



SYNERGY Programme

April 18th – 23rd, 2005

Presented To:

Renewable Energy Developers

By:

European Commission, EREC, IC-SHP, CREIA





Synergy Programme

- IN-SHP has identified 10 SHP Projects
 - To contribute to the commercialization of renewable energy in China
 - Strong Stakeholder participation especially in CDM processes
 - Projects at various stages of development
 - 8 CDM projects (PINs to PDDs)
 - 2 Attractive investment projects



Identified Project Sites

甘肃 - Gansu
大甘沟, Dagangou 8.4MW
腊子口 Lazikou 9MW
小河 Xiaohe 9.6MW

西藏自治区 - Tibet
西曲河 QiQuHe 5MW

四川 - Sichuan
曲河 Quhe 7.5MW

湖南 - Hunan
渔仔口 Yuzaikou 15MW

福建 - Fujian
溪口 Xihou 2.4MW



山西 - Shanxi
秦家磨 Qinjiamo 7.17MW

浙江 - Zhejiang,
黄谢圩 Huang XieXu 5MW
白鹤 Baihe II 8MW



Identified Projects

- 腊子口 – Lazikou

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Diebu County, in Gansu Province
Proponent	Laizhou Hydropower Development Co Ltd (Private company)
Installed Capacity & Annual Generation	9 MW capacity (Stage II 4.2 MW, Stage III 4.8 MW) 44.75 GWh



Identified Projects

腊子口 – Lazikou

Total Project Cost	34.66 million CNY (4.189,532 million USD)
FIRR & Payback Period	8.43%, payback 12.06 years
Emissions Reductions	Annual: 33,202.56tCO ₂
Project Status	Bundled project: Stage II and Stage III. Stage II: Feasibility study and Preliminary design report completed. Construction in July 2005 Stage III: Feasibility study completed. Construction start after the completion of Stage II.



Identified Projects

- 腊子口 – Lazikou

Technical Details	Diversion complex, consisting of an inlet gate, a discharge gate, and an overflow dam. Two horizontal Francis Turbines and two generators will be the main equipment. Each single unit capacity will be 2100kw.
End Users	<ul style="list-style-type: none">- Four local townships: Lazihou, Sangba, Luoda, and Huayuan- The local grid: Diebu township- The provincial grid: Ming County, Zhang County and Longxi County



Identified Projects

腊子口 – Lazikou

Socio-environmental Benefits	<ul style="list-style-type: none">- Preservation of local forests- Preservation of rare local wildlife- Development of local industries and tourism- 200 employment opportunities, directly and indirectly
CDM Additionality	<ul style="list-style-type: none">- Prevailing Practice barrier: 75% of Gansu's energy comes from thermal sources- Located in a designated poverty area (Electricity tariffs quite low)- More details to be clarified



Identified Projects

- 溪口 – Xikou

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Zherong County, Fujian Province
Proponent	<ul style="list-style-type: none">• Xikou Hydropower Co. Ltd (Limited Company in which the government holds 60% stake)• Water Resources Bureau of Zherong County, Fujian Province
Installed Capacity & Annual Generation	2.4 MW, 8.62 GWh



Identified Projects

- 溪口 – Xikou

Total Project Cost	21,390,000 CNY (2,585,519 USD)
FIRR & Payback Period	7%; payback period: 12 years
Emissions Reductions	Annual: 5,887 tCO ₂ e tCO ₂
Project Status	Preliminary feasibility report completed.



Identified Projects

- 溪口 – Xikou

Technical Details	Head is 69 m and the flow rate is 4.8 m/s. Main components of the project will be a HL170/A253-WJ-50 turbine and a SF800 generator.
End Users	The output from Xihou would be transmitted to the local area through the local grid. Main end users will be Zayang Industrial Zone.



