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Summit
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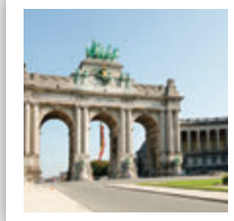

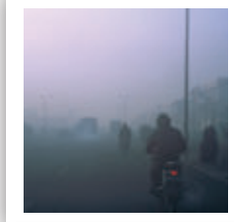

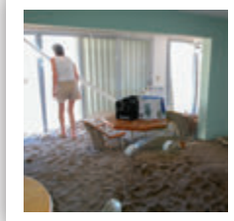

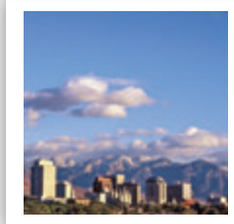

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DELTA

FOREWORD

Prestige Media is proud to present to the world's leaders in Brussels, Belgium, the publication for the 2014 G7 summit.

Due to the continued political turmoil in Ukraine, and Russia's continued refusal to change course, the planned meeting of the G8 in Sochi, Russia, has been cancelled and the meeting, changed to the G7 format has been moved to Brussels, the seat of the European parliament.

Our deepest thanks are due to the Belgian Government for allowing us to cite our credentials and assisting us in producing this publication.

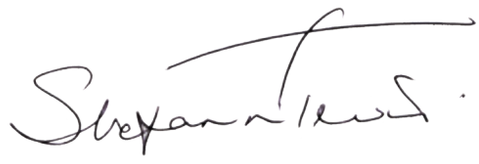
The G7 summit, attended by the seven most powerful industrial nations, collectively accounts for 63% of the word's GDP, provides an unequalled opportunity for world leaders to bring the most pressing issues of the day to the forefront of the world stage – the problems facing our planet and its future, and the multitude of races and species dependent on it.

We are proud to have been able to play our part by bringing these enormously important issues into the public eye at such a high profile event, through the advertisers who have graced our pages, seeing our magazine as a major carrier of these themes to the world arena, and recognizing the high quality penetration of our distribution.

This edition is exceptional in having secured the very best standard and quality of editorial writers, each an acclaimed expert in their respective field in each of the major topics of the G7, with an emphasis on climate change, the environment, and alternative and renewable energy. Our mission is to be their voice piece, keeping these themes to the forefront of everyone's mind. We know that through a combined force of some of the largest companies in the world, a movement has begun which will be for the benefit of everyone one of us, as well as future generations.

The problems we, as custodians of our planet face, are unprecedented. We must ensure that innovations and action promoted by governments, companies, and organizations are seized upon and embraced by us all.

To a brighter and more sustainable future,



Stefan N. Tevis
President and CEO, Prestige Media

WELCOME

Elio Di Rupo
Prime Minister, Belgium

We are happy to host the 2014 G7 Summit in Brussels. Because of its central location Belgium is a major trading partner with many of the countries in the European Union and around the world. We have numerous aid programs to a number of the developing countries in Africa and parts of Asia. Our long standing relationship with the nations of central Africa continues to stimulate our humanitarian concerns.

European energy policies are now being affected by the current crisis between Russia and the Ukraine. As Russia moves into the Crimea the Ukraine seeks independence. All Belgians hope for a peaceful resolution of this situation. Energy resources such as natural gas are vital to the continuing prosperity of Belgium and other European nations. We will look forward to the discussions during the G7 meetings in hopes of attaining mutually satisfactory goals in this area.

WELCOME

Didier Reynders
Minister of Foreign Affairs

Belgium currently has good relationships with all its fellow European neighbors. Both political stability and economic trade are important to the health of the Belgian nation and the European Union. We have recently had a very successful conference on avoiding the conundrum of genocide in the world. This is particularly relevant as the world attempts to work out a peaceful solution to the Russian/Ukrainian crisis.

At the same time we do not want to lose focus on the many other difficult problems that we face. Issues such as poverty, climate change and creating sustainable energy programs are also of major concern. The G7 nations working in concert with the European Union provides leadership in addressing problems in these areas. This will be a most important summit this year.

WELCOME

Yvan Mayeur
Mayor of Brussels

We are delighted to welcome the members of the G7 Summit to the beautiful City of Brussels. We trust that the visitors here will experience the best that Brussels has to offer. As the capital of Belgium, you will find vigorous business activity as well as the home of the European Union and the European Council.

Tourists enjoy seeing many of the historic buildings and monuments that have played a major role in European culture. Our art is a mixture of old and new. Brussels has become a modern metropolitan center that serves the needs of both Flanders to the north and Wallonia to the south. It is the political center of our fine country and exhibits the finest traditions of European hospitality.

Philippe of Belgium
King of Belgium

Belgium is honored to host the 2014 G7 Summit. Although we are not a member of the group of Seven, the European Union and the European Council both of which are headquartered in Brussels, work very closely with the G7. Since the creation of the European Union, the many nations that are members work together to the benefit of all. Each nation, of course, is unique and possesses individual characteristics that add to the wealth and diversity of the whole.

Belgium itself is unique combining the French and Dutch languages (with also some German) in the three diverse areas that make up Belgium. Flanders and Wallonia complement each other in many wonderful ways. In the north we have seaports and railways that serve our various imports and exports. They move goods throughout our part of the European economy. Centered in Brussels and the surrounding cities, our commerce and industry abound. Agriculture is important to the south and also the rest of the country.

The history of Belgium is one we can be proud of. We have played a key role in European economics and politics throughout the ages and we continue to do so today. As we meet this year, the issues that the G7 face are more important than ever. The impact of the Russian problem affects all the nations in the European Union.

WELCOME

Herman van Rompuy
President of the
European Council

First of all I want to welcome all of the participants of the 2014 G7 Summit to Belgium. We are honored to be able to host this year's summit meetings as political events have unfolded. With the expulsion of Russia from the G8, Brussels became a natural choice to provide the facilities and necessary functions for the G7 to assemble.

It goes without saying how important this Summit will be. The European Union has grown to 28 members this year. The European Council provides essential leadership to the European Union. We support the right of the Ukrainians to determine their own political future. Discussions on this topic will be of paramount concern to all members.

We also want to continue many of the important programs that address pressing needs that the G7 nations and the United Nations have instituted. We still have the important issues of energy sustainability, poverty, climate change and international trade to address. We hope that the atmosphere provided by the beautiful city of Brussels will allow us to be successful in all the endeavors of the G7.

ABOUT THE G7

With the take-over of the Crimea by the Russians this year the G8 has been transformed into the G7. The Group of Seven is a forum for the leaders of the world's seven most industrialized nations to find common ground on key topics and solutions to global issues. The G7 includes Canada, France, Germany, Italy, Japan, the United Kingdom and the United States. While the leaders of these countries are in regular contact, they meet in summit format as the G7 once a year.

The G7's origin stems from meetings held in the 1970's between France's Giscard D'Estaing and Germany's Helmut Schmidt when they were finance ministers. Each subsequently assumed the leadership of their respective countries just as the mid-1970's oil crisis was buffeting the world's largest economies. French President Giscard D'Estaing urged the leaders of Germany, Italy, Japan, the United Kingdom and the United States to meet in 1975 to discuss how to respond to the oil crisis.

Canada joined the group in 1976 at the Puerto Rico Summit hosted by the United States. The European Community, now the European Union, was given observer status the following year at the London Summit. Russia became a full-fledged member of the G8 in 1998. This year, 2014, has seen the Ukraine attempt to break away from the domination of Russia. Russia, who has historically desired a water connection to the Mediterranean, is attempting to take over the strategic area of the Crimea. This has led to the expulsion of Russia from the G8, resulting in what is now the G7.

Depending on the discretion of the G7 presidency, additional nations are invited. In the past, these have included the top emerging nations of Brazil, the People's Republic of China, India, Mexico and South Africa.

G7 PRESIDENCY

The role of chairing the G7 rotates each calendar year among the member countries in the following order: United States, United Kingdom, Germany, Japan, Italy, Canada and France. The European Union, though, usually not part of the hosting rotation, is hosting the G7 this year in Brussels, Belgium. The President of the European Council and the President of the European Commission represent the European Union.

The country holding the G7 presidency is responsible for hosting and organizing the summit and a number of ministerial-level preparatory meetings in the lead-up to the main event. The chair also bears the responsibility of speaking on behalf of the G7 and engaging non-member countries, non-governmental organizations and international organizations.

PREPARATORY MEETINGS

The host country organizes several preparatory meetings before the summit. G7 leader's personal representatives, known as Sherpas, attend these meetings to discuss potential agenda items. The Sherpas, usually high-ranking government officials, communicate directly with each other throughout the year.

FOREIGN MINISTERS

Foreign and finance ministers have always played a key role in the G7/G8, both at the summit itself and in the lead-up to the event. Other ministers meet as required. Since 1998, foreign and finance ministers have developed their own agenda and followed up on their commitments. G7 foreign ministers deal specifically with foreign and security policy issues and they support the efforts of the summit.

Finance ministers meet regularly during the year. In 2008 at a G8 finance ministers meeting in Washington D.C. for example, the ministers drafted a five-point plan aimed at easing the global financial crisis. It included recommendations such as taking steps to support struggling financial institutions and unfreeze credit and money markets.

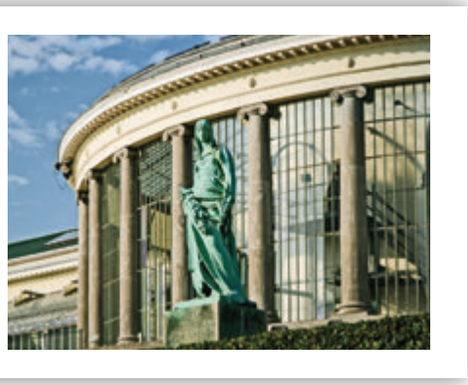
Brussels

WHY IT WAS CHOSEN

Brussels is the capital and largest city of Belgium. It is also the largest urban area in Belgium. It consists of 19 municipalities. The metropolitan area of Brussels has a population of over 1.8 million. Since the end of the 2nd World War Brussels has become a key center for international politics. It contains the headquarters of the North Atlantic Treaty Organization (NATO) and the main European Union institutions.

The city is bilingual. The major languages are French and Dutch. All street names, road signs and many advertisements are in both languages.

Brussels was officially founded around 979 AD. It became an important trade route between Bruges, Ghent, and Cologne. As it grew around 1000 to 1200, the surrounding marshes were drained to allow for expanding the city. In 1183 to 1184, the Counts of Leuven became Dukes of Brabant. After 1200, city walls were erected. During the 13th century, Brussels grew considerably. In the 15th century, Brabant was taken over by the House of Valois. This led to Brussels becoming the capital of the Prince of the Low Countries. The Palace at Coudenberg become the center of the Holy Roman Empire under Charles the Fifth in the early 1500's. It was later destroyed by fire in 1731. In 1695 France attacked Brussels destroying the Grand Palace and a third of the buildings in the city. The city was captured by France in 1745 during the War of the Austrian Succession, but possession was returned to Austria in 1748.



Brussels remained with Austria until 1795. At that time the Southern Netherlands were captured and appropriated by France. The Belgian revolution occurred in 1830. Brussels became the capital and seat of government in the new nation. On 21 July 1831 Leopold I became the first King of Belgium. He knocked down the city walls and began erecting numerous new buildings. Because of the Senne becoming a serious health hazard Brussels completely covered over the course of the river. This resulted in a large urban renewal project. Many of the modern buildings and streets of Brussels today were constructed at this time.

In 1921 Belgium was split into three language regions. Flanders officially spoke Dutch, Wallonia spoke French, Brussels became bilingual. In 1935, Brussels hosted a world's fair and again in 1958. In World Wars I and II the city avoided major damage. After the second world war, the city was considerably modernized. In the 1960's Brussels slowly became the capital of the European Union.

The Brussels-Capital region was created on 18 June 1989 after the constitutional reform of 1988.

Architecture

The architecture of Brussels is quite varied. It covers the medieval time period to the post-modern buildings of the European Union institutions. Main attractions include the Grand Palace. The Gothic town hall the St. Michael and Gudula Cathedrals and the Royal Palace of Laeken are in the old center of town.
The Atomium is a symbolic 103-meter (338 foot) tall structure that was built for the 1958 Worlds Fair. It is built of nine steel spheres connected by tubes to form a model of an iron crystal. The building has been devoted to science by the architect A. Waterkeyn. Abutting the Atomium is the Mini-Europe park with maquettes of famous buildings from across Europe at a 1:25 scale.

The Manneken Pis is a fountain containing a bronze sculpture of a urinating youth. This is a tourist attraction and symbol of the city.
Other landmarks include the Cinquantenaire Park with its triumphal arch and museums nearby. Also located in this area are the Basilica of the Sacred Heart, the Brussels Stock Exchange, and the Palace of Justice. The buildings of the European Union are in the European Quarter.

Cultural facilities include the Brussels Theatre and the LaMonnaie Theatre and opera house. There are many museums such as the Royal Museum of Fine Arts, the Museum of the Army and the Comic Museum. Brussels also has an active music scene, with opera houses, concert halls, music bars and techno clubs.
The city center is notable for its Flemish town houses. Some of Brussels' districts were constructed when the Art Nouveau style was popular. Many buildings are in this style.

Arts

The city has had a renowned artist scene for many years. The famous Belgian surrealist René Magritte, for instance, studied in Brussels. The city was also home of Impressionist painters like Anna Boch from the Artist Group Les XX and include other famous Belgian painters such as Léon Spilliaert & Guy Huygens. The city is also a capital of the comic strip; some treasured Belgian characters are Lucky Luke, Tintin, Cubitus, Gaston Lagaffe and Marsupilami. Throughout the city, walls are painted with large motifs of comic book characters. The totality of all these mural paintings is known as the Brussels' Comic Book Route. Also, the interiors of some Metro stations are designed by artists. The Belgian Comics Museum combines two artistic leitmotifs of Brussels, being a museum devoted to Belgian comic strips, housed in the former Waucquez department store, designed by Victor Horta in the Art Nouveau style.

Brussels contains over 80 museums, including the Museum of Modern Art, and the Royal museums of Fine Arts of Belgium. The museum has an extensive collection of various painters, such as the Flemish painters like Bruegel, Rogier van der Weyden, Robert Campin, Antony van Dyck and Jacob Jordaens . The Magritte Museum houses the world's largest collection of the works of the surrealist René Magritte. Brussels is well known for its performing arts scene, with the Kunstenfestivaldesarts, the Kaaitheater and La Monnaie" stand out among the most notable institutions. The King Baudouin Stadium is a concert and competition facility with a 50,000 seat capacity, the largest in Belgium. The site was formerly occupied by the Heysel Stadium. Furthermore, the Bozar (Center for Fine Arts) is home to the National Orchestra of Belgium and the Flagey cultural centre hosts the Brussels Philharmonic.

Cuisine

Brussels is known for its local waffle, its chocolates, its French fries and its numerous types of beers. The Brussel Sprout has long been popular in Brussels, and may have originated there.

The gastronomic offer includes approximately 1,800 restaurants, and a number of high quality bars. Belgian cuisine is known among connoisseurs as one of the best in Europe. In addition to the traditional restaurants, there are a large number of cafés, bistros, and the usual range of international fast food chains. The cafés are similar to bars, and offer beer and light dishes; coffee houses are called the Salons de Thé. Also widespread are brasseries, which usually offer a large number of beers and typical national dishes.

Belgian cuisine is characterized by the combination of French cuisine with the more hearty Flemish fare. Notable specialties include Brussel waffles (gaufres) and mussels (usually as "moules frites", served with fries). The city is a stronghold of chocolate and pralines manufacturers with renowned companies like Neuhaus, Leonidas and Godiva. Numerous friteries are spread throughout the city, and in tourist areas, fresh, hot, waffles are also sold on the street.

In addition to the regular selection of Belgian beer, the famous lambic style of beer is predominately brewed in and around Brussels, and the yeasts have their origin in the Senne Valley. Kriek, a cherry lambic, enjoys outstanding popularity, as it does in the rest of Belgium. Kriek is available in almost every bar or restaurant.

Sports

Brussels has three major football clubs. R.S.C. Anderlecht, based in the Anderlecht municipality, is the most successful Belgian football in the Belgian First Division with 31 titles. It has also won the most major European tournaments for a Belgian side. F.C. Molenbeek Brussels Strombeek, often referred to as FC Brussels and recently rebranded RWDM Brussels FC, is based in the Saint-Jans-Molenbeek municipality and plays in the Belgian Second Division. Brussels is also home to R. Union Saint-Gilloise, the most successful Belgian club before World War II with 11 titles. The club was founded in Saint-Gilles, but is based in the nearby Forest Belgium municipality. Union currently plays in the Belgian Third Division.

China Polution – Inner Mongolia ©Gary Braasch 2014

THE TIME TO ACT IS NOW

by Michael C. McCracken

Three years ago, a spike in commodity prices fueled civil unrest in some nations and contributed to the worst global economic downturn in a generation.

The disruptive effects of climate change are already impacting society's activities and the environment. For the fifth time in 25 years, the Intergovernmental Panel on Climate Change (IPCC), representing the collective voice of the nations of the world and the international scientific community, has unanimously concluded that human-induced changes to the climate, including overall warming, sea level rise, drenching rains, drying in arid regions, and more are intensifying and represent an increasing threat to the environment and society.

The IPCC's results also make clear that far more aggressive steps than those currently planned will be required to change the destabilizing path toward "dangerous anthropogenic interference with the climate system"—the fancy way of saying climate disruption—that the world's nations pledged to prevent in the 1992 United Nations Framework Convention on Climate Change (UNFCCC). The natural and managed environments on which we rely for food, fiber, water, shelter, medicines, livelihood, recreation, and more are already showing signs of stress, and doing so much more rapidly that had been projected.

