2005 fiscal year CDM/JI Feasibility Research
The 30MW Project of Xinjiang Urumqi Tuoli Wind Farm

Mizuho Information and Research Institute
Climate Change Solution

1. Basic factors of project implementation

1.1. General description of the proposed project and background of the planning

In china Coal accounted for 68% of primary energy consumption and 82% of fuel for power generation in 2003. And various forecasts indicate that coal-fired power generation as the most mature and the most economically competitive technology will continuously dominate the power market and play the role of the principal GHG emission source. As a zero-emission renewable energy, wind power is no doubt one of the options for China reducing dependence on fossil fuels and CO2 anthropogenic emissions. Though total capacity of wind power in 2020 is forecasted to be 20,000 MW , the existing capacity in 2003 was just 567 MW due to the restriction of technology, cost and funds. Thus, there exists a huge development potential for wind power development.

Concretely, the construction and operation of the proposed project (Tuoli Wind Farm) will replace the corresponding electricity that would be otherwise generated by thermal power plants (mainly coal-fired plant) in Xinjiang electric grid, avoiding fossil fuel consumptions and CO2 emissions.

1.2. General information

1.2.1. Political, economic and social circumstances

Table. 1.1 Overview of China

Area	total: 9,596,960 km² ,land: 9,326,410 km²,water: 270,550 km²
Population	1,313,973,713 (July 2006 est.)
Language	Standard Chinese or Mandarin (Putonghua, based on the Beijing dialect), Yue (Cantonese), Wu (Shanghaiese), Minbei (Fuzhou), Minnan (Hokkien-Taiwanese), Xiang, Gan, Hakka dialects, minority languages (see Ethnic groups entry)
Capital	Beijing
Ethnic groups	Han Chinese 91.9%, Zhuang, Uygur, Hui, Yi, Tibetan, Miao, Manchu, Mongol, Buyi, Korean, and other nationalities 8.1%
Religions	Daoist (Taoist), Buddhist, Christian 3%-4%, Muslim 1%-2% note: officially atheist (2002 est.)
Government	Communist state

type	
chief of state	President HU Jintao (since 15 March 2003) and Vice President ZENG Qinghong (since 15 March 2003)
Cabinet	State Council appointed by the National People's Congress (NPC)
Legislative branch	unicameral National People's Congress or Quanguo Renmin Daibiao Dahui (2,985 seats; members elected by municipal, regional, and provincial people's congresses to serve five-year terms) elections: last held December 2002-February 2003 (next to be held late 2007-February 2008)
GDP	(official exchange rate):$1.79 trillion (2005 est.)
	(purchasing power parity): $8.182 trillion (2005 est.)
Currency (code):	yuan (CNY); note - also referred to as the Renminbi (RMB)
GDP - real growth rate:	9.3% (official data) (2005 est.)
Inflation rate	(consumer prices):1.9% (2005 est.)
Industries	mining and ore processing, iron, steel, aluminum, and other metals, coal; machine building; armaments; textiles and apparel; petroleum; cement; chemicals; fertilizers; consumer products, including footwear, toys, and electronics; food processing; transportation equipment, including automobiles, rail cars and locomotives, ships, and aircraft; telecommunications equipment, commercial space launch vehicles, satellites
commerce	Exports: $752.2 billion f.o.b. (2005 est.) Imports: $631.8 billion f.o.b. (2005 est.)
Labor force	791.4 million (2005 est.)
Unemployment rate	4.2% official registered unemployment in urban areas in 2004; substantial unemployment and underemployment in rural areas; an official Chinese journal estimated overall unemployment (including rural areas) for 2003 at 20% (2004)
GDP – per capita (PPP):	$6,300 (2005 est.)

1.2.2. Energy situation

The projection of oil,natural gas and coal consumptions made by EIA in 2005 shows steadily growth for each fossil fuel. We show a projection of oil consumption in china as follows.

China was the world's second largest consumer of petroleum products in 2004, having

surpassed Japan for the first time in 2003, with total demand of 6.5 million barrels per day (bbl/d). China's oil demand is projected by EIA to reach 14.2 million bbl/d by 2025, with net imports of 10.9 million bbl/d. As the source of around 40% of world oil demand growth over the past four years, with year-on-year growth of 1.0 million bbl/d in 2004, Chinese oil demand is a key factor in world oil markets.

