



Irene Papst is Senior Advisor at HEAT GmbH and has more than 10 years of experience in advising the transformation of the refrigeration and air conditioning sector at all stages of ODS and HFC use: manufacture, service and decommissioning.

As a modeling specialist, she estimated global ODS and HFC banks and waste streams on a per country-level to provide a starting point for national considerations of ODS banks management. Irene is experienced in the monitoring, review and verification of emissions abatements of mitigation projects, including several projects on abatement of F-gas emissions.

Ms. Irene Papst
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WEBINAR SERIES

CLOSING THE LOOP: ENVIRONMENTALLY SOUND MANAGEMENT OF END-OF- LIFE ODS AND HFC

Country Roadmaps for the Management of ODS/HFC Waste

Irene Papst



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UNIDAD TÉCNICA OZONO
Colombia



This webinar is being organized within the
framework of a project funded by US EPA

Agenda

Global Roadmap and guidelines on collection, recycling and destruction of ODS banks

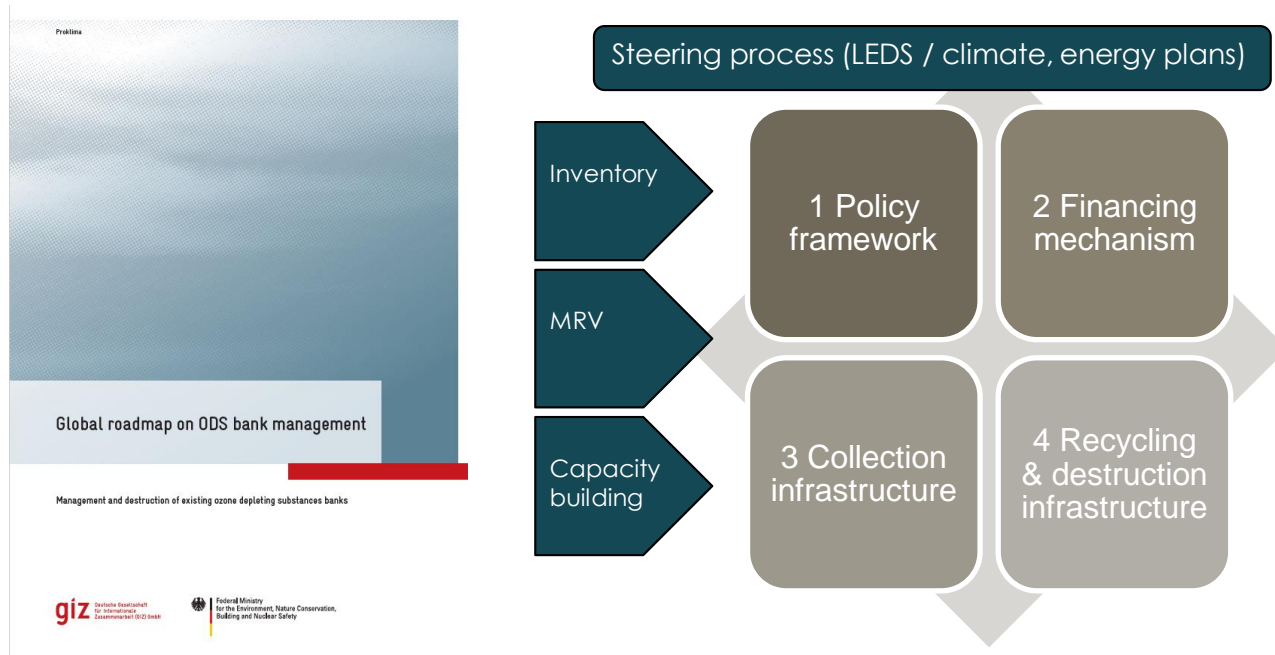
Core Process 1: Policy Framework

Core Process 2: Financing Mechanism

Core Process 3: Collection Mechanism

Core Process 4: Recycling and Destruction Infrastructure

Products from the GIZ ODS bank management project

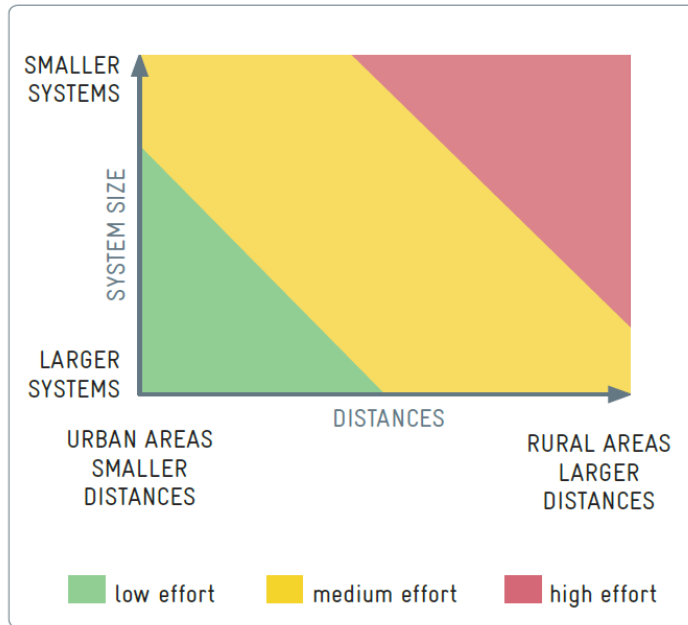


Products from the GIZ ODS bank management project

<https://www.giz.de/expertise/html/4809.html>

1	2	3	4	
Global roadmap on ODS b	Guideline to conduct an ODS bank inventory	Guideline on policy measures for management and destruction of depleting substances	Guideline to establish a collection for equipment containing ODS	Guideline for the transboundary movement of ODS waste
