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FOREWORD

Eight years ago I joined with a global group of CEOs and political leaders in London, to launch The Climate Group, recognizing a new generation of leaders that saw strong links between action on climate change and improved financial and economic performance. In recent years the financial crisis and struggling international negotiations have led many in business, government and the media to downgrade the importance of climate change and wider efforts on sustainable development. But on the eve of the Rio+20 conference, I believe that urgent action is more relevant than ever to today’s challenges, and that it remains fundamentally aligned with our economic success.

In the late 18th century the Industrial Revolution started in the UK and spread around the world, sparking an unprecedented period in human development. It was driven by a handful of visionary leaders. People like James Watt, Sir Richard Arkwright and – later – John D Rockefeller, Andrew Carnegie and Thomas Edison. The benefits of transformation they drove are undeniable, from improved sanitation and health to longer life expectancy and reduced poverty.

More recently, the rise of the internet and information technology – again led by a small group of innovators and pioneers like Larry Page, Sergey Brin, Bill Gates and the late Steve Jobs – has enabled our lives and connected us in new and unexpected ways. Today, radical change, from the rise of the emerging economies to rapid urban growth, has arguably become the new norm.

But our growth model has also brought the challenges of resource depletion, environmental degradation and climate change, a recognition that catalyzed the first Rio Earth Summit in 1992. Twenty years on and despite valiant efforts, we have reached the point where radical change is again required to ensure our continuing human development in the face of an increasingly resource-constrained world.

Success means a new industrial revolution – one built on a swift, massive scale-up of clean technology, green infrastructure, smart design and resource-efficient behavior. It can solve climate change and resource depletion and secure a better, more prosperous future for all. Critically it can also meet our shorter term interests - creating high-value jobs, boosting competitiveness and improving energy security.

Clean energy investment already creates more jobs than coal or natural gas. By the end of the decade, the low carbon market will be worth more than US$2 trillion. China, now the world’s fastest-growing market for renewable energy, has placed clean technology at the center of its economic growth plans. In Brazil, more than US$8 billion has already been invested in clean energy.

This report makes the case that this new Clean Revolution again hinges on bold leadership in the spirit of Watt, Carnegie and Edison. As Chair of The Climate Group’s International Leadership Council, I will be working to help convene, inspire and enable this new generation of leaders from around the world. They are already driving clean energy, alternative fuels, resource-efficient innovation and low carbon products and services.

Together we can make the Clean Revolution a reality.

Tony Blair
PREFACE

Last September we introduced The Clean Revolution; a campaign to inspire, catalyze and enable the world’s most influential business, government and thought leaders to take transformative action on climate change, creating a tipping-point for the low carbon economy.

Since then, we have spoken to a wide range of business and government leaders around the world. Based on these conversations, we developed this manifesto on Clean Revolution leadership and our rationale for why we need it now. We have found plenty of examples of leading action along the way. In building our case we have matched the latest thinking on climate policy, technology and science, with a practical set of characteristics and actions that are exhibited to varying degrees by global sustainability leaders today, and that we believe need to become mainstream by 2015.

History shows that it is only through leadership that real change can happen. Leadership that provides a positive and inspiring vision of tomorrow, while answering the imperatives of today. To make the Clean Revolution a reality, we understand that decision makers need a clear, pragmatic and compelling set of arguments on both the urgency for change and the opportunity presented by taking a leading role.

In this report we begin to highlight that opportunity, and to examine the emerging characteristics of innovative leadership that we are seeing in our network. Through The Clean Revolution Campaign, we and our partners will continue to develop this vision of leadership. We welcome your feedback and input into this process as it evolves.

Our goal is to show the world’s most influential decision makers that the Clean Revolution will create jobs, boost economic growth, and secure a better, more prosperous future for all: laying the foundations of both current and future leaders’ legacies.
SECTION 1: INTRODUCTION

THE OPPORTUNITY

We live in the most exciting time in history. At the Rio+20 Earth Summit conference we will sit at a crossroads that did not exist in 1992: where we can see the promise of clean technology becoming a reality and witness environmental action accelerating at all levels, while also experiencing the first impacts of an increasingly unstable climate.

