

# Guide for green recovery in Latin American cities:

Case studies in the water, energy, waste and transport sectors



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The GADeR-ALC is a sectoral network of the German development cooperation, implemented by GIZ, for knowledge management among programs and projects at the regional level. The network promotes the exchange of information and the creation of products among different Latin American countries, under a common and innovative theme, that contribute to its members and respond to the needs of partners and commissioners.

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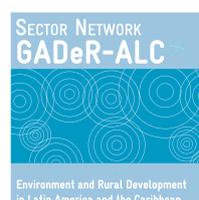
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# Introduction

## Context

Cities are tackling with environmental, social and economic challenges, such as increasing population, energy demand, the impacts of climate change and resource scarcity. The COVID-19 pandemic amplified these problems, generated new ones and increased the vulnerability of certain groups to its impacts.

In this context, why not take this opportunity to reconsider our development model that we live under?. Therefore, it is important to understand what Green Recovery (GR) is and how to apply this concept in developing a more sustainable economy moving forward.

## Purpose of the document

The purpose of this guide is to present the Green Recovery's concept and projects' features under this approach. The document will focus on case studies<sup>1</sup> developed in the water, energy, waste and transportation sectors to boost the development of sustainable, resilient and carbon neutral cities in Latin America.

“Thus, economic recovery requires major public and private commitments - but also a reformulation of production, consumption and sustainability patterns.”

## ¿What is green recovery?

GIZ understands Green Recovery as measures which, with public and private financing, not only help to cope with the immediate social, economic, ecological and political consequences of the COVID-19 crisis, but also set the course for structural reforms and a transformative change towards sustainability, resilience and climate neutrality when economic and social life restarts.

In this regard, Green Recovery measures are aligned to environmental, climate and economic opportunities and risks. This implies a long-term green growth, which ensures that the foundations of life are preserved for future generations<sup>2</sup>. National and subnational governments must guide society and the economy along this path.

Therefore, exists two types of measures to be highlighted:

- **Response measures:** aimed at addressing the immediate consequences of the pandemic on economic activity, society and the environment - currently, most of the existing measures are developed under this approach in the world.
- **Recovery measures:** aimed at addressing the medium and long-term consequences of the pandemic, in order to recover previous levels of economic activity in a sustainable, resilient and carbon neutral manner.

## Importance of Green Recovery

The COVID-19 pandemic generated significant economic losses: the global economy decreased by 4,4% in 2020, the worst performance since 1930; there was an increase in unemployment in all G8 countries (except China); economic sectors relevant to Latin America, such as tourism, lodging and retail, have no clear prospects for recovery.

<sup>1</sup> It is important to mention that the case studies were underway when the pandemic began.

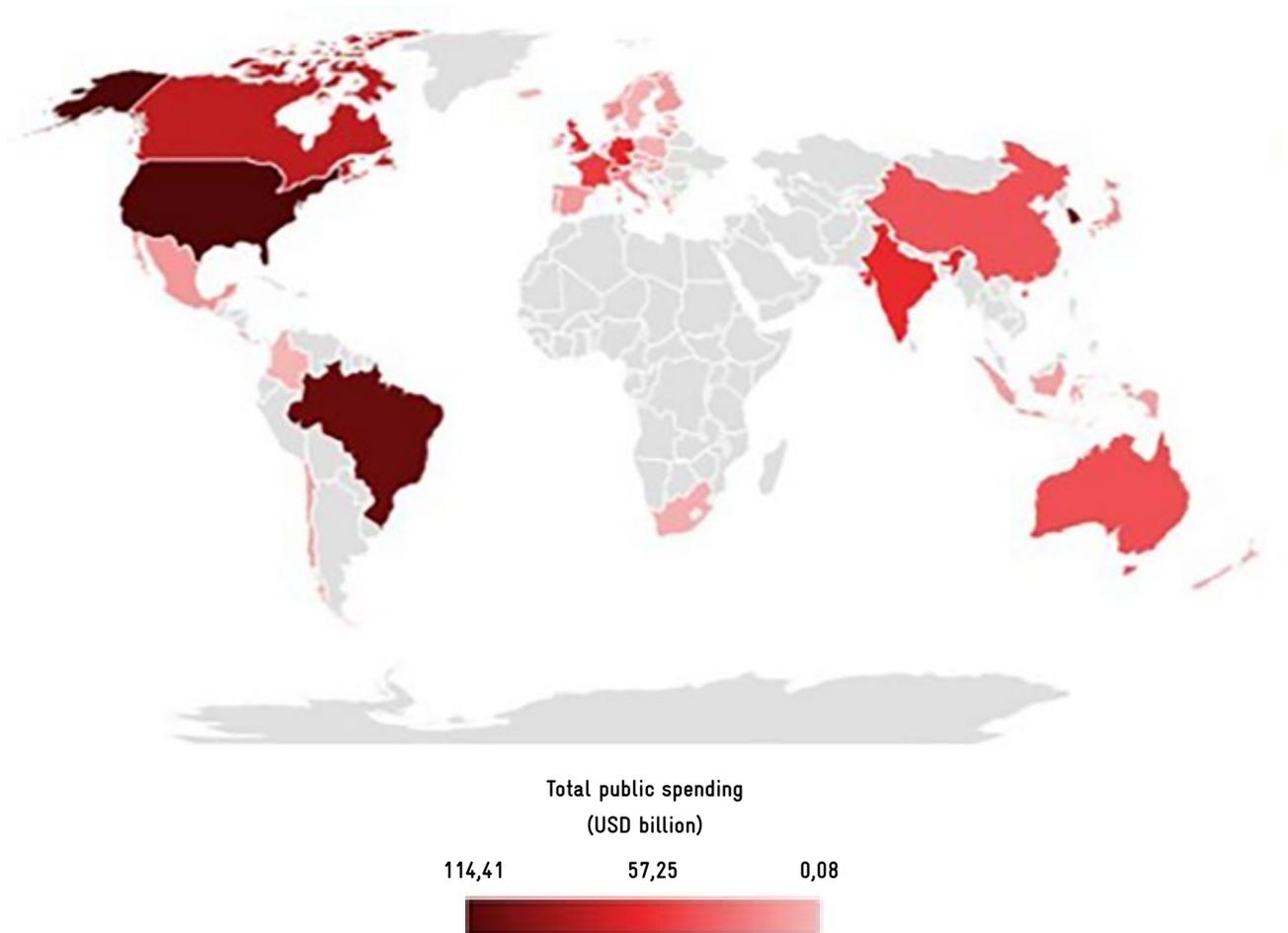
<sup>2</sup> GIZ. 2020: GIZ understanding of Green Recovery.

Other sectors, such as water, energy, waste and transport, were affected, there were service delivery's gaps highlighted during the pandemic and/or will play a relevant role in green economic recovery. Thus, economic recovery requires major public and private commitments - but also a reformulation of production, consumption and sustainability patterns.

Moreover, the pandemic demonstrated the fragile relationship we have with nature. A broader climate crisis, of which the emergence and increasing intensity of pandemics is only one aspect, may generate even more significant losses. Therefore, investing in green technologies and infrastructure and measures of well-being, social inclusion and sustainability is essential.

Several response and recovery measures were implemented. Furthermore, a few countries had significant economic recovery packages. (figure 1)<sup>3</sup>. The countries that implemented these packages, in general, are the large economies: hard hit by the pandemic, but also well positioned to recover.

“Investing in green technologies and infrastructure and measures of well-being, social inclusion and sustainability is essential.”



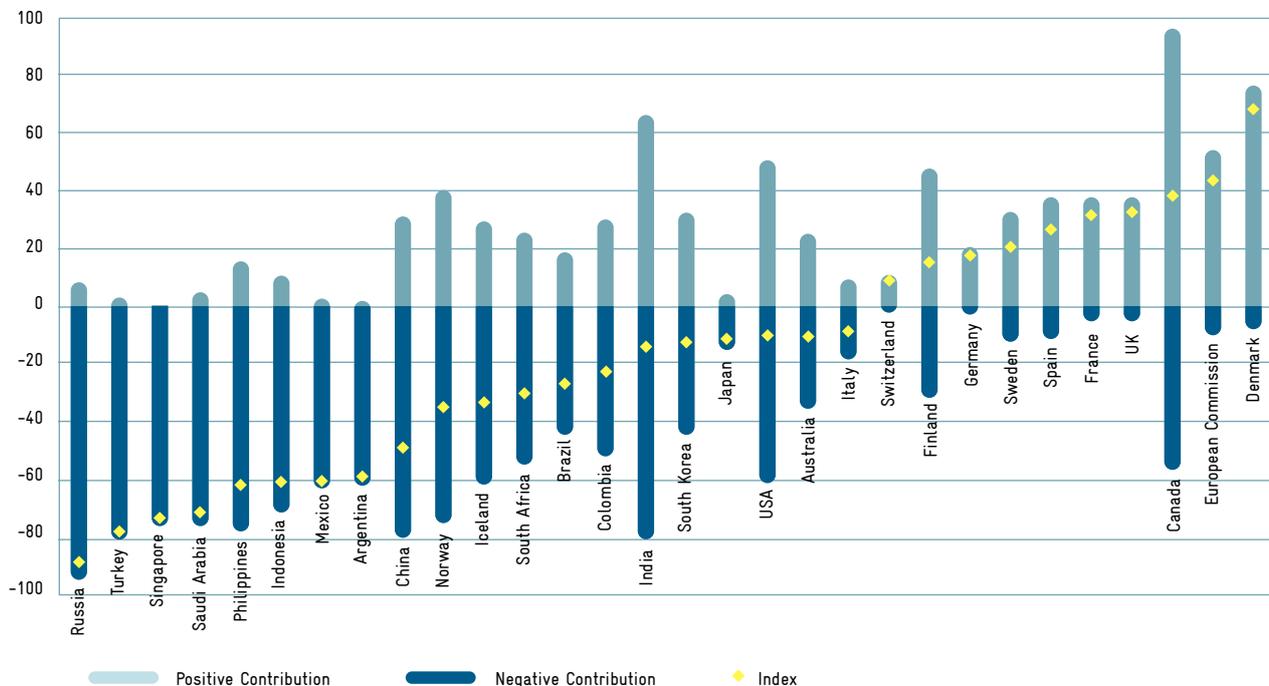
Source: Australian Bureau of Statistics, GeoNames, Microsoft, Navinfo, TomTom, Wikipedia

**Figure 1. Public spending for COVID-19 crisis' s recovery**

<sup>3</sup> The European Union (EU) accounts for more than 50% of global spending on recovery measures. To make the figure readable, the EU was excluded from this analysis.

However, it is estimated that only 17% of the economic stimulus package budget was allocated to positive environmental impact measures. On the other hand, it is estimated that an equal amount was allocated to measures with negative environmental impacts - that is, measures

that favor business as usual. This indicates that governments are not following through on their proposals and/or are failing to take advantage of significant opportunities. (figure 2).



Source: Vivid Economics

Figure 2. Degree of environmental issues' integration into economic stimulus packages<sup>4</sup>

A large percentage of green recovery resources was allocated to projects in specific sectors: energy, land transport, air transport and industry. These sectors account for a high percentage of global greenhouse gas (GHG) emissions and are candidates for rapid transformation (e.g. renewable energies, electric vehicles, more efficient industrial technologies, etc.). The main topics covered are climate change mitigation and air pollution.

