SUSTAINABLE ENERGY FOR ALL

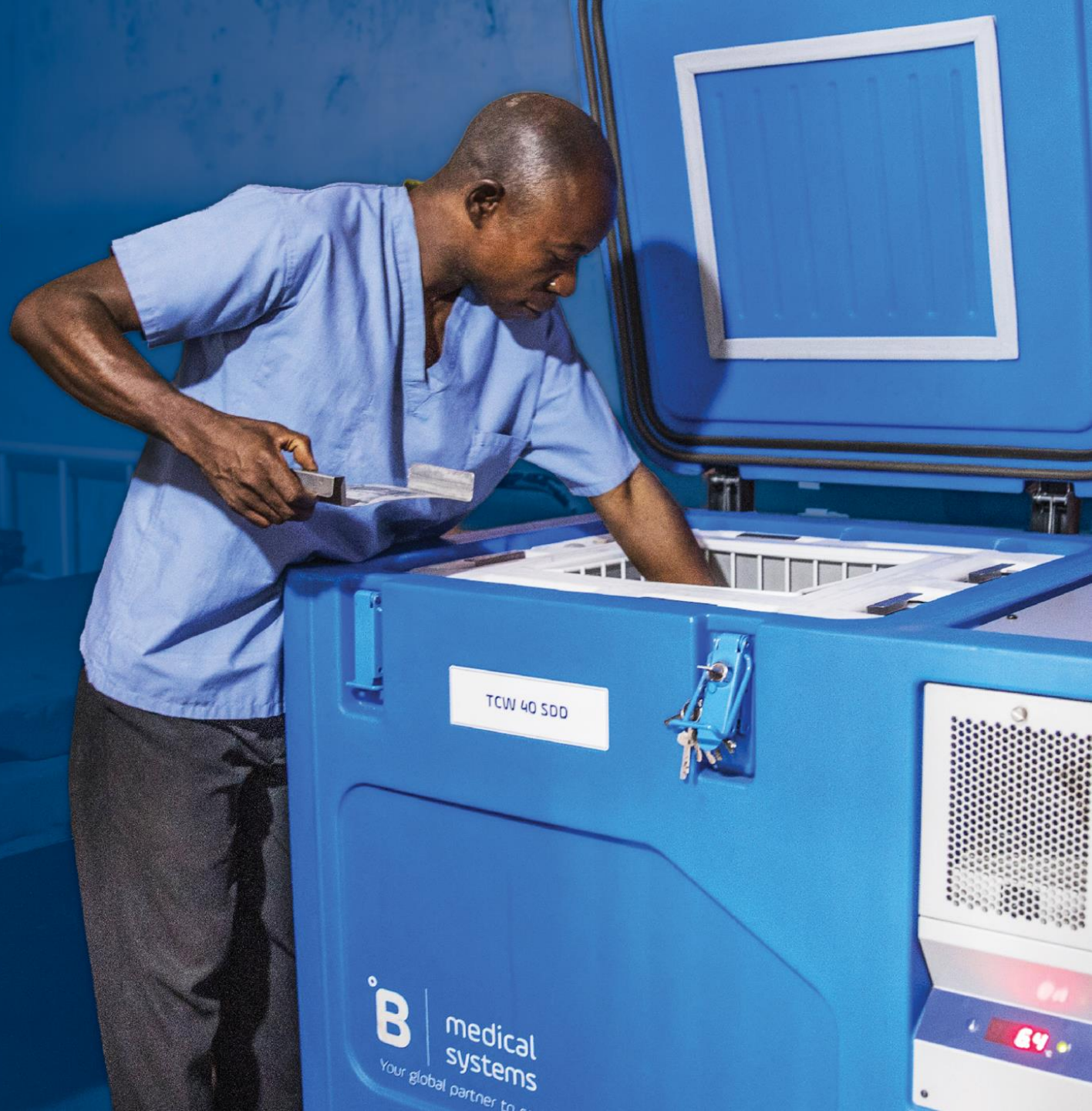
CHILLING PROSPECTS 2022

Cool Coalition

WEBINAR

Sustainable Cooling for All in Africa

19th July 2022 13:30 CEST / CAT



SUSTAINABLE ENERGY FOR ALL

CHILLING PROSPECTS

Chilling Prospects

TRACKING SUSTAINABLE COOLING FOR ALL

Schweizerische Eidgenossenschaft
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Confederazione Svizzera
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Swiss Agency for Development and Cooperation SDC