To paraphrase novelist William Gibson, the positive future for humanity is already here, it is just distributed unevenly – and whether it will win out remains very uncertain. As the world crawls out of an economic recession, we have a profound choice. We can continue business as usual, or deliver health, wealth, education and prosperity through clean energy: the Clean Revolution.

Many cities, companies and regions today can already give us a glimpse of a world transformed by the Clean Revolution. A world where 100% of energy is clean, with clean water and clean energy available to all, and minimal fuel poverty and conflict over resources. A world where streets are lit by smart LED lights, vehicles are fuelled by electricity and advanced biofuels, and buildings produce their own clean energy.

Humanity has faced similar crossroads in the past and, time and time again, we have chosen to lead. From a wealth of examples, here are two. We eradicated small pox: fifty million people a year contracted the disease in the 1950s, while by 1980, the number of cases was zero. Global life expectancy has since risen dramatically, with a 15-year increase in 50 years (1960 - 2010).

A Clean Revolution will create the same monumental, positive change. A stable climate will enable the world to continue to develop peacefully. Clean energy provides wealth and health by offering access to energy for the 1.4 billion people in remote rural areas who currently don’t have it, using solar power and advanced batteries. It improves the world’s health and education by supplying stable electricity where centralized electricity is unstable. Imagine a peaceful, clean, smart and happy world for our children, free of oil spills, air pollution-induced asthma and coal mining disasters. That’s what the Clean Revolution will bring, benefitting the economy, the environment and humanity. We can do it. We can create that clean, smart, prosperous world. But we must make the choice now.

“WHAT WE HAVE BEFORE US ARE SOME BREATHTAKING OPPORTUNITIES DISGUISED AS INSOLUBLE PROBLEMS.”

- John Gardner, 1965 speech
THE CLEAN REVOLUTION

The future we want for our children requires a stable climate.
The technologies, policies, financing and business models available to us today have the potential not only to drive rapid carbon reductions, but also to create the future we want. By addressing climate change we will—and must—meet a host of other human needs: improved air quality, energy security, economic development and increased productivity. Even more than that—a low carbon future can help to solve other urgent resource, environmental and health challenges. If we do nothing, young people alive today will inherit a stranded high-carbon energy infrastructure, which would require about 13,000 large new coal plants. But if we act now, we can seize the opportunities of the Clean Revolution and start to secure the future we want.

We have less than five years to get major economies to agree to significantly reduce emissions, but we already know what we must do.
The good news is that we know what actions we need to take today to accelerate a Clean Revolution. We know from experience what policies will work. We know what investment is needed. We already have much of the technology we need. And we understand the science that underlies a Clean Revolution. While the general consensus on mitigating climate change points towards peaking global CO\(_2\) emissions by 2020 and decreasing by 2-3.8% per annum thereafter, some studies now project that much more radical action will be required to ensure a reasonable chance of containing global temperature rise to within 2°C. Under either scenario, we are left with less than four years to produce a global agreement, and less than nine years for it to come into force. This timing reflects what has already been agreed between governments at the UNFCCC Durban Climate Change Conference in 2011. Meanwhile, we must meet the social, energy, mobility, housing, food and water needs of a projected global population of nine billion people by 2050—at least five billion of whom will make up the global middle class—as well as drive out poverty from broad swathes of society: two challenges that are mutually dependent. The only way we can achieve this is to change the way we produce and consume.

We need greater investment, but long-term total cost is small—or zero.
Total investment for key technologies to meet these goals between now and 2050 is significant, but manageable. We need annual investment in low carbon energy technology to grow to as much as US$600 billion per year by 2020. National energy security and public sector research and development (R&D) spending on low carbon energy technology needs to increase to above US$40 - 50 billion per year as soon as possible. McKinsey & Company estimated that with an oil price of US$60 per barrel, the incremental cost of additional investment would be US$400 billion per year in 2015, rising to US$1 trillion per year in 2030. At US$120 per barrel, however, the cost over the period would be small or even zero. With oil currently close to US$100 per barrel, the low-cost prospect looks favorable. For comparison, analysts identified US$440 billion in oil payments by the United States in 2008. The International Energy Agency (IEA) has estimated this level of incremental investment could translate into US$112 trillion in fuel savings in 2050.
There are three core policies all governments need to adopt: a price on carbon, energy efficiency and technology RD&D.

