



**PACIFIC ALLIANCE
EFE PROGRAM**

Report

May 2022

Intersectoral Forum on Environmental Sustainability in the Extractive Sector: Best Practices and Policies from the Pacific Alliance and Canada

SUSTAINABLE DEVELOPMENT AND SKILLS FOR EMPLOYMENT IN THE
EXTRACTIVE SECTOR OF THE PACIFIC ALLIANCE





The Pacific Alliance Education for Employment Program (PA-EFE) is a seven-year (2016-2023) regional program funded by the Government of Canada (Global Affairs Canada) and is implemented by Colleges and Institutes Canada (CICan).

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Foreword - Intersectoral Forum on Environmental Sustainability in the Extractive Sector: Best Practices and Policies from the Pacific Alliance and Canada.

Key to supporting countries' economic development is the management of natural resources, as these provide the inputs needed for production processes. However, natural resources are finite, and their extraction requires operations that potentially affect the environment. The growing extractive field contributes significantly to the development of the economies of the countries that make up the Pacific Alliance, which even depend on this industry to some extent, creating pressure on natural resources and environmental quality.

Against this backdrop, the Pacific Alliance is committed to promoting green growth as a necessary alternative to achieve economic and social development, with a focus on the sustainable use of natural resources. The countries that make up the Pacific Alliance have stated their intention to continue promoting sustainable and inclusive development in the region, helping to meet the Sustainable Development Goals of the 2030 Agenda, in line with the Pacific Alliance's Strategic Vision for 2030.

Accordingly, the Pacific Alliance Technical Group on Environment and Green Growth (Spanish acronym: GTMACV) helped design and develop the "Intersectoral Forum on Environmental Sustainability in the Pacific Alliance and Canada: Best Practices and Policies in the Extractive Field," organized by Colleges and Institutes Canada (CICan), as part of the Pacific Alliance Education for Employment Program (PA-EFE), which is funded by the Canadian government, to whom we are grateful.

The Forum gave experts and government authorities from the four Pacific Alliance countries and Canada a chance to discuss and exchange on relevant issues related to policies, experiences, and environmental best practices in the extractive field—with one of the main issues being the sustainable management of plastics. In this way, the Forum created an important space for international dialogue on sustainable and inclusive development in the extractive field among different players from the public and private sector and civil society, resulting in valuable contributions, proposals, and reflections being made by participants, as well as the identification of possible work streams in the area of environmental sustainability in the region.

**The Environment and Green Growth
Technical Group (GTMACV)**
Chile-Colombia-Mexico-Peru
Coordinador Luis Ledesma Goyzueta



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Initialisms and Acronyms

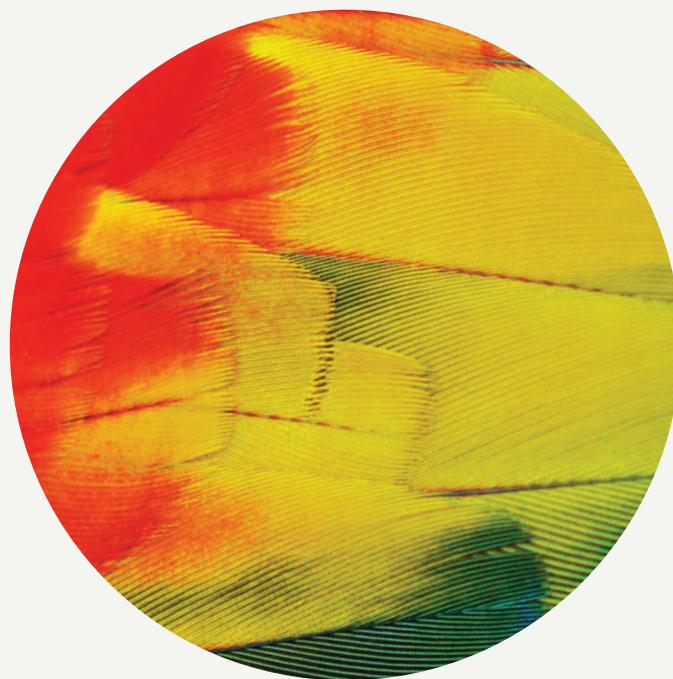
Initialisms and acronyms that will be used in the report. Below is an example of this section.

CICan	Colleges and Institutes Canada
CONAGUA	National Water Commission of Mexico
CTRI	Industrial Waste Technology Centre
EFE	Education for Employment
GTMACV	Environment and Green Growth Technical Group of the Pacific Alliance
IPCC	Intergovernmental Panel on Climate Change
OAS	Organization of American States, Sustainable Development Department
PA	Pacific Alliance
PNM 2050	Chile's National Mining Policy 2050
SEMARNAT	Mexican Ministry of the Environment and Natural Resources
SEP	Mexican Ministry of Public Education
SWAP	Permuta Financiera
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change

Intersectoral Forum on Environmental Sustainability in the Extractive Sector

**Best Practices and Policies
from the Pacific Alliance and Canada**

Introduction



The fourth and final thematic forum of the Pacific Alliance Education for Employment Program (PA-EFE), “**Environmental Sustainability in the Pacific Alliance and Canada: Best Practices and Policies in the Extractive Sector,**” funded by Global Affairs Canada, took place over four virtual sessions, on October 28, and November 4, 11, and 18, 2021, with over 500 participants on international panels composed of high-level experts and international representatives from Chile, Colombia, Mexico, Peru, and Canada, where issues of interest were discussed among the governments to ensure alignment with the environmental sustainability goals of the United Nations Sustainable Development Goals 2030 Agenda and directly respond to the current and future priorities of the Pacific Alliance (PA) in Environmental Sustainability.

This forum reflected the importance of the environment for attendees, focusing in the first three sessions on exchanging best practices, policies, innovative guidelines, and experiences among the PA countries and Canada. The first three webinars delved more deeply into topics related to actions to **reduce environmental impact, develop human capital with an environmental perspective, and create consultative processes and recognition systems for good environmental management.** The fourth and final webinar was participatory and interactive, directed at national stakeholders in the public and private sector and civil society, and institutional executives from the four PA countries and Canada. Webinar participants worked in geographic subgroups so they could exchange recommendations for a practical and sustainable implementation of the ideas expressed in the previous webinars.

This report summarizes the best practices, policies, and guidelines shared by the experts from the four PA countries and Canada in the first webinars, as well as the key information, lessons, and knowledge shared and exchanged by forum work session attendees in the final webinar.

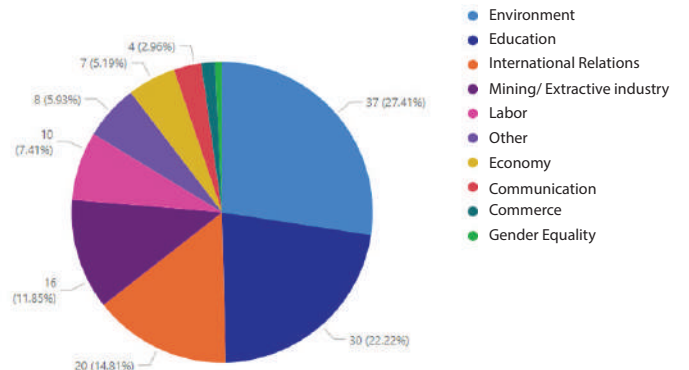
We believe that this report will provide useful tools for recognizing the relevance of environmental sustainability from the multiple perspectives of the actors involved in environmental stewardship, the government and the private sector, civil society and the educational sphere for the design of public policies, environmental management and certification, as well as timely actions and the best practices identified in the roundtables, such as the “**incorporation of green energy in productive processes**” and “**establishment of criteria measurement protocols and indicators for communities, the environment, and climate change,**” to name a few. These actions provide concrete answers to reduce environmental impacts in order to aid environmental sustainability as a whole in the four PA countries and Canada.

The Conclusions and Next Steps for the Forum are in the **summary of best practices and policies identified** throughout the forum, as are the results of the dialogue between the institutions and people involved in the work sessions.



The **Intersectoral Forum on Environmental Sustainability in the Extractive Sector**: Best Practices and Policies from the Pacific Alliance and Canada brought together in the end **521 participants**, mainly from Chili, Colombia, Mexico, Peru, and Canada.

The civil servants and the representatives of civil society and industry that attended the Forum were from **various areas of work**.






Intersectoral Forum on Environmental Sustainability in the Extractive Sector



**Best Practices and Policies
from the Pacific Alliance and Canada**

A. Actions to Reduce Environmental Impact



Before the presentations began, forum participants heard welcome remarks from **Michael Grant**  **Canada**, **Assistant Deputy Minister for the Americas, Global Affairs Canada**, who acknowledged CICan's efforts in organizing the forum, and the speakers' accomplishments, while also offering a brief history of the collaboration between Canada and the PA that enabled cooperation projects to be developed, such as the Education for Employment Program in the Pacific Alliance, a program implemented by CICan that promotes opportunities for young people and men and women, and analyzes the industry's best practices and policies. He stressed that the forum is an opportunity where dialogue among stakeholders will come from different perspectives on sustainable management, human capital development, and environmental impact reduction. He concluded by inviting the participants to apply the tools provided by the forum and share best practices and policies in environmental management.

Denise Amyot  **President and CEO of CICan** , then made opening remarks, thanking the authorities present, experts, panelists, and participants from Chile, Colombia, Mexico, Peru, and other countries, and acknowledged the huge effort required to organize this event, and PA members' excellent collaboration from the start to make it a successful program.

 **Edgar Blanco Rand, Deputy Minister of Mines in Chile** , followed Michael Grant and Denise Amyot's remarks with an introduction to the webinar. He stressed that **“protecting the environment is a priority for all PA countries, and only by reducing environmental impacts can we achieve sustainable development and growth for our countries.”** He referenced the [“Role of Critical Minerals in Clean Energy Transitions,”](#) a report from the International Energy Agency that highlights the importance of governments in creating actions to guarantee a reliable, sustainable supply of the elements necessary for energy transitions, such as the use of unconventional technologies to meet established pledges. He also stated that we need projects with high standards and no major environmental impact to obtain an optimal supply of minerals to fight climate change.

Blanco Rand noted that in its national mining policy, Chile set out fundamental goals for 2050 as well as targets in conjunction with regional communities and mining producers, with the environment as the main focus. The policy discusses the development of sustainable mining and includes established targets.

Blanco Rand underlined the importance of this forum in this regard, since it brings the perspective and knowledge of other PA mining producers who are interested in improving their processes with the environment in mind to contribute to green mining. In closing he emphasized that the commitment to sustainable development and the fight against climate change is one that we must all make for a better future.

Participants in this first webinar session represented government agencies, companies, and civil society in the PA countries.

They presented topics related to environmental impact reduction actions that are being implemented in the extractive industry as well as in governments, and developments within higher technical education institutes.

The following five panelists took part in this webinar ([see panelist biographies](#)):

Roxana Yanet Díaz Vega: Civil Society Independent Consultant in Peru


Diego Grajales: Climate Change Coordinator in the Ministry of Mines and Energy of Colombia

Jorge Sanhueza Urzúa: Sustainable Development Manager for the Chilean National Copper Corporation (Codelco)

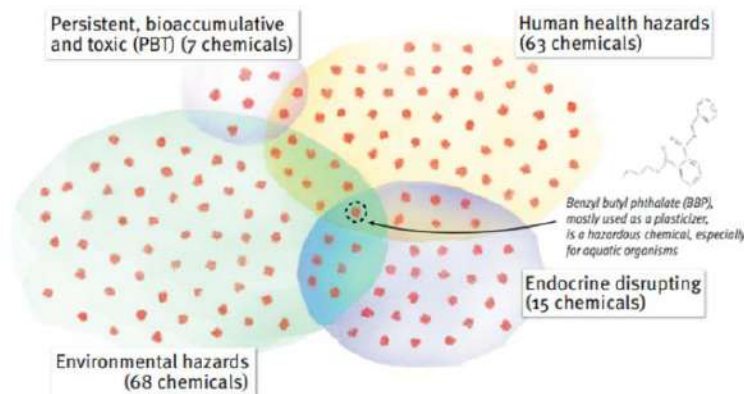
Pierre Cartier: Forest Engineer, Professor at Cégep Abitibi-Témiscamingue, and Research Professional at the University of Quebec in Abitibi-Témiscamingue (UQAT), Canada

Rodrigo Murillo Fernández: Assistant Manager of Reservoir Security at the National Water Commission of Mexico (CONAGUA)

A1. Sustainable management of plastics: regulation, best practices, and public policies

Roxana Yanet Díaz Vega is a Civil Society Independent Consultant with expertise in the circular economy, environmental management, political processes, sustainable economic development, and environmental challenges in Peru. In her [talk](#) , she explained why it is important to regulate the use of plastics, and stressed that the circular economy model should not be confused with the recycling process.

Díaz Vega's presentation outlined the issues surrounding the increase in plastic production and its inadequate final disposal. Sixty per cent of waste is dumped into landfills or directly into the environment.



Source: Groh et al. (2018), Illustration by GRID-Arendal (2020).

