



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Sustainable Industrial Parks in Latin America

DEVELOPMENT OF SUSTAINABLE INDUSTRIAL PARKS

IN LATIN AMERICA & CARIBBEAN



EGM Report
May 2017



DEVELOPMENT OF SUSTAINABLE INDUSTRIAL PARKS

IN LATIN AMERICA & CARIBBEAN

EXPERT GROUP
MEETING REPORT



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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EXECUTIVE SUMMARY

During the first United Nations Industrial Development Organization (UNIDO) Inclusive and Sustainable Industrial Development (ISID) forum, held in June 2014, the Latin American and Caribbean Group (GRULAC), the UNIDO Latin America and the Caribbean (LAC) division and the participating countries in the region came together to establish a regional platform for exchanging knowledge and experience of planning, developing and managing sustainable industrial parks. The “Developing Sustainable Industrial Parks in Latin American and Caribbean countries” initiative, which is supported by the UNIDO LAC Trust Fund, is in line with the commitments and strategies of the eight participating countries (Argentina, Bolivia, Chile, Costa Rica, El Salvador, Guatemala, Peru, Panama and Paraguay) to strengthen cooperation and potential synergies for promoting social development and sustainable industrial growth, minimizing negative impacts on the environment.

The project began at the end of 2015 and seeks to improve cooperation within the region and develop technical experience in planning, developing and managing sustainable industrial parks, with the following specific objectives: 1) Establish and consolidate national and regional strategies for sustainable development and cooperation on industrial parks; 2) Build national capacities for applying best practice method for sustainable industrial parks, in terms of management, policies and Resource Efficient and Cleaner Production (RECP); and 3) Develop the technical guidelines for sustainable industrial parks to allow their replication.

As part of the project activities, the eight participating countries evaluated their national circumstances and identified gaps preventing the development of sustainable industrial parks, with discussions on sustainable approaches to industrial parks at public-private coordination meetings. National committees have also been established or existing formal mechanisms have been strengthened to coordinate the designated government bodies, industry and technical service providers in the field.

The technical approach of the project is based on existing tools, which have been adapted by the teams in the individual countries to suit their specific conditions. This has allowed the countries to draw up a list of recommendations for public policy, the management of zones/parks and the companies within them assessed using the RECP method. In terms of the latter, a large number of financially viable options were identified to increase productivity, reduce demand for natural resources, improve the efficiency of resources, promote industrial symbiosis and encourage approaches based on industrial networks.

One important activity in the knowledge exchange process and the establishment of a regional platform was the expert group meeting (EGM) organized by UNIDO in Lima, Peru, on 23–24 May 2017. The meeting was attended by eight delegations from Latin America and the Caribbean and senior figures from the Ministry of the Environment and the Ministry of Production in Peru. The meeting provided an opportunity for the officially delegated government focal points and participating industrial development professionals from LAC countries to share their progress, knowledge and experience. The following aspects were evaluated during the workshop:

- » Current progress in implementing the action plan established at the launch workshop in Vienna, Austria, in April 2016
- » The results achieved by each country so far in developing and strengthening national and regional strategies for sustainable industrial parks and implementing the method and evaluations for existing parks and selected companies within them
- » The guide to the development of sustainable industrial parks produced by UNIDO as a project outcome
- » The investment requirements and funding sources for sustainable industrial park projects and the proposal for implementation of the second phase covering the replication and scalability of results

The main outcome was a continuity plan, which included the following objectives:

1. Strengthening regional integration and positioning the issue of sustainable industrial zones/parks as an instrument to support meeting the Sustainable Development Goals (SDGs) in relevant regional forums
2. Supporting national and regional policies and strategies to promote the circular economy and low-carbon industry in sustainable industrial zones/parks
3. Building national capacities for the practical application of the circular economy and low-carbon industry at sustainable industrial zones and parks

A final meeting is planned (provisionally to be held in Panama) to present the final outcomes of the project and the specific bankable proposals as outcomes of the RECP assessments carried out in the individual countries, in addition to proposals for their scalability and replication, to obtain funding for the second phase of the regional initiative.





OPENING SESSION



Marcos Alegre, Vice Minister of Environmental Management, Ministry of environment, Peru

The event was opened by the Undersecretary of the Environment in Peru, highlighting the added value of sustainable industrial parks for industry in any country. Given the multisectoral nature of the environmental dimension, he encouraged the various ministries and institutions at the event to work together and with UNIDO to develop consistent and integrated national and regional policies.



Ariel Carbajal, President of the LAC Regional Chapter of the RECP Network

Carbajal noted that the RECP network has a long track record and extensive knowledge and experience working with industrial parks. The work done by the various centres as part of this project sets an example for the network as a whole, demonstrating its capacity to address the issue in different countries with different circumstances applying the method and approach developed by UNIDO.



Petra Schwager, UNIDO Industrial Development Officer and manager of the technical component of the regional project

Schwager highlighted the importance of the initiative in the participating countries, where the commitment shown by the counterparts and the results obtained so far illustrate the need to continue the work. Similarly, the permanent missions of the participating countries in Vienna have ratified their support for the regional project and have all (alongside other countries such as Peru and the Dominican Republic) pledged to continue working on the second phase of the initiative.



Alejandro Rivera, UNIDO LAC Programme Officer and manager of the political component of the regional project

As Rivera noted, one of the region's main challenges is its external perception as being comprised of middle-income countries, making it harder to access funding sources. This means it is important to capitalize on existing regional initiatives, such as the one implemented by UNIDO, to promote cooperation and synergies between the governmental, academic and technical actors involved.

CHAPTER 2

PRESENTATION OF REGIONAL OUTCOMES OF THE PROMOTION OF SUSTAINABLE INDUSTRIAL PARKS IN THE LATIN AMERICAN AND CARIBBEAN REGION



The circular economy and its importance to sustainable industrial parks

(Petra Schwager, UNIDO Industrial Development Officer and manager of the technical component of the regional project)

The growing global population and the continuous expansion of the so-called middle class has led to a significant increase in industrial waste in recent years, with the associated environmental impact. The 17 Sustainable Development Goals (SDGs) approved in September 2015 are the targets we should aim for to eradicate poverty, protect the planet and ensure prosperity for all. In specific terms, SDG 9 encourages innovation and promotes inclusive industry, highlighting its contribution to sustainable development. A few months after the SDGs were approved, the European Union approved its circular economy strategy to promote competitiveness, stimulate employment and generate sustainable economic growth.

The circular economy is based on the principle that industrial waste represents a lack of efficiency in the use of raw materials. The approach aims to ensure that the utility and value of products, components and resources in general is preserved throughout the life cycle of materials. The strategy promotes a systematic shift from a linear approach to a circular approach, beginning with the extraction of raw materials, encompassing their processing and use, all the way through to reincorporation, reuse and recycling throughout the life cycle.

The UNIDO mandate as set out in the Lima Declaration, which was adopted in 2013, is to promote and accelerate sustainable and inclusive industrial development in developing countries and economies in transition. There are four key aspects of the organization's work: technical cooperation; policy assistance and analysis; establishing and meeting standards; and meetings and partnerships.

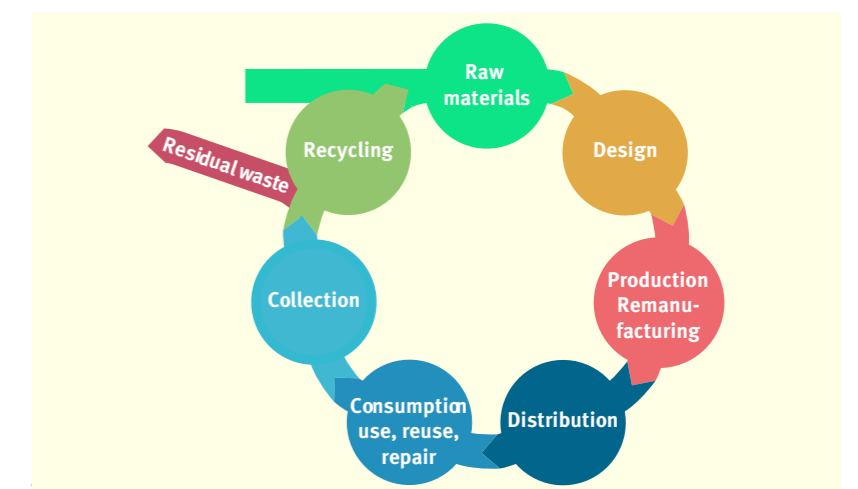
There are many problems derived from industrial production, including water and air pollution, chemical exposure and waste. Industrial parks can provide an alternative for dealing with these issues, not only by addressing environmental problems but also by generating social and economic benefits for businesses and communities.

Petra Schwager, Manager of the technical component of the UNIDO regional project



FIGURE 1

Phases of the circular approach.



Source: Ellen MacArthur Foundation (2017)



One of the most complex aspects with the potential to have a major impact is RECP, which increases the productivity of businesses and reduces environmental pollution. Another aspect is industrial symbiosis, whereby a group of companies participating in industrial networks sets up businesses in which some companies use the waste of others as a raw material for their production processes.

The UNIDO mandate for Inclusive and Sustainable Development (ISID) and the sustainable industrial parks approach have many shared elements, including economic competitiveness, creating shared wealth and environmental protection. Sustainable industrial parks have a significant impact on various levels. They benefit companies by improving productivity, reducing production costs, creating links with supply chains and helping obtain certifications. For investors, companies that form part of sustainable industrial parks with procedures in place for managing environmental risks offer additional guarantees. In terms of local communities, projects such as industrial parks fail in many countries because they do not consider the social dimension or

the local community, despite the fact these initiatives should be used as a tool to address social inequality. For national lawmakers, sustainable industrial parks help generate environmentally friendly growth strategies. Finally, benefits for the park management include increased investment support, reduced costs and higher revenue, all of which helps improve shared services.

Similarly, the relationship between the circular economy and sustainable industrial parks is based on four principles: reducing environmental footprint; minimizing waste; reducing the dependence on resources and thus exposure to price volatility; and creating jobs and increasing revenue. All this has a significant impact on aspects such as the existing political framework, the establishment of and compliance with standards, and promoting innovation. The overall impact of the circular economy has the potential to contribute GDP growth of 0.8–7.0 per cent from new jobs and cost reductions, job creation of 0.2–3.0 per cent and a reduction of 8–70 per cent in emissions. Sustainable industrial parks are an effective tool for implementing

the circular economy and can increase its impact through the efficient use of resources and cleaner production. Moreover, working with a group of companies to develop industrial symbioses increases the scalability of the results. Applying the sustainable industrial park approach also helps improve production activities and has the potential to create economic, social and environmental benefits.

The method used by UNIDO to implement the project is based on a baseline study of the circumstances of industrial parks in the country and the establishment of working groups or national committees to develop strategies for sustainable industrial parks. A pilot programme was implemented for one park in each country to study its performance based on a series of indicators and two companies were assessed using the RECP method.

