











Division of Technology, Industry and Economics

UNEP

Management and Safe Disposal of ODS Banks by Appliance Replacement Programme in Pakistan

Saurabh Kumar
Programme Officer, CAP ROAP
UNEP, Bangkok

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Ozone-Climate-Energy Nexus

Accelerated HCFC Phaseout – Opportunity to Maximize Environment Benefit

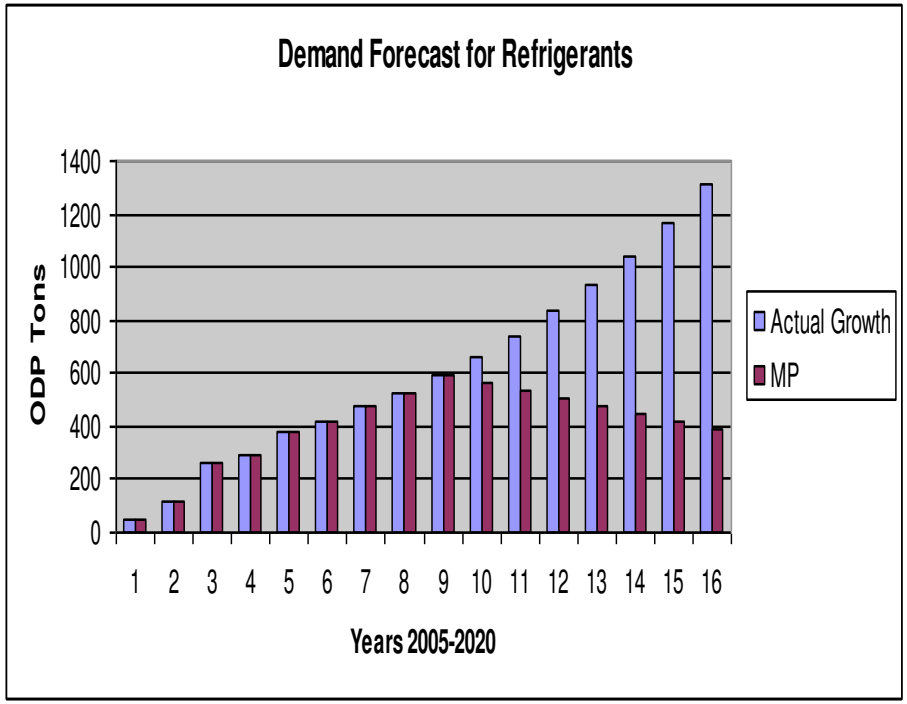
Decision XIX/6 of MOP:

- Acceleration of HCFC phase out deadlines – 2030 for developing countries and 2020 for Annex-2 (developed countries)

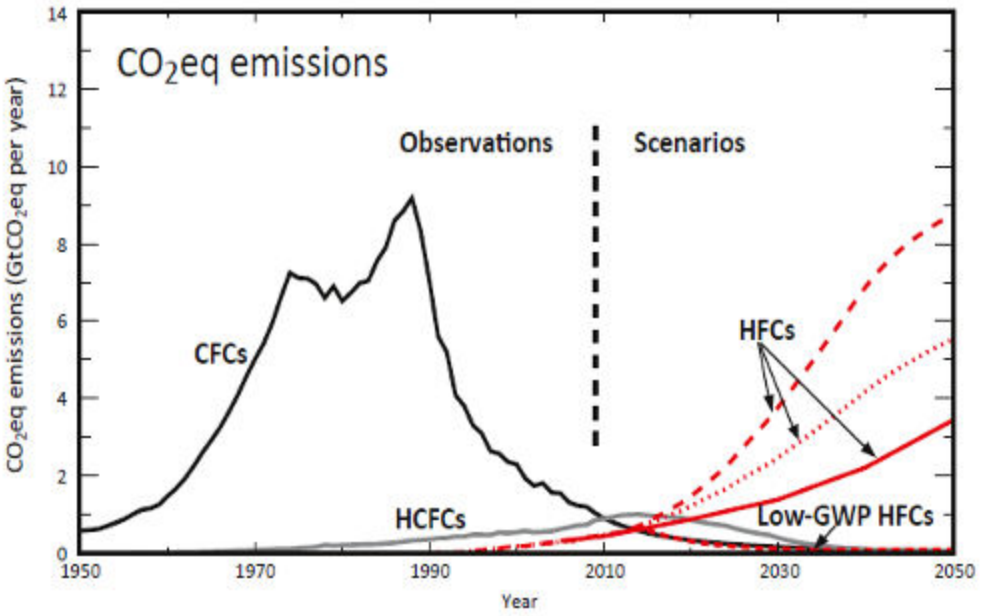
- Encourage Parties to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations.

