

Colombia Domestic Refrigeration

Mid-term Evaluation and Learning Exercise (ELE) Report & Management Response

July 2022

Overview

- **Management Response:** response to the recommendations made by the evaluation team in this Evaluation and Learning Exercise (ELE) report. Jointly written by the NAMA Support Project (NSP) and the Technical Support Unit (TSU) of the NAMA Facility.
- **Evaluation and Learning Exercise Report:** external and independent evaluation conducted by the consortium AMBERO and Oxford Policy Management.

Evaluation and Learning Exercise (ELE) of the Colombia Domestic Refrigeration NAMA Support Project (NSP) - Management Response

1. Background

In 2021, the NSP Colombia Domestic Refrigeration was subject to an independent mid-project ELE conducted by an evaluation team led by AMBERO Consulting. The ELE report is published on the NAMA Facility's [website](#).

The NSP and Technical Support Unit (TSU) provided responses to the recommendations made by the evaluation team as follows:

2. Response to the recommendations to the NSP Team to achieve the goal of the NSP

Recommendations	Activities	Responsible Entity	Timeline
Recommendation 1: Maintain the NSP's flexibility to adapt its actions to the fast-changing context created by the involvement and leadership of private sector institutions.	Recommendation accepted. The NSP will continue to keep a close relationship with its implementing partners and other relevant stakeholders to identify changing situations that might impact the project's implementation and attainability of its goals. Similarly, the NSP will continue working with the Technical Support Unit of the NAMA Facility in the design and deployment of actions to maintain the relevance of the NSP.	NSP/TSU	2022 Onward
Recommendation 2: Request a time extension to the NAMA Facility to compensate for the late project start and the COVID-19-induced delays.	Recommendation partially accepted. A cost-neutral extension of 10 months presented by the NSP was approved by the NAMA Facility to extend the NSP implementation period until August 2023. This extended timeline will allow the NSP to compensate for the late start of implementation caused by the delayed signature of Implementation Agreements.	NSP/TSU	Ongoing
Recommendation 3: Increase the engagement of Ministers, Vice-ministers or even a high-	Recommendation partially accepted.	NSP	Ongoing

level advisor or staff members from the Office of the President of Colombia to increase the profile of the NSP and facilitate collaboration and coordination across sectors.	The NSP has kept an open line of dialogue with its political partners and their representatives which facilitates the discussion of any possible action that could enhance the performance of the NSP. The NSP is ready to maintain these communication channels with any new governmental officials involved with the NSP's intervention strategy.		
Recommendation 4: Design and execute more knowledge exchange and awareness-raising events for high-level officials to get them to understand the importance of coordination and collaboration for the NSP's success.	Recommendation partially accepted. The NSP has kept an open line of dialogue with its political partners and their representatives which facilitates the discussion of any possible action that could enhance the performance of the NSP. The NSP is ready to maintain these communication channels with any new governmental officials involved with the NSP's intervention strategy.	NSP	Ongoing

3. Response to the recommendations to the NAMA Facility for the review, approval, and management of future interventions

Recommendations	Activities	Responsible Entity	Timeline
Recommendation 1: Conduct an appropriateness assessment of the NSP reporting and M&E processes at least every two years.	Recommendation partially accepted. As part of its annual reporting cycle, the NAMA Facility assesses the appropriateness of its monitoring and evaluation requirements and draws lessons learned to improve the M&E process both for the NAMA Facility and its NSPs. The changes undertaken by the NAMA Facility include, among others, the addition of new topics to be reported on such as the impact of Covid-19 and the NSP alignment with green recovery efforts. The last M&E framework revision took place in 2020.	TSU	Ongoing

	<p>The NAMA Facility works together with the NSPs to normalize the reporting efforts across the different stages of implementation and maturity of the projects in its portfolio, keeping in mind that some of the more mature projects were developed under former M&E frameworks and methodologies.</p>		
<p>Recommendation 2: Consider creating unique calls or fast-track review and approval processes to leverage current NSPs' knowledge and capabilities to execute NSPs in adjacent sectors.</p>	<p>Recommendation partially accepted.</p> <p>Indicating the lessons learnt from the ongoing and/or past NSPs and other mitigation projects is required for the NSP Outline submissions. The focus of the Calls is decided by the NAMA Facility Board ahead of the Call announcement.</p>	TSU	Ongoing

Mid-term Evaluation and Learning Exercise of the Colombia Domestic Refrigeration NAMA Support Project

NAMA Support Project Evaluation and Learning Exercises for the NAMA Facility

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Final Report

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About AMBERO Consulting Gesellschaft mbH

AMBERO Consulting provides services to our clients in the field of international development. Since 2003, we have supported national and international development agencies in designing, preparing, implementing, and monitoring small and large projects that improve living conditions around the world.

At the heart of our work is a dynamic team integrated in interdisciplinary networks worldwide. Our strength is to generate, mobilise, and apply tailor-made knowledge. As a result, we are able to quickly initiate projects together with internationally recognised experts and established partners in many places around the world. The technical focus of our work is good governance and civil society; climate, environment, and biodiversity; and regional and economic development.

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We seek to bring about lasting positive change using analytical and practical policy expertise. Through our global network of offices, we work in partnership with national decision-makers to research, design, implement, and evaluate impactful public policy.

We work in all areas of social and economic policy and governance, including health, finance, education, climate change, and public sector management. We draw on our local and international sector experts to provide the very best evidence-based support.

Disclaimer

The results and analysis included in the report are based on an external and independent evaluation conducted by the consortium AMBERO-OPM. The conclusions drawn in the report do not necessarily reflect the official views of the NAMA Facility and/or of the NAMA Support Project under evaluation.

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Preface

The NAMA Facility is a joint initiative of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), UK's Department for Business, Energy and Industrial Strategy (BEIS), the Danish Ministry of Climate, Energy and Utilities (KEFM), the Danish Ministry of Foreign Affairs (MFA), the European Union and the Children's Investment Fund Foundation (CIFF). The NAMA Facility was established in 2013. The NAMA Facility's vision is to 'accelerate carbon-neutral development to keep temperature increases to well below two degrees Celsius by supporting NAMA Support Projects (NSPs) that effect sector-wide shifts toward sustainable, irreversible, carbon-neutral pathways in developing countries and emerging economies. All NSPs with an overall duration of more than three years are subject to a mid-term and a final evaluation and learning exercise.

The NAMA Facility's Technical Support Unit (TSU) functions as the secretariat of the NAMA Facility. The TSU commissioned AMBERO and Oxford Policy Management to conduct mid-term and final Evaluation and Learning Exercises (ELEs) for NSPs from calls 1, 2, 3 and 4.

Each ELE is conducted using the same Theoretical Framework (FW), which involves the application of a document review, participatory workshops, and stakeholder interviews to collect evidence about NSPs' results and lessons analysed using a Theory-based approach centred on the use of contribution analysis reinforced by elements of process tracing.

This document presents the findings of the **mid-term ELE of the Colombia Domestic Refrigeration NSP**. The report has been reviewed by Luca Petrarulo (Technical Lead, NSP ELE Team) and Elizabeth Gogoi (International Expert A, NSP ELE Team). For further information, please contact vera@ambero.de.

Executive summary

This document presents the findings of the **mid-term Evaluation and Learning Exercise (ELE) of the Colombia Domestic Refrigeration NAMA Support Project (NSP)**. The ELE was undertaken during the period October - December 2021. Following its Terms of Reference¹, this ELE sought to address the following questions:

- Is the NSP achieving its planned results?
- Is the NSP starting to trigger transformational change?
- What can be learnt from the NSP so far?

More information about the focus of this ELE and the methodology followed can be found in Section 1.2 and Section 2, respectively.

At the time of the preparation of the NSP Proposal, in 2014, Colombia's domestic refrigeration sector's greenhouse gas (GHG) emissions were estimated to be around 5.5 Mt CO_{2eq} a year and were expected to double by 2030. According to the NSP Proposal, the Colombian Government identified a GHG reduction potential of over 50% for this sector to be achieved through energy-efficiency measures and changes to the refrigerants. Based on that it prepared and submitted to the NAMA Facility the proposal for a Colombia Domestic Refrigeration NSP. The proposed NSP combined actions to review and strengthen regulations and provide technical and financial assistance aimed at: (i) encouraging the conversion of Colombian refrigerator producers to natural refrigerants and designing and selling more energy-efficient fridges; (ii) designing and implementing a refrigerator substitution programme that would encourage the withdrawal of older CFC- or HFC-based energy inefficient refrigerators and the sale of the "greener" fridges; and (iii) strengthening the ability of environmentally-certified Waste of Electric and Electronic Equipment (WEEE) processing and disposal companies to process old fridges, sell-off what could be sold and adequately dispose of all other materials or elements that required special waste disposal treatment.

According to the NSP proposal submitted to the NAMA Facility, the Colombia Domestic Refrigeration NSP was expected to be executed between April 2017 and March of 2022, and consisted of a EUR 3.726 million Technical Component and a EUR 5.28 million Financial Component. The *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH is in charge of the execution of both Technical and Financial Components. The NSP has had multiple implementation partners, but the interaction of GIZ has taken place mainly with Colombia's Ministry of Environment and Sustainable Development's (MinAmbiente – Acronym in Spanish) Ozone Technical Unit (UTO – Acronym in Spanish), Bancoldex (Colombian Development Bank) and with *Red Verde*².

Table ES-1 summarises the key findings of the ELE according to its five evaluation criteria: relevance, effectiveness, efficiency, impact, and sustainability.

¹ The ELE Terms of Reference is provided in Annex H.

² *Red Verde* is a not-for-profit institution created by domestic appliance producers and importers to address the upcoming requirements of Extended Producer Responsibility (EPR) regarding the processing and disposing of Waste of Electric and Electronic Equipment (WEEE).

Table ES-1. Summary of key ELE findings

Evaluation criterion / ELE Question and RAG rating ³	Summary of key findings
1. Relevance: To what extent does the NSP address an identified need (by the national government, refrigerator producers and recycling companies)?	<p>The ELE Team found the NSP to be highly relevant and assigned a green RAG rating to this dimension. In terms of the government's needs, the NSP supports Colombia's domestic refrigeration sector to align and contribute to the national policies and targets that have existed for many years across four lines of action: (i) phase-out of ozone-depleting substances in compliance with the 1987's Montreal Protocol; (ii) climate change actions that started in the late 2000s, and have become more mainstream in this decade, (iii) energy efficiency which can be traced back to the National Law passed in 2001 and (iv) environmentally-sound management of WEEE which has been pursued since 2011 with guidelines, and since 2013 based on a National Law. Importantly, the Domestic Refrigeration NSP, with its GHG reduction contributions, is included among the actions contained in Colombia's 2020 revision to the Nationally Determined Contributions (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC).</p> <p>The NSP's relevance for refrigerator producers is a direct result of their need to transform and evolve their product portfolios and production lines towards refrigerators that comply with the three legal requirements mentioned above. Considering that the regulations include a ban on sales of non-complying refrigerators or appliances, and consider sanctions on refrigerator producers or importers that do not comply with WEEE sustainable management requirements, the NSP is providing support in crucial areas for the producers' business.</p> <p>Finally, the NSP's relevance for WEEE processing and disposal companies is related to the improvements that these companies will have to adopt to dispose of harmful substances like HFC and CFC refrigerants or insulating foams that may release GHGs when incinerated in full compliance with Colombia's regulations.</p>
2. Effectiveness: To what extent has the NSP been achieving its intended intermediate outcomes (and unintended ones)? Intermediate Outcome 1: Colombian manufacturers produce green	<p>The ELE assigned a RAG rating of green to Intermediate Outcome 1, reflecting the NSP's strong contribution to:</p> <ul style="list-style-type: none"> • The revision of the national energy efficiency labelling regulation, with more demanding requirements and future sales ban to any fridge that fails to meet these tighter energy savings requirements. Particularly, the NSP supported the technical discussions and consensus-building around the new regulation • Build the capacity of Colombian domestic refrigerator producers to safely build and service the refrigerators using the climate-friendly R-600a refrigerant, despite its flammable nature. • Upgrade the technical capacities of Colombian fridge producers to design, manufacture and sell more energy-efficient fridges, in compliance with the new Colombian National Minimum Energy Performance Standard (MEPS) regulations that will come into full force starting in 2023 and will ban sales of any refrigerator that does not achieve energy efficiency savings of 42% (which corresponds to the

³ Good / Very good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey.

Evaluation criterion / ELE Question and RAG rating ³	Summary of key findings
(HFC-free and energy-efficient) refrigerators	Colombian energy efficiency RETIQ label Level C) or higher, in relation to a baseline consumption estimated using a formula contained in the energy efficiency regulation that takes into account the size and features of the refrigerator.
<p>2. Effectiveness (continues):</p> <p>Intermediate Outcome 2: Trading up programme and monitoring and impact assessment in operation</p>	<p>Intermediate Outcome 2 is aimed at fostering and accelerating the substitution of old, energy-inefficient and HFC-based fridges with new, energy-efficient and climate-friendly ones. However, the context in which the NSP was set to operate has had some significant changes demanding adjustments to the activities associated with this intermediate outcome. In particular: (i) a Value Added Tax (VAT) break incentive was introduced by the government, cutting the VAT from 19% to 5% when people from lower-income groups buy a new, small⁴, more efficient fridge while returning their old one; (ii) Red Verde had expanded from Bogota to 4 additional cities, which meant that the NSP's proposed target of expanding Red Verde's operations to four additional cities became superfluous; and (iii) the Non-Conventional Energies and Efficient Energy Management Fund (FENOGE) had started providing refrigerator substitution efforts, without coordinating with the NSP.</p> <p>The introduction of the VAT-break incentive is a positive development for promoting the switch to greener refrigerators and the return of old ones. However, although the VAT incentive would imply higher savings for consumers than the financial incentive considered in the NSP proposal, it implies administrative and logistic costs or hassle that led many retailers not to promote the measure. Seeking to make the best use of the incentive and instruments available, and having listened to fridge producers and retailers' feedback on these higher costs, the NSP repurposed its financial incentive into one called "NAMA Bonus" aimed at offsetting some of those higher costs to increase support and commitment from refrigerator producers and retailers with the substitution programme.</p> <p>The contextual conditions created by the VAT-break incentive, the repurposed NSP financial incentive and the resistance of producers and retailers to apply the incentive due to lack of awareness or administrative complexity, led the NSP to direct efforts at raising the consumers' awareness of the incentive, and to provide technical support and training to retailers on how to apply and manage it from an accounting perspective.</p> <p>The NSP proposal suggested that, once operational, FENOGE would contribute EUR 2.4 million to the NSP to support the national substitution efforts. Nevertheless, FENOGE has already begun operations and supporting refrigerator substitution efforts, but has not done it through the NSP: its support is channelled through the IDB-formulated <i>Programa de Eficiencia Energética Caribe Energía Sostenible</i> (PEECES) instead.</p> <p>Finally, many interviewees expressed concerns about the possible lack of effectiveness of the existing or proposed incentive schemes to achieve the desired substitution target. The NSP's latest reports mention that only about 1,000 fridges have been substituted from the expected 300,000. Different NSP Stakeholders argued that the reasons for the slow uptake of the substitution schemes may be due to many unexpected and unmanageable external conditions, such as the lengthy negotiations with Bancoldex to launch the "NAMA Bonus" or</p>

⁴ The regulation does not actually consider a refrigerator size, but a refrigerator price threshold. However, given that refrigerator prices are strongly correlated to size, the incentive ends up being applicable only to small fridges.

Evaluation criterion / ELE Question and RAG rating ³	Summary of key findings
	<p>the COVID-19 pandemic and its economic and social impacts. However, the interviewees pointed out other aspects that may prevent the consumers from participating in the substitution schemes: (i) the traditional Colombian practice of households passing on working fridges to relatives or friends when they buy a new one; (ii) rising prices of fridges due to the newer technologies or higher domestic and international logistics costs may price many fridges out of the incentive eligibility thresholds; (iii) the interest of households to buy larger fridges than the one they owned, overshooting the price threshold; and, (iv) the recent introduction by the government of VAT-Free Days, providing an extra 5% discount on fridge prices than the VAT-break incentive during specific days, without requiring the consumer to return their old fridge.</p> <p>The ELE Team assigned the intermediate outcome 2 a RAG rating of amber that considers the progress made in revising the substitution scheme and incentives to suit new contextual conditions, but that also seeks to draw the attention of the NAMA Facility and the other NSP stakeholders to the fact that actions above and beyond those included within the NSP may be required to tackle the contextual, cultural and implementation challenges of the substitution scheme and achieve Colombia's ambitious GHG reduction targets for this sector within the timescales of the NSP and of the NDC commitments.</p>
<p>2. Effectiveness (continues):</p> <p>Intermediate Outcome 3: Appropriate refrigerator recycling or disposal in operation</p>	<p>The ELE Team assigned Intermediate Outcome 3 a grey RAG rating, based on the NSP Team's acknowledgement that work with WEEE processing and disposal companies for this intermediate outcome had just begun at the time of the Mid-term ELE. In spite of this, the ELE Team interviewed some of the WEEE processing and disposal companies expected to participate in the NSP to identify any progress or conditions that could influence the NSP's effectiveness. One initial aspect arising from these interviews is that the WEEE processing and disposal companies claimed to have already started analysing possible business models for refrigerator processing. The ELE Team also learned that WEEE processing and disposal companies have obtained tools and equipment that they could use to dismantle fridges through other initiatives. These two elements suggest that WEEE processing and disposal companies may be more advanced than expected to participate in or benefit from the NSP, and that, just as was the case with the refrigerator producing companies, the activity scheduled with the WEEE processing and disposal companies will require changes to adapt to the current conditions.</p>
<p>3. Efficiency: To what extent is the relationship between inputs and outputs timely and to expected quality standards?</p>	<p>Multiple interviewees reported delays in starting the project and getting some critical elements, like the NAMA Bonus and the loan facility for refrigerator producers, up and running. Delays in the processing of the NSP Intergovernmental agreement meant the project started in September 2019, rather than in April of that year, with COVID's travel restriction further generating delays as some of the training and technical assistance was limited by travel restrictions. Still, many others highlighted the flexibility, responsiveness and quality of the work of the NSP Team, which were enabled and supported by the NSP's approach of constant discussions and co-design of activities with the technical assistance beneficiaries.</p> <p>Despite the delay at the beginning of the Financial Component, the choice to engage Bancoldex in the execution of the Financial Component represented an efficient use of the NSP's resources. This resulted in lower fund management costs, a lower interest rate, and</p>

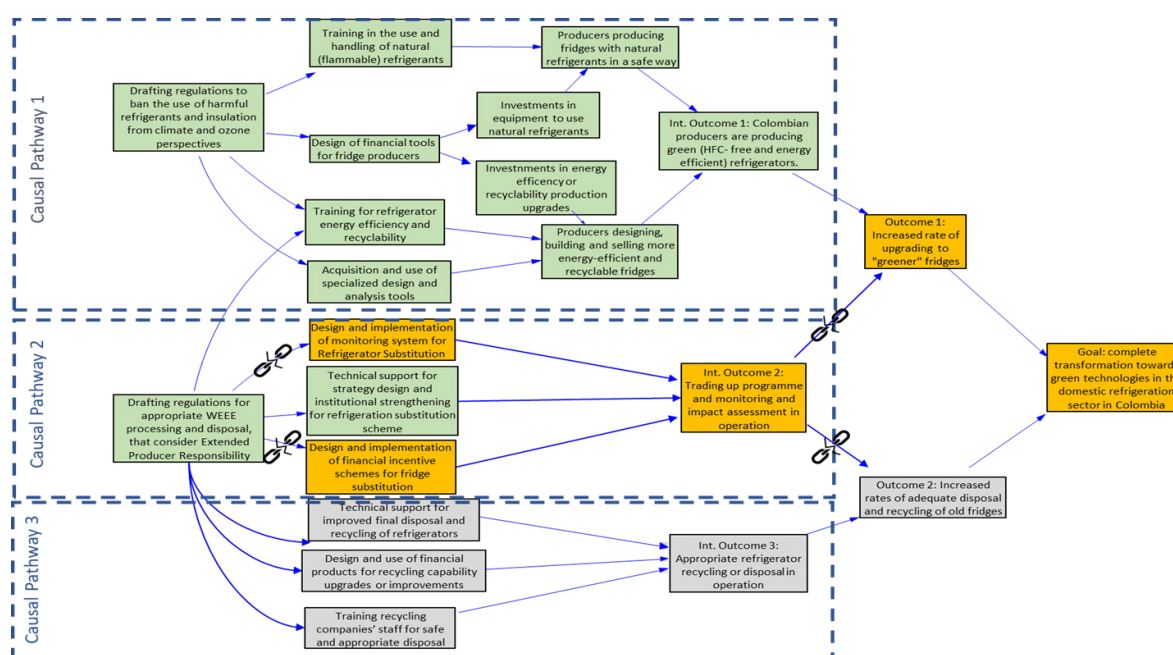
Evaluation criterion / ELE Question and RAG rating ³	Summary of key findings
	<p>higher scope of action by leveraging Bancoldex's increasing ability to provide loans to companies relying on financial institutions.</p> <p>Many interviewees considered that the NSP had lacked higher-level political support that could promote alignment and complementarity of the NSP with other national policies and actions to achieve the GHG reduction objectives. The establishment of VAT-free days could have contributed to the substitution efforts if they had adopted similar old-refrigeration return requirements as those applied to the NSP and the PEECES substitution schemes. Multiple interviewees commented that the environment sector institutions seemed to be pursuing a different agenda than those in the energy sector, even though both Ministries and sectors are involved in the NSP and the Steering Committee. The ELE learnt, but did not cross-validate with meeting minutes, that the people appointed as members of the Steering Committee hold director-level positions within the ministries and institutions involved, which are generally third-tier staff of the organisations under Vice Ministers or deputy CEOs. The membership of this type of executives may be good for execution, but may compromise the strategic, coordination or policy-making capabilities that having the participation of first or second-tier staff could provide. Considering the scale and scope of the NSP, and its requirements in terms of coordination and execution, some alternative steering arrangements could be required.</p> <p>The ELE Team assigned a RAG rating of amber to the NSP's efficiency, wishing to highlight the need for increased high-level support and coordination for the substitution scheme, given that achieving the NSP (and NDC) GHG reduction targets depends on the effectiveness of that substitution programme.</p>
<p>4. Impact: What evidence is there that the NSP is likely to contribute to the intended impact in the ToC (incl. transformational change)?</p>	<p>The analysis of the impact evaluation criterion utilises the NSP-induced transformational change framework presented in Section 1.2.1 and Annex B.</p> <p><u>Dimension 1: Producing a demonstrational effect and promoting learning</u></p> <p>The ELE Team finds that <u>interim signals</u> of Dimension 1 have been achieved by the NSP, although these have focused mostly on the production of refrigerators and more learning is needed to find an effective alternative for the refrigerator substitution scheme. The demonstrational effect of the NSP was limited as most of the awareness, interest and commitment from the public and private sectors to design and produce greener fridges, as well as to collect and appropriately dispose of the older ones already existed before its start (see discussion about the NSP Relevance above). Nevertheless, the NSP demonstrated good levels of self-learning and has produced significant lessons on how to design and run energy-efficiency-seeking appliance substitution efforts, particularly on key barriers to them.</p> <p><u>Dimension 2: Caused a catalytic effect</u></p> <p>The most significant impact of this NSP is concentrated in Dimension 2, with its support contributing directly to the producers upgrading their practices and procedures and the substitution effort getting the necessary support. The NSP contributed to the refrigerator producers' ability to design and market R-600a-based and energy-efficient fridges. The support provided by the NSP to the preparation and discussion of regulation updates was also instrumental as it operated as a "trusted" neutral stakeholder during consultation processes. Yet, although the NSP has made significant contributions to the production of energy-efficient and low GHG-emitting refrigerators, it suffers from the same cultural and</p>

Evaluation criterion / ELE Question and RAG rating ³	Summary of key findings
	<p>contextual problems that prevent other current refrigerator substitution efforts in Colombia from scaling up to their expected replacement scale and pace. In conclusion, the ELE Team finds that <u>interim signals</u> of catalytic effect have already been achieved by the NSP. However, the ELE Team also considers important to highlight that the full GHG reduction potential of the NSP may not be achieved within the proposed timeframes if the substitution scheme or the WEEE processing and disposal efforts cannot be scaled up to deliver energy and GHG emission savings.</p> <p><u>Dimension 3: Contributing to additional, large-scale and sustained GHG reductions</u></p> <p>According to the transformational change analytical framework used (Figure 3), <u>it is not necessary to see signals</u> of additional, large-scale and sustained GHG reductions at mid-term. However, the NSP already reports GHG savings, which can be traced to the combination of sold green fridges and older fridges withdrawn from the market. In spite of this early success, the ELE Team wanted to warn about the importance of the substitution scheme to achieve that large-scale sustained GHG reductions, particularly due to the long lifecycles of refrigerators: without an effective and efficient substitution programme, the conversion to the newer, greener, fridges, may take decades instead of the years that are required to meet NSP and NDC commitments. Two aspects that merit further consideration are: (i) the likelihood of the substitution programme to succeed based on the VAT-free days, the cultural barriers and production and logistic cost increases pushing the fridge prices beyond the VAT-Break incentive eligibility thresholds, and (ii) limitations and challenges of a substitution scheme that focuses on small fridges.</p> <p>The importance of the substitution scheme for achieving the goals, and the multiple challenges that it faces led the ELE Team to assign a RAG rating of amber to the NSP's impact at project mid-line.</p>
5. Sustainability: What is the likelihood that the outcomes will be sustained after the end of the NSP funding period?	<p>The ELE Team assigned to the Sustainability dimension a green RAG rating to acknowledge that none of the regulatory reforms or capability improvements supported by the NSP are likely to backslide. Interventions aimed at improving the capabilities of producers and WEEE companies are unlikely to disappear after the end of the NSP, as the production line conversions/improvements and the stricter regulations that incentivise them have been in existence for long enough. The only moderate risk for potential backsliding includes the substitution measures, with government or international cooperation funding likely to be required for the near future to continue the substitution effort.</p> <p>Red Verde will continue to exist as EPR requirements are expected to increase in the future.</p>

The ELE Team analysed the appropriateness and strength of the causal pathways underpinning the NSP's Theory of Change (ToC). Three causal pathways were identified, each underpinning one of the three intermediate outcomes of the NSP (see Figure ES-1). At mid-term, the causal assumptions behind Causal Pathway 1 have held as expected. For Causal Pathway 2, the ELE found two main causal assumptions that have not worked as expected: i) there were problems and delays in hiring the IT developer for Red Verde's IT Monitoring System; and ii) there were delays in the start of the financial incentive scheme, and concerns about the ability of the substitution scheme to reach the necessary

scale. For Causal Pathway 3, the causal pathway analysis was inconclusive as the NSP has not officially started to work in activities linked to Intermediate Outcome 3.

