Demonstrating technology cooperation worldwide: Examples of green cooling in air-conditioning and refrigeration

Hydrocarbon (R290) Air-Conditioner by Godrej, India

Solar powered Vaccine Cooler, Fridge Factory Swaziland

ATMO EU sphere
Solutions for Europe
natural refrigerants

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Content

Background: GIZ Proklima – Where do we come from?

The need for innovation and exchange

Different forms of technology cooperation

Project Examples

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GIZ PROKLIMA

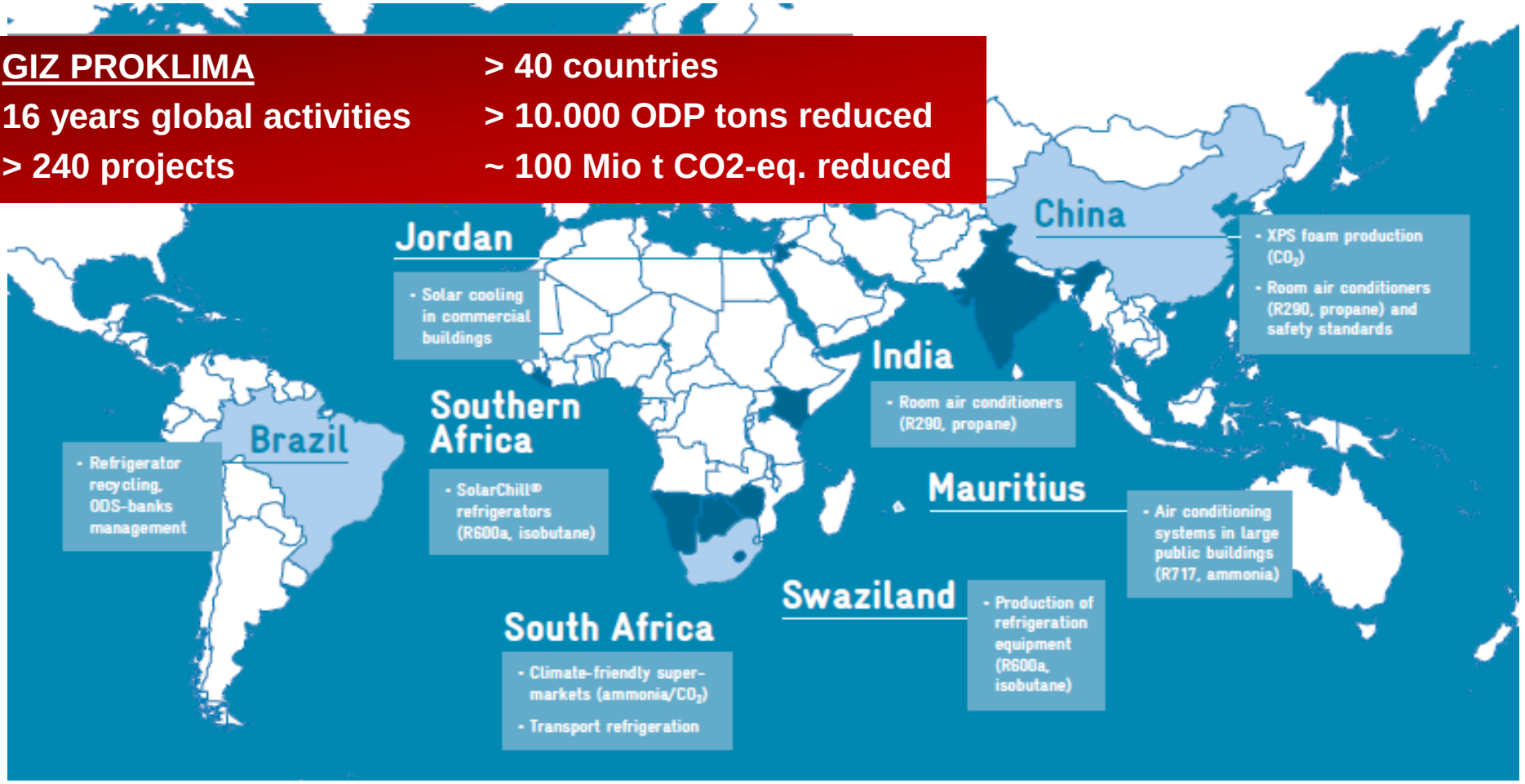
16 years global activities

> 240 projects

> 40 countries

> 10.000 ODP tons reduced

~ 100 Mio t CO2-eq. reduced



On behalf of

Federal Ministry for Economic Cooperation and Development

