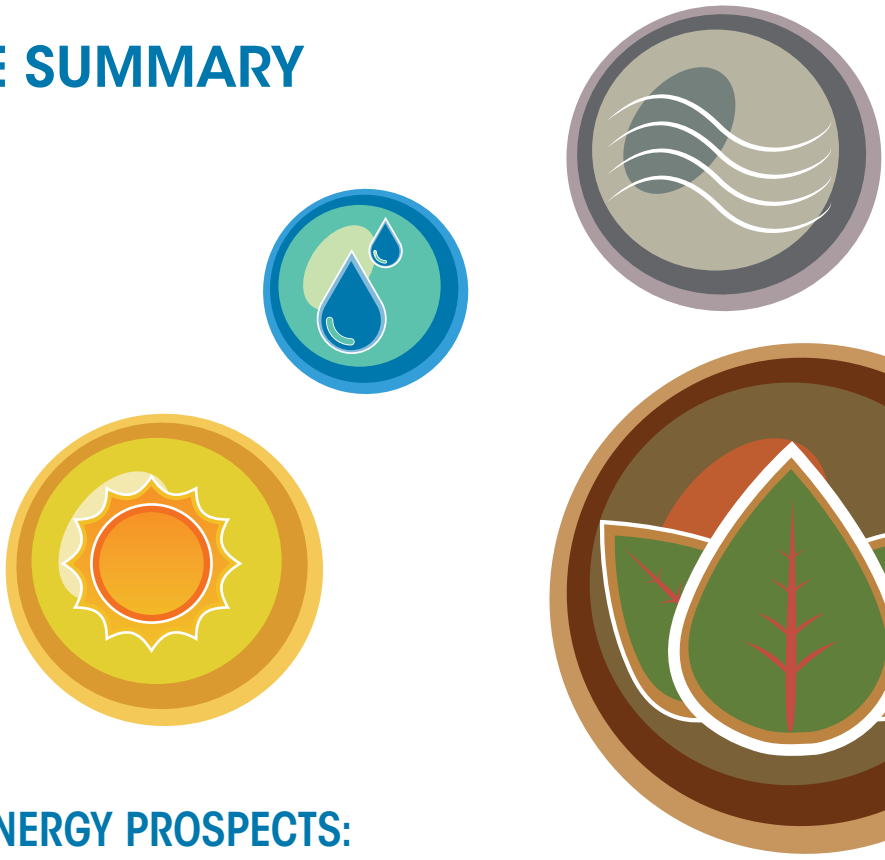
IRENA
International Renewable Energy Agency

REmap 2030
A Renewable Energy Roadmap

EXECUTIVE SUMMARY



RENEWABLE ENERGY PROSPECTS:

DOMINICAN REPUBLIC

July 2016

About IRENA

The International Renewable Energy Agency (IRENA) is an intergovernmental organisation that supports countries in their transition to a sustainable energy future and serves as the principal platform for international co-operation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity.

The full country report for the Dominican Republic, the global REmap report edition 2016 and other supporting material are available at **www.irena.org/remap**

IRENA and REmap reports are available for download from **www.irena.org/publications**

For further information or to provide feedback, please contact the REmap team at **remap@irena.org.**

Disclaimer

International Renewable Energy Agency REmap programme

By 2014, renewable energy use amounted to 18% of global total final energy consumption (TFEC). If existing and proposed energy plans and targets of countries are aggregated, the global renewable energy share by 2030 would increase to 21%. This represents a continuation of past growth trends in renewable energy share.[1]

The International Renewable Energy Agency (IRENA) REmap programme shows it is possible to actually double the global share of renewable energy by 2030 compared to 2014. Such accelerated growth helps fulfil the Sustainable Development Goal (SDG) for affordable and clean energy, and contributes to climate change mitigation.

REmap is a roadmap based on close cooperation and consultation with experts (energy statisticians, energy modellers and energy policy experts) nominated by governments. It is an analysis of the potential, costs and savings of renewable energy technology options. REmap provides a perspective on the technology options available at the sector level that represent the realistic potential of renewables beyond national energy targets and plans. These technology options are aggregated to build technology cost curves. As of July 2016, REmap works with more than 40 countries responsible for over 80% of current global energy demand.

Context

The Dominican Republic is one of the largest and most diverse economies in the Caribbean region, and its energy consumption is growing rapidly. The country relies heavily on fossil fuel imports, which account for nearly all of its primary energy supply at present.

