
WWF GCEI

**Global Climate & Energy Initiative**

3 March 2014

# WWF Submission on Actions with High Mitigation Potential

WWF is pleased to submit this document pursuant to paragraph 4 of FCCC/ADP/2013/L.4 and the request for submissions on opportunities for actions with high mitigation potential, including those with adaptation and sustainable co-benefits, as referred to in decision 1/CP.19, "Further Advancing the Durban Platform," paragraph 5(a).

This submission presents WWF's views and proposals on the role of the UNFCCC to contribute to closing the emissions gap, estimated to be between 8-13 Gt $CO_2$, between now and 2020 through the enhancement and scaling up of concrete actions related to renewable energy and energy efficiency (RE&EE).

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## Introduction

The UN Climate Convention (UNFCCC) is the global community's principal international instrument for addressing climate change, and is to a great extent the embodiment of humanity's hopes and aspirations to protect this and future generations from man-made climatic disruptions. The current negotiations under both work streams of the ADP have the potential to redefine domestic and international efforts to limit pollution and create a shift to low-carbon climate resilient development pathways. Yet it is not at all clear at this point whether the global community will have the courage and foresight to face up to the clear implications of the limited carbon budget available if we are to stay below 1.5 or even 2 degrees Celsius of warming. Nor is it apparent that countries are about to adopt targets to ensure an emissions peak in this decade and a rapid decline thereafter in accordance with that carbon budget.

Yet, for post-2020 climate commitments to have any chance of avoiding dangerous climate change it is critical that Parties bring emissions to a peak and close the pre-2020 emission gap, which UNEP (2013) estimates will be between 8 and 13 Gt $CO_2$ by 2020.This should be done through two approaches under the UNFCCC. Developed country Parties must lead by ramping up their currently inadequate emission reduction targets, developing countries must enhance and rapidly implement their NAMAs with support where appropriate, and all countries must work together on concrete actions and measures that can contribute to unleashing the potential of technologies and human ingenuity to close the gap between current action and what is required by science.[1]

The UNFCCC can play a positive and proactive role in supporting such collaborative concrete actions and measures related to specific technologies, sectors and policies. It can do this through the institutions Parties have created under the UNFCCC over the years, including those related to financing and technology cooperation and support, as well as its capacity to convene countries and non-governmental actors and make collective decisions, contributions and commitments. It should play a coordination and guidance role for international efforts related to emissions reductions and climate protection, including in those areas where measures have multiple benefits that go beyond climate protection, which is certainly the case for energy efficiency and renewable energy. Where other international or non-governmental organizations are well-placed to lead in particular areas, the role of the UNFCCC can be to ensure coherence and coordination, encouraging greater ambition and mobilizing resources. In areas where there are no other organizations in a position to lead the effort, the UNFCCC can act directly through its existing institutions or through cooperation between groups of countries or global initiatives.

[1] Working Group 3 of the IPCC Fifth Assessment Report (SPM 2014: p. 8) finds that "without additional efforts to reduce GHG emissions beyond those in place today, emissions growth is expected to persist driven by growth in global population and economic activities. Baseline scenarios, those without additional mitigation, result in global mean surface temperature increases in 2100 from 3.7 to 4.8°C compared to pre-industrial levels." Analysis of the figures presented in IPCC AR5 WG 1 (SPM 2013: p. 27) show that at current emissions levels we have less than 27 years left of the global carbon budget for a 66% chance of keeping warming below 2°C above 1880-1890 levels.

In particular, scaling up **renewable energy (excluding traditional biomass) to provide 25% of global energy consumption could save 3.5 Gt $CO_2$eq per year by 2020**, closing the emissions gap by between 1.2 and 1.5 billion tonnes (Gt) of $CO_2$ by 2020.[2] Similarly i**f the rate of energy efficiency improvement doubled to 2.4% per year by 2020 the emissions gap could be closed by 4-5 Gt $CO_2$eq by 2020**.

The technologies already exist. What is required to scale up and accelerate their implementation is political will, appropriate and stable policy frameworks, information in the right hands, and *up-front financing.* The decisions need not even be about tradeoffs - more rapid implementation of energy efficient and renewable technologies can achieve development objectives, improve the quality of life and help to ensure a prosperous and sustainable future, while reducing greenhouse gas emissions.