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

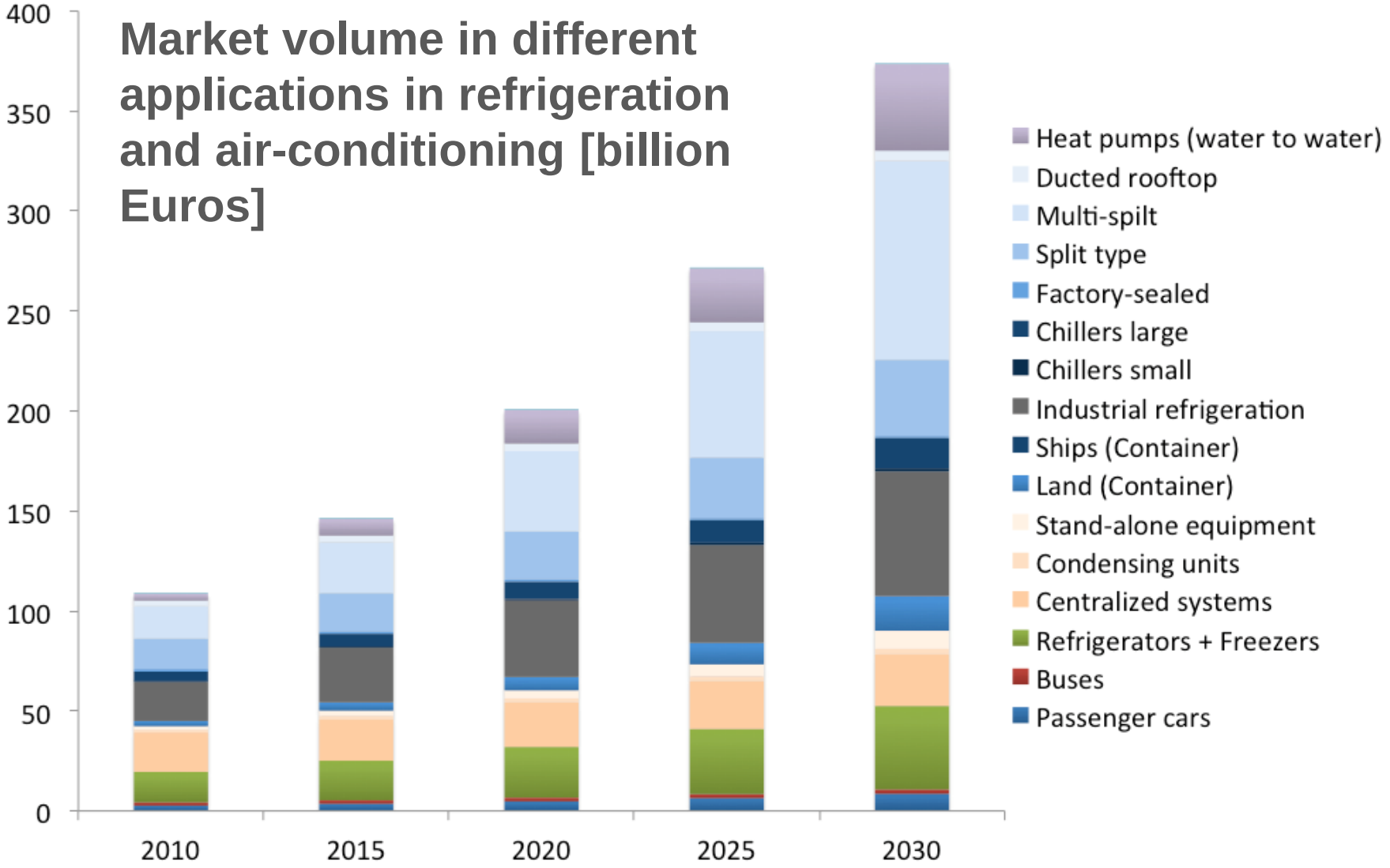
Content

On behalf of

Federal Ministry for Economic Cooperation and Development

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

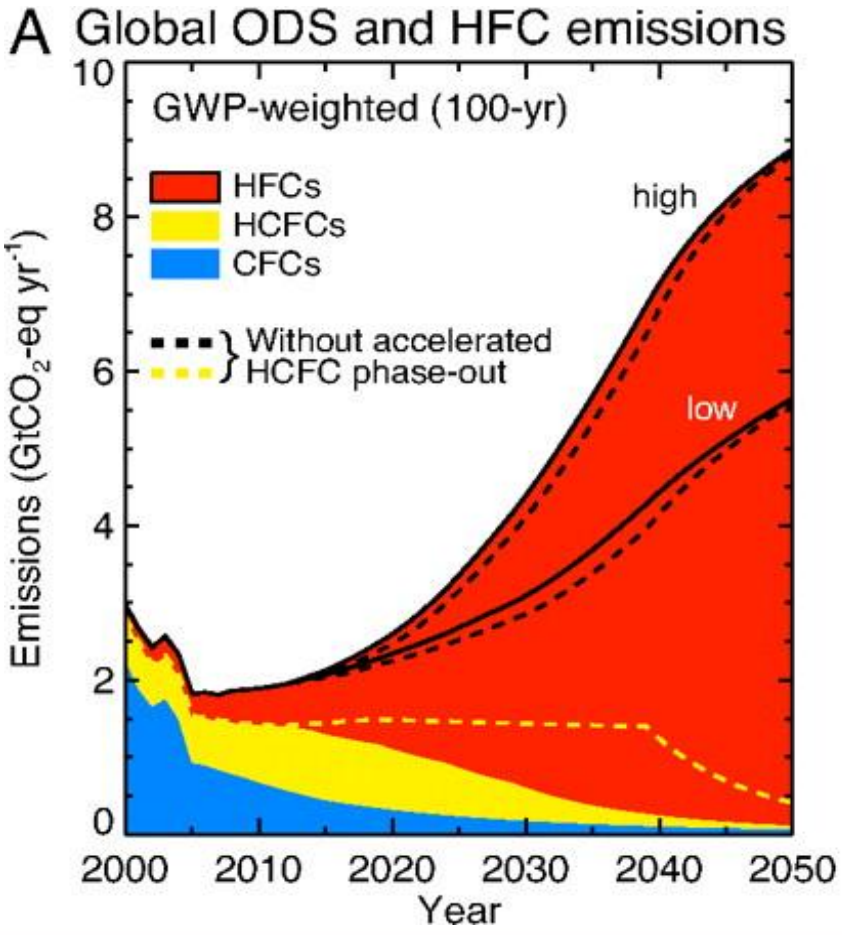
Market volume in different applications in refrigeration and air-conditioning [billion Euros]



Global relevance

- Ca. 15% of global energy consumption for cooling (7% growth/year until 2050) [IEA]
- Approx. 40% of energy consumption in urban areas for refrigeration and air conditioning
- Refrigerator and air conditioning unit are (next to light and tv) the top investments for poor families
- Up to 80% of energy costs of poor households come from the household refrigerator