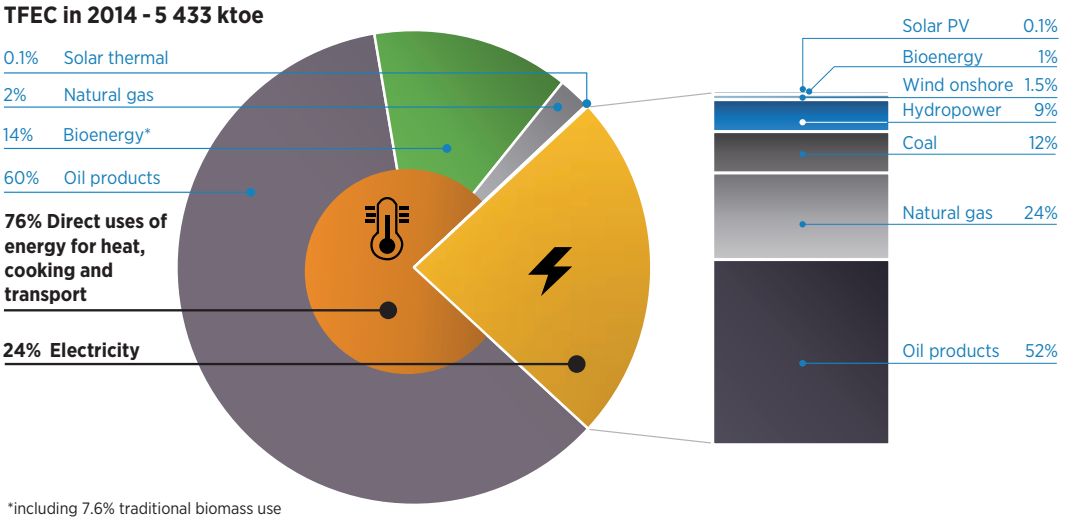
The Dominican Republic has set ambitious targets to reduce its per capita greenhouse gas (GHG) emissions. Another objective is to reduce import dependency and the local and global impacts of fossil fuel combustion on the environment, including those associated with climate change. The target is to reduce GHG emissions by 25% by 2030 compared to 2010. Realising this target will require a shift in the country's energy mix. Renewable energy can play a key role in achieving the climate policy objectives as well as energy supply diversification. Moreover, accelerated renewable energy deployment can reduce energy cost for consumers and reduce the fuel imports bill. In 2014, renewable energy share in total final energy of the Dominican Republic stood at 16.3% (8.7% modern renewables and 7.6% traditional biomass use, figure 2).

The power sector is key for an increase in the share of renewable energy. At the moment power generation is predominantly based on hydrocarbons, as shown in figure 1. In recent years the sector has gone through a series of reforms to ensure secure and affordable electricity supply to consumers. This has been met with mixed success so far. As part of these reforms, Law 57-07[2] sets specific targets for the power sector to increase its

1 Renewable energy includes bioenergy, geothermal, hydropower, ocean, solar and wind energy.

2 Law 57-07 of 7 May 2007 on Renewable Sources of Energy Incentives and its Special Regimes.

Figure 1: Dominican Republic final energy mix, 2014



Source: IRENA estimates based on national energy balances

Note: 1 kilotonne of oil equivalent (ktoe) = 41.868 megajoules (MJ)

share of renewables in the power generation mix to 25% by 2025. To achieve this target, a number of policy instruments have been introduced, including tax incentives and feed-in tariffs. A rural electrification programme also supports the deployment of renewable off-grid projects, and the country is extending its grid infrastructure to ensure universal electricity access. Furthermore, a blackout reduction programme aims to improve the quality of the power supply service to the population.

In this evolving environment characterised by increasing electricity demand, the pipeline of new power generation projects amounts to 2.4 gigawatts (GW). Of this total, 66% is renewable energy capacity – mainly onshore wind and hydropower. The country has significant additional renewable energy potential to go beyond what is being planned. This relates not only to power but also to direct uses of renewables for residential and commercial buildings, industry and transport.

This roadmap was developed in close co-operation with the National Energy Commission (Comisión Nacional de Energía or CNE). It quantifies what can realistically be achieved by 2030 in the Dominican Republic's total energy system in terms of renewable energy technology potential, cost and savings. CNE has provided the background energy and economic data for the analysis, and the potential has been worked out by IRENA with CNE's experts. This is the first report prepared for the Dominican Republic covering its entire energy system. As described in this roadmap,

each sector has a number of specific challenges relating to the accelerated deployment of renewable energy technologies. With the right policy framework and technical solutions, the Dominican Republic can be a key country in the region attracting significant investment in renewable energy.

A rapidly developing power system

The Dominican Republic power sector is developing rapidly. The reforms that started in the late 1990s have shaped its current structure. As a result of these reforms, activities across the power supply chain have been unbundled, and private sector participation has increased.

The national interconnected system (Sistema Eléctrico Nacional Interconectado de la República Dominicana or SENI) supplies 87% of all the electricity consumed in the country. The high voltage transmission network belongs to a single, state-owned company (Empresa de Transmisión Eléctrica Dominicana or ETED). Three public sector companies distribute 78% of all the electricity consumed, with concessions in three different geographical zones. Seven smaller, mostly privately owned companies, generate and distribute electricity in non-interconnected zones. High electricity losses, at the distribution level in the three main concessions, currently affect the power system. This situation is being addressed by the government because it jeopardises the economic viability of the system.

Total national demand for electricity has experienced a rapid growth of approximately 45% over the past decade. Electricity generation reached 18 terawatt-hours (TWh) in 2014 from a total installed power generation capacity of around 4.9 GW (including SENI, off-grid installations and autoproducers).[3] More than 60% of the installed capacity runs on oil products, mainly heavy fuel oil whic is especially polluting.