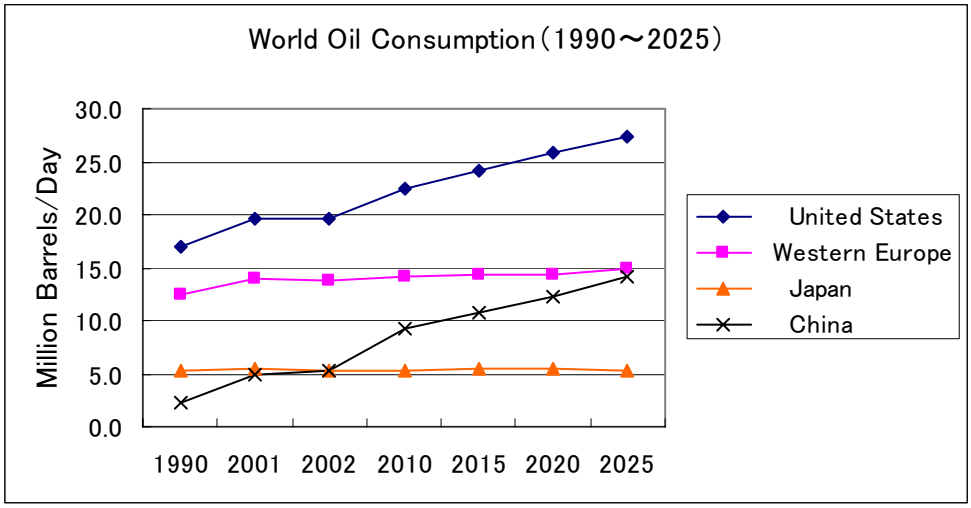
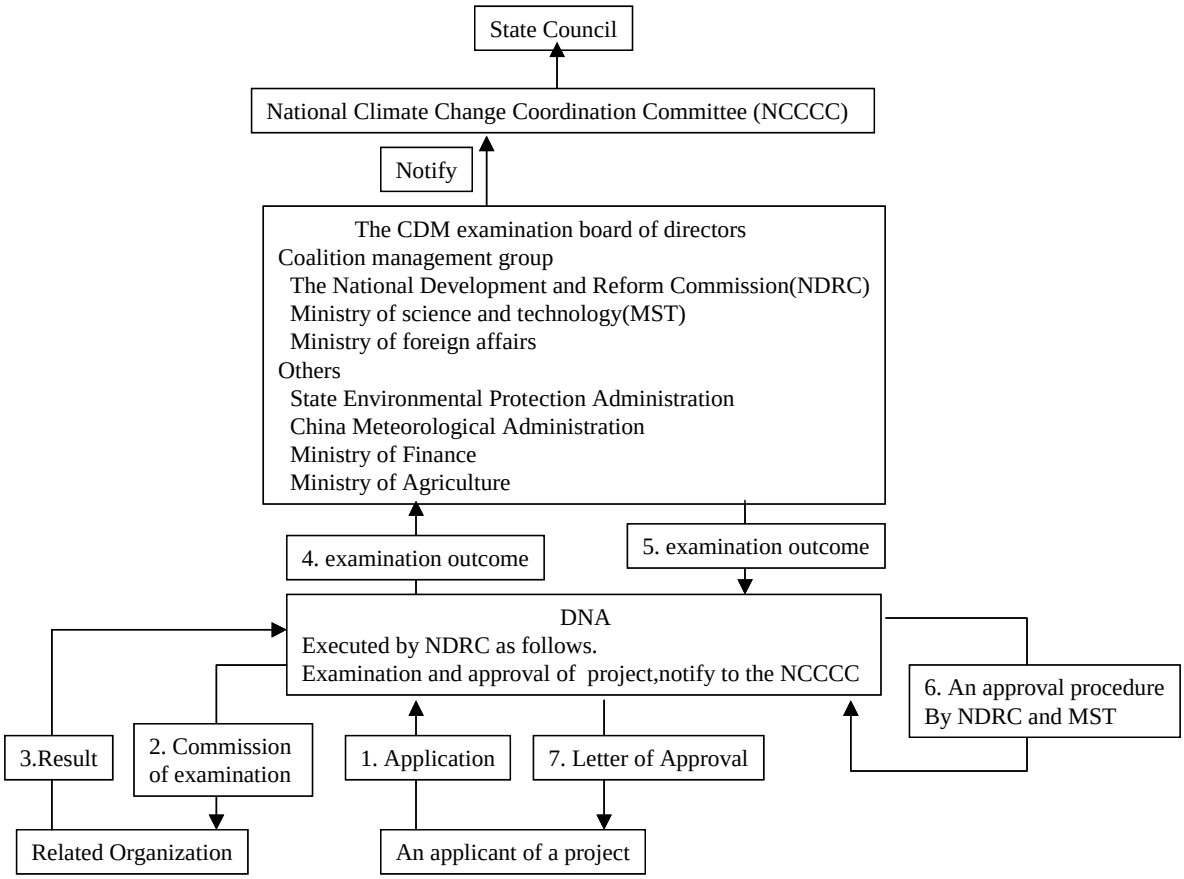