Figure ES-1. Overview of NSP Causal Pathways Assessment at Mid-Term



Based on the analysis, a **summary⁵ of the key lessons** deriving from the ELE is provided below:

1. The NSP's flexibility to adapt to changing context conditions has been crucial in keeping it relevant and, to some extent, efficient and effective.
2. When executing multi-sectoral work, it is essential to get and maintain a high profile for the project and engage persons or institutions able to align the agendas and coordinate the actions of public sector institutions.
3. The substitution programme is critical to achieving the sector's transformation and GHG reduction targets within the NSP and NDC's timeframes.
4. Adding local climate considerations or a more proactive approach to target specific fridges for withdrawal could make the substitution effort deliver a higher impact with fewer resources.
5. Better alignment and collaboration across government sectors and tiers could improve the NSP's traction and achievement of the goals.
6. There is a need for a national communication strategy or a broader set of incentives to promote refrigerator substitution.
7. When properly engaged, the private sector can be a key driver of sectoral transformation.

⁵ Please refer to section 5 for the full description of the lessons.

8. Financial mechanisms should be regularly assessed, refined and, when successful, replicated while considering each country's regulations and requirements.
9. Bancoldex has proved itself in recent years to be a strong financial institution and reliable partner that could be relied upon as a partner for future NSPs too.
10. There seems to be good potential for a second stage or a future refrigeration NSP in Colombia focused on adjacent sectors.
11. The NSP reporting process could be simplified and made more easily understandable for all parties involved.
12. Bilateral talks with other NSPs helped improve knowledge exchange.

From these lessons, specific recommendations for the NSP Team, the political implementing partners and other key NSP stakeholders, future NSPs applicants, and the NAMA Facility were derived. **Table ES-2 presents a summary⁶ of these recommendations.**

Table ES-2. Key recommendations from the Final ELE

Summary of recommendations	
Recommendations to the NSP Team to achieve the goal of the NSP	
1.	Maintain the NSP's flexibility to adapt its actions to the fast-changing context created by the involvement and leadership of private sector institutions.
2.	Request a time extension to the NAMA Facility to compensate for the late project start and the delays due to the COVID-19 pandemic response.
3.	Increase the engagement of Ministers, Vice-ministers or even a high-level advisor or staff members from the Office of the President of Colombia to increase the profile of the NSP and facilitate collaboration and coordination across sectors.
4.	Design and execute more knowledge exchange and awareness-raising events for high-level officials to get them to understand the importance of coordination and collaboration for the NSP's success.
Recommendations to the political implementing partners and other key NSP stakeholders for the success of the Domestic Refrigeration NSP	
1.	Raise the awareness of all crucial domestic refrigeration sector stakeholders about the need for the substitution to be effective to meet the GHG reduction goals within the NSP and NDC's timescales.
2.	Due to the limitations of the VAT-break incentive, particularly against the VAT-free days, consider other financial incentives, such as leasing or Energy-Service Company (ESCO) schemes.
3.	Consider removing from the VAT-break incentive the current household income and/or refrigerator price constraints.
4.	Identify geographical areas where fridges consume the most energy and/or deteriorate faster due to saline or other weather conditions, and target these areas for priority substitution.
5.	Review and consider adopting additional measures that could help focus the substitution effort on owners of older, CFC and HFC using, or less efficient fridges, rather than the poorest groups of the population.
6.	Review proposed refrigerator collection strategies for low-population areas, seeking economies of scale and WEEE collection strategies to make this initiative affordable.

⁶ Please refer to section 5 for the full description of the recommendations.

7. Find ways to make the substitution, collection and disposal effort more conducive to the circular economy in Colombia.
8. Facilitate collaboration and coordination, particularly across the energy, environment and finance ministries and agencies, to ensure that the substitution efforts achieve and maintain a pace adequate to comply with NSP and NDC targets.
9. Increase the engagement of local governments and their utility companies more integrally into the marketing of the substitution programme.
10. Design and conduct appropriately coordinated communications campaigns that raise the households' awareness of the benefits they and the planet would gain by upgrading to a "green refrigerator" and sending the older one for appropriate processing and disposal.
Recommendations to other or future NSPs
1. When formulating or executing an NSP or similar sectoral transformation initiative, make creating and maintaining the motivation and commitment of the key private sector stakeholders a priority through determining and using the suitable types of incentives.
2. When designing the NSP proposal, allow for some flexibility in the financial instruments that are expected to operate as incentives to catalyse transformational change.
3. During NSP execution, participate in financial instrument knowledge-exchange events or sessions with other similar NSPs to discuss whether and how the financial instruments proposed could be improved or fine-tuned to the specific needs.
4. Consider involving Bancoldex as an execution partner for the Financial Component of future Colombian NSPs and leverage its experience.
5. Consider leveraging all the experience and capabilities (institutional and technical) generated by the Colombia Domestic Refrigeration NSP to formulate new NSPs for transforming sectors adjacent to domestic refrigeration.
Recommendations to the NAMA Facility for the review, approval, and management of future interventions
1. Conduct an appropriateness assessment of the NSP reporting and M&E processes at least every two years.
2. Consider creating unique calls or fast-track review and approval processes to leverage current NSPs' knowledge and capabilities to execute NSPs in adjacent sectors.

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List of abbreviations

Bancoldex	Colombia's public-sector enterprise development bank
BAU	Business As Usual
BMWK	German Federal Ministry for Economic Affairs and Climate Action
BMZ	Bundes-ministerium für wirtschaftliche Zusammen-arbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development)
CFC	Chlorofluorocarbon compounds
COVID-19	Corona Virus Disease 2019
ELE	Evaluation and Learning Exercise
ELEQ	Evaluation and Learning Exercise Question
EPR	Extended Producer Responsibility
EQ	Evaluation Question
EUR	Euro
FENOGE	Fondo de Energías No Convencionales y Gestión Eficiente de la Energía (Non-Conventional Energies and Efficient Energy Management Fund)
FC	Financial Component
FW	Framework
GHG	Greenhouse Gases
GIZ	Gesellschaft für Internationale Zusammenarbeit
HFC	HydroFluoroCarbon compounds
KfW	KfW Development Bank (KfW – Kreditanstalt für Wiederaufbau)
KII	Key Informant Interview
Logframe	Logical Framework
MADS	Ministerio de Ambiente y Desarrollo Sostenible (Ministry of Environment and Sustainable Development)
MEPS	Minimum Energy Performance Standards
MinMinas	Ministerio de Minas y Energía (Ministry of Mines and Energy)
M&E	Monitoring and Evaluation

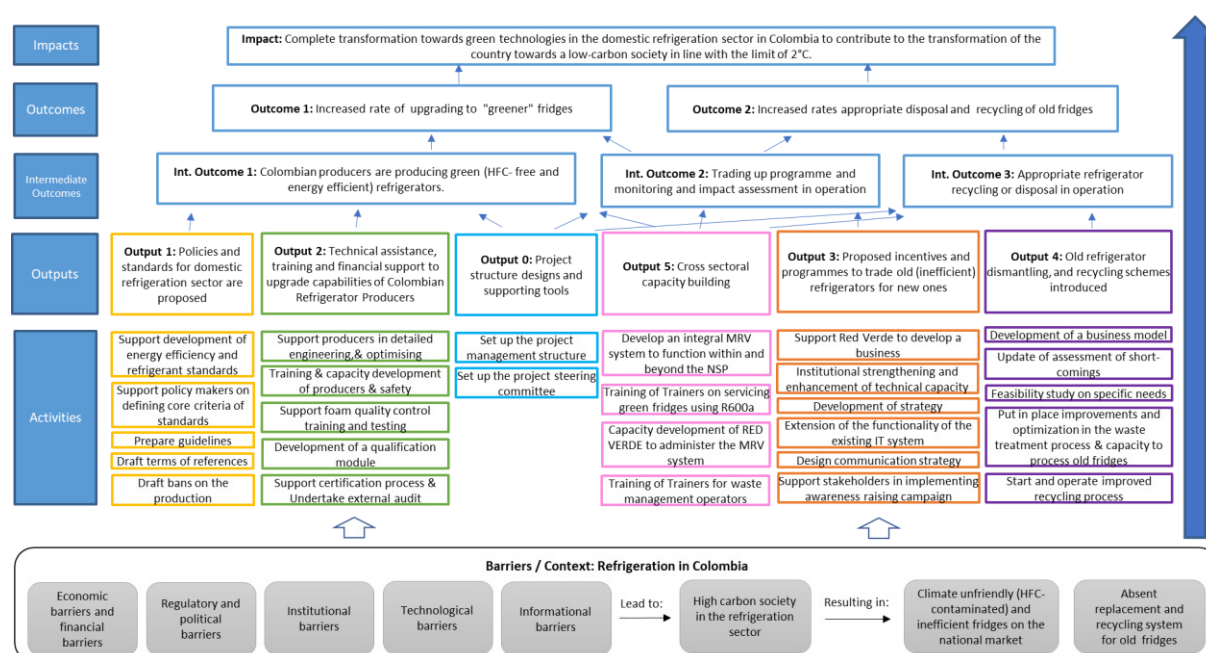
MRV	Measuring, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contributions
NSP	NAMA Support Project
NS	NSP Stakeholder
NT	NSP Team
OECD DAC	Organisation for Economic Co-operation and Development's - Development Assistance Committee
OPM	Oxford Policy Management
PEECES	Programa de Eficiencia Energética Caribe Energía Sostenible (Programme for Energy-Efficiency Caribbean Sustainable Energy).
PROURE	Programa para el Uso Racional de la Energía, Eficiencia Energética y la adopción de fuentes no convencionales de Energía (Programme for the Rational Use of Energy, Energy Efficiency and the adoption of non-conventional Energy Sources).
QA	Quality Assurance
QC	Quality Control
RAG	Red Amber Green
TC	Technical Component
ToC	Theory of Change
TP	Third Party
TS	Types of Sources
TSU	Technical Support Unit, NAMA Facility
UPME	Unidad de Planeación Minero Energética (Mining and Energy Planning Unit)
VAT	Value-Added Tax
WEEE	Waste of Electrical and Electronic Equipment

1 Introduction

1.1 Overview of the NSP

Figure 1 illustrates the Theory of Change (ToC) of the Colombia Domestic Refrigeration NSP, which presents the structure of the project, and its expected outcomes and impact. A larger version of the figure with key underpinning assumptions is provided in Annex A. Some of the key ToC elements are summarised below.

Figure 1. Theory of Change of the Colombia Domestic Refrigeration NAMA Support Project



The problem

At the time of the preparation of the NSP proposal, in 2014, Colombia's domestic refrigeration sector's GHG emissions were estimated to be around 5.5 Mt CO_{2eq} per year and were expected to double by 2030. A Study of the Hydrofluorocarbon's (HFC) Market in Colombia, commissioned by the Technical Ozone Unit of Colombia in 2014 estimated that Colombia had 12.5 million refrigerators in use in 2015 of which 10% were still using Chlorofluorocarbon compounds (CFCs) as a refrigerant agent, with the remaining 90% using mostly Hydrofluorocarbon (HFC) which are to be phased out in accordance to 2016's Kigali Amendment to 1987's Montreal Protocol on ozone-depleting substances, due to their high Global Warming Potential and ozone-depleting properties. The same studies estimated that 85% of refrigerators were located in lower-income households.

During the ELE kick-off meeting, NSP Team members stated that, in Colombia, domestic refrigeration-related GHG emissions have different sources according to the moment of the refrigerator's lifecycle in which they take place: 4% are generated during production, 68% during operation due to energy consumption, and 28% during the final disposal. Emissions from production and final disposal are mostly related to the production, use and disposal of refrigerator's materials and components,

particularly of the refrigerant agents (gases) and insulation foam. Emissions from the operation phase come from the consumption of energy to cool down and maintain the set temperature, which can be also affected by other external elements like the local climate conditions or the place in which the refrigerator is located within the household.

Achieving the GHG emissions reduction targets from this NSP required a combined action of multiple stakeholders from the energy, environmental and financial sectors in Colombia. Producers needed to upgrade their design and production capabilities to upgrade their product portfolios with energy-efficient and non-GHG producing materials or components, and they also needed to create and consolidate capabilities to comply with the Extender Producer Responsibility (EPR) regulations that require them to dispose of a growing percentage of the appliances they sell. Furthermore, Waste of Electrical and Electronic Equipment (WEEE) processing and disposal companies needed to upgrade their capabilities to process old fridges in a safe and environmentally adequate manner. Finally, the government needed to adopt the right type of regulations, and introduce incentives that help increase the rate at which the older refrigerators are replaced with the newer ones, in order to achieve the expected GHG emissions and the energy-efficiency targets.

The expected impact and outcomes of the NSP

To address the opportunity for GHG reductions in the domestic refrigeration sector, the Colombian Government prepared and submitted in 2015, under the NAMA Facility's Second Call, a proposal for a Colombia Domestic Refrigeration NSP. The NSP aims at supporting the complete transformation of the domestic refrigeration sector in Colombia towards using green (i.e. climate-friendly and energy-efficient) technologies, thus fostering Colombia's transition to a low-carbon economy. Specifically, the NSP sought to act to achieve two outcomes: Increasing the penetration of green fridges; and the appropriate recycling and disposal of older and inefficient ones. To get there, the NSP's ToC pursued three intermediate outcomes: (i) Supporting changes in the regulatory environment and increasing the capability of domestic refrigerator producers to get all new refrigerators to contribute to reduced GHG emissions; (ii) Supporting the creation and consolidation of a refrigerator substitution programme that withdraws 300,000 older fridges from the market and continues supporting the EPR effort in the future; and (iii) Assisting WEEE processing and disposal companies in developing business models and capabilities for appropriate recycling or disposal of old refrigerators.

According to the proposal submitted to the NAMA Facility, the Colombia Domestic Refrigeration NSP was expected to be executed between April 2017 and March 2022, combining a EUR 3.726 million Technical Component focused on technical assistance and capacity-building for key NSP stakeholders (i.e. the government, refrigerator producers, WEEE processing and disposal companies and Red Verde⁷), and a EUR 5.28 million Financial Component targeted at financing the refrigerator substitution "incentive", along with the investments that refrigerator producers and WEEE processing and disposal companies would need in line with the NSP's goals. GIZ is in charge of the execution of both the Technical and Financial Components. The NSP implementation is supported by multiple

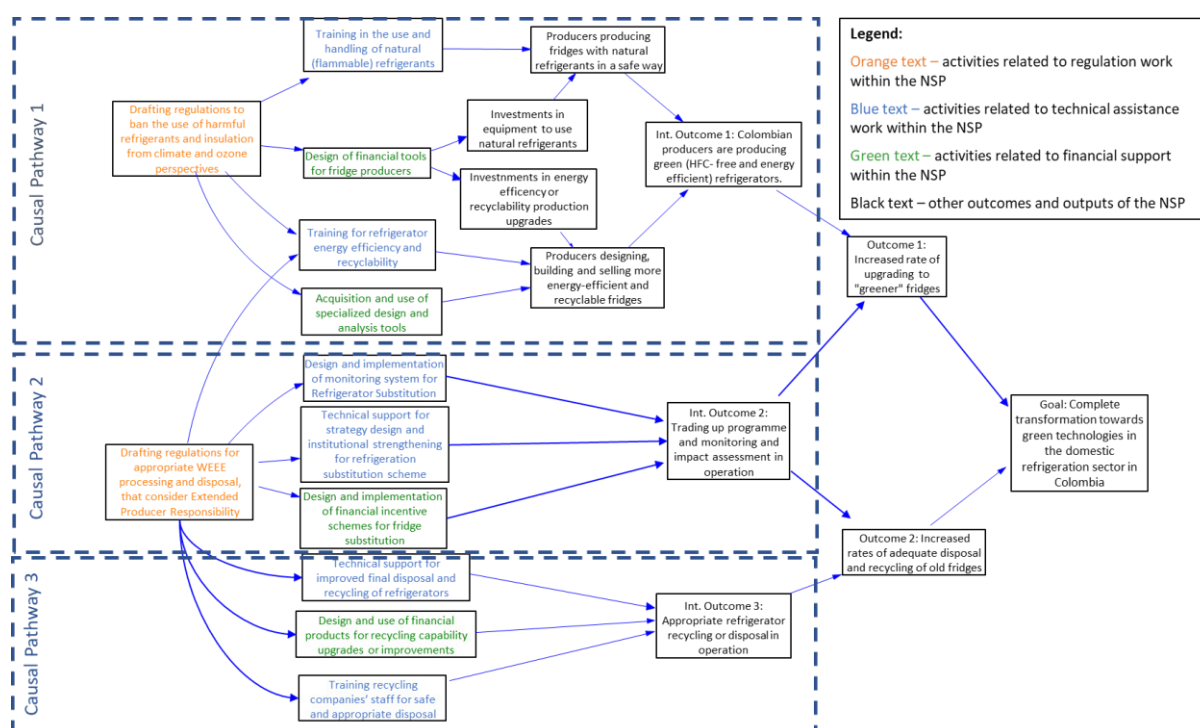
⁷ Red Verde is a not-for-profit organisation that was established in Colombia in 2014 by 5 appliance-makers (two domestic and three foreign) to help them comply with the EPR demands that the Colombia regulations would impose on all appliance producers for appropriate WEEE processing and disposal. Because of the affinity between Red Verde's EPR collection and disposal task, and the needs of the substitution effort, Red Verde became the organisation in charge of executing the refrigerator substitution effort.

public and private sector partners, being the three main partners the Ministry of Environment and Sustainable Development's (MADS – Acronym in Spanish) Ozone Technical Unit (UTO – Acronym in Spanish), Bancoldex (Colombian Development Bank) and *Red Verde*. MADS supports the outreach and coordination with refrigerator producers and WEEE processing and disposal companies' improvements, Bancoldex focuses on the feasibility and implementation of the NSP's financial tools, and Red Verde's effort concentrates on the design and implementation of the substitution programme.

The original causal pathways

To better unpack the assumptions behind the ToC and assess the progress of the NSP along it, the ELE Team developed a Causal Pathway Map (Figure 2) that seeks to reflect how the different actions of the NSP aggregate to deliver the expected outcomes and impact.

Figure 2. Causal Pathways of the Theory of Change of the Colombia Domestic Refrigeration NSP



The ELE has identified the following causal pathways sustaining each of the 3 Intermediate Outcomes of the NSP:

- Causal pathway supporting Intermediate Outcome 1 – Enabling the production and sale of green refrigerators:** If appropriate climate and energy efficiency regulations are adopted and supported with the corresponding technical and financial support, refrigerator producers will speed up the conversion of their production lines to natural refrigerants and to designing, manufacturing and selling "green" (HFC-free and energy-efficient) refrigerators (Intermediate Outcome 1). Having green fridges in the market is necessary for an increased rate of consumers upgrading to "greener" fridges (Outcome 1), hence achieving reduced direct and indirect emissions.

- **Causal pathway supporting Intermediate Outcome 2 – Consolidation and scale-up of the refrigerator substitution programme:** If adequate WEEE regulations that consider EPR are adopted and, if technical support is provided for strategy design and institutional strengthening for the refrigerator substitution and impact monitoring schemes, and design and implementation of financial incentive schemes for fridge substitution are also offered, then it will be possible to have an effective refrigerator trading up programme in place, and monitoring and impact assessment (in terms of energy efficiency and GHG emissions reductions) in operation (Intermediate Outcome 2). An effective substitution programme will help to increase both the rate of upgrading to "greener" fridges (Outcome 1) and the speed of adequate disposal and recycling of old fridges (Outcome 2).
- **Causal pathway supporting Intermediate Outcome 3 – Enabling and promoting adequate processing and disposal of old fridges and their constituents:** If an appropriate WEEE disposal regulatory framework is enacted, and if WEEE processing and disposal companies are provided technical support for improved final disposal and recycling of refrigerators, design and use of financial products for recycling capability upgrades or improvements, as well as training of recycling staff for safe and appropriate disposal is granted, then proper refrigerator recycling will be in operation (Intermediate Outcome 3). This will increase old fridges' adequate disposal and recycling rates (Outcome 2).

1.2 Focus of the Evaluation and Learning Exercise

In accordance with its Terms of Reference (ToR), this ELE seeks to address the following General ELE Questions (ELEQs):

- Has the NSP been achieving its results?
- Has the NSP started to trigger transformational change?
- What has been learnt from the NSP so far?

In addition to the General ELEQs, the ToR requested the ELE to answer the following questions:

- What is the level of commitment of the refrigerator producers to continue supporting the Red Verde Program after the NSP ends?
- What is FENOGE's commitment or its limitations or requirements to contribute to the refrigerator substitution scheme?

The General ELEQs presented above were broken down and operationalised in Specific ELEQs answered in this report. In Table 1, the General and Specific ELEQs are mapped against the Organisation for Economic Co-operation and Development's Development Assistance Committee's (OECD DAC) evaluation criteria⁸, widely used as international standards for evaluating development interventions. The relevant report section where each ELEQ / evaluation criterion is treated is also given. Finally, the specific ELEQs were broken down further into sub-questions included in the official ELE Matrix, approved by the NAMA Facility Technical Support Unit (TSU), and reported in Annex C.

⁸ Relevance, Effectiveness, Efficiency, Impact, Sustainability. The ELE Team added a 6th criteria, namely Learning.

Table 1. General and specific ELE questions and their link to the ELE Report sections

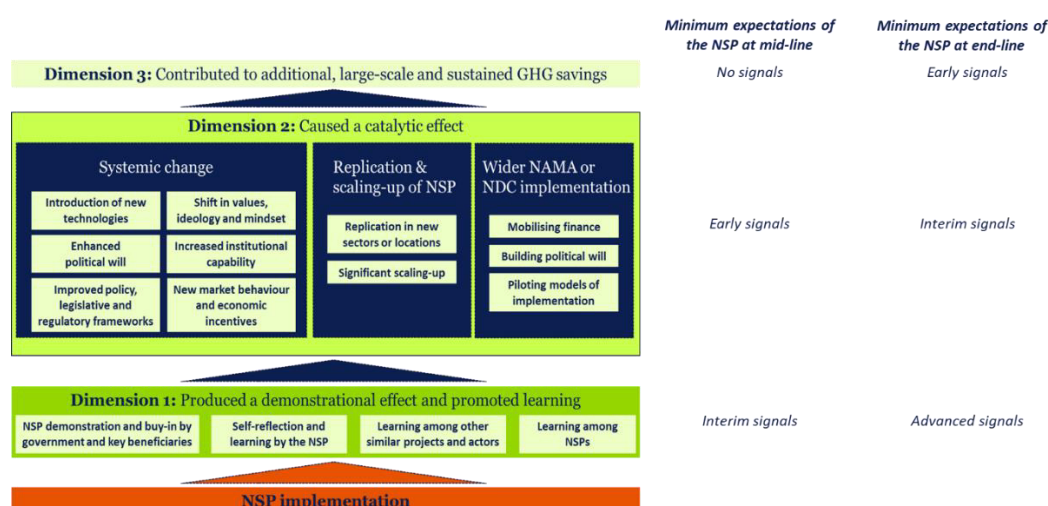
General ELE Question	Specific ELE Question	Evaluation criteria (relevant ELE Report section)
Is the NSP achieving its planned results?	To what extent does the NSP address an identified need (by the national government, refrigerator producers and recycling companies)?	Relevance (Section 3.1)
	To what extent has the NSP achieved intended intermediate outcomes (and unintended ones)?	Effectiveness (Section 3.2)
	To what extent is the relationship between inputs and outputs timely and to expected quality standards?	Efficiency (Section 3.3)
Is the NSP starting to trigger transformational change?	What evidence is there that the NSP is likely to contribute to the intended impact in the ToC (incl. transformational change)?	Impact (Section 3.4)
	What is the likelihood that the outcomes will be sustained after the end of the NSP funding period?	Sustainability (Section 3.5)
What has been learnt from the NSP so far?	What key lessons can be learnt to benefit this NSP or other projects or NSPs in achieving their results?	Learning (Section 5.1)

1.2.1 The NAMA Facility Transformational Change Framework

The enabling of Transformational Change is one of the key aims of the NAMA Facility, and therefore of NSPs. The NAMA Facility defines Transformational Change as “*Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways*”⁹. The Theory of Change is broad, and there are different ways in which Transformational Change can be achieved through the NSPs. Figure 3 illustrates three dimensions that interact and reinforce each other to produce NSP-induced Transformational Change. Each NSP will work on different elements of the three dimensions to define its pathways for Transformational Change. A more detailed explanation of the Transformational Change framework summarised in Figure 3 is presented in Annex B.

