



Report and Recommendation of the President to the Board of Directors

Project Number: 41957
April 2008

Proposed Loan People's Republic of China: Municipal District Energy Infrastructure Development Project

In accordance with ADB's public communications policy (PCP, 2005), this abbreviated version of the RRP excludes confidential information and ADB's assessment of project or transaction risk as well as other information referred to in paragraph 126 of the PCP.

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 15 April 2008)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.14
\$1.00	=	CNY7.00
€1.00	=	\$1.58
\$1.00	=	€0.63

ABBREVIATIONS

ADB	–	Asian Development Bank
CHP	–	combined heat and power
CO ₂	–	carbon dioxide
Dalkia Asia	–	Dalkia Asia Pte Ltd
DES	–	district energy system
EDF	–	Électricité de France
EEI	–	Energy Efficiency Initiative
GHG	–	greenhouse gases
IEA	–	International Energy Agency
MOC	–	Ministry of Construction
NDRC	–	National Development Reform Commission
PRC	–	People's Republic of China
SO ₂	–	sulfur dioxide

WEIGHTS AND MEASURES

MW	–	Megawatt (1,000 kilowatt)
m ²	–	square meter
tce	–	ton of coal equivalent

NOTE

- (i) The fiscal year (FY) of Dalkia SAS ends on 31 December. FY before a calendar year demotes the year in which the fiscal year ends, e.g., FY2006 ends on 31 December 2006.
- (ii) In this report, "\$" refers to US dollars.

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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan of up to CNY2.8 billion without government guarantee, of which up to CNY1.4 billion (A loan) will be funded by the Asian Development Bank (ADB) and up to CNY1.4 billion (B loan) will be funded by international or local banks under participation agreements between ADB and such banks, to the joint ventures established by Dalkia Asia and local partners for the Municipal District Energy Infrastructure Development Project (the Project). If approved, the Project will be ADB's first private sector project to provide assistance to municipal district energy systems (DES). It will constitute ADB's 21st nonsovereign assistance in the People's Republic of China (PRC). The design and monitoring framework is in Appendix 1.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. District Energy System

1. Energy Efficiency in Heating and Cooling

2. Urban areas are responsible for about 75% of all energy use and greenhouse gas (GHG) emissions in the world. Buildings account for nearly 40% of GHG emissions worldwide, and close to 70% in cities like New York and London. Improving energy efficiency in buildings with appropriate technologies determines the pattern of energy use for many years. Substantial progress is being made in increasing the energy efficiency of individual buildings. Beyond these improvements, major opportunities are available through the broader rebuilding of an integrated approach of DES to the planning, construction and operation of these systems. The integration of energy generation and use occurs not only within energy end users (such as buildings or industrial installations) but also between (a variety of) energy end users. Linking buildings together using pipelines enables installation of a central plant that is more economically viable and environment friendly. Heated or chilled water is piped underground from the central plant to individual buildings within a designated area for heating, cooling, or industrial use.

3. Use of DES, including integrated centralized combined heat and power (CHP), is recognized as one of the most significant ways to maximize the efficiency of heating and cooling and the electricity generation process. It provides the means to (i) use the waste heat and save energy while displacing the need for additional heat generating plants; and (ii) share heat loads, thereby using the plant more effectively and efficiently. Typically the pipeline network is developed over time with heat-only boilers used in the early years. Later when the network coverage reaches a critical mass, the network is to be connected to centralized CHP plant, which allows significant reduction of fuel consumption based on recycling of surplus heat from the power station. Furthermore, some of the heat from the CHP generator is utilized in an absorption chiller to produce cold water. The water is circulated through insulated mains to provide cooling to the various end users. An ice storage system can be added to this scheme to meet peak load demands.¹

4. Since 1983, the International Energy Agency (IEA)² has promoted DES with CHP to reduce GHG emissions, promote sustainable development, and reduce vulnerability to supply disruptions. Some countries, particularly in Scandinavia, have a significant penetration of district

¹ The ice store will be frozen at night using chillers driven by electricity from the CHP generators. The ice will be used to provide cooling during the day.

² District Heating and Cooling including the Integration of CHP has been one of seven building-related implementing arrangements operating under the auspices of the IEA.

heating—more than 50% of the heat market. Increasingly, in many parts of the world the DES concept is being implemented for cooling. In the United States and other countries where cooling is important, use of district cooling has grown significantly.