Limiting and then reversing these stresses will require moving to an alternate energy path that reverses the atmospheric build-up of greenhouse gases; other steps can also help, but this shift cannot be avoided. What is most clear is that the longer we wait to make this shift, the greater will be the impacts on agriculture, water resources, coastlines, public health, biodiversity and the landscapes and ecosystems that are vital to improving human welfare and promoting sustainable economic development. We have bet the planet and our well-being, and Nature has repeatedly shown the danger of ignoring her warnings.

It was nearly 30 years ago when the international scientific community first made clear to environmental resource manag-

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ers and governments that:

> Many important economic and social decisions are being made today on long-term projects—major water resource management activities such as irrigation and hydro-power, drought relief, agricultural land use, structural designs and coastal engineering projects, and energy planning—all based on the assumption that past climatic data, without modification, are a reliable guide to the future. This is no longer a good assumption since the increasing concentrations of greenhouse gases are expected to cause a significant warming of the global climate in the next century. It is a matter of urgency to refine estimates of future climate conditions to improve these decisions.

Now, three decades later, negotiations are proceeding slowly and there remains insufficient urgency in moderating the growing risk, even though much could be done to deal with this environmental and societal threat than is being spent today on arms and defense. Simply leaving the response to market forces when the costs of the impacts to the environment and future generations are not included is just not going to bring about fast enough change.

While the UNFCCC set an ambitious goal in 1992 and the Kyoto Protocol that was initialed in 1997 sought to initiate the process of limiting emissions during the first decade of the 21st century, real progress has been spotty, at best. As a consequence, global emissions of carbon dioxide (CO2) and other greenhouse gases continue to rise rapidly, making the prospects for dire consequences worse rather than better. The global average temperature has already risen almost 1ºC and the world is committed to another 0.5ºC warming as the oceans warm in response to past emissions. A 1ºC warming may sound like a small amount, but it is roughly a sixth of the difference between full glacial conditions 20,000 years ago and the present (a warming that caused a sea level rise of 120 meters!). Likewise, a 1ºC warming is about a sixth of the difference between the present and the much warmer time of the dinosaurs (when palm trees could grow in the Arctic). And the recent 1ºC global warming has occurred over only a century—not thousands or millions of years. Both the amount and rate of change will make adaptation difficult.

Oregon Town flooded by Nehalem River ©Gary Braasch 2014

Over the last hundred years, temperatures in the Arctic have risen several times as much as the global average, in large part because of the warming influence of the retreating sea ice. Warming is also causing mountain glaciers to recede and the massive Greenland and Antarctic ice sheets to lose ice much more rapidly than was projected just a decade ago. As a result of the added glacial meltwater and the warming of oceans, sea level has already risen a few tenths of a meter, starting a slow, but inexorable, invasion of low-lying coastal areas and aquifers.

Mid-latitude regions are experiencing more frequent heat waves and extreme high temperatures. The overall warming is pushing the ranges of flora and fauna up mountainsides and toward higher latitudes, leaving only remnant areas behind. Unfortunately, the warmer conditions favor pests, weeds, and disease vectors, an impact compounded as the resilience of crops and ecosystems becomes weakened by heat and water stress. With warmer temperatures increasing evaporation, arid, and even very arid, conditions are spread-

ing, increasing the likelihood and intensity of wildfires and desertification. Supplied by the higher atmospheric water vapor content, the thunderstorm-generating weather systems that sometimes include tornados are becoming more intense, increasing the incidence of drenching rains and the likelihood of flooding in vulnerable areas. Emerging evidence also indicates that the seasonal weather is changing, with larger and more persistent periods of excessively wet and dry conditions.

While reliance on coal, oil, and natural gas for roughly 85% of the world's energy provides tremendous benefits, the associated societal and environmental impacts, costs and risks are increasing rapidly. It can seem inconceivable that driving automobiles, heating and cooling buildings and that powering industry and agriculture can cause major ice sheets to melt and the arid subtropics to expand. That human activities are having such major impacts, however, is the only explanation that is consistent with recent trends and patterns of climate change, Earth's climatic history, and the well-established laws and understanding from the physical, chemical, and biological sciences. In more familiar terms, we are burdening the planet's balance sheet with waste and liabilities, and escaping this reality by bankruptcy is not an option.

If the world continues to develop and generate energy as it has been and presently plans to do, IPCC's summary of scientific and economic realities make it clear that disruption of the food, water, health, and other vital systems will intensify over coming decades. As detailed in recent World Bank reports, the projected pace and degree of climate change will become so damaging in many areas that the resources required for adaptation and recovery will limit global development and absorb the financial resources required to lift the poorest nations out of poverty. The anticipated societal disruption will increase the number of environmental refugees, exacerbate conflicts over water and arable land, threaten international peace and security, and weaken the global economy as demand outstrips supply for the basics of life, ultimately leaving diminished funds also for powering international commerce.

The question is what can be done? The commitment to "prevent dangerous anthropogenic interference" made at Rio's Earth Summit in 1992, reconfirmed in Copenhagen in 2009, is admirable, even though the global-warming target of 2ºC that has been agreed to is unlikely to be stringent enough to prevent considerable environmental and societal disruption. Meeting this target remains possible, but only barely. Doing so will require nations to move aggressively toward an energy system based on technologies that do not release CO2. While some nations and businesses have begun this conversion, the collective pace and commitments are not yet nearly enough. As a result, the world continues to face an increasing likelihood that the rate of sea level rise will further accelerate, that ocean acidification will kill off much of the coral and many types of marine organisms, and that the potential for returning climate to what we have called normal will be lost. Indeed, there is an increasing likelihood that warming will trigger an additional and irreversible release of stored CO2 and methane as northern land areas thaw and coastal sediments warm.

For two decades the approach to limiting global emissions has been to negotiate an international agreement with lower emission targets and meaningful penalties. That there has been little success should perhaps not be surprising given the propensity for nations to only agree to modest targets to avoid the possibility of penalties. With the different situations of different countries, each has put forward their special circumstances and been hesitant to participate without special considerations and ex-

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emptions. Except for such topics as limiting deforestation, which would be beneficial for many reasons, there has been little indication that continuing along this path will lead to adequate and timely reductions in emissions of CO2 and other greenhouse gases.

To make a real difference, an all out effort is needed. Recent negotiations have asked nations to set more aggressive, aspirational goals (e.g., 20% by 2020 and 80% by 2050). If they can be fulfilled, goals set in this way, put forth without fear of penalty, offer the potential for larger emissions reductions. At least to date, however, the promises, much less the actions, remain far too modest to adequately limit impacts. Rather than focusing on the long-term necessity and economic benefits of taking action (which is what would replace penalties as the incentive to act), most nations seem hung up on the near-term challenges and unrealized benefits of taking first steps (the promises to cut emissions of hydrochlorofluorocarbons are one important exception). Thus, the likely gains from reducing major losses and impacts to future generations are being sacrificed to avoid dealing with the poor choices made yesterday and still today; the ethical and moral implications of this approach seem sure to be profound.

There is still time, although very limited, to change our choices. Having largely dithered for decades, there is no "silver bullet"--an aggressive, multi-pronged strategy will be required. Central to its long-term component must be switching to sources of energy and industrial practices that will not amplify climate change and not exacerbate ocean acidification. Four simultaneously applied approaches are needed:

- Improve energy efficiency to reduce demand for and waste of energy;
- Shift ground transportation to electricity and non-grain-based biofuels;
- Switch electric generation to renewable and other non-CO2 emitting technologies; and
- Adjust personal and community choices, preferences, and practices.

A few countries are already moving to demonstrate that a modern economy can prosper without significant CO2 emissions. The Dan-

One ton of Carbon Dioxide ©Gary Braasch 2014

ish island of Samsø, for example, has achieved carbon neutrality and many island nations around the world are pursuing the same goal, thereby benefitting their economy as well as the climate. For the developed nations to have credibility in asking developing nations to join in limiting climate change, such carbon neutrality must be much more widely demonstrated. One giant leap forward would be to leave most of the coal and unconventional oil in the ground—there is no way to adequately limit global emissions if the carbon in those fuels is released to the atmosphere.

Despite the increasing and improving array of technological options, inertia is likely to prevail unless the present and prospective costs of climate change are accounted for in the decision process. While no one likes a tax or emissions-limiting permit, using such approaches to internalize the growing environmental costs of fossil fuels has the potential to reduce climate-changing emissions and lead to other benefits. In particular, moving away from coal, oil, and natural gas would reduce air and water pollution, generate a large number of jobs, and make the global economy more efficient. As former president Bill Clinton noted in 2007:

> ... you cannot maintain a growing economy with rising median wages over any significant length of time unless there is a source of good new jobs every five to eight years... this historic challenge we're facing from climate change [could be] this decade's source of good new jobs...

Indeed, not taking actions to change our energy system may well lead to so many adverse impacts that it impairs the sustainable economic development goal referred to in the UNFCCC's objective, which is sometimes interpreted as a reason for proceeding slowly to limit climate change.

The second leg of the strategy needs to be to reduce non-CO2 emissions. Emissions of methane, black carbon (soot) and the chemical precursors of photochemical air pollution (smog) are projected to add as much warming influence during the 21st century as in the century's CO2 emissions. While a necessary step, controlling such emissions is not an alternative to reducing emissions from combustion of coal, oil, and natural gas because CO2's warming influence will continue for many centuries. A 2011 UNEP/WMO assessment identified steps that could cut the projected warming out to 2050 in half.

While developed nations also need to cut their emissions of these substances, developing nations can and should play a leading role, and, importantly, be recognized for this important contribution to slowing climate change. Because such cuts are also vital to improving air and water quality, reducing energy costs, improving public health and more, there are many co-benefits to such steps, creating the basis for a balanced agreement on comparable, but differentiated, actions by developed and developing nations. The global clean stove initiative is an example of an emissions reduction program that will improve women's and children's health and reduce deforestation as well as moderate climate change.

Ending deforestation, encouraging reforestation and taking steps to sustain and build-up carbon in the soils are also essential, especially

as warming may lead to release of some of this sequestered carbon. Forests provide many benefits not often counted in economic analyses storing and cleansing air and water, hosting vital flora and fauna, limiting soil erosion, buffering runoff from inundating rains, and more. Increasing soil carbon not only reduces the atmospheric carbon loading, but also increases the soil's water holding capacity, which

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Kenyan Women Planting Trees in Green belt area ©Gary Braasch

will be essential for agriculture as temperatures rise and rainfall becomes heavier, but more intermittent. In addition, the only way to moderate and then reverse ocean acidification will be to help nature pull CO2 out of the atmosphere, sequestering it in forests, soils, and possibly deep below the surface of the Earth.

Because moderating climate change will take time even with aggressive actions, enhancing resilience to increasing climatic stresses must be the fourth component of the strategy. In all planning that is done, the question needs to be posed about whether the proposed development will be able to withstand future climatic conditions. Improving scientific capabilities are becoming able to offer insights in addition to what is emerging from trend analysis. What is clear is that coastal areas must plan for rising sea level (including for ongoing rise beyond the 21st century); cities must plan for more frequent episodes of prolonged heat; farmers must plan for shifting growing seasons; water and river managers must plan for heavier rains and earlier snow runoff—and even in some systems for eventual loss of snow storage and runoff. Each city and region will face its own challenges.

Finally, some are asking whether additional human intervention might be able to cancel out at least some of the inadvertent warming. Conceptually, such geo- or climate-engineering appears possible, but its likely benefits in limiting global warming would come with important provisos. First, the cancellation of the CO2-induced changes in climate would not be exact or necessarily complete; resulting conditions would be different, but, if used the approach would work, in a significantly less severe way, at least for most nations. Second, future generations would need to continue its implementation, possibly for centuries, with relatively rapid climate change and serious environmental consequences if stopped. Given the increasing risks from ongoing emissions and many questions concerning potential governance, prudence would seem to justify, as fifth component of the strategy, further investigation of the potential for climate engineering as a back-stop approach, especially because emerging impacts from ongoing use of fossil fuels are tending toward the upper range of scientific projections.

My preference would be to first explore whether potential applications of proposed climate engineering technologies might be able to moderate some of the worst emerging impacts, such as the amplified warming of the Arctic, the increased melting of the polar ice sheets, and warming of waters in the regions where hurricanes and tropical cyclones intensify. Coupled with aggressive reductions in emissions as the ultimate exit strategy, such regionally focused climate engineering could perhaps be combined with adaptation and enhanced resilience to reduce the likelihood and severity of critical impacts, some of which, like loss of species and polar ice sheets, could be irreversible.

Accelerating efforts on such a multi-pronged strategy certainly poses challenges. Moderating the pace of climate change will require aggressive attention and balanced actions by all nations, even in the face of the other near-term challenges that fill the headlines. As Dr. Jim Yong Kim, President of The World

Bank Group stated recently in Davos, however, reflecting on his responsibility to promote poverty reduction and global economic development:

> We have seen great climate leadership from countries and companies, but emissions are still rising, the poor are suffering. This is the year to take action on climate change. There are no excuses.

Indeed, the time for leaders and nations to step forward is NOW.

Dr. Michael MacCracken has been Chief Scientist for Climate Change Programs with the Climate Institute in Washington DC since retiring from the University of California in October 2002. His current research interests include human-induced climate change and consequent impacts, climate engineering, and the beneficial effects of limiting emissions of non-CO2 greenhouse gases. From 1968-93 he led studies at the Lawrence Livermore National Laboratory using computer models to evaluate the climatic effects of volcanic aerosols, land-cover change, nuclear war, and the increasing CO2 concentration. From 1993-97, he served as the first executive director of the interagency Office of the U.S. Global Change Research Program and then from 1997-2001 as executive director of the National Assessment Coordination Office. He has also served as president of the International Association of Meteorology and Atmospheric Sciences (2003-07) and as an integration team member for the Arctic Climate Impact Assessment (2002-04). His legal declaration on standing based on the impacts of climate change on the United States was cited favorably by Justice Stevens in his majority opinion in the April 2007 landmark Supreme Court decision in Massachusetts et al. versus EPA. Mike's undergraduate degree is from Princeton University and Ph.D. from the University of California Davis.

Dr. Michael MacCracken

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Climate Change & Environmental Issues

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by Kevin E Trenberth

The climate has always varied on multiple timescales, but now humans are the main agents of change and are likely to remain so for the next few centuries. Climate change is already affecting every continent and ocean, posing immediate and growing risks to people. The longer society delays taking steps to cut the release of planet-warming greenhouse gases, the more severe and widespread the harm will be. According to the Intergovernmental Panel on Climate Change (IPCC), global warming threatens food and water supplies, security and economic growth, and will worsen many existing problems, including hunger, drought, flooding, wildfires, poverty and war.

There are many facts related to climate to demonstrate conclusively that the problem is real. The observational evidence combined with physical understanding based on well-established physical principles makes this abundantly clear. However, the facts are not enough. The role of scientists is to lay out the facts, evidence, prospects and consequences, but the decisions on what to do about them resides in the realm of politics and should involve all of society.

Patrick Daniel Moynahan famously said "You are entitled to your own opinion but not your own facts". The observations and data – the facts – are of mixed quality and duration, but together tell a compelling story that leaves no doubt about the human role in climate change. Changes in some phenomena, such as hurricanes and tornadoes, are confounded by the changing observing system and shortness of reliable records. But the absence of evidence is not evidence of absence of important changes, and our physical understanding and climate modeling can fill the gaps. Climate change is happening because of human activities, but what we do about it involves value systems and politics.

The IPCC, US national assessments, reports from the National Academy of Sciences, and many other scientific organizations have proclaimed that "global warming is unequivocal" and it is mainly caused by human activities. Yet the public is not alarmed. Many politicians either do not believe in global warming or discount it. But it is not a matter of belief. From the scientific standpoint, by the time the problems associated with climate change are so blatant, it will be far too late to do anything about it. Already the costs are substantial every year from drought, wild fires, floods, heat waves, storm surges, and strife. The climate events that cause the damage are isolated events, regional in nature, and affect but few at a time. The public does not see an integrated view. A major IPCC report comes out and it is a headline for at most one day. But the problem continues, and in fact gets worse every day. Yet it is no longer news because it remains the same problem, although

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the problem has not been solved. It is easy for the public to set it aside.

Climate change is inherently an inter-generational problem. What kind of a planet are we leaving our grandchildren? It is also a problem of equity among nations. Small island states and developing countries have not contributed much to the problem but are affected by it. Costs of climate change and air pollution are not borne by those who cause these problems. There are substantial uncertainties associated with exactly what form and where climate change effects will be felt, but the risks are growing. A normal way society deals with risk is by building resilience and taking out insurance. The precautionary principle should come into play. But society is not doing enough to mitigate the problem or plan for the consequences.

THE PHYSICS OF CLIMATE CHANGE

The Sun serves as the primary energy source for Earth's climate. Some of the incoming sunlight is reflected directly back into space, especially by ice and clouds, and the rest is absorbed by the surface and the atmosphere. All bodies radiate at a rate related to their temperature, and most of the absorbed solar energy is re-emitted as infrared (longwave) radiation. The atmosphere in turn absorbs and re-radiates heat, some of which escapes to space. The components of the atmosphere playing this role are present in only small amounts: the so-called greenhouse gases (GHGs). As a rule of thumb, a GHG has more than 2 atoms per molecule and thus the main components of the atmosphere, nitrogen N2 and oxygen O2, do not play a role. Instead water vapor H2O is the dominant GHG, followed by carbon dioxide CO2, Ozone O3, methane CH4 and Nitrous Oxide N2O.