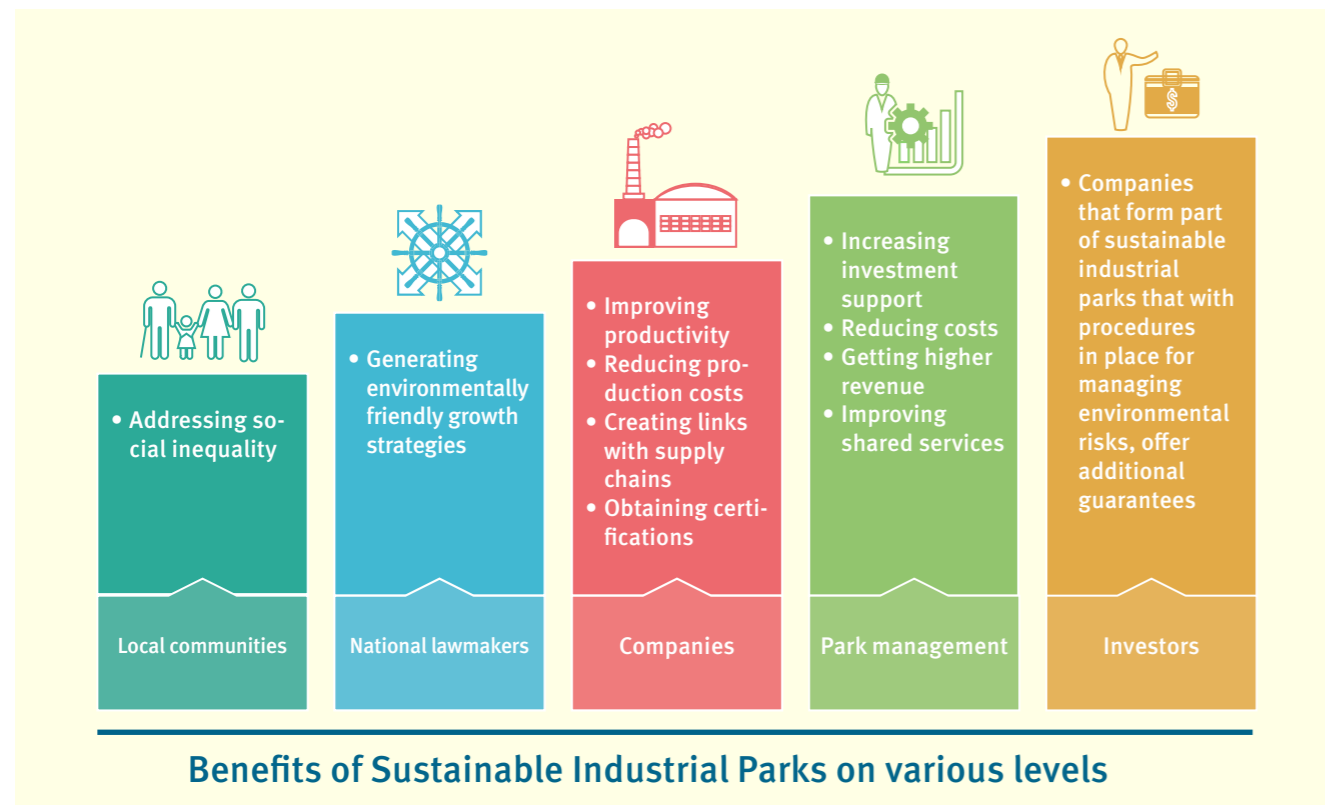
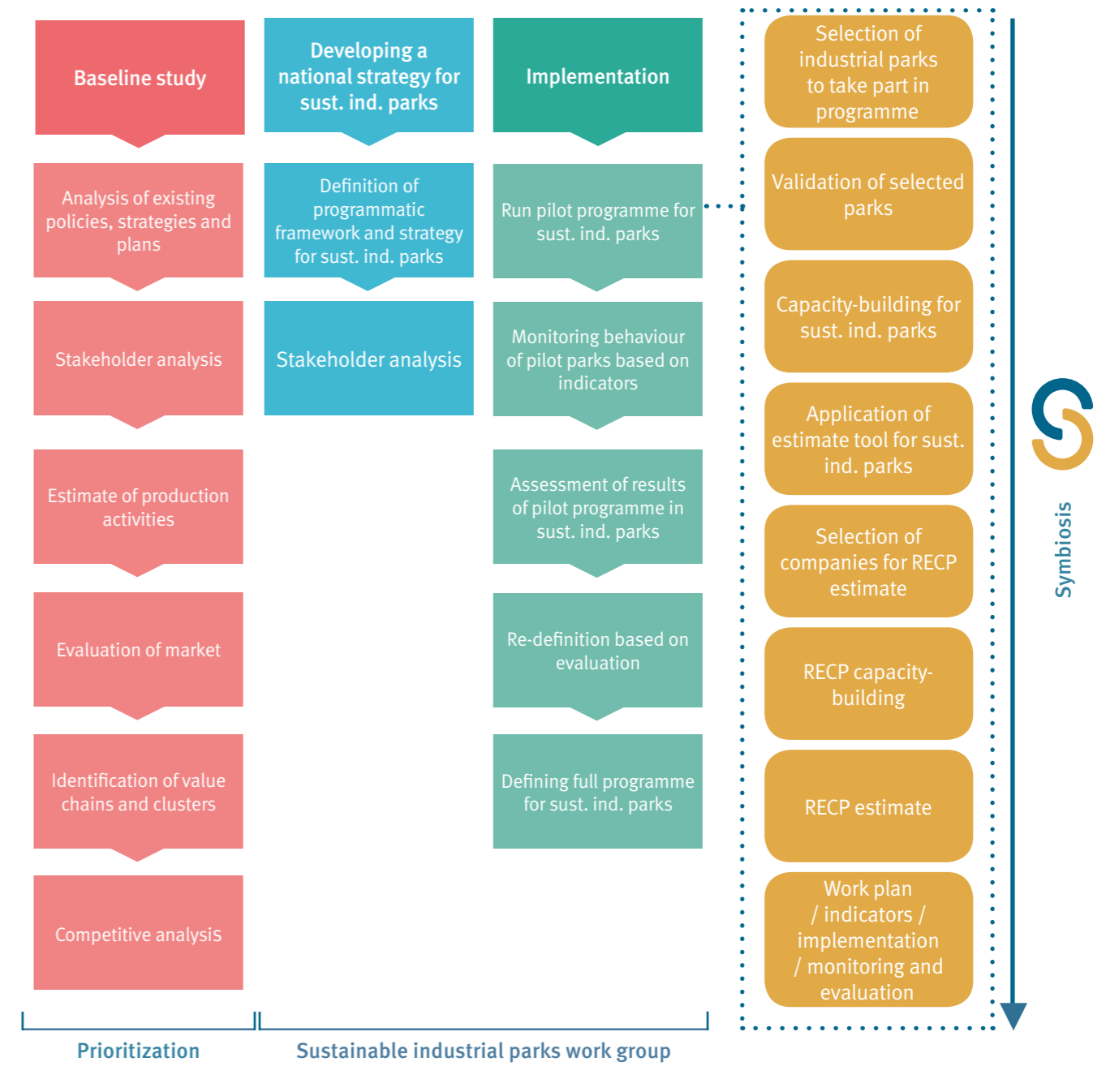


FIGURE 2

The UNIDO method for implementing the regional project





Policy conditions for promoting sustainable industrial parks in LAC

Sylvia Aguilar, CEGESTI Environment and Development Coordinator



(Sylvia Aguilar, Environmental and Development Coordinator of the Costa Rican Technology and Information Management Centre Foundation (CEGESTI), Costa Rica)

To encourage the cooperation and integration of the various national actors in industrial parks, the project had a government-appointed national focal point in each country responsible for creating or strengthening national and regional strategies, as well as a technical coordinator from each of the UNIDO/UNEP RECP network centres responsible for providing technical advice and carrying out the assessment and diagnostic of the pilots implemented.

During the implementation of the project, national committees were formed or the relevant stakeholders were included in the country's existing formal mechanisms to present the project and the results of the SWOT analysis of national strategies for planning, developing and managing sustainable industrial parks. The tasks of these committees include working on the inputs for developing the policy framework and national legislation for the standardization of industrial parks and the recognition of parks classed as sustainable. In parallel, workshops have been organized to raise awareness and promote debate among the relevant stakeholders in national development strategies for sustainable industrial parks in each country.

The technical component involved analysis by the technical coordinators in each country of opportunities for improvement in the chosen industrial park/zone. The organizational, social, economic and environmental aspects of the industrial park were analysed and RECP assessments were carried out for two representative companies. This analysis was used to produce the prefeasibility study for the identified options and extrapolate to all the companies in the industrial park.

The conclusions of the work carried out so far include:

- » The requirement for communication and coordination between companies, the management of parks and the authorities to bring about structural changes
- » It is necessary to expand the scope to the national sphere in each of the countries to have a real positive impact on the development of sustainable policies
- » Public-private cooperation is perceived as the best way to mobilize the resources required to achieve this goal and the inclusion of representatives from the academic sector is recommended to enhance success
- » Issues to be covered in the following stages include ensuring diagnostics are accompanied by resources or a mechanism for the implementation of plans by the companies and management of industrial parks to ensure a successful outcome

Experiences of developing sustainable industrial parks in the LAC region

(Ariel Carbajal, President of the LAC Regional Chapter of the RECP Network)

The roots of sustainable industrial parks can be traced back to the Danish city of Kalundborg near Copenhagen. Steam, natural gas, cooling water and gypsum are shared by the partners in the park. Excess heat is used for fish farming, heating nearby houses and greenhouse farming. Other by-products that cannot be used in the park, such as sulphide, ash and wastewater, are sold to local companies.

The Kalundborg model was not developed solely as a means to comply with environmental regulations: the park's partners created these arrangements between companies to save materials and energy, minimize waste disposal costs, increase revenue production from waste and show greater environmental responsibility. This combination of motivations clearly shows an innovative and promising relationship

between economic benefits and reduced environmental impact as a result of industrial symbiosis and industrial sustainability.

There are two different applications of the sustainability approach: existing industrial parks and those currently under development. For the former, the aim is to generate knowledge and methods for organizing industrial parks based on concepts of sustainability, using tools and techniques such as cleaner production and industrial symbiosis. The outcomes include improvement plans based on RECP and the identification and application of industrial symbioses from a life cycle perspective. The Gualeguaychú

industrial park, where the project activities were implemented in Argentina, is an illustrative example.

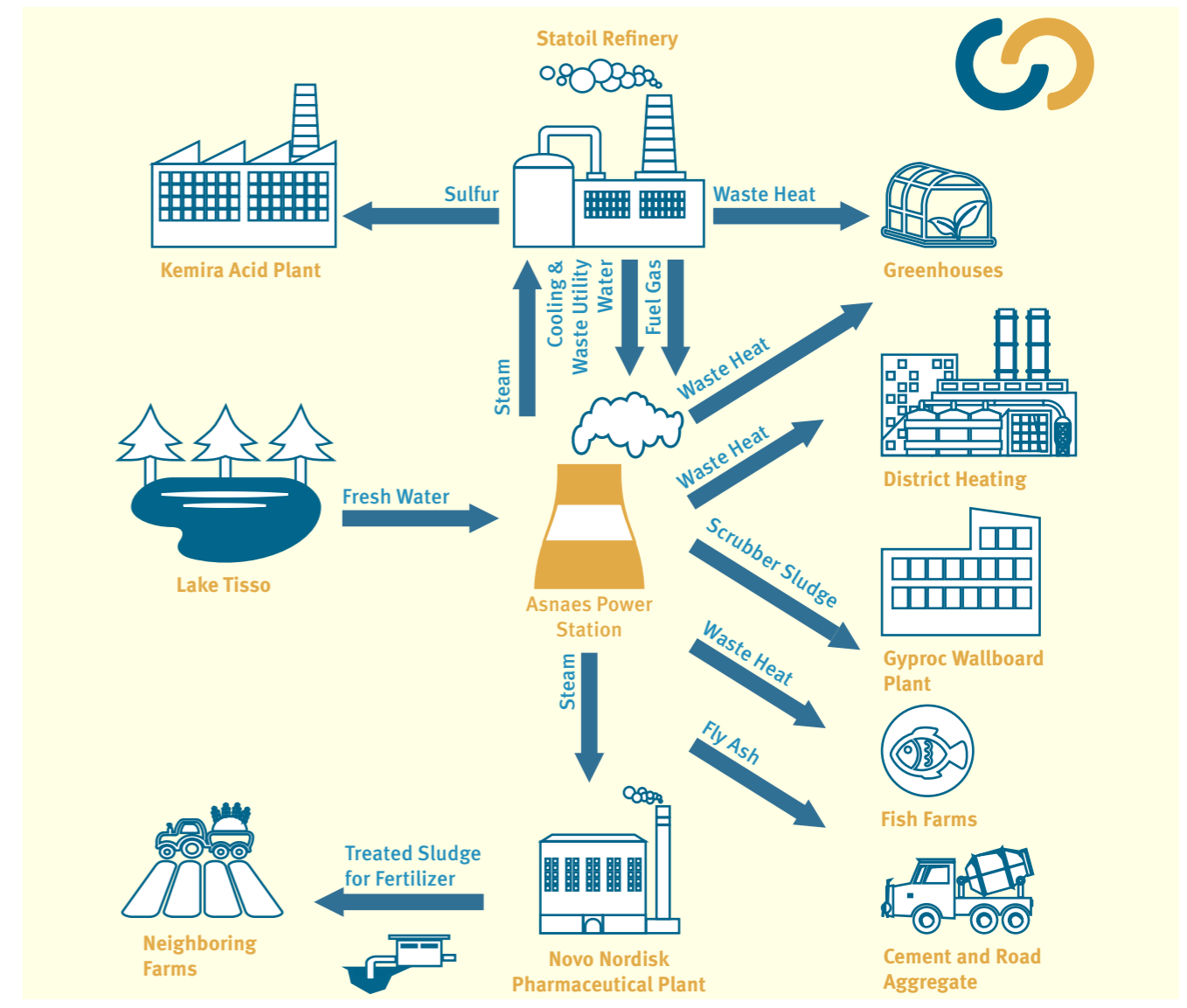
In terms of industrial parks in the planning stages, Ubajay is one of the most representative examples in Argentina. Ubajay is a sustainable industrial park that is home to timber manufacturers, renewable energies, waste recycling and technology companies. Its design used cleaner production and industrial symbiosis tools, even creating a waste and by-product portal (BORyS). One of the main advantages of this approach is that the companies in the park are less concerned about legislation and can avoid sanctions.