2. District Heating in the PRC

5. In the PRC, heating needs for households and industries have been met mainly by coal-fired stoves and heat-only boilers. Since household stoves have very low efficiency and are not convenient or safe, the PRC started implementing a unique district heating system in the 1950s. It involves a large number of smaller plants directly linked to localized heat networks, which cover a relatively small area. Under the centrally planned and controlled economy, providing heating during the winter was considered a general welfare service, which was priced below the cost of providing services.

6. Successful economic reforms and significant growth of the overall PRC economy have accelerated urbanization and increased heating demand. The PRC is now the second largest district heating market behind the Russian Federation. It is comparable to 27 countries of the European Union combined and 5.5 times larger than the United States market. Yet district heating represents only about 30% of the floor area even in northern cities, leaving a large service area still served by decentralized systems. Compared to the 55%–60% penetration in European countries, this presents substantial opportunities for further expansion. Total heated floor area reached 2.5 billion m² in 2005 and is expected to reach 3.6 billion m² in 2010 and 7.5 billion m² in 2020.

7. Growing demand for district heating has highlighted the energy inefficiency and environmental concerns under the current heating system. In most cities, the operation is still run by municipally owned utility companies which have neglected minimum level of investment and maintenance for lack of adequate finance. The aging pipeline network caused 233,000 general failures in district heating networks in 140 cities and 1,400 serious breakdowns from 2001–2005. The majority of end users receive heat directly from the heat source at low temperature. The operations tend to be intermittent which further decreases the temperature of the circulating hot water. To obtain heated water sooner, end users often dispose of the circulating water. This together with leakage due to the aging pipeline network causes significant water loss—about 8–30 times higher than a modern DES system. Furthermore, the existing heating system has relatively high thermal heat losses due to oversize pipe diameters, pumps, valves, and substations.

8. Household stoves have very low efficiency (less than 30%). Under the current district heating system, heat (hot water) is typically sourced by many small coal-fired heat-only boilers (as opposed to centralized CHP) with boiler house capacity of 2–14 megawatts (MW) or 3–20 tons of steam/hour, which are also inefficient (40%–45%). Because stove and boiler smokestacks are not tall and not equipped with adequate pollution control devices, they directly disperse smoke into the air near residences, creating health problems. During the winter, black smoke commonly floats in the air, and fly ash covers districts in northern cities. Despite the Government efforts to replace small boilers with central heating systems, more than 500,000 small coal-fired heat-only boilers are still in operation in the country. These heating systems, in addition to numerous coal-fired boilers and stoves used by individual households and industries, consume almost half of the country's coal and are the largest single-point sources of urban air pollution. The resulting local, national, and global environmental impact could be substantial. Sulfur dioxide (SO₂) and particulates produced through coal combustion are two major air pollutants, resulting in the formation of acid rain, which now falls on about 30% of the PRC's total

landmass. From a long-term global perspective, the main environmental problem is GHG emission.³

3. District Cooling in the PRC

9. In the PRC, air conditioners supply the cooling needs of households and industries. Energy demand for cooling is growing rapidly to support the living standards of the large population. During the 1990s, household electricity consumption tripled, growing by an annual average of 14%. Improving the energy efficiency of air-conditioning systems, which on hot summer days account for up to 40% of major cities' entire power load, is one of the most effective measures the municipalities can take to decrease energy usage and mitigate air pollution, given that 82% of electricity is now produced by burning coal. District cooling is an untapped area of energy efficiency in the PRC; its use improves energy efficiency, flexibility, and reliability with sharing redundancy ensures minimum disruption. Economies of scale result in the need for less equipment by grouping of small equipments and sharing of redundant capacity, lower manpower requirement, and also less maintenance costs. Each building can access the capacity needed and reduce its initial capital investment, operation, and management. Furthermore, space formerly occupied by ventilating and air-conditioning equipment will be available for commercial use.

4. Policies and Regulations

10. In the 1980s, the PRC Government began studying and making efforts to address the challenges of prospective energy supply shortages and environmental degradation stemming from the PRC's fast-growing economy. The Government recognizes district heating as an important area for reform because of its significant impact on energy conservation, air pollution, and standard of living. Since 1986 the PRC has strengthened the regulatory framework to encourage, support, and develop district heating emphasizing on CHP as the preferred technology. Provisional Ordinance on Energy Saving and Management in 1986 demanded that urban heating should choose more efficient production processes or advanced equipments to replace inefficient systems. Soon after, the State Council issued Special Order No. 22 in 1986, outlining a policy encouraging the rebuilding of urban district heating using CHP to replace small coal-fired heating boilers and household stoves.

11. With the recent energy intensity⁴ increase since 2001, the Government recognizes the urgent need to invest in and significantly improve energy efficiency. From its previous emphasis on energy exploitation, the national energy policy now assigns top priority to energy conservation and energy efficiency. Expanding investment in energy efficiency projects is a high priority for environmental sustainability and enterprise competitiveness. The Government seeks to promote market-based methods to deliver and finance energy efficiency projects in partnership with the private sector.

12. In 2003, the Ministry of Construction (MOC), National Development and Reform Commission (NDRC), State Environmental Protection Administration, and five other central government agencies jointly issued a document (MOC[2003]-148) for heating system reform. The objectives are to (i) gradually transform current welfare-based heating services to be more market-oriented consistent with the PRC's socialist market economic development; (ii) continue

³ Energy consumption accounts for more than 80% of the PRC's GHG emissions. Emissions of carbon from coal combustion are estimated to increase from 820 million tons in 2000 to more than 1.1 billion tons in 2010 and more than 1.8 billion tons in 2020 if environmental issues are not properly addressed. Even then PRC's CO₂ emissions per capita would amount to only 20% of that of OECD countries in 2010 and 30% in 2020.

⁴ Energy intensity is calculated as units of energy per unit of GDP.

to develop and implement more efficient heating technologies and energy-efficient buildings; and (iii) develop a healthy urban heating service system to meet demand for increased quality of living standards, and support sustainable urban development in the PRC. Activities include (i) transforming the welfare-based heating services system to a commodity-based heating service system; (ii) improving the efficiency of heat supply, transmission, distribution, and building heat consumption; (iii) reducing the environmental impacts of urban heating; (iv) continuing to expand economic, safe, environmentally compatible, and highly efficient central urban heating systems; and (v) accelerating reform, introducing competition, and developing a commercial urban heating service market.

13. The 11th Five-Year Plan (2006–2010) strengthens the policy orientation to energy conservation, high-efficiency use, and energy security. The large energy efficiency potential is seen as a great opportunity to obtain some flexibility in the PRC's dependency on external sources of energy. By 2010, the Government aims to improve energy intensity by 20% and reduce SO₂ emissions by 10% compared with 2005 levels. Achieving these targets requires major policy changes that would revitalize investment in energy efficiency throughout the PRC. A number of steps have been taken to support this target. During the 11th Five-Year Plan period (2006–2010), the PRC aims to increase heat supply from CHP in district heating systems from 20% to 50% and increase district heating market penetration from 30% to 50%.

14. The Medium- and Long-Term Energy Conservation Plan highlights key sectors and provides a conceptual road map for improving energy efficiency. The plan puts forward 10 specific types of energy efficiency projects, and identifies district heating and CHP generation as one of the key fields of energy conservation. Specifically, it aims to replace the current heat supply generated by scattered small coal-burning boilers with district heating using CHP units with environmental protection features. It plans to achieve annual energy savings of 35 million tons of coal equivalent (tce) by 2020.

15. In 2007, the NDRC and MOC jointly issued Interim Measures for the Price Control of Urban Heat Supply,⁵ which guides the pricing of heat supplies in urban administrative areas. It states that the state further encourages private investors to invest in CHP and district heat supply facilities, constructions, and operations. Urban heat price comprises the cost of heat supply, taxes, and profit. The heat supplier can request tariff increases to maintain an adequate profit.

5. Private Sector Participation

16. Under the central Government's guidance, many cities are obligated to close down decentralized small heat-only boilers completely by 2010 and connect the associated heated area to the centralized DES. To replace small boilers with more energy-efficient CHP generation facilities, the pipeline network should be rehabilitated and expanded so that the CHP can be fully utilized. This will require an investment of CNY200 billion over the next 5 years. Many cities are having difficulty in securing adequate funding.