In this document WWF identifies specific areas where the UNFCCC can meet these requirements and contribute to scaling up actions and efforts. WWF believes that Workstream 2 under the ADP provides the UNFCCC with a platform that can encourage *a race to the top* in best practice renewable energy and energy efficiency policy through:

1. **Sharing of information and experience:** The UNFCCC can serve as a central collection point and coordinating body for existing international information and experience sharing initiatives in the areas of building efficiency, appliance efficiency and public instruments to promote renewable energy investment. Greater information sharing would assist developing countries in identifying and developing locally appropriate technologies and could in future grow into agreements that ensure market access to affordable materials and technologies.

2. **Connecting "means of implementation" needs and initiatives:** the most commonly observed barriers to renewable energy and energy efficiency measures are the high initial investment costs and lack of technology capacity. The UNFCCC's existing mechanisms, including the Green Climate Fund (GCF) and TEC/CTCN, coordinated under ADP workstream 2, should work with regional and local financial institutions to overcome these barriers. This could be done through mobilizing public climate finance from developed countries and leveraging additional finance for developing countries from a range of public and private sources including for example targeted development bank investments, tax incentives for private companies, public-private investment partnerships, soft loans, carbon pricing systems and credit guarantees. Workstream 2 under the ADP could also be used to provide capacity building support through for example a coordination initiative that could offer technical support for RE&EE codes and training and resources for implementation, monitoring and enforcing.

[2] The difference between the two figures is due to the fact that some emission reductions from expanding renewable energy are already captured in existing pledges. The figures for the potential to close the gap refers to reduction potential beyond existing pledges. The same difference applies to the figures for energy efficiency.

3. **Provide a platform for sharing Best Practices:** for documenting, supporting and disseminating best practices in the areas of policy frameworks, efficiency standards, labeling schemes and incentive approaches that could be adopted or enacted by countries or groups of countries, through e.g. national legislation, regulation or support mechanisms that could be reflected internationally through commitments by developed countries and NAMAs for developing countries. Championing countries could even come together in high ambition clubs that take on voluntary goals for RE and EE scale-up.

This submission provides recommendations and information relevant to actions that could be taken by the UNFCCC in the areas of energy efficiency (specifically buildings and appliances) and renewable energy, as well as financing needs and potential mechanisms for scaling up financing. It also showcases some examples of initiatives that are ongoing in order to illustrate that there is much experience that can be built on.

**Potential initiatives related to the building sector include:**

1. Creating an information-sharing website database for existing building codes in countries and the emissions reductions achieved through these.
2. Inviting a relevant international organization to create a meta-standard for voluntary building certificates.
3. Establishing a process to explore ways for multilateral climate finance institutions such as the GCF to assist local financial institutions in financing the high initial investments required to support some elements of energy efficient building construction.

**Potential initiatives related to the appliance sector include:**

1. Encouraging minimum performance standards and phasing out inefficient products through creating an information sharing website database and making recommendations for accelerated adoption.
2. Development of incentive systems and financing mechanisms to support the transition to energy efficient appliances.

**Realizing the potential of renewable energy and energy efficiency scale up through the institutions of the UNFCCC requires that:**

1. The GCF must be fully operational in 2014 with initial capitalization from developed countries totaling at least 10 billion, and scaling up substantially from this level towards 2020.
2. Parties start making the financial reforms required to escalate investments in clean energy[3] in all countries.
3. Parties commit to implement measures to support a shift of investments away from

[3] Clean energy includes: renewables, primarily all wind, solar and geothermal supply technologies as well as sustainable hydropower and biomass and all efficiency and demand-side measures from all sectors including grid infrastructure and storage of power.

fossil fuel intensive technologies, and especially subsidies for production and consumption of fossil fuel.

4. Parties agree to adopt measures capable of scaling up clean energy investments to 500 billion USD annually by 2020.

A further major precondition of leveraging enhanced resources towards clean energy and energy efficiency investments remains the removal of fossil fuel subsidies and reallocation of some of the funds to a domestic pro-poor development and energy security policy. The International Monetary Fund has suggested that phasing out the almost $US 2 trillion of global post-tax fossil fuel subsidies will reduce about 13% of all $CO_2$ emissions from fossil fuels, equivalent to 4 Gt $CO_2$ annually.