Ariel Carbajal, President of the LAC Regional Chapter of the RECP Network



FIGURE 3

Diagram of the industrial symbioses between companies at the Kalundborg Industrial Park



PROJECT TEAMS IN ACTION



ARGENTINA



BOLIVIA



EL SALVADOR



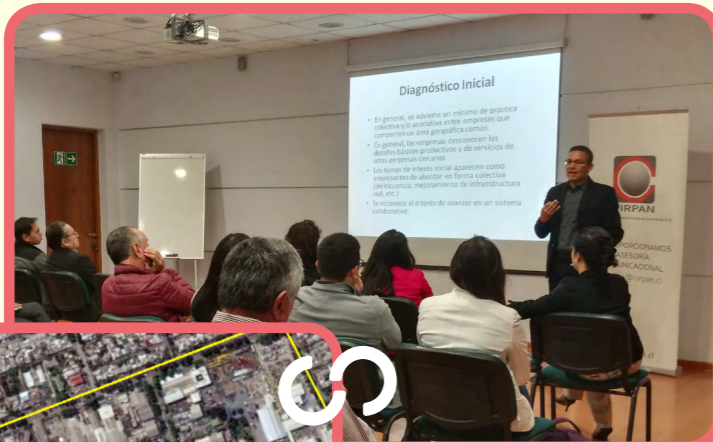
GUATEMALA



COSTA RICA



CHILE



PARAGUAY



PANAMA

CHAPTER 3



PRESENTATION OF COUNTRY OUTCOMES

Method for evaluating industrial parks

A series of tools and guides developed for different types of industry clusters were reviewed in order to evaluate the sustainable performance of industrial parks. They were then used to develop a simplified tool that served as a guide to converting existing industrial parks into sustainable industrial parks. The guide, trialled in the eight countries, was then evaluated and feedback provided by the implementing specialists to produce a revised guide adapted to the local conditions identified.

The tool developed (Guide to Transforming Industrial Parks into Sustainable

Industrial Parks) is part of the work by UNIDO to establish an LAC regional platform for sharing knowledge and experience of planning, developing and managing sustainable industrial parks/zones to strengthen cooperation and synergies in the region and support sustainable and inclusive industrial growth.

The tool aims to provide technical guidance for sustainable development service providers on converting industrial parks into sustainable industrial parks. It provides a systematic diagnostic method that can be used to identify the actions required and put in place a workplan for the gradual transition to a system for the management and operation of the park and its companies that includes the three dimensions of sustainable

National representatives and UNIDO officers during the working sessions of the EGM



development to deliver the benefits associated with this model. The guide brings together the experiences of UNIDO and other organizations in implementing strategies for the efficient use of resources and financially viable and socially inclusive management. Focusing on analysing the management strategies of a park, coordination between companies and optimization methods using RECP, it also includes analysis of the integration of economic, environmental and social aspects to guarantee sustainable and inclusive industrial development.

The guide sets out the detailed procedure for establishing the development plan for sustainable industrial parks/zones based on an analysis of existing circumstances and the relationships between the key actors involved. Finally, it

describes the actors involved in creating the conditions for the development of sustainable industrial parks.

UNIDO, German Development Cooperation (GIZ) and the World Bank are currently in the process of producing a document setting out the minimum criteria for an industrial park to be classified as sustainable. The document seeks to define the basic indicators in terms of four categories: management of the park/zone; economic performance; social performance; and environmental performance. The minimum criteria assume previous compliance by parks and businesses with existing legislation and that they have gone beyond these as evidenced by compliance with the minimum criteria to be set.

FIGURE 4
Actors involved in a conversion project



Pilot Projects Site

- Responsible
- Pilot project
- Companies participating
- Future plans

ARGENTINA		National Sustainable Industrial Development Office
		Gualeguaychú park
		3 companies
BOLIVIA		Office of the Undersecretary of Medium- & Large-Scale Industrial Production
		Cochabamba industrial park
		12 companies
CHILE		Identifying potential measures and applying them in other parks
		Production Infrastructure Unit (national committee)
		Panamericana Norte industrial zone
COSTA RICA		2 companies
		Establishing and strengthening policies to certify environmental best practices
		National committee
EL SALVADOR		Zeta Cartago industrial park
		2 companies
		Establishing distinctive branding for industrial parks
GUATEMALA		Commission for Sustainable Development, Cleaner Production and Energy Efficiency
		San Marcos industrial park
		2 companies
PARAGUAY		Developing a holistic vision of the regulatory framework for sustainable industrial parks
		Low-Emissions Industry Board (national committee)
		The ZOLIC trade and commerce free zone
PANAMA		4 companies
		Replicating the pilot experience in 2 private parks to provide input for development of the policy
		Paraguayan Quality Association (APC)
PARAGUAY		Tosa Industrial Park
		2 companies
		Continuing the implementation of RECP measures within the enterprises located in the park, and raising awareness about best environmental practices with other Paraguayan companies.
PANAMA		The Panama Industrial Eco-Parks Sectoral Committee
		The Panamá Pacífico special economic zone
		3 companies
PANAMA		Converting the country's existing industrial parks and zones into sustainable industrial parks, and developing a tool for their certification





ARGENTINA: Florencia Fernández and Ariel Carbajal

Florencia Fernández (right) and Ariel Carbajal (left)



In Argentina, the structure and range of tools to promote national production comprises a range of instruments with different types of incentive mechanisms.

The National Sustainable Industrial Development Office, which forms part of the Ministry of Production, is responsible for implementing the activities of the regional project in Argentina. Its current priorities include the circular economy, sectoral agreements and representation of the sector's position, as well as sustainable production, including sustainable industrial parks. Work is jointly carried out with the National Programme for the Development of Industrial Parks. The objectives include encouraging industrial development throughout the country through the promotion, standardization, creation and strengthening of industrial parks with a view to transforming them into national public policy vectors, as well as encouraging small and medium enterprises to join these clusters. The programme has been operating for a number of years and has accumulated a significant body of information on the country's industrial parks. It has three main components: loans with preferential interest rates for companies in or planning to move to public industrial

parks; non-repayable funding for internal infrastructure studies and works; and the national register of industrial parks (REN-PI). The register includes information on 210 of the country's 402 industrial parks, providing valuable information on their organization and management and the companies present. The data shows the impact and importance of industrial parks in Argentina: industrial parks are home to 9 per cent of all companies and generate 10 per cent of employment in the industrial sector.

The activities promoted by the project included the inaugural meeting of the national committee in August 2016. The committee comprises representatives of the Ministry of Production, the Technology Centre for Sustainability, the National Industrial Technology Institute (INTI), the Ministry of Energy and Mining, the National Technology University, provincial and municipal governments, and chief executives of industrial parks who are interested in the programme. Awareness-raising and training workshops have been run, in addition to a workshop in December 2016 on the dissemination and sharing of experiences of sustainability in industrial parks in Latin America and the Caribbean, with representatives from Bolivia and Paraguay. The event included a tour of selected industrial parks to share best practices and national experience regarding the legislative framework for industrial parks.

The Gualeguaychú park was chosen for implementation of the pilot project. The park is located in the Entre Ríos province of Argentina, is home to 32 companies in different sectors and is jointly managed by the provincial state, the municipality and the Gualeguaychú Development Corporation (CODEGU). Different aspects of the sustainability of industrial parks were analysed, giving rise to a number of recommendations, including:

- » Promotion of forums involving public bodies, NGOs and the general public to discuss the planning, development and management of sustainable industrial parks
- » Design and implementation of a programme for separating and using recyclable waste
- » Design and implementation of a corporate social responsibility plan
- » Systematization of internal and external information and communication mechanisms
- » Logistics and sustainable mobility plan
- » Analysis for the implementation of a carbon neutral programme
- » Strengthening RECP and industrial symbiosis
- » Creating environmental branding for companies and a scheme for certifying occupational skills
- » Strengthening the Gualeguaychú industrial park's managers
- » Integrated project to enrich forest and indigenous species

RECP assessments were carried out for three companies in the park in the fields of metallurgy, industrial textiles and the recycling of starter batteries. In all three cases, the outcomes of the assessment included suggestions for changes and best practices in the bankable proposals. The potential results of applying these recommendations will be extrapolated to the park as a whole and the country to quantify their impact on a larger scale.

Based on the work so far, Argentina's proposal for the second phase of the regional project includes producing a report on

current regulations for industrial parks, with a focus on sustainable development, and expanding the scope of the activities to 20 industrial parks and 200 companies, using the results obtained as an input for producing internal regulations.

BOLIVIA: Roberto Carlos Tapia and Patricia Durán

Roberto Carlos Tapia (left) and Patricia Durán (right)



Bolivia does not have specific regulations for the creation and operation of industrial parks or zones and each industrial park or zone has its own specific regulations. In terms of national strategies for industrial parks, there is an approved document setting out a strategy for strengthening industrial parks. This document is currently in the initial stage of development and its implementation aims to promote the creation and optimal running of production infrastructure throughout Bolivia. The country has three public-private business associations, two for free zones and one for industrial parks.

Bolivia opted against establishing a national committee for sustainable industrial parks. Instead, the Office of the Undersecretary of Medium- and Large-Scale Industrial Production is the national authority responsible for production infrastructure via the Production Infrastructure Unit. Dissemination workshops have been planned with the national actors and the government counterparts are also working on implementation of the plan for coordinating the actors involved in matters related to production infrastructure and enacting national regulations that cover sustainable industrial development.

