

GEF – Funded Program
Industrial Energy Efficiency in key Sectors

History of Pilot/Demonstration Projects

March 2015

Introduction

Pilot/demonstration projects as one of the main outputs of the program which are categorized in the component four of the program, “Direct Support to Industry”. The program offers up to 50% support of GEF grant or USD 500,000 for maximum five pilot projects, regarding available budget. Pilot project needs to have the potential of replicability, in addition to technical and economic viability from energy efficiency view.

Demonstration/Pilot Projects

Sector	Beneficiary	Project(s) Title	Investment Cost (USD)	GEF grant (USD)	Beneficiary Co-funding (USD)
Cement	Hormozgan Cement Co.	1) Upgrading Grate Cooler 2) Replacement of airlift with bucket elevator system	1) 351,139,000 2) 13,189,906,200 (IRR)	351,139,000	13,189,906,200 (IRR)
Iron&Steel	Esfahan Steel Co. (Zob Ahan)	Implementation of Hot charging in continuous casting machine #5 and rolling mill #500	1,245,330	500,000	745,330
Oil Refinery	Abadan Oil Refining Co.	Replacement of barometric condensers with plate heat exchangers	1,100,000*	500,000	600,000
Brick	Ati Morvarid Pardis Co.	Installation of monitoring and control system on Hoffman Kiln	30,000	15,000	15,000

*The financial offers have not been opened yet; therefore the investment cost is estimation and is not the real amount.

Energy Saving / CO₂ emission mitigation

Sector	Project Title	Expected Energy Saving	Expected Energy Saving (Gj/year)	Energy Cost Saving (USD/Year)	CO ₂ Emission Reduction (Ton/year)
Cement	1)Upgrading Grate Cooler 2)Replacement of airlift with bucket elevator system	5 (Million m ³ /yr) Natural Gas	183,450	188,000	10,270 ^[1]
		1,344,000 (kWh/yr)	17,280 ^[2]	40,000 +146,000 ^[3] = 186,000	968 ^[1]
Iron&Steel	Implementation of Hot charging in continuous casting machine #5 and rolling mill #500	14.9 (Million M ³ /yr) ^[4] Natural Gas	531,000	550,560 ^[5]	29,740 ^[1]
Oil Refinery	Replacement of barometric condensers with plate heat exchangers	15.6 (million m ³ /yr) Fuel gas of Refining	608,850	183,780 ^[6]	34,100 ^[1]

Assumptions:

National gas price: 1000 Rials/m³ please correct me if applicable)

Electricity price: 800 Rials/kWh ??? (Please correct me if applicable)

[1] CO₂ emission ratio is accounted for 0.056ton CO₂/ 1Gj of energy consumption.

[2] The ratio of power plant is accounted for 0.28.

[3] Besides of electricity saving, this project increases the production capacity which decreases SEC to minimum of 10 (kJ/kg_{clinker}). So, the non-energy cost saving is added as it affects SEC.

[4] Calculation is based on 700 C of hot charging temperature for at least 60% hot charging production over the year.

[5] There is non-energy cost saving which is not brought in this calculation. (Non-energy profit: reduction of waste in rolling mill #500)

[6] Fuel gas price is 3.14 USD/million Btu Fuel gas (reference: Abadan Oil refining Co.)

History of the pilot projects and some issues

Project No.	Sign agreement between UNIDO and Beneficiary	Tender	Select the Contractor	Contractor	Primary Approval of UN SC [1]	Secondary Approval of UN SC [2]	Contract with contractor	Final Approval of UN SC [3]
Cement	Feb. 2014	Mar.-Jun. 2014	June 2014	CemProTec, German Co.	Sep. 2014	First of Dec. 2014	Dec. 2014	Not yet
Iron&Steel	July 2014	Aug.- Nov. 2014	October 2014	INTECO, Austrian Co.	Sep. 2014	–	Not yet	Not yet
Oil Refinery	July 2014	Aug. 2014 to Jan. 2015	Not yet (technical assessment is under process)	Not yet	Sep. 2014	–	Not yet	Not yet

[1] Based on the first request, the technical specification of all above projects were submitted to the UN Committee for clearance and on 10 Sep. 2014, the answer was that the projects are approved in general view, however for final clearance, the committee needs list of equipment based on offers submitted for the bidding.

[2] The list of equipment in more detail after bidding and selection of contractor was sent to the sanction committee in 24 Sep. 2014. Then on 4th Dec. 2014 after two months, the committee found out that the proposed list is not sufficient and more detail specification of equipment and services is necessary. Since providing that much detail information would not be possible without performing engineering work, it was supposed to contract with the contractor is issued, but in two phases. First phase is engineering work in order to provide the detail information as requested by sanction committee. Second phase is procuring and supplying the equipment and it is subject to the clearance of the sanction committee on the list/specification from engineering work.

[3] In the last request, UN sanction committee asked for the list and detail specification of the equipment as well as list of suppliers which can be prepared during detail engineering design.

Issues:

- 1- It should be noted that for ESCO (Iron&Steel) and Abadan Oil refining Company, we had re-tendering once and twice; respectively. Despite all UNIDo effort in sending the letter of interest and invitation to the potential supplier for participation in the tender, eventually and after two or three times extending the deadline of the biddings, only one offer has been received for each of the projects in Iron& Steel (ESCo) and oil refinery (Anadan oil Refining Co.). the main reason is the Iran situation in terms of sanctions in which most of well-known companies are not open to contribute in Iran’s projects.
- 2- Moreover and as it is explained earlier, the process for selection the contractor for all aforesaid projects encountered delay as the stage of Un sanction committee has been added and it was applied more than one time.

List of Equipment/Services

Project Title	1.Upgrading Grate Cooler	2.Hot charging in continuous casting machine #5 and rolling mill #500	3.Replacement of barometric condensers with plate heat exchangers
List of Equipment	<ol style="list-style-type: none"> 1. Clinker Distribution System (CDS) 2. Air Duct 3. One new cooling Fans (90 kW, 80mbar) 4. Air Cannons (with Stainless steel nozzles and pipes) 5. Cooler housing (3 compartments, 2 entry ports, 3 inspection viewing ports) 6. Refractory 	<ol style="list-style-type: none"> 1.Mechanical Equipment of hot charging <ol style="list-style-type: none"> 1.1.Roller table 1.2. Billet Lifter (Hydraulic Lifting device) 1.3 Cross transport table 1.4 Collecting bed 1.5 Rollers and electric motors/drives 2. Electrical and Automation System <ol style="list-style-type: none"> 2.1 Measuring system including 	<p>Three pieces of Plate heat exchangers.</p> <p>Note: Data sheet is attached.</p>

	<p>7. Instrumentations 8. Spare parts</p> <p>Note: detail of equipment is attached.</p>	<p>(protective measures, motor protection, emergency stop, motor control cabinet (MCC), Frequency Converters, PLC control cabinet, etc.)</p> <p>2.2 Standard cables for signals and powers and special cables</p> <p>2.3 Automation system including (necessary operating modes, Data Recording, Control Desk)</p>	
--	--	--	--