The ELE used the Transformational Change Framework to assess the NSP’s progress towards its impact in Section 3.4. In particular, in the evidence gathered through the ELE, the evaluators have looked for “signals” of the materialisation of the three dimensions, which were therefore classified as early, interim, and advanced signals according to the definitions in Table 2. The right end of Figure 3 shows the minimum level of signals of each of the three transformational change dimensions that NSPs are expected to have achieved by respectively their mid-line and end-line.

⁹ <https://www.nama-facility.org/concept-and-approach/transformational-change>

Figure 3. NSP-induced Transformational Change Framework**Table 2. Transformational Change “Signals” assessment by ELEs**

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the NSP, but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway, and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway, and there is little doubt that it will continue.

2 Methodological approach

The ELE entailed activities under four main phases: Inception, fieldwork, analysis, and reporting.

During the Inception Phase, the ELE Team reviewed key NSP documentation, including the NSP Proposal, Annual and Semi-Annual Reports, and the NSP Monitoring and Evaluation (M&E) Framework (see the complete list of documents reviewed in Annex G). Following that, the team used the information from the document review to **develop an adjusted ToC diagram and an initial Causal Pathway Map**. The adjusted ToC was the same ToC included in the NSP proposal, but a few adjustments sought to correct some issues with *outputs* presented as *outcomes* or vice-versa. The Causal Pathway Map was grounded on that adjusted ToC and was used as the basis to assess the solidity of the causal assumptions underpinning the NSP strategy. **It is important to highlight that the Causal Pathway Map is focused on understanding how the proposed activities of the NSP contribute to its final purpose and goal.**

The data from the document review and the ToC served as a reference point to **develop a tailored matrix including the ELEQs** (ELE Matrix – see Annex C), which the ELE Team **integrated with the initial hypotheses** to be tested by the fieldwork. At the same time, the ELE Team worked on the organisation of the fieldwork interviews, **applying a purposive sampling approach of the key informants according to their involvement with the NSP**. In this way, the ELE Team grouped them in **3 general categories: (i) NSP Team**, i.e. members of the NSP Delivery Partners and Implementing Partners, the performance of whom is directly assessed by the ELE; **(ii) NSP Stakeholders**, i.e. government officials, company representatives and individuals who have actively supported one or more NSP activities; and **(iii) Third Parties**, i.e. organisations and individuals who received one or more NSP activities (e.g. were part of the audience of an event or training), or, despite not being involved in the NSP, whose insights and contributions may help validate some challenges suggested by the NSP Team or Stakeholders, or identify new ones. For example, third parties included a few interviewees from some of the target income groups of the substitution effort (e.g. domestic workers, elder citizens). The above helped the ELE Team test, triangulate the evidence, and assess its strength. Table 3 summarises the number of interviews and people interviewed (some calls had multiple interviewees) by each sampling category. For a detailed list of the institutions and organisations interviewed, refer to Annex G.

Table 3. Overview of the number of interviews and interviewees by sampling category

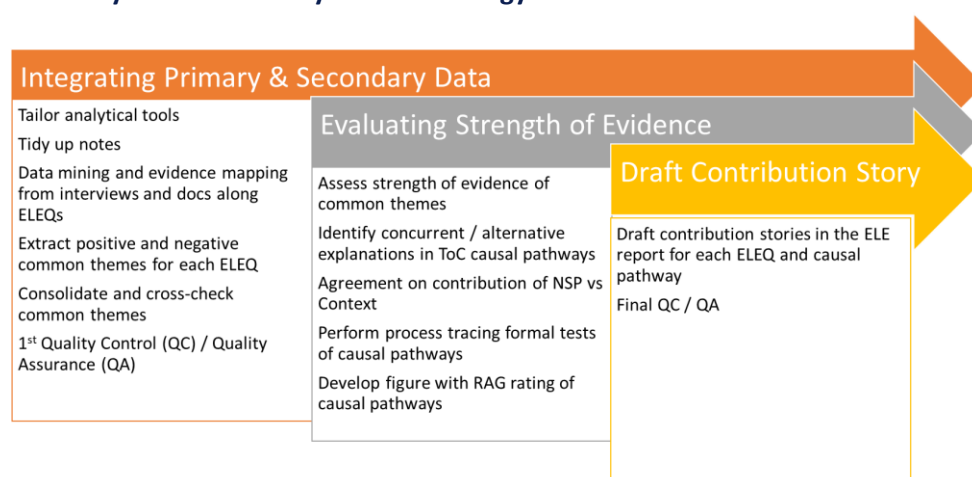
	NSP Team	NSP Stakeholders	Third Parties	TOTAL
No. interviews	9	12	6	27
No. interviewees	9	13	6	29

The Fieldwork Phase began with an ELE Kick-Off Workshop on 8th November 2021. The workshop was conducted in a virtual setting and was attended by 5 participants from the NSP Team and ELE Team. The workshop's purpose was to review, clarify and validate: (i) purpose, scope, and expectations of the ELE; and (ii) the NSP's ToC. The Kick-Off Workshop achieved two key outcomes: the validation of the adjusted NSP ToC diagram and the definition of initial insights into the priorities for the fieldwork.

The initial workshop was followed by **nine days of primary data collection using in-depth interviews with the NSP Team and Key Informant Interviews (KIIs) with NSP Stakeholders and Third Parties. The general ELE Interview Guides prepared during the inception phase were reviewed and tailored to the specific interviews daily.** The Guides followed the ELEQs, and the general structure remained consistent among interviewees from the same sampling category. Still, the content and wording of the questions were tailored to capture essential knowledge from specific informants, cover knowledge gaps, test hypotheses or triangulate certain information. Where necessary, the interview was conducted in Spanish. **Following the intense period of interviews, the ELE Team put together some preliminary findings and lessons, which were discussed with the NSP Team during the ELE Validation Workshop on 29th November 2021, also held in a virtual setting, with the NSP Team. In addition to reviewing, discussing and validating the preliminary ELE findings, the Validation Workshop was used to discuss additional adjustments to the ToC and Causal Pathway Map and identify ways to adapt the NSP based on the lessons identified.** The fruitful discussion on the preliminary ELE findings allowed the ELE Team to validate them in collaboration with the NSP Team and identify and discuss recommendations as laid out in Section 5.

The final part of the fieldwork moved the ELE Team into the **Analysis Phase**. Figure 4 illustrates the different steps taken to analyse the data.

Figure 4. Summary of the ELE Analysis Methodology



Evaluating the NSP performance: Section 3 of this report uses the evidence and emerging themes discussed above to present the ELE Team’s findings in terms of the performance of the NSP against the OECD DAC criteria (relevance, effectiveness, efficiency, impact, and sustainability) and (under the effectiveness criteria) its performance against the ToC intermediate outcomes. Performance is summarised for each DAC criterion and/ or ToC intermediate outcome, in the form of a **Red-Amber-Green (RAG) rating**: Green – good/ very good performance; Amber - some progress but problems also identified; Red - serious deficiencies in the performance.

Evaluating the strength of the evidence: To assess the strength of the evidence behind the emerging themes extracted from the interview notes or documents, the ELE Team cross-referenced each emerging topic with its sources. Consequently, the Team went through all the emerging topics again and rated the strength of the evidence behind each of them according to the scorecard in Table 4. The rating exercise highlighted when emerging topics were based on personal opinions, several people from a specific type of sources, or came across multiple types of sources. **A key methodological**

limitation is that the threshold to define what constitutes weak or strong/very strong evidence is subjective and it has been decided by the evaluators based on the size and diversity of the sample of sources. Therefore, the strength of evidence labels (weak, medium, etc.) are only to be viewed in relative terms to the evidence of the other themes rather than in absolute terms. The final result can be seen in the “Evidence and Answers to the ELE Matrix” in 5, which still reports the sources and the evidence strength of the emerging themes used in the answers.

Table 4. Scorecard for assessing the strength of evidence

		Variety (number of types of sources (TS) reporting the evidence)		
		1 TS only	2 TSs	3 TSs
Quantity (number of sources reporting the evidence)	1 source only	Single source		
	2 sources	Weak evidence	Medium evidence	
	3+ sources	Medium evidence	Strong evidence	Very strong evidence

The final ELE phase is the Reporting Phase. During this phase, the ELE Team compiled this report which has undergone internal quality assurance and one round of comments from the NSP Team, the NAMA Facility TSU and its Donors.

The COVID-19 pandemic imposed some methodological challenges on the ELE. The main limitation was conducting the fieldwork in a virtual mode. Although the ELE Team was able to arrange interviews with an appropriate number and variety of stakeholders, the virtual nature of the interviews limited it in two ways. Firstly, the ELE Team could not be personally immersed in the NSP’s national and local context. To some extent, this may have limited their complete understanding of the contextual dynamics influencing the NSP. However, the participation of an experienced local consultant in the ELE Team has mitigated this issue to a great extent. Secondly, given travel between interviews was not required, it was possible to schedule more interviews, of which many were back-to-back interviews, forcing the team to concentrate and absorb large amounts of information for a long duration.

3 Key Findings

In this section, the ELE Team presents the main findings of the ELE. These are structured according to the ELE Questions in Table 1. At the beginning of each section, a RAG rating of the strength of the NSP's contribution story to the ToC and the OECD DAC criteria is included, following the scale: Good / Very good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey.

3.1 Relevance of the NSP

Relevance

To what extent does the NSP address an identified need (by the national government, refrigerator producers and recycling companies)?

Domestic producers sell three-quarters of all refrigerators sold in Colombia each year and are therefore the crucial stakeholder for any initiative that seeks to reduce emissions from the refrigeration sector in Colombia. The HFC compounds that were instrumental in supporting the shift away from the Ozone-layer-depleting CFC compounds have been found to contribute significantly to climate change, and, after the 2016 Kigali's Amendment to 1987's Montreal Protocol on the ozone layer preservation, they are being phased out. The shift towards climate-friendly refrigerants or other elements such as insulation foams is not straightforward. Particularly given that the new refrigerant, named R-600a (Iso-Butane), is flammable and requires investment in training and tools to handle it properly and safely, and in adapting the production lines from the previously ubiquitous HFCs to the new refrigerant.

Colombia has officially pursued energy efficiency measures in the refrigeration and other sectors since the Law 697 of 2001. Almost a decade later, the first Indicative Action Plan for the Programme for the Rational and Efficient Use of Energy (PROURE) was adopted. PROURE's latest draft covers the period 2021-2030 and links energy efficiency with GHG emissions savings. According to this draft, households represented 19.2% of energy consumption in Colombia. Within this sector, cooking and refrigeration had the highest share with 68% and refrigeration with a 15%, although this analysis considers all energy sources, including firewood. This latest iteration of the PROURE estimates that promoting a shift toward energy-efficient fridges could produce reductions in energy consumption of up to 72.81 PJ (Peta Joules) and GHG emissions of up to 3.36 million Tonnes of CO_{2eq}. These savings represent 39.3% of the GHG reductions to be achieved for residential energy consumption over the 2021-2030 period.

In 2013, the Colombian Congress passed law 1672, setting the legal basis for Electric and Electronic equipment producers to develop Extended Producer Responsibility (EPR) Schemes and requesting the establishment of certified waste management companies that would help ensure that appliances will be collected and disposed of properly after they conclude their lifecycles. Within the environmental protection and preservation efforts, Colombia has been adopting policies and regulations that seek to reduce the impact of different types of waste that could be harmful or polluting if not correctly processed. According to the interviewees, 80% of a refrigerator's components and materials are easily recyclable. The remaining 20%, including the refrigerant and the insulating foam, need special processing that makes their disposal pricey. To achieve the policy's goal of

adequately disposing of 90% of the waste of electrical and electronic equipment (WEEE) by 2032, two further challenges need to be solved: (i) Developing the capacity of certified waste processing and disposal companies to process and dispose of refrigerator “waste”, and (ii) Increasing the capacity and scale of refrigerator recycling systems and infrastructure to improve the financial sustainability of WEEE processing and disposal companies, and of the reverse logistics required to collect the old appliances and deliver them to the WEEE company facilities.

Red Verde was created in 2014 by appliance producers and importers to comply with their WEEE EPR requirements. Red Verde was established as a non-profit organisation whose income comes mainly from its members’ contributions every year. The non-profit nature of the organisation highlights that its role is more operational and of support than a commercial one: Red Verde facilitates the collection and transportation of the old appliances to the certified WEEE processing companies, but does not participate in any business beyond that. However, its logistics capabilities, prior relationships with refrigerator producers, retailers and WEEE processing and disposal companies, and the advances in record keeping (all linked to the WEEE EPR regulations), made it an excellent partner to coordinate the substitution efforts

The NSP addresses under one initiative these three needs previously pursued by the government separately, i.e. the need for promoting energy efficiency and climate-friendly technologies in the domestic refrigeration sector (driven by PROURE and the Montreal Protocol), the need for providing appropriate disposal of old and polluting refrigerators (driven by the WEEE EPR law), and the need for incentivising the substitution in a way that is economically viable for the producers and disposal companies (driven by Red Verde). Concerning GHG emissions, the NSP Team mentioned that the stages of a refrigerator’s lifecycle contribute differently to its total emissions: 4% are generated during production, 68% during operation due to energy consumption, and 28% during the final disposal. Considering that there are economies of scale and scope¹⁰ that can be obtained from joining up the three efforts under one line of work, tackling these three fronts under the same NSP makes sense.

At the end of 2020, Colombia sent updated NDC commitments to the UNFCCC, which explicitly include the Domestic Refrigeration NSP’s GHG emissions reductions among the revised targets. Explicitly, the new NDC mentions that it expects to reduce GHG emissions from substituting ozone-depleting substances and potent GHGs in refrigerators and energy efficiency improvements achieved from upgrading to newer fridges.

According to the analysis above, it is clear that the NSP is relevant to the needs of its key stakeholders, them being the government, fridge producers and WEEE disposal companies. The NSP is correctly linked to national targets and priorities for climate change, energy efficiency and environmental sustainability, and the particular requirements of the stakeholders involved in each one of those three lines of action. Therefore, **the evaluators assigned a green rating to the Relevance evaluation criterion.**

¹⁰ Economies of scope take place when the capacity of an organisation to develop or provide a product or service A increases its ability or capacity to develop or provide a product or service B. In this case, Red Verde’s EPR efforts to collect and deliver the old fridges to the certified WEEE processing companies, makes it also very good at supporting a substitution scheme.

3.2 Effectiveness of the NSP

Effectiveness	2. To what extent has the NSP achieved intended intermediate outcomes (and unintended ones)?
	Intermediate Outcome 1: Colombian manufacturers produce green (HFC- free and energy-efficient) refrigerators.
	Intermediate Outcome 2: Trading up programme and monitoring and impact assessment in operation
	Intermediate Outcome 3: Appropriate refrigerator recycling or disposal in operation

3.2.1 Intermediate Outcome 1: Colombian manufacturers produce green (HFC- free and energy-efficient) refrigerators

All three domestic producers of refrigerators, which reportedly had a 70% share of the domestic refrigerator market, converted their production lines to the R-600a climate-friendly refrigerant, but they did it before the NSP officially started. Interviewees highlighted that all three domestic producers that were expected to convert their production lines to the climate-friendly but flammable R-600a, with the assistance of the NSP, went ahead and made some of the investments expected to be supported by the NSP before its official start (see more info in Section 3.4), meaning that the NSP has had no role in this technological conversion.

However, Colombian refrigerator producers have benefitted from the training and the additional tools and equipment provided by the NSP to safely produce the R-600a based refrigerators. Having invested in the conversion of the production lines did not imply that the Colombian producers had all the knowledge or training to safely build refrigerators in the presence of a flammable refrigerant gas. According to multiple interviewees, the NSP trained the technicians working in the factories and toolkits to build and service these R-600a-based refrigerators safely.

The NSP supported the drafting of the regulation banning the import and sale of HFC-based refrigerators in Colombia, which had not been formally adopted at the time of the ELE fieldwork. A draft regulation was posted for consultation in 2020. Comments were considered, and a final version was produced for consultation with the World Trade Organization (WTO). Having received conformity from the WTO, the adoption should follow shortly.

The NSP supported the discussions and consensus building around a new Energy Efficiency Labelling regulation and the adoption of Minimum Energy Performance Standards (MEPS) for refrigerators. Interviewees highlighted how the NSP helped the debate from a technical, neutral perspective and provided support to assess reasonable yet desirable increases in these labelling standards. Many interviewees considered introducing this regulation as central to getting commitment and compliance by the refrigeration producers with these energy efficiency goals, as meeting them requires investments and using more expensive materials, which may affect the price of the fridges and the ability of the producers to make a profit.

The reduced needs and demands on the NSP to support the investments to convert the production lines to the R-600a refrigerant allowed for some resources to be reallocated to energy efficiency capability improvements. The NSP has provided training, tools, and specialised services to the

producers as part of the capacity-development effort. The producers mentioned that, in addition to energy efficiency technical support, they had benefitted from the provision by the NSP of (i) thermal cameras to support their internal energy-efficiency testing capabilities and (ii) support from Brazil's "Polo" research institution (contracted by the NSP) to review the energy-efficiency of their product designs and recommend improvements.

In conclusion, progress towards Intermediate Outcome 1 has been significant, and a green rating has been assigned. Yet, such progress has not come without its difficulties. Training schedules were disrupted by the COVID-19 pandemic's mobility and gathering restrictions. The NSP pivoted and has developed jointly with the Technical Ozone Unit of the Ministry of Environment and Sustainable Development and Colombia's SENA (the public-sector organisation providing technical and technological training) to create e-courses that go over the theoretical part of the training. Still, delays persist for the practical part of the training. Challenger, one of the three domestic producers participating in the NSP, withdrew in early 2021 from the substitution programme. The ELE Team was not able to get a clear reason for the withdrawal as a Challenger representative did not respond to interview requests during the ELE fieldwork period. Other interviewees provided their opinions on the possible reasons for Challenger's withdrawal, but since these reasons are not related to the NSP, it would not be appropriate to disclose them.

3.2.2 Intermediate Outcome 2: Trading up programme and monitoring and impact assessment in operation

Intermediate Outcome 2 aimed at fostering and accelerating the substitution of old, energy-inefficient and HFC-based fridges with new, energy-efficient and climate-friendly ones. However, the context in which the NSP was set to operate has had some significant changes demanding adjustments to the activities associated with this intermediate outcome. In particular: (i) a Value Added Tax (VAT) reduction incentive was introduced by the government, cutting the VAT from 19% to 5% when people from lower-income groups buy a new, small¹¹, more efficient fridge while returning their old one; (ii) Red Verde had expanded from Bogota to 4 additional cities, which meant that the NSP's proposed target of expanding Red Verde's operations to four additional cities became superfluous; and (iii) the Non-Conventional Energies and Efficient Energy Management Fund (FENOGE) had started providing refrigerator substitution efforts, without coordinating with the NSP. These are explained below.

The introduction of the VAT-break incentive is a positive development to promoting the switch to greener refrigerators and the return of old ones. However, although this incentive would imply higher savings for consumers than the NSP-led substitution scheme, it implies administrative and logistics costs or hassle that led many retailers not to promote the measure. The way the VAT-break incentive was created requires the retailer that sold the refrigerator to conduct additional checks, administrative work and assume logistics costs to ensure the application of the rebate, as they need to make sure that the old fridge has been received for disposal by a certified WEEE processing facility

¹¹ The regulation does not actually consider a refrigerator size, but a refrigerator price threshold. However, given that refrigerator prices are strongly correlated to size, the incentive ends up being applicable only to small fridges.

before confirming the discount. This added complexity, reportedly, discouraged retailers from promoting the incentive in many places across Colombia.

Given that the VAT-break incentive would be equal to or larger than the original NSP's consumer incentive, the NSP repurposed its financial incentive to provide \$50,000¹² (ca. EUR 11.40 at the time of this ELE) per fridge as a bonus to the retailers participating in the VAT-break incentive scheme to help them cover some of the additional administrative and logistics costs of the substitution programme. Bancoldex, which will operate this \$50,000 "NAMA Bonus" incentive scheme for retailers, officially communicated the start of the incentive in mid-November 2021 after months of preparation and delays due to Bancoldex's call to assist in COVID-19 recovery actions. **The delays in the launch of the NAMA Bonus have therefore delayed the deployment of a broader substitution effort.**

The contextual conditions created by the VAT-break incentive, the repurposed NSP financial incentive and the resistance of producers and retailers to apply the incentive due to lack of awareness or administrative complexity, led the NSP to reallocate some funds to consumer awareness and training for retailers on the incentive and its application. The NSP refocused some of its technical assistance resources to develop videos or other marketing material that helped to present consumers the benefits and the requirements of the VAT-reduction based refrigerator substitution incentive. The NSP also provided training and accounting assistance to refrigerator producers and retailers' staff to encourage the use of the incentive.

The NSP proposal suggested that, once operational, FENOGE would contribute EUR 2.4 million to the NSP to support the national substitution efforts. Nevertheless, FENOGE has already begun operations and supporting refrigerator substitution efforts, but has not done it through the NSP: its support is channelled through the IDB-formulated *Programa de Eficiencia Energética Caribe Energía Sostenible* (PEECES) programme instead. The ELE Team reached out to FENOGE for an interview under this ELE but received no response. Still, multiple interviewees considered that future support from FENOGE is likely, as the NSP is directly contributing to the PROURE's objectives and targets, which are a crucial driver of FENOGE's work. In addition, a collaboration between the NSP and PEECES' refrigerator substitution programmes have been achieved in PEECES eligible areas through an agreement signed by the respective executing agencies, i.e. Red Verde and *U.T. Caribe Eficiente*.

Many interviewees expressed concerns about the possible lack of effectiveness of the existing or proposed incentive schemes to achieve the desired substitution target. The NSP's latest reports mention that only about 1,000 fridges have been substituted from the expected 300,000. Different NSP Stakeholders argued that the reasons for the slow uptake of the substitution schemes may be due to many unexpected and unmanageable external conditions, such as the lengthy negotiations with Bancoldex to launch the "NAMA Bonus" or the COVID-19 pandemic and its economic and social impacts. However, the interviewees pointed out other aspects that may prevent the consumers from participating in the substitution schemes: (i) the traditional Colombian practice of households passing on working fridges to relatives or friends when they buy a new one; (ii) rising prices of fridges due to the newer technologies or higher domestic and international logistics costs may price many fridges out of the incentive eligibility thresholds; (iii) the interest of households to buy larger fridges than the one they owned, overshooting the price threshold; and, (iv) the recent introduction by the

¹² \$ stands for Colombian pesos.

government of VAT-Free Days, providing an extra 5% discount on fridge prices than the VAT-break incentive during specific days, without requiring the consumer to return their old fridge.

The NSP Team has demonstrated flexibility in adapting to key changes in their operating context, and the evaluators are hopeful that they still have time to address the persisting problematic issues. However, the delays in the execution, but mostly the uncertainty about the effectiveness of the substitution scheme, led the ELE Team to assign a RAG rating of amber to the Intermediate Outcome 2.

3.2.3 Intermediate Outcome 3: Appropriate refrigerator recycling or disposal in operation

The NSP Team reported having only started to work with the WEEE processing companies when the ELE was conducted in 2021. Based on the NSP Team interviews and reports, the team was initially focusing on increasing the number of refrigerators collected through the substitution scheme, seeking to attain a larger refrigerator return scale that would make the WEEE companies' engagement in old-refrigerator processing and disposal activities more attractive and sustainable.

Given that the NSP had just started to work with the WEEE processing companies, the ELE team considers it pertinent to assign a grey RAG rating to this intermediate outcome. However, the ELE team decided to contact and interview WEEE processing and disposal companies to learn about their current advance and identify any aspects or conditions that could have positive or negative impact upon the support the NSP is to provide them, and could justify considering and adopting adjustment to that scope of work. It is important to highlight that these elements cannot be considered as a diagnostic of the WEEE processing and disposal companies, which would be beyond the scope of this ELE, nor is it possible to link these aspects or conditions to the NSP, as the work has only just begun.

Based on requests from the MADS' Ozone Technical Unit, WEEE processing and disposal companies have made initial cost-effectiveness assessments of the processing and disposal of refrigerators. They concluded that, unlike for other large electric or electronic appliances, it may not be possible to recoup the cost of the refrigerator processing and disposal activities just by re-selling their parts. This finding could be significant for the NSP as it means that the WEEE processing and disposal companies, which operate under a for-profit scheme, are likely to have to charge someone to dispose of a refrigerator. This would likely add to the costs of collection that producers are taking on through Red Verde and ultimately to the price of a new fridge.

A second important aspect is that even if economies of scale are achieved, the WEEE processing and disposal companies may have to charge for the processing of the fridge. The main problem could lie with the insulating foams, which are costly to store and transport due to their low density (high volume per unit of mass). According to the WEEE Processing and disposal companies interviewed, this cannot be resolved by increasing the number of fridges available for processing.

The third aspect resulting from these interviews is that few fridges arrive at WEEE processing and disposal companies (before the NSP's intervention) and these are not necessarily the older, larger, less energy-efficient and using CFCs or HFCs, that could contribute more to the energy and GHG savings if withdrawn from service. This may just be a coincidence or a larger condition from the sector, but it calls for some consideration on whether the substitution scheme should work in a passive

manner, i.e. waiting for the consumers to decide to upgrade, or if a more proactive substitution scheme that targets particular fridges, social groups or geographical locations could be a better way of using the limited resources for substitution. A robust monitoring system able to collect characteristics of the fridges being processed as WEEE will be important to follow-up and monitor the focus and effort of the substitution scheme.