## Energy Efficiency

While it is absolutely critical that the global economy move away from a fossil fuel base to a renewable energy base, such a transition will not happen fast enough to prevent dangerous climate change if it is not complemented by massive energy efficiency improvements. Renewable energy scale up must replace fossil fuel energy sources, not just add to the available energy capacity. The only way to achieve this in a world with growing energy and development needs is through massive energy efficiency improvements. The benefits of energy efficiency also stretch beyond climate mitigation through reduced cost of energy services, reduced need for new infrastructure investment and conservation of scarce resources through optimal use. Most energy efficiency improvements pay their own costs within a few years through avoided energy costs. In many cases the only barriers to efficiency improvements are thus higher upfront costs as well as non-economic barriers such as the lack of a supportive policy and regulatory environment and access to technology. The UNFCCC, through ADP workstream 2, can play a key catalyzing role in eliminating these barriers by encouraging countries to adopt ambitious energy efficiency initiatives, mobilizing financial institutions to invest in energy efficiency and showcasing best practice solutions.

The UNFCCC could also proactively contribute to a process with other intergovernmental bodies and industrial representatives to develop minimum energy efficiency standards for groups of products that are internationally manufactured and traded. This could comprise all appliances/consumer products like light bulbs, fridges, TV sets and computers as well as industrial energy consumption devices like electric motors and cars. Such an approach to foster a parallel global improvement in energy efficiency across various products also has the advantage that the number of global industrial actors in some sectors is limited. For instance more than 75% of all cars are produced by about a dozen companies. The same situation applies to a variety of business and entertainment electronics as well as domestic appliances. Such an approach could be implemented first on a voluntary basis and subsequently be incorporated into national legislation.[4]

The underlying message is that in an increasingly globalised economy it is difficult for national governments alone to create strong enough market signals to shift building or appliance efficiency levels. By creating a framework for information sharing and offering assistance in overcoming the technology and financial barriers and building capacity where needed, workstream 2 under the ADP could help to bring about accelerated efficiency improvements through international collaboration that increases the demand for, and trade in, efficient appliances, equipment and buildings.

This submission will focus on the appliance and building sectors but interventions could be equally effective in the transport and other sectors.

[4] There may also be a role for the UNFCCC in any efforts to assess and facilitate the role of reducing or eliminating duties or taxes on highly efficient products and technologies, or other economic measures or incentives to ensure more rapid dissemination and take-up.

## Energy Efficiency in Buildings

The building sector accounts for roughly a third of global energy use (IEA 2013a) and it holds significant potential for emission reductions, up to a total of 1.4 to 2.9 Gt $CO_2$ by 2020 through appliance efficiency and 0.5 to 0.6 Gt CO2 by 2020 through heating and cooling efficiency (UNEP 2013). The UNFCCC (2013a) has already recognized the area of "building heating and cooling" as one thematic area for closing the emissions gap, what remains now is to act on this potential.

The IEA (2013a) states that an "important first step in improving the global building stock is to establish and enforce stringent building codes that include minimum energy performance for new and refurbished buildings." UNEP (2013) also identifies building codes for new and existing buildings as “best-practice policies.” Though these international bodies agree on the need for strong building codes, or equivalent policy instruments, for new and existing buildings many countries in the world still lack strong policies in this regard.

Climatic conditions and lifestyles, and therefore building requirements as well as the age of the building stock and the ratio between new and old buildings, vary greatly between countries. This necessitates locally appropriate policy instruments that reflect the appropriate technical and economic potentials to enhance energy efficiency and conservation. This needs to be taken into account when proposing targets, goals or standards for buildings. However, the UNFCCC could still play an important role in identifying and supporting common areas of policy instruments that can greatly advance building efficiency globally.

To create an environment that encourages all countries to adopt adequate building efficiency standards the UNFCCC can take the following concrete actions:

1. **The UNFCCC can take a decision to create an information-sharing website database for existing building codes in countries and the emissions reductions achieved through these.** The database should show whether countries have building codes for new and existing buildings and, in case they have, it should show the status of the codes. It does not have to create a new institution to collect the information as it could work with the IEA which already has a database called BEEP (Buildings Energy Efficiency Policies). The Global Building Performances Network (GBPN) also has an interactive website called “BuildingRating” which includes a “Policy Map”.[5] Without requiring much additional institutional capacity the UNFCCC can formalize these databases and add information related to the emission reductions achieved through these standards. It can then report back to Parties on the progress that they are making in closing the gigatonne gap.