Management and destruction of existing ozone c	Management and destruction of existing ozone depleting	Management and destruction of existing ozone depleting sub	Management and destruction of existing ozone depleting subst	Management and destruction of existing ozone depleting substances banks
 	 	 	 	 

Priorities and technical feasibility



Effort levels: low, medium, high
(TEAP 2009)

Less effort for recovery when:

- equipment containing larger quantities,
- ODS that is geographically more concentrated, and
- non-diluted ODS (e.g. refrigerant) compared to diluted ODS (such as foams)

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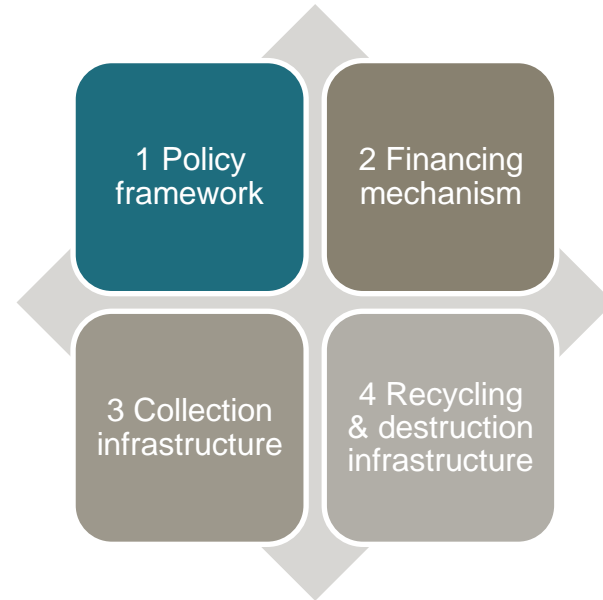
Core Process 4: Recycling and Destruction Infrastructure

Core process 1: Policy framework



In a suitable policy framework,

- a venting ban and mandatory recovery for destruction, recycling or reclamation are essential,
- operators of equipment are obligated to conduct leak checking, adhere to national standards and comply with monitoring schemes,
- technician training and certification is mandatory





Core process 1: Policy framework

Examples from the Regulation (EC) 1005/2009

- ‘Controlled substances contained in refrigeration, air-conditioning and heat pump equipment, equipment containing solvents or fire protection systems and fire extinguishers **shall**, during the maintenance or servicing of equipment or before the dismantling or disposal of equipment, **be recovered for destruction, recycling or reclamation**’ (Article 22)
- ‘[...] **shall maintain records** on the quantity and type of controlled substances added and the quantity recovered during maintenance, servicing and final disposal of the equipment or system [...]’ (Art. 23)

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Core process 2: Financing mechanism