Renewable energy technologies account for 15% of total installed capacity. The national share of renewable energy in the power sector is about 11.5% of total electricity generation. This consists of 9% hydropower, 1.5% onshore wind and 1% bioenergy. The remaining 0.1% is met by solar photovoltaic (PV). This is displayed in figure 1. Installed capacity and generation from renewables is rising at the same rate as demand for electricity.

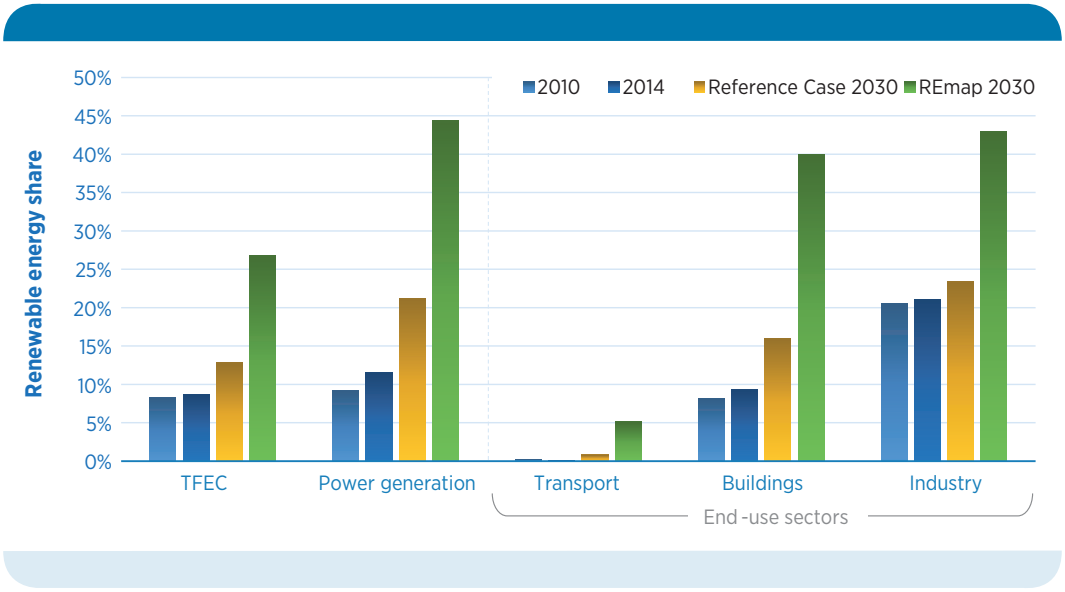
The renewables share in non-power sectors is thus far limited to bioenergy for industrial heating (amounting to 27% of direct uses of energy in industry) as well as cooking and water heating in buildings (representing 41% of traditional biomass plus 8% of modern bioenergy use, in the non-power energy demand in this sector). Deployment in these sectors has been mainly driven by private initiatives. No policy directed at these sectors exist yet.

REmap analysis: renewable energy prospects for the Dominican Republic

The Dominican Republic's total demand for final energy will grow by 2.2% per year between now and 2030, reaching 7 677 ktoe

3 From the total installed capacity in this year, the SENI accounts for 3.7 GW and the autoproducers and off-grid installations represented about 0.9 GW and 0.3 GW respectively.

Figure 2: Modern renewable energy share, 2010–2030



Note: End-use sectors include renewable energy consumption from direct uses and electricity

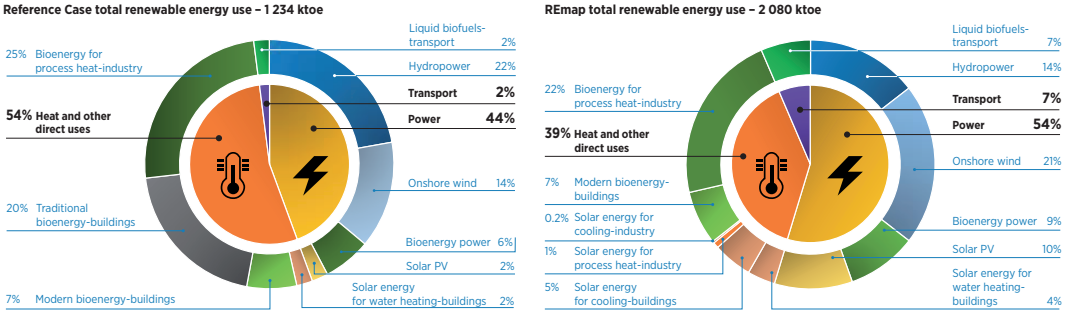
per year. These figures are based on the preliminary results of the CNE energy demand projections for 2013-2030, worked out with Fundación Bariloche, which form the basis of the Reference Case (or business as usual). In the Reference Case, the share of modern renewable energy would be 13% of the total final energy mix by 2030, compared to 9% in 2014 (excluding traditional uses of bioenergy).

The Dominican Republic has abundant solar and wind resources. Several sources of small hydropower are not utilised. Agricultural residue and waste are the predominant potential sources of bioenergy supply. These can be used to meet growing demand and raise the share of renewables beyond the Reference Case.

