

# PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC560

<b>Project Name</b>	JO: ODS III - HCFC Phase-out Project (P127702)
<b>Region</b>	MIDDLE EAST AND NORTH AFRICA
<b>Country</b>	Jordan
<b>Sector(s)</b>	Petrochemicals and fertilizers (90%), Central government administration (10%)
<b>Lending Instrument</b>	Specific Investment Loan
<b>Project ID</b>	P127702
<b>Borrower(s)</b>	Ministry of Planning and International Cooperation
<b>Implementing Agency</b>	Ministry of Environment
<b>Environmental Category</b>	B-Partial Assessment
<b>Date PID Prepared</b>	08-Aug-2012
<b>Estimated Date of Appraisal Completion</b>	15-Nov-2012
<b>Estimated Date of Board Approval</b>	31-Jan-2013
<b>Concept Review Decision</b>	Track I - The review did authorize the preparation to continue

## I. Introduction and Context

### Country Context

Hydrochlorofluorocarbons (HCFCs) are substances used in several manufacturing sectors but primarily as refrigerants in refrigeration and air-conditioning equipment and as blowing agents for producing foam. HCFCs were introduced as transitional substances to chlorofluorocarbons (CFCs) given that they have a much lower ozone depleting potential (ODP). Nonetheless, as ozone-depleting substances (ODS), HCFCs are now also subject to control measures of the Montreal Protocol on Substances that Deplete the Ozone Layer (an international environmental treaty with universal ratification) following the complete elimination of CFCs in 2010.

HCFCs are not only ODS, but also high global warming gases with global warming potential (GWP) ranging from several hundred to several thousand times that of carbon dioxide. The conversion of HCFC-based manufacturers to alternative, advanced technologies in fact usually leads to improved energy efficiency, particularly in the refrigeration and air-conditioning sectors. Thus, phasing out HCFCs provides two types of potential benefit to the climate. Synergies with the climate agenda were duly recognized by the Parties to the Montreal Protocol when they decided to accelerate HCFC phase-out in 2007 through Decision XIX/6 for both developed and developing countries also known as “Article 5” countries.

As a Party to the Montreal Protocol operating under Article 5, the Hashemite Kingdom of Jordan must also phase out HCFCs by 2030 in accordance with the accelerated HCFC phase-out schedule. This entails meeting stepped reduction targets on consumption, including the first – a 2013 freeze on its 2009-2010 average consumption of 83 ODP tonnes. This presents a number of challenges for effective HCFC phase-out, including resistance from enterprises that only recently converted from CFC to HCFCs, an extremely high growth rate in HCFC-using sectors (particularly air-conditioning), and constraints in alternative technologies for some manufacturing sectors.

Until 2011, Jordan enjoyed a relatively high average growth rate with annual real GDP growth averaging around 7% and per capita GDP more than doubling since 2000. Sectors which led in growth include manufacturing, construction and real estate. HCFC-consuming sectors of foam and refrigeration, particularly residential air-conditioning which are integral for manufacturing, construction and housing, have consequently been part of this rapid expansion.

A high level of growth in these sectors, particularly for air-conditioning, reflects the improvement of living standards taking place coupled with recent trends that have seen growing economic stability in neighboring countries that trade with Jordan. Although growth slowed temporarily in 2009 to 2.3% as a result of the global financial crisis, some upward trends continued, notably the growth in domestic energy consumption at 9.6%. An indicator that this energy demand continued was that 2010 sales in air-conditioning – which consumes up to 40% of electricity in developing country households – soared due to a severe summer heat wave across Jordan. Consequently, HCFC consumption in Jordan has also rapidly increased as seen through the progression of consumption in 2006-2010 data reported under Article 7 of the Montreal Protocol.