The Cochabamba industrial park was chosen for implementation of the pilot and its mixed public-private management was enthusiastic about participating in the project. This industrial park is currently under development and has the support of the local population, with 35 businesses currently operating there. Four major activities have been carried out in close collaboration with the governmental and technical counterparts for the project: dissemination

FIGURE 5
Diagnostic of Sustainable Industrial Zone/Park – ARGENTINA

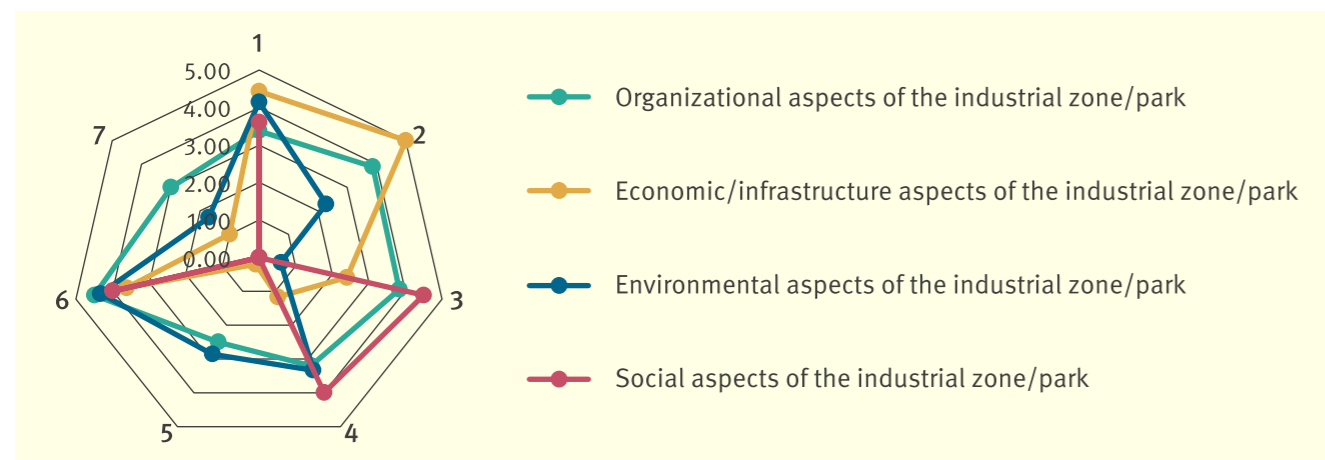
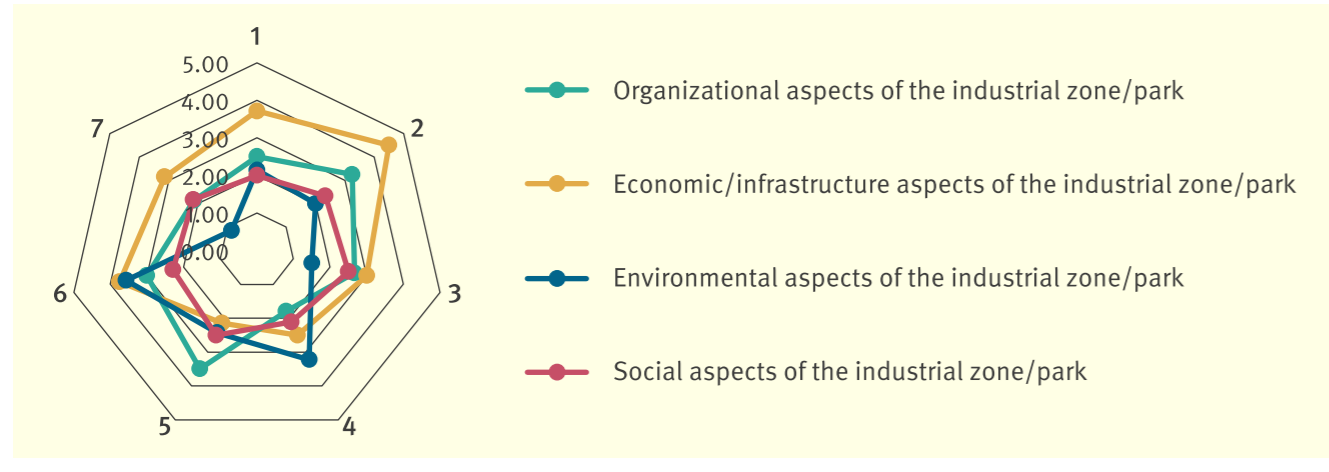




FIGURE 6
Diagnostic of Sustainable Industrial Zone/Park – BOLIVIA



of the project, primarily to convince the business community by explaining how it can help them improve productivity; a diagnostic and characterization of the industrial park; energy efficiency training for private business; and presentation of the results to the park management.

To characterize the park, a number of visits, surveys, interviews, diagnostics and energy efficiency audits were carried out with support from the GREENPYME programme. Although the park has a capacity of 500 companies, just 35 are currently operating there, 12 of which are covered by the project. The management has internal by-laws, regulations and standards for construction to facilitate the implementation of efficiency measures. However, the park currently has a problem with its water supply, which has dissuaded companies from setting up there. The analysis included work on identifying potential industrial symbioses from reusing waste as raw materials (mainly used oil and plastics). This aspect is particularly important at the park, given that there is no sanitary landfill and waste disposal costs are therefore high. The main findings include:

- » The scarcity of water in Bolivia’s Cochabamba department has forced companies to implement measures to use water more efficiently and these can be replicated at other industrial parks
- » Managing the park is vital to integrate the companies present and identify potential synergies and complementarity between them

- » The mixed management of parks, which includes community participation, facilitates the dissemination of benefits from this type of project and its implementation
- » Investment is not necessarily required to achieve sustainable industrial development, since it is possible to implement simple measures (e.g. efficient power demand management)
- » Energy is affordable, a factor hindering the implementation of projects that prioritize the generation of alternative energy sources

Regarding the companies that underwent RECP assessment, improvements have been identified in three main areas:

1. Energy efficiency: measurement of the carbon footprint of the companies showed that the application of the improvements recommended for the 10 companies studied (e.g. efficient lighting, using the correct size of equipment and switching fuels) could deliver savings of 460,000 kWh per year.
2. Saving water: given the problem with the park’s water supply due to the drought suffered by Bolivia in recent years, many companies already have their own water recovery systems. Nonetheless, the analysis of water usage by two companies identified measures that could reduce consumption by 10 per cent (3,600 m³ per year).

3. Waste management: the implementation of industrial symbiosis and product recovery measures (e.g. measures to recover up to 0.5 per cent of metals like silver concentrate and improvements to scrap dilution operations) could deliver savings of US\$30,000 for the companies assessed.

The results of the initial pilot of the regional project serve as a guide for identifying potential measures and applying them in other parks during the second phase of the project. They will also be a major input for the cleaner production policy for the manufacturing sector being developed by the country’s government counterparts, as well as the programme to strengthen production infrastructure for sustainable development.

CHILE: Jorge Morales and Rafael Lorenzini

Chile currently has two types of industrial areas: industrial zones, where a group of companies share a site without common spatial planning; and industrial parks, where land is developed and subdivided into plots under a general plan, benefits from shared infrastructure and is used by a community of industrial companies. There are three types of zones: exclusive (polluting) industries; nuisance industries and inoffensive industries.

While industrial parks allow industries to set up and operate there, they are not designed to promote symbiosis. Furthermore, Chile takes a sanitary approach to waste management, whereby companies must register as solid waste treatment companies to use waste as a raw material. All this means that although shared areas in parks are managed, there is no mechanism to encourage companies to work together to improve overall performance. Even though local unions have been formed in some industrial zones to improve the relationship between businesses and the community, they are relatively weak.

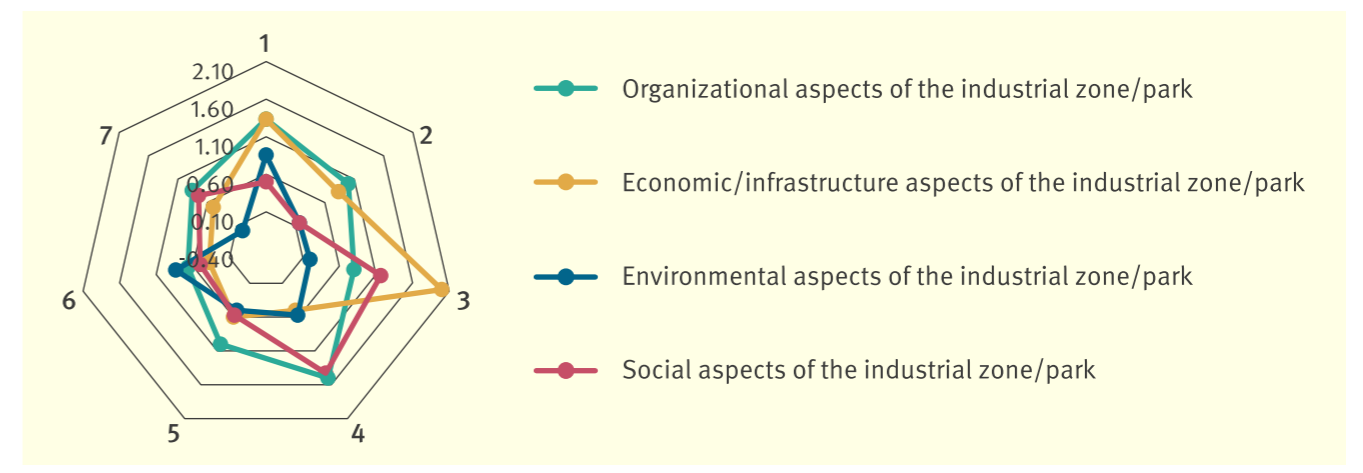
In general terms, the parks are not a public policy priority and many are located in areas that do not have urban planning mechanisms. Furthermore, there are no incentives to promote the development of sustainable industrial parks, which currently suffer from low industrial diversification and the predominance of services. Effort has therefore been focused on a voluntary model for cleaner production agreements and a standardized strategy for meeting environmental targets.

The country has 131 cleaner production agreements, involving 7,000 companies. These are signed between a sector, company or companies and the state body or bodies responsible for the environment, sanitation, occupational health and safety, energy use and the promotion of production. Their purpose is to apply cleaner

Jorge Morales (left) and Rafael Lorenzini (right)



FIGURE 7
Diagnostic of Sustainable Industrial Zone/Park – CHILE





production through specific measures and targets. The agreements deliver changes in local areas and production sectors, promoting a shift towards a low-carbon economy, with more efficient use of resources and increased capacity to adapt to new environmental conditions. The project activities also aim to incorporate industrial symbiosis as a crosscutting issue in the new agreements that will begin this year. They will also incorporate a system for evaluating the flows of materials and energy, together with the promotion of shared infrastructure as part of the clean production agreements.

The Production Infrastructure Unit acts as the national committee and comprises representatives of the Panamericana Norte Business Circle (CIRPAN), the Sustainability and Climate Change Agency (formerly the National Clean Production Council) and the consultant APLE Gestión Sustentable. The unit has been formed to define the scope of the project and the industrial zoning of sustainable industrial parks, establish the strategy for promoting the project and evaluate progress. The pilot chosen for the project was the Panamericana Norte industrial zone, located in the metropolitan region of Santiago de Chile and home to 26 companies. Particular emphasis was placed on the potential for industrial symbiosis at the park, gathering as much relevant available information and data as possible. The findings include:

- » Companies believe there is a need to set up a body with powers to manage initiatives related to the collective purpose of the industrial park. The lack of such a body reduces the systemic progress of the park, impeding coordination of companies and resulting in a focus on individual action.
- » The general interest in the evaluation contrasted with the possibility of evaluating symbiosis options with specific companies. The problem stems from the difficulty in gathering specific information for this purpose, since companies are reluctant to share information they class as strategic.
- » While the importance of having a brand or recognition for industrial parks that

meet certain sustainability criteria was acknowledged, there needs to be a simple process that can take into account the different business cultures in a park, without disadvantaging companies that are more advanced in this area.

The RECP assessment was carried out for two companies, the first of which sells and services machinery, while the second manufactures dietary supplements and paints. However, the diagnostics were not successful in the country, since the commitment of the companies was relatively weak. Although the companies had high environmental standards, some measures are being overlooked because of a lack of knowledge of the volumes, characteristics and properties of waste produced by other nearby companies, the amounts of water and energy used and the characteristics of liquid waste.

In conclusion, the concept of sustainable industrial parks is of interest in Chile and none of the businesses consulted had reservations regarding its potential application. The country needs to establish and strengthen policies to certify environmental best practices and a common model to promote sustainable industrial parks.

COSTA RICA: Luis Roberto Ramírez, Elisabeth Venegas and Sylvia Aguilar

Costa Rica has 43 industrial parks, 30 of which are registered with the Costa Rican Foreign Trade Agency (PROCOMER). Many are classified as special economic zones, which act as models for local development in the country. Costa Rica has a law on free zones and a sizeable body of environmental legislation governing the various parties involved. The vast majority of the country's industrial parks also have their own initiatives on environmental and social matters or the companies located there promote these issues within and outside the organization.