Meanwhile, the renewable energy share of total electricity generation in the Reference Case rises from around 12% in 2014 to 21% by 2030 if all renewable energy projects in the pipeline come online. This would imply that the target of 25% of renewable electricity generation by 2025 set in Law 57-07 might be missed in the Reference Case, thus there is a need for additional policies. According to the Reference Case, the share of renewable energy in end-use sectors experiences a slight increase between 2014 and 2030, from 21% to 23% in industry, 9% to 16% in buildings and 0.3% to 0.8% in transport. This is displayed in figure 2.

Implementing the potential additional renewable energy technology options identified in REmap would increase the renewable energy share to 27% by 2030 in the Dominican Republic's total final energy mix. Industry and the power sector could have the highest renewable energy share, estimated at 43% and 44% respectively. This

Figure 3: Modern final renewable energy use in Dominican Republic according to Reference Case and REmap in 2030



would be followed by buildings and transport at 40% and 5% each.

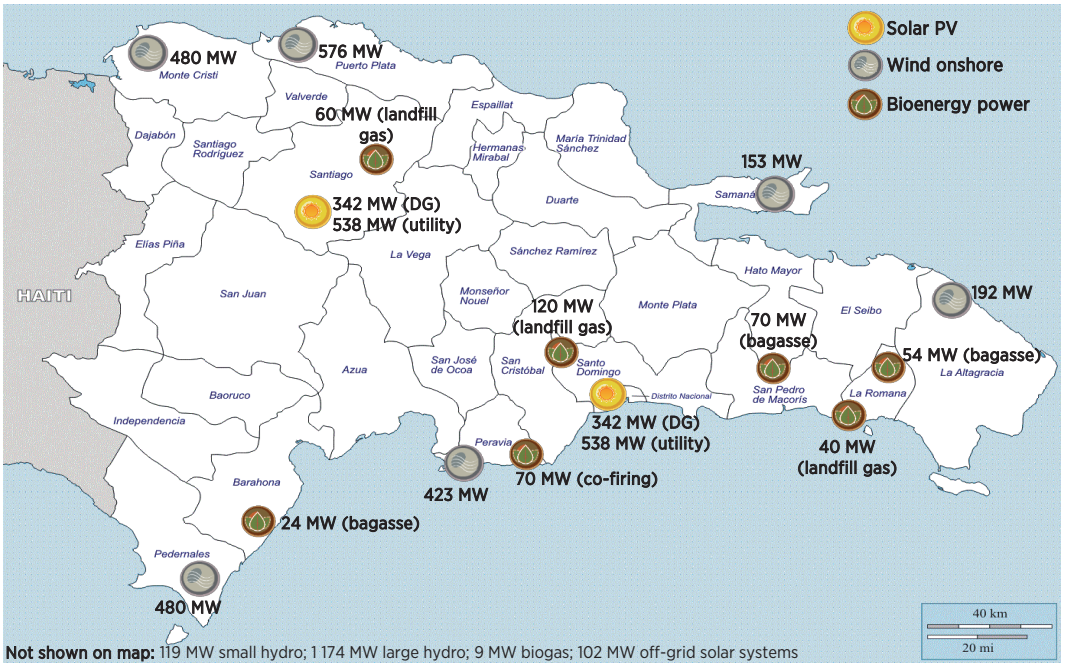
Under REmap, final renewable energy use could double to 2 080 ktoe per year by 2030 compared to the Reference Case. Bioenergy would be the largest source of renewable energy accounting for almost half of total final renewable energy use in 2030. This is explained by its various uses across all energy sectors, including power generation. Solar energy for power generation, heating and cooling would account for 20%. Finally, wind and hydropower would represent 21% and 14% of the total final renewable energy use, respectively.

Wind and solar lead renewable power generation

Under REmap, 54% of all final renewable energy use is related to the consumption of power from renewables in 2030 as shown in figure 3. Data provided by CNE and IRENA estimates show that the Dominican Republic could generate 16 TWh of electricity from renewables by 2030. This would be produced from a renewable power generation capacity of 6 GW (from a total installed capacity of 10 GW, including non-renewable technologies). Renewable electricity generation under REmap is higher than current levels by a factor of eight and significantly higher than the country's planned expansion in the Reference Case (7.7 TWh mainly from hydropower and onshore wind). To realise the potential identified in Remap, the country's major onshore wind and solar resources need to be utilised. These are also among the most cost-effective options in the mix.

Onshore wind would be the single largest source of renewable power producing 6.1 TWh electricity per year. The total wind capacity if all REmap Options are implemented is 2.3 GW in 2030. This translates into the construction of about 45 wind farms between now and 2030. Wind projects would be spread across

Figure 4: Location of renewable power generation capacity in 2030 under REmap



DG: distributed generation; km: kilometre; mi: mile

the northern, eastern and southern parts of the country as shown in figure 4.

