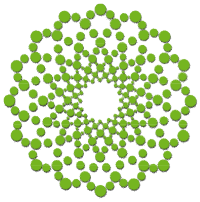

International Renewable Electricity Standards
Concept Paper
July 1, 2014

Melissa Powers
Associate Professor and GEI Director

I. Introduction

This document outlines different strategies for deploying and promoting renewable electricity on an international level. It aims to provide a basic description of two policy design options and to serve as a starting point for further policy development. The document begins with a discussion of how policies designed to increase renewable power could garner broader support than direct greenhouse gas (GHG) reduction mandates under the United Nations Framework Convention on Climate Change (UNFCCC). Next, the paper explores the design options for an international renewable electricity standard that would benefit both developed and developing countries. Third, the paper discusses options to leverage developing country parties' nationally appropriate mitigation actions and Annex I Parties' funding commitments to develop renewable electricity sources in developing countries. Finally, the document proposes options to link renewable energy development and investment with GHG reduction commitments.

II. The Importance of Renewable Energy Promotion in the International Climate Framework

The energy sector is the largest contributor to global GHGs, and multiple studies predict that GHG emissions will rise as more countries expand their production and use of carbon-based energy. The energy sector contributes 65–85% of developed countries' emissions, with electricity production contributing 30–40% (the other energy-based emissions come from the transportation sector and end uses). In major emerging economies, emissions from the electricity sector have increased significantly due to recently installed coal-fired power plants. For less-developed countries, GHG emissions from electricity production are much lower, largely due to the lack of power production. However, these less-developed countries must have access to electricity, and they will turn to fossil fuels unless they have other options. Climate mitigation and sustainable development thus depend on transitioning the electricity sector away from fossil fuels and toward renewable sources.

Although governments and stakeholders involved in the international climate change negotiations recognize the importance of energy-related emissions reductions, they have yet to reach agreement regarding reduction strategies. To a large extent, this inability results from the

perception that emissions reductions will require deep sacrifice. For developing countries in particular, emissions reductions have been equated with stagnant development and economic decline. So long as stakeholders link climate mitigation and economic stagnation, climate mitigation strategies will likely not progress.

An emphasis on renewable energy development, however, could change the focus of climate mitigation. Renewable energy development provides opportunities for economic growth, infrastructure development, technological innovation, and capital investment. The development and installation of renewable power sources present opportunities for job creation and investment. Renewable energy sources could also bring electricity to places that currently lack power sources or rely on inefficient and carbon-intensive generators, wood stoves, kerosene cookers, and other old technologies. Finally, technologies to produce renewable power have improved and become less expensive, and they therefore provide opportunities for low-cost carbon mitigation. Thus, policies to promote renewable energy development could garner more support from more stakeholders because of the opportunities renewable power offers.

With these ideas in mind, the following two sections introduce two policy options to increase international support for renewable electricity development. The first proposal recommends that countries agree to adopt international renewable electricity standards. The second proposal recommends the use of nationally appropriate mitigation actions and the Green Climate Fund as platforms to support renewable energy deployment in developing countries. These proposals could work independently or collectively, as explained below. Moreover, while neither proposal directly generates carbon credits, both have the potential to link to a carbon market. Some details about the proposals follow. As this is merely a concept paper, however, the proposals require much further development.

III. Proposal 1: Establish International Renewable Electricity Standards

This first proposal recommends that the Parties to the UNFCCC create a treaty protocol developing international Renewable Electricity Standards (RES). Under the RES, the Parties would establish an international mandate for Parties to obtain specified percentages of electricity within specified timeframes. Parties would use Renewable Electricity Credits (RECs) to verify compliance with the applicable RESs. Parties could also choose to make some portion of the RECs tradable, in an effort to increase flexibility and lower costs. Finally, to promote more development of renewable energy in developing countries—or to promote other policy goals—the Parties could award extra RECs for specified projects. Similar policies have already worked in several jurisdictions, whose experiences could help inform the development of an international RES.

