



## THE POST-COVID-19 RECOVERY

# HOW TO ARTICULATE INTEGRATED RESPONSES TO THE HEALTH, ECONOMIC AND CLIMATE CRISES IN LATIN AMERICA & THE CARIBBEAN

### POLICY BRIEF

Once Latin American and Caribbean states have tackled the health emergency, the region will face a period of economic contraction. The need to respond quickly to avoid a severe economic shock may provide a strong argument to disregard climate considerations. Yet, if these are not integrated, the recovery will push the region down a pathway with even more dramatic effects than those of COVID-19.

Economic recovery plans after COVID-19 will require vast amounts of resources, increasing the region's already high debt. With current and expected impacts of climate change – drought, floods, hurricanes, losses in agriculture production, energy losses and exposure to

increased pandemics, among others – most countries' capacity to respond to climate crises will be critically decreased. In this context, it has never been more important to make the COVID-19 response strategies different to any economic recovery plans seen before.

Mainstreaming sustainability and climate proof solutions has never been more important than now to improve resilience of societies, to be prepared in the best possible way for the future. Countries should integrate sustainability into their recovery plans. This brief describes the opportunities of integrating five key areas that can yield substantial economic growth and millions of decent jobs.

## OPPORTUNITIES TO LINK COVID-19 RECOVERY PLANS WITH INTEGRATED CLIMATE SOLUTIONS

### 1. Intensify deployment of renewable energy & energy efficiency



These technologies support energy security, reducing dependence on third countries, while contributing to job creation and economic dynamization. Actions to promote these technologies would have positive impacts on both the aggregate demand and supply of the economies to a greater extent than traditional infrastructure. These technologies are winning the race to be the cheapest sources of power generation, making investments in fossil fuel unjustifiable.

The region would create up to 37 million additional jobs by 2050 by moving to a fully renewable energy power matrix. This matrix will require substantially less capital investment than fossil fuel-based generation, leading to reductions of USD\$283 billion.

Solar power generation could promote new business and job creation through installer-training programs, technology standards certification, and eligibility criteria for installation companies. For example, Mexico, up to 2019, invested USD\$1 billion with the creation of more than 9,000 jobs and more than 200 new solar Small and Medium Enterprises (SMEs).<sup>i</sup> Through energy efficiency technologies, the region could achieve electricity savings of USD\$8 billion by 2030, with the creation of a vibrant and decent job market.

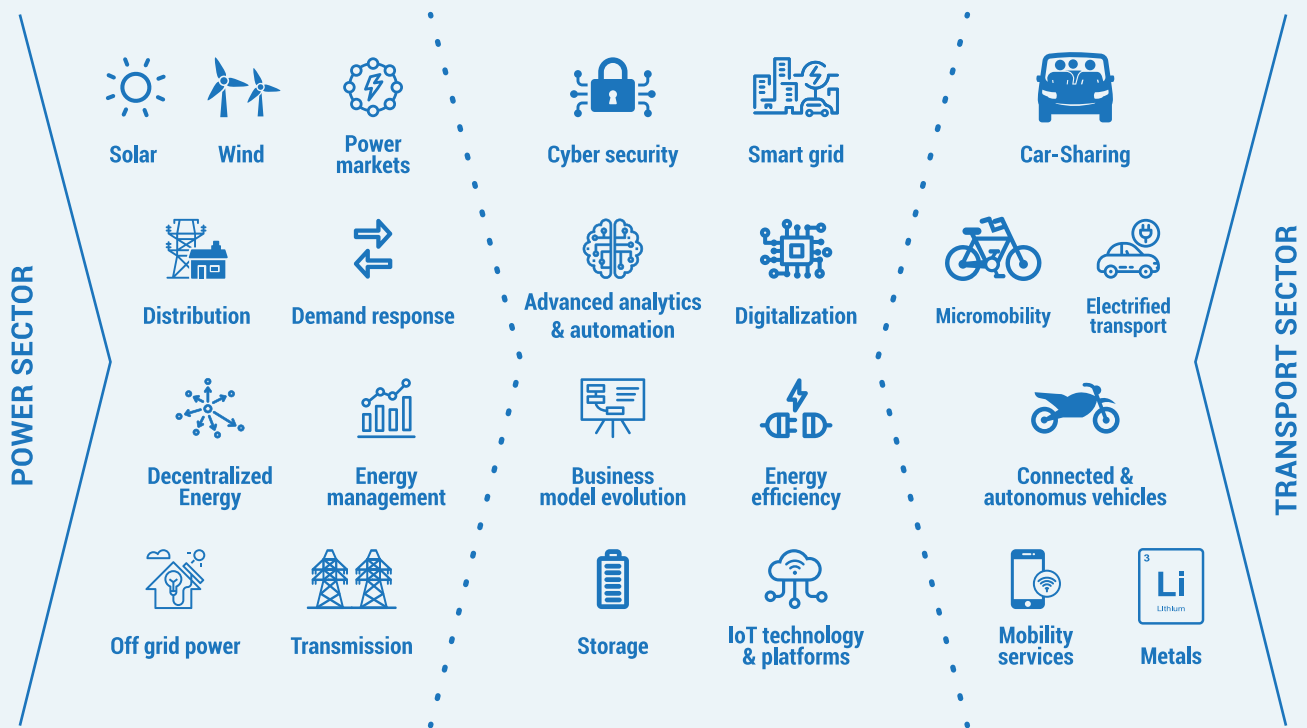


### 2. Deliver clean air and better health through electric mobility

International studies link long-term poor air quality with increased deaths caused by COVID-19.<sup>ii</sup> Transport is responsible for about half of the pollution in the region's cities. A shift to electric mobility would improve air quality and increase resilience to the pandemic and forthcoming health events. This transition would also be strategic in order to revamp the regional vehicle production and foster new value chains in the automotive sector, such as cobalt, or lithium in the "lithium triangle". Furthermore, the development of electrical infrastructure and charging systems also has the potential to create jobs and promote new business models. Mass public transport, state and business fleets, as well as light-duty cargo transport, are the region's low-hanging fruits.