Solar PV could contribute 3 TWh from a total of 1.9 GW capacity under REmap by 2030. This potential includes both on-grid (utility-scale and decentralised) and off-grid capacity. About 60% of this potential is related to utility-scale plants, which would require an average annual installation rate of about 77 megawatts (MW) between now and 2030. Decentralised on-grid generation comprises 685 MW capacity by 2030 for residential and commercial systems that would cover about 8% of all electricity demand in buildings. According to REmap, these solar projects would be split between the two major demand centres of Santo Domingo and Santiago as shown in figure 4. Solar home systems totalling 102 MW of installed capacity would supply electricity to 2% of the population, which will still lack access in 2030 (about 70 000 units).

Bioenergy and waste constitute other important source of renewable power generation. There is potential to increase total bioenergy capacity from landfill gas, bagasse and biogas, as well as through co-firing. By 2030, total installed capacity could

reach 448 MW under REmap. This is divided into four sources. Firstly, landfill gas from the large Duquese and the other major landfills could supply 220 MW. The four largest sugar mills in the country could reach 148 MW bagasse based combined heat and power. Finally, animal manure could supply 9 MW in biogas and co-firing of biomass in coal fired power plants could supply another 70 MW. Most bioenergy projects would be in the southern parts of the country.

Key role of end-use sectors

The other half of final renewable energy use under REmap, besides renewable power, comes from the direct use of renewables in end-use sectors. However, until now the national energy plans of the Dominican Republic do not make use of this potential.

Renewables for industrial heating offers the greatest potential among all end-use applications. Medium-temperature process heat can be generated from industrial combined heat and power based on bagasse. Likewise, solar thermal systems can be employed to deliver low-temperature heat and cold. Under REmap, 100 heating and about 85 cooling installations can be implemented in the industry plants by 2030, representing a total capacity of 125 MW.

In buildings, solar water heating capacity could reach 1.4 GW to deliver half of all energy demand for water heating in residential and commercial buildings – mainly hotels, under REmap. Demand for cooling has increased considerably. The main drivers for cooling are increased income, growing population and the hospitality sector. Solar cooling and seawater cooling systems can cover 20% and 5% of the total space cooling demand of the buildings respectively.

Hostelries generate significant amounts of organic waste among others, from cooking and from collected waste food that can be reconverted into biogas, using anaerobic digestion, usable as an energy source for cooking. About 100 such digesters can be installed by 2030 into hotels in the Dominican Republic, supplying the equivalent of 10% of the energy used for cooking in hostelry.

Under current policies, only limited growth is forecast for renewable energy in transport, which only includes biodiesel usage. Ethanol and electric mobility provide significant additional potential. This would be an important step for a sector that represents the largest share of total final energy demand in the Dominican Republic. Thousands hectares of land were previously used for sugar cane production. A share of now fallow arable land can once again be used for sugar cane production for ethanol. By 2030, more than 170 million litres of conventional ethanol could be produced, allowing a blending rate of 15%, which requires flex-fuel vehicles. For biodiesel, a blending rate of 5% is estimated, for a total consumption of 50 million litres. The production of conventional liquid biofuels must be derived from sustainable sources and not compete with resources required for food production.

The number of four-wheel electric vehicles by 2030 could reach 220 000, representing 15% of the total passenger car stock. Two- and three-wheeled electric vehicles have major potential, especially in congested parts of cities and in tourist resorts. Realistically, 500 000 such vehicles can be deployed by 2030. In summary these are opportunities

to combine electric mobility with renewable power supply.

The energy storage offered by all types of electric vehicles represent a total capacity of 1.4 gigawatt-hours. This can provide significant flexibility to facilitate the management of the variability from wind and solar generation.

Significant savings to renewable energy mix in 2030

Increasing the Dominican Republic's renewable energy share to 27% of its final energy mix would result in financial savings. In the REmap analysis, the cost and savings of renewables are estimated from both business and government perspectives. The business perspective is based on national energy prices which include local taxes and subsidies and uses a national discount rate of 12%. The government perspective is based on standard international commodity prices and a fixed 10% discount rate. The cost analysis in this roadmap is based on 2030 capital cost projections for energy technologies. It assumes an average increase of 40% in local fossil fuel prices between 2010 and 2030 (in real terms) and also no change to present energy pricing schemes. Assessment excludes the costs for infrastructure (*e.g.* additional generation or transmission capacity) and enabling technology costs (*e.g.* grid integration).

Under REmap, more than 80% of all renewable energy technology options could be deployed with financial savings when compared with the non-renewable technology counterparts they replace. From the business perspective, the mix of renewable energy technologies identified on top of the Reference Case translates into savings across all sectors of USD 62 per megawatt-hour of final renewable energy (or USD 17 per gigajoule - GJ). From a government perspective, this results in savings of USD 68 per megawatt-hour of final renewable energy (or USD 19/GJ). This translates into total annual savings of USD 1 billion in the Dominican Republic energy system. A small proportion of the technologies will incur additional costs and will require total investment support of about USD 160 million per year.