Any imbalance between the incoming and outgoing radiation results in climate variability or change. Examples include the annual cycle, where the oceans take up and store heat in summer, and then release it in winter. Another example is the El Niño phenomenon whereby heat stored in the tropical western Pacific Ocean is moved around and transferred back into the atmosphere during an El Niño event, resulting in a mini global warming. Climate change comes about on longer timescales, mainly from changes in the composition of the atmosphere by human activities, as discussed below.

The natural cycles of water and energy flows on Earth are very large; the absorbed heat from sunshine is moved around by winds and ocean currents but ultimately radiated back to space as infrared radiation. The natural flow of energy through the climate system is about 122 PetaWatts (122 million billion Watts) or 240 Watts per square meter of the Earth's surface. Even with over 7 billion people, the actions of humans in terms of energy use (from burning fossil fuels, electricity usage, and so forth) result in heat amounts of only about one part in 9,000 of the sun's energy flow through the climate system (14 TeraWatts or 0.03 Watts per square meter). Locally, in major urban cities, heating effects from human activities, including the effects of buildings and roads, can be a few tens of Watts per square meter, which creates a microclimate called the urban heat island. But global effects are very small.

The main way humans affect the climate is not by competing with the sun directly, but by interfering with the natural flows of energy through the climate system by changing the composition of the atmosphere. Human activities, mainly the burning of fossil fuels since the start of the industrial revolution, have increased atmospheric carbon dioxide (CO2) concentrations by about 40%, with more than half the increase occurring since 1970. Without this greenhouse effect, life as we know it could not have evolved on our planet. But adding more greenhouse gases to the atmosphere makes it even more effective at preventing heat from escaping into space.

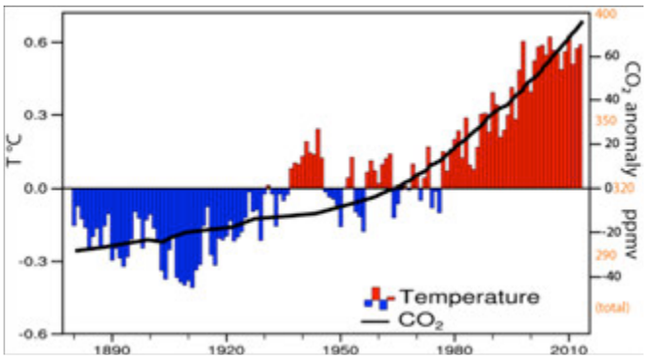

Fig. 1. Global annual mean temperature and carbon dioxide anomalies as departures from the twentieth Century mean through 2013; updated from Trenberth and Fasullo (2013). Note the accelerating rate of CO2 increase in spite of the Kyoto Protocol. Data are from NOAA.

Heat trapping greenhouse gases, in particular carbon dioxide, have increased from human activities, especially burning of fossil fuels mainly in coal-fired power stations and industrial plants, vehicles, and planes, to the point where their warming effects now exceed the noise of natural variability. The heating effect of the increased greenhouse gases is about 3 Watts per square meter, but it is offset by cooling effects from increased pollution (aerosols) in the atmosphere. Further, as a result of the energy imbalance, the Earth warms until a new balance is established by radiating more energy back to space. At present the net energy imbalance of Earth is int the order 1 Watt per square meter so that the planet is still warming.

Although the current effects are still relatively small, they are always in one direction, that of warming, and the effects accumulate. The result is warming oceans, where 90% of the energy imbalance accumulates, melting land and sea ice, raising sea levels, warming land and atmosphere, and a more vigorous hydrological cycle. Global surface temperatures have increased by 0.8°C since about 1900; 0.7°C for the oceans and 1.0°C for land areas (Fig. 1). For every degree C increase in atmospheric temperature, the water holding capacity increases by about 7%, and over and near oceans or bodies of water this sort of increase is observed; it amounts to about 5% increased atmospheric moisture since the 1970s. This in turn increases intensity of precipitation and invigorates storms. But in places where it is not raining or snowing, the warmer air sucks moisture out of plants and the ground, promoting drying and ultimately drought and wild fires. Comparisons of the thermometer record with proxy indicators of climate change suggest that the 30-year period since 1983 has been

Continuing Erosion in Rodanthe, North Carolina ©Gary Braasch 2014

the warmest in at least 8 centuries and that global temperature is approaching temperatures last seen 5,000 to 10,000 years ago, which was the warmest period in the past 20,000 years since the last glacial maximum. Detailed analyses using climate models

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and observations have shown that the warming since the mid-20th century is mainly a result of the increased concentrations of CO2 and other greenhouse gases. Continued emissions of these gases will cause further climate change, including substantial increases in global mean surface temperature and important changes in regional climate. The magnitude and timing of these changes depends on many factors. Pauses, slowdowns and accelerations in warming lasting a decade or more are expected to continue to occur, but long-term climate change over many decades will depend mainly on the total amount of CO2 and other greenhouse gases emitted as a result of human activities.

The effects of warming are widespread and evident in many different variables and datasets. As well as surface temperatures, temperatures are observed to be increasing throughout the troposphere (using satellites and balloons), and throughout much of the ocean (using Argo floats, expendable bathythermographs deployed by ships, and so forth). Extremes of high temperatures are increasing along with heat waves and risk of wild fire. Arctic sea ice is melting and in late northern summer losses have been over 40%. Northern Hemisphere snow cover has decreased in late spring, glaciers and ice sheets such as Greenland are melting and cold temperatures are generally reducing. Melting of land ice plus expansion of the warming oceans contribute to sea level rise which has averaged 3.2 mm/yr since 1992 when altimeters were deployed in space to truly measure global sea level for the first time (Fig. 2). Sea level rise for the 20th Century is estimated to be about 20 cm. Water vapor has increased by about 5% over the oceans since the 1970s, and as a result, precipitation intensity has generally increased. Storms are invigorated. Warming and precipitation changes are altering the geographic ranges of many plant and animal species and the timing of their life cycles. Some excess CO2 in the atmosphere is being taken up by the ocean, changing its chemical composition and causing ocean acidification.

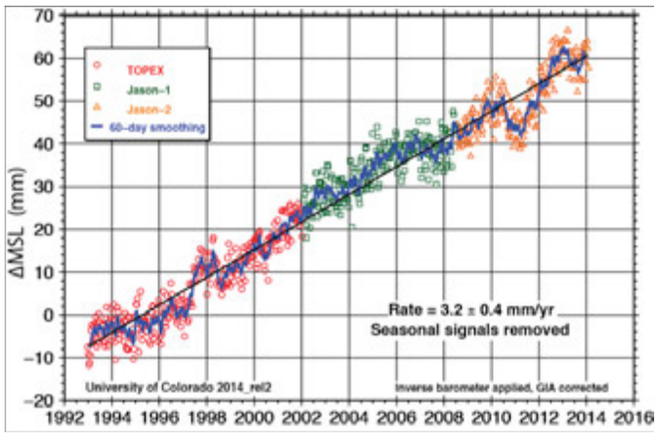

Fig. 2. Sea level rise from altimeters in space since 1993 in mm relative to a base period of 1993-1999; from University of Colorado (Nerem et al 2010). A 60-day smoothing is applied to individual 10-day estimates and a linear trend has been fitted.

The changes in external influences on the climate system affect the climate not just as a simple forcing because there are many complex feedbacks involved. The most important feedbacks involve various forms of water and a warmer atmosphere contains more water vapor, which is a potent greenhouse gas. Hence it amplifies warming. Another amplifier is from higher temperatures in polar regions which melt sea ice and reduce snow cover, leaving a darker ocean or land surface that can absorb more heat, causing further warming. However, effects of changes in clouds are less clear. Water vapor increases may cause

Nepal Farmer Grows Strawberries on the Mountainside ©Gary Braasch 2014

cloud cover to increase while higher cloud tops reduce radiation to space, and the net result depends on the changes in the horizontal extent, altitude, and properties of clouds. For instance a doubling of atmospheric CO2 concentration from preindustrial levels (up to about 560 ppm) would cause a global average temperature increase of about 1°C (1.8°F) in the absence of feedbacks. In the real world, however, the net warming estimated from climate models is 1.5 to 4.5°C.

Analysis of all data and climate model results convincingly shows that most of the observed global warming over the past 50 to 60 years cannot be explained by natural causes and instead requires a significant role for the influence of human activities.

Predictions of the future climate rely on climate model results. However, because human activities are not predictable, and indeed may well be influenced by the results of climate models, rather that predict the future population and energy use, various emissions scenarios are used as possible futures for use in driving climate models to see "what if" outcomes. These are called projections and they go hand-in-hand with an emissions scenario. Ideally the models are run many times to get the average results and to sample the range of possibilities thereby taking weather and natural climate variability fully into account. Differences among models from different Centers are also factored in. The robust results then form the basis for projected outcomes.

All model projections indicate that Earth will continue to warm considerably more over the next few decades to centuries. If there were no technological or policy changes to reduce emission trends from their current trajectory, further global warming of 2.6 to 4.8°C (4.7 to 8.6°F) in addition to that which has already occurred would be expected during the 21st century. Rising sea levels, more intense storms and heavier rainfalls and amplified droughts and risk of wild fire are projected with confidence.

Natural variability modulates the expectations from the changing atmospheric composition from human activities. Large volcanic eruptions, which occur from time to time, increase the number of small particles in the stratosphere that reflect sunlight, leading to short-term surface cooling lasting typically 2–3 years, followed by a slow recovery. Ocean circulation and mixing vary naturally and cause variations in sea surface temperatures as well as changes in the rate at which heat is transported to greater depths. For example, the tropical Pacific fluctuates between warm El Niño and cooler La Niña events on a time scale of 2 to 7 years. Following an El Niño event a mini global warming takes place as heat escapes from the ocean into the atmosphere, while the ocean cools. Similar processes also occur from one decade to the next.

CHANGES IN EXTREMES

Even though an increase of a few degrees in global average temperature does not sound like much, global mean temperature during the last ice age was only about 4 to 5°C colder than now. Global warming of just a few degrees will be associated with widespread changes in regional and local temperature and precipitation as well as increases in some types of extreme weather events. These and other changes (such as sea level rise and storm surge) have serious impacts on human societies and the natural world.

Extremes are classified in two main ways. One is when values exceed certain thresholds, such as 30°C temperature. Another is events that are outside the bounds of normal experience at that location. In this case the events are inherently statistically rare, and often not well documented owing to short incomplete records. But when the climate changes, while most of the time the weather experience is still within the bounds of previous experience, the changes in extremes can be several hundred percent and records are broken. Because of the rarity of such events, they are often very damaging.

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Much of the cost of climate change occurs in association with extremes.
There are many examples in recent years of major extremes that have occurred in association with human-induced climate change, ranging from heat waves and wild fires in Russia in 2010, to the USA in 2011 (Texas, Arizona) and 2012 (widespread), and Australia and China in 2013; super storm Sandy in the United States in 2012; flooding in Pakistan, Colombia, and United States in 2010; Australia in 2010-11, Argentina, the Elbe in Germany, India, Brazil, Alberta, Canada, and Colorado, United States in 2013, and the U.K. in 2014.

The World Meteorological Organisation's (WMO) state of the climate report for 2013 was released recently, and provides a very useful overview of last year's weather and climate events. It confirms that 2013 was the 6th warmest year in the long term record (tied with 2007), that 13 of the 14 warmest years in that record have occurred this century, and that the litany of extreme weather events that struck the planet is in line with what would be expected on a warming planet. A list of some key climate events of 2013 likely exacerbated by climate change include:

- Greenhouse gas concentrations in the atmosphere reached record highs.
- Typhoon Haiyan (Yolanda), one of the strongest storms to ever make landfall, devastated parts of the central Philippines.
- Surface air temperatures over land in the Southern Hemisphere were very warm, with widespread heat waves; Australia saw record warmth for the year, and Argentina its second warmest year and New Zealand its third warmest.
- Angola, Botswana and Namibia were gripped by severe drought.
- Heavy monsoon rains led to severe floods on the India-Nepal border.
- Heavy rains and floods impacted northeast China and the eastern Russian Federation.
- Heavy rains and floods affected Sudan and Somalia.
- Major drought affected southern China.
- Northeastern Brazil experienced its worst drought in the past 50 years.
- The widest tornado ever observed struck El Reno, Oklahoma in the United States.
- Extreme precipitation led to severe floods in Europe's Alpine region and in Austria, Czech Republic, Germany, Poland, and Switzerland.
- Israel, Jordan, and Syria were struck by unprecedented snowfall.
- The global oceans reached new record high sea levels.

Bangla Bhola town Edge ©Gary Braasch 2014

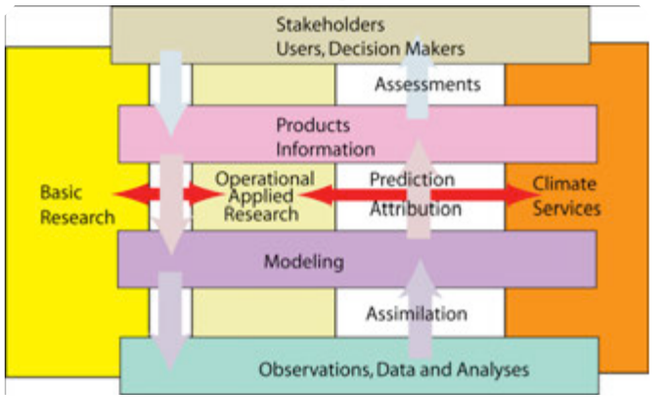
On the other hand, the Antarctic sea ice extent reached a record daily maximum, a likely consequence of the changing atmospheric circulation and especially changing winds over the southern oceans, and frigid polar air plummeted into parts of Europe and the eastern United States, again a regional consequence of changes in the atmospheric circulation. Indeed, there will always be some regions that exceed the global mean values and some will be much less or even with another sign; that is an inherent part of natural variability and weather.

WHAT IS TO BE DONE?

There are three main approaches that should

be followed. The first is often referred to as "mitigation" and it refers to the reduction of emissions of greenhouse gases to greatly slow or even stop further climate change from happening. The second is "adaptation" which recognizes that climate change is happening and it is essential that we all adapt to the changes. In fact we will adapt in some form, either autonomously or through planning, building resiliency, and coping with the changes, or by suffering the consequences. The third is to build an information system to tell us what is happening and why, what the prospects are for the future on different time horizons, and thus what we must adapt to. As a whole we are not doing nearly enough of any of these.
The climate observing system is in decay and satellite observations are in jeopardy, and climate models must continue to improve. Building climate services is a priority of the WMO, but one that is struggling in some countries. In particular, many more observations are needed of social science aspects to properly enable adaptation. The benefits of building a climate information system occur regardless of whether or not climate change occurs.

Fig. 3. The climate information system (Trenberth 2008) showing the interactions from basic, to applied research to operational climate services, and the activities from observations, their processing, the modeling and interactions with users and decision makers.



There are several steps under the adaptation heading. These include assessing the impacts of the projected climate change effects on various regions and sectors, assessing vulnerability to the impacts, making plans to reduce the vulnerability and build resiliency, and generally cope with the expected changes, including extremes. The longer society delays steps to cut the release of planet-warming greenhouse gases, the more severe and widespread the harm will be, according to the IPCC. Global warming threatens food and water supplies, security and economic growth, and will worsen many existing problems, including hunger, drought, flooding, wildfires, poverty and war. The IPCC WG II emphasizes eight major climate risks:

1. Death or harm from coastal flooding
2. Harm or economic losses from inland flooding
3. Extreme weather disrupting electrical, emergency, or other systems
4. Extreme heat, especially for the urban and rural poor
5. Food insecurity linked to warming, drought, or flooding
6. Water shortages causing agricultural or economic losses
7. Loss of marine ecosystems essential to fishing and other communities
8. Loss of terrestrial and inland water ecosystems.

A case can be made that many of the biggest potential issues arise in association with water availability owing to increasing demand and changes from climate change, especially the extremes of drought and flooding.
According to IPCC WG II, global adaptation cost estimates are substantially greater than current adaptation funding and investment, particularly in developing countries, suggesting a funding gap and a growing adaptation deficit. The most recent global adaptation cost estimates suggest a range from 70 to 100 US$ billion per year in developing countries from 2010 to 2050. The IPCC concludes that the world's poorest people will suffer the most as temperatures rise, with many of them

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already contending with food and water shortages, higher rates of disease and premature death, and the violent conflicts that result from those problems.

For mitigation, many good things are happening in towns, cities, States, and some countries, which responsibly attempt to limit their carbon footprint. However, in general the national and international framework is missing, yet it is essential. If one region implements a carbon tax, for example, some companies and even industries threaten to move to the next town or State or even overseas. The main international discussions occur through the annual meetings of the Conference of Parties to the UNFCCC, which was most effective with the adoption of the Kyoto Protocol at COP-3 in 1997. On February 16, 2005, the Kyoto Protocol was ratified by 164 countries, but it did not include Australia and the USA. Australia ratified it much later

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in December 2007 and it has been ratified by 192 parties but not by the United States. The Kyoto Protocol was designed to limit carbon dioxide emissions and those of other greenhouse gases from developed countries, but did not impose restrictions on developing countries. Some good progress was achieved in Europe, but undermined by the tremendous industrialization and emissions from China, in particular, and other developing countries. Great hopes for a further agreement occurred after the IPCC AR4 report in 2007, which announced that "global warming was unequivocal" and the IPCC shared the Nobel Peace Price with Al Gore in 2007. These hopes were carried forward into COP-15 in Copenhagen in 2009, but failed to be realized. One factor was the development of so-called "Climategate" whereby a large number of emails were stolen from the University of East Anglia server, and cherry picked, distorted and abused by climate change deniers to carry out malicious attacks on some scientists who participated in the IPCC report and thereby undermine the scientific basis for the agreements. Although there was no basis for these claims, they appeared to achieve their purpose. Six major investigations of the scientists involved in the hacked emails showed some minor violations of Freedom of Information Acts but complete vindication of all other aspects.