A 100% electrification of transport scenario in LAC by 2050 would reduce total energy demand by nearly 2Bn barrels of oil, equivalent to Canada's annual consumption. The electrification of road transport across the

Business opportunities in the coupled decarbonization of power and transport sector



region would save US\$ 369 billion by 2050 through reduction in fuel and operation costs. Transport electrification by 2050 would also reduce air pollutants in urban areas, resulting in \$30 billion in avoided annual health costs and many avoided deaths.<sup>iii</sup> With 100% penetration of electric vehicles in Buenos Aires, Santiago, San José, Mexico City and Cali, more than 435,000 premature deaths could be avoided by 2050.<sup>iv</sup> Complete electrification of transport would open up new avenues of economic activity, resulting in the creation of over 5.3 million new jobs.<sup>v</sup>



3. Gradually reduce fossil fuel subsidies and tax emissions

Energy subsidies in the region represented almost 2% of annual GDP in 2011-2013; 1% of GDP for fuel and 0.8% of GDP for electricity.<sup>vi</sup> The recent fall in oil prices presents a window to gradually phase out fossil fuel subsidies and redirect these resources towards zero-emission technologies, such as non-conventional renewable energy. These technologies are available in the region, are more competitive than fossil fuels, and create more jobs.

An example is found in Indonesia, which has a very successful story of eliminating subsidies to transport fuels. These measures saved USD\$15.6 billion, which was later reinvested in social and welfare schemes designed to boost growth, reduce poverty and develop infrastructure.<sup>vii</sup>



In this same context, a carbon tax would increase state revenues and accelerate the deployment of zero or low-emission technologies. It would also help improve the efficiency and effectiveness of the tax system if national circumstances were taken into account. The most important thing is to have a clear vision of how government capacity and the rule of law can support the implementation of the carbon tax and establish a plan that protects the most vulnerable and promotes alternatives.

#### 4. Make ecosystems, food and rural livelihoods resilient

Rural areas are key to cope with pandemics, ensure food sovereignty and the wellbeing of the population. Yet, food security is under threat due to climate change and competing conservation and ecosystem services. Declining yield trends for all major crops endanger food production, associated with decrease in water availability and increase in extreme weather events. This has a direct impact on food availability, with consequences for coping mechanisms to deal with disease. Cost-effective national interventions can be implemented to ensure equilibrium between humans and nature, enhancing the ability to control outbreaks of disease via natural regulation from improved biodiversity and increased competition among pest species in productive systems, while ensuring jobs, profits and access to water.



Nature based Solutions (NbS) are extremely cost-effective to help ecosystems produce services for the economic development of local populations, enabling them to cope with the impacts of climate change and disease. Healthy ecosystems provide major economic benefits in the form of avoided losses from related disasters, as well as supporting ecosystem services worth an estimated US\$125 trillion annually.<sup>viii</sup>

#### 5. Make cities resilient

Urban sprawl over ecosystems has increased the capacity of a virus to spread given the lack of biological control over species. NbS can make cities more resilient while improving the health of their citizens and creating urban jobs. NbS priority actions are:



Enhancing connectivity between cities and habitats, such as nature trails; urban landscaping for nature-based social distancing; afforestation in cities.



Creation of artificial wetlands for water and wastewater treatment.



Permeable pavements to increase infiltration and reduce flooding and water loss.

Climate-proofing infrastructure and new climate-resilient infrastructure makes sound economic sense. The benefits outweigh costs by 4 to 1. Investments in this sense need to directly build resilience, whether for storm-water drainage in cities or protecting coastal communities from sea level rise, reducing the risk of damage to health infrastructure and water supply systems.<sup>ix</sup>

The installation of sustainable urban drainage systems in cities shows cost savings of up to 85% compared to traditional drainage. It reduces the risk of flooding, the collapse of water supply and sanitation systems, and damage to strategic transport and health infrastructure.<sup>x</sup>



UNEP can provide technical assistance to integrate environment in the social response to the crisis and recovery related to COVID19 in all the options described above.

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## THE POST-COVID-19 RECOVERY

### 1. Why the region cannot go back to business as usual after COVID-19?

COVID-19 is the most urgent threat humanity faces in the short term. Infectious diseases are related to the loss of ecosystems and biodiversity (zoonosis).<sup>1</sup> Two-thirds of emerging infections and diseases come from wildlife.<sup>2</sup> Considering the increase in human population, land-use change and climate change as combined factors related to loss of habitat for wildlife, interaction between humans and animals and illegal wildlife trade, infectious diseases will raise, unless we change our development and agricultural production patterns.

