



Evaluation Study

Rapid Sector Assessment
October 2008

Mongolia: Urban Development Sector

Operations Evaluation Department

Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
CAPE	–	country assistance program evaluation
CDM	–	Clean Development Mechanism
CEA	–	country environment assessment
CSP	–	country strategy and program
DCSC	–	district construction and service company
DHC	–	District Heating Company
EIRR	–	economic internal rate of return
EOCC	–	economic opportunity cost of capital
FSU	–	former Soviet Union
GDP	–	gross domestic product
GEF	–	Global Environment Facility
JFPR	–	Japan Fund for Poverty Reduction
JICA	–	Japan International Cooperation Agency
MCUD	–	Ministry of Construction and Urban Development
MDG	–	Millennium Development Goal
MFE	–	Ministry of Fuel and Energy
MNE	–	Ministry of Nature and Environment
MOH	–	Ministry of Health
MRTT	–	Ministry of Roads, Transport, and Tourism
NO _x	–	nitrogen oxides
O&M	–	operation and maintenance
OED	–	Operations Evaluation Department
OEM	–	operations evaluation mission
PM	–	particular matter
PRC	–	People's Republic of China
PUSO	–	public urban services organization
RRP	–	report and recommendation of the president
RSA	–	rapid sector assessment
SO _x	–	sulfur oxides
SPIA	–	State Professional Inspection Agency
TA	–	technical assistance
UNDP	–	United Nations Development Programme
WHO	–	World Health Organization

NOTE

In this report, "\$" refers to US dollars.

Key Words

adb, asian development bank, development effectiveness, district heating, infrastructure, mongolia, performance evaluation, sanitation, urban development, urban environment, urban infrastructure, water supply

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The guidelines formally adopted by the Operations Evaluation Department (OED) on avoiding conflict of interest in its independent evaluation were observed in the preparation of this report. In terms of consultant input, Paul Bulson, Erdene Dorjsuren and Oyun Bayanzul assisted as consultants for the study. To the knowledge of the management of OED, there were no conflicts of interest of the persons preparing, reviewing, or approving this report.

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EXECUTIVE SUMMARY

Urban development in Mongolia has been greatly influenced by the country's rapid rate of urbanization in recent years. Heightened demand by residential and commercial consumers of urban services has outstripped supply, particularly in Ulaanbaatar and in aimag (provincial) centers. This has become a constraint to the growth of economic activity. There is, therefore, an urgent need to expand the physical infrastructure in the urban development sector, as well as to improve the management and sustainability of the urban infrastructure network, to meet this demand.

The Asian Development Bank (ADB) has been among the most active funding agencies in the urban development sector in Mongolia over the last decade. The objective of this rapid sector assessment (RSA) is to provide an independent assessment of ADB assistance to the Mongolian urban sector and identify key areas for further improving the effectiveness of its operations. The RSA's findings will also be used as inputs to the broader country assistance program evaluation that is being carried out by the ADB's Operations Evaluation Department. The evaluation covers the following subsectors: water supply, sanitation, solid waste, district heating, urban environment, and housing finance.

Government Priorities

In the period before 2000, the Government was preoccupied with the transition process from a centrally planned to a market-based economy. Hence, the development and management of its urban sector was not initially accorded sufficient priority. Since 2000, the Government has formulated urban policies, plans, and implementation strategies. The recent National Development Strategy for 2007–2021 includes urban-related strategies for meeting the Millennium Development Goals (MDGs). For example, the Government plans to prioritize urban migration to the aimag centers to ease migration pressure on Ulaanbaatar. Also, an important step in the development of urban utilities was the 2004 Mongolia Water Law, which established a new Water Agency and called for the semiprivatization of the publicly owned water supply and sanitation agencies in the aimag centers. Another priority of the Government is its "40,000 Houses" program, which envisages construction of 15,000 suburban houses, 15,000 homes in ger ("informal urban") areas and 10,000 apartment units. This is in line with the Government's thrust to narrow the gap between the urban and rural areas in terms of development. This will be done through provision of infrastructure to aimag centers and promotion of economic development.

ADB's Urban Sector Strategy and Program

The urban development sector was first included as a distinct sector in ADB's 1992 Mongolia country strategy. However, the strategic linkage between the urban sector and the overall country strategy remained weak. The 2005 country strategy and program (CSP) attempted to strengthen this strategic link by reorienting urban sector strategy toward the provision of services vital to the achievement of MDG targets. The CSP's four expected urban sector outcomes were (i) improved living conditions for the urban poor, (ii) improved access of the poor to basic services, (iii) better urban environmental conditions, and (iv) improved planning. On the other hand, expected urban sector outputs included (i) upgrading low-income housing, (ii) provision of services to marginal urban areas, and (iii) formulation of an urban sector strategy.

ADB has provided both lending and nonlending assistance in the urban sector. Loan operations in the urban sector commenced in 1997, and, since then, ADB has approved five loans amounting to \$110.1 million. Also, ADB has provided 10 technical assistance (TA) grants in a total amount of \$5.6 million, of which 5 were for the preparation of loan projects, while the rest were for capacity building, which includes institutional strengthening and policy support. In addition, ADB provided three grants from the Japan Fund for Poverty Reduction (JFPR) fund amounting to \$5.7 million for assisting ger and remote rural areas.

Sector Impacts and Outcomes of ADB's Assistance

Overall, the RSA finds that ADB contributed significantly to improvements in Mongolia's urban sector. Impacts of ADB's urban assistance program included (i) greater access to clean water and sanitation; (ii) increased access to heating for formal area residents in Ulaanbaatar and selected aimag centers; (iii) provision of low-cost housing for ger area residents; (iv) upgrading of low- and middle-income housing; (v) establishment of a sustainable, market-based system for the delivery of housing finance to meet the borrowing needs of low- and middle-income households; and (vi) assistance to local urban strategy development. ADB's urban sector program contributed to improving the level of access to clean water and sanitation, which is one of the MDGs. Economic growth indicators show that, on the average, the aimag centers covered under ADB's two provincial urban services loans grew substantially faster than other aimag centers, and some aimags showed improvement in poverty incidence.

It appears that ADB's interventions have had a modest impact, albeit indirectly, on the reduction of poverty in the selected aimag centers. ADB's assistance for housing finance led to a fledgling mortgage market that exceeded the sector development goal expectations. Overall, the impact of ADB's urban assistance program is rated as substantial.

ADB's Results and Performance Rating

Overall, the RSA assesses ADB's assistance to the Mongolian urban development sector as *successful*, on the high side. The performance of the urban sector strategy is rated *successful*, based on separate assessments of strategic positioning, responsiveness of ADB's performance, and contribution to development results. The performance of the urban sector program is rated *successful*, based on separate assessments of relevance, effectiveness, efficiency, sustainability, and impact. In terms of assistance modality, the JFPR grants are found to be *highly successful*, while loans and TA are found *successful*.

Issues, Lessons, and Recommendations

The main issues that have been identified at the strategic, institutional and policy levels are as follows:

- (i) **Strategy.** Although the urban sector strategy is rated successful, the assessment was hindered by the fact that the sector outcomes and outputs were not well formulated in the 2005 CSP. In particular, there were some inconsistencies between the sector framework and sector roadmap, while the sector outcome and output indicators were not specific enough to be monitorable.
- (ii) **Institutions.** Over the last decade, ADB and other aid agencies have supported the Government in rebuilding assets in various urban subsectors, but in general less attention has been given to setting up the institutions and systems required

to ensure that these assets are properly maintained and efficiently used. To catch up with other former socialist countries in institutional reform and strengthening and to avoid wasting of resources on infrastructure that is not well maintained and managed, Mongolia needs to institute a program of wider institutional reform.

- (iii) **Tariff Policy.** Full cost recovery for water supply, and wastewater treatment, has not yet been attained; and tariff setting is currently highly politicized and remains heavily influenced by the local governors. In the short term, the Government should be encouraged to adopt more transparent and efficient mechanisms for subsidizing utilities. In the longer term, other means of depoliticizing tariff control should be pursued. One possibility is through the creation of a National Water Board, while another solution recommended by the World Bank is integrating a new water board with the recently established and successful Energy Regulatory Authority, which regulates energy tariffs. Any national tariff proposal should be reviewed for governance, capacity, and implementation arrangements at the aimag/center level.
- (iv) **Resource Saving Measures.** Much of the short-term energy and water demand in the aimags can be realized from water and energy savings. Water meters, plumbing fixtures, and step tariffs to encourage off-peak use are all cost-effective measures. High-efficiency appliances, maximizing network distribution, use of renewables (wind, solar, biogas), and maximizing utility operations are all areas that can bring substantial resource savings and thus reduce new fixed power investment costs.

The following are the main lessons learned:

- (i) **Delegate project administration to the resident mission.** From ADB's perspective, its Mongolia urban sector operations are labor intensive, because investments are dispersed across many components in many cities. In such circumstances, it is usually more efficient to delegate project administration to the resident mission. In this context, the appointment of an urban development specialist to the resident mission in 2007 and the concomitant delegation of administration of two loans are considered very appropriate.
- (ii) **Optimize synergies between the various assistance modalities.** In at least one case, synergies between the different ADB assistance modalities helped in the achievement of CSP urban sector outcomes/outputs. The implementation of the Housing Finance Sector Project alone would not have ensured achievement of the sector output of "upgrading low-income housing," because most of the project beneficiaries were middle-income households, not low-income households as originally intended. However, a JFPR grant aimed at assisting ger area residents in Ulaanbaatar and 10 other cities was successful in upgrading the housing of a substantial number of ger area residents. This contributed to the partial attainment of the sector output.

The following are the main recommendations:

- (i) **Focus more on the urban environment.** Continuing migration to Ulaanbaatar and aimag urban centers is expected to put further pressure on the urban environment. Investment is needed, particularly in Ulaanbaatar, for improving air and water quality. Most aimag centers do not have an environmental plan, environmental ethos, or community involvement programs. Initially, ADB may consider providing assistance for the formulation of urban environment plans/programs in the aimag centers. ADB may also consider increasing its involvement in tackling Ulaanbaatar's urban environmental issues, possibly through collaboration with other development partners on new urban sector programs.
- (ii) **Increase aid coordination and make more use of bilateral resources.** ADB should strengthen its coordination with other aid agencies and make better use of bilateral resources for addressing urban environment issues. Possible areas where ADB could leverage its urban sector program through increased aid cooperation and support include the following:
 - Cooperate with Japan International Cooperation Agency (JICA) on aimag center sanitation.
 - Cooperate with the World Bank on its Ulaanbaatar air pollution program.
 - Cooperate with JICA and the World Bank on implementing the Ulaanbaatar urban master plan, when it is completed.
 - Cooperate with the German Technical Cooperation Agency and other existing bilateral resources on current ADB aimag programs.
 - Mobilize Global Environment Fund grant funding for urban environmental issues.
 - Apply for Public-Private Infrastructure Advisory Facility grant assistance for aimag private sector participation programs in water and sanitation delivery.
- (iii) **Formulate a more detailed sector roadmap.** The next CSP should formulate a more detailed urban development sector roadmap and identify monitorable indicators for each of the sector outcomes and outputs that are linked to the urban-related MDG targets.
- (iv) **Carry on policy dialogue to reform district heating services.** There is a need to undertake/continue policy dialogue with the Government and assist it to reform district heating services in Ulaanbaatar to become more efficient and sustainable. ADB could share good practices from other similar developing member countries in district heating (e.g., the Central Asian republics). Cost recovery is possible in any urban services, including district heating.

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MONGOLIA CITIES/TOWNS COVERED BY ADB URBAN DEVELOPMENT PROJECTS



- Project City/Town (Loan 1560)
 - Project City/Town (Loan 1907)
 - Project City/Town (Loan 2301)
 - National Capital
 - Provincial Capital
 - City/Town
 - Road
 - Railway
 - River
 - Provincial Boundary
 - International Boundary
- Boundaries are not necessarily authoritative.

I. INTRODUCTION

A. Background

1. The urban development sector¹ in Mongolia has been greatly influenced by the rapid rate of urbanization in the country over the past 10 years. Heightened demand by residential and commercial consumers of urban services has outstripped supply, particularly in Ulaanbaatar and in provincial towns, and has become a constraint to the growth of economic activity in these areas. There is an urgent need to expand the physical infrastructure in the urban development sector, as well as to improve the management and sustainability of the urban infrastructure network to meet this demand.

2. The urban development sector is one of the Asian Development Bank's (ADB) priority sectors in Mongolia and was first included as a distinct sector in the 1992 Mongolia country strategy. ADB's assistance has focused mainly on four areas: (i) urban services in provincial towns, (ii) housing finance, (iii) district heating in Ulaanbaatar, and (iv) the poor living in the ger areas² of Mongolian aimag centers (provincial towns). Although initially a priority sector during 1992–1999, ADB has by and large exited from the energy sector in Mongolia. Nevertheless, assistance for district heating in Ulaanbaatar is still ongoing, and assistance for community-based heating supply in rural areas has recently been introduced, both of which are considered as part of the urban development sector.

3. ADB has been among the most active aid agencies in the urban development sector in Mongolia, with a combination of lending and nonlending interventions. Urban sector lending commenced in 1997, and, since then, ADB has approved five loans in the amount of \$110.1 million. In addition, ADB has provided three grants from the Japan Fund for Poverty Reduction (JFPR) fund for assisting ger (informal) and rural remote areas in the total amount of \$5.7 million. Finally, ADB has provided 10 technical assistance (TA) grants in a total amount of \$5.6 million, of which 5 were for the preparation of loan projects and 5 in support of capacity building, including institutional strengthening and policy support.

B. Evaluation Purpose and Process

4. The objective of this rapid sector assessment (RSA) (the evaluation) is to provide an independent assessment of ADB's assistance to the Mongolian urban development sector and to identify areas for further improving the effectiveness of its interventions. The findings of this evaluation will feed into the broader country assistance program evaluation (CAPE) being carried out by the Operations Evaluation Department (OED).