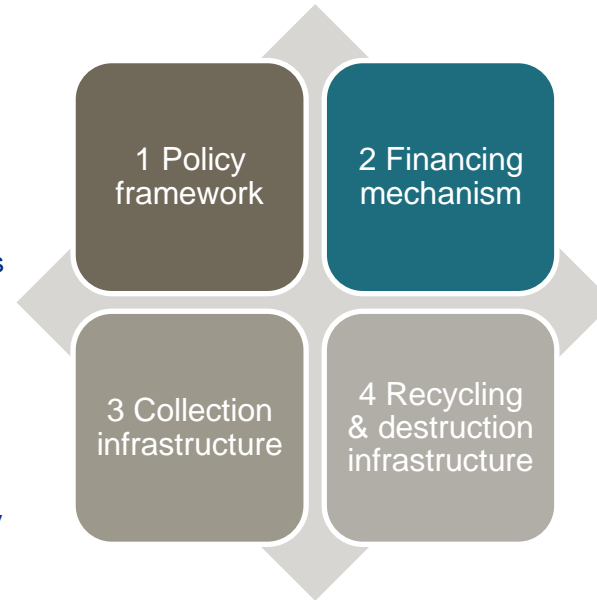


Appliances (WEEE) containing ODS

- EPR scheme
 - product take-back requirements,
 - economic and market-based instruments
 - regulations and performance standards, and
 - accompanying information-based instruments
- Import tax or levy (part of EPR)
- Advanced disposal fee (part of EPR)

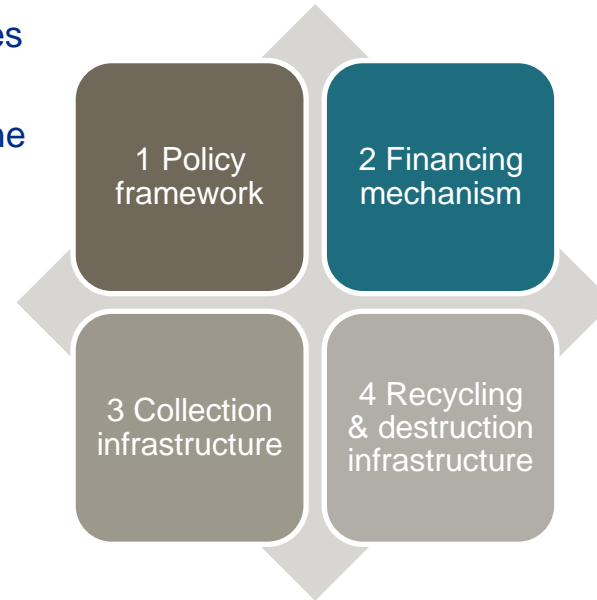
Large refrigeration and AC equipment

- Owner of the RAC system is financially responsible



Core process 2: Financing mechanism

- Carbon dioxide allowance auction revenues
- Support through industrialised country's contributions to climate financing and ozone layer protection
 - The Multilateral Fund of the Montreal Protocol (MLF)
 - National initiatives such as the International Climate Initiative (IKI)
 - The Green Climate Fund (GCF)
 - Global Environment Facility (GEF)



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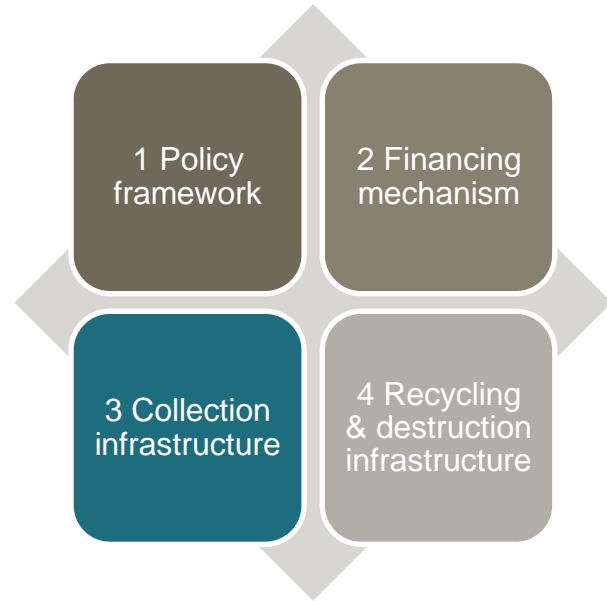
Core Process 4: Recycling and Destruction Infrastructure

Core process 3: Collection mechanism



An effective collection mechanism

- is based on a sector plan which defines the responsibilities of all involved players,
- incorporates the informal sector,
- ensures that both old equipment and refrigerants are accepted without charge by manufacturers, retailers or collection points,
- ensures that equipment returned within replacement programmes is subject to proper waste management



