United Nations
Framework Convention on
Climate Change

Climate Action Now

Renewable Energy Supply and Accelerating Energy Efficiency Action in Urban Environments

Technical Expert Meetings and Climate Action Fair

Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP)

Bonn, Germany
3–6 June 2015

PURPOSE AND OBJECTIVES

By the Lima Call for Climate Action (decision 1/CP.20), the Conference of the Parties at its twentieth session (COP 20) decided to continue the technical examination of opportunities with high mitigation potential, including associated adaptation, health and sustainable development co-benefits in the period 2015–2020, and requested the secretariat to organize a series of in-session technical expert meetings. The in-session technical expert meetings, which began in 2014:

- Assist Parties in the identification of policy options, practices and technologies with high mitigation potential and in planning for their implementation in accordance with nationally defined development priorities;

- Build on and utilize services of relevant organizations, and further enhance the collaboration and synergies among them;

- Provide meaningful and regular opportunities for the effective ambitious of experts from a wide range of relevant organizations;

- Support the accelerated implementation of policy options and enhanced mitigation actions, including through international cooperation.

The objective of the technical expert meetings during the June 2015 session is to assist Parties in advancing the implementation of good practice policy options and technologies. In conjunction with the technical expert meetings, the secretariat has organized a Climate Action Fair to showcase examples of (1) pre-2020 action related to the two technical expert meeting topics (renewable energy supply and accelerating energy efficiency action in urban environments) and (2) actions by non-state actors to address climate change.

RENEWABLE ENERGY SUPPLY

1) BACKGROUND

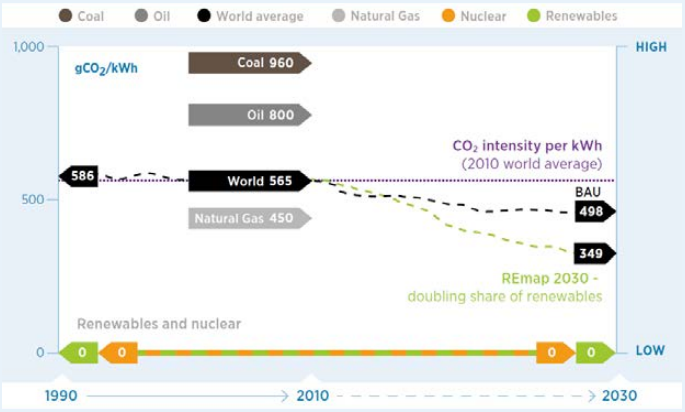
Prepared in partnership with the International Renewable Energy Agency (IRENA)

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) underlines that increasing energy efficiency and renewable sources are fundamental steps towards achieving a low-carbon energy system and development pathway, as over two thirds of global greenhouse gas emissions originate from the energy sector. The AR5 highlights that renewable energy technologies have demonstrated substantial performance improvements and cost reductions in recent years, and that a growing number of such technologies have achieved a level of maturity to enable large-scale deployment. As such, renewable energy technologies could play a significant role in achieving the goal of limiting global warming to below 2 ˚C above pre-industrial levels.

A shift to renewable energy is already underway, as evidenced by positive trends in the deployment of renewables seen worldwide through various national climate action plans and strategies. To date, 164 countries have national level targets related to renewables, representing various policy designs. In 2014, renewable energy accounted for more than half of new global power capacity, and investment in new renewable energy capacity has outpaced investment in new fossil-based power generation for the last three years.

However, the International Renewable Energy Agency's (IRENA) global renewable energy roadmap (REmap 2030) shows that under current policies and national plans (the 'business as usual' scenario), global carbon dioxide (CO_2) emissions will not be sufficiently reduced by 2030 to keep atmospheric CO_2 levels below 450 parts per million (ppm), beyond which severe adverse effects on the climate system are expected to occur according to the IPCC. Doubling the share of renewable energy in the global energy mix by 2030 compared to the 2010 level and enhancing energy efficiency efforts could help to mitigate climate change including by reducing the global average CO_2 emissions intensity per kWh by 40 per cent compared to 1990 levels, as seen in REmap 2030 (see the figure below).

CO_2 emissions intensity per kWh - 2030 outlook



Sources: International Energy Agency. 2010. ***CO_2 Emissions from Fuel Combustion***. IEA Statistics. Available at <www.oecd-ilibrary.org/energy/co2-emissions-from-fuel-combustion-2010_9789264096134-en>; and International Renewable Energy Agency. 2014. ***Remap 2010: A Renewable Energy Roadmap***. Abu Dhabi: IRENA.
Abbreviations: BAU = business as usual, CO_2 = carbon dioxide.

Based on REmap 2030, doubling the share of renewable energy in the global energy mix by 2030 compared to the 2010 level would require an annual investment of approximately USD 650 billion between now and 2030[1]. This means that annual investment in renewable energy assets in this time period should be approximately USD 375 billion compared to estimated USD 275 billion invested in 2014[2]. Achieving such an increase in investments requires countries to implement policies and measures that stimulate investment and innovation, help to scale up financing, and facilitate the broad engagement of all key stakeholders and actors. Of particular importance is to have a predictable long-term policy framework to attract investments, develop expertise, drive technology innovation and upgrade existing capacities in order to build a competitive renewable energy industry.

BARRIERS, OPPORTUNITIES AND POLICY OPTIONS

While individual barriers must be considered in relation to specific national circumstances, a number of common challenges include: technical barriers associated with geographical circumstances and grid reliability, with the increasing integration of renewable energy; economic and political barriers related to cost, finance and manufacturing; as well as a lack of adequate technical support, policymaking capacity and financial planning skills. One preferred option to address such barriers is for countries to have a stable policy framework that enhances investor confidence in renewable energy, while allowing for national renewable energy policies to be adapted in order to reflect changing market conditions such as rapidly decreasing cost of technologies, changing ownership structures in the energy sector and increasing shares of variable renewable power in the grid.

Specific policy options to support renewable energy deployment include high-level policy frameworks and integrated action plans; effective renewable energy targets and quotas; financial and pricing policies, such as feed-in tariffs and green quantitative easing; fiscal incentives; grid integration measures; and support for

1 International Renewable Energy Agency. 2014. *Remap 2010: A Renewable Energy Roadmap*. Abu Dhabi: IRENA.
2 This number includes asset finance of USD 170.7 billion, small distributed capacity investments of USD 73.5 billion and large hydropower investments of USD 31 billion. Based on FS-UNEP & BNEF 2015.

tradable renewable energy certificates and net metering. Implementing such policies could also lead to opportunities for domestic industry development and deliver socio-economic benefits, such as increased personal income and job creation. For example, the renewable energy sector already employs nearly 6.5 million people (excluding large hydro-powers) globally and this number is projected to further grow.

Additional information on the technical expert meeting topics, distributed generation and policies and financial incentives (including feed-in tariffs), is provided below.

Distributed generation

The deployment of renewable energy is causing a shift from centralized utilities to more diverse, localized energy production and mini-grids within the power sector. As such, the future of many power grids involves a broad mix of fossil fuels and renewables, decentralized generation, expanded storage capacity and improved demand and supply planning and operation through smart grids. A more distributed generation model is already emerging in markets with higher renewable energy penetration. By 2022, global installed mini-grid capacity is forecast to rise above 15 GW, which demonstrates an emerging demand for decentralized technologies in mature markets, along with other niche applications in telecommunications, defense and mining.

While storage capacity and costs remain a barrier for some countries, off-grid renewable energy technologies, including stand-alone and mini-grid systems, are emerging as a viable alternative to centralized solutions in developing regions, where access to electricity is non-existent or unreliable. For nearly 1.3 billion people living without electricity access globally, off-grid renewable energy solutions represent an important opportunity to access modern energy and stimulate socio-economic development. The distributed nature of such solutions allows them to be tailored to local conditions and deployed closer to centres of demand. This can reduce, or in some cases eliminate, the need for a centralized grid infrastructure.

Stand-alone solutions represent only a first step in meeting the aspirations of rural households and enterprises. Rural mini-grids, which can range from a few kilowatts to several megawatts of capacity by tapping into single or multiple resources, will play an increasingly important role, as they cater to basic and productive uses of energy. Falling costs and increasing maturity make renewable energy the most appropriate option for new rural mini-grids.

Policies and financial incentives, including feed-in tariffs

A range of financial incentives and relevant schemes exist to promote renewable energy investments. These schemes can be divided into market based and non-market based schemes, as well as price regulation and quantity regulation incentives. These may include:

- **Feed-in tariffs.** A typical example of a non-market-based price instrument is the feed-in tariff scheme. In the scheme, renewable energy projects are granted a long-term fixed price for the generated power, and there is usually an obligation for utilities to purchase the power at a premium price. These schemes have been effective in increasing the amount of renewable energy power generation, but have sometimes been criticized as being costly for the consumers.

- **Competitive tendering procedures.** These are market-based pricing instruments which can increase the cost-efficiency of feed-in tariff schemes. In the competitive tendering procedure, the project owners have to compete against each other to win the long-term fixed price contract. The competition between bidders, when designed carefully, can lead to more cost-efficient support for renewable energy compared to a feed-in tariff applied without such procedures.

