SOFOFA HUB

Collaborative spaces for **sustainable development**

2021 Annual Report
SOFOFA Hub

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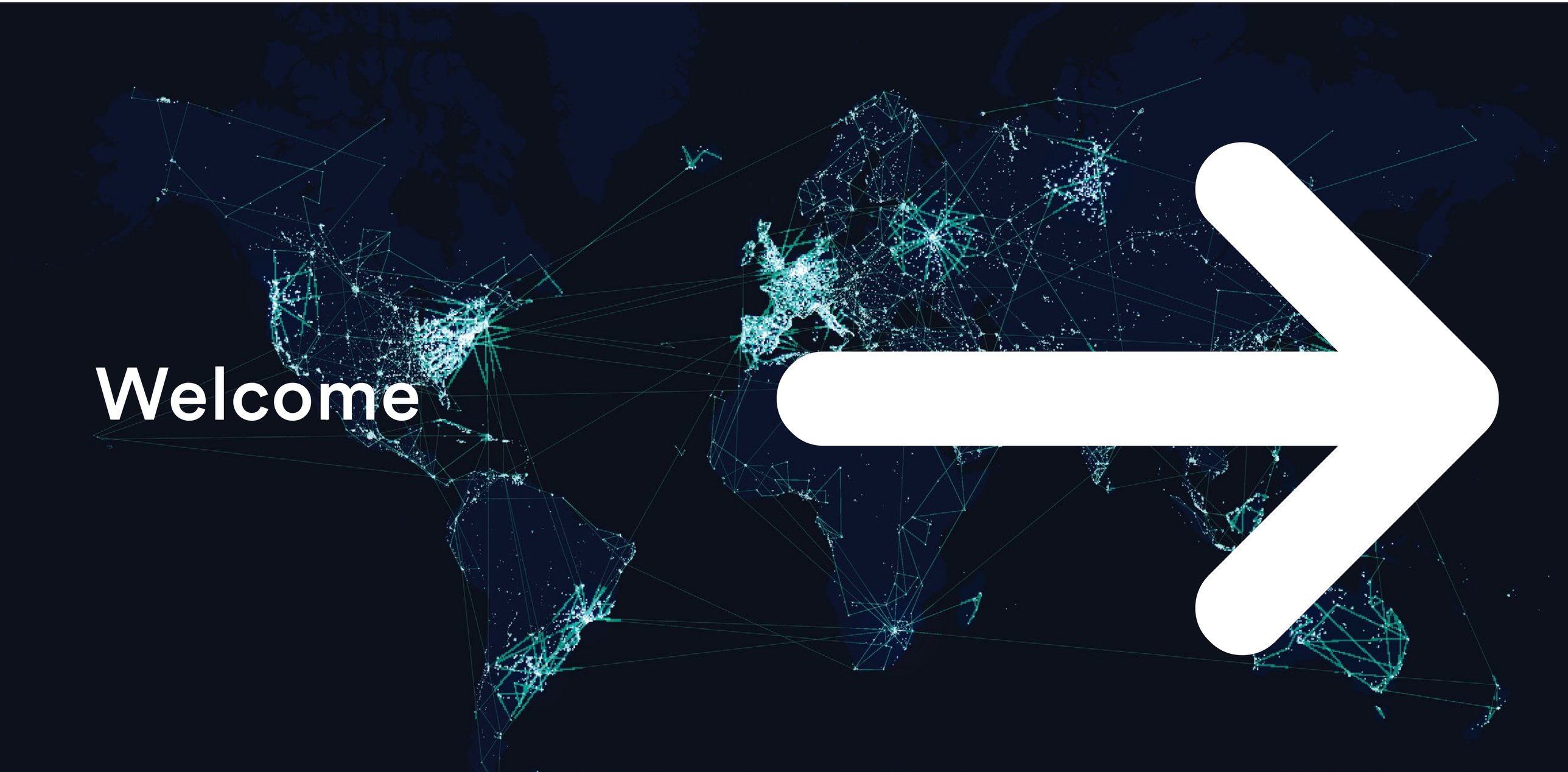


Welcome

Richard von Appen
SOFOFA Chairman

Connect and reconnect

The social changes that Chile and the world are experiencing have demanded that companies apply a different outlook. Therefore, ever since I assumed as SOFOFA's chairman, we set as our first action to actively listen to our associates and learn -through them- about the reality of many local entrepreneurs, to empathize with their problems, desires, and frustrations. Subsequently, we decided to focus our actions on four main areas of work: sustainability; growth and inclusive development; expansion of international trade; and the strengthening of institutions and the constituent process.

During this period, I have seen the commitment and interest of the business community to adapt to the new social environment in which they work. We have also contributed to promote changes we believe are relevant, while also flagging aspects of Chile's history that must be maintained and that serve as a foundation for our future development.

I am convinced that our current mission is to reconnect with people, because we are at their service; therefore, they must be at the center of our work. Through dialog, we will regain the confidence that we need to pursue the development of a modern, integrated, and sustainable economy.

A company is sustainable if it takes care of the environment, while being simultaneously legitimized by its main interest groups as a valid partner and stakeholder, with a place and the right to play an important role in the society that we aspire to build. In this regard, the space that SOFOFA Hub has opened during these two years points in the right direction, establishing cooperation synergies that help companies improve and become more competitive. With determination and precision, SOFOFA Hub has pursued an agenda that has succeeded in rallying companies and connecting them with other of society's stakeholders, to jointly address the industries' and the country's specific challenges.

Big challenges related to climate change and circular economy must be tackled collectively. SOFOFA Hub has taken on the mission of facing them via public-private projects that generate greater impact, by collaborating with corporates, innovators, and entrepreneurs. Tasks of this nature, linking worlds that are often far apart, take time and require a cultural change. However, we are convinced that this is the way to promote greater sustainable development in our country.

SOFOFA Hub 2021

2021 marked the three-year anniversary of the conception of this new space in SOFOFA. The largest trade association in Chile spawned a change, inspired by the conviction that the key to sustainable development lies in collaborating and working with other of society's stakeholders, particularly, entrepreneurs and technological innovators. Today we can say that the teachings that have resulted from this collaborative work have been critical to continue growing and achieving our goals.

Circular economy, one of our strategic axes, was the protagonist of 2021. Through the World Economic Forum's Scale 360° program, and together with 15 companies representing the main productive sectors, we were able to identify more than 150 opportunities for industrial symbiosis. This program, aimed at accelerating the transition to circular economy, has allowed the business sector to take on a leadership role in this necessary and urgent process for Chile. During 2022, we will work to enable the scaling of some of these opportunities together with other Chilean-based sectors, authorities, and entrepreneurs who are pioneering these issues in the world.

At the Center for Translational Biotechnology (CBT), our role has been focused on promoting project scaling and connections with the Chilean Industry's innovation and entrepreneurship ecosystem. Biotechnology rises as a path for our economy's sustainable development, in a context in which climate change has forced us to think of new ways to address water scarcity, or the existence of pests and diseases in our animal and plant fauna.

This path, which we have traveled along with our strategic partners CMPC, Agrosuper, Pucobre, Melón, Enel, Molymet and CCU, has helped us understand our culture, identify opportunities for sustainable development and sample Chile's potential for innovation through collaboration between various sectors. With enthusiasm, we have seen how our articulation role has allowed for the generation of enabling conditions, the breaking down of barriers, the mobilization of changes, and the creation of solutions to the country's greatest challenges. These capabilities currently inspire us to begin a new stage in the development of SOFOFA Hub, in which we will seek to consolidate all these learnings to scale our impact through a model that is unique in Chile.

Alan García Clydesdale
Executive Director, SOFOFA Hub

SOFOFA Hub 2021 Board

Its members were appointed in December 2021 and its term extends until 2023.

Aurora Olave
Secretary SOFOFA

Alan Meyer
General Director for
Chile, Perú and Ecuador
Mercado Libre

Francisco Ruiz-Tagle
CEO
CMPC

Fernada Soza
Executive Director
ChileMass

José Guzmán
Vice President
Agrosuper

Manuel José Casanueva
SOFOFA board member
Vice-President of GTD

María José Montero
Director of Impact
and Sustainability
Investments
FIS Ameris

Rosario Navarro
SOFOFA board member
Senior Business Partner
IDEMAX Chile

Sebastián Ríos
CEO
Pucobre

SOFOFA Hub 2021 Board:

Our experience of collaboration, connection and innovation

Alan Meyer
Director Chile, Perú and Ecuador
Mercado Libre

"At Mercado Libre we don't have an innovation division because we believe that innovation must be transversal to the entire company, and not to a particular team. We coach talented individuals, who are inspired by the MELI culture, and who want to be part of an agile company, which develops its own technological solutions for products, with a scale that is unique in the region. Technology and innovation are part of our DNA, it's what we need to be able to focus on consistently improving and enhancing people's experiences. SOFOFA Hub is an opportunity to contribute from our innovative DNA and to collaborate to improve people's lives, from the companies down to the entrepreneurial community".

María José Montero
Director
Impact and Sustainability Investments
FIS Ameris

"I'm so grateful for participating in collaborative experiences throughout the years. The first years of the '2000 emergency houses for the year 2000' initiative, the creation of the first impact investment fund in Chile, the philanthropic work of the Olivo Foundation and the efforts of trade associations such as ACAFI, have all been inspired by an awareness that collaboration is a value that makes us stronger. These experiences have taught me that working together with a multiplicity of people with various outlooks can be complex, but that it, nevertheless, allows us to go further. That is why joining SOFOFA Hub has been an opportunity for me to jointly contribute with others to circular economy and tackle climate change, both of which need to be addressed through the creation of spaces for connection around that common purpose. If we can effectively and efficiently articulate that space, we will contribute to the momentum of our production matrix and to our society's sustainable development".

Fernanda Soza
Executive Director
ChileMass

"At ChileMass, we have learned about the collaborative culture of Boston's powerful innovation ecosystem —America's most innovative state for several consecutive years— where the public and private sectors have a tradition of working together. We want to bring this collaborative culture to Chile, and we believe SOFOFA Hub is the best articulating agent to realize this vision: it connects companies, startups, universities, venture capital and government to create long-term projects that generate economic, social, and environmental impacts. I hope to contribute this vision to the board, identifying ideas and projects with American peers in topics such as biotechnology, clean technologies, and robotics; all areas where we are witnessing revolutions that will change our lives. By connecting Chilean companies with agents working in the forefront of research, we will be able to transform our economy and adapt it to the challenging needs of the 21st century".

SOFOFA Hub's strategic partners

SOFOFA Hub has seven partner companies: CMPC, Agrosuper, Melón, CCU, Pucobre, Enel Chile and Molymet. It is a select group that has led a new model of collaborative work to promote sustainable development through innovation.