Financing and deploying these technologies requires the right incentives and regulation. The Intergovernmental Panel on Climate Change (IPCC), IEA and many academics that study global policy’s role in creating a Clean Revolution, emphasize the critical function of 1) technology policy (RD&D), 2) a price on carbon and 3) efficiency policy. The specifics of policy frameworks can and should vary by region, but all should integrate short-term emission reductions and longer-term technology support, using these three building blocks.

Technology roadmaps vary in the deployment of technologies, especially in the amount of nuclear power and carbon capture and storage (CCS) proposed, but all agree that emission reduction goals can be met at minimal direct cost with generous co-benefits.

Technology roadmaps agree: with efficiency, fuel switching and renewables we can peak emissions by 2020.

Businesses and governments can choose from a variety of technology options to adopt. Emission scenarios have been developed by the IEA, IPCC, the World Business Council for Sustainable Development (WBCSD), Rocky Mountain Institute and others that each use a different set of technologies but meet emissions goals. Most scenarios focus on efficiency, fuel switching, wind power, hydropower, an increased use of solar power, and RD&D for less developed technologies like cellulosic biofuels, CCS, fuel cells and hydrogen, to peak global emissions by 2020. IEA’s BLUE Map scenario includes continued use of fossil fuels to meet climate goals, with emission reductions provided by 38% end-use fuel and electricity efficiency; 15% fuel switching end-use; 5% power generation efficiency and fuel switching; 6% nuclear; 17% renewables; and 18% CCS.

An all-renewable energy portfolio is not a fantasy for many parts of the world.

For example, Mark Z. Jacobson of Stanford University has modeled an all-renewable energy scenario to meet emission reduction goals using wind, water and sun. In Jacobson’s scenario, wind supplies 51% of the energy demand, provided by 3.8 million large wind turbines (rated at five megawatts each) worldwide. Another 40% of the power comes from photovoltaics and concentrated solar plants, with about 30% of the photovoltaic output from rooftop panels on homes and commercial buildings. About 89,000 photovoltaic and concentrated solar power plants would be needed – averaging 300 megawatts apiece. The mix also includes 900 hydroelectric stations worldwide, 70% of which are already in place. Similarly, Graeme Hoste of Stanford University recently calculated how a mix of four renewable sources could generate 100% of California’s electricity around the clock, on a typical July day in 2020.
THE WORLD IS UNDERGOING A PERIOD OF IMMENSE GROWTH THAT HAS NO PARALLEL IN HUMAN HISTORY.
The world is undergoing a period of immense growth, unparalleled in human history.

We are on track for a population of nine billion people by 2050, living mostly in cities.

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. The predicted global urbanization rate in 2030 is 75%.

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 world will shift from less than two billion people being rich or middle class today, to more than three billion by 2020, and five billion by 2030. By 2020, 50% of China’s population will be middle class.

The world is getting richer, faster than ever.

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. 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.

Fossil fuels have driven development to date, but are now inadequate for global energy needs.

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 emissions are increasing at the fastest rate in history (5.9% in 2010), while 20% of the world’s population still has no access to electricity. Fossil fuels have brought great development, but the associated impact from greenhouse gas 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 almost 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.
Climate change gets more expensive to address the longer we wait to acknowledge it.

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.\(^{\text{29}}\)

Not only is the science of climate change clear, it’s getting clearer – and now it’s showing its impacts. Global greenhouse gases (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.\(^{\text{30}}\) We’re not only going in the wrong direction, we’re accelerating in the wrong direction. Without further action, by 2017 all CO\(_2\) emissions permitted in the IEA’s ‘450ppm CO\(_2\)’ scenario will be ‘locked-in’ by existing power plants, factories and buildings.\(^{\text{31}}\)

Climate change will roll back economic and human development if left unchecked.

If we don’t act, climate change will eliminate much of the improvement in child malnourishment levels that would happen with no climate change. Because of climate change, calorie availability in 2050 will not only be lower than in the ‘no climate change scenario’, it will actually decline relative to 2000 levels throughout the developing world.\(^{\text{32}}\) By 2050, the decline in calorie availability will increase child malnutrition by 20% relative to a world with no climate change. As GHG emissions increase at unprecedented rates, and as scientific understanding improves, the politically-accepted target of limiting warming to 2°C begins to look risky.\(^{\text{33}}\) At the same time, the delay in action is making even this target harder to reach: global emissions need to peak by the end of the decade, by 2020, to stay within two degrees.

