



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



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GEF/UNIDO Project 5300

“Regional Demonstration Project for Coordinated Management of ODS and POPs Disposal in Ukraine, Belarus, Kazakhstan and Armenia”

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GEF Chemicals Cluster- Area of Work

The GEF Chemicals Focal Area includes POPs, ODS, Mercury and Sound Chemical Management for increased coherence.

- Phase out of Persistent Organic Pollutants – *Stockholm Convention*
- Phase out of Ozone Depleting Substance, specifically to Countries with Economies in Transition – *Montreal Protocol*
- Pilot activities and enabling conditions on mercury – to support early ratification of *Future Minamata Convention on Mercury*
- Pilot activities on chemicals (and chemical issues) of Global Concern – Related to the Objectives of the Strategic Approach to International Chemicals Management (*SAICM*), including E-waste, chemicals in products and lead in paint.



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Synergy of Multilateral Environmental Agreements include provisions related to technology and facilitating access and transfer:

UN Framework Convention for Climate Change (UNFCCC): agreed on the Technology Mechanism in December 2010 to support action on technology development and transfer for mitigation and adaptation

Stockholm Convention: calls for promoting use of Best Available Techniques and Best Environmental Practices (BAT/BEP) to reduce persistent organic pollutant (POPs) releases from unintentional production (waste incinerators, aluminum production, open waste burning, etc.)

Montreal Protocol: adopted decision on environmentally sound destruction of ozone depleting substances (ODS) banks. The Multilateral Fund is requested to continue its efforts on further cost-effective projects for the destruction of ODS banks, using appropriate technologies

Convention on Biological Diversity (CBD): recognizes that access to and transfer of technologies among Parties is essential to achieving CBD objectives

Overall Project Structure and Implementation Arrangements

**The Global Environment
Facility (GEF)**
(Funding Partner)

**The United Nations Industrial Development
Organization (UNIDO)**
(Implementing Agency)

Project Steering Committee

Chair: Rotation between the 4 Ministries of Ecology
(Ukraine, Belarus, Kazakhstan, Armenia)

Members: UNIDO, lead Ministries in the 4 participating
countries, other relevant stakeholders

Headed by: National Project Coordinator
Supported by: National/ International staff

CSOs, Private sector, Research and Academic Institutes, PCB
owners, etc.

Executing Partners

Project Information

Project Title: Regional Demonstration Project for Coordinated Management of ODS and POPs Disposal in Ukraine, Belarus, Kazakhstan and Armenia

GEF Project ID: 5300;

GEF Agency (ies): UNIDO;

GEF Agency Project ID: 150105;

Project Duration (Months): 60;

Grant amount for Ukraine: 6,5 mln USD

Executing Partner (s) in Ukraine: MENR, MEDT

Co-Financing: MENR (in-kind - 500 000 USD), Private sector (cash)

Project Objectives

1. Institutional capacity building at the state and regional levels (in selected regions), improvement and development of the regulatory framework for the environmentally sound management of POPs and ODS.
2. Establish a waste management system for ODS and POPs, including their collection, storage, transportation and final disposal.
3. Integration of national systems for collecting, storing and transporting ODS and POP waste into a single regional network.
4. Establishment of facilities for the disposal and disposal of ODS and POPs.

Project Outcomes

1. Creation of a system for collection, processing and disposal of ODS, contained primarily in large domestic appliances (refrigeration and freezing equipment, the annual market volume is estimated at 1.5 million units), which involves the introduction of compensation payments to the operator enterprises on the principle of increased responsibility of the importer / exporter and manufacturer.

2. Launch (within the framework of a pilot project) a plant based on a partner enterprise for processing refrigeration and freezing equipment with a capacity of 25 pieces per hour , delivery, installation of equipment, training of personnel and 1 year of warranty service, 2 years of international monitoring).

Project Outcomes

3. Installation and start-up of the incinerator furnace (plasma, combustion temperature 1.5 thousand degrees and higher Celsius) for the final destruction of ODS (fractions of freons of inappropriate reoccupation) and POPs (approximate power 100 Nm / h³ of gas and 250 kg / h of various forms of POPs, and can also be used for the disposal of a wide range of hazardous wastes including medical). The project provides for the acquisition, delivery, installation of equipment, staff training and 1 year of warranty service, 2 years of international monitoring.