The representatives of these seven companies are part of our Executive Committee and actively participate in the definition of strategic guidelines for our projects.

cmpc
AGROSUPER
melón
PUCOBRE
CCU
MOLYMET
enel

Governance model and team:

How are we organized?

BOARD

- 9 members appointed by SOFOFA
- Sessions every 6 months

- Aurora Olave
- Rosario Navarro
- Manuel José Casanueva
- Francisco Ruiz-Tagle
- José Guzmán
- Sebastián Ríos
- María José Montero
- Alan Meyer
- Fernanda Soza

EXECUTIVE COMMITTEE

- Raising business challenges (market pull)
- Prioritization of business projects
- Supervision of the development and advancement of business projects

- Aurora Olave
- Rosario Navarro
- Manuel José Casanueva
- Felipe Alcalde – **CMPC**
- Cristián Meyer – **Agrosuper**
- Sebastián Ríos – **Pucobre**
- Juan Carlos Muñoz – **Melón**
- Martín Rodríguez – **CCU**
- Juan Cristóbal Valenzuela – **Molymet**
- Antonella Pellegrini – **ENEL**

CBT COMMITTEE *

- Direction and supervision of the CORFO program
- Allocation of public funds

- Gonzalo Russi
- Rosario Navarro
- Manuel José Casanueva
- Isaac Kohlberg – **CTO Harvard**
- Eduardo Abeliuk – **TeselaGen**
- Francisco Chiang – **Partner universities**
- Mauricio Cañoles – **Partner R&DCenters**

- SOFOFA
- Partner companies
- Independent parties
- Universities and R&D Centers

*CBT: Center for Translational Biotechnology, a program supported by CORFO and ANID.

Our team

The SOFOFA Hub team works to foster a collaborative business culture for the benefit of sustainable development of industries.

Its task is to link representatives of the R&D world, entrepreneurs, and stakeholders from the public and private scene, to solve our country's and industry's main challenges.

Tomás Mardones joined our team as the CBT's Deputy Director of Technology until September 2021.

Alan García Clydesdale
Executive Director
SOFOFA Hub

María Paz Merino
Deputy Director
of Technology
CBT

Maximiliano Rubio
Project Manager
SOFOFA Hub

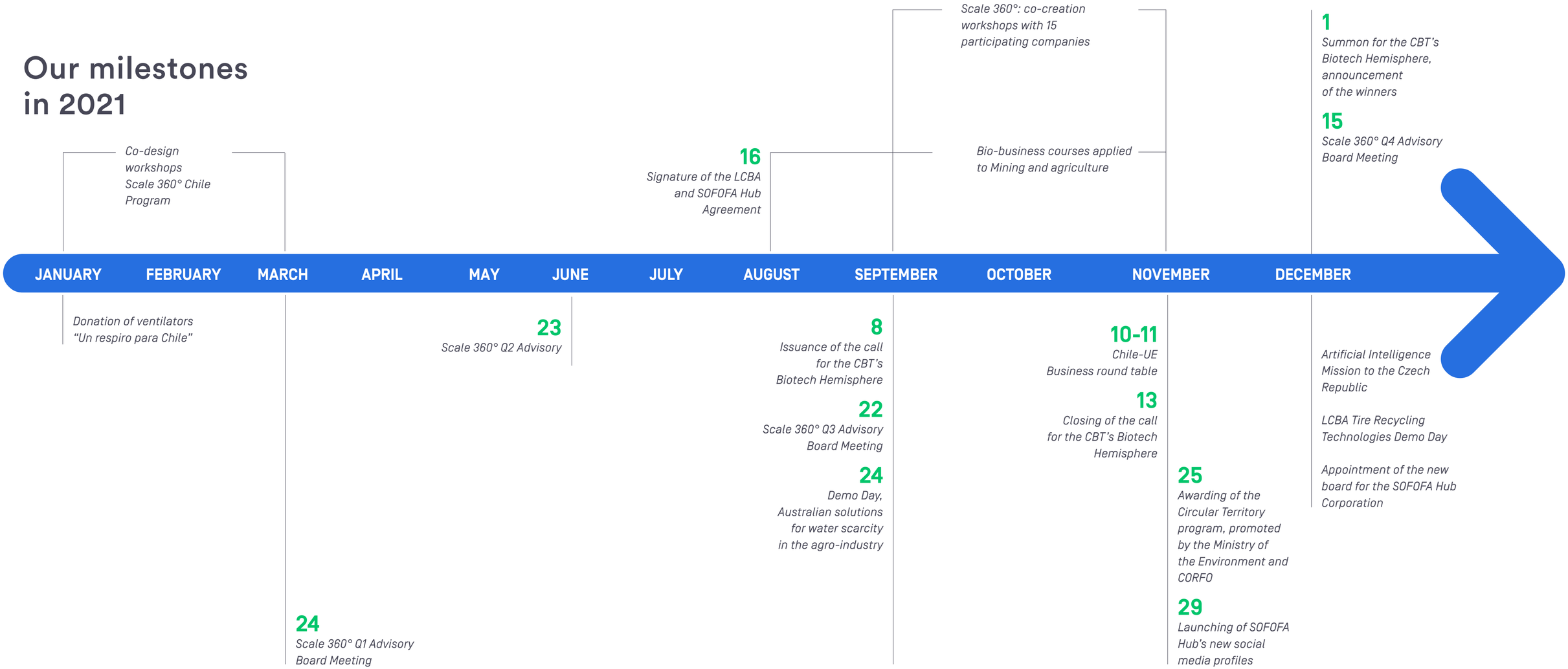
Andrea Guzmán
Communications
and Onboarding
SOFOFA Hub

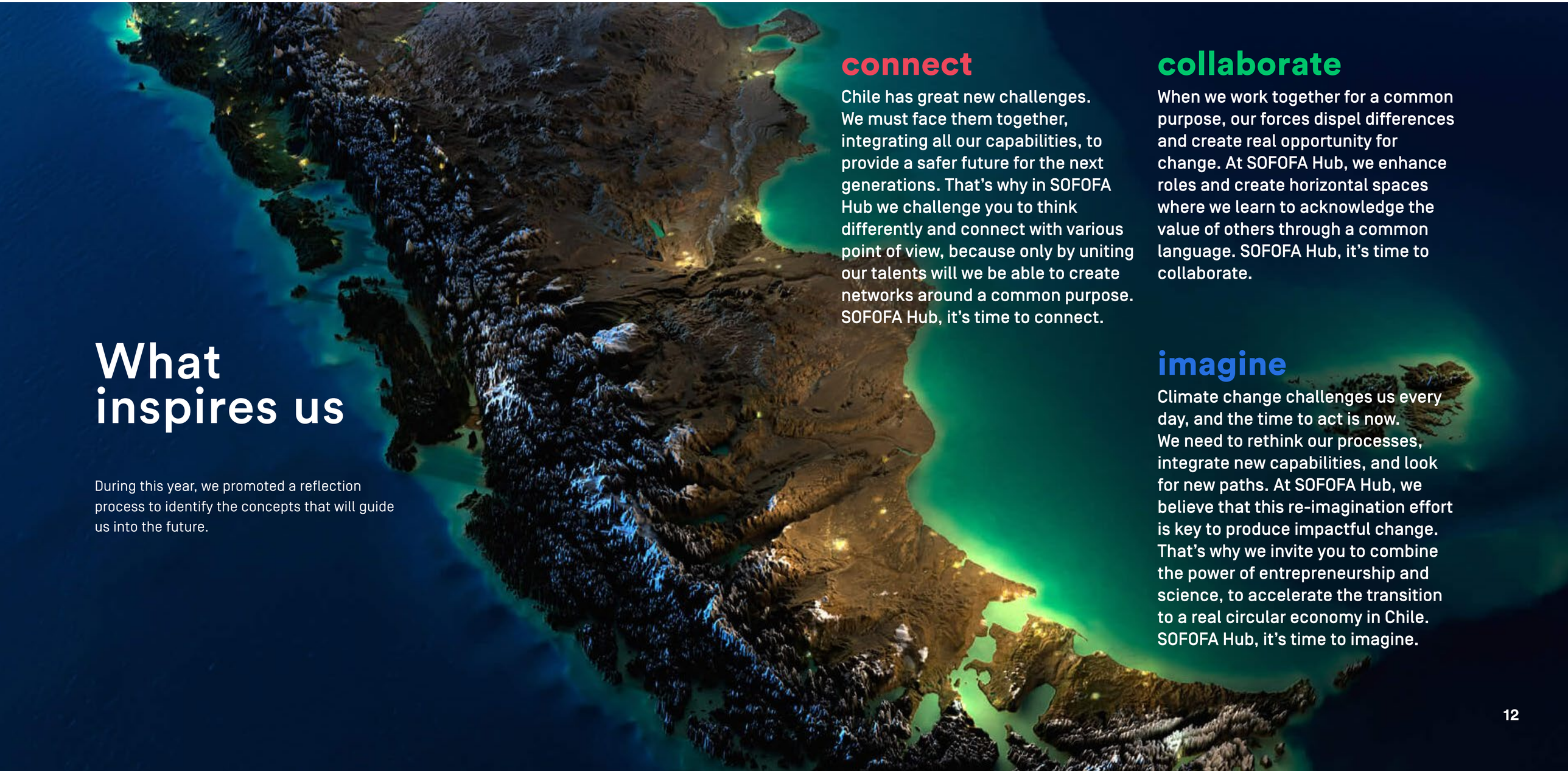
Florencia Undurraga
Attorney
SOFOFA Hub

Montserrat Roll
Project Analyst
CBT

Giovanni Cruz
Head of Administration
and Finance
SOFOFA Hub

Our milestones in 2021





What inspires us

During this year, we promoted a reflection process to identify the concepts that will guide us into the future.

connect

Chile has great new challenges. We must face them together, integrating all our capabilities, to provide a safer future for the next generations. That's why in SOFOFA Hub we challenge you to think differently and connect with various point of view, because only by uniting our talents will we be able to create networks around a common purpose. SOFOFA Hub, it's time to connect.

collaborate

When we work together for a common purpose, our forces dispel differences and create real opportunity for change. At SOFOFA Hub, we enhance roles and create horizontal spaces where we learn to acknowledge the value of others through a common language. SOFOFA Hub, it's time to collaborate.

imagine

Climate change challenges us every day, and the time to act is now. We need to rethink our processes, integrate new capabilities, and look for new paths. At SOFOFA Hub, we believe that this re-imagination effort is key to produce impactful change. That's why we invite you to combine the power of entrepreneurship and science, to accelerate the transition to a real circular economy in Chile. SOFOFA Hub, it's time to imagine.