2. **The UNFCCC can invite a relevant international organization to create a meta-standard for voluntary building certificates.** Such standards would present a high-level summary of existing standards and provide a resource that countries can refer to when they create their own standards. Some examples of existing voluntary building certificates/standard systems that recognize high energy efficiency include

    - the Passivhaus programme in Germany.

[5] For GBPN, see http://www.gbpn.org. For BuildingRating, see http://www.buildingrating.org .

- The Energy Conservation Building Code (ECBC) in India, which is voluntary in each state until state law makes it mandatory (India Bureau of Energy Efficiency, 2010).
- the Building Research Establishment Environmental Assessment Method (BREEAM).
- Leadership in Energy and Environmental Design (LEED) initiated by the US Green Building Council (GBC) and now being rolled out in China and many other countries including Mexico, Brazil, Argentina, Columbia and Peru (ELLA 2014).
- The Chinese three-star Green Building Certification program.
- Energy Star, a voluntary program run by the US Environmental Protection Agency.
- The EU directive on energy performance of buildings (Directive 2002/91/EC and Directive 2010/31/EU).
- Green Building Council standards and certification in South Africa, Argentina, Australia, Brazil, Peru, Poland, Canada, Chile, Colombia, the Netherlands, the United Arab Emirates, France, Germany, Hong Kong, India, Israel, Japan, Jordan, Korea, New Zealand, Sweden, Spain, Singapore, Taiwan, Turkey, Romania, the United Kingdom, and the United States of America (World Green Building Council 2014).

These schemes have proven to be effective in promoting even higher standards than the mandatory codes for building efficiency in those countries. Meta standards could capture the experiences of these schemes so that other countries can learn and create their own successful initiatives.

3. **The UNFCCC should establish a process to explore ways for multilateral climate finance institutions such as the GCF to assist local financial institutions in financing the high initial investments required to support some elements of energy efficient building construction.** One of the main barriers identified in existing studies is the higher initial investment cost for energy efficient buildings. Multilateral climate finance can help local financial institutions overcome this barrier by reducing the cost of capital through soft loans or by offering guarantees for energy efficient projects. Detailed economic analysis would be required for optimal intervention but after further exploration the UNFCCC could play a key role in helping overcome the initial cost barrier.

