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SUMMARY REPORT

Enhancing Food Security and Poverty Reduction through Net-Zero Food Cold Chains

Date: 28 October 2020 – **Time:** 2:00pm to 3:00pm CET

Video Recording: <https://youtu.be/EOeLPhRnJmg>

Moderator: Thin Lei Win, Food Security and Climate Correspondent, Thomson Reuters Foundation

Report of the Session

Brian Dean, Lead of Energy Efficiency and Cooling at SEforALL, opened the event by welcoming attendees and highlighting the need to identify and showcase sustainable solutions for cooling services and cold chains. He explained that [This Is Cool](#) is a solution-focused communication campaign focusing on cooling solutions to transform markets, identify policy and business opportunities, and increase cooling access to the 1 billion people experiencing heat risks. This, while reducing the environmental impacts of cooling itself, bringing the cooling sector on the path to net-zero emissions. Dean called on participants to share their solutions by using the #ThisIsCool tag to ensure they can be shared at wider scale and contribute to deliver efficient, climate-friendly cooling for all.

David Aitken, Associate Director at the Carbon Trust, took the floor to present the newly launched brief on [“Net Zero Cold Chains For Food”](#). Today, cold chains for food present big challenges, but action on this matter can unlock invaluable benefits to communities and stakeholders around the world, he said. Aitken defined net-zero cold chains as *safe, monitored, and integrated refrigerated networks designed with cooling technologies that use environmentally friendly refrigerants and maximise the efficient use of low carbon energy*. The goal of action on net-zero food cold chains is the provision of safe and nutritious food to consumer and good financial return to producers, while minimizing climate change impacts from cooling.

He explained that the deployment status of cold chains around the world varies significantly, depending on multiple socio-economic and agri-food sector factors. While limited data is available, food cold chains globally are thought to be responsible for 1% of global greenhouse gas emissions, and these emissions are expected to increase, driven by a growth in need for cold chains, dietary changes, pressure to reduce food losses, climate impacts on food security, and population growth. In developing and deploying net-zero cold chains, multiple challenges exist, including around coordination and planning, logistics and infrastructure, awareness and finance. However, there already exist valuable opportunities to leapfrog to sustainable technologies and unlock net zero cold chains. He concluded by stating that philanthropy can play an important role in collecting data and modelling, conducting advocacy, and ensure integrated demonstration of sustainable cold chain systems.

Arijit Sengupta, Director, Bureau of Energy Efficiency, Ministry of Power, India started the panel discussion by highlighting the importance of cold chains in India, the second largest fruits and vegetables producer in the world, where horticulture contributes 17% of the GDP. Food loss and waste, estimated between 6 and 18% for fruits alone, represent a loss of value, evitable



greenhouse gas emissions, and a challenge to food security. As such, well-designed, integrated cold and efficient chains can be a game changer for Indian agriculture, Sengupta stated, especially so in the context of the national goal to double farmers' incomes. Cold chains in India can and should become more effective, energy efficient, use climate friendly refrigerants and renewables. Energy efficient cold chains are critical for improving farmers' livelihoods, reduce the use and cost of energy, as well as avoidable post-harvest food loss, and ensuring the sustainability of the entire country's value chain, from farmers to consumers.

To strengthen cold chains in India, the Bureau of Energy Efficiency is working with the World Bank's ESMAP program on a study for the assessment and potential development of regulatory tools for promoting energy efficiency in the cold chain, with specific focus on pack houses, the entry points of cold chains. Sangupta explained that the major recommendation from the study are to develop guidelines for good practices for operation and maintenance, for energy efficient packhouse designs, to raise awareness about energy efficiency in the post-harvest management, to develop minimum energy efficiency performance standards, and develop a framework and training and certificates.

Sangupta explained that the Bureau of Energy Efficiency is in the process of preparing a roadmap to implement recommendations of the World Bank report. Effective energy efficiency policies, standards and labels will be developed to drastically reduce the energy demand of various cold chain equipment. These efforts are part of the India Cooling Action Plan, a comprehensive long-term plan at the national level to address cooling requirement across sectors, he concluded.

Nnaemeka Ikegwonu, Founder and CEO, [ColdHubs Limited](#) and winner of the Cooling as a Service prize, presented the business model of his company and its benefits for the community. Coolhub is a Nigerian social enterprise that designs, builds, operates and maintains a hundred percent solar powered walk-in cold rooms and outdoor cold markets. The hubs are used by smaller retailers and wholesalers to store and preserve fresh fruit and vegetables and extend the shelf life from 2 to 21 days, reducing emissions and profit loss that would result from lack of cold chain access. Their cold chain technologies seek to minimize the environmental impact by using R290 propane refrigerants, which have low global warming and no ozone-depletion potential.