Fig. 1.1　Table. 1.2Projection of World Oil Consumption

1.3.　CDM acceptance mechanism of the host country

CDM policies and situations are described below, including the host country's criteria for CDM acceptance and the status of DNA establishment.

The National Development and Reform Commission is designated as DNA.



reference：JKAP　http://www.kyomecha.org/pf/china.html

1.4. Contribution to sustainable development of proposed project

The project objective is to generate electricity by tapping wind resources, and to contribute towards the government's goal of increasing wind capacity according to the Renewable Energy Law of P. R. China, which has been approved recently. Based on the data from the World Bank, Urumqi city is one of 20 most polluted cities in the world. The Urumqi electric grid constitutes the major part of the Xinjiang main power grid, with a coal-dominated generation mix. Coal combustion in huge amount results in large GHG emissions and serious environmental pollutions. Wind farm emits neither greenhouse gases, nor other air, soil or water pollutants, while in operation. So this project helps reduce environmental pollution and promote urban sustainable development in the region of Urumqi.

The proposed wind farm is located in Northwest China, a remote and poverty-hit region.

The implementation of the project is expected to promote local business investments, create new job opportunities, and increase tax income that would further push the sustainable development of renewable energy industry, improve local living standard, boost local education and tourist markets, and contribute more to the strategic targets of China's west economic development initiatives.