5. The evaluation draws upon a review of documents and other relevant studies, and on discussions between ADB staff and officials of government agencies concerned with the urban on development sector. An Operations Evaluation Mission (OEM) visited Mongolia from 28 November to 15 December 2007, and the evaluation incorporates the results of the OEM's interviews in Ulaanbaatar and field inspections in Sainshand Town in Dornogovi Province, which

¹ For the purpose of this report, the urban development sector covers water supply, sanitation, solid waste, district heating, urban environment, and housing finance in Ulaanbaatar and provincial towns consisting of at least 10,000 inhabitants or more. Issues related to urban transport are not covered in the report, since they have been covered in the Sector Assistance Performance Evaluation for Transport and Trade Facilitation in Mongolia.

² The word "ger" refers to the felt tents used traditionally by Mongolian herdsman. In the context of this report, the term "ger areas" refers to the periurban areas surrounding Ulaanbaatar and many aimag centers occupied by informal settlers.

was one of the provincial centers covered under an ADB urban sector loan.

6. Section II of the RSA describes the conditions of the urban development sector in terms of available capacity, demand for urban services, existing constraints and challenges, and the way the Government has responded to the challenges. Section III summarizes the country program and strategy as it relates to the urban development sector. Section IV assesses ADB's performance in the urban sector in terms of strategic focus (top-down assessment) and project quality (bottom-up assessment). Section V summarizes the RSA's urban sector performance ratings. The last section identifies issues, future challenges, and recommendations for ADB's partnership with Mongolia in the urban development sector.

II. DEVELOPMENT CONTEXT AND GOVERNMENT PRIORITIES

A. General Urban Setting

7. At end 2006, about 1.58 million persons (roughly 61% of the total population of 2.6 million) were living in urban areas in Mongolia.³ The population in Ulaanbaatar accounts for the majority of this urban population and is estimated at 994,000 (38% of the total population and 63% of the urban population).⁴ The urban population in the rest of Mongolia resides in medium- to small-sized aimag centers (provincial towns). Distances between the 21 aimag centers are vast, and their individual small populations, usually less than 20,000, limit their ability to attract and sustain business.

8. According to the 2000 Census, nearly 72% of urban households lived in conventional housing (i.e., apartment units, private houses, and all-weather houses in the ger areas); 38% lived in apartment buildings, virtually all of which had been privatized. Between 2000 and 2005, an additional 10,900 apartment buildings were constructed, such that by 2006, the housing stock consisted of 7.7 million square meters of living space.

9. Table 1 shows the population shifts in Mongolia during 2003–2006. In general, there was a strong migration from rural areas into urban areas, and particularly into Ulaanbaatar, over this period. The average annual growth rate of Ulaanbaatar's population during 2003–2006 was around 3.6%, which was triple the total Mongolian population (1.2%) and nearly four and a half times that of the aimag centers (0.8%). Meanwhile, over the same period, rural areas registered a 0.8% drop in population. Although official statistics are lacking, it is believed that most of the urban population growth is in the ger areas.

³ These figures are based on "resident population," which is defined by the National Statistics Office of Mongolia as the number of people living in current place of residence for more than 6 months (183 days).

⁴ Formal estimates do not capture all the residents of Ulaanbaatar. Informal estimates of the population size range from 1 to 1.4 million.

Table 1: Mongolia Population Growth 2003–2006
(‘000 persons)

Year	Urban			Rural	Total	Percentage Increase Year-Over-Year
	UB	Aimag Centers	Total			
2003	893.4	570.8	1,646.2	1,039.8	2,504.0	
2004	928.5	569.7	1,498.2	1,034.9	2,533.1	1.16%
2005	965.3	578.0	1,543.3	1,019.1	2,562.4	1.16%
2006	994.3	585.2	1,579.5	1,015.3	2,594.8	1.26%
2003-2006 Average Growth Rates of Total Mongolia Population					1.19%	
2003-2006 Average Growth Rates of Total Urban Population					2.56%	
2003-2006 Average Growth Rates of Ulaanbaatar Population					3.63%	
2003-2006 Average Growth Rates of Aimag Center Population					0.83%	
2003-2006 Average Growth Rates of Total Rural Population					-0.79%	

UB = Ulaanbaatar.

Source: National Statistics Office of Mongolia. 2007. *Mongolian Statistical Yearbook 2006*. Ulaanbaatar.

B. Urban Sector Context and Challenges

10. During the former Soviet Union (FSU) era, Mongolia’s economy and urban services were centrally planned and managed. With the introduction of democracy and market reforms in the mid-1990s, many of the regulatory institutions and urban service providers started experimenting with private sector management, service delivery, and revenue models in both Ulaanbaatar and the aimag centers. By the early 2000s, Mongolia had established proper legal and institutional frameworks for the urban sector.⁵

11. Over the last decade, ADB and other aid agencies have supported the Government in rebuilding assets in various urban subsectors, but generally have not given sufficient attention to setting up the institutions and systems required to ensure that these assets are properly maintained and efficiently used. Given the acute needs in urban areas in the 1990s, this emphasis on infrastructure was probably justified. Now, however, it is clear that Mongolia lags behind some other former socialist countries in institutional reform and strengthening, and risks wasting resources on infrastructure that is not well maintained and managed. This is a major challenge that needs to be addressed.

12. Another challenge facing the urban sector is the cross-sectoral nature of the sector and the proliferation of responsible agencies. It is not uncommon for urban projects to cover housing, water supply, sanitation, district heating, and solid waste management. Other sectors, such as transport, education, health, and environment, are also often associated with urban sector projects. All of these subsectors have sector-specific agencies with their own mandates. Table 2 provides an example of a complicated institutional structure. It summarizes the current allocations for policy making and regulation in the water sector.

⁵ Examples of major enactments of legislation include the Environmental Protection Law (1995), Water Law (1995), Environmental Impact Assessment Law (1998, 2001), Sanitation Law (1998), Housing Law (1999), Housing Privatization Law (1999), National Housing Strategy (1999), Condominium Law (1999), Energy Law (2001), Water Supply and Sewerage Treatment Law (2002), Regionalized Development Management and Coordination Law (2003), Water and Mineral Water Use Fees Law (2004), and Revised Water Law (2004). Other important legal provisions included the Government Resolution establishing public urban service organizations (PUSO) (1997) and the Regulation for PUSOs (2001), which obliged the governors of aimags and Ulaanbaatar to “privatize” PUSOs in accordance with the “Program of PUSO Privatization.”

Table 2: Policy Making and Regulation in the Water Sector

Area	Policy	Regulation		
		Licensing	Tariffs	Environmental Standards and Impact
Use of Water Resources	MNE, Water Agency, MCUD	Governors, Water Agency	Governor	MNE, Water Agency
Water Suppliers	MCUD, MH	MCUD, CPUSC	Governor	State Professional Inspection Agency, MH, MCUD, CPUSC
Water Distribution	MCUD, MUB	MCUD, CPUSC	Governor	MH, MCUD, CPUSC
Wastewater Collection	MCUD	MCUD, CPUSC	Governor	MH, MCUD, CPUSC
Wastewater Treatment and Effluent Quality	MCUD, Ministry of Trade and Industry, MH	MCUD, CPUSC	n.a.	State Professional Inspection Agency, MH, MCUD, CPUSC
Ger Area Sanitation	MCUD, MNE	None	n.a.	None

CPUSC = Construction and Public Utilities Support Center, MCUD = Ministry of Construction and Urban Development, MH = Ministry of Health, MNE = Ministry of Nature and Environment, MUB = Municipality of Ulaanbaatar.

Source: World Bank/Public-Private Infrastructure Advisory Facility. 2007. *Foundation for Sustainable Development: Rethinking the Delivery of Infrastructure Services in Mongolia*. Washington DC, USA.

13. The disparity between Mongolia's formal and ger areas remains one of the most difficult challenges for the Government. Virtually none of the ger areas are connected to a central heating network. Very few have access to piped water. Over 70% of the gers use pit latrines. Both apartment and ger areas suffer from limited urban land use planning. Zoning, construction standards, and construction regulations have still vestiges of FSU legacy.

14. There has been a considerable amount of progress in the regulatory environment in Mongolia over the past decade. Of particular note is the country's active and independent energy regulatory agency, which was established in the wake of the 2001 Energy Law. In contrast with the energy sector, there is excessive regulation in the provision of urban infrastructure services, with some regulatory functions duplicated by aimags, Ulaanbaatar soums (administrative subdivisions of an aimag), and districts. Hence, there is a need to consolidate these regulatory functions under bodies with legal autonomy from related ministries, and to enforce a pricing regime that links prices to costs. Other governance-related challenges in the urban sector include (i) lack of clarity on the delineation of managerial and financial management functions in the urban sector; (ii) the need to improve transparency of public decision making, particularly with regard to the flow of government funds, the rationale for investment decisions, choice of supplier, and implementation of investment projects; and (iii) the need to improve perceptions of corruption.⁶

15. **Water Supply.** Mongolia's water consumption is approximately 5,000 million cubic meters. Over 50% is consumed by the industry and agriculture sectors. Eighty percent of drinking water comes from aquifers, and 70% of residents either acquire their own water or get it from public kiosks. Government surveys record that in 2006 just over half of Mongolian households indicated that they had access to clean water. Ulaanbaatar and most aimag centers

⁶ Transparency International's Corruption Perception Index fell from 4.3 to 3.0 in 2004 (suggesting a worsening corruption problem).

have centralized systems that involve pumping groundwater through a piped network. However, these water supply networks were constructed in the 1980s and have not been well maintained. In the last 10 years, the Government has actively pursued policies to promote full cost recovery, promote private sector involvement, reduce ger area water tariffs, and promote efficiency.

16. The main challenge being faced by water utilities is that of setting tariffs at levels sufficient to ensure cost recovery. In the aimags, water-related urban services are provided by public urban services organizations (PUSOs). These PUSOs were established as semi-privatized, government-owned service delivery companies. However, they remain heavily influenced by the aimag governors. Consequently, raising tariffs to meet expenses has tended to become a political issue rather than simple cost recovery. Most aimag center tariffs are less than 50% of the level needed to achieve the relevant revenue targets, and most PUSOs cross-subsidize the shortage by overcharging for district heating.⁷ Ger areas are currently paying between twice and 10 times what nonger areas are paying because of the high cost of delivery water by truck. Under their respective assistance programs, ADB and the World Bank have provided water kiosks to reduce the ger area tariff burden. However, ger area water tariffs have not yet been substantially reduced. Aside from the tariff issue, other important challenges faced by the PUSOs are identifying new water supplies and trying to reduce nonrevenue water losses.

17. **Wastewater Treatment.** According to government statistics, less than 25% of Mongolians are serviced by sewers. Many of the sewage treatment plants and collection systems built before 1995 are generally not functioning due to lack of proper operation and maintenance (O&M). As a result, wastewater is often simply discharged into a river or directly onto the ground. Collection networks are equally in poor condition. Consequently, raw sewage leaks from buried pipes into the soil and is potentially contaminating local groundwater. In ger areas, sewage treatment is generally non-existent, and most residents use unimproved open pit latrines or open field defecation, both of which pose public health hazards.

18. As with water supply, the main challenge in wastewater treatment is that the PUSOs are generally not allowed to set tariffs at a level sufficient to ensure full cost recovery.⁸ Complicating the situation is the fact that full cost recovery in the wastewater sector is difficult to assess, since services, connections, and treatment systems vary among the aimag centers. For Ulaanbaatar, the Japanese International Cooperation Agency (JICA) is completing a city master plan that includes a focus on sewer connections and upgrading the sewage treatment plants. Several PUSOs are now investing in sewage treatment, and PUSO tariffs, if implemented, will cover most of the sewage treatment costs. In the aimag centers, much of the current investment is for construction of primary sewage treatment plants or sewage lagoons. These are low-cost solutions that should reduce the threat of fecal contamination of nearby water sources. Aside from the tariff issue, other important challenges include improving planning and construction of wastewater plants and collecting more data on the costs and benefits of constructing sewage collection networks to allow easier assessment of the costs and benefits of wastewater treatment.

19. **Solid Waste Management.** Ulaanbaatar is generally well served in terms of solid waste disposal. It has a landfill, a garbage collection service, and a tariff regime in place. By contrast, most aimag centers lack a garbage collection system and a secure landfill for disposal of solid

⁷ The average PUSO water tariff is MNT0.7 per liter for apartments and MNT1.5 per liter from the kiosks located in the ger areas.

⁸ Currently, organizations and enterprises connected to sewer lines are paying between MNT152 and MNT3,100 per month for a sewer connection. Apartments connected to sewer lines are paying between MNT50 and MNT447 for the sewer connection. Ger areas are serviced by pit latrines and are not assessed a wastewater tariff.

waste. Garbage in many aimags is strewn over open land on the periphery of aimag centers. Although several aimag centers are gradually developing secure landfill locations and putting in place garbage collection systems, garbage collection and disposal is still a new concept, and the main challenge will be to convince residents to make use of the new system. Another issue relates to the need to separate garbage collection fees from wastewater tariffs, under which they are currently subsumed.

20. **District Heating.** There are three main sources of space heating in Mongolia: (i) combined heat and power plants, which provide electricity, heat, and hot water to the urban centers in Ulaanbaatar and a few other cities; (ii) heat-only boilers, which meet the heating and hot water needs of a small central network of several buildings; and (iii) individual heat stoves, which burn coal and/or wood to meet residential heating needs in periurban areas. There is marked difference in heating sources between urban and rural areas, and in Ulaanbaatar between the city center and the periurban ger areas, with ger areas using predominantly coal-fired heating stoves, while the formal areas are connected to the district heating system. The aimag centers have much smaller district heating networks and depend primarily on heat-only boilers, while the soums depend on a variety of individual systems using mostly dung, wood, coal, and diesel oil.