CHILLING PROSPECTS 2022

OVERVIEW

1. TRACKING AND FORECASTING COOLING ACCESS RISKS
2. COOLING NEEDS: GLOBAL TRENDS & REGIONAL DATA
3. SUSTAINABLE COOLING FOR CITIES
4. TRACKING THE ENABLING ENVIRONMENT
5. COOLING FOR ALL SOLUTIONS

GLOBAL TRACKING | GLOBAL COOLING ACCESS RISKS

CHILLING PROSPECTS 2022

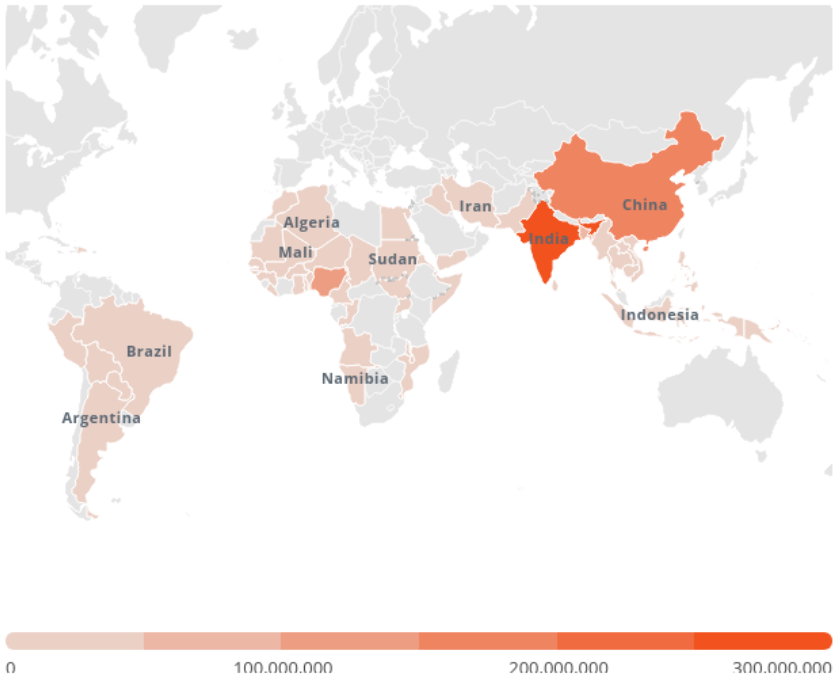
1.2 billion people are at high risk because they lack access to cooling, an increase of 28 million from 2021.

2.47 billion people are at medium risk, purchasing cooling devices with limited affordable, efficient, climate-friendly options.

Populations at high risk includes:

- **371 million rural poor** in high-impact countries
- **797 million urban poor** in high-impact countries
- **30.5 million** people in 22 additional countries with **sub-national** cooling access risks.

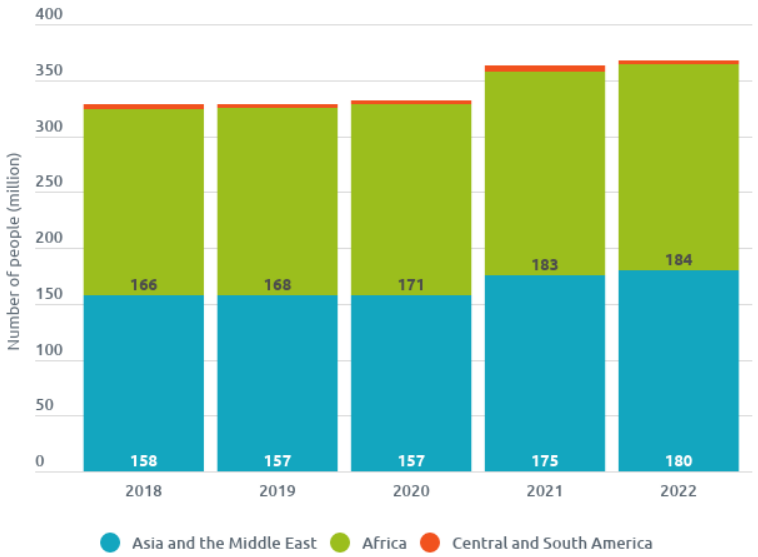
Populations at high risk by country, 2022



