

India Small Project Facility

Project Overview (2003-2004)

Table 1: Projects Supported by the CDM SPF in India

Project Proponent	Technology	Description/Benefits	Source of GHG Emissions Reduction	Estimated Emissions Reductions (CO ₂ e)
IDE, Delhi	20,000 Treadle Pumps	A major marketing expansion of IDE's innovative treadle pumps among small and marginal farmers as the most cost-effective means of irrigation for small holders.	The pumps will replace the use of diesel pumps that use up to 1 litre of diesel fuel per hour.	95,600 tonnes over 10 years
Market Dynamics, Calcutta	38,000 Solar Home Systems	Expansion of the PV lighting market in West Bengal with systems ranging from 17 to 72 Wp. The main beneficiaries of the project include remote area households, marginal farmers, and small and marginal micro-enterprises	The lighting systems will replace kerosene and biomass for lighting, and diesel generator sets.	42,000 tonnes over 10 years
Tara Nirman Kendra, Delhi	70 Vertical Shaft Brick Kilns	Improved energy efficient brick kilns and concrete building material technology. This will lower the amount of coal that is burned in brick production and thus pollution levels surrounding the kilns.	The new kilns will reduce the use of coal.	234,000 tonnes over 10 years
Sahyadri Energy Systems, Bangalore	300 micro hydro power units at 5 & 25 kW capacity	Beneficiaries include individual farmers who would benefit from an uninterrupted supply of power for food processing and pumping in remote areas	The hydro schemes will replace existing or planned diesel generators	8,360 tonnes over 7 years
India Rural Energy Network (IRENet). Coordinated by IRENet Secretariat, Delhi	24,572 Solar Lanterns	An India-wide Solar Lantern project involving 20 NGO Members of IRENet. Expansion of the availability of solar lighting to village communities. Project beneficiaries include households, farmers, market stallholders, local suppliers and maintenance shops.	The lanterns will displace the use of kerosene, batteries, and temporary grid connections.	20,600 tonnes CO ₂ over 10 years
Sungrace Energy Solutions, Bangalore	159,374 Solar Lanterns	Manufacturing and distribution of PV lighting products to the rural poor throughout India. The solar lanterns and home systems will provide both a source of energy-efficient lighting as well as income generation through rural cooperatives.	The lanterns will displace the use of kerosene, batteries, and temporary grid connections.	92,180 tonnes over 10 years
NAMSI Solar, Bangalore	4695 Domestic Solar Water	This will help end users in Karnataka consume less grid power, saving considerably on their monthly electricity bills,	The systems will replace electrical boilers/geysers	40,860 tonnes over 10 years

Project Proponent	Technology	Description/Benefits	Source of GHG Emissions Reduction	Estimated Emissions Reductions (CO ₂ e)
	Heating	and reducing environmental impacts from coal power generation.	that use grid electricity.	
Vijay Engineering, Bangalore	126 Biomass Gasifiers	Market expansion of small waste wood biomass gasifiers for thermal applications — primarily in small industries like textiles, food and metal processing, and hotels	The gasifiers will replace diesel-fuelled boilers used for small industrial thermal applications.	46,400 over 10 years

Table 2 Financial Benefits¹ of the CDM to Each Project

Project Proponent	Technology	Financial Viability without CDM	Financial Viability @ US\$3 per tonne	Financial Viability @ US\$5 per tonne	Financial Viability @ US\$8 per tonne
IDE, Delhi	20,000 Treadle Pumps	IRR = 51%	IRR = 82%	IRR = 104%	IRR = 131%
Market Dynamics, Calcutta	38,000 Solar Home Systems	IRR = 25.9%	IRR = 26.6%	IRR = 27.4%	IRR = 28.7%
Tara Nirman Kendra, Delhi	70 Vertical Shaft Brick Kilns	Non-viable	Viable	Viable	Viable
Sahyadri Energy Systems, Bangalore	300 micro hydro power units at 5 & 25 kW capacity	IRR = 9%	Makes the project non-viable	Reduces IRR	IRR = 11%
India Rural Energy Network (IRENet), Delhi	24,572 Solar Lanterns	Average DSCR = 22.8%	Average DSCR = 22.6%	Average DSCR = 22.4%	Average DSCR = 22.2%
Sungrace Energy Solutions, Bangalore	159,374 Solar Lanterns	IRR = 62%	IRR = 66.7%	IRR = 73.4%	IRR = 83.2%
NAMSI Solar, Bangalore	4695 Domestic Solar Water Heating	IRR = 38%	IRR = 47%	IRR = 58%	IRR = 73%
Vijay Engineering, Bangalore	126 Biomass Gasifiers	IRR = 41%	IRR = 51%	IRR = 63%	IRR = 77%