21. The combined total capacity of the central heating systems is about 2011 megawatts-thermal, of which Ulaanbaatar accounts for 67%. The Ulaanbaatar heat network was recently expanded and is now able to provide space heat and hot water service to about 453,000 residents together with numerous commercial and public consumers. Outside of Ulaanbaatar, 19 of the 21 aimags are connected to the central power network, with about five aimags having their own central heating plants. Many of the ger areas have access to the power grid but for cost reasons use coal-, dung-, or wood-fired stoves for cooking and heating. Inefficient ger stoves produce a wide range of toxic air pollutants well beyond national and World Health Organization (WHO) standards.

22. In contrast to the situation in the other urban subsector services, Mongolia enjoys one of the most active and independent energy regulatory entities in Asia. The main challenge currently facing the heating sector is that Ulaanbaatar's heat network has for long been undermaintained and presently labors under serious operational vulnerabilities. Without proper maintenance, it is estimated that space heat and hot water service to hundreds of thousands of residential commercial customers in Ulaanbaatar would be at risk. A disaster scenario briefing memorandum⁹ commissioned by the United States Agency for International Development indicates that, in the event of an extended winter outage, serious harm to the public health and welfare would result. Hence, there appears to be a strong need to reform the current structure of the district heating sector and to improve allocations for maintenance.

23. **Urban Environment.** This discussion on "urban environment" focuses on air and soil quality in order to complement the above discussions on water supply, wastewater, and solid waste. In terms of urban air quality, Ulaanbaatar is currently one of the most polluted cities in Asia. In particular, during the long winter season, when residents resort to coal burning, the air quality of Ulaanbaatar falls to well below recommended national and WHO standards for indoor and ambient concentrations. In terms of urban soil quality, the situation is much better. This is mainly due to the fact that industrial activity in most aimag centers is between 50% and 90% less than the FSU era industrial activity some 20 years ago. Current industrial discharges are

⁹ United States Agency for International Development. 2007. *Ulaanbaatar Heat Network Disaster Scenario Briefing Memorandum*. Ulaanbaatar.

thus minimal. However, there are likely to be legacy chemicals contaminating local soils from these former activities.

C. Government's Urban Sector Policies, Strategies, and Plans

1. Policies

24. Much of the Government's effort over the last decade has been spent on adapting to a new form of government. Unfortunately, urban planning was accorded low priority. In 1996, government policy directives¹⁰ contained nine priorities including the development of management capacities and the reform of the public administration and civil service, covering the devolution of powers to local levels. In addition to public sector reform, Mongolia has been moving to encourage more private sector involvement. In 2006, the private sector accounted for 70% of the business activity in Mongolia.

25. In 2007, the Government commenced work on a National Development Strategy (NDS).¹¹ Although still in draft stage, the NDS is expected to define the Government's main policies and priorities up to 2021. The Government's basic policy underpinning the NDS is to improve the welfare of its people and to reduce poverty by accelerating sustained and equitable economic growth. In terms of urbanization policy, the Government plans to prioritize urban migration to the aimag centers in order to ease the migration pressure on Ulaanbaatar. Another priority of the Government is its "40,000 Houses" program, which envisages construction of 15,000 suburban houses, 15,000 ger area homes, and 10,000 apartment units. This is in line with the Government's regional development concept to narrow the urban and rural development gap by providing infrastructure to aimag centers and promoting economic development.

2. Strategies and Plans

26. Currently, there are several ongoing initiatives by the Government and other agencies to strengthen urban strategies and implementation plans. The Ministry of Construction and Urban Development's (MCUD) 2004-2008 Strategic Plan¹² includes the following objectives (i) improving access to water supply and sanitation and increasing service delivery efficiencies, (ii) providing equitable distribution of urban services between the formal and nonformal areas, (iii) implementing full cost recovery via tariffs and private sector delivery models, and (iv) improving infrastructure O&M. However, these policies need further development and clarification; and, most importantly, they need to be implemented. The latter is especially evident in the difficulties encountered in implementing sustainable tariffs for most urban services, with the exception of district heating.

27. Past legislation attempted to establish water as an environmental resource, with the eventual goal of full cost recovery for service delivery. In 2004, amendments to the Mongolia Water Law¹³ established a new Water Agency and called for the semiprivatization of the PUSOs. The PUSOs are now utility companies and are trying to deliver utilities services on a commercial

¹⁰ Government of Mongolia. 2006. *The Mongolian State Policy on Reforming Government Processes and the General System of Structure*. Ulaanbaatar.

¹¹ Government of Mongolia. 2007. *Draft National Development Strategy*. Ulaanbaatar.

¹² MCUD. 2004. *Strategic Development Plan*. Ulaanbaatar. Relevant sections of the plan related to urban development are in Appendix 5.

¹³ Government of Mongolia. 2004. *National Water Law*. Ulaanbaatar. Relevant sections of the law are in Appendix 5.

basis. They are still struggling with the balance of tariffs, service delivery, and financial forecasting and thus require additional institutional strengthening.

28. Mongolia is making modest progress in meeting its national Millennium Development Goals (MDGs) and national targets/indicators.¹⁴ Preliminary indications show that Mongolia will be able to partly achieve its target/indicator of halving poverty, but will not be able to achieve its three other targets of combating air pollution in urban areas, improving access to water supply, and improving access to sanitation by slum dwellers. At the end of 2000, only 40% of Mongolia's urban population had access to piped water; thus, meeting the target/indicator of 70% by 2015 appears difficult.¹⁵ Similarly, the target/indicator for doubling the number of slum dwellers with access to sanitation by 2015 does not appear to be achievable.

III. ADB'S URBAN SECTOR STRATEGY AND PROGRAM

A. Previous Evaluation Findings Related to the Urban Sector

29. The 2002 Mongolia CAPE¹⁶ evaluated ADB's strategy and program in the country during 1991–2001. Although the urban sector was included in the 1992 country strategy, the urban sector program was relatively new then. Hence, there was little mention of the urban sector in the CAPE. Much of the CAPE's findings were confined to the financial sector and governance, which dominated lending and TA operations. Privatization was also a key theme, but there was little mention of privatization of the water and wastewater sector, which began in the early 2000s. The CAPE's environment section referenced the single urban loan as having a positive environmental impact by treating aimag center wastewater and collecting solid waste. The OED's urban special evaluation study¹⁷ has a number of suggestions that are relevant to urban sector operations in Mongolia. These include (i) the need for closer alignment of the TA program with the lending program, with TA focusing mainly on policy dialogue, demand surveys for project identification, project preparation, capacity development, and reform; (ii) careful consideration to be given to whether to focus on single city (Ulaanbaatar) or multicity projects; and (iii) the need to regularly update country strategies based on policy dialogue and demand surveys.

B. Urban Sector Strategy

30. The urban development sector was first included as a distinct sector in ADB's 1992 Mongolia country strategy. However, the strategic link between the urban sector and the overall country strategy was weak. The 2005 country strategy and program (CSP) reinforced the strategic link by reorienting the strategy in the urban sector towards the provision of services vital to the achievement of the MDG targets. The CSP's four expected urban sector outcomes were (i) improved living conditions for the urban poor, (ii) improved access of the poor to basic services, (iii) improved urban environmental conditions, and (iv) improved planning. The three expected urban sector outputs were (i) upgraded low-income housing, (ii) provision of services

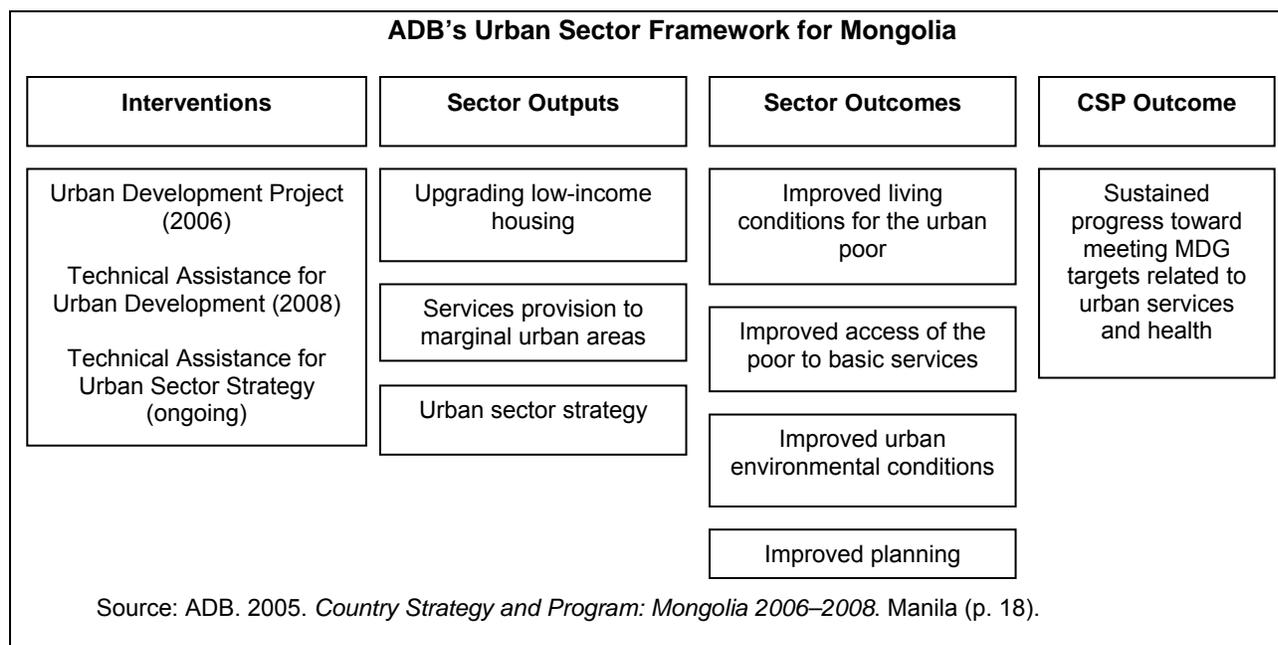
¹⁴ Government of Mongolia. 2004. *Mongolian National MDG Report* (<http://www.undg.org/index.cfm?P=87&f=M>). There are some differences between the international MDG targets and the national MDG targets. Whereas the international MDGS specify only 7 goals and 11 targets, the Mongolian national MDGs specify 9 goals and 22 targets.

¹⁵ World Bank/PPIAF. 2007. *Foundation for a Sustainable Development: Rethinking the Delivery of Infrastructure Services in Mongolia*. Annex 4: Water Supply and Sanitation contains cost estimates of meeting MDGs based on different development scenarios.

¹⁶ ADB. 2002. *Mongolia Country Assistance Performance Evaluation*. Manila.

¹⁷ ADB. 2006. *Special Evaluation Study of Urban Sector Strategy and Operations*. Manila.

to marginal urban areas, and (iii) urban sector strategy. The Figure shows the relationship between the CSP outcome, sector outcomes, sector outputs, and interventions.



31. The 2005 CSP was the first Mongolia country strategy to include detailed sector roadmaps, including an urban development sector roadmap (Appendix 1), which set out the sector outcomes/outputs and their corresponding indicators. It also indicated a number of important sector issues and constraints and suggested actions, milestones, and investments for addressing the identified issues. Unfortunately, there were some inconsistencies between the sector outputs shown in the CSP urban sector framework (Figure) and those included in the CSP's urban sector roadmap. Of the five sector outputs listed in the roadmap, only one (urban sector strategy) corresponds exactly to the three sector outputs in the framework. The use of unclear terms such as "marginal urban areas" renders interpretation particularly difficult. Similarly, the sector roadmap detailed a number of access-related outcomes that were not listed as separate sector outcomes in the framework. Another drawback of the urban sector roadmap is that, unlike most of the other sector roadmaps included in the CSP, the urban roadmap's outcome/output indicators were qualitative rather than quantitative, and neglected to establish a baseline or provide monitorable performance targets that would enable the tracking of their achievement. However, the CSP main text mentioned one specific outcome indicator for increasing the coverage of water, sanitation, heating, and hot water supply by 40%. However, it did not specify a baseline level or target date of the achievement of the indicator. Consequently, it is very difficult to monitor the achievement of the CSP sector outcomes and outputs.

C. Urban Sector Program

32. ADB is one of the most active aid agencies in the urban development sector in Mongolia. Urban sector lending commenced in 1997.¹⁸ To date, ADB has approved five loans amounting to \$110.1 million: Ulaanbaatar Heat Efficiency¹⁹ (1997), Provincial Towns Basic Urban Services²⁰

¹⁸ Prior to 1997, ADB provided two loans for rehabilitation of the district heating system in the amount of \$50 million.

¹⁹ ADB. 1997. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Ulaanbaatar Heat Efficiency Project*. Manila.

(1997), Housing Finance²¹ (2001), Integrated Development of Basic Urban Services in Provincial Towns²² (2002), and Urban Development Sector²³ (2006). In addition, ADB provided three grants from the JFPR for assisting ger (informal) and rural remote areas in the amount of \$5.7 million, with a focus on community participation, affordable heating in remote rural areas, and upgrading of urban ger areas. Finally, ADB has provided 10 TA grants in a total amount of \$5.6 million, of which 5 were for the preparation of loan projects and 5 were in support of capacity building, including institutional strengthening and policy support. Policy support TA has been concentrated on housing policy, urban development and housing strategy, and capacity building for provincial town services. Appendix 2 summarizes the urban sector lending and nonlending program since 1992.

D. ADB's Positioning and Coordination with Other Aid Agencies

33. Although ADB has been coordinating closely with other development partners, it is only since 2000 with the opening of the resident mission that it has been able to play a more active role in aid coordination activities. But even with the establishment of the resident mission, ADB has had only limited on-the-ground, local urban expertise. This situation was remedied in 2007 when ADB appointed an urban development specialist to the resident mission. ADB is now in a good position to take the lead in the urban sector. Appendix 3 presents an aid coordination matrix summary.