#### 2005-2010 HCFC Consumption in ODP and metric tonnes per Art. 7 Reporting

Consumption	2006	2007	2008	2009	2010
HCFC – ODP tons	46.6	55.759		70.9	95
HCFC – metric tons	721	833	874	1,080	1,405

Jordan will have to reduce its consumption of HCFCs dramatically if growth continues at the same pace after 2010 in order to meet its Montreal Protocol obligations. Starting from the calculated baseline level in 2013, Jordan would need to phase out 8.3 ODP tons to comply with 10% reductions required by 2015. Assuming there is no growth from 2010 to 2013, Jordan would still have difficulties meeting the freeze – it would have to reduce consumption (defined as imports minus exports) by nearly 12 ODP tonnes by 2013 in addition to 8.3 ODP tonnes by 2015 for a total reduction of 20 ODP tonnes (over 360 metric tonnes).

#### Sectoral and Institutional Context

Through support from the Multilateral Fund for the Implementation of the Montreal Protocol (MLF), Jordan prepared an HCFC Phase-out Management Plan (HPMP) that constructs a detailed picture of HCFC consumption and uses by substance and product, presents patterns of growth and identifies priority sectors for receiving MLF funding and achieving its first reductions. HCFC consumption in Jordan is made up of primarily HCFC-141b and HCFC-22 for manufacturing in the foam and refrigeration and air-conditioning (RAC) sectors, respectively, as well as HCFC-22 for servicing installed refrigeration and air-conditioning equipment.

#### HCFC Consumption by Major HCFC Sector in ODP tonnes: 2006-2010

HPMP Data by Sector	2006	2007	2008	2009	2010

HCFC-22 Manufacturing	13.1	15.6	18	24.37	33.3
HCFC-22 Servicing	19.8		20.519.1	23.76	26.24
Total HCFC-22	32.9	36.1	37.1	48.1	59.5
Total HCFC-142	0.7	0	0	0.2	0.2
Total HCFC-141b	13	19.6	21.9	22.8	35.3

The HPMP assumed an average HCFC growth rate of 15%. Using historical consumption figures for each major sector (foam and RAC manufacturing, and servicing) however, variations were seen with the growth rate for HCFC-22-based manufacturing of AC units coming out in front at an estimated 28%. Of the total HCFC-22 consumed in 2010, 43% went to AC manufacturing alone. Industrial trends in Jordan and neighboring countries confirm growing demand for air-conditioning with two new enterprises starting operations in 2008 and 2009, enlarging the sector to six HCFC-based manufacturers. One manufacturer, NIIC, will be the largest in the region.

HCFC-22 consumption for air-conditioning has the potential to grow significantly seeing that NIIC was only at 28% capacity in 2010. Imports are also increasing with the majority being low-cost, inefficient, HCFC-22 models from China. In addition, the growing fleet of installed AC units in Jordan compounds the challenge of reigning in HCFC-22 consumption given that they will require servicing throughout their 8-10 year product lives with leakage rates estimated to be 30% annually, particularly in Aqaba where temperatures often exceed 40°C. HCFC demand in servicing has been modest to date but will eventually accelerate as AC becomes established in Jordan.

Given that Jordan is nearly fully dependent on imported energy (96% in 2009), continued economic development rests on its ability to secure affordable energy. Energy demand is expected to double by 2020 which has given impetus to Jordan's energy strategy, embodied in the 2010 Law on Renewable Energy and Energy Efficiency. In parallel to developing energy efficiency (EE) by-laws, Jordan has been considering various sectors and targets for implementing EE measures that can absorb the rising domestic energy demand and meet the national target of saving energy by 20%. Three types of electrical appliances, including air-conditioning, are already subject to EE labeling as of 2011 in recognition of the large potential for energy savings. In fact, this labeling system is partly a result of the rapidly developing Jordan EE program for appliances that comprises investments from bilateral and multilateral donors of several tens of US\$ millions.

#### **Relationship to CAS**

The World Bank Group prepared a new Country Partnership Strategy (CPS) for FY12-FY15 for Jordan which will form the basis of its development assistance to the country. The strategy is a reflection of the turbulent developments in the Region in 2011, which also impacted Jordan and its economy. Nonetheless, it has as one of its three objectives to strengthen the foundation for growth with a focus on competitiveness which is a continuation of past support, but through among other means, cost-effective energy. In addition, the strategy aims to foster growth in the private sector by removing obstacles to innovation at the firm level, among others.

