



# Clean Energy

Fueling Sustainable  
Global Growth

The Business Council for  
 **Sustainable  
Energy**®



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# INTRODUCTION

Clean Energy – Fueling Sustainable Global Growth



The challenge before the world community at Cancún is to renew international cooperation on protecting the climate, and to find a path forward that enables countries to sustainably develop their economies and lower greenhouse gas emissions (GHG).

*Clean Energy - Fueling Sustainable Global Growth* outlines how commercially-available clean energy technologies and resources can lead the way toward a low-carbon global economy, and how the Cancún climate change negotiations can contribute to this objective.

Existing clean energy technologies and resources – such as renewable energy, supply-side and demand-side energy efficiency, and natural gas – offer proven and effective solutions to meet the world's energy and GHG reduction challenges. The benefits are clear - these clean energy resources will help diversify the portfolio for the world's energy supply, reduce dependence on high-carbon and finite sources of fossil fuels and create jobs worldwide.

In December 2009, an unprecedented number of world leaders gathered in Copenhagen, and came to an accord that recognized the need to take action. The opportunity exists in Cancún to build upon that political will, to take balanced steps forward and to maximize our potential to adapt, innovate and build a better, low-carbon future.

### **About the BCSE**

*The Business Council for Sustainable Energy (BCSE) represents the broad portfolio of existing clean energy business sectors, including renewable energy, supply-side and demand-side energy efficiency, natural gas, and electric utilities in North America. Since 1992, the Council has represented the views of clean energy industries in the United Nations Framework Convention on Climate Change (UNFCCC) process. For more information please visit <http://www.bcse.org>.*

### **About the ICSE**

*The BCSE is also a founding member of the International Council for Sustainable Energy (ICSE). The ICSE is an alliance of Business Councils for Sustainable Energy in Europe, the United Kingdom, the United States and the Clean Energy Council of Australia. The mission of the ICSE is to provide a cohesive and credible voice for the global sustainable energy industry in international climate change and sustainable development forums.*

*The ICSE represents more than 500 companies with a commercial interest in the expansion of global sustainable energy markets. These companies are active in investing substantial capital to meet the intersecting challenges of climate change, energy security and access to clean energy. For more information please visit <http://www.i-cse.org>.*

### What Clean Energy Industries Want From Cancún

Clean energy industries are ready to engage and can deliver immediate reductions in global GHG emissions. Our business coalition calls upon Parties in Cancún to take decisions in key areas that will send strong signals to the private sector to encourage investment into existing clean energy technologies, resources and services.

More specifically, we seek steps forward in Cancún that:

- **Agree** upon elements necessary to move towards an international regime, and set a clear mandate for the path ahead;
- **Enhance** engagement of the private sector in the design and implementation of a post-2012 international agreement;
- **Recognize** the vital role of private sector finance in meeting long-term objectives;
- **Reinforce** the role of market-mechanisms and provide clarity to the post-2012 carbon market; and
- **Advance** the design and implementation of a technology center and network, as well as make progress in other building block areas.

### Clean Energy in Mexico

Clean energy companies and expertise are already at work today in Mexico, helping to build a low-carbon economy. The Cancún conference provides an opportunity to showcase these efforts.

#### **Verifying the Transition**

Mexico City

The government of Mexico City has piloted a Bus Rapid Transit (BRT) system along Insurgentes Boulevard, a busy corridor that cuts through the heart of the Mexican capital. **First Environment, Inc.** worked directly with Metrobus to assess the pilot project's impact on GHG emissions. Metrobus, with a mandate from the Secretary of Transport and Urban Development (SETRAVI), designed, implemented, and now manages the new 19.4 kilometer BRT system for the city. First Environment, Inc. confirmed that as a result of the BRT pilot project along the corridor, Metrobus provided 250,000 daily riders with a less GHG-intensive way to move about the city than they had before. Annual GHG emissions along Insurgentes Boulevard dropped over a three-year period from 41,500 to 32,400 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e), as verified by First Environment and its use of best practice GHG accounting and auditing procedures.



A Natural Gas Pipeline

### ***Delivering Reduced Emissions Via a Natural Gas Pipeline***

Rosarito, Baja California

**Sempra Energy**, a California-based energy company, has completed a 23 mile-long natural gas transmission line from San Diego to a power plant in Rosarito, which has allowed the government's major oil-fueled plant to shift much of its energy use to cleaner-burning natural gas. As a result of natural gas delivered to homes and businesses in Mexicali via ECOGAS, Sempra's investment has reduced air emissions in Baja California, reducing 41,350 tons of sulfur dioxide, 2,650 tons of nitrogen oxide and 2,700 tons of particulate matter larger than 10 microns.