SOFOFA Hub

Circular economy

A necessary transition

Scale 360°

Industries aligned with change

The SCALE 360° Program, which SOFOFA Hub joined in 2020 through the signing of an alliance with the World Economic Forum and the collaboration of the Ministry of the Environment, exhibited significant progress during 2021. Two initial instances were implemented: the design stage, in which the program's focus and scope in Chile were defined, and the stage for the identification of opportunities, where companies from different sectors worked to connect productive chains through industrial symbiosis, by prioritizing opportunities, detecting barriers, and co-creating validation or escalation projects. All of this was developed with the support and leadership of the Advisory Board's members and of the organizations that they represent (see the chart on the following page).

Scale 360° is a global initiative of the World Economic Forum that seeks to accelerate the transition to circular economy through technology and public-private partnerships. In Chile, its focus is on the identification of opportunities for industrial symbiosis in the main productive sectors and on the generation of collaborative networks for their scaling.

During 2021, its efforts centered on summoning Chile's main industry representatives to jointly identify symbiosis opportunities and gaps, through the integration of their production chains. In 2022, the focus will be on validating these opportunities with society's stakeholders, such as authorities, companies from other sectors, entrepreneurs, and scientists, among others. With this validation as our foundation, we seek to advance our pilot project and scale upcoming opportunities.

Alan García,
Executive Director
SOFOFA Hub

"The World Economic Forum provided a fantastic opportunity to summon sectors that don't generally speak to each other, sit them in the same table, and find ways to integrate their productive chains. Industrial symbiosis may very well be the most effective way to accelerate the transition to a circular economy in Chile".

Advisory Board Scale 360° Chile

The program in Chile succeeded in summoning a high-level advisory board with representatives from the public and private sectors and civil society, thus achieving the alignment of stakeholders that are key for transitioning into a circular economy.

Richard von Appen
Chairman
SOFOFA

Carolina Schmidt
Minister of the Environment Chile

Marisol Argueta de Barrillas
Head of the Regional Agenda LATAM
World Economic Forum

Pablo Terrazas
Ejecutivo VP
CORFO

Gonzalo Muñoz Abogabir
High-Level Climate Action Champion
COP25 (ONU)
CEO Triciclos

Peter Ostojic
CEO
Center for Innovation and Circular Economy (CIEC)

Martín Rodríguez
Transformation Manager
CCU

Francisco Ruiz-Tagle
CEO
Empresas CMPC

John Graell Moore
CEO
Molymet

Paolo Pallotti
CEO
ENEL Chile

Sebastián Ríos
CEO
Pucobre

"Since its inception in 2020, the collaboration between SOFOFA and the World Economic Forum's Scale 360° Circular Innovation initiative has uncovered more than 150 opportunities for industrial symbiosis that present significant potential benefits for local industries and stakeholders at a global scale. These efforts help leaders prioritize ideas and promote the development of solutions. Additionally, the program in Chile has been sharing updates and its process advancement status, along with the unique lessons that have been learned, to contribute to the strengthening of knowledge exchange within the global SCALE 360° community".

Helen Burdett
Head of Circular Economy
World Economic Forum (WEF)

Industry has activated to lead the transition towards circular economy

Our work in 2021 focused in designing the SCALE 360° program in Chile, its scope, and objectives. We also worked with industry leaders to identify opportunities for industrial symbiosis.

Design stage:

An outlook on local needs

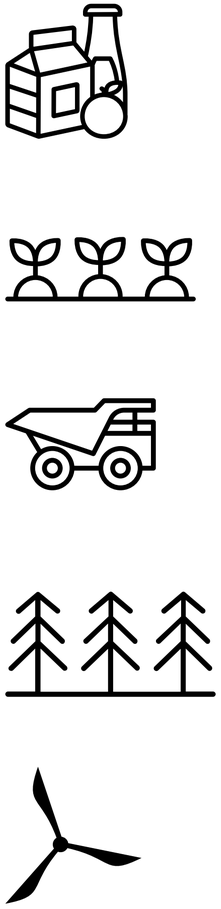
Three workshops were held in the first quarter of 2021 with representatives of the entities that are part of the Scale 360° Advisory Board, to define the program's focus, as well as its objectives and primary sectors. The World Economic Forum methodology was used to establish the program's scope and objectives during these sessions.

It considers 26 intervention models that allow us to link different stakeholders and accelerate the transition to circular economy.

The objective was to choose the model that would best suit the local scenario and Chile's specific work methods, opportunities, and requirements.

More on the World Economic Forum's methodology here

- Food & beverages
- Agriculture & aquaculture
- Mining & construction
- Forestry & wood pulp
- Energy



Opportunity-Searching Stage

Connecting by-products of one sector with the inputs from others.

SOFOFA Hub summoned companies representing the country's main productive sectors through an open call. Among the foregoing, 15 accepted the proposal to lead this transition, using industrial symbiosis in Chile as its starting point.

These companies signed an agreement with SOFOFA Hub that considers an antitrust competition protocol and confidentiality agreements, to generate a space of trust and collaboration. Each of them appointed at least two representatives to participate in the process: one from the operations arena, with the relevant knowledge; and one from the corporate division, with internal articulation capacities.

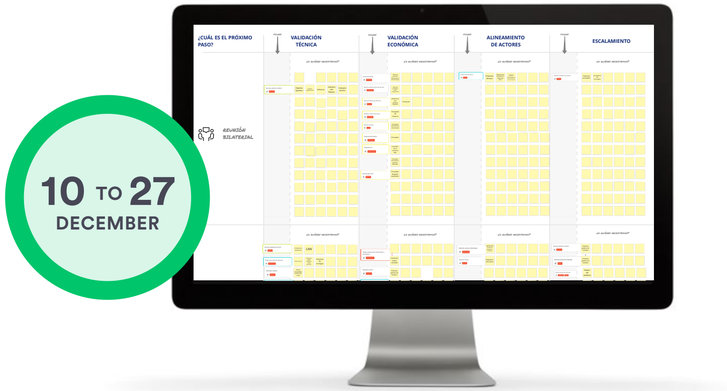
15 PARTICIPATING COMPANIES

MOLYMET	PUCOBRE	CODELCO	elecmetal Product Design Group	AngloAmerican
melón	EcoAZA	ASFALCURA	tresmontes lucchetti	sodexo
CCU	cmpc	Salmones Austral	enel	AGROSUPER

WORKSHOPS AND IN-DEPTH MEETINGS: HOW DO WE WORK?

"We use the methodology developed by the World Economic Forum for Scale 360°; a methodology that was applied not only in Chile, but throughout the world. Of the 26 intervention models included in the methodology, we selected two for the program in Chile," explains Alan García, SOFOFA Hub's executive director.

A survey was conducted with the companies prior to the first workshop to understand the nature of their main byproducts and inputs. Additionally, SOFOFA Hub summoned its network of Universities and R&D Centers to identify the opportunities for industrial symbiosis detected by the technological world.



- **Workshop 1: Identification and prioritization of opportunities**

During the workshop, held virtually through the Miro platform, the companies worked to identify opportunities for industrial symbiosis, which were later categorized based on their impact potential and development stage. 150 opportunities emerged from this initial work, prioritizing 85 of them that exhibited a high impact potential and/or that showed advanced stages of development.

- **Workshop 2: Search for relevant stakeholders**

During this second workshop, the companies articulated the next step that should be taken to further implement each opportunity. Moreover, new stakeholders were also identified through another collaborative process for the validation or scaling of prioritized opportunities.

- **Workshop 3: Further analysis**

Metals Industry

Mining Industry

Forestry Industry

Agriculture Industry

Food Industry

Energy Industry

Construction Industry

Aquaculture industry

The voice of the companies participating in Scale 360°

Eight of the companies that participated in the SCALE 360° workshops in 2021 share their visions on the process and highlight its value.

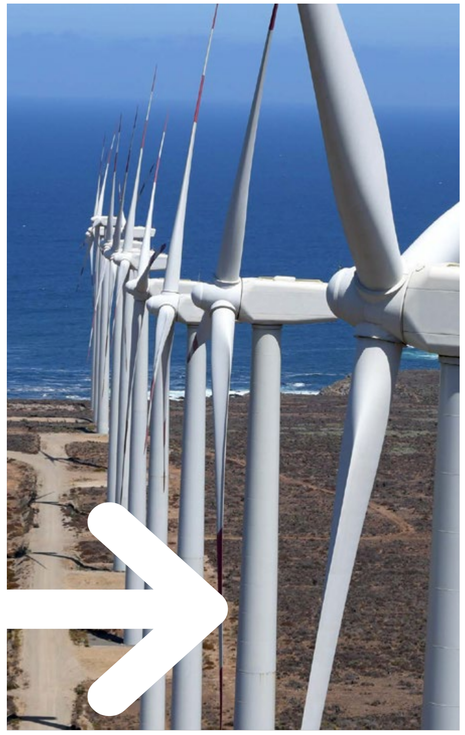
AngloAmerican

"Anglo American has clear sustainability goals heading towards 2030, enshrined within the Sustainable Mining Plan, which is the Road Map that defines our work on this matter. Advancing in the greater circularity of our production processes is one of the objectives that underpins this strategy, which allows us to achieve our purpose of reimagining the mining industry and improving people's lives. Scale 360° provides us with a clear methodology and the commitment of diverse industries that engage with us as potential suppliers or customers, facilitating the articulation and advancement of circular economy".

Esteban Rojas
Head of Public Affairs
AngloAmerican

Enel

"Scale 360° has allowed us to have a broader outlook; that is, to think about the recovery of metals coming from electricity infrastructures and pass on those resources to other sectors. Disused posts and cables are a good starting point. This discussion clearly leads to quite an exciting vision of the future, which we must now bring home and materialize with the teams. In other words, once the conversations have been held, we need to focus these projects and make them operational. It is also necessary to think about their consequences, for example, the regulatory issues that they entail, the access to materials, the impacts on supply chains that may have an interest in participating, and the positive effects on the communities involved".



Paolo Palloti
CEO
Enel Chile

Melón

"I highlight the use of innovative platforms, which allowed us to conduct the workshops remotely, effectively, and didactically. The companies' involvement is a good sign. We have learned that there are more synergies than we originally thought".

Rodolfo Ramírez
CEO
Melón

Agrosuper

"It gave us the opportunity to share best practices and showcase the project. Many things may arise when submitting a project to public scrutiny, which were not previously considered, and which allow to make it stronger".