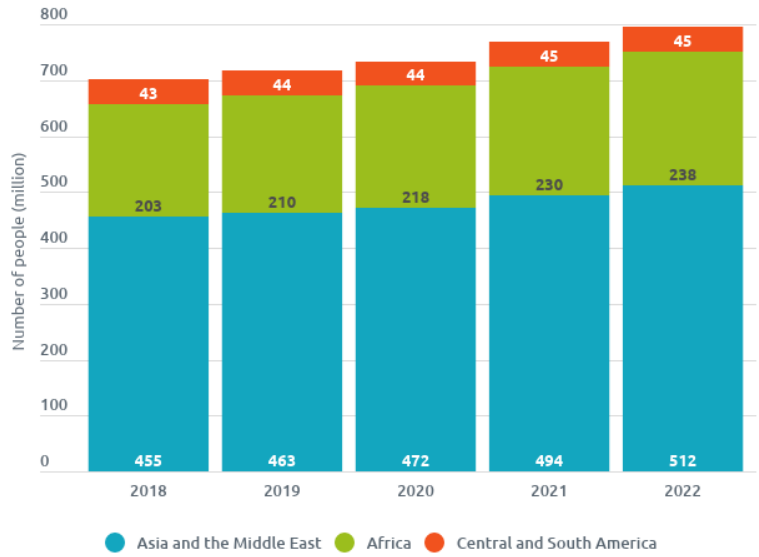
GLOBAL TRACKING | AFRICA

CHILLING PROSPECTS 2022

Rural poor population regional breakdown (2018-2022)



Urban poor population regional breakdown (2018-2022)



In 2022, 31 high-impact countries in Africa are home to:

- **50% of the rural poor** in high-impact countries, with 8 African countries among the top 10
- **30% of the urban poor**, with Nigeria, Angola and Sudan among the global top 10
- **15% of the lower-middle income population** at medium risk (Egypt, Nigeria in the top 10)
- **Subnational-risks exist** in 3 additional countries, most notably Ethiopia

GLOBAL FORECAST | AFRICA

CHILLING PROSPECTS 2022

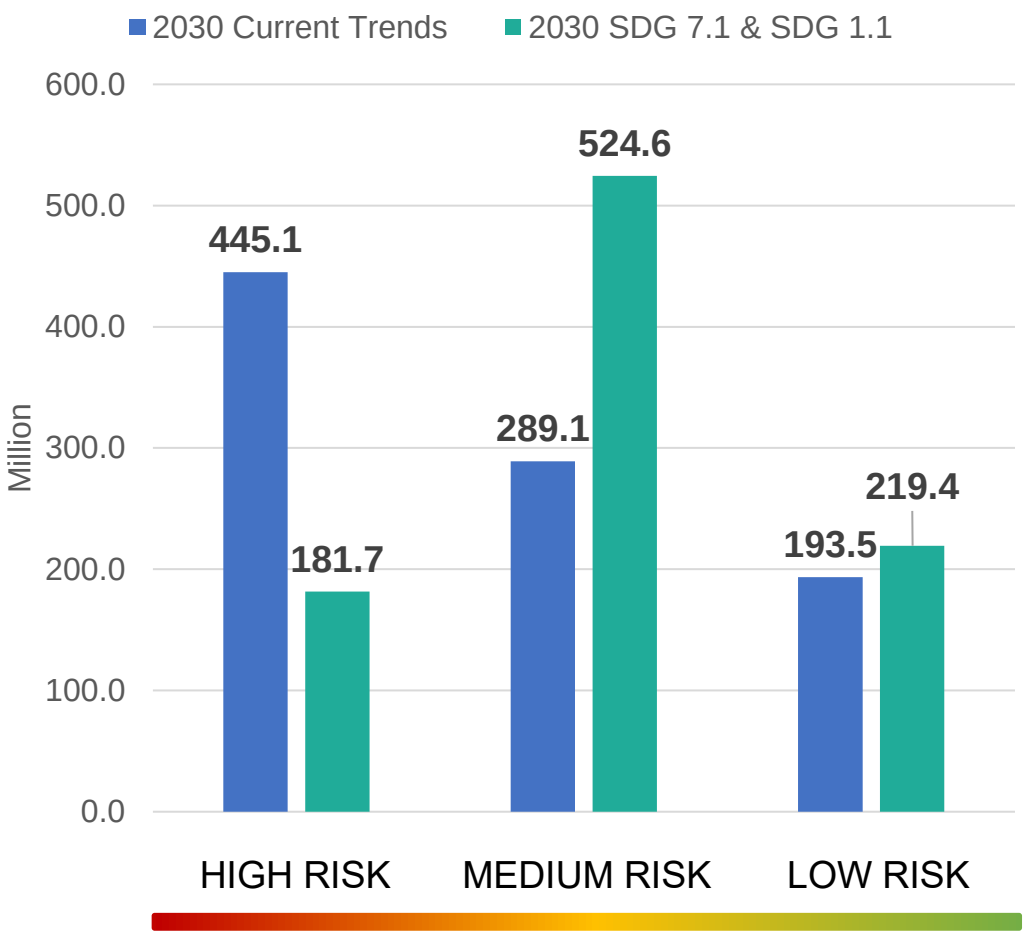
Globally, achieving **universal access to electricity** and **eradicating extreme poverty** by 2030 could:

- Lift over **430 million people – particularly rural poor - out of high risk** compared to current trends,
- Result in over **2 billion people** at medium risk.

In this scenario, by 2030 high impact countries in **Africa** will still see:

- Over **165 million urban poor** at high risk,
- Over **520 million lower-middle income** people at medium risk

Populations at risk in high-impact countries in Africa, 2030



COOLING NEEDS | HUMAN COMFORT AND SAFETY

CHILLING PROSPECTS 2022

Globally:

- **356,000 people** died of extreme heat in 2019
- Worker productivity losses due to heat stress could equal **80 million full-time jobs** in 2030

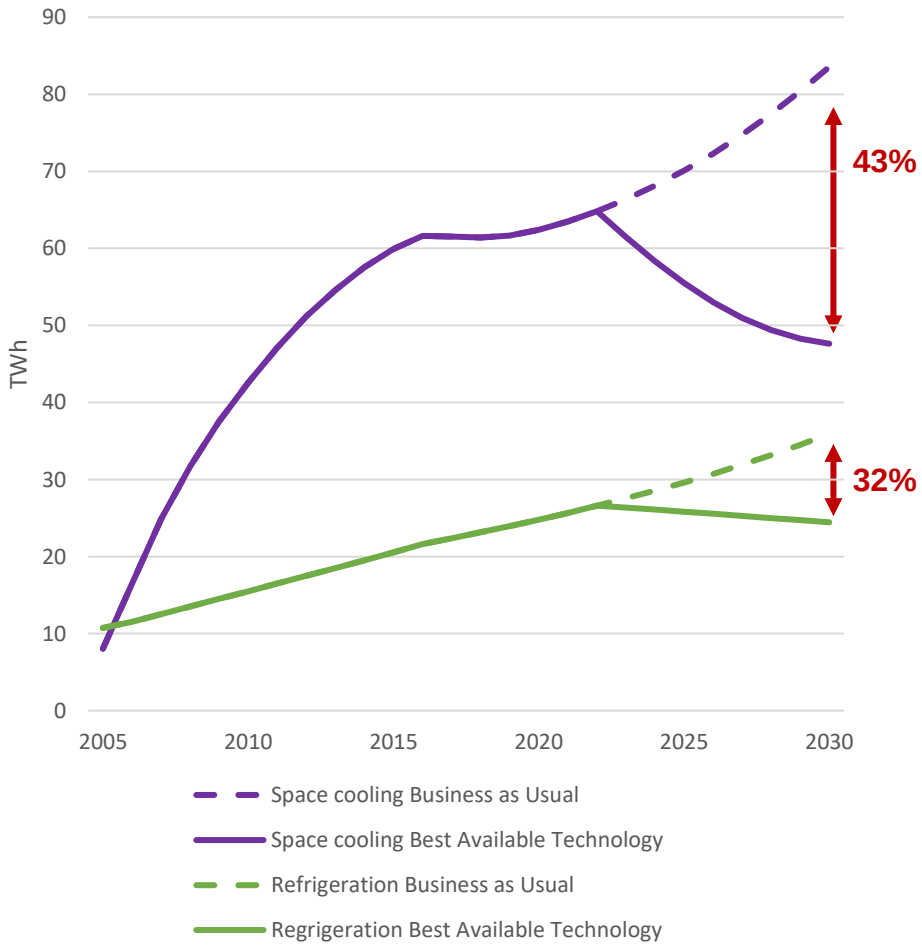
In Africa:

In 2030, 27 high-impact countries[1] will account for

- Almost **100 million space cooling units** in use
- Almost **84 million refrigerators** in use
- Deploying **best available technologies** could save over **217 TWh** of cumulative final energy use in 2023-2030