### ***Providing Efficient Access to Clean Water***

Monclava, Coahuila

Through its *Watergy* program, the **Alliance to Save Energy** (Alliance), a nonprofit coalition of prominent business, government, environmental and consumer leaders who promote the efficient use of energy worldwide, provided technical assistance on how to optimize the existing water distribution network to Sistema Intermunicipal de Agua y Saneamiento (SIMAS Monclava), the operating agency for the municipal water system and sanitation services in the state of Coahuila. As a result of this three-year project, SIMAS Monclava was able to increase availability of water supply from 10 hours to 24 hours a day, provide increased access to an additional 40,000 customers, and simultaneously reduce the total energy and water consumed as well as GHG emissions.

Due to the successful implementation, the ASE's *Watergy* methodology has been adopted as part of the National Water Policy in Mexico, and projects have been implemented in 11 additional states. Internationally, the Alliance has implemented *Watergy* projects in more than 40 cities around the world with recent projects in India, South Africa, and a number of Central American and Caribbean countries.

### Fueling Sustainable Global Growth

Deployment of clean energy is important to a country's economic growth, because it can reduce GHG emissions and also provide energy access to those who are without. Approximately 20 percent of the world's population or 1.4 billion people, 85 percent of whom live in rural areas, still do not have access to electricity.<sup>1</sup> Energy poverty is a significant barrier to economic development. A clean energy portfolio of technologies that includes renewable energy, energy efficiency and natural gas provides options for countries to provide both economic development and clean energy to its people, whether concentrated in cities or spread out in the countryside.

- **Renewable energy** can deliver this energy access and meet new incremental demand with zero or low-carbon emission technologies.
- Supply-side and demand-side **energy efficiency** technologies can help communities use energy in smarter and more economically-efficient ways.
- **Natural gas** is a lower-carbon source of fossil fuel that is both reliable and efficient.

Clean energy technologies should be the heart of today's economic revitalization. The following examples show the range of economic, environmental and social benefits of distributed renewable energy, combined heat and power, and integrated building retrofits.

### *Lighting Rural Communities*

Mindano, Philippines

In many small communities in the Philippines, access to electricity is difficult due to their remote location and distance from the electric power grids. **Winrock International** has been working with small barangays (communities) in the Mindano region in the southern Philippines to provide energy access through deployment of solar photovoltaic (PV) and micro-hydropower technologies under the Alliance for Off-Grid Renewable Energy (AMORE). AMORE is a public-private partnership program implemented by Winrock in partnership with USAID, the Philippine Department of Energy, and SunPower Corporation. Under AMORE, Winrock has electrified over 400 communities and over 200 schools, while also creating jobs by training technicians and supporting development of the rural clean energy sector. Access to power brings greater potential to local communities for distance learning and education, entrepreneurial opportunities and an enhanced quality of life. The AMORE program is continuing, and will bring renewable energy-based electrification to 12,000 more households and 150 additional schools.

## ***Generating Energy, Reducing Pollution***

Shandong Province, China

Existing clean energy technologies can allow for a country to industrialize in an energy-efficient, low-carbon way.

**Solar Turbines**, a manufacturer of natural gas turbines, has deployed this combined heat and power technology at the Jinneng Coal Gasification Chemical Company plant in Shandong Province, China. The coke-oven gas generated as a byproduct of the plant's coking process is a hydrogen-rich waste gas containing significant amounts of dust and corrosive pollutants. This waste-product is captured, treated and used as a gas turbine fuel, which produces both electricity and useful thermal energy while also reducing local air pollution.

## ***Making Buildings More Efficient***

New York, USA

In New York City, **Trane/Ingersoll Rand** worked with TIAA-CREF, a financial products and service provider, to evaluate their headquarter building's existing heating, ventilation and air conditioning systems (HVAC) and develop innovative, high performance infrastructure solutions to improve the building's energy efficiency. Trane's Energy Services team replaced the building's aging steam absorption chillers with Trane high-efficiency chillers, upgraded the cooling towers and installed an ice thermal storage system. The



TIAA-CREF Building in New York City

thermal storage system shifts energy use to off-peak hours, saving approximately \$765,000 per year in operating costs and energy use. These energy savings help TIAA-CREF, a non-profit firm, continue to offer low fees and long-term investment advice to those in the academic, medical, cultural and research fields.

# POST-2012 FRAMEWORK

Clean Energy – Fueling Sustainable Global Growth



## A Post-2012 International Agreement

To maximize the potential of the private sector to make investment choices into a country's low-carbon energy portfolio, energy infrastructure and daily business practices, the clean energy industry calls for a post-2012 international climate change agreement that includes:

- **2020 and 2050 investment signals**, in the form of targets, timetables and national commitments; and further, a common structure must be adopted for tracking emission reductions and for carbon accounting practices;
- **Market-based approaches**, including reform of the Clean Development Mechanism, and the addition of new mechanisms;
- **Continuity** and a commitment to maintaining and reforming existing market mechanisms to assure businesses that their investments will be honored;
- **Capacity-building initiatives** that foster enabling environments attractive to clean energy investments and help countries adapt to climate change;
- A practical **technology transfer** regime that facilitates accelerated clean energy deployment;
- Strong **intellectual property rights** that reward innovation and spur investment in clean technology; and
- A **private sector role** in all levels of the design and implementation of a robust post-2012 agreement.

## The Role of the Private Sector

As Parties continue negotiations towards a post-2012 international agreement, a more effective role for the private sector is needed. This enhanced role is essential because of the scale of private capital required to deploy clean energy technologies to meet global mitigation and adaptation needs. This level of private investment is estimated to be at least 50% of the \$100 billion pledged annually by governments by 2020.<sup>2</sup> It is important that Parties understand the full range of positive contributions that businesses can provide to assist countries in meeting their national low-carbon goals.

The negotiation process will benefit greatly from the creation of mechanisms that allow for Parties to access private sector expertise, and should be guided by the following principles:

- Inclusivity and recognition of diversity within the business community;
- Openness and transparency; and
- Flexibility.

Our coalition believes the private sector can help serve the negotiation process in two primary areas:

- 1. Consultation on design of a post-2012 agreement**  
To serve as a resource for negotiators as they draft the agreement and subsequent decisions; and
- 2. Implementation & technical assistance**  
As a working-level consultative body of experts to provide technical assistance in response to country-driven requests during the implementation phase of an agreement.

### Private Sector & Climate Finance

In Copenhagen, governments pledged to mobilize \$100 billion annually by 2020 to address climate change in developing countries. These pledges have the potential to catalyze large-scale investments in clean energy sectors. In the coming years, the choice of policy instruments can begin unlocking these private sector financial flows. It is estimated that such interventions could leverage private investments in climate change mitigation at the magnitude of \$100 to \$200 billion annually by 2020.<sup>3</sup>

Decisions made by national governments and the Conference of the Parties (COP) should include a clearly identified role for private sector finance. These decisions should also streamline, simplify and fill-in public financing gaps. National policy frameworks should be designed to channel low-carbon foreign investment into key sectors with high mitigation potential, such as the building, transportation and power sectors.

More specifically, a COP decision on the governance of a new Green Fund should be balanced in composition between donor and recipient countries, and the fund should be administered through existing multilateral institutions. Considering both the investment and mitigation potential that can be delivered by the private sector, inclusion of private sector viewpoints in the operation of this new fund is essential.

At the country level, creating a market and policy framework that is conducive to foreign private sector investment is critical to the successful deployment and dissemination of clean energy technologies. Key elements of this type of framework include a rule of law, a business infrastructure, work force capacity and the protection of intellectual property (IP) rights.

IP rights are critical to encouraging private sector innovation and for enabling countries to develop their own value chain. If a company knows that its assets and operations, at all stages of the value chain are protected, from research and development (R&D) to the final commercial product, then the company is much more likely to invest in the local economy.

### *Protecting Innovation, Attracting Investment*

Singapore

**Siemens** opened its global Water and Research Development Center in Singapore, due to the country's strong intellectual property laws, with the aim to develop innovative water and wastewater treatment technologies for the Asia-Pacific region. Water is a critical factor in both energy generation and climate change adaptation, and technology centers such as these will be necessary to develop more energy-efficient water and wastewater management and applications. For example, the technologies developed at this R&D center greatly reduce the methane gas normally generated by traditional wastewater treatment processes.

## **Financing Efficiency**

Mumbai, India

At Inorbit Mall, one of the largest shopping malls in Mumbai, India, **Johnson Controls** worked with the building owner, K. Raheja Corp Group, one of the largest property developers and owners in India, to perform an energy efficiency retrofit of the building. This effort, in cooperation with the Clinton Climate Initiative, included a performance guarantee which measured and verified the energy and cost savings annually. The project was implemented using an energy service performance contract, in which the retrofits are

paid for through the energy savings over time. The retrofit included upgrades to the building's heating, ventilation and air conditioning (HVAC) system, optimization of energy management systems, and a transition to energy efficient lighting. These measures are reducing the mall's energy consumption by 17 percent and lowering its annual carbon-dioxide emissions by 1,100 tons. The project, completed in 2010, is expected to pay back the initial investment made by K. Raheja in 2.8 years. Daily visitors to the mall can check on the building's performance through a solar powered LCD panel, which communicates the environmental and financial impacts of the project in real time.



Inorbit Mall in Mumbai, India

Parties in Cancún must clearly express support for market-based mechanisms, and opportunities for their reform and expansion in a post-2012 agreement. Action must be taken in order to provide the certainty that is needed to sustain investment today as well as in the post-2012 period.

Parties in Cancún should consider development of new mechanisms, and to allow for existing market mechanisms to adapt and grow. Created by the Kyoto Protocol, the Clean Development Mechanism (CDM) is a tool that is estimated to produce 1.5 billion tons of CO<sub>2</sub>e in emission reductions from 2001 to 2012, much through renewable energy, energy efficiency and fuel switching. Furthermore, the World Bank reports that “in addition each dollar of carbon revenue leverages on average \$4.60 in investment and possibly up to \$9.00 for some renewable energy projects. It is estimated that some **\$95 billion in clean energy investment benefited from the CDM over 2002–08.**”<sup>4</sup>

Potential reforms to the CDM include expansion of the programmatic CDM approach, lowering of transaction costs and the adoption of standardized baselines. New market mechanisms under consideration include: sectoral approaches and the aggregation of projects, and crediting for Nationally Appropriate Mitigation Actions (NAMAs). These reforms and new tools will maximize both private sector investment and the mitigation potential of market-based mechanisms.

Market-based mechanisms, whether within a national framework or an international agreement, enhance the cost-effectiveness of and promotion of mitigation actions. The creation of domestic or internationally recognized offset credits and programs lowers the cost of compliance in domestic climate change regimes, and also promotes low-carbon growth in developing countries.

### Market Mechanisms for Buildings

The potential for GHG reductions in the building sector is significant, as buildings consume 25-40 percent of energy produced and are responsible for 40 percent of total GHG emissions. Major developing countries, including China, Brazil, Russia and South Africa are expected to construct the equivalent of 5 percent of their existing stock annually through 2030.<sup>5</sup>

Creating the right market mechanism to attract investment to ensure these buildings are as efficient as possible is important. To complement the effectiveness of market mechanisms, a multi-faceted approach, that also includes policy mandates and incentives, as well as education and awareness programs, is needed. Examples of such measures can already be found in variety of countries, and which can be further customized per specific country needs.

Sectoral approaches have been considered as a viable model for building sector efficiency improvements because they could allow integrated building technology solutions to be credited. A sectoral approach could also provide a

vehicle to aggregate a set of buildings within a geographic region. To this end, a COP decision within the negotiations would be powerful, although implementation within individual country NAMAs can move forward in advance of an international decision.

## Carbon Markets at Work

Carbon markets have the potential to mobilize a key stream of private sector finance that can deliver the billions of dollars of investment needed to mitigate climate change. The following case studies demonstrate the many benefits of carbon markets at work.

### ***Harnessing the Earth's Energy***

Amatitlán, Guatemala

In the face of growing demand for energy, which has been largely met by fossil-fuel based sources, **EcoSecurities** developed this CDM project which accesses Guatemala's geothermal resources (800 megawatts). This project implements a state-of-the-art geothermal power plant to generate renewable energy for the electricity grid. This power plant generates 162,000 MWh of power annually and as a result reduces approximately 82,000 tons of CO<sub>2</sub>e per year. This transfer of technology has helped Guatemala diversify its energy portfolio, providing a stable and predictably priced source of domestic power.



Geothermal Power Plant in Amatitlán, Guatemala

### ***Renewable Biogas for Home Cooking***

Kerala, Madhya Pradesh, India

**First Climate**, in partnership with INSEDA, an Indian non-governmental organization, has mobilized carbon finance to help households transition from firewood to biogas as the primary fuel for cookstoves and heating. The biogas is produced from dairy manure and other organic material that is processed in family-sized anaerobic digesters. In addition to avoiding 14,000 metric tons of carbon dioxide emissions from the waste; other benefits from this Gold Standard project include improved human health and indoor air quality. This project provides time for women and children to pursue activities other than the collection of firewood – such as education or other economic endeavors.

Clean energy industries are willing partners in the negotiations to achieve a post-2012 international climate change agreement. Readily available clean energy technologies can deliver immediate GHG reductions by 2020. A blend of policy incentives, market-based mechanisms, and investor-friendly environments are needed to help achieve these reductions.