¹ Assuming that a CDM registration fee of US\$5000 is paid, and other CDM transaction costs are deducted.
IRR = Internal Rate of Return, DSCR = Debt Service Coverage Ratio

Table 3: Application of Simplified Procedures

Project Proponent	Technology	Simplified Procedure Category	Baseline Option	Monitoring Protocol
IDE, Delhi	Treadle Pumps	IB: Mechanical Energy for the User	Option b): Equivalent diesel fuel consumption times hours used per year times IPCC emissions coefficient	Annual check that a sample of systems are operating + hours of operation of sample
Market Dynamics, Calcutta	Solar Home Systems	IA: Electricity Generation by the User	Option a): kWh used to charge batteries with fossil fuel generator (<15 kW used when needed)	Annual check that a sample of systems are operating + hours of operation of sample
Tara Nirman Kendra, Delhi	Vertical Shaft Brick Kilns	IIC; Demand Side Energy Efficiency for Specific Technology	Standard fuel consumption of replaced fossil fuel device times hours of operation times operation times IPCC emissions coefficient	Hours of operation of VSB kiln
Sahyadri Energy Systems, Bangalore	Micro hydro	IB: Mechanical Energy for the User	Option a) Power requirements times hours of operation times standard diesel emissions coefficient	Metered output of micro hydro systems
India Rural Energy Network (IRENet)	Solar Lanterns	IA: Electricity Generation by the User	Fuel consumption of replaced kerosene lanterns (40 ml per hour) - NEW BASELINE	Annual check that a sample of systems are operating + hours of operation of sample
Sungrace Energy Solutions, Bangalore	Solar Lanterns	IA: Electricity Generation by the User	Fuel consumption of replaced kerosene lanterns (40 ml per hour) - NEW BASELINE	Annual check that a sample of systems are operating + hours of operation of sample
NAMSI Solar, Bangalore	Solar Water Heating	IC: Thermal Energy for the User	Annual power consumption of equivalent electric water heater times weighted average grid emissions coefficient	Annual check that a sample of systems are operating + hours of operation of sample
Vijay Engineering, Bangalore	Biomass Gasifiers	IC: Thermal Energy for the User	Fuel consumption of replaced fossil fuel device times hours of operation times IPCC emissions coefficient	Measurement of replaced fossil fuel device + hours of operation of gasifier

Table 4: Value of CDM to Small Scale Projects and Required Price per Tonne

Project Proponent	Technology	Estimated Emissions Reductions (CO₂e)	Impact on Project Viability @ US 5 per tonne CO₂	Minimum price per tonne CO₂ to make CDM Worthwhile
IDE, Delhi	20,000 Treadle Pumps	95,600 over 10 years	IRR doubled	\$3-\$5 per tonne
Market Dynamics, Calcutta	45,000 Solar Home Systems	42,000 tonnes over 10 years	Less than 2% increase in IRR	>\$10 per tonne
Tara Nirman Kendra, Delhi	70 Vertical Shaft Brick Kilns	234,000 tonnes over 10 years	Sufficient increase in revenue to make project viable	\$3-\$5 per tonne
Sahyadri Energy Systems, Bangalore	750 kW remote area micro hydro power schemes	8,360 tonnes over 7 years	Decrease in IRR	>\$8 per tonne
India Rural Energy Network (IRENet)	10,000 Solar Lanterns	20,600 tonnes CO ₂ over 10 years	Less than 1% reduction in Debt Service Coverage Ratio	>\$10 per tonne
Sungrace Energy Solutions, Bangalore	159,374 Solar Lanterns	92,180 tonnes over 10 years	10% increase in IRR	\$5-\$8 per tonne
NAMSI Solar, Bangalore	1500 Domestic Solar Water Heating	40,860 tonnes over 10 years	20% increase in IRR	\$5-\$8 per tonne
Vijay Engineering, Bangalore	126 Biomass Gasifiers	46,400 over 10 years	20% increase in IRR	\$3-\$5 per tonne