



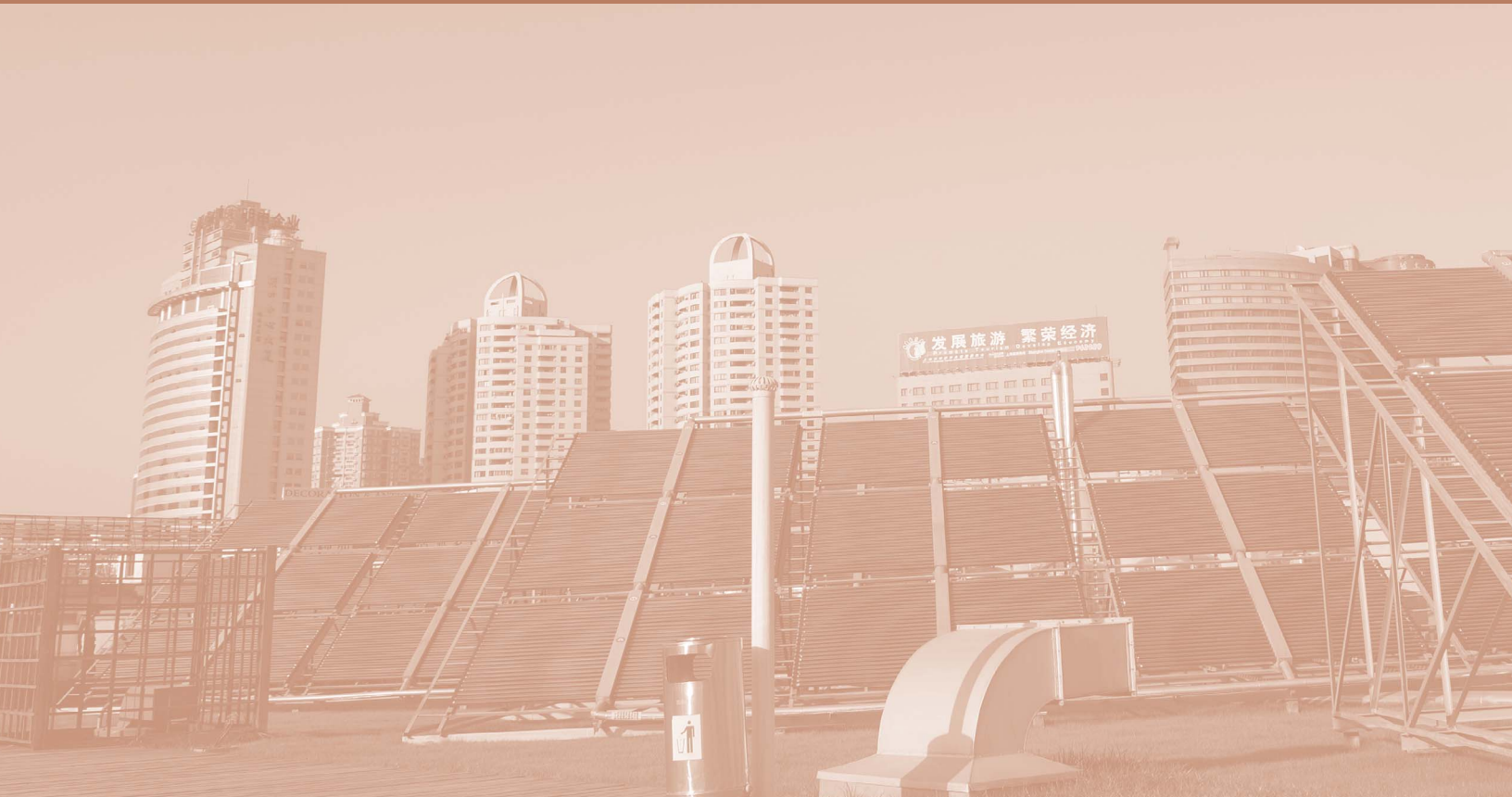
# Energy+:

Opportunities, Challenges and Options

by

David Reed and Pablo Gutman

March 2011



## Technical Working Group on the International Architecture for Climate Finance

The analysis and opinions expressed in this document are those of the individuals participating in the Technical Working Group. They do not represent the positions of the funding institutions, the institutions employing the participants or the Government of Norway.

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David Reed and Pablo Gutman

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## Acronyms Used in This Report

CDM	Clean Development Mechanism
CIF	Climate Investment Fund
COP	Conference of the Parties (to the UNFCCC)
EE	Energy efficiency
EU	European Union
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program
GEF	Global Environmental Facility
GHG	Greenhouse gasses
GoN	Government of Norway
ICFI	Norway's International Climate and Forest Initiative
IEA	International Energy Agency
LCDS	Low Carbon Development Strategy
MRV	Measurement, reporting and verification, some sources alternately identify it as Monitoring, reporting and verification
NAMA	Nationally Appropriate Mitigation Action
RE	Renewable energy
TWG	Technical Working Group on International Climate Finance
ODA	Overseas Development Assistance
OECD	Organization for Economic Co-operation and Development
REDD	Reduced emissions from deforestation and forest degradation
REDD+	Reduced emissions from deforestation and forest degradation, plus forest conservation, sustainable management of forests and enhancement of forest carbon stocks
TAP	Technology Action Plan
TNA	Technology Needs Assessment
UNFCCC	United Nations Framework Convention on Climate Change

## The Mandate

The purpose of this document is to provide the Government of Norway (GoN) with a proposal by which it can make a significant contribution to expanding renewable energy and energy efficiency (RE/EE) in developing countries. Hereafter, the GoN's potential commitment to this endeavor will be referred to as "Energy+." In keeping with instructions from the GoN, the Energy+ proposal should:

- Address both increasing energy access in least developed countries and reduce emissions of greenhouse gases (GHG) in developing countries;<sup>1</sup>
- Have a "systemic impact"—that is, have a transformative influence on the development or deployment of RE/EE for the purposes stated above;
- Contribute to establishing a robust, effective and flexible international architecture by building partnerships with developing country governments, contributing countries, private sector actors, international agencies and civil society and taking advantage of their relative contributions and strengths. Ultimately, those partnerships should accelerate and expand private sector investments in RE/EE;
- Build on the successes and lessons drawn from the GoN's International Climate and Forest Initiative (ICFI) supporting REDD+;
- Contribute to the development of a credible system for measurement, reporting and verification (MRV) emission reductions from energy generation and for increasing energy access. The purpose of strengthening the MRV system is to increase accountability, develop results-based financing mechanisms and encourage stronger linkages with carbon markets; and
- Draw on expertise and experiences from two specific sources. First, it should make use of the contributions of the Technical

Working Group on International Architecture for Climate Finance (TWG) that has designed specific financing mechanisms to address the transformation of high GHG-emitting sectors in developing countries and to promote coordination among diverse international financing mechanisms and sources. Second, the proposal should draw on the views and experiences of international RE/EE experts from the private sector, international agencies, bilateral agencies, trade associations and non-governmental organizations. This was accomplished through a two-day seminar held in Oslo in early December 2010.

The first four sections of this document review a range of contextual factors that determine the opportunities and constraints facing implementation of Energy+. Those background analyses begin with an examination of the scale of the global RE/EE challenge, along with a review of current trends developing and deploying RE/EE technologies. Next, the analyses focus on the economic sectors involved and the main actors, namely governments, businesses and civil society, and their intimate interaction in moving RE/EE to scale in developing countries. The third section examines the Norwegian government's experience with REDD+, the emergence of more than two dozen new RE/EE funding mechanisms and developments in international climate negotiations. The fourth section examines the challenges and opportunities for putting in place a results-based approach for Energy+ and discusses how that approach should relate to carbon markets and other sources of sustainable financing.

The fifth and concluding section of the document draws from these background analyses to identify the niche of Energy+ in the broader RE/EE landscape and present three detailed recommendations that call for:

- Supporting development of a prototype RE/EE climate registry to foster greater coherence and cooperation among international donors;
- Applying a three-phase approach to the planning and financing of RE/EE in developing countries to strengthen coordination of national activities and international support for them; and
- Building a range of partnerships to move RE/EE deployment and development in developing countries to scale.

This section concludes with a discussion of the potential rewards, risks and risk mitigation strategies that the Government of Norway should consider as it maps the steps to implementing Energy+.

Respectfully submitted:

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March 1, 2011

## Section 1. Challenges and Trends

### 1.1. Energy Challenges in the Developing World

All developing countries face one or more of the following three energy-related challenges. The first imperative is to increase the access of the poorest segments of society to modern energy. Current estimates hold that 1.4 billion people are without access to electricity, and 2.7 billion people rely on unsustainable fuel wood for cooking and heating. The majority of that deprived population resides in sub-Saharan Africa, India and developing Asia.

The International Energy Agency (IEA) has recently estimated that the investments needed to increase energy access of the poor to achieve the 2015 poverty reduction targets set by the Millennium Development Goals would require increasing energy investments above business-as-usual trends by \$41 billion each year between 2010 and 2015. Achieving universal access to modern energy by 2030 would require additional global annual investments of \$36 billion a year between 2015 and 2030 (IEA, 2010b).

The second major challenge is to substantially increase energy supply for national economic development. The IEA estimates that from 2010 through 2035, non-OECD countries' energy needs will grow 60 percent. Staying on that track will require investments of approximately \$800 billion each year, generating a cumulative investment of \$21 trillion in the course of that 25-year period (IEA 2010b).

The third and equally important challenge is to reduce energy-related GHG emissions. Energy generation and use are the source of approximately 60 percent of the world's GHG. Many developing countries are and will remain small GHG emitters. Other developing countries are large emitters, and their emis-

sions are projected to increase dramatically if proper mitigation measures are not put in place immediately. Hence, without robust, comprehensive developing country cooperation in global mitigation efforts, there can be no solution to global climate change.

According to European Union (EU) estimates, meeting the below-2°C target could add some \$90 billion a year to the energy investments of non-OECD countries (EU/JRC/IPTS, 2009).

A dramatic scaling-up of renewable energy and energy efficiency (RE/EE) is necessary to address these three challenges. Admittedly, RE and EE do not constitute the entire solution to global energy needs, but they are a significant part of it, given that by 2035 it is estimated that renewable energy would contribute between 25 percent and 58 percent of the world's energy supply.<sup>3</sup> As the IEA states regarding electricity, which is a major piece of the energy puzzle,

“Electricity generation is entering a period of transformation as investment shifts to low-carbon technologies; the result of higher fossil fuel prices and government policies to enhance energy security and curb emissions of CO<sub>2</sub>” (IEA, 2010b, p. 50).

### 1.2. Renewable Energy: Points of Reference

Renewable energy, sometimes referred to as “modern renewable energy” to differentiate it from traditional uses of firewood and biomass, is useful energy extracted from a variety of primary sources in ways that strive to comply with three basic standards: First, the energy source is unlimited or is managed through a sustainable, renewable cycle; second, renewable energy technologies seek to

minimize emissions of GHG and other pollutants; lastly, whenever possible, renewable energy sources seek to minimize other negative environmental and social impacts, particularly when compared to the emissions and impacts of fossil fuel-based energy. In keeping with those three criteria, the usual list of RE sources includes solar, wind, biofuels, biomass and wastes, geothermal, marine, and hydro. A multitude of different technologies are employed to harness those sources.

It is important to note that there is no complete agreement on what constitutes “modern renewable energy.” For instance, because of nuclear energy’s potentially large negative impacts, few analysts are willing to bestow the RE mantle on it. In regard to hydropower, many experts are willing to give “renewable energy” or “sustainable energy” labels only to small hydro projects of 50MW or less.<sup>4</sup> Other analysts would exclude corn-based ethanol because, when assessed on a life-cycle basis, corn-based ethanol may end up emitting more GHG than the oil or gas it is intended to replace.<sup>5</sup> Even when the energy resource is renewable, some of its applications may be controversial if other necessary inputs, particularly land and water, are in short supply. Such is the case when trade-offs are to be made between producing biomass for fuel or food, or in the debate regarding how much fresh water in northern Africa could be diverted to cooling concentrating solar power systems.

Regarding technology development, some RE technologies are well-established technologies with a vibrant manufacturing sector and clear markets. Those include wind power, photo-voltaics (PV), household solar water heaters, hydropower, sugar cane ethanol and geothermal plants. Other RE technologies such as concentrating solar power, marine

and most biofuels are in earlier stages of development.

In addition, there are other technological challenges that even the most advanced technologies, such as wind and solar PV, must overcome to allow significant scaling-up, including:

- Finding energy storage solutions to facilitate the scaling-up of intermittent renewables;<sup>6</sup>
- Finding technological solutions to reduce costs of integrating renewable energy into existing power grids; and
- Finding technological solutions to reduce RE demand for scarce resources like agricultural land and freshwater.