HCFC phaseout in RAC sector with energy efficiency and climate friendly alternatives could provide maximum benefits

Rising demand for refrigerants and HFC lock-in



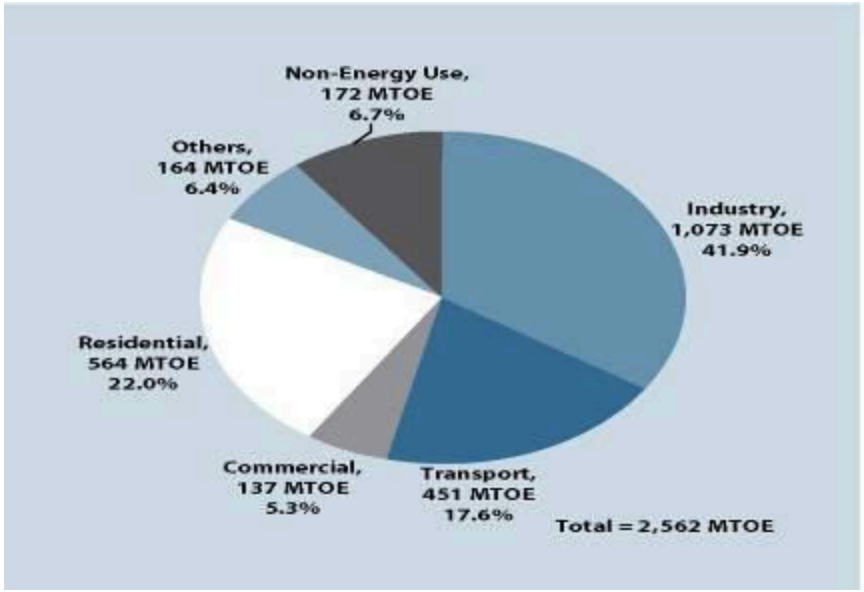
Source: HPMP of countries in the region

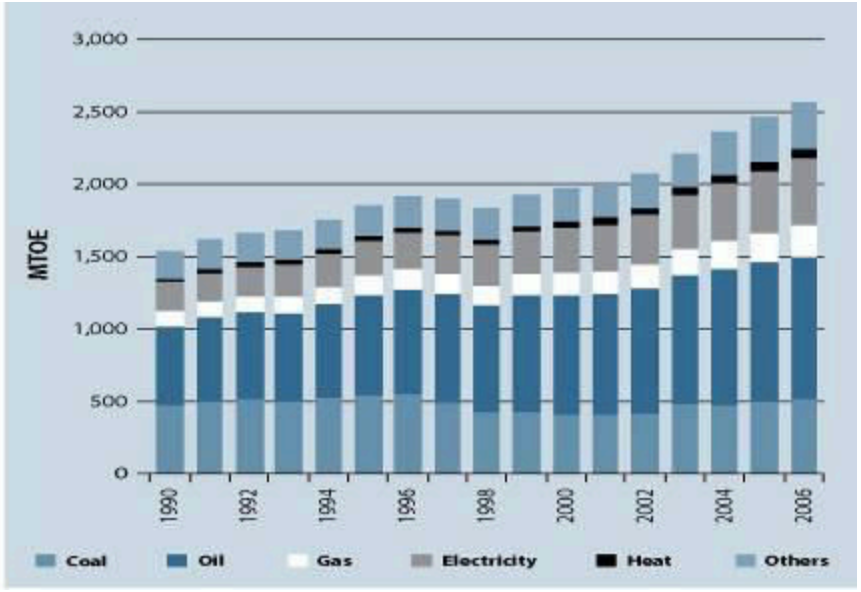


Source: HFCs: A Critical Link in Protecting Climate and the Ozone Layer (2011): UNEP