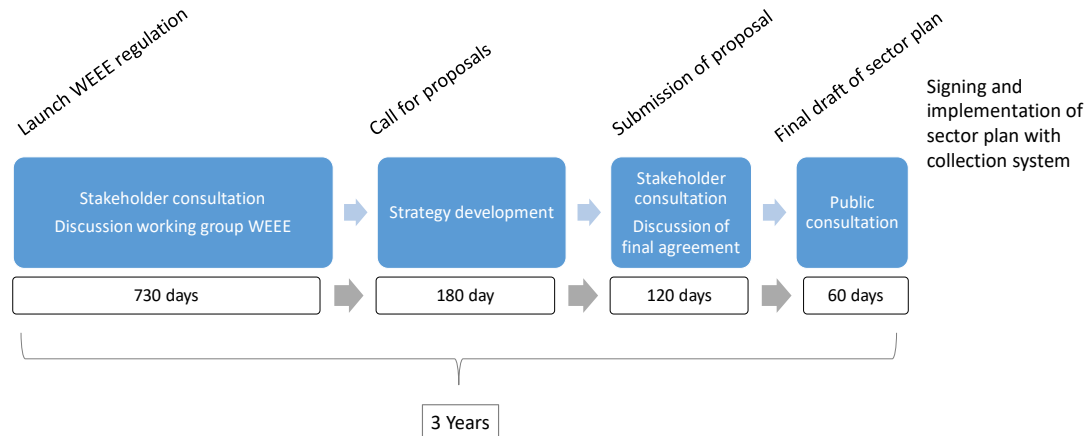
Core process 3: Collection mechanism





Core process 3: Collection mechanism

- It can take some time from launching a WEEE Regulation to the implementation of a WEEE collection scheme



Core process 3: Collection mechanism



Tax & refund scheme in Norway

- Participants can apply for a refund if used refrigerants are delivered to an approved destruction facility
- Requires an analysis and proper labelling of the returned refrigerant
- Refund is paid in the form of reduction in paid taxes



Core process 3: Collection mechanism



Integration of informal sector in Ghana

- Formal sector (City Waste Recycling Ltd) signed a MoU with the Accra Scrap Dealers Association (informal waste sector)
- Informal sector can sell (W)EEE to the formal sector → processing considering environmental/health standards
- In return, the formal sector commits to educating the informal sector / to contract scrap collectors as required

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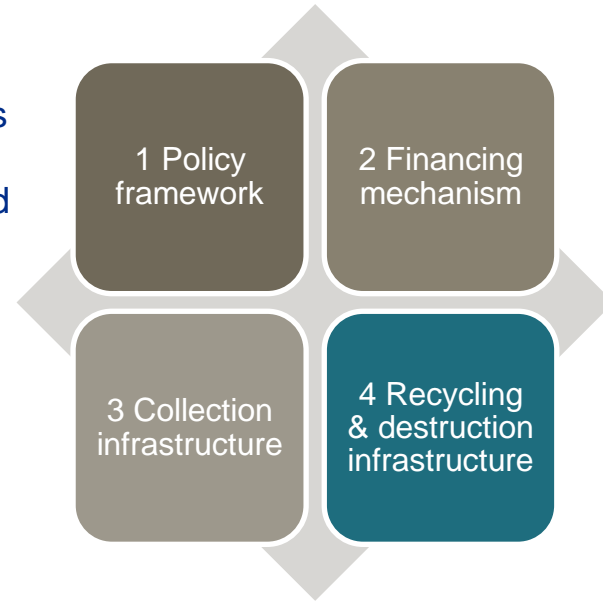
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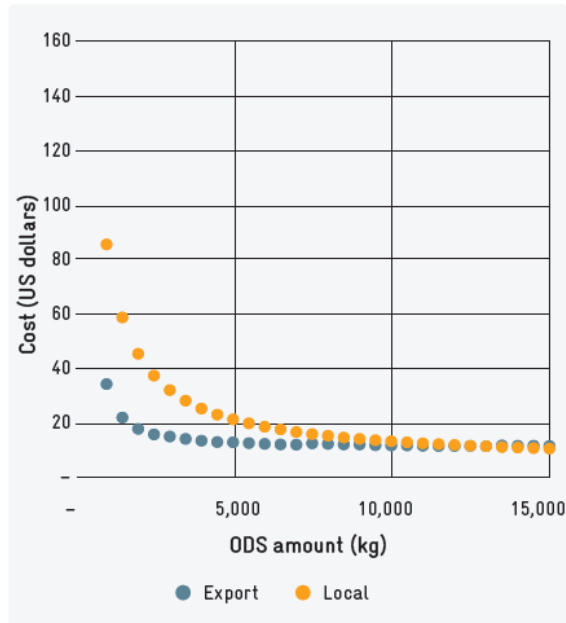
In a functioning recycling and destruction infrastructure,