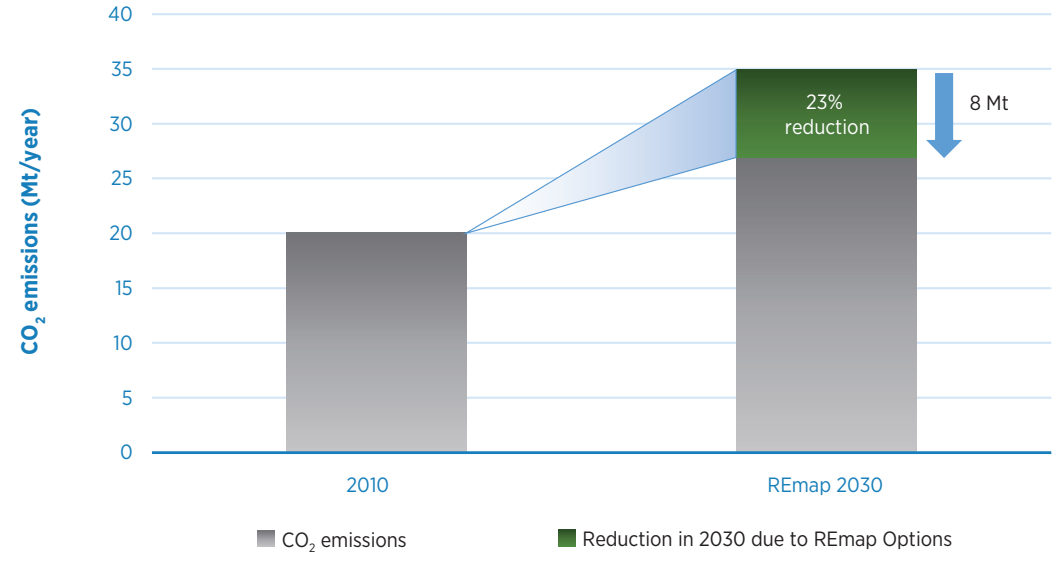
Savings are also achieved due to reduced externalities from avoided carbon dioxide (CO_2) and air pollutant emissions as estimated in this roadmap. When accounting for these reduced externalities, additional annual savings could range from USD 1.1-4.3 billion by 2030. This would result in total savings of USD 2.1 billion-5.3 billion per year.[4]

The health savings are estimated on the basis of the unit external costs of the five major outdoor air pollutant emissions caused by fossil fuel combustion in power generation, heating and transport.[5] Traditional bioenergy use in households for cooking and water heating also results in indoor air pollution. These unit external costs are specifically applied to the case of the Dominican Republic by accounting for the expected developments in its gross domestic product by 2030. In

4 The costs of renewables have been compared with the non-renewable energy technologies assuming a relatively high growth in crude oil prices to 2030 and the assessment of externalities has been carried out based on a set of standard parameters that may overestimate the savings in the context of islands. Therefore a sensitivity analysis of these findings is provided in the full report.

5 The five air pollutants assessed include: ammonia, mono-nitrogen oxides, particulate matter, sulphur dioxide and volatile organic compounds.

Figure 5: CO_2 emissions from energy use, 2010–2030



addition, the calculation assumed a price range of USD 17–80 per tonne of CO_2 with the same range applied to all other countries in the REmap programme.

In addition to these savings, the replacement of non-renewable technologies by renewables in REmap cuts fossil fuel demand by almost 2170 ktoe by 2030 compared to business as usual. Much of this reduced demand is imported fossil fuel that lowers the annual energy bill by USD 1.6 billion in 2030.

Total investments in renewable energy technologies needed to attain the 27% renewable energy share would require USD 566 million in investment per year. Of this, USD 337 million would come from the REmap Options and USD 229 million from investments taking place in the Reference Case.

Lower fossil fuel combustion reduces CO_2 emissions by around 8 megatonnes (Mt) per year of CO_2 by 2030. This amounts to a 23% cut compared to the Reference Case in 2030. These reductions would be an important step for the country to realise GHG emission reduction targets in its Nationally Determined Contribution. Around 70% of that total mitigation potential comes from the power sector.

Challenges to accelerated renewable energy growth

If renewable energy use is to grow rapidly along the lines suggested in this report, a number of challenges need to be overcome. A Consultation with CNE and other stakeholders in the Dominican Republic energy sector has identified barriers to rapid growth of renewable energy technologies. The independent power system operator, project developers and equipment manufacturers were some of the institutions involved in the consultation. These challenges relate specifically to the national circumstances of the Dominican Republic today. In the case of the power sector, the main challenges are related to current institutional and regulatory framework and whether the required investment can be attractive to realise the REmap Options. In addition, there are technical challenges associated with integrating large amounts of variable renewables that have to be overcome.

Challenges in the power sector

Institutional and economic challenges

It is important to acknowledge that a long-term vision needs to emerge with intermediate renewable energy targets and necessary incentives to realise the potential according to the REmap Options. This means maintaining consistency between the national energy plan and national development strategies to bring legitimacy.

Strong institutional and regulatory frameworks need to be adopted to provide a stable and attractive environment for the required investments. The regulatory framework needs to allow the implementation of the changes required in the planning and operational procedures of the power sector, including the electricity market. The purpose of these changes should be to integrate a high share of variable renewables.