Rodrigo Arias
Deputy Manager for product innovation
Agrosuper

Salmones Austral

"Aside from the standards of excellence and sustainability under which we operate, our participation in Scale 360° allowed us to identify and define our byproducts in accordance with the impacts and benefits of the circular valuation process. This triggered various collaborative initiatives with companies, municipalities, communities and local organizations for the design and implementation of sustainable projects".

Jaime Molina
Sustainability Deputy Manager
Salmones Austral

CMPC

"I highlight the turnout and the exposure that the process generated, which was key to enable the interaction of different companies, representing various industries. As a result, it was possible to combine opportunities that would have been very hard to create, if each company were acting alone. There are lessons —such as confirming that there is an interest in using each other's waste or by-products— that although may seem obvious, are useful to learn, to leverage them and allow for a pool of very interesting projects to surface".

Sandra Ramírez
CMPC Environmental Manager

Sodexo

"Scale 360° fosters a community that unites the efforts of government, specialists, and companies, to make an actual contribution to the planet. This collective construction allowed sharing product and by-product classification methods and volumes, as well as finding common areas that can be systematized by industries for the exchange of this rubbish or by-products that, although may be deemed waste in one production, can very well be reusable inputs for another".

Alfredo Do Nascimento
Director of Strategic Projects
Sodexo

ME Elecmetal

"Although we have been working on the revaluation and reuse of our waste for some time, this program has the potential to accelerate our processes by working directly with other companies. Moreover, this initiative adds value to recycling and circularity, going beyond its mere economic significance, which is quite compatible with our way of doing business and adding value".

Matías Bustos
Operations Manager
ME Elecmetal

Scale 360° Chile 2021 Figures

15 companies

5 Focus sectors

42 Participants

150 Generated opportunities

85 Prioritized opportunities

5 Lines of work

Circular territory

A public-private partnership that will allow us to bring the Road Map for a Circular Chile to the Chilean territories

CORFO, in partnership with the Ministry of the Environment, launched an open call for proposals in 2021, to summon organizations interested in articulating the implementation of the Road Map for a Circular Chile by 2040. This initiative is part of CORFO'S Chile Transforma program, which promotes the development of various production sectors through the strengthening of innovation and sustainability.

SOFOFA Hub was selected in November 2021 to implement the program, now called Territorio Circular, and to oversee the execution of the Road Map that was approved by the Council of Ministers for Sustainability. SOFOFA Hub aims to provide greater proximity and involvement of regional communities in the territories of industries such as mining, construction, transportation, raw materials and the processed food sector, whose operation centers are in different areas of the country. The goal is to build this path starting from the opportunities present in the country's territories, connecting its productive sectors with stakeholders of the innovation and local entrepreneurship ecosystem.

"The vision of the future, and how we dream Chile will be in several more years, is one of the program's key components. The Road map is established over that foundation, which represents our desire; what we wish to do. We bring this idea down to earth with concrete actions that allow us to move forward, step by step. One of the first steps is to shake up the innovation ecosystem so that more businesses are created under the circular economy model".

territorio circular

Javier Obach
Circular Economy
Project Manager

What is the Road Map for a Circular Chile?

The Road Map for a Circular Chile by 2040 was developed in 2020 by the Ministry of the Environment, the Ministry of Economy, the Sustainability and Climate Change Agency (ASSC) and the Production Development Corporation (CORFO), as a measure to deal with the effects of global warming, the scarcity of natural resources, and ecosystem degradation. Its lodestar is to consolidate a more circular and waste-free country by 2040.

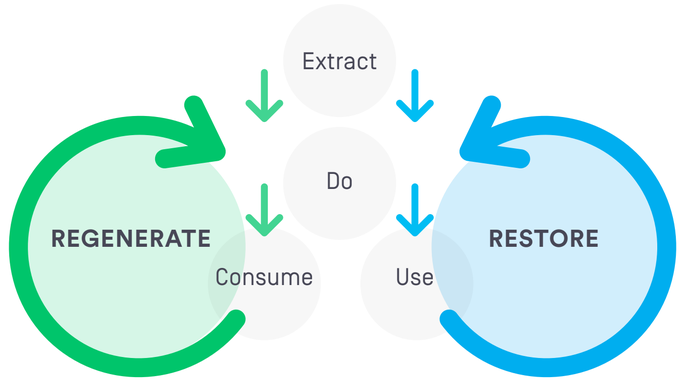
The Road Map sets out the deadlines and objectives which, in a 20-year time frame, will guide the national industry's economic, cultural, regulatory, social, and territorial transformation towards sustainability.

Chile Transforma

This CORFO program, of which Circular Territory is a part of, seeks to improve the national economy's competitiveness by strengthening human capital, innovation, and productivity, to solve coordination failures and remove obstacles in strategic productive sectors. Its aim is to transform Chile in a globally competitive country, with an innovative and sustainable industry, and high productivity and technology levels. It is addressed at small and medium-sized companies, with strategic focus on management entities of the national economy's key productive sectors.

In January 2021, Carolina Schmidt, who at the time was the Minister of the Environment, led the launch of the Road Map for a Circular Chile. The document has ambitious targets for 2040, under four axes: Circular Innovation, Circular Culture, Circular Regulation and Circular Territory.

HOW DO INDUSTRIES OPERATE IN A CIRCULAR ECONOMY?



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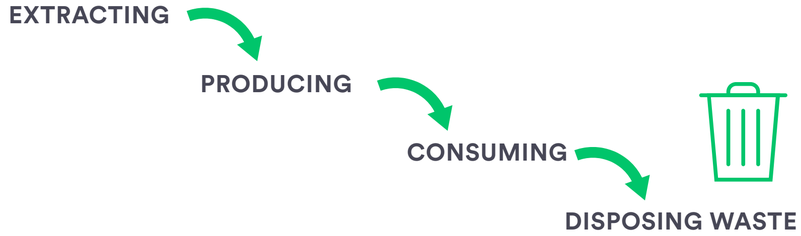

Circular Economy Committee for Mining

A space to encourage collaboration between mining companies and other industries.

División de Salvador, CODELCO

The Circular Economy Committee for Mining was created by SOFOFA Hub and CESCO (Center for Copper and Mining Studies) to generate a coordination space between companies interested in driving circular economy from that sector. The Committee is comprised of representatives from AngloAmerican, Codelco, Antofagasta Minerals, Teck, Glencore, the Ministry of Mining and Corporación Alta Ley.

The initiative has three subcommittees that articulate specific projects to advance the transition, starting from byproducts specific to this industry: the Copper Slag Subcommittee, the Mining Tailings Subcommittee, and the Out-of-Service Tires Subcommittee. In 2021, the subcommittees initiated the development of pilot projects, technical studies, and partnerships with various sectors to promote a new economic model. They recorded their progress through bimonthly meetings. “Each subcommittee is headed by a mining company, which summons other non-mining companies to participate in the challenges and opportunities associated with each byproduct,” explains Carlos Rebolledo, CESCO’s representative on the committee.

PROGRESS IN 2021

Once the results of the projects proposed by the subcommittees have been analyzed, the objective is to up-scale these opportunities and overcome the pre-existing regulatory, legislative, and cultural barriers hindering their implementation. “Each subcommittee is coordinated through a bimonthly meeting where its participants discuss its progress. Meetings will be held with key stakeholders in 2022, to address issues of interest for mining companies. The role of the Ministry of Mining will be very relevant to support initiatives and summon other State authorities”, explains Carlos Rebolledo of CESCO.

COPPER SLAG SUBCOMMITTEE

The AngloAmerican Chagres Smelter heads this subcommittee, which also includes Codelco, Ecometales, Melón, EcoAza, Glencore Altonorte and Alta Ley. Its first challenge in 2021 was to quantify waste volume records, the places where they are found and the type of slag that exists; shot or crushed.

“The alternative use of slag has been on the public agenda for many years. This subcommittee’s value is that it is composed of the Ministry of Mining, as well as by the companies that could generate supply and demand. Among all, we can establish the support needed to lift barriers and empower circular economy projects using this material”.

Kattherine Ferrada
Sustainability Manager at AngloAmerican and head of the subcommittee

PROJECTS FOR 2021

Partnerships with Melón and Asfalcura

The companies that could demand this byproduct as a raw material were identified, including some in the concrete industry that use aggregates to produce cement. Extracting it from the natural waterways of rivers produces an environmental impact. Therefore, replacing aggregates with slag is a viable alternative. Melón collected slag samples at the Chagres Smelter and Asfalcura at the Ventanas Smelter, to use them in their products and study the results of this raw material substitution, to generate a circular economy.

Opportunities in urban construction

The subcommittee issued a summon for universities and selected Pontificia Universidad Católica de Valparaíso (PUCV) to develop a project using slags in urban furniture. As a result, the institution prepared a proposal to produce cement elements, present in public squares and sidewalks. In this way, the waste would be reincorporated into the economic circle while it fulfills the need for greater public infrastructure that exists in mining territories. In 2022, the subcommittee will move forward to unlock the regulatory barriers to run this pilot on a larger scale.

CBT

Biotechnology

Generating conditions for the development of biotechnology in Chile.

CBT

Scaling of local biotechnology projects

The Translational Biotechnology Center stood out in 2021 in its role of articulating collaborations between companies that seek biotechnological solutions and those able to offer them, promoting the development of the biotechnology industry at the local level. Through evaluations and coaching, it generated important spaces to support the development of biotechnology projects with scalability potential, that are attractive for the main productive sectors. We highlight the Biotech Hemisphere call, launched in September, which resulted in the tender of 19 proposals of biotechnology solutions developed at the laboratory level, which seek to become pilot programs at an industrial scale.

This was also a year of progress in consolidating alliances with projects and stakeholders in the biotechnology industry, such as INIA and Concha y Toro, and the company ICTIO Biotechnologies.

One of the CBT's tasks is to develop enabling capabilities to support the growth of the biotechnology industry, and one of its challenges is the establishment of regulations that go hand-in-hand with this industry's latest achievements. Therefore, the CBT has promoted the articulation of three public-private tables: the Biobanking Table, the Microorganisms and Algae Table, and the Cultured Meat Table. Each of them was held with the participation of stakeholders from the research world, and representatives from the business and public sectors, all interested in developing regulatory frameworks that are in line with international standards and the latest developments in these industries.

Continuing with the work started in previous years, the CBT consolidated its support for the dissemination of knowledge and the design of training programs on biotechnology and business. It promoted thematic webinars and worked in conjunction with Chilean universities for the design and implementation of two courses in applied biotechnology.

María Paz Merino
Deputy Director of Technology
CBT

"2021 was an important year for the CBT, as it deployed tools and services to address the gaps detected in the diagnosis conducted by the center at the time of its inception. Today, we can say that these actions begin to bear fruits, with specific projects for scaling biotechnological solutions, and a plan to address regulatory barriers, enhancing the links with industry".