- **Quota based schemes.** These schemes can include renewable portfolio standards and green certificate schemes. In these schemes, end-users or power retailers have an obligation to source a certain share of their consumption or sales from renewable energy sources, and this share increases year after year, thus creating demand for renewable energy investments. These schemes can be effective but are more variable, as the price certainty of the scheme can be challenging to maintain.

Any of these incentive schemes can be both effective and cost-efficient. From the perspective of renewable energy investments, the most important aspect is to ensure long-term price certainty for renewable energy generation due to its long term and capital intensive nature. As the cost of financing is a key determinant of the competitiveness of renewable energy generation, reducing the risk of an incentive scheme is a cost-efficient way to promote renewable energy.

2) PROVISIONAL AGENDA

Technical Expert Meeting on Renewable Energy Supply
Organized in partnership with IRENA

9:30–16:30 on Wednesday, 3 June 2015
Facilitator: Mr. Amit Kumar, Adjunct Professor – Sustainable Energy (TERI University)
Room: Please see CCTV at the World Conference Centre

Wednesday, 3 June 2015	
9:30–10:00	Opening remarks by the ADP Co-Chairs and the TEM facilitator – Mr. Amit Kumar (India) Keynote presentations: • Enhanced action on climate change - opportunities in renewable energy: IRENA (Ms. Angela Churie Kallhauge) • Deep de-carbonization pathways: IDDRI (Mr. Thomas Spencer) Questions and answers
10:00–11:00	Session 1: Policies, practices, and actions – unlocking potential on the ground now *Experts share experiences on capitalizing on renewable energy potential, lessons learned, challenges and plans for further scaling up* Expert panel: • United Arab Emirates' journey towards economic diversification: United Arab Emirates (Mr. Majid Al Suwaidi) • The sustainable production of low carbon fuels: GranBio (Mr. Alan Hiltner) • Lessons from Sweden: Sweden (Ms. Marie Karlberg) • The business case for accelerating climate action - We Mean Business (WMB) initiatives on renewable energy: WMB (Mr. Ed Cameron) • Questions and answers

Wednesday, 3 June 2015

11:00–13:00	Session 2: Leveraging scalable, replicable and transformative support efforts Scene-setting presentation • Accelerating the clean energy transition: Bloomberg New Energy Finance (Mr. Angus McCrone) Two parallel break-out groups *Participants discuss options to bring action to fruition (where are the real opportunities); mobilize finance, technology and capacity and ways of overcoming barriers (what is happening on financing and policy fronts)* **Group A**: Distributed generation Moderated discussion by Astonfield Renewable Resources (Mr. Sourabh Sen) Expert panel: • Distributed generation and integration: Technology Executive Committee (Mr. Kunihiko Shimada) • Business and Policy Frameworks for Successful Mini-grid Rollouts: EU Energy Initiative Partnership Dialogue Facility – Mr. Michael Franz • Scalable and replicable public–private partnerships (PPPs) - hybrid mini-grid PPPs for rural electrification in Mali: Mali (Mr. Ibrahim Maiga) • Financial instruments for distributed generation (tbc) **Group B**: Policies and financial incentives, including feed-in tariffs Moderated discussion by the Center for Clean Air Policy (CCAP) (Mr. Ned Helme) Expert panel: • The role of public policy, finance and other incentives in mobilizing renewable energy investments: Chatham House – Ms. Kirsty Hamilton • The UK small-scale feed-in tariff scheme: United Kingdom (Mr. Gareth Redmond) • Renewable Energy Independent Power Producer Procurement Programme: South Africa (Mr. Maesela Kekana) • Financial instruments for renewable energy (tbc)
13:30–14:45	Dialogue series: ADP Briefing on support to increase renewable energy supply by UNFCCC institutions and other international organizations Facilitator: Ms. Marion Canute, Freelancer journalist working for Deutsche Welle Speakers/Panellists: Technology Executive Committee (TEC) (Kuni Shimada), Global Environment Facility (GEF) (Camila Florez Bossio), Durban Forum (SBI Chair Mr. Amena Yauvoli), IRENA (tbc) Location: Plenary Building, Holzfoyer, Level +1

Wednesday, 3 June 2015	
15:00–16:15	Session 3: More and faster renewable energy now through the 'accelerator partnerships': turning potential into action on the ground Follow up: Reporting back by the break-out group moderators of Session 2 *Panellists share information on international partnerships that are/will in the near future assist countries and cities to capitalize on their renewable energy potential* Expert panel: • Africa Group Renewable Energy Partnership Proposal (Mr. Hussein Alfa Nafo) • Clean Energy Ministerial (Mr. Daniel Noll) • Small island developing States lighthouse initiative (Mr. Emanuele Taibi, IRENA) • Global Energy Efficiency and Renewable Energy Fund (Mr. Guenter Fischer) • Renewable Energy Policy Network for the 21st Century (REN21) (Ms. Laura Williamson) Interactive discussion on how to turn potential into action on the ground
16:15–16:30	Closing of the technical expert meeting

The final agenda for the technical expert meeting on renewable energy supply can be found on the UNFCCC website at <http://unfccc.int/bodies/awg/items/8895.php>

3) TECHNICAL EXPERT MEETING FACILITATOR

Mr. Amit Kumar
Adjunct Professor – Sustainable Energy
TERI University
Coordinator of SE4All Capacity Building Hub
India

Mr. Kumar is a mechanical engineer with specialization in thermal engineering from the University of Roorkee (now the Indian Institute of Technology, Roorkee) where he was awarded the University Gold Medal. Prior to becoming an adjunct professor (sustainable energy) at TERI University, Mr. Kumar was leading research activities in the fields of renewable energy and resource efficient process technology applications at the Energy and Resources Institute (TERI).

Mr. Kumar has been working on the development and diffusion of cleaner and renewable energy resources-based technological solutions in India for over 32 years. His experience ranges from policy and programme formulation, through project implementation, to the design and development of renewable energy technologies, as well as manufacturing of solar energy devices. His experience combines different facets of the renewable energy industry as well as the research domain. He is actively involved in taking forward South–South cooperation in Africa and the Pacific island States. In his capacity as the Regional Programme Advisor, Renewable Energy and Energy Efficiency Partnership (REEEP) South Asia Secretariat, he oversees REEEP activities in the region. Mr Kumar is also coordinating the SE4All Capacity Building Hub, one of the global hubs of the United Nations supported Sustainable Energy for All (SE4All) initiative.

4) PARTICIPATING ORGANIZATIONS

International Renewable Energy Agency

The International Renewable Energy Agency (IRENA) is an intergovernmental organization that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity. With a mandate from countries around the world, IRENA encourages governments to adopt enabling policies for renewable energy investments, provides practical tools and policy advice to accelerate renewable energy deployment, and facilitates knowledge-sharing and technology transfer to provide clean, sustainable energy for the world's growing population.

IRENA website: <www.irena.org>.

Institute for Sustainable Development and International Relations

The Institute for Sustainable Development and International Relations (IDDRI) is a non-profit policy research institute based in Paris. Its objective is to determine and share the keys for analysing and understanding strategic issues linked to sustainable development from a global perspective. IDDRI helps stakeholders in deliberating on global governance of the major issues of common interest: action to attenuate climate change, to protect biodiversity, to enhance food security and to manage urbanization. IDDRI has been mandated to advise the French government in preparation for COP 21 in 2015, notably on the 'agenda of solutions'. As part of its activities in the lead-up to COP 21, IDDRI has convened and coordinated the Deep Decarbonization Pathways Project since late 2013, in partnership with the Sustainable Development Solutions Network (SDSN). Applied in 16 countries among the major greenhouse gas emitters, this project aims at developing national-scale analyses of low-carbon trajectories consistent with the 2 °C target, in order to provide an evaluation of the mitigation potentials at different time horizons, their consistency with domestic development priorities, and the enabling conditions to support national action and increase ambition at the global level.

IDDRI publications: <http://www.iddri.org/Publications/>.
IDDRI COP 21 blog: <http://www.blog-iddri.org/?lang=fr>.

United Arab Emirates

As a central player in the global hydrocarbon economy, the United Arab Emirates (UAE) has emerged as one of the world's leading investors in low-carbon energy by pioneering projects and policies in renewable energy, energy efficiency and carbon sequestration. By investing in both the latest technology and in research in related fields, the United Arab Emirates aims to generate sustainable employment and economic growth that is not tied to hydrocarbons. A recent solar project in Dubai has shown that the benefits of such an approach are already materializing; the Dubai Water and Electricity Authority has the lowest cost for solar electricity in the world, at USD 5.84 per kWh, which is below the cost of current gas-fired power.