Technical challenges associated with high share of variable renewables

Generation adequacy and flexibility: to fulfil the potential identified in REmap at least 4 GW of dispatchable generation (both renewable and non-renewable) would be required to cover peak power demand in 2030 in periods of low variable renewable energy generation. Long-term generation expansion plans with corresponding intermediate targets will be essential to achieve this condition. They will need to take the requirements for flexibility and firm dispatchable generation capacity into consideration. Appropriate financial mechanisms are required in order to guarantee that the firm capacity, alongside flexibility services from certain thermal plants, are available when necessary. The financial mechanisms should consider the new reduced utilisation conditions imposed by increasing shares wind and solar energy.

Adequate electricity grid development: Santiago and Santo Domingo are the two major load centres. Both are at a considerable distance from the rich resource areas of wind in the North, West and Southwest of the country. Fulfilling the potential under REmap would require transmission capacity expansion to avoid uneconomic wind power curtailment. Planning for this expansion will require co-ordinated action with the development of renewable energy capacity targets. Long-term transmission plans and annual operational restriction studies may need to incorporate the new renewable energy projects and the evaluation of

alternative local balancing options. Long-term plans may need to look beyond transmission capacity expansion in order to find optimal ways of managing potential congestion in the transmission grid. The definition of clearer and attractive rules for financing the connection of new renewable generation and required reinforcements in the transmission system should also be considered.

Management of variability and limited predictability of variable renewable power: the operational procedures of the power system may need to be reviewed and adapted to the new conditions imposed by the variability and limited predictability of variable renewables. The adaptation of the power system operation and the corresponding market procedures should be in line with the mid-term generation expansion targets and the implementation of new renewable energy projects. Benefiting from advanced forecasting tools to reduce system operation costs would require an increased frequency in generation scheduling updates and the use of available flexibility options to respond to the updated schedules. Adapting the operational and market procedures may mean extending the existing grid codes. At the same time, incentives would be needed to implement flexibility options (outside generation), flexible generation and better forecasts of variable renewables to make them more predictable.

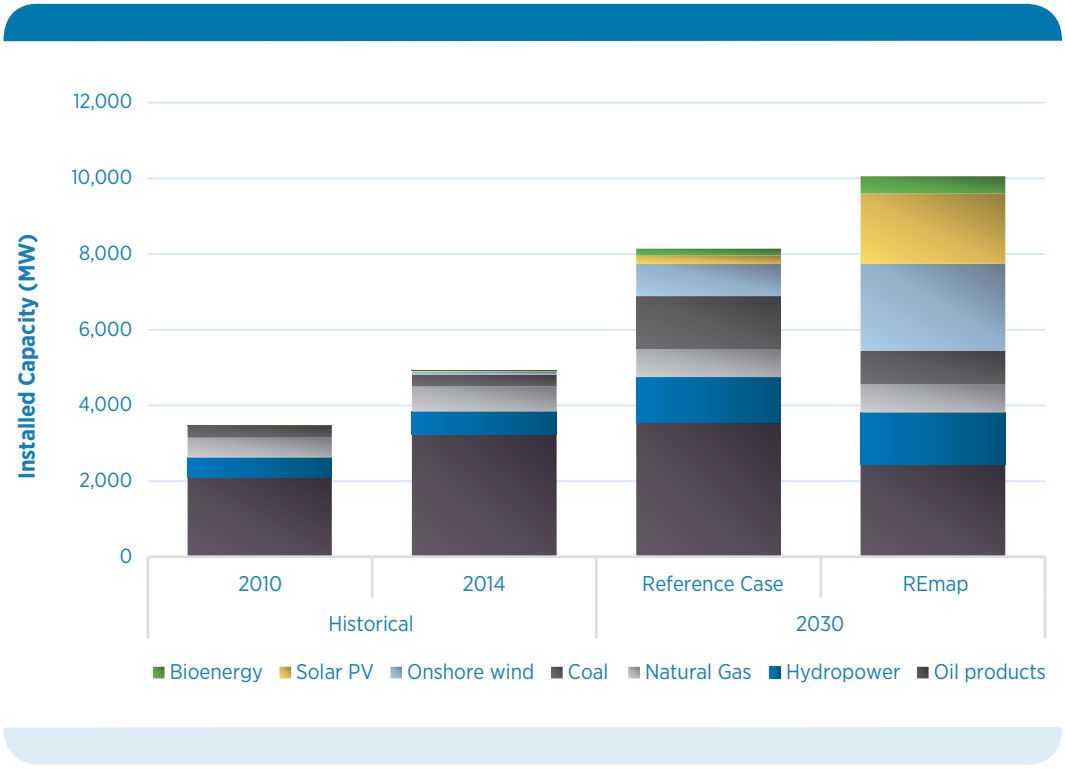
Management of instantaneous penetration levels for variable renewable power: in the isolated power system of the Dominican Republic, very high instantaneous penetration levels of variable renewables can create challenges to the security and stability of the electricity supply. This assessment suggests that under REmap, up to 10% of total electricity generated by renewables by 2030 may need to be curtailed to guarantee system security. This assumes current state-of-the-art technologies and operational procedures not currently implemented in the Dominican Republic. The use of the most up-to-date technologies and operational practices in the future may help reduce curtailment to less than 2%. This ratio was calculated taking the specific characteristics of SENI into consideration as far as possible but is largely based on parameters in line with international experience. Future developments in SENI's characteristics and economics may change these estimates. Hence, there is a need to understand and identify the maximum penetration levels for different system configurations. The necessary measures to efficiently manage possible curtailments need to be defined in line with the mid- and long-term generation expansion targets.

