MISSION INNOVATION

August 2022

National Innovation Pathway Round-up

CHILE

National Innovation Pathway Round up - Chile

Introduction

Mission Innovation members agreed to develop **National Innovation Pathways (NIPs)** to describe and build collective understanding on how each member plans to pioneer clean energy technologies to meet their climate and energy goals.

Each member has their own approach to developing and identifying innovation needs and priorities, with some already having undertaken extensive strategy development. The Roundup provides a **single location of summary information on countries' innovation priorities** utilizing existing sources of information so members and interested stakeholders can easily find key information of interest.

All MI members were asked to provide answers to a survey (Annex A) providing as much information as possible, with some questions being optional. The survey asked questions relevant to each element of the National Innovation Pathway described in the Joint Launch Statement:

1. Energy transition scenarios and priority national-level energy innovation needs / priorities until at least 2030;
2. Strategies or national-level plans to address these energy innovation needs / priorities, including institutional design and working internationally
3. Information on how Members will measure innovation outcomes and innovation ecosystem developments;
4. Members' preferred modes and methods of collaboration; and
5. Any further supporting evidence that was used to identify the energy innovation needs / priorities, such as analysis of domestic competitiveness, economic opportunities or national level climate and clean energy plans.

Members will be asked to refresh this document annually if significant changes to national policy have taken place

1. Clean Energy Innovation Strategy

1.1 Summary

Chile has achieved the target to be carbon neutral by 2050, according the Climate Change Law. Moreover, the NDC indicates that the peak for the national GHG emissions must be at last by 2025, among others important compromises. Nowadays, the energy sector is the major CO2 emitter, with more than 70% of the total emissions. To reach the targets, a number of initiatives has been defined, such as the coal power plants phase out by 2040. All of the initiatives related to the energy sector -and its impacts- has been published as part of the Long Term Energy Planning.

Chile is aware that is not enough keep doing the same way. It is not time. Chile must accelerate the transition from a thermal and conventional energy matrix to a renewable energy based one. This is the main need to incorporate new and innovative solutions.

Chile has committed to increase in three times the public investment in R&D in the period 2022-2026, following the mission-oriented and people-centred approach. And one if the national challenges is already defined as the energy transition. It is from this challenge that Chile is designing its National Innovation Plan for the Energy Transition and selecting the missions to be faced in the short and medium term.

1.2 Methodology

A successful energy transition has been defined as a country priority. A number of official compromises are aligned with this priority. The energy transition is part of Climate Change Law and the the NDC; and is the main driver included in the Long Term Energy Policy 2050 and in the Long Term Energy Planning 2050, both already published. Chile has also defined a number of strategies for the medium term, such as the hydrogen, the electro mobility and the energy system flexibility strategies. Moreover, there is the Energy Agenda 2022-2026, where has been defined the short term priorities for the energy sector. All of these initiatives have been prepared based on an participative approach, including a wide range of stakeholders.

It is in the Energy Agenda 2022-2026 that the innovation is considered a key for both the energy transition and for a new development model for the country, based in knowledge.

The innovation in the Energy Agenda indicates that will be prepared a National Plan for the Energy Transition, based on the mission-oriented approach. The Plan will be designed in a participative way, including researchers, companies, entrepreneurs, related public agencies and civil society. The Plan will develop a wide portfolio with the opportunities and innovation projects needed for the short and medium term. It is based on this portfolio that will be prepared technological roadmaps, all of them oriented to achieve a successful energy transition.
Some of the innovation opportunities already detected, are related to: zero emissions electrical system, energy storage, green hydrogen, electromobility, digitalization and smart cities, sustainable heating ,among others.

