A journey to sustainable growth

The draft Climate-Compatible Development Plan of the Dominican Republic

Foreword

For the good of our world, our region, and our country, we are embarking on Climate-Compatible Development. Indeed, we aim to contribute to the global solution to climate change, to serve as a regional model of climate-compatible development, and to stimulate our country's economic and social development, creating a path for sustainable growth.

In our pursuit of these goals, we have developed a Climate-Compatible Development Plan (CCDP). Three principles guide and inspire us in this effort:

When a dilemma looms, have the courage to make bold decisions.

Seize opportunities that benefit the world and our country at the same time.

And most importantly: come together in difficult times.

Ever since climate change started to threaten the most vulnerable nations of our planet, resolute climate action the world over has become more urgent year by year. At the same time, developing countries on all continents struggle to meet the hopes and dreams of their people for a better future. Economic and social development are non-negotiable when poverty still exists among us, and conventional wisdom was that climate action would be a major hindrance to our developing economies. When dilemmas like this appear, we should dare to question conventional wisdom, analyze the facts rationally, and have the courage to make bold decisions. This principle guided us when we first started to wonder whether a well-conceived strategy for climate action might actually reinforce our development efforts, and it emboldened us to pursue this question.

The more we learned about our options to reduce emissions and promote development at the same time, the more clearly we realized that a Climate-Compatible Development Plan represents one of the rare opportunities to simultaneously benefit both the world and our country. In our daily lives just as much as on the world stage, examples of selfishness abound. While our primary responsibility is undoubtedly to the Dominican people, we are also citizens of the world with a global responsibility. That is why opportunities that benefit our own people as well as all of humanity are precious, and we must seize them when they present themselves. Climate-Compatible Development is such an opportunity. We intend to seize it, and we encourage our friends and neighbors to join us.

And yet, great intentions remain mere words until they are transformed into action. Progress towards full prosperity and the fight against climate change require the collaboration of people and institutions from all parts of society and from around the world. We cannot

afford to be idle: our country will feel the effects of climate change early and forcefully, while much work remains to be done before we achieve our aspirations for the economic and social development of our country. We need to come together in difficult times such as this, and it is reassuring to see how this principle has guided our work towards the CCDP so far.

This concerted effort is only possible because of a very collaborative spirit. We are deeply grateful to the German government for their generous support of our work, and the Coalition for Rainforest Nations has made the invaluable contribution of technical assistance and the joint experience of its member states in the field of Climate-Compatible Development. Our development partners from around the world are standing by our side as we develop our strategy. Countless people and institutions from all branches of our government, our private sector, and Dominican civil society have dedicated themselves to help in Technical Working Groups. As we embark on refining the CCDP, we will reach out to an ever-growing number of stakeholders from all parts of society to continue this fruitful collaboration.

The CCDP will be one of the largest reform programs the Dominican Republic has ever seen. This feat requires dedicated minds and committed hearts. Let us have the courage to embark on this journey and let us come together around Climate-Compatible Development – for the good of our world, our region, and our country.

Dr. Leonel Fernández Reyna

President of the Dominican Republic

Santo Domingo, September 2011

Acknowledgments

The evolution of the Climate-Compatible Development Plan (CCDP) of the Dominican Republic – since COP 16 in Cancún in November 2010 – has been a success story of fruitful collaboration. The progress made thus far would not have been possible without the dedication of countless individuals and institutions that deserve our sincere thanks.

First and foremost, we thank the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety for their generous support at this critical stage of our development.

The Coalition for Rainforest Nations (CfRN) deserves our deep gratitude for its policy advice and dedication to sharing the experience and expertise of its member states in the field of Climate-Compatible Development.

A plethora of institutions from government, civil society, and the private sector has already taken part in the development of the CCDP, and it is our hope that they will form the vanguard of an ever-growing number of stakeholders that help shape the CCDP going forward.

Working Groups in the key sectors of the CCDP are coming together regularly to share ideas and data and to make the CCDP more and more concrete. Special thanks for their hard work in the Energy Working Group go to the Comisión Nacional de Energía (CNE), Corporación Dominicana de Empresas Eléctricas Estatales (CDEEE), Ministerio de Industria y Comercio (MIC), Empresa de Generación Hidroeléctrica Dominicana (EGEHID), Superintendencia de Electricidad (SIE), Organismo Coordinador (OC), and AES Dominicana.

For their dedication to the Transport Working Group, we are grateful to the Oficina Para el Reordenamiento del Transporte (OPRET), Fondo para el Desarrollo del Transporte Terrestre (FONDET), Comisión Nacional de Energía (CNE), Ministerio de Industria y Comercio, Ministerio de Obras Públicas y Comunicaciones (MOPC), Oficina Metropolitana de Servicios de Autobuses (OMSA), Asociación Nacional de Agencias Distribuidoras de Vehículos (ANADIVE), Federación Nacional de Transporte Dominicano (FENATRADO), and Oficina Técnica de Transporte Terrestre (OTTT).

The Forestry Working Group is led by the Ministerio de Medio Ambiente y Recursos Naturales, Viceministerio de Recursos Forestales, Plan Nacional Quisqueya Verde, Dirección de Información Ambiental y Recursos Naturales (DIARENA), Centro para el Desarrollo Agropecuario y Forestal (CEDAF), and Instituto Dominicano de Investigaciones Agropecuarias y Forestales (IDIAF). We sincerely thank these organizations for their efforts thus far.

For general oversight of the CCDP and its economic impact, we are grateful to the Ministerio de Economía, Planificación y Desarollo as well as to the Ministerio de Hacienda and the Banco Central.

Amongst the additional institutions that have joined hands and committed themselves to this effort, we would like to acknowledge the Red Nacional de Apoyo Empresarial a la Protección Ambiental (RENAEPA), Asociación Dominicana de Productores de Cemento Portland (ADOCEM), Centro para la Conservación y Ecodesarrollo de la Bahía de Samaná y su Entorno (CEBSE), Fundación Global Democracia y Desarrollo (FUNGLODE), Fundación Sur Futuro, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Embassy of the Federal Republic of Germany in the Dominican Republic, United States Agency for International Development (USAID), The Nature Conservancy (TNC), United Nations Development Programme (UNDP) in the Dominican Republic and the Proyecto Carbono 2012, British Embassy in the Dominican Republic, Embassy of the Netherlands in the Dominican Republic, Grupo Jaragua, Consorcio Ambiental Dominicano (CAD), Ministerio de Turismo, Ministerio de Agricultura, Ministerio de Salud Pública, Asociación Nacional de Hoteles y Restaurantes (ASONAHORES), Consejo Nacional de Investigaciones Agropecuarias y Forestales (CONIAF), and the Dirección General de Ganadería.

Behind every one of these institutions stand committed individuals who are dedicated to Climate-Compatible Development and deserve our sincere thanks. It has been a pleasure to work with all of you and we look forward to continuing this journey. Our common work is far from over!

Omar Ramírez Tejada

Executive Vice-President

National Council on Climate Change and Clean Development Mechanism

Executive summary

Resolute climate action is a key priority of the Dominican Republic (DR). Our nation on the island of Hispaniola is very vulnerable to the effects of climate change, such as coastal flooding worsened by rising sea levels and increasingly severe hurricanes. We view climate action as both a practical preventive effort for ourselves and as our moral responsibility as a nation in an increasingly interdependent world.

At the same time, the economic and social development of our nation remains our highest priority. Building on our solid growth, we are committed to further improving the lives and livelihoods of our citizens by continuing our strong record of economic and social development, and by at least doubling gross domestic product (GDP) per capita by 2030.

However, we recognize that unless we take decisive action, our economic growth will raise our greenhouse gas (GHG) emissions by about 40% in 2030, far exceeding recommended climate-compatible levels. To prevent this from happening, the DR has resolved to take on the dual challenge of climate-compatible development. Not only do we believe that development and climate action can go hand in hand, we are convinced that they actually reinforce each other when pursued in an integrated strategy.

We therefore intend to more than double GDP by 2030 at the same time as cutting our emissions by half. To guide our work, we have prepared a Climate-Compatible Development Plan (CCDP). The analyses we conducted to flesh out a specific plan for the DR have identified strategies that make climate-compatible development possible.

The DR has completed the first stage and is issuing its draft CCDP. In this endeavor, pursued since the beginning of 2011, we enjoyed the generosity of the International Climate Initiative (ICI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and invaluable technical support from the Coalition for Rainforest Nations (CfRN).

The draft CCDP draws a comprehensive strategic arc. It begins by describing our ambitions for economic development in the coming two decades and an estimate of GHG emissions under business-as-usual (BAU) conditions. Subsequently, it identifies options for emission abatement and estimates their impact on economic and social development. Concrete action plans in the key sectors and an overarching implementation strategy provide a guiding framework for our work ahead to make climate-compatible development a reality.

The CCDP reflects our core aspiration of economic development: we intend to raise GDP per capita from USD 5,200 to 12,500, an increase of 140%. Translating our economic growth sector by sector into the GHG emissions it would entail, we have estimated

the emissions of the DR until 2030. This BAU scenario models what would be our future GHG emissions if we did not include climate considerations in our policymaking.

In the BAU scenario, the GHG intensity of our economy would substantially decline—but our absolute GHG emissions would still increase by ~ 40% within the next 20 years, up from ~ 36 $MtCO_2e$ (megatons or million metric tons of carbon dioxide equivalent) in 2010 to more than 50 $MtCO_2e$ in 2030. This would translate into per capita emissions of ~ 4.3 tons per person per year by 2030, in a time when the world ought to decrease emissions to an average 2 tons per person per year to limit global warming to 2° Celsius.

Yet by choosing a low-emission development path, there is potential for a much larger reduction in emission intensity and a substantial abatement of GHG emissions. Having defined Dominican emissions under BAU assumptions, the CCDP identifies a wide range of options to reduce GHG emissions across all sectors of the economy.

In the aggregate, by 2030, we can reduce our annual emissions by up to 65% compared to the results in the BAU scenario if we fully implemented all the identified abatement levers. This entails reducing our annual emissions by ~ 33 $MtCO_2e$ compared to the BAU scenario in 2030, to reach an emission level of ~ 18 $MtCO_2e$ or around half of our current emissions in 2010.

The environmental benefits identified will also have a positive impact on the Dominican economy. On average, the abatement potential comes at a net financial gain of USD 40 for every ton of CO_2e that we abate compared to the BAU scenario, with over half of the abatement potential achievable at net financial gains to the DR. The remaining 40% of abatement potential come at a cost to the DR compared to the BAU scenario.

In the BAU scenario, 70% of all emissions in 2030 would be concentrated in three sectors: energy, transport, and forestry. These are the key sectors of the CCDP, offering great impact in terms of carbon abatement as well as economic and social development. Furthermore, a set of quick wins in the cement, waste, and tourism sectors has been identified which could contribute another ~ 15% of abatement potential.

- **The energy sector holds more than one-third of the DR's maximum abatement potential.** Annual emissions could be reduced by a maximum of 60% compared to the BAU scenario by 2030, dropping from an annual ~ 18 to only ~ 7 $MtCO_2e$. This is the sector of our economy with the highest potential for emission reduction through a combination of energy efficiency measures and a cleaner power generation mix that relies less on fuel oil and off-grid generation and more on renewable energy and natural gas. Furthermore, reducing carbon emissions is not the only rationale to move away from developing the power sector in a business-as-usual way: nearly all of the abatement levers available to us in the power sector would come at a net financial gain to our country.

- **The transport sector has the potential to reduce GHG emissions from burning fossil fuels by ~ 50% compared to the BAU scenario in 2030.** Total abatement potential for the transport sector is ~ 6 $MtCO_2e$ in 2030. Additionally, these measures would decrease our oil dependency by up to 9 million barrels of oil equivalent (mBOE) per year compared to the BAU scenario in 2030, thus significantly improving the DR's current account balance. Four main levers drive this reduction: increasing efficiency across all vehicle categories, switching to biofuels, increasing the share of vehicles running on compressed natural gas (CNG), and shifting urban traffic in Santo Domingo to a modern public transport system.
- **In forestry, current estimates suggest that the DR could transform the sector into a net carbon sink.** While acknowledging significant data uncertainties, estimations of current net emissions add up to ~ 2 $MtCO_2e$ and are expected to decrease to ~ 1 $MtCO_2e$ by 2030 under BAU assumptions. By implementing all abatement measures, the DR could turn the forestry sector into a carbon sink that sequesters up to ~ 6 $MtCO_2e$ by 2030 at an estimated average cost of ~ USD 4/tCO_2e. This maximum abatement potential is almost equally driven by reducing deforestation and forest fires and by increasing afforestation and reforestation (A/R). The combination of the many programs and levers in forestry could create ~ 15,000 new jobs by 2030 and capture ~ USD 35 million per year of international funding from Reducing Emissions from Deforestation and Forest Degradation (REDD+) and Clean Development Mechanisms (CDMs).

All the estimates that determine the abatement potential are based on the collective experience and expertise of various Technical Working Groups, composed of a range of experts within the DR's governmental bodies as well as the private sector and non-governmental organizations (NGOs), using local data where available or regional proxies. Data improvement opportunities remain, especially for forestry and renewable energy measures.

The Ministry of Economy, Planning and Development estimated that the full implementation of our abatement potential would yield an increase of disposable income of ~ USD 3 billion or ~ USD 260 per person per year in 2030. Without taking into account second-order effects (e.g., additional employment in the retail sector through the enabling of increased household spend), the CCDP could create > 100,000 new permanent jobs and improve the trade balance by USD 2 to 3 billion per year by 2030.

The draft CCDP includes sector action plans for the priority sectors energy, transport, and forestry and the quick wins to capture this potential for emission abatement and development. The sector action plans unite key measures that stand out not only in terms of abatement potential and cost but also in terms of economic impact, feasibility, and potential synergies. In sum, they capture over 70% of our maximum abatement potential, amounting to annual emission reductions of ~ 24 $MtCO_2e$ compared to the BAU scenario by 2030.

The draft CCDP is very ambitious, and we are fully aware that implementing it will require a substantial long-term effort by the Dominican government—supported by civil society, the private sector, and our development partners. Continued advice and access to funding will be vital. With this support, we are committed to making our transformative CCDP a reality. We are putting in place all of the key factors for success and learnings from other countries that have already embarked on this journey.

The implementation strategy of the draft CCDP is centered on five key factors for success:

- **Commitment and leadership** from the highest level of government and society
- **Stakeholder engagement and mobilization** that takes all perspectives into consideration and brings out the best in Dominican society as we set out to develop in a climate-compatible way
- **Effective institutions and systems** that are enabled to deliver what surely is one of the most ambitious reform packages in Dominican history
- **Comprehensive strengthening of the government's ability to perform** through capacity and capability building at multiple levels in all of the institutions involved
- **Smart financing,** which is vital, as access to funds is likely to be a bottleneck to the implementation of measures that require investments of up to USD 17 billion within the next two decades or about USD 800 million a year. A smart combination of climate finance, public finance, and private investment is needed to make the transformative CCDP a reality.

We hope that our ambitious vision and transformative plan will inspire other green growth efforts in both developing and developed countries around the world. Together, we need to rethink our economic model. It is time to join forces in a global partnership, and we look forward to continuing on this path with our neighbors and friends at the Conference of the Parties (COP) 17 in Durban, South Africa, where we will present progress and first results of the CCDP of the DR.

Table of Contents

I Our vision: Accelerating our strong track record in economic growth to become a high-income country by 2030

A The Dominican Republic at a glance—a rapidly developing and stable middle-income country in the Caribbean

Ever since Christopher Columbus saw the land of the New World for the first time in 1492, the Dominican Republic has been a vibrant center of the Caribbean. Home to approximately 10 million inhabitants, our country shares the island of Hispaniola with Haiti and comprises ~ 48,442 km^2, an area comparable to that of Costa Rica, Slovakia, or Denmark.

The DR is a county of great natural richness and diversity: **1,576 km of tropical coastline**, paired with rugged highlands and fertile valleys, including the highest mountain in the Caribbean, Pico Duarte, with an **altitude of 3,100 meters**. Nearly a third of our country is covered with forests; at 22% of the total, we possess substantial arable land, and we have designated 123 national parks and protected reserves along the coast and inland to safeguard our tremendous biodiversity.