More generally, the Bank has played a major role in assisting developing countries develop and implement policies, investment and technical assistance activities to meet their obligations under various multilateral environmental agreements. The World Bank serves as an implementing agency under the MLF and the Global Environment Facility (GEF). Under the MLF, it has assisted client countries phase out over 302,000 ODP metric tonnes – nearly 70% of the total ODP phased out under the MLF. The Bank has been engaged in Jordan on MP work since the early 1990s and was

an important partner in assisting it to completely eliminate CFC consumption by the 2010 Montreal Protocol (MP) phase-out target. Moreover, the cumulative phase-out of 834 CFC tonnes of consumption has also resulted in climate benefits amounting to emissions of approximately 5.8 million tCO<sub>2</sub> eq. per year avoided (given the high GWP of various CFCs of up to 10,900 CO<sub>2</sub> eq).

## **II. Proposed Development Objective(s)**

### **Proposed Development Objective(s) (From PCN)**

The project development objective is to support Jordan in its overall efforts to meet its first Montreal Protocol HCFC phase-out obligations of (i) a freeze of HCFC consumption at baseline levels by 2013; and (ii) 10% reduction from the baseline level by 2015 through industry conversions to alternative technology which also result in net climate benefits.

### **Key Results (From PCN)**

The project's outcome indicators will be Jordan's level of compliance with the consumption phase-down targets, and performance indicators agreed upon between the Executive Committee of the Multilateral Fund (MLF) and Jordan under its 2011 approved HPMP, i.e. submission of annual consumption verification audits which confirm conformity with maximum annual HCFC consumption levels during the project life. In addition, climate benefits from HCFC phase-out will be included as an outcome indicator, specifically benefits that stem from a) eliminating HCFCs (which are not controlled by the Kyoto Protocol), and b) avoiding CO<sub>2</sub> emissions through improved energy efficiency of HCFC-free products.

## **III. Preliminary Description**

### **Concept Description**

The proposed project, consisting of a "sector plan" for HCFC phase-out in air-conditioning manufacturing is to contribute to the estimated 20 ODP tonnes in phase-out needed for Jordan while minimizing the longer-term impact on the climate and ozone layer (i.e. reducing the amount of future equipment requiring HCFC-22 servicing). In addition, the project will reintroduce a standing line of MLF assistance that is dedicated specifically to strengthening the focal point for the Montreal Protocol in Jordan: the national ozone unit in the Ministry of Environment (MoE).

Thus, given the similar objectives and scope of the proposed project with those under the ongoing Jordan ODS II Project (P049706), it is proposed that new project arrangements build upon the existing infrastructure and capacity established in MoE to deliver the required assistance to beneficiaries and stakeholders. In that sense, the proposed project can be considered to be a continuation of the previous one and will consequently include a combination of investment, technical assistance, and policy and regulatory interventions which will be carried out in tandem to assure sustainable HCFC phase-out while enabling Jordan to manage its overall ODS program.

Funding from the MLF for sector plans follows a performance-based, programmatic approach. The advantages of this approach are flexibility given to the country to utilize the funding in the most effective manner and to reprogram funding as needs evolve; the inclusion of a regulatory and policy framework and technical assistance to create an enabling environment; long-term funding commitment by donors that allows the government to secure buy-in for phase-out from an otherwise reluctant private sector; and, the guarantee provided to the MLF of continued phase-out through independent verification audits of HCFC import data. Funding is thus released to the World Bank in tranches upon the country's achievements of agreed consumption targets.

### Component 1: Investment in HCFC Consumption Reductions (US\$1,923,850)

Investments will be made in residential AC manufacturers in Jordan and complement the already approved Petra project. This component therefore includes coordination of conversions of six enterprises: one under UNIDO, three under this project, and two, which are not eligible for MLF financing, will convert on their own in compliance with future Government regulatory actions to ban HCFC-based manufacturing. The conversion entails a change in HCFC-22-based technology to, what is considered by industry as currently the only commercially viable alternative technology on the market, HFC-410A. The three project enterprises will receive funding for new manufacturing equipment and technology and for operating costs.