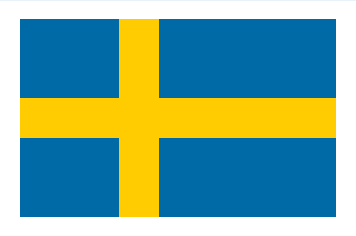
During the discussion, Majid Al Suwaidi, the United Arab Emirates' Lead Climate Change Negotiator, will discuss how the United Arab Emirates' clean energy programmes and investments fit into the country's larger economic diversification strategy.

GranBio (Brazil)

Due to the availability of biomass and its biodiversity, Brazil has the potential to take the lead in the biotech industry through the production of low-carbon fuels that will address energy demands, reduce GHG emissions and create a healthy environment for economic development.

GranBio is a Brazilian biotech company that creates solutions to transform raw materials into products such as biofuels and biochemicals. With the aim of supplying the world's growing demand for fuels and energy in a sustainable manner, GranBio has put together a complete set of advanced technologies using an innovative business model in order to produce ethanol with the lowest carbon footprint in the world.

http://www.granbio.com.br/en/



Sweden

Sweden's integrated energy and climate policy framework creates long-term conditions for the energy market and defines 2020 targets and decarbonisation priorities for 2030 and 2050 and aims to combine three key principles; ecological sustainability, competiveness, and security of supply. Increasing the production of electricity from renewable resources is crucial in achieving these aims. The Swedish Government's main instruments for achieving these developments are market-based support systems, as the pricing of CO2 emissions is essential. The CO2 tax and the electricity certificate system are important drivers of the increased share of renewables in Sweden's energy mix.

The certificate system for renewable electricity production was introduced in 2003 and has been extended to 2035. The aim of this technology neutral and market based scheme is to promote the most cost-effective production of renewable electricity. By 2020, the Swedish electricity certificate system aims to increase the production of renewable electricity by 25 terawatt hours (TWh) compared to 2002. The certificate system was extended in 2012 to a bilateral system with Norway, in what may be the only bilateral support measure for renewable electricity in the world. The combined target for the two countries is 26.4 TWh of new, renewable electricity by the end of 2020.

WE MEAN BUSINESS
economic opportunity
through bold climate action

We Mean Business

We Mean Business (WMB) is a coalition of seven organizations, Business for Social Responsibility (BSR), CDP, Ceres, The B Team, The Climate Group, Corporate Leaders Group, and WBCSD, working with thousands of the world's most influential businesses and investors on the transition to a sustainable, low carbon economy. WMB has formed a common platform to amplify the business voice, catalyze bold climate action by all, and promote smart policy frameworks.

http://wemeanbusinesscoalition.org/

Bloomberg
NEW ENERGY FINANCE

Bloomberg New Energy Finance

Bloomberg New Energy Finance (BNEF) is the leading source of analysis, research, data and news on the energy transition worldwide. It provides unique analysis, tools and data for decision makers driving change in the energy system. With a staff of 200 people based around the world, BNEF covers all aspects of renewable energy, energy-smart technologies, carbon, power and gas. New Energy Finance was acquired by Bloomberg in December 2009.

BNEF website: <http://about.bnef.com/>.
Global Trends in Renewable Energy Investment 2015: <http://about.bnef.com/press-releases/global-trends-renewable-energy-investment-2015/>.
Climatescope 2014:
<http://about.bnef.com/press-releases/global-study-shows-clean-energy-activity-surges-developing-world/>.

Astonfield Renewable Resources

Astonfield Renewable Resources is a leading provider of renewable energy in emerging markets worldwide, delivering affordable clean energy solutions tailored to the unique needs of customers. Committed to addressing the challenges of sustainable development in emerging markets, it partners closely with local governments to shape renewable energy markets and drive economic growth. Led by a management team with extensive experience in the execution of power projects in emerging markets, Astonfield Renewable Resources employs a unique combination of global expertise and deep local knowledge to ensure seamless project implementation.

http://astonfield.com/

Technology Executive Committee

The Technology Executive Committee (TEC) is the policy component of the Technology Mechanism established at COP 16 by decision 1/CP.16 to facilitate the implementation of enhanced action on technology development and transfer, and to support action on mitigation and adaptation. Along with the other component of the Technology Mechanism, the Climate Technology Centre and Network (CTCN), TEC is mandated to facilitate the effective implementation of the Technology Mechanism. TEC is also mandated to further implement the technology transfer framework agreed at COP 7 and enhanced at COP 13.

More information about TEC may be found at the technology information clearing house at
<http://unfccc.int/ttclear/pages/home.html>

Mali (ZED Mali-SA)

Most rural areas of landlocked Mali are not connected to the national grid, and are instead supplied by decentralized diesel-based generation plants. Faced with rising prices, in January 2011 the rural community of Ouélessébougou, 80 km south of Bamako, partnered with the national utility and a private solar company, ZED Mali-SA, to build, install and operate a supplementary 216 kW peak solar photovoltaic plant. The solar arrays of the plant provide electricity during daylight hours, while also charging a bank of 73 batteries, which take over for a few hours when the sun sets. Together, these sources of energy provide electricity for an average 18 hours a day. The thermal generator only needs to provide electricity for six hours during the night, when load is at its lowest. The solar plant performs best during the hot and sunny season, for 6–8 months a year, and has reduced yearly fuel costs for the thermal plant by one third. The Government of Mali and the national utility are currently considering introducing hybrid systems throughout the country.

http://www.zed-sa.com/

Center for Clean Air Policy

Since 1985, the Center for Clean Air Policy (CCAP) has been a leader in climate and air quality policy and is the only independent, nonprofit think tank working exclusively on such issues at the local, national and international levels. Headquartered in Washington, D.C., United States of America, CCAP helps policymakers around the world to develop, promote and implement innovative, market-based solutions to major climate, air- quality and energy problems that optimize both environmental and sustainable development goals.

A primary sectoral focus of the international work of CCAP is to move the focus of the emerging power sector transformation away from centralized, utility-scale generation towards lower-carbon distributed energy, and to develop policy reforms and targeted financial incentives that can help to facilitate such a transformation in developing countries. CCAP promotes this power sector transformation in developing countries through direct technical and policy support aimed at developing ambitious renewable energy nationally appropriate mitigation actions (NAMAs) that can seek implementation funding from the Green Climate Fund, the NAMA Facility and other potential funding sources, and at contributing to the host country's development and implementation of its intended nationally determined contribution.

More information is available at: http://ccap.org/
NAMAs: http://ccap.org/assets/Chile_Renewable_Energy_Price_Stabilization_Fund_May_2013_NAMA-Executive-Summary.pdf

United Kingdom of Great Britain and Northern Ireland

The United Kingdom's small-scale feed-in tariff scheme was introduced in 2009 so as to facilitate the deployment of sub-5megawatt (MW) low-carbon generation, empowering people to take a direct stake in the transition to a low-carbon economy, encouraging behavioural change and drawing new players into electricity generation. Funded through a levy on energy bills, the scheme has delivered more than 650,000 installations which total 3.4GW of electricity generation across five renewable technologies – solar photovoltaic systems, wind, hydropower, anaerobic digestion and micro combined heat and power, although solar accounts for the vast majority of installations and capacity deployed under the scheme. Set up to give rates of return of between 4.5 and 8 per cent, the scheme has had issues with costcontrol and changes were made in order to manage the impact of deployment on consumer costs. Tariffs are set at varying rates for different scales of deployment in each technology and degression triggers cause tariffs to fall at set levels of deployment. The feed-in tariff scheme has been popular and successful, facilitating the uptake of renewable generation at the household, small business and community organization levels, as well as supporting businesses aiming to develop renewable generation on a larger scale (up to a 5MW threshold of the scheme).

South Africa

South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has, since its first request for proposals in 2011, dramatically altered the South African electricity landscape through the successful procurement, in four bidding rounds, of more than 5000 MW of new renewable energy capacity, and in the process mobilized more than 150 billion South African Rand of foreign direct investment. The technology mix consists of wind, solar photovoltaic and solar thermal, biomass, biogas, landfill gas and small hydro. Projects awarded in the initial rounds have already begun generating electricity, and South Africa's Minster of Energy has just announced an additional 6000 MW to be procured. Not only is the programme dramatically transforming South Africa's coal-dominated energy mix, but has been coupled with other sustainable development goals such as local development and ownership and local content. Costs have fallen dramatically from the first round to the fourth round, which has created more opportunity for further acceleration of the programme.

Africa Group Renewable Energy Partnership Proposal

The Africa Group's Renewable Energy Proposal describes an initiative to tackle two of the greatest challenges of our era – the twin crises of climate change and energy poverty – through efforts to speed the transition to renewable energy and other climate solutions, to empower local people and communities to improve their own lives, to strengthen practical cooperation between developed and developing countries, and to pave the way for success in United Nations climate change negotiations. To that effect, the group has called for the establishment of a global renewable energy partnership to strengthen demand- and supply-side incentives, address regulatory and financial challenges, and promote country-driven policies and technology transfer, with the goal of enhancing access to renewable energy, protecting the climate and accelerating the clean energy transformation.