- sufficient recycling and reclaim facilities prevent the accumulation of unwanted ODS which would have to be destroyed



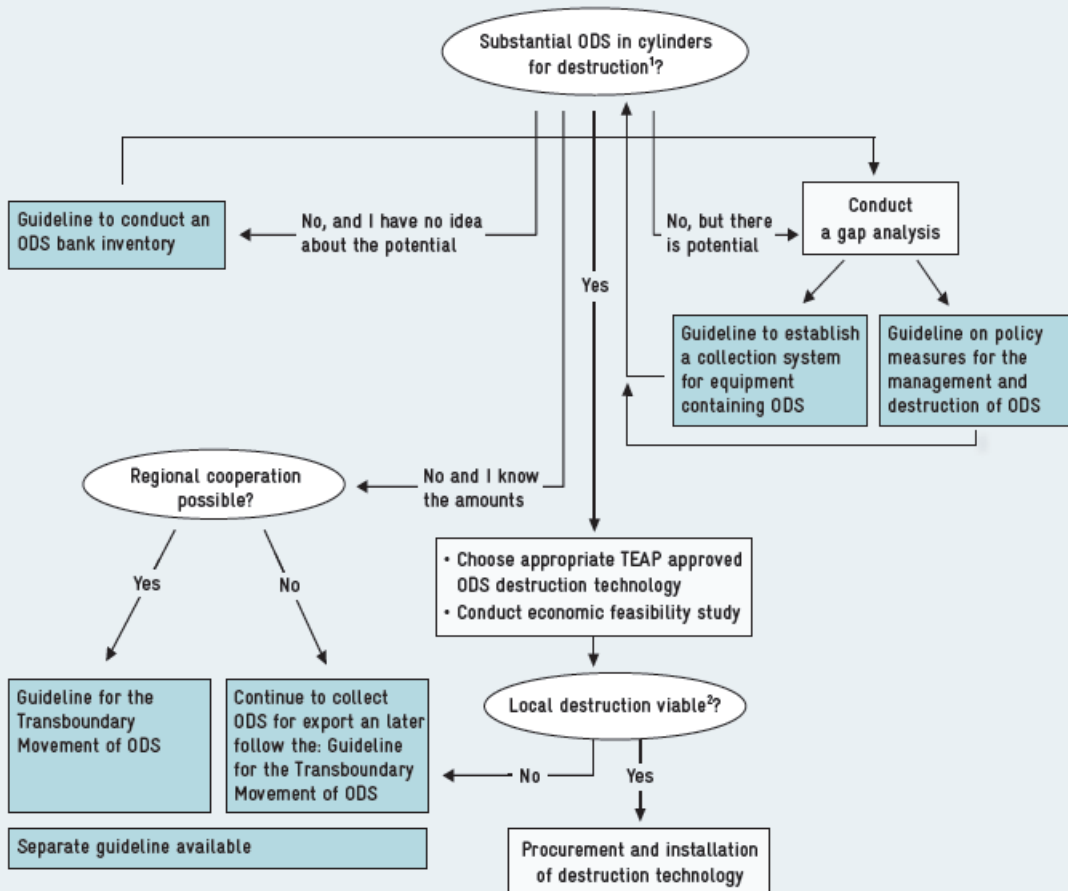


Core process 4: Recycling and destruction infrastructure



- Less than 10 tonnes of ODS are available for destruction per year
→ Export for destruction (Basel Convention)
→ Regional cooperations
- Only when more than 10 tonnes of ODS are available for destruction per year
→ local destruction plant
- Potentially available destruction techniques in developing countries are
 - Rotary Kiln Incineration
 - Cement Kiln

Decision tree



1 The availability of about 10 metric tonnes of ODS per year is a reasonable threshold
 2 Cost > 11- 12 US dollar/kg ODS appear as too expensive for local destruction for many countries



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Thanks for your attention

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giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany