

Financing Options And Innovative Business Models For Green Cooling Along The Cold Chain.

Rahul Srinivasan, Sustainable Energy for All, Oct 10-2023

Access to affordable, efficient, clean cooling is not a luxury but a development priority



- **2.3 bn people could be exposed and vulnerable to heatwaves (by 2030)**
 - Urban spaces heating up at twice the global rate (world's 30 hottest cities are in developing countries)
- **Over 1 billion people globally at immediate risk** due to lack of access to cooling in sectors such as health and agriculture

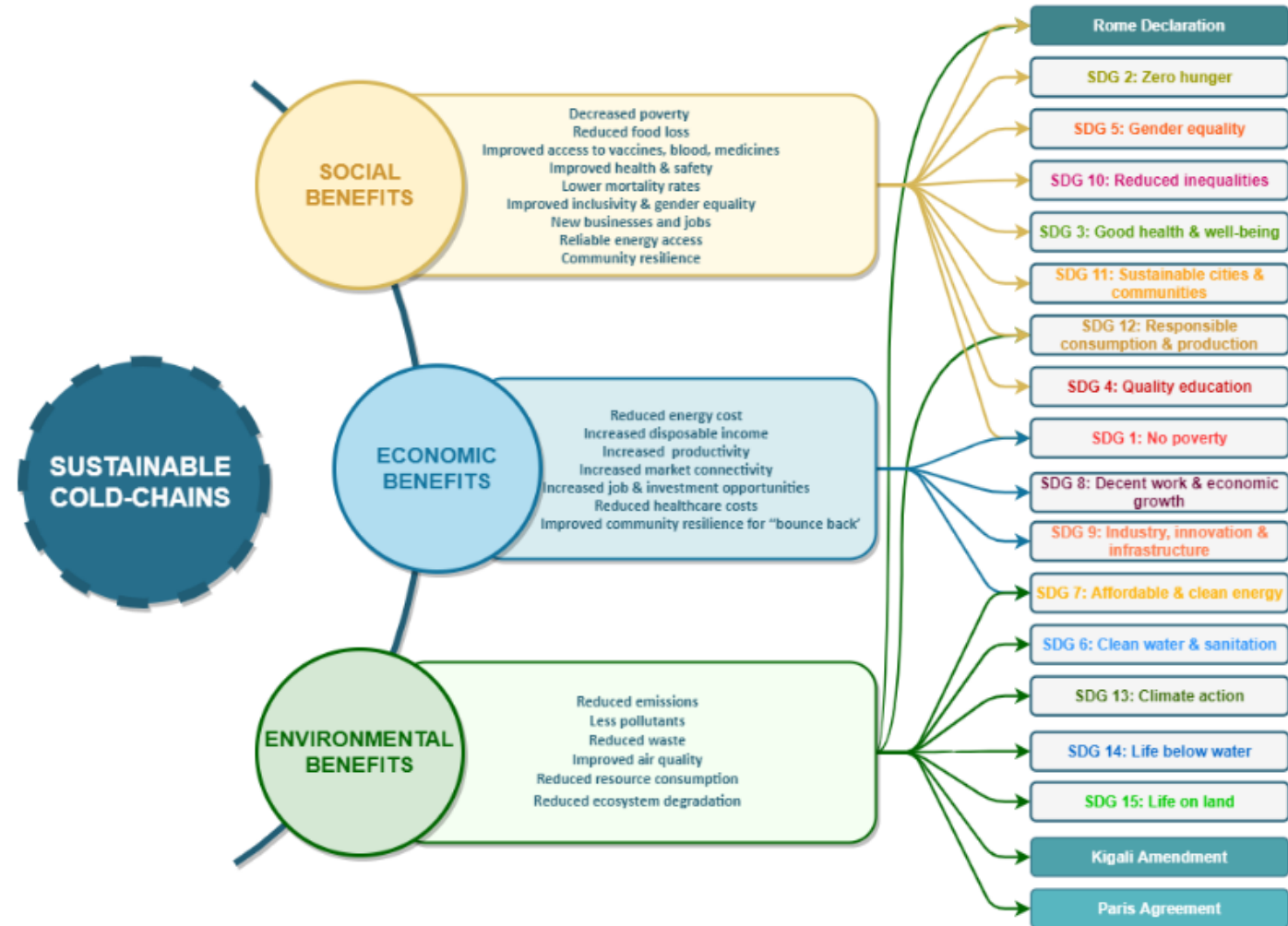


- **Health & well-being impact**
 - Heat is world's deadliest natural disaster; sensitive populations (children, elderly) at high risk
 - Uncooled indoor environments: reduced student performance; increased mental stress; difficulty sleeping
 - Lack of reliable cold storage damages and hinders access to medicine and vaccines; compromises food safety
- **Productivity impact:** By 2030, productivity loss due to heat reach 80 million full time jobs