IV. ADB'S RESULTS ACHIEVED AND PERFORMANCE

A. Assessment of ADB's Urban Strategy (Top-Down)

1. Strategic Positioning

34. **Relevance.** Mongolia underwent an economic and political transformation in the early 1990s. When it joined ADB in 1991, the country was going through a transition toward a market economy and democracy. With the collapse of the FSU's urban financial support, Ulaanbaatar and many aimag centers experienced a rapid decline in economic activity and concomitant deterioration of urban infrastructure. The aimag centers, in particular, were in great need of external assistance due to their limited institutional capability and the Government's financial constraints. Early on, ADB decided to focus its urban strategy on the urban poor outside Ulaanbaatar through financing of urban infrastructure in aimag centers. The strategy also covered district heating and housing finance in Ulaanbaatar. ADB's strategic focus on upgrading urban service delivery in aimag centers is found very relevant, since it addressed a priority development need and was fully consistent with the Government's development strategies. The strategic focus on housing finance and district heating in Ulaanbaatar is also found to be relevant to the development needs of the country. Overall, ADB's urban strategy is rated relevant.

²⁰ ADB. 1997. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for Provincial Towns Basic Urban Services*. Manila.

²¹ ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Housing Finance (Sector) Project*. Manila. ADB. 2008. *Project Completion Report on the Mongolia: Housing Finance (Sector) Project*. Manila. Draft report dated March 2008. Government of Mongolia/ADB/Project Management Unit. 2007. *Housing Finance (Sector) Project: Implementation Outcomes*. Manila.

²² ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Integrated Development of Basic Urban Services in Provincial Towns Project*. Manila.

²³ ADB. 2006. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Urban Development Sector*. Manila.

35. **Selectivity.** ADB's strategy sharply focused on a number of areas where other agencies were not active. These were improvements of urban infrastructure in aimag centers and housing finance. Thus, the selectivity of ADB's strategy and program is rated highly satisfactory.

36. **Sequencing and Continuity.** The urban sector has been a priority in the overall strategy since 1992. Urban sector nonlending activities commenced in 1993, while lending activities in the sector commenced in 1997. Since then, the strategy and program have continually evolved, building on previous interventions. There is evidence that urban development sector interventions contributed to needed institutional strengthening and capacity building. However, the continuity of government human resources affected project performance and is a risk to long-term sustainability. The Government has recognized the need to retain institutional knowledge and has made efforts to offer incentives such as overseas training and better remuneration to retain and attract staff. ADB's sector work in PUSO privatization is still ongoing, but has already resulted in sustainable, semiprivate companies. The current urban strategy and program ensure continuity for at least the medium term. The sequencing and continuity of the sector strategy are rated satisfactory.

2. Responsiveness and ADB's Performance

37. **Responsiveness.** In general, ADB has responded adequately, flexibly, and in a timely manner to changing needs and government requests for ADB assistance. In particular, given the deteriorating conditions of aimag center infrastructure, ADB's strategy and program responded well by providing needed water, sanitation, solid waste management, and district heating utility upgrades. Moreover, ADB's assistance has addressed the increasingly serious issues facing the growing ger areas by providing needed utility services there. Likewise, ADB's housing finance and district heating programs were timely interventions and provided needed policy, technical, and financial assistance.

38. **Suitability of ADB Policies, Systems, and Lending Instruments.** ADB policies, systems, and assistance modalities were suitable for Mongolia. ADB's policies regarding project management, financial management, procurement, program monitoring, and program implementation were highly suitable and relevant to Mongolia's stage of development. ADB's lending and nonlending assistance modalities were also found appropriate, with the assistance through the JFPR grants being found particularly effective in addressing urban issues in ger areas.

39. **Capacity and Core Competencies.** ADB's capacity development efforts were substantial. It provided assistance to develop capacity at the PUSO level, at the aimag center government level, and at the national Government level. Resources mobilized by ADB included its staff and international experts, who provided both guidance to the Government and on-the-job training to government staff. Specific capacity development efforts included capacity building initiatives at the newly established PUSOs; development of capacity for implementing the Housing Area Action Plan and developing a commercially driven housing mortgage market; and expanding MCUD's ability to implement procurement cost control guidelines, and construction standards.

3. Contribution to Development Results

40. **Sector Work and Policy Dialogue.** Contribution to development results was assessed based on the extent to which ADB's overall sector program contributed to the achievement of national development goals and the MDGs. ADB's urban strategy focused on upgrading water

supply, sanitation, housing finance, and district heating delivery. Based on the MDG goals, this was an appropriate strategy. It also engaged the Government in dialogues on various urban policy issues. ADB's contributions to the urban sector have been significant, including institutional strengthening, private sector development, increased awareness of international best practices, and promoting government decentralization efforts. The Government has struggled with the growing migration to Ulaanbaatar and aimag centers ger areas. In response, ADB has engaged the Government in dialogue on how to better plan and provide infrastructure for this rapidly growing urban, migrant population. Through this policy dialogue, ADB has earned a reputation as a reliable development partner. Overall, ADB's contributions to policy dialogue on the urban sector have been substantial.

41. **Sector Outputs and Outcomes and Their Likely Sustainability.** Evaluating the achievement of the urban sector outcomes/outputs is difficult, because the 2005 CSP did not consistently present the expected urban sector outcomes/outputs in its urban sector framework and sector roadmap (para. 31). Moreover, the CSP's urban sector roadmap neglected to establish a baseline or provide monitorable performance targets that would enable the tracking of their achievements (Appendix 1). Given these drawbacks, the most that can be said is that there appears to have been some progress in meeting the expected sector outcomes and outputs. However, it is not possible to determine the extent of progress that has already been made. Given the overall good fiscal, political, and social conditions, it is likely that whatever outcomes/outputs have been achieved can be sustained.

42. **Impact.** ADB's assistance has improved the access to urban services of a large number of urban residents through its focus on improving water supply, sanitation, waste management, and district heating. These have helped ADB contribute to Mongolia's attainment of at least three of the MDGs. ADB's urban operations have directly assisted the Government in its attempt to attain MDG Targets 14 and 15 for increasing by 50% the access to clean water and sanitation by 2015. In addition, ADB's urban operations indirectly contributed to helping the Government meet MDG Target 1 for reducing poverty by 50% by 2015. This was done mainly through ADB's assistance to ger area improvement. Overall, ADB's urban operations have had a significant impact though its contribution to long-term changes in development conditions in Mongolia.

43. **Synergies and Focus.** In providing integrated urban infrastructure assistance covering water supply, sanitation, waste management, and district hearing to 12 aimag centers, ADB effectively optimized potential synergies among the separate urban subsectors. However, there is little evidence to indicate that an attempt was made to optimize activities between public and private sector operations. Following the approval of a third urban loan in 2006, it can be construed that ADB urban interventions have achieved a level of critical mass. ADB's synergies and focus are rated as satisfactory.

44. **Value Addition.** Although ADB's urban sector operations represented only a small share of total government development expenditure, they did represent a sizable share of external development assistance in the urban sector. In terms of addressing development challenges, ADB's urban assistance through JFPR grants spearheaded the introduction of issues related to ger area residents into both the urban and housing interventions. In terms of policy and institutional reforms, the ADB urban sector program has helped (i) better define water and wastewater tariff needs, and (ii) develop the platform for the mortgage market in the housing sector. ADB's value addition is rated as satisfactory.

45. **Cross-Fertilization and Dissemination.** There is little evidence that ADB's experience with successful urban projects in Mongolia has been disseminated and replicated. The OEM

found anecdotal evidence that the urban sector program in Mongolia may have benefited from cross-fertilization from People's Republic of China (PRC) urban sector programs, but this could not be confirmed. Cross-fertilization and dissemination are rated satisfactory.

B. Assessment of ADB's Urban Assistance Program (Bottom-Up)

46. The assessment covered five loans, three JFPR grants,²⁴ and 10 TA operations. The loan projects included four completed and one ongoing project. Ongoing project evaluation is based on the report and recommendation of the President (RRP), back-to-office reports, and available project administration indicators. Thus, the evaluation is tentative. Performance assessment summaries are in Section V.

1. Program Relevance

47. Relevance refers to whether ADB's urban sector operations (i) focused on critical impediments to sector development; (ii) were based on ADB country and sector strategies; (iii) were aligned with government sector priorities, including sector policy and institutional reforms, and took into account sector conditions in the country; (iv) were aligned with international best practices and standards; and (v) were effectively coordinated with other key development partners. A rating of highly relevant (3 points) refers to sector operations that were in line with most of the above criteria; relevant (2 points) refers to operations that met most of the above criteria; and partly relevant (1 point) refers to operations that met only a minority of the criteria.

48. As discussed in para. 34, ADB's urban strategy was found to be highly successful in addressing relevant and priority development needs in Mongolia and was consistent with the Government's development strategies. ADB's urban sector operations were also generally found to be firmly based on the evolving country and urban sector strategies during the evaluation period. The one exception was the assistance for district heating in Ulaanbaatar. Although originally based on an early country strategy in which energy was a priority focus, subsequent country strategies excluded energy as a strategic focus. The urban sector operations were generally aligned with government urban sector priorities and often included sector policy and institutional reforms. Evidence suggests that good practices from sector operations in the PRC were replicated in the Mongolian urban sector program. Coordination with development partners was also effective. Overall, the urban sector operations are rated relevant.

2. Effectiveness

49. Effectiveness refers to whether ADB's urban sector assistance achieved meaningful sector outcomes and outputs. A rating of highly effective (6 points) refers to sector assistance that achieved all, or nearly all, of its intended outputs and outcomes; effective (4 points) refers to assistance that met at least 75% of its intended outputs and outcomes; less effective (2 points) refers to assistance that met at least 50% of its intended outputs and outcomes; and ineffective (0 points) refers to sector assistance that met less than half of the outputs/outcomes.

50. All projects were designed to meet one or more of the CSP sector outcomes for improving urban living conditions—improved access of the poor to basic urban services,

²⁴ Unlike loans and TA operations, JFPR grants are not normally programmed in advance and thus are not technically part of the country program. In the case of Mongolia, all three of the urban sector JFPR grants approved for Mongolia were not included in the CSPs or CSP updates. OED has decided to include the JFPR operations in this evaluation due to their important synergies and complementarities with the other urban sector interventions in the country.

improved urban environmental conditions, and improved urban planning. In particular, the three loans in the urban sector, starting in 1997 with Provincial Towns Basic Urban Services, followed in 2002 by Integrated Development of Basic Urban Services in Provincial Towns, and followed in 2006 by the Urban Development Sector Loan, were all well designed to meet the intended sector outcomes. The first two interventions achieved sector outcomes for improved access of the poor to basic services and improved urban environmental conditions through better access to safe water, sanitation, heating, and solid waste collection in 12 aimag centers. The project completion report for the first urban loan²⁵ rated the project as “satisfactory” to “highly satisfactory” for meeting the development objectives and “satisfactory” for implementation progress. The District Heating Project also achieved its sector outcome of improving the reliability and adequacy of heat supply in Ulaanbaatar, albeit with considerable delay in the original schedule. The Box gives details of project outcomes and outputs in Sainshand Soum, Dornogovi Aimag.

Sainshand Soum, Dornogovi Aimag

The OEM visited Sainshand Soum in Dornogovi Aimag to assess the implementation of the second urban loan, the ongoing Loan 1907-MON: Integrated Development of Basic Urban Services.

The report and recommendation of the President^a linked the project outcome to the sector outcome for providing better access to clean water and sanitation services. Loan proceeds went to eight aimag centers and affected 148,000 residents (representing over 25% of total aimag center population and 9% of total Mongolian urban population). The project design included emphasis on using 41,000 person-months of local, unskilled workers to develop local capacity, contribute to project sustainability, and help sector institutions operate in a market-based economy. The OEM found that the ADB-financed Sainshand water supply, wastewater treatment, solid waste collection, and bath houses components were all under construction using local resources. Sainshand’s social and economic indicators from 2000 to 2006 indicated that Sainshand had an increasing population but a decreasing poor population, so that sector and project outcomes were met in part. Effective program implementation was enhanced by flexibility in lending. Although not in the original project design, ADB and the project management office agreed to install an additional 11,000 water meters. This provided the PUSOs with valuable information on water leaks and water usage. Prior to ADB’s intervention, PUSOs experienced an average of 70% nonrevenue water (NRW) loss. In 2007, the NRW for the project cities averaged around 37%. The Project was assessed to be highly effective in meeting both the project-level and sector-level outcomes.

^a ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Integrated Development of Basic Urban Services in Provincial Towns Project*. Manila.

51. Evaluating the achievement of the urban sector outputs is more difficult due to the fact that the 2005 CSP did not consistently present the expected urban sector outputs in its urban sector framework and urban sector roadmap (paras. 31 and 41). In general, it appears that the urban sector assistance was able to achieve the intended sector output of increasing service provision to urban residents, particularly for water connection, sanitary services, and heating connections in aimag centers and for district heating in Ulaanbaatar. Likewise, it appears that ADB’s urban sector assistance was able to at least partly achieve the expected sector output of upgrading low-income housing. The expected project outcome of the Housing Finance Sector Project was to establish a long-term, market-based, sustainable housing finance system, which the project achieved through lending over \$16.7 million to individual borrowers, compared with the original appraisal target of \$10 million.²⁶ However, to achieve this project outcome, it was

²⁵ ADB. 2003. *Project Completion Report on the Provincial Towns Basic Urban Services Project (Loan 1560-MON(SF)) in Mongolia*. Manila.