Table 1: RELEVANT DOCUMENTS AND POLICIES

Document or policy name	Description of the document or policy	Specific outcomes, goals or targets identified in the document or policy	Year	Web Link(s)
NDC	Chilean nationally determined contribution (NDC) under UNFCCC Paris Agreement	Sets the emissions peak by 2025	2021	https://cambioclimatico.mma.gob.cl/wp-content/uploads/2020/08/NDC_2020_Espanol_PDF_web.pdf
National Strategy for Science, Technology, Knowledge and Innovation for the Chilean Development	Chilean strategy developed by the National Science, Technology, Knowledge and Innovation Council	- Focus of the R&D on the main challenges of the country and in the citizens needs - Science, technology, knowledge and innovation as a key to achieve a sustainable development	2022	https://www.consejoctci.cl/_files/ugd/1296dd_5f4e394324614ef99dea042ef39710b4.pdf
Long Term Energy Policy	National policy for the long term pathway of the energy sector	- 100% of vehicle sells must be zero emission by 2035 - 100% zero emissions electricity matrix by 2050	2022	https://energia.gob.cl/sites/default/files/documentos/pen_2050_-_actualizado_marzo_2022_0.pdf

Green Hydrogen Strategy	Chilean strategy for the development of a green hydrogen industry in the country	- Top destination for green hydrogen investment in Latam by 2025 - 5 GW electrolysis capacity operating and under development - 100 kton/year production in Chile	2021	https://energia.gob.cl/sites/default/files/estrategia_h2_-_ingles2022.pdf
National Electro mobility Strategy	Chilean strategy for the deployment of zero emissions transportation	- 100% of new incorporations for urban public transportation zero emissions by 2035 - 100% of light and medium weight vehicles sales zero emissions by 2035	2022	https://drive.google.com/file/d/1rE_oSWxcfap5TY01fhB7AM9FADEtBPnt/view

2. Clean Energy Innovation Priorities

2.1 Overview of Clean Energy Innovation Priorities

Table 2: CLEAN ENERGY INNOVATION PRIORITIES

Innovation priority	Focus of innovation activity (tick all that apply)	Targets/Goals (if applicable)	Technologies or topics of interest	Planned demonstration Investments (include budget years and indicate if domestic or international spending where possible)	Links to relevant reports or plans
Decarbonization for a zero emissions system	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:	Coal power plants phase oy by 2040 and carbon neutrality by 2050	System stability with high variable energy generation and use of old coal infrastructure		
High quality energy for all	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:	100% of population with high quality energy access	Mix of technologies		

Hydrogen	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:	Hydrogen: The cheapest green hydrogen on the planet	Electrolysers Hydrogen storage Final uses	USD 50 MM in pilot projects	https://energia.gob.cl/sites/default/files/estrategia_h2_-_ingles2022.pdf
Electro mobility	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:	100% of light and medium weight vehicles sales zero emissions by 2035	Inter operability and vehicle to grid solutions		https://drive.google.com/file/d/1rE_oSWxcfap5TY01fhB7AM9FADEtBPnt/view
Sustainable heating and cooling	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:	- 80% of the energy used for heating and cooling must be sustainable by 2050	New technologies for heating and cooling		https://caloryfrio.minenergia.cl/descargable/Estrategia_calor_frio_v1.1.pdf
Digitalization and smart cities	☐ Early-stage research ☑ Applied research ☑ product development ☑ Demonstration ☑ Commercialisation Other:				

Chile is a long and wide country, with different and extreme weather conditions. The geography of the country is highly diverse, including islands, mountains, coastal lines; and even forests, deserts and fertile valleys. The country has also a number of different renewable energy sources, such as solar irradiation, wind, wave and tidal and geothermal.
The characteristics of the country mention above, together with a high quality researches and international energy companies, that become to Chile in a singular natural laboratory for testing new energy technology in real conditions.

2.2 Tracking Progress (Optional)

Nowadays the R&D and innovation tracking is led by the Ministry for Science, Technology, Knowledge and Innovation, according to international standard. The methodology is aligned with the Government budget allocations for R&D - GBARD, used by OECD and published in https://observa.minciencia.gob.cl/indicadores/presupuesto-publico

The Energy Agenda 2022-2026 establishes the creation of a National Innovation Observer, a web platform where will be included indicators related to public budget, patents, ecosystem, scientific publications, studies, public and international funds, among others.