Adding to technology issues, RE faces other important market obstacles to at-scale deployment. Foremost is the fact that at current market prices most RE is more expensive than fossil fuel energy. Two major failures contribute to the weak competitiveness of RE. The first failure is the widespread use of subsidies to support fossil fuel production and consumption. Globally, those subsidies totaled \$312 billion in 2009 (IEA 2010b). The second is the continued failure to acknowledge and internalize the social cost of carbon through a carbon price or carbon tax. As demonstrated over recent years by the EU – which has the world’s highest fossil-fuel prices and has set the highest, but still quite low, price on GHG emissions – those two measures alone would go a long way in increasing the global competitiveness of RE.

### 1.3 Energy Efficiency: Points of Reference

The goal of increasing energy efficiency, or energy efficiency gains (EE gains), is to use less energy to attain a comparable physical output, sustain the same level of consumption or maintain the same level of human well-being. EE gains can be obtained in all stages of the energy chain. These gains begin in energy generation by switching, for example, from traditional coal-based power plants to integrated gasification combined cycle or supercritical technology, then move to energy distribution by reducing power transmission losses, pass on to energy consumption by using better building insulation or vehicles that get more miles per gallon, and end by changing energy consumption patterns – for example, by installing power-use meters.

Energy-efficiency businesses cover an very extensive number of technologies. These businesses include a large number of small- or medium-sized applications and generally have no market-dominant players on either the supply or demand side, with the exception of car and transport manufacturers. The sectors that offer the larger unmet opportunities for EE gains include commercial and domestic buildings, appliances, transport and vehicles, industry, and power generation.

Many EE technologies are mature and are competitive at current market prices. In fact, they tend to have negative costs in that they generate net savings over the EE product or process life. In spite of this economic potential, expansion of EE applications has been very slow, as reflected in the following statement from the IEA:

“Despite energy efficiency’s recognized advantages as a bankable investment with immense climate change mitigation benefits, economic advantages and posi-

tive impacts for energy security, most of the EE potential remains untapped and the investment gap [to secure a below-2 °C future] is tremendous” (IEA, 2010a p. 7).

Numerous analyses point to the following market failures as reasons that EE has failed to reach its market potential:

- Lack of consumer and business awareness;
- Business perception that EE investments may be riskier than other investments and deliver no tangible output that can be demonstrated by impacts on the bottom line;
- Consumers’ high rate of discount, which may discourage households from paying the initial comparatively higher costs of EE products;
- Subsidized and low-cost energy that may make EE gains irrelevant to consumer choices;
- Principal agent (PA) conflicts, meaning that, for example, a commercial building developer (PA) would have to pay for EE improvements, but the tenants would be the ones who would benefit from lower energy bills; and
- Asymmetric knowledge and conflict of interest; for example, power companies and other energy providers are well-positioned to promote EE among their clients, but see no benefit in doing so, given that their profits are tied to the volume of power sold.

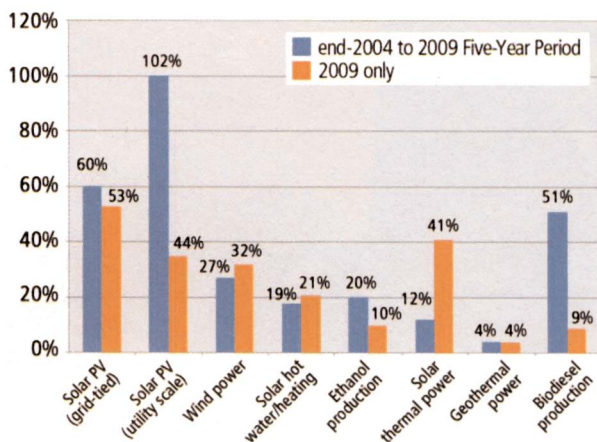
These barriers are present in both developed and developing countries but tend to be more acute in the latter, where knowledge barriers are higher and commercial credit to finance EE up-front costs is scarcer.

### 1.4. Recent Trends in Renewable Energy and Energy Efficiency Deployment

Beginning from a very small base in the early '90s, renewable energy has experienced a dramatic growth in the last two decades. According to a recent REN21 publication,

“Trends reflect strong growth and investment across all market sectors – power generation, heating and cooling, and transport fuels. Grid-connected solar PV has grown by an average of 60 percent every year for the past decade, increasing 100-fold since 2000. During the past five years from 2005 to 2009, consistent high growth year-after-year marked virtually every other renewable technology. During those five years, wind power capacity grew an average of 27 percent annually, solar hot water by 19 percent annually, and ethanol production by 20 percent annually. Biomass and geothermal for power and heat also grew strongly” (REN21, 2010 p. 9).

#### Average Annual Growth Rates of Renewable Energy Capacity, End-2004 to 2009



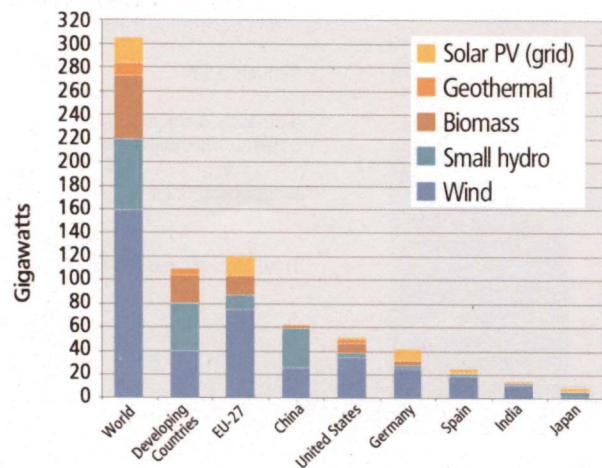
Source: Reproduced from REN21 (2010)

This fast growth of renewable energy is not limited to developed countries. In recent years, China, Brazil and India have ranked first, fifth and eighth, respectively, in the world in deployment of renewable energy. In 2009 their combined total RE investments reached \$44.2 billion, representing 37 percent of global investment in clean energy (UNEP/SEFI/Bloomberg, 2010). In the past two years Mexico has joined this leading group, with RE investment figures approximating those of India.

Large investments in RE have also spurred the growth of leading RE industries in developing countries: China is already the world leader in deploying wind power technology, installing small hydro plants and solar water heaters; India is also a world leader in wind power generation; Brazil is a world leader in biofuels and hydro; and Turkey now boasts a large solar water heater industry.

Thus far, however, developing country advances in RE are strongly concentrated in these five countries. The rest of Africa, Asia

#### Renewable Power Capacities: World, Developing Countries, EU and Top Six Countries, 2009



and Latin America — over a hundred countries — accounts for less than five percent of the world investment in RE, representing less than 11 percent of developing country investment in RE. It is understandable that the larger and faster-growing countries would make up the bulk of RE in the developing world. Nonetheless, most of the developing world trails far behind its potential, whether that potential is measured by the currently low penetration of RE in its total energy mix<sup>7</sup> or by the availability of large and untapped renewable energy resources, including prime locations for wind and solar developments, hydro, geothermal resources, and large opportunities for biofuels farming.

Compared to the relatively strong growth of RE, energy efficiency investment trends are not encouraging, with all countries — developed and developing, large and small — lagging far behind opportunities.

### **1.5. RE and EE as Vehicles for Energy Access and GHG Mitigation in Developing Countries**

Renewable energy is an important path for increasing access of poor populations in developing countries to modern energy, particularly to provide energy to off-grid rural populations. Likewise, the use of energy efficiency technologies, once considered relevant only to populations with high energy consumption patterns, has been demonstrated to bring clear benefits to low-income consumers too.<sup>8</sup>

Renewable energy and energy efficiency are even more important for GHG mitigation, as they encompass over two-thirds of all opportunities for reducing energy-related emissions. For example, the IEA estimates that in

order to secure a below-2°C future, renewable energy will have to account for 24 percent of all energy-related emission reductions by 2035 and energy efficiency will have to account for an additional 48 percent of needed reductions.<sup>9</sup>

While both RE and EE are central to reducing GHG emissions, there are important cost differences between them that are relevant to the Energy+ initiative. Most EE options lie in the left side of mitigation cost curves, meaning that they have low or negative costs and that, from a financial perspective, they should be undertaken first. In contrast, most RE options lie on the right side of the mitigation cost curve, meaning that they have significantly higher costs and that they should be undertaken only after cheaper mitigation options such as REDD+ and energy efficiency measures have been exhausted.

To date, neither markets nor governments have followed that logic, and RE has taken the lead, in large part because RE is pursued not only for its GHG mitigation potential but also for a host of other reasons relating to national development priorities, including energy diversification, energy security and the cost of energy imports.

**Box 1: RE and EE Challenges and Trends:  
Salient Issues**

- Worldwide demand and supply of renewable energy and interest in energy efficiency are growing fast, but investments still lag well behind what is needed to mitigate emissions to secure a below-2°C scenario. This lag applies to all countries, developed and developing.
- In developing countries, deployment of RE and EE falls far behind their potential to contribute to eliminating energy poverty and reducing GHG emissions.
- In developing countries, RE is pursued for a host of reasons well beyond GHG mitigation, including expanding the domestic energy supply, increasing energy security, diversifying energy sources and reducing the energy import bill. The Energy+ initiative should take these motivations into account, because carbon mitigation alone may not provide adequate justification to cover the incremental costs of developing and deploying renewable energy technologies at scale.
- The estimated global costs of eradicating energy poverty are on the same cost level of reaching global REDD+ objectives. In marked contrast, reducing energy-related GHG emissions in developing countries would cost 40 times more than the investment costs of meeting global REDD+ objectives. This difference is significant, and the GoN should take it into account when setting the priority investment areas for Energy+.

## Section 2. Greening Energy: Main Sectors and Stakeholders

### 2.1. Greening Energy: One Issue, Many Sectors

In policy discussions, it is not uncommon to refer to the “energy sector.” To the extent that the term “sector” refers to a group of economic activities that share strong similarities in terms of products, markets, technologies and regulations, the energy sector, per se, doesn’t exist. There is a power generation sector, a transportation sector, a household heating sector and so on. The differences among these sectors in terms of products, markets, technologies and regulatory frameworks far outstrip their common trait; namely, that they all use and transform energy. The same is true for RE and EE: Those terms are applicable to many different economic sectors that range from power generation to many different energy-related industrial processes. Acknowledging this complexity and diversity is important both for a developing country trying to green its economy and for the Energy+ initiative that is trying to support national efforts.

- For a developing country acknowledging this diversity helps to distinguish between energy-wide issues and sectors specific issues. Energy-wide issues call for broad policies that constitute important parts of a country’s low carbon development strategy such as setting economy-wide RE and EE targets, reforming energy subsidies and changing energy prices. On the other hand, sectors-specific issues call for sector level targets and policies that are frequently covered in NAMAs and include, for example, setting standards for appliances, reforming codes for residential and commercial buildings, or raising mileage standards for vehicles.
- For the Energy+ initiative, this differentiation is significant because it obliges choosing and prioritizing specific areas of engagement. For instance, in an initial

phase, Energy+ could support the preparation of comprehensive low carbon development strategies that touch on all of a country’s major energy issues. However, when it comes to actually planning investments, the GoN will have to narrow its support to more specific sectors that can have a potential transformative impact.

### 2.2. The Role of the Public Sector

The GoN has explicitly stated that a primary condition for implementing Energy+ is building partnerships with a range of stakeholders. Foremost of those partners are governments from developing countries that either embrace the purposes and modalities of Energy+ or that have developed low-carbon development strategies that support the scaling-up of RE/EE as a strategic pillar in their low-emission, sustainable economic development paths.

Apart from ensuring national ownership, there are additional reasons for placing developing country governments at the forefront of the GoN’s partnership building. First, national governments are the primary source of financing for multiple activities required to develop RE/EE industries. Those public expenditures are most needed in the early stages of planning, technology introduction and deployment but continue thereafter to cover the higher costs of renewable energy. Without public financial support, often totaling billions of dollars, infant RE industries would not be able to survive in the face of lower-cost fossil fuel competitors. Second, bilateral relations with developing country governments are the primary established channel for delivering international assistance (ODA). In the absence of coordination with and approval from national governments, much of current bilateral and multilateral

resources flows would not materialize or be sustained. Third, developing country governments are at the very center of developing and regulating energy development, regardless of continent and size. Whether or not governments are active market participants, say, through public utilities or parastatals, they provide other fundamental and irreplaceable functions that allow the energy sector to expand. Those functions include the following:

- Establishing a broader development framework in which energy provision is firmly grounded;
- Defining a strategic plan for development of the energy-related sector and RE/EE in particular;
- Implementing a coherent policy, legal and institutional framework that supports developing and sustaining RE/EE;
- Establishing and maintaining a stable, transparent regulatory system under which private actors can function; and
- Providing a broad range of financial incentives to encourage the transition to and growth of RE/EE.

Each government articulates and implements those functions in ways unique to the country's capacities, level of development, resource endowment and needs. When provision of those functions is deficient, engagement of private investors and companies is impeded and growth of the RE/EE sector is undermined.

The figures below indicate a general sequence of policy decisions necessarily included in the development of national RE and EE development strategies. This chain of decisions ultimately decided by policy makers in government and parliaments determines in large degree the standards, policies and incentives under which private sector agents must calculate the risks and opportunities for

investing in a given country or sector.

We direct the reader's attention to the last boxes in those figures, called "Setting policies and incentives to support RE and EE," because that box indicates the kinds of actions that governments can undertake to foster the scaling-up of RE and EE. Although there are many instruments available to governments, those instruments can be grouped into five major categories:

- Policy, pricing and regulatory changes that increase the demand for RE and EE
- Investments in technology development
- Investments in education and capacity building
- Providing financing for RE and EE manufacturers and operators
- Financing household and business demand for RE and EE

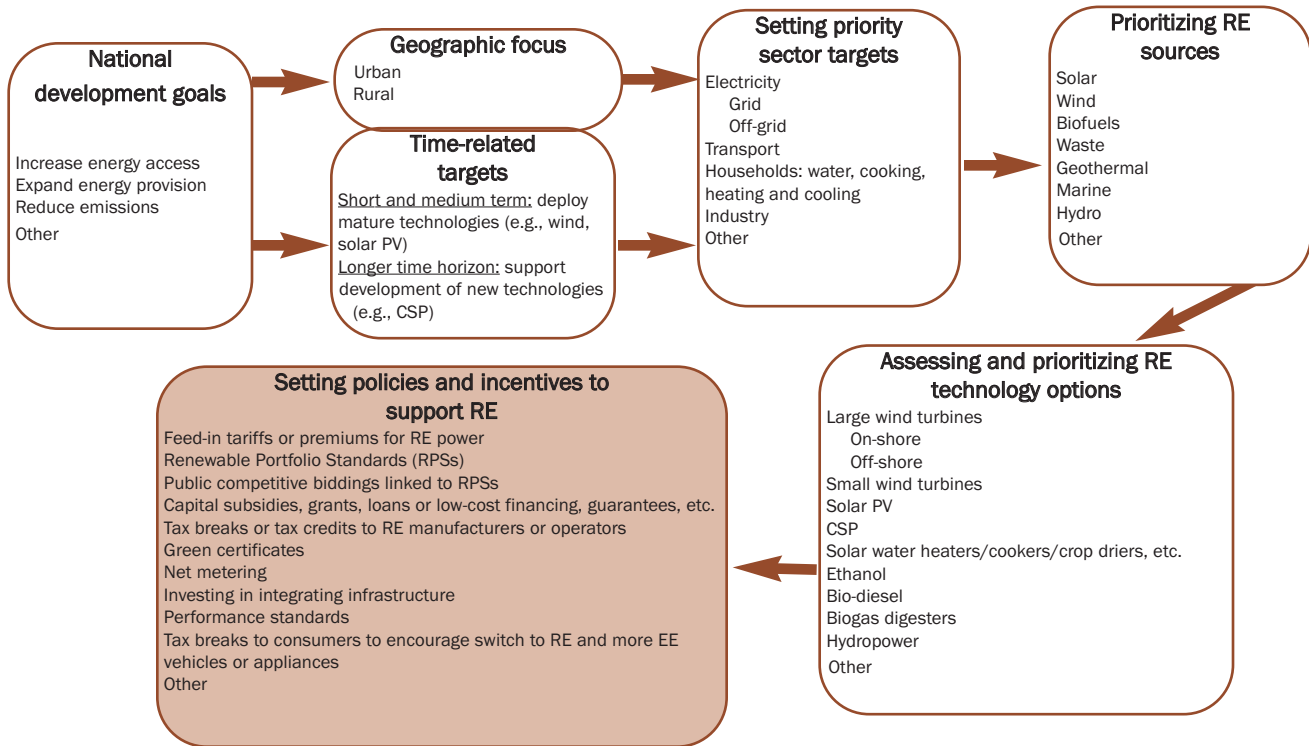
Ideally, a robust dialogue with the private sector and civil society sustained throughout the government planning process would ensure that these public policies meet the needs and expectations of businesses, consumers and society at large.

### 2.3. The Role of the Private Sector

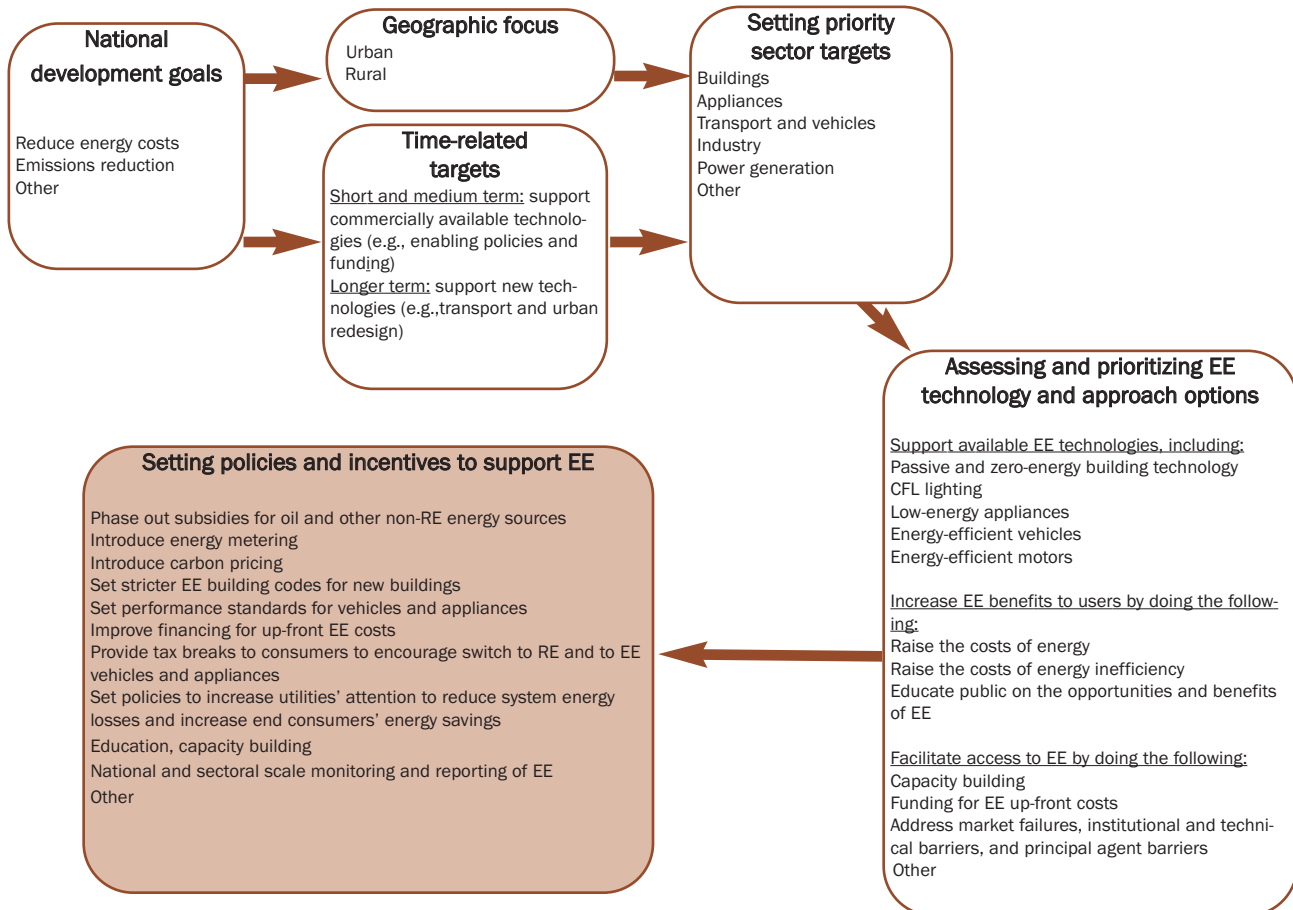
The partnerships to be forged through Energy+ should result in the acceleration and expansion of private sector RE/EE investment and deployment in developing countries. The private sector, including government utilities operating on a commercial basis, should be among the long-term partners in the programs supported by Energy+. This perspective is consistent with the fact that about 90 percent of global investments in RE capacity expansion in recent years came from the private sector (UNEP/SEFI 2008).

Below, we highlight the various roles that the private sector has already taken in RE/EE.

## Public sector process for setting targets policies and incentives to support RE



## Public sector process for setting targets policies and incentives to support EE

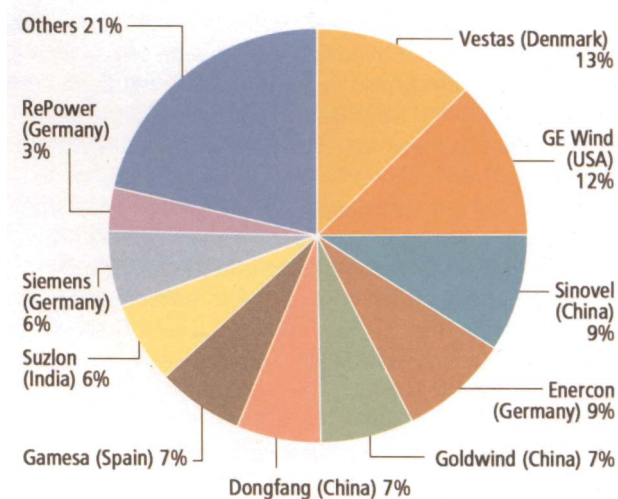


The reader should keep in mind, though, that underlying this dynamic private sector are the multiple functions of the public sector required to create opportunities for private sector growth.

Private companies and other economic agents serve many roles and provide a wide range of goods and services:

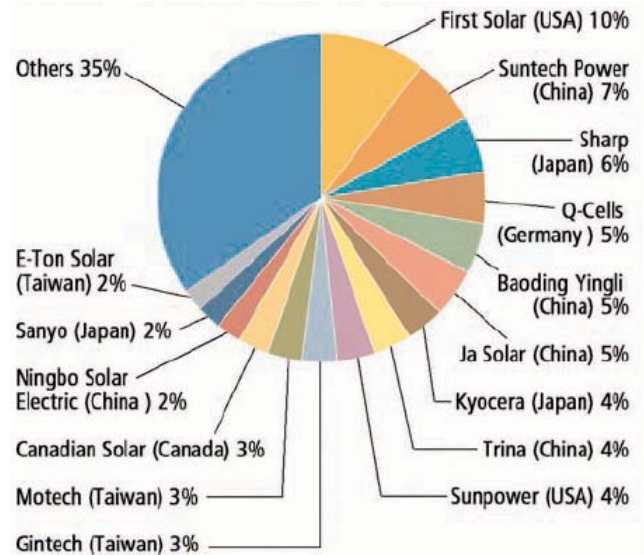
- Manufacturer of RE/EE equipment and technologies: Some technologies, notably wind turbines and solar PV, are already mature and are commercially deployed globally by a limited number of dominant international companies that have ready access to capital markets. With proper national incentives and a transparent regulatory framework, those technologies can be scaled-up and deployed as needed. The figures below indicate the market shares held by the dominant players in the wind turbine and solar PV manufacturing markets.

### Market Shares of Top 10 Wind Turbine Manufacturers, 2009



Source: Reproduced from REN21 (2010)

### Market Shares of Top 15 Solar PV Manufacturers, 2009

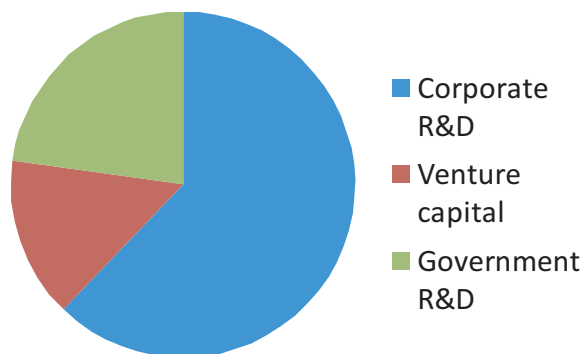


Source: Reproduced from REN21 (2010)

- Operator of energy-generating plants and equipment: A large portion of RE electricity is generated by private companies or public utilities operating on a commercial basis. These operators can be either utilities that incorporate RE power into their energy mix, RE power producers that sell energy to the grid or industries that produce RE to use in their own manufacturing processes.
- Technology innovator and developer: Despite the 20 percent of global investment provided by public funding for technology research and development (R&D), the private sector is the primary investor in RE/EE technology development, as indicated in the figure below.
- Investor and financing agent: Private financial companies act as either lenders or investors in financing RE/EE deployment. They also provide a wide range of financial products such as insurance, futures trading and venture capital. As

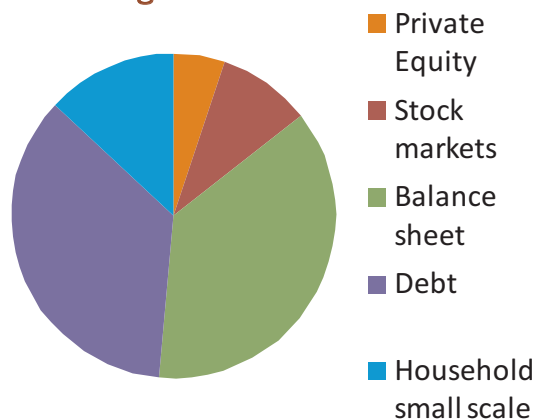
indicated below, balance sheet and borrowing were the major sources of funding for RE expansion in 2008.

### 2008 World Investment in RE Research and Development



Source: Based on figures from UNEP/SEFI/Bloomberg (2010)

### 2008 World Investments in RE Manufacturing



Source: Based on figures from UNEP/SEFI/Bloomberg (2010)

- Provider of technical services: While manufacturers often provide backup technical support, a wide range of supporting services are required to deploy and maintain RE/EE systems. These are usually provided by private firms.
- Purchaser of regulated or voluntary carbon credits generated by RE/EE projects, including intermediate buyers (bundlers, brokers) and final buyers of carbon credits produced by RE/EE projects. These pur-

chases result from both buyers in compliance markets, such as EU firms buying CDM credits to comply with EU emission targets, and from buyers in voluntary markets seeking to meet corporate environmental standards. Until now, private purchasers of carbon credits have largely been developed country companies. In the future, private demand for carbon credits may also arise in large developing countries (see the discussion on carbon markets below).

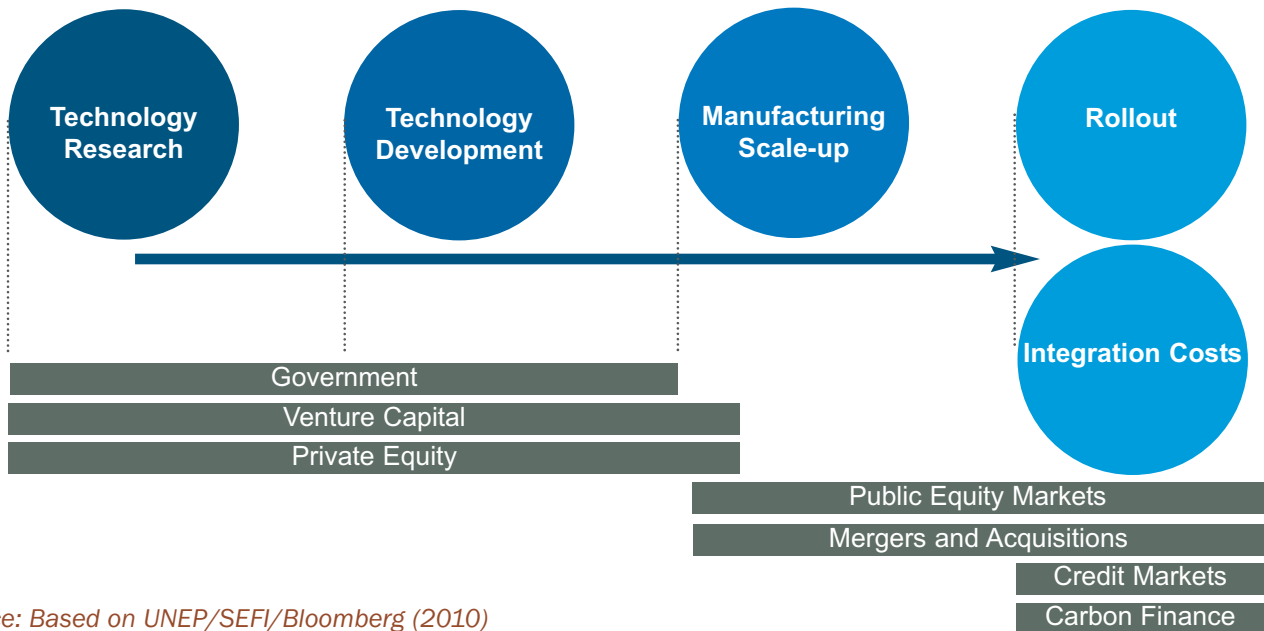
Regarding the question of what kind of support RE/EE businesses need from the government to scale-up their operations, it is important to understand that these needs change according to the role of the business in question. For example:

- A technology firm may be in need of government research and development grants (left side of the figure below);
- Entrepreneurs trying to open a new RE/EE business may need early-stage financing (center of the figure below);
- A power company trying to increase the share of electricity produced from RE sources may want government subsidies to pay higher feed in tariffs to RE power providers (left side of the figure).

In many cases support sought by the private sector from government is not for directly funding business activities but rather for fostering markets and demand for RE and EE products. For example:

- Large manufacturers of wind and solar PVC repeatedly state that once governments create the demand for RE-- for example, by setting RE quotas-- they can raise all required capital through commercial lending sources;
- Government investment in RE/EE education and training can also expand the demand for the private sector;

## The Sustainable Energy Financing Continuum

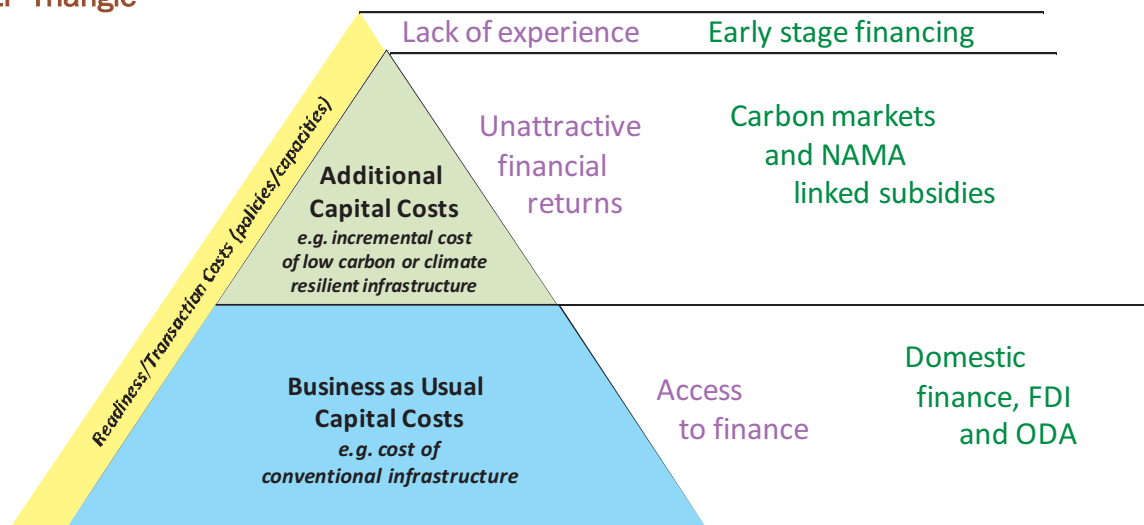


Source: Based on UNEP/SEFI/Bloomberg (2010)

- Likewise, energy price increases or tax breaks for energy-efficient products can boost consumer demand for RE and EE products; and
- Significant public investment in infrastructure, notably for smart grids, may be required to scale-up the share of power production provided by intermittent RE such as wind and solar.

A highly simplified view of RE/EE financing needs is found in the three areas of the UNEP financing needs triangle. The triangle

### The UNEP Triangle



assumes that the blue “business-as-usual-costs” are already covered by investors, so that the areas with unmet financing needs are the yellow segment, representing costs associated with readiness activities such as establishing supportive policies, capacity building and early project development costs, as well as early transaction costs for background studies, legal/licensing fees and other start-up costs; and the green upper cone, representing the additional costs of RE/EE relative to standard fossil fuel solutions.

The onetime costs covered in the yellow area represent high-priority needs that could be covered relatively easily by direct government and international support. The recurrent costs in the green area could be significantly larger over time and, consequently, government and international support could be viewed as a bridge toward more sustainable financing arrangements. For example, those higher recurrent costs could be covered by new international sources of funding and carbon markets, or they could be covered if the national government set higher regulatory standards that would require businesses and consumers to pay the higher costs of low-carbon alternative energy.

It is important to note that the size of the green cone is bound to shrink as technology innovation reduces the cost differential of low-carbon technologies. Moreover, most EE and some RE applications already have “negative green cones,” meaning that, over time, those applications are actually cheaper than business-as-usual solutions. What is lacking in order to realize those potential savings is the initial investment in policy reform covering transaction costs (represented by the yellow segment) and public education initiatives.

#### **2.4. The Role of Civil Society**

The role that civil society plays in fostering the greening of energy production and consumption may seem minor when compared to the functions of governments, which regulate, subsidize and invest, and the private sector, which innovates, invests and operates energy systems. And yet, while minor, civil society performs critical functions in generating public support, setting terms of governance and regulation, and providing technical know-how to support the transition to low-carbon energy strategies.

Regarding the process of generating support for RE/EE, moving from business-as-usual strategies toward a low-carbon development path entails major changes in consumption, transportation and leisure patterns. These changes will not come about if they lack broad societal support. Civil society organizations have provided information and educational platforms and have generated the necessary social communication and dialogue required to build public support for the transition to low-carbon economies.

Civil society organizations also play an irreplaceable role in setting regulatory standards and ensuring transparent governance of energy-related sectors. For better or worse, these sectors are populated by public or private monopolies such as large urban power suppliers, or oligopolies such as the oil industry, that deliver goods and services critical to the functioning of modern society. Not surprisingly, these companies are heavily regulated by governments to ensure compliance with a broad range of performance standards, including pricing, product specification and public access. Civil society organizations have been central in setting regulations, providing public oversight functions, ensuring protection of social and environmental safeguards, and ensuring fair pricing schedules. Providing those and other functions is vital in supporting RE and EE programs in the transition to low-carbon development paths.

Finally, in many cases, civil society organizations are the repository of valuable know-how needed to scale-up RE and EE in developing countries. Such know-how covers technical skills in providing rural energy access technologies to ensuring ownership and informed participation in community-based electrification projects.

## Box 2: Main Sectors and Stakeholders: Salient Issues

- There are many energy-related sectors, each with distinctive products, markets, technologies and regulatory frameworks. Likewise, RE/EE activities encompass different products and technologies that are relevant to different users in the full range of energy-related activities, including power generation, transport, heating, and many others. It is important for the Energy+ initiative to acknowledge this diversity, prioritize the sectors in which it intends to intervene and outline the approaches it intends to employ in promoting RE and EE. In addition, Energy+ will have to differentiate the intervention strategies it employs in the different stages of developing a low-carbon economy, as it moves from comparatively low-cost interventions in the preparatory and strategy-building stage into the more costly stages of investing in the greening of specific economic sectors.
- Regarding the role of the public sector: Developing country governments provide an irreplaceable set of the building blocks on which RE/EE sectors and industries are built. Without those foundational elements, ranging from setting national and sector strategies and building regulatory frameworks to providing a range of targeted subsidies and incentives, RE/EE activities can neither move forward with any degree of efficiency nor scale-up.
- For countries lacking institutional and human capacity to set in place those building blocks, a primary objective of Energy+ should be to provide the financial and technical resources that will

allow governmental partners, perhaps in conjunction with multilateral institutions, to establish the necessary policy and institutional foundation.

- An integral part of supporting development of national RE/EE strategies is to ensure sustained engagement with leading private-sector agents, which will be central in deploying RE/EE technologies in following years. Supporting this public-private interaction is vital to fulfilling the GoN's intent to foster development of the private sector.
- Regarding the role of the private sector: The private sector has already established its primacy as the driver and major investor in most RE and EE areas and roles, including technology innovation and development; manufacturing and operation of RE and EE equipment; provision of technical services and technical support; investor and financing agent; and purchaser of RE and EE goods and services.
- Regardless of the specific energy-related sector in which they are involved, their technological level and available capital, private companies cannot scale-up RE and EE investments unless a country has in place a strategic low carbon development plan, a regulatory framework and a mechanism for providing incentives that will allow emerging RE/EE industries to compete with traditional energy sources.
- There is a large variety of incentives that are appropriate for different types of RE/EE activities. Indirect support, in the form of RE/EE market creation and investment in RE-/EE- friendly infrastructure, can be equally or more important than direct support to RE/EE firms and investors.

- We have found in discussions with corporate representatives that the private sector seldom has an intimate understanding of the strategies and plans to be pursued by national governments to promote RE/EE. That lack of understanding results, in large part, from the absence of a sustained governmental dialogue and intentional planning mechanisms designed to involve key private-sector actors. The failure to sustain that long-term planning dialogue is more acute when a country goes through economic change and reforms, whether to address emerging national development pressures or to shift the economy deliberately to a low-carbon development trajectory.
- Regarding the role of civil society: The role that civil society plays in the greening of energy production and consumption may seem minor compared to the role of governments and the private sector. Nonetheless, its contributions are critical for creating public awareness and social support, establishing transparent regulatory and governance arrangements, and providing know-how on RE and EE programs.

## Section 3. The International Landscape

### 3.1. Lessons from Norway's International Climate and Forest Initiative (ICFI)

The GoN's intention to develop the Energy+ initiative springs directly from the success and lessons learned from its International Climate and Forest Initiative, which has had a systemic impact on global REDD+ activities over the past two years. Some of the salient features of the ICFI REDD+ program are as follows:

- The GoN's early entrance into the REDD+ arena had no precedents and few competitors.
- The magnitude of the financial resources committed to developing country governments by the GoN raised the REDD+ framework and activities in major tropical forest countries from a project or sub-national scale to programmatic and national levels.
- The focus on national policy readiness as part of a three-phase approach brought coherence to Norway's investments and to other international and national REDD+ programs and encouraged tailoring REDD+ programs to the different needs of participant countries.
- Direct contracts backed by long-term financial commitments with major developing countries increased acceptance and credibility of the GoN's REDD+ initiative among developing country partners.
- The GoN collaborated with other multilateral platforms, including the Forest Carbon Partnership Facility (FCPF) and CIF's Forest Investment Program (FIP).
- The GoN worked outside of but in close coordination with the United Nations Framework Convention on Climate Change (UNFCCC).

As with any new funding mechanism, it will require a number of years to assess the ICFI's impact on reducing deforestation and degra-

dation in tropical countries. What should be recognized and lauded is the GoN's choice to partner first and foremost with national governments, which places responsibility and decision making with national authorities that will ultimately be held accountable for the successes and limitations of the bilateral agreements.

Even at this early stage, however, there are reasons to be concerned that the bilateral agreements do not require compliance with a number of standards that have been embedded in REDD+ programs implemented through multilateral institutions and supported through international agreements under the UNFCCC. Those standards include ensuring stakeholder consultations and participatory processes with affected parties, establishing environmental and social safeguards, setting measurable targets with clear verification standards and processes, and providing for a public grievance mechanism to address concerns of affected parties. Admittedly, there is a delicate balance that must be struck between respecting national sovereignty and country systems, on the one hand, and meeting agreed-upon international standards and safeguards, on the other. That said, there are concerns that the ICFI has underestimated the central function that safeguards play in ensuring that benefits from REDD+ programs actually reach key stakeholders and that communities and the environment are protected.

Additional concerns have been expressed that the GoN's decision to fund the creation of a new international operational mechanism, the UNREDD Programme, rather than work through existing mechanisms like the Global Environment Facility (GEF) or other recently created multilateral funds like the FCPF and the CIF's FIP has created unnecessary confusion and competition for REDD+ countries.

**Box 3: Lessons from Norway's REDD+ Activities: Salient Issues**

- As is the case for REDD+, the success of Energy+ may require a high volume of long-term financial commitment by the GoN.
- Still, \$3 billion – the approximate level of the GoN's commitment to REDD+ – may be unlikely to generate the same “systemic impact” in the RE/EE field, which requires higher investments and is already populated by numerous actors and programs, wherein a considerably higher level of steady investment flows will be required to achieve a transformational impact.
- The governments of developing countries are foundations on which Energy+ partnerships should be built. By the same token, existing multilateral institutions and bilateral agencies, should be drawn into the partnership on the basis of their value-added and comparative advantage. Due care must be taken to strengthen multilateral efforts to scale-up RE/EE investments and deployment rather than create new funding windows and mechanisms.
- An internationally supported planning and investment process similar to the three-phase approach employed by the GoN in REDD+ could prove equally useful in the Energy+ initiative.

**3.2. Lessons from Existing RE and EE International Programs**

A recent review commissioned for this report analyzed 25 relatively new international funding programs that are fully or partially devoted to supporting RE and EE in developing countries (Magnoni, 2010). Given that most of those new programs are less than five years old, it may be premature to assess their overall performance, identifying contributions and signaling gaps. The relative newness aside, the report offers some preliminary conclusions.

To begin with, the creation of these new funds reflects the growing international interest in supporting RE and EE in developing countries, and, without exception, the new funds explicitly support one or more of the three energy-related objectives mentioned at the beginning of this document. Most of the 25 funds identified in the review are of small scale, by which we mean that 20 have capitalization targets of less than \$250 million. Only four funds have capital targets above \$1 billion: the CIF, the GEF, Japan's Hatoyama Initiative and the Kyoto Protocol's Clean Development Mechanism (CDM).<sup>10</sup>

Because of the relatively small scale of most, the funding programs seem to limit their activities to supporting policy development, and technical and capacity building, with very limited investments geared to expanding RE and EE projects on the ground.

The four large funds-- the CIF, GEF, Hatoyama Initiative and CDM-- manage substantial funds to support RE and EE expansion in developing countries. It is true that the contributions of even the largest funds may be eclipsed by the billions of dollars invested every year in RE and EE in China, India, Brazil and Mexico. Nonetheless, those large interna-

tional funds, if properly targeted, can have considerable impacts in emerging economies and an even greater impact on second-tier developing country economies.

Moreover, given the moderate costs of increasing access of poor populations to modern energy in least developed countries, estimated by the UNDP in 2010 at about \$100 per person, large and small funds could have considerable positive impacts in increasing energy access in least developed countries if properly pooled and coordinated.

Beyond data on RE/EE dedicated funds, it has not been possible to acquire disaggregated information on RE/EE financing from regular multilateral development banks' operations, bilateral development agencies' programs, and financing from export-import banks and international commercial banks. This limitation is unfortunate because multi-purpose windows in all probability outpace funding from RE-/EE-dedicated funds.

For instance, REN21 estimates that overall financing for RE in developing countries originating in multilateral development banks and bilateral development programs amounted to \$5 billion in 2009, up from \$2 billion in 2008.<sup>11</sup> That said, the reader should keep in mind that in recent years the majority of RE/EE investments in developing countries have been financed by in-country sources, both public and private.

#### **Box 4: Lessons from Existing International Programs that Support RE and EE: Salient Issues**

- The relatively small size of the majority of new RE/EE international funds and programs has encouraged most of these interventions to support policy development and capacity building in developing countries.
- Increased collaboration and a clearly articulated division of labor among existing and new programs would certainly amplify their overall impact. Enhanced cooperation among this growing body of international programs would make their resources more accessible and attractive to developing countries, which now navigate a multitude of small and competing offers of assistance.

### 3.3. UNFCCC and the Outcomes of COP16 (Cancun)

The COP16 in Cancun delivered the positive message that governments around the world are committed to addressing climate change and supporting the UNFCCC process. Major COP16 accomplishments included embedding the Copenhagen Agreement in the UNFCCC negotiations, advancing a REDD+ framework, agreeing on the creation of the Green Climate Fund and a new technology facility, and expanding agreements on international monitoring of Annex 1 and non-Annex 1 countries mitigation activities.

On the negative side of the ledger, COP16's embrace of a "voluntary" approach was not accompanied by new mitigation or financing pledges, which consequently remained at the level of the Copenhagen Accord. Even if fully honored, current mitigation pledges will fall far short of what is needed to secure a below-2°C target. Funding pledges didn't advance either and, outside of the CDM, remained capped at around \$10 billion a year for 2011 and 2012. Also on the minus side, the future of the Kyoto Protocol was left in jeopardy and negotiators failed to advance on a global carbon market.

Beyond this brief overview, three developments have particular relevance for the GoN's RE/EE initiative:

- The creation of the Green Climate Fund: In Articles 95 through 112, the Cancun Agreement endorsed the creation of a new UNFCCC Green Climate Fund that will have thematic funding windows, will be accountable and operate under the guidance of the COP, will be managed by the World Bank as its trustee for its initial three years, and will work alongside and in cooperation with other multilateral and

bilateral financing mechanisms. COP16 postponed until COP17 all discussions regarding the source of financing for the Green Climate Fund and how its resources will be disbursed.

While many basic issues regarding the Green Climate Fund are yet to be resolved, this new fund may serve as an important point of reference for Energy+. For example, Energy+ should consider collaborating with the Green Climate Fund by pooling financial resources, developing joint planning and implementation instruments, or establishing a sequencing of activities to support RE and EE.

- The creation of a climate registry: In Articles 53 to 67 of the Cancun Agreement, COP16 clearly embraced the creation of a climate registry, stating that the UNFCCC "decides to set up a registry to record nationally appropriate mitigation actions seeking international support and to facilitate matching of finance, technology and capacity building to support these actions" (UNFCCC, 2010, Article 53). The climate registry may open two important opportunities to the Energy+ initiative. First, Norway's limited funds may be multiplied by partnership and cooperation with other multilateral and bilateral agencies as encouraged by the UNFCCC registry. Second, investing in the registry could, in and of itself, be a low-cost, high-return activity should the GoN decide to underwrite its development. (This issue is discussed in more detail in Section 5.)
- Regarding technology development and transfer (UNFCCC, 2010, Articles 113-129), COP16 endorsed the creation of a Technology Mechanism composed of an Executive Committee as well as a Climate Technology Centre and Network to promote technology cooperation. The deci-

sion also supports cooperation outside the COP to “[s]eek cooperation with relevant international technology initiatives, stakeholders and organizations to promote coherence and cooperation across technology activities, including activities under and outside of the Convention” (UNFCCC, 2010, Article 121, f). These decisions open opportunities to position Energy+ as an important contributor to RE and EE technology programs, whether under or outside the UNFCCC mechanism.

#### **Box 5: UNFCCC and the Outcomes of COP16 (Cancun): Salient Issues**

- COP16 delivered an overall positive message but postponed some hard decisions – including scaling -up mitigation targets and pinpointing sources of international financing – for subsequent COP meetings. For the time being, those issues will be handled outside the UNFCCC and addressed through countries’ voluntary pledges and bilateral and multilateral agreements.
- Given the current state of UNFCCC negotiations, it would be best for the GoN’s Energy+ initiative to operate independently of but in cooperation with the UNFCCC process. The independent moorings would allow the initiative to pursue a variety of innovative arrangements and delivery mechanisms.
- Through close cooperation with the UNFCCC process, Energy+ can coordinate activities and approaches with the UNFCCC and its bodies while seeking opportunities to feed into COP negotiations. Of particular interest are opportunities to partner with, cooperate with or otherwise complement the Cancun Agreement on creation of a new Green Climate Fund, a climate registry and a network of technology centers.

## Section 4. A Results-based Approach

### 4.1. Measuring Results and Results-based Financing

How to measure results, how to increase accountability and how to create a results-based reward system are recurrent concerns in international development assistance, in international agreements of many kinds and, for that matter, in virtually all types of public and private undertakings that rely on more than simple monetary yardsticks such as rates of return.

Measurement issues have figured prominently in international climate change negotiations under the rubric of MRV, measurement, reporting and verification, including the following:

- MRV of mitigation commitments;
- MRV of developed countries' funding for adaptation and mitigation in developing countries;
- MRV of developing countries' mitigation and adaptation achievements, particularly when undertaken with funding from developed countries or international agencies; and
- MRV of carbon offsets and carbon market operations.

In some cases there are widely accepted MRV standards, such as the MRV protocols for assessing carbon offsets in CDM projects. In other cases there are accepted MR standards, such as the Intergovernmental Panel on Climate Change (IPCC) Tier 1, 2 and 3 standards for country measurements and reporting of GHG emissions, with discussion on verification still unresolved.

Establishing an MRV system for results-based financing arrangements, however, is clearly entering into uncharted territory. Take note, for example, that after more than 50 years of development lending, the World Bank began

internal discussions in 2009 to explore the design of a new results-based lending instrument, which has yet to be deployed. Setting up a results-based financing system for climate change finance may prove to be of comparable difficulty.

An international initiative to promote renewable energy and energy efficiency in developing countries will require appropriate metrics to assess outcomes and to identify and reward successes. In an abstract sense, the twin goals of Energy+ are quite straightforward: It seeks to increase access to energy and to reduce GHG emissions. The complications with measuring accomplishments toward reaching those goals arise when trying to agree on what is to be measured and how to measure accomplishments.

Consider, for example, the case of measuring and rewarding REDD+ results that, from the international donor side, are driven by the goal of reducing GHG emissions. We note that early agreement regarding what to measure and what to reward in the REDD+ three-phase approach is becoming more complicated as REDD+ makes on-the-ground progress. For example, many REDD+ stakeholders and COP16 agreements now require that REDD+ programs MRV not only emissions reductions but also social and environmental impacts. And on the rewards side, there are efforts to create voluntary markets for "premium" REDD+ outputs, with a premium designed to reward additional environmental benefits of REDD+ projects. The growing complexity of metrics associated with REDD+ suggests that major climate-related initiatives will have to address a range of economic, social and environmental impacts and opportunities, many of which may require specific measurement and corresponding rewards.

That is clearly the case for promoting RE and

EE to increase energy access and reduce GHG emissions in the many energy-related sectors referenced above. Should metrics and incentives for energy access projects be associated with GHG mitigation, poverty reduction, economic development, improved health resulting from air pollution reductions and other environmental benefits, for example? That is but one of the many challenges that Energy+ must sort out.

A recent review of approaches for assessing the results of energy access projects found that a single-indicator approach such as the number of new connections or the increase in kWh delivered are supply-side indicators that fail to give an adequate picture of changes in energy access in poor households.

Alternatively, the World Bank employs a more complex set of indicators to evaluate the impact of its energy access projects. Those indicators include the type of connection (grid, off-grid), the number of new community electricity connections by type, the average interruption frequency per year, technical and non-technical electricity losses, and transmission and distribution lines constructed. Likewise, the CIF's Scaling-Up Renewable Energy Program (SREP), the German Technical Cooperation (GTZ) and other programs have rejected a single-yardstick approach in favor of a suite of metrics (Bazilian et al, 2010).

Furthermore, since Energy+ expects that a significant part of RE/EE investments will be funded by the developing country itself, the question arises as to whether measurements should be limited to tracking and rewarding performance in areas of international interest— say, GHG mitigation— or whether an MRV system also should track and reward other criteria that may be of interest to the host country, such as health, income and gender indicators.

These and other unresolved issues suggest that the metrics, MRV and international financial incentives for RE and EE will probably be associated with a suite of outcomes rather than a single indicator.

#### 4.2. Prospects for a Carbon Market and Other Innovative Sources of Financing

An underlying premise regarding international financing for mitigation of GHG emissions in developing countries— a premise that is also part of the Energy+ design discussions— is that public, ODA-type money from developed countries would provide initial funding to launch the mitigation process. Those public funds would pay for many of the readiness, capacity building and initial investment costs. Following these initiating activities, new funding sources would kick in and drive mitigation activities over subsequent years. Those supplemental resources would come from:

- New forms of international financing such as a financial transaction tax, a levy on bunker fuels, the auction of pollution permits and others in keeping with the work of the UN Secretary General's High-level Advisory Group on Climate Change Financing, that may be channeled through the new UNFCCC Green Climate Fund or through other multilateral or bilateral arrangements;
- International carbon markets; and
- Financing from the developing countries themselves to comply with their agreed-upon mitigation targets, including the creation of national-level carbon markets.

The issue of international funding sources is of particular relevance for the Energy+ initiative because the investments required to scale-up RE in major developing countries are of such magnitude — tens of billions of dollars a year — that they will remain beyond the scope of any ODA-type support program.

One positive outcome of COP16 was that major developing countries such as China, India, Brazil and several middle-income countries have confirmed their voluntary mitigation targets and are already investing tens of billions of dollars of their domestic resources to expand the scale of RE and EE. Moreover, some developing countries, including China and Chile, are actively developing their own national or subnational cap-and-trade and carbon market systems.

Those advances aside, there has been little progress regarding new forms of international finance or international carbon markets.<sup>12</sup> COP16 created a new Green Climate Fund (UNFCCC, 2010, Articles 102–112) but did not agree where the fund’s financial resources would come from. Furthermore, negotiators postponed to COP17 in Durban consideration of “one or more market-based mechanisms to enhance the cost-effectiveness of, and to promote, mitigation actions” (UNFCCC, 2010, Article 80).

As COP16 postponed these financing issues for consideration in future COPs, several recent developments have cast a shadow on expectations that a large and liquid international carbon market may arise in the short term. Foremost, the U.S. Congress failed to pass cap-and-trade legislation, signifying that the United States will not be a major player in carbon markets in the near future, although some state-level programs and voluntary demand may begin to fill that void in coming years. In addition, Japan and Russia stated that they will not support an extension of the Kyoto Protocol beyond 2012 if the U.S., China and other major emitters remain outside the agreement. If pursued, their withdrawal could result in the demise of the CDM, by far the largest carbon market mechanism wherein developed country companies buy carbon off-

sets from a handful of developing countries. On a more positive note, even if the Kyoto Protocol is not extended, it can be expected that the EU and other developed countries will continue to buy carbon offsets from developing countries on a bilateral basis.

If viewed in a hopeful context in which all parties agree at COP17 to support development of a robust international carbon market, it is still doubtful that market flows could become a major funding source for RE and EE in developing countries before 2020. First, the size of the international carbon market will depend on how strong the mitigation targets in developed countries are. The more stringent the mitigation caps, the more businesses will look to the market for cheap carbon offsets. If the modest pledges made in the Copenhagen Agreement framework remain in effect, the emerging carbon market is bound to remain small through 2020.

Moreover, recall that most RE lies in the right-hand side of the mitigation cost curves, meaning that renewable energy is a relatively expensive way of reducing emissions. Given the option, carbon buyers will look first for the cheapest carbon offsets available, and if mitigation cost curves are accurate, REDD+ and EE offsets could be far more attractive to the buyer, leaving only a few cases where RE carbon offsets are attractive before 2020.<sup>13</sup> Still, EE offsets would be a fairly new concept and would require considerable testing and development of MRV standards, before becoming an attractive option for carbon offset buyers. Even if short-term prospects are not positive, carbon markets are bound to grow in the mid- and longer terms for the simple reason that they make economic sense as a way to reduce the global costs of addressing climate change. Given this strong likelihood, Energy+ should prepare for the growth of carbon mar-

kets, and the best way to do so is by promoting strong MRV standards that would allow Energy+ programs to pursue a smooth transition from donor financing to certified emission reductions and carbon market financing. Having a strong and broadly accepted MRV system in place would also help the emergence of in-country financing as several developing countries begin to experiment with their own cap-and-trade and national carbon markets. The development and deployment of the Green Climate Fund can provide additional funding for activities supported by Energy+.

#### **Box 6: Results-based Approaches: Salient Issues**

- Developing appropriate metrics and MRV for an Energy+ results-based approach will require considerable research and testing as the RE/EE initiative moves to implementation. Recent experiences suggest that the MRV for RE and EE programs will require measuring not one but a suite of indicators. For example, kWh of RE (a proxy for avoided emissions) may be one such indicator but certainly not the only one that will find common use. The Energy+ metrics toolbox may finally contain a few across-the-board yardsticks together with more specific ones appropriate to the variety of sectors involved in RE and EE.
- International carbon markets will probably take time to develop and may not be a significant source of funding for RE before 2020. There may be better opportunities for early marketing of EE carbon offsets. However, considerable testing and development of MRV standards may be required before developing country EE investments become an attractive option for carbon offset buyers.
- From the outset, Energy+ needs to consider how it will eventually give way to self-sustained forms of financing. Carbon markets, the Green Climate Fund and new forms of international financing represent three potential sources of sustainable finance. A robust MRV system for Energy+ projects would facilitate transition to any of those funding mechanisms and would encourage development of country-level cap-and-trade systems.

## Section 5: Options and Recommendations

In the preceding four sections of this document we have provided an overview of key contextual issues that will shape the Energy+ initiative. That overview suggests a number of relatively clear paths that should be followed in implementing Energy+. We have translated those pathways into three parts. The first part identifies the specific niche of Energy+ in relation to main stakeholders in the RE/EE field, in relation to investment areas and in relation to a results-based implementation approach. The second part sets forth three specific recommendations regarding the development of a climate registry, application of a three-phase approach and the building of partnerships. The third part discusses the risks and risk mitigation strategies that the Government of Norway should consider as it implements Energy+.

### 5.1. Defining the Niche: Choosing among Options

#### 5.1.1. Energy+'s Niche Regarding Stakeholders

Shifting economies to low-carbon development paths poses daunting challenges regarding both the magnitude of funding required and the number of actors engaged in energy-related sectors. Below, we suggest basic guidelines that Energy+ should embrace in working with main stakeholders in the RE/EE transformation process:

- Recognize the pivotal role of developing country governments: Energy+ resource flows should be organized around agreements reached with governments of developing countries. Whether resources flow directly from government to government, through multilateral institutions to the private sector, or to nongovernmental organizations and other civil society groups, broad, strategic RE/EE agree-

ments reached with partner governments must provide the foundation and framework for all these activities and investments.

Public sector responsibility begins with putting in place national development frameworks and RE/EE sector strategies and establishing appropriate laws, policies and regulatory frameworks. In addition, government responsibility extends to with the development of human capacity and the provision of public financing for initial preparatory and initial activities. Where these steps are missing, Energy+ should give priority to supporting their development. Even if these are already in place, additional support from Energy+ may be important to expand and scale-up RE and EE.

In the long run, the role of government should diminish as RE/EE deployment increases. Public resources will still be needed to support RE/EE technologies until they are fully competitive with fossil fuel technologies.

- Support the private sector: A requisite for sustained scaling-up of RE/EE in any developing country is the engagement of leading actors from the private sector that manufacture, service, finance, distribute, sell and buy RE/EE energy, goods and services. The GoN should ensure that, along with the development of necessary strategy, planning and regulatory functions, its resources are used to encourage and maintain a sustained dialogue between the government and private agents. This dialogue can be greatly facilitated by a three-phase sector development approach.
- Help shape international financial flows through increased cooperation: Because funding needs are so large and because

there is a growing number of international mechanisms and programs for financing RE/EE, the Energy+ initiative could find that its most important contribution resides in strengthening mechanisms and incentives for enhanced cooperation among those international contributors and private investors.

- Work outside of but in close cooperation with the UNFCCC: In light of considerable uncertainties underlying direction and outcomes of international climate negotiations, the GoN would be well-advised to promote the Energy+ initiative independently of but in close cooperation with the UNFCCC process.
- Engage civil society organizations: Work with them to take advantage of their capacity to communicate with and mobilize public opinion, and contribute to important aspects of a successful RE/EE scale-up, including governance, safeguards and capacity building.

More specific proposals on the issues of actors and partnerships are presented below in section 5.4 “Building partnerships.”

### 5.1.2. Energy+’s Niche Regarding Where to Invest

The global combined costs of scaling-up RE and EE to significantly increase energy access and reduce GHG emissions eclipse the costs of REDD+. It follows that, to achieve systemic impacts, the new Energy+ initiative may have to either commit considerable financial resources, probably well beyond the level anticipated by the GoN, or adopt a very focused and selective approach to its partnership building and investments. The following sets of choices may help the GoN narrow its investment options and priorities:

- Choosing between energy accesses and reducing GHG emissions: From a strict cost perspective, increasing energy access through RE/EE deployment will require considerably less investment than reducing GHG emissions caused by energy generation. Focusing resources on increasing energy access would direct Energy+ investments to the least developed countries and particularly to Africa.
- The significance of country size in selecting partners for reducing GHG emissions: RE/EE investments required to reduce GHG emissions at scale in emerging economies such as China, India, Mexico and Brazil are most likely beyond the financial reach of Energy+. That said, cooperation with those countries on energy policy, institutional strengthening and technology development could be areas of direct cooperation at moderate costs. Another option would be to support RE/EE investment to reduce GHG emissions in middle-sized developing countries.
- Choosing between renewable energy and energy efficiency: In the years leading up to 2020, scaling-up RE will require tens of billions of dollars to pay the cost differential between RE and fossil fuel-based energy. Even if medium-sized countries were given priority, Energy+ would need to partner with other donors to have a marked impact on RE development and deployment. By contrast, promoting EE can be much cheaper, and if market failures and institutional impediments are removed, EE emission reductions at scale can be achieved on a commercial basis, since many EE technologies have negative costs. Additional analysis and testing are required, however, to make EE investments more attractive and the benefits more easily quantifiable.

- Choosing between a country-by-country or regional approach: There may be good reasons for the Energy+ initiative to consider working with a number of developing country governments within a selected region to strengthen regional markets and other transborder impacts. A regional approach may also make sense in promoting development of technological centers as endorsed at COP16.

### 5.1.3. Energy+'s Contributions to Developing a Global Financial System for Low-carbon Development

From the outset, Energy+ should plan to fold into self-sustained financing mechanisms, including carbon markets, the Green Climate Fund and new forms of international finance that are likely to evolve over the coming years. International carbon markets will probably take time to develop and may not be a significant source of funding for RE before 2020. There may be better opportunities for early marketing of EE carbon offsets. Despite those opportunities, considerable testing and development of MRV standards may be required before investment in developing countries EE projects becomes an attractive option for carbon offset buyers. At the same time, Energy+ should actively support development of country-level cap-and-trade systems as a means of strengthening global carbon markets.

In the immediate term, the most significant contribution of Energy+ in supporting global financing mechanisms may reside in testing innovative MRV and results-based financing approaches. Many areas of RE/EE will need further analysis and development as the Energy+ initiative moves to implementation. Such areas include: improving the metrics to measure success as resource flows increase

and as countries scale-up deployment of RE/EE technologies; establishing standards for national and international MRV systems; and developing and testing indicators used to support payment-for-performance approaches. Energy+ may have a wide impact by partnering with relevant centers of excellence to develop and test such metrics that can subsequently shape the international community's use of multiphase approaches, indicators and incentives.

### 5.2. Developing a Climate Registry for RE and EE

We recommend that the Energy+ initiative dedicate part of its resources to support the development of a prototype climate registry for RE/EE as a necessary step in maturing the international financial architecture for addressing climate change. The primary reasons for establishing an international RE/EE registry are to strengthen coordination among the growing number of international funding mechanisms, and to increase the impact of the comparatively small scale of the financial resources they bring. As RE/EE occupies an ever-larger space in global energy generation and in climate change mitigation in the coming decades, the need to coordinate international activities will only increase.

