Project evaluation - PEACCE

External, mid-term evaluation of the

Promoting Efficient, Affordable and Clean Cooling for Everyone

(PEACCE) project 2019 – 2024.

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Management response to the external, mid-term evaluation of the Promoting Efficient, Affordable and Clean Cooling for Everyone (PEACCE) project

Management Response

The Management Response (MR) states the position of the SDC on the recommendations of the external, mid-term evaluation of the **Promoting Efficient, Affordable and Clean Cooling for Everyone (PEACCE) project**. The MR provides a solid basis for strategic decision-making and provides solid inputs regarding SDC's potential future engagement in the field of cooling.

Assessment of the evaluation

The evaluation was conducted by a scientific team of independent experts composed of Professor Toby Peters, Dr Leyla Sayin and Dr Tim Fox. The evaluation process was well managed and included close involvement of the SDC's reference group comprising of Janine Kuriger (Head of the Section Climate, DRR and Environment), Ms Cornelia Hett and Mr André Mueller.

The main objectives – i) assess the performance of the two initiatives (Clean Cooling Collaborative and Sustainable Energy for All's Cooling for All), ii) conduct a mapping of global initiatives in the cooling sector, iii) make recommendations regarding the future focus of SDC's engagement in the field of cooling, and iv) assess the quality and effectiveness of the partnership with the Climate Works Foundation and SEforALL – have been met by the evaluators. The SDC appreciates the comprehensiveness of the evaluation report and the sound and balanced analysis of key elements of the SDC's performance in the Promoting Efficient, Affordable and Clean Cooling for Everyone (PEACCE) project.

The report's analysis and resulting recommendations are considered to be useful for strengthening the strategic orientation of the Promoting Efficient, Affordable and Clean Cooling for Everyone (PEACCE) project.

Main findings

The overall approach adopted in the review process was discussed with the SDC during the inception as well as briefing meetings. The external review was carried out successfully and in a timely manner between May and November 2023.

A key concern highlighted in the report was that while both initiatives have made good progress towards achieving the agreed objectives of the PEACCE project, they currently take a macro-economic approach and focus more on policy interventions than on achieving tangible practical benefits in access to efficient, affordable and clean cooling on the ground. In addition, the evaluation team found that the documented project monitoring and reporting to date did not provide evidence of tangible, detailed impacts of SEforALL and the Clean Cooling Collaborative (CCC).

The principal conclusion from the review is that, despite some delays in implementation, both the CCC and SEforAll initiatives appear to be on track against the defined project objectives.

From the findings of the evaluation, the evaluation team made five recommendations to the SDC. Out of the five recommendations, four are 'fully agreed' (green) and one is 'partially agreed' (orange) – see table below. The SDC agrees to seize this opportunity to improve its results by taking specific measures in line with the recommendation.

1.	Continued SEforAll support and building of in-country teams
2.	Review follow-on funding the CCC initiative
3.	Improved alignment with Swiss Government overseas development strategy
4.	Adopt robust impact targets
5.	Consider cold-chains in future activities

Fully agree	Partially agree	Disagree

Overview of recommendations, management response and measures

Recommendation 1		
Continued SEforAll support and building of in-country teams since SEforAll is well positioned and engaged / respected to continue promote the update of cooling into policies, national plans and strategies. The SDC was the first SEforAll funder to request the organisation to support an in-country presence, thus providing greater depth and granularity to their focus. Building on this philosophy, SEforAll was able to place in country personnel in Kenya and Ghana with the funding they received for their Energy Efficiency Program. Having in-country personnel has resulted in an opportunity to support these national governments more closely, increased opportunities to deliver training, and improved relationships with technical partners in-country, all of which opens up new opportunities to influence government policies and plans in terms of access to cooling.		
Management response		
Fully agree	Partially agree	Disagree
We fully agree with this recommendation. The current engagement with SEforAll under phase 1 of the PEACCE project lasts until mid-2024.		
Measures	Responsibility	Timing
a) The SDC will enter into dialogue with SEforAll on a continuation of the successful cooperation within the frame of a possible phase 2 of the PEACCE project and jointly define the priorities and support needed.	MAL	Q1 2024

Recommendation 2		
Review follow-on funding the CCC initiative, as there are no plans to continue the currently funded NDC Support Facility, and maximise the funds going directly to the target programmes (reducing the cost of administration by intermediaries).		
Management response		
Fully agree	Partially agree	Disagree
We fully agree with the recommendation and will reassess our engagement with the CCC beyond our current involvement in Phase 1 of the PEACCE project, which will continue until the end of 2024.		

Measures	Responsibility	Timing
a) Review of the SDC's engagement with the CCC beyond the current involvement internally within the CDE section.	MAL	Q1 2024

Recommendation 3		
Improved alignment with Swiss Government overseas development strategy. Opportunities are being missed for the transfer of Swiss experience of, and knowledge and expertise in, passive cooling approaches and clean cooling technologies for clean cooling applications in the built environment, agriculture, and health domains. Furthermore, a lack of a clear recognition within the PEACCE project of sustainable cooling as a climate change adaptation strategy, as well as mitigation initiative, means opportunities for alignment with Switzerland's threefold interest in responding to climate change challenges is being missed. We recommend that a closer relationship is developed with the Expert Groups of the Swiss Humanitarian Aid Unit and the UNHCR and the SDC co-convened Geneva Technical Hub to increase access to Swiss expertise and facilitate knowledge transfer into targeted developing countries.		
Management response		
Fully agree	**Partially agree**	Disagree
We agree that sustainable cooling should be considered as a climate change adaptation strategy and mitigation measure in a future phase 2 of the PEACCE project. However, we only partially agree with the observation that opportunities have been missed to transfer Switzerland's experience, knowledge and expertise in passive cooling approaches and clean cooling technologies for clean cooling applications in the built environment, as there have been exchanges, for example, between the SEforAll' s Cooling for All initiative and the Swiss expert involved in the Building Energy Efficiency Project in India. However, a closer coordination/collaboration between the different sections at the SDC (Swiss Humanitarian Aid Unit and thematic sections) can be envisaged in view of a continued engagement in the field of cooling.		

Measures	Responsibility	Timing
a) Ensure that sustainable cooling is considered as a climate change adaptation strategy and mitigation measure in a future phase 2 of the PEACCE project.	MAL	Q1-Q2 2024
b) Assess the potential for coordination/collaboration between the different sections at the SDC (Swiss Humanitarian Aid Unit and thematic sections) in view to phase 2 of the PEACCE project.		

Recommendation 4		
Adopt robust impact targets and ensure that applicants set clear, evidencable objectives with clear indicators to assess performance.		
Management response		
Fully agree	Partially agree	Disagree
We fully agree with this recommendation and will improve the impact indicators with a view to phase 2 of the PEACCE project.		

Measures	Responsibility	Timing
a) Set clear, evidencable objectives with clear indicators in the project logframe of the PEACCE project phase 2.	MAL	Q1-Q2 2024

Recommendation 5		
Consider cold-chains for food and pharma in future activities, given their role in addressing multiple developmental challenges.		
Management response		
Fully agree	Partially agree	Disagree
We fully agree with this recommendation and will analyse whether we can integrate cold-chains for food or pharma as a pillar in a possible phase 2 of the PEACCE project.		

Measures	Responsibility	Timing
a) Assess possible global/regional programmes dealing with cold chains for food or pharmaceuticals in which SDC could participate in view of phase 2 of the PEACCE project in close consultation with the Health and Food System Sections.	MAL	Q1-Q2 2024

The management would like to thank the review team for the successful completion of the external, mid-term review of the Promoting Efficient, Affordable and Clean Cooling for Everyone (PEACCE) project. The recommendations made have been extremely useful in making and supporting the strategic decisions.

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08.12.2023

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Acronyms and Abbreviations

AC	Air Conditioner
BEEP	Indo-Swiss Programme on Building Energy Efficiency
CCAC	Climate and Clean Air Coalition
CCC	Clean Cooling Collaborative
CDE	Climate, DRR and Environment Section of SDC
COP	UNFCCC Conference of the Parties
E4	Energy Efficiency in Emerging Economies
GESI	Gender, Equality and Social Inclusion
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GPCCE	Global Program Climate Change and Environment
GPFS	Global Program Food Security
GPH	Global Program Health
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
K-CEP	Kigali Cooling Efficiency Program
IEA	International Energy Agency
LICs	Low Income Countries
LMICs	Low-Middle Income Countries
LNOB	Leave No One Behind
MEPS	Minimum Energy Performance Standards
MoU	Memorandum of Understanding
MRV	Monitoring, Reporting and Verification
NCAP	National Cooling Action Plan
NDC	Nationally Determined Contribution
OECD/DAC	Development Assistance Committee of the Organisation for Economic Cooperation and Development
PCAP	Pakistan Cooling Action Plan
PEACCE	Promoting Efficient, Affordable and Clean Cooling for Everyone
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goals
SEforAll	Sustainable Energy for All
U4E	UNEP United for Efficiency Project
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

The Climate, DRR and Environment Section of the SDC has been contributing since December 2019 in the frame of the project "Promoting Efficient, Affordable and Clean Cooling to Everyone" (PEACCE) to two global initiatives on cooling: the Clean Cooling Collaborative (CCC) Nationally Determined Contributions (NDCs) support facility of the Climate Works Foundation (former Kigali Cooling Efficiency Program, K-CEP) and the Sustainable Energy for All's (SEforAll's) 'Cooling for All' platform.

Through this work, there are three specific objectives:

- Efficient, affordable and clean cooling is addressed in selected countries climate policies or action plans.
- Access to efficient, affordable and clean cooling especially for the most at risk is increased through testing and leveraging new cooling solutions and by strengthening capacities.
- Efficient, affordable and clean cooling is elevated to a global priority on development and policy agendas and on global financial flows.

CCC would:

- Provide technical assistance to countries to help implement efficient, climate-friendly cooling policies, standards, or programs, for MRV, and/or for climate finance readiness.
- Launch efficient, climate-friendly cooling implementation projects (including new cooling solutions).
- Submit proposals to help developing countries secure funding for efficient, climate-friendly cooling.

and SEforAll would:

- Develop a methodology for measuring access to cooling gaps and integrating the "Chilling Prospects" report recommendations into National Cooling Plans.
- Provide professional advice and technical expertise to new cooling initiatives by the Cooling for All Secretariat.
- Publish Annual Cooling for All Outlook Report on global access to cooling and distribute widely.
- Produce videos and develop and launch communications campaign developed.

SDC is required to subject all projects to an external review in the second half of the project period and this applies to PEACCE which has now passed its mid-point. In-line with the organization's guidelines, an external review team was commissioned and tasked with undertaking the review and this Evaluation Report presents the review team's findings, conclusions and recommendations.

We, the evaluation team, were instructed to objectively assess the performance of the CCC and SEforAll's Cooling for All platform against the criteria of the Development Assistance Committee of the Organisation for Economic Cooperation and Development and make recommendations specific to these collaborations, as well as more broadly in terms of SDC's focus and engagement in the field of cooling. To this end, we have assessed how effectively the project is meeting its aims and objectives to provide impact and considered whether value for money is being achieved by the Swiss government. The evaluations also considered lessons learnt and the wider context to ensure that future spend by the project and associated programmes is used most effectively. It should be noted that CCC is not planning to extend the NDC window beyond the current programme co-funded by SDC, which ends in 2024.

As a first stage in our evaluation, we undertook extensive desk-based research to understand the background context and Swiss Government policy landscape that led SDC to participate in the cooling space as well as the rationale for the choice of the two initiatives chosen as implementation vehicles for the PEACCE project. Our findings, conclusions and recommendations from this initial work were presented to SDC in an Inception Report which was approved in July (2023). The work undertaken in the first stage enabled us to define our assessment methodology in detail, establish the suite of evaluative questions we considered essential to answer, and create a short list of target interviewees for the full evaluation. Additionally, we identified further research required by us in relevant areas for the purposes of better understanding gaps in PEACCE project progress to-date.

A key concern highlighted in our Inception Report, as determined through the initial review, was that while both initiatives report good progress against the PEACCE project's agreed deliverables, currently they are macro in approach and focussed more on policy interventions than achieving tangible practical gains in on-the-ground access to efficient, affordable and clean cooling. Additionally, it was also our view that the evidence base for tangible granular impacts by SEforALL and CCC appeared to be absent in the documented project impact auditing and/or the reporting cited to date. It did not therefore enable a comprehensive understanding to be gained of the project's performance against Switzerland's international cooperation policy objectives or associated national interests.

In response to our initial findings, we set out in the full assessment stage, as presented in this Evaluation Report, to better understand and quantify the:

- increased, earlier uptake of integrated sustainable clean cooling and cold-chain solutions in developing countries as a result of the PEACCE project;
- extent to which the CCC and SEforAll Cooling for All initiatives, and 10 supported NDC facility projects, are likely to lead to "Transformational Change";

and in turn, as a result of the investment by the Swiss Government

- GHG emissions reduced or avoided – current and future projected.
- Number of people supported to better adapt to the effects of climate change (disaggregated by gender and country).

in addition to

- knowledge products (knowledge products and outreach events organized);
- outreach and influence (number of members, resource mobilization and countries reached);
- and additional funds allocated/invested at national and sub-national level.

In the interview process of this main assessment, we spoke extensively to the PEACCE project teams employed by both initiatives, as well as a representative group of their country-partners /grantees (CCC) and external parties in the sustainable cooling space[1]. It must be noted that from the perspective of the review, a concern is that much of the cooling work is conducted by a small and, for a large part, relatively nascent / non-sector community working in its own echo chamber and often from the same group of funders. For completeness, we also interviewed SDC employees involved directly in the project and, more broadly, individuals working in the development / humanitarian aid teams of the organisation.

The principal conclusion from the findings of our assessment is that, despite some delays in implementation, both the CCC and SEforAll initiatives appear to be on track against the defined project objectives. However, our evaluation has raised two fundamental concerns:

- whether there is a clear connection between the overarching SDC / PEACCE objectives and the selected initiatives?
- whether adequately robust and rigorous impact targets were set?

In our view, to determine whether both "impact" and "value for money" are being achieved through the project, in each case both initiatives need to be assessed from the perspective of:

- improving the health, nutrition and productivity of people living in developing and emerging (hot) countries;
- strengthening their resilience to increasing temperatures by promoting efficient, affordable and clean cooling adaptation;
- and meeting cooling needs with minimal environmental impact.

[1] Given the small community within the cooling development space and most parties either work together (and many funded by CCC) for different programmes, we have necessarily kept parties we talked to anonymous. They do however include the portfolio of stakeholders including government, intergovernmental agency, project delivery partners, recipients, etc. We spoke to CCC project partners in three markets - Pakistan, Burkina Faso and Vietnam

It is only then that the validity of the intervention design; synergies and effective collaboration between projects/initiatives; the agreed deliverables; and the reporting processes can be effectively assessed (currently, rather than "wins" being defined through these tangible, practical, "on-the-ground" impact and value for money perspectives, the dominant policy and communications lens sees including cooling in NDCs as a "win"). Additionally, the project data cited to date does not enable a full understanding to be gained of their tangible impact or the relationship between PEACCE activities and the aims and objectives of Switzerland's international cooperation strategy in the period 2021-24.

The conclusions drawn from the findings of our evaluation lead us to make five key recommendations to SDC. These are as follows:

1) Cooling should remain a key focus for SDC;

2) Continued SEforAll support and specifically building of in-country teams;

3) Review continuation funding for the CCC initiative (NDC facility supported by the SDC will not be continued unless fully funded by SDC, which will have to take the lead) and whether the new CCC strategy is well aligned with the SDC objectives;

4) In any future programmes, agree robust and measurable social and environmental impact targets.

5) We also suggest SDC consider whether funding could be directed towards projects developing sustainable, resilient and equitable cold-chains for food and pharma given

- their role in addressing multiple developmental challenges.
- cold-chain investments in developing countries would directly contribute to Switzerland's food and health security.

EXPERT OPINIONS ON COOLING AND COLD-CHAIN ACTIVITY

By way of scene-setting context to this Evaluation Report we here set-out a range of key sector specific insights determined from our interview discussions and own broad ranging knowledge of the cooling space.

There has been substantive work undertaken since 2016 to raise awareness of the importance of cooling in both the climate change and sustainable development space. While cooling is now a topic in the debate, it is not, however, a global priority on development and policy agendas. Likewise, there is limited financing dedicated to cooling relative to that which is being pitched into the generic renewable energy or productive use of energy space.

This is reflected by the number of people at high risk (rural and urban poor) from lack of cooling, which continues to increase and is indeed projected to grow through to at least 2030, and that cooling emissions are the fastest growing source of greenhouse gases. Despite the wins at individual project level, the community as a whole is failing on both metrics – environment and social development.

The challenge is, in our view, three-fold – 1) cooling is treated as a sub-set of other sectors (energy, food, buildings, health) rather than as a cross-cutting "theme" in its own right; 2) the focus has been on advocating for cooling to be added to policy agendas, whereas we need to transition to implementation and impact at a material scale, and; 3) the complexity of solutions.

Cooling is critical infrastructure and access to it is vital to our ability to function in the modern world, improve human well-being, boost economic growth, enable sustainable urbanization and lift hundreds of millions out of rural poverty. Without it, we would not have access to safe and nutritious food, the efficacy of medicines and vaccines would be compromised, workplaces and homes would be less comfortable for safe productive work, effective study, and pleasurable leisure, and the digital systems that underpin every aspect of contemporary life would be unable to operate.

However, despite cooling being vital to a nation's productivity, prosperity and economic well-being, it is typically absent from lists of important national infrastructure. For example, in the UK, national economic infrastructure is defined in the National Infrastructure Commission's remit as: energy, transport, water and wastewater (drainage and sewage), waste, flood risk management and digital communications. Although cooling might be considered tangentially as part of advice given on transport, energy, and digital communications, its central role to the economic functioning of society demands that it should be a distinct sector, considered in its own right by the Commission.

Critical infrastructure involves large scale physical systems formed of many physical sub-systems, the whole operating within an overall non-physical system that impacts upon it, and it, likewise, simultaneously impacts. A systems level thinking approach is therefore a prerequisite for a successful outcome to optimally planning, designing, building, operating, and maintaining such critical infrastructure to be well adapted and resilient in a hotter world.

Systemic Resilience is a property of an infrastructure system that arises dynamically when the national infrastructure is organised in such a way that it can provide agreed critical services (power, heat, communications channels, mobility services, potable water, and wastewater and waste removal) despite endogenous and/or exogenous hazards, and despite the addition, modification and removal of infrastructure components. Source: *Principles for Resilient Infrastructure*, UNDRR (2022)

It is generally agreed that we must go far beyond high-level policy interventions which so often simply focus on incremental changes in energy efficiency, or quick wins and mitigation actions such as painting roofs white. We must create a sustainable new energy, climate, economic and societal approach underpinned by cohesive, integrated, needs-driven, resource-smart, system-level strategies and the integrated solutions. To achieve this, we need to:

- Understand and delver the comprehensive need for cooling.
- Prioritize how to mitigate cooling demand through behavioral change, low-energy buildings, and cooling-informed design of new cities.
- Ensure that we have an adequately skilled workforce to design, install, and maintain efficient, clean cooling systems.
- Recognise the free, natural, and energy-waste resources that are available to help meet demand.
- Define the right mix of energy sources, natural refrigerants, thermal energy storage, cooling technologies, business models, manufacturing, maintenance regimes, end-of-life management, and policy interventions and then optimally and safely integrating all available energy resources using holistic system approaches.

However, despite this transformational need:

- NGOs are often driven by winning grant-funding and it is easier to get funding for specific projects rather than "whole systems" approaches.

- Cooling is typically spread across numerous government departments which means it is difficult to co-ordinate or get championed at the highest levels in a joined-up approach.

- A material problem is that when governments think about energy and energy storage, they continue to default to electricity and batteries rather than "thinking thermally".