- **HFCs use growing at 8% per annum (2004-2008)-GHG emissions could be upto 19% of total GHG emissions in 2050 in BAU – from 1%**
- **Annual emission could be 8.8Gt CO-eq by 2050**

Sector wise energy use and energy source



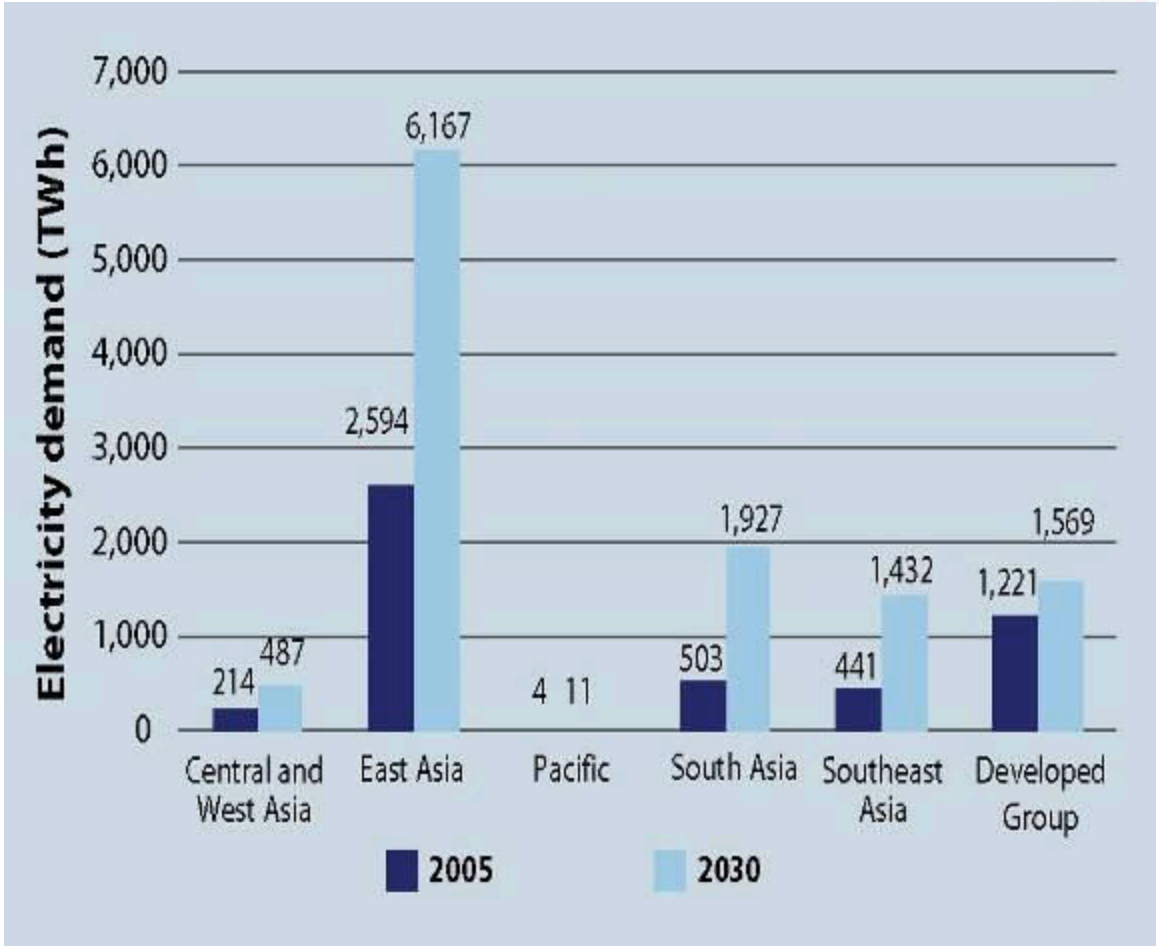


Source: Energy Outlook for Asia and Pacific (2009), ADB

- ✓Residential, commercial and industrial sectors account for about 70% of overall consumption in AP region – largely due to RAC equipments
- ✓Fossil fuel based energy sources
- ✓Significant biomass use- shift to fossil fuel energy

Trends of Electricity Demand

- ✓High electricity growth projected
- ✓Most of it due to increase access to energy using equipments- almost 70% of such equipments in 2030 to be installed between now and 2030
- ✓RAC equipment usage witnessing high growth rates – 15-25%