4. The main requirements for the partner enterprise: the desire to participate in the implementation of the project; the opportunity to act as a co-investor of the project in accordance with UNIDO standards; own production premises, for installation of the equipment proposed within the project (the minimum area of production facilities is 1-1.5 thousand square meters, the ceiling height is 7.5-8 m).

Extended Producer Responsibility

Existing Systems in EU and CIS

System of Collective Responsibility

Implemented
in EU

(operated by
NGO)

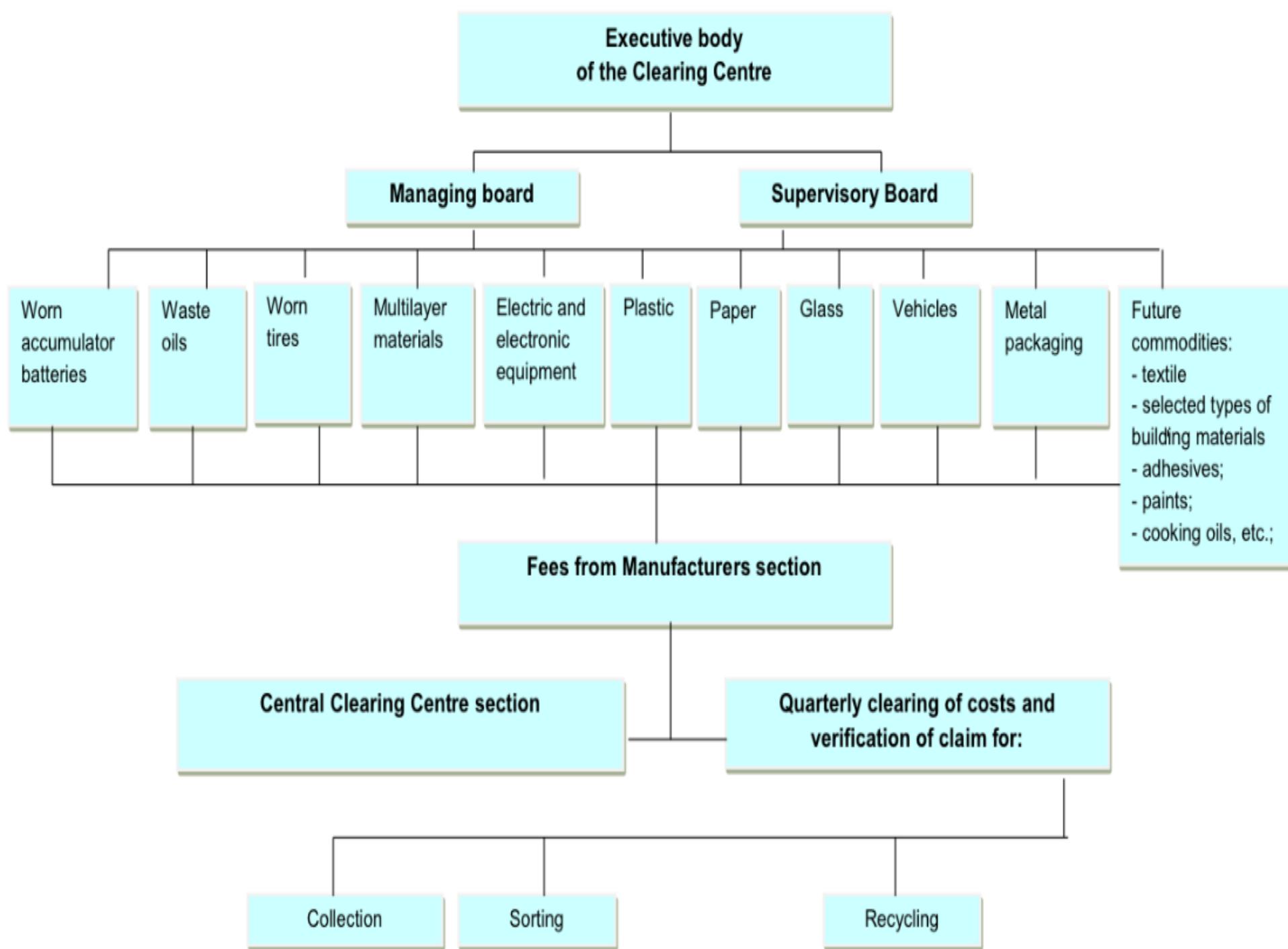
Clearing Fund

Implemented
in Serbia
(operated by
State Bank),

Good initiative
as a pilot
project for
further EU
Association

State Agency

Implemented
in Belarus
(operated by
Ministry of
Housing and
Communal
Services) and
in Kazakhstan
(operated by
Ministry of
Environment)



