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A FRAMEWORK FOR TRACKING COOLING INVESTMENT

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SUSTAINABLE ENERGY FOR ALL

CLIMATE POLICY INITIATIVE

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ABSTRACT

Global cooling needs are significant and expected to continue growing rapidly, especially in high-impact countries (HICs).[1] This increasing demand is likely to drive spikes in energy use and GHG emissions and will require large volumes of finance for low-carbon, climate-resilient cooling solutions. However, current cooling finance datasets do not include investment in several important types of cooling solutions and lack project-level information, preventing governments, development banks, and private investors from assembling comprehensive cooling transaction databases. Without the ability to track financial commitments to cooling projects over time, these actors will be unable to evaluate how actual cooling investment patterns compare to projected needs across sectors and geographies, limiting public and private institutions' ability to deploy capital where it is needed most.

To address this challenge, we propose a standardized Cooling Investment Tracking Framework (Framework) that integrates four aspects of cooling investment. Our approach builds upon existing OECD sectoral definitions and SEforALL cooling solution types to create a simple, flexible code-tagging system that development banks and other financial institutions can use to track project-level cooling investment. The next step toward implementation is to pilot this concept through partnerships with development banks and data providers. The long-term goal is universal adoption of the Framework among financial institutions and donor governments, enabling the tracking of finance flows and informing smart, targeted investment strategies that meet growing sustainable cooling needs around the world.

This Knowledge Brief proposes a new approach to identify and track cooling transactions, a first step toward understanding current finance commitments and acting on growing global needs for sustainable cooling solutions.

[1] SEforALL has identified 54 high-impact countries (HICs) for cooling needs, including a Critical 9 of India, China, Indonesia, Pakistan, Bangladesh, Nigeria, Mozambique, Sudan, and Brazil.

INTRODUCTION 1

The expected growth of global cooling needs in the near- to medium-term emphasizes the need for increased investment in sustainable cooling solutions, which are vital to improve human quality of life, to fight climate change and to achieve multiple UN Sustainable Development Goals (SDGs).

Cooling is an often energy-intensive activity that is vital to human health and well-being, including for basic human comfort and safety; food security, agriculture, and supply chains; and access to health services, vaccines, and treatments, especially in the developing world. Healthcare-related cooling needs are especially urgent now due to the COVID-19 pandemic, with reliable cold chains required to transport and store vaccines that must be shipped at temperatures well below freezing (Fischetti, 2020). Cooling needs are growing rapidly worldwide, and this growth will accelerate as populations grow, incomes rise, and warmer temperatures from climate change increase both the magnitude of global demand for cooling solutions and the urgency of meeting this demand.

SEforALL's *Chilling Prospects* report found that there are over 1 billion poor people in HICs who are vulnerable to health and economic risks from rising temperatures in the absence of adequate cooling (SEforALL, 2020). An additional 2.2 billion lower-middle income people in these HICs lack access to clean and efficient cooling, and are driving growing demand for cooling solutions. The rapid growth of the middle class in China, India, and other nations experiencing significant increases in household income and purchasing power is a key driver of future demand, with the global air conditioner stock expected to more than double between 2020 and 2050, to over 5 billion units (Dean et al, 2018). By 2030, annual cooling equipment sales are projected to reach 460 million units, up from 336 million in 2018 and 260 million in 2010. Half of 2030 demand is expected to come from China, India, and the United States (Griffin et al, 2019).

This anticipated growth in demand for cooling solutions poses two major challenges for low-carbon, climate-resilient development. First, growing demand for cooling equipment could cause a spike in energy use and emissions in the absence of appropriate minimum equipment performance standards (MEPS) (SEforALL, 2020). Even with strong efficiency requirements in place, the absolute increase in energy use could be significant as more households join the ranks of the global middle class and purchase refrigerators, air conditioning units, and other cooling equipment. Second, sustainable active cooling solutions must not only be "efficient" in terms of energy use and emissions rate, but also "clean" with respect to the refrigerants used. In addition to driving increases in energy use and emissions, rapidly increasing global demand for cooling solutions underlines the need to phase out hydrofluorocarbons (HFCs), which are hyper-polluting chemical refrigerants. Phasing out HFCs in most countries by 2024, in keeping with the 2016 Kigali Amendment to the Montreal Protocol, could avoid 0.6 degrees Celsius of global temperature rise by 2050 (Molina et al, 2020).

To address these huge gaps in cooling access and help achieve the SDGs, a rapid increase in sustainable cooling investment is required.[2] This applies to investment in both active cooling equipment like efficient and climate-friendly air conditioners and refrigerators, and passive cooling solutions such as energy-efficient building design and heat-resilient landscape architecture. Increased public funding is also needed for programmatic solutions at the national and local

[2] Specifically, SDGs for good health and well-being (3), decent work and economic growth (8), sustainable cities and communities (11), and climate action (13).

levels, including development of new MEPS and training courses for cooling equipment maintenance providers. Sustainable cooling solutions often contribute to both mitigation and adaptation outcomes, reducing energy use and GHG emissions while also filling increased refrigeration and space cooling needs driven by rising average temperatures and more frequent extreme weather events.