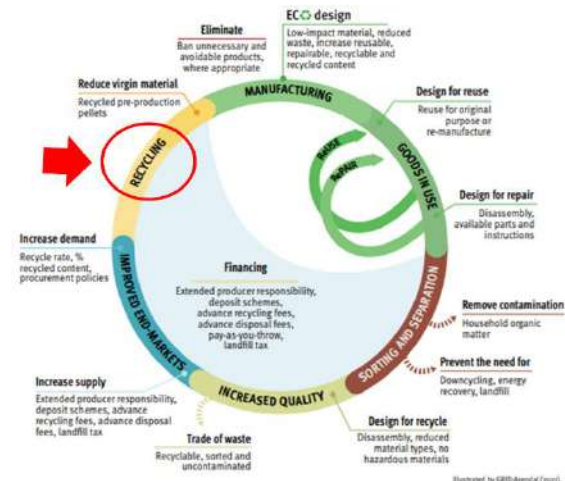
She added that there are hazardous chemicals in plastics, making the use of this material problematic not only for the environment, but also for health. Because it is disposed of improperly, it becomes part of the food chain.

She presented domestic actions, grouped into four categories:

- Consumer responsibility: Education;
- Producer responsibility: Ban or regulate the product;
- Promotion of recycling;
- Promotion of biodegradation.

The first point refers to raising awareness of plastics use, and the second one involves rules to ban or regulate plastics, including incentives to minimize their use.

Díaz Vega stressed that recycling does not solve the problem of plastic, and that replacing it with biodegradables is in question since these must be generated under the proper conditions in order to be biodegrade, for example, as industrial compost, and these properties are not always present in the manufacturing process. Also, the lack of proper final disposal means that these biodegradable materials become microplastics of biodegradable resins.



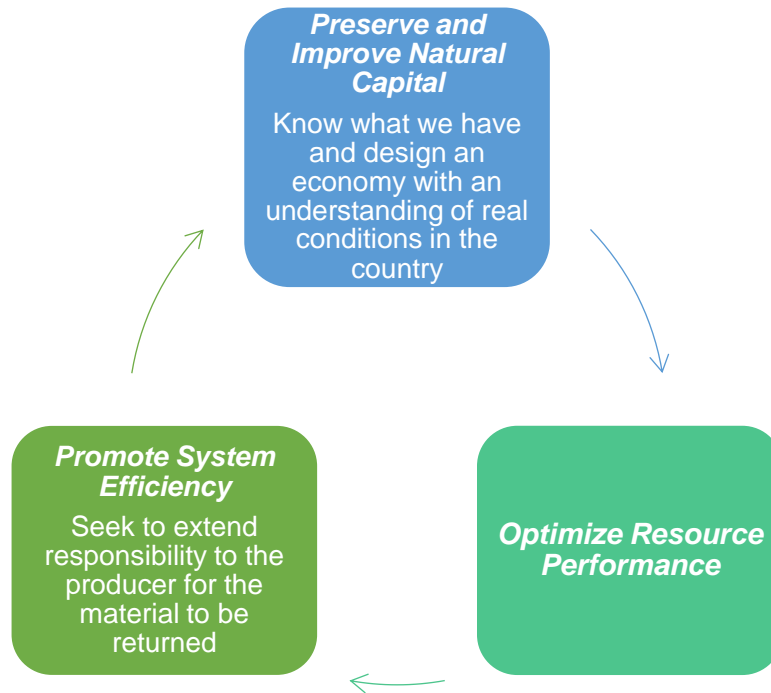
Recycling is one of the traditional ways to dispose of plastics. There are other methods, which should focus on the value of each stage, from extraction to final disposal. A public policy should be designed considering these stages, as well as evidence, a broad vision, and a clear understanding of the country's particular characteristics.

Díaz Vega said that in Peru, [Law No. 30884](#) regulates single-use plastic and disposable containers and packaging. The idea is to move from single-use plastics toward reusable biodegradable products, except for plastics used

for health and hygiene purposes (such as prosthetics). The law states that plastics must end their life cycle with either recovery or disposal in landfills; however, Díaz Vega acknowledges that this law must be updated based on recent studies on biodegradables.



The presentation showed that plastics are a national and international problem. It pointed to the initiative of Peru and Rwanda for a globally binding agreement whereby countries agree to implement the established actions involving plastic imports and exports. This topic will be covered in 2022 during [the fifth session of the United Nations Environment Assembly \(UNEA-5\)](#). The goal is to reduce plastics dumping into the environment, covering all stages of the plastics life cycle, and adopting a circular economy approach. In this matter, Díaz Vega explained that the circular economy should not be confused with recycling, because it is based on three principles:



Díaz Vega concluded her presentation with some challenges for implementing the circular economy model in the plastics industry, such as:

- Understanding the circular economy model;
- Establishing the baseline and have immediate information;
- Training staff on the issues.

Despite the above, she pointed out that plastics dumping is undeniably a health and environmental problem that is leading to the creation of intergovernmental agreements, where states must consider establishing regulatory standards, defining a clear goal based on evidence, and strengthening their personnel capacities by making clear the What? and the How? She put forward these recommendations:

Recommendation 1: Business owners must understand that some plastic products are not part of the economy, so they will be withdrawn. Consequently, business owners must manage their waste appropriately.

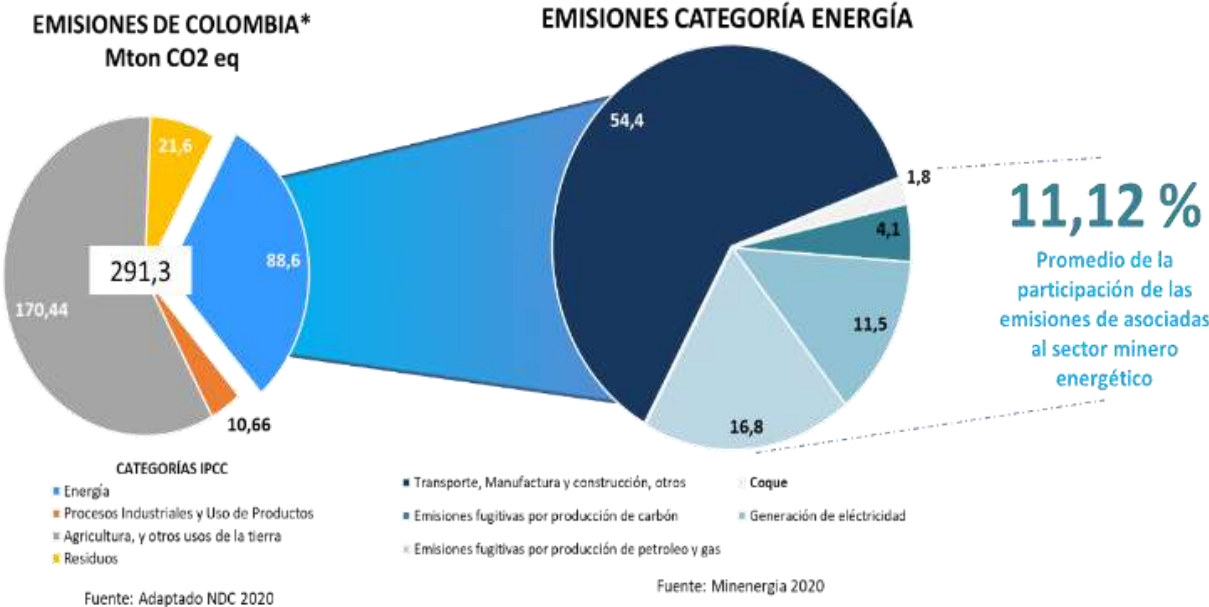
Recommendation 2: Consumers must make conscious, informed decisions to avoid greenwashing.

A2. Climate risk management as an opportunity to contribute to the sustainability and competitiveness of the business sector

Diego Alexander Grajales Campos, Climate Change Coordinator at the [Ministry of Mines and Energy of Colombia](#), presented *Climate risk management as an opportunity to contribute to the sustainability and competitiveness of the business sector*. He pointed out that achieving carbon neutrality by 2050 is an international commitment and outlined how the mining industry in Colombia will help to reach this goal.

He began his [presentation](#) by explaining that countries emit greenhouse gases in different ways. In Colombia’s case, roughly 8-10% of emissions come from mining, unlike European countries, where the mining industry accounts for 70% of emissions. Analyzing this percentage, he explained that five scenarios were outlined to show how the energy sector can become carbon neutral, that is, achieve a zero balance of these emissions, via three specific actions:

- Curb greenhouse gas emissions as much as possible;
- Capture emissions;
- Use offsets.



In Colombia, the government is creating options for industries to focus on carbon neutrality, depending on their specific features:

- Diversify the electricity mix by boosting energy supply through the use of non-conventional energies;
- Make better use of energy through regulatory processes that promote energy efficiency;
- Control emissions (methane);
- Replace fossil fuels;
- Invest in, innovate, and develop new, emission-capturing technologies;
- Promote environmental offsets and carbon markets;

Each of these options includes various specific activities for capture and offsets. Carbon neutrality offers the opportunity to invest in emerging technologies, such as those that capture and use stored carbon, which, despite not being economically effective, are being researched and are expected to be implemented by 2025.

One alternative is bioenergy with carbon capture, which is a project for a nature-based solution that involves collaboration between industries and the community to promote land development while also adapting to climate change in the lands where it is applied.

In this context, and in order to remain competitive, companies must perform their own risk analyses, identifying which option will help it to achieve carbon neutrality.

Climate risk analyses define the paths to carbon neutrality. Companies must be aware of the new climate change scenarios, since these can affect projections established at the start of planning the options to implement. They may be forced to leave behind previous processes, depending on climate phenomena, such as a drought that affects the reforestation of previously established areas.



In his **conclusion**, Grajales Campos described the challenges and opportunities ahead. He stressed the **opportunities** of carbon neutrality:

- Greater investment;
- Innovations;
- More jobs;

The main recommendation in his speech was:

Recommendation 3: Business, academia, and industry must work together to visualize a common goal to achieve the opportunities provided by carbon neutrality.

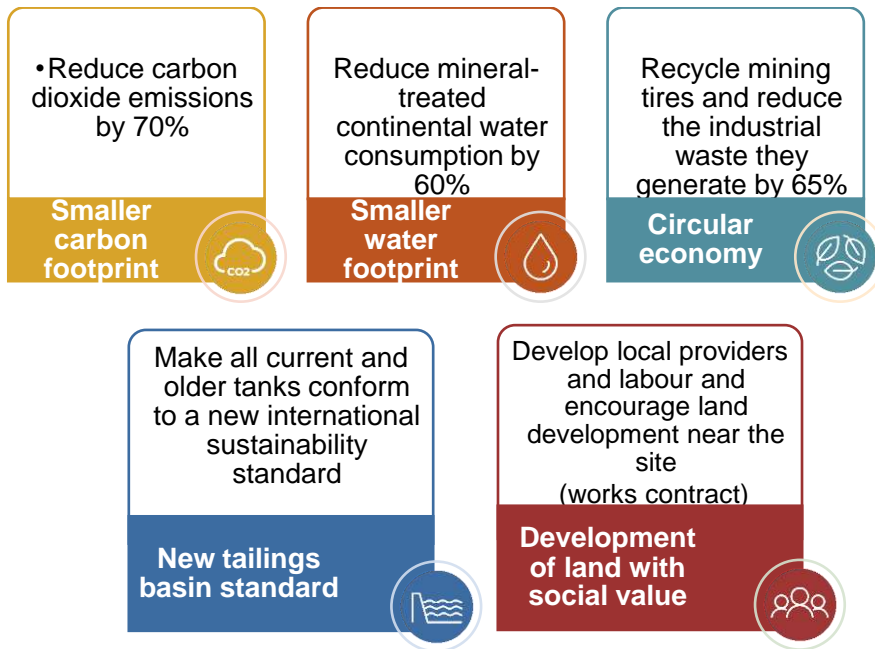
A3. Defining and respecting rural property rights and proper water resource management for the extractive sector

 The representative from Chile, **Jorge Sanhueza Urzúa, Sustainable Development Manager for the Chilean [National Copper Corporation \(Codelco\)](#)**, spoke about the circular economy, reducing carbon and water footprints, and developing land with social value during his [talk](#).  “Transforming mining for the future of Chile.”

Based on data from 2019, Codelco is the largest copper producer and owns 6% of the world’s reserves. It has seven deposits and four foundries throughout northern and central Chile: Radomiro Tomic, Chuquicamata, Ministro Ales, and Gabriela Mistral and Salvador in the northern part of the country, and Ventanas, Andina, and El Teniente in the south-central part of the country.



In December 2020, Codelco published [five pledges for 2030](#) based on a transformation strategy to change the way they operate, with sustainability at the core. The pledges are:



Sanhueza Urzúa stressed that the second pledge is one of the ambitious goals for 2030 and that its challenges are economic resources and the work method. He explained three key points for reaching this goal:

- Harvesting waters from tailings basins
- Increasing process efficiencies
- Incorporating desalinated water


Regarding the first point, he explained that some of the divisions are looking into how to recirculate the waters, seeking business models with Permuta Financiera (SWAP) and others that allow for these waters to be incorporated into productive processes depending on conditions. He gave the example of the tanks in Teniente and Andina, for which, due to their considerable remoteness, water recirculation presents an economic and engineering challenge. Regarding process efficiency, a key element is to incorporate innovation and create a culture of efficiency. A desalination plant is being built in the northern district to incorporate desalinated water. It is expected to begin operations in 2024. Thickeners and concentrators are being built and improved in the district's mining divisions as well.


Sanhueza Urzúa shared some **best practices** established in the divisions throughout the country, as listed in the table below.