17. Involving the private sector in the modernization of the management of district heating management companies is acknowledged as a priority to achieve the energy-saving objectives and profitability allowing further investment in infrastructure. The Government has taken active steps to develop more uniform policies to promote a market orientation and the use of more energy-efficient technologies. Moreover, complementary reforms in housing and construction, such as higher standards for heat efficiency in new buildings and a shift to individually owned

⁵ Measures issued by NDRC have the force of law in the PRC.

housing units, was implemented in order to improve operator revenues. The Government recently stepped up efforts to encourage private sector participation in district heating infrastructure as one of the priorities in the restructuring of state-owned enterprises. In 2003 the Government opened up the district heating market to foreign investors to obtain operational know-how and private sector capital.

B. Asian Development Bank Operations

1. Country Strategy

18. ADB's country partnership strategy for the PRC⁶ is based on four development thrusts: (i) inclusive growth and balanced development, (ii) resource efficiency and environmental sustainability, (iii) regional cooperation and public goods, and (iv) an environment conducive to private sector development.

19. The PRC has been steadily transforming into a market economy, which has become the basis and driving force for economic growth and job creation. In addition to ADB's policy advice to the Government on private sector development, ADB also provides project-based financial assistance. ADB's private sector operations in the PRC have focused on the infrastructure and energy sectors, the financial sector, and environmental improvements. In the infrastructure and energy sectors, ADB prioritizes pioneering projects with innovative contractual and financial structuring to encourage private sector participation, enhance management expertise, and improve corporate governance. As agreed with the Government, ADB private sector operations will identify and support viable projects that are located in the less-developed central and western regions, and explore the possibility of using proceeds of yuan-denominated bonds for lending to local borrowers.

2. Medium-Term Strategy II

20. ADB's Medium-Term Strategy II (2006–2008) seeks more directly to help developing member countries acquire low-carbon technologies, and to implement energy efficiency and renewable energy projects to enable Asia to take the technology leap. Catalyzing investment to improve the investment climate, expanding private sector operations, and managing the environment are also priorities.

3. Energy Sector Strategy

21. ADB's energy sector strategy supports, as operational priorities, (i) poverty reduction through such means as energy infrastructure development for sustainable economic growth and increased access to energy for the poor, particularly in rural areas; (ii) private sector involvement through energy sector restructuring and the creation of an enabling environment for the private sector to invest and operate; (iii) regional and global environmental impact through measures that address acid rain problems and promote the use of clean energy; and (iv) regional cooperation. The ongoing review of ADB's energy policy is expected to recommend a greater focus on energy efficiency. In its public sector operations, ADB is involved in a number of efforts to help improve the heating system in the PRC.

⁶ ADB. 2008. *Country Partnership Strategy (2008–2010): People's Republic of China*. Manila.

4. The Energy Efficiency Initiative

22. ADB's Energy Efficiency Initiative (EEI) aims to expand ADB operations in energy efficiency and clean energy to at least \$1 billion a year, according to the general framework for the implementation of EEI. The EEI task force identified the PRC as a priority developing member country with the highest potential in the Asia and Pacific region for energy efficiency and clean energy investments. The task force has been holding consultative meetings in the PRC to learn firsthand from energy efficiency market stakeholders about immediate investment opportunities and barriers in the PRC market as a prerequisite for developing energy efficiency projects. EEI consultations confirmed that many different approaches are needed to access various segments with significant energy efficiency potential.

III. THE PROJECT

A. Project Description

23. The Project involves the establishment, acquisition, rehabilitation, and operation of DES CHP technologies, where possible, to address operational inefficiency and financial constraints faced by municipalities—two key obstacles to DES market development in the PRC. The proposed ADB loan will support the investment plan of Dalkia SAS (Dalkia, the Guarantor) to rehabilitate and expand DES in municipalities through joint ventures with local partners across the PRC. Those joint ventures will provide DES services to residential clients and industrial and commercial businesses. The impact of the Project is twofold: (i) to provide access to clean, reliable, safe, and high-quality heating and cooling services to the municipalities, and (ii) to expand private sector investment in DES projects in the PRC, thereby achieving large-scale energy efficiency improvements and associated reduction in the growth of GHG and other pollutants.