The same holds true regarding private investors. Over time, private financial flows will increase exponentially in response to RE/EE growth opportunities in developing countries. For the private sector, a registry mechanism that provides information on country strategies and needs and that posts data on prior work by government and investments by other private agents could facilitate decision making, dialogue with the government and expanded investment opportunities.

We also believe that the GoN can be a “first mover” to translate into a practical mechanism the agreement reached during UNFCCC negotiations in Cancun to develop a climate registry. By developing an RE/EE registry prototype through Energy+, the GoN can offer many lessons to other economic sectors that must be transformed to reach the below-2°C target.

Over time, an efficient registry can provide four functions:

- *Information and knowledge management functions:* The registry posts information from all concerned parties regarding national development strategies and RE/EE sector development plans, current status of government, private sector and international activities and projects, as well as updates and evaluations of major activities in the sector.
- *Matching functions:* The registry proactively helps match financing and technical needs presented in national and sector development strategies with resources offered through public and private financing mechanisms. In addition, this function can facilitate communication with publicly mandated funds such as the Green Climate Fund to signal when critical needs and opportunities arise. Some experts have recommended that this matching function be performed at a country level but not at an international scale. In reality, matching functions at both the international and the national levels can co-exist and reinforce each other. In keeping with the Cancun Agreement, we believe that, while national applications should proceed immediately, testing of an international matching function should be given priority by Energy+.
- *Regulatory functions:* The metrics for

RE/EE will undergo considerable growth and change in the coming years. Those metrics will be used to underpin MRV systems and performance-based payment systems and will set new measures for increasing energy access. The registry can serve as a neutral platform for facilitating cooperation and promoting agreements on standards that result from the work of numerous international technical bodies. It could, if requested, facilitate agreement on standards and encourage their application.

- *Verification functions:* Over time, agreements will be reached on procedures for verifying compliance with commitments and targets associated, in this case, with increasing energy access and reducing GHG emissions. Although actual verification will remain with technically competent bodies, the registry can encourage use of verification procedures and post results for public review.

While conceptually clear and straightforward, constructing an efficient climate registry will prove to be a challenging endeavor. Several key issues must be addressed in the course of that process, including the following:

- 1) *Identifying the appropriate level:* Over the coming years, a climate registry should become a key operational part of an international climate regime and should be responsible for harmonizing and organizing public and private resource flows to address multiple climate challenges in developing countries. In keeping with the agreements reached in COP16, the international climate registry should be managed under the auspices of the UNFCCC and its corresponding bodies. The GoN should engage the UNFCCC Secretariat to explore specific

steps in building an international registry and to identify ways Energy+ can contribute to that endeavor.

The urgency of scaling-up RE/EE to meet developing country needs means that the global community cannot wait for an international arrangements before an inclusive climate registry is firmly in place. That urgency also underlines the need to initiate appropriate interim measures, including developing prototype climate registries at the national level, to support the RE/EE scaling-up process.

To that end, pragmatic efforts should be undertaken with support of Energy+ to develop a limited number of RE/EE registries at the country level with a view to providing lessons to inform the establishment of an international climate registry managed through the COP process. The GoN should include supporting development of country-level registries as important but voluntary parts of partnership agreements with developing country governments.

We underscore the complementary nature of working at the national and international levels simultaneously so as to encourage the sharing of experiences and emerging lessons. Given that development of a climate registry is relatively uncharted terrain, we recommend that a key responsibility during the interim period be to ensure active participation and discussion with public, private and non-governmental stakeholders.

2) *Supporting an interim approach:*

Energy+ should reach a five-year interim agreement with an appropriately qualified international entity to support, if

necessary, development of national RE/EE registries. One possible agency would be the Energy Sector Management Assistance Programme (ESMAP), whose comparative advantage lies in supporting sector-wide growth in developing countries. Other options should be explored.

3) *Selecting countries:* Distinction needs to be made between the needs and opportunities of high- and low-capacity developing countries. High-capacity developing countries such as China, India and Mexico have developed and put into operation economy- and sector-wide energy strategies for increasing energy security, increasing energy access for poor communities and reducing GHG emissions. In equal measure, they have actively engaged international donors and lenders from both public and private sectors to complement domestic financial and technical resources. Those emerging economies do not lack capacity to create their own national RE/EE registries or similar arrangements. But even in these cases support from Energy+ may provide incentives to increase national commitments and accelerate the creation of national registry mechanisms that, in turn, would support development of a more inclusive international registry.

The lack of capacity to establish national registries is acutely evident in most other developing countries where national and sector strategies are under development and access to international resources is significantly more limited. We recommend that Energy+ give priority to working in low-capacity countries, with a focus on demonstrating how an

RE/EE registry can expedite information sharing and gaining access to international resources for clearly defined domestic priorities. This recommendation is underscored by the fact that the IEA provides data on investments in China and a few emerging economies, whereas such information is not available from the IEA on scores of other developing countries.

- 4) *Prioritizing functions:* The most important function of international and national RE/EE climate registries at this stage is to post comprehensive information about partner country energy sector transformation strategies and the constituent elements and priorities of those plans. To the greatest degree possible, postings should include progress to date and other data that will better inform potential donors and investors. The second priority is the need to match country RE/EE needs with available resources of donor countries and private investors. Given the way international assistance is structured, the great majority of developing country governments present stand-alone projects to donors rather than seek assistance for transforming sectors or industries. The RE/EE registry should give priority to programs and investments that will scale-up RE/EE and support sectors-wide transformation.

The registry's regulatory function is needed to set standards and metrics on which MRV systems and performance-based financing arrangements can be operationalized. Testing metrics and implementing results-based financing with national agencies operating in partnership with Energy+ can contribute significantly to developing a more inclusive,

international regulatory function.

By the same token, setting international standards and metrics is reserved for the UNFCCC and its corresponding bodies. The UNFCCC has not only the mandate to set international standards but also access to and support of a multitude of technical institutes capable of proposing and updating metrics and methodologies. Implementation of the verification function will await establishment of metrics and standards under the UNFCCC. However, activities carried out under Energy+ at the national level can pioneer new MRV systems and test mechanisms for supporting compliance with agreed-upon outputs.

- 5) *Supporting sector-level transformations:* Energy+'s objective in supporting development of the RE/EE prototype climate registry is to facilitate significant expansion of renewable energy and energy efficiency solutions in developing countries. To that end, Energy+ should require developing countries to post, via the registry, sectors-level strategies within which the contribution of RE/EE are clearly defined and within which the contributions of specific RE/EE projects is identified. Sector strategies should include expanding infrastructure, implementing institutional and policy reforms, and responding to capacity development needs.

In the context of prioritized sector needs, the prototype registry should solicit public support and private investment for specific projects. In the context of REDD+, the GoN provided vital global leadership by setting in place innovative and urgently needed coordination mechanisms and by moving REDD+ financing

to scale. By supporting the testing and maturation of climate registries at both the international and country levels, the GoN can again exert innovative leadership that can influence climate finance modalities during the coming decade.

### 5.3. Applying a Three-phase Approach

The registry seeks to coordinate financial flows from multiple external sources to support the national RE/EE strategy. The basic purpose of using the three-phase approach is to increase cooperation among the many agents acting within a country while ensuring coordination with the growing number of external agencies and investors.

The three-phase approach, as endorsed by international REDD+ agencies and now part of COP16 Reducing Emissions from Deforestation and Degradation (REDD) agreements, is a simple construct to help organize developing countries' sector-wide mitigation efforts. International support for the three-phase approach is built on recognition that those transformation efforts require:

- Economy-wide, long-term national strategies and sector plans;
- Clear metrics to track progress; and
- Identified financing mechanisms and financial commitments from both national and international sources.

The three-phase approach is a flexible instrument that helps align and manage the three requisites mentioned above. The content of each of the three phases will vary from country to country and sector to sector. Phases may well overlap, as activities from an initial phase may continue while new activities from a later phase are undertaken. Moreover, a country may simply leapfrog one or more

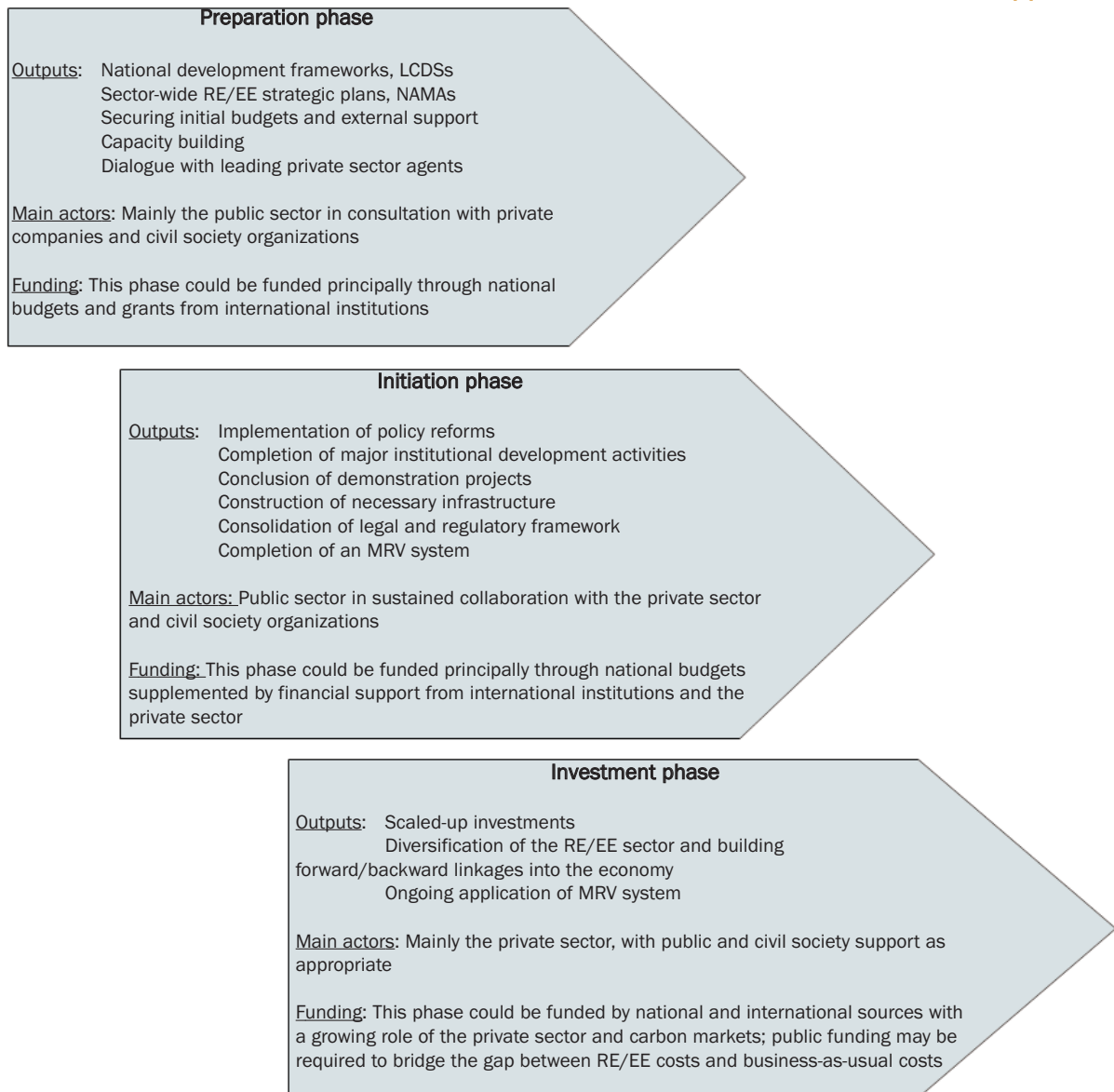
phases. For example, previously prepared NAMAs, LCDSs, energy sector plans, TAPs or TNAs may allow a country to move directly into the initiation phase. Similarly, if a national strategy is in place and a mature technology is ready to be applied at a commercial level, the country may move directly into the investment phase.

With that adaptability and flexibility in mind, a number of activities and outputs are typical of each of the phases, as depicted in the following figure.

We recommend that the GoN encourage governments and multilateral agencies to employ a three-phase approach as they seek to partner with the GoN and Energy+. Supporting this approach will enable the GoN to identify what progress has been made, what gaps remain, and when and for what purpose supplemental resources will be required. We stop short of recommending that the three-phase approach be a mandatory requirement for accessing Energy+ resources, because many high-capacity countries have developed planning approaches and instruments that best serve their domestic needs. What must be ensured, however, is that those planning and implementation systems are consistent with the overall framework and phased approach of Energy+.

We recognize that many of the existing RE/EE financing mechanisms have developed their own internal planning and implementation approaches. We recommend that development of the Energy+ three-phase approach be conducted through an open participatory process by which other agencies can contribute and improve its effectiveness.