 - Close to 5% in South Asia & West Africa - Almost 10% of working hours in agriculture in Bangladesh expected to be lost heat stress Most affected sectors: agriculture & construction
- **Food impact:** African countries losing up to 80% of post-harvest food (e.g., fruit, vegetables, fish, meat, dairy)
 - 2/3 of global food wastage happens in Africa and Asia → contributing to malnourishment, depressed farmers' income
 - Energy embedded in global annual food loss = ~38% of total energy consumed by agri-food chain
- **Equity Impact:** Without exception, negative effects of heat including climate impacts are disproportionately borne by poor and marginalized populations



Sustainable cold chains have multi-dimensional benefits

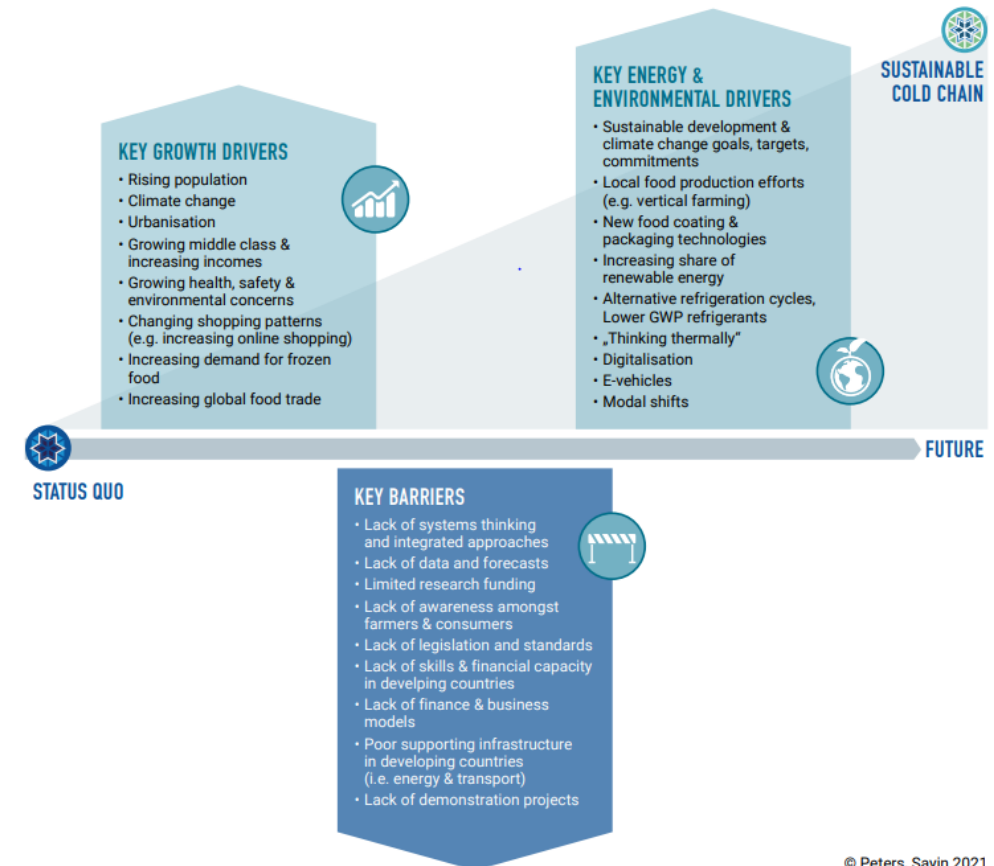
- Sustainable cold-chains are key for improving human well-being, boosting economic growth and delivering socioeconomic development through the SDGs,
- Delivering sustainable cold-chains requires balancing environmental, social and economic benefits.
- This includes providing access for all considering the cooling economy as a whole; and identifying synergies between sectors where cooling demand can be aggregated and/or capacity shared