Identified Projects

溪口 – Xikou

Socio-environmental Benefits	<ul style="list-style-type: none">- Alleviation of rural poverty through local industry development- Flood control and irrigation- creation of 40 direct jobs
CDM Additionality	Prevailing practice barrier



Identified Projects

- 西曲河 – Xiquhe

Project Type	Small scale renewable energy electricity generation (investment)
Location	Mangkang County Town, Tibet
Proponent	Tibetan Water Resources Bureau (State Owned)
Installed Capacity & Annual Generation	5 MW (2 x 2.5 MW), 38.2 GWh



Identified Projects

- 西曲河 – Xiquhe

Total Project Cost	77.7307 million CNY (9.39211 million USD)
FIRR & Payback Period	10.8%; static investment return period is 10.7 years
Emissions Reductions	N/a
Project Status	Feasibility study completed and approved.



Identified Projects

- 西曲河 – Xiquhe

Technical Details	Diversion type station. Will include two Francis turbines, type HL220 –WJ-84; two horizontal-type synchronous generators, type SFW2500 – 10/1730.
End Users	-Mangkang County households on local grid -Industrial use: Haitong Cement Plant



Identified Projects

- 西曲河 – Xiquhe

Socio-environmental Benefits	<ul style="list-style-type: none">- Mitigate problems of electricity shortages- Support development of local industry- Mitigate deforestation- Protect rare local plant and wildlife
CDM Additionality	N/a



Identified Projects

- 曲河 – Quhe

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Qinghuang County Sichuan Province
Proponent	Qingchuan Electricity Co. Ltd (Private company in which the government holds a stake)
Installed Capacity & Annual Generation	7.5 MW, 31.2 GWh



Identified Projects

曲河 – Quhe

Total Project Cost	69.403 million CNY (8,389,097USD)
FIRR & Payback Period	6.992%; Payback period 17 years
Emissions Reductions	Annual: 12,213tCO ₂ e tCO ₂
Project Status	Feasibility and Preliminary Design Report completed



Identified Projects

- 曲河 – Quhe

Technical Details	The installed capacity of the plant will be 7.5 MW at 54m net head , with a flow of 17.7 m ³ /s The main components of the project will be three HL220-WJ-84 model hydraulic turbines, and three SFW2500-10-1730 model generators, each with a capacity of 2500 kW
End Users	<ul style="list-style-type: none">- Qingchuang County households- Small scale industries- 8,781 households without electricity



Identified Projects

- 曲河 – Quhe

Socio-environmental Benefits	<ul style="list-style-type: none">- Preserve local forests, especially the Tangjiahe National Nature Reserve- Increase the revenue of the county by approximately 1.2 million yuan per annum- Reduce the costs of electricity
CDM Additionality	<ul style="list-style-type: none">- Financial barriers: will reduce the cost of electricity therefore less likely to be an attractive investment- project has been planned since 1988



Identified Projects

- 渔仔口 – Yuzaikou

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Rucheng County, Hunan Province
Proponent	Rucheng County Yuzikou Hydropower Co. Ltd (State owned company)
Installed Capacity & Annual Generation	15 MW (2 x 7.5 MW units), 66 GWh



Identified Projects

- 渔仔口 – Yuzaikou

Total Project Cost	98.67 million CNY (11,846,600USD)
FIRR & Payback Period	11.4%; payback expected in 10 years
Emissions Reductions	Annual: 40,237 tCO ₂ e tCO ₂
Project Status	Feasibility study completed; approval obtained, PIN developed Jul 2004, PDD first edition developed Oct 2004, PDD to be finalised by the end of March 2005



Identified Projects

- 渔仔口 – Yuzaikou

Technical Details	Installed capacity of the plant would be 15,000kW (two vertical 7,500kW Francis type turbines) at 55m net head, with an associated maximum hydraulic capacity of 15.65m ³ /s.
End Users	<ul style="list-style-type: none">- Rucheng County- Chenzhou Municipality- Guangdong grid



Identified Projects

渔仔口 – Yuzaikou

Socio-environmental Benefits	<ul style="list-style-type: none">-Meet growing demand of electricity-Flood protection-Mitigate deforestation, clean energy for local industry
CDM Additionality	<ul style="list-style-type: none">- May have problems proving prevailing practice / technology barriers-However, thermal generation set to increase therefore providing a cheaper energy option and Yuzaikou will displace the business as usual option of coal plants