## The Three-Phase Approach



### 5.4. Building Partnerships

In addition to enlisting other donor countries to support Energy+, the GoN should build partnerships on several complementary levels with developing country governments, multi-lateral development agencies, the private sector and civil society. The center of gravity of partnerships should be national governments that are committed to investing in the scaling-up of RE/EE. The foundation of partnership agreements with governments should be LCDSs with RE/EE sector strategies presented in a three-phase framework. On that foun-

ation, partners should, on the one hand, identify specific outputs and activities for which recipient government agencies would take implementation responsibility over a sequenced time frame and, on the other hand, agree on the financial and other forms of support to be provided through Energy+.

Complementing the foundational bilateral relationship, the GoN, in consultation with the partner government, should identify responsibilities and activities for which supplemental external support, both technical and financial, may be needed. We recommend that partnerships be built with existing international agen-

cies dedicated to increasing energy access and reducing GHG emissions. The substance of those partnerships must be defined in reference to the specific needs articulated in the country's RE/EE sector plan.

An innovative possibility to be considered by Energy+ would be to forge a close partnership with one or more large, emerging economies so as to become a regional partner to promote RE and EE in their respective geographic regions. For example, China or India could become partners in promoting RE and EE in Asia; Brazil or Mexico could follow likewise in Latin America; and South Africa could play a leading role in the Africa region. Such partnerships would acknowledge that several emerging economies are already at the forefront of RE and EE deployment, having technologies and financial resources to offer to other developing countries. This regional partnership building would also boost the resources, the leverage and the credibility of the Energy+ initiative across the developing world.

Consistent with the GoN's intent to influence RE/EE development and deployment at scale, we would like to highlight the possibility of working through the CIF's Scaling-Up Renewable Energy Program (SREP). This program, implemented by the five regional development banks, focuses primarily on increasing energy access through renewable energy. SREP has identified six countries (Ethiopia, Honduras, Kenya, Maldives, Mali and Nepal) that will serve as the initial pilots and for which financial commitments ranging between \$35 million to \$70 million have been made. In addition, five countries and one region (Armenia, Liberia, Mongolia, Tanzania and Yemen and a Southern Pacific region) have been selected and will receive support once financing is available. In that

context, we recommend that the GoN build on pilot projects in Ethiopia and Kenya and reach an agreement with SREP to provide additional resources to three or four more countries, including Tanzania. In that manner, Energy+ could explore opportunities for building RE/EE programs with potential cross-border impacts and synergies.

Having a transformative impact in GHG emission reductions through RE and EE poses a different set of challenges to the GoN, owing to the large volume of financing required to significantly influence either national or global emission levels. That said, a systemic impact can conceivably be accomplished through careful targeting of middle-sized and small countries and through Energy+ grants combined with resources and soft loans from other donors.

A good example of this approach is provided by recent programs financed under the CIF's Clean Technology Fund (CTF). To date, investment plans have been endorsed for 12 countries (Colombia, Egypt, Indonesia, Kazakhstan, Mexico, Morocco, Philippines, South Africa, Thailand, Turkey, Ukraine and Vietnam) and the Middle East and North Africa region. The approved programs, largely through loans, will receive between \$150 million and \$500 million each from CTF and in each country leverage from \$800 million to \$5.4 billion in additional funds from national and international sources. The CTF expects that for every \$1 from the CTF, \$8 will be leveraged in co-financing, of which 30 percent will come from the private sector. Based on this example, the GoN's Energy+ could make similar financial commitments through the CTF to selected countries. Another approach would be to make a major contribution to the CTF program in the form of a bundle of grants to be applied to a number of

countries. The attractiveness of CTF loans, already built on concessional terms, could be further enhanced by adding a substantial grant component from Energy+.

The Energy+ initiative should engage the private sector, which, as all interested parties agree, is expected over time to bring the bulk of resources to RE/EE. In an indirect way, the financial and technical support provided to developing country governments is designed to improve national planning, enhance international support and coordination, strengthen the national regulatory system and provide a steady, predictable flow of public financing. In turn, successful completion of those tasks will provide many opportunities and benefits to the private sector as it seeks to do businesses in RE and EE.

On the other hand, short of becoming a semi-commercial bank along the lines of a national export-import bank or the International Finance Corporation, there are very limited opportunities for the GoN to directly finance private firms. Private companies invest primarily on a project-by-project basis and only rarely on an industry-wide basis. It is certain that Energy+ could invest the totality of its resources in a number of specific projects, but there is considerable doubt that those investments could make a systemic contribution to deploying and developing RE/EE in the country and certainly not across the developing world. Moreover, direct public-to-private investments are often limited by competitiveness issues and ethical safeguards to minimize conflicts of interest.

One path through which Energy+ could strengthen its relation with the private sector would be by providing resources to mitigate risks, including technical performance uncertainties, political stability concerns, financial

risks and broader macroeconomic stability issues. A range of proven guarantee instruments could be made available to private investors and governments involved in public-private partnerships. We recommend that risk absorption financing be provided through an existing international or specialized lending agency.

An additional area where Energy+ could seek a direct partnership with private industry is through the development of technology centers that would specialize in sector planning, capacity building and training. Not only is this approach consistent with decisions made in Cancun, but there are also a number of models, including the Consultative Group on International Agricultural Research network and the recently formed Global Green Growth Institute hosted by South Korea, on which Energy+ could build.

Finally, Energy+ should move quickly to partner with a range of civil society organizations, and the GoN should encourage recipient countries to do the same. Strengthened relations with civil society can build public awareness and support for RE and EE initiatives and improve the quality and transparency of regulatory and governance arrangements. In many rural areas, civil society organizations are far more adept and knowledgeable than other public or private partners in engaging local communities in deployment of low-carbon energy systems.

## **5.5. Rewards, Risks and Risk Mitigation Strategies**

Discussing rewards, risks and risk mitigation strategies is standard procedure in all major business or policy decisions. Although the authors are not in a position to have firsthand knowledge of trade-offs under consideration by the Government of Norway as it makes final decisions regarding Energy+, it is appropriate for us to offer an outside assessment of the benefits risks and risk mitigation strategies associated with this bold initiative.

### **5.5.1 Rewards of Success**

If successful, Norway's Energy+ initiative would accelerate the scaling-up of RE and EE in developing countries thereby having a positive systemic impact on how the world addresses climate change in subsequent years.

For Norway, a small, high-income country, the Energy+ Initiative coupled with its preceding REDD+ initiative would position the government as a leading voice in international climate change negotiations and reinforce Norway's longstanding commitment to promoting international development and world peace. Moreover, the initiative opens international outlets for Norway's RE and EE industry in hydro, solar, wind, mass transport, energy efficiency technologies and more.

### **5.5.2 Risks and Available Risk Mitigation Strategies**

Our discussion of risks and mitigation strategies is presented in the below table.

## Risks and Available Risk Mitigation Strategies

Risks	Available risk mitigation strategies
<p><b>Risks in Norway</b></p> <p>The program lacks popular and/or political support.</p>	<ul style="list-style-type: none"> <li>• Collaborate with a range of civil society and environmental organizations to communicate and educate the public and policy makers on Energy+ rationales and goals</li> <li>• Define clear targets and ensure systematic measurement of Energy+ results</li> <li>• Regularly and proactively communicate the achievements of the Energy+ initiative to the Norwegian public</li> </ul>
<p><b>Risks vis-a-vis the UNFCCC, other donors and other international programs supporting RE/EE</b></p> <ol style="list-style-type: none"> <li>1. Energy+ fails to create momentum.</li> <li>2. It phases out as one more small program that lacks scale and vision to be a game changer.</li> <li>3. Doubts arise about its contribution to the UNFCCC process.</li> <li>4. Doubts arise about its contribution to increasing energy access and reducing GHG emissions.</li> </ol>	<ul style="list-style-type: none"> <li>• Start with a significant commitment of Norwegian funds</li> <li>• Strike innovative partnership to pool resources with other donors</li> <li>• Become a champion of the Climate Registry (endorsed in the Cancun Agreements), which would become a platform to bring together donors and recipients to agree on approaches, priorities and division of labor</li> <li>• Work outside of, but maintain a steady dialogue with, the UNFCCC so that Energy+ can collaborate with, contribute to international processes or fold into new UNFCCC funding mechanisms as they evolve, including the Green Climate Fund, offset markets and innovative financing mechanisms</li> <li>• Define clear targets and systematically measure Energy+ results</li> </ul>
<p><b>Risks vis-a-vis developing countries</b></p> <ol style="list-style-type: none"> <li>1. Creates expectations that are not possible to meet with Energy+'s available resources.</li> <li>2. Creates bilateral conflicts around the delivery of Energy+ support.</li> <li>3. Offers little to large, emerging countries</li> <li>4. Doubts arise about its contribution to increasing energy access and reducing GHG emissions.</li> </ol>	<ul style="list-style-type: none"> <li>• A three-phase approach would help frame expectations and encourage an orderly pooling of resources for the more expensive later phases.</li> <li>• Energy+ should prioritize sectors and countries it can support with its limited resources</li> <li>• China, India, Brazil, South Africa and other large, developing countries could be approached by Energy+ as both potential recipient countries and regional partners.</li> <li>• Define clear targets and systematically measure Energy+ results</li> </ul>
<p><b>Risks vis-a-vis the private sector</b></p> <ol style="list-style-type: none"> <li>1. Energy+ fails to significantly increase business communities' interest in investing in RE/EE in developing countries.</li> <li>2. Businesses are not interested in Energy+ activities.</li> </ol>	<ul style="list-style-type: none"> <li>• Ensure that the government-to-government operations of Energy+ have a strong focus on supporting the growth of the domestic RE and EE business sectors</li> <li>• Find opportunities for direct Energy+ engagement with business, e.g., partnering in regional technology centers, conducting periodic international or regional surveys of the state of RE/EE markets to identify barriers and opportunities for private investment</li> <li>• Develop a financing strategy that clearly spells out what can be expected from each party, e.g., Energy+ , governments and businesses</li> </ul>
<p><b>Risks vis-a-vis civil society</b></p> <ol style="list-style-type: none"> <li>1. Energy+ fails to address social, environmental equity, participation and governance concerns of civil society organizations.</li> <li>2. Energy+ fails to engage and mobilize civil society organizations' know-how and social networks.</li> </ol>	<ul style="list-style-type: none"> <li>• Engage civil society organizations from the very beginning of Energy+</li> <li>• Adopt transparent procedures and decision-making mechanisms.</li> <li>• Find innovative arrangements to partner with civil society organizations in areas of shared interest, including governance mechanisms and safeguards</li> </ul>

## Endnotes

1. Even in the below-20 scenarios, most developing countries' GHG emissions would keep growing before they picked off around 2015-2020, so it may be more appropriate to talk of "reducing the growth of emissions" at least in the short term. In this document and just for simplicity reasons, we use "emission reductions" to refer to both emissions reduction proper – reductions below a baseline – and to reducing the growth of emissions – reduction against a business-as-usual (BAU) scenario, also called "emissions intensity reduction."
2. Recent work of the TWG on a design and operation of a climate registry and the design and operation of a mitigation window in a UNFCCC Green Climate Fund can be found at [www.climateregistryoption.org](http://www.climateregistryoption.org)
3. Lower figure from IEA (2010b); higher figure from Ecofys (2011).
4. See, for example, UNEP/SEFI/Bloomberg (2010), p. 17.
5. See, for example, the discussion in IEA (2010b), chapter 9.
6. Power from wind, solar PV, marine and run-of-the-river hydro is inherently intermittent, and these sources are sometimes called "variable renewable."
7. The exception is large hydropower, which is well represented in most developing regions.
8. See, for example, Casillas and Kammen (2010).
9. Because energy is only one (albeit the largest) source of GHG emissions, these percentages are lower when we referred not to energy emissions but to total emissions—approximately 17 for RE and 35 percent for EE. All figures from IEA 450 ppm scenarios; see IEA (2010b), chapter 14.
10. The CDM is not a fund but a carbon offset mechanism under the Kyoto Protocol. Still, since its inception it has been the largest source of international financing for mitigation projects in developing countries.
11. Figures from UNEP/SEFI/Bloomberg (2010), p. 52; and the REN21 (2010), p. 29.
12. The COP16 agreement simply "takes note" of the work on new sources of funding done by the High-level Advisory Group on Climate Change Financing. See article 101 in UNFCCC (2010).
13. Or in other words, RE carbon offsets would find buyers, but only buyers willing to pay a price far below RE incremental costs.

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## The Technical Working Group

The “Technical Working Group on the Institutional Architecture for Climate Finance” (TWG) was founded in early 2009 to develop practical architectural arrangements to support a post-2012 climate agreement. The TWG is composed of experts from developing and developed countries and operates through face-to-face meetings, electronic and phone consultations, the production of documents, and the commissioning of studies.

[www.climateregistryoption.org](http://www.climateregistryoption.org)

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