1.5. Research implementation system (Japan, China and other)

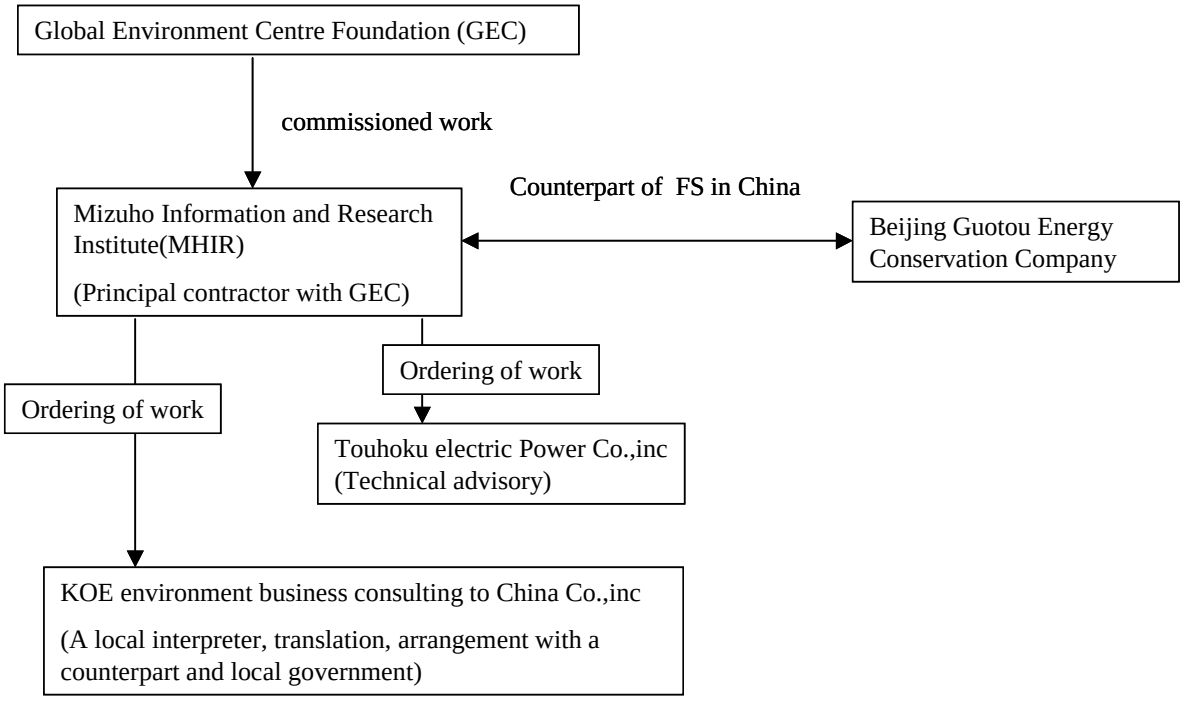


Fig. 1.2 implementation system of feasible study

2. Planning of the project

2.1. The concrete explanation of the project

This project is aimed to develop a 30MW wind farm to be located within Tuoli Town of Urumqi County, under the jurisdiction of the Urumqi city, capital of Xinjiang Uygur Autonomous Region of the P.R.C. In this proposed project, 20 wind turbines with the per-unit capacity of 1.5MW will be installed. About 89.08 GWh of wind-produced electricity will be commercially interconnected to the Xinjiang power grid based on the power purchase agreement (PPA), which would reduce about 653,490.88t CO2 emissions in total as a result (7 Years Crediting period). The Beijing Guotou Energy Conservation Company is responsible for the construction and operation of this project.

2.2. The definition of the project boundary

The electricity generation of the proposal project will be transmitted to Xinjiang grid. According to the statistics in China, Xinjiang grid has not yet been connected with China Northwest grid(the regional grid), only feasibility has been assessed. Therefore there are currently no electricity import and export between Xinjiang grid and Northwest grid.

The Northwest grid, the Xinjiang grid, the system boundary of Tuoli wind farm and the connection relationship are illustrated below:

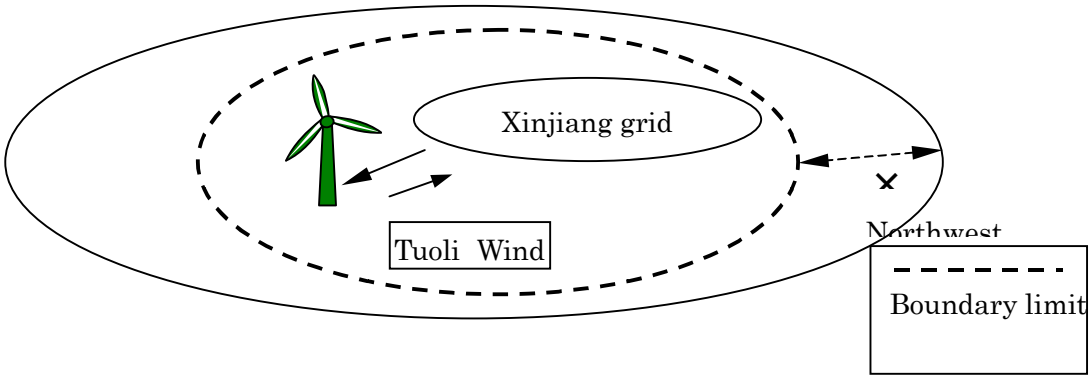


Fig. 2.1 sketch map of project, grid and connection relationship

2.3. An estimate of generation electric energy

From observational data of wind resource and performance data of a wind-power generator annual generation electric energy is as follows.

8,908 万 kWh

We can apply consolidated methodology ACM0002 which has already approved by CDM executive board to this wind firm project.

In the absence of this project, it can be presumed the occurrence of three type of alternative scenario.

a). the proposed project itself, that is, 30MW Touli wind-farm project, but not undertaken as a CDM project activity

b). construction of a thermal power plant or small hydro power station with the same installed capacity or annual electricity generation.

c). equivalent capacity or electricity service provided by the Xinjiang power grid

Concerning option a), the following financial analysis shows that the expensively imported 1.5MW advanced wind-driven units for Touli wind farm would prove less commercially competitive or attractive to investors in terms of the internal return rate (IRR) even considering possible preferential policies if without the revenue from the sale of CERs to be accrued from the expected CDM project activity. So this Touli wind-farm project is apparently ineligible for a realistic and credible non-CDM alternative.