Small island developing States lighthouse initiative

Islands have been early adopters of renewable energy technologies to reduce the burden of high energy costs, which they face due to heavy reliance on imported diesel fuel. Through ambitious targets, innovative technical approaches and new partnerships, many islands have taken great strides towards energy transformation through renewable energy investment. Globally, islands have provided strong political leadership in promoting renewable energy as a key element of sustainable development and international efforts to cope with the challenge of climate change. The small island developing States (SIDS) lighthouses initiative, facilitated by IRENA in partnership with SIDS, development agencies, financial institutions and others, aims to assist islands in their renewable energy transformation.
This initiative has an ambitious agenda, to mobilize significant capital flows for renewable power projects that would include 100 MW of new solar photovoltaic power, 20 MW of wind power and significant additional capacity in other renewable energy technologies. The work gives particular priority to SIDS but also serves the needs of other countries with islands and virtual islands far from power grids.
http://www.irena.org/menu/index.aspx?mnu=Subcat&PriMenuID=44&CatID=112&SubcatID=458

Global Energy Efficiency and Renewable Energy Fund

Advised by the European Investment Bank Group, the Global Energy Efficiency and Renewable Energy Fund (GEEREF) is an innovative 'fund of funds', catalysing private sector capital into clean energy projects in developing countries and economies in transition. GEEREF invests in private equity funds which focus on renewable energy and energy efficiency projects in emerging markets. GEEREF funds concentrate on infrastructure projects that generate clean power through proven technologies with low risk, and target attractive financial investments that also deliver a strong positive environmental and developmental impact.

GEEREF was structured to catalyse private sector investments into funds and underlying projects by leveraging public sector seed contributions. GEEREF was initiated by the European Commission in 2006 and launched in 2008 with funding from the European Union, Germany and Norway, totalling EUR 112 million. Currently, GEEREF is completing its fundraising with private investors and has attracted a further EUR 100 million from private sources.

GEEREF website: <http://geeref.com/>.
GEEREF portfolio: <http://geeref.com/portfolio/>.

Renewable Energy Policy Network for the 21st Century

First released in 2005, REN21's annual Renewables Global Status Report provides a comprehensive and timely overview of renewable energy markets, industries, investments, and policy developments worldwide. It enables policymakers, industry, investors, and civil society to make informed decisions. The Renewables Global Status Report relies on up-to-date renewable energy data, provided by an international network of more than 500 contributors, researchers, and authors. Today it is the most referenced report on renewable energy market, industry and policy trends.

Global Status Report - http://www.ren21.net/ren21activities/globalstatusreport.aspx

ACCELERATING ENERGY EFFICIENCY ACTION IN URBAN ENVIRONMENTS

1) BACKGROUND

Prepared in partnership with the United Nations Environment Programme (UNEP)

Various recent global energy studies[3] point out that numerous efficiency improvement opportunities exist and these improvements result in energy savings and reduced energy demand. Globally energy intensity[4] was estimated to have improved on average by 1.6 per cent annually between 2002 and 2012[5]. As a result, energy efficiency is increasingly called the 'first fuel'[6].

Further energy efficiency measures would substantially reduce GHG emissions and thereby contribute to mitigating climate change. The International Energy Agency's *Redrawing the Energy-Climate Map* states that adopting further energy efficiency measures would reduce global energy-related emissions by 1.5 gigatonnes of carbon dioxide equivalent (Gt CO2 eq) in 2020, thereby helping to "keep the 2 °C target alive"[7]. The *UNEP 2013 Emissions Gap Report* estimates that energy efficiency measures offer an emission savings potential of approximately 2 Gt CO_2 eq per year by 2020[8]. Many energy efficiency measures can be implemented with negative or very low long-term costs.

Improving energy efficiency comes with substantial multiple benefits. Not only does it reduce or avoid GHG emissions, but it has long been considered a main way to increase productivity and sustainability, primarily through the delivery of energy savings. Moreover, energy efficiency measures can contribute to economic growth and social development by increasing economic output, employment and energy security. Improving energy efficiency also has important positive social impacts

3 UNEP, *The Emissions Gap Report,* 2013; IEA, *Redrawing the Energy-Climate Map: A World Energy Outlook Special Report,* 2013; UNEP, *Increasing Access to and Demand for Energy Efficiency in a Perspective of Sustainable Energy for All,* 2012.
4 Energy intensity is a measure of the energy efficiency of a nations' economy, calculated in units of energy per unit of gross domestic product.
5 UNEP, The Emissions Gap Report, 2014, p. xxii.
6 IEA. Energy Efficiency Market Report 2014 – Market Trends and Medium-Term Prospects. Paris – International Energy Agency.
7 IEA. Redrawing the Energy-Climate Map: A World Energy Outlook Special Report, Paris - International Energy Agency. 2013
8 UNEP 2013 Emissions Gap Report, table p. 30

Demand increase, Potential savings and Avoidance factor[11]:

One-third: Global energy demand on present trends will increase by one-third from 2010 to 2035[12]. While the OECD countries will account for some portion of this growth, the non-OECD countries are expected to account for 90 per cent of it, as they are expected to account for 90 per cent of the population growth and 70 per cent of the increase in economic output[13].

USD 250-325 billion: Estimated annual financial savings, or avoided energy costs, of global energy efficiency opportunity in 2030[14].

Double: Each additional USD1 spent on energy efficiency in electrical equipment, appliances and buildings avoids more than USD2, on average, in energy supply investments[15].

Avoid 1,300 mid-size power plants by 2030: By adopting minimum standards for a wider range of currently available and cost-effective technologies and thereby reducing global projected electricity consumption by buildings and industry by 14 per cent[16].

Abbreviation: OECD = Organisation for Economic Co-operation and Development.

that together with the other benefits are high in the policy agenda of a majority of countries. Hence improving energy efficiency can be seen as an excellent opportunity for linking sustainable development with climate mitigation.

Energy efficiency is particularly relevant in cities as they are now home to more than 50 per cent of the world's population, account for more than 70 per cent of global energy use and for 40–50 per cent of GHG emissions worldwide[9]. By 2030, the global urban population is projected to double, with 90 per cent of that growth expected to occur in developing countries[10]. By 2050 the world population living in urban areas is expected to increase to 66 percent.

The 2 Gt CO_2 eq in energy efficiency savings highlighted in the *UNEP 2013 Emissions Gap Report* are dispersed over four main focus areas: buildings (0.6 Gt CO_2 eq), light bulbs (0.5 Gt CO_2 eq), electrical appliances (0.6 Gt CO_2 eq) and vehicles (0.7 Gt CO_2 eq). These potential savings have to be primarily exploited in urban spaces. Heating efficiency in urban buildings alone carries a potential of 0.9 Gt CO_2 eq by 2030, and appliances and lighting account for 0.7 Gt CO_2 eq by 2030[17].

BARRIERS, OPPORTUNITIES AND POLICY OPTIONS

Energy efficiency measures, however, generally cannot be adopted overnight. The scale and pace at which efficient technologies displace old, outdated, and inefficient technologies are partly determined by the rate at which the existing stock is replaced, and partly by new additions to the capital stock, all depending to a large extent on individual country context. Barriers to the widespread adoption of energy efficiency in urban contexts can mostly be clustered in three categories: political and institutional; financial; and skills-related. Operation and maintenance practices are a further enabling factor.

9 *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the IPCC*. Available at <http://mitigation2014.org/>.
10 World's population increasingly urban with more than half living in urban areas, UN News, 10 July 2014.
11 Increasing Access to and Demand for Energy Efficiency in a Perspective of Sustainable Energy for All, UNEP flyer, 2012
12 International Energy Agency, World Energy Outlook, 2012.
13 International Energy Agency, World Energy Outlook, 2011.
14 McKinsey & Co., Pathways to a Low-Carbon Economy, 2009
15 International Energy Agency, World Energy Outlook, 2006
16 Ibid.
17 UNEP, 2013 Emissions Gap Report, p30.

A number of opportunities exist for the rapid scaling up and replication of good practices. A suite of context-specific policy frameworks could be introduced to utilize these opportunities and address the implementation barriers. These policy frameworks comprise: cross-sectoral policy coordination; strengthening of regulatory and legal frameworks; monitoring and evaluation and; strengthening of (and improving access to) financial instruments[18]. Expanding the use of public procurement or improving compliance through regulatory enforcement programmes are yet more complementary ways through which to advance energy efficiency.

Effective policy options for promoting and disseminating energy efficiency measures in urban environments are vast. During this TEM, participants will explore policy options in the following sectors, which have significant energy efficiency potential in the pre-2020 period.

The sectors being considered at this technical expert meeting (TEM) are significant users of energy, but they also present sizeable potential for energy efficiency improvements, especially in urban environments, building on proven technologies, policy approaches and successes in many cities across the world in both developed and developing countries.

Lighting and district energy

Electricity for lighting accounts for almost 20 per cent of global power consumption or 6 per cent of worldwide CO_2 emissions[19]. Lighting includes street lighting, office lighting, residential lighting and industrial lighting. The global demand for electric lighting is expected to be 60 per cent higher by 2030 if a switch to efficient lighting does not occur, that is equivalent to increasing global CO_2 emissions by about 4 per cent. Potential savings and gains of a shift to efficient lighting represent about 40 per cent in overall energy consumption or 760 million tonnes of CO_2 globally. In Africa alone, this is equivalent to savings of 20.5 TWh of electricity or 13 Mt CO_2. In street lighting, there is a significant opportunity for cities to move towards energy-efficient lighting systems.

Establishing district energy systems is a good practice approach for providing a local, affordable and low-carbon energy supply. District energy represents a significant opportunity for cities to move towards climate-resilient, resource-efficient and low-carbon pathways. A transition to modern district energy systems, as part of energy efficiency measures, could substantially contribute, at a low cost, to the 58 per cent energy sector CO_2 emission reductions that are required by 2050 in order to keep global warming to within 2–3 ° C above pre-industrial levels[20].

Some cities are providing both thermal energy and electricity to buildings in a very efficient manner through district energy systems. Although these systems have been used mostly in cooler climates in the northern hemisphere, they are also becoming a popular way to cool buildings efficiently. The provision of heating, cooling and hot water is estimated to account for roughly half the global energy consumption in buildings[21].

An important task for governments and other stakeholders is to acknowledge and tackle the many barriers to saving energy in lighting, including the uneven dissemination of information on energy efficiency opportunities, limited access to

18 FCCC/TP/2014/3. Technical Paper. Updated compilation of information on the mitigation benefits of actions, initiatives and options to enhance mitigation ambition.
19 UNEP, *Green Paper: Policy Options to Accelerate the Global Transition to Advanced Lighting*, 2014
20 International Energy Agency, *Co-Generation and Renewables: Solutions for a Low-Carbon Energy Future*, 2011.
21 International Energy Agency, *Technology Roadmap. Energy Efficient Buildings: Heating and Cooling Equipment*, 2011.

capital by energy users and the need for country-specific benchmarking of energy-use patterns and technology performance. To overcome these and other barriers there are many successful and proven policies that can be drawn upon, including the phasing out of inefficient lighting products and systems, and the replacing of them with energy-efficient ones.

Buildings

Buildings account for about 40 per cent of final energy use and up to 30 per cent of all energy-related GHG emissions[22]. Energy is used in buildings for lighting, the heating and cooling of space, electronics, cooking, etc. Of the latter, 45 per cent is in Organisation for Economic Co-operation and Development (OECD) countries, 10 per cent in countries in transition and 46 per cent in developing countries. By 2050 at present trends, corresponding energy use would nearly double[23].

The potential savings and gains of a shift to energy efficient buildings corresponds to reduced energy use and a reduction of GHG emissions by 40 per cent with annual investments of USD 150 billion and one of more than 50 per cent with annual investments of USD 300 billion. The discounted payback time is 5 years or less on average, and between 5 and 10 years for investment of USD 150 billion and USD 300 billion, respectively[24]. These figures indicate a huge market for energy efficiency in buildings, of between USD 6 trillion and USD 13 trillion over the next 40 years, and also opportunities for technical development[25]. Owing to advances in materials and know-how, new energy efficient buildings use 60–90 per cent less energy than conventional buildings of a similar type and configuration, and are cost-effective in all countries and climate zones[26].

As the rate of new building construction in developing countries is very high, energy efficiency in buildings can best be achieved through the implementation of regulations for building energy performance or building codes for new construction. Due to their older building stock, most developed countries also need to pay special attention to renovating their existing buildings.

An important task for Governments and other stakeholders is to acknowledge and tackle the many barriers to saving energy in buildings, including uneven dissemination of information, limited access to capital, high discount rates and market fragmentation. To overcome these and other barriers there are many successful and proven policies that can be drawn upon, including energy and carbon taxes, energy performance standards and regulations, investment grants, soft loans, mandatory energy audits, energy efficiency obligations (for example, for utilities) and energy labelling and certification schemes.

Transport

Transportation consumes more than half of global liquid fossil fuels[27]. Improving energy efficiency in the transport sector, in particular in road transportation, can slow down growing fuel consumption. While most member countries of the OECD have fuel economy or efficient transport system policies, few countries that are not OECD members have such policies. From 1990 to 2005, vehicle stock increased by

22 International Energy Agency, *Energy Technology Perspectives: scenarios and strategies to 2050*, 2008.
23 International Energy Agency, *Transition to Sustainable Buildings and Strategies*, 2013.
24 World Business Council for Sustainable Development, Energy efficiency in Buildings, 2009.
25 Ibid.
26 UNEP, Emissions Gap Report 2014, a UNEP synthesis, Executive Summary, p.xxiii.
27 UNEP, Green Economy Report : Chapter on Transport – Investing in Energy and Resource Efficiency, 2013

60 per cent, compared to a 25 per cent population increase[28]. By putting in place fuel economy policies in all countries, more than 1 Gt CO_2 emissions per year can be avoided by 2030 and over 2 Gt CO_2 by 2050[29]. Potential savings and gains of a shift to efficient vehicles are equivalent to reduced annual oil import bills of over USD 300 billion in 2025 and USD 600 billion in 2050, as well as reduced greenhouse gases, air pollution and oil dependence, thus improving countries' energy security[30].

Effective policies are available to make efficiency improvements in transport happen. Without strong new policies, fuel use for road transport is projected to double between 2010 and 2050[31]. The principal means for improving energy efficiency in the transport sector is through mandatory fuel economy standards for road vehicles. Governments often supplement standards with other measures such as labelling, taxes and incentives, which aim to boost vehicle efficiency and accelerate the market penetration of new efficient vehicle technologies. Vehicle fuel efficiency can also be increased by making the air conditioning, lighting and other non-engine components of vehicles more efficient or by modifying driving habits, which can reduce average fuel use by 10 per cent or more[32].

An important approach to improving energy efficiency in the transport sector, in particular in the urban environment, is to promote the use of more efficient modes of transportation, especially by shifting from private vehicles to public transport or cycling. Regulatory measures can be used to restrict the use of certain motorized vehicles, but they can also be used to influence the types of vehicles used. More broadly, land-use planning and management can play a critical role in reducing energy use related to mobility by reducing the need for motorized transport and enabling full-capacity public transport. Further, information available in easily accessible formats can increase the public's awareness of alternative modes of transport[33].

28 IEA, World Energy Outlook, 2008
29 Global Fuel Economy Initiative, Vehicle Efficiency Accelerator Flyer, 2013.
30 Global Fuel Economy Initiative, *Top Reasons for Supporting Cleaner, More Efficient Vehicles*, online tool at http://www.unep.org/transport/gfei/autotool/understanding_the_problem/benefitsofaction.asp
31 OECD Environmental Outlook to 2050, Climate Change Chapter, p. 15.
32 Emissions Gap Report 2014, a UNEP synthesis, Executive Summary, p.xxiv.
33 UNEP 2013 Emissions Gap Report

2) PROVISIONAL AGENDA

Technical Expert Meeting on Accelerating Energy Efficiency Action in Urban Environments

Organized in partnership with the United Nations Environment Programme and ICLEI – Local Governments for Sustainability

13:30–17:30 on Friday, 5 June 2015 and 10:00–13:00 on Saturday, 6 June 2015
Facilitator: Ms. Sylvie Lemmet, Director for European and International Affairs, French Ministry of Ecology, Sustainable Development and Energy
Room: Please see CCTV at the World Conference Centre

Friday, 5 June 2015

13:30–14:45	Dialogue series – ADP briefing on support for accelerated energy efficiency action in urban environments by UNFCCC institutions and other international organizations Facilitator: Nick Nuttall (UNFCCC). Speakers/panellists: Green Climate Fund - GCF (Rutger de Witt Wijnen), Climate Technology Centre and Network - CTCN (Jukka Uosukainen), Clean Development Mechanism Executive Board, ICLEI - Local Governments for Sustainability and KfW (Klaus Gihr)
14:45–15:45	Opening remarks by the ADP Co-Chairs and the TEM facilitator – Mrs. Sylvie Lemmet (France) Keynote presentations: • Cities as planners, regulators and implementers of climate action: ICLEI - Local Governments for Sustainability (Ms. Maryke van Staden) • From a global response to local action: Sustainable Energy for All (SE4ALL) (Mr. Luis Gomez Echeverri) Questions and answers
15:45–17:15	Session 1: Realizing potential and benefits of enhanced energy efficiency policies in urban environments Expert panel: • Multiple benefits of energy efficiency in the urban environment: International Energy Agency (IEA) (Mr. Brian Dean) • Health benefits of energy efficiency in the urban environment: World Health Organization (WHO) (Dr. Diarmid Campbell-Lendrum) • Energy challenges for cities and city-level responses: United Nations Environment Programme (UNEP) (Dr. John Christensen) • Cities solutions for energy efficiency in a rapidly urbanizing and climate resilient world: World Business Council for Sustainable Development (WBCSD) (Ms. Delphine Garin) Questions and answers
17:15–17:30	Closing of Session 1 of the technical expert meeting

Saturday, 6 June 2015

10:00–11:30

Session 2: Accelerating implementation of scalable, replicable and transformative actions in urban environments

Three parallel break-out groups

Participants discuss options to bring action to fruition (where are the real opportunities); mobilize finance, technology and capacity; and ways of overcoming barriers (what is happening on financing and policy fronts)

Group A: Lighting and district energy systems in cities
Moderated discussion by UNEP (Mr. John Christensen)

Expert panel:

- Experience in operating district cooling network: Paris, France (Mr. Yann Francoise)
- Implementation of a pilot project on district energy systems: Rajkot, India (Mr. Vijay Nehra)
- Lighting and district energy systems in cities: the experience of Catalonia – Mr. Mercè Rius
- The contribution of lighting to an energy efficient urban environment: Philips (Mr. Harry Verhaar)
- Financing energy efficiency projects in urban environments - CAF Development Bank of Latin America – Mr. Ubaldo Elizondo

Group B: Energy efficient buildings
Moderated discussion by World Green Building Council (Mr. James Drinkwater)

Expert panel:

- Legal framework for implementation of the Green Buildings Policy: Tshwane, South Africa (Ms. Mercedes Mathebula)
- Innovative legislation on green roofs: Recife, Brazil (Mr. Romero Pereira)
- Energy Freedom in buildings – The Zero Emissions Byron Bay: Byron Bay, Australia (Mr. Simon Richardson)
- Perspective of the private sector on ways to advance energy efficiency policies and actions: Velux (Mr. Kurt Emil Eriksen)
- The European Bank for Reconstruction and Development's experience and solutions in buildings, energy and resource efficiency: EBRD (Mr. Jan Willem van de Ven)
- Financing low-carbon houses – Inter-American Development Bank (IADB) (Mr. David Wilk)

Group C: Sustainable urban transport
Moderated discussion by the Partnership on Sustainable Low Carbon Transport (SLoCaT) (Mr. Karl Peet)

Expert panel:

- Implementation of the Sustainable Urban Transport Programme: Bogor, Indonesia (Ms. Lorina Darmastuti)
- Innovative solutions in urban transportation (tbc)
- Electrified Public Transport: BYD Company (Mr. Isbrand Ho)
- Mode choice in urban transport, fuel use and emissions: World Bank (Mr. Andreas Kopp)
- Successful and practical partnership to improve resource efficiency: The Global Fuel Economy Initiative (Mrs. Sheila Watson)

Saturday, 6 June 2015	
11:30–12:30	Session 3: More and faster energy efficient action now through the 'accelerator partnerships": turning potential into action on the ground Follow up: Reporting back by the break-out group moderators of Session 2 *Panellists share information on international partnerships that are or will in near future assist countries and cities to capitalize on their energy efficiency potential* Expert panel: • UNEP En.lighten Initiative (Mr. Zitouni Ould-Dada) • The BUILD UPON Initiative - World Green Building Council (Mr. James Drinkwater) • Paris Process on Mobility and Climate: SLoCaT Partnership (Mr. Karl Peet) • Transformative Actions Programme - ICLEI - Local Governments for Sustainability (Mr. Yunus Arikan) Interactive discussion on how to turn potential into action on the ground
12:30–13:00	Closing of the technical expert meeting

The final agenda for the technical expert meeting on energy efficiency in urban environments can be found on the UNFCCC website at <http://unfccc.int/bodies/awg/items/8896.php>

3) TECHNICAL EXPERT MEETING (TEM) FACILITATOR

Ms. Sylvie Lemmet
France

Since November 2013, Ms. Sylvie Lemmet has been the Director for European and International Affairs at the French Ministry of Ecology, Sustainable Development and Energy. She is thus responsible for the UNFCCC process within the Ministry. Since COP 20 in Lima, Peru, Ms. Lemmet has also been in charge of the Lima–Paris Action Agenda, where international cooperation initiatives and non-state actors play a central role. Prior to that, from 2007 to late 2013, she was the Director of the UNEP Technology, Industry and Economy Department, where she gained strong expertise in the field of energy efficiency and technologies for the environment.

4) PARTICIPATING ORGANIZATIONS

ICLEI – Local Governments for Sustainability

ICLEI is the world's leading network of cities, towns and metropolises committed to building a sustainable future, with over 1,000 such members. By helping members to make their cities sustainable, low-carbon, resilient, biodiverse, resource-efficient, healthy and happy, with a green economy and smart infrastructure, ICLEI has a positive impact on over 20 per cent of the world's urban population.

ICLEI's Low Carbon City Agenda: <http://www.iclei.org/our-activities/our-agendas/low-carbon-city.html>.

Sustainable Energy for All

SE4All, an initiative led by the United Nations Secretary-General and the President of the World Bank, has as one of its three objectives for 2030 a doubling of the global rate of improvement in energy efficiency. To help reach this objective, the Global Energy Efficiency Accelerator Platform was established to drive action and commitments by leaders at every national and international level. Two key deliverables are envisaged for COP 21: a global campaign to recruit substantial commitment to ambitious energy efficiency goals that can be tracked and reported; and some 100 integrated policy and investment roadmaps/action plans which will guide project implementation, supported by a global network of experts, institutions and businesses.

SE4All website: <www.se4all.org>.
Global Energy Efficiency Accelerator Platform: <http://www.se4all.org/energyefficiencyplatform/>.

International Energy Agency

The International Energy Agency (IEA) is an autonomous organization which works to ensure reliable, affordable and clean energy for its 29 member countries and beyond. Founded in response to the 1973–1974 oil crisis, the agency's initial role was to help countries coordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets. While this continues to be a key aspect of its work, IEA has evolved and expanded. It is at the heart of global dialogue on energy, providing authoritative statistics, analysis and recommendations.

Today, the agency's four main areas of focus are energy security, economic development, environmental awareness and engagement worldwide.

IEA website: <www.iea.org>.
Policy Pathways publications: <www.iea.org/publications/policypathwaysseries>.

World Health Organization

The World Health Organization (WHO) has an active and long-standing programme on protecting health from climate change, guided by a World Health Assembly resolution. Through its country, regional and headquarters offices, WHO provides evidence and supports capacity-building and implementation projects to strengthen the health system response to climate change, and to ensure that health is appropriately considered in decisions made by other sectors, such as energy and transport. The organization also provides the health-sector voice within the overall United Nations response to this global challenge. Moreover, WHO has worked actively on the theme of health co-benefits of climate change mitigation and adaptation policies for the last five years.

WHO website: <http://www.who.int/>.
More on WHO and climate change: <http://www.who.int/globalchange/climate/>.

United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the United Nations' designated entity for addressing environmental issues at the global and regional level. UNEP facilitates the transition towards low emission development pathways and a green economy in the context of sustainable development and poverty eradication, by helping countries overcome the various policy, technological, financial, institutional and regulatory barriers to the adoption of energy efficiency measures. UNEP builds technical skills and knowledge about policy options on energy efficiency and helps countries develop mechanisms, strategies, actions and policies that ease the costs and risks for technology transfer and financial actors. The organization's work in the area of energy efficiency covers five thematic areas: lighting, transport, buildings, appliances and district energy.

Green Paper Policy Options to Accelerate the Global Transition to Advanced Lighting (2014): <http://www.enlighten-initiative.org/portals/0/documents/global-forum/Green_Paper_FINAL%20reduced.pdf>.
District Energy in Cities: Unlocking the Potential of Energy Efficiency and Renewable Energy (2015): <http://www.unep.org/energy/portals/50177/DES_District_Energy_Report_full_02_d.pdf>.

World Business Council for Sustainable Development

The World Business Council for Sustainable Development (WBCSD) thought leadership, effective advocacy, and shared action generate business solutions for a sustainable world. The WBCSD comprises around 200 companies from over 35 countries and 22 sectors, collectively representing an estimated 15 million employees, USD 7 trillion annual revenues and USD 6 trillion market capitalization.

Action 2020: <www.action2020.org>.
Energy efficiency in buildings: <http://www.wbcsd.org/buildings.aspx>.

Paris, France

Paris has developed Europe's first and largest district cooling network, part of which uses the Seine River for cooling. The Paris Urban Heating Company serves the equivalent of 500,000 households, including 50 per cent of all social housing, as well as all hospitals and 50 per cent of public buildings, such as the Louvre Museum. The district heating network aims to use 60 per cent renewable or recovered energy by 2020.

District energy in cities: <http://www.unep.org/energy/districtenergyincities>.
Paris climate protection plan: <http://carbonn.org/uploads/tx_carbonndata/Paris_climate_protection_plan_2007.pdf>.
NAZCA: <http://climateaction.unfccc.int/>.

Rajkot, India

Rajkot, a model Urban-Low Emission Development Strategies (LEDS) city in India, committed to become the first pilot city of the Global District Energy in Cities Initiative. The signing ceremony took place on 8 April 2015, during the initiative's regional launch for the Asia-Pacific.

Urban-LEDS: <http://urbanleds.iclei.org/>.
Carbonn Climate Registry: <http://carbonn.org/data/>.