ANID ASSUMES MANAGEMENT OF THE TECHNOLOGICAL CENTERS

In 2021, the National Research and Development Agency (ANID) —from the Ministry of Science, Technology, Knowledge, and Innovation— took over the management of several instruments for the promotion of scientific and technological development, as well as the technological centers that had been run by CORFO up to that moment, including the CBT.

CBT Committee

Building bridges with the biotechnology industry

Representatives of three key areas for the development of the biotechnology industry are united under the CBT Committee: universities, research and development centers, and companies. Innovation possibilities are based on this diversity of experiences and knowledge, from which each one contributes something unique and valuable.

Isaac Kohlberg
Chief Technology Development Officer
Harvard University

Eduardo Abeliuk
Founder
TeselaGen

Francisco Chiang
Director of Innovation and Entrepreneurship
Universidad Andrés Bello

Mauricio Cañoles Ph.D., MII
General Manager
UC Davis Chile Life Sciences Innovation Center

Gonzalo Russi
Administration and Finance Director
SOFOFA

Rosario Navarro
SOFOFA Board Member
Senior Business Partner
IDEMAX Chile

Manuel José Casanueva
SOFOFA Board Member
Vice-President of GTD

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Collaboration for development

Mauricio Cañoles — representative of the associated research centers— and Francisco Chiang —representative of the partner universities— share their vision on how to bridge the gaps between the private and R&D worlds, and the collaboration needed to tackle pending challenges.

Francisco Chiang
Director of Innovation and Entrepreneurship
Universidad Andrés Bello

"It is essential for universities, research centers and companies to collaborate, because no organization has all the skills and resources to efficiently innovate on its own. The pandemic has strengthened the positioning of biotechnology as a key development tool to cope with major threats, such as COVID-19. In fact, a sharp increase in the use of biotechnology in the health, food and forestry industries is expected in the coming years, for a sum that will globally exceed US$950 billion in 2027, with an annual growth ranging between 9 and 10%. In this sense, successful cases such as Phage Lab and NotCo enhance the local biotechnology ecosystem. I notice cultural obstacles, such as the level of collaboration and trust among stakeholders in the innovation process, and the fact that the Chilean biotechnology ecosystem is still under development. However, we see important opportunities in the quality of advanced human capital and the local stakeholders' increasingly unobstructed access to develop ecosystems that generate collaboration".

Mauricio Cañoles Ph.D., MII
General Manager
UC Davis Chile Life Sciences Innovation Center

"The collaboration between the country's scientific and business sectors has been a complex challenge for decades. Various initiatives have been explored to achieve this, ranging from the 'scientific education' of entrepreneurs and the 'business immersion' of researchers (with unsatisfactory results from a public investment standpoint), up to the creation of institutions or spaces, such as the CBT, that serve an interpreter or translational role.

The value of this collaboration is proven and documented in countries around the world, particularly those with developed economies. This relationship allows focusing the joint efforts of science, the State, and the companies, not only for the development of technologies and knowledge relevant to the specific needs of the productive sector, but also, for their correct implementation in productive systems and in specific companies.

Obstacles will appear along the way, among which I highlight:

- Getting business and academia to understand that biotechnology solutions need a multidisciplinary approach, to achieve their greatest benefits.
- Collaboration must be effective at all project stages because it allows for a clear definition of objectives and the identification of the critical factors of future commercial implementation, provided that such collaboration is in fact successful.
- The deadlines for academia will never be long enough to achieve its goals, while for the companies, deadlines will never be as fast as they require them to be. This balance is the biggest challenge to uphold future trust and collaboration".

Two necessary questions

The public sector is an essential stakeholder in this collaborative work equation that integrates universities and research centers to enhance biotechnology innovation and development. Within this framework, the National Research and Development Agency (ANID), of the Ministry of Science, Technology, Knowledge, and Innovation, took over in 2021 as the state body entrusted with the CBT's administration. Camilo Erazo Leiva, ANID's deputy director of Centers and Associative Research, discusses this mission and its challenges.

Camilo Erazo
ANID's Deputy Director of Centers and Associative Research

What is the value of collaboration between universities, research centers, companies and the State for the development and execution of biotechnology projects in a Chile (and a planet) beginning to emerge from the pandemic?

"The pandemic has generated major impacts on the national and global economy, and in this context, innovation is emerging as a powerful mechanism to activate the country's economy and improve competitiveness with new science and technology-based solutions that contribute to improving the quality of people's lives. Potentially disruptive innovations generally result from identifying opportunities and business or community challenges, as an answer that comes from science-based solutions. Because of their degree of novelty, these solutions often contribute to improving competitiveness through the increase of productivity and the sustainability of our productive sectors. To make this possible, centers such as the CBT, now supported by ANID, are at the heart of this link between needs and suitable capabilities, for the effective solution of business challenges and the decrease of information asymmetries".

What obstacles must still be overcome to favorably impact the country's development?

"There is still much to do to ensure that collaboration flows expeditiously between universities, research centers, companies, entrepreneurs, and the State, and for it to capture the potential impact of research on development, within the challenges of the existing productive industries and the economy's new sectors. There is a need to build trust between the parties and respect for their different capacities and roles, to share a common vision that contributes to the different objectives of each of the entities involved in the science, technology, knowledge, and innovation ecosystem. As ANID, this is where we wish to collaborate, through our centers and using our institution's other tools, to bring science closer to the business world and to the various public services".

Caligus antiparasitic scaling

A solution for a high impact problem.

One of the CBT's mandates is to facilitate the links among stakeholders in the local ecosystem of biotechnology companies, making it a priority to connect companies in need with potential suppliers of biotechnology solutions. In 2021, the center supported ICTIO Biotechnologies, a national biotechnology consortium, in the search for a counterpart to scale the production of an antiparasitic that they had developed for farmed salmon. To that end, the CBT issued a call among its implementing partners and selected Domolif, a biotechnology startup from Antofagasta. The Caligus, or salmon louse, causes USD 350 million in annual losses in the salmon industry.

The solution had been developed by ICTIO Biotechnologies at the laboratory level and the challenge was to produce it at the industrial scale. This task will be tackled in conjunction with the selected company, while the CBT monitors the process. Its scaling and manufacturing tests will begin in 2022.

"At Ictio Biotechnologies we have developed an extremely innovative biological antiparasitic product for the treatment of caligidosis. We needed to advance toward its industrial scaling and the CBT has actively supported us in its optimization and pre-scaling, through financial support and its valuable contacts with a network of national and international scientific and technological partners. Each of these collaborators presented excellent proposals and the decision was not easy, but the CBT guided us through every stage of the process. We have made remarkable, swift advances that allow us to currently have a cost-effective, domestically manufactured product. And now we're going for more! The end of the industrial scaling stage, field validation and marketing".

Geraldine Mlyrnaz
CEO
ICTIO Biotechnologies

Vegetable cellular expansion platform

Support for agricultural stakeholders to face climate change.

Proyecto

Concha y Toro

This project promotes the generation of a new technology that will allow the national wine agricultural industry to adapt and increase its productivity in the new climate change context. For such purposes, the Concha y Toro Research Center and the Institute of Agricultural Research (INIA) are genetically strengthening the strains of the Chilean Industry's most demanded grapes, with the CBT joining this consortium in 2021 as its new member.

After three years of research, the project's technological advances have proven to be on the right track, with the CBT taking on the role of facilitating dialog among participants, coordinating technical meetings, and providing support regarding technical gaps that require finding new specialists or collaborators.

Negotiations began in 2020, and last year the parties' roles and contributions were defined. The agreement is scheduled to be signed in 2022.

María Paz Merino
Deputy Director of Technology
CBT

"This is a key project for the CBT, because it is fully aligned with our mission of generating the enabling conditions for the development of the national biotechnology industry. Its articulation is also key. On the one hand, there is INIA, a leading center in agro-science with unique capabilities in Chile for a project of this type, and on the other hand there is Concha y Toro, who raised a clear challenge to solve and contribute with their knowledge and expertise, from an industrial standpoint".

ANTICIPATING THE WATER CRISIS

The project seeks to generate grapes capable of resisting the complex scenario that the agricultural industry is facing due to climate change, water scarcity, and the presence of increasingly aggressive pathogens. Concha y Toro and INIA are developing stronger strains, that can be adapted through the modification of the grape's genetic material, regardless of genes from other species, as in the case of transgenesis. They use CRISPR technology, in which the cell's genetic material is edited to facilitate its adaptation to new scenarios.

Prior to applying the CRISPR technology, the laboratory must generate cell lines from clones that have physiological conditions that can be genetically improved. INIA and Concha y Toro worked during 2021 in this first stage, named Adobe Project. They also developed a technological platform and work protocols to apply this process to the needs of other industries. In this regard, the project aims to have a much broader outlook and purpose, transcending the limits of the wine industry.


Concha y Toro

Geoplasma bank

How does the CBT's participation contribute to this project?

"This partnership presented us with the challenge of considering components that are not entirely scientific, such as those relating to business, power visualization, technology, as well as other commercial aspects. It has immersed us into a different world, where our research is subjected to a commercial or utilitarian translation, for it to be received by society; and that has also been an interesting challenge".

Humberto Prieto
Senior Researcher
INIA

A successful case

"This is a successful and dynamic case of institutions that reach an agreement, and that is why I consider it a collaboration and virtuous innovation model. On the one hand, there is INIA, a State entity with its technical capabilities and the experience it has developed. Also present is Concha y Toro, one of the industry's leaders, from the private world. And there's SOFOFA Hub's CBT, whose role is to act as a nexus, a facilitator and technology enabler, making dialog possible between these two worlds, and who has integrated very well".

Felipe Gaínza-Cortés
R+D+I Leader in Molecular Biology
Research and Innovation Center Concha y Toro

THE 3 STAGES OF THE PLANT CELL EXPANSION PLATFORM PROJECT

Step 1:
Designing a technological platform, working protocols and an agreement between INIA, Concha y Toro, and the CBT.
Status: in progress.

Step 2:
Editing work on the genetic material of the clones of selected strains.
Status: pending.

Step 3:
Conducting pilot testing with clones whose genetic material has already been successfully edited in the laboratory.
Status: pending.

Worktables

Promotion of regulatory frameworks that facilitate the adoption of new technologies.

The creation of public-private working tables has been leveraged to promote new regulatory frameworks in the processes of biotechnology-related industries, in line with one of the CBT's main guidelines (i.e., the promotion of enabling conditions for the creation and implementation of biotechnology solutions).