What began as a health emergency, is turning into a massive economic crisis. Once Latin American and Caribbean states have tackled the immediate health emergency, the region will face

a period of economic recession. This will require large-scale responses to avoid severe economic and social impacts.

Economic recovery plans for COVID-19 will require vast amounts of resources, increasing the region's already high debt. With current and expected impacts of climate change throughout the region – drought, floods, hurricanes, losses in agriculture production, energy losses and exposure to increased pandemics, among others – most countries' capacity to respond to certain climate crises will decrease critically. In this context, it has never been more important to make the COVID-19 response strategies different to economic recovery plans seen before. Mainstreaming sustainability and climate proof solutions has never been more important than now to improve resilience of societies to be prepared in the future.



Recovery from COVID-19 must address simultaneously the health, economic and climate crises while reducing inequalities. Countries must design economic stimulus packages to accelerate systemic change towards a sustainable economy, anchored on nature-based solutions, zero-emission energy and transport, and decent job creation.

The need to respond quickly to the worst economic shock since the “Great Depression”<sup>3</sup> may provide an argument to disregard integrating climate considerations. However, if this is done, responses put in place will accentuate the very conditions that created the pandemic, and exacerbate climate change, and the economic recession ahead. Should the economic responses of states to COVID-19 promote further GHG emission sectors and disregard climate resilience, the region would be in a pathway to more dramatic and long-term effects than COVID-19.



Foto: Science in HD, Unsplash



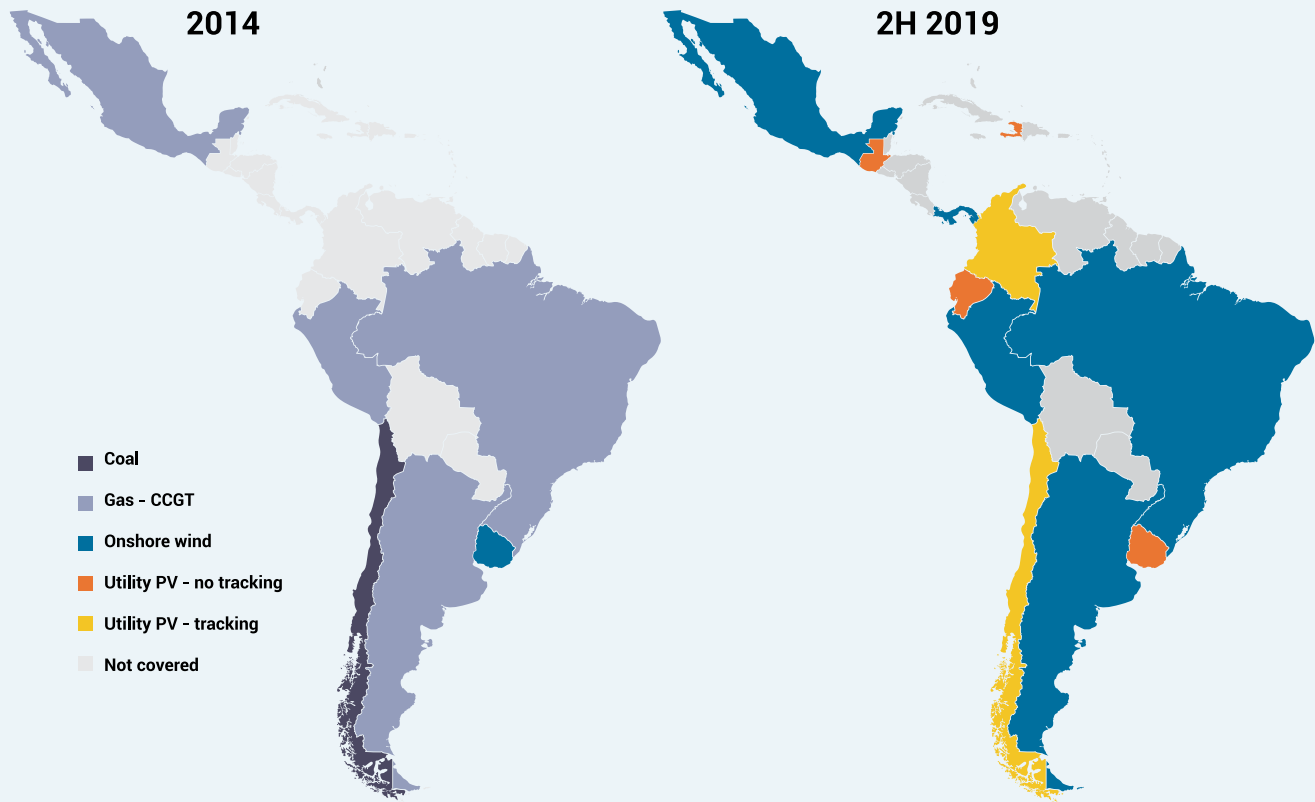
## 2. The opportunity to link post-COVID-19 recovery plans with climate change solutions

States throughout the region are already devising post-COVID-19 recovery plans through stimulus and investment packages, employment plans and infrastructure promotion. Solutions vary from country to country according to their conditions, as well as the severity in which they have been impacted by the crisis. Yet, solutions should respond to the social and economic effects of the pandemic, while improving the resilience of societies to be better prepared in the future, at the same time creating decent jobs and promoting sustainable economic development.