B. Dalkia Group

24. Founded in 1860, Dalkia is the world's leading DES management and maintenance company employing more than 50,000 people in 40 countries. The company's core value is "optimizing energy in cities". With energy-efficient and environment-friendly solutions, Dalkia optimizes the technical, financial, and environmental performance of the facilities which it manages on behalf of local authorities and businesses. Its primary business is that of an operating engineer; it designs, constructs, operates and manages energy facilities throughout the energy chain from production to consumption. Based on audited financial statements for FY2006, Dalkia has the total equity of €2.1 billion and the total assets of €7.1 billion.

1. Shareholders

25. Dalkia is owned by Veolia Environment (Veolia) (66%) and by Électricité de France (EDF) (34%). Dalkia is one of Veolia's four divisional companies⁷ and is in charge of energy. In 2000, Veolia and EDF merged their energy service business, giving EDF a 34% stake in the company.

⁷ Veolia has four divisional companies by sector—energy (Dalkia), water, transport, and waste management. In 2006, Dalkia's revenue made up 21.4% of Veolia's total revenue, and assets 17.8%.

2. Operations

26. Dalkia's main services include thermal and multitechnical services, heating and cooling networks, industrial utilities, installation, comprehensive building management, industrial maintenance, and public lighting services. It manages 96,000 sites worldwide with 83,400 MW of total heating capacity, and 6,266 MW of power production capacity, including 709 MW of renewable energy facilities.

27. Following the Government's 2003 policy to introduce private sector participation in DES, Dalkia Asia Pte Ltd (Dalkia Asia), a subsidiary of Dalkia, launched its operations in the PRC as one of the first foreign companies authorized to own and operate district heating networks.

28. Dalkia will support the operation and maintenance of the joint ventures through technical (design, operations, information technology, maintenance), legal (contract drafting, deal structuring), financial (equity contribution, financial guarantee), accounting (accounting tool and expertise, tax advice), and human resource support (secondment of staff, sharing good practice, training).

C. Environmental Aspects and Social Dimensions

1. Environment, Safety, and Health

29. Municipal DES projects including CHP abide by national, provincial, and municipal environmental laws. Dalkia duly applies for all permits required to implement the projects and operate project facilities. The design, construction, and operation are required by law to strictly follow safety standards and practices that are well-established by professional institutions in the industry worldwide. The controlling authorities periodically monitor safety aspects. The municipal government or Dalkia conducts an environmental impact assessment for all projects when required. Due diligence was conducted on the environmental, safety, and health aspects of current operations of Dalkia's joint ventures to ensure compliance with ADB's safeguard policies.

30. The Project is classified as environment category FI. To comply with ADB's environmental safeguards requirements, Dalkia will ensure that the joint ventures set up an environmental management system for new projects to be funded by ADB loans, including environmental assessment and review procedures for potential investments acceptable to ADB. ADB's *Environmental Assessment Guidelines* (2003) and *Environment Policy* (2002) and the PRC's environmental laws and regulations will be complied with and implementation of environmental mitigation measures will be monitored in collaboration with municipal environmental protection bureaus. Such environmental mitigation measures will be included in progress reports on project implementation with reporting requirements appropriate to subproject classification, such as semiannual reports on environmental monitoring to be submitted to ADB for review.

2. Clean Development Mechanism

31. Energy savings provide opportunities to reduce GHG emissions such as CO₂ and have the potential to generate carbon credits under the Clean Development Mechanism (CDM). The CDM is an offset arrangement under the Kyoto Protocol that allows buyers in the industrialized countries with GHG reduction commitment to purchase carbon credits from developing countries, such as the PRC, to meet their commitment in achieving global GHG emission reduction. The Project will seek assistance from ADB's Carbon Market Initiative for this purpose.