Three tables were set up in 2021: Biobanks; Microorganism Collections (MO) and Algae; and Cultivated Meat, comprised of representatives of the public, academic and business sectors. During 2021, they met in different instances and in different formats to advance the regulatory proposals of their respective sectors.

Although the work of each table is currently in different stages, all stakeholders have shown great interest and proactivity. The CBT, for its part, fulfills the role of keeping these tables active and enriching the discussion by integrating new stakeholders in accordance with the advances and challenges that arise along the way.

CULTIVATED MEAT TABLE

Participants:

- CBT, Agrosuper, Luyef Biotechnologies and Universidad de Chile's Center for Biotechnology and Bioengineering.

Advances in 2021:

The worktable was established, and it addressed Chile's challenges and regulatory framework.

"This worktable exemplifies that in Chile we are at the forefront in the creation of the technologies of the future, that push us toward sustainable development as a society. Simultaneously, it will lay the future foundations of how to conduct communications between government agencies and the private sector when regulating innovation".

Kris Blanchard
CEO and co-founder
Luyef Biotechnologies

BIOBANKING TABLE

Participants:

- CBT and Universidad del Desarrollo's Bioethics and Law Observatory.
- The biobanks of Universidad de Chile, Universidad Católica, Fundación Arturo López Pérez, the Luis Calvo Mackenna Hospital, Universidad Mayor, Universidad de la Frontera, Universidad de Valparaíso, Universidad Austral, the Advanced Center for Chronic Diseases (ACCDiS), the MAUCO Cohort study, the Chilean Alliance of Patient Groups, FENPOF and FECHER.
- Ministry of Health.
- National Investigation and Development Agency (ANID).
- Public Health Institute (ISP).

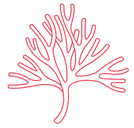
Advances of 2021:

- Establishment of a technical commission to oversee the next working tables.
- Two working sessions with biobanks in Chile, with the participation of relevant stakeholders from the fields of biomedical research, pathology, and research ethics committees.
- Two public sector working tables: one with DIPlAS and DIPRECE (Ministry of Health), and the other with the ISP and ANID.
- Links with the Chilean Alliance of Patient Groups, integrated by FENPOF and FECHER; Latin American entities that advise governments in this field.

"The highlight of this process was the exclusiveness of the country's most representative biobanking Groups, guaranteeing the legitimacy of the proposal-drafting process. The participation of representatives of the public sector, particularly the Ministry of Health and ANID, was also key as they play a very important role in the adoption and implementation of the regulatory proposals developed in this CBT project, whose aim is to fill the regulatory gap and allow the generation of enabling conditions that enhance the development of biomedical research and biotechnology in Chile".

Juan Alberto Lecaros
Director of the Bioethics and Law Observatory at Universidad del Desarrollo

MICROORGANISMS (MO) AND ALGAE COLLECTION TABLE



Participants:

- CBT and Universidad de La Frontera's Chilean Type Culture Collection-CCCT.
- Universidad Católica, INIA Technological Center, Universidad de Santiago, and Universidad de Antofagasta, among others.
- The Ministry of the Environment and the General Directorate of National Mobilization (DGMN) joined some of the meetings.

Advances of 2021:

- Launching of the Microorganisms and Algae Network.
- Monthly meetings among participants to define the mission, objectives, work methods and potential new members.
- Creation of subcommittees to work on documentation and curatorial issues, financing, regulation and access, dissemination, linking and technology transfer.
- In December, the Network met —under a hybrid format— with Nelson Lima, director of the Microbial Resource Research Infrastructure (MIRRI), a European initiative that seeks to standardize the preservation, systematic research, supply and enhancement methods of microbial resources and biodiversity. This instance was attended by industry stakeholders that are yet to join the table.

"If we wish to achieve the highest crop-collection level and be acknowledged as a benchmark, we must take what has already been done in the world and use it as our starting point. Otherwise, the Network will not be cost-effective. This issue is very relevant to us".

Cledir Santos
Founder and Director of Universidad de La Frontera's Chilean Type Culture Collection-CCCT

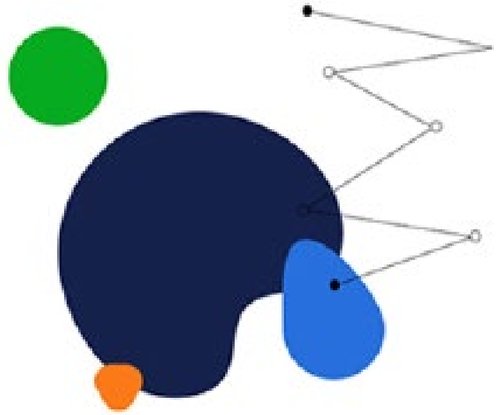
Biotech Hemisphere

Supporting the scaling of Chilean biotechnologies.

Rubisco Biotechnology

One of the CBT's guidelines is to provide enabling conditions for the incorporation of scientific proposals, and to create bridges between different stakeholders, to join efforts and make the production of scalable projects possible. The Biotech Hemisphere Call was launched within this context on September 8, 2021, offering support to national biotechnology initiatives that are at a scaling stage.

This initiative is led by the CBT and SOFOFA Hub, together with the Chilean Venture Capital Association (ACVC). In its first version, it received 19 proposals from companies, startups, universities, and local research centers.



THE SELECTION PROCESS

The chosen tool: TLR

The first pre-selection of submitted projects was held in October 2021. An independent technical committee, external to the CBT, was established to apply the first initiative filter. State agents and companies participated in the process. This review led to the selection of three proposals.

Only projects that reached a TRL (Technology Readiness Level) greater than 5 were considered in this preselection.

Technological Due Diligence

A new assessment stage was initiated through a due diligence process, on November 26, 2021.

Preselected projects were analyzed by commissions comprised of three experts from the respective industries. Their processes and methodologies were reviewed in order to ensure that the laboratory prototype was indeed ready for industrial scaling. Additionally, we assessed whether the proposed solution solved an actual problem for the market.

This phase ended with the final selection of two proposals, submitted by Rubisco Technology and Citokin+.

SELECTED PROJECTS

Rubisco Biotechnology:
Creating anti-aging cosmetics with larch cells

Rubisco is a biotechnology company specializing in the production of ingredients through cell cultures, which for the last 5 years has been developing unique products for its customers, made from larch cells.

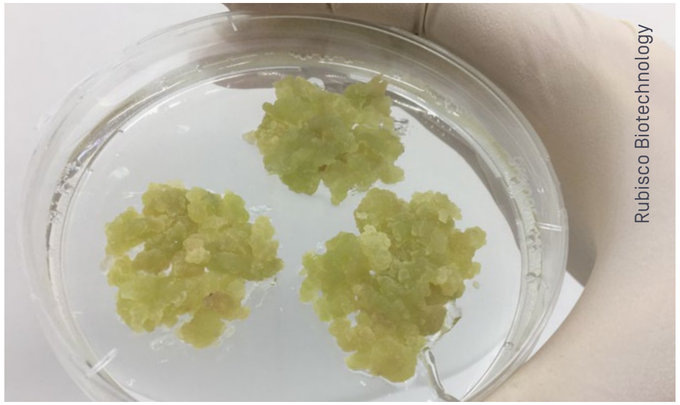
Its technology allows developing these formulas in laboratories, without the need to cut down trees or destroy legally protected ecosystems.

The company has submitted a proposal to the Biotech Hemisphere for the execution of a pilot for the scaling of plant biomass in bioreactors, to subsequently commercialize it at the industrial level.

The main ingredient, AustralCell Alerce, has been proven to have high anti-aging efficiency. It can therefore be used as an active ingredient in a wide range of anti-aging cosmetics in formats such as facial creams, body creams, eye contours, serums, and cleaning fluids.

"We created a platform to reproduce plant species in a laboratory and not in the field. This doesn't generate an environmental footprint, it saves up to 99.8% water use, it doesn't use pesticides and it protects biodiversity. To test the platform we chose larch, which has an extraordinary resistance to biological degradation. There are several larches in Patagonia, with an age of over 3,600 years, standing as one of the species with the greatest longevity in the planet. Thanks to the CBT's help, we have begun the industrial production process via bioreactor scaling, which we will implement in Chile".

José Pablo García
CEO
Rubisco Biotechnology


Rubisco Biotechnology

Citokin+

Stimulating plant growth at one-tenth of the usual cost.

Cytokines are plant hormones that are used as supplements in cultures to control cell cycle and boost cell growth.

The most common hormone in the agricultural market is trans-zeatin; however, since it is extracted directly from plants, its cost is very high and often inaccessible to producers.

Responding to this reality, DICTUC's scientists have developed, with the support of the company ADAMA, a trans-zeatin hyperproducing yeast capable of synthesizing 20 milligrams of this hormone per hour. This allows to obtain high quantities of cytokines, produced at ten times lower cost, when compared to the traditional method. Additionally, it has no environmental side effects. This was the project called Citokin+, presented at the Biotech Hemisphere's call.

The science behind Citokin+ was made possible thanks to the joint efforts of DICTUC's academics and ADAMA, the seventh largest crop protection company in the world.

The company asked Citokin+ to design this technology to enhance its bio-stimulant products, while simultaneously contributing with their knowledge of the agricultural sector.

"This call grants us the opportunity to continue with the close collaboration that we have consolidated with the company ADAMA Chile. I see a unique opportunity here to reach the market with a high-tech biotechnology product obtained through precision fermentation. For the first time we are going to move from the laboratory into industrial processes. Facing this challenge and achieving a profitable Chilean product of global interest, fills us with joy as a team".