On the other hand, relevant sectors, especially in the Latin American context, such as sustainable and resilient urban infrastructure, green construction and waste management, had very few resources allocated to them. This gap needs to be closed.

### Countries with > Positive Contribution

Canada | Denmark | India

### Countries with > Negative Contribution

Russia | Turkey | China | India

### Characteristics of a green recovery project (GR)

The following table describes the characteristics to be considered for the formulation and implementation of projects that contribute to Green Recovery<sup>5</sup>.

4 The yellow diamonds indicate the “net balance” of the negative and positive impacts of the stimulus packages, according to the methodology of **Vivid Economics**.

5 GIZ 2020: GIZ understanding of Green Recovery.

**Table 1.**  
**Expected characteristics for a GR project**

	Time span	GR measures must have a dual effect: on the one hand, they must be rapid, time-limited, reduce the socio-economic damage created by the pandemic and target specific groups with acute needs. On the other hand, they must have a medium- and long-term effect that sets the course for socio-economic and ecological transformation.
	Local-global alignment	<p>During the planning and implementation of GR measures, the inclusion of international standards should be considered and avoid undermining environmental and climate policies requirements and international agreements, such as Paris Agreement on Climate Change, with each country's climate actions known as Nationally Determined Contributions (NDCs); Sustainable Development Goals (SDGs)/ 2030 Agenda; and Biodiversity Convention, as well as non-compliance with fundamental labor and social standards.</p> <p>There are sector-specific SDGs, which will be explored in the next chapters of this document, as well as SDGs and targets whose alignment is expected for all urban GR projects:</p> <ul style="list-style-type: none"> <li>▪ SDG 1 (No poverty): target 1.4</li> <li>▪ SDG 5 (Gender equality): target 5.a</li> <li>▪ SDG 8 (Decent work and economic growth): target 8.2</li> <li>▪ SDG 9 (Industry, innovation and infrastructure): target 9.4</li> <li>▪ SDG 11 (Sustainable cities and communities): targets 11.1 y 11.6</li> <li>▪ SDG 12 (Responsible consumption): targets 12.2 y 12.5</li> <li>▪ SDG 13 (Climate action): targets 13.1 y 13.3</li> </ul>
	Just transition	In the interest of a <i>just green transition</i> , people, regions and sectors that suffer negative consequences in the short and medium term as a result of economic transformation should receive targeted support. Human rights standards must be observed, and gender equality and inclusion of minorities actively promoted. Particularly associated with SDGs 1 and 5.
	Inclusion	GR measures should be context- and conflict-sensitive, especially in fragile and conflictual situations, in order to address the acute needs of the most vulnerable. The principle of " <i>Leave no one behind</i> " (LNOB) from the Agenda 2030 should always be observed. Particularly associated with SDGs 1 and 5.
	Consumption and production patterns	Economic and trade policy related GR measures should provide specific incentives for a transformation towards sustainable consumption and production patterns (e. g. towards a circular economy). <i>Leapfrogging</i> offers particular opportunities for technological innovation and greater resource efficiency (skipping or omission of individual steps in a development process). Particularly associated with SDG 12 and circular economy <sup>6</sup> .
	Green jobs	The creation of <i>green jobs</i> also beyond environmental industries, the qualification of people for the challenges of a green economy ( <i>green skills</i> ), active labour market policies and sustainable economic and employment policies should be a thematic focal point of GR measures. Particularly associated with SDG 8.
	Green financial and budgetary policy	GR measures need to be supported in the short term by "green tax incentives" and in the longer term by green financial and budgetary policies, e. g. through environmental fiscal reform. This creates ecological cost transparency and reduces false incentives, e. g. by reducing environmentally and climate-damaging subsidies or introducing carbon pricing.
	Sustainable financial system	A sustainable financial system is essential for mobilising private resources and systematically redirecting financial flows for investment in sustainable development. The new EU taxonomy could serve as an orientation.

Source: GIZ understanding of Green Recovery (GIZ, 2020)

6 According to [European Parliament](#), the circular economy is a production and consumption model involving sharing, lending, reusing, repairing, restoring and recycling materials and products as much as possible. Thus, the life cycle of these products is extended.

7 Available [here](#).



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## Water and Sanitation

Green recovery projects in this sector focus on the expansion, operation and maintenance of water and sanitation systems<sup>8</sup>, including water and energy

efficiency of processes; moreover, the generation of green jobs and local business opportunities for economic reactivation.

### Examples of water and sanitation's projects aligned with GR<sup>9</sup>

- Drinking water supply and treatment projects that promote climate resilience:
  - Aquifer recharge through green infrastructure.
  - Expanding access to water service.
  - Drinking water treatment.
- Efficient water use projects:
  - Reduction of water losses.
  - Reduction of water consumption through water-saving technologies.

<sup>8</sup> Recognizing its importance for public and environmental health.

<sup>9</sup> The lists of examples of sectoral projects in this and the following sections are not exhaustive.

- Sewage, wastewater treatment and reuse projects that promote carbon neutrality and/or climate resilience:
  - Expansion of sewerage services.
  - Wastewater and sludge treatment with low carbon technologies (e.g. anaerobic digestion).
  - Wastewater reuse.
  - Commercialization of raw wastewater.
  - Energy recovery from wastewater and sludge (biogas).
  - Nutrient recovery from sludge (phosphorus, nitrates).
- Energy efficiency projects in water supply and sanitation that promote carbon neutrality:
  - Replacement of inefficient pumping equipment.
  - Optimization of treatment processes through digital technologies.



© GIZ/ Adrián Portugal

“Green recovery projects in this sector focus on the expansion, operation and maintenance of water and sanitation systems, including water and energy efficiency of processes.”

**Table 2.**

**SDG and targets specifically applied to GR water and sanitation projects**



- 6.1** By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
- 6.2** By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
- 6.3** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- 6.4** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Source: 2030 Agenda for Sustainable Development (UN, 2015)

**Table 3.**  
**Characteristics for a GR water and sanitation project**

	Time span	<ul style="list-style-type: none"> <li>▪ Short term: ensure proper economic conditions for water and sanitation service providers.</li> <li>▪ Medium/long term: expansion of water access for groups without service access; reduction of water losses; increase in aquifer recharge capacity; reuse of wastewater.</li> </ul>
	Local-global alignment	<ul style="list-style-type: none"> <li>▪ Paris Agreement/SDG 13: t CO<sub>2</sub>e avoided with urban wastewater management; and through sectoral strategies and plans for integrated climate change management.</li> <li>▪ SDG 1: % of population with access to drinking water services.</li> <li>▪ SDG 5: number of inhabitants served by the drinking water supply project by gender.</li> <li>▪ SDG 6: increase % access to drinking water services; increase % access to sewerage services; reduction % of water losses; reduction % of untreated wastewater.</li> <li>▪ SDG 8: number of employees involved in projects and hired in accordance with applicable laws.</li> <li>▪ SDG 11: number of inhabitants served by the water supply project by social stratum.</li> </ul>
	Just transition	<p>The transition in the water and sanitation sector may affect economically and socially certain population sectors. For example, water tanker trucks' vendors lose their jobs when extending the coverage of drinking water supply by the public network; or farmers who use untreated wastewater for irrigation are also affected. For a just transition, strategies to mitigate these socio-economic impacts must be considered to ensure the support of the population.</p>
	Inclusion	<ul style="list-style-type: none"> <li>▪ In the medium/long term, the aim should be to reduce the gap in access to water and sanitation services and ensure the services quality, particularly for the poorest and vulnerable population/regions.</li> </ul>
	Consumption and production patterns	<ul style="list-style-type: none"> <li>▪ Incentives should be provided to water and sanitation utilities for increasing efficiency in water and energy, through new equipment, technologies, control measures, etc.</li> <li>▪ Promote wastewater reuse and the rational water use by population.</li> </ul>
	Green jobs	<ul style="list-style-type: none"> <li>▪ Low-carbon and climate-resilient water and sanitation projects demand infrastructure construction and offer a high potential for green job creation. In addition, the construction-skills created can be applied to other infrastructure projects.</li> <li>▪ Ongoing education and training for sectoral experts to develop long-term green skills in climate resilience, energy efficiency and digitalization.</li> </ul>
	Green financial and budgetary policy	<ul style="list-style-type: none"> <li>▪ Most Latin American countries have significant gaps in access to water and sanitation services in a context of climate change. An increase in the budget for these projects should be sought in the medium/long term.</li> <li>▪ Involve the private sector. If a country's legislation does not allow it, the possibility of public-private partnerships should be discussed to make these projects viable.</li> <li>▪ Offering subsidies for more efficient water consumers and penalizing inefficient consumers.</li> <li>▪ Fiscal incentives for water reuse (e.g. green area irrigation, agro-export) can generate positive impacts in the short term.</li> </ul>
	Sustainable financial system	<ul style="list-style-type: none"> <li>▪ Water use efficiency/reuse projects have high potential for financing through green funds and sustainable bonds<sup>10</sup>.</li> <li>▪ Public and/or private low-carbon and climate-resilient water supply and sanitation projects can also be financed by sustainable bonds<sup>11</sup>.</li> </ul>

Source: Own collection

10 For instance, the green bond of Development Finance Corporation (COFIDE), Peru, also seeks to finance wastewater treatment plant projects.

11 For example, **the company Iguá Saneamento from Brazil issued green bonds** a total amount of BRL 620 MM for sanitation projects. Moreover, the **Sabará Group from Brazil issued green bonds based on inputs production for the water sector**.

## Case study: Sewerage and Wastewater Treatment Plant for Tonchigüe in Esmeraldas, Ecuador

### Basic data:

- Project name: Financing Energy for Low Carbon Investment – Cities Advisory Facility (FELICITY Ecuador)
- Location: Atacames, Esmeraldas, Ecuador
- Entities: European Investment Bank (EIB) and Development Bank of Ecuador (BDE) (financiers); BDE (political partner); Autonomous Decentralized Municipal Government of Atacames (implementing partner)
- Financial volume: USD 3.690.052 (project)
- Project duration: 2017 – 2022
- Case study duration: to be implemented 2023-2024

### Context

- The rapid growth of urban areas - accounting for 75% of global GHG emissions - as is the case in Atacames, often involves a not well planned and managed urbanization, generating environmental degradation as well as growing social disparities.
- Those cities demand greater investment in low-carbon and climate-resilient infrastructure. However, cities tackle significant barriers to developing bankable projects, securing financing and implementing them.
- Therefore, FELICITY - Ecuador is supporting the municipality of Atacames to develop the sewerage and wastewater treatment project for Tonchigüe in order to make it bankable and meet international financing requirements.

### Objective:

- Provide sewerage service to the community of Tonchigüe.
- Mitigate greenhouse gases (GHG) emissions by treating wastewater.

### Proposed actions:

- FELICITY provides customized support (technical assistance, advice, etc.) to financial intermediaries and cities/municipalities to make their low-carbon infrastructure projects bankable through EIB's loans.
- The Atacames pilot project involves the treatment of wastewater using low-carbon technology, with anaerobic digestion of sludge, methane (CH<sub>4</sub>) capture and its thermoelectric use to generate electricity and thus reduce GHG emissions.