The flip side of our great natural endowment is that, as a tropical island, the DR is also especially vulnerable to the effects of climate change. Extreme climatic events such as hurricanes, tropical storms, inland and coastal flooding, droughts, and forest fires have the potential to severely disrupt the path of our social and economic development.

As one of the largest economies in Central America and the Caribbean, the DR is a rapidly developing middle-income country with a GDP of USD 52 billion. Our GDP per

capita of USD 5,200 is similar to that of Serbia and Sri Lanka. We are on a stable path of economic development, and the World Bank's *Doing Business 2010* report praised the DR for the ease of conducting business and ranked us as runner-up "global reformer" in protecting investors.

Services dominate today's economy at 54%, driven mainly by our fast-growing telecommunications, banking, and information technology (IT) sectors. Manufacturing ranks second at 19%, followed by agriculture at 8%, while tourism contributes 7% to our GDP.

Our central location in the Caribbean and proximity to the United States and Latin America allows us to be a dependable trading partner with strong ties to North America, Europe, as well as Central and South America. Free trade agreements have been signed and form the mainstay of our trading relations, namely the North American Free Trade Agreement (NAFTA), the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA) including the United States, and our trade agreement with the European Union and 13 Caribbean countries.

Of our 10 million inhabitants, 42% or 4.2 million participate actively in the DR's workforce. Labor participation has been growing at 2.2% per year since 2000, while unemployment remains a serious issue for our economic and social development: in 2009, the unemployment rate was 15%, amounting to 630,000 workers who seek reentry to our economic life. Continuing our strong economic growth therefore represents our main priority.

B Economic growth in the DR is among the top five in all of Latin America

Over the last decade, the DR has grown at an average of 5.2% per year in terms of real GDP, even though we experienced tumultuous times in 2001 and 2003 to 2004, when real GDP growth dipped between -0.25 and 1.8%. During the last five years, our average growth rate reached 6.9%, a figure topped only by Panama and Peru in all of Latin America and the Caribbean.

At forecasted growth rates, the GDP of the DR will more than double in the coming two decades, growing from ~ USD 50 to 130 billion in 2030. Our strong growth trajectory is mainly driven by the services sector, where telecommunications and banking are performing particularly well at ten-year compound average growth rates (CAGRs) of 22% and 10% respectively. Economic gains are mainly driven by gains in labor productivity, while labor inputs remained largely flat.

C Going forward, the DR has set itself even more ambitious targets for economic development

An ambitious National Development Strategy (NDS) that aims at continuously improving the life of DR citizens in a sustainable way has been developed under the leadership of the Ministry of Economics, Planning, and Development together with the National Council for the Reform of the State. The NDS encompasses social, political, institutional, and economic issues, and frames the country's long-term vision.

One of the core aspirations of the NDS is to accelerate the DR's strong economic growth track record. During the past decade, GDP per capita grew at an average of 3.5% per year. Over the next 20 years, the DR aspires to increase its GDP per capita from USD 5,200 in 2010 to USD 12,500 in 2030 in a sustainable way. This represents a per capita growth rate of 4.3% per year and a net increase of 140%. Achieving our goals will require us to further boost competitiveness, productivity, skills, and employment.

According to research conducted in preparing the NDS, the DR faces at least four major challenges when trying to achieve its growth aspirations. Growth in employment is slow relative to economic growth, with a high proportion of low-skilled jobs and low wages. The productive sector has a parallel structure, in which the free trade zones or *Zonas Francas* and the local industry have no incentives to integrate, leading to lower productivity overall. Small and medium-size enterprises struggle with a lack of available financing. Finally, the country's electric power sector is inefficient, with high levels of technical and non-technical losses, and highly dependent on fossil fuels.

The NDS proposes specific actions to overcome these challenges, including:

- Establishing a robust and transparent regulatory framework to create a more business-friendly environment and attract more investments to drive employment
- Increasing the efficiency, productivity, and investment capabilities of small and medium-size enterprises
- Promoting growth in exports based on a more competitive positioning of the productive sector in the international markets.
- Securing a reliable and cost-efficient supply of electricity to improve the DR's economic competitiveness

A recent study commissioned by the Ministry of Economics, Planning, and Development and carried out by the Center for International Development at Harvard University under the leadership of Professor Ricardo Hausmann concluded that the key enablers to achieve the economic development goals set by the NDS are:

- Increasing competitiveness and establishing mechanisms to promote exports of higher-value products, particularly in the agriculture, manufacturing, and tourism sectors

- Improving productivity, promoting the participation of small and medium-size enterprises in the economy, and facilitating access to financing
- Developing and building capacities to support the productive sector through the timely and focused use of public resources
- Reducing unemployment mainly through job creation in the manufacturing sector.

Though not exclusively, these tasks are largely focused on economic growth, not on sustainability. Our ambition is to tackle them with an explicitly climate-compatible approach—not as a compromise or trade-off but with the aim of achieving a new synthesis of both valuable goals.

D Economic success must not mean failure to protect our climate: we believe sustainable development is possible

Virtually all developing countries share our challenge. Our highest priorities remain the economic and social development of our nation and the eradication of poverty. At the same time, our country is especially vulnerable to the effects of climate change, and we have begun to see the effects. Like many developing countries around the world, we understand that our future success in economic development will lead to a sharply rising contribution to global climate change unless we take decisive action to alter the course of our development.

Facing this dual challenge, we went back to square one and revisited our strategies for development and climate change, in the hope of finding a path that would allow us to make progress towards both goals. The analysis of our dual challenge and the example of other developing countries have given us the confidence to be able to say: climate-compatible development is possible! As President Fernández stated at the Delhi Summit of the World Sustainable Development Forum in February of this year: “Economic development and climate action are complementary. And the world’s best thinkers are learning that these two can truly go hand in hand.” The key to unlocking this synergy is a strategy that integrates development and climate action: a Climate-Compatible Development Plan.

In recent years, we have undertaken concrete steps towards an integration of development and climate action. First, we set up a lean government institution dedicated to climate change: the National Council on Climate Change and Clean Development Mechanism (NCoCC). Since its formation in 2008, the NCoCC has concentrated the government’s action towards mitigating climate change as well as adapting to its effects and leads our country’s participation in the United Nations Framework Convention on Climate Change (UNFCCC). The NCoCC unites all relevant government institutions to guarantee holistic action, and the presidency directly oversees the council’s work.

The second step we undertook was to integrate sustainability and climate change mitigation into our development strategy. In 2009, we developed an NDS based on four central pillars, sustainability being one of them:

- A state with efficient and transparent institutions that serves a responsible and participative citizenry and guarantees safety, while promoting development and a peaceful society
- A cohesive society with equal opportunities and low levels of poverty and inequality
- An articulate, innovative, and sustainable economy with a productive structure that fosters high and sustained growth with decent employment and that competes successfully in the global economy
- A sustainable management of the environment and an effective adaptation to climate change.

The objectives of the environmental sustainability pillar consist of protecting and managing the country's natural resources, developing a national risk management system, embarking on mitigation and adaptation efforts, and promoting the decarbonization of the economy.

Having laid these foundations, the next logical step was to develop a concrete strategy that would define and guide our work towards the integrated goals of development and climate action. It was with great interest that we noted the offer of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) to assist developing countries in the formulation of exactly such an integrated strategy. We were very pleased to be selected from among the more than 20 candidate countries and were spurred on by the news that it was precisely our groundwork for sustainable development that had convinced the BMU to assist the DR in the development of a CCDP.

The completion of the draft CCDP marks the high point of our preparation for joint progress on economic development and climate action, but it is only the beginning. It is now time to implement our ambitions and to achieve our aspiration for climate-compatible development. The government of the DR is committed to implementing the CCDP, and President Fernández reiterated our commitment to the plan publicly in February of this year at the Delhi Summit of the World Sustainable Development Forum, when he announced: "We will work to improve and sustain our economic growth and convert the Dominican Republic into a model for doing so. We will develop what will be more formally referred to as one of the world's first Climate-Compatible Development Plans."

"Green growth is not only important to our economy—it is conducive to the nature of our country. In addition to protecting ourselves from the trials and tribulations of climate change such as rising sea levels and deadly hurricanes, the Dominican Republic assumes the global fight against climate change as our global responsibility. We consider our efforts part and parcel of our moral responsibility to this increasingly interdependent planet."

President Leonel Fernández,
Delhi Sustainable Development Summit (DSDS),
February 2011

II Our challenge: Developing our economy in a "business-as-usual" way would result in sharply rising emissions

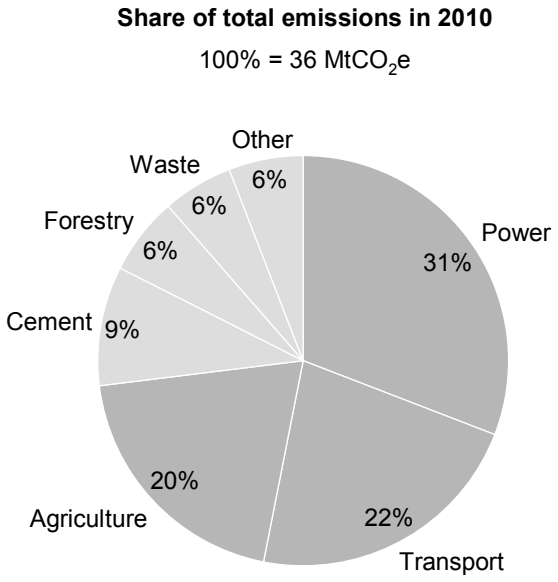
A Current GHG emissions in the DR amount to ~ 36 $MtCO_2e$

In 2010, the DR emitted ~ 36 $MtCO_2e$. This translates into ~ 3.5 tCO_2e per person per year. This means that we are already emitting more than is sustainable: in order to limit the effects of climate change, the world must aspire to a level in the range of 1 to 2 tCO_2e per person per year.

Our GHG emissions come from a wide range of sources across all sectors of our economy, but 80% is attributable to only four sectors. The most important emitter is the power sector. The burning of fossil fuels for power generation is responsible for ~ 30% of our total emissions, amounting to ~ 11 $MtCO_2e$. The sector with the second-highest level of emissions is transport: 22% of our emissions are caused by the burning of fuel in cars, trucks, and other motorized vehicles, amounting to ~ 8 $MtCO_2e$ per year. The agricultural sector causes a similar amount of emissions: ~ 7 $MtCO_2e$ per year, equaling 20% of our total emissions, mainly in the form of methane and other GHG that are released in cattle farming and the cultivation of rice and other crops. Together, these top three sectors account for ~ 70% of our total emissions.

FIGURE 1: Distribution of current GHG emissions by sector

Power, agriculture, and transport are the 3 key sources of GHG emissions and currently make up ~ 70% of our total emissions



Analysis by the National Council on Climate Change and Clean Development Mechanism

All other sectors account for the remaining 30% of GHG emissions, with cement, forestry, and waste being the next most important sources. The forestry sector merits special attention, however, because it is the only sector that not only emits but also captures (sequesters) GHG. In fact, deforestation, land use change, and forest degradation currently cause emissions of ~ 4 $MtCO_2e$ per year, making the forestry sector the fifth-heaviest emitting sector. However, when we account for the carbon capture that occurs when new trees grow, the forestry sector causes net emissions of ~ 2.5 $MtCO_2e$, amounting to ~ 7% of total emissions.

B Annual emissions would grow by ~ 40% to ~ 51 $MtCO_2e$ up to 2030 in a BAU scenario

The basis of a good CCDP is solid diagnosis. Dozens of experts from all parts of government, the private sector, and civil society have spent months to obtain a rigorous fact base for our CCDP: a forecast of how our GHG emissions would increase if our development were to follow the BAU scenario. We have modeled emissions under BAU assumptions bottom up by analyzing each sector of the Dominican economy and how they would develop until 2030 if we do not alter our course. The text box below provides more information on the way in which we modeled future emissions under BAU assumptions.

The BAU scenario—background and assumptions

The starting point for any CCDP must be sound diagnosis. To identify the main drivers of future emissions, it is therefore essential to gain a clear picture of how emissions would develop in each sector of our economy if we developed under BAU conditions. With this BAU scenario as our baseline, we can assess mitigation levers by calculating their abatement potential: how much would the implementation of each lever reduce annual emissions compared to BAU? As such, the BAU scenario is a key analytical concept of any CCDP.

It is important to define the BAU scenario clearly. The BAU scenario is neither a "frozen technology" scenario nor "the most likely" scenario, but a theoretical scenario based on the following assumptions:

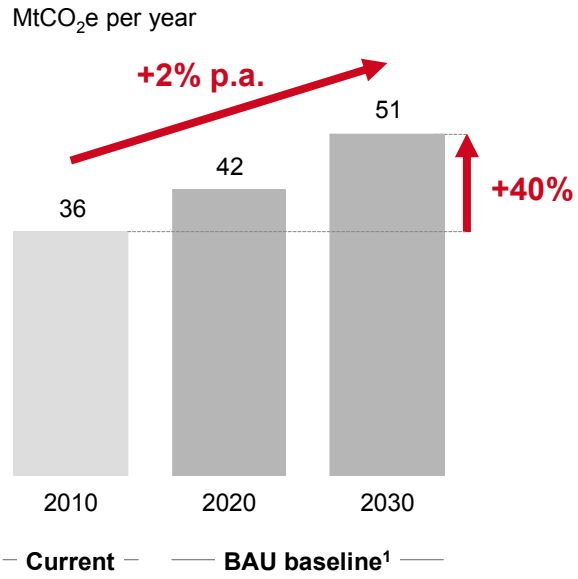
- The primary assumption of a BAU scenario is that the relevant country acts in its economic self-interest and does not take additional action to avoid GHG emissions.
- Investments in carbon abatement technology, such as wind parks, are included in the BAU scenario only if they are cost competitive with fossil sources of energy or if they are already under construction or in an advanced stage of planning.
- For the DR specifically, the BAU scenario referred to in this report assumes that the DR economy will grow in line with the growth aspirations outlined in chapter I (GDP per capita by 4.3% per year and GDP by ~ 5% per year). Uncertainties around actual growth remain and will influence actual emissions by 2030.
- Emissions are assumed to grow less than or at about half the rate of the economy (~ 2% vs. 5% per year) because economic growth in the DR is mainly driven by low-emitting sectors such as telecommunications and financial services.

FIGURE 2: GHG emissions in the BAU scenario

With business-as-usual, economic development aspirations will increase current GHG emissions of 36 $MtCO_2e$ by ~ 40% to ~ 50 $MtCO_2e$ by 2030

BAU assumptions

- GDP growth of ~ 5% p.a.
- Population growth falling continuously from 1.4% p.a. in 2010 to 0.9% p.a. in 2030
- Sector-specific assumptions aligned to economic development under BAU
- Changes to sector fundamentals only included when they
  - Are certain to occur (e.g., power plants already under construction)
  - Have stand-alone economic rationale (e.g., subsidized renewables projects excluded)



1 BAU baseline scenario is a basis for assessment of mitigation levers and carbon finance negotiations. It is not the most likely scenario, but a theoretical case assuming a country acts in its economic self-interest and does not include additional action for avoiding GHG emissions (e.g., renewables only added if cost competitive with fossils)

Analysis by the National Council on Climate Change and Clean Development Mechanism

The results show that, if our development were to follow BAU, our annual emissions in 2030 would be more than 40% higher than they are today, reaching ~ 51 $MtCO_2e$. In per capita terms, this entails an increase from ~ 3.5 to ~ 4.25 tons of CO_2e per capita per year. We realize that this deterioration would be contrary to the direction necessary to avert the risks of climate change, which threaten our country and the entire planet. If we want to reach the world average of emissions per person required to keep carbon concentration in the atmosphere at 450 ppm[1], we need to limit our emissions to ~ 26 $MtCO_2e$ per year—or half the amount that we would reach by 2030 in the BAU scenario.