Sustainable cold chains – Drivers and Barriers

- The COVID-19 pandemic and sub-zero cooling requirements for vaccines played an important role in driving demand for health cold chains.
- Agriculture cold chains have a role in increasing rural incomes, nutritional benefits, and climate change impacts – including food waste.
- Energy access is both a driver and a barrier. Rural health facilities and farms require sustainable access to electricity to power cooling, but reliability and economic viability of systems remains a challenge.

Figure 3: Key drivers and barriers to a sustainable cold chain



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Curated Climate Finance is Imperative to Accelerate Sustainable Cooling



For Example: ESMAP Led Green Climate Fund (GCF) Cooling Facility

Innovation

- One of the world's first cooling-focused facilities : emerging priority for climate and development
- **Cross-sectoral and covering 9 countries:** Tackling cooling across buildings, agriculture, healthcare
- **Cross-cutting:** both mitigation and adaptation

Components

Component 1: Policy, regulatory and enabling environment support - to strengthen institutional, policy and regulatory frameworks, support program design & roll-out, raise awareness and stimulate behavioral changes, and build capacity of key stakeholders

Component 2: Financing for cooling investments- to foster adoption of sustainable cooling technologies, appliances

Component 3: Project management – to support Executing Entities and Project Implementation Entities' management, coordination and implementation of project activities

Pragmatic and inclusive approach

- **Integrated and holistic approach**
 - Minimize: reduce & avoid cooling loads
 - Improve energy efficiency
 - Shift to cooling solutions with lowest GHG emissions: e.g., solar cooling, low GWP refrigerants
 - Optimize: e.g., smart sensing & behavior change
 - Protect the most vulnerable (enhance access)

Impact

- Mitigation of **16.2 MtCO_{2e}**
- **Financing mobilization: \$157 M GCF Climate finance** to co-finance \$722.8 M IBRD/IDA (total of \$880 M)
- **Beneficiaries: 21.1 million**
- **Contributes to multiple SDGs, e.g.:** #7 (energy); #2 (hunger); #3 (health & well-being); #13 (climate)

