

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC550

Project Name	Concentrated Solar Power Project (P129657)
Region	EAST ASIA AND PACIFIC
Country	China
Sector(s)	Other Renewable Energy (100%)
Lending Instrument	Specific Investment Loan
Project ID	P129657
Borrower(s)	China Datang Corporation Renewable Power Co.Ltd, Ministry of Finance, Ministry of Finance, Ministry of Finance
Implementing Agency	China Datang Corporation Renewable Power Co.Ltd, China Datang Corporation Renewable Power Co.Ltd, China Datang Corporation Renewable Power Co.Ltd
Environmental Category	A-Full Assessment
Date PID Prepared	02-Aug-2012
Estimated Date of Appraisal Completion	04-Dec-2012
Estimated Date of Board Approval	02-Jul-2013
Concept Review Decision	

I. Introduction and Context

Country Context

China's double-digit economic development has spurred huge consumption of total primary energy (TPEC) and electricity: TPEC increased by 8.8 percent during 2000-2011, more than threefold the World growth rate. Electricity consumption grew by 12 percent, fourfold of the World growth. Such rapid growth is expected to continue for coming years. According to the latest International Energy Agency (IEA) New Policies Scenario forecast, China's primary energy demand is expected to grow by 2 percent annually up to 2035, 0.7 percent higher than World growth rate and 1.7 percent higher than OECD growth rate. China Electricity Council predicts that the power generation capacity will reach 1950 GW by 2020. Currently, coal dominates China's energy mix, contributing 68.5 percent of the primary energy consumption, and fueling around 50 percent of power generation in 2011. According to the IEA forecast, coal will remain the dominant fuel and would account for more than 50% of the primary energy up to 2035.

The Government of China (GoC) has come to recognize that such tremendous primary energy and power growth cannot be met by fossil fuels. Coal combustion has already led to deteriorating local environment and China became the largest CO2 emitter in the World. The past growth trends are

unsustainable and the government plans momentous reduction in energy and carbon intensive industries.

Sectoral and Institutional Context

To meet fast growing energy demand in a sustainable and environmentally responsible manner, GoC committed to increase the use of renewable energy (RE) to limit coal growth. China's Renewable Energy Law (REL) was enacted in 2005 and became effective in 2006. The REL set up an ambitious RE target and mandated grid access for RE-based electricity. It also provided financial incentives to promote RE-based electricity. Later in 2009, the GoC updated RE targets in the RE Medium and Long Term Development Plan and committed to increase the share of none fossil fuel to 15 percent of primary energy consumption by 2020 . The legislation and enabling policy framework provided the necessary incentive mechanisms to scale up RE development to meet the surging electricity demand.

As a result, RE development boomed during the 11th Five Year Plan (FYP, 2006-10). China's installed wind capacity doubled in three consecutive years 2007-08-09. In 2010, the installed capacity reached 44.7 GW. In the same period, installed biomass capacity grew remarkably to reach 5 GW in 2010. Solar photovoltaic (PV) also made considerable progress. The installed capacity reached about 1 GW, but remained a marginal share due to its high cost. In 2011, the growth lessened for biomass and wind: biomass stayed at 5GW and wind capacity increased slightly to 45.1 GW. Only PV sustained a healthy growth and installed capacity more than doubled to reach 2.14 GW.

Recently CSP gained momentum due to its comparative advantages over fossil fuels and other RE technologies. Firstly, it has a huge potential of becoming a key technology for climate change mitigation as it uses renewable solar thermal energy to generate green electricity with low levels of greenhouse gas emissions. Secondly, unlike small hydropower, wind power and solar PV that are not dispatchable, CSP plants, when equipped with thermal storage, can deliver dispatchable electricity to meet changing demand of power, which is of particular interest to utilities. Although CSP is a mature technology, it has experienced scattered deployment globally. High upfront capital cost impeded its large-scale deployment at the moment. However, CSP holds a very promising future as technology improvement and economies of scale may bring down its cost in the near future, as experienced for the solar PV. GoC is considering to develop CSP up to 3 GW by 2020, given the abundant solar resources in China's northern and western regions. The proposed CSP project is set in these global and domestic contexts.

Relationship to CAS

Supporting CSP development in China is fully consistent with the Country Partnership Strategy (CPS) for 2013-2016. the CPS stresses the need for encouraging the development and use of clean and renewable energy technologies. The proposed project contributes to China's efforts to expand use of renewable energy and to address climate change.

The proposed project would be the first of its kind in China. As a demonstration project, it will help China gain experience in project design, construction, operation, and maintenance, and will serve as a valuable example to facilitate subsequent large-scale deployment in the future to achieve China's CSP development targets. The Bank Board approved two projects, one in Morroco and one in South Africa, and several projects are under preparation in MENA and South Africa. Those projects will provide useful experience to the proposed project even if the extreme weather conditions in Inner Mongolia have not yet experienced in other countries.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The development objective of the proposed demonstration project is to jump start CSP development in China and contributes towards achievement of China's 2020 CSP development target.

Key Results (From PCN)

The key results indicators are: (a) successful completion and commissioning of the CSP plant; (b) installed CSP power generation capacity (MW); (c) electricity production (GWh); (d) avoided local air pollution (tons of NO_x, SO_x annually); (e) avoided GHG emissions (tons of CO₂ annually).

III. Preliminary Description

Concept Description

The proposed project is a national concessional bidding project organized National Energy Administration (NEA). As one of the leading RE enterprises in China, China Datang Corporation Renewable Power Co. Ltd (Datang RE hereafter), whose mother company is Datang Corporation (Datang), won the bid. Datang RE created and registered a subsidiary, Datang Ordos Renewable Power Co. Ltd., in Ordos, Inner Mongolia, to develop the proposed project.

The proposed project includes the construction of a 50 MW CSP plant on a 200 ha site in the Gobi area. Annual power generation is estimated at 120 GWh. The approved tariff is about US\$ 0.15/kWh. According to the concession's conditions, the project should be built within 30 months after the project company is registered. The project company was registered in December 2011.

Site. The project is located in Balagong Town of Hangjinqi in Ordos, Inner Mongolia (see Figure 1-1). The site is well suited for solar projects, especially for development of CSP, due to adequate solar resources and proximity to the power grid. An existing 220 kV substation is located 700 meters away from the project site. The land acquisition for the proposed CSP plant is currently under progress.

Technology and cost. Following the requirement in the concession program, parabolic trough technology was selected for the proposed CSP project with 4 hours of thermal storage. Given the water scarcity in the northern region of China, the plant will be dry-cooled. The CAPEX is estimated to range from US\$ 148 million to US\$156 million.

Project scope. The project scope includes development and construction of a 50MW Concentrating Solar Power plant. The designed plant consists of four principle components: a solar field, heat transfer fluid (HTF) system, thermal energy storage system, and power block. Bank resources will be used for financing a solar field, HTF system, and thermal energy storage system.

Financing. The total project investment is estimated to be US\$156 million and the proposed IBRD loan would be around US\$80 million. The remaining financing will be covered by (a) Equity from Datang RE as required by Chinese law (at least 20 percent); and (b) a commercial loan from the China Construction Bank.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
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Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10			x
Involuntary Resettlement OP/BP 4.12			x
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

V. Tentative financing

Financing Source	Amount
Borrower	76.00
International Bank for Reconstruction and Develo	80.00
Financing Gap	0.00
Total	156.00

VI. Contact point

World Bank

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