<i>Division</i>	<i>Description</i>	<i>Goal</i>	<i>Impact</i>
Radomiro Tomic	Installation of THERMOFILM in dynamic leaching piles: Heat the bed under the film and increase the temperature by 5°C on average and reduce evaporation.	Recover more copper with less water	Savings of 20 l/s
Teniente	Advanced analytics cooperation for efficient operation of tailings basin thickeners: Incorporate artificial intelligence into tailings basin thickeners for advanced analytics to predict behaviours and suggest positive actions for better operational continuity in the processing line.	Use artificial intelligence to improve decision-making on water consumption and optimize production	Projected savings of 15 l/s
Andina	Online rheological measurements of tailings to increase tailings concentration of solids by weight to technical limit: Install online systems in various parts of the process to detect variations in the tailings transportation process.	Online rheology study and measurement to ensure technical reliability of tailings transport	Savings of up to 15 l/s

Sanhueza Urzúa concluded by saying that it was hoped that the actions taken at the divisions would be replicated in other divisions with similar conditions. He added that involving operations in these practices is key to success. He also emphasized that current innovations and available technologies must be considered and added to the search for mining processes that use less water.

Recommendation 4: Company employees should be involved, and work programs integrated together with other industries, countries, universities, and academies to develop strategies that help mitigate climate change and its effects.

In keeping with this subtheme, from **Canada Pierre Cartier, Forest Engineer, Professor at [Cégep Abitibi-Témiscamingue](#), and Research Professional at the [University of Quebec in Abitibi-Témiscamingue](#)**  presented on “Successes and challenges of integrated water management in a natural resource region, Abitibi-Témiscamingue, Quebec, Canada” using his 20 years of experience in conflict management in natural resource management.

In this [talk](#),  we heard examples of two collaborative projects entailing collective citizen action. Cartier began with the background that led to the nonprofit foundation of Osiko Lake, an urban lake in Rouyn-Noranda (Quebec, Canada), where the city’s basin received water from copper smelting for 40 years. As a result, this body of water contains metals, as well as urban contamination and invasive species. In February 2020, 100 participants met to share opinions and comments and seek solutions or prototypes to this lake’s environmental challenges. They created environmental education projects for young people and promoted recreational activities.



One of the prototypes developed for this lake was the [floating islands project](#) from the Industrial Waste Technology Centre (French initials, CTRI). The project fixes nitrogen and phosphorus. Another project is the Horne copper smelting project, financed by Horne and the Agnico Eagle Mines Limited, called “How to treat the lake bottoms passively?”

“Domestic well,” the second project described by Cartier, is located in Abitibi-Témiscamingue, Quebec, Canada, where, according to Ministry of Health data (Social Services and Health Centre), 30% of the population has a domestic well with high natural and anthropogenic contamination. What is more, people are not aware of the danger of the contaminants and lab analyses are very costly.

Watershed agencies are in charge of agreements and integrated management of the water in the region. However, little is known about the land degradation, and people have active concerns about mining and farming activities.

This background gave rise to “Voluntary Well Analysis,” a project partly financed by the Ministry of Health and for which H2 Lab reduced analysis costs. Four hundred and forty-nine tests were completed as part of the project. Of the 100 done for the mining company Canadian Malartic, 14 chemicals and two bacteriological elements were found, 43% of wells exceeded public health thresholds, 26% contained manganese, 11% contained arsenic, and 20% had bacteriological contamination.

Those involved in the project were the Canadian Malartic mine monitoring committee (Malartic City), Yamana Gold, and Agnico Eagle Inc. The Abitibi-Témiscamingue Water Basin Organization, which asked the monitoring committee to participate in the regional profile, found it difficult to share the results.


The Abitibi-Témiscamingue Water Basin Organization also served as a neutral guide between the Goldex Mine in Val d’Or and its inhabitants. It was the mediator between the mining company and the city concerning the issue of water pumping and water quality, which was also analyzed.

Recommendation 5: Integrated projects (society, government, and academia) must be feasible technically, bureaucratically, and financially, and consider their ongoing improvement and monitoring.

Recommendation 6: Considering the human aspect, government organizations must avoid extremist leaders and slow innovation; include a creative civil servant and involve technocrats only in technical committees.


A4. Planning for investments and activities for reducing the ecological footprint




The [talk](#)  given by **Rodrigo Murillo Fernández, Assistant Manager of Reservoir Security at the [National Water Commission of Mexico \(CONAGUA\)](#) and Hydraulic Works Consultant at the Mexican Water Institute of Technology**, focused on the technical design of tailings dams in the mining industry.

Among its functions in Mexico, CONAGUA is responsible for managing national assets, including rivers and riverbeds, surface water, and aquifers. Therefore, its activities are to measure, assess, analyze, and oversee water quantity and quality. Its jobs include issuing construction and renovation permits and occupying riverbeds and federal zones to develop structures, such as reservoirs and mining dams, and issuing and monitoring water concessions and permits to discharge fluids to receiving bodies.

As part of its supervision tasks, CONAGUA oversees these works, making sure that water use does not cause negative effects for the population and the environment. The duties assigned are contained in Mexican legislation: Article 27 of the Mexican Constitution, [National Waters Act](#), and Official Mexican Standards, such as [NOM-141-SEMARNAT/2003](#) for tailings dams, and [NMX-AA-175-SCFI/2015-2016-2017](#) for safe dam operation. Mexico currently has a total of 6,533 dams, of which 42 are on national streams, out of 511 active and inactive mining dams.


Various governmental institutions are involved in installing and monitoring dams, such as the [Ministry of the Environment and Natural Resources \(SEMARNAT\)](#) , with multiple requirements based on environmental legislation. These requirements are tied to CONAGUA's opinion on the effect of water quality in rivers and aquifers.

Murillo Fernández stated that tailings dams in particular have conditions that can make them suddenly turn into an environmental and social hazard, since they are exposed to disruptive elements such as weather and structural flaws.

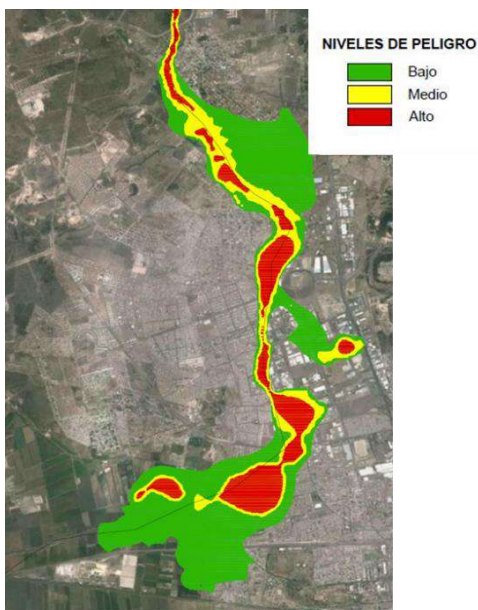
One of the concerns in the mining industry is the environmental footprint. Murillo Fernández gave two examples of environmental liabilities due to abandoned mines that resulted in environmental damage because of a lack of managers, both located in Veracruz State. Remediation occurred subsequently in both cases, via joint efforts by [PEMEX](#)  and the Veracruz state government, using modern methodologies.

On the topic of tailings dams legislation, Mexico's efforts can be seen in the revision and update of NOM-141-SEMARNAT-2003 since 2013, to characterize tailings and create a single inventory of tailings deposits with the participation of various governmental organizations and the mining industry.

Among the ideas for improving procedures was the use of current technologies as a model, using finite elements of the tailings dams to reduce the possibility of failures that expose the population and ecosystems to environmental damage, through studies such as the characterization of offset sites, the tailings to be placed there, their possible changes, and the effects they may have on the environment, particularly on water quality.

One of the goals of NOM-141 is to incorporate current tailings dam safety concepts, based on criteria from various international organizations, such as the International [Commission on Large Dams](#) (ICOLD),  among others. In addition to updating this standard, CONAGUA is seeking to add three others that include:

- Risk Analysis and Classification
- Safety Inspections
- Emergency Action Plans (EAP)





Proposed regulations include applying risk analysis to establish areas potentially affected by tailings dams and the probability that a risk will occur under various scenarios and offering information to the public on the dangers they may be exposed to, resulting in the development of Action Plans for these emergencies.

Murillo Fernández stressed **the importance of the application of best practices, the sharing of experiences, and coordination between the mining industry, technical associations, and environmental associations** to ensure a healthy environmental future, free of hazards at tailings dams in the federal zone, considering all the stages of a tailings project's life before installation.

Recommendation 7: Use current technologies for timely analysis, such as risk analysis, and invest in preventive rather than remediation measures during all the stages of a tailings project's life.

Recommendation 8: Link the sector's infrastructure works to the updating of current standards on mining works to ensure a sustainable future with fewer risks for everyone.

Closing of Webinar

To end the day's webinar, we heard closing remarks from [Efraín Alva Niño](#) , **Head of the Extractive Activities Coordination Unit within the [Ministry of Economy of Mexico](#)**,  who stated that extractive activity must be based on sustainability issues, as seen in this forum. He emphasized that sustainability must not be confused with long-term sustainability¹, that it is important for society to understand the activities being developed in the sector, and that the sector is evolving under demanding regulatory frameworks to ensure environmental sustainability.

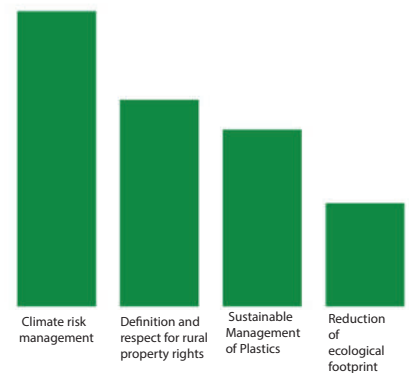
He highlighted the importance of working together with companies and society, complying with the Sustainable Development Goals (SDG) of the 2030 Agenda, wherein companies make pledges internationally, supporting the government in its energy transition from fossil fuels to renewable energy. He rounded out his remarks by thanking attendees for their participation.

¹ The Spanish uses two terms that sound very similar.



The first webinar on **Actions to Reduce Environmental Impact** brought together **200 participants** from various areas of work (environment, education, international relations, extractive sector, ...).

According to the post-forum survey, one of the most relevant topics addressed was that of **climate risk management as an opportunity for contributing to sustainability and competitiveness in the corporate sector**, especially for those who are working in this field.



Source: Post-forum survey, 2021

81%

According to the post-forum survey, **81% of participants** considered that the first webinar contributed significantly to their professional training and capacity building.


Intersectoral Forum on Environmental Sustainability in the Extractive Sector

**Best Practices and Policies
from the Pacific Alliance and Canada**

B. Development of Human Capital with an Environmental Perspective





Opening remarks were given by **Alain Roy**,  **Vice-President of International Partnerships at CICan**. He outlined the issues to be covered: the social and

globalizing outlook of environmental education, ethical transformation and new challenges, contributions for the design of environmental policies, and sustainable plastics management. He noted that providing employment internships for students to have the opportunity to test their skills at occupations linked to environmental issues, climate change, or environmental challenges was a successful strategy in Canada, enabling employers to obtain significant financing to cover wages and training fees, which helps companies meet their needs by providing them with new talent, while for the graduates it is work experience that supported them in their transition to employment in the fields of environmental sustainability and climate change. These initiatives represent significant progress. He invited government leaders to allocate resources to the development of skills for a green economy and to the fight against climate change.

He ended by noting that the PA-EFE Program goals are to increase socio-economic opportunities for men and women in a sustainable, inclusive extractive sector, which requires innovative, transformative leadership.

After Alain Roy's remarks, we heard from [Milagros del Pilar Verastegui Salazar](#),  the representative of the [Ministry of the Environment](#) of Peru,  **Director General of Environmental Quality**, who welcomed participants.

Del Pilar Verastegui Salazar thanked the representatives of PA countries for coming, as well as the participants, and underscored that holding the forum is of the utmost importance for the exchange of environmental policies, best practices, and tools and guidelines in the extractive sector. She also stated that it will allow participants to share knowledge and experiences to help them face the current challenges of sustainability, gender equality, and technical training in Peru and in PA countries.

At the end of her remarks, del Pilar Verastegui Salazar restated that the forum is part of Peru's commitment to contribute to sustainability in the region, to align with the 2030 Agenda goals, national policy, and the PA's strategic guidelines for 2030. She assured listeners that the forum's activities will enrich and enhance skills in the extractive sector.

The goal of this second webinar was to present social perspectives on environmental education and the design of environmental public policies and sustainable plastics management in education and citizen transformation.

These are the representatives of the five countries ([see panelist biographies](#)) who contributed to the dialogue with their experiences and best practices:

Luis Leonel Heath Moncada: Head of the Department of Planning and Management for Sustainability, Polytechnic University of Santa Rosa Jáuregui, Mexico;

María Cristina Güell Escobar: National Mining Policy Coordinator 2050, Ministry of Mining of Chile;

Marie Paz Rodríguez Mier: Leader of Gender Equality in the Ministry of Mines and Energy of Colombia;

Gabriela Velarde Medina: Head of Projects, Reciclame, Peru Civil Association;

Paolo Mussone: Applied Bio/Nanotechnology Industrial Research Chair, Northern Alberta Institute of Technology, Canada.