Many arguments relate to the long lifetimes of carbon dioxide, which means it is the accumulated emissions of carbon dioxide rather than the current values that matter most, and therefore developed countries mainly caused the problem. So why should the developing countries be penalized? Many arguments relate to emissions per capita, and that this should be one metric of allocation of responsibility, but the atmosphere cares not one iota about emissions per capita, only about total emissions. In recent years, China has emitted more carbon dioxide into the atmosphere than any other country. And so population should be a major factor. Somehow it isn't! The population and its standards of living relate directly to the demands on precious natural resources that are inherently limited. In that sense, climate change is but part of the major issue of sustainability. Far too many things being done and exploited by humans are simply not sustainable, and it is easy to argue that the world is already way over-populated if we are to eliminate poverty and upgrade standards of living.

The issue really boils down to one of the "tragedy of the commons". The oceans are one major commons, and there is very limited pro-

tection of the oceans from the Law of the Sea. The atmosphere is the other major commons. Air over China one day is over North America 5 days later, and over Europe in another 5 days or so. It is in everyone's interest to exploit the atmosphere and use it as a convenient dumping ground for pollutants and emissions. This applies to individuals, companies, industries, cities, counties, states, and nations. But there are major costs, in terms of air quality and climate change that are not borne by the users. There ought to be a principle of "user pays" in which case there is a great need for a price on carbon that is universal. This can be implemented in many ways, through cap-and-trade schemes, fees or a carbon tax, combined with tariffs for international trade involving non-compliant countries.

To this observer, it is not clear that the COP is the right framework to hammer out an agreement. Rather leadership must come from the G7/G8 and G20. The United States has reduced emissions in recent years, in part from deliberate actions by the government under the Obama administration, but without compliance by the Congress. US leadership internationally, along with Europe and China, could set the stage.

There is no doubt that there are winners and losers, and some regions can benefit from climate change through things like a longer growing season. Moreover, climate change is not necessarily bad; after all climate has always varied, but rapid climate change is always disruptive. Further, the climate is changing at unprecedented rates. It may well be that the climate locally changes to be one that is better in some respect, but it won't stay that way because it keeps changing, and changing, and changing. Even short-term benefits sooner or later become negatives as the climate continues to change. So a key point of climate change is the "change" part. No sooner has the climate changed to be nicer than it changes again. It behooves us to greatly slow the pace of climate change in order to provide the future generations with a manageable and livable planet.

REFERENCES AND FURTHER READING

For more detailed discussion of the topics addressed in this document (including references to the underlying original research), see:
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Appendix 1: Climategate

A number of independent enquiries have investigated the conduct of the scientists involved in the hacked emails. All have cleared the scientists of any wrong doing, but the hackers have not been found:
In February 2010, the Pennsylvania State University released an Inquiry Report that investigated any 'Climategate' emails involving Dr Michael Mann, he was fully vindicated.
In March 2010, the UK government's House of Commons Science and Technology Committee published a report finding that the criticisms of the Climate Research Unit (CRU) were misplaced.
In April 2010, the University of East Anglia set up an international Scientific Assessment Panel, in consultation with the Royal Society and chaired by Professor Ron Oxburgh. The Report of the International Panel assessed the integrity of the research published by the CRU and found "no evidence of any deliberate scientific malpractice in any of the work of the Climatic Research Unit".
In June 2010, the Pennsylvania State University published their Final Investigation Report, determining "there is no substance to the allegation against Dr. Michael E. Mann".
In July 2010, the University of East Anglia published the Independent Climate Change Email Review report. They examined the emails to assess whether manipulation or suppression of data occurred and concluded that "The scientists' rigor and honesty are not in doubt".
In July 2010, the US Environmental Protection Agency investigated the emails and "found this was simply a candid discussion of scientists working through issues that arise in compiling and presenting large complex data sets."
In September 2010, the UK Government responded to the House of Commons Science and Technology Committee report, chaired by Sir Muir Russell. On the issue of releasing data, they found "In the instance of the CRU, the scientists were not legally allowed to give out the data". On the issue of attempting to corrupt the peer-review process, they found "The evidence that we have seen does not suggest that Professor Jones was trying to subvert the peer review process. Academics should not be criticised for making informal comments on academic papers".
February 2011, the Dept Commerce Inspector General independent report of the emails and found "no evidence in the CRU emails that NOAA inappropriately manipulated data".
9August 2011, National Science Foundation concluded "Finding no research misconduct or other matter raised by the various regulations and laws discussed above, this case is closed"

Dr. Kevin E. Trenberth

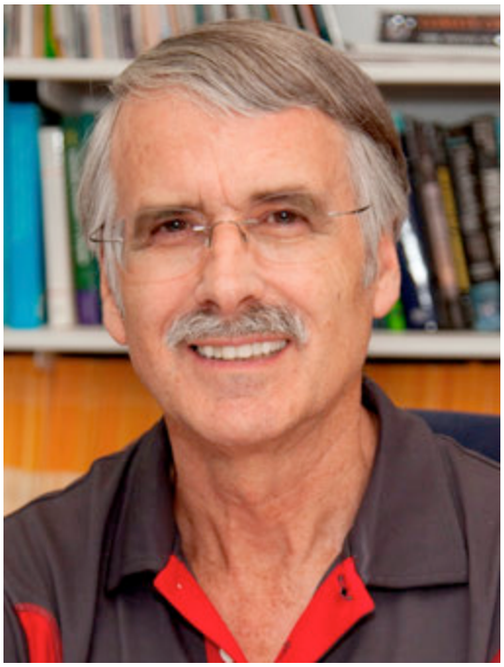
Dr. Kevin E. Trenberth is a Distinguished Senior Scientist in the Climate Analysis Section at the National Center for Atmospheric Research. From New Zealand, he obtained his Sc. D. in meteorology in 1972 from Massachusetts Institute of Technology. He was a lead author of the 1995, 2001 and 2007 Scientific Assessment of Climate Change reports from the Intergovernmental Panel on Climate Change (IPCC), and shared the 2007 Nobel Peace Prize which went to the IPCC.

He served from 1999 to 2006 on the Joint Scientific Committee of the World Climate Research Programme (WCRP), and he chaired the WCRP Observation and Assimilation Panel from 2004 to 2010 and chaired the Global Energy and Water Exchanges (GEWEX) scientific steering group from 2010-2013; he is still a member and chairs the 7th International Scientific Conference on the Global Water and Energy Cycle Committee.

He has also served on many national committees. He is a fellow of the American Meteorological Society (AMS), the American Association for Advancement of Science, the American Geophysical Union, and an honorary fellow of the Royal Society of New Zealand. In 2000 he received the Jule G. Charney award from the AMS; in 2003 he was given the NCAR Distinguished Achievement Award; in 2013 he was awarded the Prince Sultan Bin Abdulaziz International Prize for Water, and he received the Climate Communication Prize from AGU.

He edited a 788 page book Climate System Modeling, published in 1992 and has published 520 scientific articles or papers, including 60 books or book chapters, and over 235 refereed journal articles. He has given many invited scientific talks as well as appearing in a number of television, radio programs and newspaper articles.

He is listed among the top 20 authors in highest citations in all of geophysics.



Gary Braasch Photography

World View of Global Warming

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Published by United Nations, UNFCCC, WMO, US Government,
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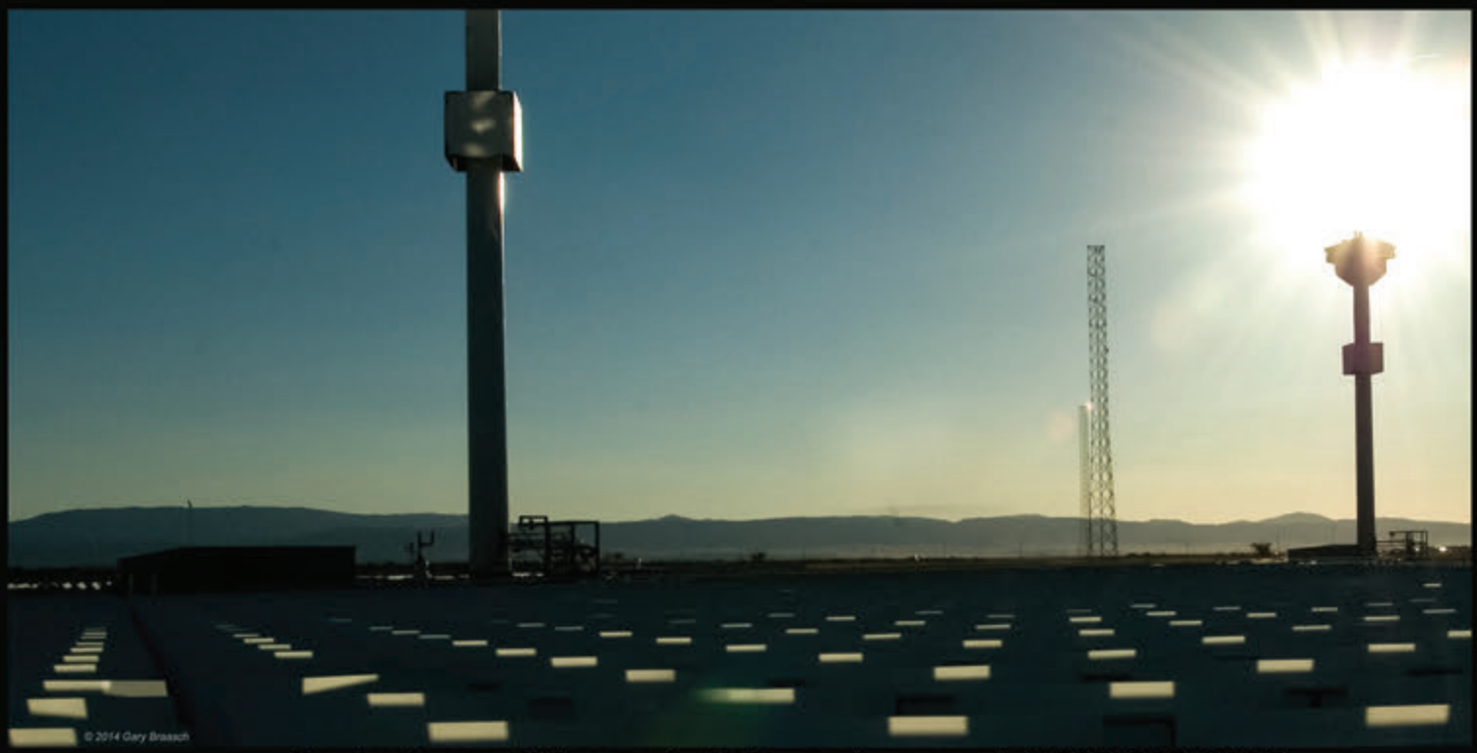

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King Philippe

Philippe Léopold Louis Marie (French), or Filip(s) Leopold Lodewijk Maria (Dutch) ascended the throne as King of Belgium on 21 July 2013. Philippe was born on April 15, 1960. He is the eldest child of King Albert II, whom he succeeded upon Albert's abdication for health reasons. His mother is Queen Paola. He married Countess Mathilde d'Udekem d'Acoz (now Queen Mathilde), with whom he has four children. King Philippe's elder daughter, Princess Elizabeth, is next in the line of succession. At age 53, Philippe is Europe's second youngest reigning monarch, following the 46-year-old Willem-Alexander of the Netherlands.

From 1978 to 1981, King Philippe was educated at the Belgian Royal Military Academy. On 26 September 1980, he was appointed second lieutenant and took the officer's oath. He continued his education at Trinity College, Oxford and he attended graduate school at Stanford University, California, where he graduated in 1985 with an MA degree in political science.

He obtained his fighter pilot's wings and his certificates as a parachutist and a commando. In 1989 he attended a series of special sessions at the Royal Higher Defence Institute. At that time he was promoted to Colonel. The Prince was appointed to the rank of Major-General in both the Land and Air Components on March 25, 2001. He was promoted to the rank of Rear Admiral in the Naval Component.

King Albert II announced on 3 July 2013 that he would abdicate in favor of Philippe on 21 July 2013. Approximately one hour after King Albert's abdication, King Philippe was sworn in as King of the Belgians.

Kingdom of Belgium

Located between the countries of France, Germany, Luxemburg and the Netherlands, Belgium is the center of the administration of the European Union. It has a rich and delightful history as an important player in the Europe of the past and present. As a small nation, one can travel from one end of the country to the other in about three hours. Many of its cities and towns are historically fascinating and contain a mixture of Art Nouveau and medieval art and architecture. The Belgians have enduring traditions of fine dining, fashion and art. Sandy beaches can be found along with the heavily forested hills and crests of the Ardennes.

Brussels, the country's lively capital, is a modern world city with a highly international character. In its European Quarter, one finds large post-modern buildings with impressive historic monuments. Medieval guild houses and the Gothic town hall surround monuments such as the Grand Palace. St. Michael and the St. Gudula Cathedral are dedicated to the city's patron saints. Also prominent is the Laaken Castle. The Royal Palace is a more recent but no less extraordinary structure. One of the city's most famous landmarks is the Atomium, a remarkable steel structure and remnant of the 1958 World's Fair.

Belgium has historically been divided between the Dutch and French languages. The Flemish community in the north constitutes about 59% of the population and speaks mainly Dutch. The Walloon community in the south constitutes about 41% of the population and speaks mainly French. In eastern Wallonia there is a small group of German speakers who are officially recognized. The Brussels Capital Region is officially bilingual, but is mostly a French speaking enclave in the Dutch-speaking region of Flanders.

ECONOMY AT A GLANCE

Belgium has an economy that operates globally. Being located in the center of Europe's industrial region has made Belgium the world's 15th largest trading nation. Its transportation infrastructure and its port in Antwerp are vitally important to all of Europe. The Belgian economy is highly productive with strong GNP numbers, and vigorous importing and exporting businesses.

The Belgian economy is heavily service oriented and shows a dual nature: a dynamic Flemish economy and a Walloon economy that lags behind. One of the founding members of the European Union, Belgium strongly supports an open economy and the extension of the

Kingdom of Belgium - continued

powers of EU institutions to integrate member economies. Since 1922, through the Belgium-Luxembourg Treaty, Belgium and Luxembourg have been a single trade market with a united approach to customs and currency.

GLOBAL EFFORTS

Belgium is a constitutional popular monarchy with a federal parliamentary democracy. The parliament is bicameral with a Chamber of Representatives and a Senate. The 150 members of the Chamber of Representatives are elected from eleven proportionately divided electoral districts. The Senate is comprised of 40 directly elected politicians, 21 representatives appointed by the three community parliaments, 10 co-opted senators and the children of the king. The children of the king are Senators by Right, but in practice do not cast their vote. Popular voting in Belgium is compulsory.

The King (currently Phillipe) is the head of state, but has limited prerogatives. He appoints ministers, including a Prime Minister. The ministers must have the confidence of the Chamber of Representatives to form the federal government. The Council of Ministers is comprised of no more than fifteen members. Its members are composed of an equal number of Dutch-speaking members and French speaking members, except for the Prime Minister. Walloon socialist Elio di Rupo has been Prime Minister since December 2011.

BELGIUM SNAPSHOT

Official Name:
Kingdom of Belgium

Land Area:
11,787 sq. miles (30,528 sq. kilometers)

Population:
11,099,554

Capital:
Brussels

Government:
Federal parliamentary constitutional monarchy

King:
Philippe

Prime Minister:
Elio Di Rupo

Principal Languages:
Dutch, French, German

Life Expectancy:
78 Years (male); 83 Years (female)

Currency:
Euro

GDP Per Capita (US$):
$47,787

BELGIUM HISTORY

1930	Declaration of independence from Netherlands
1944	Allied Forces liberate Belgium
1955	West Germany joins NATO.
2002	Euro replaces Belgian franc.
2011	Elio di Rupo appointed prime minister, ending 541 days without a government.
2013	King Albert II abdicates in favor of his son Philippe.

Angela Merkel

Angela Merkel, Chancellor of Germany since 2005, has played a strong role in politics and has been the leader of several significant groups of interest since the late 1980's. A few notable groups include the Christian Democratic Union, of which she is the chairwoman, Grand Coalition, of which she leads with the Christian Social Union and Social Democratic Party of Germany. She is a member of the Council of Women World Leaders and is an elected member of the German Parliament.

Mrs. Merkel is credited with the honor of being the first woman Chancellor of Germany since 1871 and the youngest person to become Chancellor since the Second World War. She joins Margaret Thatcher and Kim Campbell as only the third woman to serve on the G8 and only the second to become chair of the G8 summit. Additionally, Chancellor Merkel was recently awarded the 2008 Charlemagne Prize for her work in uniting Europe as an EU member.

ENVIRONMENTAL DIRECTION

Commitment to addressing climate change has long been a part of Chancellor Merkel's agenda. In the 1990's Ms. Merkel was Germany's Environmental Minister and strived to bring elected officials from across the globe to start serious talks about the current state of the environment and what could be done to start limiting greenhouse gas emissions. Her efforts in these talks are credited with getting officials to outline and sign the Berlin Mandate, which led to the implementation of the Kyoto Protocol.

Mrs. Merkel attended the 2007 European Union Summit where a plan was commissioned to reduce EU greenhouse gas emissions by at least 20 percent by 2020 and increase renewable energy's production to 20 percent by 2020. Many attribute these goals and agreements to the hard work and convincing speeches given by Mrs. Merkel at the Summit.

GERMANY ON THE HORIZON

Mrs. Merkel has outlined numerous proposals for improving Germanys' future. In her first address as the Chancellor of Germany, she proposed her goals on improving Germany's' economy and reducing unemployment rates. She wants fundamental reforms to pull the economy out of the doldrums, especially reducing staff costs and red tape for employers and raising sales tax.