For example, in a time with the lowest oil price in the last three decades, there is good reason to gradually phase out fossil fuel subsidies and redirect them to zero-emission technologies deployment. This can include non-conventional renewable energy technologies and energy storage, most of which are now available almost everywhere in the region, and are already more economically competitive than fossil fuels. Additionally, they can create more jobs.

The transport sector is the main sector responsible for air pollution in cities. Recent studies have associated poor air quality with COVID-19 mortality. Considering this, it is key

## Most competitive source of new utility-scale generation in 2014 and 2019



to direct significant efforts into sustainable transport and its electrification. Moreover, the industries associated with this market, namely automotive, responsible mining and energy, would accelerate the added-value production and service chains, increasing foreign direct investment, promoting high-value jobs and new business opportunities.

In addition, a key tool to dynamize the economy is the implementation of Nature-based Solutions (NbS) in cities, in agriculture, and to conserve valuable ecosystems services, such as water supply. NbS would increase human and natural resilience, avoiding the negative effects of future potential pandemics and preventing catastrophic climate change, while strengthening the resilience of the overall system and creating employment opportunities

and a fair transition that leaves no one behind. Finally, the economic resources needed to confront the health, economic and climate crises are of an unmanageable scope if only public resources are available. More than ever, financial flows need to be climate-oriented and partnerships with the private sector, especially with private banks and investors, should be implemented.

### 3. Putting in place integrated solutions in priority sectors

According to their respective socio-economic and political circumstances, countries should integrate a sustainable approach in their recovery plans to make their societies more resilient, climate-proof and with the potential to dynamize their economy and create new employment opportunities. The need for financial flows might



depend more on how investments are done rather than on how much is invested. Below, is a brief description of the opportunities of increasing action in five high-impact and opportunity areas with the potential to yield enormous economic and employment opportunities in the region, namely:



1. Intensify the deployment of renewable energy and energy efficiency.



2. Deliver clean air and better health through electric mobility.



3. Gradually reduce fossil fuel subsidies.



4. Make ecosystems, food and rural livelihoods resilient.

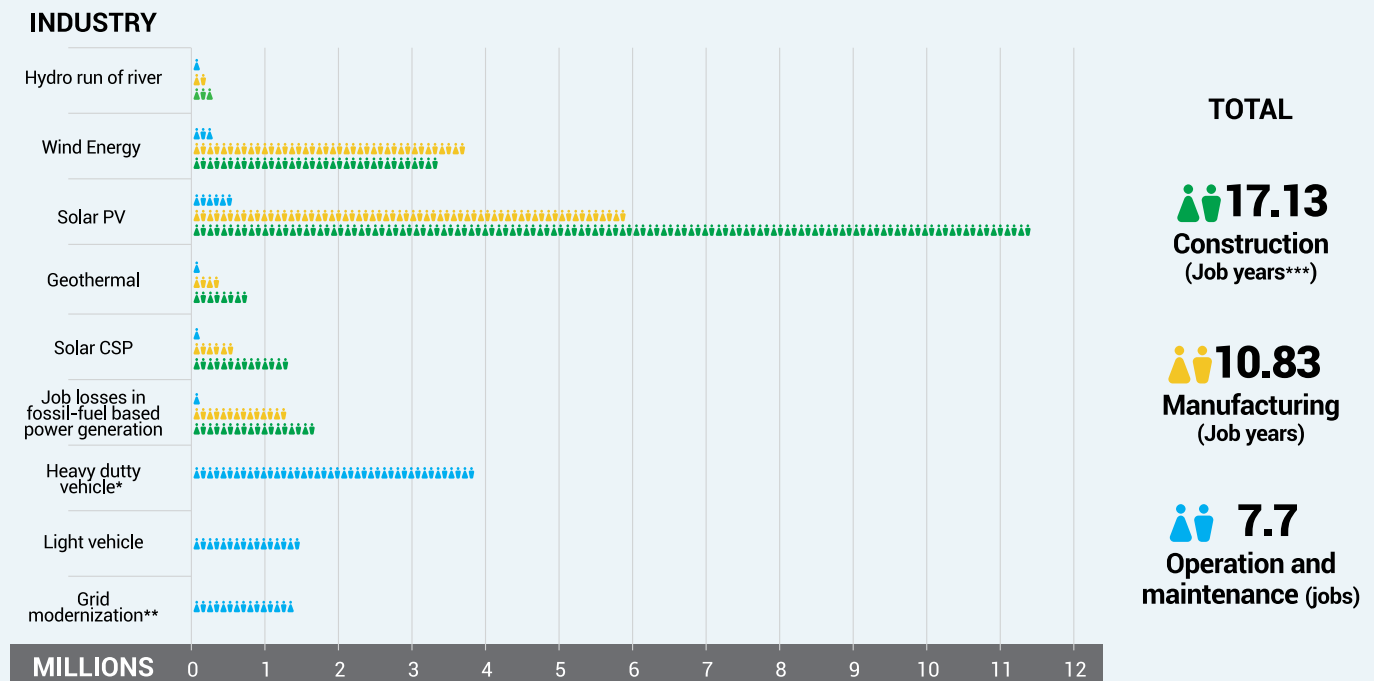


5. Make cities resilient.



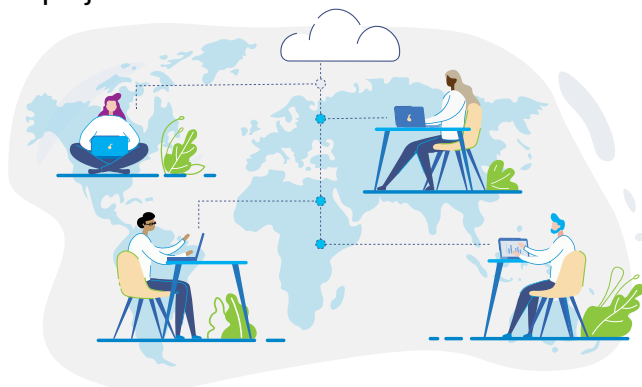
Installation of a solar water heating system at the Panama Solidario hospital in Panama City. Photo: Termosolar - UNEP.