- Cooling and cold-chains are complex. They require a knowledge of thermodynamics and mechanical engineering; chemical engineering; food and vaccine and health protocols etc. for sustainable and impactful solutions. NGO teams need technical competency at the highest level (not as advisors) as well as policy and advocacy. Likewise, delivery has to be underpinned by building competent workforces.

- There is a lack of clarity on equipment deployed, or emissions from cooling, while projection efforts on the scale of the cooling challenge are based on these poor historical equipment trends. They do not capture the unmet needs nor consider how these needs will change with often highly localised drivers. The current projections therefore have a high tendency to underestimate the actual size of the cooling provision that is needed to achieve developmental targets. They also do not provide a clear understanding about what the cooling provision will look like in the future, particularly as it becomes more widely adopted as a climate change adaptation strategy for dealing with higher seasonal ambient temperatures and more frequent and intense heatwaves, and whether we are embedding the right solutions given the lifetime of equipment.

  This is compounded by limited work on the implications of climate change adaptation on cooling need and the associated costs. As we miss Paris targets and have to manage climate adaptation, this will further increase cooling demand – volume of equipment, rating, and operational hours.

- At the current rate of emissions, we have a carbon budget of approximately 5 -10 years. That is not long enough to carry out extensive real-world trials, so we need to use virtual models to "accelerate time" and discover what the future might look like if we do certain things. This capability can extremely be valuable to policy makers and regulators who set the rules. Currently, cooling and cold-chain services are largely delivered by the private sector, which primarily puts more value on the financial return of their investment over social and environmental impacts. The broader benefits of access to cooling are typically treated as a "soft win", rather than the core driver for provision. These benefits often translate to reductions in other costs or lower economic losses (e.g., reduced cost of food loss to the economy or savings for governments that subsidise energy production and consumption due to reduced cooling energy demand), and these impacts should be quantified and monetised as part of cost-benefit analyses.

  To date, these wider benefits have not been systematically assessed, hence the degree to which sustainable and resilient cooling access could enhance economic and social development is not well understood. To attract the necessary prioritisation and investment by Governments, understanding "real value" of sustainable and resilient cooling access is increasingly important by expanding the perspective beyond

reductions in energy demand and greenhouse gas emissions and by identifying and measuring its impacts across multiple dimensions.

- We disjoint developed and developing world. We specifically need to take a global approach to cold-chain development and address the disconnect between high-income and low-income countries in terms of cold-chain development and connectivity as well as policy and regulations across technologies, food, and health. We need to work together on shared goals of sustainably to improve the heat resilience of local and global supply chain infrastructure to achieve food and health security for the benefit of all their citizens, and prevent beggar-thy-neighbour strategies. Governments of high-income countries should collaboratively invest in the sustainable and equitable cold-chain development in low-income countries to achieve global food and health security and resilience, and to bring transformational change.

- Consumers don't want to pay more to buy efficient cooling equipment (although they would benefit from lower lifecycle costs) and are often constrained in developing economies by affordability criteria.

- Governments don't want to burden consumers and hamper domestic manufacturers with challenging standards, building codes and higher costs. And cooling manufacturers are slow to innovate and scale up rapidly because they don't see a market opportunity to increase revenue or profitability without regulation driving performance standards beyond Minimum Efficiency Performance Standards (MEPS).

    - Energy strategies need to consider the unique challenges and potential impacts of mass uptake of mobile heating, ventilation, and air conditioning (HVAC) and cold chains within the transport sector.

- Shortage of sufficiently skilled and trained workers in developing economies leads to poor design, installation and maintenance of equipment degrading energy performance and increasing emissions.

- Intervention can have unintended consequences which need to be understood and planned for by stakeholders.

INTRODUCTION AND BACKGROUND

Rationale for the evaluation

SDC is required to subject all projects to an external review in the second half of the project period (considering whether a further engagement in the field or with the project partners is envisaged) and this applies to the PEACCE (Promoting Efficient, Affordable and Clean Cooling to Everyone) project which has now passed its mid-point. According to SDC guidelines, the review is to be carried out by an external review team directly commissioned by the SDC and is to be based on the OECD/DAC (Development Assistance Committee of the Organisation for Economic Cooperation and Development) criteria as described below in this section of the report. The review is required to objectively assess the performance of Sustainable Energy for All's (SEforAll's) 'Cooling for All' programme and the Clean Cooling Collaborative (CCC) Nationally Determined Contributions (NDCs) Support Facility of the Climate Works Foundation against the criteria and make recommendations specific to these collaborations, as well as more broadly in terms of SDC's focus and engagement in the field of cooling.

Purpose, scope and objectives of the evaluation

The purpose of this evaluation is to inform the SDC as to whether the CCC and the SEforAll's Cooling for All initiatives are the best suitable global programmes for the organisation to fulfil its goal of contributing to access to efficient, affordable and clean cooling, as well as to set efficient, affordable and clean cooling on development and policy agendas globally, or if not, suggest alternatives.

The scope of the evaluation encompassed desks studies and literature review; and interviews with selected personnel from the two initiatives, as well as other relevant initiatives and the SDC. It including highlighting the unique selling point and niches of each initiative - both in terms of results achieved and of future opportunities - and comparing them with other relevant global programmes in the field of cooling.

The evaluation was required to be guided by, but not limited to, the indicative evaluation questions that are listed in the evaluation's Terms of Reference (ToR). The evaluators were asked to complement this list through further questions relevant to the assignment.

The timeframe to be covered by the evaluation was defined as from the start of the SDC's engagement with the two initiatives in December 2019 to September 2023.

Evaluation criteria and evaluative questions

The evaluation assessed the development relevancy of the two initiatives (CCC's NDC Support Facility and SEforALL's Cooling for All) as well as their contribution to sustainable development at global and national levels in the field of cooling. There were four key foci for the evaluation: Performance assessment; Mapping of global initiatives; Forward focussed recommendations; Assessment of partnership quality and effectiveness. Requirements for these four key foci were as follows:

Performance assessment.

Assess the performance (achievements in the past and future potential) of the two initiatives for their contribution to access efficient, affordable and clean cooling as well as to set efficient, affordable and clean cooling as a priority on the global and national development and policy agendas.

Mapping of global initiatives.

Conduct a mapping of global initiatives in the cooling sector and assess the relevance and uniqueness of the CCC and Cooling for All within this landscape of initiatives, to identify and inform the SDC on the most relevant and influential initiatives in the field of cooling.

Forward focussed recommendations.

Produce recommendations regarding the future focus of SDC's engagement in the field of cooling.

Assessment of partnership quality and effectiveness.
Asses the quality and effectiveness of the partnership with the Climate Works Foundation and SEforALL and make recommendations regarding SDC's potential future engagement in the field of cooling.

The evaluators were empowered to determine the approach and detailed methodology for the assessment to effectively achieve the purpose and objectives described above. We were, however, required to review the available documentation (progress reports, strategies, framework documents and result frameworks of the initiatives etc.) and conduct interviews with personnel from the two initiatives, as well as with a selection of the latter's implementation partners where relevant. A requirement was also imposed to analyse elements from a thematic and conceptual point of view and give a good description of the results achieved as well as the lessons learned. The evaluation had to be forward-looking and include in its conclusion recommendations for the future engagement of the CDE section of the SDC in the field of cooling.

Use of OECD/DAC criteria
All SDC project reviews must be structured according to the OECD/DAC (Development Assistance Committee of the Organisation for Economic Cooperation and Development) criteria of Relevance; Coherence; Effectiveness; Efficiency: Impact; Sustainability, and the evaluation was therefore guided by these. Details of these criteria are as follows:

- Relevance: Is the intervention doing the right things?
  The extent to which the intervention objectives and design respond to beneficiaries' global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change.

- Coherence: How well does the intervention fit?
  The compatibility of the intervention with other interventions in a country, sector or institution.

- Effectiveness: Is the intervention achieving its objectives?
  The extent to which the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups.

- Efficiency: How well are resources being used?
  The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way.

- Impact: What difference does the intervention make?
  The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects.

- Sustainability: Will the benefits last?
  The extent to which the net benefits of the intervention continue, or are likely to continue.

The relevant evaluation criteria were selected to formulate pertinent evaluation questions and, in consultation with the SDC, both the criteria and questions were refined, added to, and prioritised (see Section 3 below – Review Methodology used). The focus on, and the exclusion of, criteria is explicitly stated in this final evaluation report.

DESCRIPTION

PEACCE Project within the Swiss national policy landscape.
Through its international cooperation, which consists of three pillars covering humanitarian aid, development cooperation and the promotion of peace and human security, Switzerland contributes to reducing poverty and promoting sustainable development in developing countries. The strategy defines **four thematic priorities**:

a) creating decent local jobs.

b) mitigating and adapting to climate change.

c) reducing the causes of forced displacement and irregular migration.

d) promoting the rule of law and good governance.

The objectives and instruments of Switzerland's international cooperation contribute to these four thematic focus areas. The Federal Council sets objectives for its international cooperation strategy and for the period 2021–24 it has set the following **four objectives**:

A) Contributing to sustainable economic growth, market development and the creation of decent jobs (economic development).

B) Addressing climate change and its effects and managing natural resources sustainably (environment).

C) Saving lives, ensuring quality basic services, especially in relation to education and healthcare, and reducing the causes of forced displacement and irregular migration (human development).

D) Promoting peace, the rule of law and gender equality (peacebuilding and governance).

These four objectives are all of equal importance. They complement one another and contribute towards poverty reduction and sustainable development. Through these objectives, Switzerland will support developing countries in their implementation of the 2030 Agenda and its 17 Sustainable Development Goals (SDGs), in particular Goal 1 - to eradicate extreme poverty by 2030. International cooperation is committed to promoting gender equality and good governance in all its interventions.

Objective B of the International Cooperation Strategy 2021–24 gives the SDC a clear mandate to systematically include climate change in all its activities and support effective climate action across its entire portfolio. The strategy foresees that approximately CHF 400 million per year will be allocated for climate change mitigation and adaptation activities by the end of 2024.

The Programme Framework 2021-24 of the Global Programme Climate Change and Environment (GPCCE) now of the Section Climate, DRR and Environment (CDE) aims to realise Objective B whilst simultaneously addressing the other three objectives. It contributes to a world where the environment is preserved, global warming is limited to 1.5° C, the disadvantaged and most vulnerable people and ecosystems are resilient to climate change and its impacts, natural resources are managed sustainably, and everyone has access to clean energy.

Switzerland has a threefold interest to play an active role in responding to the global challenges of climate change and environmental degradation:

1. Switzerland has seen a temperature increase of more than twice the global average and will therefore benefit above average if the effects from global warming can be reduced to a minimum.

2. Switzerland's economy is very much dependent on other countries (import and export of goods, services and investments). Therefore, climate change impacts in other countries on the one hand can affect Switzerland's economy while, on the other hand, a large share of the Swiss ecological footprint occurs abroad, raising the need for global solutions in an increasingly interdependent world.

3. Climate change, disasters and environmental degradation threaten global progress towards development, poverty reduction and economic and political stability, which are key objectives of Switzerland's international cooperation and foreign policy and can lead to migration and displacement. As a party to the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, the Sendai Framework for Disaster Risk Reduction (2015–30) and the 2030 Agenda for Sustainable Development, Switzerland has an interest in a well-functioning international governance that finds durable solutions to global climate and environment challenges.

Switzerland has strong thematic expertise in the fields of climate change, environment, and managing and reducing disaster risks, and can add value by facilitating access to this expertise; bringing together key stakeholders; and contributing to the international policy dialogue in order to achieve systemic change in the field of climate change and environment. The nation has a longstanding experience in working with Low Income Countries (LICs) and Low-Middle Income Countries (LMICs) on environmental and climate change issues and is committed to supporting them through financial, technical and capacity building activities.

The CDE (formally GPCCE)

- mobilises thematic expertise and know-how in order to support partner countries in the development of innovations and the design of national or regional guidelines and policies.

- engages in partnerships with key stakeholders from the public administration, the private sector, academia and civil society to influence the development and implementation of policies, norms and standards at the national, regional and global levels.

- contributes to the definition of Switzerland's positions in international negotiations, policy dialogues and multilateral institutions and initiatives with the aim of promoting solutions that are practicable for LICs and LMICs and that can be widely applied in different regions of the world.

and will:

- continue to engage in the UNFCCC and other international negotiations on the topics of climate finance, adaptation and loss and damage, ensuring that the development perspective is part of the Swiss position and that it is coherent with other development policy processes.

- maintain its previous thematic focus on low carbon and climate-resilient development and the sustainable management of natural resources, streamlining and consolidating the existing portfolio, but adding new aspects. A greater focus on enhancing the science-policy dialogue, creating actionable knowledge and developing innovative financing mechanisms will be essential for upscaling action.

- enhance its collaboration with the SDC's other thematic sections (previously global programmes), the bilateral cooperation and the Humanitarian Aid in order to more systematically integrate climate change and environment across all activities and to better harness the experiences of the SDC's bilateral cooperation and feed them into policy dialogue and knowledge exchange at the global level.

- Strengthen is support for innovative approaches for sustainably managing natural resources and reducing pollution, considering the climate and environmental relevance and the impacts on livelihoods and health of increasing ecological degradation.

The CDE's activities are structured around **four strategic components**:

1. International climate and environment governance and finance.
2. Low-carbon development.
3. Climate-resilient development.
4. Sustainable management of natural resources.

These components contribute to Objective B of the International Cooperation Strategy 2021–24 (for combating climate change and its effects and managing natural resources sustainably) and the PEACCE project sits within component 2, Low-carbon development although contributes significantly to all four.

In all four components, the CDE will work either through global or regional initiatives or engage in bilateral cooperation in selected countries. Throughout the design and implementation of its activities, as well as through the participation in multilateral initiatives, the CDE will advocate for the systematic integration of gender, leave no one behind (LNOB) and governance aspects, with its target group in terms of ultimate beneficiaries being the disadvantaged and most vulnerable people. While the CDE has so far successfully supported the design and development of inclusive policies, projects and initiatives, the focus for the coming years will be on following up with their implementation.

The specific objective assigned to Strategic Component 2 of the CDE is access to affordable, reliable and clean energy for all is increased, while the sustainability of the built environment is improved, contributing to low-carbon development. By supporting increased access to clean energy for all, the CDE fosters a low-carbon built environment and by doing so believes that the wellbeing of the disadvantaged and most vulnerable people will be simultaneously increased while the quantity and intensity of Greenhouse Gas (GHG) emissions are reduced.

With rising temperatures, access to energy efficient, affordable and clean cooling will become increasingly important to ensure protection against heatwaves and access to safe food and medicines for the one billion people who are currently still at high risk due to a lack of cooling access. The CDE will work towards elevating this need to global and national policy agendas, putting a special emphasis on access to clean cooling by showcasing renewable and passive solutions with multiple climate, economic and health benefits. In all these topics, innovative approaches (e.g., circular economy, digitalisation), partnerships (e.g., with the private sector) and financing (e.g., set-up of an outcome fund, payment for services or access to cooling as a service) will be demonstrated for scaling-up and policy adoption.

Project, partnership and programme delivery

The PEACCE project aims to contribute to the implementation of the Kigali Amendment of the Montreal Protocol, which in turn aims for a phase-down of hydrofluorocarbons (HFCs), promote access to efficient, affordable and clean cooling, as well as to set efficient, affordable and clean cooling to a global priority on development and policy agendas.

The project has the following three specific objectives:

1. Efficient, affordable and clean cooling is addressed in selected countries climate policies or action plans.

2. Access to efficient, affordable and clean cooling especially for the most at risk is increased through testing and leveraging new cooling solutions and by strengthening capacities.

3. Efficient, affordable and clean cooling is elevated to a global priority on development and policy agendas, and on global financial flows.

and it is active for the period 15th December 2019 to 31 December 2024 (Phase 1).

PEACCE contributes to strengthening the resilience of people living in developing and emerging countries to rising temperatures by promoting efficient, affordable and clean cooling (See Appendix 1 for a definition and description of clean cooling). The project intends to both mitigate and adapt to climate change while improving the health, nutrition and productivity of people living in hot climates. Many developing and emerging countries would benefit from the solutions presented by Swiss experience in efficient, clean cooling in buildings (e.g. through passive design or external movable shadings which have been largely tested and proven through the SDC Indo-Swiss Programme on Building Energy Efficiency [BEEP] Project in India), agriculture and health (e.g. renewably-powered storage for food and vaccines), and the project aims to transfer knowledge and expertise in these areas through its activities.

To achieve its objectives the project supports two multilateral initiatives: SEforAll's Cooling for All platform and the CCC NDCs support facility. The SDC takes an active role in both initiatives so as to co-shape the cooling agenda and highlight thematic priorities of Switzerland, in particular to promote passive and climate-friendly solutions.

SEforAll

Launched in 2011, SEforALL is an international organization that works in partnership with the United Nations and leaders in government, the private sector, financial institutions, civil society and philanthropies to drive faster action towards the achievement of Sustainable Development Goal 7 (SDG7) – access to affordable, reliable, sustainable and modern energy for all by 2030 – in line with the Paris Agreement on climate.

SEforALL, supported by the Kigali Cooling Efficiency Program, announced Cooling for All programme in the summer of 2017. Cooling for All provides a coordination platform for access to sustainable cooling and aims to generate the evidence, partnerships, policy and business solutions necessary to deliver a faster response to provide sustainable cooling for all, as well as to reduce the energy demand needed to achieve such an outcome. It advocates both, the reduction of the demand for mechanical cooling and the uptake of the most efficient cooling solutions.

The work of the platform builds on the annual "*Chilling Prospects Report",* which was first published in 2018. The report serves as an assessment, benchmark and status update on global access to cooling. It profiles fast action in access to sustainable cooling and provides policymakers, the private sector and development financiers with tools and guidance on how to accelerate progress in priority areas.

Cooling for All provides technical support to nine countries: Bangladesh, Brazil, China, India, Indonesia, Mozambique, Nigeria, Pakistan and Sudan to integrate cooling gaps and needs into their National Cooling Plans and to address them.

CCC

CCC was set up initially to manage a financial commitment of USD 51 million by 17 foundations and individuals to support the implementation of the Kigali Amendment. It supports energy-efficient, low Global Warming Potential (GWP) cooling in developing countries and focuses not only on air-conditioning and refrigeration, but also on other climate friendly cooling solutions.

In January 2020 as part of their phase 2 programme, CCC launched the NDC support facility to provide grants to at least 10 developing and emerging countries for including efficient and clean cooling into their NDCs or other climate policies and action plans. PEACCE's financial contribution feeds into this facility. CCC plans to reward the most ambitious proposals based on: emissions reduction potential; certainty of NDC or climate action plan commitment; suitability of implementing activities being proposed; and the co-benefits (e.g. health, poverty reduction, education) associated with the solutions.

In 2019, these two global initiatives were identified by SDC to be complementary and the most relevant and influential globally in the field of cooling in developing and emerging countries, with the CCC mainly focusing on the implementation of cooling-related activities in emerging countries through their NDC support facility; and Cooling for All mainly focusing on tracking progress on access to cooling and shaping national and global policy agendas and financial flows.

The expected results of PEACCE during the 2019 – 2024 timeframe are:

1. Technical assistance is provided to countries to help implement efficient, climate-friendly cooling policies, standards, or programs.

2. Efficient, climate-friendly cooling implementation projects are launched.

3. Methodology for measuring access to cooling gaps and integrating the "Chilling Prospects" report recommendations into National Cooling Plans are developed.

4. Annual *Cooling for All Outlook Report* on global access to cooling is published and widely distributed, videos produced, and a communications campaign developed and launched.