[1]Algeria, Angola, Benin, Burkina Faso, Cameroon, Chad, Congo Rep., Djibouti, Egypt, Eritrea, Eswatini, Gambia, Ghana, Guinea, Guinea Bissau, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, Sudan, Togo, Uganda

Projected final energy consumption from AC, fans and refrigeration in 27 high-impact countries in Africa[1], 2005-2030



Source: SEforALL analysis of CLASP data

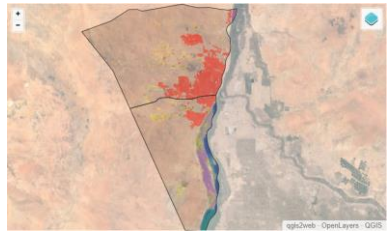
COOLING NEEDS | SUSTAINABLE COOLING FOR CITIES

CHILLING PROSPECTS 2022

The IPCC warns that the exposure of the urban population to extreme heat in Africa could increase more than 20 times over the coming decades, even with 1.7°C of global warming.

Lagos, Nigeria

Maputo, Mozambique



Omdurman, Sudan

Lagos, Maputo, Omdurman

- In 2015-2019, increase in the built-up area was limited (1.2 km^2 overall), but cities expect rapid growth
- All cities will experience a significant number of dangerous heat days every year
- Lagos and Omdurman are also exposed to other adverse effects of climate change (e.g. rising sea level, flooding)

How to mitigate risks?

- Factoring urban resilience and heat mitigation into urban planning and expansion processes, using natural heat sinks, green spaces and passive cooling measures.

COOLING NEEDS | FOOD AND AGRICULTURAL COLD CHAINS

CHILLING PROSPECTS 2022

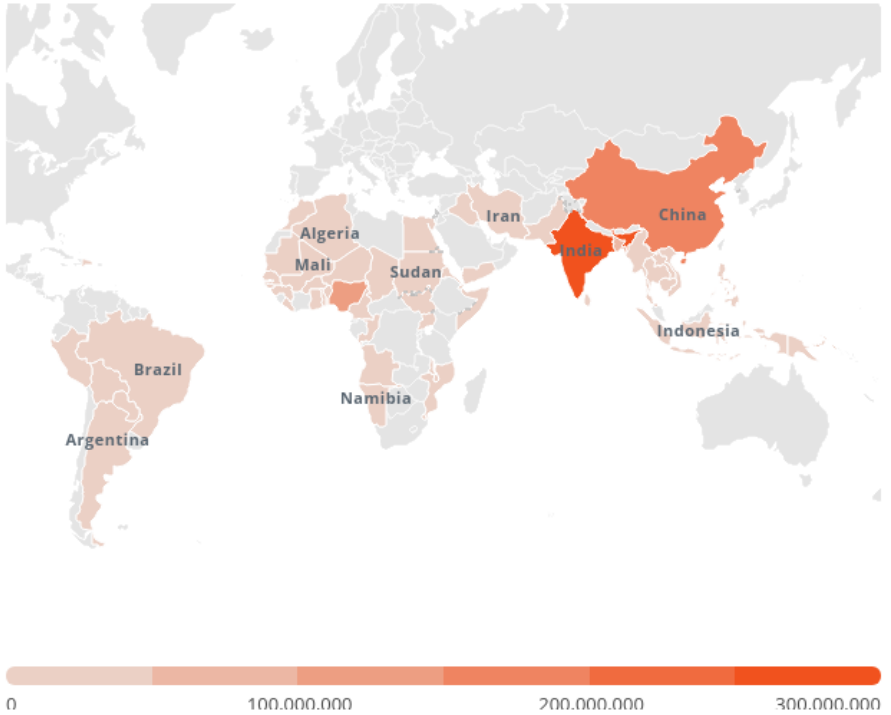
Globally:

A lack of sustainable cold chains leads to **526 million tons of food production loss** every year, and -15% in smallholder farmers' income.