Identified Projects

- 小河 - Xiaohe

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Xiahe County, Ganan Autonomous Prefecture, Gansu Province
Proponent	Anduo Cement Group and Chenxian Hydro Electric Company
Installed Capacity & Annual Generation	9.6 MW, 42.5 GWh



Identified Projects

小河 - Xiaohe

Total Project Cost	68,480,000 CNY (8,277,259 USD)
FIRR & Payback Period	12.73%; payback period: 8.66 years after tax
Emissions Reductions	Annual: 31,533 tCO ₂ e
Project Status	Preliminary design report completed. Approved by Gansu Provincial Planning Committee. Construction is planned in April 2005, the project is in PIN stage for the CDM



Identified Projects

- 小河 - Xiaohe

Technical Details	Head is 52m to 58m. Flow is 19.86m ³ /s. 3x3.2MW mixed flow turbines. Cascade station using tailwater from upstream station.
End Users	Most sold to Anduo (安多) Cement Factory, rest sold to grid



Identified Projects

• 小河 - Xiaohe

Socio-environmental Benefits	<ul style="list-style-type: none">• Protect 21,344 hectares of reforested land, 640,320 hectares of natural forest• Anduo Cement Factory is short of 20GWh per year• 40% of population in Ganan Prefecture have an annual income of less than 1,300RMB• Create 320 direct and indirect jobs
CDM Additionality	<ul style="list-style-type: none">• Located in a designated poverty area (Electricity tariffs quite low)• Xiaohe will be the largest hydro station in the county.• 75% of Gansu's electricity generation is from thermal sources• More details need to be clarified



Identified Projects

- 白鹤II – Baihe II

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Jingning She Minority Goup Autonomous County, Zhejiang Province
Proponent	Jingning County Baihe II Station Hydropower Co. Ltd
Installed Capacity & Annual Generation	8 MW, 21.2 GWh



Identified Projects

白鹤II – Baihe II

Total Project Cost	66,150,000 CNY (7,989,130 USD)
FIRR & Payback Period	7.01%; payback period: 14.95 years
Emissions Reductions	Annual: 19,418.49 tCO ₂ e
Project Status	The project can start construction by the end of this Spring. Tentatively found CDM intermediary



Identified Projects

- 白鹤II – Baihe II

Technical Details	Head is 44.25m, flow is 7.06m ³ /s, 2x4MW vertical mixed-flow turbines
End Users	Connected to provincial grid, some electricity diverted to local use.



Identified Projects

- 白鹤II – Baihe II

Socio-environmental Effects	<ul style="list-style-type: none">• Submerge a total of 2.234 km² of land (mainly woods, some paddies and dry fields)• Ease dependence on coal (64% of annual output.)• The local minorities and disadvantaged communities will directly benefit from electricity sales (they can purchase shares and are given preferential deals)
CDM Additionality	<ul style="list-style-type: none">• Project is an additional renewable energy source providing more clean energy to the province and local energy users.• The additional (though incalculable) benefit is from the projected benefits arising from the “Replace Firewood with Electricity” programme.



Identified Projects

- 大甘沟 - Dagangou

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Yongchang County, Gansu Province
Proponent	Yongchang Hydropower Company
Installed Capacity & Annual Generation	8.4 MW, 37.968 GWh



Identified Projects

- 大甘沟 - Dagangou

Total Project Cost	57,369,275 CNY (6,996,253 USD)
FIRR & Payback Period	8.13%; payback period: 11.8 years
Emissions Reductions	Annual: 24,521 tCO ₂ e
Project Status	Construction is scheduled for May 2005 and the project is in PIN stage for the CDM



Identified Projects

- 大甘沟 - Dagangou

Technical Details	Run-of-river, diversion type station with 8.4MW capacity (3x 2.8MW horizontal Francis turbines). Located downstream from a regulated reservoir.
End Users	Yongchang County



Identified Projects

•大甘沟 - Dagangou

Socio-environmental Benefits	<ul style="list-style-type: none">•displace combustion of firewood and coal•forest coverage would increase 0.86% per annum as a result of the project•potential for small-scale local commercial development. The activities identified in the project area include carrot plantation and processing, metallurgy, construction materials and textiles.
CDM Additionality	Prevailing Practice Barrier