The ability to identify and act upon specific cooling needs and market opportunities depends on the availability, clarity, and comprehensiveness of investment data, especially transaction-level records of finance for cooling or cooling-related activities. If available, such granular data would:

- Enhance the ability of countries and financial actors to quantify actual financial commitments and compare against identified investment needs
- Reveal trends in the financial structures, business models, technologies, and policy interventions deployed to support cooling solutions
- Provide a baseline to monitor progress in phasing out dirty and inefficient cooling in favour of sustainable cooling activities
- Enable the development of more detailed and targeted national cooling action plans (NCAPs)
- Distinguish between finance for sustainable cooling solutions that enable low-carbon, climate resilient development, and cooling finance that does not

However, current data resources are insufficient to achieve these desired outcomes, and a new approach is needed to standardize the tracking of cooling finance commitments among development finance institutions and other development organizations.[3] To that end, this brief discusses shortcomings and gaps in current approaches to estimating cooling finance commitments and proposes a new framework that can be applied to track and analyse finance for cooling.

[3] While we envision our approach eventually being expanded to track private investment data, our use of OECD DAC codes was specifically intended to streamline implementation of the Framework for development banks, national governments, and other providers of official development assistance (ODA), as defined by the OECD.

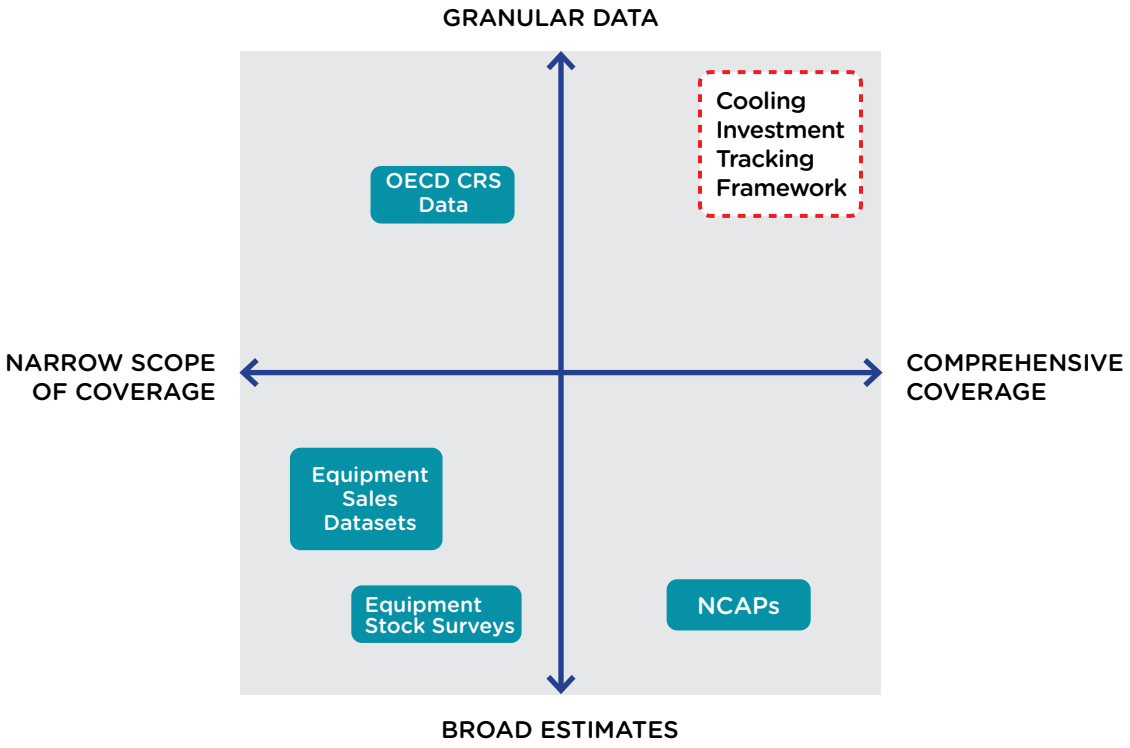
PROBLEM IDENTIFICATION 2

No unified approach exists to track cooling finance, as current datasets focus exclusively on cooling equipment sales rather than accounting for the full range of cross-sectoral solutions relevant to a comprehensive picture.

This section provides an overview of current approaches and datasets used to track cooling finance. Our review reveals substantial data gaps in many key areas, as well as inconsistent or nonexistent methods for determining which transactions in broader financial databases qualify as cooling investments. This fragmentation makes it difficult to aggregate individual datasets into a coherent overall picture of global investment. Data gaps also arise from the difficulty of defining cooling finance: cooling is not a clearly defined sector like renewable energy, but rather a service or need that can correspond to many combinations of sector and solution type.