REVIEW METHODOLOGY USED

Approach and criteria

Our evaluation task was to understand the targets of the programmes when they were designed and track progress to date (end of 2022) in achieving those goals; the confidence in meeting (or exceeding) targets to be achieved by the end of the programme (30 June 2024); and the projected legacy impact (i.e., out to 2025 or even 2030). We did this against the eight criteria below:

1. *Relevance and strategic fit* – the extent to which the objectives are aligned with SDC's strategy and objectives and PEACCE programme objectives.
2. *Validity of design* – the extent to which the project design and strategy remain valid to SDC's strategy and objectives and PEACCE programme objectives.
3. *Risks and assumptions* – the extent to which external conditions were identified to achieve expected outcomes.
4. *Programme effectiveness* – the extent to which the project delivers the expected outcomes and builds synergies with other relevant projects.
5. *Effective use of resources* – the extent to which the financial and human resources are used effectively to achieve desired results.
6. *Programme efficiency* – how efficiently are the inputs converted into outputs.
7. *Robust impact measurement* – the extent to which the positive and negative impacts caused by the project are adequately measured and reported.
8. *Sustainability* – the extent to which the project benefits are likely to continue/be maintained beyond project completion.

Specifically, though, we wanted to understand how they are measuring and tracking impact against economic, environmental, and social sustainability. Ideally the project partners will have appropriate and quantifiable measures/indicators being captured, but if not (or if not comprehensive) we defined these with them, inter alia. The key is to measure/track not only the economic dimension – that generally focuses on the energy efficiency gains, but also to properly understand the social and environmental benefits within an integrated whole.

Example outcomes include:

- Improved livelihoods.
- Increased uptake of integrated, fit for purpose, sustainable, clean and equitable cooling and cold-chain solutions in relevant countries.
- Strengthened capacity to facilitate uptake of sustainable cooling and cold-chain solutions, and to ensure continuity of functionality and optimised performance of solutions.
- Improved understanding of sustainable cooling and cold-chain solutions in specific markets which can lead to transformational change.
- Enhanced capacities to implement policies, programmes, and investment plans.
- Improved skills and technical capacity within country to implement sustainable cooling and cold-chain solutions through capacity building.
- Increased access to, energy efficient and climate friendly cooling and cold-chain solutions for food and vaccines including use of passive cooling.
- Improved climate-adaptive capacity and resilience.
- Support leveraged by stakeholders (disaggregated by capital incl. equipment and resource).

Indicators

Through our evaluation we wanted to assess the following key indicators:

- As a first step, the level of understanding of societal and individual cooling and cold-chain needs within the socio-economic-political landscape context.
- The level of understanding of the economic, environmental, and social benefits of the programme.
- Knowledge products (knowledge products and outreach events organized).
- Outreach and influence (number of members, resource mobilization and countries reached).
- Additional funds allocated/invested at national and sub-national level.

Specific indicators should include, inter alia, the following:

- Number of people (disaggregated by country and gender) supported to better adapt to the effects of climate change.
- Greenhouse gas emissions reduced or avoided.
- Increased efficiency in the use of resources due to improved availability of sustainable cooling and cold chain solutions (including passive cooling) to deliver environmental benefits.
- Value of Energy efficiency savings and how they are delivered (e.g., mitigating the need for active cooling and making "best use" of available natural, "free" and waste resources.).
- Number of macro level tools developed and applied for gaps and needs analyses and impact assessment (disaggregated by countries).
- Increase in policy and technical capacity within country on sustainable cooling and cold chain solutions to deliver systemic change (and de facto alignment to market need).
- Number of knowledge bases created through needs and impact assessments, as well as models and other tools developed (disaggregated by countries).
- Increase in skills and technical capacity (including by stakeholder group, for example farmers, gender etc.) for sustainable cooling and cold chain solutions.
- Number of technicians trained to maintain cooling and cold chain facilities in partner countries (disaggregated by countries and gender).
- Reduced dumping of inefficient equipment (disaggregated by country).
- Increased uptake in energy efficient and climate friendly equipment (disaggregate by country).
- Societal wins, such as
    - → Number of farmers reporting improved post-harvest practices, food processing, storage and transportation (disaggregated by gender).
    - → Increased income of farmers due to reduced food loss leading to increase in value sales.
    - → Value of food saved due to deployment of new technologies by farmers.
    - → Value created and captured.
    - → New jobs created.
    - → New business opportunities and activities.
- Number of reports published to further understand sustainable cooling and cold-chain solutions.
- Number of demonstration activities completed.

Evaluation design

Process and methodology.

SDC wishes to understand whether the CCC's NDC Support Facility and SEforAll's Cooling for All initiatives are the best suitable global initiatives to fulfil its goal of contributing to access efficient, affordable and clean cooling as well as to set efficient, affordable and clean cooling on development and policy agendas globally or suggest alternatives. We assessed the overall performance (achievements in the past and future potential) of the two projects/initiatives against their planned outcomes and outputs to understand lessons learned and generate recommendations, see Figure 1. The assessment provided analysis according to eight criteria that we have ourselves developed and which go beyond the six criteria of the OECD/DAC, 'OECD/DAC Plus' as described below. *Please see Appendix 3 for the mapping of the OECD/DAC questions provided by SDC onto our OECD/DAC Plus questions.*

While we conducted, as required, desk-based research of the project teams, their programmes and the impact and sustainability, our aim was to ensure we maximised the opportunity to gather qualitative insights from the programme operators, the recipients and the wider community. Through these engagements – and while we are sector experts and can create extensive understanding and key areas of investigations - we wanted to ensure that we built the report on wider industry inputs. A key area of the work was also to enable SDC to understand the wider cooling activity, investments and initiatives and indeed the material differences between "cooling for comfort and safe environments to live and work" and "cold-chain for food and health".

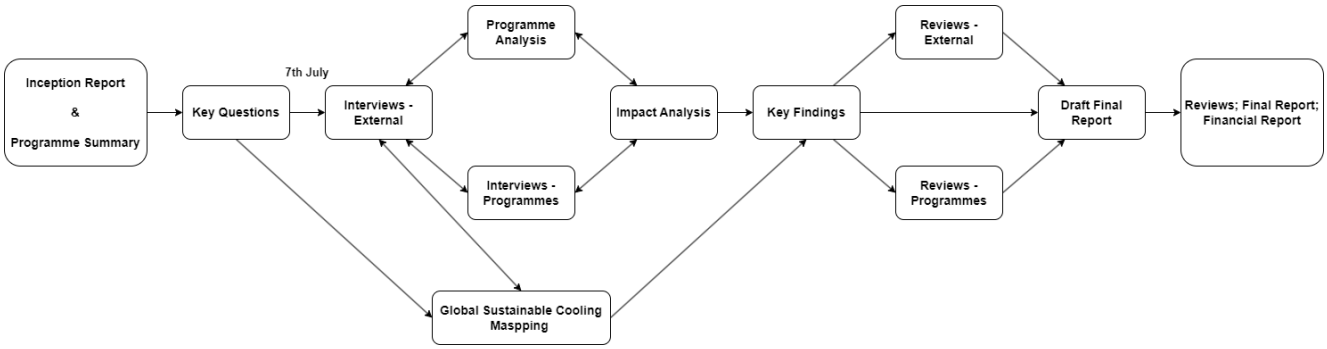


Figure 1: Process flow diagram for our approach and methodology.

OECD/DAC Plus Criteria framework.

We expanded and slightly modified, where necessary, the OECD/DAC criteria to cover additional dimensions. These changes and additions included:

- We considered the "coherence" criterion under "relevance and strategic fit".
- An additional criterion, "validity of design", was created to assess the validity of projects/initiatives throughout the programme cycle and future phases.

  Validity of design is the extent to which the project design, logic, strategy, and elements are/remain valid vis-à-vis problems and needs. This is different to the **sustainability** criterion, which is the extent to which adequate capacity building of social partners has taken place to ensure mechanisms are in place to sustain activities and whether the existing results are likely to be maintained beyond project completion.
- The criterion "robust impact measurement" was added to assess robustness of the impact measurement procedures/analyses of the projects. Within this, we wished to ensure that the Gender Equality and Social Inclusion (GESI) dimension was appropriately integrated into impact analyses, and the impact evaluation process took into account impacts of other projects to avoid double counting.
- Additional questions to better capture the GESI dimension were also added under "relevance and strategic fit" to assess the integration of GESI into the project design, and under "programme effectiveness" to assess how well the actual outcomes reflect the needs and expectations of underserved segments.
- We added the "risks and assumptions" criterion to help us assess the risk assessment and mitigation procedures of the projects.

The relationship between our eight OECD/DAC Plus criteria and the elements of projects' structures and activities is presented in Figure 2.

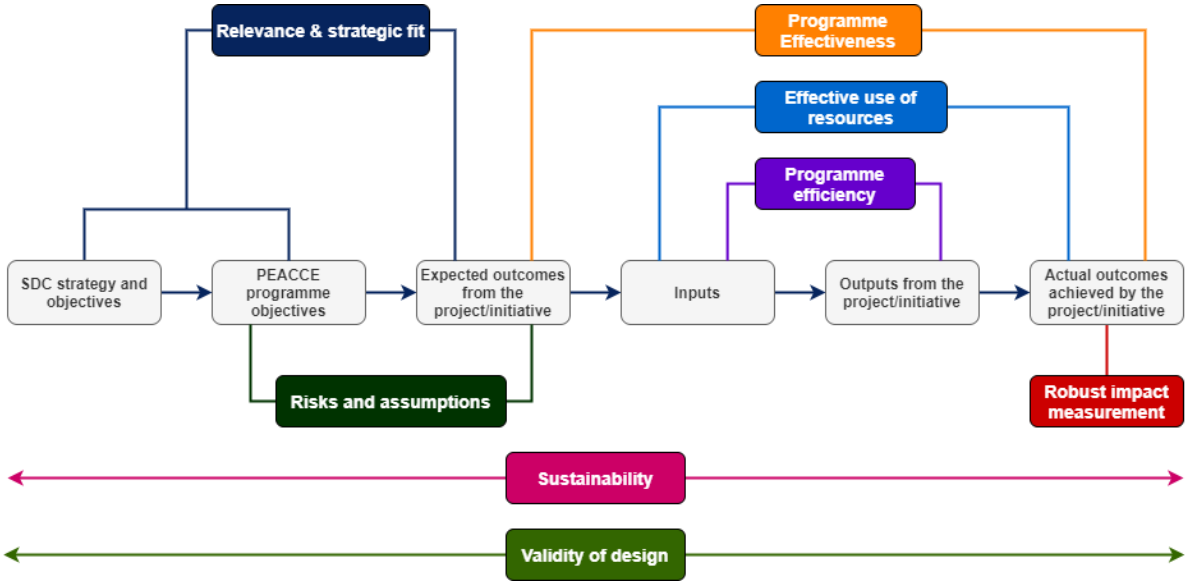


Figure 2: Relationship between our OECD/DAC Plus criteria and the elements of the projects' structures and activities.

SDC's Assessment Grid.

Table 1 is a modified version of SDC's assessment grid and is based on the OECD/DAC Plus criteria developed by the evaluation team: 1) relevance and strategic fit, 2) validity of design, 3) risks and assumptions, 4) programme effectiveness, 5) effective use of resources, 6) programme efficiency, 7) robust impact measurement, 8) sustainability.

The table was used to provide an assessment rating against the main criteria evaluated; the scores given reflect the following (1 – very low/unsatisfactory, 2 – low/below expectations, 3 – medium/meets expectations, 4 – high/above expectations, 5 – very high/excellent performance).

A separate table was prepared for each project/initiative.

Criteria	Findings and conclusion/explanation	Score (1-5)
Relevance and strategic fit		
Validity of design		
Risks and assumptions		
Programme effectiveness		
Effective use of resources		
Programme efficiency		
Robust impact measurement		
Sustainability		
Overall		

Questions.
The questions addressed in the evaluation against each OECD/DAC Plus criteria are listed in Appendix 3, which also includes the mapping of the OECD/DAC questions provided by SDC onto our OECD/DAC Plus questions.

GLOBAL SUSTAINABLE COOLING MAPPING

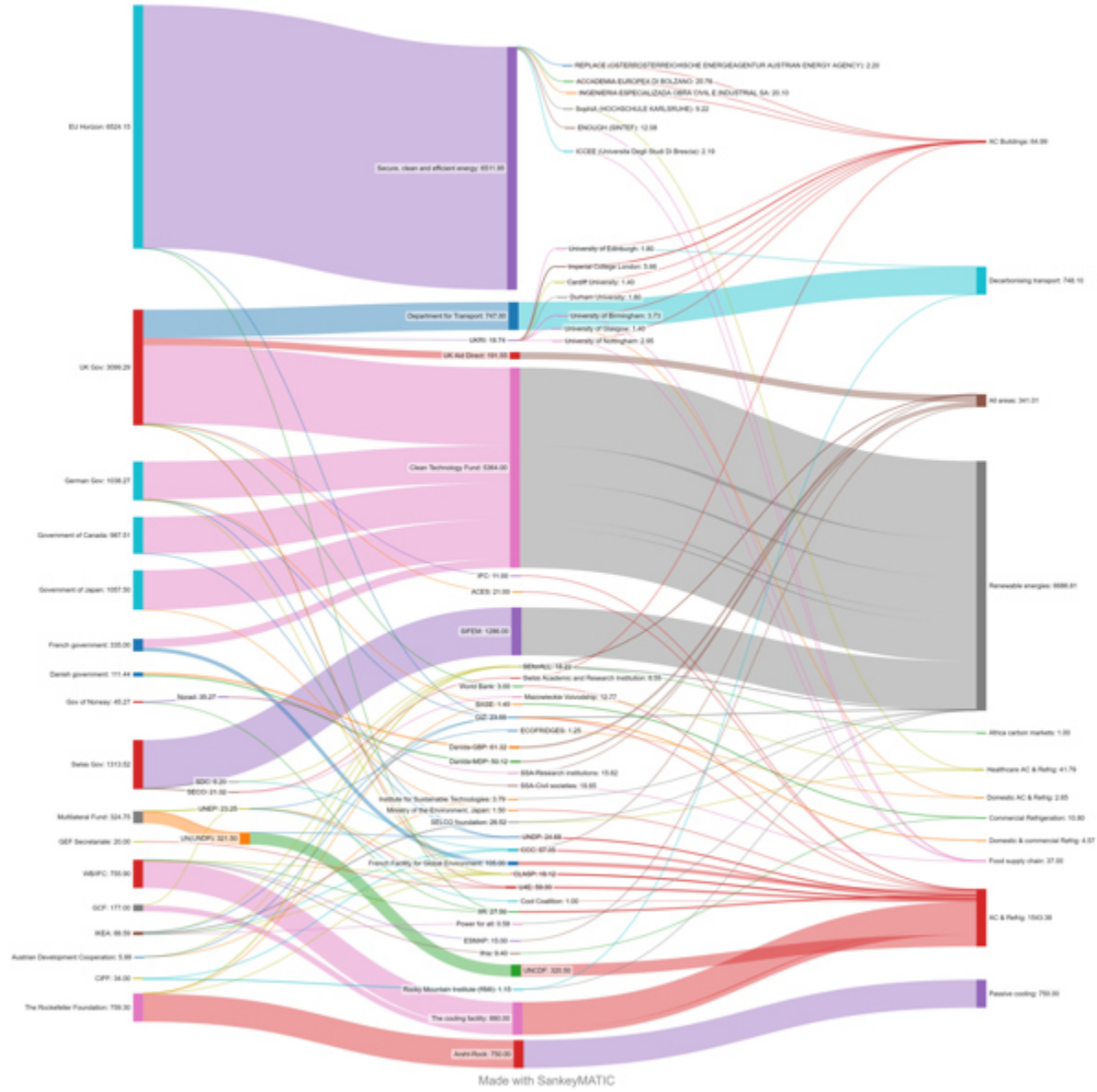


Figure 3: Sankey diagram – global sustainable cooling funding stream map (© Centre for Sustainable Cooling). See appendix 7 for enlarged version.

An integral part of our evaluation has been a review and mapping (desk-based and existing library) of clean cooling initiatives globally with a value ~$3-4M (or that are transformational if under this value) and a comparison with those in which SDC has invested through the PEACCE project.

Our main findings include:

- The highest value allocated fund is within the European Union's Horizon 2020 programme and has made €5931.20 million (US$ 6511.95 million) available through the ''SOCIETAL CHALLENGES -*Secure,*

clean and efficient energy'' theme. However, this funding stream not only addresses cooling programmes, but also other energy-related topic areas. Hence, the amount allocated for cooling is much lower than US$ 6511.95 million. The Sankey diagram below, Figure 3, illustrates six example programmes receiving funding.

- The UK Government has allocated about US$3100 million- US$2087 million to the Clean Technology Fund (CTF) which focuses on renewable energy technologies (not cooling specific), US$747 million for decarbonising the transport sector (this includes all types of transport), and about US$192 million through the UK's Aid Direct programme.
- Governments of Germany, Canada and Japan have allocated around US$1000 million each into CTF.
- The Swiss Government contributed over US$1300 million, with US$1286 million allocated through the Swiss Investment Fund for Emerging Markets (SIFEM) (which is a financing programme for private sector projects in eligible countries to invest in renewable energy infrastructure - not limited to cooling), and the remaining through SECO and SDC.
- The World Bank (WB) and Green Climate Fund (GCF) allocated about US$880 million to finance the cooling facility programme (US$723 million from the WB and US$157 million from the GCF).
- The Rockefeller Foundation funded the Arsht-Rock programme (the Cool Capital Stack), with a US$750 million investment pipeline to address the urgent climate crisis of extreme heat by utilising passive cooling techniques.

All funder contributions are presented in Figure 3, which shows that renewable energy received the highest allocation of US$66,86 million (note that this funding amount does not represent the total worldwide investment in the sector and the totals amount is not all related to cooling). In contrast, air conditioning and refrigeration for all sectors received about US$1,543 million (with US$880 million allocated from WB and GCF finance programme). Other areas such as passive cooling, decarbonising transport, buildings air conditioning, healthcare air conditioning and refrigeration and food supply chains received US$750, US$748, US$65, US$42 and US$37 million, respectively.

The limitation of this evaluation is the difference in the time frame across funds, as well as the need for some programmes to be broken down to distinguish between activities that specifically fund cooling and those that support energy topics (heat and electricity) but are not related to cooling.

Cold-chain programmes

According to 3rd party input, there is a fast-growing number of parties working on separate pieces of the puzzle but are very siloed with hardly any sharing of insights. Core efforts have been on promoting cold chain technology for smallholder farmers in emerging markets and experimenting with different business and finance models. Some were undertaken from an energy-access perspective; others from a food angle. Results have been varied. For example, 95% of farmers who live within 1km of cold stores deployed in Rwanda by the World Bank do not use them. Limited work on vaccine cold-chains.

- The Africa Centre of Excellence in Sustainable Cooling and Cold-chain (ACES) is viewed as the only programme taking a system of systems approach, working collaboratively and looking at food *and* vaccines. The programme is developed by the Governments of Rwanda and the United Kingdom (UK); the United Nations Environment Programme; the UK's Centre for Sustainable Cooling (CSC) bringing together a consortium of leading UK and international universities, and the University of Rwanda. Funding and support to date exceed US$25M with further funding approved. Two further Centres are in development in India, in the states of Telangana and Haryana[2]. Although CSC has a strong technological and energy underpinning, to bridge the gap between technological breakthroughs and practical implementation we place equal focus on the essential non-technological aspects - finance, business models, policy and behavioural challenges. Solutions need not only to be technologically sound but financeable, integrated into processes, underpinned by skilled workforces, enabled by the right policies and be accepted by end users.

[2] The programme is developed and led by two of the report authors.

- Another initiative that aims to take a holistic approach is Cool Move. However, it is still in development and has no funding / formal mandate. ACES is currently supporting Cool Move to help get it established. It is intended to become a co-ordinating mechanism for the many parallel initiatives - providing an umbrella structure to connect the dots between existing projects, enable them to scale, and ensure that new interventions can be ideated to complement the current players and instruments (services in the field).

- At the project level, parties include PEF, WWF, GIZ, Bopinc, Enviu, Open Capital Advisors, European investment bank, Danfoss, DanChurch, UN-organisations (UNEP, FAO etc), Efficiency for Access (EforA), CLASP, BASE-energy,MerciCorp, TradeMark Africa, Flying Swans, IDH GCCA/WFLO (with American government), Pegasus invest, IFC (Tech Emerge & TLC program), World Bank (through different departments, including climate, energy, agriculture and competitiveness, Asian Development Bank.

- Entrepreneurs, working to deploy solutions and seeking finance (grants, debt or equity), the likes as Ecozen, Cold Hubs, Koolbox, Purix, InspiraFarms, Celtic Cooling, Omnivent, Allround vegetables, Easyfreeze, Tessol. ATC, IjaIce, New Leaf, Lord etc.

FINDINGS

Overview

In its overall goals, the PEACCE programme is well-focused, recognising the importance of clean cooling to simultaneously meeting the world's climate and societal goals. Its ambition is to address both climate change mitigation *and* adaptation. It specifically aims to both improve the health, nutrition and productivity of people living in developing and emerging (hot) countries and strengthen their resilience to increasing temperatures by promoting efficient, affordable and clean cooling.

PEACCE puts a particular focus on the nine 'critical' countries identified in the 'Chilling Prospects' Report published by SEforALL in 2018 as having the largest populations at heat and economic risk. These are Bangladesh, Brazil, China, India, Indonesia, Mozambique, Nigeria, Pakistan and Sudan.

SEforAll has been contracted to:

- Develop a methodology for measuring access to cooling gaps and integrating the "Chilling Prospects" report recommendations into National Cooling Plans.
- Provide professional advice and technical expertise to new cooling inititiatives by the Cooling for All Secretariat.
- Publish Annual Cooling for All Outlook Report on global access to cooling and distribute widely.
- Produce videos and develop and launch communications campaign developed.

CCC has been contracted to:

- Provide technical assistance to countries to help implement efficient, climate-friendly cooling policies, standards, or programs, for Monitoring, Reporting and Verification (MRV), and/or for climate finance readiness.
- Launch efficient, climate-friendly cooling implementation projects (including new cooling solutions).
- Proposals are submitted to help developing countries secure funding for efficient, climate-friendly cooling.

The SDC funding commenced in 2020 and at that time across the 54 high-impact countries, as defined through the Chilling Prospect reports, 1.02 billion people among the rural and urban poor were identified at high risk from lack of cooling. A further 2.2 billion located in LMICs were considered to be at medium risk. In 2022, overall, across the 54 high-impact countries and 22 additional countries, the number of rural and urban poor at high risk because they lack access to cooling was 1.2 billion. Of this figure, 1.17 billion were in high-impact countries and the medium risk populations had increased to 2.47 billion.

In SEforAll's critical nine countries, the number of people at high risk (rural and urban poor) grew between 2021 and 2022 by an average of 7%, with an increase in all countries except for Indonesia. Chilling Prospects 2022 now forecasts scenarios for populations at risk through to 2030. The scenarios show that across the 54 high-impact countries, and the high-temperature regions of the additional 22 countries, current trends would result in 1.22 billion people at high risk in 2030, compared to 1.2 billion in the 2022 analysis.

In the critical nine countries identified, four have cooling goals in their NDCs (i.e., less than 50%), though we note that other policies have been adopted to a greater or less extend, Figure 4. The highest policy option adopted is the introduction of Minimum Energy Performance Standards (MEPS) for Air Conditioners (ACs), which has been adopted in the seven of the nine.

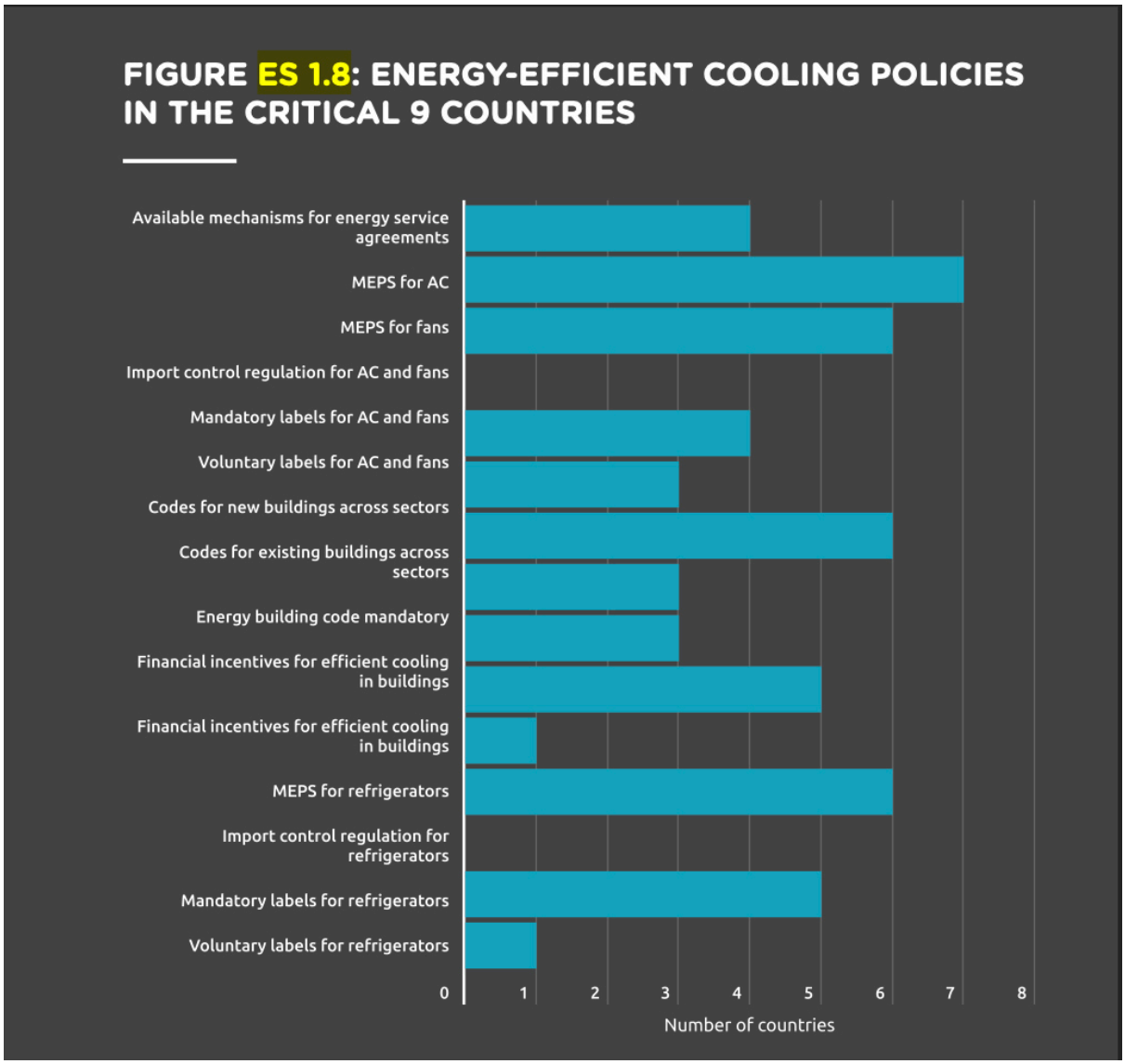


Figure 4: Figure ES 1.8 from Cooling Prosects Report 2022.

It is anticipated that the CCC and SEforAll programmes will deliver their overarching objectives and the expected results of PEACCE during the 2019 – 2023 timeframe, which are:

1. Technical assistance is provided to countries to help implement efficient, climate-friendly cooling policies, standards, or programs.

2. Efficient, climate-friendly cooling implementation projects are launched.

3. Methodology for measuring access to cooling gaps and integrating the "Chilling Prospects" report recommendations into National Cooling Plans are developed.

4. Annual Cooling for All Outlook Report on global access to cooling is published and widely distributed, videos produced, and a communications campaign developed and launched.

While these appear to be on track to deliver, other than the specific requirement to publish an annual report, there are no quantifiable targets against which to measure tangible success. We anticipate that the intended impact of the programme will **not** be fully realized across two of the three stated objectives of the PEACCE project:

Efficient, affordable and clean cooling is addressed in selected countries' climate policies or action plans: Countries will be supported to set ambitious commitments on efficient, affordable and clean cooling in their updated 2020 (2025) NDCs and climate policies.	Achieved	While on track to deliver, questions remain about ambition versus need, implementation, sustainability without continued support, and tangible deliverables on the ground.
Access to efficient, affordable and clean cooling especially for the most at risk is increased through testing and leveraging new cooling solutions and by strengthening capacities: Technical assistance and capacity building will be provided in order that countries can implement their commitments, launch new solutions and adopt best practices.	Not achieved	While there is good activity and progress, the actions are not commensurate to the size of the challenge at either country or global scales. This is, in our view, more a lack of funding than the competence of SEforAll.
Efficient, affordable and clean cooling is elevated to a global priority on development and policy agendas and global financial development flows: The topic of cooling will have gained global recognition as a key determining factor in the achievement of the Paris Agreement and the SDGs and increased public and private finance will flow into efficient, affordable and clean cooling.	Not achieved	While the cooling message is gaining awareness, it is not yet a global priority. For example, at the forthcoming COP28 (December 2023) cooling is not actually on the formal agenda as a lead topic or cross-cutting theme, but rather as a side event on Day 5.

Additionally, while the programmes report good progress against the agreed deliverables, the granular impact on health, social development, or emission 'wins' currently seems to be lacking in programme reviewing and/or reporting. This leads to two questions:

- To what extent are the social, economic and environmental impacts identified and quantified based on actual outcomes?
- Has the contribution to national/regional/global targets been identified and measured?

Both questions need to be better explored with regard to the validity of design, agreed deliverables and reporting processes, and whether there is complete end-to-end connectivity from funding through to impact measurement as assessed against:

- improving the health, nutrition and productivity of people living in developing and emerging (hot) countries;
- strengthening their resilience to increasing temperatures by promoting efficient, affordable and clean cooling adaptation);
- and reducing emissions from cooling.

This is key to enabling an understanding of the effective use of resources and how well the actual outcomes reflect the needs and expectations of underserved segments, as well as considering GESI perspectives and how the outcomes contribute to SDC's strategies etc.

Detailed findings

SEforALL

With the Kigali Amendment, the need for holistic and synergistic actions on achieving the SDGs, NDCs and Kigali Amendment targets has been recognised globally. National Cooling Action Plans (NCAPs), a global policy best practice, have gained prominence among countries beginning to develop long-term policy strategies. Starting in 2018, several countries opted to develop an NCAP with technical support from specialized agencies and address the cross-cutting nature of cooling, thereby bringing stakeholders from government, industry and academia to the table to discuss needs and possible solutions, as well as translate this into a document that would provide a roadmap for action. Building on their Chilling Progress reports and Needs Assessment Methodology, SEforALL played an important role in making sure that their tools are embedded in the design of NCAPs and that they are linked to cooling needs with a strong focus on impact. Throughout the process, SEforALL has taken a proactive approach making sure that the partners receive the needed support along the way.

Building on their foundational work and from progress to date, SEforALL quickly aimed to become more operational "on-the-ground", rather than focussed on high level engagement. One of the lessons they learned from this shift is that the programmes should be durable, in the sense that they should not be perceived by the local stakeholders as "one and done". Continued follow-up action including mobilizing funding is critical to effectiveness of the support they offer. On this point, the existence of in-country personnel has been proved to be very effective, enabling them to forge deeper relationships with the governments and other stakeholders.

SEforAll were able to place in-country personnel in Kenya and Ghana with the funding they received for their Energy Efficiency Program. Having in-country personnel resulted in an opportunity to support the governments more closely; more opportunities to deliver training; and better relationships with technical partners on-the-ground, all of which opens up new pathways to influence government policies and plans in terms of access to cooling. In the earlier phases of the programme, when they did not have in-country presence, they were reliant on other partners to use their advisory support (e.g. UNDP). As a result, access to cooling has not been effectively integrated in some of the NCAPs.

As a case study, in Kenya, SEforALL has been able to support:

- Elevating energy efficiency and cooling topics through supporting the **President, Ministers, and Governors** in providing content for speeches on local and global platforms, including sharing lessons in South-to-South learning and engagement with the Africa Union Commission.
- Advising, validating and launching of the Energy Efficiency and Conservation Implementation Plan that was developed by Kenya **with the UNEP-CCC and support from World Bank**. The plan is used as an investment readiness plan in energy efficiency pool of projects.
- Developing and convening of a **community of practice** to accelerate project realization. The community of practice includes development of an investment marketplace and training on various sectors.
- Technical assistance in strategic energy efficiency market readiness, through enhancement of communication strategies, engaging stakeholders, and developing and reviewing projects (by creating a pool of priority projects for investment, for example, Super ESCO set up; ESCOs; Grid Efficiency; Secondary School lighting upgrade project; State House energy audit - President's residence; and the Nairobi Governor's Office energy audit).

The establishment of this in-country presence created opportunities to provide more specific support to the Government of Kenya, private sector and civil society to address the opportunity of access to sustainable cooling, including:

- Creation of a community of practice of cooling with the government, private sector and civil society stakeholders to provide training on cooling for various industries and to support the development, implementation, and financing of the **Kenya National Cooling Action Plan.** Revision of the National

Cooling Action Plan to reflect access to cooling, immediate, short term and long-term implementation activities. Support to the Government of Kenya to launch the National Cooling Action Plan in June 2023.

- A partnership with IBM to use machine learning to improve the geospatial modelling of building footprints and the opportunities for passive cooling and cool roofs, with the model piloted in Nairobi.
- Agreement with the Kenya Council of Governors to provide a training program on effective strategies to mitigate urban heat, and the first commitment to the Nature for Cool Cities Challenge from Homa Bay County.
- Agreement with the Government of Kenya to provide technical support to integrate sustainable cooling into the forthcoming National Climate Change Action Plan for 2024-2029.
- Agreement from the Government of Kenya to become a Cooling Champion in support of the Global Cooling Pledge at COP 28.
- Development of communication strategy to create awareness on cooling.

In addition, the relationship with the Government of Kenya established through the in-country team played a strong role in securing Government of Kenya agreement for SEforALL to develop Kenya's Green Growth Plan. This will include a cost-effective analysis in a pathway scenario to net zero, as well as provide more evidence and political support for action, including for the mobilization of finance for sustainable cooling projects. SEforALL is now also supporting the Government of Kenya by playing leading the energy transition program for the climate summit hosted in Kenya in September.

Given these successes, SEforALL is now looking recruit in-country personnel in other nations across Africa, as well as more broadly in countries such as India and Indonesia.

Clean Cooling Collaborative

The NDC Support Facility for Efficient, Climate-Friendly Cooling (NDC Support Facility) was launched in January 2020 by CCC (CCC at that time was known as the Kigali Cooling Efficiency Program, K-CEP) with funding from several organizations, including the US$3.6 million grant from the SDC.

Through the facility, K-CEP would provide up to US$12 million in funding (with US$5 million earmarked for proposals that focus on providing support to small- to medium-sized enterprises) to support eligible Article 5 countries[3] to scale up efficient, climate-friendly cooling policies, financing, and initiatives, and to embed such solutions in their enhanced Nationally Determined Contributions (NDCs).

Technical Assistance organizations applied to receive funding from the facility via an open request-for-proposals (RFP). Throughout the seven-month RFP process—which was extended due to the Covid-19 pandemic—K-CEP received 42 proposals requesting a total of more than US$41 million in support.

Applications were subject to robust scoring criteria that were designed to select the most ambitious, impactful, and catalytic projects. Emphasis was placed on proposals that factored in existing in-country efforts and the needs of key stakeholders[4].

With support from CEA Consulting, shortlisted candidates participated in a series of interviews and other due diligence activities. To assess suitability, proposals were thoroughly evaluated by the K-CEP team, CEA Consulting, and a range of external experts, including representatives from funding partners.

In December 2020, K-CEP announced the 11 countries—Burkina Faso, Cambodia, Chile, Ethiopia, India, Jordan, Morocco, Nigeria, Pakistan, Tunisia, and Vietnam—that would receive funding from the NDC Support Facility via Technical Assistance providers.

[3] Any Party to the Montreal Protocol that is a developing country and whose annual calculated level of consumption of the controlled substances is less than 0.3 kilograms per capita on the date of the entry into force of the Protocol for it, or any time thereafter until 1 January 1999, shall, in order to meet its basic domestic needs, be entitled to delay for ten years its compliance with the control measures set out in Articles 2A to 2E,provided that any further amendments to the adjustments or Amendment adopted at the Second Meeting of the Parties in London, 29 June 1990, shall apply to the Parties operating under this paragraph after the review provided for in paragraph 8 of this Article has taken place and shall be based on the conclusions of that review.

[4] The SDC was involved in the selection of the projects would be founded from SDC's contribution.

The selected proposals covered a wide range of cooling-related activities from energy-efficient technologies and passive cooling in buildings and cities, to cold-chain improvements and national cooling-related policy development.

In total, US$7.7 million in funding was allocated to the 11 proposals, with US$2.6 million going specifically to access-focused projects. US$5 million aligned funding for SMEs manufacturers was managed and programmed by Lawrence Berkley National Laboratory.

To date, 10 out of the 11 NDC Support Facility implementing partners have included cooling in their enhanced NDCs or other long-term climate strategies. However, it is important to note that for many of the NDC Support Facility countries, cooling is a new topic and there is a significant gap/need for foundational analysis, capacity-building, and stakeholder mobilization. Countries are at various stages of that process and their cooling commitments vary.

Support includes a range of activities, such as adopting model regulations and standards, appliance replacement programs, passive cooling solutions, cold-chain improvements, and the mobilization of finance.

CCC have identified multiple risks and challenges based on the lessons learned across the NDC Support Facilities:

- Political instability
    - *Challenge* - Political changes or instability (election, coups, regional conflicts etc.) could significantly hinder the progress of technical assistance on sustainable cooling.
    - *Risk Mitigation effort* - Flexibility around project timeline and scope-of-work (SoW). CCC has established a candid and collaborative working relationship with implementing partners through regular check-ins and in-person convening, which allows challenges as such to be communicated and addressed through no-cost extensions and/or project strategy/milestones pivot.

Example(s) collected from in-country partner interviews are summarised below:

Burkina Faso	Due to the Coup in October 2022 in Burkina Faso, political changes occurred such as the forming of a new government in March, the nomination of a new permanent secretary on April 13 and of the director general of DGAHC in May. This situation of turnover in state institutions resulted in delays to some activities that needed strong support and involvement of the government in the short term. In response: • Global Green Growth Institute (GGGI) initiated meetings with new authorities to introduce them to the project. • The project team launched and conducted technical activities which did not need the strong political support of governments. • The Government was invited to chair activities, such as workshops, for increased ownership.

- Institutional shifts
    - *Challenge* - Changes in institution or ministry personnel can slow down momentum.
    - *Risk Mitigation effort* - Work to institutionalize the cooling agenda to ensure long-term commitment and continued support.

Example(s) collected from in-country partner interviews are summarised below:

Pakistan	Elections are expected later in 2023, which causes challenges for the interim government in carrying out long-term planning. In response, the team has been working closely with Ministry of Climate Change and Environmental Coordination (MoCC) to meet its targets and finalize the Pakistan Cooling Action Plan (PCAP) earlier than planned. Some actions, including approval of MEPS for commercial refrigerators, and their

	roll out for other priority cooling appliances, has been delayed due to competing government priorities.
Burkina Faso	Election of new Council members to the Order of Architects of Burkina Faso (OAB) during the second quarter of 2021 resulted in a change in the level of involvement in the Social Housing Energy Efficiency Cooling Program (SHEECP) from previous OAB leadership. GGGI discussed the level of engagement of OAB and they mutually agreed to transfer the budget and responsibility of technical assistance to the government under the SHEECP from OAB to GGGI. OAB agreed to retain responsibility for the facilitation of Community of Practice meeting contents and management of membership. A Memorandum of Understanding (MoU) has been signed to formalise this collaboration.