## A coupled transition of renewable energy and electric mobility in the region will create more than 35 million new jobs by 2050



Source: Author's estimate based on of factors and multipliers reported by Dominish E., et. al. 2018. \* Job estimates based on a constant fleet of 150 million cars; 4 million buses and 34 million trucks by 2050. See assumptions and details in Annexes 5 & 12. \*\* Job estimates based on an investment of 26 billion USD between now and 2030 and using the factors for job creation of a smart energy study<sup>24</sup> \*\*\*Job years is a metric used to assess the size of temporary jobs created by activities with a limited time frame.

The concrete implementation of these solutions will vary from country to country and from project to project.



The UN Environment Programme (UNEP) implements several initiatives, and has teams of experts and international partners, ready to support countries to devise their response strategies to COVID-19, while at the same time shaping on them climate-proof solutions. Such solutions are the most cost-effective, more efficient in terms of job creation than traditional ones, and would also serve to ensure the preparedness of countries to avert the next systemic, approaching crisis – climate change. UNEP stands ready to provide technical advice and analysis to facilitate climate-proofing solutions in recovery plans.

### 3.1 Intensify deployment of renewable energy & energy efficiency

Future economic recovery and job creation plans could integrate actions for the promotion of renewable energies and energy efficiency. These technologies support energy security and sovereignty – reducing or avoiding the need to import energy from third countries – and also can contribute to decent job creation opportunities and dynamization of the economy. Actions in these sectors would encourage innovation, promote new businesses and decent jobs. In short, they would have positive impacts

on both the aggregate demand and supply of the economies of the countries of the region, to a greater extent than traditional infrastructure sectors.



According to the new UNEP report *Zero Carbon Latin America and the Caribbean (2020)*,<sup>5</sup> the region can create up to 37 million additional jobs by mid-century if it moved to renewable energy to meet its electricity needs. This figure would, in fact, be higher given that jobs generated by the improvement of the electrical infrastructure of the transmission and distribution networks have not been considered.

Renewable technologies are the most economic sources of electricity generation, demonstrating that on economic grounds, it is impossible to justify new investments in fossil fuel generation (oil and gas). A fully renewable energy matrix will require substantially less capital investment than fossil fuel-based generation, resulting in investment (CAPEX) reductions of US\$283 billion by 2050. Additionally, a fully renewable electricity matrix by 2050 will have 50% lower electricity generation costs, resulting in overall savings of almost US\$223 billion by 2050. The reductions in generation costs would go directly on to electricity consumers, generating savings to citizens and competitiveness for businesses.

Initial efforts in several countries of the region to decarbonize their electricity system have resulted in an investment of over US\$35 billion in non-conventional renewable energy over the last 5 years (accounting for 44% of global foreign direct investment flows).<sup>6</sup> The distributed solar generation sector could promote new businesses and job creation through installer-training programs, certification of technology standards, and eligibility criteria for installation companies. The development of the local PV industry would create new jobs and increase the competitiveness of countries. Such is the case of the Mexican solar distributed market, estimated at US\$ 7 billion for 2024.<sup>7</sup> Up to 2019, US\$1 billion had been invested with the creation of over 9,000 jobs and more than 200 new solar small and medium enterprises created.<sup>8</sup> When it comes to energy efficiency,

UNEP assessments show that large-scale tangible results in saved energy can be achieved in the LAC region in the short term, with savings in electricity bills of more than US\$ 8 billion by 2030. These would avoid the need to construct more than 34 large (500 GW) power plants over the next twenty years –through the adoption of higher efficiency electrical products.<sup>9</sup>

The American Council for an Energy-Efficient Economy calculated that energy efficiency creates almost 2 million jobs across the US, almost 10 times more than oil and gas extraction.<sup>10</sup> This trend could be replicated in Latin America and the Caribbean if governments accelerated efforts towards market transformations to high-efficiency products.

### 3.2 Deliver clean air and better health through electric mobility

International studies have correlated long-term poor air quality and pollution with increased deaths caused by COVID-19.<sup>11</sup> Transport is responsible for approximately half of the local pollution in cities in the region. Ensuring improved air quality through the shift to electric mobility can significantly ensure greater resilience to this pandemic and forthcoming health events.

Economic recovery plans should include the promotion of the transition to electric mobility as a pillar to ensure the well-being of inhabitants. Collective public transport, state and business fleets, as well as light-duty cargo transport, are low-hanging fruits due to their high utilization rate, in order to take advantage of the lower operational costs. This transition would also be a good strategy to revamp regional vehicle

production while generating or improving existing jobs and fostering new value chains in the automotive sector.

The development of the electrical infrastructure and associated charging systems, necessary for the increase in the penetration of electric vehicles, also has the potential to create jobs and foster new investments and business opportunities that countries can exploit to reduce social and gender inequalities.