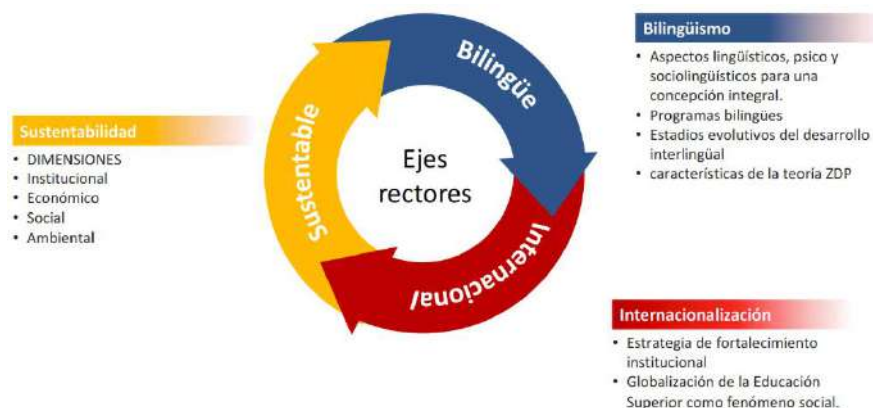
B1. Social and globalized perspective on environmental education: ethical transformation and new challenges

Luis Leonel Heath Moncada, Head of Management for Sustainability at the [Polytechnic University of Santa Rosa Jáuregui](#),  Mexico, [spoke on](#)  “Education for Sustainability in the BIS model.” He highlighted the following:

As a background, polytechnical and technology universities emerged in Mexico in 1941, following the educational model of French institutions of higher education. The subsystem currently comprises 121 technological universities and 63 polytechnics, and the education is based on professional skills. In this way, technical professionals are trained to play specific, specialized roles.

The Bilingual, International, and Sustainable (BIS) model of these universities arose in 2011, based on specific needs in Aguascalientes state, which required highly skilled human talent that could speak a second language. This model adds to the skills model, generating intelligent solutions based on human development, bilingualism, and internationalization. The model is based on three pillars:

- Bilingualism: It is based not only on English, but on Mexican sign language and others
- Internationalization: Through dual degrees and globalization
- Sustainability: It uses the model to train fully rounded citizens



The model adds the skills of the three pillars, helping to train professionals who are competent, bilingual, and globally and socially responsible citizens based on two strategies: Comprehensive training and education for sustainability. The first strategy includes informative processes (theoretical-conceptual-methodological), knowledge, and skills, such as transferable skills, to train these professionals. The second strategy involves transferable skills that include values, skills, and training processes for responsible citizens.

Four pillars support the comprehensive training model:

- Significance;
- Social environment;
- Physical environment;
- Identity.





Heath Moncada concluded by stating that the BIS model in Mexico is designed as a public policy to train global, responsible citizens, where 25% of technological and polytechnical universities in Mexico have the model; however, there are areas of opportunity, including the design and application of quantitative and qualitative assessment tools to reveal the true impact of applying this model. He explained that correction and enhancement measures must be implemented to improve graduate performance, with a view to the new civilizing model to help improve the quality of life of all people.

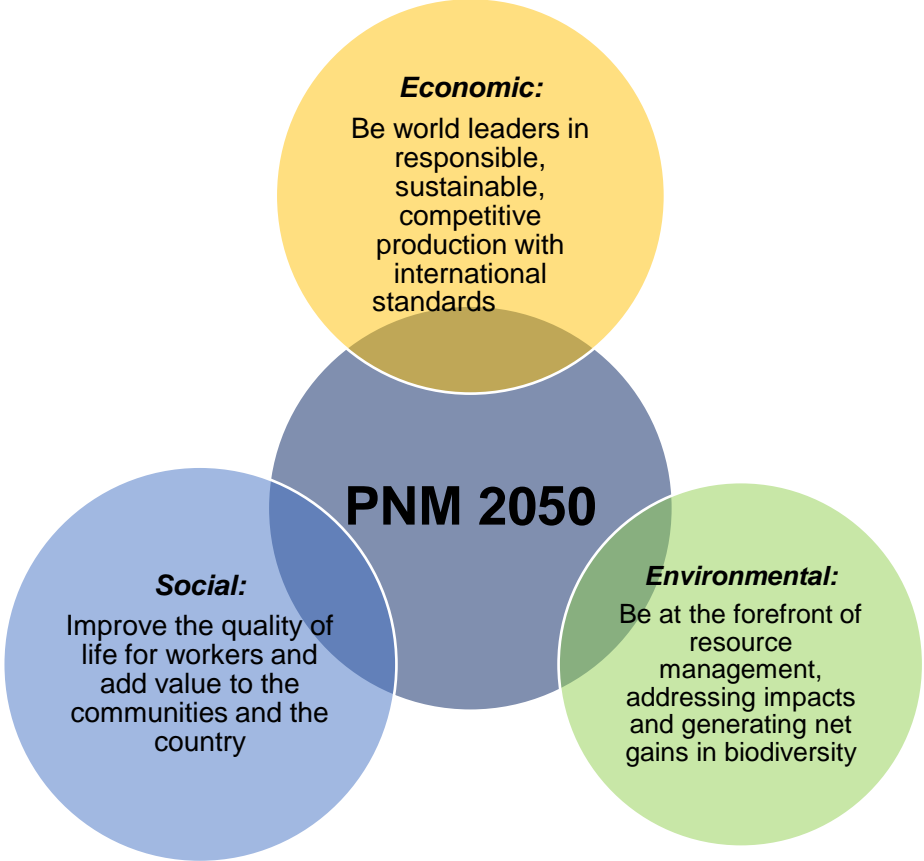
Recommendation 9: Seek institutional transformation by changing the way the campus is managed, implementing strategic plans for sustainability, where institutional policies are formulated that guarantee the establishment of a culture of sustainability.

Recommendation 10: To reach the goal of a sustainable university, the institution must first consolidate, then become certified to be able to offer high-quality educational programs.

B2. Contributions to the design of environmental public policies

María Cristina Güell Escobar, Coordinator of the National Mining Policy 2050 ([PNM 2050](#)) for the [Chilean Ministry of Mining](#),  focused her [talk](#)  on the importance of PNM 2050 and the tool used for a strategic environmental assessment of that policy.

Although Chile is historically a mining country, it did not have a policy and road map to provide the necessary guidelines to make this economic activity sustainable. Mining, mostly of copper, accounts for 12% of GDP and is centred mainly in the northern area of the country. Due to its importance, the country had to include key guidelines for sustainable mining. The integrated policy was a participatory process that had the help of over 3,500 citizens during the central phases on technical, territorial, and virtual committees; 30% of those participating were women. The process is now in its final stage of public consultation, with the goal of being published as a decree in early 2022. Following the participatory process, it was decided that the policy would have to be developed around **three main pillars**:



Institutions were included as the backbone for the State. A solid network of institutions and a favorable climate were created to ensure the attraction of investments.

The key points to fulfill the goals of PNM 2050 are a shared, cross-sector vision geared toward sustainability, strategic guidelines with established short-, medium-, and long-term targets that include industry and the State, and the necessary governance to track indicators in order to monitor the progress toward the targets set and update the policy to incorporate new realities.

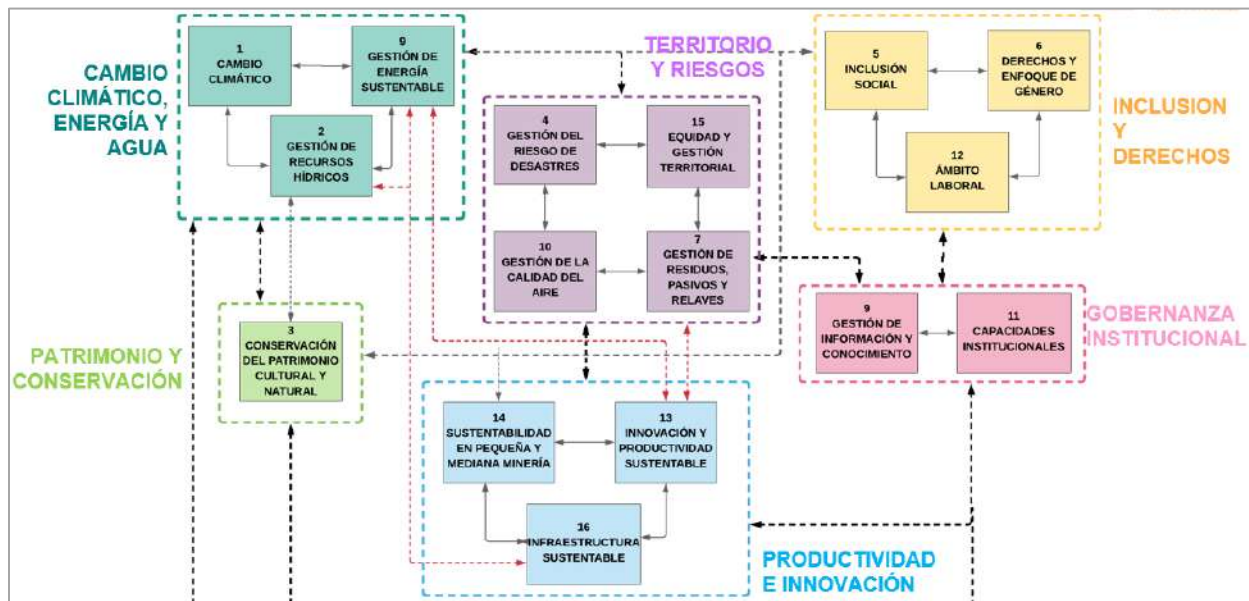
The strategic environmental assessment tool in PNM 2050 is an international tool that enables the inclusion of sustainable development environmental considerations, with a clear methodology for developing policies and general plans. Not only does it apply to the assessment of PNM 2050 and the Ministry of Mining, but also to the country's other policies and ministries. It transcends administrations and provides a clear road to reach the targets for 2050.

The road map process used the inputs from the participatory process, finding a strategic reference point and defining environmental goals. These goals were based on environmental and sustainability values, issues, and concerns.

As a result of this exercise, 635 environmental and sustainability topics were included. The language was unified into 115 topics that ultimately produced 16 groups of related topics. Next, the critical decision-making factors, i.e., the key policy points that would be used as the foundation and guidelines for policy, were defined.

A flow analysis was then created to place the topics in a hierarchy to see how to approach them and to have technical support and acknowledge the pillars of the integrated policy.

Below is an example of the topics organized into broader groups and the flow analysis carried out.



These topics were used to define the strategic assessment framework wherein each topic has the assessment criteria, indicators, and goals to be evaluated. Those topics that did not have clearly defined targets or indicators were grouped together as development options.

Once this definition was complete, its consistency was analyzed. The consistency of all the preliminary definitions made in the policy's draft project was studied, environmental goals and sustainable development criteria were analyzed, as was their relationship to the policy's strategic pillars and goals and the relationship between the critical decision factors and the level 1 or 2 goals, to finalize the strategic assessment process.

The assessment was validated by the Ministry of the Environment. Güell Escobar underscored the fact that PNM 2050 has all the environmental criteria, and concluded that this tool is important, in addition to lending legitimacy to the process. She further stated that the process is one of continuous feedback, meaning that at each stage they check to see if new concepts are being integrated. In this case, they were integrated in this assessment stage since some concepts were not considered during the participatory process.

Recommendation 11: We must have a shared, cross-sector vision among the actors involved in setting up short-, medium-, and long-term targets.

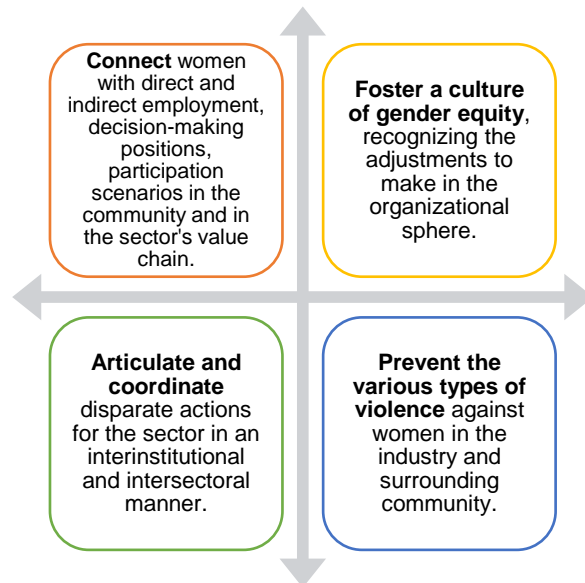


Following the work flow of this subtheme came the [talk](#) by **Marie Paz Rodríguez Mier, Gender Equality Leader at the [Ministry of Mines and Energy of Colombia](#)**. Her focus was the socio-environmental aspect in the extractive field. The key points of her talk were the following:

Women in the energy and mining industry in Colombia face obstacles in gaining access to it, remaining at their jobs, and advancing. Women participate less in decision-making, adding to the low access to careers and/or positions in science, technology, and math. Twenty-seven per cent of jobs in this industry are filled by women. These and other aspects demonstrate the current situation for women in the industry. Note that according to the SDG for the 2030 Agenda, gender equality must be combined with development.

In keeping with the idea of gender equality, the Ministry of Mining and Energy designed [guidelines for gender equality in the mining and energy industry](#), the product of a collective where women's representatives, civil society organizations, unions, companies, and local authorities participated through regional meetings. They produced an action framework for promoting and articulating the initiatives that help focus on gender in two dimensions: work and community.

Four pillars were defined:



Regarding Colombia's efforts to join the energy transition, it is leading the fight against climate change by promoting the generation of nontraditional renewable energy, energy efficiency, and sustainable mobility. One example of the use of this renewable energy is the [San Fernando Solar Farm](#) project, in the municipality of Castilla La Nueva, Meta department, the largest self-generating solar energy farm in the country, with a capacity of 61 megawatts (MWp), enough to power a city of 93,000 inhabitants, occupying a surface area of 57 ha. This project exemplifies the idea of connecting women and development: 38% of the work on the project is done by women. For 10% of these, it is their first job, while 13% are mothers or heads of family, and 91% are local women.