- Lack of quality data
    - *Challenge* - While the work is underway, grantees discover that the quality of the available data is insufficient or, sometimes, that countries lack meaningful data. This can cause delays to project implementation as grantees take time to correct or collect the data required to make technically valid recommendations. While in some cases the data might be incomplete, such as annual equipment sales numbers or average operating hours, rough estimates are often available and yield similar conclusions regarding the overall benefits and directional changes that were achieved.
    - *Risk Mitigation effort* - When engaging grantees with project scopes that include analyses and quantitative impacts, CCC works with them to understand the type of data they believe is already accessible; what data may yet need to be collected in order to proceed; and the type of methodology they will be using to document results and impact. Often, the projects include some element of data collection, typically performed by local experts which subsequently allows the data to stay in the country upon project completion.

    Example(s) collected from in-country partner interviews are summarised below:

Pakistan	For on-grid appliance data, the team worked closely with industry and gathered primary data through retail store surveys, online data scrapping, testing of products and validating the collected data with industry stakeholders. For off-grid cooling access data, the team conducted household surveys, retail surveys and product performance testing. This data was validated at a stakeholder workshop. It informed PCAP recommendations and can be built upon in the future.

- Administrative delays
    - *Challenge* - Where cooling is being built into national agendas for the first time, a considerable amount of time can be needed to formalize institutional agreements such as an MoU, mobilize government stakeholders, conduct baseline studies etc. This may result in longer delivery times and impact horizons.
    - *Risk Mitigation effort* - Flexibility around project timeline and scope-of-work (SoW). CCC has established a candid and collaborative working relationship with implementing partners through regular check-ins and in-person convening, which allows challenges to be communicated and addressed through no-cost extensions and/or project strategy/milestones pivot.
- Ongoing finance
    - *Challenge* - The need for additional finance to continue advancing clean cooling.
    - *Risk Mitigation effort* - Finance mobilization elements have been embedded in several NDC Facility projects; implementing partners are working on the development of proposals for additional public, private, and/or philanthropic funding to help finance ongoing efforts.

NOTE: ***CCC expect the NDC Facility programme not to continue into another phase. The reason we have been given for this position is that the organisation shifted its strategy in 2021 and is now focused on energy efficiency in priority geographies of India, US, China, and Southeast Asia. Therefore, CCC believe that undertaking another NDC Facility launch which is more global in nature is not quite in line with their current 4-year strategy[5]. However, they still see value in continuing work if there is funder interest, for example:***

- Model regulations. CCC fund UNEP's United for Efficiency (U4E) project to lead the process to develop model regulations for key categories of cooling equipment (e.g., room ACs, household refrigerators, ceiling fans, and commercial refrigerators). These model regulations have been used by developing countries around the globe and incorporated in whole, or as a starting point, into MEPS and labels (here you can find U4E's assessments of country-level savings potential). The funding for local adoption of these model regulations has come from other funders, such as the UK government's Department of Environment, Farming and Rural Affairs (DEFRA). (CCC has, and will continue, to provide support for its focal countries to adopt/update their efficiency standards and product labelling requirements.)

  The Swiss Government could continue to provide funding to ensure the model regulations are updated and that new versions are developed for, inter alia, off-grid refrigerators, evaporative coolers etc., and make direct grants to local implementation partners.

- Deployment of super-efficient fans in India. Work to develop the market for super-efficient fans, currently focused in India, will have substantial spillover potential and with additional funding CCC believe they could expand this work into other countries in the SE Asian region and elsewhere.

- Cool roofs. CCC is carrying out a lot of work to increase the adoption of cool roofs and continues to explore project opportunities to expand this activity in selected geographies:
  - India. Cool roof solutions are being advanced by various partners (NRDC, Mahila Housing Trust, CEPT University, RMI, etc.) in India with various degrees of success. To achieve impact at scale, additional work needs to be done building on the ongoing efforts, including data collection on performance, testing/rating and certification, market segmentation with viable business models, and synchronizing cool roof efforts with comprehensive urban cooling work at city and national level.
    - CCC is supporting Mahila Housing Trust to implement cool roofs and other passive cooling measures in the city of Jodhpur as part of the Jodhpur Heat Action Plan implementation.
    - CCC is in discussion with CEPT University and NRDC to conduct a scoping study for setting up a cool roofs rating entity in India (with possibility to expand to other countries in the global south) to spur responsible growth of the market.
  - Indonesia. Increased support in Indonesia would support efforts to equip the country's first testing facility for solar reflective materials to ensure product quality and performance, as well as provide opportunities for collaboration with affordable housing developers to demonstrate affordable, modular housing design with cool surfaces integrated (through Cool Roofs Indonesia's ongoing technical assistance to Ministry of Public Work and Housing).

- Cold chains for smallholder farmers in India. CCC is working to launch a comprehensive, multi-year program in early 2024 to increase access to sustainable cold chains for smallholder farmers. The initial phase will focus on agricultural clusters in two states, engaging a range of partners on market and policy linkages; farmers capacity-building; technology optimization; and financing, to deliver a 'critical mass' of successful use cases of cooling solutions suited for smallholder farmers. The aim is to generate critical momentum in market and policy activities for roll-out of the initiative at scale. (NB. We have not tested the validity of this programme).

[5] https://climateworks.box.com/s/2mkwqf0yfpi7e8u6mlt3xq34o4qhm1dp

Also CCC has been exploring grantmaking with grassroots-led, community-based organizations. Last year, they leveraged co-funding from ClimateWorks' JEDI Pilot Fund (JEDI is Justice, Equity, Diversity and Inclusion) and built out a partnership with Mahila Housing Trust to bring its on-the-ground insights and expertise into CCC's grantee community. This year, CCC is exploring potential collaboration with the Asian Coalition for Housing Rights (ACHR) and working towards a grant that will enable ACHR to implement resilience-based work (e.g. passive cooling pilots) across multiple cities in Asia, as well as enrich regional collaboration and learning in close coordination with member grassroots organizations.

Programme Evaluations

Our evaluation of SEforAll Cooling for All initiative has found that:

SEforALL currently track:

- Number of capacity building activities, knowledge of products and events organised.
- Number of countries supported.
- Additional funds allocated/invested (i.e. what has been leveraged).

They do not yet track the real impact in terms of:

- GHG emissions reduced/avoided.
- Number of people better adapted to climate change[6].
- Increased uptake of sustainable cooling solutions / what is being deployed versus. what is projected.

However, they do have plans in place to better understand the impact of their projects on target populations (taking into account the GESI dimension) as well as the impacts of access to cooling on energy consumption and emissions (direct and indirect cooling emissions, as well as those resulting from food loss and waste) compared to business-as-usual development.

SEforALL is also taking steps to improve the integration of the GESI dimension into the design and implementation of their projects. For example:

- In Ghana, they have tried to hire female trainees, giving exposure to young professionals that could play a role in the sector in the future.
- In Madagascar, they have developed a gender-oriented plan for the programme. Within this, female-led agricultural cooperatives were specifically sought out to understand what their needs and barriers are.
- At a higher level, they are also adding gender-based analytics into Chilling Prospects, and are looking to add generational, youth and senior vulnerability analytics in the upcoming years.

It is important to recognise that, to date, SEforALL has been laying the foundation to improve access to cooling and are now shifting from advocacy to putting support into driving investment. In this regard, they acknowledge that the next step will be understanding how to quantify real impacts.

It is our conclusion that SEforALL have been playing an important role in drawing awareness to access to cooling, as well as integrating cooling needs, and access issues, into NCAPs and other national plans and policies. We anticipate that if SEforALL is not involved in the process of NCAPs, while medium risk populations would likely still be addressed by other organisations, due to their close link to future growth of cooling appliance numbers, energy consumption, and cooling emissions, there is a distinct possibility that the access to cooling issue for high-risk populations would drop off policy agendas.

It is our view that there is a demonstrable link between SEforALL's contribution and the effective use of funding. Implementation of the Needs Assessment methodology has impacted the direction of NCAPs, which in turn has enabled investments to be better focused on needs. Within this, the Needs Assessment, and SEforAll's other

[6] SEforALL have identified specific projects they could support in Kenya and they are planning to track the number of people better adapted to climate change as a result of these projects once implemented.

tools that track cooling needs, have extended knowledge and capacity outside of the energy efficiency and buildings paradigm, thereby enabling increased investments in cold-chains.

Criteria	Findings and conclusion/explanation	Score (1-5)[7]
Relevance and strategic fit	SEforALL has played a significant and crucial role in raising awareness about the importance of access to cooling. While the level of granularity varied across countries (they were more successful in countries where they have in-country personnel), they have successfully incorporated cooling requirements and access issues into NCAP and other national policies and plans. However, they do not quantify the impact on (potential) GHG emissions reduced/avoided; number of people better adapted to climate change; increased uptake of sustainable cooling solutions / what is being deployed versus. what is projected. In response to this short coming, they have established plans to enhance their understanding of how their projects impact target populations, with a specific focus on considering the GESI dimension. Additionally, they aim to grasp the consequences of providing access to cooling on energy usage and emissions, including both direct and indirect cooling emissions, as well as effects on food loss and waste when compared to conventional development approaches.	4
Validity of design	As the SEforALL do not currently track impact on improving the health, nutrition and productivity; adaptation and resilience building; and environmental impact, it is our view that the validity of design cannot be assessed effectively *but we have not marked them down for this as intuitively the programme is well-designed*. However, SEforALL have successfully laid the foundation to improve access to cooling in the countries they are supporting, and in our view, further support would enable them to mobilise additional investments underpinned by evidence-based impact assessment/quantification.	4
Risks and assumptions	In the earlier phases of the programme when they did not have in-country presence, they were reliant on other partners to use their advisory support (e.g. UNDP). As a result, access to cooling has not been effectively integrated in some of the NCAPs. They are currently looking to improve the in-country presence in those nations they support.	3
Programme effectiveness	Overall, SEforALL has significantly contributed to the alignment of NCAPs with cooling needs, including the high-risk populations, emphasizing the importance of tangible impacts.	3
Effective use of resources	In our view, SEforALL's contribution has a demonstrable impact on the effective use of funding. Their Needs Assessment methodology has influenced the direction of NCAPs, leading to better-targeted investments, increased knowledge, and capacity-building in the field of cooling.	5
Programme efficiency	The milestones and outputs for programme efficiency have been achieved in terms of project agreed deliverables. However, they have identified the need to have in-country personnel in more nations to reduce their dependency on other partners and accelerate progress.	3/4
Robust impact measurement	Until now, SEforALL has been focused on establishing the groundwork to enhance access to cooling. They are currently transitioning from advocacy to actively facilitating investment in this area. Currently, evidence-based granular impact on health, social development, or emission appears to be lacking in the documented programme auditing and/or reporting. However, they recognise that the upcoming challenge will involve measuring the actual impact of their efforts.	

[7] (1 – very low/unsatisfactory, 2 – low/below expectations, 3 – medium/meets expectations, 4 – high/above expectations, 5 – very high/excellent performance). The final scoring was based on a merge of individual scoring by Toby Peters and Dr Leyla Sayin and reviewed by Dr Tim Fox

	That being said, SEforALL successfully tracked the impact indicators that was set by the grant agreement.	4
Sustainability	The programme will not continue without SEforAll's work and its grantors' funding. More support is needed to improve local capacity and ownership. One valuable insight gained from the experiences in the field is the importance of ensuring that programmes are sustainable. This means that the organization or programme should not be seen by local stakeholders as a one-time effort. It is crucial to maintain ongoing follow-up actions, including the ability to secure funding, to ensure the effectiveness of the support being provided. Kenya and Ghana serve as examples where the presence of local personnel has enabled the establishment of stronger and more enduring relationships. They are also seeking to recruit in-country personnel in other nations across Africa, as well as more broadly in countries such as India and Indonesia. SEforALL aim to continue provide evidence and political support for action, including for the mobilization of finance for sustainable cooling projects.	4
Overall	Lots of good impact and lessons learnt to go further. Overall higher than we were expecting.	4.5

See Appendix 4 for more in-depth review and comments against the full list of questions.

Our evaluation of CCC's NDC Facility has found that:

The NDC Facility is a foundational work to get cooling into a country's NDC or development of a national cooling action plan or policy agendas These lay out the importance of addressing cooling - both from a product enhancement perspective (more efficient, switch to refrigerants with lower global warming potential, as well as increasing access to this equipment. CCC equally recognises that the next stage will be implementation and impact (see note below).

CCC currently track policies and programmes that have a specific focus on access to cooling and some of their in-country partners track increase in access to cooling in their pilot projects, but not at a higher level. Furthermore, while qualitative data on diversity, equity, inclusion and justice is also collected in their mid-year and annual reports, it is not specifically built into project design and implementation and not tracked quantitatively.

While CCC currently do not track project impact on energy consumption and cooling emissions, they have recently commissioned CEA Consulting to measure the quantitative impact of CCC's grant making activities. This will include developing a GHG reporting methodology and framework, collating data and conduct ongoing monitoring, and sharing results in an annual report. Note that, currently, some NDC Facilities are collecting data/technical information for GHG reduction calculations, however some do not (such as Burkina Faso). Based on interviews:

- Pakistan collected data to establish a GHG baseline for priority cooling sectors (domestic air conditioning, fans, domestic and commercial refrigerators). The data collected included installed stock, equipment sales, and product-level data such as size, performance, refrigerants and energy consumption. This data informed forward modelling of a Business-as-Usual scenario, and various policy option scenarios to evaluate, energy, cost and overall emissions reduction benefits. Subsequently, the modelling was used to establish costs and benefits of the individual policies, actions, and interventions identified in the PCAP.
- In Jordan, data regarding GHG emissions collected after the installation of pilot installations in a school will be used to understand the impact of a scale-up of the project.

Beyond the NDC Support Facility, CCC continues efforts to increase access to cooling, particularly for those who face the greatest risks. Some key learnings CCC are integrating include:

- Designing grants/projects and building partnerships in ways that allow a more holistic approach, addressing interconnected issues that underpin communities' vulnerability to extreme heat and the lack of cooling access (e.g., poverty, lack of access to water, land rights issues, gender inequalities etc.).
- Challenging the view that climate action is either for mitigation OR adaptation. Instead, CCC is working to further integrate resilience-aligned strategies into their work on cooling.

It is our view that while CCC plays a valuable role in uniting organisations in a global effort to address the cooling challenge, this is no longer seen as a primary focus (whereas it was for K-CEP), drifting some partners back into silos. In some of our interviews, there were also questions raised whether "double counting" of impact due to cross financing although CCC state they are sensitive to this and work hard to ensure does not happen.

Criteria	Findings and conclusion/explanation	Score (1-5)[8]
Relevance and strategic fit	The NDC Support Facility allocated funds to Technical Assistance partners with the aim of scaling up clean cooling policies, financing, and initiatives in eligible Article 5 countries. Support efforts could include a range of activities, such as adopting model regulations and standards; appliance replacement programs; passive cooling solutions; cold-chain improvements; and the mobilization of finance, with emphasis on improving access for those most affected by a lack of cooling provision. However, (potential) impacts have not been tracked and quantified.	3
Validity of design	Given cooling is a relatively new topic in many of the NDC Support Facility countries, we recognise that the majority of CCC's work has been more foundational and there exists a substantial requirement for fundamental analysis, capacity development, and the mobilization of stakeholders. CCC engaged countries are in different phases of this journey and their commitments related to cooling differ. While the programme is delivering against the agreed deliverables, CCC do not currently track project impacts on improving the health, nutrition and productivity; adaptation and resilience building; and the environment, it is our view that the validity of design cannot be assessed effectively.	4
Risks and assumptions	CCC have identified risks and challenges which caused delays/sub-optimal outcomes as well as mitigation actions based on the lessons learned. In addition to requiring letters of support from key government partners at the time of application, CCC has ongoing collaboration with grantees to understand and mitigate risks as they arise. At various points throughout the grants, CCC may be advised of new challenges to the initial strategic approach and the risks those might pose to the intended project outcomes. CCC discusses the identified challenges and proposed new approaches with grantees, and shares learnings from their experiences. CCC then determines if the grant has enough flexibility built into it to make the necessary adjustments, and if not, tries to find a workable solution.	4
Programme effectiveness	CCC have made a substantial contribution to laying the essential groundwork required in NDC Facility countries to prioritize cooling in their policy agenda. Nevertheless, they have not conducted comprehensive impact analyses that would allow for a clearer understanding of the tangible benefits achieved.	3
Effective use of resources	Alongside other comments in this list, CCC plays a valuable role in uniting organisations in a global effort to address the cooling challenge. One area needs attention is that, in our view, the team do not have the technical expertise required (e.g., refrigeration experts, mechanical engineers etc.) and relies on external consultants.	3
Programme efficiency	While there are some delays, the NDC Facilities are on track in terms of project agreed deliverables.	3

[8] (1 – very low/unsatisfactory, 2 – low/below expectations, 3 – medium/meets expectations, 4 – high/above expectations, 5 – very high/excellent performance).

Robust impact measurement	The NDC Facility represents a crucial initial step in bringing the issue of cooling into policy agendas. The CCC acknowledges that the subsequent phase involves putting these policies into action and assessing their effects. Currently, the CCC monitors policies and programs with a specific emphasis on improving access to cooling, and some of their local partners assess the expansion of cooling access in their pilot projects, albeit not on a broader scale. Additionally, although qualitative data concerning diversity, equity, inclusion and justice is collected in their mid-year and annual reports, it is not inherently integrated into the design and implementation of projects. That being said, as part of CCC's refreshed strategy, CCC have developed a new results framework that provides clear trackable indicators of success[9]. In addition, as part of their grant agreements, CCC have added more detailed reporting requirements. This includes indicators such as avoided tons of CO2 and energy demand reduction.	3
Sustainability	More support is needed to improve local capacity and ownership. Based on our interviews with NDC Facility countries, it is our view that, even though willingness has been developed, governments and implementing agencies need more resources to both develop and implement cooling plans and strategies. NB: CCC expect NDC facility programme not to continue into another phase[10].	1
Overall	Programme not planned to be continued and probably needs significant uplift in resourcing to deliver sustainable impact. Overall programme was delivering as we were expecting and against the agreed deliverables	3.5

Note

Follow on support/resources. CCC state that the NDC Facility's support to countries has helped develop a pipeline of bankable projects, and grantees have been working to mobilize additional pubic/ private/ philanthropic funding for follow-on work. India, Vietnam, Ethiopia, and Morocco project teams have prepared and submitted funding proposals to various funding facilities/funders like CCAC, IKI, KOICA etc.

For example, the Morocco project team has submitted a Mitigation Activity Idea Note (MAIN) to the Swiss Foundation for Climate Protection and Carbon Offset KliK in the context of the bilateral agreement between the government of Morocco and Switzerland.

Projects team in India and Vietnam are also working to integrate cooling into existing public funding mechanism in order to unlock state/provincial public funding and/or subsidy programs for cooling projects.

Results framework. As part of CCC's refreshed strategy, CCC has developed a robust results framework that provides clear trackable indicators of success. In addition, as part of its grant agreements, CCC has added more detailed reporting requirements. For example, when a country updates it Minimum Energy Efficiency Standards (MEPS) for a product, they are required to provide impact data such at avoided tons of CO2 by 2030 and 2050, demand reduction in terms of equivalent 500 MW power plants, etc.

In addition, CCC's grantee Lawrence Berkeley National Labs (LBNL) is buying market share tracking data that enables CCC to see how the markets are improving in the key countries in which CCC works.

See Appendix 5 for more in-depth review and comments in line with questions.