Source: Energy Outlook for Asia and Pacific (2009), ADB

Total Environmental Impact

10% Direct and 90% Indirect emissions

Refrigerant Leakage

- Leak during life
- End of life recovery leak
- Leak during production

Energy Consumption

- Energy used during life
- Source of energy

Challenges and Opportunities for Climate-Ozone-Energy Benefits

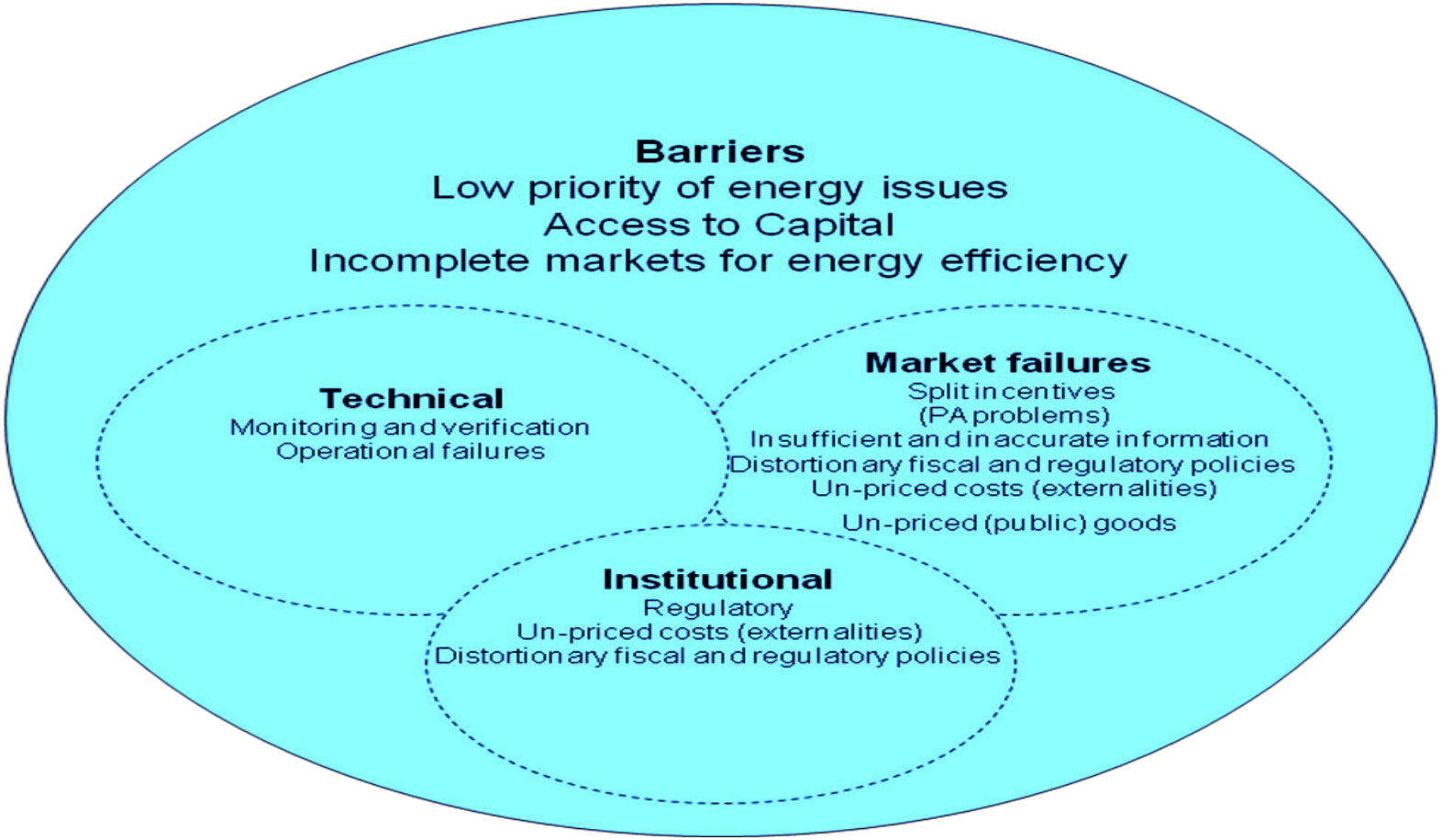
Policy Challenges

- Inadequate regulatory framework for efficiency– lack of incentive
- Standards and regulations for handling negative externalities not in force.
- Policy tools to evaluate most suited alternative not standardised – LCCP/ TEWI/ ERR
- Global policy fuzzy about the direction – little coordination between global efficiency efforts and refrigerant selection
- Low-GWP based equipments costly – low demand

