

**UNITED NATIONS
DEVELOPMENT PROGRAMME
*HCFC PHASEOUT PROGRAM***



**“LOW COST”
HC-BASED PU FOAM
TECHNOLOGIES**

HYDROCARBON TECHNOLOGY

- **HIGH INVESTMENT COSTS**
 - typically US\$ >400,000/co-funding common for smaller entities
- **HIGHLY FLAMMABLE/EXPLOSIVE**
 - up to 75% of investment
- **LOW OPERATING COST**
 - can up to 10%

GOAL

- **LOWER COSTS BY ~35% FROM ~400,000-450,000 TO ~250,000**
- **MAINTAIN LOW OPERATING COSTS**
- **SIMPLIFY OPERATIONS BUT KEEP SAFETY**
- **PROMOTE INNOVATION BY CLOSER COOPERATION WITH SUPPLIERS**

OPTIONS

- **LOW PRESSURE**
- **PRE-BLENDING**
- **CO-BLENDING**
- **DIRECT INJECTION**

PROJECT DESIGN

- 1. DEVELOPMENT OF PRE-BLENDS**
- 2. DEVELOPMENT OF A THREE COMPONENT FOAM DISPENSER**
- 3. TRIALS**
- 4. DEMONSTRATION**

EXECUTION

1. SYSTEM DEVELOPMENT

DOW SYSTEMS-ITALY/EGYPT, INPUT FROM BAYER

2. EQUIPMENT DEVELOPMENT

SAIP; CANNON STARTED SIMILAR DEVELOPMENT

3. TRIALS

DOW M/E SYSTEM HOUSE

4. DEMONSTRATION

EGYPT, EL SALVADOR

COSTS

#	ACTIVITY	BUDGET	REMARKS
1	Project Management	10,000	Local consultant
2	Technology transfer, training	30,000	International Expert
3	Testing/monitoring equipment	55,000	Analytical and monitoring equipment
4	Production equipment development	125,000	Three-stream high pressure pentane dispenser with suitable safety features
5	Preblended systems preparation	100,000	
6	Technology Dissemination Workshop	60,000	
7	Safety review/Reporting	50,000	Include workshop
8	Contingencies	43,000	10% of sub-total
	TOTAL	473,000	

OUTCOME

PREBLENDED SYSTEMS

- **PREBLENDING OF HCs IS POSSIBLE AND SAFE**
- **MORE INVESTMENT AT SH LEVEL**
- **LESS INVESTMENT AT DU LEVEL**

- **ICC REDUCTION ~ US\$ 100,000**
- **IOC REDUCTION ~ 8%**

OUTCOME

DIRECT INJECTION

- **DIRECT INJECTION OF HCs IS POSSIBLE, CONSISTENT AND SAFE**
- **SOME OPTIMIZATION STILL NEEDED**
- **NO INVESTMENT AT SH LEVEL**
- **SAME INVESTMENT AT DU LEVEL**
- **ICC REDUCTION NONE**
- **IOC REDUCTION ~ 8%**