In 2019, Ikegwonu explained, his company had 24 operational cold hubs that alone saved 20,400 pounds of food from spoilage. This means saving farmers' resources that went into food production, such as labels, water, seeds, and fertilizer. The work of Cold Hubs allowed to increase by 50% the household income of 8,517 small holder farmers, retailers, and wholesalers who are using their services, simply by helping them transform their crop losses, into new sales.

Cold Hubs not only help reduce food waste, but also ensure that the food in the community remains safe and nutritious, away from direct sun exposure and pollution, uncontaminated, and safely packaged to ensure healthy consumption for consumers. Cold Hubs also drives change in the community by creating 48 new jobs for women by recruiting and training them to work in their field operations, most of whom have never worked before.

Ikegwonu states that the [Cooling as a Service](#) business model makes it possible to ensure access to cooling for those that cannot afford to buy cooling appliances. It "liberalises and democratises" cooling services by taking the stress and risk of acquisition and maintenance from farmers and wholesalers, allowing them to use cold storage facilities those for small amount of money, while they can focus on their business. CaaS should be implemented at scale, and can



be elevated by enhancing awareness and understanding of the business model, sharing insights and lessons learned by success stories, channeling philanthropic capital to unlock CaaS business models, test them rigorously, prove them beyond every reasonable doubt, and then incentivize private investment to go to scale globally. He concluded his remarks by inviting the audience to participate to the global [Cooling as a service e-summit](#) on 1 December, organized by BASE.

Juergen Goeller, Director Regulatory Affairs, Carrier Refrigeration, Co-Chairman of the [Global Food Cold Chain Council \(GFCCC\)](#), outlined his company’s available solutions for safe and sustainable cold chains and named key obstacles in the implementation of net-zero cold chains around the world. Carrier takes the lead in a continuing migration to increasingly energy-efficient cooling technologies and climate friendly refrigerants from very high global warming potential (GWP) HFC refrigerants to ultra-low GWP refrigerant blends or natural refrigerants like carbon dioxide, ammonia, and propane. Carrier also provides integration solutions of supermarket refrigeration with waste heat recovery systems to further enhance efficiency.

Goeller pointed to key obstacles in the delivery of net-zero cold chains. First, a lack of cooperation between governmental and inter-governmental agencies and the industry, which should instead follow the model used for the delivery of the Montreal Protocol and its Kigali Amendment. He suggested that national cooling action plans, now developed in several countries, can be the first building block to ensure cross-sectoral coordination and collaboration. Second, the weak awareness of the readily available net-zero cold chain technologies and the importance of using them. Third, the need for training of service and maintenance technicians to effectively and safely deploy net-zero cold chain technologies, which usually operate at higher pressure levels or with flammable refrigerants, for whose handling technicians are not sufficiently trained.

Fourth, differences in regional requirements and technology offers, building codes and product safety standards may pose barriers to the widespread applications of existing net-zero cold chain technologies. Finally, as net-zero cold chain technologies are mostly available in developed countries, increased awareness on the return on investment in better cold chain technologies could help overcome investment barriers and highlight the benefits of these solutions throughout the value chain to communities in developing and emerging countries. Developing new net-zero cold chain technologies is expensive and time consuming, which means that regulatory support needs to be integrated with financial support for small- and mid-size enterprises (SME), he concluded.

Toby Peters, Professor at the University of Birmingham explained how his background in co-developing liquid air energy storage systems and technologies helps him think about cooling technologies and cold chains in terms of “cooling service” and “thermal systems”. He stated that energy storage and moving cold are key pieces of the puzzle needed to solve existing cold chain challenges. Today, Peters works with over 50 researchers and global collaborations looking at the portfolio of cooling needs worldwide, seeking solutions to reduce the demand of cooling, finance existing sustainable cooling solutions, and move cold effectively throughout cold chains in developing countries.

Peters and his partners launched the [Rwanda Centre of Excellence in Sustainable Cooling and Cold Chain](#) to accelerate technology deployment, provide market understanding, technology demonstration, data, technical and business assistance to help communities in the African continent to deploy cooling services and get produce to markets quickly and efficiently. Among other things, this and upcoming Centres of Excellence aim at helping design emergency cold



chain solutions for the deployment of the COVID-19 vaccine, which will be rapidly needed to ensure mass vaccination of 5 billion people around the world. This will be the “single biggest logistics challenge we’ve ever faced” Peters said, for which innovation is rapidly occurring.

However, specific data and insights are still lacking for remote and last mile cold chain access. The work needed now also needs to help plan for future emergencies where effective cold chains will be needed, and also needs to take advantage of synergies with other cooling services relative and broader cooling needs, as the emergency technology will outlast the vaccine for 10-15 years.

Makena Ireri, Manager at [CLASP](#), explains how her team works to ensure both clean energy access and climate change mitigation through the development and deployment of sustainable cooling technologies. CLASP does so by helping countries set and revise efficiency standards for cooled technologies, providing actionable data for policy change, running competitions to unearth innovations in cold storage, independently testing off-grid cooling appliances, and managing incentives that help develop the market for better cooling technologies.

Ireri’s primary research focus is on off-grid cooling appliances: these have the potential to provide effective and affordable solutions for cold chain development for the first mile in rural areas that lack stable, reliable electricity grids. However, most of off-grid cold chain technologies are at their early stage of development and need to be further developed, researched and tested with innovative business models tailored to specific contexts, before becoming widely viable, she said.

Investments need to be made available for research and development, as well as testing existing business models in different environment and markets, she underscored. CLASP is the co-secretariat of [the Efficiency for Access Coalition](#). Through initiative like the [Off-grid Cold Chain Challenge](#), R&D funding, applied research and testing, the coalition’s programs work to identify appropriate technology, and business models, help overcome technical challenges, and help their dissemination and deployment in other regions through cost reductions and technology improvements.

Amanda Brondy, Director of International Projects at the [Global Cold Chain Alliance](#), started her intervention by presenting the organisation she works for: GCCA is a trade association with 100 member companies, working on cold storage, transportation and manufacturers of critical components needed to successfully build and operate cold chain facilities. She highlighted that the GCCA aims at reducing the two primary operating costs of cold chains, which are labour and energy, a goal that members work towards to by sharing information and supporting international development projects in emerging economies.

It is, in fact, in emerging economies that cold chains are growing most rapidly and where most action needs to take place to get to net-zero. In this context, GCCA provides advisory and review services to business owners to empower them with the information needed to implement what they see as the most fitting cold chain technologies. GCCA also recently launched an energy excellence recognition program that provides qualitative and quantitative assessment tools to allow to establish a baseline year, and then track cold chain performance over time to identify challenges and opportunity that have great potential in emerging economies.

Brondy highlighted how the ongoing global crisis has shed light both on the resiliency and weaknesses of cold chains, especially lack of capacity both in terms of the actual space available for frigerated storage or transport, as well as human capacity. Developing additional capacity and dealing with the system’s weaknesses while reducing emissions will not be easy, she said. Cold



chains are in fact complex networks, with countless products that require different temperature control, the engagement and education on best practices of different groups of people. Getting to universal access and net zero cold chains is possible, but will require coordinated efforts between governments, donors and the private sector. Governments can provide an enabling environment and support the private sector, while donors should provide support through training, platforms for information sharing, feasibility studies, she concluded.

Dan Hamza-Goodacre, Non-Executive Director of K-CEP, COP26 Champions Team, closed the event by thanking speakers for sharing their invaluable work and solutions that help move cold chains to net-zero. The race to net-zero emissions for food cold chains will be determined by the efforts of all stakeholders working together, bridging the gap between supply needs and solutions, he said.

Today, demand for these solutions is stronger than ever: over 2000 non-part stakeholders from 120 countries around the world have already committed to the [Race to Zero](#), demonstrating a real demand for net-zero technologies and solutions. They represent 50% of the global GDP and 25% of emissions and need to be made aware of sustainable cooling solutions. Action on cooling and cold chains will be guided by the forthcoming Pathway for Net Zero Cooling, led by the COP26 Champions Team, for which the Cool Coalition will invite all present stakeholders for a review and feedback session in November.

[About the This Is Cool Webinar Series](#)

The Cool Coalition has teamed up with SEforALL to present a webinar series to showcase leadership and solutions from individuals, organizations, governments, private sector to accelerate the transition towards net zero cooling. The This is Cool webinar series draws on the [Sustainable Energy for All](#) (SEforALL) [“This Is Cool”](#) campaign which shows what can be done across the world to make net-zero cooling for all a reality.

[About the Cool Coalition](#)

Launched at the First Global Conference on Synergies between the 2030 Agenda and Paris Agreement, the Cool Coalition is a global multi-stakeholder network that connects a wide range of key actors from government, cities, international organizations, businesses, finance, academia, and civil society groups to facilitate knowledge exchange, advocacy and joint action towards a rapid global transition to sustainable cooling.

In September 2019, the Cool Coalition became one of the official outcomes and “Transformation Initiatives” put forward by the Executive Office of the Secretary-General for the UN Climate Action Summit in New York. The Cool Coalition has already over 100 partners driving change in the cooling sector who pledged to share knowledge, advocate and act on sustainable cooling.