1 Source: IEA World Energy Outlook 2010. Based on 21.4 Gt sustainable emissions per year to reach 450 parts per million (ppm) at a future population of 9.7 billion in 2050

C Four sectors continue to be the main sources of emissions: power, transport, forestry, and agriculture

What would drive the strong increase in GHG emissions by 2030 projected in the BAU scenario? Under BAU, power, transport, and agriculture would continue to be the top three sources of emissions, jointly causing nearly three-quarters of our total emissions by 2030. Deforestation currently continues to be the fourth leading source of emissions with around 4 $MtCO_2e$ per year, but carbon sequestration in new trees is projected to increasingly offset this figure, putting net emissions from the forestry sector as a whole to only ~ 1 $MtCO_2e$ by 2030. The main drivers of emission growth in these key sectors are discussed in more detail below.

1 Power would account for about half of all growth in emissions under BAU

The power sector is by far the highest emitter of GHG, accounting for an annual volume of 11 $MtCO_2e$ or ~ 30% of the country's total GHG emissions in 2010. For each MWh of power generated today, the DR emits 0.7 tCO_2e. The reason for the power sector's high carbon intensity is the DR's almost complete reliance on fossil fuels: 90% of power is currently generated using fossil fuels and ~ 70% using coal and fuel oil, the fossil fuels known to produce the highest GHG emissions. With more than 55% of power being generated from fuel oil and diesel, the DR currently has one of the most oil-reliant power sectors in the world. This heavy reliance on fuel oil has two reasons:

- One-third of all power is generated in small, inefficient, expensive, and high-emission power plants running on fuel oil; these plants were added to the generation mix in years of economic crisis (2001 and 2003/2004), when additional generating capacity had to be built rapidly and cheaply.
- Nearly another one-quarter of all power is generated off grid. Because the grid in the DR has been unreliable and prone to brownouts, industry and private consumers commonly use medium-scale power generation units and backup generators running on fuel oil, gasoline, or Diesel to satisfy their power needs—an expensive, high-emission solution.

Under BAU assumptions, the contribution of the power sector would increase to more than 35%, growing from annual emissions of 11 $MtCO_2e$ today to 18 $MtCO_2e$ in 2030. Four drivers would cause this strong growth in BAU emissions—demand growth and three aspects of the power generation fuel mix:

- Power demand is projected to grow by around 3% per year, increasing from ~ 16 TWh in 2010 to ~ 28 TWh in 2030.
- While some highly emitting fuel oil plants will be retired or converted to run on natural gas, power plants running on fuel oil will still provide ~ 14% of all power in 2030.

- If current plans are realized for two coal-fired power plants of 250 MW each, power production from coal would triple from ~ 1.9 TWh in 2010 to ~ 5.5 TWh in 2030, representing 20% of the generating mix. Because coal is the highest-emission fossil fuel by far, GHG emissions from coal-fired power plants alone would amount to ~ 4.5 $MtCO_2e$ per year by 2030.
- Off-grid generation running on fuel oil and diesel will grow proportionally to total power demand and would thus continue to account for just under one-quarter of power generation, reaching over 6.5 TWh per year by 2030.

Under BAU assumptions, the power sector would therefore remain heavily emitting. Even though we assume the addition of emission-free generating capacity (330 MW of hydro power and 185 MW of wind power), the carbon intensity of power generation under BAU would decrease only slightly, from 0.71 to 0.64 tCO_2e/MWh. High emissions would not be the only deficiency of the sector, however. The cost of generating power would rise sharply from ~ USD 185/MWh to ~ USD 220/MWh, aggravating the pressure that high power prices already exert on Dominican productivity today. Lastly, the heavy reliance on conventional fuel sources under BAU assumptions would mean that climate finance remains largely out of reach to help fund capital investments: only 20% of the projected total investment needed in the power sector until 2030 would go to renewable energy infrastructure and thus be eligible for climate-compatible financing from international sources. The remaining 80% of investment in power sector infrastructure—an estimated USD 4 billion between now and 2030—would have to be financed by the DR without any climate-related financial assistance.

2 Transport emissions would spike with a fast-growing and "fuel guzzling" vehicle fleet

The transport sector is the second-largest source of GHG emissions in the DR, contributing ~ 8 $MtCO_2e$ or 22% of the total GHG emissions in 2010. Today's emissions are driven by an old and inefficient fleet composed of 2.3 million vehicles, with an average age of 15 years. These vehicles consume an estimated 3 billion liters of imported fossil fuels (63% diesel, 32% gasoline, and 5% liquefied petroleum gas (LPG)).

By 2030, in the BAU scenario, emissions would grow by ~ 40% or 1.7% per year up to ~ 11 $MtCO_2e$; the vehicle fleet would consist of 3.5 million vehicles, and fuel consumption would increase to ~ 3.5 billion liters (58% diesel, 36% gasoline, and 6% LPG).

By far the strongest driver of growth in BAU emissions in the transport sector would be the projected increase in the number of light-duty vehicles (LDVs) in the country from ~ 100 to ~ 160 vehicles per 1,000 persons between 2010 and 2030, in line with economic development. Emissions from this segment would grow by ~ 65% in the next 20 years and would contribute ~ 45% of total emissions in the transport sector by 2030. Vehicle sales in the DR are dominated by imports of used cars (two out of every three vehicles

that enter the country are used). The addition of old vehicles to the park contributes to the low efficiency of the fleet.

After LDVs, the second-largest emitting segment in the transport sector consists of the medium-duty vehicles (MDVs), which would contribute 40% of total transport sector emissions in 2030. This segment is larger when compared to other countries; however, the increase in vehicles over the next 20 years will be slower relative to other segments, growing by ~ 20%.

Finally, the third most important driver of emission growth in the transport sector is projected to be the motorcycle segment. Emissions from this segment are expected to grow by ~ 49% in the next 20 years and would represent ~ 8% of total emissions in 2030.

3 Deforestation is a leading source of emissions, only partially offset by carbon sequestration in new forests

The forestry sector appears to be a significant driver of emissions through deforestation and land use change; however, there is great uncertainty around data availability and reliability. Getting a more comprehensive and complete picture of the forestry data in the DR will be our starting point for action in the sector.

The most recent and comparable land cover maps of 1998 and 2003 show an increase in forest cover of ~ 5%. There is no doubt forest cover has increased due to the concerted efforts the government has made over the past two decades through the National Reforestation Program, *Quisqueya Verde.* This program has been applauded internationally and enjoys the bipartisan support of the two major political parties. Over the last ten years, the program has contributed to ~ 80% of all reforestation efforts, planting an average of ~ 6,300 hectares per year, and it is likely to continue contributing to carbon sequestration in the future. In addition, natural expansion of forests is also occurring—mainly due to migration of rural populations to urban centers—but the limited available data suggests that this contributes only a minimal amount compared to A/R at around ~ 750 hectares per year. Today, forest cover is estimated to be ~ 32% or ~ 1.6 million hectares.

On the other hand, a more detailed analysis of the land cover maps of 1998 and 2003, together with data and evidence on the ground, suggests that losses of forest cover from land use change and deforestation are also occurring, contributing substantial GHG emissions. The key drivers of loss of forest cover are land use changes from slash-and-burn agriculture and infrastructure development, deforestation for charcoal production, and forest fires. All of these changes deplete carbon stocks, thus adding to the country's total GHG emissions. Land use changes would contribute the largest share of emissions from forestry under BAU, slightly decreasing from 1.6 to 1.4 $MtCO_2e$ per year between now and 2030 as the affected area decreases from 3,400 to 2,900 hectares per year by 2030. Forest fires under BAU would affect more area at a constant 4,500 hectares per year, but

emissions would be limited to 1.4 $MtCO_2e$ as only ~ 10% of forest cover is permanently destroyed by forest fires, while the remainder grows back within ten years. Illegal logging of some 2,500 hectares per year under BAU would contribute a constant 1.2 $MtCO_2e$ per year.

Based on the available data and recognizing significant uncertainty, we estimated current gross emissions from the forestry sector at ~ 4 $MtCO_2e$; these emissions are expected to remain relatively stable over the next 20 years. Meanwhile, carbon sequestration from reforestation efforts is estimated at ~ 2 $MtCO_2e$ in 2010 and is expected to grow to ~ 3 $MtCO_2e$ by 2030 as the government continues the Quisqueya Verde program. Therefore, the net BAU emission balance for the sector is projected to be ~ 2 $MtCO_2e$ in 2010 and to decrease to ~ 1 $MtCO_2e$ in 2030.

4 Agriculture would remain a major source of emissions though growing at a much lower rate than other sectors

The agriculture sector is today's third-largest contributor to GHG emissions, accounting for ~ 7 $MtCO_2e$ in 2010. Under BAU assumptions, sector emissions would only grow by 20% over the next 20 years, adding up to ~ 9 $MtCO_2e$ in 2030. Despite a significantly slower growth rate than that projected for the other key sectors, agriculture would contribute ~ 18% of the total emissions in 2030, remaining the third-largest source of GHG emissions in the country.

The main driver of emission growth in the sector is cattle farming, which causes significant methane emissions from enteric fermentation and manure handling. As population and income grow, cattle farming and meat demand in the country are expected to rise as well. Based on historic sector growth rates and population forecasts, BAU emissions from agriculture would grow by ~ 1.4% p.a. over the next 20 years or 31% by 2030, increasing from ~ 3 $MtCO_2e$ today to ~ 4 $MtCO_2e$. This would represent ~ 45% of the sector's total by 2030.

Despite lower growth rates, soil emissions would remain the most important source of GHG from the agricultural sector by 2030, particularly nitrous oxide (N_2O) emissions, mainly driven by the use of fertilizers. Today, these emissions add up to ~ 3.8 $MtCO_2e$ and are projected to grow by 13% over the next 20 years, reaching ~ 4.3 $MtCO_2e$ in 2030 and accounting for ~ 50% of the total. Finally, emissions from rice cultivation, particularly methane emissions, would continue to grow until 2015 and then level off after the expiration of the DR-CAFTA safeguard clauses on international rice trade. Today, these emissions add up to ~ 0.4 $MtCO_2e$ and are projected to grow to ~ 0.5 $MtCO_2e$ in 2030, accounting for ~ 6% of total emissions.

With these four sectors accounting for three-quarters of all BAU emissions in 2030, the remaining quarter is spread between different sectors of our economy. Two of these sec-

tors—cement and waste—play a particularly important role, as they display especially strong growth in emissions in the coming two decades. The cement sector is the next biggest source of emissions, amounting to about 4 $MtCO_2e$ annually by 2030, which represents 8% of the total. The waste sector follows at 7% of our total emissions in 2030, growing to about 3.5 $MtCO_2e$ annually in 2030. Together, the cement and waste sectors would account for 15% of the total emission growth that we would see in the DR until 2030 in the BAU scenario.

III Our plan:
The Dominican Republic aspires to develop in a climate-compatible way to achieve both development and sustainability targets

A The maximum technical potential for emission reductions is abundant, and more than half comes at net financial benefits to the DR

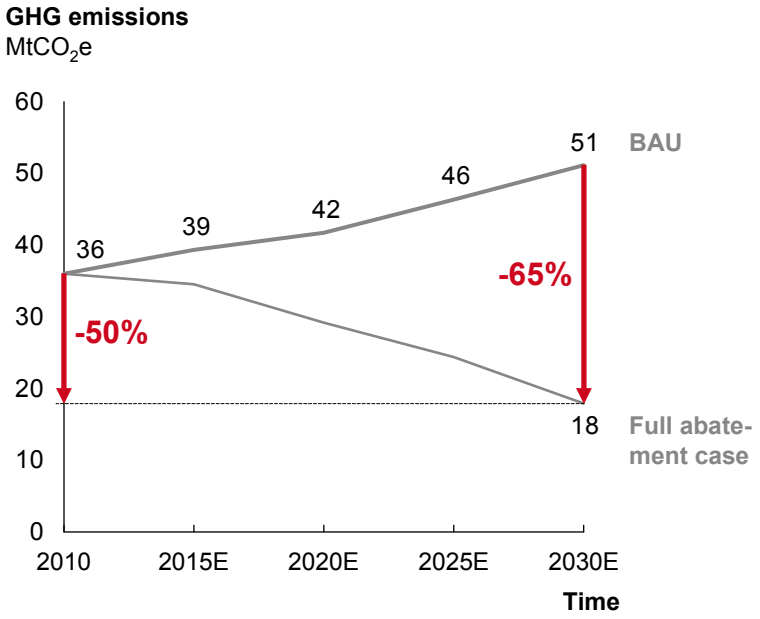
The sharp increase in GHG emissions in the BAU scenario is daunting. In this light, it might seem futile to attempt to decouple GHG emissions from our growth trajectory. However, after having analyzed both the increase of emissions in all sectors under the BAU assumptions and the levers that we have available to reduce this increase, we can report that the results prove the opposite. There is abundant potential to reduce GHG emissions in the DR while even intensifying our pursuit of goals for economic development.

Full implementation of all emission reduction levers available to the maximum degree would decrease annual emissions in 2030 by ~ 65% compared to BAU. The maximum abatement potential in 2030 amounts to ~ 33 $MtCO_2e$. If we captured it fully, we would reduce emissions in 2030 from ~ 51 to ~ 18 $MtCO_2e$. Emissions would then be ~ 50% lower than they are today, while our GDP would have more than doubled.

FIGURE 3: Emission abatement potential

GHG HIGH-LEVEL ABATEMENT POTENTIAL

Based on DR-specific analysis of technical abatement potential, ~ 65% of its BAU emissions can be reduced by 2030



- Under the **BAU reference case**[1], emissions would grow from ~ 36 $MtCO_2e$ in 2010 to **~ 51 $MtCO_2e$ in 2030**
- A **full carbon abatement case** yields **~ 33 $MtCO_2e$** of abatement potential vs. BAU in 2030 (-65%)—18 $MtCO_2e$ vs. today (-50%)

Analysis by the National Council on Climate Change and Clean Development Mechanism

Certainly, some of the available levers are more difficult to grasp in practice than others because of high costs or natural barriers to implementation. Therefore, our CCDP must incorporate smart choices about which levers to implement, and to which degree, so that we not only capture a large share of the maximum abatement potential but also realize net gains at the same time in order to boost economic and social development. To this end, it is essential to map the maximum abatement potential in a clear way as a basis for the choices that we will make as we move from the maximum theoretical abatement potential to practical action plans in the sectors of our economy.