This project revealed the need to connect women with the labour market, promote economic autonomy, and assess and mitigate the differing impacts on men and women in the communities that influence them.

ASÍ ES EL PARQUE SOLAR SAN FERNANDO EN EL META
 Uno de los centros de autogeneración de energía más modernos e innovadores en la región

61 MEGAVATIOS
 equivalente a la capacidad para energizar una ciudad de 8.500 hogares.

57 HECTÁREAS
 área similar a 70 canchales profesionales de fútbol.

Inversión **+\$150 mil MILLONES DE PESOS**

Abastece parte de la demanda de energía de Cenit y Ecopetrol.

Evitará la emisión de **+508 mil toneladas de CO₂e**
 Equivale a la siembra de más de 3,5 millones de árboles.

+114 mil paneles solares DE ÚLTIMA GENERACIÓN

Tecnología bifacial para captar energía por ambos caras. Seguidores para moverse de acuerdo con la orientación del sol.

Con este nuevo parque, el Grupo Ecopetrol se consolida como el mayor autogenerador de energía del país a partir de fuentes renovables con una capacidad instalada de 112 MW

META a 2023 400 MW


38% de la mano de obra correspondiendo a mujeres.

aes Colombia cenit ecopetrol

In her **conclusions**, Rodríguez Mier explained that **women’s participation in the industry is not a social commitment, but a necessary change to be able to improve the levels of welfare, innovation, and productivity in companies**. She added that the advantages and opportunities of the energy transition should be shared equally among men and women in order to end the model followed so far, and that including the gender perspective as a pillar in the energy strategies will allow for a faster and more inclusive transition to renewable energy that will contribute to the sustainable development agenda. Lastly, Rodríguez Mier stated, “Energy poverty has a disproportionate effect on women. Supporting their access to energy helps close gaps and meet basic needs by decreasing their excess workload as caregivers and allowing them to have greater access to economic opportunities.”

Recommendation 12: Governments, educational institutions, business associations, and other actors must adapt study programs and strengthen mentorship opportunities so that women can develop skills in the industry.

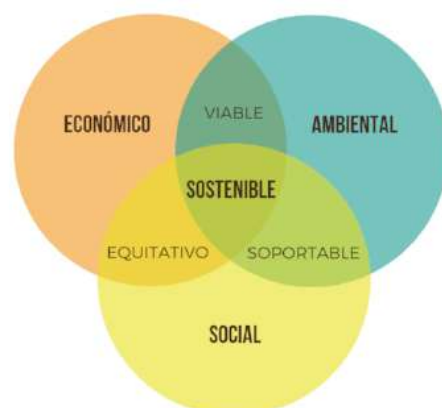
Recommendation 13: We must include the gender focus within the energy sector frameworks, from policy formulation to program design and project execution, taking into account work-life balance and equality of opportunities.

Continuing with this subtheme, we then heard from **Gabriela Velarde Medina, Head of Projects at the [Civil Association Reciclame](#) in Peru**, [Reciclame](#)  whose [presentation](#) discussed circular economy management with an emphasis on sustainable solid waste management.

Reciclame is a nonprofit association of 12 companies seeking to promote the circular economy through recycling in Peru. Some of the initiatives to promote the circular economy in Latin America have seen progress, although the challenge lies in implementation. While some countries are at this stage, others are lagging behind.

The key points put forward by Velarde Medina for implementing public policies were presented in three groups:

- **Technical baseline:** Information or diagnosis of the situation or problem that needs to be solved with a public policy
- **Identification of key stakeholders:** Participation so that the opinions of each can be included, based on their experiences and perspectives
- **Multisector approach:** Since the policy impacts each area differently, circular economy public policies seek a high social impact, because there are different actors being harmed or benefited in the process



The above points must be included to create public policy, as well as guidelines for policy implementation, keeping in mind the circular economy focus.

Velarde Medina concluded her remarks by describing four guidelines to promote the circular economy:


- **Incentives:** Offer incentives that can be financial, such as tax incentives, or nonfinancial, such as acknowledgments;
- **Technology transfer:** Integrate technology transfer. Some countries are implementing these technologies in a circular economy to streamline processes, so learning these lessons is recommended;

- **Capacity generation:** All actors in the recycling chain must make maximum effort and be more efficient in generating their responsibilities by generating capacity;
- **Information and communication:** Disseminate policies so that the population can be sure that the public policy is working and being implemented in order to improve the current system.

Recommendation 14: Include an information baseline before producing a policy or action and include key actors in the formulation of the policy, since its impact will be different for all concerned.

B3. Sustainable management of plastics: education, information, and citizen transformation

This subtheme was presented from the Canadian perspective by **Paolo Mussone, Applied Bio/Nanotechnology Industrial Research Chair at the [Northern Alberta Institute of Technology](#)**. 

The [talk](#)  covered rules of chemistry, mission, vision, and lessons learned about building lasting, effective partnerships between industry, governments, and the public to encourage environmental sustainability using applied science and student hands-on learning. The most salient aspects of the presentation are described below.

Mussone discussed three studies in which they worked together with government, industry, and civil society, and how applied research influenced these projects to achieve sustainability involving students. [The first study](#) involved the pulp and paper industry. As background, the processes used in this industry produce over 64,000 tons of fly ash every year.

This waste is an environmental problem because some of the ash contains metals that can contaminate water, making the industry responsible for this issue.

Despite the impact, little information exists on the physical and chemical properties of these materials. As a result, and on the industry's initiative, the ash was analyzed to break down its mineral content so as to help the industry improve its applications and environmental management of this material.



This five-year project resulted in:

- A detailed analysis of the physical and chemical profile of fly ash;
- An upgrade of boilers to create cleaner combustion where the ash produced is also cleaner;
- The finding of applications for the ashes generated, providing value for the industry.

The main lesson learned from this study was to listen to industry clients and partners, build and maintain **confidence, and continue generating information of value for the industry**.

The [second study Mussone](#) discussed was a project on the North Saskatchewan River for the development of methods to evaluate microplastics in rivers.

This project resulted from a lack of information on the source of microplastics and their management and analysis. Consequently, technologies have not been developed to minimize their impact. The purpose of the study was to provide a quantitative baseline assessment of the presence of microplastics in the surface water and coastal sediment of the North Saskatchewan River. The result of the study was an extensive database with information on microplastics in western Canada, the development of which involved field work and lab analyses.

Mussone stressed that the **lesson learned** in this study was not to give up on the process, especially when the methodology is completely new and does not show any results.


The [last study](#) Mussone discussed was one about a gas and oil company that was looking to rehabilitate sites impacted by its activities by focusing on solving the issue of how to monitor hydrocarbons and bacteria in freshwater, specifically in groundwater bodies, at the same time, because the established techniques describe methods for monitoring both variables separately, not together.

After an exhaustive review of the literature, they used chemical analysis, nano analysis, field monitoring, and other processes, working together with microbiology specialists to develop the methodology and the necessary tools to collect samples and bio stimulate microorganisms to rehabilitate soils. The lesson that Mussone drew from this study is to be inclusive and collaborate with other specialists to reach the study or project goal.

Rounding out his remarks, Mussone said that the students involved in the studies had the opportunity to gain experience. They included students with distinct roles, from collecting and analyzing data to presenting the findings, allowing them to develop new skills and apply what they learned in the classroom.

Recommendation 15: It is essential to listen to clients, industry partners, and others involved, and build and maintain confidence, to generate valuable information for the industry.

Closing of Webinar

At the end of the presentations, **María Carmelina Londoño Lázaro, Deputy Minister of Multilateral Affairs at [the Ministry of External Relations of Colombia](#)**,  offered some closing words, indicating the PA's successes over the years. She recognized that they have been able to learn about a series of best practices and experiences that have helped strengthen regional dialogue and contributed to the development and improvement of public and private stakeholders' abilities to provide good governance in a sector that is important for PA countries, the extractive sector.

Londoño Lázaro noted that holding this forum and the previous ones contributes to the space for formulating comprehensive policies and adopting practical improvements. She acknowledged that as a forum on sustainability in the extractive sector, it is a space of vital importance for enhancing capacities not just in environmental management, but also in human resources, as it promotes public management practices that are essential for the countries of the alliance, reinforcing pledges such as the Cartagena Commitment.

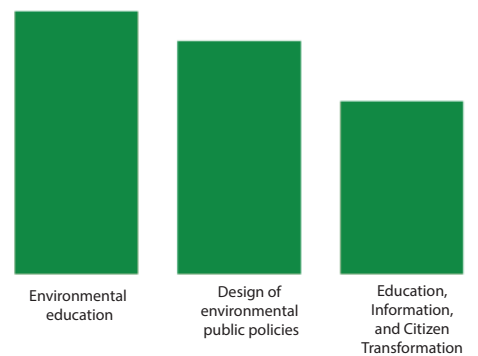
She applauded the creation of the environment and green growth technical group, whose goal is to integrate the PA's work with strategic topics across sectors to reap economic and environmental benefits.

She stated that the Development of Human Capital webinar offered informative talks with special emphasis on the environmental perspective. It provided valuable insights for policymakers, and it published and fueled the debate in academia, which led to providing indispensable tools for the business sector.



134 people, mainly from the Pacific Alliance countries and Canada, participated in the second webinar of the Forum that focused on the **Development of Human Capital with an Environmental Perspective**.

The session on Social and globalized perspective on **environmental education**: ethical transformation and new challenges was evaluated by participants as the most relevant topic to the work they carry out.



Source: Postforum survey, 2021

85%

According to the post-forum survey, **85%** of participants stated that the second webinar contributed significantly to their **professional training and capacity building**.


Intersectoral Forum on Environmental Sustainability in the Extractive Sector

**Best Practices and Policies
from the Pacific Alliance and Canada**

C. Consultative Processes and Recognition Systems for Good Management






To open the webinar, **Marie-Josée Fortin, Director of International Partnerships for Colleges and Institutes Canada**,  welcomed attendees and stressed that this forum supports the activities set forth in SDG 13 of the 2030 Agenda, Climate Action.

She also thanked the students for being there, saying they were the change agents that will contribute to progress in applying environmental best practices in the extractive field. She then briefly described the five UNESCO-UNEVOC dimensions for the greening of TVET, and shared some best practice examples from Canada, which include energy and waste management on campus, and the promotion of water treatment research and waste recycling, to mention but a few.



After these brief words, **Mariano Castro Sánchez-Moreno, Deputy Minister of Environmental Management, at the Ministry of the Environment of Peru**,  welcomed participants and acknowledged that while there has been progress in institutional policies, corporate management, etc., urgent, major challenges remain that require the creation of better regulations and capacities to define and implement these policies. He indicated that we should consider more than just major investments, such as those of extractive sector companies even though they are relevant in the region, and include the challenges of micro and small companies, since they are a source of employment and income for the country.

Sánchez-Moreno shared the experience of reviewing a regional project, where they discovered they were in the initial phase of systematizing best business practices, particularly in the Amazon, but also in the PA countries, where this systematizing effort is helping to spread these best practices to understand what the factors are for implementing them, and to identify processes for replicating them, considering the particularities of each case to lead to the transition to green growth, a circular economy, etc.

In closing, Sánchez-Moreno said that this forum was “fundamental, because it is the launchpad for the process, and generates exchange networks; it is very important for boosting replication.” He concluded by underscoring that the challenge lies in developing capacities and building a better sustainability context, through the process of recognizing and incentivizing best practices that forms an important pillar.

The speakers ([see panelist biographies](#)) for this session were:

Pedro Joaquín Gutiérrez-Yurrita: Director General of Planning and Promotion of Audits and Federal Prosecutor for Environmental Protection in Mexico (PROFEPA)



Katherine Gosselin: Director of the Towards Sustainable Mining (TSM) program at the Mining Association of Canada

Alfonso Domeyko Letelier: National Director of National Geology and Mining Service in Chile

Carlos Jairo Ramírez Rodríguez: Coordinator of the Sustainability Group of the Productive Sectors, in the Directorate of Sectorial and Urban Environmental Affairs at the Ministry of Environment and Sustainable Development of Colombia

Paloma Roldán Ruiz: Executive Director of Ciudad Saludable, a civil association in Peru

C1. Methodology for obtaining green certifications in the extractive sector

Pedro Joaquín Gutiérrez-Yurrita, Director General of Planning and Promotion of Audits and Federal Prosecutor for Environmental Protection in Mexico ([PROFEPA](#)),  began his [talk](#)  with a focus on the following:

Mexico has divided environmental authority between SEMARNAT, an agency in charge of producing the permits needed by industry to work and operate, and PROFEPA, responsible for ensuring full corporate compliance with regulations through its four divisions. Three of these are in charge of environmental complaints, oversight, and inspection of industries and natural resources, and the fourth is in charge of environmental auditing. The goal of this latter division is to develop voluntary, self-managed programs for environmental standards. Consequently, in 1992, the [National Environmental Auditing Program](#) was developed. Any type of organization can join the program to improve the efficiency of its productive processes, environmental performance, and competitiveness. Compliance with environmental standards and standards for saving water and energy and reducing emissions and waste is assessed based on a methodological examination of processes, where areas for opportunity and improvement in environmental standards are identified.