Financing Challenges

- Financing for CEU not easily forthcoming
- MLFS does not provide funding for CEU – GEF is discussing a window for the same
- CDM mechanism does not recognise as an eligible activity
- Inadequate capacity at country level to leverage voluntary markets for carbon
- Activity is not mainstreamed due to absence of financing

Barriers to EE - Similarities



Source: IEA, 2007

DSM could help achieve the ozone-climate goal

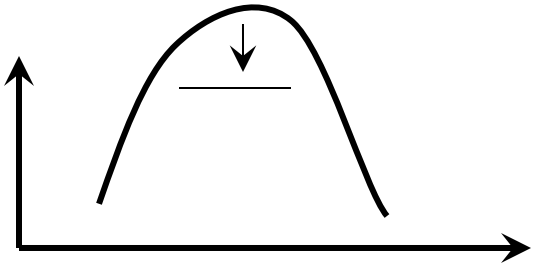
Barriers	Recommended Measures	Linkage with EE of RAC
Technical		
Negative externalities	Robust standards for toxicity, safety, etc.	
Energy performance	Minimum energy performance standards (MEPS) and comparative/ endorsement labeling	Yes
Climate change concerns in selection	Include refrigerant GWP standard in MEPS	Yes
Inadequate capacity	Training of technicians to handle new class of refrigerants	Yes
Low demand and information asymmetry	Awareness and outreach, demonstration projects/ events, policy assistance	Yes
Policy		
Policy and Regulatory framework	ODS policy framework established – link with EE	Yes
Tools to evaluate total environment impact	Regional/ country level standard to be adopted – linked with EE	Yes
Linkages with international efforts	Refrigerant GWP standard to be part of agenda for enhanced EE of RAC	Yes
High first cost	Fiscal incentives, DSM	Yes
Financing		
Financing for CEU	Linkage with EE to leverage GEF/ multilateral/ bilateral sources	Yes
Lack of capacity to develop projects	Training national stakeholders to link ODS and EE issues	Yes

Opportunities

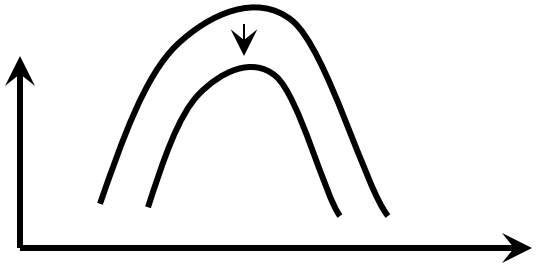
- Estimated 1.5 m old refrigerators – energy inefficient and contained ODS that will leak if no action is taken
- 750 m t of CFCs in theses banks – CFCs are potent GHG gases with GWP of 10,900
- Replacement with energy efficient refrigerators and safe disposal of ODS could lead to:
  - 5mt of GHG emission mitigation
  - 0.5 m KWh of energy savings

Demand Side Management (DSM)