As part of the project, the national committee for sustainable industrial parks was established in August 2016,

comprising representatives from the Ministry of the Economy, Industry and Trade, the Ministry of Foreign Trade, the Ministry of the Environment and Energy, the Costa Rican Foreign Trade Agency (PROCOMER), the Costa Rican Association of Free Zone Companies (AZOFRAS), the Agency for the Promotion of Foreign Direct Investment in Costa Rica (CINDE) and the Costa Rican Chamber of Industry (CICR).

The committee has met twice so far: once to find out the details of the project and again to discuss the results of the national workshop and the sustainable industrial park method and define the next steps. There was also a national event attended by actors related to industrial parks (the authorities, industrial parks, associations, the finance sector, chambers of commerce, environmental consultants) to discuss the challenges facing sustainable industrial parks in Costa Rica. The workshop revealed the need for a means of recognizing parks that meet sustainability criteria (combined with a clear method). The participants in the workshop also requested a single point of contact and clarity regarding the benefits of sustainable industrial park status.

The Zeta Cartago industrial park, located on the outskirts of San José and home to 50 companies, half of which operate under free zone arrangements, was chosen for implementation of the pilot. Nine

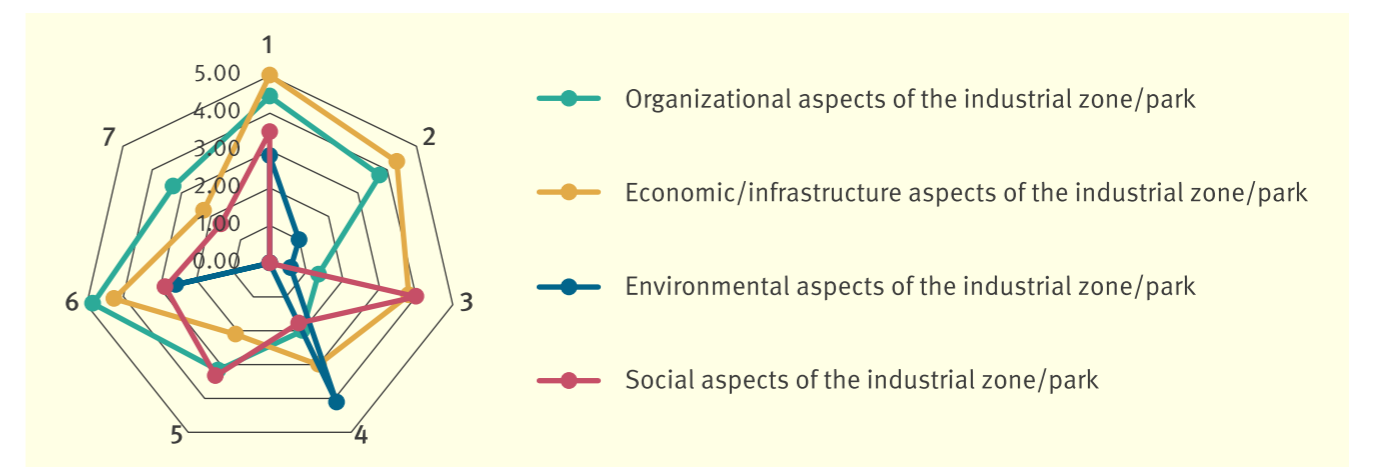
companies, mainly exporters, attended an awareness-raising event organized for companies and capacity was built within the park's management and companies. The project also marked the start of the implementation of two specific initiatives identified in the evaluation: support for the integrated waste management plan and the format of the form used to gather information on the needs and operation of companies in the park. In parallel, the park management has also begun to implement other plans set out in the diagnostic, such as the proof-of-concept project for using solar power for the park's management office and promoting the associated benefits. The conclusions of the evaluation include:

- » The creation of policies and incentives is fundamental for attracting park managers.
- » Although a system to recognize sustainable industrial park status has been proposed, this will only apply at the park level and for companies that pass an independent assessment. The park management should treat companies as black boxes, monitoring their performance without influencing their operation.
- » Training models must be promoted by the government, since it has greater reach. The sharing of experiences should also be encouraged to make further progress in good practices.

Luis Roberto Ramírez (left), Elisabeth Venegas (centre) and Sylvia Aguilar (right)



FIGURE 8
Diagnostic of Sustainable Industrial Zone/Park – COSTA RICA





» If the park management takes the initiative to promote this concept, it must actively involve all companies in the park to ensure that there is significant impact, genuine industrial symbiosis initiatives are analysed and shared resources such as time, money and knowledge are provided.

» Develop software, initially to support monitoring of the implementation of the method and in a second phase to provide a dashboard of savings from its use.

» The adoption of the tool should be promoted and the programme's institutional ties should be strengthened to ensure it survives changes of government.

Two companies were assessed at the selected park, the first in the metal mechanics industry and the second in bread-making (for sale nationally). Both have appointed someone responsible for sustainability but this figure does not have managerial support to implement the proposed measures. The next step involves establishing distinctive branding for industrial parks that meet sustainability requirements (in light of the impossibility of tax benefits). In this respect, the workshop organized by the national committee in January 2017 selected the Esencial Costa Rica brand on account of its international reach and potential to attract foreign investment. A survey has been carried out among industrial parks to evaluate the attractiveness of applying the concepts

of sustainability and the potential licence for the national brand, with all companies showing interest in this status.

EL SALVADOR: Yesenia Ayala and Tomás Alas

El Salvador has 17 free zones, five of which are designed as service parks for exporters and international service providers. The country does not currently have a system for regulating, promoting and incentivizing behaviour in sustainable industrial parks. The main industrial regulatory structure for companies are public/private free zones, or service parks, which are governed, promoted and regulated under legislation for special economic zones.

This project forms part of the remit of the Commission for Sustainable Development, Cleaner Production and Energy Efficiency, which includes representatives from the El Salvador Chamber of Trade and Industry (CCIES), the Office of Innovation and Quality (DICA) of the Ministry of the Economy, the National Centre for Cleaner Production (CNPML), the El Salvador Association of Industry (ASI) and the Ministry of the Economy Production Development Fund (FONDEPRO). The objectives of the project are as follows: find mechanisms to extrapolate the results obtained by the participating companies to other companies in the selected park

and establish that park as a model to be followed; develop cleaner production strategies that can be related to current water initiatives; improve current regulations for the sustainable disposal or processing of electronic and electrical waste (e.g. motors, lighting, sewing machine parts), which currently takes up physical space in industrial zones and could be used for the development of production.

The San Marcos industrial park, located in San Salvador and home to eight companies, was chosen for the pilot. The park has been operating since 1967 and employs 5,200 people, 72 per cent of whom are women (largely assembly work). Its core activity is parts assembly and logistics. The park management controls water, waste collection and the development of common areas but only has control over energy in common areas and lighting, not the energy consumed by companies. Water is extracted from its own well and is pumped to the industrial zones at very low cost. The conclusions of the analysis include:

- » The need to strengthen state bodies for promoting and strengthening the concept of sustainable industrial parks
- » Clarity is also required on the guidelines for sustainable industrial parks and indicators for promoting and extending their benefits to society
- » Environmental modernization activities could be promoted if it were possible to find a national private bank to support environmental sustainability initiatives
- » Internal measures should be proposed to reduce demand for water and the stress caused by effluent
- » It is important to take internal industrial symbiosis measures to reuse plastics in the park's internal plant
- » Measures should be established to improve the park's lighting system by using efficient equipment
- » Measures should also be taken to improve the operating conditions of the equipment in the management area (e.g. changing air-conditioning units and the lighting system)

» A general plan should be established to reduce energy consumption, allowing incentives to be created for companies to deliver a percentage reduction in the electricity they use and incentivizing the use of renewable sources for self-consumption

The diagnostic of the two selected companies was extremely useful since both are involved in the same activity (manufacturing clothing) and have roughly the same number of staff. However, the results show that the average water and energy consumption of the second company is almost double the first, despite having similar production levels. After identifying potential improvements, the funding required for implementation was estimated and funding sources were assessed, both national, such as the Production Development Fund (FONDEPRO) and the El Salvador Development Bank (BANDESAL), and private (banks).

In general terms, the analysis of the current situation shows that trading and assembly make up 80 per cent of production in the country's industrial parks. These are dry processes that do not generate large volumes of waste, meaning the greatest potential lies in energy savings. The goal of the government counterpart for the project is to develop a holistic vision of the regulatory framework for sustainable industrial parks in El Salvador. However, this means backing companies that apply this kind of method. Companies are aware of the competitive advantage but there is no regulatory framework, although work is being carried out to address regulatory gaps and encourage more companies to become involved in the project.

GUATEMALA: Luis Muñoz

The country already receives a 50 per cent contribution from renewable energies, but there are no national strategies linking economic and environmental aspects. There are also no incentives and mechanisms to support the environmental approach, and sustainable industrial parks are not embedded in the country's institutions. In this context, Guatemala is

Yesenia Ayala (left) and Tomás Alas (right)

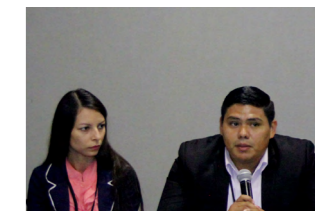


FIGURE 9

Diagnostic of Sustainable Industrial Zone/Park – EL SALVADOR

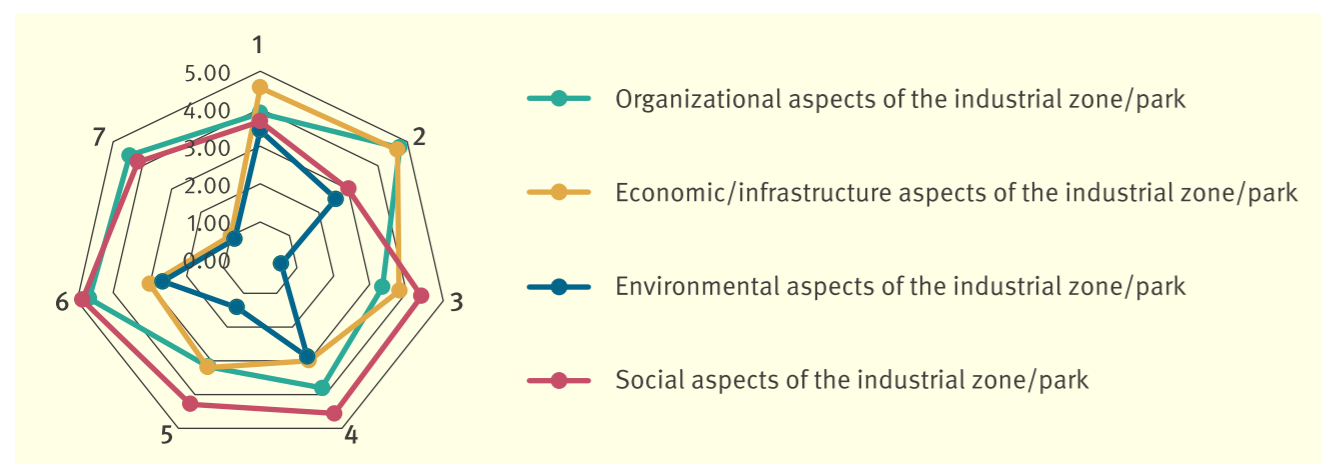
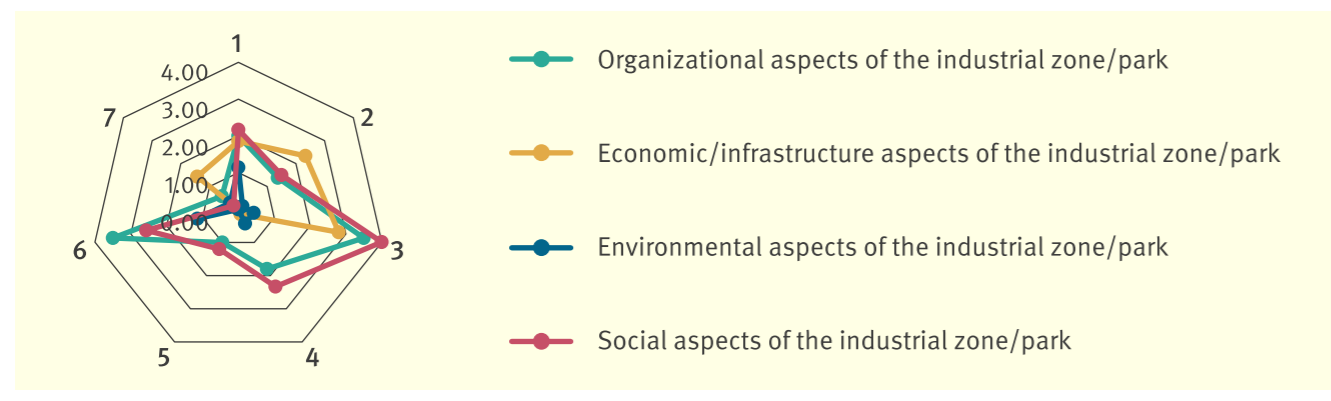




FIGURE 10
Diagnostic of Sustainable Industrial Zone/Park – GUATEMALA



Luis Muñoz



seeking to establish an approach based on government and private incentives and to set up a working group to establish a regulatory framework for sustainable industrial parks. There is also no law on water use and treatment and a lack of coordination for knowledge transfer.