Philips Lighting

Royal Philips is a diversified health and well-being company, focused on improving people's lives through meaningful innovation in the areas of health care, consumer lifestyle and lighting. Headquartered in the Netherlands, Philips posted 2014 sales of EUR 21.4 billion and employs approximately 105,000 employees, with sales and services in more than 100 countries. The company is a leader in cardiac care, acute care and home health care, energy efficient lighting solutions and new lighting applications, as well as male shaving and grooming and oral health care.

News from Philips: <www.philips.com/newscenter>.

World Green Building Council

Green Building Councils are not-for-profit, member-based organizations that are driving the transformation of buildings, communities and users' behaviour towards sustainability. The World Green Building Council is a coalition of more than 100 national Green Building Councils and 27,000 members around the world, making it the largest international organization influencing the green building marketplace. With 100,000 buildings and almost 1 billion square meters of green building space registered, the influence and impact of this global network is a significant force for social and environmental change.

World Green Building Council: <http://www.worldgbc.org/>.

Tshwane (Pretoria), South Africa

Within the scope of Tshwane Integrated Environmental Policy (TIEP), on 30 May 2010, the city council approved the Green Buildings by-law and policy. Tshwane is also named as South Africa's Earth Hour Capital in 2015.

Earth Hour Capital:
<http://www.wwf.org.za/?13701/Tshwane-named-SAs-Earth-Hour-Capital-2015>.

Recife, Brazil

On 16 December 2014, the Municipal Council of Recife, Brazil, approved the Green Roof Law. This law requires buildings with more than four floors to have their roofs covered with native vegetation. The law also applies to any commercial building with more than 400 square meters. The city is in the process of reviewing the construction code with sustainability incentives.

Byron Bay, Australia

Byron Bay is the first regional city in Australia to announce its intention to be zero emissions city by 2025. A key element of the initiative will be increased energy efficiency in the urban environment, particularly in buildings. The project will draw from the strategies of Australia's Energy Freedom initiative in order to provide information to households and businesses on how to improve energy efficiency and on the benefits of rooftop solar panels. The initiative also involves working with the businesses who supply these products and rolling out an information campaign with the city council across the whole community.

Energy Freedom initiative - www.energyfreedom.com.au

VELUX

VELUX is the world's largest roof window manufacturer. The company was established in Denmark in 1942, and aims to lead the development of better living environments with daylight and fresh air provided through a building's roof. Currently, VELUX manufactures in 11 countries and has sales offices in more than 40 countries worldwide.

VELUX website: http://www.velux.com/our_company/our_views
VELUX demonstration projects at: http://www.velux.com/sustainable_living/demonstration_buildings

European Bank for Reconstruction and Development

The European Bank for Reconstruction and Development (EBRD) is a multilateral development bank that invests in 36 countries from Central Europe to Central Asia and North Africa. Founded in 1991, the EBRD promotes transition towards an open market economy and private and entrepreneurial initiative. To achieve building energy and resource efficiency, the EBRD has developed various financial instruments. In 2014 alone, the EBRD invested almost EUR 300 million in energy efficiency and renewable energy in buildings, and the accumulated investment in the sector since 2006 amounts to EUR 1 billion.

Sustainable Energy Initiative: <http://www.ebrd.com/what-we-do/sectors-and-topics/sustainable-energy-initiative.html>.
Sustainable Resource Initiative: <http://www.ebrd.com/what-we-do/sectors-and-topics/sustainable-resources-and-climate-change/sri.html>.

Inter-American Development Bank

The Inter-American Development bank (IDB) launched the Emerging and Sustainable Cities Initiative (ESCI) in order to address urban challenges through a multidisciplinary approach that integrates environmental sustainability and climate change, comprehensive urban development, fiscal sustainability and good governance, with a focus on intermediate cities. IDB is also mainstreaming mitigation actions in its transport portfolio with the Regional Environmentally Sustainable Transport Strategic Area , which has identified a list of 11 transport strategies containing 39 innovative GHG reduction measures in the transport sector, applicable to cities in Latin America and the Caribbean. Additionally, it has also driven innovation in the housing sector.

ESCI methodology: https://drive.google.com/file/d/0B93Bl6qR3zQ_OXgyN3lwMURqNE0/view
Transport – mitigation strategies: http://publications.iadb.org/bitstream/handle/11319/3613/GHG%20Mitigation%20Strategies%20and%20Accounting%20Methods%20for%20Transport.pdf?sequence=1

SLoCaT

The Partnership on Sustainable, Low Carbon Transport (SLoCaT) promotes the integration of sustainable transport in global policies on sustainable development and climate change. It was established in 2009 to provide a global voice on sustainable transport and is the world's largest multi-stakeholder partnership working on land transport. SLoCaT has more than 90 members including United Nations agencies, multi-lateral development banks, bilateral development organizations, non-governmental organizations, business sector companies, universities and research institutions.

Bridging the Gap is a multi-stakeholder partnership that focuses on transport and climate change. It works closely with SLoCaT and co-organizes the Transport Day at the COP and also numerous side events. It can connect Parties with transport expertise if required and its website (<www.transport2020.org>) has a number of useful resources, reports and fact sheets on transport and climate change.

SLoCAT website: <http://www.slocat.net/>.

Bogor, Indonesia

Bogor is one of the seven pilot cities of the Sustainable Urban Transport Programme Indonesia (NAMA SUTRI) and one of the two model cities of the Urban-LEDS project in Indonesia. The city council decided at the end of November 2014 to allocate the equivalent of about USD 12 million to improve sustainable low emission transport in the city. This will support the revitalization of the bus system, the *Transpakuan*, which serves 14 km of the city. The buses will switch to using natural gas, as a low emission fuel option. Another objective is the conversion of a huge number of microbuses to either use gas (planned for 1,000 microbuses) or electricity (50 microbuses).

NAMA SUTRI: <http://transport-namas.org/wp-content/uploads/2015/02/Indonesia_NAMA-SUTRI_Full-NAMA-Concept-Document.pdf>.

BYD

Founded in 1995, BYD specializes in information technology, automobile and new energy industries. BYD has nearly 180,000 employees with offices located in China, the United States of America, Europe, Brazil, Japan, India, Hong Kong, and Taiwan. BYD entered the automotive field in 2003 and initiated the use of the iron-phosphate battery to make electric vehicles. In 2010, BYD introduced electric buses and taxis in Shenzhen, China, and BYD's zero emission vehicles are now running in over 110 cities in 36 countries. BYD ensures that all energy sources to charge its batteries are non-fossil fuels in order to create a zero emission ecosystem of enterprises.

BYD website: <www.byd.com>.
BYD on Facebook: <www.facebook.com/bydcompany>.

World Bank

The World Bank Group is one of the world's largest sources of funding and knowledge for developing countries. Many developing countries use World Bank Group assistance ranging from loans and grants to technical assistance and policy advice. The World Bank Group works in partnership with a wide range of actors, including government agencies, civil-society organizations, other aid agencies and the private sector. Transport is one of the largest lending sectors of the World Bank, with road investment and urban transport being the largest sub-sectors.

Transport – The World Bank Group:- http://www.worldbank.org/en/topic/transport

Global Fuel Efficiency Initiative

The Global Fuel Efficiency Initiative (GFEI) works to secure real improvements in fuel economy and the maximum deployment of existing fuel economy technologies in vehicles across the world. GFEI is a partnership of the International Energy Agency, United Nations Environment Programme, International Transport Forum, UC Davis, the International Council on Clean Transportation and FIA Foundation.

GFEI. 2014. *International Comparison of Light-Duty Vehicle Fuel Economy: Evolution over 8 Years from 2005 to 2013.* Available at <http://www.fiafoundation.org/media/45112/wp11-iea-report-update-2014.pdf>.

GFEI. 2014. *Fuel Economy State of the World 2014.* Available at <http://www.fiafoundation.org/media/44209/gfei-annual-report-2014.pdf>.


PRIZES
ACTION FAIR

CLIMATE ACTION FAIR

1) CLIMATE ACTION FAIR ACTIVITIES

3–6 June 2015
World Conference Centre, Bonn, Germany

In conjunction with the technical expert meetings, the secretariat has organized a Climate Action Fair to showcase examples of (1) pre-2020 action related to the two technical expert meeting topics (renewable energy supply and accelerating energy efficiency action in urban environments) and (2) actions by non-state actors to address climate change. The Climate Action Fair consists of side events, exhibits, a dialogue series, a networking reception and the Climate Action Fair Virtual Expo, which all aim to support the work and discussions taking place under the technical expert meetings, as well as increase the visibility of the climate action among cities, regions, companies, investors and international cooperative initiatives. More details regarding the Climate Action Fair, as well as a site map, are provided below.

SIDE EVENTS

Presentations will be given by a variety of stakeholders, including non-state actors, which focus on renewable energy and energy efficiency in urban areas. These side events will take place from 3 to 6 June in the designated 'Climate Action Fair' room. Please see the 'Climate Action Fair Agenda' section below for more information.