[9] https://climateworks.app.box.com/s/2mkwqf0yfpi7e8u6mlt3xq34o4qhm1dp

[10] CCC stated that ""NDC Facility Phase 2" was never part of the original scope/objective – it was not designed to serve as a long-term technical assistance program for developing countries. Instead, it was designed as an opportunistic initiative meant to leverage the unique moment of COP26 to focus on the importance of cooling to meeting emissions goals set forth during the Paris Agreement.".

CONCLUSIONS

Our mid-term evaluation of the PEACCE project has assessed the performance of the CCC NDC Support Facility and SEforALL's Cooling for All platform against a modified and extended set of OECD/DAC criteria (our OECD/DAC Plus criteria set), as well as considered more broadly how effective the project is in meeting its aims and objectives to provide impact and, additionally, whether value for money is being achieved by the Swiss government. The evaluation has also examined lessons learnt and the wider context of the cooling space to ensure that future spend by the project and associated programmes is used most effectively. The conclusions that can be drawn from our work are as follows.

The PEACCE project has the following three specific objectives:

- Efficient, affordable and clean cooling is addressed in selected countries climate policies or action plans.
- Access to efficient, affordable and clean cooling especially for the most at risk is increased through testing and leveraging new cooling solutions and by strengthening capacities.
- Efficient, affordable and clean cooling is elevated to a global priority on development and policy agendas and on global financial flows.

To achieve these objectives, the project supports two multilateral global initiatives within the cooling space: SEforAll's Cooling for All platform and the CCC NDC Support Facility. SDC takes an active role in both of these initiatives with the intention of co-shaping the international cooling agenda and highlighting Switzerland's thematic priorities, in particular the promotion of passive and climate-friendly solutions.

It is SDC's intention that the desired impact of PEACCE will be realised by achieving three main outcomes, as well as through supporting selected developing and emerging countries (those most at risk and with the highest emissions reduction potential) to set and implement ambitious commitments on cooling in their national climate policies and action plans, and by mobilizing finance. Specifically:

- Countries will have been supported to set ambitious commitments on efficient, affordable and clean cooling in their updated 2020 (2025) NDCs and climate policies.
- Technical assistance and capacity building will have been provided in order for countries to implement their commitments, launch new solutions and adopt best practices.
- The topic of cooling will have gained global recognition as a key determining factor in the achievement of the Paris Agreement and the SDGs and increased public and private finance will flow into efficient, affordable and clean cooling.

To this end it was agreed that CCC would:

- Provide technical assistance to countries to help implement efficient, climate-friendly cooling policies, standards, or programs, for MRV, and/or for climate finance readiness.
- Launch efficient, climate-friendly cooling implementation projects (including new cooling solutions).
- Submit proposals to help developing countries secure funding for efficient, climate-friendly cooling.

and SEforAll would:

- Develop a methodology for measuring access to cooling gaps and integrating the "Chilling Prospects" report recommendations into National Cooling Plans.
- Provide professional advice and technical expertise to new cooling initiatives by the Cooling for All Secretariat.
- Publish Annual Cooling for All Outlook Report on global access to cooling and distribute widely.
- Produce videos and develop and launch communications campaign developed.

Given that the PEACCE project is at the mid-term stage final outcomes and outputs are clearly not available to assess, however, from the evidence cited and interviews conducted we can conclude that, despite some delays in implementation, both the CCC and SEforAll initiatives appear to be on track against the defined project objectives. That having been said, our evaluation has raised two fundamental concerns:

- whether there is a clear connection between the overarching SDC / PEACCE objectives and the selected initiatives?
- whether adequately robust and rigorous impact targets were set?

With regards to these concerns we do, however, appreciate that the project was designed in 2019/20, that is at a time when much of the cooling sector's focus was on advocating for the inclusion of the topic on policy agendas, and both grantees recognise that the next stage needs to be implementation and impact.

From our assessment, both SEforAll and CCC currently appear to be delivering against their agreed sets of deliverables. But in our view, to determine whether both "impact" and "value for money" are being achieved through the PEACCE project, in each case both initiatives would need to be assessed quantitatively from the perspective of:

- improving the health, nutrition and productivity of people living in developing and emerging (hot) countries;
- strengthening their resilience to increasing temperatures by promoting efficient, affordable and clean cooling adaptation;
- and meeting cooling needs with minimal environmental impact.

It is only then that the validity of the intervention design; synergies and effective collaboration between projects/initiatives; the agreed deliverables; and the reporting processes can be effectively assessed (currently, rather than "wins" being defined through these tangible, practical, "on-the-ground" impact and value for money perspectives, the dominant policy and communications lens sees including cooling in NDCs as a "win"). This investigation needs to be undertaken.

While both initiatives report good progress against the agreed deliverables, from our evaluation exercise (desk study and interviews) it is our view that, currently, the evidence-based granular impact on health, social development, or emission 'wins' (including disaggregated by country or gender) appears to be lacking in the documented internal project auditing and/or reporting. In turn, therefore, the project data cited to date does not enable a full understanding to be gained of their tangible impact or the relationship between PEACCE activities and the four objectives of Switzerland's international cooperation strategy in the period 2021-24, as set by the Federal Council:

- Contribute to sustainable economic growth, market development and the creation of decent jobs (economic development).
- Address climate change and its effects and managing natural resources sustainably (environment).
- Save lives, ensuring quality basic services, especially in relation to education and healthcare, and reducing the causes of forced displacement and irregular migration (human development).
- Promote peace, the rule of law and gender equality (peacebuilding and governance).

All of four of which the Swiss Government regards as equally important.

Likewise, Switzerland has identified a threefold interest in playing an active role in responding to the global challenges of climate change and environmental degradation and, therefore, it is also important to understand how PEACCE, through the CCC and SEforAll Cooling for All initiatives – or future programmes - delivers again these:

- Switzerland has seen a temperature increase of more than twice the global average and will therefore benefit above average if the effects from global warming can be reduced to a minimum.
- Switzerland's economy is very much dependent on other countries (import and export of goods, services and investments). Therefore, climate change impacts in other countries on the one hand can affect Switzerland's economy while, on the other hand, a large share of the Swiss ecological footprint occurs abroad, raising the need for global solutions in an increasingly interdependent world.
- Climate change, disasters and environmental degradation threaten global progress towards development, poverty reduction and economic and political stability, which are key objectives of Switzerland's international cooperation and foreign policy and can lead to migration and displacement.

> As a party to the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, the Sendai Framework for Disaster Risk Reduction (2015–30) and the 2030 Agenda for Sustainable Development, Switzerland has an interest in a well-functioning international governance that finds durable solutions to global climate and environment challenges.

The latter two elements in this threefold interest are fundamentally connected to the need to ensure that climate change adaptation and building capacity for resilience are an intrinsically embedded component in Swiss Government supported development programmes. A well-adapted and resilient world is essential to a nation with an economy deeply dependent on other countries for trade, services, and investment, as well as potentially a future recipient of populations migrating from climate change impacts. Cooling is a core adaptation strategy to climate change induced increases in ambient seasonal temperatures and the frequency, intensity and length of extreme heatwaves. However, to meet the third element of the government's threefold interest it is vital that such a strategy is underpinned by the adoption of efficient, affordable and clean cooling, thereby mitigating against significantly increased greenhouse gas emissions that would otherwise exacerbate Switzerland's above average warming.

Furthermore, Switzerland has strong thematic expertise in the field of climate change, including experience of passive cooling approaches in the built environment and clean cooling technologies in agriculture and health, and can add value by facilitating access to this expertise. The PEACCE project aims to transfer knowledge and expertise in these areas through its activities, however, there is little tangible evidence of this transfer taking place. Indeed, interviews with SDC employees working in the development space, as well as those engaged in Swiss Government Humanitarian Aid programmes, revealed a missed opportunity in this regard. For example, there appears to be little use being made within the PEACCE project of access to the Expert Groups of the Swiss Humanitarian Aid Unit (SHA), who have extensive expertise on passive cooling of the built environment, or the UNHCR and SDC co-convened Geneva Technical Hub (GTH).

RECOMMENDATIONS

The conclusions drawn from the findings of our mid-term evaluation of the PEACCE project lead us to make five recommendations to SDC. These are as follows:

1. Continued SEforAll support and building of in-country teams

SEforAll is a robust initiative and plays a vital role in delivering the broad sustainable development message, in contrast to others who are more narrowly focussed on promoting energy efficiency, as well as placing people at high risk due to lack of cooling access on agendas for relevant national plans and strategies. SEforAll is well positioned and engaged / respected to continue promote the update of cooling into policies, national plans and strategies. However, in the absence of SDC support, the organisation risks being exposed to inadequate funding.

SDC was the first SEforALL funder to request that the organisation to support an in-country presence, thus providing greater depth and granularity to their focus. Building on this philosophy, SEforAll was able to place in-country personnel in Kenya and Ghana with the funding they received for their Energy Efficiency Program. Having in-country personnel has resulted in an opportunity to support these national governments more closely, increased opportunities to deliver training, and improved relationships with technical partners in-country, all of which opens up new opportunities to influence government policies and plans in terms of access to cooling.

We therefore strongly recommend support is continued, but also that SEforAll is encouraged by SDC to build in-country teams. We also recommend SDC to recognise the risk of dependency if further funders are not secured.

2. Review follow-on funding the CCC initiative

The CCC NDC Support Facility is being terminating as a core programme, although we understand CCC would continue it if full financed. We and CCC have identified elements of the initiative to be continued, however, we would suggest that SDC may wish to consider alternative funding routes to maximise funding flowing directly through to targeted programmes, thereby mitigating intermediary management costs. We are unsure whether investment of the size committed by SDC would be meaningful in the new objectives of CCC where, in the view of expert external parties, the Multilateral Fund of the Montreal Protocol is the primary route to reduce climate impact of cooling in China and India.

Given the programme is not being planned to be continue unless funded outside of the core CCC programmes, we recommend SDC review not committing to follow-on funding of CCC and seeking a wider engagement with the cooling community programmes directly.

3. Improved alignment with Swiss Government overseas development strategy

Opportunities are being missed for the transfer of Swiss experience of, and knowledge and expertise in, passive cooling approaches and clean cooling technologies for clean cooling applications in the built environment, agriculture, and health domains. Furthermore, a lack of a clear recognition within the PEACCE project of sustainable cooling as a climate change adaptation strategy, as well as mitigation initiative, means opportunities for alignment with Switzerland's threefold interest in responding to climate change challenges is being missed. We recommend that a closer relationship is developed with the Expert Groups of the Swiss Humanitarian Aid Unit (SHA) and the UNHCR and SDC co-convened Geneva Technical Hub (GTH) to increase access to Swiss expertise and facilitate knowledge transfer into targeted developing countries.

4. Adopt robust impact targets

The assessment undertaken in our evaluation exercise has encountered difficulties as a result of a lack of clearly defined, tangible, evidencable targets. **We therefore recommend that in designing future projects, SDC should ensure that applicants set clear, evidencable objectives with clear indicators to assess performance**. For example:

- increased, earlier uptake of integrated sustainable clean cooling and cold-chain solutions in developing countries as a result of the project;
- extent to which the project is likely to lead to Transformational Change;

and in turn as a result of the investment by the Swiss Government

- GHG emissions reduced or avoided – current and future projected.
- Number of people supported to better adapt to the effects of climate change (disaggregated by gender and country).

in addition to

- knowledge products (knowledge products and outreach events organized);
- outreach and influence (number of members, resource mobilization and countries reached);
- and additional funds allocated/invested at national and sub-national level.

Key expanded deliverables which could be considered include, inter alia,

- Improved understanding of sustainable clean cooling and cold-chain solutions in specific markets which can lead to transformational change.
- Strengthened capacity to facilitate uptake of sustainable clean cooling and cold-chain solutions.
- Enhanced capacities to implement policies, programmes, and investment plans.
- Improved skills and technical capacity within country to implement sustainable clean cooling and cold-chain solutions through capacity building.

- Increased access to, energy efficient and climate friendly clean cooling and cold-chain solutions for food and vaccines.
- Improved farmer knowledge and skill on best-practices through capacity building.
- Increased deployment of sustainable clean cooling solutions to improve living and working conditions for urban communities.

5. Consider cold-chains in future activities

The work to date has been foundational, but while promoting energy efficiency standards etc., it will unlikely be meaningful or transformative without a substantial investment to scale-up deployment activities in the cooling marketplace.

The focus of the NDC Support Facilities is predominantly on thermal comfort and lacks cold-chain. We recommend that in planning funding strategies, SDC evaluates sustainable, resilient and equitable cold-chains for food *and* pharma, given their role in addressing multiple developmental challenges. This is also important given that cold-chain investments in developing countries would directly contribute to Switzerland's food and health security. A summary of cold-chain activity is included in global sustainable cooling mapping.

APPENDIX 1 – CLEAN COOLING

Background to the cooling trilemma

Cooling and cold chain demand is growing rapidly, especially in developing countries where most of the unmet air conditioning and refrigeration needs are and with a massive additional projected demand driven by climate change (the cooling paradox), rapid economic growth, and rising living standards. By 2030, 80% of cooling equipment is projected to be in the new developing markets; as just one example projected refrigerator stock in use in developing and emerging economies is expected to double from approximately 1 billion today to nearly 2 billion by 2030. And while today less than a third of households around the world own an air conditioner, two in every three households around the world is expected to have one by 2050.

Most cooling is highly polluting due to the climate impact of the refrigerants (hydrofluorocarbons) and the indirect emissions from energy use to run the appliances, equipment and systems. Cooling today accounts for more than 10% of global anthropogenic emissions. Equally, at an infrastructure level, the global demand for cooling is already pressuring energy systems. Space cooling alone was responsible for nearly 10% of the world's total electricity consumption in 2016 with a 300% anticipated increase by 2050 without intervention (IEA 2018). By 2050, AC units alone could account for 45% of India's peak energy demand without intervention. At the same time, hydrofluorocarbons (HFCs) from cooling and refrigeration are the fastest-growing source of greenhouse gas (GHG) emissions in the world, with existing cold chain technologies representing a third of HFC emissions and projected significant increases by 2050 without action.

Despite the growth in cooling, lack of cooling and cold-chain access is and will remain a critical development challenge that has significant implications for people's livelihoods, productivity, health, and food and nutritional security. While business-as-usual demand projections suggest more than 13 new cooling appliances will be sold every second by 2050, in a warming world, universal access to cooling is expected not to be a reality even at this rate of growth, leaving poor and vulnerable populations to suffer the consequences. Lack of cooling access also raises concerns about equity across and within countries. The burden of lack of cooling access will fall disproportionately on poor, disadvantaged, and often marginalized individuals and communities in developing countries that tend to be situated in some of the hottest parts of the Earth.

Extreme heat restricts physical functions and capabilities and reduces work capacity and productivity. It affects workers both in outdoor settings, such as the world's 1 billion agricultural workers who are regularly exposed to high temperatures, and those who work in hot indoor settings, such as the 66 million textile workers who work in manufacturing facilities and workshops without air conditioning. Research suggests that temperatures above 24–26 °C are associated with reduced labor productivity and that temperatures of 33–34 °C can reduce the work capacity of a worker operating at moderate work intensity by 50% (Kjellstrom and Maître 2019). Increased heat stress is projected by the International Labour Organization (ILO) to reduce total working hours worldwide by 2.2% and global GDP by US$2.4 trillion in 2030 (Kjellstrom and Maître 2019).

Cooling is essential to reduce food loss (as high as 50% in many countries in Africa), economically empower small-holder subsistence farmers, meet our global demand for safe and healthy and affordable food, and support the distribution of vaccines, blood etc.

- A lack of effective refrigeration and cold chain currently results in annual food losses estimated to be around 526 million tonnes, or 12%, of total global production. This is enough food to feed approximately 1 billion people in a world where as many as 828 million people suffer from hunger. In addition, it is estimated that 600 million people worldwide fall ill, and 420,000 lose their lives, from contaminated food, in part due to a lack of refrigeration.
- 736 million people today still live in extreme poverty, with about 79% residing in rural communities where they are primarily dependent on agricultural production derived from farms based on small land holdings. Integrated cold chains could increase the incomes of poor rural farmers 4-5 times, through a combination of reduced food losses and the facilitation of a switch to higher value produce as well as value-added food processing.

Alongside the social and economic impacts, the production of food which does not reach the marketplace due to inefficient or missing cold chains accounts for ~1GT CO2e GHG emissions and represents an unnecessary waste of agricultural inputs required for cultivation, such as energy, land, irrigation water and fertilisers, as well as an unsustainable drain on the world's natural resources.

In Rwanda, as an example, food loss equates to 21% of its total land use, 16% of GHG emissions, and 12% loss to its annual Gross Domestic Product. A technology audit of Rwanda's fruits and vegetables value chain, conducted by the National Industrial Research and Development Agency (NIRDA) in 2019, revealed that only 5% of businesses in the food and agriculture sector have a refrigerated truck for transport and just 9% of firms have a cold room to store fresh produce. But, only 1% of the nation's total cold storage capacity was being used for fruit and vegetables with around 72% allocated to flowers.

A lack of adequate cold storage and refrigerated transport vehicles to support medical supply chains in developing economies currently contributes to over 1.5 million vaccine preventable deaths each year. Apart from resulting in this tragic loss of human life, these infrastructure deficits are a major impediment to achieving universal vaccine access. The global financial cost of vaccine wastage due to exposure of vaccines to temperatures outside of their recommended range is estimated to be $34.1billion annually, not including the substantial physical burden and economic cost of illnesses that could be avoided by ensuring on-time delivery of effective vaccines. Estimates suggest that every dollar spent on child immunization provides around $44 worth of economic benefits in low- and middle-income countries.

Data availability on medical cold chain equipment in underserved communities remains a challenge. In 2014, a survey of 57 Gavi-eligible found that up to 90 percent of health facilities did not have access to reliable cold chain equipment that could guarantee vaccines were stored safely, of which 20 percent lacked any cold chain equipment at all[11].

Similarly, we need **'next-generation' vaccine cold-chain**s for future resilience and sustainability. The COVID-19 vaccine emergency was also a vaccine cold-chain emergency, and is set to repeat itself. Over the coming years the existing cold-chain will come under added pressure as the ever-warming planet strains cooling capacity and aging CCE needs replacement. Furthermore, the success of viral-vectored and *especially* mRNA vaccine technology for COVID-19 means future breakthroughs in vaccinology for other infectious diseases may need a cold-chain system that does not currently exist. A warming climate is expected to alter the distribution for many disease vectors (such as mosquitoes) as the conditions favour them becoming established in new geographical areas and human populations unfamiliar with the need to protect against the diseases they can confer. One academic study has estimated that over 50% of infectious diseases will undergo a significant change in their global epidemiology under the effects of a warming climate, resulting in new outbreaks of disease. Climate migration and refugees are likely to result in a geo-spatial disconnect from the existing, and relatively static, VCC of equipment that is needed to deliver stable and effective vaccine products. Scientists at the University of Brussels in Belgium and at Scripps Research in the United States published in September 2022 that climate change is causing Lassa fever to extend its deadly reach far beyond its Nigerian and West African origins. They suggest by 2070, that the number of countries across the whole of Africa that will develop the ecological conditions suitable for Lassa virus spread could drastically increase, potentially exposing hundreds of millions more people to the disease.

If current trends continue and we do not transition to equitable and sustainable cooling strategies, cooling (and the lack of cooling) will simultaneously make the Paris Agreement; the Sustainable Development Goals (SDGs); and the Kigali Amendment to Montreal Protocol unattainable. Intervention is therefore vital to deliver clean efficient, equitable cooling to all who need it and avoid lock-in through the installation of climate polluting, inefficient cooling technologies that then creates a servicing legacy for the next twenty to thirty years. Many developing countries lack the technical capacity and insights on global best practice to rapidly decrease or avoid HFC use as they transition from ozone depleting substances in cooling and cold chains. Instead, they continue

[11] Cold Chain Equipment Optimisation Platform, Gavi the Vaccine Alliance, December 2020.

to deploy conventional HFC technologies, locking-in to obsolete climate polluting technologies despite increasingly available alternatives that enable leapfrogging to more sustainable cooling and cold-chain infrastructure.