The Low-Emissions Industry Board was selected as the best forum for the national committee. The board is an initiative of the Office of the Undersecretary for Investment and Competition of the Ministry of the Economy, giving it support at the highest levels. It is also closely aligned with the country's economic policy and the national competitiveness and urban agendas. The United States Agency for International Development (USAID) also backs the low-emissions project. The board is formed of public institutions, such as related ministries, councils, secretariats and other relevant actors. The private sector is also represented by various industrial chambers and companies.

The board is firmly established, has been operating for around one year and has made significant progress in developing a low-emissions development policy. It also has excellent records of attendance. The Low-Emissions Industry Board is the ideal platform for the national committee for industrial parks due to the alignment of its actors and its politico-technical structure. The Guatemalan National Competitiveness Programme (PRONACOM) has also raised the issue on the cleaner production coordination committee, led by the Ministry of the Environment.

The initial challenges identified for implementing the project activities in the country are as follows: including all relevant actors, debating the best current platform for industrial parks and the analysis of the actors; aligning current and future agendas in the private and public sector to ensure they include and prioritize the concept of sustainable industrial parks; and facilitating funds and benefits. An effort has been made to identify strategic partners and the concept of sustainable industrial parks has been included in the economic model being promoted in the country in terms of profitability, market access, human capital and the profitability of services.

The ZOLIC trade and industry free zone was chosen for the pilot. This public-private park is located in the Izabal department, 294 km from Guatemala City. The park houses companies engaged in trading, agribusiness, industrial manufacturing, services and the import and distribution of bulk liquids. The biggest opportunities for improvement are economic and environmental, two aspects that are related, since both relate to the services provided by the park and the environmental performance of its operations. An environmental management plan should be designed, with a focus on energy, water and solid waste management for both the park management and its companies' operations. An awareness-raising event was also held in the park, in which seven companies took part and expressed an interest in joining the project. The findings include:

There are no official technical guidelines for developing sustainable industrial parks in the country and, in most parks from which feedback was received as part of the project, sustainability is not on the agenda

- » It is essential to create a structure to facilitate awareness-raising and training for park developers and managers in areas such as sustainability, RECP and competitiveness
- » It is also important to develop technical tools for creating technical standards that can be formally established and promoted by the public sector
- » It is important to develop financial incentives (e.g. investment funds) and non-financial incentives (e.g. local recognition schemes and differentiation systems such as brands and certification) for RECP and sustainable industrial parks

The technical diagnostics for four companies at the ZOLIC park in the fuels, chemicals and agribusiness sectors are currently under preparation.

Guatemala does not have experience of or guidelines for sustainable industrial parks, meaning the outcomes of the project will serve as baseline information. Government counterparts are currently developing a specific line of work for sustainable industrial parks as part of an industrial policy focused on innovation and competitiveness. There are also plans to replicate the pilot experience in two private parks to provide further input for development of the policy.

PANAMA: Leyda Aparicio and Abdiel Gaitán

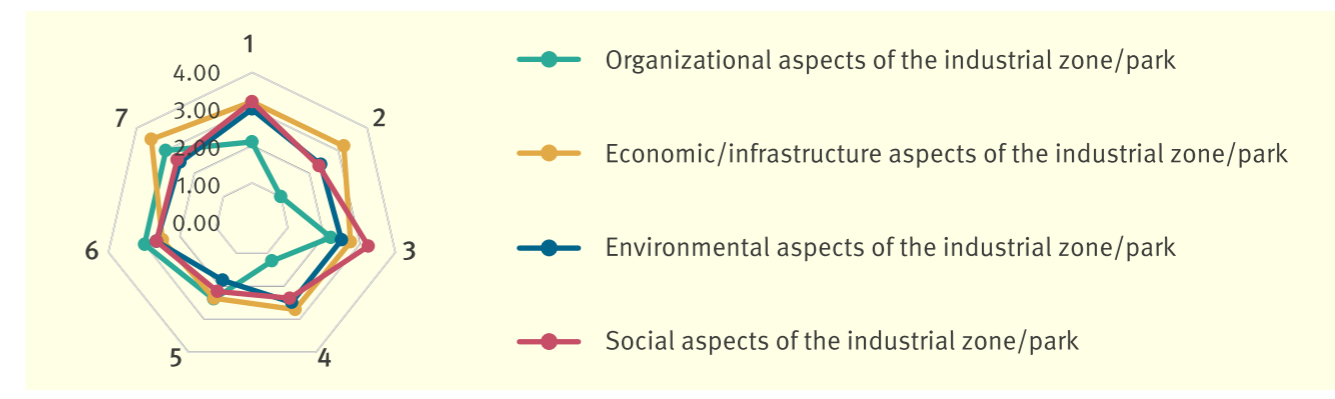
Panama has 60 special economic zones and industrial zones throughout the country. The zones operate in different ways, under different tax regimes and with different levels of institutional maturity. Although these structures allow processing and manufacturing activities, they are nonetheless concentrated in export processing zones and urban industrial zones. In spite of the wealth of legal arrangements and infrastructure governing special economic zones in Panama, the majority lack a crosscutting regulatory framework that considers the environment, eco-efficiency and sustainability across the whole legal and regulatory spectrum. This means it is necessary to urgently develop and adopt regulatory frameworks and implement international standards and pilot projects that promote competitiveness, industrial synergies and the efficient use of resources in industrial or manufacturing areas. Panama has currently ratified the SDGs, creating the potential for special legal-regulatory instruments, such as those for sustainable industrial zones and parks.

The Panama Industrial Eco-Parks Sectoral Committee is part of and operates under the umbrella of the national ISO TC 207 committee for environmental management. The committee meets on a monthly basis to review the regulations being discussed. There is a strategic link between the national committee for sustainable

Leyda Aparicio (left) and Abdiel Gaitán (right)



FIGURE 11
Diagnostic of Sustainable Industrial Zone/Park – PANAMA





industrial parks and the regulatory department of the Ministry of Trade and Industry for compiling the results of the project to develop sustainable industrial parks in Latin America, as well as for producing inputs and analytic data that can be used to develop guidelines for technical standards and guides to converting current local industrial parks and promoting sustainable industrial parks. The committee comprises eight members from the public and private sectors, in addition to accredited independent professionals. Members include the Ministry of Trade and Industry, the Ministry of the Environment, the Ministry of Health, the National Energy Secretariat and the Technology University of Panama.

The Panamá Pacífico special economic zone was chosen for implementation of the pilot. The zone occupies the site of an old American airbase near Panama City and has an area of over 2000 hectares, 39 per cent of which is allocated for green spaces in the park's master plan. It houses over 250 companies and has a residential district with five complexes currently built and occupied, providing 2,000 family homes, 1,000 of which are occupied by the current population of 3,000, with two further residential areas under construction.

Two awareness-raising workshops took place with the park management and it was found that, in spite of numerous initiatives, there are no performance indicators and no monitoring of information to demonstrate the efficacy of the measures that have been implemented.

From the analysis carried out, it should be noted that the park has a recently approved plan for solid waste management that is ready for implementation. One of the best opportunities for adaptation is the liquid waste treatment system, which was built when the park was still an air base and for which a modernization process to double its capacity is now under way. A pilot solar project is also under way and has currently been implemented in five of the administrative buildings. The pilot has generated an average of 27,600 kWh per month and meets 10 per cent of the industrial park's demand for power. The park also has a processing

plant that is almost 100 years old and was designed for much smaller volumes than at present. This means there is potential to improve the management of both solid and liquid waste. The recommendations derived from this analysis include:

- » Implement a social programme to promote staff participation and boost production, as well as strengthen organizational aspects such as the integration of management systems and disseminating the results to internal customers
- » Draw up plans for the prevention of natural risks and disasters, including emergency drills and user training
- » Implement plans to reduce the consumption of drinking water and energy and strengthen plans to harvest rainwater
- » Create plans for managing domestic and industrial solid and liquid waste and implement a system of quantitative records for benchmarking, such as the greenhouse gas (GHG) inventory, energy and water consumption by sector and quantifying solid waste by area of the park

Three companies in the industrial park, operating in the technology, food and chemical sectors, were chosen for the diagnostic. The RECP analysis of the companies is currently under way and the proposal for potential improvements will be produced in the coming months.

As Panama has six legal structures for grouping companies, there is a need for some unification of the legal and policy criteria to facilitate the implementation of projects in this area. This is also a priority for local governments given the land rezoning process taking place in metropolitan districts. The next steps include developing a country proposal as the second phase of the current project, with a view to converting the country's existing industrial parks and zones into sustainable industrial parks, and developing a tool for their certification. To promote a regulatory structure, it is proposed to compile an inventory of regulations that apply to industrial parks, promote a legal-administrative framework for industrial parks that have formed organically and develop legislation for sustainable industrial parks. It is also planned to

create a non-fiscal incentive for converting parks to sustainable industrial parks (recognition/certification scheme), based on the recently approved law for promoting industrial growth, which establishes incentives for national industry.

PARAGUAY: Victor Leguizamón and Sergio Oddone

As many industries in Paraguay are not located in the existing industrial parks, the country would like to encourage them to relocate to free up space at their current sites. Paraguay has a law regulating industrial parks, which governs their creation, development, construction and operation and ensures they are environmentally friendly, as well as promoting their establishment and development through incentives and other benefits. However, application of the law has been limited due to poor institutional communication and the need to strengthen dialogue between the various national actors.