²⁶ Before the Project, the banks in Mongolia were providing housing loans with maximum maturity of 2.0 years and at

necessary to direct the housing loans to those who could pay the market interest rate, i.e., mainly to middle-income households instead of low-income households. As a complementary measure, a JFPR grant²⁷ was provided to assist ger area residents in Ulaanbaatar and 10 other cities, which included more than \$1 million for housing loans to low-income households at interest rates much lower than market rates. This grant was successful in improving the living conditions of a substantial number of ger area residents and contributed to the partial attainment of the sector output.

52. The JFPR and TA grants were generally well designed to contribute to meeting the CSP's urban sector outcomes and outputs, and complemented the lending assistance. The assessment of the completed Living Environment of the Poor in Ger Areas of Mongolia Cities JFPR grant indicates that the grant met all of its expected outputs. In particular, the grant's housing finance component achieved 600% of the expected output by assisting over 1,800 ger area households in Ulaanbaatar and in 10 other cities, compared with the appraisal estimate of 300 poor households. The two ongoing JFPR grants²⁸ are proceeding well and are expected to greatly contribute to the development of community involvement programs in the ger areas. The community-led development approach and grassroots networks that may emerge are an important outcome and one that can be built upon by other programs in the future. Of the 10 completed urban sector TA operations, 4 have had completion reports, all of which rated their respective TA activities as successful and having achieved their project outputs. The draft housing sector strategy prepared under the TA for Developing an Urban Development and Housing Sector Strategy was well prepared, but its findings were not supported by MCUD. As such, the TA is considered to have been only partly effective in achieving the sector output of helping the Government to develop an urban sector strategy. Overall, ADB's urban sector operations are rated as effective.

3. Efficiency

53. Efficiency assesses the optimization of ADB resources to achieve sector outcomes and outputs. Efficiency is measured in terms of contribution to socioeconomic progress, economic benefits, direct benefits to the poor, and service delivery costs compared with those of other aid agencies and other DMCs. Highly efficient (3 points) means a large portion of the program was successful and delivered at reasonable cost; efficient (2 points) is for modest improvements; less efficient (1 point) is for negligible contribution; and inefficient (0 points) is for no contribution.

54. Efficiency in the lending program can be assessed by comparing the economic internal rates of return (EIRRs) at appraisal and at project completion. For the Basic Urban Services Project, Table 3 highlights the EIRRs at project appraisal and at project completion for the five project towns. In three out of five of the towns, the project completion EIRR exceeded the appraisal EIRR and in all but one case exceeded the economic opportunity cost of capital (EOCC) of 12%.

exorbitant interest rates of 2-2.5% per month. Since then, capacity in the area of mortgage lending has been significantly strengthened, and banks are providing mortgage loans with 15-year maturity and interest rate that is consistent with risk-return considerations.

²⁷ ADB. 2002. *Proposed Grant Assistance (Financed from the Japan Fund for Poverty Reduction) to Mongolia for Improving the Living Environment of the Poor in Ger Areas of Mongolia's Cities Project*. Manila. Grant status report submitted in 2007.

²⁸ ADB. 2007. *Proposed Grant Assistance Mongolia: Community-Driven Development for Urban Poor in Ger Areas (Financed by the Japan Fund for Poverty Reduction)*. Manila. Grant status report submitted in January 2008. ADB. 2007. *Proposed Grant Assistance Mongolia: Community-Based Heating Supply in Rural Remote Areas (Financed by the Japan Fund for Poverty Reduction)*. Manila.

Table 3: Economic Rates of Return for Provincial Towns Basic Urban Services Loan

Town	Appraisal EIRR (%)	Project Completion EIRR (%)
Hovd	15.7	18.5
Moron	11.0	14.6
Olgly	11.2	16.1
Ulaangom	18.4	14.0
Uliastay	22.8	10.8

EIRR = economic internal rate of return.

Sources: ADB. 1997. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Mongolia for the Provincial Towns Basic Urban Services Project*. Manila.

ADB. 2003. *Project Completion Report on the Provincial Towns Basic Urban Services Project (Loan 1560-MON[SF]) in Mongolia*. Manila.

55. A project completion report has not yet been prepared for the follow-on Integrated Development of Basic Urban Service in Provincial Towns Project. Nevertheless, the economic viability indicators estimated at appraisal indicated that the water supply components in three towns—Choibalsan, Dalanzadgad, and Sainshand—had highly satisfactory EIRRs, ranging from 46.3% in Choibalsan to 56.2% in Dalanzadgad. While the EIRRs were lower in the other towns, they remained well above the EOCC of 12%. EIRRs for district heating ranged from 23% to 58%, which were all above the EOCC. The sanitation improvement, solid waste management, and bathhouse components of the project were selected on a least-cost basis.

56. The Ulaanbaatar District Heating Project encountered numerous implementation problems that resulted in a cumulative implementation delay of 3.5 years. The chief reason for the long delay was the need to rebid three procurement packages after all of the bidders overbid. Other contributing reasons included an overambitious implementation schedule, delays caused by the redesignation of the executing agency from the Energy Authority to the District Heating Company as result of the restructuring of the energy sector, and the nonmaterialization of cofinancing by the Spanish Government on the rehabilitation of the steam system operations.

57. Overall, urban sector operations are rated as efficient.

4. Sustainability

58. Sustainability refers to the likelihood of sustaining achieved sector outcomes and outputs. Sustainability is assessed as (i) most likely (6 points); (ii) likely (4 points); (iii) less likely (2 points); or (iv) unlikely (0 points) depending on the financial, environmental, political, and institutional risks.

59. Two loans, two advisory TA operations, and two JPFR grants addressed the sector outcome of improving access to basic urban services in the aimag centers. All the urban services projects correctly focused on enhancing the underlying political, financial, and environmental conditions to ensure sustainability. The first two urban loans assisted local PUSOs in developing fiscal and corporate responsibilities, thus making them more independent and more reliant on tariffs revenues. Urban loans and the JPFR grants developed systems and infrastructure to improve living conditions in the poor ger areas. Loan covenants in the second urban loan required tariffs to reflect actual system delivery costs while keeping them capped for the poorest segment of the population. Thus the PUSOs are more likely to be sustainable while supplying subsidized clean water to the poor.

60. The loan for district heating in Ulaanbaatar also successfully addressed the sector outcome of improving access to reliable and adequate heat supply there. However, the executing agency—the District Heating Company (DHC)—is financially weak, and dependent on government subsidies. A recent project completion report²⁹ indicated that, given the DHC's adequate institutional capability and assuming continuing government support, the project is likely to be sustainable. However, the report did note that DHC has requested permission to sell some of the heating system assets procured with the use of ADB loan proceeds and that this request is under consideration by the government. It is unclear whether all of the potential new private owners of the assets would have the required institutional capacity to provide district heating services. As a result, the sustainability of the project outcomes and outputs is in doubt. The housing finance loan and related TA produced sustainable results. The loan resulted in a commercially viable mortgage system that developed into a sustainable and robust mortgage market. However, the housing fund financed under the project was found to be unsustainable and will be closed in 2008.

61. At the sector level, significant work still needs to be done to achieve sustainability of the urban sector services and ADB's assistance. For instance, the sustainability of PUSOs is questionable, especially in the aimags. Low tariffs, increasing energy demand, and increasing material costs in combination with increasing inflation have become a heavy burden on PUSO operations. The Government's plans to privatize PUSOs lack clarity and vision and need further careful assessment. Overall, urban sector operations are rated as less likely to be sustainable.

5. Impact

62. Impact refers to whether ADB sector operations have contributed to long-term sector development (including institutional capacity and relevant sectoral MDG targets). Impact is assessed as (i) high (6 points) if sector development goals, capacity, and/or MDGs are highly impacted; (ii) substantial (4 points) if sector development goals and/or MDGs are impacted but are not on track or there are persistent risks; (iii) modest (2 points) if there was limited progress made toward attaining sector development goals and/or MDGs, or developing capacity; and (iv) negligible (0 points) if no progress was made toward meeting any of the goals and thus there was no real impact.

63. Impacts of ADB's urban assistance program included (i) increased access to clean water and sanitation; (ii) increased access to heating for formal area residents in Ulaanbaatar and selected aimag centers; (iii) provision of low-cost housing for ger area residents; (iv) upgrading of low- and middle-income housing; (v) establishment of a sustainable, market-based system for the delivery of housing finance to meet the borrowing needs of low- and middle-income households; and (vi) assistance with local urban strategy development. Access to clean water and sanitation is an MDG that Mongolia has attempted to address. ADB's urban sector program contributed to improving the level of access in this area. Economic growth indicators show that, on average, the five ADB aimag centers covered under the first urban loan grew substantially faster than other aimag centers.³⁰ In addition, economic and social indicators show that in seven of eight project cities under the second urban loan, population increases were higher than the national average. Improvement in poverty incidence has also been noted. These indicators show indirectly that ADB's interventions have had a modest impact on the reduction of poverty in the selected aimag centers (MDG 1). ADB's assistance for housing finance led to a fledgling

²⁹ ADB. 2008. *Project Completion Report for the Ulaanbaatar Heat Efficiency Project*. Manila.

³⁰ ADB. 2003. *Project Completion Report on the Provincial Towns Basic Urban Services Project (Loan 1560-MON [SF]) in Mongolia*. Manila.

mortgage market that exceeded the sector development goal expectations.³¹ Overall, the impact of ADB's urban assistance program is rated as substantial.

C. Program Implementation Issues

64. The 2005 CSP roadmap (Appendix 1) cited a number of sector constraints, including (i) disparity in the provision of urban infrastructure and services between apartment areas and ger areas; (ii) poor coverage of heating, water supply, sewage, and water removal services; (iii) deteriorating conditions of old apartment infrastructure and services; (iv) outdated and unresponsive standards and norms for urban land use, zoning, and construction; and (v) unsatisfactory implementation of norms, regulations, and standards. Several of these constraints were addressed by ADB's urban assistance program. However, these remain as constraints to future program implementation. On the project level, factors affecting implementation included consultant selection delays, procurement delays, overambitious implementation schedules, sector restructuring in the energy sector, and issues relating to the short summer construction season. Some projects had frequent changes of project team leader, which could have affected project implementation. In the case of Loan 1907, the responsible headquarters unit was unable to field a full project review mission led by a project team leader for a 14-month period.³² In the area of procurement, ADB devoted substantial resources to developing procurement regulations and procedures, and capacity to prevent future program implementation delays. ADB's country performance audit report³³ found that project staff were familiar with the regulations and guidelines but recommended more staff training since implementation was poor.

V. PERFORMANCE ASSESSMENT RATING

A. Urban Sector Strategy

65. Overall, the performance of the urban sector strategy is rated successful, on the high side. The strategy is rated relevant and responsive, and the results and contribution to development are rated highly significant. Table 4 summarizes the ratings for ADB's urban strategic performance.

Table 4: Summary Rating of Strategic Performance

Item	Score (scale of 0–8)	Rating
Strategic Positioning	6	Relevant
Responsiveness and ADB's Performance	6	Responsive
Results and Contribution to Development	7	Highly significant
Overall Top-Down Sector Rating	19	Successful

ADB = Asian Development Bank.

Source: Operations Evaluation Mission.

³¹ ADB's support resulted in banks issuing primary mortgages totaling more than \$25 million. This has had a massive catalytic impact in developing the primary mortgage market in Mongolia, which is currently estimated at more than \$125 million. The legal framework for mortgage lending in Mongolia has also been established under the ADB Project.

³² Reportedly, the project team leader conducted informal supervision/administration meetings with the executing agency during this period. However, this could not be ascertained independently from the extant back-to-office reports.

³³ ADB. 2003. *Country Performance Audit Report: Mongolia*. Manila.

B. Urban Sector Program

66. Overall, the performance of the urban sector program is rated successful. Urban operations are found to have been highly relevant, effective, efficient, and sustainable, and having a high development impact. In terms of assistance modality, the JFPR grants are found to be highly successful, while loans and TA operations are found successful. A summary of the assessment is presented in Table 5. Appendix 4 contains a detailed rating analysis.

Table 5: Overall Performance Rating of ADB Urban Development Sector Assistance

Item	Aggregate			Relevance (0–3)	Effectiveness (0–6)	Efficiency (0–3)	Sustainability (0–6)	Impact (0–6)	Overall Rating	Description
	Amount (\$ million)	Weight (%)								
Loan	110.1	70		2	4	2	4	5	17	Successful Highly
JFPR	5.7	15		3	5	3	4	5	20	Successful
TA	5.6	15		3	4	2	4	4	17	Successful
Overall Bottom-up Sector Rating				2	4	2	4	5	17	Successful

ADB = Asian Development Bank, JFPR = Japan Fund for Poverty Reduction, TA = technical assistance.
Source: Operations Evaluation Mission.

C. Overall Assessment

67. Combining the strategy and program assessments, the overall performance of the urban development sector is rated as successful, but very close to the lower bounds of highly successful. A summary of the overall assessment is shown in Table 6.

Table 6: Overall Rating of Performance Assessment at the Sector Level

Item	Score	Rating
Urban Sector Strategy	19	Successful
Urban Sector Program	17	Successful
Total Score	36	Successful

ADB = Asian Development Bank.
Source: Operations Evaluation Mission.

VI. ISSUES, LESSONS LEARNED, AND RECOMMENDATIONS

A. Issues Identified

68. The main issues that have been identified are as follows:

- (i) **Strategy.** The urban sector strategy is rated successful. Nevertheless, the assessment was hindered by the fact that the sector outcomes and outputs were not well formulated in the 2005 CSP. In particular, there were some inconsistencies between the sector framework and sector roadmap and the sector outcome and output indicators were not specific enough to be monitorable (paras. 31 and 41).
- (ii) **Institutions.** Over the last decade, ADB and other aid agencies have supported the Government in rebuilding assets in various urban subsectors but generally

have not given sufficient attention to setting up the institutions and systems required to ensure that these assets are properly maintained and efficiently used (para. 11). To catch up with other former socialist countries in institutional reform and strengthening and to avoid wasting resources on infrastructure that is not well maintained and managed, Mongolia needs to institute a program of wider institutional reform.