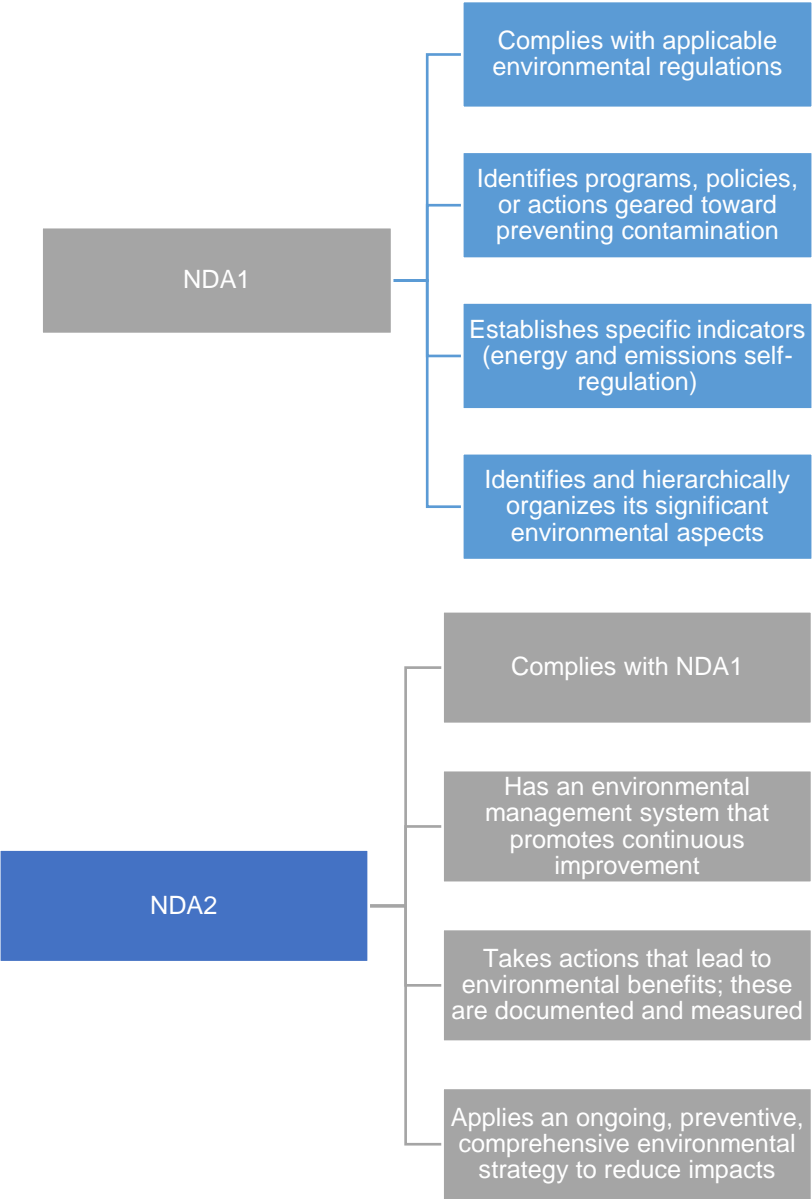
The program is supported by Article 38 of the [General Law of Ecological Balance and Environmental Protection](#) and its regulation. Pursuant to this standard, a company can be certain it will be audited according to the law with the various levels of government.

The following items are assessed during an audit:

- Air and noise;
- Water;
- Soil and subsoil;
- Waste;
- Power;
- Natural resources;
- Wildlife;
- Forest resources;
- Environmental risk;
- Environmental emergencies;
- Environmental management.

After the audit, a certificate is issued that is valid for two years. Note that the audit is done by someone outside PROFEPA previously authorized by it. This person submits a report. If there are areas of opportunity, the company sets up and complies with an action plan, which is subsequently assessed by the auditor, and then an opinion is issued.

There are two performance levels:



Mexico has 101 certified companies in the mining industry. Despite the paradigm that the industry is totally destructive, it does seek to minimize impacts by **implementing environmental best practices**. Some of the practices Gutiérrez-Yurrita mentioned were:

- [Programa predictivo de mantenimiento de las fuentes fijas](#) [predictive fixed sources maintenance program];
- Risk program for the dirt roads with reclaimed water;
- [Reforestation program \(See manual for more information\)](#);
- Recording and monthly analysis of the inventory of greenhouse gases;
- [Plan de abandono y cierre que garantice realizar las medidas necesarias para garantizar la sostenibilidad](#) [closure and abandonment plan that guarantees necessary measures to ensure sustainability];
- Inclusion of renewable energy;
- [Programa de rescate y reubicación de especies de flora y fauna \(NOM-059-ECOL-2001\)](#) [rescue and relocation of flora and fauna species program];
- [Use of energy-efficient technologies](#);
- Environmental monitoring program;
- Experience sharing among mining units in the area of environmental risk management
- The switch to cleaner fuels.

Gutiérrez-Yurrita concluded that based on the 2020 analysis, adopting these best practices produced annual savings in potable water and electricity, a decrease in solid waste, and more, that translated to \$335,105,439 Mexican pesos, or US\$16,521,249.

Recommendation 16: Environmental certification is a tool that allows for the development and implementation of best practices to minimize industry impacts and demonstrate that the mining company is meeting environmental standards.

Another talk that covered this subtheme was by **Katherine Gosselin, Director of the Towards Sustainable Mining program at the Mining Association of Canada**. Her [presentation](#)  dealt with some of the environmental quality features and standards of the [Towards Sustainable Mining initiative](#). The [Mining Association of Canada](#)  promotes the industry in Canada at the international level, working closely with governments and educating the public. They are increasingly aware that they must manage the social and environmental risks associated with the mining industry and the unprecedented existence of mining products. From this sprang the *Towards Sustainable Mining* (TSM) initiative, the first sustainability program for mining. She pointed out that this program allowed communities, interest groups, and local communities to examine the performance of mining sites for the first time.

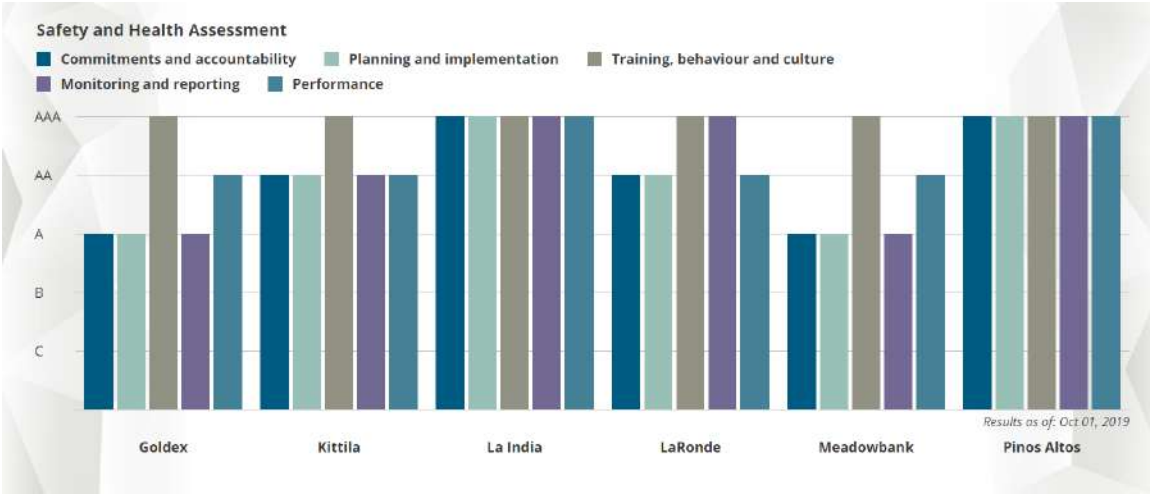
The Assessors Panel of “Communities of Interest” is in charge of drafting TSM protocols and processes. This independent panel comprises various stakeholders in Canadian society and offers critical perspectives on emerging issues. It plays a critical role in the external verification process of companies.

The TSM process is implemented via eight evolving protocols that represent the industry’s interests and go beyond legislation:

- Waste management;
- Biodiversity preservation management;
- Water management;
- Relationships with Indigenous peoples and communities;
- Health and safety;
- Crisis management and communication planning;
- Prevention of child and forced labour;
- Climate change.

These protocols are composed of 30 separate indicators. At each performance level (Level C to AAA), the protocols provide criteria that support the continuous improvement of management systems with each traditional criterion.

To help spread mining industry information, each company prepares annual reports on its performance compared against a set of indicators, which can be found on the Mining Association of Canada website so that interested parties may review the performance of a specific site against each of the 30 indicators.





The TSM has a multiphase verification process to ensure program credibility and the results published by each company. The verification process is external and takes place every three years. As a result of this program, the TSM has promoted continuous improvement in Canada’s mining industry. It is no longer a program that is exclusive to Canada; instead, it has been adopted by various mining associations worldwide. In Latin America, for instance, it has been adopted in Colombia, Argentina, and Brazil.

In concluding, Gosselin said that the TSM is gaining increasing global recognition from investors and manufacturers who want to demonstrate that they are making decisions from a sustainable perspective and are collaborating with other emerging sustainability standards so that every entity that uses this program can align itself with these certification systems.

Recommendation 17: Include international certifications such as the TSM to promote improvement in the mining industry from a sustainable perspective.

Recommendation 18: When drafting environmental sustainability protocols and program processes such as the TSM, it is important to include a panel with the communities that also benefit from the region's mining activity.

C2. Certification and measures for workplace health and protection

The next [talk](#),  by **Alfonso Domeyko Letelier, Director of the [National Geology and Mining Service in Chile](#)**,  gave insights into the continuous improvement process in mining safety, with an analysis of the percentage increase in workers in the industry between 2010 and 2021, which was 40%. Ten per cent of that is women. Meanwhile, regarding the accident and fatality rate in the period from 2010 to 2021, the fatality rate in the industry dropped, despite the increase in workers. The fatality rate in the last 10 years saw a decrease of 75% due to cultural changes in society, unions, and companies as a result of the accident involving 33 miners in San José in 2010 and the development of changes to mining site safety and inspection policies.

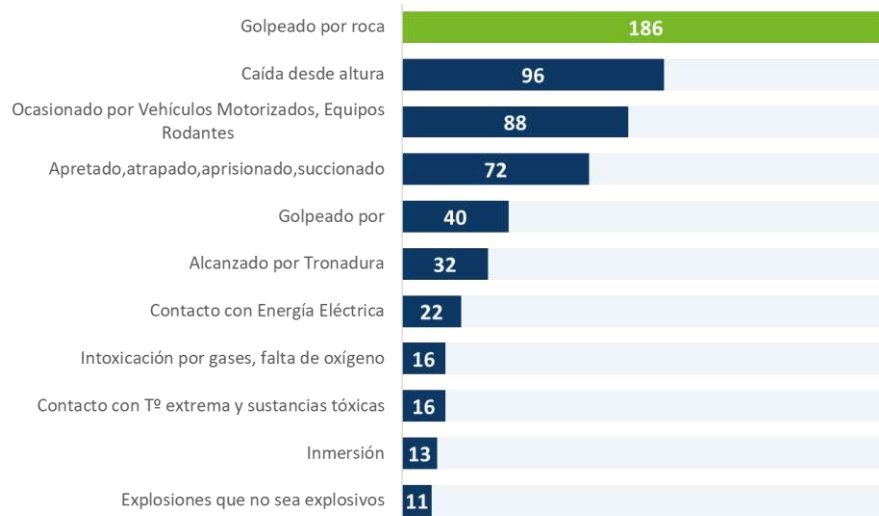
The fatality rate in small-scale mining is low, as is the rate in medium and large mining. This shows the interest and commitment of all mining segments to engage in safety and the policies that have been crafted by various governments **to make mining safer and more sustainable**.

Several work streams developed over the last 10 years focus mainly on regularizing projects and ensuring that all new projects obtain mining permits that guarantee safe mining, in addition to other projects from the ministry of mining focused on the transfer of resources to purchase small mining inputs to be able to support safety. The government's focus, specifically that of the National Geology and Mining Service, is on:

- Audit guidelines
- Project assessment
- Training centres: 1200 people on safety issues each year
- Data intelligence: Manage and assess the quantity of data
- Mining ownership
- Investigation of accidents and sanctions

The above focus enables analysis of the types of accidents, and then each of these is analyzed based on geographic area, mining segment, etc., to develop better mining in the country. There are also other tools, such as display portals, where people can identify accidents or standards violations at the company, and subsequently improve the focus and transform a vision of mining policy into an institution that develops effective support for safety policies in the field.