Angela Merkel is a key influential player in worldwide affairs and looks to strengthen that influence with a strong voice at the G7 Summit.

ANGELA MERKEL HISTORY

1978	Graduated from University of Leipzig.
1990	Doctorate from Central Institute for Physical Chemistry of the Academy of Services.
1990	Elected to Bundestag.
1994	Elected Minister of the Environment and reactor Safety.
2000	Elected Chairman of the CDU.
2005	Elected Chancellor of Germany
2007	Elected President of the European Council and the G8

Federal Republic of Germany

Germany is widely regarded as a very modern and cosmopolitan country with a diverse and open-minded society. The culture is centralized around a broad scope of fine arts. Theater, film, museums and literature are just a few of the celebrated industries in Germany's history.

The democratic political system of Germany was founded on the ideas in their constitution, the Basic Law. Germany was also a founding member of the European Community in 1957, which eventually became a major pillar in the creating of the European Union.

With a normally powerful and robust economy, a high standard of living has been established. In large part, due to a society that proclaims itself, the Land of Ideas. The proclamation is more statement of fact given the creative minds at work behind widely recognizable products that shout quality and state-of-the-art.

ECONOMY AT A GLANCE

The economy of Germany is represented by innovation, quality and cutting-edge technology. The country claims the fourth largest economy in GDP. It has the largest and most advanced national economy in Europe.

The majority of the German economy is export driven. Germany's main commodity exports come from motor vehicles, but other substantial exports machinery, chemical products, electrical devices and telecommunications technology. Germany currently has 37 companies that are included in the Fortune 500.

Fitting for a G7 member, Germany can also pride itself as the leading producer of wind turbines and solar technology in the world.

Germany has made itself into a worldwide staple of high quality products. Where design and innovation has clearly played its part, quality control divisions are unsung heroes that factor in the success of many of the larger companies like Daimler, Bosch and BMW.

GLOBAL EFFORTS

Germany has strived to give humanitarian assistance nationwide. After the devastating Myanmar cyclone in May, Germany was front and center in providing aid organizations to assist the people in Myanmar with shelters,

Federal Republic of Germany - continued

drinking water, household goods and mosquito nets. According to recent statistics from the Organization for Economic Cooperation, Germany trails now only the United States in development assistance in aid.

Through it's commitment to several environmental treaties, Germany has long been known as advocates for environmental awareness. These treaties concern everything from low emission standards and recycling to renewable energy and biodiversity at a global level. Although the country as a whole believes action needs to be taken to improve the status of the global environment, the country is somewhat split on the urgency that this action needs to occur.

Due to country-wide efforts, pollution in the Baltic Sea have been reduced and Germany's governmental heads have announced plans to end the use of nuclear power to produce electricity. The production of electricity will be shifted towards solar technology, but primarily wind energy. Germany already has the largest installed capacity for wind energy and this move will provide not only a stabilizing factor in providing a necessary consumable, but also sets an example as a leader in a move towards alternative methods to harvest energy.

GERMANY SNAPSHOT

Official Name:
Federal Republic of Germany

Land Area:
137,847 sq. miles (357,021 sq. kilometers)

Population:
81,99,600

Capital:
Berlin

Government:
Federal Parliamentary republic

President:
Joachim Gauck

Chancellor:
Angela Merkel

Principal Language:
German

Life Expectancy:
76 Years (male); 82 Years (female)

Currency:
Euro

GDP Per Capita (US$):
$43,741

GERMANY HISTORY

1929	Suffers Great Depression.
1939	Hosts Berlin Olympics.
1945	Divides into West and East Germany.
1955	West Germany joins NATO.
1970	Joins the United Nations.
1989	Fall of the Berlin Wall.
1990	Reunification of Germany.
2002	Euro replaces Duetsch Mark.

Shinzu Abe

On September 26, 2012, Abe was re-elected as president of the opposition Liberal Democratic Party winning the support of 328 members of the 480-seat lower house.

In elections on December 16, 2012, the LDP won 294 seats in the 480 seat lower house of parliament. Following his victory, Abe said, "With the strength of my entire cabinet, I will implement bold monetary policy, flexible fiscal policy and a growth strategy that encourages private investment, and with these three policy pillars, achieve results. Abenomics, as his economic policy has been called, consists of fiscal and monetary expansion with a 2% target interest rate. Abe also said he favors the re-building of Japan's nuclear reactors following the Fukushima disaster (though much of the authority to restart nuclear plants lies with local governments) and plans to strengthen relations with the United States. His first budget increased defense spending and manpower while reducing foreign aid.

Hailing from a politically prominent family, Abe became Japan's youngest post-war prime minister, and the first to be born after World War II when he was elected by a special session of the National Diet in September 2006. Abe served as prime minister for less than a year, resigning on September 12, 2007. He was replaced by Yasuo Fukuda beginning a string of prime ministers, none of whom retained office for more than a year.

JAPAN ON THE HORIZON

On September 26, 2012, Abe defeated former Minister of Defense Shigeru Ishiba in a run-off vote to win the LDP presidential election. Following the LDP's landslide victory in the 2012 general election, Abe became the Prime Minister again. He is the first former Prime Minister to return to the office since Shigeru Yoshida in 1948. Abe is a right-wing nationalist and holds views that have caused concern in China and South Korea. However, he has also strengthened Japan's strategic ties within Africa, India, the Philippines, Southeast Asia and Taiwan.

SHINZO ABE HISTORY

1954	Born to prominent political family.
1993	Elected to the House of Representatives of the the first district of Yamaguchi Prefecture.
2006	Appointed Prime Minister
2012	Elected Prime Minister for the second time.

JAPAN

Japan, known as The Land of the Rising Sun, is an island country made up of over 3000 small islands. It spreads from the Sea of Okhotsk in the north to the East China Sea in the south. Japan's culture has become very contemporary, yet the Japanese people still hold strong to their traditional values and ideals in relation to education, arts and ceremonies.

The government of Japan is a unitary Constitutional Monarchy led by Emperor Akihito and a parliament called the National Diet of Japan consisting of a House of Representatives and the House of Councilors. These houses are responsible for electing the Prime Minister of Japan.

ECONOMY AT A GLANCE

Japan's economy has a very competitive and skillful spirit. It's the world's third largest social market economy and the second largest GDP economy. This strength is widely attributed to unique Japanese characteristics such as work ethic, knowledge of cutting edge technology and close government-industry cooperation.

The major industries in Japan's economy include banking, insurance, real estate, retailing, transportation and telecommunications. They are also heavily focused on industrial endeavors such as vehicle and electronic manufacturing.

Vehicles, electronics, and chemicals are Japans main exports. Due to the lack of natural resources they also rely on exports to provide much of its raw materials such as fossil fuels, food including meat and various materials for their many industries. Japan's main import and export partners are the United States, the European Union and China.

One issue that the Japanese economy faces is a dwindling population. The birthrate has dropped to an alarming rate of 1.2%. As this trend continues the workforce will shrink and unclear results can lead to a turbulent future. The government will either have to coax the population to have more children or relax immigration policies to maintain a healthy population growth rate.

GLOBAL EFFORTS

Since the early 1970's, Japan has been leading the way in environmental preservation through many environmental laws introduced by the

Japan - continued

government and the creation of the Ministry of the Environment in 1971. In doing so, their recent history and current policies boast a delicate but successful balance between development and environmental protection.

Current policy makes Japan world leaders in creating environmentally friendly technology. Japan's government takes the climate crisis and global warming very seriously and is feverishly seeking out innovative efforts to comply with the promises made in the Kyoto Protocol. They've made strides in vehicle emissions issues with hybrid, biofuel and building material technologies and they are aiming to reduce pollutants from factories and other places of business.

Japan has long been a supporter for humanitarian aid across the globe contributing their share of financial donations. From wars and other crisis plaguing countless countries to natural disasters like tsunamis and earthquakes Japan often steps in to provide emergency food, shelter materials, goods, and monetary donations where they are needed.

In 2006 they were first in line to contribute funds to help launch the Central Emergency Response Fund and in 2008 pledged one million dollars to continue the program year after year.

JAPAN SNAPSHOT

Official Name:
Japan

Land Area:
145,925 sq. miles (377,944 sq. kilometers)

Population:
127,799,000

Capital:
Tokyo

Government:
Parliamentary democracy and Constitutional monarchy

Head of State:
Emperor Akihito

Prime Minister:
Shinzu Abe

Principal Language:
Japanese

Life Expectancy:
78 Years (male);
85 Years (female)

Currency:
Yen

GDP Per Capita (US$):
$45,920

JAPAN HISTORY

1914	Joins Britain in World War I.
1937	Goes to war with China.
1947	New constitution goes into force.
1951	Signs peace treaty with U.S. and othernations.
1972	Diplomatic relations resumed with China.
1997	Economy enters recession.
2004	Deploys combat soldiers to Iraq.
2011	Earthquake hits Northern Japan.

Matteo Renzi

Matteo Renzi was appointed the Prime Minister of Italy on February 22, 2014. He has been Secretary of the Democratic Party since 2013. From 2004 to 2009 he was the President of the Florence Province and was Mayor of Florence from 2009 to 2014.

Following the resignation of Enrico Letta, Renzi formally received the task of forming a new government from President Giorgio Napolitano on 17 February 2014. Renzi held several days of talks with party leaders, which he broadcast live on the internet, before he unveiled his cabinet on 21 February, which contained members of his Democratic Party, the New Center-Right, the Union of the Center and Civic Choice. The following day he was sworn in as Prime Minister.

Renzi is the youngest Prime Minister that Italy has had since its 1861 unification. He was born January 11, 1975. He is the first to lead the Italian government serving as a Mayor instead of a Member of Parliament. His rise to become Prime Minister was widely seen as a sign of much-needed generational change, and at the time he took office he enjoyed by far the highest approval rating of any politician in the country.

ITALY ON THE HORIZON

On 11 March, the Chamber of Deputies approved Renzi's flagship electoral reform law that would see Italy's voting system overhauled and also significantly reform the Italian Senate.

He ordered the auctioning of several luxury cars that were used to transport the heads of state, as he felt they were an unnecessary use of government money.

The cars included nine Maseratis, a couple of Jaguars, and various other cars such as BMWs and Alfa Romeos. Out of the 1500 cars, 170 are already out for sale on E-Bay.

MATTEO RENZI HISTORY

1975	Born in Florence Italy.
1999	Graduated from the University of Florence with a degree in law.
2009	Elected President of the Province of Florence
2009	Became Mayor of Florence.
2014	Became Italy's youngest Prime Minister.

REPUBLIC OF ITALY

Italy was at the forefront in founding the European Union in 1957, then known as the European Community and is a charter member and energetic supporter of the North Atlantic Treaty Organization, NATO.

Though relatively small in size, Italy is widely known for its iconic fashion, passionate opera, exquisite cuisine and timeless architectural landscape. Italy had produced some of the most famous artists and explorers in history, from Marco Polo and Christopher Columbus to Leonardo da Vinci and Michelangelo.

Italy's government is made up of a bicameral parliament, consisting of a Chamber of Deputies and a Senate and a separate Judiciary. Its executive branch is made up of a Council of Ministers (cabinet) headed by the prime minister. A new government has just been established headed by Mateo Renzi.

ECONOMY AT A GLANCE

Italy's economic stability rests in the hands of private family run firms that are in the business of processing and manufacturing goods. Since World War II, it has transformed from an almost exclusively agricultural based economy to its rank as the world's fifth largest industrial economy.

The most significant exports include luxury vehicles, scooters and motorcycles. Tourism, food and fashion also play a major role in Italy's economy. With over 37 million tourists flocking to Italy each year the country ranks again as the fifth largest destination for travel in the world.

Because Italy is faced with having scarce natural resources and very little land capable of farming, their main imports are agriculture and energy sources. However, the natural gas reserves coming from the Po Valley and offshore Adriatic have flourished in recent years making it Italy's most significant mineral resource.

Trade with the European Union makes up about 59 % of Italy's total trade with their main trading partners being Germany, France and the Netherlands. Outside of the European Union, Italy's major exporting partners are the United States and Great Britain.

GLOBAL EFFORTS

Italy is still a generous nation when providing poorer countries with aid. Sierra Leone ranked the least developed country after a long civil war received huge financial boost from Italy. This aid will help stabilize a growing agricultural sector in the area and increase food security.

ITALY SNAPSHOT

Official Name:
Republic of Italy

Land Area:
116,346 sq. miles (301,338 sq. kilometers)

Population:
60,681,514

Capital:
Rome

Government:
Parliamentary republic

Prime Minister:
Mateo Renzi

Principal Language:
Italian

Life Expectancy:
77 Years (male);
83 Years (female)

Currency:
Euro

GDP Per Capita (US$):
$36,267

ITALY HISTORY

1915	Joins allies in World War I.
1941	Declares war on USSR.
1948	New constitution formed.
1955	Joins the United Nations.
1994	Freedom Alliance wins election.
1997	Umbria earthquake damages Basilica of St. Frances.
2005	Parliament ratifies EU constitution.
2009	Earthquakes in Abruzzo region lead to relocation of G8 Summit.

Stephen J. Harper

The Right Honourable, Canadian Prime Minister, Stephen Joseph Harper is committed to keeping Canada a strong and independent nation. Mr. Harper is a charismatic visionary who co-founded the Conservative Party of Canada, which was a merger of former parties the Canadian Alliance and the Progressive Conservative Party of Canada in 2003.

Mr. Harper has a long and distinguished resume transcribing a successful political career most notably winning an election for Member of Parliament for Calgary West over his former employer. He served as MP until 1997 when he was appointed as a vice-president of the National Citizens Coalition, a conservative think-tank and advocacy group, and soon was nominated their President.

ENVIRONMENTAL DIRECTION

Prime Minister Harper has pledged to a responsible approach to a safe and healthy environment for the Earth. He believes global climate change is a clear danger to all inhabitants and all gross polluting countries must reach a strict reduction in gashouse emissions.

Mr. Harper works tirelessly towards uniting leaders around the world to agree to a projected reduction of global emissions by half by the year 2050. Mr. Harper has already made aggressive strategies to reduce overall greenhouse emissions by 60-70% by 2050 and 20% by 2020.

Details were published by Canada in a regulatory framework titled "Turning the Corner." These details include federally regulating of emissions reduction, targeting dates to start oil sands operation to perform emissions storage and retrieval, as well as banning the construction of coal plants that contribute to excessive pollution. Prime Minister Harper is preparing Canada to lead the way for all nations to act responsibly for a cleaner, cooler planet.

CANADA ON THE HORIZON

Prime Minister Harper has Canada's most pressing issues at the forefront of his agenda. The areas of federal accountability, tax reform, crime, childcare and health care are said to be his top priorities during his time as Prime Minister. There has also been more attention given to military forces to improve national and worldwide security.

STEPHEN J. HARPER HISTORY

1978	Works in Alberta oil fields.
1991	Earns MA in economics from University of Calgary.
1993	Won seat for Canadian House of Commons.
1997	Lead the National Citizens Coalition.
2002	Wins leadership of Canadian Alliance Party.
2004	Becomes leader of Conservative Party of Canada.
2006	Elected Prime Minister of Canada.

CANADA

Canada occupies most of the upper portion of North America, extending from the Atlantic to the Pacific Ocean and northward into the Arctic Ocean. It is the world's second largest country by total area, and shares land borders with the United States.

The country is filled will natural wonders and beauty. Vast forests offer solace to visitors and a backbone to the economy with the logging industry. Mammoth rivers and lakes are born from snow-capped mountains providing watering holes to unique wildlife. Canada's natural resources are its most invaluable commodity.

The Canadian government is made up of a sovereign head of state, Queen Elizabeth II, head of government, Prime Minister Stephen Harper and the legislative power of parliament. Canada has maintained its own independent foreign policies without external influence, despite its heavy trade relationship with the United States.

ECONOMY AT A GLANCE

Canada is a mixed market, or social market economy, commonly found in Western and Northern Europe during the Cold War. This type of economy looks for a middle ground between socialism and capitalism.

Over the years, Canada has maintained a diversified economy that is heavily reliant upon its abundant natural resources. Roughly 75% of all imports and exports occur with its southern neighbor the United States. Canada has avoided economic recession for several years while keeping unemployment rates to its lowest percentages in a number of decades.

The nation's economic identity is slowly moving away from agriculture, mining and factories to a more knowledge and service-based focus. Retail leads the way in Canada's economic identity employing more than one tenth of the Canadian population and tourism received a significant boost when Canada hosted the 2010 Winter Olympic Games in Vancouver.

The major sector of the country's exported product has always been oil and logging. Canada is one of the few developed nations that is a net

Canada - continued

exporter of energy. Ranging offshore deposits of natural gas and crude oil can be found centered in the province of Alberta. Canada touts the world's second largest reserves of crude oil behind Saudi Arabia.

GLOBAL EFFORTS

Dedicated to aiding developing countries, Canada was recently joined by other nations in funding the creation of various vaccines for third world countries and a call to all other able countries to do the same has been made. Canada has also been providing aid in the form of debt relief to these poorer countries. The main concern is that these countries should not have to focus on the debts of the past, but rather refocus their goals on their future.

Greenhouse gases will be reduced through advances in technology for carbon capture and storage. This process stores carbon dioxide instead of releasing it into the atmosphere. Canada is committed to reducing global emissions by 20% by the year 2020. This goal represents a considerable challenge, however the country believes in its leader's guidance and citizen's willingness to face the obstacles with collective fervor.