In Africa:

- Egypt, Nigeria, Algeria, Morocco, Cameroon and Angola have the largest **volume of food losses** among African high-impact countries
- Food **losses per capita** are high in Cameroon (>56 kg/person), Angola (>48 kg/person), and several other countries (>30 kg/person)
- 31 countries in Africa account for 7% of **energy use for food production** in high-impact countries, but some are highly energy-inefficient

Food production per unit of energy consumption, 2022 (kg/kWh)



COOLING NEEDS | VACCINES AND MEDICAL COLD CHAINS

CHILLING PROSPECTS 2022

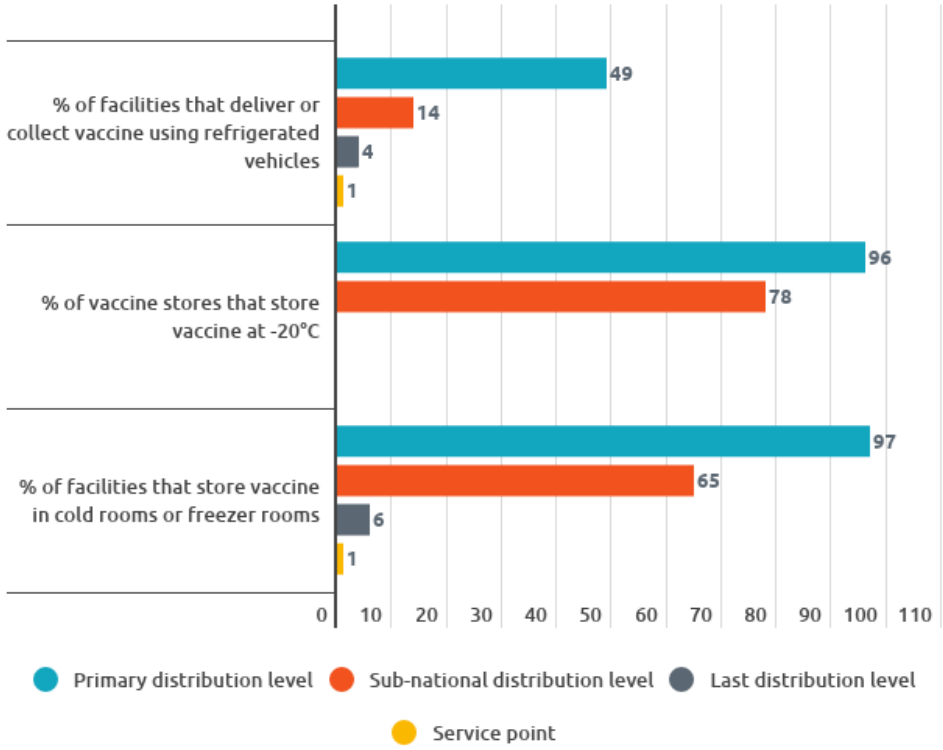
Globally:

- Up to 90% of health facilities in 57 Gavi-eligible countries **lack sufficient cold chain**.
- Over 50% of health facilities assessed by WHO experience significant **voltage fluctuations**.

In Africa:

- Recent vaccine developments have made cold chains essential for stronger malaria response
- Super efficient and renewable-powered appliances provide cost-effective and reliable cold chains solutions in off- and weak-grid settings

WHO EVM cold hain indicators for 86 countries (2009-2020)



Source: WHO Effective Vaccine Management Assessment (2009-2020)

Assessing the cost, climate, and energy implications of climate friendly & energy efficient cold chain infrastructure in Nigeria