FIGURE 1

Visualizing granularity and comprehensiveness of current cooling investment tracking approaches (blue) vs. hypothetical unified approach (red/white)



National Cooling Action Plans (NCAPs)

Several countries, including China, India, Rwanda, Trinidad & Tobago, Cuba and Panama, have voluntarily developed and implemented NCAPs to identify their cooling requirements and synthesize action across sectors to support sustainable cooling. The majority of NCAPs are based on historical trends analysis of economic growth, equipment sales, and other socio-economic variables including the rate of urbanization and improvements to standards of living over time.

Two key missing links in NCAPs developed to date are needs-based assessments and scenario-based modeling that incorporate a country's international commitments, such as the Kigali Amendment to the Montreal Protocol, Nationally Determined Contributions under the Paris Agreement, and the UN 2030 SDGs (Peters et al, 2020). By incorporating these analytical approaches, future NCAPs can provide clear, compelling insight into future trends and strengthen nations' abilities to establish appropriate national cooling investment targets and strategies.

Equipment datasets

Several existing data sources such as the Green Cooling Initiative, the IEA, and The Japan Refrigeration and Air-Conditioning Industry Association (JRAIA) provide estimates or projections of annual cooling equipment sales, sometimes including estimates of cooling needs, energy use, and associated GHG emissions, with various levels of granularity. Some datasets constructed using manufacturer surveys also estimate global cooling equipment stocks.[4] For instance, the value of installed cooling equipment stock in 2018 is estimated at USD 1.47 billion[5] and expected to increase to USD 5.99 billion to reach the 2050 target of 'Cooling for All' (University of Birmingham and Herriot Watt University, 2018). Such equipment-based estimations are a good starting point, but do not convey the whole picture. For instance, most often it is difficult to incorporate granular details like lifetime of the equipment, growth in prices, policy changes related to the cooling sector, and technological innovation in translating stock and equipment information to investment costs. Nor do these resources track deployment of cooling solutions beyond active technologies like air conditioners and refrigerators. Improved data on finance for passive cooling solutions, policy development, and services contracts are required to construct a holistic assessment of cooling investments.

OECD

By performing word searches on project descriptions in the OECD's Creditor Reporting System (CRS) data, we identified cooling activities across several different sectors, including agriculture, energy, health, industry, and general environmental protection.[6] These activities often represent a small component of larger infrastructure projects.[7] For instance, an agro-industrial sector project in Ethiopia focused on developing rural connectivity and agro-infrastructure, including roads, bridges, storage facilities, pre-cooling facilities, cold storage units, and mobile processing units; access to credit; and sustainable management of natural resources.

Because of the lack of a dedicated sectoral tag or use category associated with cooling, many investments must be identified manually. In a first attempt, we used a word search[8] to identify cooling-related project commitments totaling USD 343 million in the 2018 OECD CRS database. This amount may not include all cooling investments, as some unlabeled cooling or cooling-related projects cannot be identified because they are categorized by purpose (as above) rather than by use case or intended impact (i.e. cooling solutions). Another consideration is the proportion of cooling-oriented financing commitments used directly for cooling. For example, some agricultural aid projects funded not only crop storage but also drought-resistant seeds and fertilizer, so the entire sum of these projects should not be considered as cooling finance.

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[4] i.e. total existing operational assets in a given year, as opposed to sales datasets that measure new assets added in a year.
[5] This is calculated as value of annual sales of equipment divided by annual unit sales for all sub-sectors (space cooling, stationary refrigeration, and mobile cooling), multiplied by installed equipment stock.
[6] The CRS dataset can be accessed here.
[7] A similar issue has been identified in tracking clean cooking investment in SEforALL's *Energizing Finance: Understanding the Landscape* series. For instance, most often clean cooking investments are part of large programmatic interventions with multiple benefits: increasing electricity access, improving health outcomes, raising climate awareness, increasing entrepreneurial skills, etc. This makes it difficult to identify, classify, and report clean cooking activities.
[8] Terms searched: Cool*, cold stor*, freez*, refrig*, congel*, cold chain/cold-chain, cadena de fr*, air con*/air-con*, and aire acond*.

Development finance institutions (DFIs)

We administered a brief questionnaire to several DFIs and data aggregators, asking about their current approaches, if any, to tracking cooling finance. We also asked respondents to identify barriers to tracking such finance and comment on whether a new cooling investment tracking framework would be useful as a tracking tool. While responses varied across institutions, the overall key findings were:

- Most of the DFIs surveyed currently invest or have recently invested in cooling or cooling-related projects in their regions of operation.
- Only a few institutions currently have a dedicated cooling finance tracking effort.
- Those that do track cooling lack a multi-layer approach to cover cooling activities across a broad range of possible sectors and uses.
- Almost all respondents were in favour of using a standardized tracking approach for cooling finance if one were provided. However, such an approach would need to be intuitive and adaptable to successfully integrate with existing tracking systems and tools that already capture a wealth of other information.
- Identifying the cooling-oriented portion of large, complex investments is far more challenging. Cooling finance for certain project-directed investments may be easy to identify, as in district energy projects or large-scale government procurement contracts for air conditioning equipment. However, tracking cooling investment in supply chain, agribusiness, manufacturing, retail, and services applications would require revisiting technical due diligence materials for each project and manually identifying investment in cooling solutions, an especially challenging and time-intensive task.