Tipologías de Accidentes Fatales 2000 -2021



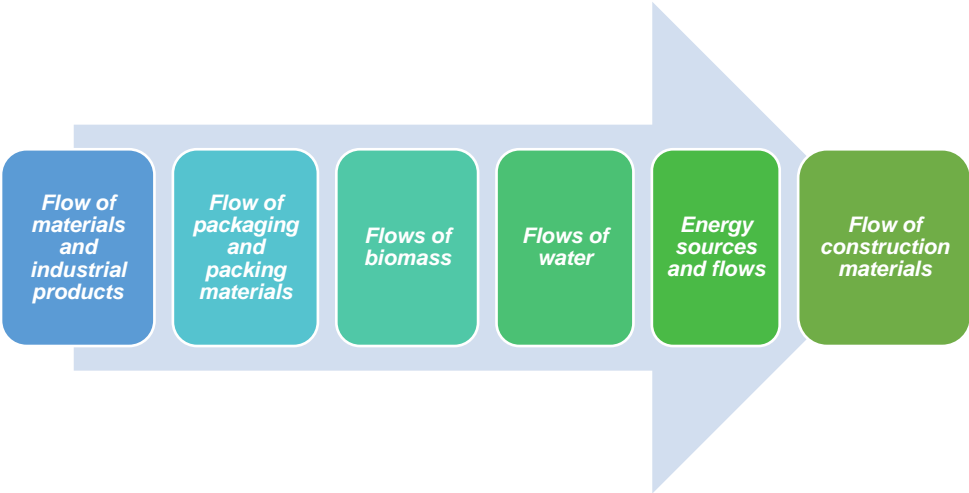
Domeyko Letelier ended with some challenges for mining, organized into three groups: **Human capital (safety training)**, **new technologies** to improve production, and **health risks**, resulting from the SARS-CoV-2 pandemic.

Recommendation 19: Regularizing mining operations and auditing compliance with current applicable legal standards for the industry are major factors in reducing accident rates in the mining industry.

C3. Certification and measures for workplace health and protection

Colombia’s representative to the webinar, **Carlos Jairo Ramírez Rodríguez, Coordinator of the Sustainability Group of the Productive Sectors, in the Directorate of Sectorial and Urban Environmental Affairs at the [Ministry of Environment and Sustainable Development of Colombia](#)**, discussed  the circular economy as a contributor to carbon neutrality.

He began his talk by highlighting the place of the circular economy within the country’s [National Development Plan](#), in which this topic is considered a priority for development over the administration’s four-year mandate, to be continued over the long term, establishing the following work streams:



These were included because they are part of the GDP, contribute to the economy, and create jobs, but they also are contaminants by their very nature. In this scenario, the target focused on was the recycling and waste recover rate, expected to go from 11.82% to 14.6% by the end of the four-year period. Actors are working from two angles to achieve this goal: The first is extended producer responsibility through the [extended producer responsibility standards](#), where compliance with recovery goals is mandatory as of 2021, and over 1,500 companies are implementing these goals with 196 individual plans and 56 collective plans. The goal for 2030 is to recover 30% of packing and packaging waste, approximately more than one million tons of packaging.

Under the banner of the circular economy strategy, a national single-use plastic sustainable management board was formed, creating the [national plan for managing these plastics](#). The board included companies, civil society, academia, and government institutions. It took on a series of actions, such as the gradual replacement of single-use products, the environmental management of home meal deliveries, and the strengthening of the recycling chain, to name a few, which led to a series of strategies that includes research, ecodesign, and more.

Ramírez Rodríguez stressed that one of the key strategies is organizing extended responsibility with public sanitation services, and he underscored the importance of communication and citizen culture programs as a strategy of the plan.

The program is currently making progress in life cycle analysis, symbiosis, ecodesign, recycling, private eco-labeling, recycling processes, municipality-compliant construction, and citizen cultural communication work.

Ramírez Rodríguez said that there is a need for coordination between the municipal administration and the other sectors that are part of extended product responsibility. This is crucial when official recyclers are vulnerable and in the process of becoming formalized.



Construction waste can be managed internally and externally, where large generators must submit and implement a waste management program, unlike small producers who must deliver the waste to agents, under 2017's [standard 0472](#). Ramírez Rodríguez said that this is being modified to include a third recipient, so that the country's large builders working on simultaneous projects can use the waste at the various work sites, without there being improper disposal, adding quarterly reports to collect information and the design of a site to look up this information.

Tools are also being developed to enable government purchases of these materials in tender processes, and the creation of technical standards and pilot projects to combine advances through the collaboration of chambers of commerce, the chamber of construction, and other interested parties.

The materials flow contains over 1,300 manufacturers and importers with more than 10,000 collection sites. Over 5,000 tons of waste are being used to date, and there is an application ([Red Posconsumo](#), postconsumer network), for consumers to locate sites where they can properly dispose of their waste (worn tires, light fixtures, pesticides, batteries, etc.).

In conclusion, Ramírez Rodríguez explained that the goal is to reduce carbon dioxide emissions by 40% by 2050 through the circular economy, with a major contribution from managing post-consumer waste and construction by implementing the strategies described.

Recommendation 20: The circular economy should be seen as a strategy to curb carbon dioxide emissions, considering post-consumer management and proper handling of construction rights.

Next, continuing with this subtheme we heard from **Paloma Roldán Ruiz, Executive Director of Ciudad Saludable [Healthy City]** , a civil association in Peru. Her [talk](#)  began with the question, “How can we develop models of plastics circularity in Latin America?” She pointed out that while machinery and technology are important for developing a circular economy, in the case of Latin America, other considerations are in play as regards existing conditions. These must be added to the fact that over four million people of varying ages work in plastics recovery both formally and informally. In Peru, 70% of the plastics industry is informal.

One of the challenges in speaking about the circularity of plastics is looking at the big picture. The problem must be solved not only with public policy or environmental education or the businesses themselves, but also with waste management.

A challenge in public policy design is incorporating the local aspect based on standards for ordinances and territories, a challenge associated with enhancing the recycling ecosystem and the capacities of the government sector. Public policies must also be based on new synergies that are moving toward the logic of creating shared value.

Referring to environmental education and communication, Roldán Ruiz said that while public awareness campaigns have been carried out, mainly on single-use plastics, in her experience, **environmental communication must come from formal spaces such as schools and institutes out to the public space, by creating materials, initiatives, and proposals that directly support circularity, explaining basic concepts, and also by bringing together infrastructure and public spaces.**

The circular economy also poses a paradigm shift, a topic generally addressed by businesses. But it should be analyzed with effective inclusion, not only in large companies but in small ones that can contribute to this economic model through small changes in their practices and an analysis of the entire process. According to the German Federal Agency, 80% of environmental impacts occur in the design stage.

The presenter explained that it is important to include recyclers in the circularity model, since they are the packaging and packing specialists and the primary source of information, and environmental educators and communicators in the process.



To conclude, Roldán Ruiz said, “To reach circularity, environmental waste management must have a broader perspective.” She highlighted the continent’s creativity in taking the opportunity to include circularity that must be maintained throughout the final waste disposal process, to increase the useful life of disposal sites such as landfills, and to use materials that have the potential to continue circulating in these types of sites.


Her last point was that it is the human factor that enables creation of these cost savings and extension of the useful life of disposal sites, and generates various social, environmental, economic, and political benefits in terms of effective inclusion of communities.

Recommendation 21: The inclusion of recycling firms is crucial, because they are the packaging and packing specialists.

Recommendation 22: Raising awareness of the circular economy should come from formal spaces such as schools and institutes out to the public space, by creating materials, initiatives, and proposals that describe basic concepts of this topic and their importance.

Closing of Webinar



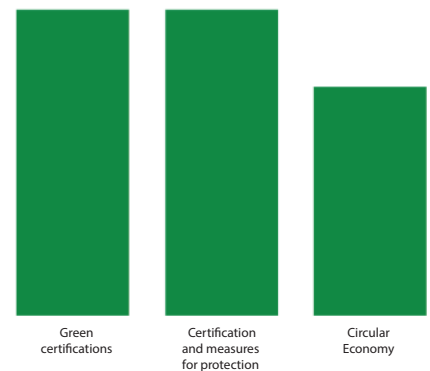
The closing message of the webinar was provided by [Andrea Corzo Álvarez](#) , **Director of Environmental, Sectorial, and Urban Affairs at the Ministry of Environment of Colombia**. She listed the sustainability policies and advances in the country and region related to the productive process. She stated that while achieving these productive process goals was a dream years ago, people are now exerting greater effort into reaching the collective consciousness to be able to implement these goals as well as to obtain information on extractive activities and let the community know about them. In her own words, “We can produce by conserving and conserve by producing” within the extractive sector.

She explained that the circular model allows for new ideas about entrepreneurship, innovation, and technology to manage productive processes that do not impact the environment or the health of the population. She thanked the participants and acknowledged that the space was full of enriching perspectives that brought progress as a region in the area of sufficient and useful management, as well as tangible results for curbing the environmental impact.



The third webinar on **Consultative Processes and Recognition Systems for Good Management** was a success in terms of participation, as 126 people were connected, mainly civil servants, students, teachers, directors of educational institutions, as well as some representatives of civil society and industry.

The topics of **Methodology for obtaining green certifications in the extractive sector and Certifications and measures for workplace health and protection** were the most relevant to the work carried out by participants.



Source: Postforum survey, 2021

90%



According to the post-forum survey, **90% of participants** stated that the third webinar contributed significantly to their **professional training and capacity building**.

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D. Small group interactive sessions



The final webinar session began with welcome remarks by [María Carolina Schmidt Zaldívar](#) , **Minister of the Environment at the [Ministry of the Environment](#)**  in Chile. She spoke of the country's efforts in managing and using plastics by updating rules to establish measurable, concrete goals to consolidate PA commitments, and actions that help make progress toward a circular economy country with truly sustainable development.


She ended by saying that she hoped the work to be done can meet the challenge of transforming the world into a circular economy.

The methodology developed by the webinar was to hold two sessions. The first one organized participants into roundtables by thematic issue, based on the three previous webinars, and by geographic area, to ensure high-quality outcomes. The main goal was to enhance dialogue and allow for exchanges between the PA countries and Canada.

The specific goal of the first stage was to produce a more personalized access to panelists and experts via a conversation space on the challenges of implementing the topics discussed based on the personal reality of each participant, while also including recommendations according to the participants' experience with each issue. The goal of the second session was to identify best practices or policies of greatest interest or relevance for each country according to their administration, and to establish the next steps for collaboration and activities following the forum.

Each subgroup had five minutes to show all attendees the results of their roundtable discussions. These are described in the section on policies and best practices identified.




Closing remarks were given by [Tonatiuh Herrera Gutiérrez](#) , **Deputy Minister of Development and Environmental Regulation, in the Ministry of the Environment and Natural Resources** in Mexico. He noted that the issue of sustainability and mining is a controversial one, where there are environmental impact assessment tools in mining, but the social aspect must be included as well, by consulting with others not just to include social validation, but so that the communities where the activities take place can have access to their benefits.

This consulting process should be carried out according to international guidelines, with a view to integrating the communities that may be affected by mining activity.

He stated that Mexico is working from an overall, systematic vision of all environmental issues, in order to prevent the impacts of future activities in the industry. The country's experience allows it to establish policies to continue seeking to comply with international pledges and translate social responsibility into individual responsibility for each company and for stakeholders in the industry. He congratulated the participants and hoped that having this opportunity for dialogue would lead to an environment that can be protected and sustainable.



The final speaker was [Claudio Ramírez](#) , **Senior Trade Commissioner, Embassy of Canada in Colombia**, who closed the session. He pointed out that Canada and the PA countries share the same challenges and values related to gender equity, sustainability, jobs, etc., and are learning how to leverage these resources. He ended by reiterating Canada's commitment to the PA countries, stating that cooperation is fundamental, and that Canada will continue to participate in establishing dialogue as an observer country to continue building productive dialogue through various commitments with PA countries. He thanked CIGCan for holding the event, and the participants for attending the sessions, and reiterated the commitment to support all countries through the established embassies.



61 representatives of the public, private and civil society sectors joined the working groups by thematic and geographic interest, with the aim being to continue strengthening the capacities of national and regional actors and support the development and implementation of policies and good practices.

94% of participants who completed the post-forum survey rated the forum webinars as **good**.

94%

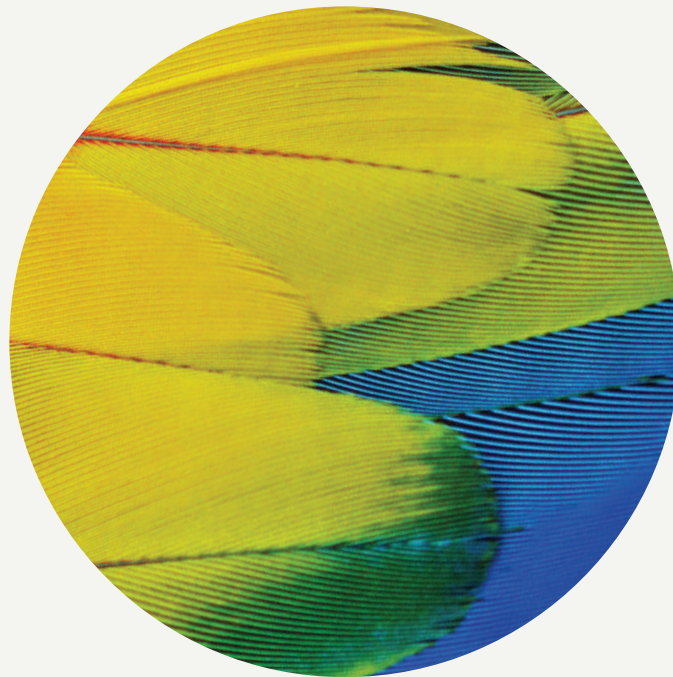


In terms of the sex of participants, parity was almost reached in the forum, with **52% men and 48% women**.

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Forum Conclusions and Next Steps



Policies and best practices identified during the forum

This section included the best practices and policies identified during the small group interactive sessions webinar, where **the best practices and policies that were repeated in different roundtables were summarised into one idea**, and then were divided by the central issues of each forum webinar. While the importance and impact of the joint work of academic and government institutions, industry, and civil society are emphasized, the column for main actor involved indicates who is responsible for applying the policy identified as a whole, without ruling out that implementing and developing the practice or policy may have an impact from various perspectives on the actors mentioned.