## Expected benefits:

- Improvement of the living conditions and health of its inhabitants.
- Improvement of environmental conditions to contribute to Ecuador's NDCs through GHG mitigation.



Time span

- Short term: compliance with EIB social and environmental safeguards.
- Medium/long term: access to sanitation services for vulnerable population; reduction of GHG emissions; contribution to NDC's Ecuador.



Local-global alignment

- Paris Agreement/SDG 13: 1.458 tCO<sub>2</sub>e/year avoided by wastewater treatment.
- SDG 5: 6.200 women and 6.685 men benefited by the project.
- SDG 6: 98% access to sewerage; 95% treated wastewater.



Just transition

Not applicable



Inclusion

- Reduction gaps in access to drinking water and sanitation for the most vulnerable population.
- The project will promote gender equality and minority inclusion in the construction phase.



Consumption and production patterns

Not applicable



Green jobs

Jobs will be generated for services' management, operation, maintenance, and commercialization. It's foreseen permanent jobs for 6 workers and 1 administrative staff.



Green financial and budgetary policy

Application of differentiated rates for sanitation services and investment recovery through contribution of improvements, mainly in the tourism sector.



Sustainable financial system

By complying with the EIB's environmental safeguards, 50% of the resources will be provided by the EIB and the remaining 50% by the BDE.

Source: Project FELICITY Ecuador | Own collection

“FELICITY - Ecuador is supporting the municipality of Atacames to develop the sewerage and wastewater treatment project for Tonchigüe in order to make it bankable and meet international financing requirements.”



Old sector of Tonchigüe  
© Municipality of Atacames

### Basic data

- Project name: Water and Wastewater Companies for Climate Mitigation (**WaCCliM** Peru)
- Location: Cusco, Peru
- Entities: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU (commissioner); Peruvian Ministry of Housing, Construction and Sanitation - MVCS (political partner); Water and Wastewater Company of Cusco - SEDACUSCO (pilot utility)
- Financial volume: EUR 1.180.000 (total project)
- Project duration: 2014-2022
- Case study duration: 2015 - 2021

### Context

- In the city of Cusco, sewage treatment generates 110.000 tons of sludge annually.
- Without proper treatment, this sludge attracts insects, rodents and generates odors, polluting the environment and contributing to climate change through methane (biogas) emission.

### Objective:

- Integrate climate protection measures into SEDACUSCO's service operation: optimizing municipal sludge treatment to enhance methane (biogas) production; and recovering biogas to generate thermal and electrical energy for self-consumption.

### Proposed actions:

- With the support of the Ministry of Housing, Construction and Sanitation and German development cooperation, implemented by GIZ through the WaCCliM project, the company SEDACUSCO developed and implemented a cost-effective and innovative **solution**: sludge is treated in an anaerobic digester to produce methane (biogas), which is burned before being released into the atmosphere to reduce its impact on climate change. Thus, avoiding more than 7.800 tons of GHG annually - equivalent to more than 5.500 passenger's flights from Lima - Frankfurt - Lima.
- Since 2021, biogas is being recovered to produce thermal and electrical energy, avoiding an additional 544 tons of GHG annually.

### Expected benefits:

- Savings in sewage treatment's operating costs of more than USD 290.000 per year (electricity costs).
- The wastewater treatment plant can operate autonomously from the electrical grid.

- Reduction of GHG emissions into the atmosphere by municipal sludge treatment.
- SEDACUSCO is equipped with a digital tool to calculate GHG emissions - Energy Performance and Carbon Emissions Assessment and Monitoring (**ECAM**).
- SEDACUSCO is equipped with portable digital equipment for in-situ biogas analysis and methane leak detection.
- This initiative helps to showcase the contribution of water sector to meet Peru's mitigation NDCs by 2030.



Anaerobic digester for municipal sludge treatment  
© GIZ/Dirk Loose



Time span

- Medium/long term: promotes energy recovery from municipal sludge (circular economy); savings in energy consumption and expenses; GHG reduction.



Local-global alignment

- Paris Agreement/SDG 13: 7.800 tCO<sub>2</sub>e avoided by municipal sludge treatment; contributes to the country's water sector NDCs.
- SDG 6: proportion of wastewater safely treated (indirect contribution).



Just transition

Not applicable



Inclusion

Reduction of the impact of untreated sludge (environmental pollution, negative health effects, odors nuisance, etc.), which greatly affects vulnerable populations settled nearby the wastewater treatment plant.



Consumption and production patterns

The initiative supports the transition to a circular economy through the efficient use of resources and recovery (use of municipal sludge to generate electricity and thermal energy). Thus, the treatment plant can operate with energy autonomy.



Green jobs

The initiative strengthens the skills and capacities of SEDACUSCO's personnel in charge of the operation and maintenance of biogas and cogeneration technologies, as well as for the monitoring and reporting of GHG emissions.



Green financial and budgetary policy

Not applicable



Sustainable financial system

The characteristics of the project made it possible to access international resources and leverage national resources. In addition, the generation of clean energy (biogas) allows for long-term savings in the operating costs of sewage treatment.

Source: Project WaCCliM Peru | Own collection

## Case study: Commercialization of raw wastewater at Cachiche WWTP (Ica, Peru)

### Basic data:

- Project name: Program for Modernization and Strengthening Water and Sanitation Sector - PROAGUA II (This case in Ica is one of the measures implemented within the project's framework)
- Location: Ica, Peru (case study's location)
- Entities: German Federal Ministry for Economic Cooperation and Development - BMZ (commissioner); Ministry of Housing, Construction and Sanitation - MVCS (political partner); Technical Organization for the Administration of Sanitation Services - OTASS and Water and Wastewater Company of Ica - EMAPICA (implementing partners)
- Financial volume: EUR 34.200.000 (total project)
- Project duration: 2015-2022
- Case study duration: 2017-2019

### Context:

- Ica is characterized by a severe water shortage and its main source of water is groundwater, which is overexploited due to the region's agro-export development. The Peruvian Ministry of Agrarian Development and Irrigation established a ban on the granting of new water use rights in the Ica river valley.
- In this context, wastewater reuse represents a complementary water source. In 2017, EMAPICA did not have sufficient capacity to treat the influent wastewater due to increased flow-rate by population growth, insufficient infrastructure, and lack of funding sources for a rehabilitation, expansion, or renovation of the Cachiche wastewater treatment plant (WWTP).

### Objective:

- Commercialization of raw wastewater in order to protect the environment, use efficiently water, save expenditures related to investment for the Cachiche Wastewater Treatment Plant (WWTP), and improve wastewater management, contributing to EMAPICA's financial sustainability.

### Proposed actions:

- Partial commercialization of untreated wastewater from the WWTP to a private company (Agrokasa), based on a market study, determination of the price of raw wastewater, sensitization of stakeholders and auction.
- Construction, operation and maintenance of a new wastewater treatment plant. Agrokasa invests in the construction of a WWTP in compliance with national regulations for agricultural reuse.

## Expected benefits:

- Avoid investment costs and financing for a new WWTP or expansion of the existing WWTP, as well as treatment costs (operation and maintenance of the WWTP) from the perspective of the government and EMAPICA.
- Additional incomes for utility coming from commercialization of wastewater and land rental (part of WWTP's site).
- Improved treatment efficiency of the Cachiche WWTP due to a 60% load reduction, reducing the environmental impact of Ica's wastewater discharge and groundwater's overexploitation.
- Availability of properly treated wastewater for reuse by small farmers.
- Generation of local jobs.



Time span

- Short term: reduction of water bodies pollution by wastewater.
- Medium/long term: wastewater reuse, supporting the transition to a circular economy; reduction of GHG emissions.



Local-global alignment

- Paris Agreement/SDG 13: tCO<sub>2</sub>e avoided by wastewater treatment (indirect contribution).
- SDG 6: proportion of wastewater properly treated.



Just transition

Not applicable



Inclusion

Capacity increase for adequate wastewater treatment and reduction of groundwater's overexploitation, benefiting the entire population of the city, especially the most vulnerable groups.



Consumption and production patterns

Supports the transition to a circular economy through the efficient use of resources associated with the commercialization of untreated wastewater and its reuse. In addition, it promotes changes in consumption patterns in industry by replacing the use of groundwater with treated wastewater.



Green jobs

The initiative strengthens the skills and capacities of OTASS and EMAPICA personnel in charge of wastewater commercialization, as well as those of private enterprise for reuse. Indirectly, private enterprise, by having water available, expands its potential to generate green jobs.



Green financial and budgetary policy

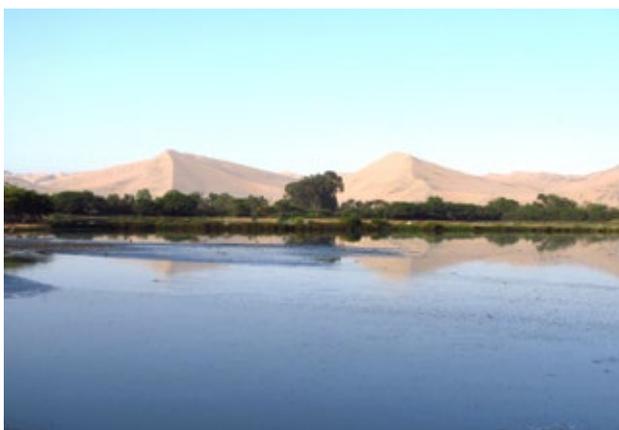
Not applicable



Sustainable financial system

The characteristics of the case allowed access to private resources for infrastructure financing. In addition, the commercialization of untreated wastewater allows for long-term savings in operating costs, as well as additional revenues for the water utility.

Source: Project PROAGUA II | Own collection



“Ica is characterized by a severe water shortage and its main source of water is groundwater, which is overexploited due to the region's agro-export development.”

Lagoon of the Cachiche WWTP  
© GIZ/Dirk Loose



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## Energy

Green recovery projects in the energy sector aim at construction, development, maintenance and/or operation of non-conventional renewable energy generation plants or hydroelectric plants in accordance with international parameters (see next subsection), as well as the distribution and transmission of the

renewable energy generated. Activities and projects that contribute to saving or improving energy performance should also be considered. These projects support carbon neutrality and/or increased resilience to climate change impacts.

### Examples of energy projects aligned with GR

- Generation and use of wind and photovoltaic energy including off grid generation and photovoltaic energy distribution.
- Energy recovery (biogas) from municipal organic waste and sludge<sup>12</sup>.
- Production of biofuels from sustainable inputs that comply with applicable environmental regulations and generate GHG emissions reduction, at least 50% compared to relevant fossil fuels.
- Hydropower generation in accordance with the Climate Bond Initiative (CBI) taxonomy or the United Nations Framework Convention on Climate Change (UNFCCC)'s methodology for the Clean Development Mechanism (CDM).
- Green hydrogen production.
- Efficient cooling or heating systems.

<sup>12</sup> See case studies of water and sanitation sector.

- Efficient replacement of equipment in public and private buildings and homes.
- Energy efficient buildings or use of solar panels for self-supply of electricity using their roofs or available areas.
- Application of smart grids, such as digitization of transmission, distribution and demand, automation and management systems resulting in more efficient energy systems.
- LED street lighting.