### Component 2: Technical Assistance (TA) Activities, Policies and AC Sector Plan Management (US \$417,300)

To support implementation of investment interventions under the project, assistance will be provided for technical experts who will support beneficiaries to prepare project proposals and equipment specifications, project completion reports, and to complete the conversions (technical support). It will also include support to increase technical capacity of local authorities in order to allow them to monitor and enforce HCFC-related policies for new and existing industrial installations, including customs officers in order to ensure effective control of HCFC imports and products containing HCFCs.

A demonstration activity that targets partly the servicing sector will also be introduced. This TA activity will provide training to service technicians to employ good practice in servicing HCFC-22 air-conditioning units to avoid excess leakage over time, to retrofit AC units to alternative refrigerants and, to be prepared for handling alternative refrigerants ranging from HFCs to natural refrigerants, in anticipation of evolving technologies worldwide.

The project will put a special focus on strengthening Jordan's capacity to implement energy conservation and energy efficiency in the residential air-conditioning sector by reaching out to the MEMR, National Energy Research Center and related agencies to ensure there is complementarity and synchronization of initiatives on EE for the sector. In addition, through the sector plan, additional TA will be pursued to help the sector including non-eligible enterprises improve and optimize energy performance of components and the entire system to achieve EERs that meet the country's new performance requirements for "A" grade products.

An import quota system to curb the supply of HCFCs will be established by January 1, 2013 through support to Jordan's overall HPMP which is managed by UNIDO. Under the proposed project Jordan will receive support to establish a policy structure that ensures HCFC phase-out in its priority sector, residential air-conditioning, is permanent and sustainable, and to promote the transfer and dissemination of suitable substitute technologies. This includes the introduction of a ban on the use of HCFC-22 in manufacturing AC as well as a ban on imports of HCFC-22-based AC units by the end of 2016. The project focal point in MoE will also work with relevant agencies to pursue regulations regarding minimum energy efficiency standards to complement Jordan's new AC appliance labeling system and the work being undertaken with USAID and other donors. In addition, the NOU will work with agencies to promote the uptake of more efficient air-conditioning and stimulate local manufacturers to compete on EE.

The project will provide support to the focal point, the National Ozone Unit (NOU) within MoE so that it may build a dedicated project team responsible for AC sector plan implementation. The staff and consultants in the NOU will manage activities related to the implementation of investments and TA activities, and ensure that MLF and World Bank policies regarding financial management, use of funds and procurement are followed when implementing subprojects.

#### Component 3: Institutional Strengthening (US\$441,999)

Support will be provided to the Recipient through the NOU in the Ministry of Environment to enhance the capacity of Government agencies to manage and address all ozone protection issues in the country and to interact with the international ozone protection community. This will include assistance for coordinating the portfolio of MP projects (with the Bank, UNIDO and GIZ); for awareness raising in industrial sectors and the general public; monitoring and reporting of annual ODS consumption; regular participation in international and regional MP meetings; and facilitating inter-agency coordination and policy and decision-making on ozone-related issues.

#### IV. Safeguard Policies that might apply

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>	<b>TBD</b>
Environmental Assessment OP/BP 4.01	<b>x</b>		
Natural Habitats OP/BP 4.04		<b>x</b>	
Forests OP/BP 4.36		<b>x</b>	
Pest Management OP 4.09		<b>x</b>	
Physical Cultural Resources OP/BP 4.11		<b>x</b>	
Indigenous Peoples OP/BP 4.10		<b>x</b>	
Involuntary Resettlement OP/BP 4.12		<b>x</b>	
Safety of Dams OP/BP 4.37		<b>x</b>	
Projects on International Waterways OP/BP 7.50		<b>x</b>	
Projects in Disputed Areas OP/BP 7.60		<b>x</b>	

#### V. Tentative financing

<b>Financing Source</b>	<b>Amount</b>
Borrower	0.00
Montreal Protocol Investment Fund	3.00
Total	3.00

#### VI. Contact point

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