CANADA SNAPSHOT

Official Name:
Canada

Land Area:
3,854,085 sq miles (9,984,670 sq.kilometers)

Population:
34,796,000

Capital:
Ottawa

Government:
Parliamentary democracy and Constitutional monarchy

Head of State:
Queen Elizabeth II

Prime Minister:
Stephen Harper

Principal Language:
English, French

Life Expectancy:
76 Years (male);
83 Years (female)

Currency:
Canadian Dollar

GDP Per Capita (US$):
$40,541

CANADA HISTORY

1939	World War II forces active abroad.
1949	Founder of NATO.
1950	Korean War forces help UN efforts.
1965	Present Canadian Flag adopted.
1982	Gains complete freedom from UK.
1991	Forces participate on Gulf War.
2003	An outbreak of SARS hits Toronto.

François Hollande

François Hollande was elected President of France on 6 May 2012. He defeated incumbent President Nicholas Sarkozy. He has served in numerous positions in public service for France. These offices include: National Assembly Member of the National Assembly of France for Corrèze Regional Council, Mayor of Tull and the First secretary of the Socialist Party. Hollande is the second Socialist President of France, following François Mitterand.

ENVIRONMENTAL DIRECTION

Mr. Hollande endorses reducing the share of electricity generated by nuclear power in France from 75 to 50% in favor of renewable energy sources.

FRANCE ON THE HORIZON

As the newly elected President of France, he has many policies that he would like to install in the French government.

Financial system: Back the creation of a European rating agency and the separation of lending and investment in banks.

Education: Supports the recruitment of 60,000 civil servants (new teachers), the creation of a study allowance and means-tested training, setting up a mutually beneficial contract that would allow a generation of experienced employees and craftsmen to be the guardians and teachers of younger newly-hired employees, thereby creating a total of 150,000 subsidized jobs.

Recruitment of 5,000 judges, police officers and gendarmes.

Construction of 500,000 state ruled homes per year, including 150,000 social, funded by a doubling of the ceiling of the A passbook, the region making available its local government land within five years.

The provision of development funds for deprived suburbs.

In early 2013, Hollande authorized the execution of Operation Serval, which aimed to curtail the activities of Islamic extremists in the north of Mali. The intervention was popularly supported in Mali, as Hollande promised that his government would do all it could to rebuild the country.

Return to a deficit of 0% of GDP in 2017.

FRANCOIS HOLLANDE HISTORY

1997	First Secretary of the Socialist Party
2001	Mayor of Tulle
2008	President of the Corrèze General Council
2012	Elected President of France

FRENCH REPUBLIC

France is a country rich in cultural heritage. Paris's monument laden grounds alone make France the most popular choice of destination for tourists. Landmarks such as the Eiffel Tower, The Louvre Museum, and the Alps to the shores of the Mediterranean draw simple conclusion as to why the number of yearly visitors outnumber the countries population itself.

France lends itself to a unitary semi-presidential republic. This means there are two key figures who lead the country; the elected President, Francois Hollande and his appointment of Prime Minister, Manuel Valls.

ECONOMY AT A GLANCE

Now that the initial impact that the global financial crisis has settled, a time for renewed commitment to energizing the economy is here. Ranked as high as 5th largest in the world by GDP, the French economy has crawled to a slower growth in recent years. President Hollande is dealing with a slowly growing economy and the apparent need to reduce France's budget deficits to a reasonable level.

Unemployment has been an issue since the 1970's and has been addressed by the government in the past. The thirty-five hour workweek was introduced to promote a need for employers to hire more workers to fill these available hours. However, this has not led to the desired increase in workers hired as was originally hoped. Other attempts to lower unemployment rates have been tax relief to younger workers entering the workforce, financial incentives to both workers and employers and a relaxation to overtime penalties.

GLOBAL EFFORTS

France has the second largest network of diplomatic missions in the world, second only to the USA.

A few of the major topics already of interest to the French government are climate change, energy security and the Common Agricultural Policy (CAP).

Proposals by the government for greater security for the supply of energy include plans to guarantee needed energy savings and secure contingency plans for lapses in supply. There are also discussions concerning

investments needed to improve infrastructures and rekindle relations with energy supplying nations.

France was presented with an opportunity to shine as a leader and founding member of the European Union. France's recent opportunities have been met with high ambitions and clear goals set for the greater prosperity not only for France, but Europe as a whole.

France is the second largest donor of development aid in the world, behind the US, and ahead of Germany, Japan and the UK. This represents 0.5 % of its GDP, in this regard rating as more generous than most other developed countries. The main goals of this help are "developing infrastructure, access to health care and education, the implementation of appropriate economic policies and the consolidation of the rule of law and democracy.

FRANCE SNAPSHOT

OfficialName:
French Republic

Land Area:
260,558 sq. miles (674,843 sq. kilometers)

Population:
65,350,000

Capital:
Paris

Government:
Unitary semi-presidential constitutional republic

President:
President François Hollande

Prime Minister:
Manuel Valls

Principal Language:
French

Life Expectancy:
77 Years (male);
84 Years (female)

Currency:
Euro

GDP Per Capita (US$):
$44,008

FRANCE HISTORY

1914	Enters World War I.
1936	Enters World War II.
1944	Women gain right to vote.
1954	Enters Algerian War.
1974	Oil Crisis causes recession.
1981	Abolition of the death penalty.
1997	Signing of the Amsterdam Treaty.
2001	Presidential election time changed in the constitution.

Barack Obama

After being re-elected as President of the United States in 2012, Barack Obama has faced many challenges in his second term. The current take-over of the Crimea by Russia has led to the expulsion of Russia from the G8. The situation in the Ukraine will be a major topic in the G7 this year.

The Affordable Care Act (ACA) has finally begun to function as intended. This has provided over 7 million citizens to date with health insurance who were not previously covered by a health insurance plan He has sponsored State Children's Health Insurance Program which will help 4 million more children, including immigrants, receive healthcare with no waiting period. He has issued orders to raise the minimum wage for federal employees to over 10 dollars an hour, in order to help lift many working poor out of poverty.

ENVIRONMENTAL DIRECTION

This will be President Obama's sixth attendance at the G8 Summit. During his current term, President Obama has already made several environmentally sound initiatives.

The American Recovery and Reinvestment Act of 2009 is a stimulus package that was signed into law by President Obama on February 17th, 2009. This stimulus package includes approximately $60 billion in clean energy investments including low income home weatherization, state and local renewable energy and energy efficiency efforts, grants to develop energy storing batteries and an advanced grid system to move renewable energy where it is most used. Additionally, the Obama Administration has created a website to track these efforts, recovery.org.

President Obama directed the Department of Transportation to establish higher fuel economy standards for Model Year 2011 and beyond cars and trucks, enabling them to get better fuel mileage. This direction was made in order to prompt transportation companies to create more innovative energy saving products. Mr. Obama also issued a memorandum to the Department of Energy to develop tougher energy efficiency standards for household appliances including dishwashers, refrigerators and stoves.

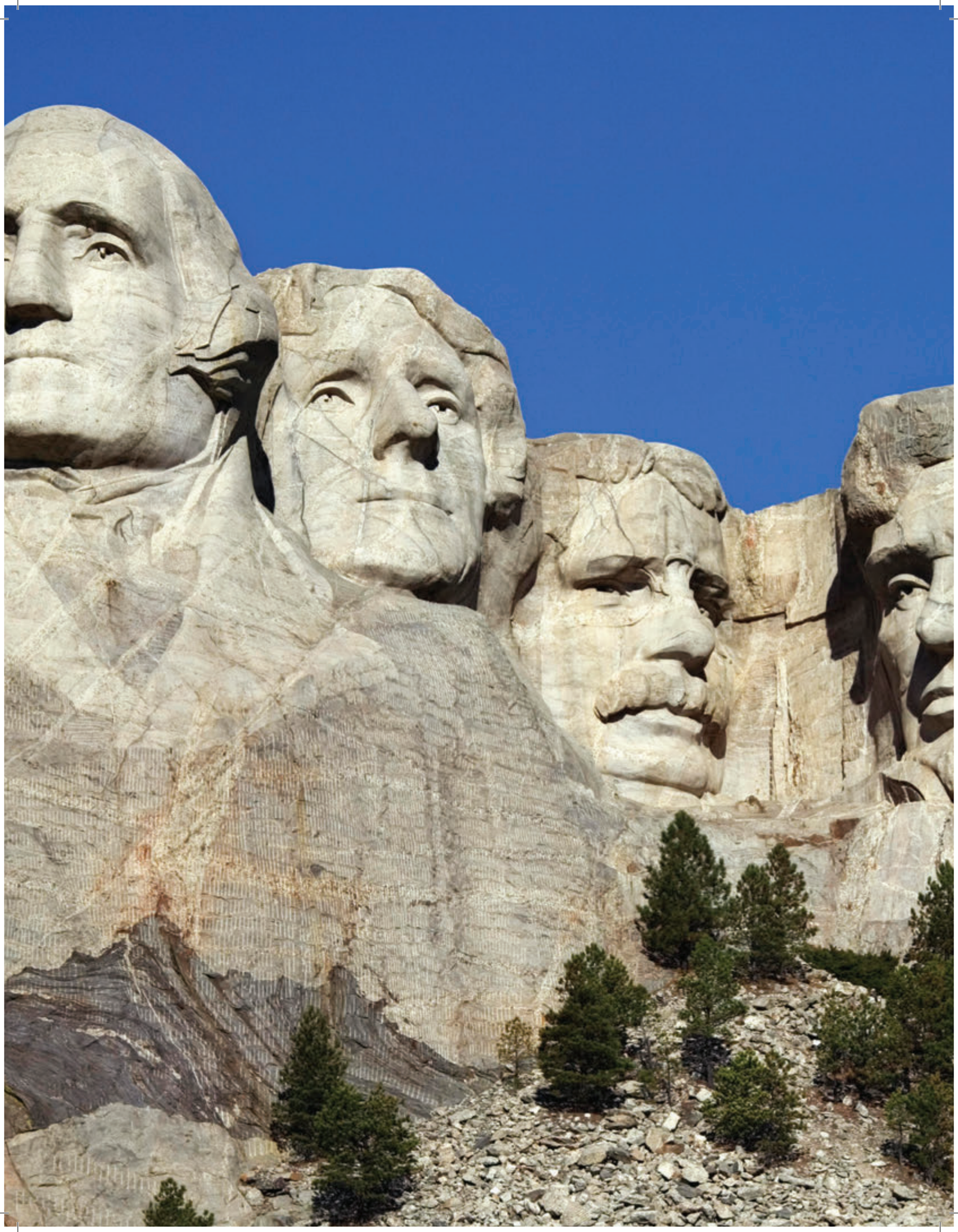
In 2009 he revealed a program to developing renewable energy projects on the waters of our Outer Continental Shelf. These projects include renewable energy that produces electricity from wind, wave and ocean currents.

USA ON THE HORIZON

Barack Obama is currently finalizing the return of American troops from Afghanistan by the end of 2014. This will end the longest running war in American history. He is also fostering a long slow economic recovery from the 2007-2008 financial crisis. With the unemployment rate now down to the 6 percent range the economy is continuing to make upward strides towards pre-crisis levels and beyond.

BARACK OBAMA HISTORY

1961	Born in Honolulu, Hawaii.
1985	Director of the Developing Communities Project.
1991	Receives Juris Doctor magna cum laude from Harvard Law School.1992 Professor of constitutional law at the University of Chicago Law School.
1997	Senator of Illinois.
2005	United States Senator.
2008	Elected President of the United States.
2011	Ordered the military operation that resulted in the death of Osama bin Laden.



THE UNITED STATES OF AMERICA

The United States of America is known as a melting pot of cultures and ethnicities. Known as the land of opportunity, such diversity has sprouted many innovative ideas like the invention of the telephone, motion pictures and motor vehicles, just to name a few.

The United States has fifty metropolitan areas with populations greater than 1 million. The overall growth rate is 0.89%, compared to 0.16% in the European Union.

Operating under a constitutional federal republic, the United States is made up of 50 states and a federal district. It was structured as a democracy regulated by checks and balances set up by the United States Constitution.

ECONOMY AT A GLANCE

The United States has what is considered a capitalist economy comprised of rich natural resources and the labor of converting those natural resources into goods and technologies. It is the world's largest national economy.

The United States is the largest importer of goods, with vehicles as the number one import, and is the third largest exporter in the world, with electrical machinery at the top of the list. Canada, China, Mexico, Japan and Germany are the United States major trading partners and it ranks at eighth in nominal GDP per capita.

After six years of recovery from the worst economic decline since The Great Depression, which began in 1929, the United States is making strong economic gains. Over the past several years, the housing market is beginning to come back as foreclosure rates are finally declining. The unemployment rates have moved down from record highs to nominally good numbers and consumer spending has been increasing. Many foreign trading partners with the U.S. are seeing a rebound in trading activity.

With a politically divided Congress, economic endeavors to increase employment have been struggling between fiscal programs to create jobs such as highway and bridge infrastructure versus economic austerity in the form of federal budget cuts and the reduction of federal workers. Still, consumer spending continues to rise and business investment is increasing.

GLOBAL EFFORTS

The United States has been heavily involved in bringing humanitarian aid to countries world-wide through federal government agencies like USAID. This agency focuses on providing humanitarian efforts to Sub-Saharan Africa, Asia, Latin America and the Caribbean, Europe and Eurasia and the Middle East. The USAID is committed to providing aid by way of economic growth, agriculture and trade, global health and conflict prevention and humanitarian assistance.

More recent humanitarian efforts by the USAID is being focused on aid for the pandemic swine flu, the global fight against the HIV/AIDS pandemic, the global food crisis caused by higher food prices, and addressing the needs of conflict affected areas of Somalia. The USAID counts on continuous charitable donations of money, food and goods that can go to various countries.

Also on the Global spectrum, through the Global Climate Change Policy the United States hopes to reduce greenhouse gasses by 18% over the next decade. The policy, along with other policies that may come into effect soon, helps continue the United States' role in leading support for research regarding climate change, resources in science and technology and working with different institutions to find solutions to the climate crisis.

UNITED STATES SNAPSHOT

Official Name:
United States of America

Land Area:
3,794,101 sq. miles (9,826,675 sq. kilometers)

Population:
313,533,000

Capital:
Washington, D.C.

Government:
Constitutional Republic

Head of State:
President Barack Obama

Principal Language:
English

Life Expectancy:
75 Years (male)
80 Years (female)

Currency:
United States Dollar

GDP Per Capita (US$):
$48,386

UNITED STATES HISTORY

1917	Enters World War I.
1920	Women gain right to vote.
1929	Stock market crashes. Great Depression begins.
1947	Enters World War II after attack on Pearl Harbor.
1965	Enters Vietnam War.
1969	Neil Armstrong is first person to walk on moon.
1974	President Nixon is investigated for Watergate scandal and resigns.
1991	Enters Gulf War.
2001	September 11 attacks.
2003	Invades Iraq.
2008	Barrack Obama first black American elected President of United States.

David Cameron

On 11 May 2010, following the resignation of Gordon Brown as Prime Minister and on his recommendation, Queen Elizabeth II invited Cameron to form a government. At age 43, Cameron became the youngest British Prime Minister since Lord Liverpool, who was appointed in 1812. Mr. Cameron is a descendant of King William IV and was born into a family with both wealth and an aristocratic pedigree.

In his first address outside 10 Downing Street, he announced his intention to form a coalition government, the first since the Second World War, with the Liberal Democrats. Cameron outlined how he intended to "put aside party differences and work hard for the common good and for the national interest." As one of his first moves Cameron appointed Nick Clegg, the Liberal Democratic leader, as Deputy Prime Minister.

ENVIRONMENTAL DIRECTION

The Conservative Government will make Britain greener by tackling climate change and protecting and enhancing the environment. They have pledged to improve Britain's environment by working towards zero waste, providing incentives to recycle, encouraging sustainable water management, and taking action to help our wildlife at home and internationally. In their manifesto, the Conservatives promised "to be the greenest government in our history."

The Conservatives have also outlined plans to modernize the national grid to deliver power more cheaply, subsidize home insulation projects, and make more use of green technologies including electric cars and offshore wind farms.

Publishing his party's "Plan for a Low Carbon Economy," Mr. Cameron said that changes in the way that Britain generates, distributes and consumes electricity will save families significant amounts of money as well as benefiting the environment.

There is an urgent need to improve the protection of their marine environment, as many of their fish stocks have been over-exploited. The Conservatives vow to fight for wholesale reform of the Common Fisheries Policy to encourage sustainable practices, give communities a greater say over the future of their fishing industries, and bring an end to the scandal of fish discards.

DAVID CAMERON HISTORY

1988	Conservative research department
1992	Special advisor, Treasury and Home Office
1994	Head of corporate affairs, Carlton Communications
1996	Married Samantha Sheffield
2003	Shadow deputy leader of the Commons
2004	Conservative party deputy chairman
2005	Leader of the opposition
2010	Apppointed Prime Minister of United Kingdom

UNITED KINGDOM

The United Kingdom is composed of four remarkable regions, which include Great Britain, Northern Ireland, Isle of Man and the Channel Islands. With its distinct landscape made up of breathtaking lakes, rolling hills, picturesque shorelines and dense forests echoing a nation's history, it's no wonder that for its small size the United Kingdom boasts one of the most culturally diverse and compact populations in europe.

The government is made up of a parliamentary democracy and is a member of the european union and commonwealth of nations. The United Kingdom is also a constitutional monarchy with her majesty queen elizabeth ii as head of state.

ECONOMY AT A GLANCE

The United Kingdom's economy is made up of the economies of England, Scotland, Wales and Northern Ireland. As leaders in the industrial revolution they have always had a strong hold on economic development and the service industry has developed considerably, establishing about 73% of the UK's GDP.