“Green recovery projects in the energy sector aim at construction, development, maintenance and/or operation of non-conventional renewable energy generation plants or hydroelectric plants”

**Table 4.**  
**SDG and targets specifically applied to GR energy projects**

	<p><b>7.1.</b> By 2030, ensure universal access to affordable, reliable and modern energy services</p> <p><b>7.2.</b> By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p><b>7.3.</b> By 2030, double the global rate of improvement in energy efficiency</p>
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Source: 2030 Agenda for Sustainable Development (UN, 2015)



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**Table 5.**  
**Characteristics for a GR energy project**

	Time span	<ul style="list-style-type: none"> <li>Medium/long term: expansion of the installed capacity of renewable sources; establishment of a more renewable energy mix; increased energy efficiency.</li> </ul>
	Local-global alignment	<ul style="list-style-type: none"> <li>Paris Agreement/SDG 13: tCO<sub>2</sub>e avoided with renewable energy generation/increased energy efficiency.</li> <li>SDG 1: % of population with access to energy.</li> <li>SDG 5: number of inhabitants served by the energy supply project by gender.</li> <li>SDG 7: expansion in MW of installed renewable energy generation capacity; annual renewable energy generation in MWh/GWh.</li> <li>SDG 8: number of employees involved in projects and hired in accordance with applicable laws.</li> <li>SDG 9: % of energy used from renewable sources/cogeneration/local generation; % of energy consumption reduction.</li> <li>SDG 11: number of inhabitants served by the energy supply project by social stratum.</li> <li>SDG 12: kW per product unit (and % reduction related to comparable product unit).</li> </ul>
	Just transition	<p>Under an energy transition, certain people and regions earn or lose economically. For example, people lose their jobs from a fossil fuel power plant, or the application of a carbon tax affects the rich and the poor differently. For a just transition, policies that mitigate these socio-economic impacts must be considered to ensure the support of the population.</p>
	Inclusion	<ul style="list-style-type: none"> <li>In the medium/long term, the gap in energy access must be bridged and the efficient use must be improved, along with enhance the supply stability and infrastructure resilience, especially for the poorest population.</li> </ul>
	Consumption and production patterns	<ul style="list-style-type: none"> <li>Incentives should be provided to the industry to increase energy use efficiency, through new equipment, technologies, control measures, green buildings, etc.</li> <li>The result should be products with lower energy use in their production (kW/unit of product), at least 30% lower than comparable traditional products.</li> <li>Promote the consumption of products with a lower carbon footprint, with the reuse of materials for energy generation, and the rational use of energy by the population.</li> </ul>
	Green jobs	<ul style="list-style-type: none"> <li>Renewable energy supply projects require significant infrastructure construction and are labor-intensive, with high potential for green job creation.</li> <li>Generation projects can also involve a significant amount of labor.</li> <li>Skills created and supported for the development of these projects allow workers to use them in other infrastructure projects.</li> <li>Promote the development of green skills in energy saving, use of alternative energy sources and smart consumption measures.</li> </ul>
	Green financial and budgetary policy	<ul style="list-style-type: none"> <li>Many Latin American countries have a significant share of fossil fuels in their energy mix. In order to change the situation, incentives/subsidies for renewables and/or local generation can be created. Defining a carbon price/tax can also discourage fossil fuels. Subsidies for more efficient consumers and penalizing inefficient consumers can also be discussed.</li> </ul>
	Sustainable financial system	<ul style="list-style-type: none"> <li>Energy efficiency, green buildings and cogeneration projects by industry have high potential for financing through green funds and sustainable bonds<sup>13</sup>.</li> <li>Public and/or private renewable energy generation projects can be financed by sustainable bonds<sup>14</sup>.</li> </ul>

Source: Own collection

13 **Pichincha Bank from Ecuador issued green bonds** that can finance sustainable construction projects (infrastructure, development and urban housing) with relevant certifications (LEED, BREAM, EDGE).

14 The **Development Bank of Minas Gerais (BDMG) from Brazil, offers green lines** for financing renewable energies, such as the “BDMG Photovoltaic”, focused on financing solar panels. Furthermore, **the bank has a framework for sustainable bonds** which includes the possibility of financing different renewable energy and energy efficiency projects, especially those that contribute to SDGs 7, 12 and 13. The bonus can also serve as a fund for the aforementioned green funds.

**Basic data:**

- Project Name: Luz do Saber “The Light of Knowledge”.
- Location: Porto Alegre, Brazil
- Entity: Municipality of Porto Alegre (implementing partner)
- Financial volume: EUR 5.000.000 (total project)
- Project duration: 2018- 2022
- Case study duration: 1 year of implementation

**Context:**

- The project was developed with the support of the Financing Energy for Low Carbon Investment - Cities Advisory Facility (FELICITY) project, financed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU and implemented by the German development cooperation (GIZ), in cooperation with the European Investment Bank (EIB).
- Public schools have a limited budget, energy generation and energy efficiency measures, not only are being environmentally friendly but also generate savings for the schools and the municipality.
- In addition, improved buildings provide better conditions for study and recreational time for students.

**Objective:**

- Expand the installation of photovoltaic panels on roofs, implement energy efficiency measures and improve buildings in 99 municipal public schools.
- The electricity produced will be used by the schools and the surplus will be fed into the power grid.

**Proposed actions:**

- Component I (energy efficiency): installation of LED lamps and brightness control measures, replacement of equipment with more efficient appliances (e.g. refrigerators), implementation of thermal insulation measures, implementation of natural ventilation measures, implementation of air conditioning measures.
- Component II (distributed generation): definition of buildings suitable for the installation of photovoltaic panels, assessment of generation potential, assessment of electric energy storage potential.

## Expected benefits:

- Reduction of energy costs and improvement of the municipality's fiscal capacity.
- Support in the adequacy of buildings to materialize fiscal savings in the municipality.
- Improved learning conditions, thermal comfort, and educational impact on 50.000 students, including poorer neighborhoods.
- Replicable strategy in other buildings.



Time span

- Short term: reduction of energy costs of public schools; improvement of study conditions in schools.
- Medium/long term: reduction of GHG emissions; reduction of public expenses; replicable strategy in other buildings.



Local-global alignment

- Paris Agreement/SDG 13: 372 tCO<sub>2</sub>e avoided per year.
- SDG 1: improved study conditions for 50.000 students.
- SDG 7: renewable energy generation; increased energy efficiency of 99 buildings.



Just transition

Not applicable



Inclusion

Savings with energy costs allow schools to have budget available for spending on improving the quality of education, which being public serves many vulnerable students.



Consumption and production patterns

Increased energy efficiency supports a transition to a lower carbon economy. The initiative can also be expanded to different parts of the city and serve as a proof of concept for implementation in other cities.



Green jobs

The installation of panels and building improvement actions generate jobs. Being a replicable strategy in other buildings, it is possible that additional jobs will be generated.



Green financial and budgetary policy

Short-term investments generate significant savings in the medium/long term. Furthermore, once its effectiveness is proven, the model can become a standard for future interventions in other schools in the municipality and other cities in the region and even in the country.



Sustainable financial system

The characteristics of the project allowed access to international resources. In addition, energy efficiency generates long-term savings in energy consumption costs.

Source: Project FELICITY Brasil | Own collection

“Public schools have a limited budget, energy generation and energy efficiency measures, not only are being environmentally friendly but also generate savings for the schools and the municipality.”

### Basic data

- Project Name: Energy Efficiency of Street Lighting - Lighting System
- Location: Maringá, Brasil
- Entities: European Investment Bank (EIB) and Regional Development Bank of the Extreme South - BRDE (financiers); BRDE (political partner); Municipality of Maringá (implementing partner)
- Financial volume: Not available<sup>15</sup>
- Project duration: 2018- 2022
- Case study duration: 1 year of implementation

### Context

- The project was developed with the support of the Financing Energy for Low Carbon Investment - Cities Advisory Facility (FELICITY) project, financed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU and implemented by the German development cooperation (GIZ), in cooperation with the European Investment Bank (EIB).
- Public lighting generates significant costs and its reduction can significantly improve the municipality's fiscal conditions.
- A deficient public lighting system is related to poorer safety indexes of the population, especially affecting women.

### Objective

- Modernization and increase in energy efficiency of the public lighting system in Maringá, Paraná.
- Installation of LED lamps (50.000 points) and integration of smart technologies.

### Proposed actions

- Component I (lamps replacement): renovation of 50.000 points, aligning the lighting system with the city's tree planting, implementation of pilot projects for the replacement of lamps.
- Component II (monitoring system): implementation of consumption measurement system, implementation of control system (remote management), improvement of management and attention to the population.

15 The municipality implemented 50.000 points of public lighting / <https://www.eib.org/attachments/factsheet-felicity-maringa.pdf>

## Expected benefits:

- Reduction of energy costs and improvement of the municipality's fiscal condition.
- Beyond the consumption's economy, the improved monitoring system can bring significant financial savings.
- Improved safety conditions through higher lighting levels - especially for the case of women.

	Time span	<ul style="list-style-type: none"> <li>▪ Short term: improved lighting in areas already served.</li> <li>▪ Medium/long term: improvement of the municipality's fiscal condition with savings in consumption and control of public lighting; improvement of safety conditions in areas with increased luminosity index; reduction of GHG emissions.</li> </ul>
	Local-global alignment	<ul style="list-style-type: none"> <li>▪ Paris Agreement/SDG 13: 689 tCO<sub>2</sub>e avoided per year.</li> <li>▪ SDG 1: improving security conditions in the most vulnerable areas.</li> <li>▪ SDG 5: reducing rates of violence against women.</li> <li>▪ SDG 7: increase energy efficiency of the public lighting system.</li> </ul>
	Just transition	Not applicable
	Inclusion	In the medium/long term, it's expected a consolidation of the correlation between the improvement of brightness indexes and the decrease in violence rates, which mainly affect women.
	Consumption and production patterns	The surplus energy generated is fed into the electrical grid, allowing the consumption of clean energy by different users.
	Green jobs	The installation of LED lamps and the implementation of public lighting management systems generate jobs. Being a replicable strategy in other municipalities, it is possible that additional jobs will be generated.
	Green financial and budgetary policy	Short-term investments generate significant savings in the medium/long term. Since the strategy is replicable, it is possible to generate additional savings and expand the budget available in the municipality for different purposes.
	Sustainable financial system	The characteristics of the project allowed access to international resources. In addition, energy efficiency generates long-term savings in energy consumption costs.

Source: Project FELICITY Brasil | Own collection

“A deficient public lighting system is related to poorer safety indexes of the population, especially affecting women.”



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## Urban solid waste

Green recovery projects in the waste sector are those that seek to expand urban solid waste (USW) management services, reducing and controlling environmental pollution. These GR projects are closely

related to the concept of *circular economy*, since, in addition to directly seeking to reduce waste generation, they also support the recovery of waste generated.

### Examples of urban solid waste projects aligned with GR

- Projects for the reduction of USW generation and waste:
  - Substitution of hazardous chemicals for safer alternatives.
  - Use of design and/or materials that facilitate reversion and disassembly.

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**Green recovery** projects in the waste sector are those that seek to **expand**

urban solid waste management services

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- USW treatment and disposal:
  - Landfills with energy generation technologies from biogas produced by organic waste decomposition.
  - Recycling of materials.
  - Promote the recovery of organic waste through composting or anaerobic biodigestion.
  - Production of waste-derived fuel for cement plants<sup>16</sup>.
  - Transformation of waste into by-products.