At Cancún, parties will be shaping the framework of a mechanism that will advance the deployment and diffusion of clean energy technologies. Clean energy companies and organizations can contribute to the Climate Technology Center and Network (CTC+N) by offering technical expertise and sharing knowledge about their products and services. The CTC+N will ease the burden of information sharing and provide access to clean energy technology solutions that are readily-available in today's marketplace.

Access to energy is a vital ingredient to a country's economic development. Clean energy technologies, from energy efficiency to distributed renewable generation to cleaner fossil fuels, are key elements to a low-carbon development plan. The energy choices made at all levels of an economy are equally important. Significant GHG emission reductions can be realized at the local, industrial, corporate and national levels.

### ***Fishing with 3G Nets***

Santa Cruz Cabrália, Bahia, Brazil

As communities grow their local economies in a carbon-constrained world, technology allows businesses to adapt

and communities to develop in the face of increasing economic pressures. **Qualcomm**, a wireless 3G technology provider, is working with the indigenous fishing communities in Santa Cruz Cabrália, to integrate mobile and web-based applications and handheld devices to improve the quality, diversity, and sustainability of the local fishing and mariculture economy. The wireless technology provided in *Pescando com Redes* 3G delivers real-time, water quality, weather, and market information that not only directly connects fishermen and mariculturists with consumers, but also allows participants to diversify their catch and improve their earning potential. By providing access to new information, the wireless technology is enabling this community to adapt and reinvigorate its local fishing economy.

### ***Industrial Efficiency: Oxy-Fuel***

Chicago, Illinois, USA

The industrial sector is a key source of a nation's economic development. **Jupiter Oxygen Corporation** developed a high flame temperature oxy-fuel technology that significantly enhances combustion efficiency for energy intensive industrial processes.

When this clean technology was applied to a licensee's aluminum re-melting furnaces, it reduced fossil fuel consumption by 70 percent and net GHG emissions by 60 percent, with very low nitrogen oxides emissions. The oxy-fuel technology, when applied to coal or natural gas fired



Uni-Solar's Flexible Thin Film Solar Panels

power plants, provides efficiency gains in the boiler and is the pathway for cost-effective carbon capture from fossil fuel or bio-mass power plants.

Jupiter Oxygen seeks to transfer its oxy-fuel technology through licensing agreements around the world, but often encounters challenges such as resistance to change by industries, the lack of strong domestic policy mandating efficiency and a need for financing to complete the transfer of technology. A regional technology center + network would greatly assist partnerships for deployment of oxy-fuel technology.

### ***Bottling the Sun***

Los Angeles, California, USA

The private sector is not only a source of clean energy technologies, it can also be a driver for change by adapting its own operations. Faced with the need to upgrade its building infrastructure and high electricity costs during the day, Coca-Cola Enterprises replaced the existing roof at its Los Angeles, California bottling facility with a new, lighter-weight single-ply roofing membrane comprised of **Uni-Solar's** flexible thin film solar panels. This integrated 325-kilowatt solar roof system can produce 1,600 useable hours of electricity annually, with a cost savings of more than \$60,000 per year, and reduces electricity demand in the community at peak hours during the day.

### Fueling the Path Forward

*Clean Energy – Fueling Global Sustainable Growth* has demonstrated how the deployment of clean energy technologies will continue to address our shared energy, economic and climate change challenges.

Clean energy industries seek specific decisions in Cancún that will show a continued commitment to clean energy investments and a renewed commitment to strengthen the multilateral climate change regime. It is hoped that the Cancún talks will result in a path forward for the negotiations on a post-2012 agreement, and one that provides for active engagement of the private sector.

The private sector is a source of expertise, innovation and financing that can greatly contribute to the UNFCCC process, both in the design and implementation stages of a post-2012 climate change agreement.

The global economy is currently challenged by not only climate change but also economic recession, fluctuating energy costs and increasing demand for energy resources. Cost-effective and pragmatic decisions are essential in these times.

The strategic investment in clean energy technologies today will open up new opportunities for revitalized economic growth tomorrow. Clean energy is the common “fuel” that can create a sustainable path forward for all countries and sectors to combat climate change and to stimulate our economies.



### Endnotes

- <sup>1</sup> *World Energy Outlook 2010*. International Energy Agency. November 2010
- <sup>2</sup> *UN Secretary-General's High-level Advisory Group on Climate Change Financing Report*. November 2010.
- <sup>3</sup> *Work Stream 7 Paper: Public Interventions to Stimulate Private Investment in Adaptation and Mitigation*. UN Secretary-General's High-level Advisory Group on Climate Change Financing Report. November 2010.
- <sup>4</sup> *World Development Report 2010*. World Bank. September 2009. P.262.
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