The Tosa Industrial Park was chosen for the pilot. Located on the outskirts of Asunción, Tosa began activities in 2013 and is currently under development. The park occupies a site of 1,300 hectares and houses eight companies. It is a model project for planning and land usage and even has plans for residential areas in the future. The conclusions of the analysis include:

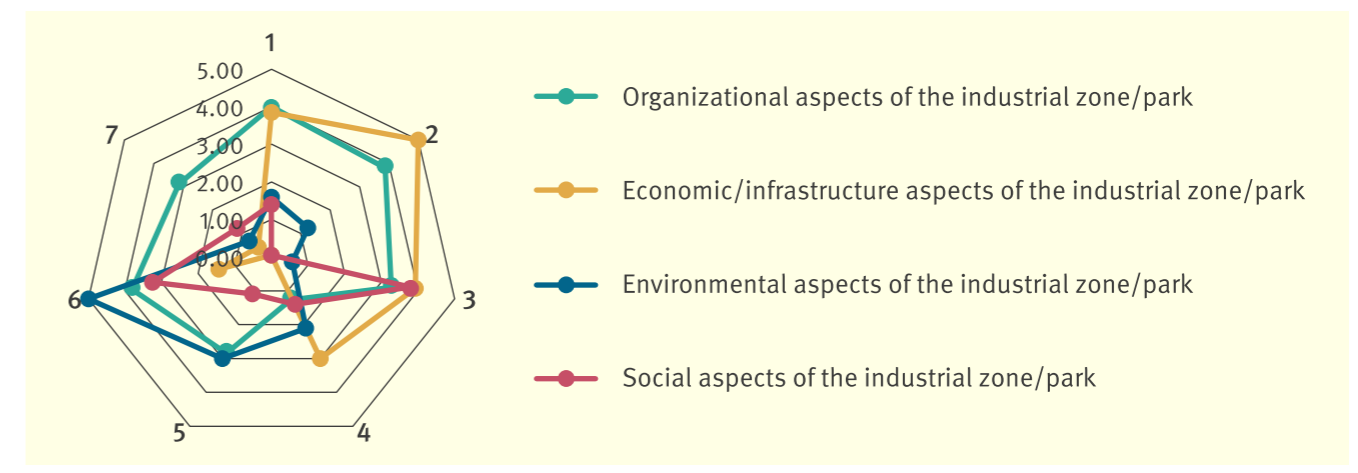
- » Tools should be applied regionally, in line with each country's circumstances and features
- » Work should take place in two areas (policy and legal requirements) and parks should be encouraged to adopt the model voluntarily
- » Actors generally have limited information on the economic and environmental benefits of applying sustainability measures
- » At present, there are not enough incentives for promoting and applying RECP and sustainability tools and there is a lack of attractive funding programmes for investment in projects of this nature
- » Platforms for dialogue between the different public and private actors should be reinforced
- » Opportunities can be identified for collaboration between companies in the same industrial park through coordination and promotion by its management

Two companies in the park were chosen for the diagnostic, one from the logistics sector and a plastics exporter. Between the two companies, 48 RECP measures were identified in areas such as saving materials, reducing chemical products and waste management. Three technical, economic and environmental feasibility studies were produced for the selected opportunities.

Victor Leguizamón (left) and Sergio Oddone (right)



FIGURE 12 Diagnostic of Sustainable Industrial Zone/Park – PARAGUAY



CHAPTER 4

PRESENTATION AND DISCUSSION OF THE GUIDE FOR THE DEVELOPMENT OF SUSTAINABLE INDUSTRIAL PARKS



Rafael Lorenzini, the technical representative for Chile, presented the guide for the conversion of sustainable industrial parks. The guide was produced using international benchmarking based on the analysis of more than a dozen documents on the topic. It sought to include tools from various sources for RECP, sustainability and industrial symbiosis and incorporate the most relevant aspects for the conversion of industrial parks into sustainable industrial parks.

The document produced by UNIDO aims to guide the process of conversion into sustainable industrial parks, with an emphasis on parks that already have some kind of management body. For parks that do not, it will be necessary to identify a lead body for the process to guide the evaluation process and development plan. The guide includes a diagnostic of the activities of the park/zone management in its role of guiding the development of conditions that favour projects and initiatives leading to sustainable development. Production and service companies in a specific zone/park should also be able to collaborate with each other as part of a strategy to ensure the efficient use of resources and apply the cleaner production strategy to capitalize on business opportunities and the economic, environmental and social benefits, both collectively and individually. Even if the objective is collective, the proposed measures must be of benefit to individual companies to secure their interest and commitment. The benefits obtained by applying the

sustainable industrial park conversion method in the document include:

1. Facilitating collaborative work by the companies present in industrial parks
2. Promoting and improving communication between companies and their surrounding areas
3. More opportunities for business networks through the collective management of services
4. Improved image of the park/zone as a production/service unit that generates economic development and social benefits
5. Reducing the external dependence of the territorial system through the collective management of supplies
6. Boosting the local economy, improving conditions in the community and creating a healthy and clean environment
7. Improved environmental performance for the group of companies, reducing potential conflicts with regulators and the community
8. The efficient use of raw materials and energy
9. Improved productivity and competitiveness in companies
10. Conditions promoting innovation and quality

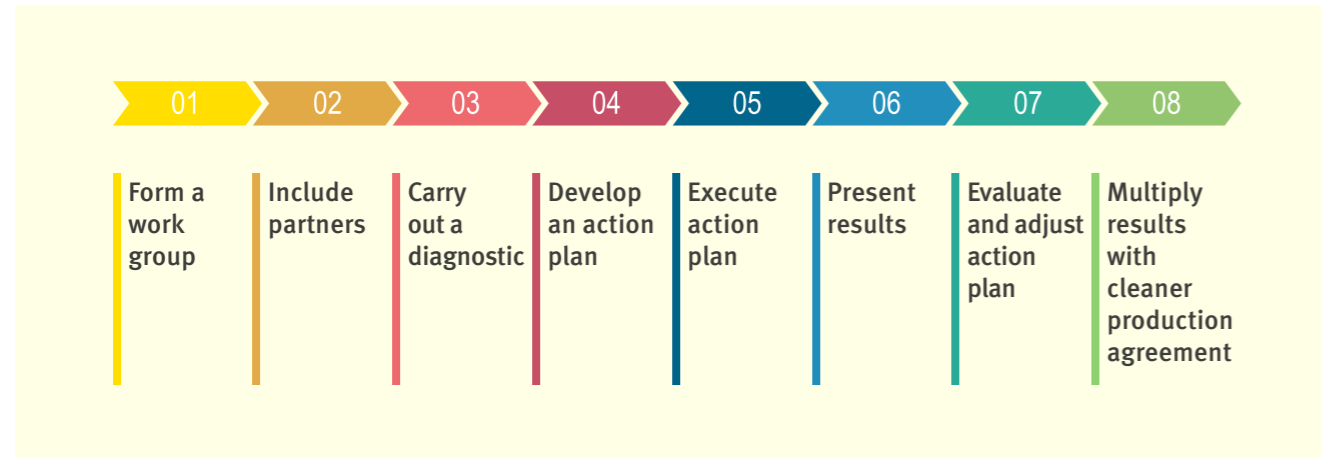
Rafael Lorenzini, Managing Director of APLE Gestión Sustentable



The document that has been distributed contains a step-by-step procedure for converting an industrial park/zone into a sustainable industrial park/zone and proposes tools and instruments for this purpose, such as questionnaires, forms and flow charts.

FIGURE 13

Conversion step-by-step



After the presentation, the attendees were split into four groups to discuss and propose improvements to the guide produced by UNIDO. The following questions were asked:

» **What are the strengths of the guide's form and content?**

The participants found the document to be well structured, with a sequence of steps that can be easily adopted. They also mentioned the support tools for carrying out the diagnostic of the park and working with companies, noting the broad range of applications, regardless of the park concerned. Cleaner production is the key but this must be achieved by integrating social aspects that allow the park to create employment, with an emphasis on increasing productivity to make the economic, social and environmental benefits possible.

» **What are the weaknesses? What recommendations should be made?**

The current guide does not include awareness-raising, above all in the public sector, and there is no glossary, despite the fact that the concepts are not general knowledge. Participants also noted the need to strengthen the institutional grounding of the programme to ensure the measures

survive changes of government. A chapter for politicians could be included for this purpose. Some participants mentioned the need to expand the scope and indicators at the company level, since only RECP aspects are considered at present. It was noted that cleaner production agreements, which are proposed as a possible tool, may not be applicable in all countries.

» **What is the best definition of a sustainable industrial park?**

The participants proposed minor changes to the current definition. The new definition is: "a group of production and/or service companies located in a specific area that work together under a strategy aimed at delivering economic, environmental and social benefits, taking advantage of business opportunities, both collectively and individually, and including the concept of sustainable development in the whole park and its companies."

» **What priorities does the guide need to highlight for conversions?**

Participants drew attention to the need to emphasize the economic, social and environmental benefits of applying the principles of sustainable industrial parks and include other concepts such

as the circular economy to broaden its scope. They also suggested including an introduction to the method and tools and giving them a more strategic focus, involving more actors. In light of the initial experiences as part of the project, it would be useful to include simple practical examples and success stories to aid understanding. Participants suggested including a list of organizations involved in each of the countries so that recipients can find out about bodies that could support them in the future.

» **How can the commitment of local public institutions be secured?**

Working with public institutions requires appropriation of and commitment to this policy by the state. This commitment must be made by the ministry or national body responsible for the development of production in the individual countries and must commit the other relevant ministries and actors to the strategy. This will help raise awareness and build trust among companies when it comes to implementing projects in this field. Voluntary work supported by the state will make it possible to formalize interaction between the various actors.

» **What can national/local government feasibly offer in the short/medium/long term?**

First and foremost, collaboration, provided the state is willing to work with the private sector. It is necessary to show leadership and a proactive attitude in producing

financial mechanisms to encourage change, such as access to microcredit and co-financing. The authorities must promote the economic benefits of this type of initiative, such as eco-taxes, efficient land usage, economies of scale, cost reductions and economic impact. In the long term, structural regulatory issues need to be solved and a certification process must be developed. The latter should be straightforward and easily accessible to companies and requires a discussion of whether the park or its companies should be certified.

» **What is the best way to ensure the commitment of companies to the challenges of sustainable industrial parks? How should companies and park management be approached to convince them?**

There are numerous incentives, including recognition, tax benefits and a single point of contact for export processing that could be included in public policy as part of the advantages of being located in a sustainable industrial park. It is also important to ensure the dissemination of social, economic and environmental benefits and success stories to build trust. In terms of public policy, the debate should take place at the macro level, with a focus on productivity and competitiveness, while at company level the focus should be more on the direct benefits associated with reducing costs and improving productivity.



CHAPTER 5



DEVELOPING THE STRUCTURE OF THE LOGICAL FRAMEWORK FOR THE SECOND PHASE OF THE PROJECT



Alejandro Rivera presented the **Regional challenges and approaches for the second phase of the project: Sustainable industrial zones and parks in LAC.**

Rivera remarked that at the end of April this year, as part of the Economic Commission for Latin America and the Caribbean (ECLAC) forum, a meeting was held in Mexico with senior Latin American representatives, at which the funding challenges involved in meeting the SDGs in the region were analysed. In addition to financial speculation and social inequality, the challenges include the

fact that 1.5 per cent of the population of LAC migrated to another country in 2015. Furthermore, the region's share of global exports in the last 15 years was only 6 per cent. Just 8.4 per cent of GHG emissions are generated in LAC, although this figure should not be perceived as low but rather as an opportunity to meet the target set.

The estimated funding required to meet the SDGs for energy efficiency is between US\$500 billion and \$700 billion, making mobilizing resources in the region a major challenge, especially since its countries are classed as middle-income.

Alejandro Rivera, Manager of the policy component of the UNIDO regional project



FIGURE 14

The 2030 Agenda is needed to...





Similarly, official development aid has with studies by the Organization for Security and Co-operation in Europe (OSCE) even estimating the region's average to be below 0.2 per cent of gross national income for 2015. This means there is a need to be more innovative and identify mechanisms to help mobilize the resources needed.

Applying the principles of the circular economy can deliver economic benefits and growth, together with cost savings for materials, create employment in new activities such as recycling and promote innovation through the development of new technologies, services and products. In terms of environmental benefits, it helps to reduce CO₂ emissions and the consumption of raw materials, improving productivity and resilience to climate change.

The transition to a low- or zero-carbon economy as a goal for the region as a whole would contribute to regional integration by establishing networks for sharing knowledge, technology, services, energy and food security and benefits for the community. GHG emissions in the region are low compared to the rest of the world, making achieving this goal feasible. A document published by the United Nations Environment Programme (UNEP) analyses the key aspects of decarbonizing the LAC economy:

- » Decarbonization of the electricity sector

- » Large-scale electrification of the transport sector
- » Transformation of land-use from carbon source to carbon sink
- » Decarbonization of industry

The industries that produce the most carbon are iron and steel, chemicals, oil, food and drink, and paper and pulp. The potential for reductions in emissions from implementing the improvements identified for the sector is extremely high, ranging from 60 per cent in the iron industry to 98 per cent in the pulp and paper industry.

These are the most CO₂-intensive industries, making raising their awareness particularly important for increasing real impact and ensuring our presence in government mechanisms for addressing these issues.