“These GR projects are closely related to the concept of circular economy, since, in addition to directly seeking to reduce waste generation, they also support the recovery of waste generated”

**Table 6.**  
**SDG and targets specifically applied to GR urban solid waste projects**

 <p>7 AFFORDABLE AND CLEAN ENERGY</p>	<p><b>7.1</b> By 2030, ensure universal access to affordable, reliable, and modern energy services.</p>
 <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<p><b>11.6</b> By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.</p>
 <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<p><b>12.4</b> By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.</p> <p><b>12.5</b> By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.</p>

Source: 2030 Agenda for Sustainable Development (UN, 2015)

<sup>16</sup> Currently, the European Union discusses the exclusion from renewable generation category, the energy generated by wood biomass burning and other materials that reduce the biomass carbon stock in soils.

**Table 7.**  
**Characteristics for a GR urban solid waste project**

	Time span	<ul style="list-style-type: none"> <li>▪ Short term: avoid and/or minimize improper USW disposal; provide economic and technical conditions (training) for the continuity of the work of recycling cooperatives; raise awareness of municipal managers and communities on the importance of recycling.</li> <li>▪ Medium/long term: increase in USW treatment capacity; recovery of USW; reduction of waste and generation of USW; support the transition to a circular economy.</li> </ul>
	Local-global alignment	<ul style="list-style-type: none"> <li>▪ Paris Agreement/SDG 13: tCO<sub>2</sub>e avoided through USW management and through sectoral strategies and plans for integrated climate change management.</li> <li>▪ SDG 5: number of inhabitants served by the USW project by gender.</li> <li>▪ SDG 8: number of employees involved in projects and hired in accordance with applicable laws.</li> <li>▪ SDG 9: % reduction in material consumption (by type); % recycling of materials (by type); % waste treated (by type).</li> <li>▪ SDG 11: number of inhabitants served by the USW project by social stratum.</li> <li>▪ SDG 12: expansion in tons/year of USW treatment capacity; reduction % of untreated/not properly treated waste; annual energy generation in MWh/GWh from landfills.</li> </ul>
	Just transition	<ul style="list-style-type: none"> <li>▪ Improper disposal of USW particularly affects the poorest regions and most vulnerable populations. Waste management actions should consider how to mitigate impacts on the income of these people (e.g., through the collection and sale of recyclable materials when closing a dumping site or introducing a new treatment technology). The working conditions of those at the front line of sorting materials should include a clean and healthy site. For a just transition, it must be considered policies that mitigate these socio-economic impacts and enable healthy conditions to ensure the support of the population.</li> </ul>
	Inclusion	<ul style="list-style-type: none"> <li>▪ In the medium/long term, a better USW management and greater recovery of USW should be sought, supporting the transition to a circular economy. In addition, training women to develop activities such as recycling through cooperatives can help reduce the gender gap.</li> </ul>
	Consumption and production patterns	<ul style="list-style-type: none"> <li>▪ Incentives should be sought for industry for projects to increase efficiency in the use of materials and their reuse, as well as the transformation of waste into by-products.</li> <li>▪ Recycling of final products should also have initiatives.</li> </ul>
	Green jobs	<ul style="list-style-type: none"> <li>▪ Infrastructure projects are labor-intensive, with a high potential for the creation of green jobs. In addition, the skills created and supported for the development of these projects allow workers to use them in other infrastructure projects.</li> <li>▪ Recycling and resource reuse projects are not very labor intensive. However, they allow the integration of less qualified labor into the labor market, particularly supporting the vulnerable population.</li> </ul>
	Green financial and budgetary policy	<ul style="list-style-type: none"> <li>▪ Most Latin American countries have a significant percentage of waste that is improperly disposed of. In this regard, an increase in the budget for these projects should be sought in the medium/long term. The involvement of the private sector can be fundamental to make this improvement feasible.</li> <li>▪ Resources for sanitary landfills should be allocated to those with carbon sequestration.</li> <li>▪ Charging for waste management services can support the provision of new resources for treatment/recovery of urban solid waste.</li> <li>▪ Tax incentives/subsidies for recycling should be discussed.</li> </ul>
	Sustainable financial system	<ul style="list-style-type: none"> <li>▪ Public and/or private sanitary landfill projects with carbon sequestration can be financed by sustainable bonds<sup>17</sup>.</li> <li>▪ Projects for the proper management/recovery/recycling of waste by industry can be financed by green funds and sustainable bonds<sup>18</sup>.</li> </ul>

Source: Own collection

17 The Inter-American Development Bank, in its report **“Opportunities of Green Infrastructure Investment”**, pointed out sanitary landfills with gas capture systems as an investment alternative for sustainable waste management.

18 The **National Bank of Economic and Social Development (BNDES) from Brazil has a credit line focused on urban cleaning and proper disposal of solids wastes.**

## Case study: Urban Solid Waste Management and Fund Raising in the Municipality of Campo Verde, Mato Grosso, Brazil

### Basic data

- Project Name: Cooperation for Climate Protection in Urban Solid Waste Management - ProteGEEr
- Location: Campo Verde, Brasil
- Entities: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU (commissioner); Ministry of Regional Development – Brazil and Ministry of Environment - Brazil (political partner); GIZ (implementing organization)
- Financial volume: EUR 6.000.000 (total project)
- Project duration: 2017-2021
- Case study duration: 2018 - 2020

### Context

- Campo Verde closed its dumping site, implemented integrated management of urban solid waste (USW), and accessed non-reimbursable funds to improving municipal management.
- The municipality received technical assistance for implementing charges and selective collection planning in order to increase recycling rates, including the participation of city recyclers' association.

### Objectives

- Contribute to GHG reduction through sustainable USW management, supporting natural resources' preservation and energy use reduction.
- Select 5 pilot projects (supporting 32 municipalities). Among them, Municipality of Campo Verde, a small one of 46 thousand inhabitants in the state of Mato Grosso.
- Implement actions to identify potential GHG emissions reduction in the USW sector and their integration into sectoral guidelines, in addition to implementing measures.
- Develop a toolkit and instruments for supporting municipal managers' decision making in sustainable waste management considering circular economy through selective collection and recycling, fee collection and sustainability charges.

### Proposed actions

- Until 2017, Campo Verde's wastes were disposed of in a dumping site, burning of wastes covered the city with soot. Granted by the National Health Foundation (FUNASA), a sanitary landfill was built, started operating from 2018 along with technical assistance process.
- With the dumping site already closed, a planning process was initiated to implement charging of USW management services and plan improvement of selective collection to increase recycling rates.
- In 2019, Campo Verde submitted a funding proposal to further improve its management through equipment acquisition. Supported by ProteGEEr, Campo Verde achieved EUR 700 thousand for equipment.

## Expected benefits:

- Campo Verde has become a reference in waste management in the state of Mato Grosso.
- The acquisition of equipment contributes to a more efficient waste collection and recycling in the municipality, which generates around 40 thousand tons of USW per year, benefiting approximately 46 thousand people.
- In addition, tool's application for calculating rates and fees was a reference for developing a bill submitted to the Municipal Council to charge a rate for service management.
- Improvement of environmental condition and population's health.



Landfill in the municipality of Campo Verde  
© Municipality of Campo Verde

“Contribute to GHG reduction through sustainable USW management, supporting natural resources’ preservation and energy use reduction.”



Time span

- Short term: improvement of selective collection and waste sorting; improvement of recyclers’ working conditions.
- Medium/long term: improved operation and increased lifespan of sanitary landfill; increased recycling rates; development of logistics chain for selling dry recyclable waste.



Local-global alignment

- SDG 1: Improving recyclers’ living conditions.
- Paris Agreement/SDG 13: GHG avoided through USW management.
- SDG 12: expansion of USW treatment; increase recycling.



Just transition

Upon closing the dumping site, the municipality planned, with the community and people living nearby the dumping site, alternatives so that the transition would not affect recyclers’ incomes. Thus, creating new jobs with better sanitary conditions.



Inclusion

Professional qualification of women both technical and managerial level; and promoting actions that directly benefit quality life and work of recyclers.



Consumption and production patterns

The municipality launched the Recicla Verdinho action, a recycling project in the public school network. Students can bring recyclable waste from their homes to school and receive a “bonus” for every ten containers, to be used in the family basic basket at the municipal fair.



Green jobs

An estimated 20 people were included in USW management in the city that can be considered green jobs, in addition to training city recyclers.



Green financial and budgetary policy

The application of the fee and rate calculation tool provided by the project was the basis for a bill to charge a rate for service management, submitted to the Municipal Council.



Sustainable financial system

With the project’s technical support, Campo Verde was able to raise resources, about 700 thousand Euros, granted by the Federal Government for implementing initiatives to improve USW management in municipalities.

Source: Project ProteGEEr - Brasil | Own collection

**Basic data:**

- Project Name: Medium-Scale Organic Solid Waste Treatment Plant and Home Composting in Komunitas<sup>19</sup>.
- Location: Desamparados, Costa Rica
- Entities: Desamparados Municipality (financier); German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU y CRUSA Foundation (co-financiers); Curridabat Municipality, La Unión Municipality, Montes de Oca Municipality and San José Municipality (political partners); Desamparados Municipality and GIZ<sup>20</sup> (implementing organizations).
- Financial volume: USD 322.350 (total project in Desamparados Municipality)
- Project duration: 2016-2022.
- Case study duration: 2020 - 2021<sup>21</sup>.

**Context:**

- Solid waste generates 19% of Costa Rica's greenhouse gas (GHG) emissions and is the second largest source of GHGs in the country. Most of them result from organic waste, which usually does not receive adequate treatment to reduce its impact on the environment and climate.
- In the canton of Desamparados, with a population of about 33.000 people, located in the Greater Metropolitan Area of Costa Rica, 52% of GHG emissions are attributed to organic waste. Most of this is generated by households in the canton, weekly farmer's fairs, and pruning waste in the municipality's parks and green areas. For this reason, the municipality of Desamparados is promoting along with other four municipalities the Komunitas project. This project aims to make the five cantons zero waste and reduce GHG emissions through a series of key actions that address the problem.
- The canton lacks an operating centralized treatment plant for the integrated management of organic waste; it does have a center for recovering recoverable waste; however, requires a composting process due to the problems associated with its disposal.
- In addition, there is a significant gap in the knowledge and management of information on the proper solid waste treatment among the canton's population.

**Objectives**

- Implementation of a composting plant in the Municipal Ecological Complex of Desamparados.
- Development of a Composting Web Portal to educate citizens on organic waste composting.
- Capacity building for operators and managers of municipal services, as well as for citizens and generators of the canton's farmer fairs.

19 Inter-municipal project for waste management: Towards a circular economy, a joint project of five cantons in Costa Rica.

20 Through the Climate ACTION II project, component TRANSFORM Waste into Resources.

21 This was the first pilot with GIZ Costa Rica.

### Proposed actions:

- Acquisition of equipment for the composting plant: Support was provided for acquiring mechanized equipment for the composting plant (rotary composting machine). Aiming to treat organic waste from fairs and pruning waste from public cleaning services generated in the canton (first phase). Later on, household waste will be added and organic waste from the four extra cantons of the project.
- Technical capacity building: Treatment plant's operators received training to use the new equipment purchased.
- Citizen awareness and training: Through a new web portal, citizens are trained to handle organic and recoverable waste. In addition, the platform is helping to follow up on composting carried out in the cantons.
- Collection of relevant climate information and MRV: The web portal provides accurate and relevant information for tracing and analyzing composting in the canton, including waste weight, locations of gardens and composters. It also allows to calculate GHG emissions avoided by organic waste disposed of in sanitary landfills.