As the efficiency of electric vehicles is three times higher than that of internal combustion vehicles, the energy demand of the transport sector would be drastically reduced if it transitioned to zero-emission and electric transport. A 100% electrification scenario, excluding air transport, in LAC by 2050 would reduce total energy demand by nearly 2 billion barrels of oil, equivalent to Canada's annual consumption.

In many cities of the region, such as Santiago and Bogota, electric buses have reached cost parity with internal combustion engine buses. An overall transition to electrified road transport across the region would result in savings of US\$ 369 billion by 2050 through the reduction in purchase price, fuel costs

and operation. Electrifying transportation by 2050 would also reduce air pollutants in urban areas, resulting in \$30 billion in avoided annual health costs. In addition, through 100% penetration of electric vehicles in five Latin American cities: Buenos Aires, Santiago, San José, Mexico City and Cali -- over 435,000 premature deaths could be avoided by 2050.

Due to the characteristics of the region's road transport sector, opportunities for transport electrification are mainly in (low hanging fruit) public transport (buses) and last-mile cargo transport.<sup>12</sup> Furthermore, the complete electrification of transport would open new avenues of economic activity, resulting in the creation of over 5.3 million new jobs by 2050.

### Estimated values after 100% electrification of the transport in selected cities., 2019-2050

Accumulated values from 2019 to 2050					
	PM thousand tons	CO <sub>2</sub> million tons	BC thousand tons	CH <sub>4</sub> thousand tons	Avoided deaths
Cali	29,0	214,3	15,5	577,8	24.664
CDMX	142,6	818,8	78,0	650,3	180.117
Buenos Aires	82,8	343,1	43,3	342,7	207.672
Santiago	27,7	99,9	13,9	262,9	13.003
San José	23,5	101,8	12,4	77,0	9.923
<b>Total</b>	<b>305,6</b>	<b>1.577,8</b>	<b>163,1</b>	<b>1.910,8</b>	<b>435.378</b>

\* Estimates made by UN Environment Programme through the evaluation of integrated benefits of electric mobility policies, carried out by Clean Air Institute (2019). Estimates assume a gradual electrification of 50% of transport in these cities by 2030, reaching 100% in 2050.





Photograph of an electric taxi in Cuba. Photo: Excelencias del Motor



Joanna Edghill, entrepreneur in charge of the company Megapower Ltd, Barbados. Photo: Business Barbados.

### 3.3. Gradually reducing fossil fuel subsidies and taxing emissions

The post-COVID-19 recovery is a unique opportunity to gradually phase out fossil fuels and redirect them to zero emissions investments, such as the deployment of non-conventional renewable energy technologies and energy storage. Most of these are now available throughout the region and, in many cases, cheaper than fossil fuels. The recent fall in oil prices presents a window of opportunity to eliminate perverse subsidies to fossil fuels states' revenue-raising capacity necessary to meet social needs.

In the same context, a well-designed carbon tax would increase state revenues and accelerate the deployment of zero or low-emission technologies. It would also help improve the efficiency and effectiveness of the tax system, if national circumstances were taken into account. But most important is to have a clear vision of how government capacity and the rule of law can support the implementation of the carbon tax and establish a plan that protects the most vulnerable and promotes alternatives.

Energy subsidies for countries in the LAC region accounted for almost 2% percent of GDP annually in 2011-2013, about 1 percent of GDP for fuel and 0.8 percent of GDP for electricity.<sup>13</sup> Indonesia has a very successful history of reforming subsidies to electricity and transport fuels. When electricity consumption subsidies reached USD 7.5 billion in 2014, the country introduced automatic monthly price adjustments to reduce subsidy costs.

Similar reforms were conducted in 2015 for gasoline and diesel in the transport sector. These measures saved USD 15.6 billion, subsequently reinvested in social (education and health) and welfare schemes designed to boost growth, reduce poverty and develop infrastructure in Indonesia's many remote regions and villages.<sup>14</sup>



## Combined costs, benefits and avoided costs by mid-century under a coupled power and transport zero emissions pathway (in billion dollars), 2018

### Annual savings by 2050



**Avoided cost of illness**

**\$30**  
US billion dollars



**Reduction in annual costs of cargo road transport**

**\$41**  
US billion dollars



**Reduction in annual costs of passenger road transport**

**\$328**  
US billion dollars



**Savings in electricity cost**

**\$223**  
US billion dollars



### Cummulative impact on capital assets by 2050



**Value of stranded assets in the refinery sector**

**\$10**  
US billion dollars



**Value of stranded assets in the power sector**

**\$80**  
US billion dollars



**Reduction in capital investment to meet power demand by electric transport**

**\$103**  
US billion dollars



**Reduction in capital investments in the power sector**

**\$283**  
US billion dollars

### 3.4 Make ecosystems, food and rural livelihoods resilient

Fragmentation and loss of natural habitats facilitate the spread of infectious diseases. Nature-based Solutions enable the conservation of ecosystems and improve their connectivity, reducing dramatically this risk. Due to the expansion of the agricultural frontier, these ecosystems are usually located in the same landscapes where food production is taking place.

