



ATMO sphere

Business Case for
Natural Refrigerants

04/09/2018 – Singapore





Training, standards and capacity building in South East Asia

GIZ Proklima projects

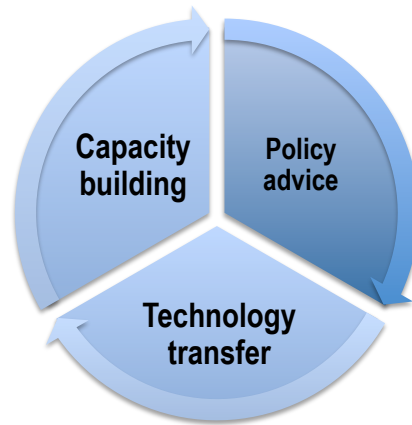
Philipp Munzinger

Project Manager, GIZ Proklima

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Promoting energy efficient cooling using natural refrigerants

- GHG emissions monitoring in the RAC sector
- Training and certification of technicians on safe handling of natRefs



- GHG inventories
- Technology needs assessments
- Adoption of performance (MEPS) and safety standards

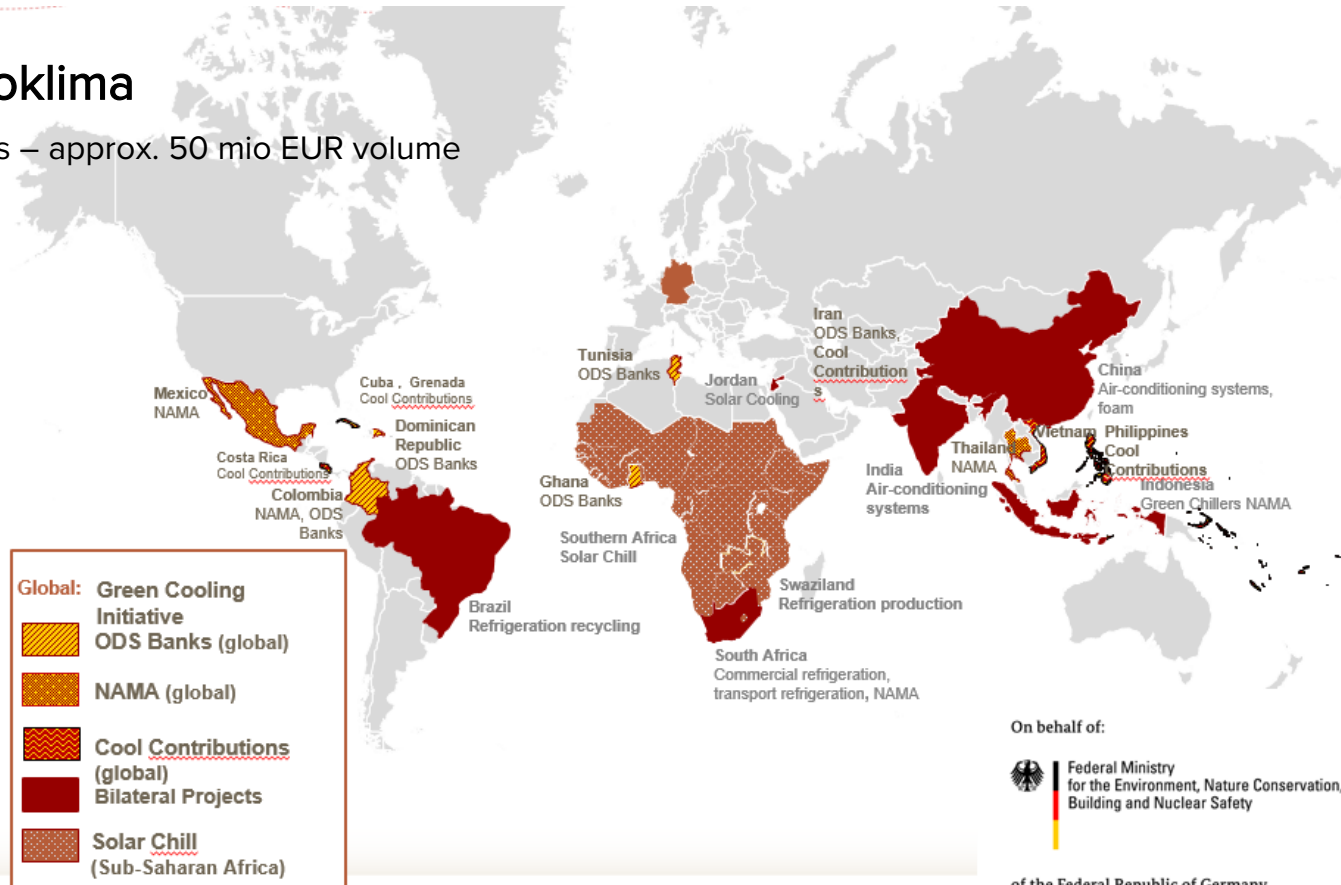
- Conversion of local production lines
- Technology demonstration



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17 projects – approx. 50 mio EUR volume



Barriers and solutions to hydrocarbons market uptake in Asia

Barriers	Solutions
Lack of certified and skilled technicians to produce, install and maintain hydrocarbon refrigeration and air conditioning systems	<ul style="list-style-type: none"> • Development of certification schemes • Roll-out of training programs for RAC technicians on the safe handling of hydrocarbons in cooperation with vocational training schools
Current national standards stick to charge size thresholds that are too small for flammable refrigerants (underlying assumptions lack basis in evidence based research)	Adopt national standards within national standard committees by increasing charge size and introducing risk mitigation measures, referring to evidence research-based model addendums
Hydrocarbon RAC component often not available, oligopoly on HC split AC compressors	Promote local manufacturing and assembly of components and appliances
Hydrocarbon RAC equipment still more expensive than conventional HFC-based systems due to negligible market scales.	Introduce tax incentives and / or public procurement programs to ease market uptake
Little awareness about actual risk and risk mitigation measures related to use of hydrocarbons in RAC systems	Target-oriented awareness-raising campaigns that inform about safe use of HC RAC equipment, making use of evidence-based results

How to improve the technical capacity in our national RAC sector?