In the above context, two components have been proposed for the second phase of the regional project, scheduled to begin in 2018. In terms of policy, we believe it is important to strengthen the network of existing parks, which have considerable potential both nationally and regionally. The activities for this second phase include:

1. Coordinating and strengthening the network created in the first phase at the government and regional levels, possibly incorporating other countries in the region that are interested in participating

2. Developing a new platform for managing knowledge
3. Organizing high-level regional conferences, provisionally in the context of the ECLAC SDG forum, the Community of Latin American and Caribbean States (CELAC), Central American Integration System and MERCOSUR summit of ministers of industry to strengthen regional integration and national advocacy of sustainable industrial zones/parks
4. Supporting updates to strategies, policies and regulatory frameworks and the development of financial and tax incentives for implementing the approach, both nationally and regionally
5. Fostering partnerships and promoting funding mechanisms (e.g. public and private investment, green credit, international development institutions).

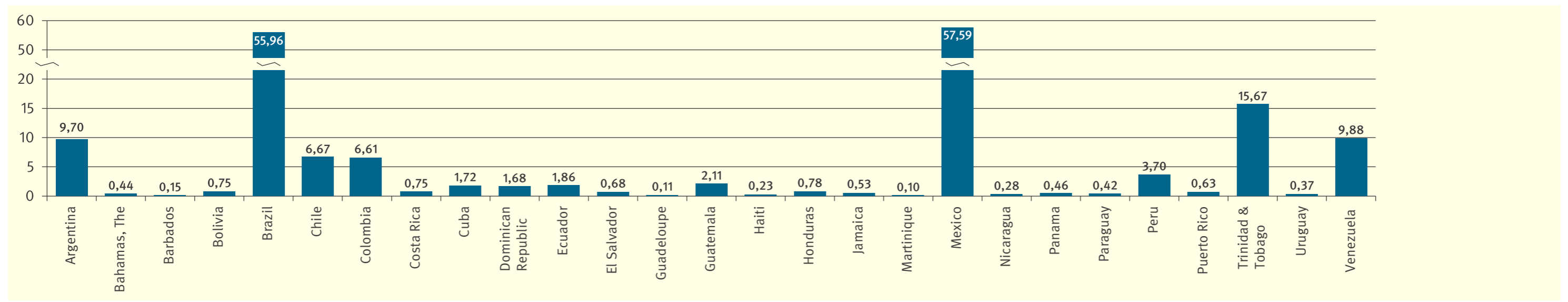
The second component of the regional project will systematize the work carried out so far and take it to the next level. This will involve studying the country's real potential if achievements in one park are scaled up. The activities proposed for the second component include:

1. Systematizing and expanding the implementation of the approach and the opportunities identified in the industrial parks where work has been carried out so far

2. Gathering information/carrying out a diagnostic of the potential of sustainable industrial zones/parks at the national level, with a new focus on strategic sectors with the potential for high economic and environmental impact
3. Undertaking larger-scale evaluations at selected sustainable industrial zones/parks (industrial symbiosis, recycling, renewable energies, energy efficiency, carbon capture and storage technologies)
4. Updating the technical guide for applying the approach in sustainable industrial zones/parks
5. Supporting the development of national and regional certification schemes in this area

The proposal expands the concept of an industrial park to cover areas and zones, making it applicable to more cases and more intensive industries, helping increase impact and the potential for industrial symbioses. While coordination among these actors may be more complicated, UNIDO is proposing this more ambitious vision, which will allow the inclusion of sectors with greater impact to facilitate access to more resources and deliver a real focus on the circular economy.

FIGURE 15
Greenhouse gas emissions from industrial processes in selected countries in LAC (MtCO₂e)



CHAPTER 6



CONCLUSIONS

All participants in the EGM, both government and technical, reaffirmed their countries' commitment to the regional project. The main results of the meeting are as follows:

- » National representatives emphasized the need to strengthen regional cooperation to promote a more integrated and sustainable approach in planning, developing and managing industrial zones and parks.
- » The participants also stressed the need for the project to continue supporting the development of public policy to ensure the long-term sustainability of actions. In this respect, achievements in the individual countries so far should serve as inputs to the second phase of the project, showing the potential effectiveness and results of implementing this type of initiative.
- » All participants expressed their interest in continuing efforts to promote sustainable industrial zones and parks in the region and transform the pilots in individual countries into national policies to encourage the large-scale development of sustainable industrial zones and parks with an emphasis on low-carbon industry.

- » Agreement was reached to promote special recognition systems for industrial parks that meet sustainability criteria. International consensus can help establish a framework to be adopted and institutionalized by individual countries based on their specific needs and potential.
- » To validate the structure of the logical framework agreed for the second phase of the project, a final workshop for the first phase will take place in Panama, attended by ministers in the region responsible for productivity and governmental and technical representatives from the individual countries. The workshop will also strengthen the regional exchange network, see the development of continuity action plans for the countries and the region and present the regional proposal to the representatives of potential funding sources for the second phase.



ANNEXES

National committees by country

Country	Date of establishment	National actors
Argentina	August 2016	<ul style="list-style-type: none"> » Ministry of Production » Technology Centre for Sustainability » National Industrial Technology Institute (INTI) » Ministry of Energy and Mining » National Technology University » Provincial and municipal governments
Bolivia	Not officially established	Office of the Undersecretary of Medium- and Large-Scale Industrial Production via the Production Infrastructure Unit
Chile	Existing body	<ul style="list-style-type: none"> » Panamericana Norte Business Circle (CIRPAN) » Sustainability and Climate Change Agency (formerly the National Clean Production Council) » APLE Gestión Sustentable
Costa Rica	October 2016	<ul style="list-style-type: none"> » Ministry of the Economy, Industry and Trade » Ministry of Foreign Trade » Ministry of the Environment and Energy » Costa Rican Foreign Trade Agency (PROCOMER) » Costa Rican Association of Free Zone Companies (AZOFRAS) » Agency for the Promotion of Foreign Direct Investment in Costa Rica (CINDE) » Costa Rican Chamber of Industry (CICR)
El Salvador	Existing body (Commission for Sustainable Development, Cleaner Production and Energy Efficiency)	<ul style="list-style-type: none"> » El Salvador Chamber of Trade and Industry (CCIES) » Office of Innovation and Quality (DICA) » National Centre for Cleaner Production (CNPML) » El Salvador Association of Industry (ASI) » El Salvador Plastics Industry Association » National Agriculture College » Ministry of the Environment and Natural Resources » Export and Investment Agency (PROESA) » Don Bosco University » Production Development Fund (FONDEPRO), Ministry of the Economy » National Energy Council
Guatemala	Existing body (Low-Emissions Industry Board)	<ul style="list-style-type: none"> » Office of the Undersecretary of Investment and Competition, Ministry of the Economy » Ministry of the Environment and Natural Resources » Secretariat of Planning and Programming of the Presidency
Panama	July 2016	<ul style="list-style-type: none"> » Ministry of Trade and Industry » Ministry of the Environment » Ministry of Health » National Energy Secretariat » Technology University of Panama » Centre for Cleaner Production » Panamá Pacífico Business Association » Industrial Union of Panama
Paraguay	Not officially established	Ministry of Industry and Trade

List of participants



UNIDO Participants			
Department	Position	Name	
Department of the Environment	Industrial Development Officer	Petra Schwager	
	RECP Technical Adviser for LAC	César Barahona	
	Programme Coordination Consultant	Ana Acuña	
LAC Division	LAC Programme Officer	Alejandro Rivera	
	International Development Expert	Rebeca Gallardo	

Country participants			
	Country	Name	Organization
Argentina	Focal point	Juan José Galeano	National Office for the Sustainable Development of Industry (Ministry of Production)
	Technical Coordinator	Ariel Gustavo Carbajal	Technology Centre for Sustainability
Bolivia	Focal point	Roberto Carlos Tapia	Office of the Undersecretary of Medium- and Large-Scale Industrial Production
	Technical Coordinator	Patricia Carola Durán	Centre for the Promotion of Sustainable Technologies
Chile	Focal point	Jorge Morales	Sustainability and Climate Change Agency
	Technical Coordinator	Rafael Gustavo Lorenzini	APLE Gestión Sustentable
Costa Rica	Focal point	Luis Roberto Ramírez	Ministry of the Economy, Industry and Trade
	Technical Coordinator	Sylvia Elena Aguilar Elisabeth Venegas	Costa Rican Technology and Information Management Centre Foundation (CEGESTI)
El Salvador	Focal point	Yesenia Ayala	Sectoral Technician, Ministry of the Economy
	Technical Coordinator	Tomás Alas	National Centre for Cleaner Production Foundation





Country participants

Country participants			
Guatemala	Technical Coordinator	Luis Mariano Muñoz	National Centre for Cleaner Production Foundation
Panama	Focal point	Leyda Yamilett Aparicio	Directorate-General of Industry, Ministry of Trade and Industry
	Technical Coordinator	Abdiel Gaitán	National Centre for Cleaner Production
Paraguay	Focal point	Victor Manuel Leguizamón	Ministry of Industry and Trade
	Technical Coordinator	Victor Leguizamón and Sergio Oddone	Eco-Efficiency Centre (CECOEF)
Spain	Senior Sustainability Expert	Luis Sanchez	Eptisa (Tecnalia)
	Industrial Environmental Director	José Miguel Benavente	Eptisa (Tecnalia)
Peru	Undersecretary of Environmental Management	Marcos Alegre Chang	Ministry of the Environment
	Adviser to Undersecretary of Micro and Small Enterprises and Industry	Jusei Bueon	PRODUCE
	Specialist	José Gracia Calderon	PRODUCE
	Executive Director	Ana Terrazos	Centre for Eco-Efficiency and Social Responsibility (CER)
	CER President	Maricé Salvador	Centre for Eco-Efficiency and Social Responsibility (CER)
Rosana Pasoni		Centre for Eco-Efficiency and Social Responsibility (CER)	

Contact list

The contacts for the organizations in the eight countries involved in producing this guide are listed below:

Country	Name	Representing
Argentina	Juan Jose Galeano	Government representative at Expert Group Meeting
	Ariel Carbajal	Sustainability Technology Centre (CTS) – National representative of UNIDO–UNEP Global RECPnet
Bolivia	Ximena Rico	Government representative at Expert Group Meeting
	Patricia Duran	Centre for the Promotion of Sustainable Technology (CPTS) – National representative of UNIDO–UNEP Global RECPnet
Chile	Juan Ladrón de Guevara	Government representative at Expert Group Meeting
	Rafael Lorenzini	APLE Gestión Sustentable – National representative of UNIDO–UNEP Global RECPnet
Costa Rica	Luis Ramírez	Government representative at Expert Group Meeting
	Elizabeth Vanegas	Costa Rican Technology and Information Management Centre Foundation (CEGESTI) – National representative of UNIDO–UNEP Global RECPnet
	Sylvia Aguilar	Costa Rican Technology and Information Management Centre Foundation (CEGESTI) – National representative of UNIDO–UNEP Global RECPnet
El Salvador	Verónica López	Government representative at Expert Group Meeting
	Yolanda Salazar	National Centre for Cleaner Production (CNPML) – National representative of UNIDO–UNEP Global RECPnet
Guatemala	Ana Calderón	Government representative at Expert Group Meeting
	Luis Muñoz	Guatemala Centre for Cleaner Production (CGPL) – National representative of UNIDO–UNEP Global RECPnet
Panama	Leyda Aparicio	Government representative at Expert Group Meeting
	Alfredo Du Bois	National Centre for Cleaner Production (CNPML) – National representative of UNIDO–UNEP Global RECPnet
Paraguay	Víctor Leguizamón	Government representative at Expert Group Meeting
	Sergio Oddone	National representative of UNIDO–UNEP Global RECPnet
Peru	Jusei Joel Bueno	Government representative at Expert Group Meeting
	Maricé Salvador	Grupo GEA – National representative of UNIDO–UNEP Global RECPnet



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**UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION**

Vienna International Centre · P.O. Box 300 · 1400 Vienna · Austria
Tel.: (+43-1) 26026-0 · environment@unido.org
www.unido.org

C.Chanduvi-Suarez@unido.org
Chief, Regional Division - Latin America and the Caribbean

