

# Safe food and medicine with uninterrupted cold chains

Lessons from the field



green   
cooling initiative



## Uninterrupted cold chains with climate-friendly cooling

**Food begins to perish immediately after it is produced if it is not refrigerated in a timely fashion. Sometimes, produce may deteriorate to a point where chilling it will not prolong the product's shelf life any more. For highly perishable products, exposure to high temperatures for as little as one hour can reduce shelf life by a full day.**

Along the cold chain, a wide variety of cooling technologies are used by shipping, warehousing and handling companies. They have different temperature ranges and use different types of energy and refrigerants. This means the cost of buying and operating the technologies varies as well. Identifying the most suitable technologies for a given use can require specialized knowledge.

The demand for cooling is on the rise as the climate warms and populations grow. When selecting a technology, it is particularly important to focus on sustainable, environmentally friendly cooling solutions, such as those that have natural refrigerants that will not deplete the ozone layer. To keep goods safe along the cold chain, a stable and uninterrupted energy supply is needed. Power failures as well as voltage and frequency fluctuations can cause the cold chain to fail.

Up to 15% of the energy consumed globally is used for refrigeration and air conditioning, which is why energy-efficient, alternative solutions, operating with natural refrigerants, should be adopted.



## Reliable cold chains for safer food

**Food must be kept adequately cool – so that producers can preserve their goods and consumers are sure their food is fresh and safe.**

The cold chain is uninterrupted cooling for food or medicine from the time it is harvested or produced, as it is transported or stored, and until it arrives to the consumer. If food is eaten immediately after it is produced, a cold chain may not be needed. But as time passes, the likelihood of food perishing increases. Similarly, medicines and vaccines may become unusable or even dangerous if the necessary temperature is not maintained with a reliable, uninterrupted cold chain.

A significant amount of food produced today spoils before it reaches consumers or can be consumed. Post-harvest losses are estimated at 30% of global food production, while less than 10% of the

world's perishable foodstuffs are being refrigerated properly. Improving access to refrigeration in developing countries could prevent the spoilage of up to 23% of perishable foods currently produced there, according to the *International Institute of Refrigeration*.

In rural areas in particular, the handling, storage, transport, sale, and consumption of perishable food often takes place entirely outside of temperature-controlled environments. Up to two thirds of overall food losses occur in rural areas, where reliable cold chains are rare. If cold chain infrastructure is available, it is typically in or near urban areas.

Improving the cold chain for food and medicine has the potential to provide significant benefits in developing countries.

