

**Final Report on:
Demonstration project on the technical and economic advantages of the Vacuum Assisted Injection
in discontinuous panel's plant retrofitted from 141b to pentane**

1. OBJECTIVE

- Demonstrate benefits from the application of the vacuum assisted injection in replacement of HCFC-141b with pentane in term of insulation properties in the panel's sector
- Demonstrate the easy applicability of the technology and, consequently, the replicability of the results
- Demonstrate that lower cost structure can be obtained by means of shorter foaming time, lower foam density, lower thermal conductivity
- Demonstrate the advantages in terms of safety against explosion and environmental and health sustainability for the operators
- Objectively analyze, if the incremental capital cost could be reduced overall in similar future projects by means of using Vacuum Assistance applied in the foaming process automatically used also for suction of flammable and harmful gaseous substances. Thus, providing means of reducing the cost of exhaust ventilation system in the hydrocarbon based plant conversions.

2. Budget and Expenditures

Project Budget	Approved Costs	Actual Total Funding Disbursed		Actual Costs
		Grant Funds	Counterpart Funds	
Incremental Capital Costs	202,000	202,000	244,000	446,000
Contingency	20,200	20,200		
IOC	N/A	N/A	N/A	N/A
Total Costs / Funding	222,200	222,200	244,000	446,000
Total MLF Grant	222,200			
Total Counterpart Funding	0			
Total MLF Grant Not Utilized		370		

Detailed list of incremental capital cost and contingency by item:

Project Budget	Approved Costs	Actual Funding		Actual Costs
		Grant Funds	Counterpart Funds	
Incremental Capital Costs				
Modification of press for VAI, Vacuum Kit	80,000	181,200	244,000	425,200
Set of side profiles	20,000	30,000		30,000
Safety Audit	2,000	Included above		
Technology transfer, services, consultancy and training	25,000	Included above		0
Installation, commissioning, start up and trials and testing of technology and end products	75,000	11,000 and 64,000 included above		11,000
Subtotal	202,000	222,200	244,000	466,200
Contingency**	20,200	Included above		

3. Conslusions and lessons learned

- The project objectives have been met; technical report has been submitted to the MLFS for 81st ExCom
- Project funds including counterpart cost-sharing sufficed to meet the objectives of this demo.
- Capital costs as had been projected reflect real prices of the VAI standard equipment and special profiles (frames). The cost of the profiles will depend on the size and the number of sets; depending on customer needs. This demo project used two sets.
- An entire techno-economic replicability is confirmed:

-The technology is globaly applicable for any new installations as well as for retrofittings/upgrades.

-The cost pattern should reflect future commercial prices with a prospective reduction.