Rural areas are key to cope with pandemics, ensure food sovereignty and the wellbeing of the population. Yet, food security is under an ever-growing threat due to climate change, and competing with conservation and ecosystem services. Declining yield trends for all major crops endanger food production, associated with intricate factors, such as decrease in water availability, increase in pests and diseases due to changing climate and increase in extreme

weather events. This has a direct impact on food insecurity and undernutrition, with direct consequences on coping mechanisms to deal with disease. Cost-effective national interventions can be implemented to ensure equilibrium between humans and nature, enhancing the ability to control outbreaks of disease via natural regulation from improved biodiversity and increased competition among pest species in productive systems, while at the same time ensuring profitability of rural livelihoods and water supply. Priority actions that could be promoted to accelerate Nature-based Solutions as part of national recovery programmes may include:

- Establishment and management of protected areas and ecological corridors.
- Restoration of degraded lands with mixed production systems, ecological restoration of wetlands and riparian zones.

- Promotion of production activities such as sustainable forest management, and resilient smallholder agriculture with diversified products in agroecological systems.

- Improved management of water, soil and nutrients (efficient irrigation, including solar pumps; organic input production – vermicomposting, natural pesticides and herbicides).

- Sustainable grazing practices and mixed production such as agro-sylvo-pastoral systems.

- Improved value chain and processing such as solar dehydrators; blockchain traceability; linking local, regional and global markets; direct sales – from farm to table.

Besides ensuring profitable rural livelihoods that conserve natural resources, these measures could create additional job opportunities in rural

areas, ensuring sound nutrition supply, thereby decreasing the vulnerability of population to potential new epidemics.



EbA demonstration farm in Oxapampa, Pasco, Peru. Photo: MEBA - UNEP.

Research shows that Nature-based Solutions are extremely cost-effective, helping ecosystems produce services for the economic development of local populations and allowing them to cope with the impacts of climate change and disease. Healthy ecosystems provide major economic benefits in the form of avoided losses from climate change-related disasters, as well as supporting ecosystems services worth an estimated \$125 trillion annually.<sup>15</sup>

For instance, while mangrove forests provide more than \$80 billion per year globally in avoided losses from coastal flooding – and protect millions of citizens – they also contribute almost as much as \$40–50 billion per year in benefits associated with fisheries, forestry, prevention of saline intrusion and recreation. Combined, the benefits of

mangrove preservation and restoration are up to 10 times the costs and they provide essential services to coastal communities.<sup>16</sup>

Investing \$250–500 per hectare in Nature based Solutions for dryland farming increases cereal yields by 70 to 140 percent, bringing net economic benefits of billions of dollars to economies.<sup>17</sup> Using agroforestry in coffee, cocoa or cattle production systems diversifies revenues by providing timber, fruits, fuelwood and building materials<sup>18</sup> that farmers can use for additional income, especially in periods when income from the main cash crop is reduced. These additional products reduce farmer vulnerability to market changes, as well as their dependence on outside products helping improve farmer food security directly and indirectly.<sup>20</sup>



### 3.5 Make cities resilient

Urbanization throughout the region has created centres of densely packed populations where biodiversity is reduced to a minimum. This increases the capacity of a virus to spread given the lack of biological control over species. Increased urbanization and deforestation have been linked to greater exposure to hantavirus rodent reservoirs, outbreaks of leptospirosis, zika and yellow fever outbreaks.<sup>21</sup>

Nature based Solutions can make cities more resilient while improving the health of their citizens and creating urban jobs. Actions could include:

- Urban agriculture to produce local food such as roof gardens, solar hydroponic systems and food parks.
- Re-establishing connectivity (hydrology, biodiversity) between cities and conserved habitats, such as nature trails; urban landscaping for nature-based social distancing; afforestation in cities.
- Restoration of creeks, rivers and riparian zones.
- Creation of artificial wetlands for water and wastewater treatment.
- Protection of water sources and alternative supply (e.g. ecosystem conservation at top of watersheds; rainwater harvesting).
- Permeable pavements to increase infiltration and reduce flooding and water loss.

Apart from increasing water availability, conserving energy, food security and improved aesthetics, these solutions would also allow understanding in urban dwellers of the close interdependence between modified and natural environments.





Climate-proofing infrastructure and building new infrastructure that is climate resilient makes sound economic sense. The benefits outweigh costs by 4 to 1. Investments in infrastructure need to directly build resilience, whether for storm-water drainage in cities or protecting coastal communities against sea-level rise, decreasing the risk of damages to health infrastructure and water supply systems.<sup>22</sup>

For instance, the green spaces (parks, gardens and urban forests) built in Beijing in the last years, are calculated to store 154 million m<sup>3</sup> of rainwater, corresponding roughly to the annual water needs of the city's urban ecological landscape. The city of Portland, Oregon has reduced urban flooding by up to 94% through urban green infrastructure, yielding US\$ 224 million in savings to water infrastructure alone.

In Singapore, a city-state with limited water resources, harvesting rainwater was a natural extension of pre-existing strategies to reduce, reuse and replenish water sources.

Approximately 86% of Singapore's population lives in high-rise buildings, so rooftop water collection systems have been installed to maximize the use of rainwater and act as a catchment. The rainwater is collected in tanks and used for toilet flushing, helping to reduce water consumption, ensure water availability throughout the year, save on energy and reduce other costs within the buildings.

Open spaces such as parks and greenways can be intentionally constructed or protected in strategic locations to capture runoff from upstream basins and adjacent areas. The cost of open spaces is highly variable and largely dependent on land prices.