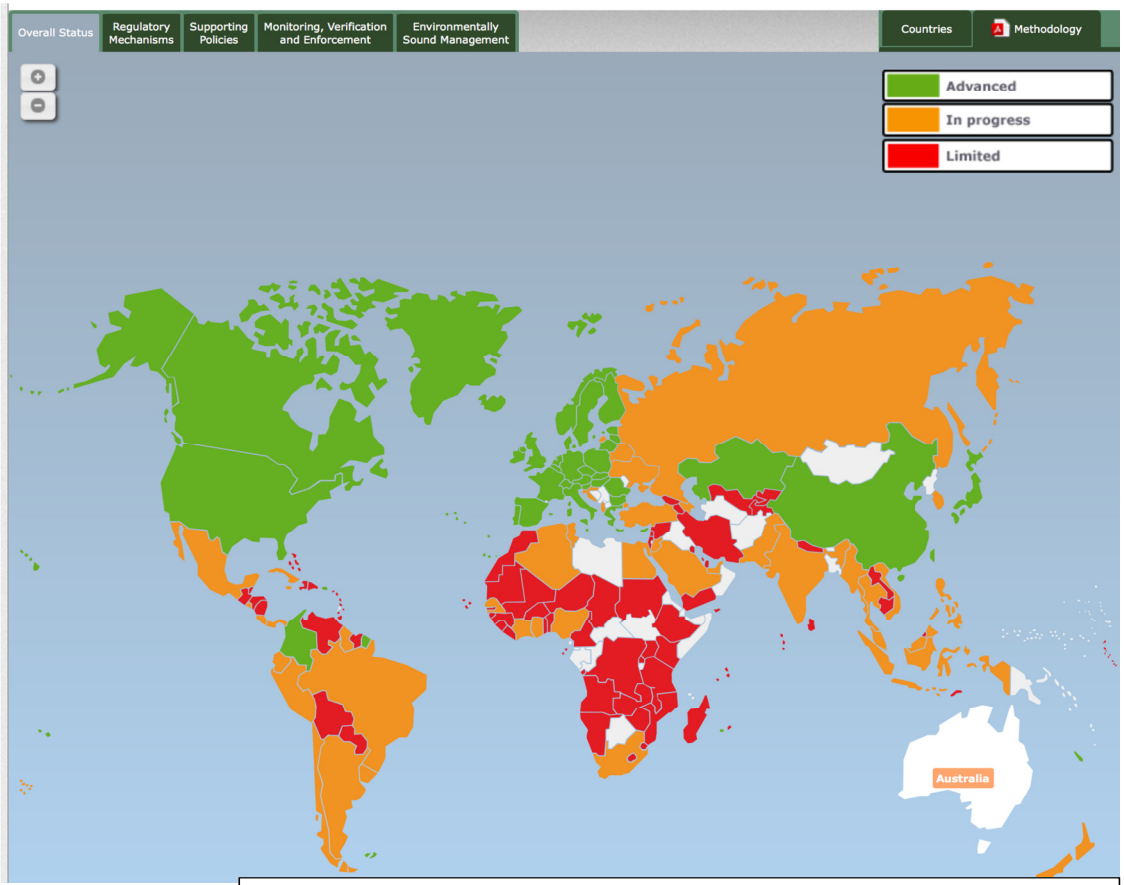
## Appliance efficiency

Electricity for appliances and equipment is one of the fastest-growing sources of energy demand. Blok et al (2012) estimates that efficient appliances could save at least 0.6 Gt $CO_2$ per year by 2020 while a phase out of incandescent light bulbs could save a further 0.2 Gt $CO_2$ per year by 2020. The combined total of these potentials are equivalent in size to Germany's current annual $CO_2$ emissions. Realizing this potential will require a significant shift in our approach to energy consumption through changing behavioral patterns in our societies and fast adoption of the most efficient available technologies. Policy frameworks, such as legislation on minimum energy efficiency standards, can play a key role in bringing about the changes required and the UNFCCC can create a framework to assist national governments in putting the correct policies in place.

WWF proposes two interventions which could be supported through the UNFCCC, and which can contribute to an accelerated adoption of energy efficient appliances as well as a framework for continued innovation in energy efficient appliance design.

1. **Encouraging minimum performance standards and phasing out inefficient products through creating an information sharing website database.** Competition and fast innovation in the appliance sector has led to a wide range in the efficiency of appliances currently on the market. Small wonder then that the IEA (2011) has found that mandatory energy performance requirements and labels have proved to be a highly cost-effective policy tool for reduced energy consumption without reducing consumer choice or triggering sustained increases in prices. Despite the options available there are limited initiatives in place to encourage consumer take-up of the most efficient technologies. There is an opportunity for the UNFCCC to work with international organizations such as UNEP[6] to encourage individual countries to adopt minimum energy performance standards for appliances by providing information on best practice in countries that have adopted successful standards. This could be done fairly resource effectively through building on existing efforts such as the *en.lighten* initiative of UNEP and GEF. The initiative has been promoting the phase-out of incandescent light bulbs within the context of energy efficient lighting. It offers a visualized, interactive map of lighting policies in the world (shown in Figure 1).

**Figure 1 Global lighting policy map by *en.lighten* initiative**




Source: http://www.enlighten-initiative.org/CountrySupport/GlobalPolicyMap.aspx

[6] Other potential partners could include: http://www.cleanenergyministerial.org/, http://www.topten.info/ and http://www.clasponline.org/

2. **Financing the transition to energy efficient appliances.** Price comparison is often a key factor driving consumers' purchasing behaviour. Even though many energy efficiency measures are fully cost effective with very short payback periods, the upfront additional capital cost may be a financial barrier in many instances. The GCF under the UNFCCC could incorporate provisions to allow developing countries to access funding for domestic financing schemes that make it easier for consumers to purchase more expensive energy efficient appliances.

## Renewable Energy

According to various scenarios (for example Greenpeace 2010 and WWF 2011) renewable energy uptake could supply up to 115 EJ of final energy in 2020. According to the scenarios considered in the IPCC Special Report on Renewable Energy Sources (2011), a large scale uptake of renewable energy technologies could save 150 Gt of $CO_2$ of cumulative emissions by 2030 (chapter 10, figure 10.22, p. 54). Annual global $CO_2$ emissions from electricity and heat production and consumption are about 13 Gt $CO_2$ (IEA, 2013d). **If 25% of this energy could be sourced from renewable energy systems roughly 3.3 Gt $CO_2$ could be saved per year.**[7] Allowing for the share of renewable energy already in place and captured in existing emission reduction pledges a scale up to **25% renewable energy could contribute to closing the gigatonne gap by roughly 1.2 to 1.5 Gt $CO_2$ per year by 2020.**

One of the key barriers to realizing the potential of renewable energy to close the gigatonne gap is the comparatively high up-front cost of renewable energy. The UNFCCC, through the GCF and TEC/CTNC could play a key role in assisting developing countries to overcome this barrier.

Costs of renewable energy technologies are falling rapidly, and wind and solar energy, for example, have achieved grid parity in some countries and regions. Some examples of the rapid progress being made in renewable energy roll-out are mentioned below:

- In the heartland of global oil production, in the Middle East region, solar electricity is becoming a preferred alternative to oil-based thermal plants (Bloomberg 2011).
- Recent large-scale wind and solar parks in the US are commanding PPA prices around 50 USD/MWh, below most of the traditional power technologies.
- According to UBS (2013), purely based on economics, almost every family home and every commercial rooftop in Germany, Italy and Spain should be equipped with a solar system by the end of this decade. On their estimates for 2020, electricity bills could thereby be reduced by 20-30%.

Despite these, and many other encouraging examples the lack of mechanisms for providing accessible and low-cost financing to overcome the high initial capital cost remains a major obstacle to the rapid dissemination of renewables and a shift to sustainable energy systems, especially in developing countries. The UNFCCC has already recognized that climate finance is a key requirement for the just transition to a low carbon economy and the Green Climate Fund was created bearing this in mind. Using this institution to facilitate the scale up of renewable energy systems is directly within the mandate of the UNFCCC.

In addition to saving the planet 3.5 Gt $CO_2$ in power and heat generation (closing the emissions gap by around 1.2 to 1.5 Gt $CO_2$ by 2020) investment in renewable energy would also improve local health and environment conditions, increase employment options, strengthen local economies through new business opportunities, improve social welfare,

[7] It is assumed here that renewable energy in the power sector will replace the same share of different fossil fuels including coal, oil and gas, each of which have different carbon intensities. However, many renewable sources are likely to come into play in countries with a high coal share (high $CO_2$/unit of energy) such as India, China, UK, Germany, USA, South Africa and/or Japan. Hence, a 25% renewable energy share is likely to save more $CO_2$ compared to a NO-RES scenario when applying a linear approach to reduce $CO_2$ in the grid mix.

decrease poverty, improve energy security and provide more resilient infrastructure (GEA 2012).

Despite growing very strongly from a year 2000 baseline of well below $US 30 billion to $US 250 billion in 2013, the last two years have seen a 20% decline in global renewable energy investments. This decline reflects not only reduced manufacturing costs of key renewables such as onshore wind and solar PV but also increased investor insecurity, in particular in Europe and the United States. While investments in these markets have weakened, they continue to grow steadily in other countries. These trends show the potential of renewable energy to attract finance, but also emphasize the need for stable policy frameworks and actions to leverage greater levels of investment. The need for additional finance is critical. According to CERES (2014) the world needs to invest an additional $36 trillion in clean energy by 2050 – an average of $1 trillion per year for the next 36 years, in order to limit global warming to well below 2°C. For the near term this requires at least doubling investments in clean energy to $500 billion per year by 2020. Over half of these investments need to be made in developing and emerging economies. In addition, the IEA (WEO 2013) had estimated that about $US 500 billion annual investments in energy efficiency are cost-effective, providing a substantive net monetary gain to the funder via reduced energy costs over the life-cycle of the equipment. Presently, investments into efficient energy end-use appliances and devices in all sectors are only approximately $US 150 billion per year.

Given that current fossil-fuel based energy sector investments are already more than US$ 1 trillion annually the scale of investments required does not pose a fundamental challenge. Much of the increased investments for renewable energy and energy efficiency can be sourced by shifting finance from highly polluting and risky technologies to clean energy. Parties also need to keep in mind that 'investments' in renewable energy and energy efficiency are likely to generate returns and that finance in this sector will not be a 'cost' to the economy as some might purposefully, but incorrectly infer.

However, in most countries the existing investment framework is economically, politically and structurally biased towards incumbent fossil fuel technologies. Sound policy measures are needed to shape a new enabling environment to ensure a cost-effective, rapid and just transition to the sustainable energy systems of the future. The incentives for such a transition goes beyond just emissions reductions as it will be absolutely essential to address other risks confronting the incumbent energy sector through the stranding of assets, climate change related investment portfolio risks, disaster management & adaptation and mitigation costs.

Accelerating the shift from inefficient and polluting technologies to renewable energy will in many cases require increased up-front investments with longer term payback periods and it may incur net incremental costs in the short term for developing and emerging economies, particularly those with difficulty in attracting low-cost investment capital. Appropriate policy frameworks will assist this shift, but in many cases there will still be a need for financial assistance through transfers of public finance and mobilization of international private finance. **The UNFCCC, through Workstream 2 under the ADP, is uniquely positioned to play a fundamental and catalytic role in mobilizing the political will, policy and investment shifts, and financial transfers necessary to put the world on a track to staying below a 2 or 1.5 degree temperature increase**. This can be done through securing climate finance from

developed countries, including the $100 billion commitment by 2020 and by using the Green Climate Fund to distribute the public finance that could leverage much larger levels of private finance. Realizing the potential of renewable energy scale up through the institutions of the UNFCCC requires that:

1. The Green Climate Fund must be fully operational early in 2014 with initial capitalization from developed countries totaling at least 10 billion, and scaling up rapidly towards 2020.
2. Parties start making the financial reforms required to escalate investments in clean energy in all countries.
3. Parties commit to shift investments away from fossil fuel intensive technologies, and especially subsidies for production and consumption of fossil fuel.
4. Parties agree to adopt measures capable of scaling up clean energy investments to 500 billion USD annually by 2020.

Further work is necessary to identify specific financing mechanisms that are appropriate for different contexts, and to provide the concessional financing necessary to leverage and accelerate clean energy investments. The paragraphs below will provide some examples of financing schemes that have been successful in the past and that could potentially be rolled out to more countries with the help of the UNFCCC. There are undoubtedly many more models that have been successful in particular contexts and that might be replicated, the important point here is that there are successful initiatives in place that could be replicated.

Below are some examples of financing mechanisms that could grow through international support:

**1. Private Financing Advisory Network (PFAN)**

The Climate Technology Initiative's (CTI) Private Financing Advisory Network (PFAN) works in support of the UNFCCC's objectives to facilitate and accelerate the transfer of climate-friendly, clean, renewable, and energy-efficient technologies to developing countries.[8] PFAN seeks to overcome access to financing as a major barrier to technology transfer by identifying promising clean energy projects, businesses and technologies and matching them to the pool of potential investment and financing. It provides project developers with mentoring for the development of business plans, investment pitches, and growth strategies, thus significantly enhancing the possibility of raising funds. This multilateral, public-private partnership was initiated by CTI in cooperation with the UNFCCC Expert Group on Technology Transfer.

To date, over 221 clean energy projects are in the Project Development Pipeline, and 44 projects[9] have achieved financial closure with over US$541 million of investment raised. Combined, these projects have the potential to mitigate over 2 million tons of CO2e annually and provide over 346 MW of clean generation capacity.

[8] http://www.cti-pfan.net/index.php?id=1

[9] Examples of countries wherein projects have received support through this initiative include Brazil, Cambodia, China, Ghana, India, Indonesia, Kenya, Mexico, Mozambique, Philippines, South Africa, Thailand and Uganda.

PFAN partnerships are developed in each new country so as to build and expand an in-country presence. With its regional scope, access to information about technological developments and knowledge of what is commercially viable, PFAN describes itself as an "ideal platform for promoting and achieving technology transfer throughout its areas of operation". Increasingly the exchange of technology is between developing countries with technologies being developed in developing countries based on lower manufacturing and development input costs. PFAN is actively seeking partnerships with agencies, organizations, and companies that specialize in technology transfer and application. The UNFCCC could partner with the PFAN to assist it to scale up its activities through access to the GCF and the technology mechanisms of the convention

**2. Property Assessed Clean Energy**

The Property Assessed Clean Energy (PACE) programs provide municipalities with a mechanism for providing homeowners and other property owners with the upfront investments for renewable energy systems or efficiency improvements, and the property owner repays the investments over a number of years through an additional charge on the property tax bill.[10] This overcomes the capital cost barrier that property owners face when they wish to invest in renewable energy. Since the repayment is tied to the property, rather than the owner, the owner doesn't incur a debt, and energy cost savings will often more than cover the annual repayment charges.

Municipalities in developed countries can often access the up-front capital needed for such programs directly from capital markets, but for smaller municipalities and most municipal governments in developing countries, a better option would be grants or concessional loans from national or international financing institutions. The UNFCCC, perhaps through the CTNC, could recommend modalities for such financing mechanisms, and the GCF could provide financing for pilot projects in countries and jurisdictions where such programs can be implemented.

**3. Energy+**

The International Energy and Climate Initiative, referred to as Energy+, is an international partnership with a goal of addressing energy access and climate change.[11] With more than 1.2 billion worldwide suffering from lack of clean, reliable and affordable energy, access to modern energy services is a prerequisite for poverty reduction and equitable, inclusive growth, as recognized by the UN Sustainable Energy for All (SE4All) initiative.

The idea behind Energy+ is to provide financial support to developing countries based on increased access to renewable energy and measures taken to achieve this. Developed countries are encouraged to take the lead in the process of transforming the energy sector in developing country partners. As per 2013, Denmark had the lead in one pilot country (Nepal),

[10] Property-Assessed Clean Energy (PACE) Financing of Renewables and Efficiency. National Renewable Energy Laboratory. http://www.nrel.gov/docs/fy10osti/47097.pdf
[11] http://www.regjeringen.no/nb/dep/ud/kampanjer/energy_plus.html?id=672635

and Norway in four pilot countries (Liberia, Kenya, Bhutan and Ethiopia).

The initiative takes a sector-wide approach, as opposed to a project by project-based approach. The developing country partner must develop national goals for energy access and energy efficiency, supported by specific plans, realistic targets and systematic monitoring. The energy access results achieved will in turn trigger funding (in the original design, only results in both energy access and reduced or avoided GHG emissions would trigger funding). This in turn can open up for funding from climate finance as a longer term objective.

**4. Financing public instruments to promote renewable energy investment through the NAMA framework**

UNDP (2013) recognizes that "Mechanisms that provide renewable energy generators with a power purchase agreement (PPA), ensuring a fixed long-term price for power and guaranteed access to the electricity grid, are often the cornerstone instrument for renewable energy market transformation efforts." In line with this finding UNDP has developed the DREI (Derisking Renewable Energy Investment Financial Tool[12]) that can help to assist policymakers in selecting appropriate public instruments to promote renewable energy investment. This tool recognizes that cornerstone instruments have different designs ranging from feed-in tariffs (FiTs) to bidding processes but that NAMAs could complement most typical public renewable energy financing instrument portfolios. The UNFCCC could further improve this complementarity through capacity building of NAMA developers and decision-makers and by asking developed countries and the GCF to provide the finance needed to ramp up large scale public instruments for renewable energy financing.

## Conclusion

The paragraphs above have shown that scaling up renewable energy (excluding traditional biomass) to 25% of global energy consumption, together with a doubling in the rate of energy efficiency improvement, could reduce emissions by more than 8 Gt $CO_2$ by 2020 – equivalent to the lower range of the UNDP emissions gap estimates.[13] We have also shown that there are many existing initiatives and policy design options that prove that such a scale-up is technically and economically feasible and that it will lead to many co-benefits for development.

The key message is that the UNFCCC, through Workstream 2 under the ADP, could play a critical role in catalyzing existing processes by providing best practice information and securing the public climate finance that is necessary to overcome the high initial capital costs.

It is clear that renewable energy and energy efficiency implementation can build collaborative and ambitious action amongst countries. What is needed is the political will to do so. If success can be achieved in realizing the short-term benefits of these interventions, the

[12] http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Strategies/UNDP%20Derisking%20Renewable%20Energy%20Investment%20-%20Executive%20Summary%20(April%202013).pdf

[13] Though part of this potential is already captured in existing mitigation plans

UNFCCC could easily build upon the momentum to scale up other low carbon initiatives and the positive progress would encourage other stakeholders to become much more positively engaged in the multilateral process. Success on this front may also just create the trust that is necessary for all countries to agree to an ambitious outcome in 2015 as it will be that much clearer that the transition to a low carbon future is advantageous and feasible in every way in every country.

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