Industry



Academia







Government







Civil Society

Webinar A: Actions for Reducing Environmental Impact	
Policy or best practices identified	Main actor(s) involved
Develop intersectoral voluntary agreements to identify and design incentives to reduce the carbon footprint	
Include a diagnostic information baseline before creating a policy or action	
Have access to scientific information or spaces where access can be gained	
Promote multisectoral and multi-institutional roundtables within academia, with a view to incorporating practical solutions that involve various actors	
Include green energy in productive processes	
Promote student mobility to develop environmental skills	
Reduce the water footprint with wastewater recovery and recirculation processes in leaching piles by applying new technologies	
Develop legislation that encourages and incentivizes the use of technologies that ensure energy efficiency in the industry	
Keep sustainable plastics management rules and regulations up to date as new studies and research are developed	

Webinar B: Development of Human Capital with an Environmental Perspective

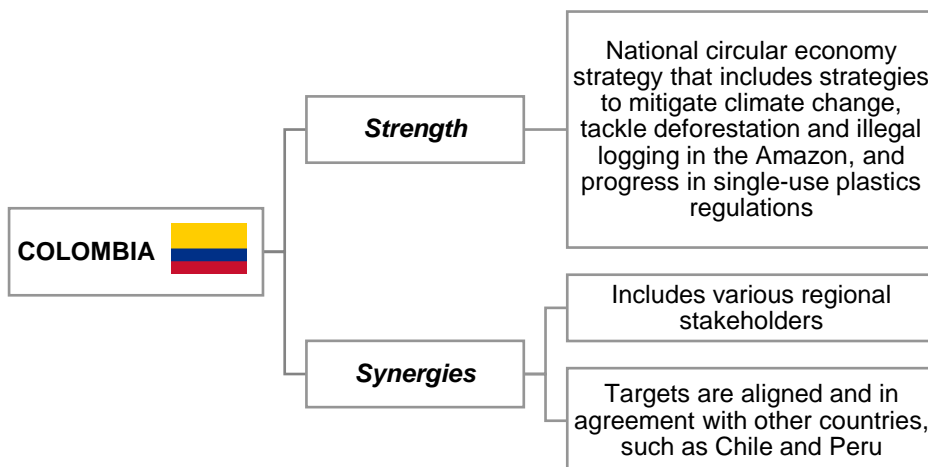
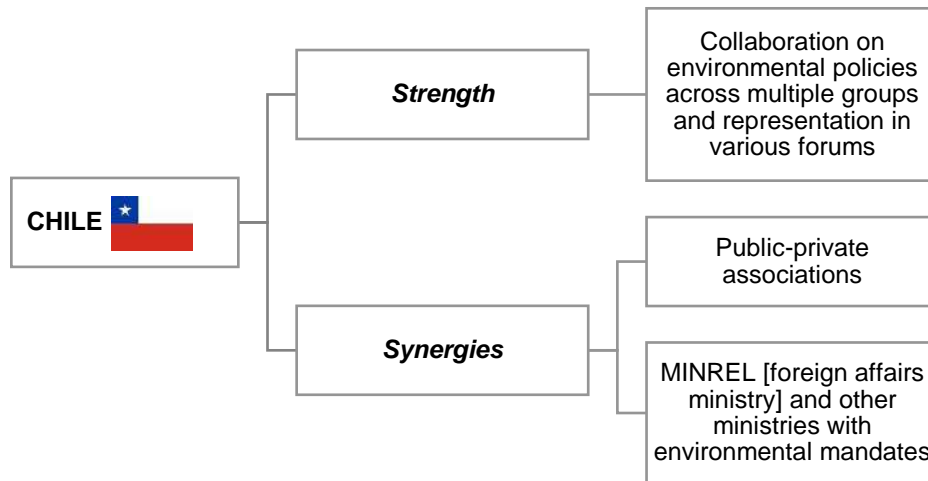
<i>Policy or best practices identified</i>	<i>Main actor(s) involved</i>
Connect academia with industry and the government sector via programs that allow for application of training knowledge and research on industry and the public sector	
Raise awareness of gender equality and environmental protection among institutions and officials	
Include the environmental issue in programs of study at various levels and recognize knowledge acquisition in this area	
Spread information on existing environmental policies and their amendments, with a participatory focus, among industry, society, government, and academia	

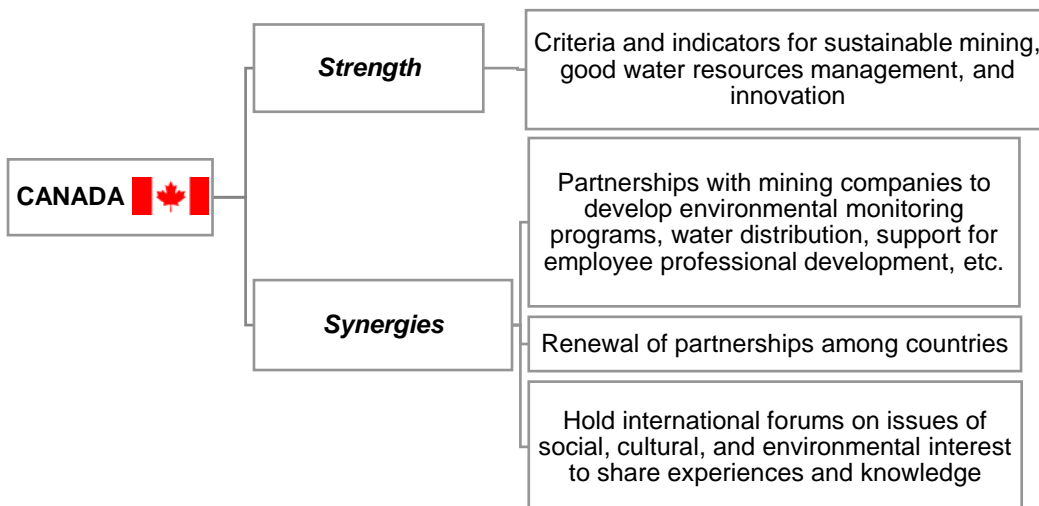
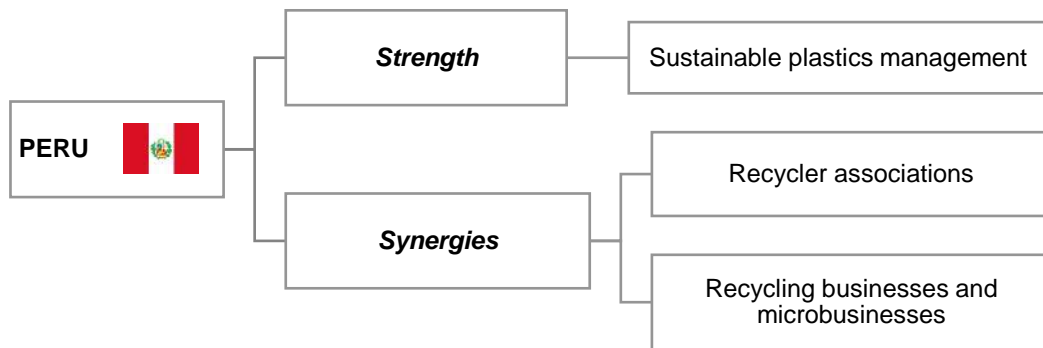
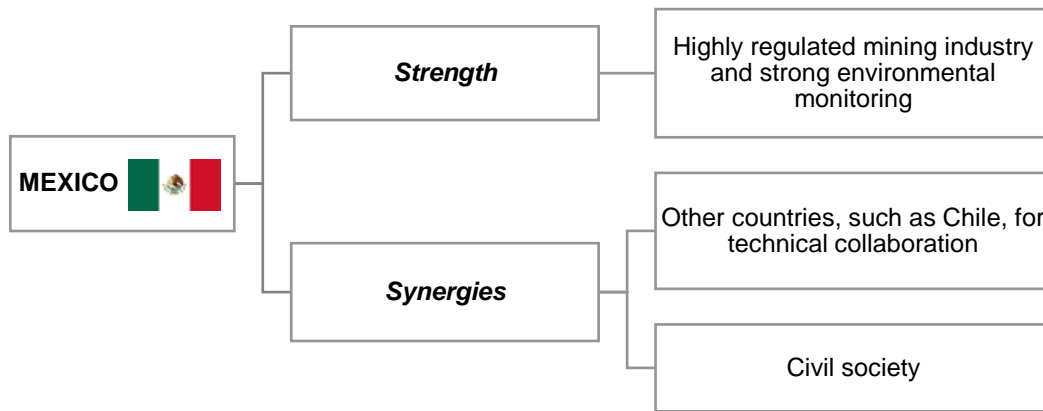
Webinar C: Consultative Processes and Recognition Systems for Good Environmental Management

<i>Policy or best practices identified</i>	<i>Main actor(s) involved</i>
Develop self-regulating programs such as environmental audits to certify clean industry processes	
Establish criteria measurement protocols and indicators for communities, the environment, and climate change	
Implement circular economy models for carbon neutrality and good plastic waste management, as well as circularity of recycled materials	
Promote green certification in extractive sectors with improvements in the area and job opportunities in the recycling industry	

Conclusions

The concept maps below describe the outstanding strengths and synergies that were highlighted in the small group discussions by geographic area that were held in the forum's last webinar. While there was not a roundtable group for Canada per se, its strengths and synergies were identified in agreement with the CIGan working group and through the sharing of experiences and knowledge by the Canadian expert panelists in the forum.





While each country has strengths and has made progress toward integrating best practices and policies to ensure sustainability in the extractive sector, every country faces multiple development and implementation challenges. Some challenges recognized by the participants were establishing practical actions among all actors involved, and achieving this synergy, due to the existence of people trained in previous paradigms. Add to these challenges, the coordination of changes in the infrastructure and technology of the business sector and implementation of environmental management systems, since companies neglect their environmental practices to focus on production. Among all the challenges listed, standouts were transparency and honesty in the development and application of policies and programs for communities, and the lack of communication among mining units in the same region, as well as the isolation of this industry from other industries.

These challenges must be faced in order to develop best practices and policies that lead the national sustainable development policies and to advance the international agreements related to ecosystem preservation, responsible consumption, and the fight against the effects of climate change, to name a few. As mentioned here and in other forums, addressing social inclusion, poverty reduction, and gender equity, together with environmental issues, allow for a more comprehensive approach to improving the quality of life for earth's inhabitants.

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**Best Practices and Policies
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Post-forum Activities



One of the objectives of the forum was to facilitate the exchange of policies and best practices for technical training in the extractive sector, with a focus on environmental sustainability in the PA countries.

In terms of the activities that will follow, building upon the conclusions and experiences of the previous PA-EFE Program forums, a working group on environmental sustainability will be established and created at the regional and national level, consolidating even further the collaboration with the GTMACV, to continue the dialogue begun in the forum. This working group will work on systematizing the policies and best practices identified in the forum, which will then be compiled in a report, with the collaboration of the appropriate organizations in each country as a way to continue exchanging and managing knowledge.

The first step will be to undertake a documentation review and systematization, and then interviews will be conducted with the key policy and best practice actors from the 4 PA countries to gather recommendations for implementing the policies and best practices identified.

To conclude, the forum fulfilled its purpose of starting a dialogue on environmental sustainability, contributing to countries' knowledge and experiences and we hope that in the next stage of activities and exchanges, all the PA countries can continue to contribute even more to the sharing and promotion of environmental policies and best practices in the PA.

With this experience completed, we hope that the PA actors and partners feel enriched by what they have learned through the Forum and are ready to continue the dialogue and regional exchange that will lead to improvement in environmental sustainability systems and the processes we face in the future.

Acknowledgments

On behalf of the PA-EFE team, we wish to extend our sincere thanks to:

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Sandra Allison Soria Mendoza, MINEDU - Ministry of Education
Jerica Yella Zanelli Flores, Ministry of Foreign Relations

Senior Officials who gave opening or closing remarks at the Forum

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Marie-Josée Fortin, Director of International Partnerships for CICan

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Pedro Joaquín Gutiérrez-Yurrita, Federal Prosecutor for Environmental Protection

We would also like to thank the more than 500 participants in this forum, whose participation was essential for the exchange of experiences and knowledge, allowing us to reach this forum's stated goal.

Appendices

Appendix 1 - General framework

Click the following link to access the forum document, Framework and Agenda:

<https://collegesinstitutes.sharepoint.com/:b:/s/ALLIANCEPACIFIQUE/EawS9CPh9axBu59bZTdYgfQB4IkNVSzCtqsNuSV82-HAPq?e=grS35H>

Appendix 2 - Website for the event

Click the following link to access the forum website:

<https://www.foroepcap.com/index.php/>

Appendix 3 - Webinar recordings

See the webinar recordings on the YouTube channel for the program at these links:

- Webinar A: Actions for Reducing Environmental Impact
<https://www.youtube.com/watch?v=dMZNMAzAOCI&t=10s>
- Webinar B: Development of Human Capital with an Environmental Perspective
<https://www.youtube.com/watch?v=cQIe38mbtNw&t=422s>
- Webinar C: Consultative Processes and Recognition Systems for Good Environmental Management
<https://www.youtube.com/watch?v=xYIE0S0PPpk&t=6s>
- Webinar D: Roundtables by Issue and Geographic Group
<https://www.youtube.com/watch?v=TewlP6RKso0&t=15s>



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