3. Resettlement

32. The Project is classified as involuntary resettlement category B/C and indigenous people category C. CHP facilities will be constructed on land allocated by the municipal government and located in an area designated as a development zone. Expansion of district heating systems will be carried out under existing public roads. In cases where a new CHP facility is constructed, laying of pipes to connect to the existing pipeline network may require very limited land acquisition or entail temporary site impacts. Land acquisition or changes in land use are normally carried out by the municipal governments before the concessions are opened to the private sector for competition. Dalkia thus has a limited direct role in land acquisition, and only in rare cases will Dalkia be directly involved in resettlement planning and implementation. Nonetheless, for ADB-financed projects, Dalkia, together with the relevant joint ventures, will work with the municipal government to prepare a resettlement plan and ensure that all land acquisition and resettlement activities are undertaken in accordance with ADB's *Involuntary Resettlement Policy* (1995) requirements; national laws; and provincial, municipal and county level regulations and ordinances. Prior to investing in concessions, Dalkia will assess the social impacts in accordance with ADB social development and safeguard requirements. In cases in which land acquisition has taken place in anticipation of its investments using ADB loan proceeds, Dalkia will undertake due diligence to ensure no issues are outstanding regarding the municipal governments' acquisition of rights to land or displacement of people or enterprises. The land acquisition and resettlement framework sets out the procedures, roles, and responsibilities for ensuring that Dalkia fully complies with ADB's requirements for joint ventures that will utilize ADB loan proceeds.

D. Development Impacts

33. The Project will promote economic growth and environmental improvement in the PRC through improved energy efficiency in DES. The impacts of improving energy efficiency will decrease the growth rate of GHG emissions, increase energy services, and improve energy security. Specifically, the Project will (i) improve environmental conditions through improved energy efficiency, support Government efforts to rebuild more energy-efficient DES in municipalities, and accelerate rehabilitation and expansion of DES infrastructure through private sector participation; (ii) improve access to clean, reliable, safe and high-quality heating and cooling services to the people in municipalities in the PRC; and (iii) demonstrate that public-private partnership for DES projects are efficient, and thus encourage the private sector and municipalities to invest in DES projects beyond the Project's interventions.

E. Development Effectiveness

34. The development impact of the Project will be assessed from the perspective of development effectiveness and project framework, and its contribution to economic sustainability and private sector development in accordance with the guidelines for the implementation of the *Good Practice Standards for Evaluation of Private Sector Investment Operations* prepared by the Multilateral Development Banks' Evaluation Cooperation Group.⁸ The Project is deemed to be developmentally effective and its performance measurable. A summary discussion of each of these assessment parameters follows.

⁸ Multilateral Development Banks-Evaluation Cooperation Group. 2006. *MDB-ECG Good Practice Standards for Evaluation of Private Sector Investment Operations*. Third Edition.

1. Project Performance

35. The Project will be assessed against its specific investment capital, construction, and operational and financial objectives. Essentially, effectiveness will be measured against how successfully the Project attracts private sector capital, secures DES concessions, and develops and expands municipal DES; and how much heating and cooling the Project supplies to end users and industries. Financial profitability and sustainability of the Project will be measured by its timely debt repayment capacity.

2. Economic Sustainability

36. The Project will be assessed from an economic sustainability perspective on its ability to develop and implement municipal DES, supply municipal heating and cooling to the end users and industries, and contribute to environmental improvements and economic growth. The Project's successful implementation will impact the promotion of heating reform.

3. Private Sector Development

37. The Project will be assessed and measured on its contribution to private sector development. The focus of this assessment will be on the Project's commercial and financial viability, and its demonstrative and catalytic effect on future private sector developments in DES itself and the economy as a whole.

38. The Project was not specifically assessed from the perspective of investment profitability, as a profitability assessment is better gauged and measured against a portfolio of similar loans and equity investments. Similarly, the Project was not assessed and measured against overall operational effectiveness, as this is a departmental consideration.

IV. THE PROPOSED ASSISTANCE

A. Loan

39. ADB's proposed loan comprise an A Loan of up to CNY1.4 billion funded by ADB and a B loan of up to CNY1.4 billion funded by international or local banks, to the joint ventures established by Dalkia Asia and local partners. The loan will have an interest rate to be determined by the Pricing and Credit Enhancement Committee. The Borrowers may have the right to convert the interest rate from a floating rate to a fixed rate and vice versa on terms agreed between ADB and the Borrowers.

40. The B loan of up to CNY1.4 billion will have terms and conditions agreed upon by the Borrowers, the participating banks and ADB. ADB will charge an arrangement fee and annual administration fee determined by the Pricing and Credit Enhancement Committee.