As our review demonstrates, current efforts to track cooling finance are generally restricted to sales estimates for active technology solutions, including air conditioning equipment, and investments in policy, such as funding for development of new MEPS. The current lack of high-quality, transaction-level datasets, a major barrier to more comprehensive analysis of global cooling investment, is partially explained by the relative dearth of investment that has been devoted to cooling solutions to date.[9] Data gaps also persist due to the challenge of defining cooling services and projects, as these often span multiple sectors, as defined by financial actors and data providers.

Cooling is increasingly entering the consciousness of development practitioners, climate advocates, and mainstream investors, as growing awareness of global needs drives interest in financing cooling solutions. **Tracking and evaluating the extent to which future cooling investment contributes to low-carbon, climate-resilient development will require a first-of-its-kind, standardized framework to identify and categorize transactions involving cooling solutions.** The next section outlines our proposal for such a framework.

[8] By contrast, many organizations have already allocated significant time and effort to standardize data collection and reporting methodologies for higher-volume investment sectors like renewable energy and low-carbon transport, enabling detailed tracking and analysis of global climate finance trends in these areas. This has empowered governments, development banks, and commercial financial institutions to understand and act on well-defined capacity gaps and market opportunities in specific geographies and sectors. For example, investors and policymakers use CPI's Global Landscape of Climate Finance and SEforALL's *Energizing Finance* research series as go-to resources for key trends in overall climate investment and energy access finance, respectively.

CREATING A COOLING INVESTMENT TRACKING FRAMEWORK

3

Key principles

Our aim is to create a Framework that provides a standardized approach to tagging cooling investments, which can be overlaid quickly and easily onto financial institutions' existing transaction databases. To do so, we first reviewed several existing investment taxonomies, including the OECD's DAC Climate Marker handbook, the EU Sustainable Taxonomy, the Climate Bonds Initiative standards, and several other resources. From this review, we have determined that an effective Framework must:

1. **Provide clear guidance on how to categorize a wide range of cooling activities.** To add value relative to current ad-hoc tracking approaches, our Framework must provide labels for different types of cooling activities and enable financial institutions to apply these labels with confidence to transaction-level data.
2. **Integrate seamlessly with existing data collection and verification approaches.** Proper implementation of a "cooling tag" system will take into account the formatting of existing data resources and prioritize fitting into these existing data collection and management approaches without requiring the creation and maintenance of siloed, cooling-only investment datasets.
3. **Leave room for future adjustments as more comprehensive data become available.** This means the proposed methodology should include the flexibility to eventually record key transaction-level attributes such as project use case or sustainability status, even if currently information is not yet available for most transactions. For example, while this brief proposes basic definitions of "sustainable," "clean," and "efficient" cooling approaches, it does not provide comprehensive evaluation criteria enabling data aggregators to assign these labels to all transactions. Additional research and partnerships with financial institutions and data providers will be required to create and implement such criteria.

Our proposed Framework is a code-tagging system based on evaluation of four dimensions of cooling investments at the transaction level.

Proposed methodology

The proposed Framework aims to enable transaction-level tagging for cooling finance, allowing development banks and national governments to better understand the scale, scope, and climate orientation of cooling investments. The development of the Framework was informed by our review of the datasets and NCAPs discussed in the previous section. Figure 2 presents a visual overview of the Framework, which uses a four-part code system to categorize individual cooling transactions.

FIGURE 2

Framework proposed approach – four dimensions of cooling investment

COOLING ORIENTATION	
Principal	A
Significant	B
Components	C
None	X
Unknown	Z

→

CLIMATE ORIENTATION	
Efficient	A
Clean	B
Sustainable	C
Other	Y
Unknown	Z

→

SOLUTION TYPE (UP TO 3)	
Technologies: Active	A
Technologies: Passive	B
Services: Preparational	C
Services: Operational	D
Policies: Regulatory	E
Policies: Information	F
Policies: Incentives	G
Finance: Financial	H
Finance: Fiscal	I
Finance: Funding	J
None	X
Unknown	Z

→

PURPOSE	
Agriculture	A
Education	B
Energy	C
Gov't/Public Services	D
Health	E
Industry/Mining/ Construction	F
Transport/Storage	G
Water/Environment	H
Other	Y
Unknown	Z

Our initial attempt to create a comprehensive tracking framework captures the following dimensions of a transaction:

1

COOLING ORIENTATION: While many equipment investments are primarily and explicitly associated with cooling, other types of investments may include cooling solutions as a secondary aspect or constituent part of the main project. For example, a housing developer may procure hundreds of air conditioning units when building a new apartment building, but this transaction would likely be financed out of a common pool of project debt that is also used to fund general structural engineering, design, and building construction activities. Similarly, some portion of government funding for energy efficiency policy might fund development of new country-level cooling equipment MEPS, while the remaining portion could be allocated to non-cooling activities like MEPS for laundry machines or televisions. In response to this issue, our taxonomy identifies four levels of cooling orientation, using an approach similar to the OECD's system to judge the climate objectives of projects:

- Principal: The investment's primary or only purpose is to provide cooling solutions.
- Significant: One of the investment's major purposes is to provide cooling solutions.
- Cooling Components: The investment includes some funding for cooling solutions but not as a major objective.
- None: The investment does not contain any funding for cooling solutions.

2

CLIMATE ORIENTATION: An additional concern in tracking cooling finance is whether a given investment qualifies as Sustainable cooling. At present, our framework only provides direction to evaluate the climate orientation of active technology solutions, as this is the only solution type[10] that consumes energy and utilizes refrigerant chemicals, which are the criteria used to assign a climate orientation tag to transactions.

When attempting to understand and address global demand for cooling equipment while avoiding lock-in of assets and strategies not compatible with Paris Agreement targets, it is important for investors to understand the meaning of Sustainable cooling investment, as well as the related terms Clean and Efficient:

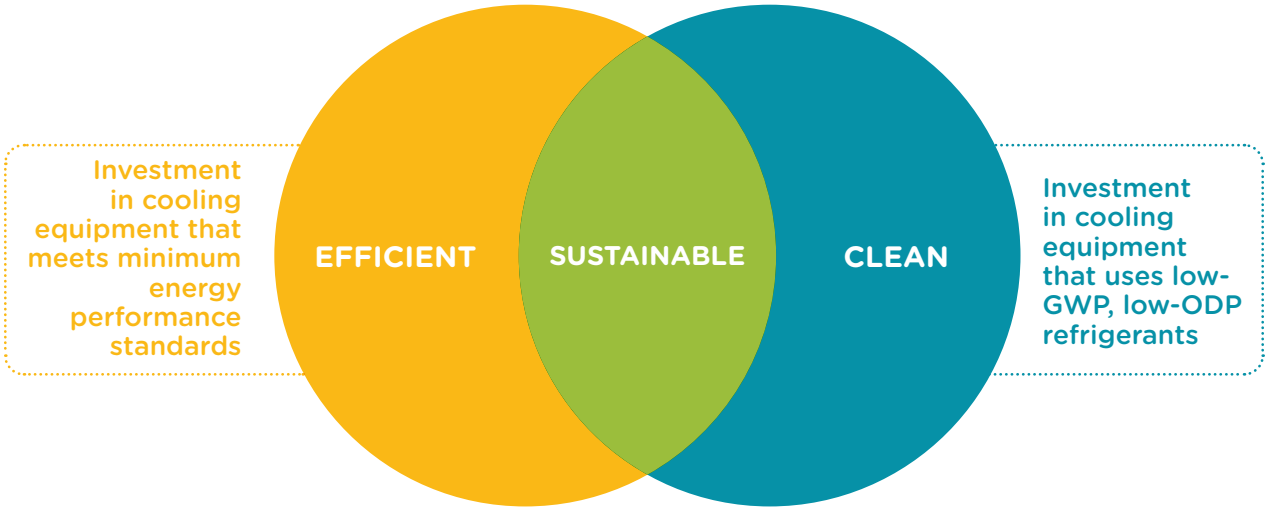
- Efficient cooling solutions comply with national MEPS and energy efficiency regulations[11], or do not use energy at all, such as passive cooling solutions.

[10] See full list of solution types in section 3 below.

[11] Under this preliminary definition, efficient cooling equipment would be defined differently in different countries, with cooling investments that would not comply with most countries' MEPS registering as efficient in countries with more lenient MEPs. Additional research and resources should be devoted in the future to redefine efficient cooling in a manner more in keeping with achievement of specific and appropriate country-level emissions targets and/or Paris Agreement goals. See Next Steps section for further discussion of this issue.

- Clean cooling solutions use refrigerants with low or no Global Warming Potential (GWP) and Ozone Depletion Potential (ODP)
- Sustainable cooling solutions meet the criteria for both the Efficient and Clean categories.
- Other cooling solutions fail to meet the criteria for both the Efficient and Clean categories.

FIGURE 3
Defining climate orientation tags for cooling equipment transactions



Further thought and research are required to determine how to treat passive technology investments like energy-efficient building design and landscape architecture. At present, because these solutions do not consume energy or use refrigerants, we assume they are sustainable, with no negative climate impacts. As our framework does not currently allow us to evaluate the climate orientation of non-technology cooling solutions (i.e. services, policy, and financial), investments in these solutions are currently to be coded as Unknown.