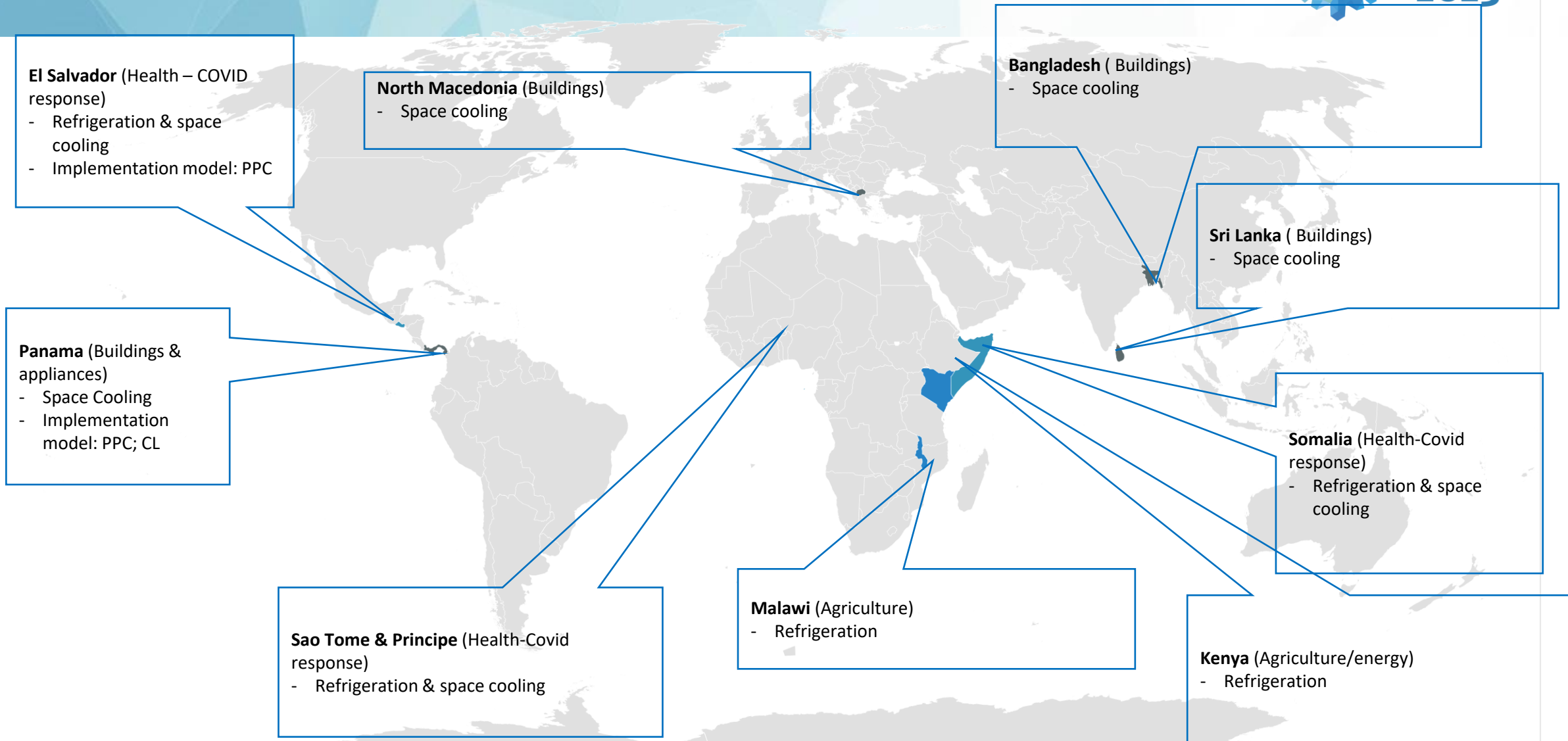
Indicative* implementation models:

PPC: Public procurement & contracting

CL: Credit lines

EEFF: Energy Eff. Financing facility (incl., public ESCO and revolving fund)

An umbrella GCF facility dedicated to sustainable cooling in 9 countries



Sample business models for cooling solutions

1 Cash sales

Customers pay the full price of the product upfront (e.g., FreshBox)

- Suited to aggregators as they can afford to pay the total cost of the products compared to SHFs whose monthly earnings are ~USD 180
- Off-grid cooling companies earn more revenue upfront to support scale but may lock out access to the first mile

EcoZen, Fresh Box, Promethean, Phocos, Steca, Sun Danzer

2 PAYGo

Customers pay an initial deposit of the product price and make regular instalment repayments (e.g., M-KOPA)

- Low-income customers can purchase off-grid cooling products they would not afford otherwise
- Limited use by off-grid cooling companies as M-KOPA is the only company providing this to traders

Koolboks, M-KOPA, PEG Africa, Sure Chill

3 Asset financing

Provision of small loans by off-grid cooling companies to customers for purchase of cold storage

- Adopted by companies such as Inspira Farms, who are providing loans of up to 80% of asset value at interest rates of 10 – 12%
- Companies are able to structure repayment around seasonality of the value chains they serve

Eja-Ice, Inspira Farms, Solar Now

4 Pay as you store

Customers are charged per day to store their produce in a section of a cooling unit (e.g., SokoFresh)

- Eliminates the burden of the upfront cost on low-income small holder farmers and small aggregators that may not afford to purchase these products
- Difficult for off-grid cooling companies to attain profitability

EcoZen, Cold Hubs, SokoFresh

Source: OCA, East Africa / SELCO, India

ESCOs, Community Cooling Hubs etc are other emerging models in the cooling space

Thank You



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