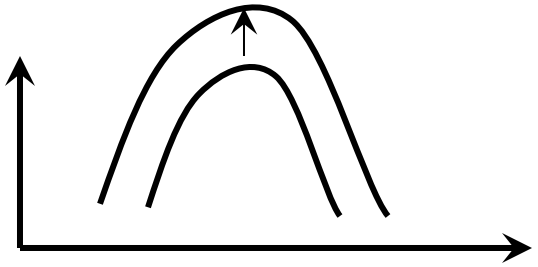
Common DSM Implementation Strategies



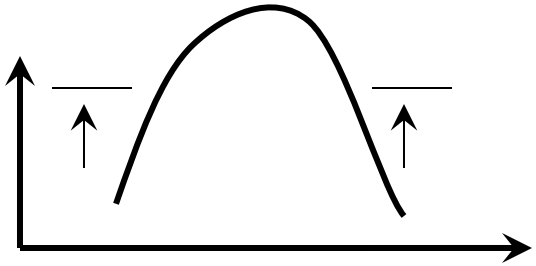
Peak Clipping



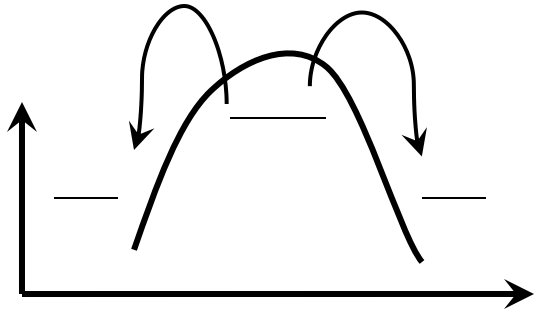
Conservation



Load Building



Valley Filling



Load Shifting

Utility DSM - Issues

Distribution Utility is not keen to implement DSM measures for following reasons:

- Distribution Utility's perception of losing revenue by way of DSM implementation- 'truing up' not considered
- DSM is not directly related to Distribution Utility's core business of Electricity supply
- DSM is not mandated in any legal framework
- Cost Plus tariff determination does not necessarily have adequate inducement for carrying out DSM measures
- Regulatory framework and M&V protocols not in place

Appliance Replacement through DSM – GEF project

GEF Project – Appliance Replacement

•UNEP has submitted a GEF project that leverages DSM to stimulate appliance replacement through DSM – endorsed by the Ministry of Climate Change – 2 m USD allocated – 4 year project

•The objectives are:

- To enable Pakistan to implement strategies to overcome barriers for:
- Implementing safe management and disposal of ODS banks contained in old residential refrigerators
- Enabling replacement of old and inefficient refrigerators with new energy efficient ones resulting in energy savings
- Achieving GHG emissions reductions, both due to enhanced energy efficiency as well as safe disposal of ODS from old refrigerators which are potent greenhouse gases

GEF Project Components

- ✓Assessment and verification of existing equipments
- ✓Appliance replacement and recycling programme (ARRP) linked to DSM
- ✓Capacity building for policies and regulations for DSM and ARRP
- ✓Collection, and safe disposal of ODS and leveraging Voluntary Carbon Markets (VCM)
- ✓Programme and Knowledge Management

Assessment & Verification

(a) Inventory of old inefficient refrigerators

(b) Assessment of recoverable stock of ODS

(c) Assessment of potential energy and GHG emission reduction

Total allocation $ 300,000 (GEF- $200,000 and Co- financing $ 100,000)

ARRP Linked to DSM

(a) Finalisation of energy efficiency standards for refrigerators
(b) Finalisation of testing protocols for the energy labeling
(c) Integration of Low-GWP refrigerant standards with energy standards
(d) Draft utility regulations for DSM
(e) Communications plan for DSM finalised
(f) Contractual agreements with equipment vendors

Total allocation $ 800,000 (GEF- $400,000 and Co- financing $ 400,000)

Capacity Building

(a) Utility regulations for implementing equipment replacement programme prepared - financial mechanisms finalised

(b) M&V protocols finalised

(c) Incentives to consumers and vendors determined

Total allocation $ 900,000 (GEF- $400,000 and Co- financing $ 500,000)

Collection and Disposal of ODS

(a) Sustainable protocols for collection and destruction of old refrigerators prepared

(b) Project proposal for leveraging VCM prepared

(c) Training module for national stakeholders prepared and delivered

(d) Guidelines for collection and safe disposal developed

Total allocation $ 800,000 (GEF- $300,000 and Co- financing $ 500,000)

Knowledge Management

a) Best practices compilation of DSM, policies, incentive mechanisms,

b) National level for information and knowledge exchange

c) Programme Management and coordination for 4 years

Total allocation $ 550,000 (GEF- $350,000 and Co- financing $ 200,000)

Partners and Stakeholders

a) Executing Agency – National Ozone Unit, Ministry of Climate Change

b) Partners – ENERCON, Ministry of Energy, Electricity Utilities, Refrigerator Manufacturers/ Importers

c) Stakeholders – Policy makers, regulators, consumers, mass media

Next Steps

a) GEF CEO endorsement

b) Project preparation –local and international consultants

c) Stakeholder consultation– Workshop planned in march in Islamabad

For more information

Saurabh.Kumar@unep.org