The installation of sustainable urban drainage systems in cities has shown cost savings up to 85% compared to traditional drainage construction approaches. They contribute to decreasing the risk of flooding and the collapse of water supply and sanitation systems as well as damages to strategic transport and health infrastructure.<sup>23</sup>



## 4. United Nations Environment Programme initiatives and partnerships with the capacity to provide support

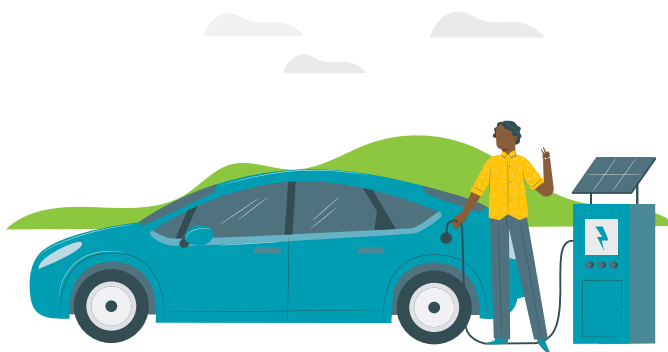
The United Nations Environment Programme is leading several initiatives and expert teams, ready to collaborate with Latin American and Caribbean countries to analyse and shape their post-COVID19 recovery strategies, integrating "climate-proof" solutions in a cost-effective manner. Solutions are always country-specific, but the lessons learned, successful examples and experience gathered by UNEP and its partners can be valuable in planning, designing, and implementing integrated response plans in the region.

Collective action, multilateralism and global cooperation are indispensable to support countries in the Latin American and Caribbean region in simultaneously addressing the COVID-19 and climate crises. That is why UNEP will seek alliances with its strategic partners, through its international cooperation programmes, such as the European Union (EUROCLIMA+ Programme), AECID (REGATTA Platform), and the Green Climate Fund, among others, with the aim of, on the one hand, supporting public policy decision makers in the region, within the framework of the Forum of Ministers of the Environment of Latin America and the Caribbean, and on the other hand, facilitating the implementation of decisions taken with environmental and sectoral authorities. Relevant UNEP initiatives where support can be mobilized include

### **MOVE -Electric mobility for Latin America and the Caribbean**

MOVE platform provides technical assistance, capacity building, knowledge creation and resource mobilization to accelerate the

deployment of electric mobility in Latin America and the Caribbean. As part of MOVE's work, studies and policy recommendations are developed on the economic, environmental and social benefits derived from the implementation of public and fiscal policies towards zero-emission and electric mobility.



### **Distributed solar generation initiative**

This initiative supports LAC countries in the creation of capacities and enabling environments to catalyze investment toward the distributed solar photovoltaic (PV) sector. It supports governments in the design and implementation of Distributed Solar PV financing programmes, unlocking solar-specific financing in suitable national and local conditions, as well as making recommendations on adapted policies and fiscal frameworks.

### **United for Efficiency, U4E**

U4E is a global effort supporting developing countries and emerging economies to move their markets to energy-efficient appliances and equipment. U4E brings together all key stakeholders active in the area of product efficiency, offering tailored assistance to governments to develop and implement national and regional strategies and projects to achieve a fast and sustainable market transformation to high-efficiency products.

## Termosolar

Termosolar promotes the development of solar water heater markets making them economical, contributing to reduce electricity and fossil fuels subsidies in the health, agro industry, households and hospitality sectors while reducing GHG, and facilitating the transition towards a sustainable economy through the penetration of solar thermal energy. The initiative promotes the development of enterprise creation and decent job opportunities in the solar thermal market.



Installation of a solar water heating system at the Panama Solidario hospital in Panama City. Photo: Termosolar - UNEP.

## CityAdapt

The CityAdapt initiative explores and pilots Nature Based Solutions for cities to generate evidence on the benefits of this approach for city development and citizen resilience to climate change and crisis. The initiative also provides insights into the potential for mainstreaming of Nature Based Solutions in urban development plans, regulations and investments to create more resilient and liveable cities.



Edible mushroom production module in Xalapa Mexico. Photo: CityAdapt - UNEP

## Micro-finance for Ecosystem-based Adaptation

The MEbA initiative partners with financial service providers to foster NbS for climate resilience via micro-lending. It builds capacity in partner institutions to promote NbS for farmer resilience while improving climate and environmental risks. It stimulates alliances that benefit technical service providers, financial institutions and small-scale farmers. Considering the COVID-19 pandemic and how the financial sector will be affected, MEbA can prove beneficial in the management of risks and establishment of contingency plans.



EbA demonstration farm in Oxapampa, Pasco, Peru. Photo: MEBA - UNEP.



## The NAP platform & community of practice

The NAP platform defines sectoral and territorial development strategies integrated with the health sector and proper functioning of the natural ecosystems. It identifies hotspots of vulnerability and future risk to negative impacts associated with climate change through climate modelling and monitoring of biophysical variables associated with climate. It increases the available capital to take actions aimed at ensuring the provision of high-quality ecosystem services through the establishment of financing schemes that involve the private sector and the most vulnerable communities.



## Climate Transparency

UNEP supports the implementation of the Paris Agreement's reinforced transparency framework. It offers support in the development of public policy to establish guidelines and strengthen instruments that track progress, account for and update of NDCs, long-term planning exercises and link 2030 efforts with the 2050 vision.

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