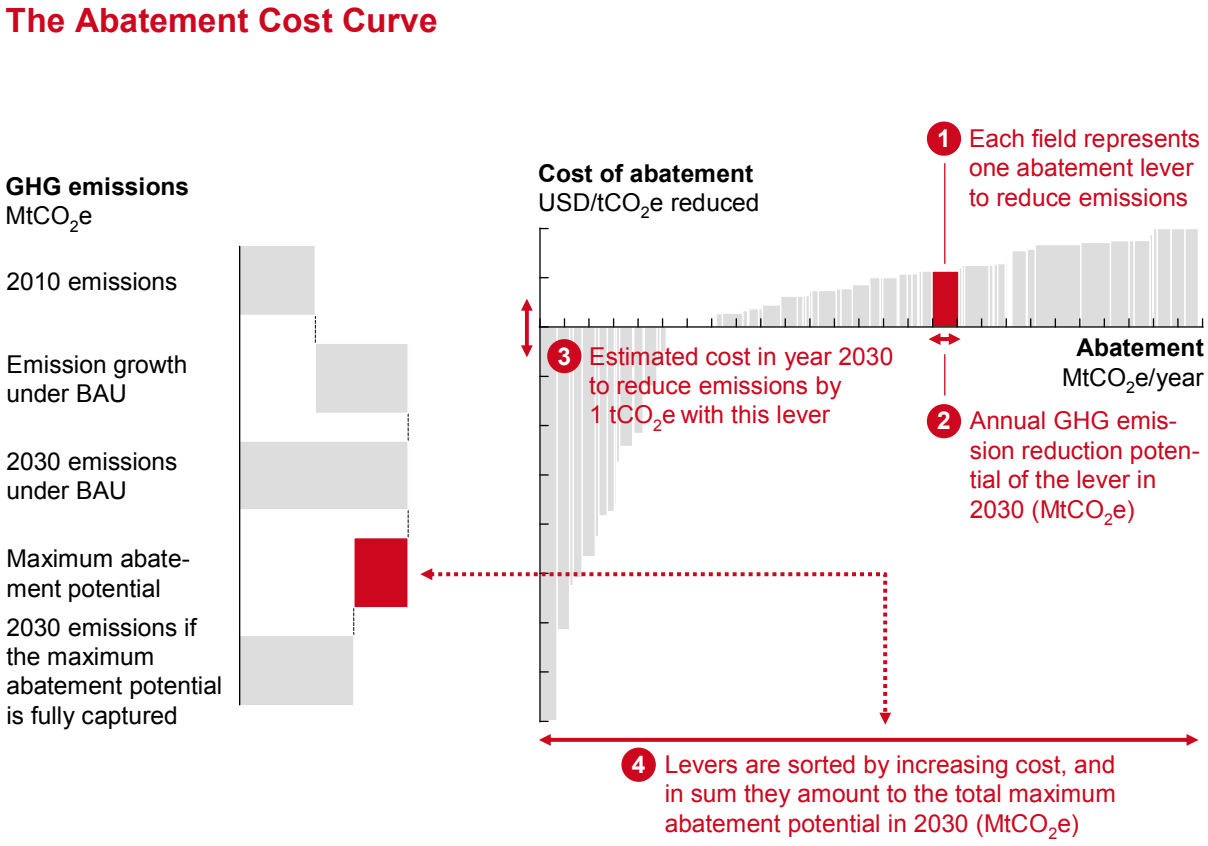
To guide these choices, each available lever offers two chief characteristics: the number of tons of annual emissions that can be saved if the lever is fully implemented and the cost of implementing the lever per ton of emissions that it reduces. Mapping all levers on these two dimensions allows us to compare the cost and benefit of each lever and therefore provides a great fact base for our decision making as we develop the CCDP. The mapping process results in a diagram called the "Abatement Cost Curve".

The Abatement Cost Curve displays the situation in 2030 as if all abatement levers had been implemented to the maximum degree. Each lever for reducing emissions is represented by a column on the cost curve. The width of each column shows the abatement potential—the tons of annual emissions that would be reduced versus the BAU scenario in 2030 by maximum implementation of the lever. The height of each column shows the abatement cost—the cost of fully implementing this option—measured in USD per ton of reduced annual emissions.

The abatement cost of each lever is defined as the incremental cost of a low-emission technology compared to the required cost in the BAU scenario, measured as USD/tCO_2e of abated emissions in a given year in the future. It includes both the incremental capital expenditure (capex, or investment) required for the implementation of the abatement lever compared to the BAU scenario and the incremental operating cost required for the abatement lever compared to the BAU scenario (opex). It does not include subsidies, taxes, or external costs that are caused indirectly and that largely depend on the exact form of implementation, such as communication and transaction costs.

The columns that extend upwards represent measures with a cost higher than USD 0 per ton of reduced emissions, while the columns that extend downwards represent measures that actually have a "negative cost" per ton of reduced emissions: they save money as well as emissions.

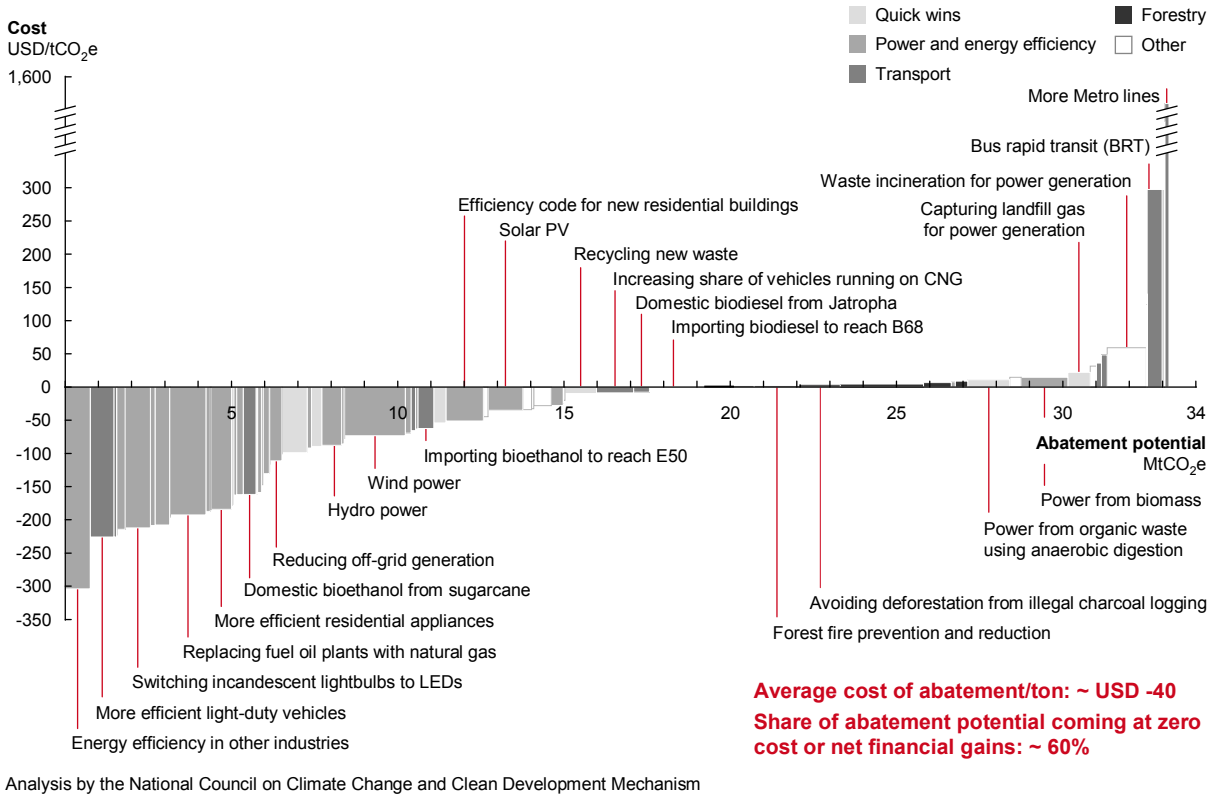
FIGURE 4: How to read the Abatement Cost Curve



We have established an Abatement Cost Curve for the DR, which serves as an important fact base for designing our CCDP. The Abatement Cost Curve is derived from local data and global and local proxies and is the product of Technical Working Groups, which the government convened in the first months of 2011 from all relevant public and private institutions in key sectors. Significant data improvement opportunities remain, especially for forestry and the potential for renewable energy in the DR.

FIGURE 5: Abatement Cost Curve of the DR in 2030

~ 85% of the DR's abatement potential lies in 3 sectors and quick wins, with more than half of potential coming at net financial benefit to the DR



Analysis by the National Council on Climate Change and Clean Development Mechanism

Along with allowing us to compare and contrast all available emission reduction levers, the cost curve yields several general conclusions about the maximum abatement potential in the DR:

- ~ 75% of the total maximum abatement is concentrated in three key sectors: power (including energy efficiency), transport, and forestry.
- Adding a fourth group of levers—easy-to-implement and high-impact abatement actions for other sectors (quick wins)—shows that ~ 85% of the DR's total maximum abatement potential lies in this very concentrated focus area.
- ~ 60% of the maximum abatement potential comes at zero or negative cost (represented by all columns extending downwards). The full implementation of these levers saves not only emissions but also money compared to the situation we would reach by 2030 under the BAU scenario. Another ~ 25% of the maximum abatement potential comes at a cost of close to USD 0 per ton of reduced emissions, and only a

marginal ~ 15% of abatement potential would cost money to implement when compared to the BAU scenario.

- If all levers were implemented fully, the average abatement cost in 2030 would be a net financial benefit—a negative cost—of ~ USD 40 per ton of reduced emissions. This means that implementing all levers fully would actually save the Dominican economy USD 1.6 billion per year by 2030 compared to the BAU scenario.

The fact that such a high share of the maximum abatement potential can be achieved at negative cost is reassuring for our country, but no reason for complacency. In fact, the high potential for net gains calculated in the CCDP indicates that our current development path is a very negative one: the situation that the BAU approach would create would be so undesirable that implementing even the costly emission abatement levers would deliver net gains in comparison. Certainly, the abatement cost of levers is an approximation based on long-term projections. Therefore, substantial deviations in key parameters, such as future energy prices, from what is the best assumption today, can have substantial effects on the abatement cost of some levers. The figures communicated here are based on the reference energy price scenario of the International Energy Agency's World Energy Outlook 2010. It forecasts the 2030 price for crude oil at ~ USD 127 per barrel and relies on the best expertise in the industry.

On the other hand, however, this is a blessing in disguise: implementing the CCDP should be much easier for us than many other countries. In places where BAU would lead to better outcomes than in the DR, the implementation of most levers would come at a comparatively high cost, requiring even more resolve and dedication than we will need.

Compared to other countries, our position is enviable: with ~ 60% of abatement potential coming at zero or negative cost, we have an ideal starting position for implementing our CCDP very successfully. The challenge remains, however, to gather the conviction and resources needed to bring about the substantial change that the CCDP implies.

B The abatement potential is concentrated in three key sectors and a number of quick wins

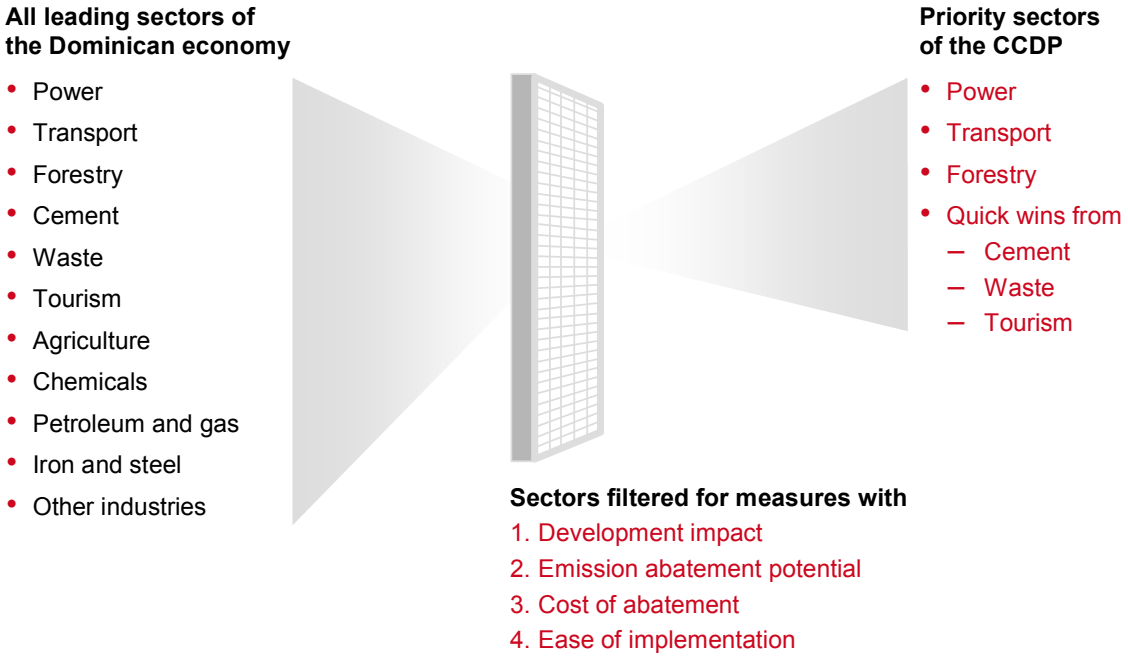
Changing the development path of an economy as diverse and vibrant as ours is a real challenge. We therefore aspire to focus our CCDP on the sectors where we can achieve the biggest results towards attaining our ambitious goals for economic and social development as well as emission reduction. Our analysis of future GHG emissions in the BAU scenario has focused our attention on the sectors that are chiefly responsible for our growing emissions and has led us to defer abatement action in the agriculture sector until a later stage.

As noted above, three-quarters of the emissions in 2030 will stem from the power, transport, forestry, and agriculture sectors. However, the opportunities for reducing these emissions vary widely across these sectors: while the power sector, including energy efficiency, holds about one-third of the abatement potential that we can capture, followed by the forestry sector, which holds ~ 20%, and the transport sector at ~ 17%, the agriculture sector holds a limited abatement potential of ~ 2.5 $MtCO_2e$ by 2030, which amounts to only 8% of our total abatement potential. Furthermore, abatement opportunities are very dispersed and difficult to implement in the agriculture sector. Under these circumstances, it is advisable to focus the CCDP on the sectors where abatement measures can reduce emissions substantially and where they are the most likely to be implemented successfully. In a later phase of our climate-compatible development, important sectors like agriculture will play a crucial role.

Having selected power, transport, and forestry as the key sectors of the CCDP, we then analyzed all abatement opportunities in the remaining sectors of our economy to determine whether there might be outstanding abatement opportunities that offer strong economic impact and are cost effective and comparatively easy to implement. These quick wins can make a significant contribution both to our development and to reaching emission reduction targets and have therefore also been included in the CCDP. They include five measures that can inhibit the projected surge in emissions from the cement and waste sectors as well as a tourism strategy that could put the sector at the forefront of implementation of abatement measures in the power, transport, and waste sectors: by changing the way the tourism sector generates and consumes electricity, by making the vehicle fleet of the sector less fossil fuel-intensive, and by embarking on modern waste management in the tourism sector.

FIGURE 6: Selection of priority sectors and quick wins

The CCDP focuses on measures in 3 priority sectors and a set of quick wins that stand out for their development impact, high abatement potential at low cost, and relatively easy implementation



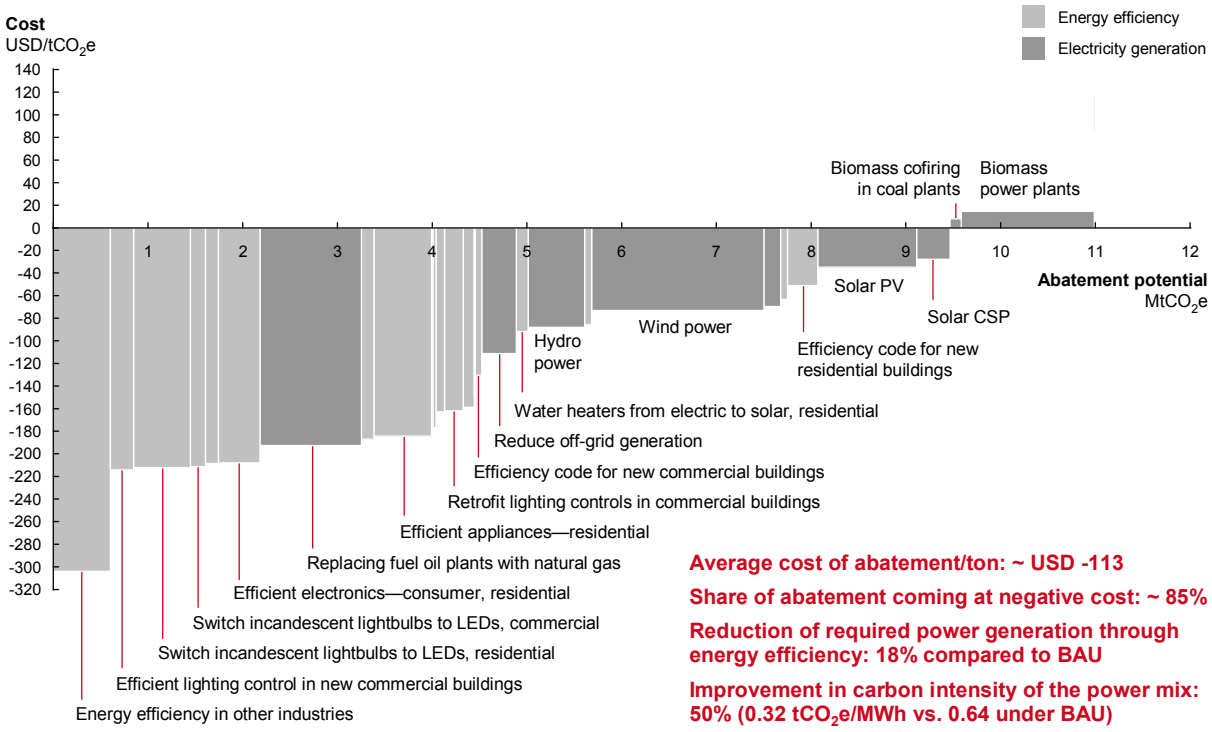
Analysis by the National Council on Climate Change and Clean Development Mechanism

As was mentioned in the discussion of the Abatement Cost Curve, the three key sectors (power, transport, forestry) and the quick wins in the cement and waste sectors jointly account for 85% of our entire maximum abatement potential in 2030. This is where we should concentrate both our analysis and our action.