From London's Big Ben Clock Tower to the mysterious astral Stonehenge the United Kingdom is known for some of the most recognizable landmarks in the world. Boasting over 32 million tourists in 2006 alone, tourism has always been a very lucrative business for the United Kingdom. In fact, both international and domestic tourists contribute billions of pounds each year towards the UK's economy.

High export revenues can be attributed to the chemical industry and United Kingdom is the leader in financial, pharmaceutical, software and defense industries. Some other profitable endeavors involve revenues from coal reserves, North Sea oil and natural gas with their primary trading partners including many other European Union countries as well as the United States.

GLOBAL EFFORTS

The United Kingdom is constantly looking for ways to stay deeply involved in the growth and welfare of the world. Two of the more pressing issues involve the development of Africa and the World's climate crisis.

Keen interest has been given regarding the future of Africa by backing a debt relief

United Kingdom - continued

agreement. The agreement details that large retailers in the United Kingdom will make strong efforts to use their buying power to assist the developing countries in the world. Already, a million quality fruits and vegetables are being sold in the UK that are grown from these developing countries. This is just a start in the hope to pave a path for big business to assist these evolving countries not only through aid, but through agricultural trade as well.

Active involvement of the United Kingdom in reducing planetary greenhouse gas emissions is one of the central concerns being concentrated on in recent years. They are focusing efforts to make their mark through the many environmental projects and initiatives laid down by the government. UK Scientist and environmental advisors to the government are studying the positive effects of biofuels replacing petroleum-based fuels versus the negative effects of biofuel production. This is to ensure that the loss of plant-life does not outweigh the benefits of our removed dependence on fossil fuels. This is a clear demonstration of the high character in leadership in the United Kingdom, to be responsible in its actions by not simply following guidelines of the established consensus.

UNITED KINGDOM SNAPSHOT

Official Name:
United Kingdom of Great Britain and Northern Ireland

Land Area:
94,060 sq. miles (243,610 sq kilometers)

Population:
62,262,000

Capital:
London

Government:
Constitutional Monarchy

Head of State:
Queen Elizabeth II

Prime Minister:
David Cameron

Principal Language:
English

Life Expectancy:
77 Years (men); 82 Years (women)

Currency:
British Pound

GDP Per Capita(US$):
$38,592

UNITED KINGDOM HISTORY

1914	Enters World War I.
1939	Enters World War II.
1952	Elizabeth II becomes Queen.
1969	Capital punishment abolished.
1979	Margaret Thatcher becomes first woman prime minister.
1994	Channel Tunnel links Britain back to European continent.
2004	English population reaches 50 million.
2010	Gordon Brown resigns as Prime Minister.

José Manuel Barroso

As President of the European Commission, José Manuel Barroso has worked hard to revitalize the public's confidence in the European Commission. Through his vigorous strategies on climate change, European and African economy growth and renewable energy sources, he has helped to sustain a public support around the Globe. Nearly twenty years into his political career he was elected president of the European Commission and re-elected twice.

ENVIRONMENTAL DIRECTION

President Barroso has stated that the economic and financial crisis and the scientific evidence of climate change have shown us that we need to invest more in sustainability. But this is not just about doing the right thing for the future of the planet – Europe stands to benefit enormously from investing in new low carbon technologies for future jobs and growth. Fighting climate change and the move towards a low carbon economy provide huge opportunities for business and people and will enhance our energy security.

First-mover advantages can be gained by exploiting the potential of EU environmentally friendly industries, services and technology through fostering their uptake by enterprises, especially SMEs, and designing the appropriate regulatory environment. An industrial base, which is modernised, to use and produce environmental-friendly technologies and which exploits the potential for energy efficiency is the key to sustainable growth in Europe.

The next Commission needs to maintain the momentum towards a low emission economy, and in particular towards decarbonising our electricity supply and the transport sector – all transport, including maritime transport and aviation, as well as the development of clean and electric cars.

EUROPEAN UNION ON THE HORIZON

President José Manuel Barroso has set his recent attention regarding the continued growth of Europe to issues such as debating nuclear energy, addressing rising agricultural prices and introducing the Treaty of Lisbon.

The shared concern for lowering greenhouse gas emissions has brought new discussion on the pros and cons of looking to nuclear energy as an alternative energy source for European countries. Concentrating on both short and long-term solutions to stabilize food security.

In 2012, Barroso recommended that the European Union be transformed into a federation of nation-states. He stated that this would help deal successfully with the economic crisis that Europe had been experiencing. He also advocated a single supervisory mechanism tying together all the banks in the Eurozone.

JOSE BARROSO HISTORY

1958	Born in Lisbon, Portugal
1999	Name President of the Social Democratic Party and reelected 3 times
2002	Appointed Prime Minister of Portugal
2004	Elected by the European Parliament to the post of President of the European Commission

EUROPEAN UNION

The European Union (EU) is an economic and political union or confederation of 28 member states which are located primarily in Europe. Important institutions of the EU include the European Commission, the Council of the European Union, the European Council, the Court of Justice of the European Union, and the European Central Bank. EU citizens elect the European Parliament every five years.

ECONOMY AT A GLANCE

The EU's share of gross world product (GWP) is stable at around one fifth.

The twelve new member states of the European Union have enjoyed a higher average percentage growth rate than their elder members of the EU. Notably the Baltic States have achieved massive GDP growth, with Latvia topping 11%, close to China, the world leader at 9% on average for the past 25 years. Reasons for this massive growth include government commitments to stable monetary policy, export-oriented trade policies, low flat-tax rates and the utilization of relatively cheap labor. The current map of EU growth is one of huge regional variation, with the larger economies suffering from stagnant growth and the new nations enjoying sustained, robust economic growth. Although EU28 GDP is on the increase, the percentage of gross world product is decreasing due to the emergence of economic powers such as China, India and Brazil. In the medium to long term, the EU will be looking forward to increase GDP growth in Italy and the UK in order to stabilize growth in European Union states. This is to ensure sustained economic prosperity.

GLOBAL EFFORTS

In 2007, member states agreed that the EU is to use 20% renewable energy in the future and that it has to reduce carbon dioxide emissions in 2020 by at least 20% compared to 1990 levels. This includes measures that in 2020, 10% of the overall fuel quantity used by cars and trucks in EU 28 should be running on renewable energy such as biofuels. This is considered to be one of the most ambitious moves of an important industrialized region to fight global warming.

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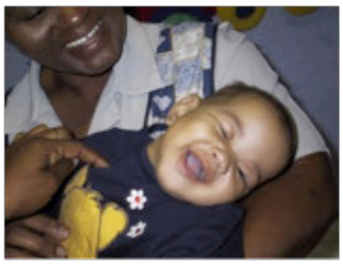
Changing the DESTINY OF CHILDREN

by U-SA & SA Cares For Life

Due to the decade's long epidemic of HIV/Aids and other health issues that are associated with improper nutrition, inadequate sanitary conditions, and abject poverty, more than 3.8 million children are growing up without one, or in many instances, both of their parents. An estimated 160,000 children in South Africa will be orphaned this year by parents who die of HIV/Aids.

U-SA Cares for Life is a charitable fundraising organization in the United States who partners with SA Cares for Life, a twenty year old NGO in South Africa who is dedicated to helping homeless and vulnerable children in their country. U-SA Cares for Life's Executive Director is Rose Pylidis, who works from a West Jordan, Utah office, donating her time to fundraising and developing awareness in the United States. None of the Directors receive any compensation for their efforts on behalf of this organization.



As an example of the work SA Cares for Life provides, Siphi is the fourth child of a young couple who decided together not to have an abortion, but to release this child for adoption after birth. She was born on the 6th of March 2014 in a rural area clinic. After confirming their decision to the nursing sister and the social workers, Siphi was brought to ABBA House on the same day. Marelise, one of our Care Home mothers was ready to take this tiny little girl into her arms and to be her mommy until future decisions would be made for her long term placement in a forever family through adoption or foster care. Most of

these foster care placements eventually turn into adoption and we trust God to open more people's arms and hearts to become foster parents for SA Cares for Life.

ABBA house is the main facility in Pretoria, South Africa for SA Cares for Life to care for abandoned children. ("ABBA Father" are the words Jesus spoke in the Garden of Gethsemane just before his crucifixion. ABBA means "father"). ABBA house provides loving care for children in need and cares for children on a temporary basis until they can be moved into permanent family placements.
Some of the activities sponsored by SA Cares for Life that are funded by U-SA Cares for Life include:

- Sponsoring abandoned children. Contributions allow SA Cares for Life to provide educational opportunities and support for school children. It also provides secure living conditions, medical care and support for child care workers.
- Sponsoring abandoned babies, providing diapers, formulas milk and medical care for the newborn.
- The Community Project teaches parenting skills to care givers in rural communities
- Educational stimulation programs to children ages 0-6 in rural communities.
- Support for birth parents, providing guidance and training as well as basic assistance to care for their children. They also provide ongoing training in life skills, employable abilities and personal development.
- A unique foster care program that allows children to have family placements until they can be placed back into biological family/community family care.
- The organization networks with partners to facilitate adoption placements, where this is in the best interest of the children concerned.
- A Quarterly Newsletter that reports on the goings-on of the program and a description of current needs.
- A Christmas Party for over 800 children in rural communities every year.
- ABBA House is registered as a Child and Youth Care Center.

Volunteer workers are an important resource for ABBA House's success. Some volunteers become Care Home Mothers. Care Home Mothers care for the lives of specific children in their own homes. They have access to all the resources available at ABBA House.

SA Cares for Life also handles the difficult cases of babies who have HIV or AIDs. Taking care of these babies is expensive, but it is crucial to know if a baby is HIV positive in order to give the child the proper diet and medicine. The care that ABBA House gives to children often transforms their lives. This can be seen on in the many stories described in the U-SA Cares for Life website: usacaresforlife.com. The attitude of a child often changes from despair to hope. The goal is to help them become normal, happy children.

ABBA House also does considerable work in helping birth parents. SA Cares for Life helps these men & women learn how to care for their newborn child and also take care of their own

needs as well. ABBA House provides clothing for the newborn and supplies the mother with formula milk to feed them. Clothing and supplies are obtained free of charge for the mother from the Blessings Boutique. The Blessings Boutique is the SA Cares for Life store that stocks the necessary supplies required by the ABBA House. Donations of clothing, non-perishable food items and other child support items are always welcome. The spiritual aspect of life is central to the mission of U-SA Cares for Life and SA Cares for Life. Prayer is a daily activity both for the children and for the workers. The emphasis is on giving these children secure, emotionally stable families that are spiritually strong and can make a lasting difference in the life of a small child.

U-SA Cares for Life also contributes to a girl's camp that is held every summer. This camp promotes educating young girls in terms of good manners, teamwork, coping with life and just having fun.

Contact Information:
For general enquiries / family placement options, please phone Sylvi at 0723591585 or E-Mail her on sylvi@sacares.co.za

To become a volunteer at ABBA House or to become a Care Home Mom please E-mail Janice at volunteers@sacares.co.za

To support us financially to cover medical bills for the babies or keep ABBA House running, to help with the education of small, vulnerable children, or to assist in the community projects, which do so much to change the lives of these most vulnerable children, please sign a debit order or make a donation electronically.

If you are a United States Resident, please contact us at info@sacaresforlife.org. You can donate directly on our website, or we will send you a credit card authorization form, or ACH authorization. Your contribution will receive a receipt, which may be tax deductible.

We are a 501(c) 3 Corporation, registered with the Internal Revenue Service. Our ID# is 20-3678683.

If you live outside the United States, please contribute directly to SA Cares for Life. We are able to provide an Art18A for tax rebates and BEE points.

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Leadership for a Clean Revolution

By Mark Kenber, CEO of the Climate Group

MARK KENBER, CEO OF THE CLIMATE GROUP

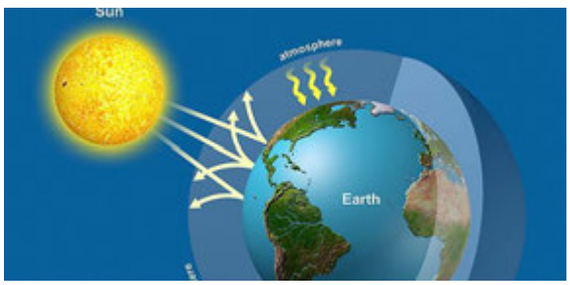
The world's population is projected to rise 16% from 6.9 billion to 8 billion between 2010 and 2025, reaching over nine billion by 2050. The population of the world's cities will almost double by mid-century – equivalent to all the urban development throughout human history being duplicated in little more than half a lifetime. In 1800, only 2% of the world's population was urban. Today, half of the world's people are living in towns and cities, with 180,000 people added to the urban population each day.

In the next 20 years, China alone will build the equivalent of another United States in terms of homes and commercial buildings. At the same time, if current trends continue, the global rich or middle class will shift from less than two billion people today, to more than three billion by 2020, and five billion by 2030. By 2020, 50% of China's population will be middle class.

Some projections suggest that the global economy may triple in terms of purchasing-power parity in just 25 years and more than quadruple in real-dollar terms by mid-century. With this growth comes demand for resources.

PRINCE ALBERT II, MARK KENBER, AND TONY BLAIR AT CLIMATE WEEK NYC 2012

Demand for food will increase by 50% between 2010 and 2030. Demand for water will increase by 40% from 2010 to 2030. Demand for energy will increase by 22.5% from 2010 to 2025. Demand for goods has already increased significantly in the last 50 years and will continue to rise. In the last 50 years, global meat production has more than trebled, milk production has nearly doubled and egg production has increased by nearly four times. Today 1.4 billion tons of steel are produced globally, which is more than seven times as much as in 1950. 1.5 billion TVs are produced today, compared to 40,000 in 1940. And in 2008, 53 million vehicles were produced ***(excluding commercial vehicles)*** compared to just seven million in 1950.



Underlying all of this growth is the energy that cools and warms our homes, lights our streets, cleans our water and runs our vehicles. But there are different forms of energy; those that provide the services we need to meet human aspiration, and those that have brought us to where we are today. Greenhouse gas ***(GHG)*** emissions are

increasing at the fastest rate in history despite the economic downturn - Data show that global *CO2* emissions in 2012 were 58% above 1990 while 20% of the world's population still has no access to electricity. Fossil fuels have brought great development, but the associated impact from *GHG* emissions are limiting our ability to meet the needs of the nine billion people who will live on the planet in 2050.

There is no shortage of fossil fuels in the world. There are 10,000 gigatons of methane frozen in the oceans. But as we have already seen with unequal global food distribution and rapidly depleting forests, consuming too much of anything can have negative consequences. The seven billion people on the planet today are already struggling from the effects of climate change. If we use up our remaining fossil fuels, it will be at the cost of all the effort we have put into meeting universal human aspirations.

TONY BLAIR AND JET LI
VISIT BAIGONG VILLAGE

Despite over 20 years of concerted effort by portions of the global community, we have hit a wall. Fossil fuels have done all they can to provide economic development and now threaten to undo all the good the world has achieved. Each month that we delay in presenting a comprehensive response to climate change not only increases the cost of that response, but reduces the opportunities that a *Clean Revolution* could unlock: cleaner air, resource efficiency, energy security, new employment opportunities and smarter cities.

Not only is the science of climate change clear, it's getting clearer – and now it's showing its impacts. *GHG* emissions increased 33.7% from 1990 to 2007 and then accelerated again after the global recession, increasing 5.9% in 2010, the largest recorded rise in one year. We're not only going in the wrong direction, we're accelerating in the wrong direction. Without further action, by 2017 all CO2 emissions permitted in the IEA's '450ppm CO2e' scenario will be *'locked-in'* by existing power plants, factories and buildings.

The current reality is daunting, but it doesn't have to be. As the many technology roadmaps and experiences of a handful of nations, states, cities and business show, emissions can be reduced. Dangerous climate change can be avoided. Around the world, we have decided that change for the better is the only way. Millions of people now spend trillions of dollars a year to provide a global foundation for education, health, housing, food, water, peace and security. And we must now accelerate efforts to peak and reduce emissions, to secure this universal progress.

The value of leadership

How do we reach this goal? With a combination of bold leadership, a collective sense of urgency to act, and record levels of

public involvement. It is leadership from businesses, governments and innovators that will bring the inspiration and coordination needed to drive urgency and public action.

THOMAS EDISON, JOHN D ROCKEFELLER, AND SIR RICHARD ARKWRIGHT

Our history books teach us that for a revolution to be truly affective it must be led by visionary and inspiring leaders. Every great technological break-through must be championed by those with the resources and platform to influence. From the *Industrial Revolution,* driven by ***James Watt, Sir Richard Arkwright, John D Rockefeller, Andrew Carnegie,*** and ***Thomas Edison*** to the rise of the internet, and information technology again, led by a small group of innovators like ***Larry Page, Sergey Brin, Bill Gates*** and ***Steve Jobs***. Throughout history our lives have been improved by the innovations of a few.

BILL GATES AND STEVE JOBS

Leadership is the most critical ingredient in creating mass change, and climate change is the defining issue of our time. *Global leaders* like ***Mahatma Gandhi, Steve Jobs, Aung San Suu Kyi, Nelson Mandela, Deng Xiaoping, Dr Martin Luther King, Jack Welch*** and many others have driven revolutions in the way we work, think and live our lives. Without leadership from individuals like these, as well as groups and organizations, humanity does not and cannot make great leaps forward. Yet despite numerous policy efforts, technology roadmaps and growing investment in clean technology, nothing has yet garnered the scale or level of action needed to avoid dangerous climate change.

Leadership is vital because within most systems, approximately 80% of the effects can be attributed to 20% of the causes. We believe this principle holds equally for sources of global emissions and emission-reduction solutions: 80% of emissions are caused by 20% of the global population. But 20% of global leaders can deliver 80% of the solution. If the most powerful leaders in business and government – the top 20% of C-suite executives and national, state and city officials – decide to pursue the *Clean Revolution,* it will become a reality.