3

SOLUTION TYPE: Categorizing the wide range of cooling solutions into four main categories allows us to identify and track investment in each individual category. This in turn enables improved visibility of investment flows and trends broken out by the type of technology or approach used in each transaction. Such visibility is critical in assessing how countries propose to meet or are falling short of cooling investment goals tied to real assets, sustainable design, regulatory rulemaking, and other solutions. Our Framework uses the four solution pillars described in the *Chilling Prospects: Tracking Sustainable Cooling for All 2020* report (SEforALL, 2020):

- Technology solutions deliver sustainable cooling through a range of materials, products, and devices to support delivery of passive cooling and active cooling and include:
  - » Active technologies, which use energy and refrigerants. Examples include air conditioners, fans, and district heating/cooling systems.
  - » Passive and nature-based technologies, which use low- or high-tech approaches that do not require energy or refrigerants. Examples include energy-efficient building design and shade tree planting.

- Services solutions support the organization and delivery of cooling technologies and include:
  - » Preparational activities to support the creation or deployment of cooling solutions, such as

[11] Under this preliminary definition, efficient cooling equipment would be defined differently in different countries, with cooling investments that would not comply with most countries' MEPS registering as efficient in countries with more lenient MEPs. Additional research and resources should be devoted in the future to redefine efficient cooling in a manner more in keeping with achievement of specific and appropriate country-level emissions targets and/or Paris Agreement goals. See Next Steps section for further discussion of this issue.

analysis, planning, and design due diligence.
    - » Operational activities to deliver and use more sustainable cooling, such as operation, management, and maintenance.[12]

- Policy solutions impact cooling through three types of measures:
    - » Regulatory policies like building codes and efficiency standards.
    - » Information policies like voluntary disclosure, certifications, labels, and awareness campaigns.
    - » Incentive policies can include both financial and non-financial measures used to drive desired outcomes.

- Financial solutions provide three types of direct or indirect financial support to influence the cost-effectiveness or upfront cost of cooling:
    - » Finance solutions enable a temporary use of funds to purchase technology or services.
    - » Fiscal solutions include taxes, tax credits, subsidies, and tariffs provided by government.
    - » Funding solutions include direct financial contributions to cooling projects, including grants and rebates.

Because a given investment can contain funding for many different types of solutions, our system allows for up to three solution types to be associated with a single transaction. Examples of multi-solution transactions include a building renovation that installs both high-efficiency insulation and new air conditioning units, or a government funding decision that enables development of new MEPS and provides tax credits to manufacturers who meet the new standards ahead of schedule.

4

PURPOSE: The final category to be assessed at the transaction level is the purpose targeted by a given cooling solution. This is important to provide detailed insights on how cooling solutions are being deployed and who benefits from them. To enable smooth implementation of the Framework, our purpose categories correspond to the OECD DAC purpose codes, with some simplifications tailored to reporting needs for cooling investments. The eight application categories are:

- Agriculture and Forestry
- Education
- Energy
- Government and Social Infrastructure
- Health
- Industry, Mining, and Construction
- Transport and Storage
- Water and Environment
- Other

Annex A provides a full breakdown of the OECD DAC purpose codes that fall into each of these groupings. While this list is designed to be compatible with OECD codes, it also provides a useful reference point for institutions and data providers that use different conventions to categorize a transaction's purpose, use, or sector in their investment tracking databases.[13]

These four categories – Cooling Orientation, Climate Orientation, Solution Type, and Purpose – encompass a wide range of approaches to cooling activities, allowing for more granular tracking of cooling-oriented finance at transaction level than has previously been possible. Figures 4 and 5 shows the resulting investment tagging process when these categories are combined to assess a specific transaction, with the output being a six-letter "cooling code" applied to a new field in the transaction record. Each category also has an Unknown option, coded as letter Z, to be used where insufficient information is available to categorize a transaction on one or more of the four framework criteria.[14] Because a transaction can be associated with up to three different solution types, the solution section of the code contains three letters. Unused solution slots are filled in with the letter X for None, as seen in the example codes in Figures 4 and 5.

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[12] This category includes service contracts to supply cooling services and maintain cooling infrastructure as an alternative to capital-intensive equipment purchase and ownership. Cooling-as-a-Service, an innovative financial instrument supported by CPI through the Climate Finance Lab, is a good example of this type of approach, in which building owners contract from equipment providers for cooling services over a set period, rather than buying assets outright – similar to a power purchase agreement, but with the service rendered being cooling rather than energy supply.

[13] However, reconciling alternate (i.e. non-OECD) sectoral category sets would require additional effort. This process could be streamlined by first mapping the alternate identifiers to OECD codes and then using the OECD-code-to-cooling-sector approach outlined here. Additional purpose categories may need to be created in the future to capture private-sector investment in real estate and other sectors not currently covered by the OECD purpose codes.