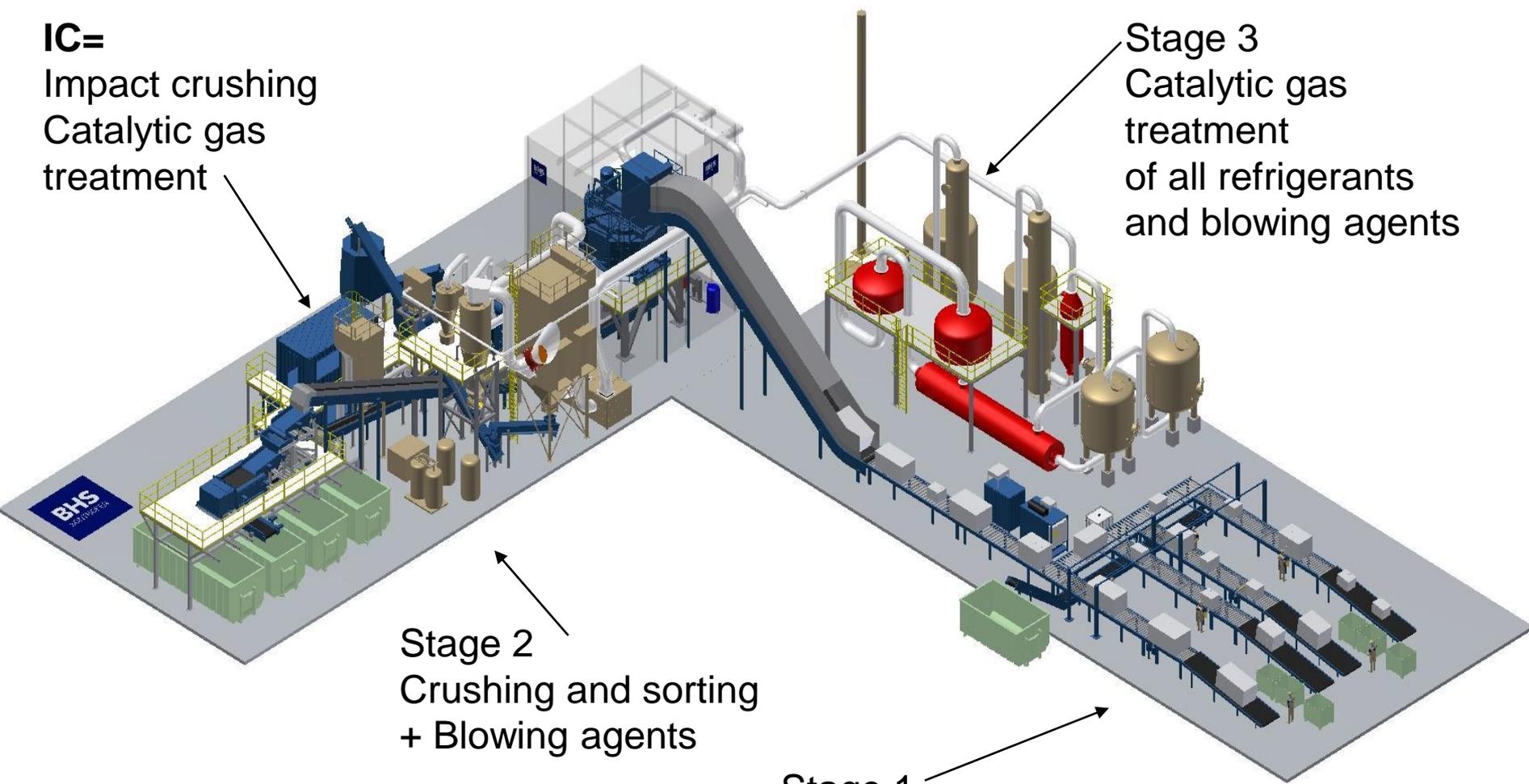
IC-Process overview

IC=
Impact crushing
Catalytic gas
treatment

Stage 3
Catalytic gas
treatment
of all refrigerants
and blowing agents

Stage 2
Crushing and sorting
+ Blowing agents

Stage 1
Dismantling/degassing
+ Refrigerants



WEE Recycling Benefit (ex.)

Refrigerators

Weight 47-50 kg consists of:

metal - 60%

plastic - 13%

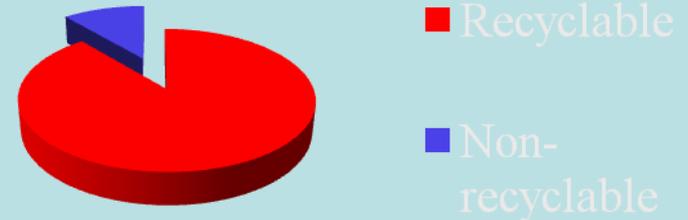
polyurethane - 10%

Colored mats - 6%

processed - 89%

not processed (OIL, PAINT, COOLER) - 11%

Refrigerators



Computers