3.2.4 How external factors impacted the NSP's effectiveness

The ELE team found two external factors that may have impacted the NSP effectiveness: the **VAT-Free Days** and the **COVID-19 pandemic**. The VAT-free days are the ones with the higher disruption potential for domestic refrigeration, as they allow consumers to buy refrigerators of any size with a higher “discount” than the substitution schemes and without the need to return their old fridge. At the moment, the VAT-free days undermine the government’s (and the NSP’s) substitution efforts, because an economically rational consumer would wait to buy a new fridge during the VAT-free days and not use the VAT-break incentives or the PEECES scheme. Given that solving the VAT-free days involves engaging in political discussions that the NSP is not mandated to lead, the NSP Team should bring to the government’s attention the urgent need to facilitate discussions within its different branches to seek for alternatives to align the VAT-Free days with the PROURE’s energy efficiency and NDC GHG mitigation goals.

COVID-19’s impacts are more generally expected to cause delays in the execution of the NSP, such as the postponement of the technical training sessions that need to be delivered “live” or the need to wait for the lockdown to be lifted to go back to promoting the substitution scheme. However, they may also have a **more profound impact if the COVID-19 supply chain disruptions, magnified by internal disruptions within Colombia due to social protests in early 2021, require most fridges to be priced over the thresholds established in the regulation.**

3.3 Efficiency of the NSP

Efficiency

3. To what extent is the relationship between inputs and outputs timely and to expected quality standards?

The involvement of the private sector in the execution of the NSP, i.e. the fridge producers and the WEEE processing and disposal companies, required the NSP execution to take a fast pace. Timescales for change within the private sector are short, even more so when companies are responding to regulations or market changes that may affect their business viability or sustainability. In this case, Colombian refrigerator producers’ commitment to changing the refrigerant agent, increasing their refrigerators’ energy efficiency, and creating Red Verde to assist their WEEE EPR processing and disposal requirements, has more to do with their financial viability and sustainability than with an environmental concern. The environmental regulations helped create and consolidate waste processing and disposal companies that are looking for ways to grow and expand their businesses. This means that, in contrast to those NSPs in which the private sector is the passive stakeholder that needs convincing, for this NSP, the private sector organisations are actively leading the sector transformation.

At the same time, the slower pace of work of the public sector and diplomatic relations, which resulted in delays in the start of the NSP, has created a need for the NSP to adjust its timeframes and activities to maintain its pertinence and timeliness. By the time the NSP officially started in 2019, the producers had already made the investments to convert their production lines to the R-600a refrigerant, Red Verde had expanded its operations to 4 cities apart from Bogota and, based on discussions between the ELE Team and WEEE processing and disposal companies, the latter had already started to look for a refrigerator processing and disposal business model. Moreover, the NSP's financial products took longer to implement due to negotiations and institutional adjustments that Bancoldex needed to start implementation.

Despite such delay at the beginning of the Financial Component, the choice to engage Bancoldex in the execution of the Financial Component represented an efficient use of the NSP's resources. The NSP decided to add the EUR 3 million, originally destined to be put into a trust fund to finance producer improvements, to a EUR 10 million blended finance line from Bancoldex that can provide cheaper financing to the producers to make investments in line with the scope and goals of this NSP. Involving Bancoldex resulted in lower fund management costs, a lower interest rate, and higher scope of action by leveraging Bancoldex's increasing ability to provide loans to companies relying on financial institutions.

Initiatives that involve multiple sectors, like this NSP, usually find it challenging to coordinate actions. Getting and maintaining higher-level political support to coordinate various sectors can be crucial for the NSP. As discussed in Section 3.1, the NSP delivered actions that combined three types of objectives: tackling climate change, energy efficiency and environmental impact. Efforts being pushed forward in one of them were not usually coordinated with the others. For example, the *Unidad de Planeación Minero Energética* (UPME) and FENOGÉ designed the PEECES refrigerator replacement initiative and selected *U.T. Caribe Eficiente* to execute it without coordinating with the NSP. Another example is the implementation by the Ministry of Finance of VAT-Free days in a way that reduces the effectiveness of the VAT-break schemes introduced in support of energy-efficiency and climate targets associated with long-standing policies and commitments from the Ministry of Mines and Energy and the Ministry of Environment, respectively. The NSP team has worked with the Ministry of Environment, the Ministry of Mines and Energy, the refrigerator producers, Red Verde, appliance (refrigerator) retailers and utility companies seeking to align efforts for the substitution programme and has found it easier to get alignment from the private sector (due to the commercial benefit potential), than the public sector due to the different sectoral agendas. Gaining higher-level political buy-in for the NSP, possibly even from the Office of the President of Colombia, could have helped improve the coordination across sectors.

The NSP's Steering Committee only formally met for the first time in 2021 due to administrative delays, although it appears that it had previously been meeting in an informal manner. Most of the NSP stakeholders get to participate in it, with the members being more of a managerial level than of a strategic level. For example, Steering Committee members from the Public Sector are not the Minister or Vice-minister, but a level below the latter. **This provides the NSP with implementation capacity, but not necessarily with strategic, coordination or policy-making capabilities.** Indeed, many interviewees expressed concerns about the ability of the NSP to support Governmental inter-agency coordination, even though it was also mentioned that the NSP was able to reach out to Ministers or Vice-ministers if their support was required for a particular activity, as was the case of the

Environment's Minister recording of the TV report presenting the substitution programme. Perhaps, a review of the Steering Committee's membership should be made, seeking to balance the implementation ability provided by the existing members, with the coordination or collaboration capabilities that higher-level officials can provide.

On top of the late start of the NSP, the COVID-19 pandemic has caused additional delays. The NSP Team has expressed its interest to request a cost-neutral extension to compensate. The NSP proposal expected the project to start in 2017, but it began officially in 2019 due to delays in the diplomatic note exchange. The emergency and the lockdown caused by the COVID-19 pandemic forced additional delays as public sector legal teams shifted their priorities to pandemic emergency regulations, and international consultants and trainers could not travel to Colombia to deliver some of the face-to-face activities (e.g. training).

The NSP appropriately discussed and agreed with the respective beneficiaries their needs and the relevant actions to support them. As discussed in Sections 3.1 and 3.4 of this report, the fact that this NSP took on more the characteristics of a transformation-support than a demonstration project, meant that its work has focused on supporting or improving a more precise set of needs of the different stakeholders involved, including R-600a safety training, and dedicated support to improve the refrigerators designs for increased energy efficiency. NSP stakeholders have expressed their satisfaction with the support provided by the NSP. However, many interviewees said that they would have liked the NSP to have played a more leading or integrating role, which, as described earlier, is challenging due to the multi-sectoral nature of the NSP.

In conclusion, the ELE Team decided to assign an amber rating to the NSP's efficiency at mid-term. Although the NSP has demonstrated a good level of flexibility and efficient use of its financial resources (e.g. by engaging Bancoldex), clear issues in the coordination of the NSP stakeholders, particularly the governmental ones, remain. Substantial delays have also occurred, despite having originated from external events beyond the direct control of the NSP.

3.4 Impact of the NSP

Impact

4. What evidence is there that the NSP is likely to contribute to the intended impact in the ToC (incl. transformational change)?

As explained in Section 1.2.1, the analysis of the impact evaluation criterion utilises the NSP-induced transformational change framework presented in Figure 3 and further explained in Annex B.

Dimension 1: Producing a demonstrational effect and promoting learning

The context in which the NSP was formulated and implemented was developed and mature enough to consider that key Dimension 1 aspects were already in place for the sector's transformation. As discussed in the relevance section above, the three main drivers of this NSP, which are climate change, energy efficiency and environmental sustainability, had existed for five or more years and were reporting progress at the time of the NSP's formulation: refrigerator producers at a global scale, with which Colombian producers compete, were converting to the R-600a and less GHG-generating insulating foams; that same international competition and the Colombian government were pushing

for energy efficiency; and there had been an increasing drive within Colombia, but also globally, for proper disposal of WEEE that the producers supported via EPR regulations and practices.

The NSP demonstrated good levels of self-learning and has produced significant lessons on how to design and run energy-efficiency pursuing appliance substitution efforts. The NSP showed high flexibility in adapting to the quickly evolving needs of the Colombian domestic refrigeration market (see Section 3.1): without the flexibility demonstrated by the NSP team, but also from the NAMA Facility in approving the changes to activities and scope it is likely that this project could have fallen short in terms of activities and execution, with multiple activities and support still required for the domestic refrigerator sector's transformation beyond the conversion of the production lines to the R-600a refrigerant or the application of a financial incentive for fridge substitution. In addition, the NSP produced important lessons for its stakeholders and future NSPs in a similar sector, highlighting key difficulties in designing and executing an electric or electronic appliance substitution scheme to deliver energy efficiency improvements and GHG emissions reductions. Lessons being learned for the domestic refrigerator sector could be used to design and execute substitution efforts for other appliances.

The ELE Team finds that interim signals of “Dimension 1: promoting a demonstration effect and learning” have been achieved by the NSP, although these have focused mostly on the production of refrigerators. Challenges remain ahead for the NSP in terms of flexibility to adapt to rapidly evolving conditions, and also to continue learning until an effective alternative for the refrigerator substitution scheme is found.

Dimension 2: Caused a catalytic effect

The most significant impact of this NSP is concentrated in Dimension 2, with its support contributing directly to the producers upgrading their practices and procedures and the substitution effort getting the necessary support.

The NSP contributed to the refrigerator producers' ability to design and market R-600a-based and energy-efficient fridges. The NSP may not have financed the fridge producers' conversion of their production lines to the R-600a refrigerant, but did provide crucial support through training and kits to run the production lines safely and service or repair the new “green” refrigerators. Specialised equipment and technical support provided by the NSP, like Brazil's “Polo” Research Lab support to review and improve the energy efficiency of their fridges, have also helped develop capabilities within refrigerator producers and Red Verde that are unlikely to be lost or rolled back.

The support provided by the NSP to the preparation and discussion of regulation updates was also instrumental as it operated as a “trusted” neutral stakeholder during consultation processes. Interviewees reported that prior regulation formulation or updating processes were ridden with disagreement between the government and the regulated (or to-be-regulated) parties. The support provided by the NSP of technical and financial analysis helped to improve these discussions and arrive at better regulations.

The NSP has encouraged Bancoldex to push forward with internal changes, making it a more capable and suitable partner to support the execution of NSPs or similar cooperation projects, with potential benefits for future cooperation projects. The focus of Bancoldex on enterprise development, its

ability to work as a second or first-tier financial institution, and mobilise and blend resources and funding from public and multilateral sources, make Bancoldex a capable partner whose contribution could benefit many other initiatives in the years to come. The EUR 10 million blended finance facility for fridge producers and the “NAMA Bonus” facility are proof of their versatility.

The project is a solid basis for the forthcoming support from the German *Bundes-Ministerium für wirtschaftliche Zusammenarbeit und Entwicklung* (BMZ) to help refrigerator producers make their fridges more recyclable. The NSP Team reported that supporting producers to make their fridges more easily recyclable or disposable was not part of the project design, but that funds from BMZ, external to the NSP, were being mobilised to assist in that endeavour, which may provide a better platform to create a circular economy around the refrigerators.

Even without formal coordination or collaboration, FENOGE can still contribute to the NSP. The PEECES initiative may not have been coordinated with the NSP at a high level but has become a complementary measure to the NSP effort. Residents of hotter coastal areas could combine the two incentives getting a better overall benefit. The collaboration agreements reportedly signed between Red Verde and *U.T. Caribe Eficiente* (PEECES’ implementer) to combine the incentives highlight that not all tools may need to be previously coordinated to pursue a joint effort.

The NSP suffers from the same cultural and contextual problems that prevent other current refrigerator substitution efforts in Colombia from scaling up to their expected replacement scale and pace. The NSP has made significant contributions to the production of energy-efficient and low GHG-emitting refrigerators, but the energy-efficiency or GHG emissions reduction benefits may not be achieved in time to meet the NSP and NDC planned timeframes, if the substitution effort fails or falls short of its own targets. It may be important to explore, under the NSP or through other NSP stakeholders, other schemes that (i) may trigger a large-scale substitution of old inefficient fridges for green ones, or (ii) leverage the cultural practice of “passing on” fridges to relatives or friends, as a means to promote large-scale substitution.

In conclusion, the ELE Team finds that interim signals of catalytic effect have already been achieved by the NSP, but the full potential of the catalytic effect of the project will be unleashed only if appropriate measures are undertaken to ensure the uptake of the substitution scheme and the appropriate WEEE processing and disposal.

Dimension 3: Contributing to additional, large-scale and sustained GHG reductions

The NSP already reports GHG savings, which can be traced to the combination of sold green fridges and older fridges withdrawn from the market. The 2020 Annual Report and its associated M&E framework report advances, which can be reasonably considered to demonstrate that the NSP is already contributing to achieving its GHG targets.

According to the transformational change analytical framework (Figure 3), **it is not necessary to see signals of additional, large-scale and sustained GHG reductions at mid-term.** However, the evaluators see some potential issues that could undermine the achievement of such reductions by the NSP. In particular, **the ELE Team considers it essential to have a robust monitoring system for the substitution effort and a detailed register for fridge disassembly and disposal that captures their age and technologies; an aspect that could not be validated as the preparation of the databases and register is delayed according to the Annual and Semi-annual reports.** Another potential problem

identified by the ELE Team is that the passive nature of the substitution scheme, which relies on the decision of consumers to return (or not) their fridge as part of the purchase, along with the size and price thresholds for the VAT-Break incentive and the lack of requirements or targets about the refrigerators to be returned under the substitution programme may lead to lower energy and GHG emission savings than those expected in the NSP and NDC targets, as older, larger, more inefficient refrigerators may escape the programme and remain in operation for many more years. Considering that the primary source of GHG reductions comes from energy efficiency gains, special efforts should be made to ensure that those older energy inefficient fridges are the ones withdrawn.

To conclude the assessment of the Impact evaluation criterion, an amber RAG rating appears appropriate for the Mid-term ELE. In fact, while the NSP has exceeded the expectations at mid-term for Dimension 2 and met those for Dimension 1, significant challenges have been identified that could affect Dimension 3. In particular, the uncertainties hanging over the substitution efforts are considered significant and require special attention by the NSP Team in the remainder of the project implementation.

3.5 Sustainability of the NSP

Sustainability

5. What is the likelihood that the outcomes will be sustained after the end of the NSP funding period?

The NSP benefits from a consolidated and robust institutional framework that makes it likely to be sustained over time. The long track record of collaboration between the multiple stakeholders, even without the formality of a steering committee, assures that the project will continue in time and interviewees considered that the knowledge gained is unlikely to be lost.

The production component of the NSP has little to no risk of backsliding, as converted plants and improved designs are consolidated changes. As discussed in earlier sections, the NSP has contributed with equipment and capacity-building that is unlikely to be lost over time, even more so when considering that producers cannot reverse from their decision of converting to the R-600a refrigerant, nor may be able to fail to meet the new energy efficiency standards and requirements.

WEEE processing and disposal companies are unlikely to lose any developed capabilities to process fridges. Abilities and equipment will remain beyond the NSP's end. The tightening governmental restrictions on proper management and disposal of WEEE will ensure that refrigerators for processing are likely to increase and that capabilities already developed and soon to be improved with the NSP will continue. WEEE processing and disposal companies have expressed their commitment to continue beyond the "parenting" phase that the NSP would provide. However, producers need to be responsible for recycling too. They should become more involved with WEEE processing and substitution companies to improve conditions for emerging and consolidating a circular economy around refrigerators.

The substitution scheme has a moderate risk of backsliding as it depends on many interactions and behaviour (e.g. work on the substitution culture and the impact of the VAT-free days). Besides the reported need to keep receiving funding to maintain these renewal dynamics, there are still significant challenges in engaging the final consumers and getting them to scrap their old fridge instead of passing

it on. The project seeks to create a revolving fund that could be replenished to continue the commitment in the longer term. The substitution program has also become a commercial tool; the reuse of the materials from old refrigerators has been included in the strategy of the manufacturers. The main challenge is incentivising the return of the older refrigerator, which at the moment is not aided by the VAT-free days.

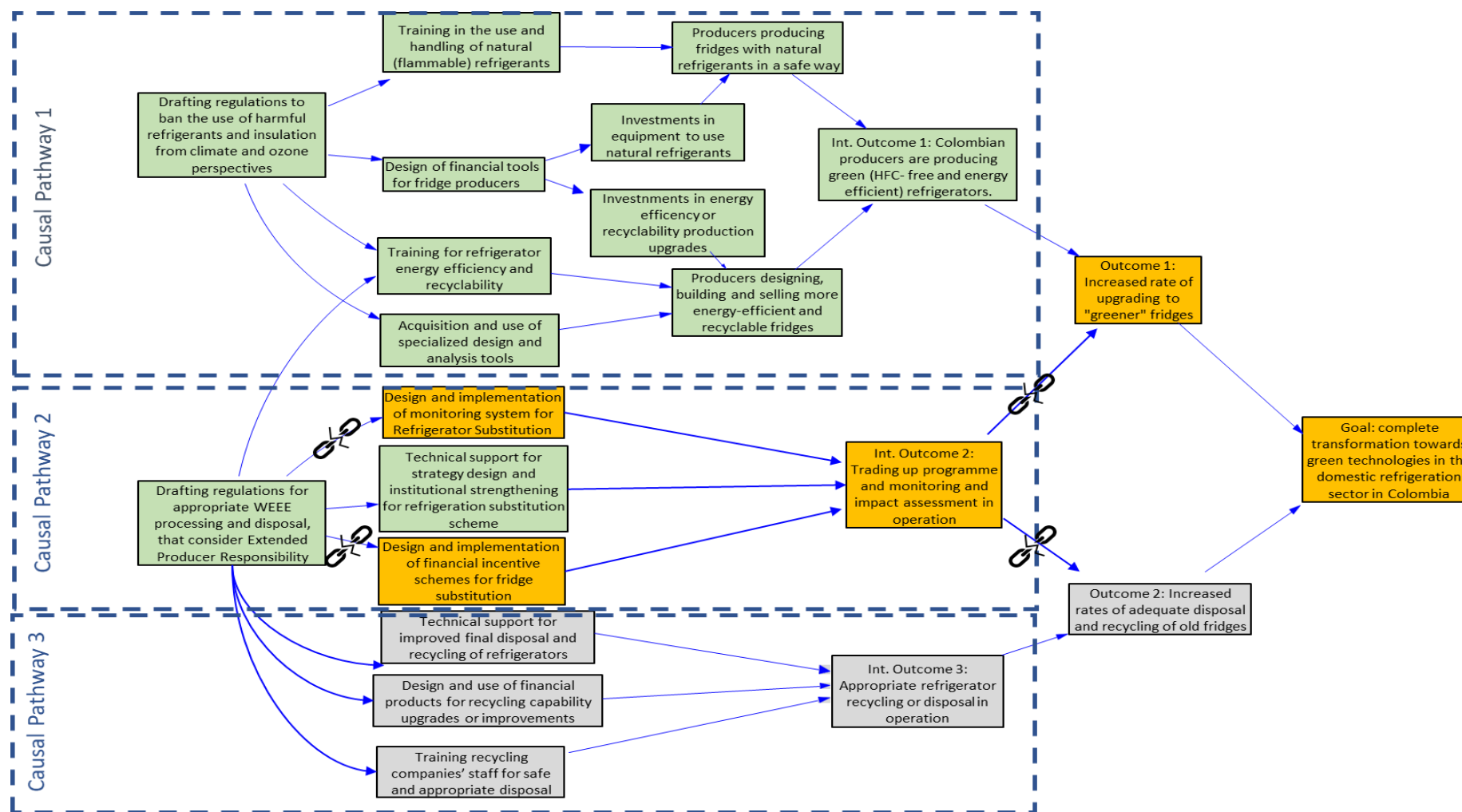
Adopting additional pieces of regulation are also unlikely to backslide as most of the regulation support has focused on improving existing regulation. Regulation is doubtful to backtrack to allow older and less efficient models to be sold. The drafted regulations seem to work in the right direction, but still need to be adopted and enforced. For recycling to be sustainable, there need to be clear regulations and responsibilities to dispose of the equipment properly. In this regard, the WEEE processing and disposal requirements that guide the proper management and disposal of old fridges (gases, foams, plastics) in compliance with the law 1672 of 2013 (see chapter 3.1) is expected to be updated in the coming months, but still seek to increase the number of environmentally-sound management of discarded fridges over time.

The organisational nature of Red Verde as a non-profit organisation and its vital role in helping producers and importers meet their EPR on WEEE processing and disposal makes it likely to remain for the long run. Producers created Red Verde to assume their co-responsibility in the proper disposal of WEEE as hazardous waste. Red Verde could have vanished during the pandemic, but was supported by producers. At present, NSP funding represents less than 20% of the overall Red Verde budget and is sustained mainly through the yearly contributions of its charter members. The organisation has developed capabilities to recollect and dispose of refrigerators and organise the proper disposal of gases and foams. The achievements so far cannot easily be reversed, especially as the different entities collaborating with Red Verde have learned how to work together to achieve new mitigations targets in other sectors. Even more so, if the EPR regulation will finally be adopted and have specific demands on the number of appliances disposed of. The requirements for final disposal are initially small, but are set to grow on time. By the end of the NSP, Red Verde will likely have the technical know-how to function as a national replacement programme for domestic refrigerators. The established EPR scheme will lead to increased sustainability of the environmentally friendly waste management of fridges and may be extended to other waste streams.

In conclusion, the project components about production and recycling are very likely to be sustained after the end of the project. In contrast, the substitution module faces a moderate risk of backsliding due to the aforementioned reasons. If further adopted and enforced, the regulations drafted so far seem to work adequately. Also, the post-consumption programme (Red Verde) shows solid evidence of continuing its operation after the project timeline. Evidence confirms that the NSP achievements are of the levels expected towards mid-term, and therefore, the sustainability of the NSP has been assessed as “green”.

4 Conclusions

Figure 5. Overview of NSP Causal Pathways Assessment at Mid-Term



Now that the evidence collected and analysed by the ELE has been explored, this section goes back to the NSP Theory of Change to test to what extent the original causal pathways and assumptions behind them have held.

Figure 5 presents an overview of the progress of the NSP along its ToC causal pathways (the ones enunciated in Section 1.1) towards its intended outcomes. The RAG rating uses the same scale as the previous section (i.e. Good / Very Good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey), and the colours of the Intermediate Outcomes' shapes are the same colours used in Section 3.13.2 to rate the NSP's achievements for each Intermediate Outcome. This is to be read as an assessment of the NSP's situation at this point in time, i.e. at mid-term.

What transpires from Figure 5 is that, at this time, the NSP shows significant advances in achieving the goal of getting Colombian refrigerator producers to design, manufacture and sell refrigerators with increased energy efficiency and free from high Global Warming Potential HFC refrigerants (Intermediate Outcome 1). The producers converted their production lines to R-600a and have improved their ability to design, test, and sell energy-efficient fridges. Because of that, the **Causal Pathway 1 features all green boxes.**

At the same time, the NSP has not formally started their activities towards developing and improving WEEE processing and disposal companies, although these have made some advances on their own. The NSP stated during the interviews and in their Annual and Semi-annual Reports that the work supporting WEEE processing and disposal companies, including business model development and capability improvements through training, equipment/tools or technical assistance, has not started yet, as the NSP expected to have been able to develop and consolidate the substitution programme before committing to this work. Because of this, the **boxes constituting Causal Pathway 3 are grey.** Nonetheless, as was discussed in Section 3.2.3, during interviews with some of these WEEE processing and disposal companies, the ELE Team learned that they have made some progress on their own in costing the processing and disposal of fridges as well as in looking for a business model. The main conclusion of this assessment was that they may have to charge a fee to the person or company asking for the disposal, a consideration that should be included in the design of future substitution efforts.

Despite the significant work and funding directed at scaling-up refrigerator upgrading efforts, the substitution programmes (including the NSP's and other ones also in operation) have found it challenging to achieve the rates of substitution expected, and the lower substitution of fridges may affect the NSP's ability to achieve its desired GHG reduction goals. The ELE Team found evidence of the work that the NSP has been doing together with Bancoldex, Red Verde, refrigerator producers and retailers to create and apply adequate financial incentives for refrigeration substitution, but has also found evidence of multiple barriers that had not been foreseen or properly considered in the formulation of the NSP, which have led to lower substitution numbers than expected. These barriers include: coordination and collaboration difficulties, administrative resistance from producers and retailers to apply and use the substitution incentives, and cultural and personal preferences from households. These barriers were not known at the time of the NSP proposal and only became apparent after Red Verde started to apply the VAT-break incentive. The NSP has reported that they are addressing these barriers (at least partially) through the NAMA Bonus financial incentive for retailers. In addition, the development of the Monitoring and Evaluation IT system that Red Verde would use

to manage and follow-up the substitution programme has suffered delays as the tendering processes to hire the system's developer faced some difficulties. Furthermore, multiple contextual elements were identified that could make the substitution effort significantly less effective than expected, at least in relation to the NSP and NDC expected timeframes to achieve the GHG reduction goals: (i) VAT-free days will continue impeding the VAT-break incentive's withdrawal of refrigerators; (ii) higher supply chain costs may push the prices of new fridges beyond the maximum legal threshold to apply the VAT-break incentive, and hamper its ability to withdraw the old fridge; (iii) cultural biases (i.e. passing on the working old fridge to a relative or acquaintance) together with the size and price conditions of the substitution scheme may be creating a bias of this substitution programme towards, small, cheap refrigerators creating a void of action to withdraw larger, older, and less energy-efficient ones from operation. When considered together, these elements contribute to breaking multiple links/causal assumptions in Causal Pathway 2, which can jeopardise or considerably delay the attainment of the NSP's outcomes.

Finally, process tracing was applied as an additional test to check the validity of the NSP ToC and assess the strength of the evidence collected by the ELE (see Annex E). The results of the process tracing test did not contradict the findings presented in the body of the report. In summary, process tracing confirmed that, at this point, the approach taken by the NSP to get the refrigerator producers to migrate their production schemes towards natural refrigerants and more energy-efficient fridges was right as there is strong evidence of the transformation happening along the proposed causal pathway. In relation to WEEE processing and disposal companies developing the capabilities along the causal pathway proposed, the fact that the NSP has reportedly only started to work with them makes it difficult to assess whether or not the causal pathway was properly designed; nonetheless, the interviews held between the ELE Team and a few of these WEEE processing and disposal companies to understand their pre-NSP support conditions suggest that the proposed pathway could be valid as these companies have mentioned that they have participated in other similar processes in the past and that they have used the new abilities, tools and equipment to strengthen their processing capabilities and businesses. Lastly, the delays that have affected the substitution effort (exchange of notes, COVID-19 pandemic and Bancoldex onboarding with the NAMA Bonus), but mostly the challenges experienced by other refrigerator substitution initiatives, even ones that provide higher financial incentives like PEECES, seem to suggest that the causal pathway considered by the NSP could not be sufficient, or may not be correct, to achieve the refrigerator upgrade rate needed to deliver the goal of halving GHG emissions from the domestic refrigeration sector by 2030.

5 Lessons and recommendations

5.1 Key lessons

The evidence gathered during the ELE, along with the key findings presented in Section 3 and the conclusions in Section 1, have been used by the ELE Team to draw the lessons below:

Lessons for the NSP Team to achieve the goal of the NSP

1. **The NSP's flexibility to adapt to changing context conditions has been crucial in keeping it relevant and, to some extent, efficient and effective.** The multiple changes that have taken place in the context of the project, both before and during its execution, have required the NSP Team to pivot to maintain the activities pertinent and timely. The NSP Team mentioned it appreciated having been able to discuss the changes or adaptations with the TSU and the Donors and having received support from them.
2. **When executing multi-sectoral work, it is essential to get and maintain a high profile for the project and engage persons or institutions able to align the agendas and coordinate the actions of public sector institutions.** The evaluation acknowledges the importance of the Steering Committee and the support received by the NSP from its members as well as the Ministers and Vice-ministers called upon in certain promotional activities as required. At the same time, interviewees expressed that the coordination within the institutions and organisations within a sector was fine, but coordination across sectors was more difficult, making it seem as if each sector was pursuing its own agenda. Considering the need and importance of cross-sectoral goals for this NSP, getting higher-level "champions" to facilitate future alignment and coordination efforts across the sectors would be desirable.

Lessons for the political implementing partners and other key NSP stakeholders for the success of the Domestic Refrigeration NSP

3. **The substitution programme is critical to achieving the sector's transformation and GHG reduction targets within the NSP and NDC's timeframes.** The conversion to R-600a and energy-efficiency measures being successfully pursued with refrigerator producers has set in motion a process that will arrive, eventually, at the complete transformation of refrigerators to the new technologies. However, achieving the large-scale and sustainable GHG reduction proposed for the NSP and the NDC, within their proposed timeframes, may not be achieved without an effective, large scale substitution effort. In this sense, it is important to get the commitment of all stakeholders, not just the NSP Team, to evolve and consolidate an effective, large scale substitution effort.
4. **Adding local climate considerations or a more proactive approach to target specific fridges for withdrawal could make the substitution effort deliver a higher impact with fewer resources.** The NSP Team mentioned that they are not considering a regionalised strategy for the substitution effort, supporting the existing VAT-break incentive or joining forces with PEECES to achieve the goals. Some interviewees suggested that the project's objective of

reducing energy consumption and GHG emissions could be achieved more efficiently if the substitution programme pursued a more targeted approach, focusing on areas whose climate conditions lead to higher energy consumption (and fridge wear through corrosion). The ELE Team considers this an interesting proposition that could be complemented with a more targeted approach to ensure that the older, larger and less efficient refrigerators are withdrawn first, and then changing the focus towards those geographical locations, refrigerators or social groups that contribute most to energy consumption and GHG emissions. This targeted approach is likely to require incentives, marketing and consumer awareness efforts over and above of what can be only achieved under the NSP, as well as a joint commercial and logistics strategy to curb commercial and logistics costs. Pursuing a joint commercial and logistic strategy for the substitution scheme will be particularly useful for smaller towns or rural areas, as it can help create economies of scale that reduce sales costs of new fridges as well as the costs of collecting, and transporting the returned fridges to licensed WEEE processing and disposal facilities.

5. **Better alignment and collaboration across government sectors and tiers could improve the NSP's traction and achievement of the goals.** To improve the substitution efforts, the NSP would benefit from improved coordination and collaboration with national institutions and partnering with local governments. The PEECES programme incentives have been matched in some regions by local energy utility companies, increasing the total incentive/subsidy for refrigerator replacement. Considering that reducing energy consumption reduces pressures on utility companies to expand the building of generation plants and transmission lines, it would be in their interest to contribute to these types of initiatives.
6. **There is a need for a national communication strategy or a broader set of incentives to promote refrigerator substitution.** Achieving the transformation of the domestic refrigeration sector necessarily involves changing the mindset and culture of Colombian citizens to get the older fridges to be scrapped. Achieving this cultural change will require more communications and marketing efforts than can be provided under the NSP on why the consumers need to return their old fridges, labelling standards, and environmental impact. Having transparent **frameworks or standards** that facilitate defining which fridges to support is also essential to remove subjectivity.

Lessons for the NAMA Facility for improving other or future NSPs

7. **When properly engaged, the private sector can be a key driver of sectoral transformation.** An important feature of this NSP is the commitment and leadership of Colombian refrigerator producers with the objectives associated with this NSP, which led them to advance in the conversion of their production lines to R-600a and to establish Red Verde for EPR WEEE collection and processing compliance, before the NSP started. This presents an interesting contrast to many other NSPs who have, among their activities and goals, the attraction, engagement and commitment of the private sector to the transformation. It would be interesting to conduct a more in-depth analysis of why the producers were so committed and motivated, and produce documents or guides on what could governments or individual stakeholders do to try and engage whole sectors or value chain partners on sectoral

transformation towards a low- or zero-carbon, and to prepare and submit more robust NSP proposals

8. **Financial mechanisms should be regularly assessed, refined and, when successful, replicated while considering each country's regulations and requirements.** In this regard, the NSP Team participated in a NAMA Facility virtual meeting on May 28, 2021, to help establish a “NAMA Facility Financial Working Group”. The working group is thought to become a forum within the NAMA Facility to share lessons, develop and maintain guidelines and tools, and even provide targeted assistance to the NSPs through ad-hoc support groups with the aim of improving the ability of the NSP teams to design and assess appropriate financial instruments. This could help NSPs save significant time and resources by avoiding proposing or pursuing financial instruments with little probability of success or low impact.
9. **Bancoldex has proved itself in recent years to be a strong financial institution and reliable partner that could be relied upon as a partner for future NSPs too.** Bancoldex has an incentive to use wisely the funds provided by the Financial Component. In addition, credit blending could additionally leverage the strengths of Bancoldex.
10. **There seems to be good potential for a second stage or a future refrigeration NSP in Colombia focused on adjacent sectors,** as identified by several interviewees. Some of the target segments mentioned are the tourism sector (hotel room fridges), the commercial sector (supermarket fridges) as well as related refrigeration sectors (such as air conditioning), which are beyond the current scope of the NSP.

Lessons for the NAMA Facility for the review, approval, and management of future interventions

11. **The NSP reporting process could be simplified and made more easily understandable for all parties involved.** Many general comments were received by the ELE about the indicators being too focused on outputs, which may be good for project management, but makes it difficult to track impacts or contextual changes. It was also suggested by interviewees that the report and M&E format required the same information to be presented multiple times, increasing the reporting effort needed and the opportunities for inconsistencies or contradictions, which made the reporting format “not very readable”. It was suggested that the project indicators should be “SMART”[er] (Specific, Measurable, Achievable, Relevant and Time-bound) while maintaining certain flexibility within these dimensions, to make the indicators easier to understand and use.
12. **Bilateral talks with other NSPs helped improve knowledge exchange and enhance replication.** Sessions held with the “Energy Efficiency in SMEs as a Contribution to a Low Carbon Economy” NSP in Mexico and the “Improving Energy Performance of Moroccan Households” NSP in Morocco reportedly contributed to the preparation and execution of those NSPs and the exchange of best practices and lessons learned under this NSP. Also, the NSP’s work in the design and execution of the substitution programme and the WEEE processing and disposal efforts could be expanded and replicated to Bolivia, Peru, and Paraguay via knowledge exchange, leveraging the refrigerator producers’ interest in replicating Colombia's experience and lessons in those countries.

5.2 Recommendations

5.2.1 Recommendations to the NSP Team to achieve the goal of the NSP

Below are some recommendations deriving from the lessons enunciated to provide the NSP Team with suggestions on how to improve the project planning and implementation:

1. **Maintain the NSP's flexibility to adapt its actions to the fast-changing context** created by the involvement and leadership of private sector institutions.
2. **Request a time extension to the NAMA Facility** to compensate for the late project start and the COVID-19-induced delays.
3. **Increase the engagement of Ministers, Vice-ministers or even a high-level advisor or staff members from the Office of the President of Colombia** to increase the profile of the NSP and facilitate collaboration and coordination across sectors.
4. **Design and execute more knowledge exchange and awareness-raising events for high-level officials** to get them to understand the importance of coordination and collaboration for the NSP's success.

5.2.2 Recommendations to the political implementing partners and other key NSP stakeholders for the success of the Domestic Refrigeration NSP

As the NSP has limited resources and its mandate is to assist the Colombian NAMA, the support from the NSP's political implementing partners and other key stakeholders is crucial to the actual decarbonisation of the domestic refrigeration sector. Based on the lessons crystallised by the ELE, below are recommendations directed explicitly to the national stakeholders that can make a difference in supporting the NSP's goals:

1. **Raise the awareness of all crucial domestic refrigeration sector stakeholders about the need for the substitution** to be effective to meet the GHG reduction goals within the NSP and NDC's timescales. Efforts should be made to ensure that the Ministry of Finance adjusts, at the earliest opportunity possible, the VAT-free day sale conditions to promote or encourage trade-in of older refrigerators. It should also be clearer for electric utility companies that they are a key stakeholder to promote these upgrades and help achieve the GHG reduction targets.
2. **Due to the limitations of the VAT-break incentive, particularly against the VAT-free days, consider other financial incentives**, such as leasing or Energy-Service Company (ESCO) schemes¹³ in which the energy bill savings resulting from upgrading to an energy-efficient fridge can be used to finance the acquisition of the new appliance without added cost, and probably even some total energy bill savings, for the consumers.
3. **Consider removing from the VAT-break incentive the current household income and/or refrigerator price constraints** that reduce the applicability of the incentives to a limited number of persons and a reduced set of the new "green" refrigerator market offerings.

¹³ Further details on ESCO and their way of operation can be found at <https://www.energy.gov/eere/femp/energy-service-companies-0>.

4. **Identify geographical areas where fridges consume the most energy and/or deteriorate faster due to saline or other weather conditions, and target these areas** for priority substitution as these areas could provide the highest benefits to the NSP and NDC.
5. **Review and consider adopting additional measures that could help focus the substitution effort on owners of older, CFC and HFC using, or less efficient fridges, rather than the poorest groups of the population.** This considering that current conditions of refrigerator size and price and consumer low-income levels could prevent the substitution effort to reach old, large, inefficient fridges and withdraw them from operation, as the buyers of the new fridges under the substitution scheme seem little likely to trade in one of those old, larger or more (initially) expensive fridge for a small, affordable one.
6. **Review proposed refrigerator collection strategies for low-population areas,** seeking economies of scale and WEEE collection strategies to make this initiative affordable.
7. **Find ways to make the substitution, collection and disposal effort more conducive to the circular economy within Colombia.** WEEE processing and disposal companies interviewed mentioned that the parts and materials that result from fridge final processing are mostly exported or taken elsewhere for reuse or final disposal, incurring in transport costs that reduce the financial viability of the disposal effort. Promoting or encouraging the location of economic activities that use those WEEE final parts or materials as production inputs can reduce or eliminate these transport cost problems. Alternatively, promoting joint commercial/logistics operations of multiple WEEE processing companies or with WEEE client companies may help to create appropriate market and cost conditions for a local circular economy for electrical appliance parts emerging and consolidating within Colombia.
8. **Facilitate collaboration and coordination, particularly across the energy, environment and finance ministries and agencies,** to ensure that the substitution efforts achieve and maintain a pace adequate to comply with NSP and NDC targets.
9. **Increase the engagement of local governments and their utility companies more integrally into the marketing of the substitution programme.** Their in-depth knowledge of local social and economic conditions and potentially detailed data of the users' energy consumption patterns could help design and target messages and incentives to the right household segments (e.g. those that would have substantial and/or short-term economic benefits from buying a new energy-efficient fridge).
10. **Design and conduct appropriately coordinated communications campaigns** that raise the households' awareness of the benefits they and the planet would gain by upgrading to a "green refrigerator" and sending the older one for appropriate processing and disposal to a certified WEEE processing and disposal company.

5.2.3 Recommendations to other or future NSPs

1. **When formulating or executing an NSP or similar sectoral transformation initiative, make creating and maintaining the motivation and commitment of the key private sector stakeholders a priority through determining and using the suitable types of incentives.** As demonstrated by the refrigerator producers participating in this NSP, committed key private sector stakeholders can help ensure things happen even without an NSP or other type of

intervention being required to encourage it and reduce the impact of any delays to the provision of external help.

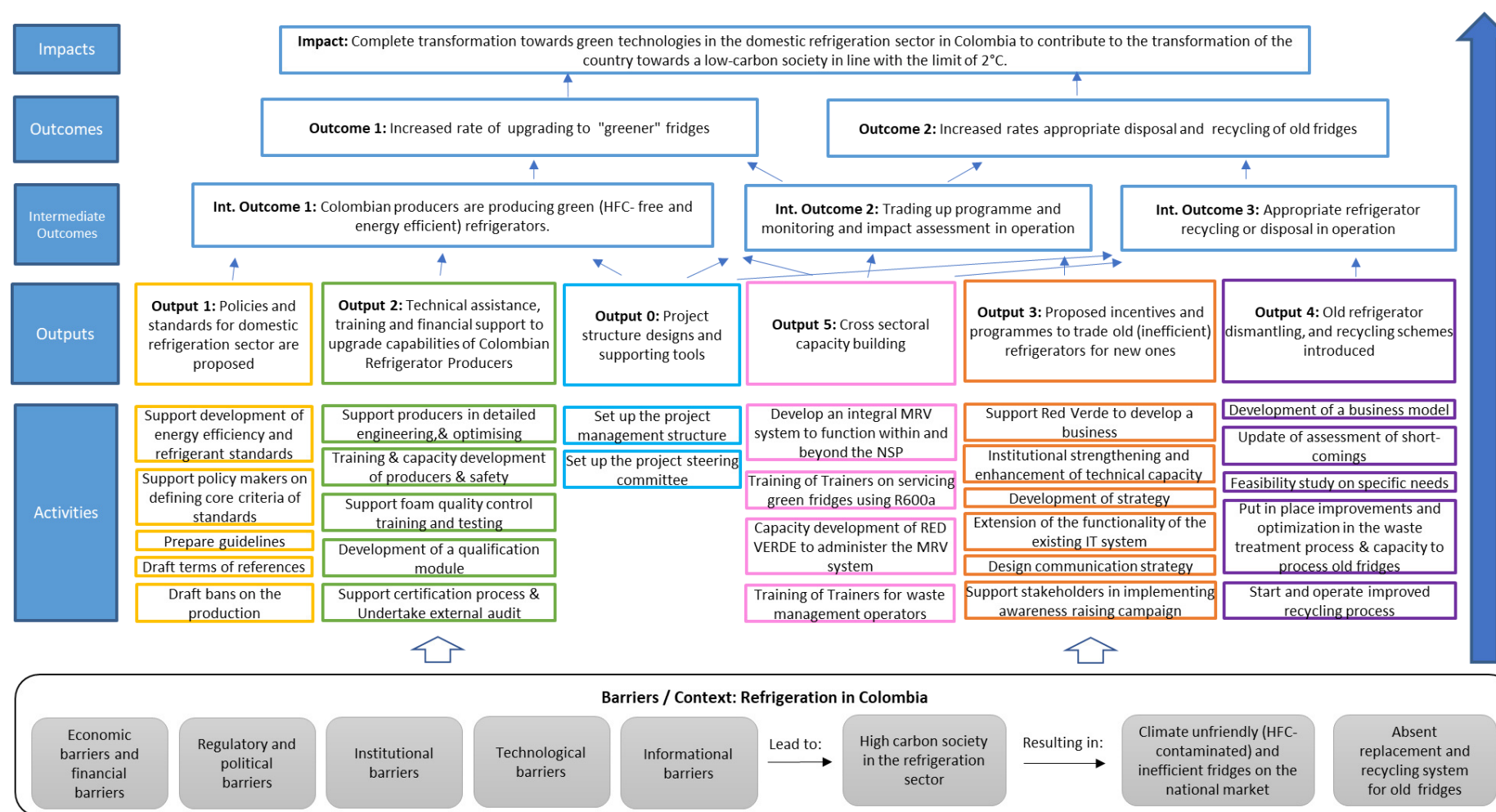
2. **When designing the NSP proposal, allow for some flexibility in the financial instruments that are expected to operate as incentives to catalyse transformational change.** That flexibility can be instrumental in allowing the financial instrument to adapt to consumer conditions, local market conditions, new lessons emerging from other projects or the market, or accommodate new financial instruments that may have been introduced to the market during the NSP's preparation, approval and start.
3. **During NSP execution, participate in financial instrument knowledge-exchange events or sessions with other similar NSPs** to discuss whether and how the financial instruments proposed could be improved or fine-tuned to the specific needs.
4. **Consider involving Bancoldex as an execution partner for the Financial Component of future Colombian NSPs and leverage its experience** in the NAMA Facility and other multilateral financial or cooperation institutions to design and execute financial instruments aimed at the private sector.
5. **Consider leveraging all the experience and capabilities (institutional and technical) generated by the Colombia Domestic Refrigeration NSP to formulate new NSPs for transforming sectors adjacent to domestic refrigeration**, including commercial refrigeration, tourist attractions/facilities and air conditioning.

5.2.4 Recommendations to the NAMA Facility for the review, approval, and management of future interventions

The evaluators read the NAMA Facility's General Information Document for the Ambition Initiative II Call for NSPs and understand that projects already undergo thorough assessments at both the project outline phase and detailed preparation phase (DPP). However, based on the lessons identified by this ELE, the ELE team makes some recommendations to improve the general NAMA Facility processes to review, approve, and manage NSPs:

1. **Conduct an appropriateness assessment of the NSP reporting and M&E processes at least every two years.** As the NAMA Facility's learning-by-doing process advances and more lessons are available through the NSP ELEs, the NSP reporting and M&E systems should be regularly assessed and improved where necessary. Considering the resources involved in such portfolio-wide effort, the ELE recommends that the assessment and refresh of the M&E and reporting system's assessment and refresh are carried out every two years.
2. **Consider creating unique calls or fast-track review and approval processes to leverage current NSPs' knowledge and capabilities to execute NSPs in adjacent sectors.** The Colombia Domestic Refrigeration NSP has developed expertise and capabilities in Colombia that could be extended into adjacent sectors, such as commercial refrigeration or air conditioning. However, the long time required between submitting a proposal and the start of the resulting NSP may cause the current knowledge and capabilities to be lost or diminished. Considering that the new NSPs in adjacent sectors would use solutions and learning from NSPs that the NAMA Facility already approved in a prior call, it may represent good value for money to create bespoke priority processes and/or dedicated budget lines.

Annex A Theory of Change of the Colombia Domestic Refrigeration NSP



Key assumptions underpinning the NSP Theory of Change

ToC element	Underpinning assumptions
Impact	<ul style="list-style-type: none"> Meeting the goal of the ToC of reducing by half the emissions generated by the domestic refrigeration sector within the NSP and NDC timeframes depends on the substitution scheme to create a refrigerator substitution dynamic large enough that most of the savings of this NSP will have been achieved by 2030. Without this increased substitution rate, the energy efficiency and GHG emissions savings may still be achieved when older fridges fail and need to be replaced by new ones, but this is a process that may take <i>decades</i>, instead of the <i>months</i> or <i>years</i> that the NSP and NDC targets and commitments required.
Outcome	<ul style="list-style-type: none"> Outcomes 1 and 2 rest on the assumption that the substitution scheme has been able to generate enough awareness and interest in households that own old fridges that they (i) decide to upgrade their old refrigerator for a new “green” one, and (ii) that they decide not to pass on their old refrigerator to relatives, or acquaintances, but to send it to the WEEE processing and disposal company for scrapping.
Intermediate outcomes	<ul style="list-style-type: none"> For intermediate outcome 1, the primary assumption is that the producers are motivated enough by regulatory requirements and consumer demand to request and use training, technical assistance equipment, tools, and financial products to upgrade their capabilities. For intermediate outcome 2, the critical assumption is that the incentive scheme can generate interest of households to replace their older fridges with the new “green” ones, The critical assumption for Intermediate Outcome 3 is that the WEEE processing and disposal companies have acquired the equipment and abilities to dispose of all refrigerators in a proper manner.
Outputs	<ul style="list-style-type: none"> For the outputs related to regulation changes, the key assumptions are (i) the regulation-making organisation within the Colombia government is willing to adopt the regulatory changes proposed within the NSP and (ii) the institutional framework for the regulations is mature enough so that the regulated parties obey regulations and subject to enforcement by the regulatory body or a delegate. For the outputs related to training and the provision of technical assistance, equipment or tools, the key assumptions are (i) the current staff or people that participate in the sector have the adequate basic knowledge to understand and use the training or tools and (ii) the beneficiary companies’ are committed to adopting and using the training and the tools. For outputs related to the financial products, the key assumptions are (i) there is a demand from refrigerator producers, WEEE processing or disposal companies or substitution programme partners to use those resources and (ii) these same stakeholders cannot get a better financial deal in the financial market, particularly from financial institutions with whom the potential beneficiary of an NSP financial product has a track record of working together. For IT or software outputs, the key assumption is that IT or software companies are willing to execute the IT/software development work.

ToC element	Underpinning assumptions
	<ul style="list-style-type: none">For output 3, which refers to the incentive scheme supporting the substitution programme, a fundamental assumption is that the decision drivers of the households (the refrigerator buyers) and the marketing companies are well understood during the analysis phase and are well articulated in the execution phase.

Annex B Capturing NSP-induced Transformational Change

Introduction

This is a brief guidance developed by AMBERO/OPM outlining a framework to consistently evaluate the NAMA Support Projects' (NSPs) progress towards bringing about Transformational Change (TC).

Transformational change is embedded in the NAMA Facility's goals and Theory of Change (ToC) and NSPs are the main way through which the NAMA Facility will achieve this TC. Therefore, NSPs need to be aiming to achieve this level of change, and the Evaluation and Learning Exercises (ELEs) of NSPs should evaluate their progress.

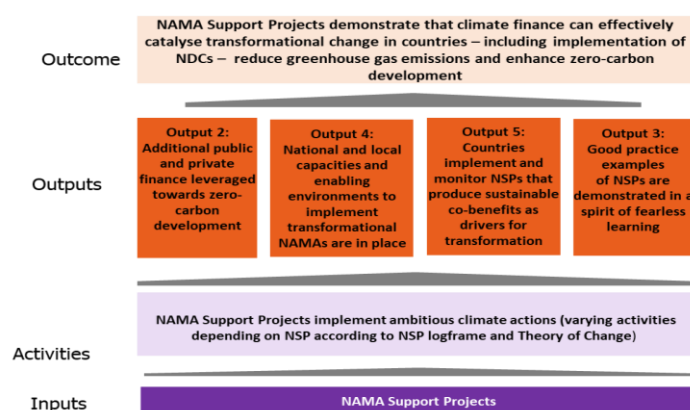
In a way, the key elements of transformational change are already monitored through the NSP Mandatory Core Indicators M1-M5, part of the NAMA Facility M&E Framework¹⁴. At the same time, ELEs already assess transformational change by NSPs through ELE Questions. However, currently, clearer guidance to identifying the signals or evidence of NSP-induced transformational change is needed.

The purpose of this brief document is to clarify whether and how transformational change is expected in NSPs, and provide guidance to both NSP and ELE teams on how to characterise the elements and evidence of NSP-induced transformational change.

Breaking down NSP-induced transformational change

The NAMA Facility defines TC as *"Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways"*¹⁵. TC lays at the centre of the NAMA Facility's ToC as shown in the extract in Figure 1.

Figure 1. Relevant elements of the original TOC for the ELEs

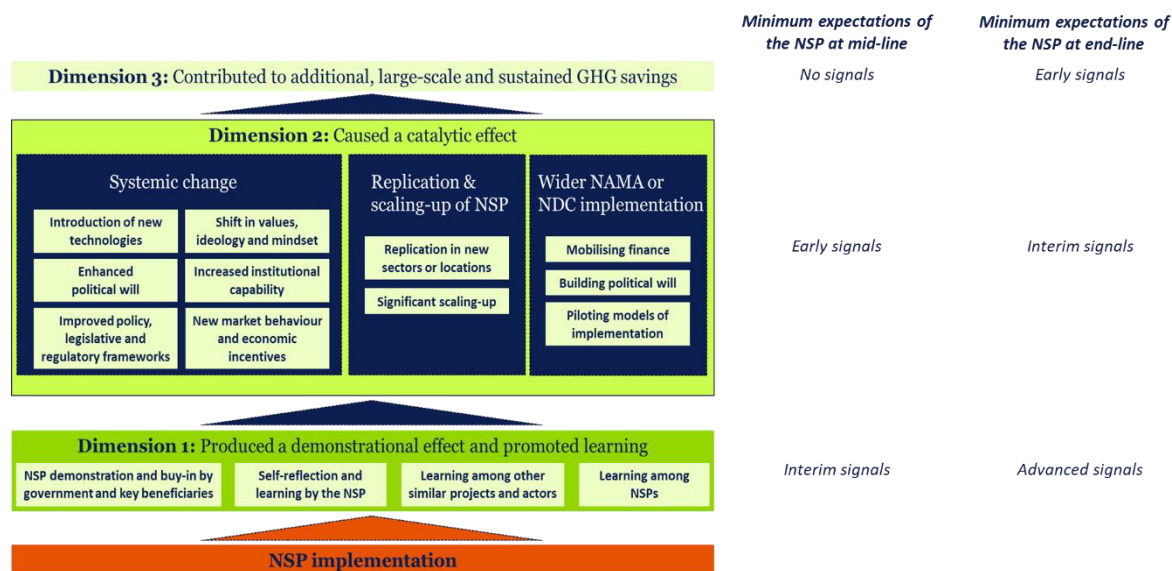


¹⁴ <https://www.nama-facility.org/publications/monitoring-and-evaluation-framework/>

¹⁵ <https://www.nama-facility.org/concept-and-approach/transformational-change>

The NAMA Facility ToC explains how TC is expected to be achieved through its outputs and outcome. The ToC is broad, and there are different ways in which TC can be achieved through the NSPs. These dimensions simplify the different possible pathways for TC outlined in the ToC.

Figure 2. Dimensions of NSP-induced transformational change



There are three dimensions that interact and reinforce each other to produce NSP-induced TC (Figure 2):

Dimension 1: Produced a demonstrational effect and promoted learning. The most direct way in which an NSP can contribute to transformational change is to produce a demonstrational effect and learning process which could imply that: a) the NSP's innovative approach has been proven valid and bought into by government and other key beneficiaries; b) self-reflection and learning by the NSP in a spirit of 'fearless learning' have been observed; c) effective sharing of lessons and experience with and by other similar projects and actors (including other NSPs) has occurred. By mid-line, NSPs are expected to show interim signals¹⁶ of achieving this demonstrational effect and learning process, which should have become clear evidence (advanced signals) by the end-line. This dimension relates to output 3 in the NAMA Facility ToC and the [NAMA Facility Learning Strategy](#). The demonstrational effect and learning generated by the NSP are enablers of achieving a catalytic effect (Dimension 2).

Dimension 2: Causing catalytic effect. In order to achieve the additional, large-scale and sustained GHG emission reductions (Dimension 3), the NSP needs to cause a virtuous catalytic effect in the operating country or region. This can take the form of one or more of the following catalytic changes:

- **Kick-starting wider NAMA or NDC implementation**, by mobilising finance, building political will, and/or piloting models of implementation;
- **Replication of the NSP's demonstrated approach** in other sectors or locations, and/or significant scaling-up of the NSP; and/or

¹⁶ See Table 2 below for the definition of the levels of signals or evidence.

- **‘Systemic’ change enabled by the NSP**, which could be supported by the one or more of the following: a) introduction of new technologies; b) increased institutional capability; c) improved policy, legislative and regulatory frameworks; d) enhanced political will; e) shift in values, ideology and mindset; f) new market behaviour and economic incentives.

By mid-line, NSPs are expected to have produced some early signals of one or more of these changes, which by the end of the project should have been strengthened into interim signals or evidence that the catalytic effects are likely to be completed in the near future. The catalytic effect relates to outputs 2, 4 and 5 in the NAMA Facility ToC, and Mandatory Core Indicator M3 (catalytic impact self-assessment) and M4-M5 (public/private finance mobilised).

Dimension 3: Contribution to additional greenhouse gas (GHG) savings. This is linked to the outcome in the NAMA Facility ToC and Mandatory Core Indicator M1 – Reduced GHG emissions. It implies that the NSP has resulted in *additional, large-scale and sustained* GHG savings¹⁷. Within the lifetime of the project, NSPs are not expected to have achieved this. Yet, by the end of the project, there should be signs that this is likely in the future (*early signals*).

Measuring NSP-induced transformational change

The NAMA Facility has a specific M&E framework that allows to track the progress of the NSPs towards the achievement of the NAMA Facility’s goals, including transformational change. The NAMA Facility Mandatory Core Indicators and the ELEs are both central parts of this M&E framework and they can be used to assess the NSPs’ advancement towards transformational change.

As shown, the TC dimensions come directly from the NAMA Facility ToC. Since the NSPs are expected to be aligned to the overall NAMA Facility ToC, then it should be possible to map the dimensions of transformational change in the NSP ToCs. All NSPs are required to monitor their progress using a series of Mandatory Core Indicators and NSP-specific indicators. The NAMA Facility Mandatory Core Indicators partially capture the elements of the TC framework in Figure 2 (see Table 1).

Table 1. How the NAMA Facility Mandatory Core Indicators capture transformational change

TC dimension	Core Indicators
1. Produced a demonstrational effect and promoted learning	Not captured but left to the NSP-specific indicators.
2. Caused a catalytic effect	M2: Number of people directly benefiting from NSP – To a certain extent captures NSP scaling up M3: Degree to which the supported activities are likely to catalyse impacts beyond the NAMA Support Projects (potential for scaling-up, replication

¹⁷ Additional = the GHG savings achieved are in addition to those achieved by the direct implementation of the NSP. Large-scale = the additional GHG savings will have a significant impact on overall GHG savings in the geography/sector. Sustained = there is no chance of the GHG savings being reversed.

TC dimension	Core Indicators
	<p>and transformation) – The TC framework presented can be used to break down / clarify the TC elements and guide the self-assessment.</p> <p>M4-M5: [additional] public/private finance mobilised – These indicators capture the NSP’s scale-up potential and the catalysation of wider NAMA and NDC implementation.</p>
3. Contributed to additional, large-scale and sustained GHG savings	M1: Reduced GHG emissions - NSP M&E Plan distinguish between direct and indirect GHG savings and has long temporal scale

Concerning the ELEs, Table 2 provides some suggestions of potential questions that could be integrated into ELE methodologies to capture the specific elements of the TC framework in Figure 2.

Table 2. How the ELEQs can capture transformational change

Transformational change dimension	Examples of relevant ELE sub-questions
1. Produced a demonstrational effect and promoted learning	<ul style="list-style-type: none"> How successfully did the NSP produce a demonstrational effect of best practices for systemic low-carbon transformation? To what extent have the government and other key NSP beneficiaries bought into these practices? What is the evidence that the NSP has learnt from its successes and failures throughout its implementation? How was learning from this NSP shared with other NSPs, and did they make any changes to their approach as a result?
2. Caused a catalytic effect	<ul style="list-style-type: none"> Systemic change: How did the NSP result in systemic change [i.e. were national and local capacities and enabling environments (e.g. new technologies, policies, regulations, incentives, behaviours) to implement transformational NAMAs strengthened]? Replication/Scaling-up: a) How much additional public and/or private finance has been leveraged by the NSP towards zero-carbon development? b) What is the evidence that the NSP approach will be replicated in new sectors and/or locations? Wider NAMA or NDC contribution: How has the NSP contributed to the implementation of the NDC or wider mitigation actions in the same sector?
3. Contributed to additional GHG savings	<ul style="list-style-type: none"> Are there signals that the NSP will contribute to additional, large-scale, sustained GHG savings (beyond direct savings of the NSP)? What were the distinct roles of the financial and technical components in contributing to these savings? What is the likelihood that the additional GHG savings will be sustained in the medium to long term (i.e. 10–15 years and beyond), meaning there is no risk of backsliding or reversing?

In the section dedicated to the OECD DAC criterion “*Impact*” of ELE Reports, sub-headings referring to the three TC dimensions are used to present the evidence observed to that point in time. These sub-

sections present the findings related to the relevant questions in Table 2 and describe the NSP's progress along the TC dimension according to the signal levels defined in Table 3.

Table 3. Transformational Change “Signals” assessment by ELEs

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the NSP but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway and there is little doubt that it will continue.

Annex C Evaluation and Learning Exercise Matrix

This evaluation and learning exercises matrix is based on the Theoretical Framework provided (version October 2020). It is a working tool that allows the evaluators to focus on a feasible target and assemble information for each question that can be synthesised in the final report, hence creating an integrative overview of the **Colombia Refrigeration NAMA Support Project** at large.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
1 RELEVANCE					
1	To what extent does the NSP address an identified need (by the national government, refrigerator producers and recycling companies)?	<ul style="list-style-type: none"> The NSP design responds to the beneficiaries' needs and strategic priorities at the time of adoption, and still continue to respond to priorities even after COVID – 19 set-in and disruptions. NSP addressed the main barriers that prevented the different stakeholders from contributing to an active renovation and upgrading of domestic refrigerators 	<ul style="list-style-type: none"> The government was interested in pushing forward energy efficiency and climate-friendly updates in domestic refrigerators but lacked the technical or financial capabilities to do so. Refrigerator producers were considering upgrading their refrigeration agents and production lines to emit a lower amount of GHG but lacked the technical or the financial capacities. Recycling companies were interested in expanding their operations to the recycling of appliances but lacked the technical and financial capacities to do it. Consumers wanted to upgrade their refrigerators for greener, more 	<ul style="list-style-type: none"> NSP Team. Direct beneficiaries (Government institutions, refrigerator producers, recycling companies, financial institutions, consumers) Former members of NSP team or stakeholder institutions (people that have been involved in NSP delivery but are no longer with it). Independent (third party) verifiers (refrigerator producers, recycling companies, financial institutions, consumers). 	<ul style="list-style-type: none"> In-depth interviews Semi-structured key informant interviews (KIIs) Context analysis Document review (Project concepts (logical framework matrix) and progress reports) National plans, strategies and other policy instruments such as norms, standards, etc.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
			<p>environmentally friendly ones but lacked the knowledge or financial capabilities to do it.</p> <ul style="list-style-type: none"> ▪ Banks (or other institutions) were interested in financing refrigerator upgrades but perceived those operations as too risky. 		
1.1	How well does the NSP align with National priorities in regard to GHG emissions reduction from industrial and energy sectors?	<ul style="list-style-type: none"> ▪ The project is in line with Government targets on environmental emissions (incl. NDC, sectorial plans, etc.). ▪ The NSP is linked to formal National MRV schemes. 	<ul style="list-style-type: none"> ▪ The NSP supports Colombia's Overall Climate Strategy and MRV systems. 	<ul style="list-style-type: none"> ▪ NSP Team. ▪ Direct beneficiaries ▪ Former members of NSP team or stakeholder institutions ▪ Independent (third party) verifiers. 	<ul style="list-style-type: none"> ▪ In-depth interviews ▪ Semi-structured key informant interviews (KIIs) ▪ National plans and strategies on climate change and energy ▪ Data from NSP monitoring system
2 EFFECTIVENESS					
2	To what extent has the implementation of the NSP achieved intended outcomes in the short and medium term?	<ul style="list-style-type: none"> ▪ The level of progress and NSP contribution to the achievement of the following (intermediate) outcomes: <ul style="list-style-type: none"> ○ Policy and regulatory changes to promote the production and sale of climate-friendly refrigerators. ○ Increased adoption of R600a by Colombian refrigerator producers. ○ Improvements to products and production lines for green refrigerator production. ○ Improvements in refrigerator recycling practices and volume. 	<ul style="list-style-type: none"> ▪ NSP activities are contributing to increasing the technical capacity of producers and recyclers to produce and recycle refrigerators. ▪ NSP activities have contributed to developing the Red Verde programme and the incentive framework to encourage domestic refrigeration replacement ▪ NSP activities are contributing to improving gender equality in refrigeration production, servicing, and recycling activities. 	<ul style="list-style-type: none"> ▪ NSP Team. ▪ Direct beneficiaries ▪ Former members of NSP team or stakeholder institutions ▪ Independent (third party) verifiers. 	<ul style="list-style-type: none"> ▪ In-depth interviews ▪ Semi-structured key informant interviews (KIIs) ▪ NSP proposal ▪ Progress reports (AR & SAR) ▪ Data from NSP monitoring system / logframe

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> Design, piloting and expansion of refrigerator upgrade incentive programmes. Increased awareness and knowledge of technicians on proper servicing of newer refrigerators Increased awareness and knowledge of recycling companies on proper dismantling and disposal of old refrigerators The level of NSP contribution to the achievement of the results compared to exogenous factors. 			
2.1 (Proposed by ELE team)	Did changes in the NSP-operating context impact (positively and/or negatively) the effectiveness of the project? If so, to what extent (greatly, partially, negligibly)?	<ul style="list-style-type: none"> COVID has maintained the level of commitment of the different stakeholders to the project. Effectiveness problems coming from other contextual changes 	<ul style="list-style-type: none"> COVID may have introduced some delays but has not compromised the ability of the NSP to create transformational change. Some unforeseen administrative or operative setbacks have occurred that may have delayed or required small adjustment, but the NSP's goals remain the same. 	<ul style="list-style-type: none"> NSP Team. Direct beneficiaries Former members of NSP team or stakeholder institutions Independent (third party) verifiers. 	<ul style="list-style-type: none"> Progress reports In-depth interviews Semi-structured KIIs Literature review
3 EFFICIENCY					
3	To what extent was the delivery of outputs timely and to expected quality standards?	<ul style="list-style-type: none"> Timeliness of the delivery of outputs and outcomes (incl. budget spending) If there are delays in the implementation, what are their causes (endogenous or exogenous factors), and how seriously have they impacted the NSP implementation? 	<ul style="list-style-type: none"> NSP activities are implemented on time and within budget. The upskilling, policy, regulatory, or training or operative outputs can be clearly linked to NSP activities (improvements in production, 	<ul style="list-style-type: none"> NSP Team. Direct beneficiaries Former members of NSP team or stakeholder institutions Independent (third party) verifiers. 	<ul style="list-style-type: none"> NSP proposal Progress reports In-depth interviews Data from NSP monitoring system Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
		<ul style="list-style-type: none"> The effectiveness of the measures adopted to prevent or reduce delay impacts. The level of satisfaction of the NSP direct beneficiaries 	<ul style="list-style-type: none"> recycling, exchange of old for new refrigerators). Adjustments made have helped mitigate the impact of delays. 		
3.1 (Proposed by ELE team)	Structure & steering: Has the NSP been managed, coordinated, and implemented effectively?	<ul style="list-style-type: none"> The chosen implementation mechanism is conducive to achieving the expected outcomes The technical and financial components are appropriate to deliver the planned outputs Communication and visibility are implemented according to an integrated approach FC and TC interact synergistically Stakeholders are participating and collaborating actively in the intervention 	<ul style="list-style-type: none"> The Steering Committee was created and operating as expected in the proposal. Other key coordination or delivery structures were created and are working according to what was expected in the proposal. The NSP has operated within their expected scope. Partner or delivery institutions are operating adequately. 	<ul style="list-style-type: none"> NSP Team. Direct beneficiaries Former members of NSP team or stakeholder institutions Independent (third party) verifiers. 	<ul style="list-style-type: none"> Progress reports In-depth interviews Semi-structured KIIs
4. IMPACT					
4	What evidence is there that the NSP has contributed to the intended impact in the ToC (incl. transformational change)?	<ul style="list-style-type: none"> The strength of the evidence that key outcomes are going to be achieved and the robustness of the causal links/pathways to the intended impact (updating and upgrading refrigerator production, improving appropriate and sustainable refrigerator recycling, and promoting consumer exchanges) 	<ul style="list-style-type: none"> The NSP is producing a demonstrational effect and is promoting learning across all relevant stakeholders (dimension 1). The NSP is causing a catalytic effect in terms of systemic change, replication or scale-up and Wider NAMA or NDC implementation (Dimension2) The NSP is contributing to additional, large-scale and sustained GHG Savings. 	<ul style="list-style-type: none"> NSP Team. Direct beneficiaries Former members of NSP team or stakeholder institutions Independent (third party) verifiers. 	<ul style="list-style-type: none"> NSP proposal Progress reports In-depth interviews Data from the NSP monitoring system Semi-structured KIIs

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
5. SUSTAINABILITY					
5	What is the likelihood that the outcomes will be sustained after the end of the NSP funding period?	<ul style="list-style-type: none"> ▪ The extent of the evidence supporting the NSP sustainability (e.g. evidence of self-sustaining institutional structures, and political and financial commitment of key stakeholders). ▪ There is little or no risk of backsliding or reversing 	<ul style="list-style-type: none"> ▪ NSP activities have helped establish strong and capable policy, technical and financial frameworks for: <ul style="list-style-type: none"> ○ Coordinating institutions or institutional arrangements (Red Verde) to promote the NSP. ○ Producers to commit to the newer technologies and more efficient products and production schemes. ○ Recycling companies to recycle fridges in an appropriate and financially sustainable manner ○ Financial institutions to provide financial instruments for replacement. ○ Consumers to replace their old refrigerators with newer ones. 	<ul style="list-style-type: none"> ▪ NSP Team. ▪ Direct beneficiaries ▪ Former members of NSP team or stakeholder institutions ▪ Independent (third party) verifiers. 	<ul style="list-style-type: none"> ▪ NSP proposal ▪ Progress reports ▪ In-depth interviews ▪ Data from the NSP monitoring system ▪ Semi-structured KIIs
6. LEARNING					
6	What key lessons can be learnt to the benefit of the legacy of this NSP, other NSPs and the NAMA Facility as a whole?	<ul style="list-style-type: none"> ▪ The NSP's generation of important lessons for 1) itself, and 2) other projects and/or NSPs. 	<ul style="list-style-type: none"> ▪ Lessons from this NSP were used to improve its execution. ▪ The NSP generated important lessons for other NSPs. ▪ The NSP has held formal knowledge exchange work with other NSPs or government or industrial programmes. 	<ul style="list-style-type: none"> ▪ NSP Team. ▪ Direct beneficiaries ▪ Former members of NSP team or stakeholder institutions ▪ Independent (third party) verifiers. 	<ul style="list-style-type: none"> ▪ Progress reports ▪ In-depth interviews ▪ Semi-structured KIIs ▪ Literature review

Annex D Evidence and answers to the ELE matrix

The following table has been part of the ELE analysis effort to link the answers to the ELEQs with the evidence from the ELE sources that underpins them. The strength of the evidence is assessed following the methodology explained in Section 2 and the legend in Table 4. The codes found in the answers' text are the references to the specific sources (interviews, workshops, documents). Each code refers to a specific source and follows this legend: NT = NSP Team; NS = NSP Stakeholder; TP = Third Party; ARXX = Annual Report of the year 20XX; SARXX = Semi-Annual Report of the year 20XX.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
1 RELEVANCE				
1	To what extent does the NSP address an identified need (by the national government, refrigerator producers and recycling companies)?	<ul style="list-style-type: none"> The NSP design responds to the beneficiaries' needs and strategic priorities at the time of adoption and continues to respond to priorities even after COVID – 19 set-in and disruptions. NSP addressed the main barriers that prevented the different stakeholders from contributing to an active renovation and upgrading of domestic refrigerators 	<ul style="list-style-type: none"> The government was interested in pushing forward energy efficiency and climate-friendly updates in domestic refrigerators but lacked the technical or financial capabilities to do so. Refrigerator producers were considering upgrading their refrigeration agents and production lines to emit a lower amount of GHG but lacked the technical or the financial capacities. Recycling companies were interested in expanding their operations to the recycling of appliances but lacked the technical and financial capacities to do it. 	<ul style="list-style-type: none"> The NSP's origin can be traced back to the signature of 1987's Montreal protocol to eliminate ozone-depleting substances [Very Strong Evidence - NT2, NT3, NS6, TP1, NS12, AR18, SAR19, AR19, AR20] in particular following Kigali's Amendment that also sought to eliminate refrigeration or insulating agents with high climate-change impact, such as HFCs or certain insulating foams. Colombia has been advancing since the mid-2000s in the adoption of Extender Producer Responsibility Schemes that require producers to ensure that their products are properly disposed of at the end of their life. Red Verde was created by producers to help manage the end-of-life collection and processing [Strong Evidence - NT2, NT3, NS2, NS4, NS9, NS12, AR19, AR20] Colombia's Climate Commitments include energy efficiency measures and considering that most homes have refrigerators and that it has been determined that refrigerator consumption can be between 20 and 40% of the home's total consumption, upgrading fridges to ones with increased energy efficiency can contribute to reduced energy consumption and, through that reduced GHG emissions. Studies in the mid-2010s determined that there were many old (obsolete) fridges that needed to be replaced [Very Strong Evidence - NT7, NS1, NS4, NS6, NS7, NS8, NS12, TP1, TP2, TP3, AR17, AR19]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
			<ul style="list-style-type: none"> Consumers wanted to upgrade their refrigerators for greener, more environmentally friendly ones but lacked the knowledge or financial capabilities to do it. Banks (or other institutions) were interested in financing refrigerator upgrades but perceived those operations as too risky. 	<ul style="list-style-type: none"> Colombia had an energy efficiency labelling scheme, but it was not standardized. The energy efficiency efforts required a standardized, demanding, energy labelling scheme being adopted [Medium Evidence - NS1, NS5, NS10] Achieving large scale substitution of old fridges for newer fridges requires a coordinated effort of producers, consumers, governments, and other value chain stakeholders [Medium Evidence - NT4, TP2]. Support from NAMA Facility would provide additional funding and support to advance in the conversion towards more climate and environmentally friendly fridges [Very Strong Evidence - NT1, NT2, NT3, NT7, TP3, NS7] COVID pandemic has introduced delays as emergency regulations, or reallocation of resources was required to respond, but the relevance is maintained [Weak Evidence - NT4, SAR20] "VAT-Free" that have been adopted during the lifetime of the NSP has worked against it as they allow buyers to get a higher VAT discount without having to return their old fridge [Single source evidence - NT4]. To meet more demanding clients and regulations in terms of climate change and environmental impact, producers needed to upgrade many of their technologies and practices to continue selling their products [Very Strong Evidence - KW21, NT2, NT3, NS1, NS2, NT6, TP2, TP3, PR14] A significant number of the fridges sold in Colombia are produced by domestic companies [Single Source Evidence - NS2] Expectation of increased energy efficiency regulations (i.e., labels) also required producers to improve their capabilities and acquire specialized equipment or services [Medium Evidence - NT3, NS1, NS5] Expectation of regulation requiring appliance producers to have extended producer responsibility for the appropriate disposal of their products, particularly Waste of Electric and Electronic Equipment (WEEE), also requires capacity upgrades and some support [Strong Evidence - NT2, NT3, NT5, TP1, TP3]. <p>Even though COVID may have led to the producers turning higher profits in 2020 than in prior years, the crises created by it have led to some of the</p>

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<p>production improvements being delayed. Yet, the project's relevance remains [Weak Evidence - NT1, NT3].</p> <ul style="list-style-type: none"> Adoption of Extended Producer Responsibility, specifically for this case of the Waste of Electric and Electronic Equipment (WEEE) creates a need for producers to respond for the proper disposal of their products, and for this, they need to team with recycling or disposal companies [Medium Evidence - NT6, AR19, SAR20]. The main challenge is creating a large enough stream of fridges, and a good enough return of the materials extracted so that the business is viable and sustainable [Medium Evidence - NS2, NS11, NS13]. 80% of fridge materials are easily recycled; the remaining 20% do have some specific requirements [Medium Evidence - NS4, NS6, NS11]. The recycling companies lacked technical capacities and equipment to process the fridges [Strong Evidence - NT4, NS4, NS11]. Volume of fridges to create fully automatic disposal plants is quite high, so alternatives are required while the number of old fridges increases [Single Source Evidence - NT1]. High level of "inheriting" or of "passing on" older (inefficient) fridges maintains high energy consumption and has the risk of inadequate end-of-life recycling, venting GHG refrigerants to the atmosphere and inadequately disposing of insulating foams [Medium Evidence - NS10, TP2].
1.1	How well does the NSP align with National priorities in regard to GHG emissions reduction from industrial and energy sectors?	<ul style="list-style-type: none"> The project is in line with Government targets on environmental emissions (incl. NDC, sectorial plans, etc.). The NSP is linked to formal National MRV schemes. 	<ul style="list-style-type: none"> The NSP supports Colombia's Overall Climate Strategy and MRV systems. 	<ul style="list-style-type: none"> Project contributes on three fronts to the reduction of climate change emissions and delivering NDCs targets: (i) reducing the use of GHG causing refrigerants and insulating foam, (ii) reducing emissions from energy consumption and (iii) reducing emissions from inappropriate disposal of the GHG-releasing substances [Very Strong Evidence - NT1, NT3, NT4, NT5, NT7, NS5, NS6, NS7, NS10, NS13, PR14, AR17, AR19, SAR20, AR20, COR19] Monitoring, Report and Verification systems are aligned with those of the Colombian Government [Medium Evidence - NT1, NT2, NT5], although those systems still need more consolidation [Single Source Evidence - NT7] or to become easier to share [Single Source Evidence - NS7]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> Red Verde was established in 2014 by producers to help manage and meet EPR WEEE requirements [Strong Evidence - NS4, NS12, NS13, TP1] Refrigerator substitution is important for energy efficiency targets [Weak evidence - NS8, NS9]: Colombian government is supporting this effort through other initiatives (PEECES and San Andres) [Weak Evidence - NS8, NS12]. National Government is supporting additional similar initiatives through the FENOGE [Single Source Evidence - NS9]. Having had the second longest lockdown for the COVID-19 pandemic, the Colombian economy and society may be vulnerable, delaying the pursuit of these goals, particularly if new lockdowns are adopted that continue deteriorating the population economic conditions [Single Source Evidence - COR19]. One key problem of MRV work is that it is not usually applied by the designer or even by the party responsible for the execution, and that does not close the feedback loop [Single source - NT7]
2 EFFECTIVENESS				
2	To what extent has the implementation of the NSP achieved intended outcomes in the short and medium term?	<ul style="list-style-type: none"> The level of progress and NSP contribution to the achievement of the following (intermediate) outcomes: <ul style="list-style-type: none"> Policy and regulatory changes to promote the production and sale of climate-friendly refrigerators. Increased adoption of R600a by Colombian refrigerator producers. Improvements to products and production lines for green refrigerator production. 	<ul style="list-style-type: none"> NSP activities are contributing to increasing the technical capacity of producers and recyclers to produce and recycle refrigerators. NSP activities have contributed to developing the Red Verde programme and the incentive framework to encourage domestic refrigeration replacement NSP activities are contributing to improving gender equality in refrigeration production, 	<ul style="list-style-type: none"> Minimum Energy Performance Standards have been prepared and adopted [Strong Evidence - KW21, NT1, NS5]. Technical support to update the energy efficiency label has been provided [Very Strong Evidence - NT1, NT3, NS1, NS2, NS5, NS10, TP2, NT7, PR14, AR19, SAR20, AR20]. Regulation to ban HFC imports has been drafted and is being reviewed for adoption [Strong Evidence - NT1, NT3, NS2, NS10, VW21, SAR21]. Regulation increasing Extended Producer Responsibility for WEEE producer has been drafted but not yet adopted [Strong Evidence - NS2, TP1, NS6, NS13, AR20] Regulation on how to manage foams or other hazardous or climate change agent releasing elements will be adopted soon [Single Source Evidence - NS6].