The road is steep, so we must act now.

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.

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 iconic businesses, governments and innovators that will bring the inspiration and coordination needed to drive urgency and public action. So it is leadership that is the critical ingredient that will decide if, and when, the world will embrace a Clean Revolution.

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.
THE SHORT-TERM CASE FOR LONG-TERM LEADERSHIP

Today, climate change is a classic principal-agent problem, where those who are the first to feel its impacts are not the same people who are benefitting economically from releasing carbon emissions. But leadership is not only a moral choice. It benefits business and government alike to lead in the short and medium term, at both an organizational and personal level.

Dominic Barton, Managing Director of McKinsey & Company, has spent two years meeting with business and government leaders to conclude that economic growth relies on shifting to ‘long-term capitalism’, with five to seven-year business planning, rather than focusing only on quarterly returns. Even before the recession of 2008, former US Secretary of State George Schultz explained how leading on long-term macro issues such as eliminating waste and staying competitive on job growth, investment and energy security, benefits businesses acting in a world “awash with change”. Many government and business leaders experience the short-term case for long-term leadership firsthand, especially when proposing large infrastructure projects, supporting preventative health care and educating children.

"THE DIFFERENCE BETWEEN WHAT WE DO AND WHAT WE ARE CAPABLE OF DOING WOULD SUFFICE TO SOLVE MOST OF THE WORLD'S PROBLEMS."

- Mahatma Gandhi
IN THE LAST FIVE YEARS, THE WORLD HAS SEEN VISIBLE PROGRESS TOWARDS A CLEAN REVOLUTION.
But despite policy lagging, we reached a tipping-point in global energy production during 2010, when 50% of new electric power capacity came from renewable sources.

SECTION 2: PROGRESS TO DATE

While there is still a significant gap in technology deployment, investment and strong policy and leadership, the world has made visible progress towards a Clean Revolution in the last five years.

Businesses and governments have proven there is an abundance of actions and technologies available to significantly reduce CO₂, some of which can lower emissions in line with global goals. Even more promising is the accelerating decline in the price of clean technology over the last five years, especially for batteries, solar energy and wind power.

Globally, we have a patchwork of policies across sub-national governments that have pushed technology deployment at various paces, and many nations have also developed their own culture of supporting climate change action.

But despite policy lagging, we reached a tipping-point in global energy production during 2010, when 50% of new electric power capacity came from renewable sources. By 2020, wind, wave and hydro power are expected to be 4¢ per kilowatt hour or less, compared to the 7¢ per kilowatt hour average cost of conventional power generation and transmission in the United States in 2007. Onshore wind and solar photovoltaic (PV) annual growth rates have been 27% and 42% respectively over the last decade.

Renewables are now the fastest growing sector of the global energy market. Global investment into clean energy since 2004 reached $1 trillion in November 2011.

The Amazon rainforest may be one of the greatest examples of GHG emission trajectory change in the world. Deforestation rates in the Brazilian Amazon fell by 11.7% from August 2010 to July 2011, reaching the lowest rates recorded since 1989 for the third consecutive year, according to data from the National Institute of Space Research, INPE.

In the United States, progress is clear: more Americans now work in renewable energy and energy-efficiency installation than in the entire coal industry.

CURRENT AMBITION: TARGETS AND COMMITMENTS TO DATE

International

At the 2010 Major Economies Forum, policymakers and economists agreed that the US$400 billion of global subsidies for fossil fuel without carbon capture must be phased out as soon as possible. This will level the playing field for low carbon energy and mobility, and divert limited public funds to clean technologies to create long-term value for taxpayers and the wider population. The global carbon budget, agreed through the UNFCCC, is 2°C or less.

However, these policies have yet to be implemented. In its Global Policy Tracker, Deutsche Bank reviewed 612 major policies and estimated that if all of them were implemented in the largest emitting countries, emissions would still rise to 49.8 gigatons of CO₂ in 2020, which is 5.8 gigatons higher than what we need for stabilization, roughly equivalent to annual US emissions.