### Expected benefits:

- Streamlining of composting at the pilot plant due to the acquisition of composting equipment.
- Reduction in GHG emissions by 114.576 t CO<sub>2</sub>e in the canton of Desamparados.
- Web portal for monitoring composting, online training of families and citizens to separate organic waste.



Organic wastes are converted into compost and mineral-rich soil  
© Pexels

“Citizen awareness and training:  
Through a new web portal,  
citizens are trained to handle  
organic and recoverable waste.”



Time span

- Short term: improvement of organic waste treatment; improvement of working conditions for participants in agricultural fairs; improvement of public awareness of waste management.
- Medium/long term: reduction of GHG emissions generated by waste and its transportation; scaling up of the project throughout the country, multiplying the results. Expected impact on 17% of the country's population.



Local-global alignment

- SDG 1: improving the living conditions of participants in agricultural fairs.
- Paris Agreement/SDG 13: 536,74 tCO<sub>2</sub>e/year avoided with waste management (114,576 tCO<sub>2</sub>e/year including all municipalities).
- SDG 11: sustainable communities regarding solid waste management.
- SDG 12: expansion of organic waste treatment.
- SDG 17: joint partnership among 5 cantons.



Just transition

Not applicable



Inclusion

Housewives and fair producers were included in the new waste management process of the KoMunitas project. An accessible platform was created for the exchange of experiences and improvement of household management and farmer's fairs. The web platform also allows women to access training and information on proper waste management.



Consumption and production patterns

The web portal will allow access to the general public and beneficiaries so that they can interact, strengthen their capacities in composting, vegetable gardens, waste management, etc.



Green jobs

The project generated two additional jobs as plant operators and at least 10 people were placed in the Municipality of Desamparados for collection and training at the agricultural fairs.



Green financial and budgetary policy

The project is part of the Municipal Plan for the Integrated Solid Waste Management of the Canton of Desamparados.



Sustainable financial system

In the first phase was financed by TRANSFORMA Residuos en Recursos, co-financed by CRUSA Foundation and BMU. The municipal authorities are seeking international and national funds to achieve the goal of zero waste cantons. The Municipality of Desamparados financed the construction of the centralized composting plant.

Source: Project Climate ACCION – Costa Rica. | Own collection



© Women on Bike



## Transport

Green recovery projects in the transport sector focus on the construction and operation of clean transport and active mobility facilities, in addition to

all infrastructure that allows the reduction of GHG emissions associated with the sector.

### Examples of transport projects aligned with GR

- Production and use of electric and hybrid vehicles for use in public transportation.
- Implementation of electric public transport fleets.
- Construction and rehabilitation of bicycle lanes.
- Increased pedestrian space.
- Inclusion of green infrastructure in roads.
- Construction and operation of railways and subways.
- Optimization of public transportation routes and digitalization of processes and controls.
- Multimodal transportation<sup>22</sup>;

<sup>22</sup> Multimodality is the use of different means of transportation on the same route, taking advantage of the benefits of the different modes of transportation (convenience, speed, cost, reliability, predictability, among others) and seeking the integration and sustainability of the transportation system.

- Implementation of public bicycle or bike-sharing systems.
- Improvements in the transportation and distribution of goods.
- Infrastructure for clean vehicles.

“Green recovery projects in the transport sector focus on the construction and operation of clean transport and active mobility facilities”



Temporal bicycle lane on Calzada Colon, Torreon, Coahuila, Mexico  
© General Directorate of Roads and Urban Mobility of the Municipality of Torreon

**Table 8.**  
**SDG and targets specifically applied to GR transport projects**



**9.1** Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.



**11.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

Source: 2030 Agenda for Sustainable Development (UN, 2015)

**Table 9.**  
**Characteristics for a GR transport project**

	Time span	<ul style="list-style-type: none"> <li>▪ Short term: increasing safe space for pedestrians and cyclists and expanding mass transit services for groups without service access.</li> <li>▪ Medium/long term: establishment of a more sustainable and resilient transport infrastructure and low GHG emission vehicles.</li> </ul>
	Local-global alignment	<ul style="list-style-type: none"> <li>▪ Paris Agreement/SDG 13: tCO<sub>2</sub>e avoided through sustainable transport.</li> <li>▪ SDG 1/SDG 9: % of the population that commutr walking, cycling, public transport and private car, % of the population with access to safe benches, bicycle lanes and efficient public transport services.</li> <li>▪ SDG 5: number of inhabitants served by the transport project by gender.</li> <li>▪ SDG 8: number of employees involved in projects and hired in accordance with applicable laws.</li> <li>▪ SDG 11: km expansion of clean transport projects; measure of clean passenger transport traffic (passenger/km); annual fossil fuel consumption avoided.</li> <li>▪ SDG 12: measure of clean freight traffic (tons of freight/km); annual fossil fuel consumption avoided.</li> </ul>
	Just transition	<ul style="list-style-type: none"> <li>▪ In the transition to active mobility systems there is the possibility that certain people and regions may be affected economically. Projects should evaluate what negative impacts could be generated by these actions to achieve a just transition; policies that mitigate these socioeconomic impacts should be considered to ensure the support of the population.</li> </ul>
	Inclusion	<ul style="list-style-type: none"> <li>▪ In the medium/long term, vehicles and transport infrastructure should be made more sustainable and resilient to climate change.</li> </ul>
	Consumption and production patterns	<ul style="list-style-type: none"> <li>▪ Increased consumption of local products/services.</li> <li>▪ Promote active mobility in all sectors.</li> <li>▪ Seek incentives in industry to promote more sustainable logistics/fleet, using more efficient vehicles and other storage and distribution measures.</li> </ul>
	Green jobs	<ul style="list-style-type: none"> <li>▪ Incentives to specialized bicycle workshops/shops can generate jobs.</li> <li>▪ Sustainable transport infrastructure construction projects are labor-intensive, with high potential for green job creation. Also, the skills created for the development of these projects allow workers to use them in other infrastructure projects.</li> <li>▪ The other projects mentioned in this section are not very labor intensive. However, clean transportation services (e.g. bicycle deliveries) can bring new freight options, generating new jobs.</li> </ul>
	Green financial and budgetary policy	<ul style="list-style-type: none"> <li>▪ Increase the percentage of investment in infrastructure for sustainable mobility compared to motorized mobility.</li> <li>▪ Electric vehicles are still a distant reality in Latin America. Public policies and incentives for the change in the acquisition and use of electric vehicles instead of combustion vehicles, especially for mass transportation, should be discussed. Infrastructure and technologies are needed for their viability, such as charging stations for these vehicles.</li> <li>▪ Public policies with a focus on mass transportation and the use of bicycle lanes for shorter trips, and disincentives for individual transportation and/or fossil fuel vehicles.</li> </ul>
	Sustainable financial system	<ul style="list-style-type: none"> <li>▪ The purchase of electric and/or more efficient vehicles can be made viable through green funds.</li> <li>▪ Public and/or private projects for the development of sustainable transport infrastructure and/or fleet renewal to incorporate electric vehicles can be financed by sustainable bonds<sup>23</sup>.</li> </ul>

Source: Own collection

23 [Pichincha Bank from Ecuador has a credit line to finance cleaner vehicles for individuals and companies.](#)

### Basic data

- Project name: Climate Protection in Mexico's Urban Policy – CiClim México
- Location: León, Mérida, Morelia, San Nicolás de los Garza, San Luis Potosí, Tlaquepaque, Torreón y Tuxtla Gutiérrez, México
- Entities: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety - BMU (commissioner); Ministry of Agrarian, Territorial and Urban Development – SEDATU and Ministry of Environment and Natural Resources – SEMARNAT (partners) and 9 municipalities (implementing partners)
- Financial volume: EUR 5.800.000 (total project)
- Project duration: 2017-2022

### Context

- The urban population requires large amounts of energy and natural resources. Current urban planning has become obsolete and leads to traffic problems, flooding, and the loss of green areas.
- Mexican cities have grown steadily in recent years. Currently, 78% of the Mexican population lives in cities, and this figure is expected to continue to increase in the coming years.

### Objectives

- Increase quality life of people in Mexican cities through a better urban planning, and ensure cities contribute to climate and environmental protection.
- The project supports the largest national program for public spaces' rehabilitation (Program of Urban Improvement), in order to include more space, pedestrian and cyclist safety, and green areas.

### Proposed actions

- The project provides technical advice and strategic support for sustainable urban development. Through cooperation with the Ministry of Agrarian, Territorial and Urban Development (SEDATU), the Ministry of Environment and Natural Resources (SEMARNAT) and nine local governments.

### Expected benefits

- The course - Green Streets and Infrastructure was developed and implemented, benefiting more than 80 key stakeholders in 4 different cities, and was transformed into an online course in collaboration with the National Government.
- Installation of 110 km of bicycle lanes, 84 km permanent and 30 km emerging.
- Social participation has been strengthened, implementing 3 urban community gardens, 11 backyard gardens in Mayan communities, 2 forest nurseries in protected natural areas, various tactical urban planning interventions and soon a bicycle school with a gender perspective.

- Use of digital tools, such as: ArbolMID, to inventory urban trees and their condition; Citizen Platform for Climate Action - MOVIDATA, to map public transportation routes and their condition.
- The paint company COMEX provided materials and financing for urban interventions. The cement company CEMEX provided materials for public spaces to improve safety for cyclists and pedestrians.



Road intervention in the Valle de Señora neighborhood, Leon, Guanajuato, Mexico  
© Tomato Collective



Time span

- Short term: temporary and emergent interventions (3-6 months) to provide more space and safety for pedestrian and bicycle mobility; training and information initiatives on sustainable mobility.
- Medium/long term: improvement of urban spaces; fixed bicycle lanes.



Local-global alignment

- Paris Agreement/SDG 13: GHG avoided by reducing the use of motorized vehicles.
- SDG 11: increased access to safe, affordable, accessible, and sustainable transport systems; increased inclusive and sustainable urbanization; increased access to safe, inclusive and accessible green spaces and public spaces.



Just transition

The opening of more space and greater safety for pedestrians, cyclists and public transport users initially generated resistance from motorists and some commercial areas. The project developed strategies to raise awareness among both groups, achieving the support of some of these stakeholders.



Inclusion

The projects allow for greater inclusion of people with disabilities in public spaces, and a gender-focused bicycle school was developed in León, whose methodology will be disseminated.



Consumption and production patterns

By promoting pedestrian and bicycle mobility, it strengthens neighborhood interaction and has the potential to increase consumption of local products.



Green jobs

Supporting and strengthening civil society organizations that have an impact on the public space, the project aims to strengthen these organizations and access financing resources to hire people for developing their activities.



Green financial and budgetary policy

Through the Diploma and Course on Streets and Green Infrastructure, 3.000 officers have been trained nationwide to detect and manage resources for developing this type of projects.



Sustainable financial system

Through the strengthening of civil society organizations, guidance will be provided to access financing for these types of institutions.