- Proper insulation reduces 35-50% of energy loss

Predicted growth of HFCs without constraint



- 2050 - > Developing countries become major consumer with a future share of over 70%
- Estimates of future HFC emissions range between 8 and 19% of the carbon emissions

Fuente: Velders, Guus J.M. et.al., 2009

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

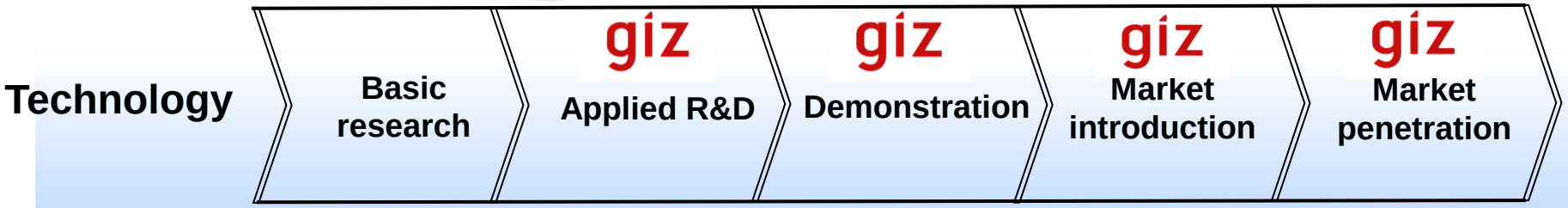
Content

On behalf of

Federal Ministry for Economic Cooperation and Development

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

GIZ activities – Multi-level approach



Macro

- Policy development
- Strategy development (e.g. for RE & EE)
- R&D-Policy for climate-friendly technologies
- Incentives, subsidies
  - e.g. reduced import customs, reduced taxes, tarifs