National goals

There are many good examples of Clean Revolution leadership among national governments that have committed to renewable energy goals and adopted climate change policies. One is the Government of Denmark, which has adopted an ambitious climate policy committing to reduce GHG emissions 40% from 1990 levels by 2020 through domestic action. This brings Denmark in line with the level of reduction proposed by the Intergovernmental Panel on Climate Change (IPCC), as well as with several other Nordic and Northern European countries like...
Norway, which has committed to a 30% reduction by 2020 and carbon neutrality by 2030. Also, by 2020, 50% of electricity consumed in Denmark must be generated by wind turbines, up from around 25% today. This means a steep increase in offshore wind, alongside an expansion of onshore wind. Transportation and agriculture are also essential parts of the new plan.

In Asia, South Korea has agreed to reduce its emissions 30% below reference emissions in 2020, which is 4% below the 2005 value. In the Americas, Costa Rica aims to become carbon neutral by 2021, reducing its fossil fuel emissions and increasing its carbon sinks so that net emissions are zero. Mexico has also committed to reduce emissions to 30% below business as usual (BAU) by 2020, conditional on international financial support.

Sub-national governments

Sub-national governments have played a significant role in experimenting with climate policy and technology, often being the first actors in a given region or nation. In The Climate Group’s ‘Clean Revolution Leadership from the World’s States and Regions’ report, we highlight many examples of Clean Revolution leadership, so we will only highlight one significant example here: the world’s 8th largest economy, the state of California in the United States.

California enacted the Global Warming Solutions Act of 2006, or AB32, the first comprehensive climate change law in the United States. The GHG rules and market mechanisms adopted by its Air Resources Board took effect – and became legally enforceable – on January 1, 2012. GHGs will be reduced 2% each year through 2015, and 3% from 2015 to 2020, through eight key strategies:

- A cap and trade program covering 8% of emissions;
- A goal of getting 30% of energy from renewable sources by 2020;
- Setting energy-efficiency appliance standards;
- Tackling high global warming potential (GWP) gases;
- Reducing agricultural emissions;
- Reducing transportation emissions by adhering to the ’Pavley Standards’;
- Waste and recycling; and
- A forestry and industry audit of the largest 800 industrial sources.

Many others, including major emerging economies like China and India, have set themselves similar targets.
SECTION 2: PROGRESS TO DATE

Many world cities are taking a lead on clean technology, energy efficiency and renewable energy. The C40 group of world cities had by 2011, taken 4,734 targeted actions between them to tackle climate change. The Climate Group’s LightSavers project has seen ten world cities, including New York, Sydney and London trial highly efficient light-emitting diode (LED) street lighting. Finally, the Living Labs Global Award is working with 20 cities to accelerate the identification and deployment of ‘smart’ information technology-enabled solutions to environmental and social challenges.

Corporations

Fortunately, many global businesses are continuing to increase climate change action, despite a lack of long-term international agreement from the world’s major emitting countries. Research from The Carbon Disclosure Project (CDP) says that of 396 of the world’s largest companies, 68% have climate change at the heart of their business strategies, compared with 48% in 2010. There was also a marked rise in the number of companies reporting reduced GHG emissions as a result of emissions reduction activities (45%, up from 19% in 2010). Additionally, 74% of the Financial Times’ Global 500 respondents reported emissions reduction targets, up from 65% in 2010.

NEXT STEPS

While national, sub-national and business leaders have accelerated progress on climate change, much of the world has continued on a ‘business as usual’ track. As economies grow and stimulus packages – many focused on ‘green growth’ – expire, the world must now review its course. There is a risk that clean technologies could fall into a market technology chasm, without governments leading with long-term policies on carbon, efficiency and technology RD&D.

Leadership by government and business alike will be a combination of long-term commitment and short-term action. All national and sub-national governments must make critical decisions. Long-term energy and transportation infrastructure decisions made today will determine global emissions in 2030 and 2050. With the declining price of natural gas in the United States and the Caspian region, it is time to decide if coal without CCS is unacceptable, and if gas can be used to transition from coal to CCS and renewable energy only. National governments must set a 2020 peak emissions target with 1) a carbon price 2) an energy efficiency target and 3) RD&D support policies. With this type of decisive, determined leadership by government, business will compete in energy markets to meet global emission reduction goals and lead the world to a Clean Revolution.
LEADERSHIP IS THE MOST CRITICAL INGREDIENT IN CREATING MASS CHANGE.
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.