Henry Ford famously said: *"If I had asked my customers what they wanted, they would have said a faster horse."* People don't envision the future; they just want to modify the present. This is what distinguishes leaders from the rest of society: they not only envision the future, they act decisively to make their vision a reality.

ROGER JOHNSON,

PRESIDENT OF NATIONAL FARMERS UNION

So it is leadership that is the critical ingredient that will decide if, and when, the world will embrace a *Clean Revolution*.

The *Clean Revolution* is a partnership of international statesmen and governments, business leaders and corporations, thinkers and opinion formers. It calls for a swift, massive scale-up of clean energy and infrastructure, and of smart technologies and design.

It aims to create a tipping point for change by inspiring government and business leaders. It presents them with the evidence of the economic opportunities of the *Clean Revolution*, and profiles how innovative leadership is already transforming policies and markets around the world.

DEBORAH FIKES, EXECUTIVE ADVISOR TO THE WORLD EVANGELICAL AT CLIMATE WEEK 2012

The *Clean Revolution* is coordinated by *The Climate Group*, an independent, global, not-for-profit organisation that works with a coalition of companies, states, regions, cities and public figures. We inspire leaders by communicating a compelling narrative for change, equipping them by delivering evidence of success; and working in partnership to drive transformative change.

Together with our partners, we are building a successful low carbon future of opportunity that boosts economies, creates jobs, enhances energy security, improves the quality of life of communities around the world, and averts the crippling impacts of runaway climate change.

EV CAR CHARGING

The Climate Group believes that climate change is an opportunity; the opportunity for us revolutionise business models and create a better world, with lower levels of pollution, innovative technology, better energy access and greater energy security, after all, It can be done, we have revolutionised the world time and time before.

Five traits for low-carbon leadership

In *Leadership for a Clean Revolution*, a report published at the Rio+20 United Nations Global Compact Sustainability Forum in June 2012, The Climate Group outlined five traits we believe every major business and government, needs to embrace by 2015 in order to be a true Clean Revolution leader.

Adopt the new agenda: disruptive low carbon innovation

Disruptive innovation is emerging as the new indicator for Clean Revolution leadership, whether it is in systems, services or technologies that accelerate emissions reductions in the wider economy.

ACTOR HUGH JACKMAN
SPEAKING AT CLIMATE WEEK
NYC 2009

Disruptive innovation for the *Clean Revolution* means changing the way your sector or state interacts with energy. For example, as a consumer-facing company, you might design your entire product line for the low carbon citizen, whereas if you're a news and media company, you might engage the public by creating a societal culture of communication around climate change solutions, policy, science and awareness through multimedia. Even small businesses and governments can have exponential impact in this way.

HIS SERENE HIGHNESS, PRINCE ALBERT II
OF MONACO, AND MARK KENBER
AT CLIMATE WEEK 2012

China-based *Broad Group* has introduced highly insulated, pre-fabricated and easy to assemble buildings to China, and hopes to expand to the developing world. The company's founder, Zhang Yue, is determined to prevent ***'carbon lock-in'*** as nations like China build infrastructure rapidly. In the US, *SolarCity, SunRun* and *Sungevity* have made solar panels affordable for California's residents with their unique business model – they let customers install solar and either lease the panels or buy the produced power at a fixed rate. *SunRun* alone has installed US$1 million in solar panels every day since January 2011.

Embrace low carbon technology

Early adopters drive the market for all new technologies and modes of financing, and embrace clean technology market-making policy. *Clean Revolution leadership* means driving change from the energy system status quo, by adopting low carbon technology and identifying ways that it can deliver wider commercial or social benefit.

TONY BLAIR OF THE CLIMATE GROUP'S
INTERNATIONAL LEADERSHIP COUNCIL AT THE
WORLD ECONOMIC FORUM
IN DAVOS 2013

Low carbon alternatives to conventional technology are evolving rapidly, improving in quality and reducing in price. Business models, financing strategies and policies are following behind technology, but catching up quickly. Leaders will be those that knock down barriers. In November 2010, GE committed to purchasing 25,000 electric vehicles to jump-start the electric vehicle

market in the US, while *La Poste*, France's postal delivery service, is purchasing 10,000 electric vehicles for its fleet. Meanwhile, home furnishing giant *IKEA* is bringing low-cost, efficient *LED* lighting to the broad consumer base, while simultaneously phasing out the sale of incandescent light bulbs.

Reduce emissions now

While setting the stage for a *Clean Revolution*, leaders must simultaneously act today. FT500 companies and developed world sub-national governments must lead by peaking emissions before 2020 and then rapidly declining them.

Global businesses and governments have shown that absolute emission reductions can be achieved in line with profitability and economic growth. The UK's 2008 Climate Change Law set a legal framework to reduce the nation's emissions 80% by 2050. At the end of 2009, the UK had reduced its emissions 13.5% below 1990 levels. Similarly, Germany had reduced absolute emissions 10% below 2000 levels by 2009, while growing its economy. Many businesses have successfully reduced emissions in absolute terms, including multinational companies like *Coca-Cola, DuPont, Nike, Timberland* and *Unilever*, providing proof across many sectors that business can grow, while absolute emissions decline. There are numerous technology roadmaps for business and government to follow to meet emission reduction goals, including those from the *IEA, WBCSD, McKinsey* and *Carbon Mitigation Initiative*.

EVAN WILLIAMS, CO-FOUNDER OF TWITTER ADDRESS CLIMATE WEEK NYC 2012

Operational emission reductions must be the first order of business for every business and government, but they are only the starting point. Continuous improvement over the long term is a basic business tenet that applies to greenhouse gas emissions as well. Managing climate change risks and reducing operational emissions in line with sector responsibility – as laid out by numerous reputable roadmaps – is necessary, but not enough on its own to be a leader.

Align carbon with your other drivers

To reduce emissions now, leaders must align carbon reduction with business and economic needs. Leadership on the *Clean Revolution* must return benefits in the short or medium term. This is especially important for coal and oil-based businesses that have important assets, capabilities and skills whose judicious deployment will be vital to a successful energy transition. Moving beyond oil and coal can harness those advantages in ways that sustain profits, diversify options and manage risks. The firms that lead in this transition will benefit over those lagging behind. This is not merely a matter of normal domestic industrial evolution but of extraordinary competition globally. Change

need not harm their strategic prospects; companies just need to adapt to these new conditions and requirements.

Governments are embracing the philosophy of reducing carbon emissions to grow their economies. South Korea's business community invested US$12.7 billion between 2008 and 2010 as part of the nation's green growth program, establishing Korean companies as major exporters of clean technology. Meanwhile, Scotland is building its economy on the back of its extraordinary renewable energy resources base, producing 35% of its electricity from wind and water resources already and planning for 100% of its electricity generation to come from renewable sources by 2020.

Benefits for all leaders of the *Clean Revolution* may include financial savings, increased competitiveness, job creation, access to energy or raised GDP. Combining carbon strategy and policy with wider objectives increases the chance of both economic success and of creating the momentum needed for a *Clean Revolution*. This action is particularly important in rapidly-emerging economies like Brazil, China and India, whose governments must prioritize quality of life for their developing populations.

Open source your leadership

It is not enough simply to act. Clean Revolution leaders need to communicate on the science, technologies, strategies and policies that underpin climate change solutions in a compelling way, persuading others to join and support them. This means working with a wide range of stakeholders – customers, governments, *NGOs*, media and scientists – and framing climate in the short term and long term. *Nike* is doing just this with its *Nike Better World Open Data Project*,

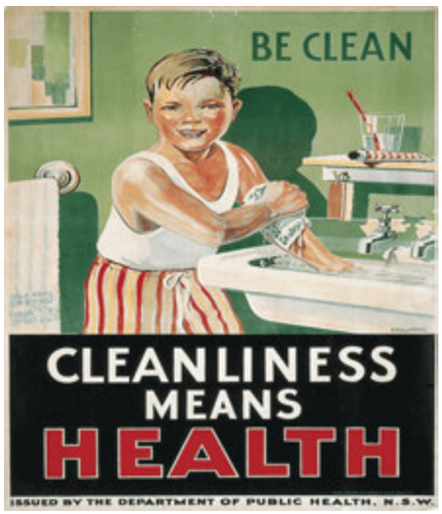
inviting data experts and materials designers to challenge the company to determine what materials are most environmentally friendly.

At state level, Quintana Roo is working in collaboration with land owners, *NGOs* and research institutes and other government levels on a *REDD+* Vision. The Yucatan Peninsula was established by the National Forestry Commission at COP16 as an early initiative area – it is the second-most heavily deforested area in Latin America. Subsequently the states of Campeche, Yucatan and Quintana Roo signed an agreement on a collaborative *REDD+* Strategy for the Peninsula.

Quintana Roo is implementing this strategy in four municipalities ***(Othón. P. Blanco, Bacalar, Felipe Carrillo Puerto and Jose María Morelos).*** It encourages the development of sustainable forests while combining agriculture and livestock activities. As there has never been sustainable ecosystems management in Mexico, the strategy is one of the first efforts to combine tropical forest management with the promotion of agriculture, livestock, forestry, beekeeping, alternative tourism and the use of non-timber. It is a strategy to meet deforestation reduction goals as well as social development goals, as it provides economic and environmental benefits to the communities that own the land.

Leaders must be willing to say what may not be popular. They must be vocal about disingenuous lobbying against peer-reviewed climate change science.

Setting bold targets, sharing success stories and supporting the implementation of low carbon policies are critical elements of leadership. Being a champion involves inspiring other leaders and organizations, as well as working collaboratively with *NGOs*, suppliers, buyers, investors and customers. *The Carbon Disclosure Project* has facilitated climate leadership in the business community, encouraging reporting of emissions to investors. Similarly, the World Resources Institute has worked with governments, scientists and businesses to lay the frameworks for international policy, greenhouse gas emissions reduction best practice and greenhouse gas standards. Leadership coalitions like *The Climate Group*, *CERES* and the *UN Global Compact* are home to today's business and government leaders on climate change, standing up for emission reductions now and continuous innovation going forward. Leadership can become ubiquitous through global companies and powerful governments engaging every branch of their extensive networks.

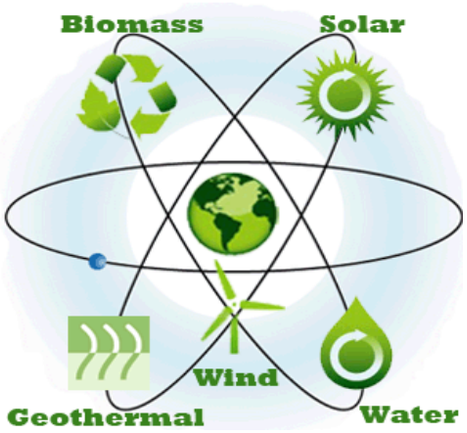


A global Clean Revolution already underway but it needs to be scaled up

One might say that a Clean Revolution is a future *"vision"* of the world or an expensive luxury. Wrong on both counts.

There is solid evidence from all around the world that the *Clean Revolution* is an area of the economy that is resiliently bucking the downturn, continuing to grow, creating jobs and, as a consequence, wealth.

In the United States, a recent report by the *Bureau of Labor Statistics* found that clean-tech jobs are growing at four times the rate of all other job sectors combined. Research by *Google* in 2011 found that breakthroughs in clean tech innovation could generate an extra $155-244 billion of GDP per year in the US from 2030 if the right investments are made now.



It is a similar story at the opposite side of the Atlantic, where the UK's green economy is growing at a rate of 5% a year, while the *Office for Budget* responsibility has predicted that the overall economy will grow by just 0.6% in 2013. As the green economy rapidly expands so too does the demand for skilled workers and as a result, these specialised workers are rewarded with higher than average salaries. In its 2011 US survey, *The Brookings Institute* found the median wage in the clean economy to be 13% higher than the national economy as a whole.

But what about the technologies needed for such a profound global transformation? Well, the technologies are available now. As we speak they are being scaled up all over the world, making real difference in economies – and raising the living standards of those who need it most.

The $100 billion global solar-photovoltaic sector ***(PV)*** is a *Clean Revolution* success story. In just six years, installed capacity has increased 1200% from 5.4 gigawatts (GW) in 2005 to over 65 GW in 2011. With current growth rates solar energy could be providing 10% of the total global power generation by the end of the decade.

As a result of government subsidies and corporate investment, across the globe *PVs* are now becoming competitive with fossil fuels. Countries with higher

electricity prices, such as Germany, Denmark, Italy, Spain and parts of Australia have already reached grid parity. Countries like Japan, France, Brazil or Turkey are expected to reach it by 2015 while the *MENA* region is close to grid parity. In the US, solar *PV* technology is expected to reach grid parity for some *PV* projects in 2014; most regions will reach grid parity by 2017 and China could reach solar power grid parity in most of its regions as early as 2015-2016.

LED ***(light-emitting diodes)*** street lighting is one technology that can help state and municipal governments to reduce carbon emissions, improve public infrastructure and lower economic expenditure. At the Rio+20 UN *Global Compact Corporate Sustainability Forum* in June 2012 *The Climate Group* published Lighting the *Clean Revolution*: The Rise of LED Street Lighting and What it Means for Cities, the findings of an independent, two-and-a-half-year global pilot of LED lamps in 15 separate trials across 12 cities including New York, London, Kolkata and Sydney.

INDIAN GIRLS READING WITH 'LED' LIGHTS

The conclusions of the trials found that LED street lighting can generate energy savings as high as 85%, a valuable saving for a public body in the current economic environment. As a consequence of these high energy savings, 670 million tons of greenhouse gas emissions every year are saved. As well as the economic and environmental benefits, the report also analysed the social benefits attributed to LED street lighting. Surveys in Kolkata, London, Sydney and Toronto indicated that citizens preferred LED lighting, with 68% to 90% of respondents endorsing city-wide rollout of the technology. As a result of the pilot's findings, *The Climate Group* together with Philips, report co-author, are calling for a new international low carbon lighting standard. We want to see all new public lighting – both street lighting and in public buildings – LED by 2015, with the aim of all public lighting being LED by 2020.

THE EDISON SEARCHLIGHT

Another technology on the cusp of the tipping point of becoming mainstream is *Electric Vehicles* ***(EVs).*** Indeed in California last year, Toyota sold 60,688 Prius hybrids making it the bestselling passenger vehicle in the state. This was a phenomenal 78% increase over 2011 sales, during a year in which gas prices in the state reached a record high $4.67 per gallon.

Last year the global management consultancy, *McKinsey & Company*, analysed the outlook for the *EV* industry and concluded that *EVs* would become cost-competitive with conventional vehicles as the price of a lithium-ion battery pack falls from its current level of $500-$600 per kilowatt hour ***(kWh)*** to $200 per *kWh*. *McKinsey & Company* believe that the decline in battery prices could occur as early as 2020 as a result of manufacturing at scale, lower component prices, and advances in battery technology.

In the United States, the *Department of Defense* ***(DOD)*** announced that it is planning to invest $20 million to incorporate up to 500 vehicles to grid ***(V2G)*** capable electric trucks, buses and related infrastructure into its non-tactical fleet in 2013. *DOD* estimates that the money saved through such a system will cover the upfront investment in 10 years, while providing valuable insights into the value of the vehicles' energy storage potential. If the project goes as planned, the next step will be to expand to as many as 1,500 vehicles at 30 installations nation-wide.

Established technologies like solar and LEDs are illuminating the way for many other emerging clean tech innovations, but the scale-up of these technologies must be accelerated.

CECIL WILSON, FORMER PRESIDENT OF AMERICAN MEDICAL ASSOCIATION AT CLIMATE WEEK NYC 2012

Catalysing the low carbon *Clean Revolution* requires visionary, transformative leadership from businesses and statesmen from all areas of society. At *Climate Week NYC 2012*, an eclectic and surprising mix of global leaders and innovators joined *The Climate Group* to call for an *American Clean Revolution*. Former ***UK Prime Minster Rt. Hon Tony Blair*** led the calls: *"Combating climate change is massively in our best interest if we want higher energy supply security, lower costs and a better life. As global citizens we are going to continue to be agitating for a solution to this problem which is absolutely critical to the future of human progress."*

Also speaking at *Climate Week NYC,* ***Evan Williams*** co-founder of *Twitter*, acknowledged the crucial role that innovative technologies will play in the low carbon economy: *"America's long history of prosperity*

was built by entrepreneurial innovators in science and technology. These visionaries imagined and then created a new and better way of doing things which was the catalyst for a century of prosperity. We need powerful new thinking in that same vein in order to challenge and transcend the limits of our high-carbon economy with clean energy innovation."

We have the technology. We have pockets of outstanding business and governmental leadership. Together with other drivers, such as resource scarcity and consumer demand, the transition to a low carbon economy is looking increasingly inevitable. But timing and scale remain key issues. The science dictates that this transition must occur at a vastly quicker rate than business as usual. Unlike the organic waves of revolutionary transformations in the past, it is clear that the *Clean Revolution's* transition needs to be quicker, ambitions greater, and actions stronger.

Thomas A.Edison, inventor of the first commercially practical incandescent light said that, *"opportunity is missed by most people because it is dressed in overalls and looks like work."* There are corporations, governments and communities across the world already capitalizing on the opportunities that a low carbon economy can bring. We cannot allow ourselves to miss out on the economic and social opportunities of the *Clean Revolution* because *'business as usual'* appears to be an easier option. We can reduce emissions and at the same time meet growing energy demands. And we can do this in a way that will support economic growth, create jobs and enhance social conditions across the globe. Underpinned by innovative leadership, *The Clean Revolution* provides a positive and inspiring vision of tomorrow while answering the economic and political imperatives of today.