Eduardo Agosín
Director
Proyecto Citokin+

COACHING SESSIONS

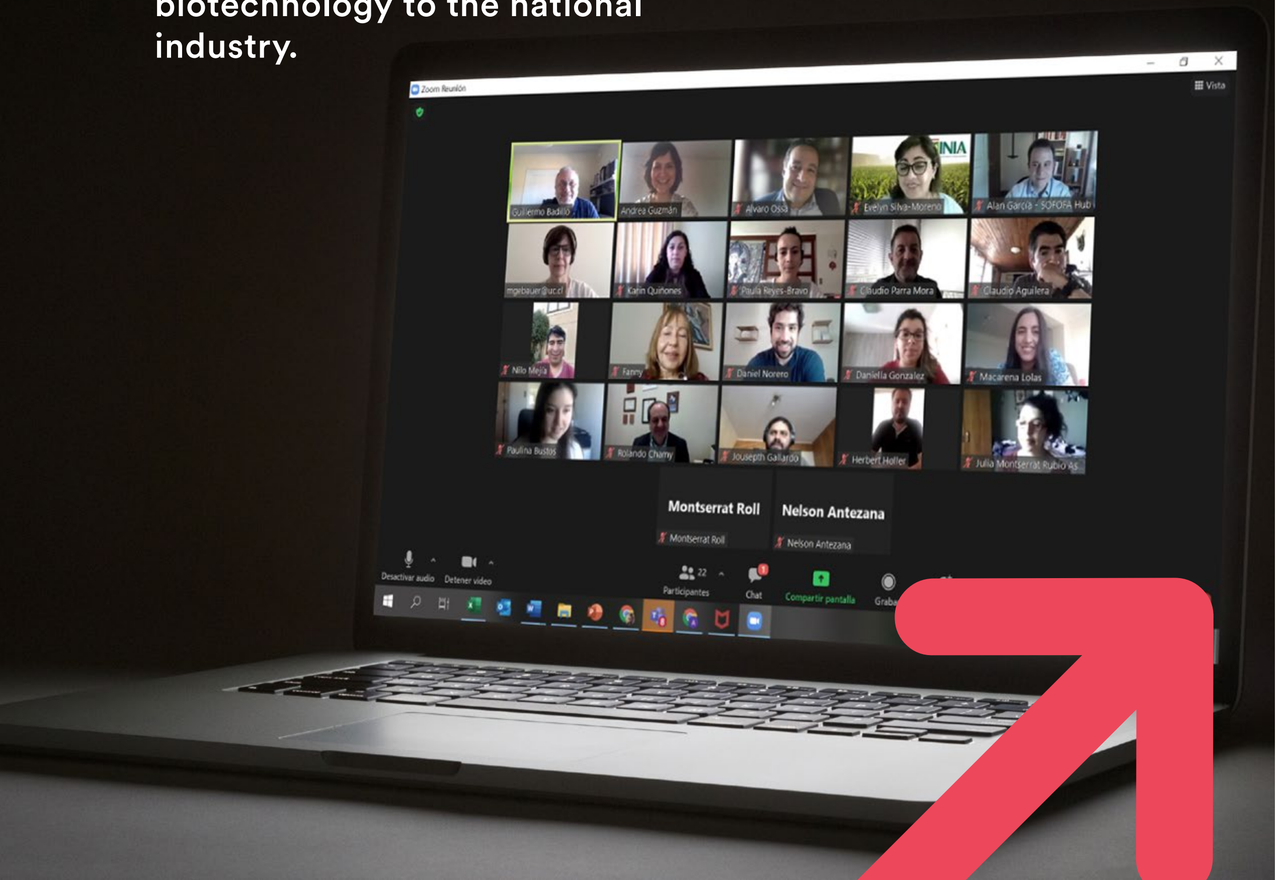
Generating links:
After the results of the call were announced in December 2021, the CBT began the coaching of both projects, in the search for —and linking with— potential customers within SOFOFA Hub's network.

Financial support:
Thanks to the sponsorship of the CBT, CORFO and ANID partnership, the center will subsidize 80% of the scaling stage of the projects, covering infrastructure costs for a period of 24 months.

Continuous monitoring:
The center will monitor compliance with the work plan at 6, 12, 18 and 24 months of operation. Therefore, the call also includes guidance throughout the development of these solutions.

Bio-business Courses

Teaching how to apply biotechnology to the national industry.



During the second semester of 2021, the CBT designed and delivered two prototype courses in applied biotechnology in two areas of the national industry: agriculture and mining.

The courses were delivered together with prestigious universities and renowned research centers, which participated through their researchers and teachers. The courses were planned so that students could learn the principles of biotechnology and their current use in these two areas, where there is a high exploring potential regarding cellular organisms for internal procedures. The classes were conducted online and resulted in certifications for all registered participants. 38 research students and professionals from related companies participated.

“The CBT’s general guidelines include the dissemination and application of biotechnology in the national industry. These two courses revealed how biotechnology is applied specifically in mining and agriculture and included the analysis of real case studies. In the final evaluation, we observed that the delivered contents and knowledge were received very well by the groups”.

Guillermo Badillo
Program Coordinator

INDUSTRY-APPLIED BIOTECHNOLOGY COURSE

It was developed and taught jointly with Universidad de Chile's Mathematical Modeling Center, Universidad de O'Higgins, and the Fraunhofer Chile Research Center. It included the review of biotechnological methods and their implementations in mineral extraction and processing. The course was developed in six online sessions and was attended by professionals from Minera Valle Central, BHP Billiton and Codelco, who shared their experiences.

"Chile is a pioneer in biotechnology applied to mining. The purpose of this course was based on the need to share examples of industrial biotechnology applied to our main industries and, certainly, the bioleaching case is of utmost importance for the country".

Carlos Saffie
Director of Innovation Vice-deanship of Research and Development
Universidad de Chile

"It was very enriching to participate in this course. The methodology was in line with the objective, evidencing the application of microorganisms in mining processes. The teachers shared their experience and portrayed the current biotechnology materialization challenges, their benefits, and innovative usage cases".

Jorge Rivera Reyes
Project Engineer, specialized in Processes

COURSE ON BIOTECHNOLOGY APPLIED TO AGRICULTURE

It was held with the participation of Universidad Católica de Chile, Universidad Católica de Valparaíso, and the Institute of Agricultural Research of Chile (INIA). Key concepts regarding biotechnology in the agricultural sector and its potential as an essential tool for implementing sustainable and efficient crop operations, were taught through five online sessions. The commercial impact in the agronomic industry was analyzed and success cases were reviewed.

"The course is a fantastic walk through the essentials of plant biotechnology. I loved the practical approach of the classes, the quality of the teachers and the exhibition of examples of related bio-businesses".

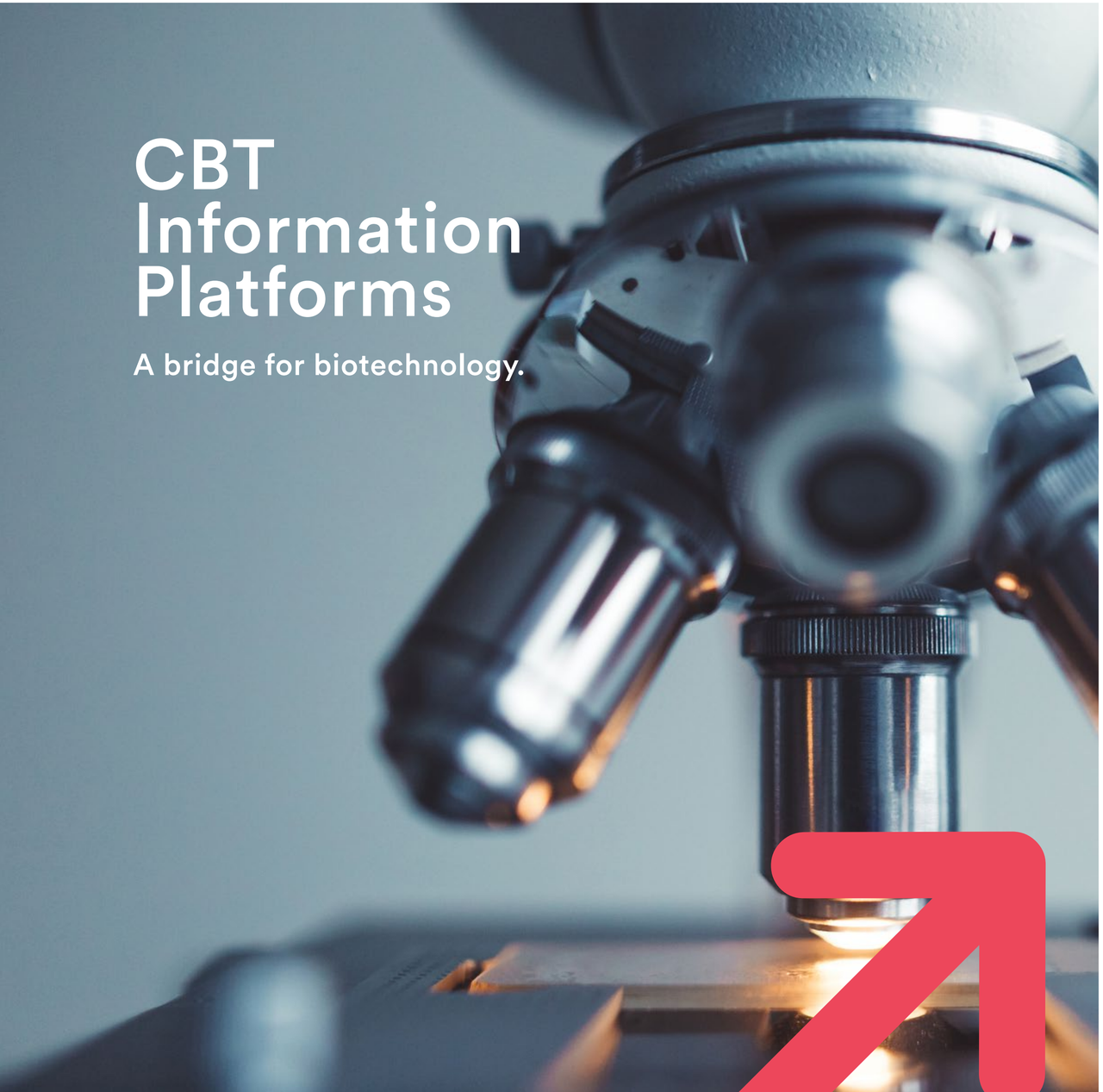
Macarena Lolas
Physician, PhD in Biotechnology and CEO of GROWMIRACLES

"Our intention was for the students to be exposed to the concepts and the old and modern tools that are available for biotechnological developments in the industry. The students were very interested in learning about the real practical experiences of local agro-biotechnology developments".

Marlene Rosales
Postgraduate and Research Director of the School of Agronomy
Universidad Católica de Chile

DIPLOMA ON BIOBUSINESS IN 2022

If the goal for 2021 was to prepare and deliver the pilot courses, in 2022 the CBT's objective is to develop and deliver a Diploma on Bio-business, 100% online, to further the dissemination of biotechnology and all its possible uses in the economy.



CBT Information Platforms

A bridge for biotechnology.

In 2021, the CBT collected comprehensive information on the current state of the biotechnology industry in Chile: the companies involved, the services they offer, the available equipment, biobanks, and the existing biodata collections and databases. Five platforms were developed with this information —biobanks and biorepositories, biotechnology companies, biotechnology equipment, genetic resources, and biotechnology services— all available online for stakeholders to access, as well as to connect with other operators that could make contributions in this regard.

To do this, the CBT's team contacted each company and research center that could be interested and invited them to participate. They were also requested to authorize the disclosure of some of this information. This initiative, unique in Chile, is in line with the CBT's mission to operate as a bridge between parties and to generate enabling conditions, within the scope of the local biotechnology industry's development.