[14] More details on OECD purpose codes can be found at the following links:
http://www.oecd.org/development/financing-sustainable-development/development-finance-standards/purposecodessectorclassification.htm
https://www.oecd.org/dac/environment-development/Revised%20climate%20marker%20handbook_FINAL.pdf

FIGURE 4

Framework coding example for a MEPS-compliant, non-HFC refrigerated hospital vaccine storage unit – Code A-C-AXX-E

COOLING ORIENTATION	
Principal	A
Significant	B
Components	C
None	X
Unknown	Z

→

CLIMATE ORIENTATION	
Efficient	A
Clean	B
Sustainable	C
Other	Y
Unknown	Z

→

SOLUTION TYPE (UP TO 3)	
Technologies: Active	A
Technologies: Passive	B
Services: Preparational	C
Services: Operational	D
Policies: Regulatory	E
Policies: Information	F
Policies: Incentives	G
Finance: Financial	H
Finance: Fiscal	I
Finance: Funding	J
None	X
Unknown	Z

→

PURPOSE	
Agriculture	A
Education	B
Energy	C
Gov't/Public Services	D
Health	E
Industry/Mining/ Construction	F
Transport/Storage	G
Water/Environment	H
Other	Y
Unknown	Z

FIGURE 5

Framework coding example for construction of a new school, including procurement of A/C units and insulation – Code C-Z-ABX-B

COOLING ORIENTATION	
Principal	A
Significant	B
Components	C
None	X
Unknown	Z

→

CLIMATE ORIENTATION	
Efficient	A
Clean	B
Sustainable	C
Other	Y
Unknown	Z

→

SOLUTION TYPE (UP TO 3)	
Technologies: Active	A
Technologies: Passive	B
Services: Preparational	C
Services: Operational	D
Policies: Regulatory	E
Policies: Information	F
Policies: Incentives	G
Finance: Financial	H
Finance: Fiscal	I
Finance: Funding	J
None	X
Unknown	Z

→

PURPOSE	
Agriculture	A
Education	B
Energy	C
Gov't/Public Services	D
Health	E
Industry/Mining/ Construction	F
Transport/Storage	G
Water/Environment	H
Other	Y
Unknown	Z

BOX 1

Use categories

While there are many distinct uses associated with cooling solutions, SEforALL's Cooling for All Needs Assessment, produced in partnership with Heriot-Watt University, defined three main use case categories for cooling investments:

- Human comfort and safety investments contribute to maintaining livable, healthy conditions for work, education, mobility, and other core aspects of everyday life.
- Food, nutrition security, and agriculture investments address the need for resilient, efficient cold chains from farm to transportation to storage to market and consumption.
- Health services investments ensure safe and effective use of medical equipment, along with the secure transport and storage of vaccines and other medical products. (SEforALL and Heriot-Watt University, 2020)

In the interest of creating a streamlined framework that is as easy as possible for DFIs to adopt, we do not include use as a category in the proposed cooling tag system. Transaction records often contain information on the solution type and sector/purpose of specific investments, but less frequently include information that clearly corresponds to one of the three broad use categories above. In addition, some projects could reasonably be assigned to more than one of the three use categories. However, specific combinations of technologies and sectors can be used to infer uses; for example, a purchase of air conditioners for a public housing development would contribute to the "human comfort and safety" use category.

RECOMMENDED NEXT STEPS

4

Our Framework should be further developed and piloted in partnership with financial actors and data providers, and eventually implemented as a universal standard to track finance for cooling commitments and investments.

1. PILOT: The inability of potential users of the Framework - development banks, data aggregators, governments, private investors - to adequately track, analyse, and understand cooling investment data hinders these groups' efforts to meet growing cooling needs across countries and sectors. Our approach aims to ensure that tracking principles are intuitive, adaptable, and easy to integrate into existing data collection processes, such as the OECD DAC Rio markers approach. A natural next step would be to identify partner institutions with whom to pilot this approach, testing the proposed methodology to determine whether the pilot Framework enables enhanced tracking of institutional cooling investment and adds value over current ad-hoc tracking approaches. Integrating feedback from the pilot will help develop a more robust, standardized second iteration of the Framework, which could substantially benefit from inclusion of additional technical evaluation criteria like:

- Country-level MEPS and cooling orientation
- Clear and consistent definitions of terms like sustainable, dirty, clean, and efficient in the context of cooling solutions
- Classification of activities based on their impact on cooling needs

After initial bilateral engagement and pilot projects contribute to a proof of concept, the Framework can be further developed for adoption by a Working Group of DFIs, with the goal of smoothing the pathway to implementation.