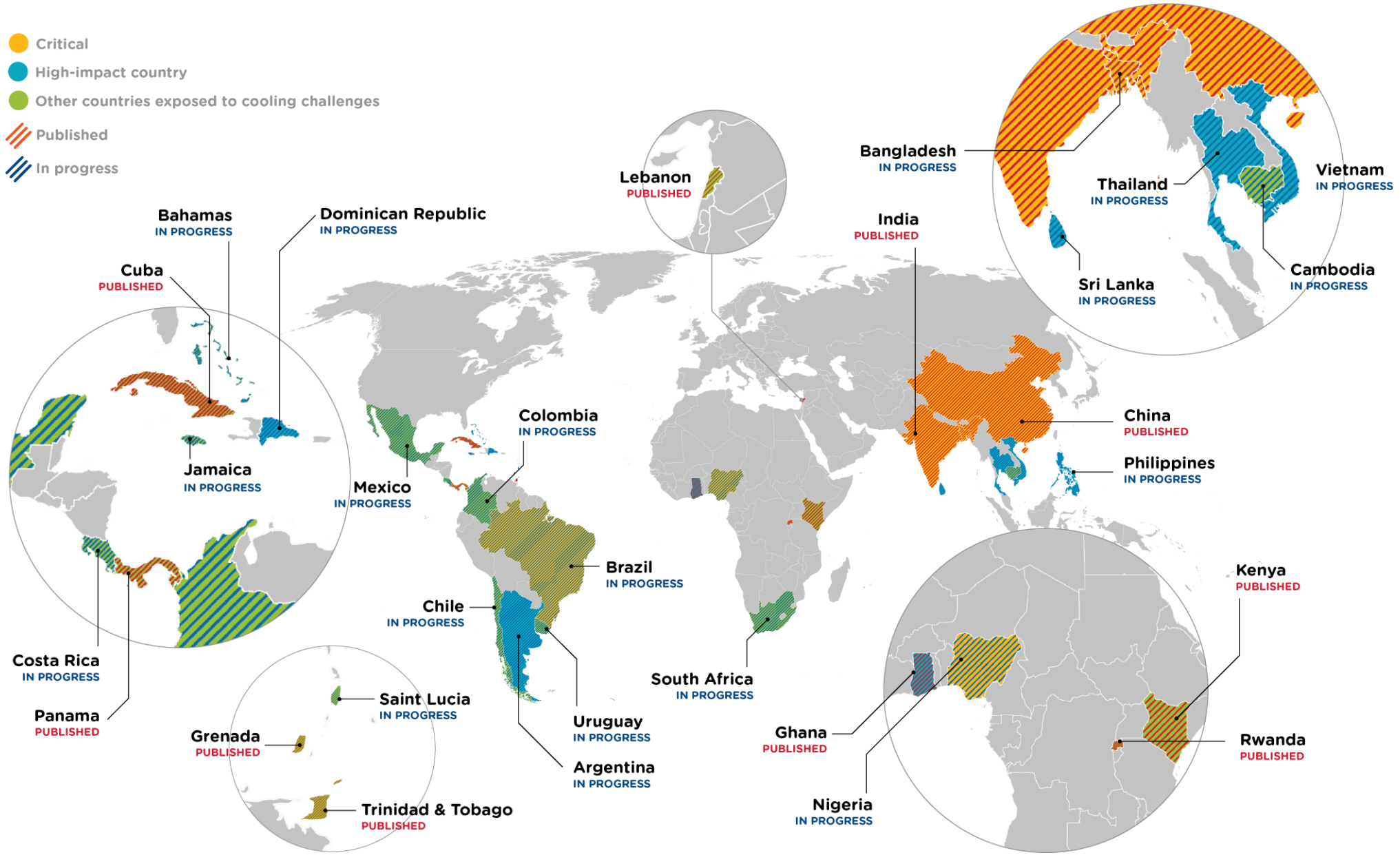
SEforALL is working with World Bank/ESMAP and Schatz Energy Research Centre (SERC) in collaboration with National Primary Healthcare Development Agency (NPHCDA) of Nigeria. The project contextualizes ESMAP's Climate Friendly Cold Chain Tool in Nigeria around 3 scenarios:

	STATUS
1. **Solar Electrification of Primary Healthcare Facilities** - *Implementation of solar energy systems at primary healthcare facilities (10k) in support of the Ward Minimum Health Care Package (WMHCP).* Implementation of solar energy systems at non-PHC clinics (forthcoming).	**Preliminary Analysis**
2. **Solar Electrification of Vaccine Storage Facilities** - *Implementation of solar energy systems at vaccine storage facilities. (forthcoming)*	***In-Progress***
3. **Solar Direct drive (SDD) Refrigeration for Vaccination Delivery** - *distribution of solar direct drive (SDD) refrigerators across comprehensive health centres as part of the Ward Minimum Health Care Package (WMHCP).*	**Preliminary Analysis**

How does energy efficiency and solarization lead to long-term cost and climate savings?

- More energy efficient facilities consume less electricity, translating to less grid electricity and diesel purchased, and lower facility operating costs
- Less burning of fossil fuels to generate electricity reduces emissions of facility CO_2 and other air pollutants that harm the climate and human health.
- Solar power systems that provide electricity to the facility can be smaller when less energy is needed, reducing the capital cost of these systems, operating costs, and payback time.
- Facility efficiency gains come from investment in energy efficient appliances and medical equipment.