Source: Project CiClim - Mexico | Own collection



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## Annex - Social and gender dimensions of green recovery

### Introduction and context to the topic of gender in green recovery

Although the COVID-19 pandemic, as well as the climate and economic crisis, affects the entire population, individuals are not affected in the same way. Social factors such as gender, age, income, type of employment, educational level, ethnicity and race, immigration status, mental or physical disability, and sexual orientation play an important role in the ability to cope with the pandemic and socioeconomic impacts. These factors affect their ability to prevent, stay at home, and access health and basic needs, among other social and economic aspects, such as access to education, health, and income<sup>24</sup>. In response to these crises, greater investment is expected in sectors that strengthen people's health and well-being and reduce

“In response to these crises, greater investment is expected in sectors that strengthen people's health and well-being and reduce economic and infrastructure vulnerability in cities.”

<sup>24</sup> UNEP (2020): Human Rights, the environment and COVID-19. Available on: <https://wedocs.unep.org/bitstream/handle/20.500.11822/33510/HRE1.pdf?sequence=1&isAllowed=y>. Last access: 5 June 2021.

economic and infrastructure vulnerability in cities. As governments must respond to the COVID-19 pandemic, an opportunity arises to redesign policies to drive economic growth that is responsive to people, climate, and nature.

In the focal countries of this work - Brazil, Peru, Ecuador, and Mexico - despite positive actions, there is a lack of coordination with other national environmental policies. According to *Greenness of Stimulus Index*<sup>25</sup>, though new investments in green infrastructure have been made, Brazil and Mexico have economic stimulus packages that score negatively in terms of alignment with the green economy. Peru has focused on the transition to renewable energy and improving the quality of sanitation, while investments in the transportation sector are still based on traditional

infrastructure<sup>26</sup>. In Ecuador, despite the launch of a digital platform and centers for technical education and job training for young people, the government announced cuts in investments in education in response to the pandemic, which has impacted the country's ability to migrate to higher value-added activities.<sup>27</sup>

In general, with respect to social approaches, the plans do not prioritize the gender approach and people in vulnerable situations, but rather focus on emergency and short-term measures, such as the transfer of resources through economic aid - aid bonds to the population and credits to micro and small businesses<sup>28</sup>. However, these responses are unsustainable in the long term. This annex provides recommendations and indicators to address social and gender issues in the energy, transport, water, and urban solid waste sectors.

## Recommendations and indicators to tackle social and gender issues by sector

A green and inclusive economic transformation has the potential to reduce socioeconomic inequalities by adopting a just transition that moves workers across sectors into sustainable and well-paying jobs, increasing green employment opportunities, including for the historically marginalized and those working in the informal sector, disproportionately represented by women<sup>29</sup>. In this section, we present recommendations and indicators to consider in policies and projects, as well as to encourage stakeholder participation in the implementation of green recovery measures.

The proposed recommendations and indicators have a multi-stakeholder approach (national and subnational governments, civil society, the private sector, and academia).



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25 The *Greenness of Stimulus Index*, formulated by Vivid Economics, combines the stimulus flow in five key sectors (agriculture, energy, industry, waste and transport), with an environmental impact indicator for each sector. The impact indicator attributes a green value (positive or negative) for each sector in each country. Available on: <https://www.vivideconomics.com/wp-content/uploads/2021/02/Greenness-of-Stimulus-Index-5th-Edition-FINAL-VERSION-09.02.21.pdf>. Last access: 22 July 2021.

26 Covid-19 Recovery Tracker for Latin America and the Caribbean. Disponible en: <https://recuperacionverde.com/tracker/#sectors-2>. Último acceso el: 23 de julio de 2021.

27 *Latin America needs a green recovery after COVID-19*. Available on: <https://blogs.lse.ac.uk/latamcaribbean/2020/09/11/america-latina-precisa-de-una-recuperacion-verde-apos-a-covid-19/>. Last access: 23 July 2021.

28 *Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic*. Available on: <https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>. Last access: 23 July 2021.

29 ParlaAmericas (2020) *Guia de Apoio para uma Recuperação Econômica Sustentável Pós-COVID-19*. Available on: [https://www.parlaamericas.org/uploads/documents/Green\\_Recovery\\_POR.pdf](https://www.parlaamericas.org/uploads/documents/Green_Recovery_POR.pdf). Last access: 25 June 2021.

## 2.1. Energy



Clean energy is one of the key sectors on the Latin American region's agenda for green recovery. The region produces most of its electricity from renewable sources, mainly through hydropower, which are increasingly threatened by variability due to climate change<sup>30</sup>. Therefore, it is essential to invest in the diversification of renewable energy sources using solar energy, wind energy and energy generated by waste.

In addition, investment in renewable energy should be prioritized because renewable energy has great employability potential, being responsible for the creation of 11.5 million jobs worldwide in 2019<sup>31</sup>. Thus, energy plans should advance in the consideration of gender, race and class sensitive strategies, ensuring that the most vulnerable populations benefit from access to energy and are also trained and qualified to act in the labor market, increasing their employability and the income of the population<sup>32</sup>.



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## Recommendations

### Governments

1. Facilitate access to renewable energies through financing programs with credit lines and low interest rates that take into account social and gender criteria to facilitate access to renewable energies for individuals and neighborhood associations.
2. Create a strategy to increase jobs in the sector by training women, youth, afro-descendants and other groups living in hard-to-reach communities to work with renewable energy systems, such as solar panels, since jobs in renewable energy chains are generally more labor intensive compared to fossil energy source chains. There is an opportunity to train people in outlying communities for installation, maintenance and technical assistance.

3. Implement LED street lighting in neighborhoods with a high rate of violence and farther away from the center of the cities, taking into account that there is a direct relationship between street lighting and violence<sup>33</sup>, especially for women.

### Private sector

1. Support the implementation of solar energy panels, in priority regions, through public-private partnerships to ensure quality public lighting, with the objective of reducing violence and insecurity in cities, which disproportionately affects women, Afro-descendants and LGBTQIA+ population.
2. Promote energy efficiency, increase the use of low-emission technologies and train professionals in the company or industry to work with this new equipment, focusing on the empowerment of women.
3. Prioritize sustainable actions, in order to achieve greater business resilience and reduce economic risks, taking into account that **climate change is an emerging risk for businesses**. Companies in the energy sector can build on the implementation and dissemination of environmental, social and governance criteria and strengthen policies and measures to include gender, sexual orientation, race and class among employees.

30 World Bank (2020): *A green recovery of Latin America and the Caribbean is possible and necessary*. Available on: <https://blogs.worldbank.org/latinamerica/green-recovery-latin-america-and-caribbean-possible-and-necessary>. Last access: 25 June 2021.

31 The sector was responsible for about 11.5 million jobs created worldwide in 2019, up from 11 million the previous year, according to this seventh edition of the *Renewable Energy and Jobs* series. Available on: <https://www.irena.org/publications/2020/Sep/Renewable-Energy-and-Jobs-Annual-Review-2020>. Last Access: 22 July 2021

32 IRENA (2019). *Renewable Energy: A Gender Perspective*. Available on: <https://irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective>. Last Access: 25 June 2021

33 Chalfin, Aaron & Hansen, Benjamin & Lerner, Jason & Parker, Lucie. (2021). Reducing Crime Through Environmental Design: Evidence from a Randomized Experiment of Street Lighting in New York City. *Journal of Quantitative Criminology*. 1-31. 10.1007/s10940-020-09490-6.

## Civil Society and Academia

1. Implement professional, mentoring and training networks for women, youth, afro-descendants, and other vulnerable groups in partnership with governments and the private sector. As carried out by the **RevoluSolar** initiative, it seeks to train people living in the outskirts of Rio de Janeiro (Brazil) to work with the installation of photovoltaic panels installed in their community, minimizing the impacts of energy access deprivation.
2. Leverage partnerships with investment networks focused on leveraging solutions that address climate and gender issues in Latin American cities, such as **Latimpacto**.
3. To provide clear and precise access to information that allows for consultation and understanding by different audiences about what renewable energy is, its application and consolidation in the region. Carried out by the **Renewable Energy's women network in Mexico**, which aims to connect, support and empower women in the sector in order to establish participation in the energy transition process.

### Examples of indicators



- Fossil fuel subsidy amounts defined and reallocated to train workers in prioritized sectors and/or young graduates - with quotas for women - to transition to renewable energy by 2030.
- Number of vacancies for unemployed women and / or with a monthly income below X minimum wages until 2030 in training courses / renewable energy professionals offered in STEM areas (Science, Technology, Engineering and Mathematics).
- Guaranteed access to energy for the inhabitants of the areas with the lowest Human Development Index (HDI) by 2030.

## 2.2. Transport



Latin America is the most urbanized region in the world, where 80% of the population - nearly 450 million people - live in cities<sup>34</sup>. Rapid population growth has not been accompanied by urban mobility planning, affecting travel time and the quality of life of the population. The geographical distance of daily activities such as work, shopping, and leisure causes dependence on transportation options, and consequently, increases greenhouse gas emissions, enhancing climate change. Thus, the use of public transportation becomes a priority in the planning of cities in the region.



© Women on Bike

In addition, the pandemic has created a need to invest in transportation that avoids crowding, and therefore represents an opportunity<sup>35</sup> to implement projects that

34 UN - HABITAT (2020) *World Cities Report 2020: The Value of Sustainable Urbanization*. Available on: <https://unhabitat.org/World%20Cities%20Report%202020>. Last access: 25 June 2021.

35 UOL (2021) *Summit Mobilidade: pandemia é oportunidade para projetos de transporte ativo*. Available on: <https://www.terra.com.br/noticias/brasil/cidades/summit-mobilidade-pandemia-e-oportunidade-para-projetos-de-transporte-ativo-dizem-especialistas,c2e7a2ac71e3dd8d970eed898c77bbe8ev8csdy.html>. Last access: 25 June 2021.

encourage active transportation in cities and include multimodal aspects. However, urban mobility must consider cross-sectoral approaches in its planning. Despite the idea that transportation projects are often considered to benefit women and men equally, regardless of race or social class, transportation is not neutral in relation to these issues, with gender, race, and social class being important factors in differences in mobility and travel behavior<sup>36</sup>.

## Recommendations

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### Governments

1. Invest in the necessary infrastructure to expand the use of public transportation and active mobility, facilitating walking and/or the use of means of transportation that offer benefits for the health of the population and reduction of greenhouse gas (GHG) emissions.
2. Ensure that policy planning, formulation and implementation incorporate gender, race and class analysis and data in order to implement efficient, equitable and sustainable measures for the benefit of all users, reducing incidents of travel violence, harassment and racism.
3. Create gender- and race-sensitive awareness campaigns and strategies to reduce violence and harassment on public transport. As carried out by the **Mexico City's Government**, which improved signage on all transport, defined rules for the operation of women's carriages, and conducted publicity campaigns, including informative videos to eradicate violence at home, at work, in public spaces and on transport.

### Private sector

1. Encourage the participation of women, including Afro-descendant women, in positions related to the transportation sector to improve the inclusion of the perception of women and other social groups in the development of mobility strategies.
2. Reduce mobility costs by adopting sustainable vehicles that are more accessible to the financial reality of the population, implementing clean technologies to reduce greenhouse gas emissions from motorized public transportation, such as the use of electricity (electrification).