WHAT DOES CLEAN REVOLUTION LEADERSHIP MEAN?

A better understanding of the state of leadership on climate today shows us how we can unlock the Clean Revolution at pace and scale. We believe that the leadership we need is both organizational, from trailblazing companies and governments, and personal, from CEOs, bureaucrats, elected politicians, innovators and entrepreneurs acting as champions for change.

Clean Revolution leadership comes from drivers ranging from a sense of moral duty through to the bare-faced pursuit of economic gain. We believe both ends of this spectrum are equally meaningful and that multiple drivers reinforce greater leadership. While nuanced for each person and organization, we believe that four core drivers – sustainability, financial gain, competitive advantage and social development – account for the majority of Clean Revolution leadership today.

So what constitutes true leadership? We propose five traits that we believe every major business and government, including elected leaders and executives, should embrace by 2015. We also suggest indicators of Clean Revolution leadership that can be aligned with each trait.
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.

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.

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.

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. We go into more detail about the economic benefits of LEDs in our report ‘Lighting the Clean Revolution’.
3

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.

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.

4

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.

5

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.

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.
INDICATORS OF LEADERSHIP

The following table proposes indicators of leadership for highly influential individuals, businesses and governments, considering a 2015 - 2020 timeline. For personal indicators, we have drawn on the pioneering work of Professor Clay Christensen, who spent eight years identifying the ‘DNA of Innovators’, analyzing case studies in business and government to define Clean Revolution leadership. We will continue to evolve and refine these observations through the life of the Campaign, and in conversation with business and government leaders in ‘Clean Revolutionary’ organizations. Organizational indicators are based on The Climate Group’s observations of leading companies and governments.

### Personal indicators (business and government leaders)

- Setting decisive public targets to reduce absolute emissions 3% per year and initiating transformational actions that enable others to reduce emissions as well.
- Taking risks and experimenting with climate change solutions.
- Continuously calling for innovations and disruptive actions from employees and peers.

### Business indicators (organizational)

- Executing a major play in a low carbon business, product or service with appropriate investment in R&D, marketing and deployment.
- Merging sustainability and innovation functions within the organization.
- Moving towards zero waste and closed loop systems by 2050.
- Tracking and reporting growth of new business units that are delivering low carbon solutions.

### Government indicators (organizational)

- Leading RD&D of low carbon technology by doubling investment by 2015 (as agreed by the Major Economies Forum).
- Establishing low carbon technology prizes (national).
- Reforming urban planning, transportation systems, water systems for climate change mitigation and adaption.
- Creating low carbon technology hubs to support job growth and economic development as part of RD&D plans.
EMBRACE LOW CARBON TECHNOLOGY, POLICY AND FINANCING

Adopting a portfolio of proven low carbon technology (70% of technology needed to solve climate change is commercial today).

Eliminating ‘business as usual’ energy use within your organization.

Achieving the following targets by 2020:
- 100% LED lighting
- 100% electric or low carbon fuel transportation
- adopting New Energy (renewables and nuclear) in line with IEA Blue Map goals
- 20% energy efficiency achieved through SMART technologies
- zero net contribution to deforestation.

Adopting World Business Council on Sustainable Development’s ‘Road to 2050’ principles and goals.

Achieving the following targets by 2020:
- three core policies: carbon pricing, energy efficiency and technology RD&D
- eliminate coal without CCS
- 100% LED lighting.

Implementing a low carbon fuel standard and electric vehicle policy.

Adopting New Energy (renewables and nuclear) development in line with IEA Blue Map goals.

Moratorium on fossil energy infrastructure deployment, and phase-out of fossil fuel subsidies.

Smart City Development underway in all cities with population of over three million.

REDUCE EMISSIONS NOW

Continuously championing targets, goals and emission reduction achievements of your organization.

Initiating sector leadership goals for emission reduction to meet the global need to peak emissions by 2020.

Aiming for 3% per year reductions in GHG emissions (Scope 1, 2 and 3) and demonstrate progress against this.

Setting a ‘Future Back’ plan for your company for 2020 - 2050: what world do you want to create?

Setting targets in line with IEA Blue Map for technology, UN Sustainability goals, Intergovernmental Panel on Climate Change scientific targets and IEA’s ‘25 Energy Efficiency Policy Recommendations’.