EXHIBITS

Exhibits and posters showcasing climate solutions by non-state actors will be set up at the World Conference Centre. In addition, exhibits organized by observers that relate to the two technical expert meeting topics (renewable energy and accelerating energy efficiency action in urban areas) will be located in the conference exhibit area. Please look for the 'Climate Action Fair' banners to identify their location.

DIALOGUE SERIES

The secretariat will host a lunchtime dialogue series to showcase (1) climate solutions by non-state actors, such as the business sector and cities and (2) support provided by the UNFCCC institutions and international organizations. In order to support the work of the technical expert meetings, special emphasis will be given to renewable energy and energy efficiency in urban areas. Please see the 'Climate Action Fair Agenda' section below for more information.

NETWORKING RECEPTION

On 5 June 2015, the UNFCCC secretariat in collaboration with the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) and Galvanizing the Groundswell of Climate Actions (GGCA) will jointly host a networking reception at the UNFCCC secretariat's Climate Change Conference in Bonn with the theme "Galvanizing a groundswell movement for transformational solutions towards a low-carbon and climate resilient future". This event will bring together participants from the Climate Action Fair organized by the UNFCCC secretariat, as well as the workshop on 'Catalysing Climate Action for Resilient Development', organized by DIE in collaboration with GGCA and The Energy and Resources Institute (TERI). The networking event aims to help build bridges within the broad civic movement—including cities, provinces and regions, and the private sector—and with governments, in order to generate opportunities for partnerships, inspire commitments, and create synergies among complementary initiatives.

CLIMATE ACTION FAIR VIRTUAL EXPO

An online platform to virtually showcase information related to the in-session technical expert meeting topics has been launched on the UNFCCC website. The information showcased includes relevant initiatives and projects submitted by Parties and observer organizations, as well as materials and presentations related to the Climate Action Fair side events (see 'Climate Action Fair Agenda' below). To visit the Climate Action Fair Virtual Expo, please use the web links below:

Climate Action Fair side event information is available at <https://seors.unfccc.int/seors/reports/events_list.html?session_id=CAFVE>.

Virtual exhibits and information uploaded by Parties and observer organizations are available at <https://seors.unfccc.int/seors/reports/exhibits_list.html?session_id=CAFVE>.

The ADP Co-Chairs invite all interested Parties and observer organizations to share information related to in-session technical expert meeting topics, such as initiatives and projects, through the uploading facility of the Side Event and Exhibits Online Registration System (SEORS). To access SEORS, please register or log in using the following web link: <https://seors.unfccc.int/seors?session_id=CAFVE>.

2) CLIMATE ACTION FAIR AGENDA

Wednesday, 3 June 2015

13:15 – 14:45	Side event	Electrical cities and eco-productive and agro-ecological parks against CC with bio-circular economy Organizers: COBASE, Cooperativa Tecnico Scientifica di Base (ECOSOC), Gherush92 Committee for Human Rights (Gherush92) Location: Plenary Building, Berlin Room
13:30 – 14:45	Dialogue series	ADP Briefing on support to increase renewable energy supply by UNFCCC institutions and other international organizations Facilitator: Ms. Marion Canute, Freelancer journalist working for Deutsche Welle Speakers/Panellists: Technology Executive Committee (TEC) (Kuni Shimada), Global Environment Facility (GEF) (Camila Florez Bossio), Durban Forum (SBI Chair Mr. Amena Yauvoli), IRENA (tbc) Location: Plenary Building, Holzfoyer, Level +1
15:00 – 16:30	Side event	Tapping the potential of local and subnational climate action to raise pre-2020 ambition and beyond Organizer: ICLEI-Local Governments for Sustainability (ICLEI) Location: Plenary Building, Berlin Room
16:45 – 18:15	Side event	Green Climate Fund: How can it support transformational change? Organizers: Asociación Interamericana para la Defensa del Ambiente (AIDA), Institute for Policy Studies (IPS) Location: Plenary Building, Berlin Room
18:30 – 20:00	Side event	Municipal partnerships to tackle global climate and sustainable energy challenges Organizers: Climate Alliance (Klima-Bündnis), De Montfort University (DMU) Location: Plenary Building, Berlin Room

Thursday, 4 June 2015

13:15 – 14:45	Side event	Accelerating the Implementation of Energy Efficiency Initiatives: UNEP/BCSE Organizer: United Nations Environment Programme (UNEP), Business Council for Sustainable Energy (BCSE) Location: Plenary Building, Berlin Room
13:15 – 14:45	Dialogue series	Climate action by businesses and cities Facilitator: Mr. Nick Nuttall, Communications Coordinator at UNFCCC. The UNFCCC secretariat in collaboration with ICLEI, C40, the Climate Group's States and Regions Alliance and We Mean Business, will host a dialogue event on the role non-state actors, including cities, regions and businesses can play in addressing climate change. Location: Plenary Building, Holzfoyer, Level +1
15:00 – 16:30	Side event	Transport Tackles Climate Change Organizers: Transport Research Foundation (TRF), Institute for Transportation and Development Policy (ITDP) Location: Plenary Building, Berlin Room
16:45 – 18:15	Side event	Getting Ready for Zero; an overview of who's working on zero carbon modelling & toolkits Organizer: Nordic Folkcenter for Renewable Energy Location: Plenary Building, Berlin Room
18:30 – 20:00	Side event	Renewable energy and energy efficiency: Momentum for Change Momentum for Change shines a light on the enormous groundswell of activities underway across the globe that are moving the world toward a low-carbon, highly resilient future. We call these activities "Lighthouse Activities" because they are beacons, showing that climate action is creating green jobs, improving lives and fostering partnerships that lead to creative ideas that are scalable, innovative and replicable. The side event will showcase presentations and foster dialogue with previous winners of the Momentum for Change Awards that focus on renewable energy and energy efficiency. Organizer: Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) Location: Plenary Building, Bonn I Room
18:30 – 20:00	Side event	How Can the 2015 Agreement Drive Energy Sector Transformation? Organizer: International Energy Agency (IEA) Location: Plenary Building, Berlin Room

Friday, 5 June 2015

13:15 – 14:45	Side event	Global renewable energy support programme: Globally funded payment guarantees for electricity access Organizer: Centre for Science and Environment (CSE) Location: Plenary Building, Berlin Room
13:30 – 14:45	Dialogue series	ADP Briefing on support for accelerated energy efficiency action in urban environments by UNFCCC institutions and other international organizations Facilitator: Mr. Nick Nuttall, Communications Coordinator at UNFCCC. Speakers/panellists: Green Climate Fund - GCF (Rutger de Witt Wijnen), Climate Technology Centre and Network - CTCN (Jukka Uosukainen), Clean Development Mechanism Executive Board, ICLEI - Local Governments for Sustainability and KfW (Klaus Gihr) Location: Plenary Building, Holzfoyer, Level +1
15:00 – 16:30	Side event	IRENA's Interactive Web Tool on International Standards and Patents in Renewable Energy Organizer: International Renewable Energy Agency (IRENA) Location: Plenary Building, Berlin Room
16:45 – 18:15	Side event	CTI PFAN's engagement in mobilizing private sector financing identifying activities for CTCN Organizers: International Center for Environmental Technology Transfer (ICETT), KfW, Renewable Energy and Energy Efficiency Partnership (REEEP) Location: Plenary Building, Berlin Room
18:30 – 20:00	Networking reception	Galvanizing a groundswell movement for transformational solutions towards a low-carbon and climate resilient future Sponsors: the UNFCCC secretariat, the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) and Galvanizing the Groundswell of Climate Actions (GGCA) Location: Plenary Building, Restaurant, Rhine level

Saturday, 6 June 2015

9:45 – 11:15	Side event	Pre-2020 climate ambition: Bridging the mitigation and finance gap Organizer: Climate Action Network - Europe (CAN - Europe), WWF Location: Plenary Building, Berlin Room
11:30 – 13:00	Side event	The New Economics of Renewable Energy Organizer: Greenpeace International (Greenpeace) Location: Plenary Building, Berlin Room
13:15 – 14:45	Dialogue series	Galvanizing the Groundswell of Climate Actions Organizers: the UNFCCC secretariat, the German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) and Galvanizing the Groundswell of Climate Actions (GGCA) Location: Plenary Building, Holzfoyer, Level +1 This session raises the profile of the groundswell of climate actions to a broader audience, explaining how the groundswell supports countries and enhances success at the Paris Conference of the Parties and beyond. It will feature short presentations to share their most exciting, innovative and ambitious ideas. Questions will be collected from the audience and directed to the presenters. In addition, the event will include a 'talk show' format in which an MC engages a diverse panel of stakeholders from developing and developed countries in an interactive and conversational way.
13:15 – 14:45	Side event	Cities and Climate Change: From the new climate agreement to the New Urban Agenda (Habitat III) Organizer: United Nations Human Settlements Programme (UN-HABITAT) Location: Plenary Building, Berlin Room

Please see CCTV at the World Conference Centre for final schedule of side events.

United Nations
Framework Convention on
Climate Change