Weight (without monitor) 32 kg consists of:

plastic - 40%

black (ferrous) metals - 29%

non-ferrous metals- 13%

Electrical installation - 5%

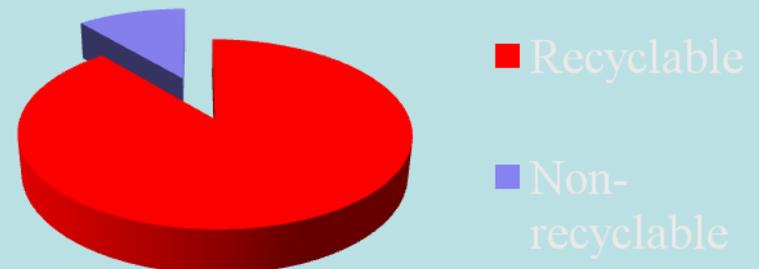
ceramics- 1%

rubber - 1%

processed - 89%

Non-processed % - 11%

Computers



Manufacturing Facilities Needed

Stage 1

Pre-treatment
(ex.70-300 g CFC R12 in the cooling circuit and compressor)



Mobile

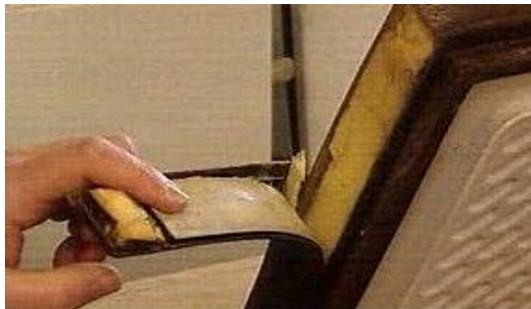


Stationary



Stage 2

Final treatment
(ex.200-800 g CFC R11 in the polyurethane foam insulation)



Mobile



Stationary



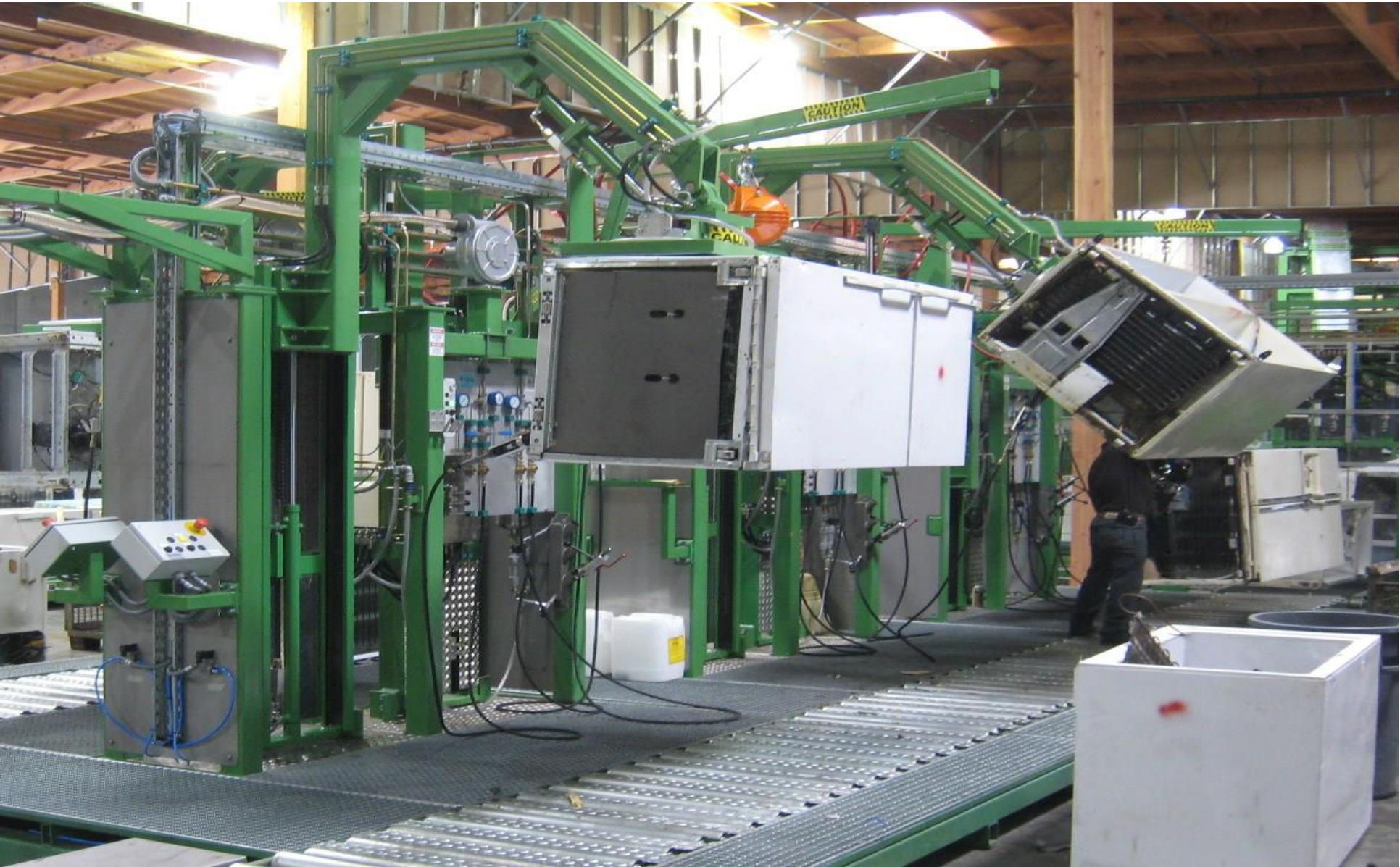
Recovery (approx.
45 kg raw materials per
appliance)



Savings (approx.2.8t CO₂
(equivalent) per appliance)

**The refrigerator/ freezer
recycling is the quickest
option for promoting
climate protection and
reducing emissions.**

Processing equipment: Extraction of CFC-12 from the compressor of the refrigerator (Step I)



Processing equipment: Extraction of CFC-11 from PU foams (Step II)



Shredder (Step II)