1 One-third of all abatement potential or ~ 11 $MtCO_2e$ lies in energy efficiency and a cleaner power generating mix

FIGURE 7: Energy sector Abatement Cost Curve for 2030

In the power sector, 60% of the abatement potential comes from a cleaner generating mix while the rest comes from energy efficiency measures



Analysis by the National Council on Climate Change and Clean Development Mechanism

The power sector holds more than one-third of the DR's maximum abatement potential. Annual emissions could be reduced by a maximum of 60% compared to BAU by 2030, dropping from an annual ~ 18 $MtCO_2e$ to only ~ 7 $MtCO_2e$. This is the sector of our economy with the highest potential for emission reduction. Furthermore, the Abatement Cost Curve makes abundantly clear that carbon emissions are not the only rationale to move away from developing the power sector in a business-as-usual way: almost all of the levers available to us in the power sector would come at a negative cost to our country. The average cost of all the power sector levers is negative ~ USD 115/tCO_2e. Therefore, the power sector offers both an outstanding potential to reduce our emissions as well as a great boost to our economy by reducing spending on energy in the future.

Of the abatement potential of 11 $MtCO_2e$ by 2030, 40% lies in energy efficiency measures that would decrease power demand while the remaining 60% of the maximum

abatement potential lies in making the generating mix cleaner. The following four types of levers add up to the maximum abatement potential in the power sector:

- Energy efficiency in buildings and industry
- Maximizing renewable energy in the generating mix
- Replacing power plants running on fuel oil or retrofitting them to run on natural gas
- Reducing the need for off-grid generation to a minimum and replacing it with new power plants running on natural gas.

a Energy efficiency

In the BAU scenario, the need for power generation would increase from ~ 21 TWh now to ~ 28 TWh in 2030. As a well-known saying in the industry puts it, the cleanest and cheapest electricity is the electricity that we do not have to generate. In this spirit, energy efficiency measures are the first set of levers that offer a tremendous reduction both in emissions and in spending by consumers in our country. If all available energy efficiency levers were implemented fully, the need for power generation would drop by ~ 5 TWh per year by 2030, representing a drop of ~ 18% compared to BAU, which would reduce GHG emissions by ~ 4 $MtCO_2e$.

The energy efficiency measure with the highest emission reduction potential in the DR is the replacement of inefficient lightbulbs. Phasing out incandescent lightbulbs and furthermore replacing almost all efficient CFL lightbulbs with even more efficient LED lightbulbs would yield electricity savings of up to 1,700 GWh per year by 2030, representing ~ 35% of the total potential of energy efficiency in the DR.

The second most potent energy efficiency measure is the replacement of inefficient electronics and appliances with more efficient ones—ranging from washing machines and TVs to air conditioning units—both in residential and in commercial buildings. A shift to more efficient electronics and appliances would save up to 1,500 GWh of power per year by 2030, amounting to another third of the potential that lies in energy efficiency.

Since a lot of energy in the DR is used to cool buildings, better insulation could save a lot of power. Efficiency standards for the construction of new residential and commercial buildings that enforce better insulation could save up to 450 GWh of electricity per year by 2030, making up 10% of the abatement potential of energy efficiency. One more key measure in buildings could reduce the amount of electricity used: replacing traditional water heaters with solar water heaters placed on rooftops. These could reduce power use by up to 150 GWh per year by 2030.

Energy efficiency measures can also reduce power use in Dominican industries. Key elements of these measures are the improvement of motors and other electricity-intensive equipment as well as the optimization of electricity-intensive processes in industry. These

measures could reduce power use in industry by up to 850 GWh per year by 2030, which represents ~ 20% of the total potential that lies in energy efficiency in the DR.

b Maximizing renewable energy in the power generating mix

After reducing the need for power generation, the remaining 60% of the maximum abatement potential lies in making the remaining power generation cleaner. Fortunately, we are blessed with a good starting position to do so. It is clear that the DR is endowed with a large potential for renewable energy: we are a topographically diverse country on a Caribbean island with 1,576 km of coastline, mountains reaching 3,100 meters, and excellent soil fertility. Given this natural endowment, the renewable energy sources with the greatest potential in the DR are hydro, wind, biomass, and solar energy.

The exact potential of each of these sources of renewable energy has not yet been determined, but a study to rigorously analyze this question is under way. It will first focus on determining the potential for wind and solar energy and then focus on biomass and the possibility of geothermal energy potential. Full results are expected in 2013.

Hydro energy has the highest potential in the DR, which has benefited from this source of clean power for decades. The maximum potential of hydro in the DR lies in the order of 1,100 MW, which would require us to double our current installed capacity by retrofitting our existing dams and pursuing new small and medium-sized projects wherever they are in line with the vital interests of our people and the environment. If we want to capture this maximum potential, we must fast-track the development of planned hydro projects, first and foremost Pring Brazo Derecho, Palomino, Ampliación Hatillo, Las Placetas, Artibonito, and Manabao Bejucal. These projects would yield an additional 330 MW in installed capacity and are already included in the BAU scenario. If we captured the full additional potential for hydro energy in the DR, we would reduce emissions from the power sector by ~ 0.6 $MtCO_2e$ per year by 2030. As the cost curve indicates, the abatement cost of hydro is a net benefit of ~ USD 90 per ton of reduced emissions—the best abatement cost of all the renewable energy sources for the DR. If we captured our hydro potential fully, we would therefore save ~ USD 450 million per year compared to our power generation cost under BAU in 2030—a tremendous economic impact on top of the emission reduction of over 0,5 Mt per year.

An even larger abatement potential lies in **wind energy,** albeit at a comparatively higher abatement cost, as the cost curve indicates. The development of wind power has begun and ~ 180 MW will come online in the next two years in the wind parks Juancho, Los Cocos, Pedernales, Grupo Eólico Dominicano, Baní, Quilvio Cabrera, Parque Eólico del Caribe, Juanillo, and Montecristi. A detailed study of further wind potential will become available later this year. In the meantime, we estimated that with improving technology and falling cost, it should be theoretically possible to bring installed wind capacity up to ~ 1,000 MW by 2030 while safeguarding our national parks and nature reserves and the

beauty of our landscape and coastline. Installing wind capacity up to this theoretical maximum would reduce emissions by 1.8 $MtCO_2e$, which is the single largest abatement lever in the power sector. Given the negative abatement cost of ~ USD 70 per ton, full implementation of this lever would save the Dominican economy USD 130 million per year by 2030 compared to the BAU scenario.

A country as fertile as ours inherently has a significant **biomass** potential. While we are anticipating the completion of a detailed analysis of available biomass in the DR, it is clear that many of our agricultural products yield biomass that is perfectly suited for power generation, chief among them sugarcane bagasse as well as coconut husk, coffee husk, rice husk, and waste from forestry and agriculture. The establishment of an efficient supply chain for feedstock is likely to yield a very competitive price for power generation in the future. However, in the absence of reliable data, we made a conservative estimate and assumed that most biomass power plants that we could build would have to run on imported biomass feedstock, making biomass a comparatively expensive abatement lever. Once a local supply chain develops and reduces the need for imported biomass feedstock, the generating cost of biomass power plants would drop, and the lever would become much less costly than assumed here.

Lastly, the DR is undoubtedly endowed with a great **solar** potential. Being situated south of the Tropic of Cancer with limited cloud overcast, the DR has some of the best solar irradiation in the world. A detailed study of the solar potential will become available later this year. Until then, we assume that a theoretical maximum of 800 MW of solar capacity could be installed in the DR by 2030, with another 100 MW in theoretical maximum capacity in the form of plants using concentrating solar power (CSP). As the cost curve indicates, solar power is among the more expensive levers in the power sector—even in 2030, when the knowledge amassed about solar energy will have substantially reduced the cost of solar technology. Nevertheless, despite relative expensiveness, investments in solar energy would have a positive economic impact compared to the BAU scenario, amounting to USD 50 million annually by 2030.

If the full potential of hydro, wind, solar, and biomass energy in the DR were utilized for power generation, these renewable sources could provide up to ~ 45% of total power generation in 2030. Sources that provide only intermittent demand (wind and solar) would amount to ~ 20%, while sources with near-baseload capacity (hydro and biomass) would amount to ~ 25%. These figures are prone to change as new data becomes available both on the renewable energy potential in the country and on power demand in 2030.

c Replacing power plants running on fuel oil or retrofitting them to run on natural gas

While many of the existing power plants running on fuel oil will retire by 2030, some 800 MW of fuel oil plants will remain in 2030 if the DR develops under the BAU assumptions. Not only will these plants continue to emit almost 2 $MtCO_2e$ per year, they will also be a major economic drain as power generation from fuel oil is projected to reach generating costs of ~ USD 320/MWh, compared to USD 185/MWh in a new natural gas-fired plant. Therefore, it is essential that we retrofit the power plants that currently run on fuel oil or that we replace these power plants with new natural gas capacity. If we replaced the full 800 MW of fuel oil capacity with natural gas, we would reduce annual emissions in 2030 by 1 $MtCO_2e$ and save an annual ~ USD 200 million.

d Reducing the need for off-grid generation to a minimum and replacing it with new power plants running on natural gas

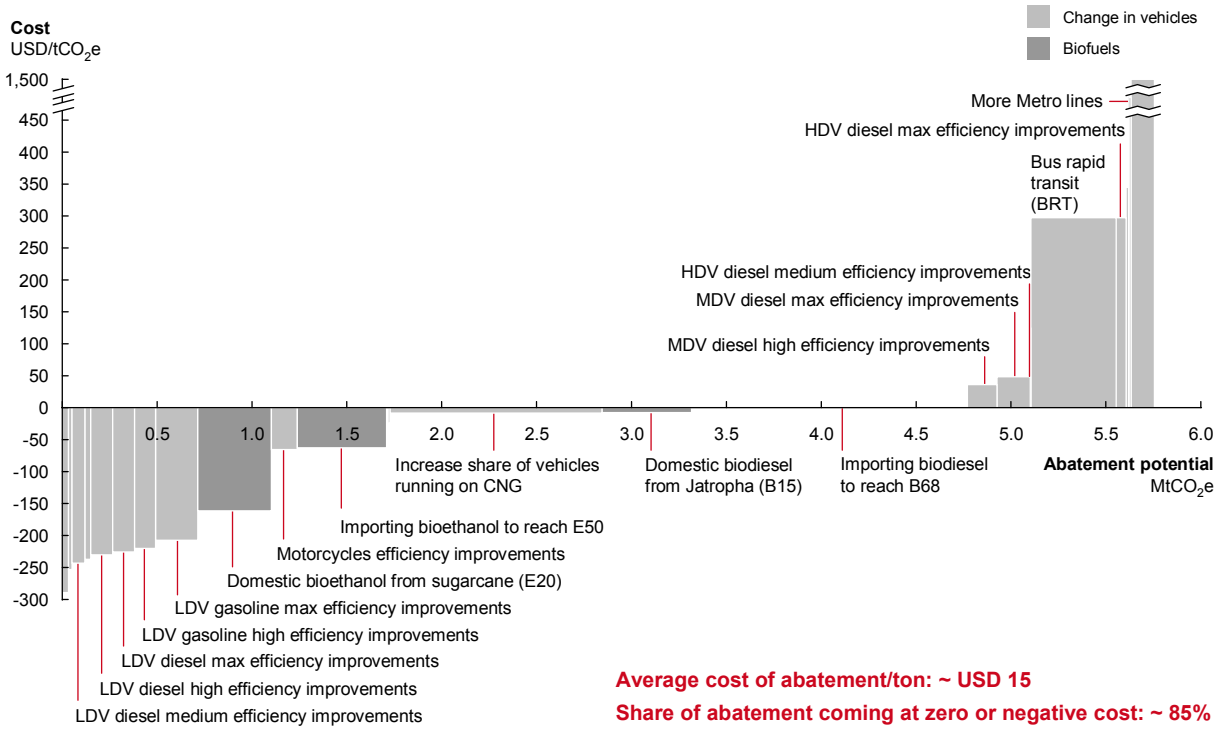
The last major share of abatement potential in the power sector lies in reducing off-grid generation. Whether it occurs in the form of backup generators or large isolated power systems, off-grid generation runs on fuel oil, gasoline, or Diesel and is therefore both highly expensive and highly polluting. Certainly, a minimum amount of off-grid generation exists in any power system, but it is theoretically possible to reduce off-grid generation to ~ 5% of total generation within the next two decades, down from ~ 3.7 TWh today to only ~ 1.2 TWh in 2030. Generating this electricity with natural gas instead would reduce our emissions by an annual 0.4 $MtCO_2e$ by 2030 and save the Dominican power consumers USD 40 million per year by 2030.

The full implementation of all abatement measures in these four categories would fundamentally alter the power sector in the DR. Not only would GHG emissions drop by ~ 60% compared to BAU in 2030, saving 11 $MtCO_2e$ per year by 2030 as energy efficiency reduces required power generation by 18% and the carbon intensity of the power generation mix would drop by half, from ~ 0.64 to ~ 0.32 tCO_2e/MWh. The economics of the power sector would also improve: the average cost of power generation (including off-grid generation) would drop by around 14%, reaching ~ USD 190/MWh compared to ~ USD 220/MWh in 2030 under BAU.

2 Efficient vehicles, biofuels, and public transport could halve emissions in the transport sector, a reduction of ~ 6 $MtCO_2e$

FIGURE 8: Transport sector Abatement Cost Curve for 2030

In the transport sector, ~ 50% of abatement comes from biofuels, ~ 20% from fuel efficiency standards, and ~ 20% from shifting to CNG



Analysis by the National Council on Climate Change and Clean Development Mechanism

The transport sector has the potential to reduce the country's oil imports, thus significantly improving the DR's current account balance while reducing GHG emissions. Under the BAU assumptions, the DR's vehicle fleet will grow from 2.3 million to 3.5 million vehicles between 2010 and 2030 (including buses and motorcycles), increasing fossil fuel consumption from ~ 3,000 million liters to ~ 4,400 million liters. As a result, fuel imports will grow from ~ 17 to ~ 25 mBOE between 2010 and 2030 while sector emissions will grow from ~ 8 to ~ 11 $MtCO_2e$ over the same period.

There is a significant opportunity to reduce GHG emissions from burning fossil fuels. Total abatement potential for the sector by 2030 is ~ 6 $MtCO_2e$ or ~ 50% of BAU emissions in the same year. Four main levers drive this reduction:

- Increasing efficiency across all vehicle categories

- Substituting traditional fossil fuels with biofuels
- Shifting high-emitting gasoline and diesel vehicles to CNG
- Shifting urban traffic in Santo Domingo to a modern public transport system.

Given the low efficiency of the vehicle fleet in the BAU scenario and the attractive potential for biofuels in the country, the DR can capture ~ 80% of the abatement potential in transport at cost savings. Implementing these four levers would have an average negative cost of ~ USD 60/tCO_2e, generating net gains of ~ USD 360 million per year by 2030.

a Increasing efficiency across all vehicle categories

Today, two out of every three vehicles entering the country are old, used cars with low fuel efficiencies. In addition, there is no strict control on the age limit for imported used cars and no regulation overseeing fuel consumption standards on vehicles entering the country. To address this issue, it is important to establish a comprehensive regulatory framework across all vehicle categories, ensuring that imported vehicles, both used and new, meet minimum fuel efficiency standards and establishing the right incentives to promote the sale of new, more efficient vehicles. Additionally, it is important to develop the necessary enforcement capabilities at customs.

Increasing the efficiency of the vehicle fleet in the DR and setting the standards and incentives to promote the sale of more efficient vehicles to increase the overall fuel efficiency of the fleet by at least ~ 15% can achieve GHG emission reductions of ~ 1.3 MtCO_2e or ~ 20% of the transport sector's total abatement potential by 2030 by reducing the consumption of ~ 150 million liters of gasoline and ~ 250 million liters of diesel per year as of 2030, saving ~ USD 270 million. More efficient vehicles come at a higher cost. However, over time, the incremental cost of the vehicle is offset by cumulative fuel savings, as is reflected by the average negative abatement cost (net financial gain) for this lever, estimated at ~ USD 100/tCO_2e.

b Substituting traditional fossil fuels with biofuels

All of the fossil fuels used in the transport sector in the DR are imported and both government and consumers are exposed to sudden changes in prices as international crude prices fluctuate. Under the BAU assumptions, fossil fuel demand for transportation will grow by 42% over the next 20 years, increasing the country's exposure to the price volatility of crude oil and its derivatives. The DR could reduce its dependency on imported fossil fuels while reducing its GHG emissions by migrating to a fuel mix that includes biofuels.

The DR is poised to embark on an ambitious program of domestic biofuels production based mainly on sugarcane for bioethanol and Jatropha for biodiesel. The key considerations for domestic biofuels production in the DR are the following:

- As biodiesel and bioethanol are made from renewable feedstock, biofuels cause only minimal emissions in their lifecycle (sugarcane at ~ 0.03 $kgCO_2e/l$ and Jatropha at ~ 0.04 $kgCO_2e/l$) compared to fossil fuels (gasoline at ~ 2.42 $kgCO_2e/l$ and diesel at 2.68 $kgCO_2e/l$).
- Domestic bioethanol production from sugarcane could supply a gasoline mix up to E20 (20% bioethanol, 80% gasoline), which would amount to an annual production of ~ 2 million barrels per year by 2030.
- Domestic biodiesel production from Jatropha could supply a diesel mix up to B15 (15% biodiesel, 75% diesel), which would amount to an annual production of ~ 2.4 million barrels of biodiesel by 2030.
- Achieving the production levels of bioethanol from sugarcane needed for an E20 mix without having to shift sugarcane away from other uses (such as sugar or rum production) requires that productivity improves by ~ 50%, from ~ 52 to ~ 78 tons/hectare by 2018.
- Achieving the production levels of biodiesel from Jatropha needed for a B15 mix requires the successful introduction of Jatropha planting on ~ 200,000 hectares of largely marginal land.
- Developing the local biofuels industry requires an incentive system to attract investments and a clear regulatory framework to ensure that there is a local market for these fuels.
- Under these conditions, bioethanol could be produced in the DR at ~ USD 83 per barrel and biodiesel at ~ USD 96 per barrel.

Under a more ambitious strategy, the DR could import biofuels to reach an average gasoline blend of E50 (50% bioethanol, 50% gasoline) and an average diesel blend of B68 (68% biodiesel, 32% diesel) by 2030. This scenario rests on the following key considerations:

- The future vehicles in the DR are not a limiting factor as the vehicle fleet will include both vehicles limited to lower blends and gasoline "flex fuel vehicles" that are capable of handling gasoline blends of up to E85. Various kinds of diesel vehicles will be capable of handling B100 as well as B20 diesel blends
- Domestic biofuels production could supply ~ 40% of the required bioethanol for E50 and ~ 20% of the required biodiesel for B68. The remaining shares must be imported.
- Biodiesel and bioethanol are readily available on global markets for import to the DR. However, the price of imported bioethanol is likely to develop in a different way than the price of biodiesel. For the purpose of estimating the abatement costs of the imported biofuel levers, the following assumptions have been made:

- Bioethanol is unlikely to be able to displace large amounts of global gasoline demand because technological barriers preventing blends with high ethanol content are likely to persist in the global vehicle park well into the next two decades. This is likely to limit the demand for bioethanol worldwide while yields of bioethanol feedstock are likely to increase. Thus, bioethanol is likely to be in excess supply by 2030 and be priced independently from the price of gasoline. This means that the bioethanol price could be defined by the marginal cost of production on the global bioethanol market across the different feedstock types (sugarcane, corn, wheat, coarse grains, etc.). Based on current and forecasted production costs, we estimate the landed cost of bioethanol to be lower than that of gasoline in 2030, resulting in a negative abatement cost of ~ USD -65 per ton.
- For biodiesel, the technological barriers that would limit the introduction of blends with high biodiesel content are much lower. The cost of switching conventional diesel vehicles to use high biodiesel blends is low and already existing technology allows for a high biodiesel blend of B68, which is likely to increase further by 2030 with the introduction of full-flex diesel vehicles. Therefore, biodiesel has a far greater latent demand. At the same time, first-generation biodiesels compete with food and cosmetic applications for vegetable oils. Therefore, experts assume that it is unlikely that global biodiesel production will exceed latent demand by 2030 and under these conditions biodiesel will probably be priced at the value of the product it replaces: conventional diesel. Therefore, we estimate that in 2030 the cost of imported biodiesel will match the cost of imported diesel, resulting in no savings when diesel is substituted by biodiesel and thus an abatement cost of USD 0.

- The abatement potential of a biofuels strategy is substantial: the domestic biofuels strategy outlined above would save ~ 0.9 $MtCO_2e$ per year by 2030 compared to BAU, at a negative abatement cost of ~ USD -77 per ton of reduced emissions.
- A more ambitious biofuels strategy including imports to reach E50 and B68 blends would reduce emissions by an annual ~ 1.9 $MtCO_2e$ in 2030, at a negative abatement cost of ~ USD -15 per ton of reduced emissions, contributing ~ 50% of the total abatement potential in the transport sector. Additionally, it could reduce fossil fuel imports by ~ 3 mBOE by 2030. While most abatement cost estimates are necessarily based on assumptions on the future cost of globally traded commodities, the import biofuel levers are based on a perspective on the differential in price between substitutable commodities and should be then seen as inherently more uncertain. On the other hand, beyond the exact estimate of future biofuel prices vis-à-vis the price of fossil fuels, pursuing a program that builds the ability to import and use biofuels creates valuable optionality for the Dominican economy and diversifies its dependence on energy sources.

c Shifting to CNG

CNG causes only ~ 65% of the emissions of fossil fuels per liter (1.74 $kgCO_2e/l$ compared to gasoline at ~ 2.42 $kgCO_2e/l$ and diesel at 2.68 $kgCO_2e/l$). Today, 49% of the LDV fleet in the country runs on gasoline, 28% on diesel and 23% on LPG. A fast-growing vehicle fleet, in combination with the high volatility of fossil fuel prices and a generalized subsidy for LPG, presents a real challenge for both government and consumers as demand for transportation fuels grows. That is why diversifying the fuel mix in the transport sector is an important lever not only for reducing GHG emissions, but also for improving our economy.

By 2030, eliminating the vehicles that currently use LPG and shifting ~ 25% of the LDV fleet from gasoline/diesel into CNG can abate up to ~ 1.1 $MtCO_2e$ or ~ 20% of the transport sector's total abatement potential at an average negative cost of ~ USD 10/tCO_2e and reduce fuel consumption by ~ 400 million liters. In order to achieve such a conversion, a key factor will be not only the ability to secure a sufficient supply of natural gas, especially as the power sector also migrates to this fuel, but also the capacity to build the necessary infrastructure to distribute and deliver CNG to the consumer while at the same time converting/importing vehicles suited for CNG.

d Shifting Santo Domingo to modern public transport

The existing public transport system in Santo Domingo is composed of an old, inefficient, and unreliable fleet of light-duty vehicles (LDV, commonly known as *conchos*), micro-/minibuses, and buses that collectively transport ~ 2 million passengers per day. The government of the DR has already made significant efforts to modernize public transport in the city and in 2009 inaugurated Santo Domingo's first metro line. To continue the modernization of public transport, the government will:

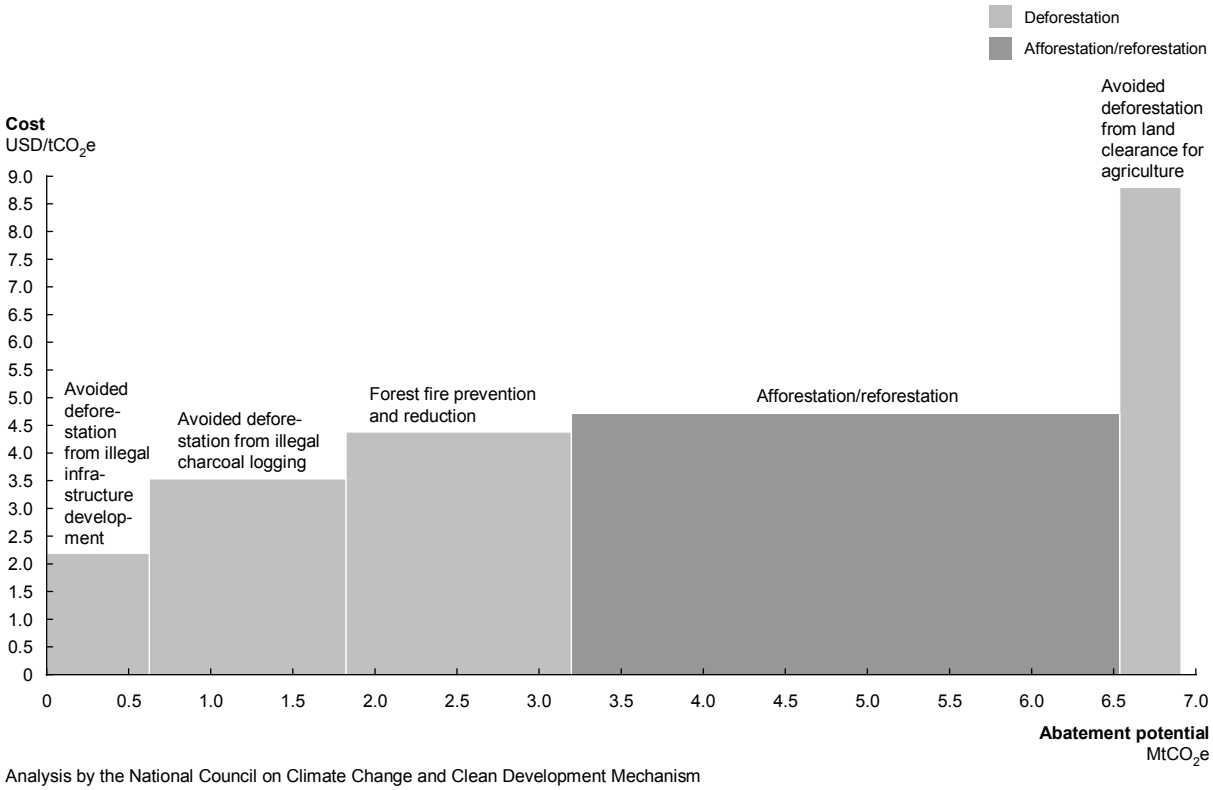
- Expand the metro system, building five additional lines, shifting ~ 700,000 passengers per day currently using ~ 2,000 old and inefficient public transport vehicles
- Build nine bus rapid transit (BRT) lines, creating a modern network of feeding lines for the metro. These lines would replace the old bus fleet and transport ~ 1.3 million passengers per day.

Together, the metro system and the BRT lines can abate up to ~ 0.5 $MtCO_2e$ in 2030 or ~ 10% of the transport sector's total abatement potential. Given the high investment requirements for these levers, the average abatement cost is amongst the highest at ~ USD 500/tCO_2e. Therefore, the reduction in carbon emissions is not reason enough for these measures. The benefits of public transport—such as traffic decongestion, citizen convenience and mobility, and pollution reduction—have to be seen in a broader sense. The key success factor here is access to smart financing to meet the high capex required to capture the many benefits of public transport.

3 Reducing deforestation and supporting carbon sequestering in new forests could diminish emissions by ~ 7 $MtCO_2e$ in 2030

FIGURE 9: Forestry sector Abatement Cost Curve for 2030

In the forestry sector, ~ 50% of abatement potential lies in reducing deforestation and ~ 50% in ambitious afforestation and reforestation



Analysis by the National Council on Climate Change and Clean Development Mechanism

Before addressing the abatement potential from the forestry sector, it is important to reiterate and acknowledge the high degree of uncertainty in the sector-specific estimates given the lack of reliable and consistent land use and country-specific carbon stocks data.

Acknowledging this uncertainty, the BAU scenario assumes that gross emissions will remain relatively stable over the next 20 years at ~ 4 $MtCO_2e$. These emissions are mainly driven by losses of forest cover from deforestation associated with slash-and-burn agriculture, production of charcoal, and land use changes due to urban and infrastructure development as well as forest fires. From the information available, we estimate that the total deforestation rate is currently ~ 6,200 hectares per year and we assume it will remain relatively constant in the future.

On the other hand, carbon sequestration, driven by A/R efforts, is projected to grow from ~ 2 $MtCO_2e$ in 2010 to ~ 3 $MtCO_2e$ in 2030. On balance, estimations of current net emissions add up to ~ 2 $MtCO_2e$ and are expected to decrease to ~ 1 $MtCO_2e$ by 2030.

The DR could abate up to ~ 7 $MtCO_2e$ by 2030 at an estimated average cost of ~ USD 4/ tCO_2e, transforming the forestry sector into a net carbon sink. This maximum abatement potential is almost equally driven by (a) reducing deforestation, (b) preventing and controlling forest fires, and (c) increasing the A/R programs. Our estimates indicate that the DR could reduce deforestation from ~ 6,200 in 2010 to ~ 1,300 hectares per year in 2030 by undertaking a series of programs that address the deforestation drivers identified. The combined effect of these programs, together with the implementation of the forest fire prevention and control program, could reduce emissions by ~ 3.6 $MtCO_2e$ per year in 2030. Additionally, by aggressively expanding the reforestation program by 9% per year, carbon sequestration could increase by ~ 3.3 $MtCO_2e$ or ~ 125% relative to BAU sequestration by 2030. The combination of all these programs and levers could create ~ 15,000 new jobs by 2030 and capture ~ USD 35 million per year of international funding from REDD+ and CDM.

a Reduced deforestation

Reducing deforestation requires addressing the drivers behind this phenomenon. The proposed measures and programs to do so consist of:

- Reducing deforestation from slash-and-burn agriculture
- Reducing deforestation and logging for charcoal production
- Reducing deforestation associated with urban and infrastructure development.

Reducing deforestation from slash-and-burn agriculture

By 2030, land clearance for agriculture in the BAU scenario would amount to ~ 800 hectares per year, causing ~ 0.4 $MtCO_2e$ of emissions per year. The DR can reduce deforestation by 100% through an extension program that supports small farmers at an average cost of abatement of ~ USD 10/tCO_2e. The goal of the program is to shift from low-input production methods and increase productivity and soil fertility to reduce the need for agricultural land, improving income and welfare of smallholder farming communities while reducing their need to clear forests. The main elements of the extension program include:

- Introducing better irrigation systems
- Increasing and optimizing the use of fertilizers
- Introducing better agronomy practices, such as planting, harvesting, and postharvesting management practices.

For the program to be effective, it is very important to develop the capabilities to reach a fragmented rural population and train specialized staff (agronomists) to implement the program.

Reducing deforestation and logging for charcoal production

Charcoal production mainly happens at the border region, and it is an important source of income for communities in the area. Today, charcoal production is estimated at ~ 7,000 tons per year requiring about ~ 2,500 hectares of forest and emitting ~ 1.2 $MtCO_2e$ per year. Given that ~ 60% of charcoal production is illegally exported to Haiti, deforestation associated with this activity under BAU assumptions is expected to remain constant over the next 20 years as demand for charcoal in Haiti is not expected to fall.

Nonetheless, we believe the DR can fully stop deforestation for charcoal production by 2030 through a series of community-support programs and law enforcement. A recent study performed in charcoal-producing regions at the border revealed that charcoal-producing communities are willing to stop this activity if they are able to find alternative sources of employment and income. This is possible through a series of programs that would consist of:

- Improving land productivity by implementing agricultural best practices and improving infrastructure for agriculture activities
- Implementing agro-forestry programs, in which communities protect the forest while reaping the benefits of the sale of higher-value agricultural products
- Involving communities in conservation and forest management projects
- Facilitating access for communities to alternative sources of energy, such as LPG.

The average cost of abatement of these programs is estimated at ~ USD 4/tCO_2e. A successful implementation will largely depend on the ability to involve and coordinate with other institutions that oversee land use and land use change issues, rural development (such as the Ministry of Agriculture and the Ministry of Economics, Planning, and Development), and the ability to modify the current economic conditions that drive charcoal production.

Reducing deforestation associated with urban and infrastructure development

Today, deforestation from urban and infrastructure development is estimated at ~ 1,900 hectares per year and, under BAU assumptions, it is expected to grow ~ 2,600 hectares per year by 2030, or ~ 1.7% per year, in line with economic development. By 2030, emissions will add up to ~ 1.3 $MtCO_2e$.

Given the economic growth expectations of the DR, it will be impossible to fully stop deforestation associated with urban and infrastructure development. However, by imple-

menting an urban planning and zoning program and improving law enforcement capabilities, we believe the DR can reduce deforestation by ~ 50%, thus reducing emissions by ~ 0.6 $MtCO_2e$ in 2030. The combination of planning and enforcement will help control the accelerated urban development in the country through the improvement of the processes under which construction permits are given and through a reduction of illegal clearance for infrastructure development. The estimated cost of abatement for this lever is ~ USD 2/tCO_2e, which only considers the incremental cost of putting in place better law enforcement mechanisms. The abatement cost could actually be higher if the opportunity cost of land were to be included. However, in the method used, this component was not included in the calculations.

b Forest fire prevention and control

Between 1972 and 2010, there were ~ 3,000 forest fires that affected a total of ~ 175,000 hectares. This equals an average of 80 forest fires per year and an average of ~ 4,500 hectares per year affected, resulting in GHG emissions of ~ 1.5 $MtCO_2e$. Under BAU assumptions, the area affected by forest fires is expected to remain constant.

Studies by local experts have showed that 90% of forest fires are caused by human activity. Therefore, by creating stricter regulatory frameworks, developing law enforcement capabilities, and setting up a more robust forest fire prevention and control system, the DR has the potential to reduce the impact of human-driven forest fires by 2030. Achieving this would result in an emission reduction of ~ 1.4 $MtCO_2e$ per year by 2030 at an average estimated cost of ~ USD 4/tCO_2e.

c Increasing A/R efforts

Since 1997, the government of the DR has embarked on a very successful reforestation program, known as *Quisqueya Verde*. Over the past decade, the average reforestation rate in the country was ~ 6,300 hectares per year, including reforestation efforts by the private sector, which contribute ~ 20% of all reforestation efforts, particularly through the work done by local NGOs.

Under BAU assumptions, the reforestation rate is expected to remain constant at ~ 6,300 hectares per year over the next 20 years; this means that by 2030, A/R efforts will add ~ 120,000 hectares of forest, increasing carbon sequestration by ~ 2.6 $MtCO_2e$. If the reforestation rate in the country were to increase by 9% per year, adding ~ 25,000 hectares per year by 2030 on top of the BAU reforestation rate, the DR could add ~ 180,000 hectares of forest and increase carbon sequestration by ~ 3.3 $MtCO_2e$ at an average estimated cost of ~ USD 5/tCO_2e.

There are three key steps for a successful expansion of the reforestation program:

- Develop a strategic reforestation plan based on analysis of up-to-date land cover maps
- Improve clarity on land ownership and titling
- Build a robust regulatory framework in coordination with the urban planning and zoning program.

Before moving aggressively towards expanding reforestation efforts, it is very important to identify the areas where it is possible to afforest/reforest. To do so, the DR needs to fill in the missing information gaps on land cover, land availability, and land ownership.

Capturing the technical abatement potential stated above will not be an easy task and will require significant efforts from both government and the private sector. We think there are important elements that are missing and need to be in place across the entire sector for a successful implementation of these programs. The most important challenges are:

- Absence of a National Forest and REDD+ Strategy
- Lack of a robust legislative and regulatory framework for the forestry sector and limited enforcement capabilities
- Little coordination among the institutions with responsibilities over land use and rural development
- Lack of consistent and reliable data on land use/land use change and carbon stocks.

The DR already has some elements needed to overcome these challenges, but there is still significant work to do. For example, despite the absence of a National Forest and REDD+ Strategy, the country has already drafted strategies for biodiversity, climate change, and desertification, among others. Under the leadership of the Environment Ministry, these strategies need to be integrated in order to build a robust and coherent National Forest and REDD+ Strategy. It is important to involve other institutions, both public and private, during the process of creating this strategy. The complexity of land use and land use change issues affecting the forestry sector requires the involvement of many institutions, such as the Ministry of Agriculture, the Ministry of Economics, Planning, and Development, the Ministry of Tourism, the Ministry of Public Works, local governments and municipalities, NGOs and the private sector.

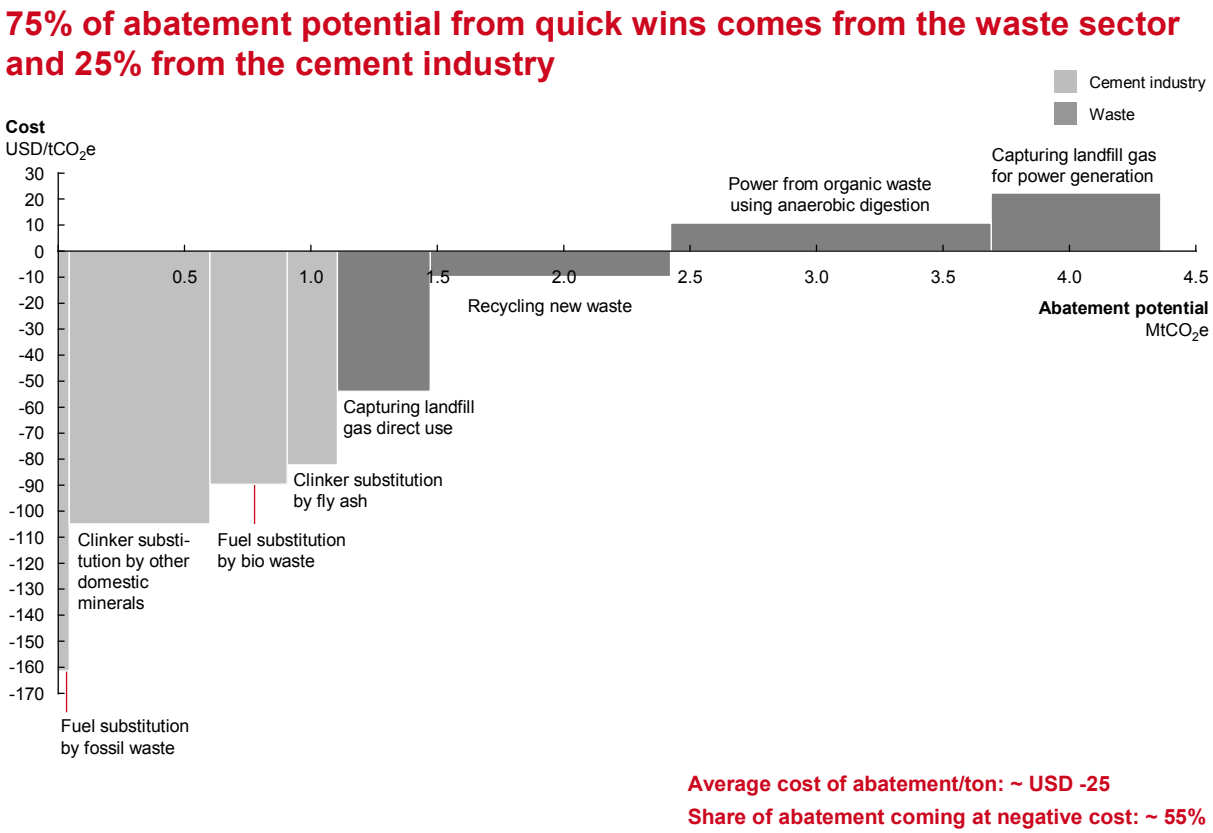
With regard to the regulatory framework, the Environment Ministry is already taking steps in the right direction. It recently passed a law approving the new Environmental Authorization System, which consolidates and centralizes the processes to evaluate and grant environmental permits. The Ministry also has draft proposals for a comprehensive National Forest Law and an Ecosystem Payment Law. It is important to pass and integrate these laws with the National Forest and REDD+ Strategy and coordinate efforts with the National Territorial Ordering Plan. Additionally, it is necessary to strengthen law enforcement capabilities. Without these, reducing illegal forest clearance and preventing forest

fires will be quite difficult. Ten years ago the number of forest rangers in the country was 1,100; today, there are only 600 agents responsible for law enforcement. Based on international benchmarks and best practices, the current number of forest rangers needs to increase by at least ~ 1,600.

Finally, none of the strategic planning processes and implementation of programs will be effective unless the country is able to build a strong and solid fact base that allows the DR to keep track of changes in land use and land activity and estimate emissions. This information is the base needed to build the Measuring, Reporting, and Verification System (MRV) that countries need to implement if they want to access REDD+ funds through active abatement. Additionally, understanding changes in land use and land activity is critical in designing pilot programs and in the planning processes for the expansion of the reforestation program. That is why, in the short term, the DR needs to update existing land cover maps and create more recent ones to determine the historic deforestation rate, accurately identify the areas where deforestation takes place, gather better information on its causes, and begin the process of building robust geographic information and MRV systems.

4 As quick wins, the waste and cement sectors offer an additional 10% of abatement potential and a strategic focus on the tourism sector will catalyze implementation of the CCDP

FIGURE 10: Abatement Cost Curve of the quick wins for 2030



Analysis by the National Council on Climate Change and Clean Development Mechanism

Under BAU assumptions, waste, cement, and tourism will account for ~ 9.5 $MtCO_2e$ of annual emissions in 2030. While these sectors are not among the priority sectors of the CCDP, they present a few outstanding, easy-to-implement abatement opportunities. Combined technical abatement potential in the waste and cement sectors is an annual ~ 6 $MtCO_2e$ by 2030, of which ~ 4.5 $MtCO_2e$ can be captured by only five measures that are relatively easy to implement:

- The cement sector currently satisfies 90% of its power requirements with fossil fuels. Increasing the share of bio- and fossil waste in the fuel mix from 10% now to 50% by 2030 would save ~ 0.4 $MtCO_2e$ and USD 35 million per year. Reducing the ingredient share of clinker—the energy-intensive main ingredient of cement—from 95 to 77% by

replacing it with fly ash from coal plants and other local alternative ingredients would reduce annual emissions by 0.8 $MtCO_2e$ by 2030 and save USD 75 million per year.

- In the waste sector, recycling 50% of valuable waste can save ~ 1 $MtCO_2e$ and USD 9 million per year. Equipping 30% of landfills to capture methane for use as cooking gas or for power generation would save 1 $MtCO_2e$ and USD 5 million per year by 2030. Using half of all organic waste for power generation through anaerobic digestion would reduce annual emissions by ~ 1.3 $MtCO_2e$ at a moderate cost of USD 14 million per year.

Implementing these quick wins yields a net benefit: average abatement cost is a saving of USD 25 per ton, generating a total cost savings for the DR of USD 110 million annually by 2030.

In addition, a strategic approach in the tourism sector can be a catalyst for the implementation of strategies to reduce emissions in the power, transport, and waste sectors.

Caveats regarding the maximum abatement potential

- The maximum abatement potential presented here does not represent actual targets but rather the maximum potential to reduce annual GHG emissions in the DR by 2030, based on plausible but very ambitious government policy and adoption rates.
- The results are based on the expertise of the Technical Working Groups and local data where available, but significant data improvement opportunities remain, especially concerning forestry and the renewable energy potential of our country.
- The economic impact of the CCDP has been estimated under the leadership of the Ministry of Economics, Planning, and Development on a standalone-project basis without taking second-order effects into account.

C We aspire to capture most of our abatement potential through four sector action plans: energy, transport, forestry, and quick wins

The abatement potential described above is encouraging as it proves that a reversal of BAU is possible—and achievable at largely net financial benefit. To capture most of this abatement potential as well as the positive effect on the economic and social development of our country, the key sectors have drafted sector action plans that set out roadmaps for implementation.

The action plans include levers chosen for their outstanding abatement potential and low abatement cost, synergies with economic and social development, and comparative ease

of implementation, including access to financing. Core measures of these draft sector action plans are described below.

a Energy

The leaders of the energy sector in the DR aspire to the following programs and objectives:

- Energy efficiency measures will reduce power consumption by 13% compared to the BAU scenario by 2030, introduced through an energy efficiency law coupled with assistance to consumers in making the necessary investments in residential and commercial buildings as well as industry.
- Renewable energy will contribute at least 25% of the generation matrix as Dominican law requires. The targets of the current draft Energy Action Plan would result in a renewables share of 33%:
  - Increase hydro capacity to 1,100 MW through optimal retrofitting of existing dams and building new dams.
  - Develop wind power to reach an installed capacity of ~ 900 MW.
  - Use biomass for power generation in ~ 300 MW of installed capacity.
  - Develop a distributed renewable system based on solar photovoltaic that supplies at least 1% of maximum demand.
- Power plants running on fuel oil will have been retrofitted to run on natural gas or will have been retired while new gas-fired plants take their place in the generating mix.
- Off-grid generation will be reduced to a bare minimum of 5% of total power generation as the need for backup generators has subsided due to an improved grid with full reliability and as self-reliant power systems have been interconnected with the grid.

b Transport

The leaders of the transport sector in the DR have committed to pursuing the following programs and objectives:

- Fuel efficiency standards
  - Reach a reduction of the fuel consumption level of at least -15% by 2030, establishing efficiency standards for those vehicles that are incorporated into the vehicle fleet.
  - Improve overall fleet efficiency by decreasing the share of annual imported used cars from 67% in 2010 to 33% in 2030 and decrease the average age of the vehicle fleet from 15 to 10 years over the same period.

- Shift to CNG
  - Promote the use of CNG through a conversion program that ensures the conversion of 110,000 vehicles using diesel and 108,000 vehicles using gasoline while eliminating 240,000 vehicles using LPG.
  - Create a network of CNG service stations, promoting investments in distribution infrastructure through incentives for the private sector.
- Biofuels
  - Develop the sugarcane bioethanol industry in the country and produce ~ 2 million barrels of bioethanol to achieve an E20 gasoline blend by 2030.
  - Develop capabilities and promote the cultivation of Jatropha to produce ~ 2 million barrels of biodiesel and achieve a B12 diesel blend by 2030.
  - Increase the share of biofuels in the country and achieve average gasoline and diesel blends of E50 and B68 by importing bioethanol and biodiesel.
- Public transportation
  - Increase use of the metro system from 100,000 passengers per day in 2010 to 700,000 by 2030 by continuing with the construction of the metro network.
  - Reorganize the current traditional system to create a network of feeding lines with a BRT system and buses operated with CNG with a capacity of 1.3 million passengers per day.

c Forestry

The leaders of the forestry sector in the DR have committed to pursuing the following programs and objectives:

- Deforestation reduction
  - Build a strong, solid fact base for land use and land use change to identify the areas where deforestation takes place and quantify the historic deforestation rate.
  - Identify the causes of deforestation and design programs to reduce deforestation from ~ 6,200 hectares today to ~ 1,400 hectares in 2030.
  - Roll out extension programs to reduce deforestation from slash-and-burn agriculture by supporting small producers to increase productivity and soil fertility and by coordinating efforts with other institutions involved in promoting rural development.
  - Reduce deforestation from charcoal production through better law enforcement and community support programs aimed at increasing agriculture productivity,

providing alternative income sources (agro-forestry projects), and promoting alternative cooking fuel supplies.