41. The financing documentation will contain financial and operational covenants, including regular financial and operational monitoring reports and requirements to meet minimum financial ratios.

B. Justification

42. ADB's assistance for the Project is justified on the basis of its development impacts and demonstration effects. It supports the Government's development plans and ADB's operational strategies, and provides value added of ADB participation in the Project:

- (i) The Project will provide access to clean, reliable, safe, and high-quality heating and cooling services to the people living in municipalities where adequate municipal DES infrastructure is lacking and demand is currently not fully met. The Project will support the Government's strategic priorities for energy and the environment as set forth in the 11th Five-Year Plan as well as Medium- and Long-Term Energy Conservation Plan to improve the energy efficiency. The Project will reduce particulates and SO₂ from scattered small coal-fired heat-only boilers and inefficient district heating networks. This will have the most benefits for the urban population, in particular the urban poor, who suffer severely from indoor and outdoor air pollution.
- (ii) The Project is consistent with ADB's private sector operations in the PRC, which have focused on private sector participation in the infrastructure and energy sectors, financial sector, and environmental improvements. In the infrastructure and energy sectors, ADB prioritizes pioneering participation, enhancing management expertise, and improving corporate governance. This Project will provide highly skilled employment and know-how transfer opportunity to the local community.
- (iii) The Project will embody ADB's country strategy for the PRC, which emphasizes supporting environmental improvement and private sector participation. The Project is in line with ADB's energy sector strategy, which recommends a reorientation of energy sector activities to address regional and global environmental impact. By introducing energy efficiency, the Project will contribute to mitigating climate change. The Project is also consistent with ADB's credit enhancement operations policy and EEI.
- (iv) As the first private sector district energy project supported by ADB, the Project is demonstrational and catalytic. It sets a model for private sector investment, including strengthening ties between the leading international investor and local municipalities and service providers, to fill in the gap between the substantial level of investment required for DES projects and limited financing capacity. ADB's participation in the Project is expected to establish more confidence in future private sector participation in DES projects based on public-private partnerships in the PRC.

C. Anticorruption, Combating Money Laundering and the Financing of Terrorism

43. Dalkia was advised of ADB's *Anticorruption Policy* (1998, as amended to date) and policy relating to the *Combating of Money Laundering and the Financing of Terrorism* (2003). Consistent with its commitment to good governance, accountability, and transparency, ADB will require Dalkia, and its subsidiaries to institute, maintain, and comply with internal procedures and controls following international best practice standards for the purpose of preventing corruption or money laundering activities or the financing of terrorism, and covenant with ADB to

refrain from engaging in such activities. The loan documentation between ADB and Dalkia will further allow ADB to investigate any violation or potential violation of these undertakings.

V. ASSURANCES

44. Consistent with the Agreement Establishing the Asian Development Bank, the Government will be requested to confirm that it has no objection to the proposed loan. No funding will be disbursed until ADB receives such confirmation.

VI. RECOMMENDATION

45. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB, and recommend that the Board approve a loan of up to CNY2,800,000,000 to the joint ventures established by Dalkia Asia and local partners to finance the Municipal District Energy Infrastructure Development Project, consisting of

- (i) an A loan funded by ADB in an amount up to CNY1,400,000,000, to be provided from ADB's ordinary capital resources without government guarantee; and
- (ii) a B loan funded by international or local banks in an amount up to CNY1,400,000,000 on terms and conditions to be mutually agreed upon between the borrowers, the participating banks, and ADB,

and on such other terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Haruhiko Kuroda
President

