiative—description and contents.

Session 13: Country Presentations

Date: 12 November 2015

Time: 09:00 to 10:30

Moderator: **Ksenia Petrichenko** (C2E2)

Countries: Armenia, Belarus, Dominican Republic

Time: 10:45 to 12:30

Moderator: **Tim Ferrell** (C2E2)

Countries: Indonesia, Kazakhstan, Nicaragua, Philippines

Time: 13:30 to 14:45

Moderator: **Xianli Zhu** (C2E2)

Countries: Sri Lanka, Tanzania, Uganda, Zambia

Session Summary

Presentations by various country representatives were structured to provide following information about respective countries

- Present Situation
 - Existing focus areas, policies, programs, institutional set-up, targets and budgets
 - Achievements and Gaps in the existing strategies, policies, structure, and data, including major barriers
- Objectives and Priority Areas
 - Objectives - Where you want to reach
 - Targets (Country or Sector Level Target)
 - Priority Areas (Where you want to focus)
 - Sectors
 - End-uses
 - Segment
 - Technologies
- Policies and Schemes
 - Policies you propose to use in the identified target segment
 - Regulatory
 - Economic
 - Information/Education
 - Schemes/Programs you propose to implement
 - Challenges
 - Capacity
 - Finance

- Infrastructure/Institutional
- Macro environment
 - Political backing
 - Legal issues
- Immediate Assistance
 - Training
 - Development of Tools
 - Studies
 - Help in situation analysis

Technical support and assistance needed, as identified in the presentations made by country representatives are summarised below:

Belarus

- Development of ESCO legislation;
- Development program of electric vehicles;
- Research of industrial potential for renewable equipment production;
- Capacity building:
 - Smart grids for district heating;
 - Differentiated tariffs for heating;
 - Energy storage;
 - Infrastructure for EV.

Dominic Republic

- Support for implementing and regulation of the proposed law on energy Efficiency
- Support to identify opportunities and instruments to reduce distribution losses in the power sector
- Capacity building of energy managers
- Support for developing financing mechanisms to improve EE in buildings
- Support to improve the efficiency of the transport sector, including promoting public transport
- To create a laboratory for testing and certification of appliances and equipments

Indonesia

- Capacity building: Industry, residential, building, appliances, transport, power generation
- Study & analysis: Industry, residential, building, appliances, transport, power generation
- Policy advising: Transport and power generation
- Development of pilot projects: Industry, residential, building, transport, power generation
- Enhancing energy efficiency data base: Industry, residential, building, appliances, transport, power generation
- Enhancing financial access: Industry, building, appliances, transport, power generation
- Empowering ESCOs: Industry, building, transport, power generation

Kazakhstan

- Capacity building
- Study tours
- Training

Nicaragua

- Development of a strategy for Monitoring, Verifying and Evaluating to strengthen the energy Labelling Program
- Improve the regional cooperation in improvements related to improving the efficiency of Air Conditioner and Refrigerator.
- Develop a long-term and permanent strategy to improve awareness and education of energy efficiency
- Capacity buildings of Energy Efficiency Managers (Energy Efficiency Services)
- Implementing Energy Management System to Public Office promoting change in the private sector
- Improve Base Indicator Energy Efficiency (BIEE).
- Capacity buildings at institution level (Ministry of Energy And Mines – Energy Efficiency Division – Design policy strategy)
- Action plan to recycle Energy Efficiency wastes (e.g. lamps, glass, metals, refrigerators etc.)

Philippines

- Database development
- Enforcement of standards
- Improvement of labelling programme

Sri Lanka

- Capacity building
 - EE policies
 - Energy conservation building codes
 - Central cooling and tri-generation
- Study and rapid analysis
 - Buildings
 - Industry
 - Transport sector - 3 wheelers
 - Cities and energy efficiency zones
 - Agriculture equipment
 - Energy storage

Tanzania

- Capacity building
 - Enhancing capacity of relevant institutions through short-term and on-the-job training