TRACKING THE ENABLING ENVIRONMENT | NATIONAL COOLING ACTION PLANS



All maps were produced by SEforALL and they are based on the UN Map of the World, which can be found here: https://www.un.org/Depts/Cartographic/map/profile/world.pdf
The boundaries, colors, denominations and any other information shown on these maps do not imply, on the part of SEforALL, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

TRACKING THE ENABLING ENVIRONMENT | POLICY PROGRESS

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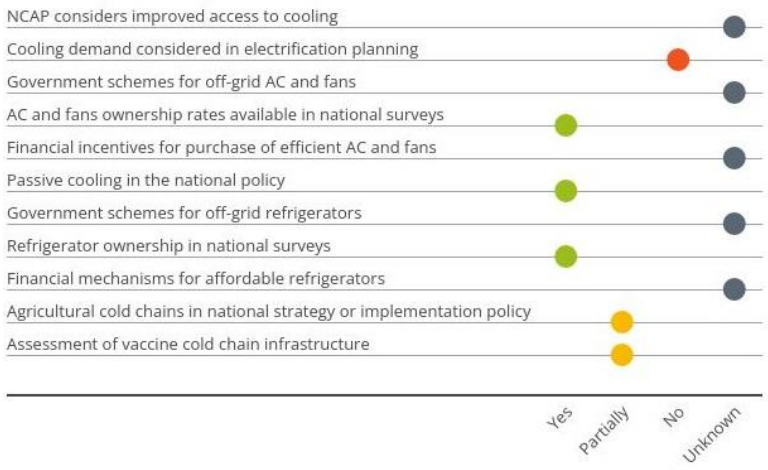
Cooling For All Policy Tracking Approach and Key Findings

What is the status of the National Cooling Action Plan? IN PROGRESS

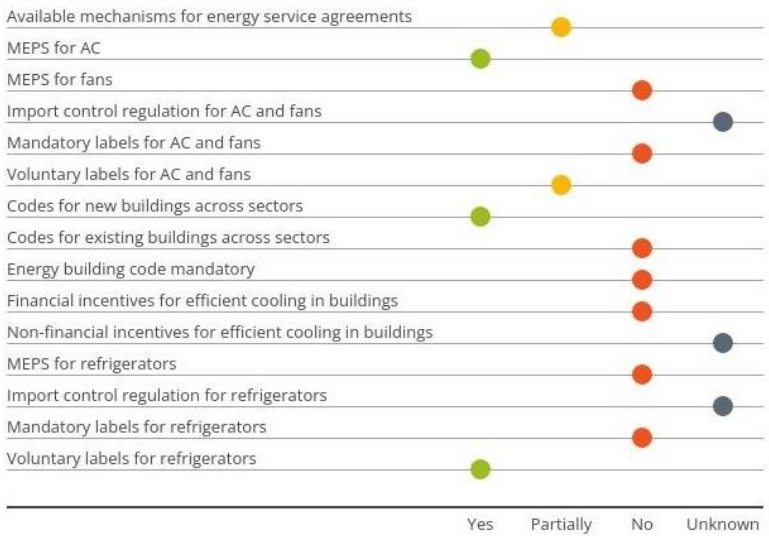
Access to cooling
To what extent do policies enhance access to cooling?

Nigeria



Energy efficiency for cooling
To what extent do policies enhance efficiency of ACs, fans, refrigerators and buildings?

Nigeria



Climate mitigation from cooling
To what extent is cooling reflected in climate targets?

Nigeria

COOLING FOR ALL SOLUTIONS | PARTNER STORIES

CHILLING PROSPECTS 2022

Health services

Data analysis 03 May 2022

Chilling Prospects 2022: Expanding the vaccine cold chain in Kenya through innovative cooling solutions

Data analysis 09 May 2022

Chilling Prospects 2022: Protecting medicines and vaccines through data analytics across the cold chain

Data analysis 11 May 2022

Chilling Prospects 2022: Advancing health facility electrification

Regional perspectives

Data analysis 07 Jun 2022

Chilling Prospects 2022: Putting natural refrigerants on the map in the Middle East and North Africa

Food, nutrition and agriculture

Data analysis 05 May 2022

Chilling Prospects 2022: Making sustainable, affordable refrigeration a reality for all

Data analysis 03 Jun 2022

Chilling Prospects 2022: Promoting sustainable agricultural food chains through the Energy Smart Food programme

Financing access to sustainable cooling

Data analysis 22 Jun 2022

Chilling Prospects 2022: Ashden's Fair Cooling Fund

Data analysis 31 May 2022

Chilling Prospects 2022: Using data science and innovative business models to strengthen agricultural cold chains in India and Nigeria

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