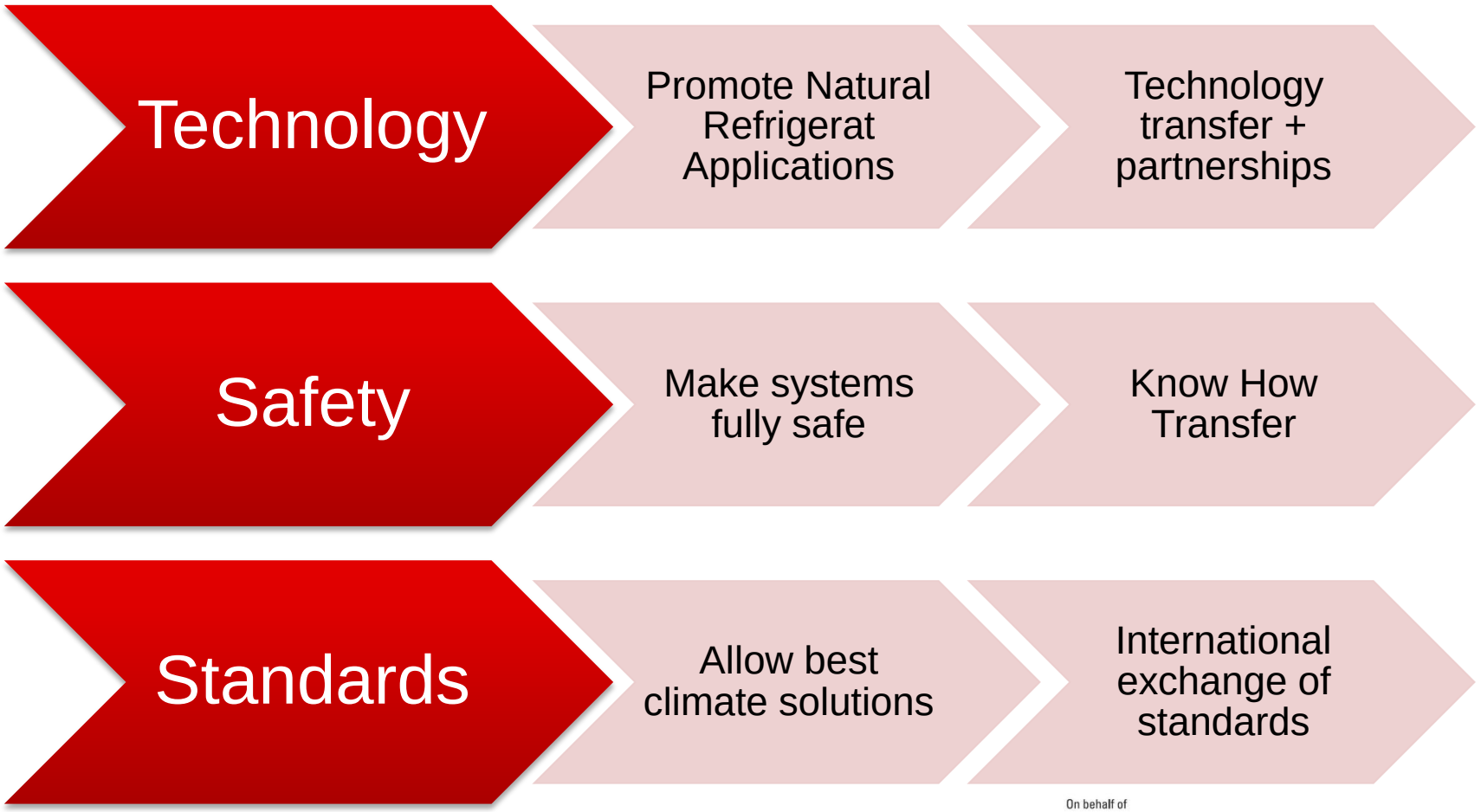
Meso

- Environmental standards
- Techn. standards, norms, calibration and measuring system, quality control
- Cooperation with research institutes
- Technology advise and information
- Financing systems

Micro

- Application of innovative technologies
- Technology adaptation
- Accompanying dissemination of new technologies