- Enhancing regulation/guidelines, systems and tools for measurement, monitoring and verification of energy efficiency targets in place and staff trained to manage the system(s)
- Allowing the MEM to establish benchmarking database for prioritizing the ECE initiatives
- Energy Managers' personnel development framework
- Energy Auditors profession development framework
- Study & analysis
 - Quantifying national and sector specific energy efficiency indicators in relation to short-, medium-, and long term targets
 - Documenting measurement, monitoring, reporting and verification (MRV) procedures and tools
- Policy
 - Standards and labeling
 - Building codes
 - Energy management systems
 - Monitoring, reporting and verification (MRV)
 - Energy management guidelines
 - ECE legislation
 - Communication strategy and awareness raising

Uganda

- Capacity building support
 - Staff skills enhancement, analysis tools/systems, knowledge exchange/technology transfer;
 - EE research collaboration;
 - Development of EE Data base & MVE Procedures.
- Policy and legislation advisory support
 - Review of the draft EE conservation bill;
 - Review and update the EESP;
 - Development of MEPS & labels.
- Support Financing of EE Activities to facilitate investments
 - Identification of the financing instruments/Tools for EE Programmes (E.g. Support Energy Audits, Energy Performance Contracting, EE Investments, ESCOs, etc.);
 - Possibility of creation of the revolving fund on EE.
- Development of an EE communication Strategy
- Development of programmes in Industry, Transport, Agriculture, Buildings (like codes etc.) and clean cooking.
- Start Uganda Energy Efficiency Facility (EEF)
 - Identify cost-reflective price for verified energy and electricity demand savings;
 - Format for least-cost energy planning;
 - Develop as a pilot (through development funds/financing);
 - Leverage with industry (Cement & sugar mills, cement kilns, tea industry, etc.).

Zambia

- Policy
 - Technical assistance for policy review and establishment of appropriate legal and institutional framework
 - Development of strategies for EE and long term actions
- Capacity building
 - Enhance capacity for data and information gathering
 - Training of trainers in Energy auditing and implementing measures
 - Capacity for enforcement of mandatory standards
 - Capacity building in product EE testing and labelling
 - Support in accessing financing for capital intensive EE projects
- Study and analysis
 - Establish EE baseline/balance
 - Monitoring and evaluation systems
 - Exchange visits to expose relevant personnel to EE technologies
 - Private sector engagement

Session 14: Closing Remarks

Date: 12 Nov. 2015 **Time:** 14:45 to 15:15

Moderator:

John M Christensen (UDP)

Speakers:

John Christensen (UDP), **Jyoti P Painuly** (C2E2)

Session Summary

John Christensen thanked all participants for continuously engaging on EE over all four days of the workshop. He looks forward to the next steps that the targeted countries take on the pathway and to further engagement between countries and C2E2.

Jyoti P Painuly also thanked all participants for the productive dialogue. He also noted that C2E2 will be in touch with countries about next steps to carry forward the energy efficiency agenda in respective countries.

Participant List

Alhassan Yakubu	Embassy of Ghana
Andrei Malochka	Belarus
Andrew Charles Michael Hibberd	Africa Region Centre-South Africa
Andriah Feby Misna	Indonesia
Anuar Koshkarbayev	Kazakhstan
Artur Tsughunyan	Armenia
Ashok Sarkar	World Bank
Benoît Lebot	IPEEC
Bilyana Chobanova	Energy Charter
Binu Parthan	Green Climate Fund
Boris Melnichuk	UNIDO
Charles Moonga Haanyika	Zambia
Corinne Figueredo	International Finance Corporation
Daniel Hugo Bouille	LAC Region Centre-Argentina
Djaheezah Subratty	UNEP
Farida Zed	Indonesia
Fie Olsen	American Embassy
Fleming Voetmann	Danfoss
Florence Ventura	African Development Bank
Gabriela Prata Dias	Portugese National Energy Agency (ADENE)
Gabrielle Dreyfus	U.S. Department of Energy
Genris Gertrudis Reyes Vasquez	Dominican Republic
H.E. Mr. Hrachya Aghajanyan	Ambassador of Armenia to Denmark
H.E. Mrs. Edith Hazel	Ambassador of Ghana to Denmark
Harry Verhaar	Philips Lighting
Hayk Badalyan	Armenia
Henriette Ellermann-Kingombe	Ministry Of Foreign Affairs
Igor Bashmakov	CIS Region Centre-Russia
Inkar Kadyrzhanova	UNFCCC
Izmail Petrov	UNIDO
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