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
		<ul style="list-style-type: none"> Improvements in refrigerator recycling practices and volume. Design, piloting, and expansion of refrigerator upgrade incentive programmes. Increased awareness and knowledge of technicians on proper servicing of newer refrigerators Increased awareness and knowledge of recycling companies on proper dismantling and disposal of old refrigerators <p>■ The level of NSP contribution to the achievement of the results compared to exogenous factors.</p>	servicing, and recycling activities.	<ul style="list-style-type: none"> Now that the labels and new standards regulations have been adopted, there is a need for awareness-raising and consumer awareness and improvement work to ensure that they know how to interpret them [Weak Evidence - TP2, TP3]. Training has been provided to producers on how to handle the R-600a refrigerant and to build the fridges with it [Very Strong Evidence - KW21, NT1, NT2, NT6, NS1, TP1, VW21, SAR19, AR20] A loan instrument for producer's upgrades has been developed in conjunction with Bancoldex, through an "innovative" blended finance scheme [Medium Evidence - NT2, NT4, VW21, SAR20] Producers made the investments towards the use of R-600a even before the NSP Started [Very Strong Evidence - NT3, NS2, TP2, SAR18, AR18, SAR20] All three Colombian producers have transformed and benefited from the NSP [Very Strong Evidence - NT3, NT7, NS1, NS8, TP1, VW21, AR19] NSP has bought and provided specialized equipment and services to the producers [Strong Evidence - NS1, NS2, SAR21]. Pandemic has delayed execution of training due to mobility restrictions [Weak Evidence - NT1, AR20] When faced with new regulations, the producers always request additional time to meet the new demands [Single Source Evidence - NS5]. Activities of the recycling component are only starting in 2021. NSP wanted to get the substitution programme before, seeking to increase and assure an adequate volume of refrigerators to recycle [Medium Evidence - KW21, NT1, NT3, VW21, SAR20, AR20, SAR21] Project supported by BMZ will help producer's design more recyclable domestic refrigerators [Single Source Evidence - NT1] <p>Recycling companies have started exploring refrigerator processing and analysing the business opportunities and business model [Very Strong Evidence - NT3, TP1, TP3, NS11].</p>

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> There has been some initial or prior work helping the recycling companies to build capacity to recycle the foams and refrigerants in a safe manner [Very Strong Evidence - NS2, TP1, NS8, VW21, NS11] Project will not work with informal or individual recyclers but with companies that are able to obtain the licenses for the disposal of electric and electronic waste [Single Source Evidence - NT3]. Red Verde emerged from a joint effort of producers to carry out the collection and processing effort [Weak Evidence - NS2, NS6]. 80% of refrigerators elements and components can be recycled easily. The remaining 20% require more specific disposal means [Strong Evidence - NS2, NS4, NT6]. Cost analyses conducted by the WEEE processing and disposal companies have determined that, in order to dispose fridges properly (due to the high cost of foam processing), somebody (either the previous owner, the producer, or the retailer) may need to be charged as the processing costs cannot be recouped by selling refrigerator components or materials [Weak Evidence - NS11, NS13]. Lack of awareness of energy efficiency compromises or the adverse impact of gases or foams keeps people passing on or inheriting fridges instead of sending them for disposal [Single Source Evidence - TP2] Logistics costs for the collection of the old fridges weigh very much in the scheme's viability, which creates a challenge for some locations [Medium Evidence - TP2, NS11]. NSP has been supporting Red Verde with consultancies, advisories, and other support to analyse and develop improvements to recent substitution efforts to increase slow/weak substitution outcomes [Very Strong Evidence - NT1, NT2, NT3, NS4, TP1]. Proposed substitution scheme has sought to leverage the VAT tax break incentive already present in Colombian Regulations [Strong Evidence - NT1, NS4, AR17]. <p>A regional focus for the substitution scheme is desirable, given that the energy efficiency problems and challenges, population elements, and</p>

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<p>WEEE processing capabilities vary. Emissions abatement cost curves could formulate and focus this regional effort [Single Source Evidence - TP2].</p> <ul style="list-style-type: none"> Substitution efforts have failed to deliver the results. Even FENOGE's supported PEECES and San Andres Fridge substitution initiatives, which can subsidize up to Col\$600,000 of the new fridges, has been slow to pick up [Very Strong Evidence - NT2, NT3, NT7, NS5, NS6, NS8, NS9, NS10, NS12, TP1, TP3, SAR19, AR19, SAR20, AR20, SAR21] There are some questions and concerns on why FENOGE's projects are being executed without coordination or participation of the NSP [Single Source Evidence - NS2] Analyses have established that the traditional VAT break incentive for fridge replacement may be interesting for consumers, but adds processing cost to the retailers, which sometimes opt to avoid promoting it [Strong Evidence - NT2, NT3, NT4, NS1, NS4, NS6, NS7, NS8, SAR20] The long time that it has taken to create, together with Bancoldex, the NAMA Bonus incentive for retailers to support the VAT scheme and (partially) cover the higher administrative and logistics costs) was only adopted in November 2021 after much discussion and delay [Strong Evidence - NT3, NT4, NS1, NS8, NS9, NS12] Most consumers, particularly those of lower-income groups, are not too mindful or concerned with the environmental impact and will either seek a second-hand fridge or pass it on their own to someone else [Very Strong Evidence - NT7, NS2, NS6, NS8, NS12, TP1, TP3, TP4, TP5, TP6, SAR21] Adoption of VAT-free days for appliances has affected the performance of the substitution scheme, which is based mainly on the VAT break scheme. Besides "offering" a higher discount (0% of VAT instead of the 5% of VAT of the substitution scheme), it does not require the buyers to return their old fridge [Single Source Evidence - NT1] COVID-19 Pandemic and the lockdown adopted to prevent transmission reduced purchasing capability of lower-income groups. That triggered a proposed adaptation of the substitution scheme to incorporate mid ("Estrato 4") income groups [Medium Evidence - NS4, COR19].

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> NAMAs require intersectoral coordination and are expected to get it, but they often fall into "traps" within each sector which prevents them from achieving the desired outcomes [Medium Evidence - NS6, TP2]. It is not common for consumers or families to trade their old refrigerator in for one of the same sizes but higher efficiency. The price caps for applying VAT or NSP benefits may lead to upgrades being made and removing older fridges from use [Weak Evidence - NS6, NS9]. IT monitoring system has had delays in its development as no developers have presented bids in the two tender processes conducted so far [Weak Evidence - AR20, SAR21].
2.1 (Proposed by ELE team)	Did changes in the NSP-operating context impact the project's effectiveness (positively and/or negatively)? If so, to what extent (greatly, partially, negligibly)?	<ul style="list-style-type: none"> COVID has maintained the level of commitment of the different stakeholders to the project. Effectiveness problems coming from other contextual changes 	<ul style="list-style-type: none"> COVID may have introduced some delays but has not compromised the ability of the NSP to create transformational change. Some unforeseen administrative or operative setbacks may have delayed or required minor adjustments, but the NSP's goals remain the same. 	<ul style="list-style-type: none"> Project initially considered that FC would be executed through a trust fund but was later changed to execution through Bancoldex, who developed a blended finance scheme [Weak Evidence - NT1, NT2]. During the (extended) period that took place between the NSP proposal and the start of implementation, the producers had made the investments to switch to R-600a on their own, which led to excluding those actions from the execution of the NSP [Single Source Evidence - NT2]. The COVID-19 pandemic is considered to have had a positive impact as staying-at-home people have realised that they need larger or better fridges [Strong Evidence - NS1, NS4, NS8, NT4]. <p>Despite the problem of not requiring the old fridge to be returned, VAT-free days seem to incentivise people to buy appliances, and Fridges have been the no. 2 appliance sold under this scheme [Strong Evidence - NS4, NS6, TP1]. - Pandemic delayed the execution of the training due to the travel restrictions for the trainers and the inability to have large gatherings [Weak Evidence - NT6, NT7].</p> <ul style="list-style-type: none"> Introduction of VAT-free days is working against refrigerator upgrade and substitution schemes, particularly towards the end of the year when the three-yearly VAT-free days occur. Unless they have to replace in a hurry a broken fridge, consumers that seek to buy a new fridge are more likely to wait for the VAT-free days to make the purchases, and the VAT-free scheme does not have the requirement to return the old fridge [Very Strong Evidence - NT1, NS1, NS4, NS12, TP2]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> ▪ The pandemic's lockdown and the social protests earlier in 2021 have caused both household income and supply chain disruptions that have affected the NSP and VAT incentive's target (the lower income group). They have also led to fewer fridges being made, or at higher prices than before, which may price them out of the threshold of eligibility for benefiting from the refrigerator substitution [Very Strong Evidence - NT1, NT3, NT4, NS2, NS4, NS6, NS7, NS9, TP2, SAR21, COR19]. ▪ The pandemic halted the active marketing of the substitution scheme, as it has traditionally depended on salesman-to-client discussions and relations, and these could not take place due to the lockdown [Strong Evidence - NT1, NT7, NS8, NS10, SAR20]. ▪ Priority and emphasis on pandemic emergency regulations and actions meant that some of the NSP administrative actions were delayed [Single Source Evidence - COR19]. ▪ FENOGE was formally established and has been promoting refrigerator upgrading through separate two programmes, with at least one of them designed with financial support from the Interamerican Development Bank (IDB) [Strong Evidence - NT2, NT3, NS2, NS4, NT4]. ▪ Discussions have been held between NSP and FENOGE, but no firm engagement has been obtained yet [Medium Evidence - NT2, VW21, AR19]. ▪ Even though coordination between public sector institutions to coordinate FENOGE's and MinAmbiente's work, Red Verde, as a key NSP partner, has signed agreements with the operator of the PEECES programme to joint efforts to promote substitution [Single Source Evidence - NS6]. ▪ FENOGE will focus its future work on delivering an updated Energy Efficiency and Renewable Energy Plan (PROURE) being adopted by UPME at the time of this report. Considering that the NSP contributes to that, there is a good possibility that FENOGE will support it [Single Source Evidence - NT7].

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> Current programmes being supported by FENOGE were not coordinated from the public sector side (MADS and MinMinas - UPME) [Strong Evidence - NT1, NS2, NS6, NS7, SAR19] FENOGE's Refrigerator substitution projects being and are also struggling [Weak Evidence - NT1, NT3] When NSP was designed, FENOGE was considered one of the funding sources, but no firm commitment existed to support the NSP [Single Source Evidence - NT3]. FENOGE needs to evolve and become more flexible to support a broader range of initiatives or to adapt to lessons learned during the execution of the projects [Strong Evidence - NT4, NS8, NT7].
3 EFFICIENCY				
3	To what extent was the delivery of outputs timely and to expected quality standards?	<ul style="list-style-type: none"> Timeliness of the delivery of outputs and outcomes (incl. budget spending) If there are delays in the implementation, what are their causes (endogenous or exogenous factors), and how seriously have they impacted the NSP implementation? The effectiveness of the measures adopted to prevent or reduce delay impacts. The level of satisfaction of the NSP direct beneficiaries 	<ul style="list-style-type: none"> NSP activities are implemented on time and within budget. The upskilling, policy, regulatory, training, or operative outputs can be clearly linked to NSP activities (improvements in production, recycling, and exchanging old for new refrigerators). Adjustments made have helped mitigate the impact of delays. 	<ul style="list-style-type: none"> TC execution is mostly advancing according to schedule. The NSP has tried to overcome the travel restrictions that prevented training from advancing by online conducting the theoretical part of the training. Still, some practical training can only be delivered in person and is still pending. [Medium evidence - NT1, NT2, NS7]. Flexibility to adapt the NSP's action to the new or evolving conditions was fundamental to maintain the pertinence and relevance of NSP's support to the refrigerator producers [Strong Evidence - NT1, NT2, NT4, NT5, NS6] Projects have arrived and have been implemented with good commitment and quality, but they started late. Support was precise and of the highest quality [Medium Evidence - NS2, NS5, NS6, NS10]. The NSP Team should be more empowered to lead the initiative that creates trust and leadership. [Single Source Evidence - NS2]. ToRs for consultancy work has been discussed and agreed upon with the beneficiary organizations [Strong Evidence - NT3, NT5, NS2, NS5, NS6]. NSP delivery has been affected by multiple delays: administrative delays in the exchange of notes were required to formally start the cooperation effort. In addition, the TC had delays on training because of pandemic

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<p>travel restrictions. [Strong Evidence - SAR19, NT1, NT2, NT3, NT4, NT5, NT6, NS2, NS6, NS9, NS10].</p> <ul style="list-style-type: none"> Paperwork that needed to be filled and submitted to get the financial incentive was too complicated and reduced the interest of the implementation institutions [Medium Evidence - NS6, NS7, NS9].
3.1 (Proposed by ELE team)	Structure & steering: Has the NSP been managed, coordinated, and implemented effectively?	<ul style="list-style-type: none"> The chosen implementation mechanism is conducive to achieving the expected outcomes The technical and financial components are appropriate to deliver the planned outputs Communication and visibility are implemented according to an integrated approach FC and TC interact synergistically Stakeholders are participating and collaborating actively in the intervention 	<ul style="list-style-type: none"> The Steering Committee was created and operating as expected in the proposal. Other key coordination or delivery structures were created and are working according to what was expected in the proposal. The NSP has operated within their expected scope. Partner or delivery institutions are operating adequately. 	<ul style="list-style-type: none"> Steering committee only met for the first time in May 2021. Nonetheless, the NSP has been advancing on multiple fronts [Strong Evidence - KW21, NT1, NT2, NT5, NS6, AR20, SAR21]. Managing the execution of the project has been challenging due to the amount, profile and diversity of stakeholders participating in it [Very Strong Evidence - NT3, NT4, NT6, NS2, NS6, NS7, NS10, TP2, VW21]. Involvement of higher-level or higher profile stakeholders would be desirable to facilitate coordination [Weak evidence - NS6, NS10]. The NSP should have assumed more of a leading, than the supporting role it actually performed. [single source evidence - NS2].
4. IMPACT				
4	What evidence is there that the NSP has been contributing to the intended impact in the ToC (incl. transformational change)?	<ul style="list-style-type: none"> The strength of the evidence that key outcomes are going to be achieved and the robustness of the causal links/pathways to the intended impact (updating and upgrading refrigerator production, improving appropriate and sustainable refrigerator recycling, and promoting consumer exchanges) 	<ul style="list-style-type: none"> The NSP is producing a demonstrational effect and is promoting learning across all relevant stakeholders (dimension 1). The NSP is causing a catalytic effect in terms of systemic change, replication or scale-up and Wider NAMA or NDC implementation (Dimension 2) 	<ul style="list-style-type: none"> Commercial competition was the main driver for producers to adopt the natural refrigerant and pursue energy efficiency gains. The NSP has been providing the technical support to achieve that transformation [Strong evidence - NT3, NS2, NS5, NS6, NS8, NS9]. The NSP is helping to raise awareness of the challenges and importance of substitution schemes [Very Strong Evidence - NT2, NT5, NT7, NS6, NS9, NS10, NS11, TP1, TP3, AR19]. At the household level, awareness is still low. More work needs to be done to encourage refrigerator substitution [Medium evidence - NS7, TP3].

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
			<ul style="list-style-type: none"> The NSP is contributing to additional, large-scale, and sustained GHG Savings. 	<ul style="list-style-type: none"> Producers are more conscious and committed to the environmental performance of their work. [Very Strong Evidence, NT1, NT3, NS5, TP2] NSP has brought technologies, best practices, the sector is upskilling and achieving transformation in the refrigerator producing activities [Very Strong Evidence - NT3, NS1, NS2, NS5, NS6, TP2] Energy Efficiency is improving. Labelling was updated last year with the technical support of the NAMA. [Strong Evidence - NT1, NT6, NS7] NSP support to Red Verde has helped to improve the internal capacity [Very Strong Evidence - NT1, NS4, NS6, TP1] NSP has facilitated the involvement and commitment of other key government stakeholders like Bancoldex [Strong Evidence - NT2, NT3, NT4, NS9, NS10, VW21]. The NSP's substitution effort has proven challenging. Other efforts with higher funding and incentives have proven to be less successful than expected, and that is cause for concern [Very Strong Evidence - NT6, NS2, NS7, NS12, TP2, TP3].
5. SUSTAINABILITY				
5	What is the likelihood that the outcomes will be sustained after the end of the NSP funding period?	<ul style="list-style-type: none"> The extent of the evidence supporting the NSP sustainability (e.g. evidence of self-sustaining institutional structures, and political and financial commitment of key stakeholders). There is little or no risk of backsliding or reversing 	<ul style="list-style-type: none"> NSP activities have helped establish strong and capable policy, technical and financial frameworks for: <ul style="list-style-type: none"> Coordinating institutions or institutional arrangements (Red Verde) to continue promoting the NSP. Producers to commit to the newer technologies and more efficient products and production schemes. 	<ul style="list-style-type: none"> Given that all steering committee stakeholders have been working for a long time and collaborating even without the formality of the steering committee, the committee is expected to be sustainable. [Strong evidence - NT2, NS7, NS9, NS10, NS13] It is all in the process of consolidation: when it is possible to demonstrate that there is a benefit to the final users, it can continue on its own. While that demonstration is not achieved, there is a risk of backsliding. [Single source - NT7] From the FC perspective, the current foundations seem robust to sustain the efforts. Still, they cannot be sure how successful it will be. [Strong evidence - NT2, NS6, PR14] <p>There is some risk of losing these changes within Bancoldex, but hopefully, the revolving fund will help continue maintaining it. [Single source - NT4]</p>

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
			<ul style="list-style-type: none"> ○ Recycling companies to recycle fridges in an appropriate and financially sustainable manner ○ Financial institutions to provide financial instruments for replacement. ○ Consumers to replace their old refrigerators with newer ones. 	<ul style="list-style-type: none"> ■ The continued use of the VAT incentive could therefore be also important. [Single source - VW21] ■ Production has little to no risk of backsliding, as converted plants and improved designs are unlikely to backtrack. [Strong evidence - NT1, NT3, NS2, NT4, NT6, NS5, NS10, NS13] ■ Recycling is probably not likely to slide back: once the support is provided and the new business model adopted, it will be difficult to go back. Recycling managers have expressed their commitment to continue beyond the "parenting" phase that the NAMA has provided. But producers need to be responsible for recycling too. [Strong evidence - NT1, NT3, NS2, NS10, NS13, VW21] ■ The substitution scheme has a higher risk of backsliding as it depends on many interactions and behaviour (e.g., working on the substitution culture). In addition, it depends on the availability of funds to support renewal dynamics. They are seeking to create a revolving fund that could be replenished to continue the commitment in the longer term. [Very strong evidence - NT1, NT2, NT3, NT4, NT5, NT6, NS5, TP1, NS7, NS10, NS13] ■ The substitution program has also become a commercial tool. The use of the materials from old refrigerators has been included in the strategy of the manufacturers. The main challenge is incentivising the return of the older refrigerator. [Single source - NS2] ■ In terms of regulation, it is very unlikely to backtrack to allow older and less efficient models to be sold, as they are in the right direction but need to be adopted and enforced. [Strong evidence - NT3, NS5, NS11, PR14] ■ There will soon be a regulation that requires proper management and disposal of old fridges (gases, foams, plastics). [Single source - NS6]. ■ Without a constant commitment of the government or international institutions to maintain the incentives, it will be difficult to drive the substitution of inefficient appliances, particularly for the lower-income groups, as they are not too committed to environmental issues but in solving their own needs and problems. Without stimuli, they will not upgrade too often. [Weak evidence - NS12, NS8]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> Recycling and residue processing need to be financially sustainable too, and for that, there needs to be adequate regulation and the scale and demand for the services. Without a responsibility or an awareness of the need to be paid by someone, this is not too likely to happen. [Medium evidence - NT1, NS11] FENOGE has a \$400,000 incentive that is not working on its own. They should join forces. [Single source - NT1] Red Verde was created by producers, assuming the co-responsibility of proper disposal, particularly hazardous waste. Red Verde was created as a non-profit, and they would like to be more self-sufficient based on increased productivity (\$/kg recovered), but there is the expectation of always having to make yearly contributions to it. Red Verde could have vanished during the pandemic, but there is still a strong commitment from producers. Currently, NAMA funding represents less than 20% of overall Red Verde funding and is sustained mostly through the yearly contributions of its charter members. Red Verde was supported by producers and had been developing capabilities to recollect and dispose of the refrigerator and proper disposal of gases and foams. The achievements can't easily be reversed. The different entities have learned how to work together to achieve new mitigations targets in other sectors. [Very strong evidence - NT2, NS1, NS2, TP1, NS6, NS7, NS9, NS10, NS13] Even more so if the EPR regulation is finally adopted. UTO asked producers to create an EPR scheme between the producers to create Red Verde. Red Verde was created for electric appliances and have started with refrigerators. New regulations coming up will have specific demands on the number of appliances disposed of. The requirements for final disposal are initially small but are set to grow on time. [Medium evidence - NT3, TP1] By the end of the NSP, the current post-consumption programme for fridges (Red Verde) will most likely have the technical know-how to function as a national replacement programme for domestic refrigerators. The established EPR scheme will lead to increased sustainability of the environmentally friendly waste management of fridges and may be extended to other waste streams. [Single source - PR14]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
6. LEARNING				
6	What key lessons can be learnt to the benefit of the legacy of this NSP, other NSPs and the NAMA Facility as a whole?	<ul style="list-style-type: none"> The NSP's generation of important lessons for 1) itself and 2) other projects and/or NSPs. 	<ul style="list-style-type: none"> Lessons from this NSP were used to improve its execution. The NSP generated important lessons for other NSPs. The NSP has held formal knowledge exchange work with other NSPs or government or industrial programmes. 	<ul style="list-style-type: none"> Aligning the efforts of different government sectors and stakeholders to work together and avoiding duplication of efforts or discoordination. Regional and urban governments need to be better engaged and also committed. Greater involvement of management, articulation between portfolios, rethinking replacement strategy was named. One example: Partnership between the social capital and the governance structures. Bancoldex needs Red Verde to do the paperwork right so that they can trust to pay the bonus. Another example: Success in transitions require a combined government and industry partnership: governments set quotas for improvements that need to be enforced, and producers need to do the research and development. Recommendation: Involve higher tiers of decision-makers into the discussions and execution. Internal government coordination is important: VAT-free days go against the programme. [Very strong evidence - NS2, NS3, NT4, NT6, TP2, TP3, NS6, NS7, NS10, NT7, VW21, PR14] Bancoldex proved to be a reliable partner, and they could be relied upon as a partner for future NSPs. E.g., Credit blending: leverage the strengths of Bancoldex. Bancoldex has an incentive to use wisely the funds provided by the FC as they get to keep it for other uses. [Medium evidence - NT1, NT2, NT4, NT5] GIZ works in a very "technical cooperation" way. It can be assumed, that the FC proved a challenge, but also a learning opportunity. E.g., since the NSP team is small, it needed to leverage other stakeholders. They also had to improve and adjust timing expectations: Considering that it is common for international cooperation projects to have a delayed start due to diplomatic and administrative arrangements, it would be expected that GIZ would have taken that into consideration and prepared a more realistic schedule. Recommendation: Projects could benefit from experienced cooperation execution staff (to better tackle administrative requirements and make more realistic schedules), and from higher-profile leaders that facilitate collaboration and coordination between sectors and speed up the project execution. [Strong evidence - NT1, NT3, NS6, NS10]