Most cooling support has been provided in an ad hoc, uncoordinated manner and often through small-scale projects with limited technical support when compared to the wider access to energy, clean energy and social investments. Given all the social and economic benefits of cooling and cold-chain but also the environmental risks, there is a clear and present major urgency for governments, development agencies and the private sector to develop and deploy sustainable, affordable, and resilient cooling solutions. Achieving equitable and sustainable cooling will require a radically different approach to cooling and cold-chain provision that starts by asking what cooling services are needed and explores ways to meet them with minimum environmental impact and cost, taking into account available renewable, thermal, and waste energy resources, synergies between processes and systems, and aggregation opportunities as well as the enabling skill, business models and policies.

What is clean cooling?

In undertaking this evaluation, it is key to understand what "Clean Cooling" is. The concept itself was developed by Professor Toby Peters and described as (https://atmosphere.cool/clean-cooling/):

"Clean cooling provides resilient cooling for all who need it without environmental damage and climate impact. It incorporates smart thinking to mitigate demand or active cooling where possible[12], is minimised, and optimal use of natural resources, and a circular economy design that includes repurposing of waste heat and cold thermal symbiosis throughout the lifespan of the cooling system.

Clean cooling meets cooling needs while contributing towards achieving society's greenhouse gas (GHG)

emissions reduction, climate change mitigation, natural resource conservation and air quality improvement. It

[12] i.e. passive cooling

necessarily must be accessible, affordable, financially sustainable, scalable, safe, and reliable to help deliver societal, economic and health goals as defined by the United Nation's Sustainable Development Goals (SDGs)."

Delivering Clean Cooling is, therefore, not simply about low GWP / energy efficient equipment but also about investing in a radical reshaping of cooling provision to design more ambitious routes to mitigation (including passive cooling) and adaptation, and management of energy use and cooling demand. Clean Cooling should facilitate a re-mapping and integration of processes, thermal energy storage and technology to achieve efficiencies and harness all resources; and it should enable new business and finance models to make cooling affordable and accessible to all. This would not be possible with a siloed or a sub-system approach.

Comprehensive Clean Cooling necessarily includes standards by which to measure the impact of cooling systems. We have produced a proprietary tool to audit Clean Cooling Solutions and we will use this, in part and where relevant, to access the programme.

APPENDIX 2 - EQUITY (HIGH-LEVEL COMMENTARY)

Approximately 1.1 billion people in the world face cooling access risks, including an estimated 470 million living in poor rural areas without access to electricity and resilient cold chains for food and medicines.

Although stark, these numbers, however, mask an underlying inequality characterised by clear gender related differences in participation in clean energy technology and development, as well as equitable energy services, that are linked to wellbeing of men and women. Energy poverty has distinct gender dimension, disproportionately affecting women and girls. As such, supporting women to develop and manage cleanner technologies and renewable energy sources would enhance national mitigation strategies, employment opportunities, poverty reduction and women's economic empowerment. To address gender issues in the energy sector, projects need to monitor non-discriminatory practices with regard to energy access and clean technologies, as well as adopt gender-inclusive, gender-balanced policies directed towards eliminating any identified inequalities.

In the case of rural communities, women and youth under age 18 are the most vulnerable groups. Rural youth are disproportionately under-nourished and lack education and training to equip them to pursue higher value-added economic opportunities beyond the traditional subsistence farming pathway. Data shows that in sub-Saharan African poverty and climate change effects are not gender neutral. While there is a growing number of innovations deployed in relation to cold-chain technologies to reduce post-harvest losses across different agricultural value chains, barriers to accessing finance among women has further impacted their ability to afford these solutions.

The design and implementation of intervention programmes should be guided by a **gender and social inclusion (GESI) framework** that seeks to ensure that project outcomes and impacts increase equality. The results criteria should identify the key performance indicators (KPIs) and develop tools to adequately capture data that needs to be monitored as part of the impact assessment.

Key principles that ensure cooling investments will deliver gender and social inclusion include:

1. Taking a GESI approach in the project that proactively addresses gender inequalities, including men's and women's differential access to assets, capacity building, finance, and any other resources that a project will utilize. Particularly attention should be paid to the most vulnerable groups;

2. Integration of GESI analyses and risk assessments into all project design and implementation that respond to distinct gender, care work, and other needs that can contribute to gender-responsive transformative and inclusive sustainable development goals;

3. Identifying and preventing potentially harmful impacts on women, men, girls and boys, including changes in livelihood, environmental degradation, and heightened violence directly or indirectly related to projects, programs or policies;

4. Accounting for specific needs of female-headed households, as well women and children within male-headed households; with a lens that understands vulnerability and marginalization within and between households;
5. Collecting sex-disaggregated data that pay attention to the heterogeneity of gender and social inclusion dimensions across project indicators to measure the investment's GESI impacts;

6. Particularly paying attention to protecting women's human rights and comply with international women's and human rights standards, treaties, and due diligence practices, and ensuring that unintended consequences which can reverse gains related to GESI are considered;

7. Providing full and complete project, program and policy information to inform and equally engage women and men in languages, forms, and ways that are culturally appropriate and easy to understand.

APPENDIX 3 – QUESTIONS TO BE ADDRESSED IN EVALUATION

The questions to be addressed in the evaluation against each OECD/DAC Plus criteria were:

Relevance and strategic fit– the extent to which the objectives are aligned with SDC's strategy and objectives and PEACCE programme objectives:

- Are the two initiatives, the best-placed initiatives to achieve the desired objective of the SDC to promote access to efficient, affordable and clean cooling as well as to set efficient, affordable and clean cooling as a priority on global and national development and policy agendas and hence contribute to the implementation of the Kigali Amendment of the Montreal Protocol, which aims for a phasedown of Hydrofluorocarbons (HFCs)?
- How well were the project's objectives aligned with SDC's strategy and objectives and PEACCE project objectives?
- Are there other initiatives/partnerships on cooling which would fit better or have stronger synergies with the SDC's priorities and programmes?
- Were the needs and priorities of the stakeholders (including national and global policies) adequately analysed, and integrated into the project design?
- How well has the GESI dimension been integrated into the project design?
- To what extent did the project provide a timely and relevant response to target stakeholders' needs and priorities?
- The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g., government, civil society, etc.) in the country of the intervention.
- To what extent did the project avoid any duplication and was in sync with the other relevant projects in-country (including other interventions of Swiss development cooperation and external interventions)?

Validity of design – the extent to which the project design and strategy remain valid to SDC's strategy and objectives and PEACCE programme objectives:

- Did the target selection remain valid throughout the project lifecycle?
- Were risk analyses implemented and were the project design readjusted when necessary?
- How the lessons learned will be implemented to further phases?
- What are the benefits of expanding the target countries in future phases?

Risks and assumptions – the extent to which external conditions were identified to achieve expected outcomes:

- Were the risks to delivering expected outcomes adequately identified, the significance of risks estimated, the likelihood of occurring assessed, and actions taken to mitigate them at the start of the project?

Programme effectiveness – the extent to which the project delivers the expected outcomes, and also builds synergies with other relevant projects:

- Which factors have positively/negatively influenced the achievements of the initiatives?
- How effective are the initiatives in linking implementation actions with policies?
- The extent to which approaches/strategies during implementation are adequate to achieve the intended results.
- Were all set targets, outputs, and outcomes achieved satisfactorily?
- The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes.
- How well did the actual outcomes reflect the needs and expectations of underserved segments, considering GESI perspectives?
- How effective was the coordination with the different stakeholders in supporting the project's objectives?
- How did the outcomes contribute to SDC's strategies?

- To what extent has the project engaged with other relevant projects for sustainable results?

Effective use of resources – the extent to which the financial and human resources are used effectively to achieve desired results:

- Is the relationship between financial and human resources and actual outcomes appropriate and justifiable?
- How effectively are the financial and human resources used to achieve the actual outcomes?
- Do the teams have the right skill-sets and expertise for delivery?
- Are there any alternatives identified for achieving the same outcomes with less resources/funds?

Programme efficiency – how efficiently are the inputs converted into outputs:

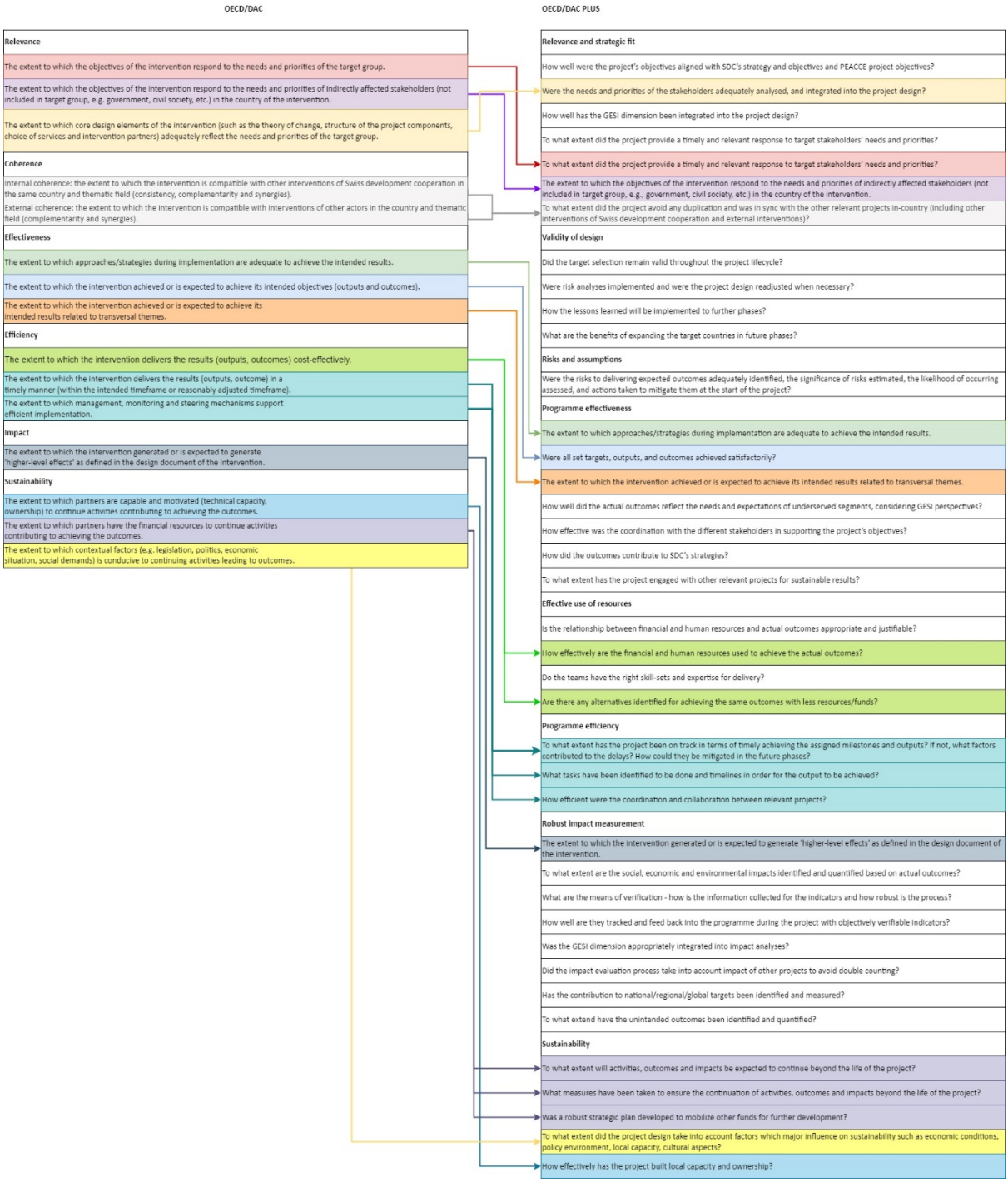
- To what extent has the project been on track in terms of timely achieving the assigned milestones and outputs? If not, what factors contributed to the delays? How could they be mitigated in the future phases?
- What tasks have been identified to be done and timelines in order for the output to be achieved?
- How efficient were the coordination and collaboration between relevant projects?

Robust impact measurement – the extent to which the positive and negative impacts caused by the project adequately measured and reported:

- The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention.
- To what extent are the social, economic and environmental impacts identified and quantified based on actual outcomes?
- What are the means of verification - how is the information collected for the indicators and how robust is the process?
- How well are they tracked and feed back into the programme during the project with objectively verifiable indicators?
- Was the GESI dimension appropriately integrated into impact analyses?
- Did the impact evaluation process take into account impact of other projects to avoid double counting?
- Has the contribution to national/regional/global targets been identified and measured?
- To what extend have the unintended outcomes been identified and quantified?

Sustainability – the extent to which the project benefits are likely to continue/be maintained beyond project completion; the extent to which the knowledge developed throughout the project support replication and scale-up:

- To what extent will activities, outcomes and impacts be expected to continue beyond the life of the project?
- What measures have been taken to ensure the continuation of activities, outcomes and impacts beyond the life of the project?
- Was a robust strategic plan developed to mobilize other funds for further development?
- To what extent did the project design take into account factors which major influence on sustainability such as economic conditions, policy environment, local capacity, cultural aspects?
- How effectively has the project built local capacity and ownership?


OECD/DAC
Relevance
The extent to which the objectives of the intervention respond to the needs and priorities of the target group.
The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g. government, civil society, etc.) in the country of the intervention.
The extent to which core design elements of the intervention (such as the theory of change, structure of the project components, choice of services and intervention partners) adequately reflect the needs and priorities of the target group.
Coherence
Internal coherence: the extent to which the intervention is compatible with other interventions of Swiss development cooperation in the same country and thematic field (consistency, complementarity and synergies).
External coherence: the extent to which the intervention is compatible with interventions of other actors in the country and thematic field (complementarity and synergies).
Effectiveness
The extent to which approaches/strategies during implementation are adequate to achieve the intended results.
The extent to which the intervention achieved or is expected to achieve its intended objectives (outputs and outcomes).
The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes.
Efficiency
The extent to which the intervention delivers the results (outputs, outcomes) cost-effectively.
The extent to which the intervention delivers the results (outputs, outcome) in a timely manner (within the intended timeframe or reasonably adjusted timeframe).
The extent to which management, monitoring and steering mechanisms support efficient implementation.
Impact
The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention.
Sustainability
The extent to which partners are capable and motivated (technical capacity, ownership) to continue activities contributing to achieving the outcomes.
The extent to which partners have the financial resources to continue activities contributing to achieving the outcomes.
The extent to which contextual factors (e.g. legislation, politics, economic situation, social demands) is conducive to continuing activities leading to outcomes.
OECD/DAC PLUS
Relevance and strategic fit
How well were the project's objectives aligned with SDC's strategy and objectives and PEACCE project objectives?
Were the needs and priorities of the stakeholders adequately analysed, and integrated into the project design?
How well has the GESI dimension been integrated into the project design?
To what extent did the project provide a timely and relevant response to target stakeholders' needs and priorities?
To what extent did the project provide a timely and relevant response to target stakeholders' needs and priorities?
The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g., government, civil society, etc.) in the country of the intervention.
To what extent did the project avoid any duplication and was in sync with the other relevant projects in-country (including other interventions of Swiss development cooperation and external interventions)?
Validity of design
Did the target selection remain valid throughout the project lifecycle?
Were risk analyses implemented and were the project design readjusted when necessary?
How the lessons learned will be implemented to further phases?
What are the benefits of expanding the target countries in future phases?
Risks and assumptions
Were the risks to delivering expected outcomes adequately identified, the significance of risks estimated, the likelihood of occurring assessed, and actions taken to mitigate them at the start of the project?
Programme effectiveness
The extent to which approaches/strategies during implementation are adequate to achieve the intended results.
Were all set targets, outputs, and outcomes achieved satisfactorily?
The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes.
How well did the actual outcomes reflect the needs and expectations of underserved segments, considering GESI perspectives?
How effective was the coordination with the different stakeholders in supporting the project's objectives?
How did the outcomes contribute to SDC's strategies?
To what extent has the project engaged with other relevant projects for sustainable results?
Effective use of resources
Is the relationship between financial and human resources and actual outcomes appropriate and justifiable?
How effectively are the financial and human resources used to achieve the actual outcomes?
Do the teams have the right skill-sets and expertise for delivery?
Are there any alternatives identified for achieving the same outcomes with less resources/funds?
Programme efficiency
To what extent has the project been on track in terms of timely achieving the assigned milestones and outputs? If not, what factors contributed to the delays? How could they be mitigated in the future phases?
What tasks have been identified to be done and timelines in order for the output to be achieved?
How efficient were the coordination and collaboration between relevant projects?
Robust impact measurement
The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention.
To what extent are the social, economic and environmental impacts identified and quantified based on actual outcomes?
What are the means of verification - how is the information collected for the indicators and how robust is the process?
How well are they tracked and feed back into the programme during the project with objectively verifiable indicators?
Was the GESI dimension appropriately integrated into impact analyses?
Did the impact evaluation process take into account impact of other projects to avoid double counting?
Has the contribution to national/regional/global targets been identified and measured?
To what extend have the unintended outcomes been identified and quantified?
Sustainability
To what extent will activities, outcomes and impacts be expected to continue beyond the life of the project?
What measures have been taken to ensure the continuation of activities, outcomes and impacts beyond the life of the project?
Was a robust strategic plan developed to mobilize other funds for further development?
To what extent did the project design take into account factors which major influence on sustainability such as economic conditions, policy environment, local capacity, cultural aspects?
How effectively has the project built local capacity and ownership?

APPENDIX 4 – SEforAll Evaluation

Relevance and strategic fit– the extent to which the objectives are aligned with SDC's strategy and objectives and PEACCE programme objectives:

- How do the initiatives achieve the desired objective of the SDC to promote access to efficient, affordable and clean cooling as well as to set efficient, affordable and clean cooling as a priority on global and national development and policy agendas and hence contribute to the implementation of the Kigali Amendment of the Montreal Protocol, which aims for a phasedown of Hydrofluorocarbons (HFCs)? 3 The question has two parts – the first is policy and deliver well, the second is impact which is not quantified in the design
- How well were the project's objectives aligned with SDC's strategy and objectives and PEACCE project objectives? 5
- Were the needs and priorities of the stakeholders (including national and global policies) adequately analysed, and integrated into the project design? 4
- How well has the GESI dimension been integrated into the project design? 2 (being implemented)
- To what extent did the project provide a timely and relevant response to target stakeholders' needs and priorities? 4
- The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g., government, civil society, etc.) in the country of the intervention. 5
- To what extent did the project avoid any duplication and was in sync with the other relevant projects in-country (including other interventions of Swiss development cooperation and external interventions)? 4

Validity of design – the extent to which the project design and strategy remain valid to SDC's strategy and objectives and PEACCE programme objectives:

- Did the target selection remain valid throughout the project lifecycle? 5
- Were risk analyses implemented and were the project design readjusted when necessary? 3 / 4
- How the lessons learned will be implemented to further phases? 3 They are currently looking to improve the in-country presence in countries they support.
- What are the benefits of expanding the target countries in future phases? 5

Risks and assumptions – the extent to which external conditions identified to achieve expected outcomes:

- Were the risks to delivering expected outcomes adequately identified, the significance of risks estimated, the likelihood of occurring assessed, and actions taken to mitigate them at the start of the project? 4

Programme effectiveness – the extent to which the project delivered the expected outcomes, and also built synergies with other relevant projects:

- Which factors have positively/negatively influenced the achievements of the initiatives? Access to cooling has not been effectively integrated in some of the NCAPs mainly due to fact that they did not have in-country presence.
- How effective are the initiatives in linking implementation actions with policies? 4
- The extent to which approaches/strategies during implementation are adequate to achieve the intended results. 4
- Were all set targets, outputs, and outcomes achieved satisfactorily? 4

- The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes. 4
- How well did the actual outcomes reflect the needs and expectations of underserved segments, considering GESI perspectives? Not tracked.
- How effective was the coordination with the different stakeholders in supporting the project's objectives? 5
- How did the outcomes contribute to SDC's strategies? - SEforALL played an important role in making sure that their tools are embedded in the design of NCAPs, making sure the NCAPs are linked to cooling needs with a strong focus on impact.
- To what extent has the project engaged with other relevant projects for sustainable results? 5

Effective use of resources – the extent to which the financial and human resources used effectively to achieve desired results:

- Is the relationship between financial and human resources and actual outcomes appropriate and justifiable? 4
- How effectively are the financial and human resources used to achieve the actual outcomes? 5
- Do the teams have the right skill-sets and expertise for delivery? 4 - The team broadly have the right skill-sets and expertise for delivery; however, we recommend building technical expertise into the delivery team rather than relying on external advisors.
- Are there any alternatives identified for achieving the same outcomes with less resources/funds? No

Programme efficiency – how efficiently were the inputs converted into outputs:

- To what extent has the project been on track in terms of timely achieving the assigned milestones and outputs? If not, what factors contributed to the delays? How could they be mitigated in the future phases? 4
- What tasks have been identified to be done and timelines in order for the output to be achieved? Having in-country personnel in more countries to support the governments more closely, build capacity, and develop better relationships with technical partners.
- How efficient were the coordination and collaboration between relevant projects? 3 (In the earlier phases of the programme when they did not have in-country presence, they were reliant on other partners to use their advisory support (e.g. UNDP). As a result, access to cooling has not been effectively integrated in some of the NCAPs.)