ODS storage in 1t cylinders



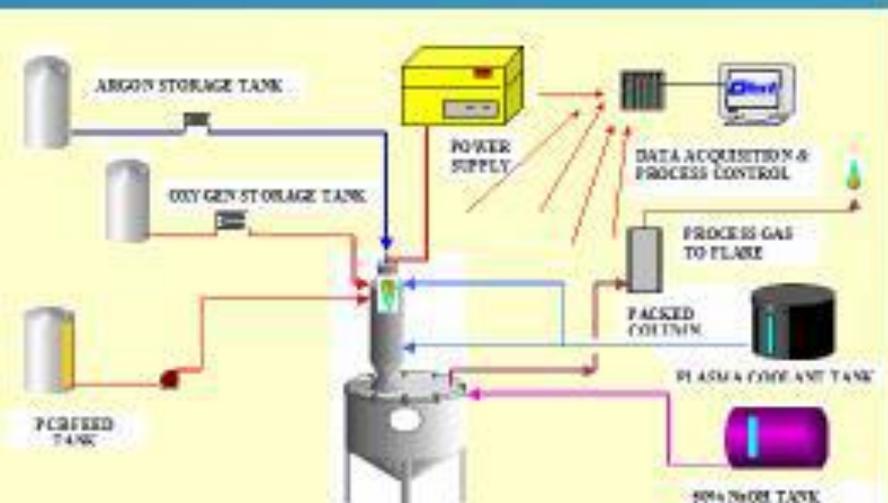
Commercial Scale Plasma Arc



Commercial Scale Plasma Arc

- Designed for specialty HW destruction including EOL ODS and POPs
- Several suppliers on the market
- Modular/transportable (single shipping container)
- Commercial facilities in Australia (4), Mexico (1), Japan (4) and US (1) with proposal in Russia
- High DE >>99.99 (varies with waste and feed rate)
- Low emissions (>0.006 ng/m³ TEQ for PCDD/F)
- Capacities range from 40-80 kg/hr. (250-500 MT/year) for gas and liquid ODS
- Capital Costs - approximately US\$2.5-3.0 million w/o infrastructure
- Unit costs quoted in the range of US\$5-20/kg. depending on overall plant throughput/market – US\$9/kg quoted in Mexico
- Relatively high operating cost/power consumption
- Typically needs another stable waste market to be viable

Commercial Scale Plasma Arc



Barriers associated with ODS and POPs destruction

1. International uncertainty vis-à-vis ODS and POPs Banks

2. ODS and POPs Banks destruction is not included in a national legislative framework strategy for sound management of Banks, and is not included in an extended responsibility scheme implemented by producers or stakeholders.

3. Not available devoted technologies for ODS and POPs destruction (plasma arc, etc.), lack of national standards for ODS destruction in multipurpose technologies, like cement kilns, rotary kilns, etc.

Barriers associated with ODS and POPs destruction

4. No local interest in providing investment for ODS and POPs destruction centers/refrigerator and AC recycling (shredders are expensive).

5. Lack of international funds allocation to finance ODS and POPs destruction projects (MLF finances only limited quantity of pilot demonstration projects, GEF vision is interaction with POPs destruction, CDM/EU TS - not allowed, Voluntary Carbon Markets – not stable market, lower CO2 cost).

6. No networks available for ODS and POPs collection, storage and transportation

Common Actions Needed

A comprehensive market analysis of the ODS and POPs consumption in Ukraine

Development of a common strategy and action plan to phase out HFCs by the institutionalization of legislative and regulatory Instruments and technical regulations, as well as the capacity to control and dispose of those substances, and joint work on the drafting of legislation

The issue of analysis of international (European) legislation on the Circulation of ODS and POPs

Development of legislation on ODS

Engaging specialists from MENR for data analysis and cooperation with UNIDO national experts

Common Actions Needed

Boost the legal and regulative framework actions (including the financial compensatory mechanisms) with the Beneficiary, Public Council of the Beneficiary, relevant Parliament Committee and other stakeholders

Finalize the selection of the incineration technology and launch the tender procedures for duly industrial investment component implementation

Ensure the implementation of UNIDO project document

Inform on the activities and events aimed at the Project implementation



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Thank you for your attention!

**Should you have any questions, do not hesitate to
contact the Project team!**

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