A. Proposal Description

The international Renewable Electricity Standards would require Parties to obtain a specified percentage of their electricity from renewable sources within specified timelines. According to various studies, effective climate change mitigation will ultimately require decarbonization of the electricity sector. It will also require humanity to forego development of approximately two-thirds of known fossil fuel resources. To achieve these ambitious goals, the

RES must set targets that increase renewable power deployment on a steady basis for approximately 50 years. For example, the RES may require Parties to obtain 100% of their power from renewable sources by 2060, with interim mandates requiring 10% by 2020, 30% by 2030, 50% by 2040, 75% by 2050, and 100% by 2060. While the specific mandates may differ from these examples, the RES should establish an ambitious, yet attainable, schedule for transitioning to renewable electricity.

To implement the mandates, the RES program would employ the use of Renewable Electricity Credits (RECs). In their simplest form, RECs serve as a compliance tool demonstrating that Parties have obtained eligible renewable power. Whenever an eligible facility produces power, it would create RECs representing each unit of electricity. RECs would include identification numbers unique to each production facility. This would allow verification that the facilities are eligible for the RES and assurance that the facilities did indeed produce qualifying power. The facility would then transfer the RECs to the power purchaser, thereby allowing the purchaser to provide proof of its compliance with the RES. RECs would therefore serve both as an accounting and compliance tool.

Beyond this basic structure, the Parties would need to agree on several critical design elements to make the RES succeed. For example, the Parties would have to establish which types of power qualify for the RES program. The Parties may also design RESs to increase flexibility, allow for REC trading, and ensure that developing country Parties receive assistance in meeting their targets. The following sections explore some of these options.

1. Qualifying Power

The Parties would need to establish a list of power types that would qualify for the RES. The Parties could look at existing RES programs to gain insight into which sources should qualify. For example, most jurisdictions allow wind, solar, geothermal, and landfill gas power to qualify. Many jurisdictions also include hydropower as an eligible source, but they often limit the size of eligible facilities. Other potential electricity sources, such as nuclear power, may also qualify as "renewable" under some existing programs. Since existing RES programs reflect local concerns, they often have sufficient flexibility to include an array of carbon-free sources. An international RES could include similar flexibility, by allowing individual Parties to specify the types of carbon-free electricity they would allow to qualify toward their own commitments. For example, Party A may allow only wind, solar, and wave power to qualify, while Party B may also allow geothermal and hydroelectric power. So long as Parties limit the RES to power sources that do not emit carbon dioxide, it would be feasible to accommodate variation between Parties.

Parties may also create specific mandates (often called "carve-outs") for specific types of power. For example, a Party's RES may specify that at least 20% of the qualifying power must come from small-scale distributed solar energy, or the RES may specify that a certain percentage come from wave energy. Carve-outs can thus help promote investment in certain types or sizes of power plants. Carve-outs could also mandate that specified amounts of power come from developing countries that have the greatest needs for energy infrastructure development. Carve-outs could thus serve a number of functions in an international RES and thereby promote broad participation in renewable energy investment.

2. Mandates for Different Parties

The RES can include different mandates for different Parties that reflect the common but differentiated responsibilities principle. However, the RES should not use the existing divisions between Annex I and non-Annex I Parties, as these divisions may delay deployment of renewable energy sources in countries with the capacity to immediately build renewable energy facilities. Instead, differentiated RES mandates should reflect Parties' variable economic and technological capacities. Only Parties with a lower capacity to develop renewable energy should have lower mandates and longer timeframes. Less developed countries may have mandates contingent upon funding assistance from developed country Parties. The RES should account for different Parties' capacity to deploy renewable electricity, but this flexibility should not undermine the overarching goal of rapidly expanding renewable energy production.

3. REC Trading

In its simplest form, a REC serves only as a compliance and enforcement tool to demonstrate that a Party has obtained power from an eligible facility. However, many jurisdictions allow facilities to unbundle and trade RECs to increase flexibility and lower compliance costs. An unbundled REC represents the "renewable" aspect of electricity. In essence, an unbundled REC allows a facility to produce two commodities: 1) electricity and 2) the renewable credit. With unbundled RECs, eligible facilities can sell their electricity and the REC separately, but only the REC would count toward compliance with the RES. For example, a concentrated solar plant in Morocco might deliver its electricity onto a transmission system that serves Moroccan cities but sell its RECs to Belgium. While Moroccan residents would benefit from the power (and the local benefits renewable power production may yield), only Belgium would include the RECs in its compliance with the RES mandate. RECs thus increase flexibility by allowing renewable power production to occur in optimal locations and may lower compliance costs by promoting investment in facilities capable of achieving economies of scale.

Tradable RECs could also promote investment in renewable power in less-developed and least-developed countries. For example, if a developed country Party invests in renewable energy development in a small-island nation, the developed country Party will be able to use the RECs toward compliance with its own RES. A developed country Party may also produce its own power and then sell RECs on the market. To increase the opportunities and incentives for investment in less- and least-developed countries, the RES may assign "multipliers" to renewable power produced from certain States. These multipliers would give additional RECs for each unit of power produced. However, while multipliers may spur development at the outset, they can also stifle long-term investment in renewables by making it easier for Parties to comply with the mandates. Thus, Parties should be careful to not rely too heavily on multipliers. Alternatively, the program may allow some developing countries to earn RECs based on the installed capacity of renewable facilities, rather than the production of the power itself. This would reduce transaction costs and perhaps incentivize even greater deployment of renewable power.

Of course, the design of a REC market requires careful attention. RECs will maintain the integrity of an international RES only where Parties develop effective mechanisms for REC

verification (i.e., ensuring a facility actually produced qualifying power), REC trading (to ensure Parties do not double-count RECs), and REC accounting. Unlike with a carbon market, however, where numerous external forces can undermine the value of carbon credits, a REC market's integrity would depend almost exclusively on the design of the RES and the REC market.

B. Experience with RES Mandates in Other Jurisdictions

Many governments require electric utilities to obtain a minimum percentage of their electricity from renewable sources within specified deadlines. The European Union, for example, aims to provide 20% of its electricity from renewable sources by 2020. In the United States, several states have established renewable power mandates, requiring, for example, utilities to obtain 25% of their power from renewable sources by 2025. California has a particularly robust renewable energy mandate: by 2020, its utilities must obtain 33% of their electricity from renewable sources. RES mandates are becoming increasingly common tools to promote renewable power.

RES mandates also work. Indeed, in the United States, many utilities have already met their renewable power procurement targets ahead of their deadlines. In 2011, the European Commission projected that renewable sources would provide 37% of Europe's power by 2020. While some EU states seem unlikely to meet their individual targets, the region as a whole will likely exceed the 20% threshold by a wide margin. These statistics provide support for multiple analyses that explain that demand-side strategies like RESs create a market for renewable energy development and spur investment in renewable power sources and technology.

IV. Proposal 2: Focusing on Renewable Power Development in NAMAs and Funding

Parties could also establish clearer mechanisms to support renewable power through nationally appropriate mitigation actions (NAMAs) and the Green Climate Fund. NAMAs provide a useful tool for developing country Parties to establish renewable energy investment goals, and the Green Climate Fund could include dedicated accounts to support renewable energy investment. By integrating renewable energy targets under NAMAs with committed funding, developing country Parties could receive substantial assistance toward expanding their electricity production capacity and reducing (or foregoing) GHG emissions.

Parties could also consider linking NAMAs and the use of the Green Climate Fund with an international RES program. For example, developing country Parties that include renewable energy development in their NAMAs could receive priority funding from the Green Climate Fund. Projects developed pursuant to the NAMAs and Green Climate Fund would then generate tradable RECs for purchase by other Parties. Revenue generated from REC sales could either go to the developing country Party or back to the Green Climate Fund, thereby creating a sustainable source of funding for renewable energy investment.

V. Linking Renewable Power Investment to GHG Reductions

This proposal focuses on the deployment of renewable energy sources and the use of RECs to track compliance and create a renewable power credit market. Thus far, the proposal has not suggested that credits generated from renewable energy sources should count as carbon-dioxide equivalent (CO_2eq) credits. In part, that is because it may not be necessary to establish a direct link: if the Parties agree to transition to 100% renewable power, they will necessarily reduce their emissions of GHGs from fossil fuel-based power plants. A RES can potentially operate independently from any carbon market. That said, this section briefly explains how Parties could link a RES to carbon reductions.

At least two options exist for Parties to link RES compliance with a carbon market. First, Parties could demonstrate that renewable power has displaced existing or planned power sources that emit GHGs and thus account for the actual GHG emissions reductions in their compliance with assigned amounts. Second, Parties without existing or planned facilities could receive credit for avoided GHG emissions. While this second option creates greater verification and additionality challenges, it may work well for less-developed and least-developed countries.

A. Displaced Emissions

Renewable electricity development will reduce the need for GHG-emitting power sources and ultimately displace existing or planned facilities. For this reason, it may be relatively easy to link the RES program to a GHG market. So long as a Party can demonstrate valid emissions reductions, it should receive CO_2eq credits. Traditional rules about additionality, verification, and permanence would apply to the CO_2eq credits,[1] and nothing about the RES program would interfere with a GHG emissions trading system.

Indeed, the RES would serve as an additional incentive for Parties to reduce emissions, because Parties would potentially earn two tradable commodities sold in two separate markets. Parties could trade RECs created through renewable power development in a REC market. Parties that reduce GHG emissions could trade their Assigned Amount Units in a GHG compliance market. The RES would therefore operate in harmony with any existing GHG system.

Keeping the markets separate would have additional advantages. First, the RES program could provide multiple opportunities for least-developed and less-developed Parties to earn and sell RECs. The value of the RECs will depend primarily on the stringency of the RES mandates and the rules implementing the RES program. Unlike the GHG market, however, REC values will depend much less on external factors. A separate RES market will thus help maintain REC value. Second, participating in the RES does not require demonstrated emissions reductions. It

[1] The Parties could, however, establish better methodologies to account for reduced emissions from small sources displaced by access to renewable electricity. For example, access to renewable electricity for cooking and electricity should reduce or eliminate use of fossil fuel-intensive diesel generators and kerosene cook stoves. In communities dependent on charcoal for cooking needs, access to renewable power would reduce deforestation associated with charcoal production. The GHG market should account for these reductions.

therefore provides less-developed and least-developed Parties access to financial and development support that the GHG-reductions program may not offer.

B. Avoided Emissions

Although the RES program would operate separately from the GHG-reductions program, Parties should consider developing methodologies to account for Parties' avoided future emissions. Multiple expert agencies have predicted that population growth and increasing urbanization will result in expanding electricity consumption. Some countries—particularly less-developed and least-developed countries—will undoubtedly increase their power use, but likely not at predictable rates. Nonetheless, Parties to the UNFCCC should develop mechanisms to award these Parties CO_2eq credits for their avoided emissions. The details of such avoided emissions credits are beyond the scope of this paper, but installation of renewable power could potentially serve as a proxy for displaced electricity usage in the accounting process. This type of accounting method should only apply to countries that cannot otherwise access the GHG market due to their lack of existing emissions.

No matter how the Parties address reduced GHG emissions from energy production and use, the RES program should remain separate. The REC market can and should operate in isolation from the GHG market. Maintaining this isolation will protect the integrity of the REC market and allow the Parties to move ahead with renewable energy development programs while the climate change negotiations continue.

VI. Conclusion

Renewable power deployment will serve as a key climate change mitigation strategy. Indeed, effective mitigation requires humanity to transition away from fossil fuel use as quickly as possible. Existing technologies to generate renewable power make this transition possible, and policies must ensure the transition occurs.

The two proposals in this paper provide complementary strategies for bringing more renewable power online. RES programs already exist in many national and sub-national jurisdictions, and they have proven track records of success. Scaling up the RES programs will require careful policy design, but various design options already in effect could assist with designing a fair and effective program. A RES also provides opportunities for less-developed and least-developed countries to obtain critical investment in and access to renewable power. Finally, the use of RECs will increase transparency, assist with compliance, and streamline accounting. Tradable RECs could also create a vigorous market to support more renewable power deployment. With the right policy design, the goal of producing 100% of the world's power from renewable sources by 2060 could become a reality.