- (iii) **Tariff Policy.** Full cost recovery for water supply and wastewater treatment has not yet been attained (paras. 16 and 18). Tariff setting is currently highly politicized and remains heavily influenced by the aimag governors. In the short term, the Government should be encouraged to adopt more transparent and efficient mechanisms for subsidizing utilities.³⁴ In the longer term, other means of depoliticizing tariff control should be pursued. One possibility is through creation of a National Water Board, while another solution recommended by the World Bank is integrating a new water board with the recently established and successful Energy Regulatory Authority, which regulates energy tariffs.³⁵ Urban water, sanitation, and solid waste tariffs, however, are more complicated than setting energy tariffs, since many aimag centers have localized issues and highly variable costs. Thus, any national tariff proposal should be reviewed for governance, capacity, and implementation arrangements at the aimag/center level.
- (iv) **Resource Saving Measures.** Much of the short-term energy and water demand in the aimags can be met from water and energy savings. Water meters, plumbing fixtures, and step tariffs to encourage off-peak use are all cost-effective measures. High-efficiency appliances, maximizing network distribution, use of renewables (wind, solar, biogas), and maximizing utility operations are all areas that can bring substantial resource savings and thus reduce new fixed power investment costs.

B. Lessons Learned

69. **Delegate project administration to the resident mission.** From ADB's perspective, its Mongolia urban sector operations are labor intensive, because investments are dispersed across many components in many cities. In such circumstances, it is usually more efficient to delegate project administration to the resident mission. In this context, the appointment of an urban development specialist to the resident mission in 2007 and the concomitant delegation of administration of two loans are considered very appropriate.

70. **Optimize synergies between the various assistance modalities.** In at least one case, synergies between the different ADB assistance modalities helped in the achievement of CSP urban sector outcomes/outputs. The implementation of the Housing Finance Sector Project alone would not have ensured achievement of the sector output of "upgrading low-income housing," because most of the project beneficiaries were middle-income households, not low-income households as originally intended. However, a JFPR grant aimed at assisting ger area residents in Ulaanbaatar and 10 other cities was successful in upgrading the housing of a

³⁴ There are opportunities to do so under existing ADB projects for improving provincial urban services, and in possible future investments in urban transport.

³⁵ World Bank/PPIAF. 2007. *Foundation for a Sustainable Development: Rethinking the Delivery of Infrastructure Services in Mongolia. Annex 4: Water Supply and Sanitation*. Washington, DC.

substantial number of ger area residents and contributed to the partial attainment of the sector output (paras. 51–52).

C. Specific Recommendations and Opportunities

71. **Focus more on the urban environment.** Continuing migration to Ulaanbaatar and aimag urban centers is expected to put further pressure on the urban environment. Investment is needed, particularly in Ulaanbaatar, for improving air and water quality. Most aimag centers do not have an environmental plan, an environmental ethos, or community involvement programs. Initially, ADB may consider assisting in formulating urban environment plans/programs in the aimag centers. Second, ADB may consider increasing its involvement in Ulaanbaatar's urban environmental issues, possibly through collaboration with other important partners (e.g., JICA and/or the World Bank) on new urban sector programs.³⁶ Appendix 5 provides an urban environment sector summary.

72. **Increase aid coordination and make more use of bilateral resources.** ADB should strengthen its cooperation with other aid agencies and make better use of bilateral resources for addressing urban environment issues. Possible areas where ADB could leverage its urban sector program through increased aid cooperation and support include the following:

- (i) cooperation with JICA on aimag center sanitation;
- (ii) cooperation with the World Bank on its Ulaanbaatar air pollution program;
- (iii) cooperation with JICA and the World Bank on implementing the Ulaanbaatar urban master plan, when it is completed;
- (iv) cooperation with the German Technical Cooperation Agency and other existing bilateral resources on current ADB aimag programs;
- (v) mobilization of Global Environment Fund grant funding for urban environmental issues; and
- (vi) application for Public-Private Infrastructure Advisory Facility grant assistance for aimag private sector participation programs in water and sanitation delivery.

73. **Formulate a more detailed sector roadmap.** The next CSP should formulate a more detailed urban development sector roadmap and identify monitorable indicators for each of the sector outcomes and outputs that are linked to the urban-related MDG targets.

74. **Carry on policy dialogue to reform district heating services.** There is a need to undertake/continue policy dialogue with the Government and assist it to reform district heating services in Ulaanbaatar to become more efficient and sustainable. ADB could share good practices from other similar developing member countries in district heating (e.g., the Central Asian republics). Cost recovery is possible in any urban services, including district heating.

³⁶ The latest draft World Bank Country Assistance Strategy includes reference to the World Bank's Ulaanbaatar Air Pollution/Stove Project and Ulaanbaatar Livable City Program, both of which may be suitable for ADB collaboration.

URBAN DEVELOPMENT SECTOR ROADMAP

Item	Indicator ^a		
	5 Years Ago	Current	5 Years
A. Sector Outcomes			
1. Access to safe water – apt/ger (%)	Moderate/low	Low/low	Adequate/satisfactory trend
2. Access to sanitation – apt/ger (%)	Moderate/low	Low/low	Adequate/satisfactory trend
3. Access to heating – apt/ger (%)	Moderate/low	Low/low	Adequate/satisfactory trend
4. Population with access to waste collection – apartments/ger areas (%)	Moderate/low	Low/low	Adequate/satisfactory trend
5. Access to hot water – apt/ger (%)	Moderate/low	Low/low	Adequate/satisfactory trend
6. Air, water, and soil quality problems related to urban development	Increasing	Increasing	Satisfactory trend
7. Health problems related to urban services and housing	Increasing	Increasing	Satisfactory trend
8. Improved approach to urban development and planning	Outdated, non-responsive	Improvements conceptualized	Satisfactory implementation progress
B. Sector Outputs			
1. Poor households with satisfactory housing	Deteriorating trend	Deteriorating trend	Improving trend in line with government plan
2. Water connections for poor households	Low	Deteriorating trend	Satisfactory improvement
3. Sanitation service for poor households	Low	Deteriorating trend	Satisfactory improvement
4. Heating connections for poor households	Low	Deteriorating trend	Satisfactory improvement
5. Urban sector strategy and norms	Little progress	Conceptualization	Satisfactory implementation
C. Sector Issues and Constraints	(i) Disparity in provision of urban infrastructure and services between apartment areas and ger areas (ii) Poor coverage of heating, water supply, sewage, and waste removal services (iii) Apartment infrastructure and services old and deteriorated (iv) Outdated and unresponsive standards and norms for urban land-use and zoning, and construction (v) Unsatisfactory implementation of norms, regulations, and standards		
D. Actions, Milestones, and Investments			By Agency
	By Issue	Schedule	ADB Others/ External Gov't
1. Second Ulaanbaatar Services Improvement Project	(i), (ii), (iii), (iv), (v)	2006–2008	√ WB √
2. City Development Strategies	(iv), (v)	2006–2009	√ WB, CIDA √
3. Cadastral Survey and Land Registration	(iv), (v)	2001–2007	√ GTZ √
4. Housing Finance Project	(iii)	2001–2007	√ √ √
5. Urban Services in Provincial Towns	(i), (ii), (iii)	2002–2008	√ √ √
6. Urban Development and Housing Project	(i), (ii), (iii), (iv), (v)	2006–2009	√ √ √

ADB = Asian Development Bank, apt = apartment, CIDA = Canadian International Development Agency, Gov't. = Government, GTZ = German Technical Cooperation Agency, WB = World Bank.

^a Baseline and target values for the indicators will be established through technical assistance to the Government as part of the Results-Based Management Plan.

Source: ADB. 2005. *Country Strategy and Program: Mongolia 2006–2008*. Manila.

SUMMARY OF URBAN SECTOR LENDING AND NONLENDING ASSISTANCE

Table A2.1: Loans

Year of Approval	Project Title	Loan No.	Amount (\$ million)	Outputs Achieved for Completed Projects or Intended Objectives for Ongoing Projects
1997	Ulaanbaatar Heat Efficiency	1548	40.0	Completed. The Project assisted in meeting the basic heating needs of the population and promoting sector efficiency. It assisted in improving district heating and steam system operations and in encouraging end-user efficiency to improve the reliability and adequacy of heat supply in Ulaanbaatar. The Project also assisted to rehabilitating and modernizing the heat supply system; instituting consumer-end heat control; and introducing a tariff and billing system based on metered heat consumption, which should provide market-based incentives to consume heat efficiently.
1997	Provincial Towns Basic Urban Services	1560	6.8	Completed. According to the project completion report (PCR), the Project achieved its outputs: (a) Physical Infrastructure and Equipment—The physical infrastructure and equipment components were fully completed as estimated at appraisal; (b) Project Implementation Assistance and Institutional Development—The institutional development component comprised four programs: (i) community participation and public health education, (ii) maintenance improvement, (iii) water loss reduction, and (iv) benefit monitoring and evaluation. No target indicators were provided at appraisal.
2001	Housing Finance	1847	15.0	Completed. According to the draft PCR, the Project achieved the following outputs: (i) establishment of a housing development fund with a balance of MNT8.13 million as of 31 December 2007; (ii) 258 loans totaling \$1.53 million channeled through public/private enterprises and onlent to low-income households (LIH) and middle-income households (MIH); (iii) loans totaling \$15.2 million made by participating commercial banks (PCB) to individual borrowers; (iv) several loans made to condominium associations; (v) 9 housing area action plan subprojects totaling \$2.47 million prepared, implemented, and financed; (vi) trained housing finance and urban development staff in the project management unit, PCBs, and project public urban service organizations; and (vii) establishment of a housing finance database, housing finance legal base, and standardization of loan documents. The expected output of establishing linkages between PCBs and small and medium-scale contractors to onlend to LIHs and MIHs was not achieved due to high risk of commercial loans and growth of the private construction sector.
2002	Integrated Development of Basic Urban Services	1907	20.1	Completed. The Project assisted in (i) supporting balanced and equitable regional development by promoting viable provincial urban centers that can provide support and services for their rural hinterlands; and (ii) reducing urban poverty and improving living conditions for urban residents in provincial towns. The specific objectives of the Project were to (i) improve basic urban services, (ii) reduce inequality in access to urban services between the formal and informal areas, and (iii) strengthen the operation and maintenance capacities of local public urban services organizations to achieve sustainable regional development in the eight provincial capitals of central and eastern Mongolia.
2006	Urban Development Sector	2301	28.2	Ongoing. The Project intends to provide or upgrade infrastructure, but also to simultaneously (i) increase access to small loans for households and neighborhood improvements, (ii) create direct short-term employment for construction and indirect long-term income

Year of Approval	Project Title	Loan No.	Amount (\$ million)	Outputs Achieved for Completed Projects or Intended Objectives for Ongoing Projects
				opportunities, and (iii) empower poor residents in decision-making processes through the establishment of community-based organizations to plan and implement community infrastructure improvements.
Total			110.1	

LIH = low income household, MIH = middle income household, MNT = Mongolian tugrik, PCR = project completion report, PCB = participating commercial bank.
Source: Data sourced from operations database of the Asian Development Bank.

Table A2.2: Japan Fund for Poverty Reduction Grants

Year of Approval	Name	JFPR No.	Amount (\$'000)	Outputs Achieved for Completed Grants or Intended Objectives for Ongoing Grants
2002	Improving the Living Environment of the Poor in Ger Areas in Mongolia's Cities	9015	2.2	Completed. This Project piloted innovative and sustainable approaches to address housing-related poverty in selected ger areas.
2007	Development of Urban Poor In Ger Areas	9106	1.5	Ongoing. The Project intends to empower local communities through increased participation in local governance and involvement in the design, implementation, and management of community demand-driven infrastructure and income-generating projects in selected ger areas.
2007	Community-Based Heating Supply in Rural Remote Areas	9109	2.0	Ongoing. The Project aims to improve the quality of life during winter in remote rural areas (soum centers). The expected outcome will be the provision of sustainable heating services in remote rural areas. The outputs will be (i) reduction in the burden placed on local budgets by coal purchases, (ii) reduction of carbon dioxide emissions from boilers, (iii) improvement in the technical capacity of local boiler manufacturers, and (iv) establishment of community-based operation and maintenance systems at pilot project sites.
Total			5.7	

JFPR = Japan Fund for Poverty Reduction grant.

Source: Data sourced from operations database of the Asian Development Bank.

Table A2.3: Technical Assistance Grants

Year of Approval	Name	TA No.	Amount (\$'000)	Outputs Achieved for Completed TA or Intended Objectives for Ongoing TA
1993	CES Institutional and Tariff Study	2035	500	Completed. The TA assisted the Central Energy System to become an efficient and financially sound utility that is able to provide adequate and reliable supplies of power and heat and thereby support Mongolia's economic transformation and development.
1996	Provincial Towns Basic Urban Services	2582	600	Completed. The project preparatory TA prepared the feasibility study for a project intended to improve basic urban services, with particular focus on water supply and sanitation. The TA was based on the analysis of the conditions in four provinces, developed solutions to increase cost recovery for water supply and sanitation and other urban services, and proposed policy reforms to be introduced at the national level. The study concentrated initially on four provincial capitals: Moron, Hovd, Ulaangom, and Olgii.
1996	Ulaanbaatar Heat Rehabilitation	2610	450	Completed. The TA developed a project to rehabilitate, modernize, and reform the heat supply system in Ulaanbaatar and improve its capacity, reliability, and efficiency.