Table. 2.1 Compared Grid-Connecting Tariff

Units	Grid-Connecting Tariff	Note
Newly installed coal-fired units	0.220 ¥/kWh	Without de-sulfur equipment
Newly installed coal-fired units	0.235 ¥/kWh	With de-sulfur equipment
Newly installed wind power	0.470 ¥/kWh	

For the choice b), Xinjiang is abundant in coal and natural gas, as well as small amount of exploitable hydro power. By the end of 2003, the installed capacity of thermal power units had accounted for 80.3%, 18.0% for hydro power and 1.7% for wind power in Xinjiang main power grid. So alternative b) could be considered as a possible alternative from the viewpoint of energy resource availability.

For the choice c), the same capacity or electricity service to be provided by the Xinjiang power grid, could be the only possible alterative for the baseline.

2.4. Comments from stakeholders

According to the Beijing Guotou Energy Conservation Company, the government of the Hsinchiang Uighur Autonomous Region has recently got interested in attracting CDM projects. In the meantime, in October and November last year when we were planning the visit to the site, local government and grid, we were requested by the company not to visit the government and grid, mainly for the following reasons:

1. The ceremony marking the 50th anniversary of the foundation of Urumqi city was carried out in October last year, which required the local government so much of labor for receiving visits from the central and provincial governments that a significant delay has been caused in approval of this project. Besides, a number of

other companies expressed interest in development of wind power generation in the area. In these surroundings, the company was very nervous.

2. As for power relationship between the power producer and the grid, the latter is much more powerful than the former in China. And, in case of wind power generation, the final price negotiation is usually conducted after one-month trial operation. Therefore, if the power producer's intention to sell CER is discovered by the grid-side before the negotiation, it could have an adverse affect on the negotiation with the grid.

Therefore, we visited the site, but not the Urumqi-city government nor the grid, and haven't obtained official stakeholders' comments yet.

3. Preparation for implementation of the project

3.1. Project implementation system (Japan, China and other)

The Beijing Guotou Energy Conservation Company has set up the Xinjiang Guotou Wind Power Station as its affiliate company in Urumqi-city, which represents SPC .

Mizuho information and Research Institute supports The Beijing Guotou Energy Conservation Company so that this wind firm project could be registered as CDM project by UNFCCC and also finds out the Buyer of the CERs which will be generated from this project.

As for fund procurement, although the company had examined the possibility of foreign investment, they have determined to focus on domestic funding because of costly and time-consuming arrangement for foreign investors, such as preparation of explanatory material. And then its parent company has become successful in obtaining a large amount of funding from domestic financial facilities and intends to invest in environmental projects including wind power generation. This means, consequently, the project is to be unilateral. The above chart shows the implementation system of this CDM project.

3.2. Financial planning

Financial planning

	Amount	Currency	remarks
Total investment	28,871	10,000 Yuan	

	4,186.3	Million yen	14.5[Yen／Yuan]
Equity	837	Million yen	20% of the total investment
Debt	3,349	Million yen	China Development Bank. Interest 6.12% pay-back period 12years

3.3. Cost-effectiveness

The cost-effectiveness for the entire project period (20 years) is assumed as below.
Project IRR (post-tax, CER excluded): 7.02%

3.4. Perspectives and problems

FUND PROCUREMENT: The parent company of the Beijing Guotou Energy Conservation Company has got enormous funds as mentioned earlier. Therefore, this project is expected to be able to be pursued based on the scenario, despite it could take time to promote coordination with the local government and the grid.

EMISSION TRANSFER: The Beijing Guotou Energy Conservation Company is already domestically and internationally recognized as a CDM development and investment entity. The CERs from wind power generation is considered to have less risk for project, and so some European carbon funds purchase them on Payment on delivery and also on condition that it should undertake all preparations necessary for CDM. The Beijing Guotou Energy Conservation Company also wishes to pass the CDM cost on to the third party, which is a challenge to be first responded. And the second challenge is that the final purchase price will be higher. The price of Japanese companies' offering is, however, definitely lower than that of European carbon funds'. We regard this as a key problem in bringing emission rights into Japan.