28 April 2008

FRAMEWORK FOR ASSESSING DEVELOPMENT EFFECTIVENESS

Table A1.1: Design and Monitoring Framework

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>Impact Lower energy intensity and better environmental conditions in the PRC</p>	<p>25% reduction in energy intensity by 2018</p> <p>At least 20% energy reduction in heating and cooling by 2018</p> <p>10% reduction in sulfur dioxide emissions by 2018</p> <p>Reduction in greenhouse gas emissions due to energy efficiency improvements.</p>	<p>National energy intensity data</p> <p>Central and municipal government reports and statistics</p> <p>Published energy efficiency market and industry reports</p>	<p>Assumptions The PRC remains committed to improving energy efficiency and environmental protection</p> <p>Macroeconomic and financial conditions in the PRC remain sound</p>
<p>Outcome Increased energy efficiency in the DES</p> <p>Improved reliability of DES in general</p> <p>Improved safety of the DES in general</p> <p>Increased access to high-quality heating and cooling services</p> <p>Increased number of municipalities to rebuild a centralized DES based on public-private partnerships</p>	<p>Annual energy savings of 35 million tons of coal equivalent by 2018 for municipal DES</p> <p>Provision of 24-hour service in more areas</p> <p>At least 10% reduction of general network failures beyond the Project by 2018</p> <p>At least 40% of market penetration in DES areas is based on concession scheme by 2018</p> <p>By 2018, at least 50 municipalities have rebuilt their DES based on public-private partnerships beyond the Project</p>	<p>Central and municipal government reports and statistics</p> <p>Published energy industry reports</p>	<p>Assumptions Demand for DES investment is sufficient</p> <p>Municipal governments honor the concession</p> <p>Risks Private sector and commercial banks are not interested or do not have the capacity to provide loans for DES projects</p> <p>Construction delayed due to industrial relations issues</p>

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>Outputs</p> <p>Demonstration of successful private investment in the DES</p> <p>Improved efficiency of project-funded DES</p> <p>Energy efficiency</p> <p>Reduction of water loss</p> <p>Improved reliability of the DES</p> <p>Improved safety of DES</p> <p>Increased area under improved DES coverage</p>	<p>At least eight municipalities provide concessions by 2018</p> <p>Rates of return of joint ventures exceed 12%</p> <p>At least 20% energy efficiency improvement in heating and cooling in the municipalities supported by the Project</p> <p>Water losses in the network are reduced by 10% per annum</p> <p>Service in the project areas of the joint ventures increased from intermittent to 24-hour</p> <p>General network failures are reduced by at least 10%</p> <p>A connected area at least 60 square meters is achieved by 2018</p>	<p>Project monitoring reports</p> <p>Annual project reviews</p>	<p>Assumptions</p> <p>Project sponsor maintains technical and operating capacity to identify DES projects and implement services</p> <p>Network coverage increases to support more energy-efficient centralized combined heat and power</p> <p>Risk</p> <p>The willingness of municipal governments to invite private sector participation is limited</p>
<p>Activities with Milestones</p> <p>Completion of due diligence and negotiation with the project sponsor</p> <p>Signing of loan agreements</p> <p>Financial close</p> <p>Clearance of all loan drawdown conditions</p> <p>Loan drawdown</p>			<p>Input</p> <p>CNY1.4 billion A loan</p> <p>CNY1.4 billion B loan</p>

ADB = Asian Development Bank, DES = district energy system, PRC = People's Republic of China.

Table A1.2: Development Effectiveness Framework

Objective	Impact	Performance Targets	Measurement
Project Performance	<p>Municipalities under the Project rebuild their DES based on public–private partnerships</p> <p>Profitability of joint ventures increases and business is more sustainable due to energy efficiency improvement</p>	<p>Increase in coverage area</p> <p>Rate of return of each joint ventures is greater than 12%</p> <p>Timely and self-sustaining debt service</p>	Project reports
Economic Sustainability	<p>Energy consumption and greenhouse gas emissions are reduced</p> <p>Local air quality is improved</p>	<p>20% energy reduction in heating and cooling in the municipalities by 2018</p> <p>10% reduction in sulfur dioxide emissions in the municipalities by 2018</p>	Municipal government reports
Private Sector Development	<p>A. Project Impact</p> <p>Concessions are obtained from the municipal governments based on public–private partnerships</p> <p>Private funds are available for DES projects</p> <p>Technical skills are introduced for more efficient implementation of DES</p> <p>B. Beyond Project Impact</p> <p>Increase in number of municipalities open DES to private sector participation</p> <p>Demonstration effect attracts more private sector participation and financing for DES</p>	<p>At least eight cities have access to a DES by 2018</p> <p>Successful syndication</p> <p>At least 50 cities have access to a DES by 2018</p> <p>At least three more private sector companies invest in municipal DES services</p>	<p>The project company's operating, financial, and environmental reports</p> <p>Central Government reports</p> <p>Industry reports</p>

DES = district energy system.

Source: Asian Development Bank estimates.