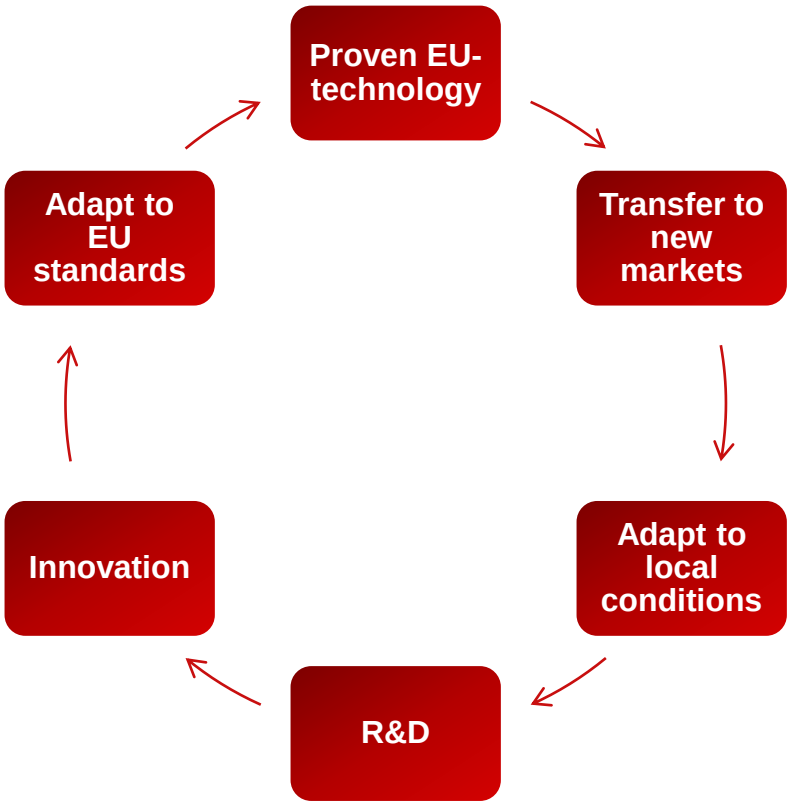
The technology challenge



giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

The innovation cycle



- **Promoting energy-efficient, ozone- and climate-friendly ‘green cooling’ policies and technologies**
- **Proving technical feasibility and economic viability of sustainable cooling technologies in emerging economies and developing countries**
- **Developing technology networks between industry, research and policy**

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

German Green Cooling Initative – Global Technology Network

- **Development of networks under the UNFCCC Technology Mechanism (Technology Executive Committee (TEC), Climate Technology Centre & Network (CTCN)**
- **Objectives:**

1) **mobilize technology providers and investors in Germany and the EU to participate in sector networks and joint initiatives with developing countries**
2) **create incentives for investments in climate-friendly cooling technologies**

- **Promoting a dialogue between stakeholders from industries, policy, research and non-governmental organizations (EU and non-Annex 1 countries)**
- **to encourage North–South, South–South and triangular partnerships on climate-friendly cooling technologies**

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Content

- Background: GIZ Proklima – Where do we come from?
- The need for innovation and exchange
- Different forms of technology cooperation
- **Project Examples**