Challenges in end-use sectors

Buildings: a wide range of renewable heating and cooling technologies exists to replace fossil fuels for households, commercial buildings and hotels. Even when externalities are not considered, REmap suggests that solar thermal technologies are cost-effective although investment support may be required for low-income families. There is a need to raise more awareness among consumers of the opportunities offered by renewables. For example, the waste generated in the hostelry sector is a valuable resource that can be turned into biogas for in-house consumption. Current energy plans overlook this potential in both existing as well as expanding building stock.

Industry: this is still the largest renewable energy user in the country to generate

Figure 6: Installed power generation capacity, 2010-2030



process heat. This is due the availability of waste and residues utilised for heat generation by the plant owners. There is a further potential to supply low- and medium-temperature process heat from solar thermal and bioenergy. However, to maintain cost-competitiveness and security of operation, the fuel supply needs to be affordable and continuous. This poses a specific challenge to seasonal residual biomass feedstocks. Solar thermal systems will also require additional storage capacity. Moreover, not all industrial plants are designed to be retrofitted with solar thermal, which requires advanced planning for space and necessary process modifications.

Transport: this sector consumes the most energy in the Dominican Republic yet national energy plans do not consider renewables deployment for the sector. Liquid biofuels could replace gasoline and diesel but no market exists. Demand needs to be created by setting targets. Planning for the major potential from the sugar industry will also be essential but food security and sustainability concerns will need to be resolved. The major potential and reduced externalities (specifically related to air pollution) achievable by implementing the various forms of electric mobility identified in REmap need to be considered. Planning is required to work out the related infrastructure, how this

can be financed and its potential implications for the power sector.

Challenges to bioenergy deployment

Under REmap, bioenergy is a key technology for power generation, heating and transport. However, the supply potential and range of arable feedstocks is limited. There is thus a need to prioritise the most resource-efficient and cost-effective uses of bioenergy across different sectors. On the supply side, waste and residues will be the key feedstocks as they do not compete with resources required for food production. Efficient and environmentally friendly feedstock collection systems will be essential to mobilise their availability. Large areas of arable land once used by the sugar cane industry is also available. Provided that sustainability and resource concerns are addressed, the potential offered by this land is achievable. Agricultural yields could reach the level set by the international best practice, particularly for ethanol production for transport.

Policy suggestions

The full REmap Dominican Republic report covers the country's policy landscape in detail and includes specific suggestions by sector. In this summary, these suggestions are outlined for each challenge identified in the previous section:

- Taking into consideration the vision set in REmap, establish clear and consistent renewable energy targets. Ensure they are consistent with other national energy strategies and a stable institutional and regulatory framework with the right financial incentives to attract renewables investments.
- Ensure enough dispatchable generation is available to provide the firm capacity and flexibility required by the power system. Design appropriate incentives for this purpose supported by updated generation expansion plan with intermediate targets.
- Align transmission planning with renewable energy targets and assess the cost and benefits of grid expansion and other local balancing measures to efficiently manage possible grid congestion.
- Define measures in line with planning for renewable energy deployment and transmission capacity to guarantee economic levels of curtailment. Explore the feasibility of flexibility measures to manage it efficiently.
- Devise and introduce appropriate incentives and market mechanisms to promote a flexible power system able to deal with the new operational conditions imposed by the expected high share of variable renewables.
- Define codes and standards for buildings construction and renovation that consider renewables, such as solar water heating and cooling. Integrate renewables into energy and urban planning to accelerate its uptake by ensuring cost-effective supply of energy to the population.
- Plan and develop a strategy for renewables use in industry by paying particular attention to the technical/economic design, operational hours and temperature levels of industrial processes.

- Create a market for liquid biofuels in transport and promote electric mobility in congested urban areas and touristic parts of the country. This market also needs to make use of synergies with the power sector and plan for related infrastructure and financing needs.

- Set targets for bioenergy use in applications lacking any other renewable energy alternative and where bioenergy creates added value to the system. Promote the uses of its most resource-efficient and cost-effective pathways to ensure sustainability.

This roadmap provides a detailed overview of the realistic potential of renewables in the Dominican Republic by 2030. Realising REmap Options by 2030 will require significant efforts to plan the intermediate targets and measures to achieve them, particularly in the power sector. The findings of this roadmap thus need to be complemented by detailed technical and economic studies focusing on operating and planning the interconnected systems containing a high share of variable renewables.

Upon request, IRENA can further support the Dominican Republic government by producing the necessary in-depth technical/economic studies supporting the accelerated deployment of solar and wind power as outlined in this analysis.

IRENA Headquarters
P.O. Box 236, Abu Dhabi
United Arab Emirates

IRENA Innovation and Technology Centre
Robert-Schuman-Platz 3
53175 Bonn
Germany

www.irena.org

International Renewable Energy Agency

www.irena.org