3.1.5. Accelerating the uptake of climate technologies in micro-, small and medium-sized enterprises in Chile

Participating country: Chile

Partners: Agency for Climate Change and Sustainability, Chilean Economic Development Agency National Council for Clean Production, CTCN, iQonsulting, Carbon Trust

Start of technology uptake process: 2016

Climate technology: Various technologies for low-emission, climate-resilient agrifood processing and new funding mechanisms

Contribution to NDC implementation: GHG emission reductions, strengthening of public–private cooperation mechanisms for executing adaptation actions at the national and local scale and increased robustness of sustainable development indicators

Further information:
CTCN technical assistance: https://www.ctc-n.org/technical-assistance/projects/incubating-climate-technologies-small-and-medium-enterprises-chile.

Uptake of the climate technology: In Chile, the agriculture sector is an important contributor to the economy and is highly vulnerable to the adverse effects of climate change. Within the sector, MSMEs make up the majority of producers. Chile sought technical assistance from the CTCN to better understand the barriers that prevent MSMEs from adopting climate technologies in the agrifood sector; increase the low level of adoption of climate technologies; analyse agrifood chains with the purpose of identifying critical points for the introduction of climate technologies; analyse and make recommendations on existing certification, demand aggregation and financial instruments and their effectiveness in promoting climate technologies to MSMEs; and propose improved instruments in this regard. Building on the results of the technical assistance, Chile adjusted its support

mechanism for MSMEs, which resulted in an increased focus on and uptake of climate technologies, in particular with regard to solar energy and water and energy efficiency.

Through the CTCN technical assistance, the domestic agrifood chains were mapped and analysed, resulting in the identification of investment priorities for technologies with the highest potential for GHG emission reductions and climate change adaptation benefits for MSMEs in the local context. The technologies identified include energy-efficient lighting and ventilation systems; drip irrigation; pre-coolers and refrigeration energy heat recovery systems; and solar energy for power generation, heating of water, biodigesters and air drying. The mapping was accompanied by an analysis of the barriers that MSMEs face in the uptake of climate technologies and by the development of solutions to overcome these barriers. Since the CTCN technical assistance, nine agrifood economic industrial associations, including the largest food export association, and their companies have been implementing enhanced action.

Stakeholder engagement, knowledge transfer and capacity-building were facilitated through a partnership between the two CTCN technical assistance implementers, Carbon Trust, an international expert on clean technologies, and iQonsulting, a local expert on agriculture and climate change, which allowed international good practices to be adapted to the local context. The partnership also leveraged the strong local network of iQonsulting to engage with local communities, policymakers, financial institutions, academic institutions and non-governmental organizations.

Chile integrated some of the recommendations of the CTCN technical assistance in its CPAs with the agrifood sector by including financing for the priority technologies identified and adopting changes in the CPAs. CPAs, recognized as a nationally appropriate mitigation action by the UNFCCC,[19] are certifiable agreements with sectoral associations in which MSMEs, through their associations, commit to specific goals and actions on making production processes more sustainable within a specified period. As such, CPAs leverage the social capital of a business association with its associates, building trust, sharing knowledge and aggregating technology demands from the specific sector or subsector. CPA preparation and coordination costs are funded up to 70 per cent by the Government of Chile. The combination of all these changes has resulted in increased work with the prioritized agrifood industries, increased uptake of photovoltaic solar energy solutions, and increased energy and water efficiency, in particular through variable speed drivers for conveyor belts, heat recovery systems and energy-efficient lighting technologies. The changes made to the CPAs also resulted in the most complete SDG reporting for a mitigation action in the country[20] as well as in the introduction of a licensed platform for supporting the MRV of CPAs.[21] At the policy level, these data help to generate traction and interest of possible partners and has helped with the provision of financing for technology transfer from subnational governments. At the company level, for example in the processed food industry sector,[22] it has become clear that the uptake of climate technologies and measured results thereof have significantly contributed to the implementation of the companies' commercial strategies.

Financing: Public finance for the uptake of climate technologies by MSMEs has increased not only through CPAs but also through other public budget lines, for example for water efficiency projects. In addition, local governments are increasingly co-financing the technology transfer components of larger interventions with local businesses. This has also resulted in enhanced ownership of technology transfer at the local level. Furthermore, commercial banks are now also increasingly financing projects in this area.

Gender-responsiveness: The Agency for Climate Change and Sustainability requires that projects applying for public funding provide information on whether there are barriers to technology transfer related to the gender of technology users or business owners. In addition, in the approval process of funding requests, the gender-responsiveness of the project and the gender balance within the project team are considered.

Contribution to NDC implementation: The uptake of climate technologies in agrifood chains is contributing to achieving Chile's mitigation and adaptation targets in its updated NDC (submitted in 2020), in particular the development of public–private cooperation mechanisms for executing adaptation actions at the national and local level. In addition, the MRV of CPAs is contributing to achieving Chile's target of establishing an MRV mechanism that considers the following criteria applied to the design, application and monitoring of each commitment: synergy with the SDGs, a just transition, water security, gender equality and equity, cost-efficiency, nature-based solutions, types of knowledge and active engagement. Private sector data greatly improved the MRV system by capturing more than 1,600 actions of more than 750 businesses of all sizes across the country.[23]

Challenges and lessons learned: The main challenges for the uptake of climate technologies in the agrifood sector include local technology providers' limited reach into remote areas and their limited possibilities for

19 https://www4.unfccc.int/sites/PublicNAMA/_layouts/un/fccc/nama/NamaForRecognition.aspx?ID=11&viewOnly=1.
20 https://datastudio.google.com/reporting/508a6d6e-72cc-4cbc-b573-8401ab9eeccf/page/1ZguB?s=g3gxLHnDosk.
21 https://github.com/AgenciaSustentabilidadyCambioClimatico/accion.
22 https://sustentabilidadchilealimentos.cl/wp-content/uploads/2022/12/Reporte-de-Sustentabilidad-2022-final.pdf.
23 https://accion.ascc.cl/empresas-y-elementos-adheridos.

serving micro- and small enterprises owing to high transaction costs. In addition, the combination of a lack of trust and a lack of capacity of MSMEs to evaluate new technologies, technology providers and financial possibilities hinders the adoption of climate technologies.

The CPAs provide a government-backed framework that aggregates demand with the support of the business association and therefore offers a solution to reduce the transaction costs of selling, importing and financing low-emission technologies by creating economies of scale and trust among participants. Insights into the transfer can be gained by one of the businesses successfully implementing the technology and then showcasing and sharing its results with other businesses in the context of the CPA. Trust and imitation of peers plays a significant role in the decisions made by MSMEs. In addition, the provision of technical support has played a significant role in the adoption of climate technologies.

Long-term sustainability, replicability and potential for scaling up: The sustainability of the technology uptake is ensured through efficiencies created in the production process of MSMEs that lead to cost reductions, increased energy and water autonomy, and more production outputs. The approach taken by Chile is replicable in other countries as it can be easily adjusted to target the most suitable climate technologies for the location. Chile has been working with Colombia on a possible replication of the CPA approach. The approach also has the potential for being scaled up as not all MSMEs have been reached in the country, but for this to happen effectively a redesign might be needed to decrease the reliance on public funds.

© Alimentos y Frutos S.A.