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

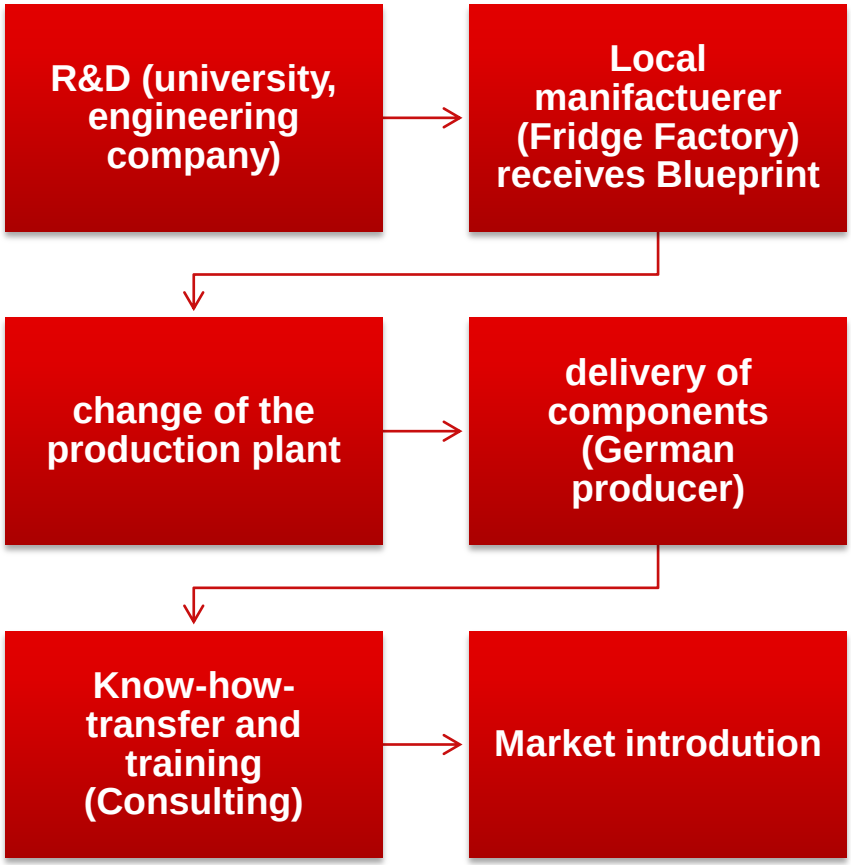
SolarchillTM – Content of the Project

- **Preserve medicine food & beverages at high ambient temperatures (48°C)**
- **Using solar energy without the use of chemical storage batteries**
- **stable temperature for more than 72 hours even without power supply**
- **Excess energy is stored in a ballast load and is used during low light conditions**
- **Refrigerant 600a (isobutane)**
- **The new prototype is currently being tested by an EU Technical Inspection Agency**
- **Set-up of a production line at the local manufacturer in Swaziland**
- **Planned mass production in 2013**

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

SolarchillTM - Process



giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

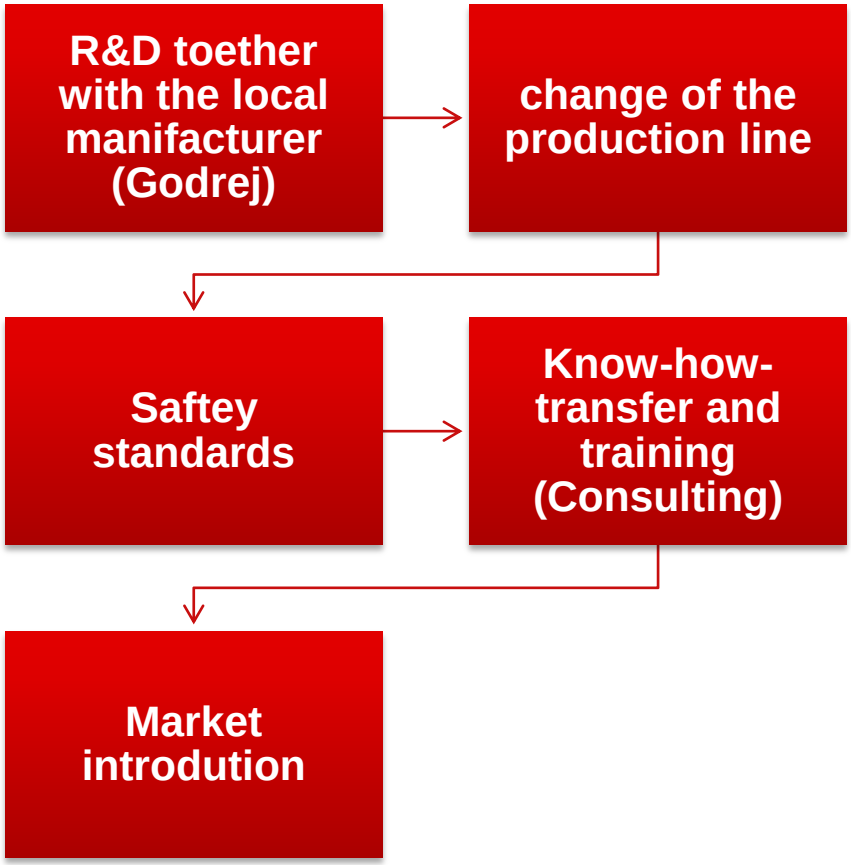
On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Room air-conditioners using the natural refrigerant R290

- **Local manufacturer in India Godrej & Boyce Mfg. Co. Ltd**
- **Developed very high efficiency split AC model on propane (HC 290) basis**
- **Achieve Indian Bureau of Energy Efficiency (BEE) five-star (highest) rating (23%+ energy savings compared to top of the line products)**
- **India: Expected emissions reduction of annual production: 1 million tonnes of CO^2 equivalent**
- **Training of Trainers (by GIZ/Godrej) – March 2012**
- **Risk Analysis & Mitigation**

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

290 A/C - Process



Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Thank you for your kind attention!