  - Reduce deforestation from urban and infrastructure development by implementing a smarter and stricter urban zoning/planning program and involving local governments and NGOs in environmental protection activities.

- Forest fire prevention and control
  - Reduce the area affected by fires in 2030 by ~ 80% relative to 2010 levels, i.e., from ~ 4,500 hectares to ~ 1,000 hectares, by implementing a stringent zero-burning policy and creating a fire-alert reporting system to minimize the spread of forest fires by decreasing response time.
  - Increase the size of the fire prevention brigades from ~ 100 workers to ~ 400; build capacities by increasing the number of Ministry personnel, agro-producers, and volunteers with knowledge/skills on fire control and invest in fire-fighting equipment, such as water pumps, water trucks, and a water helicopter.
- A/R
  - Increase forest cover by ~ 235,000 hectares through A/R efforts by increasing the reforestation rate from ~ 6,300 hectares per year in 2010 to ~ 15,000 hectares per year in 2030, providing ~ 9,500 new jobs through the reforestation program.

d Quick wins

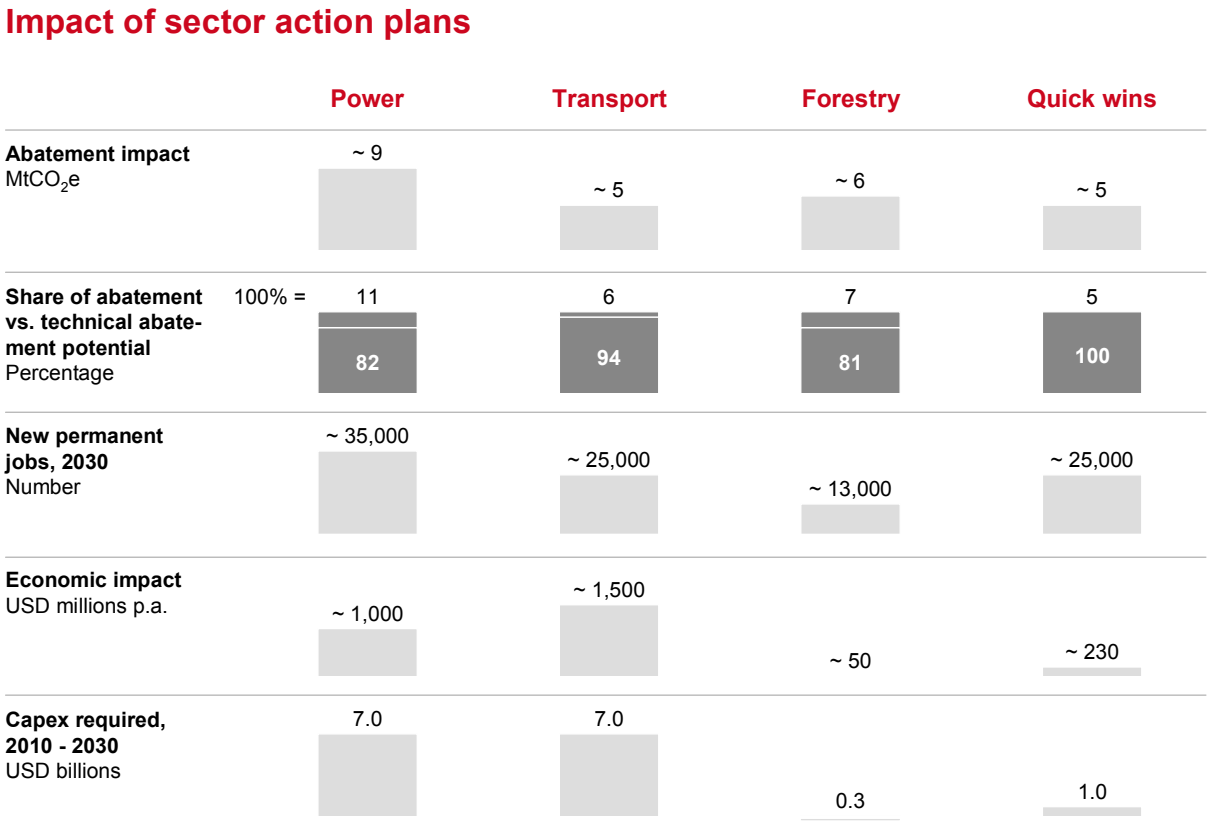
The government aspires to work together with leaders of the waste, cement, and tourism sectors to achieve the following targets for quick wins of the CCDP by 2030:

- The cement sector can reduce its annual emissions from 27% in comparison with the baseline by obtaining 50% of its energetic needs from biomass and fossil waste and replacing clinker with fly ash and other mineral ingredients to up to 23% of the cement contents.
- The waste sector can become a regional example of modern management of solid waste by having equipped 30% of landfills to capture methane for use as cooking gas or for electricity generation and by having established systems that recycle 50% of the materials with recycling value and using 50% of the organic waste to generate electricity through anaerobic digestion.
- By 2030, the tourism sector can reduce its annual emissions by 35% relative to the BAU scenario and therefore become an early adopter and a catalyst for implementing the measures of the CCDP in the power, buildings, and waste sectors.
- Furthermore, the DR can become one of the main destinations for ecotourism, boosting the sector in terms of visitors, revenue, and social and environmental impact.

D Implementing a transformative CCDP for the DR will yield significant benefits—both for the DR and the rest of the world

The action plans in the three priority sectors and quick wins of the CCDP would yield a combined abatement potential of ~ 24 $MtCO_2e$ in 2030, which represents ~ 87% of the technical abatement potential for those four sectors. In addition to the environmental benefits, carrying out the action plans would also deliver developmental benefits, such as creating > 100,000 new permanent jobs and generating an economic impact of ~ USD 2 billion per year in the form of savings from reduced fuel and electricity consumption and international revenues from mechanisms, such as REDD+ and CDM, particularly in the forestry sector. Of course, the implementation of the action plans requires significant investments. The estimated capex needed between 2010 and 2030 to implement the action plans is ~ USD 15 billion, compared to ~ USD 8 billion of capex in the BAU scenario. As such, the increased need for financing is a key challenge, which the DR must overcome in order to reap the manifold benefits of the CCDP.

FIGURE 11: Impact of sector action plans



Analysis by the National Council on Climate Change and Clean Development Mechanism and the Ministerio de Economía, Planificación y Desarollo

It is important to note here that these estimates of economic impact are initial estimates and that they will be refined as our CCDP matures and the sector action plans become increasingly concrete. Furthermore, the actual economic impact depends on myriad factors that will influence the process of implementation in the coming years, ranging from changes in the political landscape and underlying economic growth to unforeseen advances in technology. While quantifications are therefore preliminary, the main benefits of the CCDP to the DR are the following:

- **Increased employment in the form of > 100,000 new permanent jobs,** ranging from agricultural employment in biofuels and afforestation for the rural poor to highly skilled professions in the renewable energy sector
- **Freed-up household budgets of > USD 3 billion per year or > USD 250 per capita** through reduced consumption/spending on energy, predominantly achieved through holistic energy efficiency programs in both the power and the transport sectors
- **Balance of payments improved by USD 2 to 3 billion per year** by cutting energy imports by the equivalent of 20 million barrels of oil annually through reduced consumption as well as an ambitious build-up of a domestic biofuels industry (bioethanol from sugarcane and biodiesel from Jatropha)
- **Strong fact base for bilateral, multilateral, and global negotiations on both climate change and economic development** to access additional funding for climate-compatible development (e.g., carbon finance or debt-for-climate swaps)
- **Improved image and value proposition as a sustainable tourism destination,** driving higher future revenues for the sector
- **Enhanced reputation as a leader on economic sustainability** in the region and beyond due to achieving GHG emissions of less than 2 tons per capita while sustaining strong economic growth
- **Increased visibility and recognition with trade partners and investors** around the world through clear positioning and commitment on one of the world's biggest challenges.

While our CCDP is ambitious, we are of course aware that our contribution to the required reduction in global GHG emissions of ~ 30 $MtCO_2e$ per year by 2030 is minimal. However, if our CCDP can serve as success story that **inspires and motivates more efforts towards climate-compatible development** in other countries—developed and developing alike—we will have made a positive difference. For the good of our world, our region, and our country!

IV Making it happen: Lead from the top, enhance institutions, mobilize stakeholders, build capabilities, and secure smart financing

What we have laid out so far is a very ambitious agenda, and we are fully aware that its implementation will require a substantial and long-term effort on part of the DR government, supported by civil society, the private sector, and by our development partners. For this reason, we are studying the factors that have contributed to the success of other large-scale change and development programs to give the strongest-possible support to our commitment to making our CCDP a reality.

From the experiences of other developing countries that have embarked on transformation journeys, we have identified the five factors and core principles discussed below as the keys to implementing high-impact CCDPs. On some of these factors, the DR is already in a good position; for others, more work will be required over the coming months.

A High-level commitment and leadership

An effective climate-compatible development strategy transcends environmental issues and redirects the development pathway of the whole country. To be successful, it requires meaningful involvement and strong leadership from the head of state and head of government. By founding the National Council of Climate Change and Clean Development Mechanism (NCoCC) and publicly committing the DR to sustainable growth in his speech at the climate summit in India, President Fernandez has reiterated the importance of sustainable growth to the country's leadership and potential development partners.

Going forward, this commitment will be broadened and reinforced by sustained engagement from the Office of the President along three horizons: following through on the NDS 2030, supporting current legislation under development, and kick-starting a holistic economic and social reform agenda.

B Effective institutions and systems

The CCDP represents one of the largest reform packages to be launched in the DR in years. The social and economic value at stake is very high, and capital investment is required in the order of 1.5% of the DR's current annual GDP on top of what would be needed in the BAU scenario. The CCDP is by nature cross-sectoral, requiring coordination between different ministries and other government institutions as well as the broad stakeholder consultation and support discussed in the following chapter. The magnitude of the undertaking implies that "business as usual will not be enough" for success and the DR will need to develop effective institutions and systems to support the CCDP implementation.

With the NCoCC, the DR has the institutional basis on which to build. Immediate next steps are to provide the NCoCC with a clearer mandate and sufficient staffing and resources to drive and coordinate the implementation and monitor progress. Moreover, the DR will need to resolve pending questions of institutional responsibilities between government bodies and create the right mechanisms for institutional collaboration within the government and between the government and civil society.

This approach initiated with the founding of the NCoCC—the institution of a dedicated delivery unit, directly reporting to the Office of the President, and with the mandate to support ministries and other public institutions in implementing the strategy—has proved effective in a number of situations, from the Prime Minister's Office in the United Kingdom to an education reform in the United States.

A number of sector-specific institutional and legal or administrative changes will also be required for the successful implementation of the key climate change mitigation measures.

C Stakeholder mobilization

In addition to committed leadership, a successful CCDP requires wide stakeholder input and support from civil society, the public sector, the private sector, and the general public. This means opening the next phase of the strategy refinement and the design of specific implementation actions to a broader round of stakeholder consultations.

The Technical Working Groups that have been established for the development of the draft CCDP, which span government ministries, other public institutions, the private sector, and civil society, are a good starting point for this process, but further and broader consultation is now required, leveraging the appropriate fora where they exist (e.g., *Mesa de Diálogo Forestal*) and developing new ones where required.

D Comprehensive, government-wide capabilities

Realizing such an ambitious plan also calls for comprehensive strengthening of the government's ability to perform. Capacity and capability building at multiple levels in all of the institutions involved is essential to provide both the content ownership and process management necessary to continually drive and evolve the implementation of the CCDP.

It is therefore important to ensure that capacity building is appropriately considered in scoping the central and sectoral implementation measures. This is an area in which the DR could benefit from international support.

E Smart financing

Implementing the DR's CCDP will require capex of up to USD 17 billion within the next two decades on top of the required capital in the BAU scenario, which will require a holistic "smart" financing strategy. First, we must broaden our knowledge of the financing options from various sources that are available for different phases and types of abatement measures. Second, we must proactively engage the private sector at both the national and the international level to obtain the maximum leverage of our publicly committed funds. Lastly, we are keen to learn from ongoing initiatives and follow new developments in the climate finance realm closely—for example potentially emergent mechanisms, such as debt for climate and carbon swaps.

It is reassuring to know that we do not stand alone in this endeavor. The DR applauds the commitment of developed countries made at the COP 16 in Cancun in December 2010 to support developing countries in shifting towards a climate-compatible development path. We agree that developing countries need to do their part by developing sound strategies and action plans, ensuring the right policy frameworks, building effective institutions, engaging stakeholders, and gathering the required financing from domestic and international public finance and private-sector investments. We look forward to working together with our development partners on this transformative journey towards climate-compatible development.

V Outlook and next steps: Stay tuned!

Embarking on a CCDP will be one of the DR's largest holistic reform efforts in decades—after the energizing and inspiring development of our CCDP, we're excited and committed to bringing it to life now for the good of our world, our region, and our country.

We have crafted an ambitious roadmap to achieve fast-track results, which will be closely and regularly measured and monitored by both the NCoCC and the government institutions that are leading the sector-specific action plans, for example the Ministry of Economics, Planning, and Development and the Ministry of Environment, among others.

As we continue to detail and refine the CCDP, we will reach out to an ever-growing number of stakeholders from all parts of society to continue and deepen the productive collaboration that has marked the early phase of this endeavor.

Once the CCDP has firmly taken root, we aspire to integrate key issues, such as climate resilience and adaptation into our CCDP, as well as to broaden our efforts to other sectors, such as agriculture and manufacturing.

Stay tuned: we will present our progress and first results of the CCDP at COP 17 in Durban in November 2011!

Table of figures

Photos

Back and front cover plus picture on page 7: Hanna Viuhko

List of abbreviations

Abbreviation	Stands for
A/R	Afforestation/reforestation
BAU	Business-as-usual scenario
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, from the German initials for *Bundesministerium für Umweltschutz*
BRT	Bus rapid transit, a system of urban transportation giving preference to public buses
CAGR	Compound annual growth rate
Capex	Capital expenditure or investment rather than a cost
CCDP	Climate-Compatible Development Plan
CDM	Clean Development Mechanism of the Kyoto Protocol
CFL	Compact fluorescent lamp, an energy-saving lightbulb
CNG	Compressed natural gas
CO_2	Carbon dioxide, the most important greenhouse gas
COP	Conference of the Parties, the annual summit of the United Nations Framework Convention on Climate Change
CSP	Concentrated Solar Power, a solar technology for power generation
DR-CAFTA	Dominican Republic-Central American Free Trade Agreement
GDP	Gross domestic product
GHG	Greenhouse gases (mainly carbon dioxide, methane, and nitrous oxide)
GWh	Gigawatt hour of electricity
HDV	Heavy-duty vehicle on road, weighing more than 16 tons
LDV	Light-duty vehicle, weighing less than 2.5 tons

Abbreviation	Stands for
LED	Light-emitting diode
LPG	Liquefied petroleum gas
MDV	Medium-duty vehicle on road, weighing between 2.5 and 16 tons
MRV	Measuring, reporting, and verification
$MtCO_2e$	Million metric tons of carbon dioxide equivalent
MW	Megawatt of installed power generation capacity
MWh	Megawatt hour of electricity
N_2O	Nitrous oxide, a greenhouse gas
NAFTA	North American Free Trade Agreement
NCoCC	National Council on Climate Change and Clean Development Mechanism of the Dominican Republic
NDS	National Development Strategy of the Dominican Republic
NGO	Non-governmental organization
REDD+	Reducing Emissions from Deforestation and Forest Degradation
TWh	Terawatt hour of electricity
UNFCCC	United Nations Framework Convention on Climate Change

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"Green growth is not only important to our economy—it is conducive to the nature of our country. In addition to protecting ourselves from the trials and tribulations of climate change such as rising sea levels and deadly hurricanes, the Dominican Republic assumes the global fight against climate change as our global responsibility. We consider our efforts part and parcel of our moral responsibility to this increasingly interdependent planet."

President Leonel Fernández, Delhi Sustainable Development Summit, February 2011