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<ul style="list-style-type: none"> Have a direct link to TSU to discuss changes or adaptations. They would have appreciated a clearer operations framework. [Weak evidence - NT1, NT2] Maintain flexibility in terms of activities. E.g., the private sector: Indicators - not to have very detailed indicators as market conditions can shift, and some indicators can be rendered useless. [Strong evidence - NT1, NT2, NT4, NS13, VW21] The indicators in the project proposal should be SMART(er): Specific, Measurable, Achievable, Relevant and Time-bound. [Strong evidence - NT1, NT2, NS5, NS7] Having frameworks or standards that facilitate defining which fridges to support is also important to remove subjectivity. [Single source - NT4] An ex-post evaluation after 5-10 years should be undertaken by TSU, to monitor long-term transformational change [Single source - NT2] <p>The status and progress are reported annually in work plans, keeping track of relevant findings and lessons learned during the year. Besides internal monitoring and external steering structures (such as steering committee), periodic reports (semi-annually) assess overall performance and achievements of the NSP, presenting outcomes and outputs and discussing impacts and lessons learned for broader application, e.g., in the RAC sector. The annual and semi-annual report format should be improved to enhance reading. [Medium evidence - NT1, NT2, PR14]</p> <ul style="list-style-type: none"> Knowledge exchange: They've held bilateral talks with NSP Morocco, Mexico, Tunisia. Knowledge exchange sessions have been held with the "Energy Efficiency in SMEs as a Contribution to a Low Carbon Economy" NSP in Mexico as well as with the NSP "Improving Energy Performance of Moroccan Households" NSP in Morocco. Latin America was a laggard in moving to HFCs but is leading in the natural refrigerants. There is also another consideration on insulation foams, that perhaps is another area that could benefit from the refrigerant and energy efficiency. The project is likely to be expanded and replicated to Bolivia, Peru, and Paraguay, with the producers interested in replicating this experience in other countries. Recommendation: Join elements of regional climate change working groups with the circular economy working groups. Knowledge

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<p>Management System is implemented to compile in published documents lessons learned from training and workshops carried out under the NSP. Databases of key sector stakeholders and persons will be developed. [Very strong evidence - NT2, NT6, TP2, NS6, NS11, NS13, SAR20, SAR 21]</p> <ul style="list-style-type: none"> It is important to review and revise the scope and value proposal for that substitution programme, which is still going slowly. Substitution cannot be seen from only the environmental perspective, and there needs to be an economic incentive. Fridges are assets that people are not too willing to give up "for free". E.g., more involvement and capacity of the NSP leaders, particularly for the substitution scheme. The substitution programmes should (1) be supported by regulatory obligations to consumers, (2) have better marketing, and (3) be easier to implement. Logistical problems are also key for any substitution and recycling schemes mostly considering reverse logistics. Recommendation: There needs to be a more concrete product or benefit for the consumer to drive him to return his old fridge without too many conditions or requirements, or the client will avoid it. The NSP should work in close cooperation with Red Verde in order to extend the lessons learned from the replacement programme and from the EOL Management of domestic fridges to other WEEE streams (white goods). [Very strong evidence - NS2, NT4, NS5, TP1, TP3, NS9, NS12, PR14] Generate national communication strategy. E.g., increase the number of communications and market on why the consumer needs to return his old fridge, on labelling standards and also on environmental impact. There is a lot to be done in increasing the value of old refrigerators and/or convincing people to give them up. Recommendation: CHEC (with access to over 500,000 households and 30,000 commercial enterprises) could be included for subsequent phases. For the PEECES project, UPME partnered up with large retailers and also supported influencers to try and increase awareness-raising. More concrete numbers need to be provided to the users to upgrade to the newer fridges. There should be a larger number of resources allocated to educating the market and developing the programme. [Very strong evidence - NS2, NS3, NS5, TP1, TP3, NS7, NS12, NS13, NT7] Financial Mechanisms should be analysed and replicated, always considering, and acknowledging each country's regulations and requirements ("tropicalizing"). NSP Participated in a NAMA Facility Virtual

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	ELE Evidence
				<p>meeting on May 28, 2021, to help establish a financial group as part of the working group. Recommendation: Conduct impact assessment or political economy analyses of the new regulations and financial mechanisms. There need to be stimuli for producers and retailers, which would be key given that it will be up to them to push forward the initiatives. Seek partnerships with electricity utility companies and their billing schemes to help facilitate fridge upgrades. [Very strong evidence – NT3, NT6, TP2, NS7, NS8, NS11, NS12, SAR21]</p> <ul style="list-style-type: none"> ▪ - There is unexploited potential in the tourism sector (e.g., hotel room fridges) and commercial sector (supermarket fridges), e.g. for a second stage. Also, consider alternative innovating schemes like fridge renting. Colombia is looking forward to doing similar work in air conditioning, which is beyond the scope of their role but is something required. [Very strong evidence - NT1, NT2, NT6, NS5, TP3, NS10, VW21]

Annex E Validity of the causal pathways using process tracing tests

The table below shows the result of the application of formal process tracing tests on the causal pathways of the NSP ToC to assess the strength of the evidence collected by the ELE to either confirm or reject the hypotheses behind each causal chain.

Overview on the validity of the causal pathways using process tracing tests

Formal test	Test description	Causal pathways of the NSP	Process tracing test
Smoking gun (confirmatory)	If evidence is observed, the hypothesis is confirmed. If evidence is not observed, the hypothesis is not confirmed, but this is not enough to reject the hypothesis.	Causal pathway 1 – Enabling the production and sale of green-refrigerators: If appropriate climate and energy efficiency regulations are adopted and, also, if supported technically and financially, refrigerator producers will speed up the conversion of their production lines to natural refrigerants and the design, manufacture and sales of “green” (HFC-free and energy-efficient) refrigerators (Intermediate Outcome 1). Having green fridges in the market is necessary for an increased rate of consumers upgrading to “greener” fridges (Outcome 1), hence achieving reduced direct and indirect emissions.	Causal pathway 1 – Enabling the production and sale of green refrigerators: The appropriate climate and energy efficiency regulations have been adopted (see the adoption of the Kigali Amendment to the Montreal Protocol, along with climate change regulations), and the NSP has been supporting the technically and financially (only partially though). At the same time, there is evidence of producers manufacturing and selling R-600a-based energy-efficient fridges. Therefore, the Intermediate Outcome hypothesis appears to have been confirmed, with some caveats though: part of the producers’ transformation (i.e. production line conversions) occurred before the NSP, while the NSP directly contributed to the safe manufacturing, installation and maintenance of the new fridges. Consequently, the NSP’s support appears to be contributing, but not indispensable to the achievement of Intermediate Outcome 1. The contribution of intermediate Outcome 1 towards Outcome 1 is more elusive, particularly since the substitution efforts have had a slow (delayed) start

Formal test	Test description	Causal pathways of the NSP	Process tracing test
			and sales are recovering after the pandemic, but still below pre-pandemic levels.
Hoop test (disconfirmatory)	If the evidence is not observed, the hypothesis is rejected. If the evidence is observed, the hypothesis is not rejected, but this is not sufficient to confirm the hypothesis.	No causal pathway falls into this category	
Double decisive	If evidence is observed, the hypothesis is confirmed. If the evidence is not observed, the hypothesis is rejected.	No causal pathway falls into this category	
Straw in the wind	If the evidence is observed, this is not sufficient to confirm the hypothesis. If the evidence is not observed, this is not sufficient to reject the hypothesis.	<p>Causal pathway 2 - consolidation and scale-up of the refrigerator substitution programme: If adequate WEEE regulations that consider EPR are adopted and, if technical support is provided for strategy design and institutional strengthening for the refrigerator substitution and impact monitoring schemes, and design and implementation of financial incentive schemes for fridge substitution are also offered, then it will be possible to have an effective refrigerator trading up programme in place, and monitoring and impact assessment (in terms of energy efficiency and GHG emissions reductions) in operation (Intermediate Outcome 2). An effective substitution programme will help to increase both the rate of upgrading to "greener" fridges (Outcome 1) and the speed of adequate disposal and recycling of old fridges (Outcome 2).</p> <p>Causal pathway 3 – enabling and promoting adequate processing and disposal of old fridges and their constituents: If an appropriate WEEE disposal</p>	<p>Causal pathway 2 - consolidation and scale-up of the refrigerator substitution programme: WEEE regulations considering EPR are in place, technical support to refrigeration substitution has been delivered by the NSP, but the monitoring system and financial incentives of the substitution schemes have experienced delays, so the evidence is not fully observed at the moment. In addition, other multiple factors (e.g. cultural and behavioural elements, lack of coordination between different schemes) appear to influence the effectiveness and pace of the national substitution efforts (i.e. Intermediate Outcome 2). Absent a successful substitution programme, the slower fridge replacement and disposal rates will mean that the GHG reduction targets will take a longer time than expected.</p> <p>Causal pathway 3 – enabling and promoting adequate processing and disposal of old fridges and their constituents: The NSP has not started action on</p>

Formal test	Test description	Causal pathways of the NSP	Process tracing test
		regulatory framework is enacted, and if WEEE processing and disposal companies are provided technical support for improved final disposal and recycling of refrigerators, design and use of financial products for recycling capability upgrades or improvements, as well as training of recycling staff for safe and appropriate disposal is granted, then proper refrigerator recycling will be in operation (Intermediate Outcome 3). This will increase old fridges' adequate disposal and recycling rates (Outcome 2).	activities related to this causal pathway yet, so no evidence can be expected in favour or against this causal pathway.

Annex F NSP achievements against logframe indicators

Below are reported the Colombian NSP logframe indicators grouped under the relevant elements of the ToC. Target and achieved figures are reported with a Red-Green (i.e. target not met-met) assessment. Only indicators relevant to the TC are reported.

F.1 Impact indicators

Impact: Colombian manufacturers have converted their production and offer climate friendly and efficient fridges on the national market. The established replacement programme will promote the distribution of green fridges in the country while old, returned fridges are recycled.

#	Indicator	Baseline	Target 2020	Achieved
M1	Emissions reduced	0	1.100.000 tCO ₂	119.684 tCO ₂
M2	number of people directly benefitting from the NSP	0	1.290.000 people	1,010 People
M3 (1)	Degree to which the supported activities are likely to catalyse impact beyond the NSP: <i>By the end of the NSP at least two national manufacturers are exporting their green fridges to other countries in the region</i>	1	2	2
M3 (2)	Degree to which the supported activities are likely to catalyse impact beyond the NSP: <i>The replacement programme for domestic refrigerators supported and operated by RED VERDE, including the financing of a bonus scheme, has been extended to at least 1 WEEE related recycling sector (RAC white goods)</i>	2	2	2
M4 (1)	Volume of public finance (domestic and/or international) mobilised for low	0	3.900.000 EUR	0

#	Indicator	Baseline	Target 2020	Achieved
	carbon investment and development [EUR]: <i>By the end of the NSP, at least EUR7,8 million of public finances have been mobilized through Bancóldex' co-financing for the conversion of production lines for R-600a energy-efficient refrigerators, as well as adequate recycling equipment</i>			
M4 (2)	Volume of public finance (domestic and/or international) mobilised for low carbon investment and development [EUR]: <i>By the end of the NSP, about EUR2,4 million of public grant funding have been mobilized through FENOGE for co-financing the replacement programme</i>	0	1.200.000 EUR	0
M5 (1)	Volume of private finance mobilised for low carbon investments and development [EUR]: <i>By the end of the NSP, EUR100,3 million of private finance (including consumer loans) have been mobilized for the production, purchase and replacement of old equipment with R-600a and energy-efficient refrigerators</i>	0	50.000.000 EUR	55,952 EUR

F.2 Outcome indicators

Outcome: 70% or more of refrigerators in Colombia are “green” refrigerators

#	Indicator	Baseline	Target 2020	Achieved*
1	By the end of the NSP, at least 70% of domestic refrigerators sold in Colombia are using natural refrigerants, are climate-friendly and energy-efficient [percentage of domestic refrigerators]	0	35%	17.5%

F.3 Output indicators

Output 0:

Project structure implemented and operational

#	Indicator	Baseline	Target 2020	Achieved*
0.1	The project management structure has been set up within the first three months of the project [Project Management Structure]	0	1	2
0.2	The project steering committee has been established within the first three months of the project [Project Steering Committee]	0	1	1

Output 1:

Policy framework for the transformation of the domestic refrigeration sector is established

#	Indicator	Baseline	Target 2020	Achieved*
1.1	MEPS in the domestic refrigeration sector are established in 2018, and a ban on the production, imports and commercialization for HFC-134a in the domestic refrigeration sector comes into force in 2019.	0	1	1
1.2	Up to 50 representatives of regional or local environmental authorities have been trained on EPR schemes, hazardous waste and RAC waste management to spread information within the country (50% women, 50% men).	0	25	0

Output 2 – Technical Component:

Colombian producers have the technical and financial capability to design and produce climate friendly and energy efficient fridges

#	Indicator	Baseline	Target 2020	Achieved*
2.1	All three national manufacturing companies have converted their production lines to R-600a, have obtained advice on the detailed engineering for energy efficiency design improvements within the	0	2	1

	NSP and are producing climate-friendly and energy-efficient fridges within the first year of the project.			
2.2	By the end of the NSP, at least 80% of the domestic refrigerators produced in Colombia annually are climate-friendly (R-600a) and energy-efficient (class A RETIQ 2016 and higher).	0	40%	20%
2.3	Up to 90 technicians and engineers of the national companies dealing with flammable refrigerants have been trained in the manufacturing of domestic refrigerators within the NSP (30% women, 70% men).	0	45	0

Output 2 – Financial Component:

Colombian producers have the technical and financial capability to design and produce climate friendly and energy efficient fridges

#	Indicator	Baseline	Target 2020	Achieved*
2.1	The MoU with all implementing partners was signed in Q2, 2017	0	1	0
2.2	The Trust Fund is fully operational by the end of Q 2, 2017, and GIZ has proceeded with the transfer of the first tranche of the Financial Contribution into the account of the Trust fund at the Custodian Bank.	0	1	1
2.3	Three co-financing contracts have been signed with producers and commercial banks like Bancolombia or Banco de Bogota during Q3 2017	0	3	0

Output 3 – Technical Component:

The market introduction of climate friendly and energy efficient fridges is supported within the framework of the new for old replacement programme

#	Indicator	Baseline	Target 2020	Achieved*
3.1	At least 50,000 old fridges are replaced by new fridges within the replacement programme annually, including the bonus scheme.	0	150.000	235
3.2	The functionality of the existing IT monitoring system from Red Verde for the administration, monitoring and reporting of fridges replaced and	0	50%	0

	recycled has been extended, complying with the MRV requirements.			
3.3	The EPR scheme for domestic refrigerators implemented by Red Verde has been expanded to other main cities (e.g. Medellin, Pereira, Cali).	0	1	0

Output 3 – Financial Component:

The market introduction of climate friendly and energy efficient fridges is supported within the framework of the new for old replacement programme

#	Indicator	Baseline	Target 2020	Achieved*
3.1	The final rules and procedures of the Replacement programme are approved by the Steering Committee during Q3, 2017	0	1	0
3.2	Red Verde has received support to upgrade the existing software for the administration and monitoring of the replacement programme; participating institutions are trained in the implementation of the replacement programme, and GIZ transfers the second tranche of the Financial Contribution by the end of Q4, 2017.	0	1	0
3.3	Negotiations with FENOGE for local Financial Contribution for the replacement programme starts in Q1, 2018, with expected approval until Q4, 2019.	0	1	0

Output 4 – Technical Component:

Old fridges are returned and processed in an environmentally safe recycling scheme

#	Indicator	Baseline	Target 2020	Achieved*
4.1	At least one business model has been developed for e-waste management companies recycling old fridges (still in use) until year 2 of the NSP.	0	1	0
4.2	At least three e-waste management companies participating in the replacement programme have improved their capacity to process old fridges in an environmentally safe manner within the NSP.	0	1	0

4.3	Within the NSP, 300,000 old refrigerators are returned and recycled (resulting in 617,700 t CO ₂ eq emission savings) in an environmentally safe scheme.	0	100.000	235
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Output 4 – Financial Component:

Old fridges are returned and processed in an environmentally safe recycling scheme

#	Indicator	Baseline	Target 2020	Achieved*
4.1	At least two business and investment plans for e-waste management companies were developed in 2017, indicating needed investments and respective financing.	0	1	0
4.2	At least one e-waste management company has carried out the investment plan and was able to take a loan with co-financing from the Trust Fund (if required).	0	1	0

Output 5 – Technical Component:

Cross sectoral capacity building and the establishment of an MRV system for institutional capacity strengthening

#	Indicator	Baseline	Target 2020	Achieved*
5.1	An integral MRV system is developed and established to function within and beyond the NSP.	0	1	0
5.2	Training of up to 60 trainers of servicing technicians (after-sales) working in the servicing centres with R-600a refrigerant (40% women, 60% men).	0	30	21
5.3	Training of up to 15 trainers from e-waste management companies in the environmentally safe waste treatment of fridges (50% women, 50% men).	0	8	0

Output 5 – Financial Component:

Cross sectoral capacity building and the establishment of an MRV system for institutional capacity strengthening

#	Indicator	Baseline	Target 2020	Achieved*
5.1	In Q1, 2018, all institutions participating in the replacement programme were trained in the programme's procedures.	0	1	0

Annex G List of ELE sources

G.1 Internal documents

1. NAMA Facility. 2021. *Semi-Annual Report 2021*. Colombian NAMA for the domestic refrigeration sector.
2. NAMA Facility. 2021. *Annual Report 2020*. Colombian NAMA for the domestic refrigeration sector.
3. NAMA Facility. 2020. *Semi-Annual Report 2020*. Colombian NAMA for the domestic refrigeration sector.
4. NAMA Facility. 2020. *Annual Report 2019*. Colombian NAMA for the domestic refrigeration sector.
5. NAMA Facility. 2019. *Semi-Annual Report 2019*. Colombian NAMA for the domestic refrigeration sector.
6. NAMA Facility. 2019. *Annual Report 2018*. Colombian NAMA for the domestic refrigeration sector.
7. NAMA Facility. 2018. *Semi-Annual Report 2018*. Colombian NAMA for the domestic refrigeration sector.
8. NAMA Facility. 2018. *Annual Report 2017*. Colombian NAMA for the domestic refrigeration sector.
9. NAMA Facility. 2016. *NAMA Support Project Proposal*. Colombian NAMA for the domestic refrigeration sector.
10. NAMA Facility. 2020. *Survey on Implications of Covid-19 on NSPs in Implementation or DPP*. Colombian NAMA for the domestic refrigeration sector.

G.2 Public documents

1. Ministerio de Minas y Energía. 2020. *“Resolución 40247 de 2020: Por la cual se modifican condiciones de exigibilidad del etiquetado y se aclaran algunos requisitos establecidos en el Anexo General del Reglamento Técnico de Etiquetado RETIQ”*. Bogotá D.C., Colombia
2. Ministerio de Minas y Energía. 2015. *“Anexo General: Reglamento Técnico de Etiquetado RETIQ” – Resolución 41012 del 18 de septiembre de 2015*. Bogotá D.C., Colombia
3. UPME. 2021. *“Plan de Acción Indicativo Programa de Uso Racional y Eficiente de Energía (PROURE) – 2021-2030”*. Bogotá D.C., Colombia
4. UPME. 2016. *“Plan de Acción Indicativo de Eficiencia Energética 2017-2022 – Una realidad y oportunidad para Colombia”*. Bogotá D.C., Colombia

5. UPME. 2010. *“Plan de Acción Indicativo Programa de Uso Racional y Eficiente de Energía (PROURE) – 2010-2015”*. Bogotá D.C., Colombia
6. Congreso de Colombia. 2001. *“Ley 697 de 2001: mediante la cual se fomenta el uso racional y eficiente de la energía, se promueve la utilización de energías alternativas y se dictan otras disposiciones”*. Bogotá D.C., Colombia.
7. Ministerio de Ambiente y Desarrollo Sostenible. 2020. *“Actualización de la Contribución Determinada a Nivel Nacional de Colombia (NDC)”*. Bogotá D.C., Colombia.
8. Ministerio de Ambiente y Desarrollo Sostenible. 2017. *“Política Nacional – Gestión Integral de Residuos de Aparatos Eléctricos y Electrónicos – RAEE”*. Bogotá D.C., Colombia.
9. Congreso de Colombia. 2013. *“Ley 1672 de 2013: por la cual se establecen los lineamientos para la adopción de una política pública de gestión integral de Residuos de Aparatos Eléctricos y Electrónicos (RAEE), y se dictan otras disposiciones”*. Bogotá D.C., Colombia.

G.3 List of organisations interviewed

Institution	Position
NSP Team	
GIZ	NSP Team Leader
GIZ	NSP Technical Advisor
GIZ	NSP Financial Advisor
Ministry of Environment and Sustainable Development	Coordinator of the Ozone Technical Unit
Ministry of Environment and Sustainable Development	Member of the Ozone Technical Unit
Bancoldex	Leader of sustainable development
Mining and Energy Planning Unit (UPME)	Advisor to the Energy Demand Section
HEAT GmbH	Company CEO/consultant
IPC GmbH	Financial consultant
NSP Stakeholder	
Ministry of Mines and Energy	Coordinator of the technical regulations group
HACEB	Head of laboratory and regulatory compliance.
MABE	Regional Head of Sustainability
Red Verde	Executive director
Red Verde	Head of the substitution efforts
ANDI (National Association of Private Enterprises)	Director of the Chamber of Appliances
CHEC	Economist
Rayco	Head of risk management
ASYCO	Commercial Director

UT Caribe Eficiente	Coordinator of the PEECES programme execution.
OCADE	Operations director
C.I. Metales la Unión	General Manager
Third Party	
LG Electronics	Head of regulatory compliance
Water and Sanitation Regulatory commission	Expert commissioner (but also a former Vice-minister of Environment)
Bancolombia	Analyst – Sustainability division.
General population	Housekeeper at a family home
General population	Retiree, widower who lives alone.
General population	Building concierge who lives with a brother and his family

Annex H ELE Terms of Reference



On behalf of



ELE #9

Colombia Domestic Refrigeration NSP

Mid-term evaluation of the NSP

Background

This document describes the mid-term Evaluation and Learning Exercise (ELE) of the NAMA Support Project (NSP) 'Colombia Domestic Refrigeration' (referred to in this document as Colombia Refrigeration NSP). This is a work package commissioned under the Project title and contract number below.

Project title:	Project evaluation and learning exercises for the NAMA Facility
Project and reference number:	12.9097.2-108.00 / 81238912
ELE scope (mid-term/final):	Mid-term ELE
ELE focus (TC/FC/both):	both

1 Terms of reference

1.1 General TORs as defined in TORs for all ELEs and theoretical framework

This ELE is implemented within the general Terms of References (TORs) and following the theoretical framework, and these two documents are binding.

However, as a short reminder, the focus is on the following three questions:

- Is the NSP achieving its planned results?
- Is the NSP starting to trigger transformational change?
- What can be learnt from the NSP so far.

1.2 Specific additional elements to be considered in this ELE

Please note below the additional elements/questions to be considered in this ELE:

Technical component

- Assessment of the level of commitment of the refrigerator producers to continue supporting the Red Verde Program after the NSP ends (ELEQ 5): this will be carried out by querying the NSP stakeholders related to the Red Verde Programme what arrangements are being put in place to support the initiative after the NSP support ends.

Financial component

- Probing FENOGE's commitment, limitations or requirements to contribute to the refrigerator substitution scheme (ELEQ 2.1 and ELEQ 5).

1.3 Specific elements/questions that will not be considered in this ELE

The general TORs and the theoretical framework allow for a prioritisation of some evaluation questions at the expense of other evaluation questions. Please note below those elements/questions which will not be considered in this ELE:

- The ELE will focus on understanding the contribution of the NSP to its intended outcomes and impact and the lessons generated, and will not undertake a thorough verification of the delivery of the NSP's outputs, e.g. reviewing minutes of meetings, counting male and female participants to events etc. However, as per ELE Theoretical Framework, "a rapid review of the

quality of the data produced by the NSP M&E system will be carried out, including how regular and comprehensive it is, and how reliable the data sources are”.

2 The contractor suggests the following staff (see CVs attached):

- Senior International Expert A (ELE Team Leader): Andres Baquero
- Senior International Expert B: Tobias Kühner
- Senior National Expert: Gabriel Jimenez

3 Timing

The contractor suggests the following timing:

Item	Date / period	Comment
Kick-off call TSU / ELE team / NSP	26/10/2021	
Exchange of preliminary information	27/10/2021	
Availability of detailed agenda	12/11/2021	
Field phase	15-26/11/2021	Virtually
Draft report delivery	07/01/2022	
Final report delivery	11/02/2022	Assuming one feedback cycle. (Note that the TORs allow for more feedback cycles if necessary)

4 TSU agreement

The TSU agrees to the TORs, team and timing described above.

Ernesta Maciulyte Digital unterschrieben von Ernesta Maciulyte
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