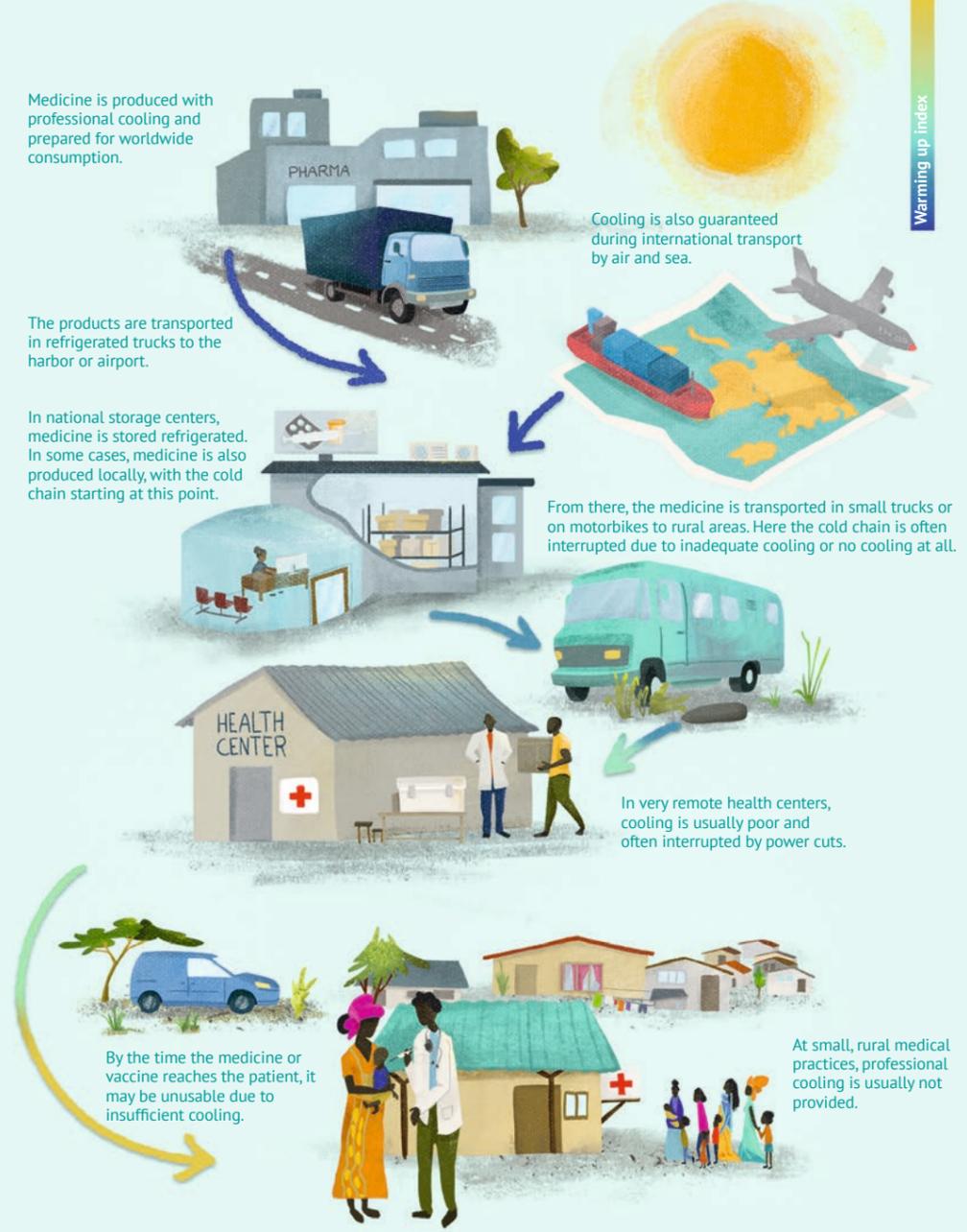
## Keeping Fish Cool



## Keeping Vegetables Cool



## Keeping Medicine Cool



## The Green Cooling Initiative and Proklima

GIZ Proklima is a program of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, which provides technical support to developing countries to implement the provisions of the Montreal Protocol and the Kigali Amendment on substances that deplete the ozone layer and affect the global climate.

impact of cooling systems used in the private and public sectors.

- Three key objectives include:
- ✳ Promoting natural refrigerants and energy-efficiency
  - ✳ Establishing advanced training institutions and certification schemes
  - ✳ Encouraging public and private financing of projects



As part of GIZ Proklima, the Green Cooling Initiative (GCI) is working on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under its International Climate Initiative (IKI) to promote ozone- and climate-friendly technologies.

One way of minimizing the impact of the cooling industry on the environment is by helping it move to green cooling technologies by leapfrogging from ozone depleting refrigerants to natural refrigerants and maximized energy-efficiency.

The overall objective of GCI is to minimize the environmental and climate

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## Registered offices

Bonn and Eschborn

Dag-Hammarskjöld-Weg 1-5

65760 Eschborn Germany

T +49 61 96 79 – 0

F +49 61 96 79 – 11 15

## Program

GIZ Proklima, Green Cooling Initiative

nika.greger@giz.de

www.giz.de/proklima

## Authors & Editing

Lena Bareiss, Nika Greger, Nicole Müller

## Design

creative republic

Frankfurt am Main, Germany

www.creativerepublic.de

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