2. SCALED IMPLEMENTATION: As this is a first-of-its-kind Framework for tracking cooling investment, the broader objective is to ensure that all relevant stakeholders can easily adapt, adopt, and implement this approach. To achieve institutional buy-in, it is crucial to demonstrate the value of tracking cooling solution investments to stakeholders by sharing case studies of successful implementation stories, providing technical assistance for adoption of the Framework, and clearly identifying the cost of inaction. For instance, detailed tracking of energy access finance over the years in SEforALL's *Energizing Finance* research continues to motivate stakeholder efforts to address chronic underinvestment in electricity and clean cooking. It has taken significant time and effort to standardize data collection and reporting methodologies for these initiatives. Therefore, it is all the more critical that we advance similar work for cooling solutions investment, to not only achieve the SDGs by 2030 but also underpin recovery from the COVID-19 pandemic.

3. DECISION-MAKING: With wider implementation of this tracking approach, more granular transaction-level information will become available, capturing various dimensions and attributes of cooling finance. Such information can be used to determine the optimal allocation of financing to different types of cooling solutions at the country and/or sectoral levels, rectifying information asymmetries and enabling detailed cost-benefit analyses of many possible Paris Agreement-aligned investment strategies.

ANNEXES 5

ANNEX A

Purpose category mapping to OECD DAC codes

Purpose	Corresponding DAC codes
Agriculture and Forestry	310-313: General AFF, Agriculture, Forestry, and Fishing
Education	110-114: Education, Education Level Unspecified, Basic Education, Secondary Education, and Post-Secondary Education
Energy	230-236: Energy, Energy Policy, Renewable Generation, Non-Renewable Generation, Hybrid Energy Plants, Nuclear Energy Plants, and Energy Distribution
Government and Social Infrastructure	150, 151, and 160: Government and Civil Society, General GCS, and Other Social Infrastructure and Services
Health	120-123 and 130: Health, General Health, Basic Health, Non-Communicable Diseases, and Population Policies and Reproductive Health
Industry, Mining, and Construction	320-323: General IMC, Industry, Mineral Resources and Mining, and Construction
Transport and Storage	210: Transport and Storage.
Water and Environment	140 and 410: Water Supply and Sanitation, and General Environment Protection.
Other is a catchall category for codes not included in any of the previous sectors listed. A review of OECD transaction data and similar datasets showed that it is exceedingly rare for cooling investments to fall into these additional categories, such that it is reasonable to aggregate them into a single Other designation.	

ANNEX B

Notes on procedure to assign cooling tag codes for a given transaction

COOLING ORIENTATION: Assign code letters as follows, as defined by the description of this category provided in the body text. Cooling Orientation is represented by the first letter of the six-letter Framework code.

COOLING ORIENTATION	
Principal	A
Significant	B
Components	C
None	X
Unknown	Z

CLIMATE ORIENTATION: Assign code letters as follows, as defined by the description of this category provided in the body text. Climate Orientation is represented by the second letter of the six-letter Framework code.

CLIMATE ORIENTATION	
Efficient	A
Clean	B
Sustainable	C
Other	Y
Unknown	Z

SOLUTION TYPE: Assign code letters as follows, as defined by the description of this category provided in the body text. Climate Orientation is represented by the third, fourth, and fifth letters of the six-letter Framework code.

SOLUTION TYPE (UP TO 3)	
Technologies: Active	A
Technologies: Passive	B
Services: Preparational	C
Services: Operational	D
Policies: Regulatory	E
Policies: Information	F
Policies: Incentives	G
Finance: Financial	H
Finance: Fiscal	I
Finance: Funding	J
None	X
Unknown	Z

If only one solution type applies to the transaction, the unused second and third letters are to be coded as X (None). If only two solution types apply to the transaction, the unused third letter is to be coded as X (None). See Figures 4 and 5 in the body text for examples of this procedure.

If three or more solution types apply to the transaction, the three letters are to be coded in descending order, by monetary value, for the first three solution types. For example, a transaction allocating USD 20 million for air conditioning units, USD 10 million to building insulation, USD 5 million to HVAC maintenance training programs, and USD2 million to government subsidies would be coded as ABI, for Active Technology, Passive Technology, and Preparational Services solution types. As the Fiscal portion of spending is not one of the top 3 solution types funded by the transaction, it is not reflected in the code.

PURPOSE: Assign code letters as follows, as defined by the description of this category provided in the body text. Climate Orientation is represented by the sixth letter of the six-letter Framework code.

PURPOSE	
Agriculture	A
Education	B
Energy	C
Gov't/Public Services	D
Health	E
Industry/Mining/ Construction	F
Transport/Storage	G
Water/Environment	H
Other	Y
Unknown	Z

ANNEX C

Image of sample code generated from category inputs in Excel tool

Outputs	
Framework Code	**Framework Description**
Z-A-BIG-C	Unknown, Sustainable, Technology - Passive / Financial - Fiscal / Policy - Incentive, Energy

Inputs					
Select input category values from cells below.					
Cooling orientation	**Climate Impact**	**Solution Type 1**	**Financial - Fiscal**	**Policy - Incentive**	**Energy**
Z	A	B	I	G	C

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