3. Support the expansion of bicycle lanes and shared bicycles in peripheral neighborhoods with conditions accessible to the local reality, being a more economical and sustainable alternative to public transport fares.

“The geographical distance of daily activities such as work, shopping, and leisure causes dependence on transportation options, and consequently, increases greenhouse gas emissions, enhancing climate change.”

### Civil Society and Academia

1. Propose solutions for the integration of active mobility with the public transport system, such as the expansion of bicycle parking at medium and high capacity transport points, widening of sidewalks, better communication in public transport areas, including principles of accessibility, comfort and safety, and sharing with decision-makers.
2. Collaborate with the collection and transparency of disaggregated data - by gender, race, class, age or special access needs - on the use of public transportation.
3. Support the creation of campaigns to promote sustainable mobility alternatives, such as active mobility with the creation of bicycle lanes and pedestrian areas.

36 *Gender in Transport*. Available on: <https://eige.europa.eu/publications/gender-transport> Last access: 25 June 2021.

## Examples of indicators



- % of outlying areas covered by public transport by 2030, facilitating access for women and people with disabilities.
- Number of rideshare spots and bike racks by 2030 in outlying and low-income communities to facilitate commuting or small daily activities.
- Number of women professionals in the transportation sector by introducing a minimum number of hires for women and others who meet inclusion and diversity criteria.

## 2.3 Water and sanitation



Latin America region has the largest amount of freshwater in the world<sup>37</sup>. However, despite the abundance, water management in the region remains insufficient to ensure fair access to the natural resource. Water and sanitation services often fail to reach those who need them, reinforcing inequalities in the region.

Climate change and the occurrence of extreme events can affect water quality, infrastructure and the quality of services, favoring the spread of diseases and affecting those living in precarious conditions. Therefore, water management and sanitation quality in Latin America should be discussed from a climate justice perspective.



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## Recommendations

### Governments

1. Including objectives for gender mainstreaming in public policies and instruments of the water sector. For example, incorporating specific objectives and actions in sectoral strategic plans.

“Water and sanitation services often fail to reach those who need them, reinforcing inequalities in the region.”

37 El País (2015): Brasil, Colombia y Perú lideran la lista de países con más agua en el mundo. Available on: [https://brasil.elpais.com/brasil/2015/03/04/internacional/1425491803\\_078422.html](https://brasil.elpais.com/brasil/2015/03/04/internacional/1425491803_078422.html). Last Access: 25 June 2021.

2. Promote opportunities for women's access to leadership positions in the different decision-making and representation positions for water users

For example, increasing quotas for women's participation in the board of directors and management of water companies. It is not a question of obtaining privileges for the mere fact of being a woman; the important thing is that women compete on equal terms with men to gain access to a decision-making position.

3. Promote greater participation of women in the technical training programs (operation and maintenance) currently offered, for example, through the National Training Service for the Construction Industry (SENCICO) in Peru.
4. Include a gender perspective in the diagnoses and/or information gathering in order to have data disaggregated by gender. This is very important to evaluate the situation and be able to take informed action.
5. Promote the use of inclusive language in compliance with national policies.

#### Private sector

1. Define criteria for social inclusion and gender diversity in corporate positions involved in the management of water and sanitation services.

#### Civil Society and Academia

1. Implement training programs in leadership and competencies associated with water management, with a strong focus on gender awareness and training.
2. To follow up on the progress of the goals for the representation of women in technical-operational and decision-making positions.

“Climate change and the occurrence of extreme events can affect water quality, infrastructure and the quality of services, favoring the spread of diseases and affecting those living in precarious conditions.”

#### Examples of indicators



- A gender equity strategy has been included in the sectoral management instruments by 2025.
- Number of water sector officials who have been sensitized and trained to address gender aspects.
- % of women occupying positions on the board of directors and general management of water and sanitation companies.
- Number of water and sanitation companies that promote gender equity through their work calls, and communication plans inside and outside the company.

## 2.4 Urban solid waste (USW)



*Latin America and the Caribbean Waste Management overview*<sup>38</sup> shows that proper waste management is one of the greatest challenges to sustainability in the region. Nearly 40 million people do not have access to waste collection, 90% of waste is not reused, mismanagement and improper disposal of USW leaves 170 million people exposed to contamination and precarious living conditions.

Therefore, promoting waste management through the circular economy in Latin America and the Caribbean can combine economic development with the best use of natural resources, through practices that prioritize the use of more durable, recyclable, and renewable inputs<sup>39</sup>. This economy can be crucial for a green and inclusive economic recovery, generating new forms of business and favoring the creation of an enabling environment for the generation of employment and income, especially for women, youth and social groups in vulnerable situations.



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## Recommendations

### Governments

1. Adopt public policies to encourage the reduction of waste generation, promote actions that contribute to the recycling and recovery of dry and organic waste, with the objective of generating green jobs and reducing environmental impacts.
2. Expand the participation of women in leadership positions in solid waste policy planning and ensure that USW policies are proposed considering gender, race, and class perspectives.

Nearly **40 million people** do not have access to waste collection

**90% of waste** is not reused, mismanagement and improper disposal of USW leaves

**170 million people** exposed to contamination and precarious living conditions.

38 ONU Medio Ambiente (2018): Panorama da gestão de resíduos em América Latina y el Caribe. Available on: [https://wedocs.unep.org/bitstream/handle/20.500.11822/26436/Waste\\_summary\\_PT.pdf?sequence=5&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/26436/Waste_summary_PT.pdf?sequence=5&isAllowed=y). Last access: 25 June 2021.

39 Portal de la Industria (2020) ¿Qué es la economía circular? Available on: <https://noticias.portaldaindustria.com.br/noticias/sustentabilidade/o-que-e-economia-circular/>. Last access: 25 June 2021

3. Promote the recovery of a wider range of waste, together with the private sector, through the circular economy perspective that considers the creation of green jobs for women.

### Private sector

1. Adopt the concept of circular economy not only to reduce costs and production losses, but also to create new sources of income, including the generation of employment for women by promoting the recovery of resources.
2. Build alliances and promote the strengthening of cooperatives of waste pickers and women recyclers, associations and other local organizations that contribute to recycling while generating income for women.
3. Expand courses and training with criteria of social inclusion, gender, race and class to professionalize the population in waste management.

### Civil Society and Academia

1. Demand, in multi-sectoral alliances, behavioral changes to reduce the volume of waste generated: Benchmark - **Plastic Delivery** campaign led by the UN with broad support and protagonism of civil society and women.

2. Foster the production of circular economy-oriented research in collaboration with the public and private sector, identifying concrete challenges related to USW management, as well as potential implementing partners and additional sources of research resources that include the participation of women.

3. Foster, through campaigns, the insertion of women in the leadership of research related to urban solid waste management, as well as other important scientific careers for the sector, in which this group is underrepresented<sup>40</sup>.

“Promoting waste management through the circular economy in Latin America and the Caribbean can combine economic development with the best use of natural resources, through practices that prioritize the use of more durable, recyclable, and renewable inputs.”

### Examples of indicators



- % of renewable energy coverage implemented to cover the maintenance and operation of recycling and composting sites by 2030, promoting the waste sector and favoring the creation of new skills and jobs.
- % of recyclable waste from households and businesses sent to cooperatives headed by women or that have a 50% female workforce by 2025.
- X mentoring programs created, involving academic mentors and USW professionals, focused on mentoring young people and women, with priority for people located in regions with lower density of professionals working in the area, also contributing to the reduction of regional inequalities.

40 Worldwide, there are few women in science, technology, engineering and mathematics (STEM) fields. In universities, women represent only 35% of students enrolled in these fields - the percentage is even lower in engineering (production, civil and industrial) and technology, not reaching 28% of the total. Available on: <https://unesdoc.unesco.org/ark:/48223/pf0000253479>. Last Access: 2 August 2021.



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## Concluding remarks

The COVID-19 pandemic showed that groups in situations of greater social vulnerability were also more affected by the health crisis and unemployment. In this sense, it is necessary that green recovery measures, in the post-pandemic stage, especially in Latin America and the Caribbean, consider existing structural inequalities and their relationship with social and gender dimensions. Economic recovery needs to address these systemic inequalities through an approach that considers aspects such as gender, race, class and territory as cross-cutting issues to ensure the achievement of a more sustainable and fairer economic development, given that the inclusion of socially vulnerable groups in the economy has social and economic benefits for society as a whole.

Green recovery measures appear as an opportunity to rethink countries and economic sectors from a human rights-based agenda in order to address the effects of the pandemic and the climate crisis simultaneously. To ensure that new policies and projects in all sectors of the economy are aware of these issues, it is necessary to strengthen international and regional cooperation in LAC and include the participation and perspective of multiple stakeholders from government, civil

society, the private sector and academia. Implement an intersectoral perspective for project planning and public policies must be accompanied by structural and strategic measures, with indicators monitored and evaluated periodically, through transparent and easily accessible data for real solutions that prioritize historically marginalized groups in the economy.

“Green recovery measures appear as an opportunity to rethink countries and economic sectors from a human rights-based agenda in order to address the effects of the pandemic and the climate crisis simultaneously.”

## References and further reading links

- Biden's infrastructure proposal.  
(<https://edition.cnn.com/2021/03/31/politics/infrastructure-proposal-biden-explainer/index.html>)
- Fact Sheet: The American Jobs Plan.  
(<https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/>)
- Plan "Paso a Paso, Chile Se Recupera".  
(<https://www.gob.cl/chileserecupera>)
- Movilidad 4s para México Saludable, Segura, Sustentable y Solidaria. Plan de Movilidad para una nueva normalidad.  
(<https://www.gob.mx/sedatu/documentos/movilidad-4s-para-mexico-saludable-segura-sustentable-y-solidaria-plan-de-movilidad-para-una-nueva-normalidad>)
- Sustainable Infrastructure Development ymposium South Africa.  
(<https://www.tralac.org/documents/news/3777-sustainable-infrastructure-development-symposium-south-africa-sidssa-23-june-2020/file.html>)
- The 88.5 billion National Green Development Fund.  
([https://finance.sina.com.cn/money/bank/bank\\_hydt/2020-07-15/doc-iivhvpwx5599537.shtml](https://finance.sina.com.cn/money/bank/bank_hydt/2020-07-15/doc-iivhvpwx5599537.shtml))
- OECD Green Recovery Database  
(<https://www.oecd.org/coronavirus/en/themes/green-recovery>)
- Global Recovery Observatory  
(<https://recovery.smithschool.ox.ac.uk/tracking/>)
- World Bank Data  
(<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>)
- WRI Brasil – O que é uma retomada econômica verde pós-pandemia.  
(<https://wribrasil.org.br/pt/blog/2020/07/retomada-verde-recuperacao-economica-verde-desenvolvimento-sustentavel-pandemia-COVID>)
- Planning for the economic recovery from COVID-19: A sustainability checklist for policymakers.  
(<https://blogs.worldbank.org/pt/climatechange/planning-economic-recovery-COVID-19-coronavirus-sustainability-checklist-policymakers>)
- Communiqué of the Forty First Meeting of the IMFC  
(<https://www.imf.org/en/News/Articles/2020/04/16/communique-of-the-forty-first-meeting-of-the-imfc>)



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