Year of Approval	Name	TA No.	Amount (\$'000)	Outputs Achieved for Completed TA or Intended Objectives for Ongoing TA
1997	Capacity Building for the Provision of Urban Services in Provincial Towns	2881	825	Completed. The TA (i) improved the health and living conditions of the residents, and (ii) reduced inequality in access to urban services between those living in apartments and ger areas. The short-term objectives of the Project were to (i) improve the access and availability of water, bathing facilities, and solid waste services for ger area residents at affordable prices; and (ii) provide reliable urban infrastructure, such as water supply, sanitation, and solid waste disposal services, for apartment residents and other formal users that can be efficiently operated and maintained over time.
1997	Housing Sector Policy	2890	210	Completed. The TA assisted in the development of a stable legal and institutional framework for the development of the housing sector in Mongolia. The objective of the TA was to help the Government to reformulate the draft housing policy law (HPL) and prioritize areas for future intervention in the housing sector. The scope of the TA included (i) assistance in the preparation of a National Housing Strategy paper and the HPL; (ii) review and advice on improvements to the housing privatization law and the condominium law, including ways to facilitate their implementation; and (iii) preparation of draft terms of reference for a proposed TA on the housing sector.
1998	Institutional Strengthening of the Housing Sector	3090	800	Completed. The TA assisted in (i) preparing the operational policy framework for establishing condominium associations, which resulted in improved management and maintenance of common areas and apartments; (ii) restructuring the housing utility companies in Ulaanbaatar, Darkhan, Erdenet, and Zuumod including a review of their legal, financial, and operational frameworks, which resulted in more efficient maintenance of apartment buildings and more equitable tariff structures; (iii) preparing four pilot housing action area plans (HAAPs) for new housing and existing ger housing areas to promote the bottom-up process of urban planning in the cities of Ulaanbaatar, Darkhan, and Zuumod; and (iv) assessing the viability of establishing a housing development fund, and accordingly preparing the objectives, scope, costs, and implementation arrangements for the project preparatory TA for the housing finance (sector) project. The TA also assisted in (i) preparing the first demand driven multiyear housing programs for Darkhan and Zuumod; and (ii) establishing a fully functional HAAP unit in the Government Implementing Agency for Construction, Urban Development and Public Utilities. The Asian Development Bank (ADB) was commended by the Government for its active support to the housing sector. It was especially noted that the TA was well designed and implemented on schedule.
2000	Preparing Housing Sector Finance	3406	600	Completed. The TA supported the Government's goals for the housing sector as set out in the Housing Law (April 1999), including (i) creating conditions whereby citizens can provide themselves with adequate housing that meets health and safety requirements; (ii) developing and implementing housing and associated infrastructure based on basic market requirements; (iii) encouraging the involvement and increasing the responsibilities of the private sector in planning, construction, maintenance, and repair of housing and its infrastructure; and (iv) developing the ger areas into comfortable housing areas.

Year of Approval	Name	TA No.	Amount (\$'000)	Outputs Achieved for Completed TA or Intended Objectives for Ongoing TA
2001	Integrated Development of Basic Urban Services in Secondary Towns	3685	700	Completed. The project preparatory TA prepared a financially and economically viable investment project intended to improve basic urban services in eight secondary towns. The TA assisted in (i) examining the roles and functions of secondary towns in the eastern and central provinces and the Government's regional development plans, and selecting the secondary towns where urban service improvements could be made to maximize the economic benefits of the ensuing investment; (ii) preparing a feasibility study of an investment project for improving basic infrastructure for urban services and enhancing the regional service functions of selected provincial towns; and (iii) proposing national policy reforms to improve sector performance. The TA also assessed the need to enhance urban land use planning skills and management of infrastructure services.
2004	Developing an Urban Development and Housing Sector Strategy	4352	350	Completed. The TA assisted with the (i) updating of basic information in urban development and housing, (ii) development of an urban development and housing sector strategy for 2005-2008, and (iii) formulation of outline proposals for priority investments and institutional capacity development requirements. The final report covered all expected outputs. In response to the Government's revised policy and priority areas and at the request of the executing agency during TA inception, special attention was paid during TA implementation to (i) preparing a detailed implementation plan of the program to provide 40,000 families with opportunities to live in housing with improved basic services; (ii) revising existing codes, standards, and regulations related to construction and urban development, especially those developed by the former Soviet Union; and (iii) undertaking a thorough study including recommendations on how to develop and expand the existing mortgage market.
2005	Urban Development and Housing	4632	600	Completed. The project preparatory TA prepared a project intended to improve the living conditions and the quality of life of the urban population, with particular focus on the urban poor, and suitable for ADB financing. The ensuing project would assist the Government to (i) provide sustainable and affordable infrastructure and services for the urban poor, especially in ger areas; (ii) promote community participation in project preparation, implementation, and postproject operation and maintenance activities; and (iii) improve urban planning and management and the capacity of government agencies to provide and operate urban services. Impacts on the environment, involuntary resettlement, and indigenous peoples would not be significant.
Total			5,635	

TA = technical assistance.

Source: Data sourced from operations database of the Asian Development Bank.

URBAN DEVELOPMENT AID COORDINATION MATRIX

Sector/Thematic/Area	ADB Strategy/Activities	Other Development Partners' Strategy/Activities
District Heating	<ul style="list-style-type: none"> • Improved district heating and steam system operations in Ulaanbaatar • Provision of sustainable heating services in remote rural areas 	<p>Japan: Support long-term energy policy; nonproject grant aid for energy sector</p> <p>USAID: Support energy sector commercialization for long-term financial sustainability</p> <p>World Bank: Improving reliability and financial sustainability of electricity distribution system in Ulaanbaatar and 10 aimags</p>
Housing Finance	<ul style="list-style-type: none"> ▪ Mortgage credit system ▪ Housing finance reform 	
Sanitation	<ul style="list-style-type: none"> • Focus on MDG goal • Financing sewage lagoons in aimag centers • Bathhouses in ger areas 	<p>France: Water and sanitation program</p> <p>World Bank: Ulaanbaatar Services Improvement Project looking at solid waste</p> <p>Japan: Ulaanbaatar Master Plan has sanitation component for centralized wastewater treatment plant</p>
Urban Environment	<ul style="list-style-type: none"> ▪ Improving water quality via sanitation investments 	<p>Japan: Support for reduction of air pollution in Ulaanbaatar</p> <p>UNDP: Reduction of air pollution by introduction of smokeless fuel</p> <p>World Bank: Support for reduction of air pollution in Ulaanbaatar</p>
Urban Services	<ul style="list-style-type: none"> • Improved access to urban services • Upgrading and rehabilitating basic infrastructure and public services in selected eastern and central provincial centers 	<p>Japan: Support for formulation of an Ulaanbaatar Development Master Plan</p> <p>Germany: Integrated urban development</p> <p>World Bank: Technical assistance and lending to Ulaanbaatar water supply company</p>
Waste Management	<ul style="list-style-type: none"> • Solid waste collection and disposal investments in aimag centers 	<p>Japan: Improvement of waste management in Ulaanbaatar</p>
Water Supply	<ul style="list-style-type: none"> ▪ Focus on MDG goal ▪ Kiosks in aimag center ger areas to keep tariff stable ▪ Upgrading water supply system, reducing nonrevenue water with metering in aimag centers 	<p>Czech: Provision of potable water supply in areas lacking water in Ulaanbaatar and Erdenet</p> <p>France: Water and sanitation program</p> <p>Netherlands: Provision of water supply and hygiene in ger areas</p> <p>World Bank: Water supply provision for ger areas of Ulaanbaatar</p>

JBIC = Japan Bank for International Cooperation, MDG = Millennium Development Goal, UNDP = United Nations Development Programme, USAID = United States Agency for International Development.

Sources: ADB. 2006. *Mongolia: Country Strategy and Program Update (2007–2009)*. Manila; ADB Mongolia Resident Mission: 2007. *Mongolia: External Partner's Assistance Matrix*. Draft matrix provided by resident mission staff, and miscellaneous reports and information provided by multilateral and bilateral agencies active in Mongolia.

EVALUATION MATRIXES FOR PROGRAM ASSESSMENT

Table A4.1: Loan Project Evaluation

Sector/Loan No./ Project	Year of Approval	Amount (\$ million)	Status	Relevance (0-3)	Effectiveness (0-6)	Efficiency (0-3)	Sustainability (0-6)	Impact (0-6)	Overall Rating
Energy Sector Development									
1548 Ulaanbaatar Heat Efficiency	1997	40	Completed	2	3	2	1	3	13
Finance									
1847 Housing Finance	2001	15	Completed	2	4	3	5	5	21
Multisector									
2301 Urban Development Sector	2006	28.2	Ongoing	a	a	a	a	a	a
Water Supply, Sanitation, & Waste Management									
1560 Provincial Towns Basic Urban Services	1997	6.8	Completed	3	5	2	4	5	18
1907 Integrated Development of Basic Urban Services	2002	20.1	Ongoing	3	5	2	4	4	18
Total		110.1		2	4	2	4	5	17

^a Loan is too new to evaluate.

Source: Operations evaluation mission estimates.

Table A4.2 TA Evaluation

Sector/TA No./ TA Name	Year of Approval	Status	Relevance (0-3)	Effectiveness (0-6)	Efficiency (0-3)	Sustainability (0-6)	Impact (0-6)	Overall Rating
Energy Sector Development								
2610 Ulaanbaatar Heat Rehabilitation	1996	Completed	2	3	2	3	3	13
Finance								
3406 Preparing Housing Sector Finance	2000	Completed	3	4	2	4	4	17
Multisector								
2035 Central Energy System Institutional and Tariff Study	1993	Completed	a	a	a	a	a	a
2582 Provincial Towns Basic Urban Services	1996	Completed	3	5	3	4	4	19
2881 Capacity Bulding for the Provision of Urban Services in Provincial Towns	1997	Completed	3	4	2	3	3	15
2890 Housing Sector Policy	1997	Completed	3	5	3	4	4	19
3090 Institutional Strengthening of the Housing Sector	1998	Completed	3	4	3	4	4	18
3685 Integrated Development of Basic Urban Services in Secondary Towns	2001	Completed	3	5	2	4	4	18
4352 Developing an Urban Development & Housing Sector Strategy	2004	Completed	3	4	2	4	4	17
4632 Urban Development and Housing	2005	Completed	3	6	3	4	4	20
Total			3	4	2	4	4	17

^a TA out of date and difficult to evaluate.

Table A4.3 JFPR Evaluation

Sector/TA No./JFPR TA Name	Year of Approval	Relevance (0-3)	Effectiveness (0-6)	Efficiency (0-3)	Sustainability (0-6)	Impact (0-6)	Overall Rating
Energy Sector Development							
9109 Community-Based Heating Supply in Rural Remote Areas	2007	a	a	a	a	a	a
Multisector							
9015 Improving the Living Environment of the Poor in Ger Areas of Mongolia's Cities	2002	3	5	3	4	5	20
9106 Community-Driven Development for Urban Poor in Ger Areas	2007	a	a	a	a	a	a
Total		3	5	3	4	5	20

^a Project is too new to evaluate.

Source: Operation evaluation mission estimates.

Table A4.4 Loan Rating Comparison

Sector/Loan No./Project	PCR Rating	PPER Rating	RSA Rating
Energy Sector Development			
1548 Ulaanbaatar Heat Efficiency	Successful ^a	Not available	Partly successful
Finance			
1847 Housing Finance	Highly successful ^b	Not available	Highly successful
Multisector			
2301 Urban Development Sector	Not available	^c	^c
Water Supply, Sanitation & Waste Management			
560 Provincial Towns Basic Urban Services	Successful	Not available	Successful
1907 Integrated Development of Basic Urban Services in Provincial Towns	Not available	Not available	Successful

PCR = project completion report, PPER = project performance evaluation report.

^a Based on PCR dated September 2008.

^b Based on draft PCR dated September 2008.

^c Project is too new to evaluate.

Sources: PCRs, PPERs and operations evaluation mission estimates.

Table A4.5 TA Rating Comparison

Sector/TA No./ TA Name	TCR Rating	RSA Rating
Energy Sector Development		
2610 Ulaanbaatar Heat Rehabilitation	Not available	Moderately successful
Finance		
3406 Preparing Housing Sector Finance	Not available	Successful
Multisector		
2035 Central Energy System Institutional and Tariff Study	Generally successful	Successful
2582 Provincial Towns Basic Urban Services		Successful
2881 Capacity Building for the Provision of Urban Services in Provincial Towns	Not available	Moderately successful
2890 Housing Sector Policy	Generally successful	Successful
3090 Institutional Strengthening of the Housing Sector	Highly successful	Successful
3685 Integrated Development of Basic Urban Services in Secondary Towns	Not available	Successful
4352 Developing an Urban Development & Housing Sector Strategy	Successful	Successful
4632 Urban Development and Housing	Not available	Successful

RSA = rapid sector assessment, TA = technical assistance, TCR = technical assistance completion report.

Sources: TCRs, Operation evaluation mission estimates.

URBAN ENVIRONMENT SECTOR SUMMARY

A. Background

1. The urban environment of Mongolia's cities has been greatly influenced by the rapid rate of urbanization in the country over the past 10 years. Heightened demand by residential and commercial consumers of urban services has outstripped supply, particularly in Ulaanbaatar and in provincial towns, and has become a constraint to the growth of economic activity in these areas. Migration into Ulaanbaatar has particularly overburdened urban infrastructure, especially in terms air and water quality. Vehicle pollution is also increasing.

B. Air Quality

2. Generally ambient air quality throughout the country is good. In winter, however, the urban areas of Ulaanbaatar and several aimag centers experience air pollution well beyond World Health Organization (WHO) standards for a variety of air contaminants, including particulate matter (PM), nitrogen oxides (NO_x), carbon monoxide, sulfur oxides (SO_x) and ozone. There is no specific sector outcome or sector output identified in the 2005 Mongolia country strategy and program (CSP) related to air pollution abatement or climate change, but the CSP's urban development sector roadmap (see Appendix 1) does indicate a general sector outcome target for "... air, water, and soil quality problems related to urban environment." The United Nations Development Programme's (UNDP) Millennium Development Goal 7 has a reduction target of 4 tons carbon dioxide per person by 2015.¹

1. Air Pollution from Burning Coal and Wood

3. From November to March, Mongolia's average temperatures are well below freezing. In January and February, average temperatures are commonly -20 to -40 degrees centigrade. Air pollution resulting from burning coal for heating during these winter months is quite evident in many of the urban areas.