Robust impact measurement – the extent to which the positive and negative impacts caused by the project adequately measured and reported:

- The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention. 5
- To what extent are the social, economic and environmental impacts identified and quantified based on actual outcomes? 3 - Not tracked but can be.
- What are the means of verification - how is the information collected for the indicators and how robust is the process? 3
- How well are they tracked and feed back into the programme during the project with objectively verifiable indicators? Not tracked
- Was the GESI dimension appropriately integrated into impact analyses? No
- Did the impact evaluation process take into account impact of other projects to avoid double counting? No

- Has the contribution to national/regional/global targets been identified and measured? No
- To what extend have the unintended outcomes been identified and quantified? Not identified / tracked

Sustainability – the extent to which the project benefits are likely to continue/be maintained beyond project completion; the extent to which the knowledge developed throughout the project support replication and scale-up:

- To what extent will activities, outcomes and impacts be expected to continue beyond the life of the project? 4
- What measures have been taken to ensure the continuation of activities, outcomes and impacts beyond the life of the project? They are currently looking to improve the in-country presence in countries they support.
- Was a robust strategic plan developed to mobilize other funds for further development? 3 (SDC major funder/higher %age than want)
- To what extent did the project design take into account factors which major influence on sustainability such as economic conditions, policy environment, local capacity, cultural aspects? 4 (e.g., considering Ghana is a heavily male-dominated government and economy, they have tried to hire female trainees, giving exposure to young professionals that could play a role in the sector. Similarly, in Madagascar, they have developed a gender-oriented plan for the programme. Within this, female-led agricultural cooperatives were specifically sought out to understand what their needs and barriers are.)
- How effectively has the project built local capacity and ownership? 4

APPENDIX 5 – CCC Evaluation

Relevance and strategic fit– the extent to which the objectives are aligned with SDC's strategy and objectives and PEACCE programme objectives:

- How do the initiatives achieve the desired objective of the SDC to promote access to efficient, affordable and clean cooling as well as to set efficient, affordable and clean cooling as a priority on global and national development and policy agendas and hence contribute to the implementation of the Kigali Amendment of the Montreal Protocol, which aims for a phasedown of Hydrofluorocarbons (HFCs)? 3 While some of the countries making cooling-related commitments in their NDCs include work on implementing the Kigali Amendment and the NDC Support Facility encourages climate-friendly solutions that reduce the use of F-gasses, energy efficiency is the main focus with regards to technologies. NDC Support Facility funding was not designed to pay specifically for the phasedown of HFCs to avoid duplication of funding provided by donor governments through the Multilateral Fund (MLF) of the Montreal Protocol.
- How well were the project's objectives aligned with SDC's strategy and objectives and PEACCE project objectives? 3
- Were the needs and priorities of the stakeholders (including national and global policies) adequately analysed, and integrated into the project design? 4 (NDC projects starts with consultation with country partners to build consensus.)
- How well has the GESI dimension been integrated into the project design? 2
- To what extent did the project provide a timely and relevant response to target stakeholders' needs and priorities? 3
- The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g., government, civil society, etc.) in the country of the intervention. 3
- To what extent did the project avoid any duplication and was in sync with the other relevant projects in-country (including other interventions of Swiss development cooperation and external interventions)? 3/4 ((i) Internal: As NDC Facility is part of wider CCC community, synergies are expected.; (ii) External: For example, in Jordan, contacts have been made with a number of entities involved in supporting climate-friendly initiatives (e.g., EBRD, IFC). Several meetings have been successfully carried out with the Ministries involved (Ministry of Environment and Ministry of Energy and Mineral Resources). Meetings with EBRD Energy Team and CooluUp Program Team have been organized to investigate about potential synergies.)

Validity of design – the extent to which the project design and strategy remain valid to SDC's strategy and objectives and PEACCE programme objectives:

- Did the target selection remain valid throughout the project lifecycle? 3/2 Cold-chain is missing in many choices
- Were risk analyses implemented and were the project design readjusted when necessary? 4 Several projects pivoted (e.g., Jordan, India
- How the lessons learned will be implemented to further phases? See above for risks, challenges, and mitigation
- What are the benefits of expanding the target countries in future phases? They expect NDC facility programme not to continue into another phase.

Risks and assumptions – the extent to which external conditions identified to achieve expected outcomes:

- Were the risks to delivering expected outcomes adequately identified, the significance of risks estimated, the likelihood of occurring assessed, and actions taken to mitigate them at the start of the project? 4

Programme effectiveness – the extent to which the project delivered the expected outcomes, and also built synergies with other relevant projects: (delayed but on track)

- Which factors have positively/negatively influenced the achievements of the initiatives?
- How effective are the initiatives in linking implementation actions with policies? 3
- The extent to which approaches/strategies during implementation are adequate to achieve the intended results. 3
- Were all set targets, outputs, and outcomes achieved satisfactorily? 3
- The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes. 3
- How well did the actual outcomes reflect the needs and expectations of underserved segments, considering GESI perspectives? 2
- How effective was the coordination with the different stakeholders in supporting the project's objectives? 3
- How did the outcomes contribute to SDC's strategies? 3
- To what extent has the project engaged with other relevant projects for sustainable results? 3

Effective use of resources – the extent to which the financial and human resources used effectively to achieve desired results:

- Is the relationship between financial and human resources and actual outcomes appropriate and justifiable? 3 / 2
- How effectively are the financial and human resources used to achieve the actual outcomes? 3 / 2
- Do the teams have the right skill-sets and expertise for delivery? 3 they do not have any mechanical/refrigeration engineer in their team; however they have external consultants
- Are there any alternatives identified for achieving the same outcomes with less resources/funds? In our view yes

Programme efficiency – how efficiently were the inputs converted into outputs:

- To what extent has the project been on track in terms of timely achieving the assigned milestones and outputs? If not, what factors contributed to the delays? How could they be mitigated in the future phases? 4
- What tasks have been identified to be done and timelines in order for the output to be achieved? (See above for risks, challenges, and mitigation)
- How efficient were the coordination and collaboration between relevant projects? 4

Robust impact measurement – the extent to which the positive and negative impacts caused by the project adequately measured and reported:

- The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention. 2
- To what extent are the social, economic and environmental impacts identified and quantified based on actual outcomes? IDENTIFIED BUT NOT QUANTIFIED - 2
- What are the means of verification - how is the information collected for the indicators and how robust is the process? – N/A AS NOT TRACKED
- How well are they tracked and feed back into the programme during the project with objectively verifiable indicators? NOT TRACKED

- Was the GESI dimension appropriately integrated into impact analyses? NO
- Did the impact evaluation process take into account impact of other projects to avoid double counting? NO
- Has the contribution to national/regional/global targets been identified and measured? NO
- To what extend have the unintended outcomes been identified and quantified? NO

Sustainability – the extent to which the project benefits are likely to continue/be maintained beyond project completion; the extent to which the knowledge developed throughout the project support replication and scale-up:

- To what extent will activities, outcomes and impacts be expected to continue beyond the life of the project? 2 / 3
- What measures have been taken to ensure the continuation of activities, outcomes and impacts beyond the life of the project?
- Was a robust strategic plan developed to mobilize other funds for further development? 3
- To what extent did the project design take into account factors which major influence on sustainability such as economic conditions, policy environment, local capacity, cultural aspects? 3
- How effectively has the project built local capacity and ownership? 3 (but not sustainable – to be expected)

Appendix 6 SDC - Assessment grid

(version July 2021)

Note: this assessment grid is used for evaluations and internal assessments of SDC or SECO financed projects and programs (hereinafter jointly referred to as an 'intervention'). It is based on the OECD Development Assistance Committee evaluation criteria.[13] If specific results are not yet measurable at the time of the assessment, it requires analysing the likelihood of achieving impact and sustainability. All applicable sub-criteria should be scored and a short explanation should be provided. Additional sub-criteria may be added.

Select the corresponding number (0-4) representing your rating of the sub-criteria in the column "score":0 = not assessed; 1 = highly satisfactory; 2 = satisfactory; 3 = unsatisfactory; 4 = highly unsatisfactory

- **Highly satisfactory** (HS) – there were no shortcomings in relation to the intervention's relevance, coherence and efficiency; the objectives at outcome level were fully achieved or exceeded and are likely to have a significant impact, which will be sustained in the future.
- **Satisfactory** (S) – There were moderate shortcomings in relation to the intervention's relevance, coherence and efficiency. Most intended objectives at outcome level were achieved (or for mid-term: are likely to be achieved). The likelihood of achieving intended impact or sustainability of the intervention's benefits is reasonable.
- **Unsatisfactory** (U) – There were important shortcomings in relation to the intervention's relevance, coherence and efficiency, in the achievement of its objectives (N.B. if outputs are achieved, but do not result in the expected outcomes, consider rating relevance and/or effectiveness as unsatisfactory). The likelihood of achieving intended impact or sustainability of the intervention's benefits is questionable.
- **Highly unsatisfactory** (HU) - There were very severe shortcomings in relation to the operation's relevance, coherence and efficiency. Intended objectives have not been achieved, achievement of intended impact or sustainability of benefits are highly unlikely.
- **Not assessed** (na) – The criteria statement cannot be assessed. Please explain and provide details in the justifications section.

Title of the evaluated intervention: Promoting Efficient, Affordable and Clean Cooling for Everyone Evaluation type: Mid-term evaluation Evaluator(s): Toby Peters, Dr Leyla Sayin, Dr Tim Fox Date of the evaluation: 14.11.2023

[13] For more guidance see: Better Criteria for Better Evaluations. Revised Evaluation Criteria. Definitions and Principles for Use, OECD/DAC Network on Development Evaluation, 2019.

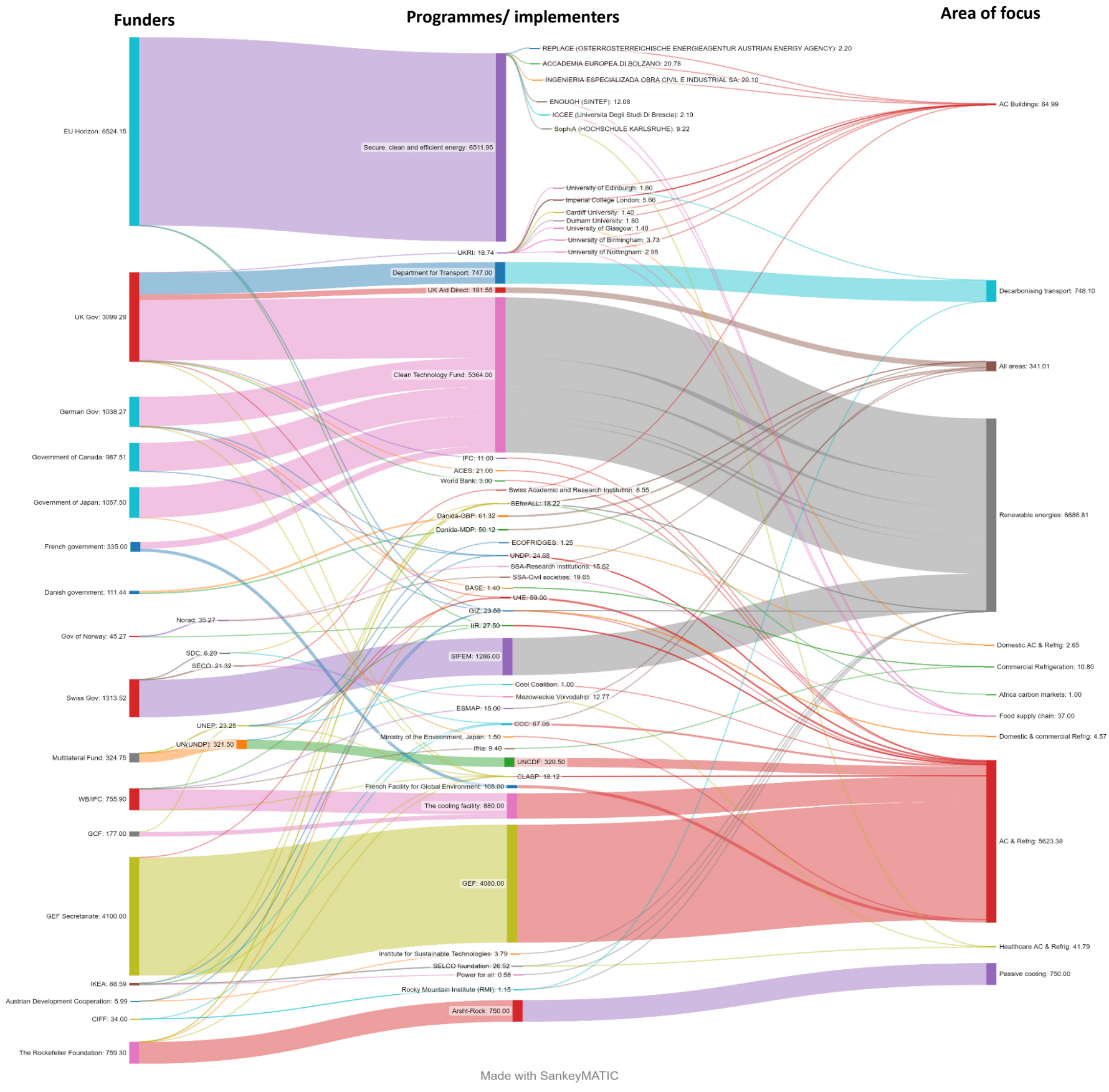
Key aspects based on DAC criteria	Score	Justification (Provide a short explanation for your score or why a criterion was not assessed)
Relevance **Note**: the assessment here captures the relevance of objectives and design *at the time of design* and *at time of evaluation*		
1. The extent to which the objectives of the intervention respond to the needs and priorities of the target group.	1 - highly satisfactory	PEACCE puts a particular focus on the countries most at risk as identified in the 'Chilling Prospects' Report
2. The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g. government, civil society, etc.) in the country of the intervention.	1 - highly satisfactory	The programmes are designed to be inclusive and affect change at government and policy level to
3. The extent to which core design elements of the intervention (such as the theory of change, structure of the project components, choice of services and intervention partners) adequately reflect the needs and priorities of the target group.	1 - highly satisfactory	Emphasis was placed on proposals that factored in existing in-country efforts and the needs of key stakeholders
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.
Coherence		
4. Internal coherence: the extent to which the intervention is compatible with other interventions of Swiss development cooperation in the same country and thematic field (consistency, complementarity and synergies).	0 - not determined	This was not explored as this is the only cooling programme
5. External coherence: the extent to which the intervention is compatible with interventions of other actors in the country and thematic field (complementarity and synergies).	1 - highly satisfactory	Both grantees actively try to be inclusive but the sustainable cooling sector is nascent and many players tend to develop and implement programmes in siloes.
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.
Effectiveness		
6. The extent to which approaches/strategies during implementation are adequate to achieve the intended results.	3 - unsatisfactory	While the projects are delivering their objectives, the reviewers feel that the objectives set did not align to the intended programme results nor did they quantify sustainable impact.

Key aspects based on DAC criteria	Score	Justification (Provide a short explanation for your score or why a criterion was not assessed)
7. The extent to which the intervention achieved or is expected to achieve its intended objectives (outputs and outcomes).	3 - unsatisfactory	Two of the three programme objectives are unlikely to be achieved (although the projects objectives are achieved)
8. The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes.	3 - unsatisfactory	Not defined or tracked originally but is being built into their programmes by the grantors
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.
Efficiency		
9. The extent to which the intervention delivers the results (outputs, outcomes) cost-effectively.	1 - highly satisfactory	The programmes are cost-effective in line with their objectives
10. The extent to which the intervention delivers the results (outputs, outcome) in a timely manner (within the intended timeframe or reasonably adjusted timeframe).	1 - highly satisfactory	The programme teams have kept the programmes on track despite Covid-19 and local issues
11. The extent to which management, monitoring and steering mechanisms support efficient implementation.	1 - highly satisfactory	The programmes are well-managed and monitored
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.
Impact		
12. The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention. Note: when assessing this criterion, the primary focus is the intended 'higher-level effects'. In the event that *significant* unintended negative or positive effects can be discerned, they must be specified in the justification column, especially if they influence the score.	2 - satisfactory	The nature of the programmes and the way in which the two project partners work is likely to develop spin-off wins.
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.
Sustainability		
13. The extent to which partners are capable and motivated (technical capacity, ownership) to continue activities contributing to achieving the outcomes.	3 - unsatisfactory	While there is the motivation, countries need both the cross-government commitment and extensive in-country capacity building to understand and deliver resilient and equitable cooling programmes.

Key aspects based on DAC criteria	Score	Justification (Provide a short explanation for your score or why a criterion was not assessed)
14. The extent to which partners have the financial resources to continue activities contributing to achieving the outcomes.	3 - unsatisfactory	The programmes have been laying the foundations and SeforAll is now moving towards implementation But given the nascent stage, it is highly unlikely the programmes will continue without further external funding.
15. The extent to which contextual factors (e.g. legislation, politics, economic situation, social demands) is conducive to continuing activities leading to outcomes.	3 - unsatisfactory	While there is progress and political will at a "pledge level", the legislative, policy, economic environment as well as cross-government prioritisation and wider donor funding have not been put in place to drive material change.
If an additional sub-criteria is relevant please formulate it here	select	Click here to enter text.

Additional information (if needed): With regard to sustainability the scores do not reflect that these programmes are foundational – and have been successful - but necessarily further on-going funding is required to make them self-sustaining in country. From the evidence cited and interviews conducted, we can conclude that both the initiatives funded are on track against the defined project objectives. That having been said, our evaluation has raised two fundamental concerns: whether there is a clear connection between the overarching SDC / PEACCE objectives and the selected initiatives, and whether adequately robust and rigorous impact targets were set. With regards to these concerns we do, however, appreciate that the project was designed in 2019/20, that is at a time when much of the cooling sector's focus was on advocating for the inclusion of the topic on policy agendas, and both grantees recognise that the next stage needs to be implementation and impact while they also recognise the need to develop more robust impact assessments.

Appendix 7 – Sankey diagram – global sustainable cooling funding stream map (enlarged)



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