3. Private Sector Engagement (Optional)

Chile has decided a mission-oriented approach for the innovation support from the public sector. Based on this approach, the R&D and innovation funds will be prioritized according the “missions”.

Chile has a number of support programs for the private sector. One of the programs is the R&D tax incentive law.

This tax incentive, allows a reduction in the Income Tax of 35% of the investment in R&D, by tax credit, with a maximum of USD 1.2 million. It also allows to consider the remaining 65% of R&D investment, as required expenses to deduct Income Tax. This tax benefit is complementary to other public programs and subsidies.

Other public support for private entrepreneurs is the StartUp Chile program. This is a public business accelerator program created by the Chilean Government for high-potential entrepreneurs to bootstrap their startups using Chile as a platform to go global. Up until today, its one of the biggest and most diverse accelerators in the world. Start-Up Chile has a large portfolio, receiving up to 180 startups per year.

Others public fundings are: innovation voucher, prototype and validation, high tech and consolidation and commercial expansion, among others.

4. National Energy Innovation Ecosystem (Optional)

Chile has a Ministry for Science, Technology, Knowledge and Innovation, leading and coordinating the public policies releated. From this Ministry, emerges the National Agency for Research and Development (ANID), on charge of the implementation of most of the science and technology initiatives. Accordingly, the Ministry for Economy and Tourism is leading the applied technology developments, corporate innovation and entrepreneurship. For this purpose, the Ministry mandate to the Chilean Economic Development Agency (CORFO) to foster the innovation activity in Chile. Both agencies, ANID and CORFO, administrate public funds for the private sector engagement.

Annex A – National Innovation Pathway Roundup Survey Questions

1.1 Summary: Please provide a summary of your national clean energy innovation strategy i.e. the overall policies, framework and/or goals that help to define the innovation priorities you will describe in Section 2. We recommend including information about your national climate or energy targets (such as NDCs or renewable energy targets) as well as national innovation strategies and policies. You can share links to relevant documents in Table 1.

1.2 Methodology: Please describe the methodology to develop your national clean energy innovation strategy such as analysis, modelling or stakeholder engagement and include any links to relevant documents in Table 1. This will be used to help share learning between members**.**

2.1 Overview of Clean Energy Innovation Priorities: Please provide a list of your national clean energy innovation priorities (i.e. specific technologies, sectors or needs). Please complete Table 2 to provide information about where you are focusing in the innovation cycle for each priority; any targets or goals; RD&D interests; current allocated budgets (including specific demonstration funding) and links to relevant strategies or reports. In the text box following please provide a brief description of how you plan to respond to each innovation priority in the coming years, such as through future plans over the next 3-10 years to mobilise further investments for innovation, launch new major programmes and timelines for major demonstration projects**.**

2.2 Tracking Progress: Please describe how you plan to measure progress towards addressing your identified energy innovation priorities. Please describe any governance processes to manage and review energy innovation efforts and, where able, please list

tracking indicators that are commonly used (e.g. such as patents, publications, rates of company formation, follow-on capital and private co-investment, technology performance upgrades).

3. Private Sector Engagement: Please can you describe your strategic approach and priorities to engagement with the private sector to address the clean energy innovation priorities identified in section 2. This could include for instance prioritising co-funding of RD&D initiatives; incubator/accelerator programs that are funded (in part or fully) by the private sector; tax credits and other fiscal incentives; initiatives that the private sector can engage with, grants, de-risking instruments such as loan guarantees etc.

4. International Collaborations: Please describe your strategic approach to international collaboration to tackle your clean energy innovation priorities (e.g. do you have an international strategy, or particular types of collaboration you are prioritising).

5. National Energy innovation Ecosystem: Please provide an overview of your national institutions, funders and organisations and describe how they contribute to tackling the innovation priorities identified in Section 2. Please either provide this information in the box or complete Table 3.

6. Further Supporting Information: Please add below any further information about your national energy innovation needs or approaches to tackling these that has not been covered above.

Mission Innovation – Catalysing Clean Energy Solutions For All