Qualification	Certification	Registration
<ul style="list-style-type: none"> • Identify local Q -partners • Assess existing education and skill levels • Assess compliance with relevant national / international standards • Benchmarking existing Code of Practice • Define entry and examination levels • Pre-entry level support • Adapt materials • Conduct ToT + assist implementation • Develop test procedures 	<ul style="list-style-type: none"> • Identify local C-partners • Identify certification needs of people, companies, products • Develop examination procedures • Build capacity of certification bodies • Develop materials, tools and instruments • Assist labelling, monitoring and reporting 	<ul style="list-style-type: none"> • Partner with registration body • Assess local procedures • Identify R-needs people, companies, products • Develop R-scheme and enforcement requirements • Assist development of materials, tools + instruments • Assist reporting + monitoring

Source: GIZ Proklima / HEAT GmbH, 2018

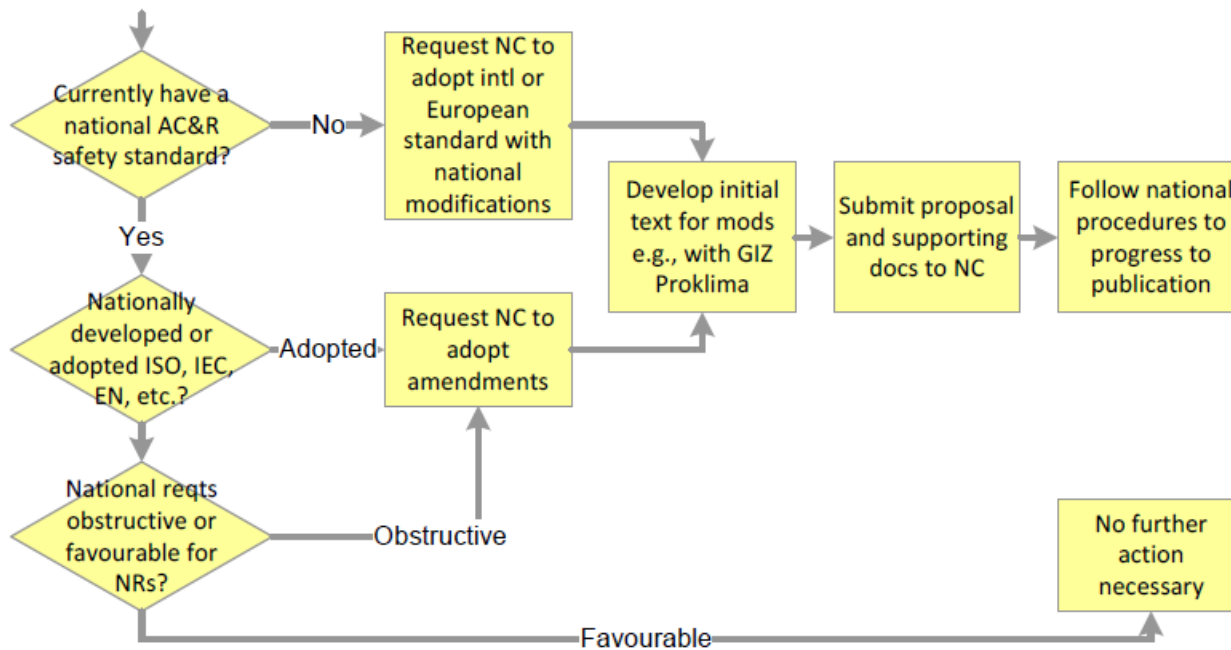
Key role of product safety standards

- Widely recognised that current safety standards pose obstructions, mostly with charge size identified as a main obstacles to the uptake of low GWP refrigerants
- Basic paper intends to introduce the approach to A5Cs to help widen use of low GWP refrigerants in a safe way
- Options and opportunities to improve safety standards internationally and/or nationally



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National modifications to safety standards



Source: GIZ Proklima, 2018

- **Indonesia:** SNI 06-6500: Published in 2000; aligned with EN 378, 2016 Part 1 and 2 with improvement for flammables
- **Philippines:** PNS 60335-2-40 - adopted IEC version but with modifications for HCs
- **Colombia:** CSN 5149 - adopted ISO version with modifications for flammables



Improved charge limits (airflow, tightness), releasable charge, leak simulation test



Contact details:

Philipp Munzinger
Project Manager
GIZ Proklima
Philipp.Munzinger@giz.de

Find more information about projects and publications at:

GIZ Proklima:
<https://www.giz.de/expertise/html/3372.html>

Green Cooling Initiative:
www.green-cooling-initiative.org



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Thank you for listening!