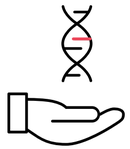
María Paz Merino
Deputy Director of Technology
CBT

"This platform improves the lack of updated and public data existing in Chile. The project aims to gather relevant and current information on different areas of biotechnology in our country, to upload it to a set of information platforms focused on the biotechnology ecosystem. The CBT contributed by collecting all the data, for it to be available in one place".

The five platforms

Biobanks and biorepositories

Information on different institutions in the country involved in the collection, conservation, and study of human biological samples of various types (healthy tissue, plasma, tumor tissue, etc.).



Biotechnology companies

This database contains information on products and/or services delivered by companies focused on national biotechnology.

Biotechnology equipment

Equipment for laboratory use (such as microscopes, bioreactors, or gas chromatographs) can be found on this platform, with the possibility of contacting the person responsible for them.

Genetic resources

Information was gathered on different collections of microorganisms and algae throughout the country.

Biotechnology services

It consists of a set of services focused on the field of national biotechnology, provided by institutions such as research centers and universities.

2021 Activities

Alan García in his participation in the *Emprende tu Mente* Fair 2021.

SOFOFA Hub's and the CBT's agenda of activities and events in 2021 were aligned with the objective of encouraging a public-private collaboration in contexts where technological development, and its application in various key industries for the national economy, represents a valuable contribution to the fight against climate change and the construction of a greener industrial paradigm.

SOFOFA Hub, for its part, organized meetings in which the dialog focused, among other topics, on the use of metrics and strategies to promote circular economy in industries, and the role of women and entrepreneurs in this collaborative scenario. The CBT's goal was to disseminate the most recent biotechnological benefits and advances, as well as their application in key industries. The seminars included the participation of key stakeholders who addressed the most recent success and innovation cases.

Alan García
Executive Director
SOFOFA Hub

"Today we face a climate crisis that threatens everyone equally. To be able to address challenges like this, that affect the country and the productive sector, we need to work with entrepreneurs. Without entrepreneurial leadership we will not be able to transform our industry within the required time frame".

SOFOFA Hub Seminars and lectures for 2021

March 30, 2021 / Webinar

"Women: Science, technology, corporate innovation"

In this SOFOFA Hub activity, held during Women's Month, we discussed women's participation in the technological industry. Presentations were delivered by Carolina Torrealba, Undersecretary of the Ministry of Science; Sandra Ogaz, Enel's Senior Specialist of Open Innovation, and Idea Factory Chile; Valeria Muñoz, IT manager at Mercado Libre; and Gloria Bonder, Coordinator of UNESCO's Global Learning Network on Gender. Rosario Navarro, SOFOFA board member and vice president of SONDA, acted as moderator.

You can view the seminar here.

August 10, 2021 / Webinar

"5G and Industry 4.0 Network: experiences and use cases in Chile"

Jointly organized with the Undersecretary of Telecommunications, the meeting focused on fifth generation mobile technology and its impact on Chile's economic development and the relevance of public-private cooperation. Subtel, SOFOFA, and the companies Enel X Chile (Enel), AquaChile and Kahuel participated. The webinar was moderated by Mariana Soto, VP of Sustainability at WOM.

You can view the seminar here.

September 2, 2021 / Webinar

"Metrics to Accelerate Circular Economy in companies"

Organized by SOFOFA Hub, Enel Chile and Hub EPD Latam, it addressed the state of the art of metrics used to render results regarding circularity and other complementary methodologies. It was held with the participation of more than 400 attendees from different industries, organizations and international research centers that are working in the transition towards a circular economy.

You can view the seminar here.

November 18, 2021 / Webinar

Entrepreneurship as Circular Economy's Engine"

We held a discussion together with the Global Shapers Santiago network, within the framework of the Scale 360° Chile initiative, to address the relevant role of entrepreneurs in promoting Circular Economy in the business world. It was held with the participation of entrepreneurial ventures, such as Ecocitex, Food for the Future, and Cora, as well as the companies Agrosuper and Uplink, from the World Economic Forum's network of entrepreneurs.

You can view the seminar here.

CBT seminars and lectures for 2021

May 6, 2021 / Seminar

"Bioinputs today: Impact and trends on agriculture"

It focused on the Chilean agro-industry's current trends and experiences regarding the use of bioinputs (products of biological origin) formulated with microorganisms and used to improve industrial processes. Representatives from the Institute of Agricultural Research (INIA), the Chilean Bioinput Network and the company Agrícola Sutil (from the Sutil Business Group) attended as panelists.

You can view the seminar here.

June 3, 2021 / Webinar

"Biomedicine entrepreneurship: Two Chileans discuss their experience"

Two Chilean entrepreneurs shared their road maps in this meeting: Hernán González, founder of Generopro DX, and Alejandro Tocigl, creator of Miroculus. The discussion focused on exposing the feasibility of embarking in entrepreneurial ventures in biomedicine, highlighting their contribution to the scientific world.

You can view the seminar here.

July 8, 2021 / Webinar

"Biotechnology for Aquaculture: From the chemical to the biological"

It addressed the salmon farming industry, its environmental impact, and opportunities for biotechnology solutions in areas such as disease control, as well as its current regulatory framework. Participants included ICTIO Biotechnologies, Fraunhofer Chile, INTESAL and Sernapesca. Salmonexpert acted as media partner.

You can view the seminar here.

September 21, 2021 / Webinar

"Biotechnology: A tool for sustainable forest development"

This seminar was attended by Bioforest (Arauco), Forestal Mininco, and the Center for Biotechnology of Universidad de Concepción. It addressed the use of biotechnology in forest genetic improvement and the challenges in the use of these tools, as well as their benefits for facing climate change.

You can view the seminar here.

December 2, 2021 / Webinar

"Biotechnology: Uses and Applications for Sustainable Mining"

This event addressed the revolutionary potential of using biotechnology in the national mining industry, with an impact both on its costs and on finding environmentally friendly solutions. In that vein, we analyzed the success stories of solutions developed by the mining biotechnology company BioSigma (Codelco) and Pucobre's Laboratory of Applied Research.

You can view the seminar here.

Our partners

LCBA AGREEMENT

On August 16, 2021, SOFOFA Hub and the EU platform, Low Carbon Business Action (LCBA), signed an agreement to establish synergies between their affiliated companies. The commitment involves sharing and promoting LCBA Chile's decarbonization and circular economy projects. LCBA will also contribute as a search engine for European technologies that provide solutions to environmental problems generated by SOFOFA'S companies. The collaboration will be carried out through a 26-month long, annual work plan.

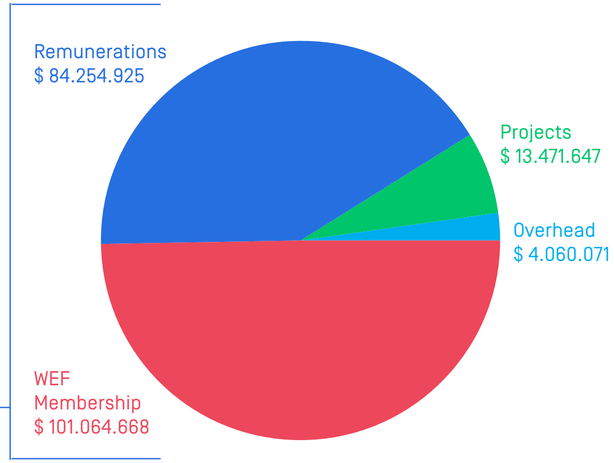
OUR PARTNERSHIPS DURING 2021

- **Gobierno de Israel,** through its embassy in Chile
- **Gobierno de Australia,** through the Australian Trade and Investment Commission (Austrade)
- **ChileMass**
- **KIT** (Karlsruhe Institute of Technology)
- **IECO** (Institute of Eco-Industrial Development)
- **Czech Trade,** trade promotion agenda of the Czech Republic
- **Gobierno de Canadá**
- **LCBA** (Low Carbon Business Action Latam)
- **WEF** (World Economic Forum)
- **Scale 360°,** the WEF's Circular Economy Program
- **ACVC** (Chilean Venture Capital Association)
- **CORFO** (Production Development Corporation)
- **ANID** (National Research and Development Agency)
- **Ganesha Lab**
- **ABPDU** (Advanced Biofuels and Bioproducts Process Development Unit), Lawrence Berkeley National Laboratory
- **Hubtec Chile**
- **APTA Hub**
- **Know Hub**
- **CENS** (National Center on Health Information Systems)
- **INRIA Chile**
- **Universidad Católica del Maule**
- **Universidad Mayor**
- **Universidad Austral**

Fund uses and applications

Hub

Cash balance 2020	$ 64.667.777
Memberships	$ 162.535.950
Projects	$ 66.562.720
Total revenue	**$ 293.766.447**
WEF Membership	$ 101.064.668
Other costs	$ 101.786.643
Total costs	**$ 202.851.311**
Cash balance	**$ 90.915.136**

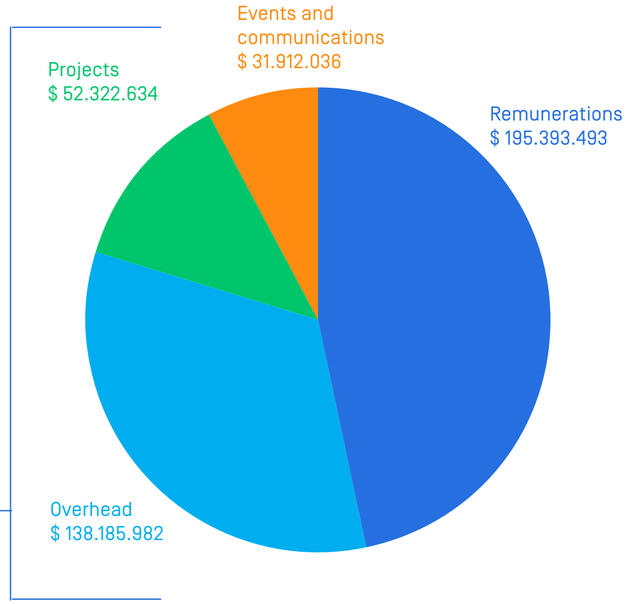


territorio circular

2021 Public Fund Quota	$ 106.170.000
Total costs	**0**
Balance to be rendered	**$ 106.170.000**

cbt SOFOFA HUB

Public funds to render as of 31-12-2020	$ 1.069.724.057
Public funds received during 2021	$ 1.100.000.000
Project revenue	$ 9.216.000
Total revenue	**$ 2.178.940.057**
Total costs	**$ 417.814.145**
Balance due $	**$ 1.761.125.912**



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