Identified Projects

- 秦家磨 - Qinjiamo

Project Type	Small scale renewable energy electricity generation (CDM)
Location	Lingchuan County, Shanxi Province
Proponent	Shanxi Provincial Hydropower Company/Prefectoral & County Utilities
Installed Capacity & Annual Generation	7.17 MW, 31.52 GWh



Identified Projects

秦家磨 - Qinjiamo

Total Project Cost	76,716,900 CNY (9,273,200 USD)
FIRR & Payback Period	8.39% ; payback period: 12 years
Emissions Reductions	Annual: 38,123 tCO ₂ e
Project Status	Construction is scheduled for July 2005 and the project is in PIN stage for the CDM, CDM Intermediary has been found and currently under negotiation



Identified Projects

- 秦家磨 - Qinjiamo

Technical Details	<ul style="list-style-type: none">• Stage I is a diversion plant with 3x 1.25MW Pelton turbines• Stage II station uses the tail water of Stage I, regulating station with 3 X 320kW horizontal Francis turbines• Stage III regulating station 3 x 500kW horizontal Francis turbines.• Stage IV run of river plant, 3 X 320kW horizontal Francis turbines).
End Users	Stage I, Stage II and Stage III stations are connected to the grid. As Stage IV is very near to Gushi, the station will supply this village.



Identified Projects

秦家磨 - Qinjiamo

Socio-environmental Benefits	<ul style="list-style-type: none">• felling of 60,000m³ of timber per annum would be prevented• Alleviation of rural poverty in Lingchuan, one of the “poverty counties” of Shanxi Province.• 40 fulltime and 350 part-time workers during construction. 50 fulltime jobs after construction.• reliable electricity supply for the Mohe water-lifting station• 533 hectares of farmland irrigated by reservoir, 200 hectares of new farmland cultivated downstream of reservoir
CDM Additionality	Prevailing practice barrier: Shanxi is a thermal power based province.



Identified Projects

- 黄谢圩- Huangxiexu

Project Type	Small scale renewable energy electricity generation (CDM)
Location	She Minority Goup Autonomous County, Zhejiang Province
Proponent	Jingning She Nationality County Hechuan Hydropower Developing Ltd.
Installed Capacity & Annual Generation	5 MW, 11.95 GWh



Identified Projects

黄谢圩- Huangxiexu

Total Project Cost	36,248,300 CNY (4,3777,814 USD)
FIRR & Payback Period	8.58 % ; payback period: 10 years
Emissions Reductions	N/A
Project Status	Construction of the civil works has started and total construction period is 22 months.



Identified Projects

- 黄谢圩- Huangxiexu

Technical Details	2x2.5 MW with annual utilisation of 2390Hrs
End Users	<ul style="list-style-type: none">• County grid• Station only sells during peak periods



Identified Projects

黄谢圩- Huangxiexu

Socio-environmental Benefits	<ul style="list-style-type: none">•The reservoir can increase the soil-and- water conservation ability, reduce soil erosion, improve vegetation.•Reservoir can release 0.07m³/s water to lower reaches of the river during drought period.•Local people will participate in the construction and management of the station as shareholders.• 700,000yuan income tax every year is expected for the local government.
CDM Additionality	N/A



Summary

- Key to success is a strong cooperative relationship with local stakeholders. Two main key issues have arisen with regard in particular to CDM projects:
 1. **Additionality.**
 - Challenge to prove SHP additionality in China.
 - Stakeholders need to provide detailed and accurate info for proving additionality
 2. **Project boundaries and Baselines:**
 - Challenge to determine the boundaries of projects from which CERs can be calculated.
 - Essential to know grid connection information.



Summary

- CDM process is strictly MONITORED, VERIFIED and VALIDATED
 - IN-SHP needs the full cooperation of stakeholders to provide detailed and accurate information in order to develop the projects.
- CDM more than financial gain -> CDM to lead to sustainable development
- The CDM process also requires accurate information, resources and additional work to make it a success.



Next Steps

- CDM projects:
 - Continue to gather information,
 - seek intermediaries,
 - develop PDDs
 - and apply for DNA approval
- Investment projects:
 - Continue to gather information
 - Identify all possible sources of financing