



Energy Efficiency and ‘Clean Development Mechanism’ opportunities in Pakistan

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1.

Sindicatum Clean Energy

Sindicatum Carbon Capital

- specialist end-to-end developer of climate change projects
- institutional shareholders include Citigroup, AIG, Cargill and the Government of Dubai
- main offices in Chicago, London, Cairo, New Delhi, Beijing, Hong Kong, Jakarta, Singapore



Sindicatum Clean Energy

- specialist end-to-end developer of renewable energy and carbon offsets for emerging markets
- sister company to Sindicatum Carbon Capital
- main projects in Thailand, Indonesia, Korea, South Africa



Origination

- project scoping and due-diligence

Development

- project design, development, commissioning, operation and management

Financing

- direct equity, debt and mezzanine financing

Registration

- Kyoto registration, monitoring, validation and 'carbon credit' sales and trading
- Power Purchase Agreements

2.

CDM opportunities

Why do anything?

We now live in a 'carbon priced' world

- > weather patterns are shifting
- > consumer behaviors are changing
- > policies are being written



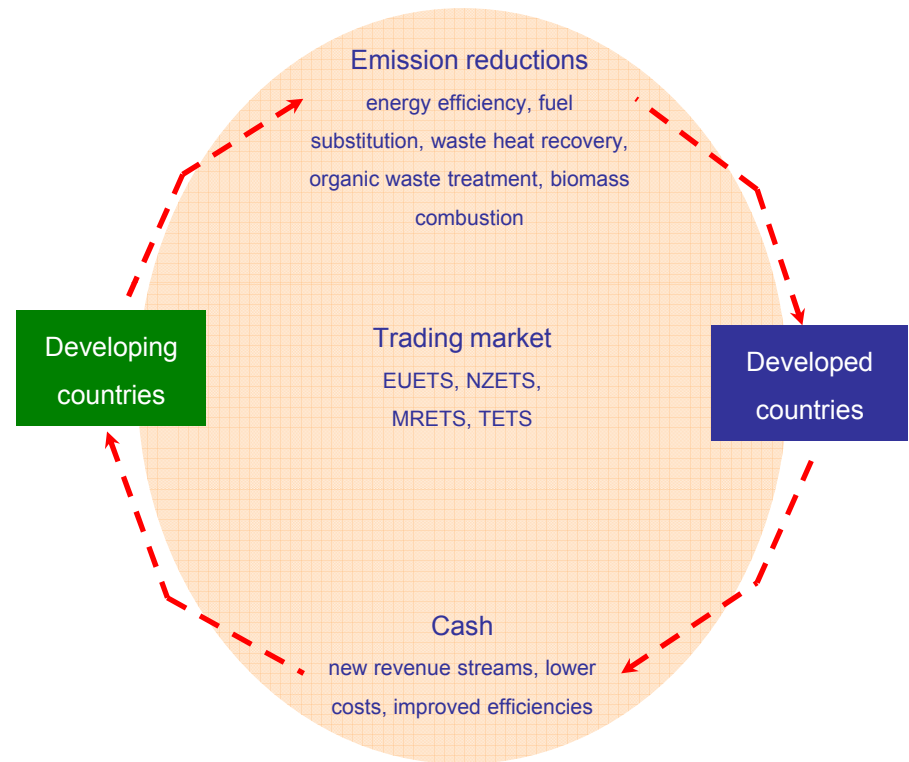
Kyoto Protocol recognizes emission reductions as tradable commodities ('carbon credits')

- > efficiency improvements
- > fuel-substitution
- > waste heat recovery
- > cogeneration



Why do anything?

- > new revenue streams
- > lower energy costs
- > job creation
- > infrastructure development
- > efficiency improvements
- > infrastructure development
- > appease our 'carbon consciousness'



Who is making the money?



Steel industry

No registered CDM projects in Pakistan

Waste gas recovery to generate electricity and offset fossil-fuel based generation



Tata Steel: 385,000 CERs, **US\$7.2m pa**



JSW Steel: 859,000 CERs, **US\$16.1m pa**

Waste heat recovery to offset other preheating energy requirements



Ningbo Iron & Steel: 134,000 CERs pa, **US\$2.5m pa**

Fuel substitution to less emissive sources



Acos Villares S.A.: 43,000 CERs, **US\$0.8m pa**



Cement industry

One registered CDM project in Pakistan – Maple Leaf fuel substitution

Energy efficiencies to reduce per unit fuel and electricity consumption



India Cements: 51,000 CERs,
US\$1.0m pa



Ningguo Conch: 56,000 CERs,
US\$1.1m pa

Clinker substitution to reduce CO₂ emissions associated with calcination and fuel combustion



CEMEX: 286,000 CERs pa,
US\$5.4m pa

Fuel substitution to less emissive sources



Holcim: 148,000 CERs,
US\$2.4m pa



Lafarge: 62,000 CERs,
US\$1.2m pa



Fertilizer industry

Two registered CDM projects in Pakistan – Pakarab Fertilizer catalytic destruction of N₂O in tail gas and waste heat recovery

Catalytic destruction of N₂O that would otherwise be vented to the atmosphere



Pakarab Fertilizer: 1,151,000 CERs, **US\$21.6m pa**



Abu Qir Fertilizer: 1,182,000 CERs, **US\$22.2m pa**

Waste heat recovery throughout the production cycle

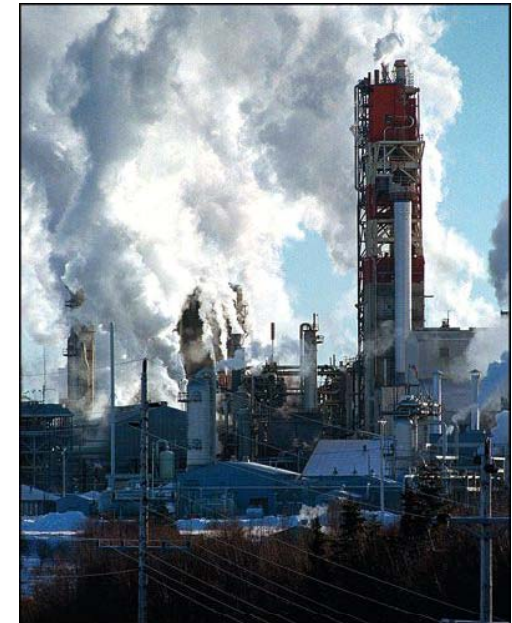


Pakarab Fertilizer: 108,000 CERs pa, **US\$2.0m pa**

Fuel substitution/switching to less emissive sources



Shriram Fertilizer: 72,000 CERs, **US\$1.4m pa**



Sugar/Ethanol industry

One registered CDM project in Pakistan – Almoiz bagasse cogeneration

High-pressure, high-temperature bagasse cogeneration with electricity export to the grid



Ugar Sugarworks: 64,000 CERs, **US\$1.2m pa**

The Ugar Sugar Works Ltd.

Methane capture and combustion from waste water ponds



Rajburi Sugar: 108,000 CERs pa, **US\$2.0m pa**

Rajburi Sugar Co.,Ltd.

The Best Friend of Consumers, Traders and Sugarcane Farmers

Energy efficiency and fuel substitution to less emissive sources



Other industry

No registered CDM projects in Pakistan

Landfill gas capture and combustion



Bangkok landfill: 500,000 CERs, **US\$9.4m pa**



Methane capture and combustion from waste water ponds



Muyuan Swine Farm: 110,000 CERs pa, **US\$2.1m pa**



Biomass based grid electricity substitution



Southern Biomass: 54,000 CERs pa, **US\$1.0m pa**

