

## Brief

**Name of Project:** “Waste Heat Recovery and Utilization for Power Generation at Maple Leaf Cement Factory Limited, Iskanderabad, Pakistan.”  
Version 01.

### Objectives:

- The main objective of the project activity is installation of waste heat recovery system to generate electricity.
- Waste heat will be recovered by installing six Heat Recovery Steam Generators (HRSGs) and electricity will be generated by installing a steam turbine of 16.5 MW. The electricity generated by the component of heat coming from the exhaust of engine will be ignored and emission reduction would be claimed only for the electricity generated by utilizing waste heat coming from the clinker production process and contributes towards sustainable development.
- To help in achieving the objectives of combating climate change under UNFCCC by reducing significant amount of greenhouse gas (carbon dioxide) emissions and contributes to the regional and national sustainable development.

**Date of Submission:** March, 28<sup>th</sup> 2009

**Submitted by:** Carbon Services (Pvt) Limited.

**Project Sponsors:** Maple Leaf Cement Factory Limited.

**Project Development Consultants:** First Climate (Switzerland) AG

### **Detail of Total Project Cost:**

<b>Cost Equipment/Service</b>	<b>Price (Million PKR)</b>
LC Amount of Equipment (STGs, HRSGs, and allied equipment)	1,197.0
Civil Works	137.2
Electrical Works	59.1
Duties and Taxes	54.2
Financial Expenses	284.1
Miscellaneous Expenses	284.5
<b>Total Project Investment (PKR Million)</b>	<b>2,016.2</b>
<b>Total Project Investment (US \$ Million)</b>	<b>25.20</b>

**Estimated Emission Reduction:**

<u>Source</u>	<u>Tons of CO<sub>2</sub>eq/ yr</u>
Maple Leaf Cement Factory Limited.	47,807
<b>Total annual reduction:</b>	<b>47,807</b>

**Operational Lifetime:** 20 years.

**Starting/Commissioning Date:** 2009

**Crediting/Validity Period:**

- Kyoto first commitment period: 2008-12
- Estimated validity period (Including Post Kyoto period): 2008-28

**Economic Viability of the Project:**

Internal Rate of Return (IRR):

Without CDM benefits: 15.38%

With CDM benefits: 17.92%

**Benefits from the Project:**

<b>Activity</b>	<b>Revenue (US\$) million/annum</b>
Sale of Carbon Credits (@ US\$ 14/tonnes of CO <sub>2</sub> eq):	0.96
<b>Total estimated annual revenue:</b>	<b>0.96</b>

**Other Qualitative Benefits:**

- The project is a role model of for other cement factories. Generation of electricity by recovered waste heat will build up a skill set for such kind of operation. The project improves the skill set for local inhabitants through training and capacity building in order to grow their technical skills.
- The project activity will enhance local employment opportunities in an economically depressed region. Local community will benefit from new job opportunities that will be created particularly for the time span of construction and operation of the WHR plant.
- The project activity reduces the local air pollutants (such as nitrogen, sulphur oxides and volatile organic compounds).
- Project activity would provide an opportunity both to Maple Leaf Cement Company and local workers to interact with foreign workers and consultants. This would not only give them a chance to learn new concepts about workplace ethics but improve social equity situation at the company as a whole.

- The project activity thus reduces the variable cost of grid electricity imports. In the absence of project activity, the project equivalent electricity would have been imported from fossil fuel based grid; thus leading to additional consumption of fossil fuels.
- Stimulates economic activity and investment in the project area.