Contact: marion.geiss@giz.de

www.giz.de/proklima

ATMOsphere EU
Solutions for Europe
natural refrigerants

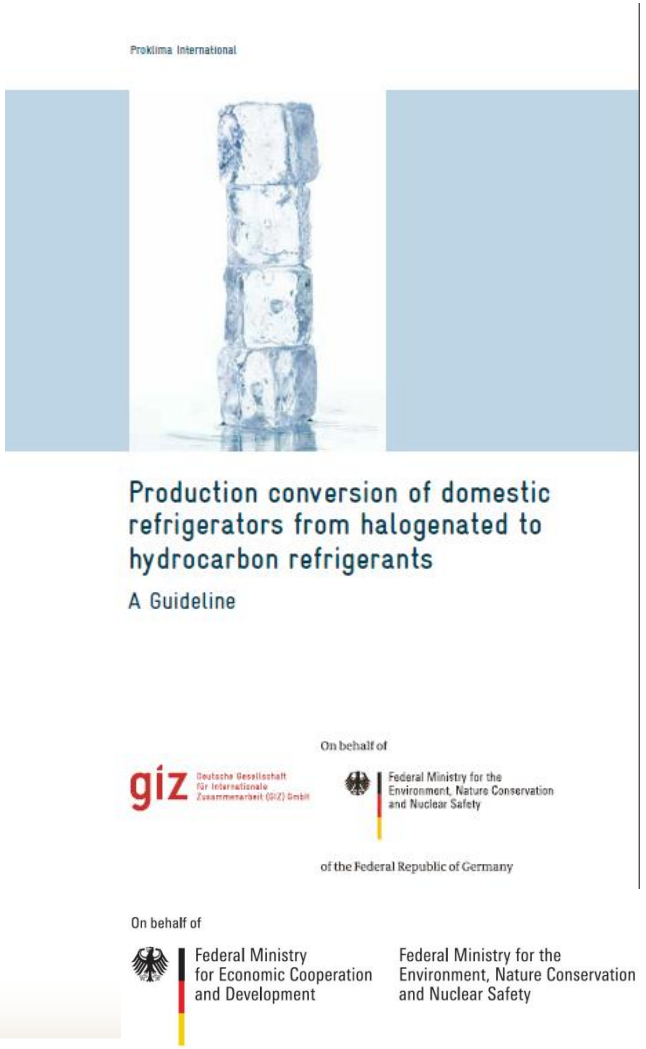
On behalf of
Federal Ministry for Economic Cooperation and Development
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Info and Training Material

- **Natural Refrigerants, 2008**
- **Natural Foam Blowing Agents, 2009**
- **Overview for NOUs, 2011**
- **GREE HC AC appliance installation, commissioning and service manual, published in 2011**
- **Best practices in refrigeration (GIZ PROKLIMA, 2010**
- **Conversion guidebook for split air-conditioning systems, 2011**
- **Conversion of the production of XPS Foam to climate-friendly blowing agents,2011**

Info and Training Material

- **Guidelines on the safe use for HC refrigerants (GIZ Proklima and Tüv Süd), 2010**
- **Production conversion of domestic refrigerators from halogenated to hydrocarbon refrigerants, 2011**
- **Whitebooks with TÜV: Conversion of the production line of airconditioners to R290, 2011**
- **More currently under development**



Download from www.giz.de/proklima

Movies about PROKLIMA projects

- **Environmental friendly air-conditioning in India**: http://www.dw.de/eco-friendly-cooling/a-16036590-1
- **Green refrigerators in Swaziland**: http://www.dw.de/green-refrigerators-in-swaziland/a-5609664-1
- **Recyling refrigerators in Brazil**: http://www.dw.de/recyling-refrigerators-in-brazil/a-14749211-1
- **Green supermarkets in South Africa**: http://www.dw.de/cape-towns-greener-grocer/a-5978571-1