Implementing proven policies at all levels of government: renewable energy standards, industry efficiency, building codes, fuel carbon content standards, appliance standards, and policies to reduce emissions from deforestation and forest degradation (REDD).
ALIGN CARBON WITH YOUR OTHER DRIVERS

- Establishing and leading peer groups to discuss accelerating away from ‘business as usual’ energy use globally.

- Setting strategies that integrate climate change mitigation and adaptation.

- Adopting a long-term view while implementing short-term action.

- Committing to the well being of future generations, including their need for a stable climate.

- Integrating carbon requirements into C-suite learning and strategy.

- Improving workforce productivity, well being and retention through employee engagement initiatives like green building design, LED lighting, telecommuting.

- Investing capital with carbon considerations.

- Creating a constituency for change to support policies.

- Building broad political acceptability for climate change policies and sustainability goals.

- Integrating climate change into workforce training, education, transportation and investments (all major ministry plans).

OPEN SOURCE YOUR LEADERSHIP

- Calling for large-scale change: when leaders speak, the public listens.

- Speaking regularly about the need for political and business leadership on climate change by becoming a messenger of non-ideological, support for urgent action on climate change.

- Denouncing efforts to propagate bogus science and analysis.

- Sharing enthusiasm about a Clean Revolution future with loyalty to principles.

- Publicly supporting low carbon policy development through business associations and other membership coalitions.

- Disclosing of carbon emissions and technology deployment.

- Actively participating in best practice and low carbon technology networks internationally.

- Demonstrating proactive engagement in international negotiations around carbon and low carbon technology markets.
SECTION 4: THE CLEAN REVOLUTION CAMPAIGN

For all of this to happen, we believe that leadership needs to be increasingly well-defined, accepted and adopted at the highest levels of business and government, supported by practical and successful examples.

At the Rio+20 conference, we highlight the systemic nature of the Clean Revolution already happening internationally, that must now be accelerated to create transformational change.

Going forwards we will continue to focus on encouraging and supporting:

- Sub-national leadership, including working through our States and Regions Alliance, our partnerships with world cities on technology implementation, and our China Redesign partnership with a group of rapidly growing Chinese cities;
- Business leadership, including innovation and performance through the value chain; and
- Technology leadership, including adoption of renewable energy, LED lighting, electric vehicles and the development of information-technology enabled solutions.

We continue to curate an evidence base at TheCleanRevolution.org to highlight the facts, case studies and insights that support the case for transformational change.

Finally, we continue to build and support a coalition of business and government leaders to communicate this evidence base to the world. This coalition includes:

- A network of Clean Revolution Ambassadors: business and government leaders who help to develop and spread our shared vision for the Clean Revolution and to make it relevant to different geographies and sectors of the economy;
- A core group of Campaign partners: leading corporations, governments and civil society organizations, who work with us to develop the Campaign’s thought leadership and action-oriented programs;
- An expert Advisory Board who will support the content and delivery of the Campaign; and
- Our network of member organizations and supporters, who underpin everything we do.

We hope you will join us.

We look forward to leading the Clean Revolution with you.
ENDNOTES

8. In the 2010 IEA Energy Forecast, the 450ppm BLUE map pathway specifies funding should grow to reach an average of US$0.672 trillion per year by over the 2011 to 2035 period. Increasing steadily each year, this means close to US$600 billion is required by 2020.
10. The US$40 - 50Bn investment figure targets 550ppm of CO₂ (equivalent to approximately 450ppm of CO₂, and projected to lead to a ~3.5°C temperature change according by IPCC).
17. Ibid.
19. “China’s middle class will reach 780 million by 2020”. 2010 Euromonitor.
42. Based on Intergovernmental Panel on Climate Change projections


49. Living Labs Global Award www.liga.org


58. Renewables 2011: Global Status Report”. 2011 REN21

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THE CLIMATE GROUP

The Climate Group is an independent, not-for-profit organization working to inspire and catalyze leadership for a Clean Revolution: a low carbon future that is smarter, better and more prosperous. For all.

Founded in 2004, The Climate Group has operations in Australia, China (Beijing and Hong Kong), Europe, India and North America.

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*All of our government members are also members of the States and Regions Alliance

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All the views in the report are those of The Climate Group and do not necessarily reflect those of our partners, members or advisors.

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