4. In Ulaanbaatar, 40% of the population live in apartments and 60% live in ger areas. Nearly all ger residents burn coal in open, inefficient stoves for heating and cooking. During the winter, a ger area family burns an average of 4.5 tons of coal and 4.7 cubic meters of firewood.² In Ulaanbaatar, over 70,000 ger area families use between 200,000 and 350,000 tons of raw coal and over 320,000 cubic meters of firewood every winter. Many families use other waste materials with a British thermal unit value, such as paper products and rubber, because of the rising cost of coal. Ulaanbaatar has three thermal power stations and about 200 small- and medium-size boilers that all use coal. Air pollution from the ger stoves and the power plants in the winter is trapped by the basin's shape and a predominant temperature inversion in which a stable layer of dense air inhibits dispersal of pollutants.

5. **Impact.** Inefficient coal and wood burning releases pollutants to the air column including SO_x, PM, and nitrogen dioxide. Half of the total air pollution load in Ulaanbaatar can be attributed to the inefficient use of coal and wood. Most aimag centers, however, have better air quality than Ulaanbaatar. Lower concentrations of ambient air pollutants recorded in aimag centers are due primarily to favorable air flow. These ambient concentrations do not reflect direct exposure to indoor air pollutants in ger area homes, which is likely to be an order of

¹ UNDP. 2002 and 2007 (2007 is a web page reference). *Mongolian Millennium Development Goals Indicators*.

² www.sonin.mn 2007.

magnitude higher. Negative consequences of the poor air quality in the urban areas are dramatic. Poor air quality has a direct connection with the high number of respiratory diseases among Mongolia's urban residents. A 2002 study conducted by the World Health Organization,³ reported a strong statistical link between air pollution and respiratory diseases requiring hospitalization among children in Ulaanbaatar and Tunkhel. Two studies conducted in 1996 and 2001 also reported the negative impact of air pollution on the physical growth of children.⁴ More recent data are limited, but a new World Bank program, Ulaanbaatar Clean Skies,⁵ proposes an extensive air monitoring program (funded by a Spanish grant) and should generate new, more accurate data.

6. Wood is both burned for heat in the ger areas and the key material used to ignite coal in the informal areas. Inefficient burning of wood can also produce dioxins and their precursors, which bioaccumulate and are extremely toxic at low concentrations. There are no actual data on dioxin concentrations in the formal or ger areas. Testing for dioxins, and many complex organics is very expensive, and any future assessment of dioxin presence and risk will likely rely on identifying precursors or extrapolating from other international examples. In addition to the exposure to pollutants, wood burning has caused vast deforestation around Ulaanbaatar.

7. **Programs.** Responsibility for air pollution control resides with several government authorities including urban municipalities, the Ministry of Nature and Environment (MNE), Ministry of Fuel and Energy (MFE), and the Ministry of Construction and Urban Development (MCUD). The Government fully recognizes the importance of controlling air pollution and is soliciting funding agency participation in several programs. Parliament recently approved a minimum State budget of MNT50 billion to be spent on air pollution control. The budget amount is far from the sum needed to ameliorate the air pollution problem, but it shows recognition of the problem. The public acknowledgement and initial funding are very different from the Government's approach to the environment and specifically air pollution in the 1990s. Then, very little air pollution data were collected or distributed. In 2007, the Government allocated MNT2 billion for assisting private companies to improve their equipment that produce carbonized coal briquettes. MFE, through its "coal" program, plans to introduce clean coal technologies and provide incentives to develop smokeless, carbonized coal briquettes.

8. **Challenges.** In Ulaanbaatar and several aimag centers, the number one threat to human health from pollution is air pollution. Unfortunately, poverty in the ger areas reduces the residents' ability to pay for air pollution control and thus burdens the Government. So far, government programs have not resulted in decreased air pollution; actually, air pollutants are significantly increasing. Many families seek out upwind property in Ulaanbaatar and other communities because of air pollution. Many families in Ulaanbaatar also spend weekends outside the city, also because of heavy air pollution. Complicating air pollution abatement is the limited urban planning. Poor urban land management, lack of urban master planning, and weak control from districts and khoroo⁶ administrations has resulted in haphazard ger area development. Consequently, air pollution investigations, public education, and control measures are difficult to administer. Low public awareness also limits public support and willingness to pay for alternative fuels. Coal briquettes burn more effectively than raw coal and thus emit fewer air pollutants. However, although they are only slightly more expensive than raw coal, they are not widely used because of poor education and limited marketing. Formal areas also have limited ability to implement air pollution abatement measures.

³ ADB. 2006. *Country Synthesis report on Urban Air Quality Management*. Manila

⁴ World Bank. 2004. *Environmental Challenges of Urban Development*. Washington, DC.

⁵ Meeting with World Bank resident mission staff, December 2007.

⁶ Administrative unit.

2. Motor Vehicle Emissions and Dust

9. **Emissions.** Vehicles are the second largest source of air pollution in Ulaanbaatar and a few of the larger aimag centers. Vehicular ownership in Ulaanbaatar has grown from 28,119 registered in 1995 to 104,539 in December 2007. The Ministry of Roads, Transport, and Tourism (MRTT) reports that as of December 2007 there were 196,332 vehicles inspected and registered nationwide. Eighty percent of the vehicles inspected do not meet national or international emission standards.⁷ More than 50% of the vehicles are over 11 years old, and 30% are 7–10 years old. Aimag center residents have the highest percentages of older vehicle ownership. However, vehicular pollution is low in most aimag centers because of their low population density and geographical setting.

10. MRTT reports that in Ulaanbaatar there are 195 automobiles per kilometer of road. In 2001 there were 115 automobiles per kilometer of road. Automobile growth now causes regular traffic jams. At low idle speed, automobile engines are very inefficient and thus emit greater concentrations of pollutants, especially particulates. Ulaanbaatar's vehicle fleet includes 71,082 cars, 21,134 trucks, and 10,991 buses, with most trucks and buses over 10 years old and equipped with older diesel engines that are characterized by high particulate emissions.

11. **Dust.** Dust storms are common in Mongolia and are appearing with increasing frequency—fourfold since 1960. The increase is directly related to ongoing land degradation. MNE reports that an average dust storm contains 131–161 cubic meters of wind-eroded topsoil (dust), which is 2-3 times above international standards.⁸ Winter has the highest number of dust storm events, but recently spring dust storms have become a regular phenomenon for urban residents. Dust can cause or exacerbate respiratory illness, but few data are available regarding the effects of dust on human health in Mongolia. Children and the elderly are particularly vulnerable to respiratory difficulties caused by dust. Dust generally has particles larger than 2.5–10 microns in diameter and thus does not become permanently lodged in the lungs; nonetheless, it is an extreme irritant.

C. Solid and Hazardous Waste

12. Solid and hazardous waste is a growing environmental problem throughout Mongolia. Aimag centers have very little in the way of collection and disposal and are usually characterized by having household and industrial waste strewn over a large area just outside the community. A total of 1,500–1,800 cubic meters (m³) of solid waste is generated per day in Ulaanbaatar.

13. Each aimag center has a public urban services organization (PUSO) or district general maintenance company responsible for solid waste collection, transportation, and disposal. Solid waste is collected and disposed at landfills in Ulaanbaatar and aimag centers. Asian Development Bank (ADB) financed the purchase of steel garbage bins and garbage collection trucks, and landfill designation in several aimag centers. The latter is simply an allocation of land and fencing. Garbage collection, transportation, and disposal are the responsibility of the PUSO. MNE, MCUD, and the Ministry of Health (MOH) are primarily responsible for the management of solid waste and sewage-related issues. The aimag governors and aimag center leaders are responsible for the implementation of waste-related activities. Solid waste

⁷ MNE. 2007. *Annual Environmental Report*.

⁸ World Bank. 2007. *Urban Air Pollution Analysis for Ulaanbaatar*. Washington, DC.

management companies and PUSOs report to the aimag center administration and the aimag governor.

14. In Ulaanbaatar, the responsibility for district waste management is decentralized. Within the Ulaanbaatar government, there is a Working Group on Waste Management. Under the Working Group are the City Reconstruction Company and nine district construction and service companies (DCSCs), of which six are in the city proper and the other three outside the city limits. DCSCs are responsible for waste management, street cleaning, public construction, parks, and the general urban environment. There are three central dumpsites managed by a separate company. These companies are entirely government owned and do not operate on commercial terms. The DCSCs collect fees for waste disposal from private households, communal entities and institutions. The fees are set by the Government. The rates, set in 1997, are MNT50 per person per month in apartment blocks, and MNT400–500 per family per month in ger areas. In 2006, the apartment residents paid MNT1,000 per month and ger area residents paid MNT1,500. A general disposal fee of MNT50 per m³ for all waste categories is charged by DCSCs. However, contracts are often negotiated individually with construction, industrial, and other commercial entities.

15. Two of Ulaanbaatar's landfills handle 90–95% of the city's solid waste disposal. They are located east of Ulaanbaatar. Both landfills are basically uncontrolled refuse dumps with out-waste control, waste separation, or landfill monitoring. Although there are no data, leachate from the landfills is highly likely. Whether the leachate contains potentially toxic materials or is affecting local groundwater quality must be determined by sampling. There is the potential for methane recovery from the landfills. However, this would require additional study. The adoption of the Solid Waste Law of 2003⁹ is an excellent first step in bringing the solid waste problem under control. Table A5.1 highlights the sources of solid waste in Ulaanbaatar. Table A5.2 presents Ulaanbaatar's solid waste content, and Table A5.3 shows the trend in Ulaanbaatar's solid waste generation.

Table A5.1: Sources of Solid Waste in Ulaanbaatar, 2005

Source of Waste	Amount	
	Average m ³ per year	Tons
Households	144.009	86.406
Apartments	152.051	45.615
Cleaning of streets and squares	15.442	6.117
Industries and commercial businesses	75.977	30.391
Others	64.610	25.844
Total	452.090	194.433

Source: MNE. 2005. Country Environmental Analysis. Mongolia.

⁹ MNE. 2005. Country Environmental Analysis-Mongolia.

Table A5.2: Solid Waste Contents in Ulaanbaatar, 2005

Form of Waste	Percentage (over 12 months)
Paper	25.20
Synthetic bags and hard paper boxes	9.19
Synthetic material	2.90
Rubber	0.30
Cotton material	2.50
Glass	4.41
Cans	5.54
Aluminum	0.4
Copper	0.25
Metal	2.46
Leather and fur	0.60
Wood and wooden furniture	1.51
Plants	2.64
Vegetables	2.61
Bones	4.48
Ashes	21.38
Coal dust	3.67
Soil, stones	7.96
Others	1.98
Total	100.0

Source: MNE. 2005. Country Environmental Analysis. Mongolia.

Table A5.3: Ulaanbaatar Solid Waste Generation¹⁰

Item	1996	1997	1998	1999	2000	2001
Solid Waste Generation in Ulaanbaatar ('000 tons/m ³)	550	580	600	650	700	770

Source: MNE. 2005. Country Environmental Analysis. Mongolia.

16. **Solid Waste Recycling.** Recycling is now being studied by the Ulaanbaatar City Administration. However, there is no formal recycling program in Ulaanbaatar or in the aimag centers. Many poor people live near landfill area(s) and collect some useful materials like metals, bottles, and plastics and sell them to so-called “changers” (trade people). This practice exposes the poor to potentially hazardous conditions. In the winter months, about 60% of Ulaanbaatar’s solid waste generation is from households, industries, and power plant ash. Currently research is focusing on using the ash for construction materials, roads, and light concrete industries. One issue is the presence of heavy metals in the ash. Another is that many times the ash is mixed with other wastes. This limits the reuse of the ash to materials that do not have human contact. Another recycling option under consideration involves better sorting of wastes, a waste exchange market, and government incentives.

17. **Hazardous Waste.** Former Soviet Union (FSU) investments supported industries and military installations in Ulaanbaatar and in many of the aimag centers. Many of the aimags have less than half of the industrial and almost none of the military activity of 15 years ago. The legacy from the FSU era is unknown, but there is likely to have been uncontrolled disposal of potentially hazardous materials. Many aimags likely have abandoned tanks and drums of leaking hydrocarbons that could contaminate local groundwater. Mongolia does not have a

¹⁰ MNE. 2005. Country Environmental Analysis-Mongolia.

designated industrial waste treatment center or landfill. Potentially hazardous waste is mixed with ordinary waste and disposed of either in a municipal landfill or in the open environment. MNE, the State Professional Inspection Agency (SPIA), and the National Emergency Management Agency monitor hazardous wastes and enforce regulations. Three laws regulate hazardous waste management: the Law on Protection from Toxic Chemicals (1995), the Law on Transboundary Movement of Hazardous Wastes and Their Disposal (2000), and the Law on Industrial and Household Waste (2003).

18. **Mining Waste.** Mining is the largest industry in Mongolia. Table A5.4 presents the mining outputs, and Table A5.5 shows the contribution of mining output to gross domestic product (GDP). There are 127 mining companies extracting gold, 44 mining fluor spar, 28 extracting coal, and 2 extracting oil in Mongolia. The mining sector is a major contributor to the Mongolian economy, accounting for 17% of GDP, 65% of industrial output, and 58% of total export earnings. The formal mining sector employs over 12,000 people, and the informal mining sector has an order of magnitude more workers, but there are no official numbers.¹¹ MNE monitors environmental pollution at mining sites, and SPIA conducts the actual inspections. The Law on Mining and Environmental Conservation includes regulations regarding mining waste, leachate treatment, and disposal. Top environmental issues related to mining include the uncontrolled chemical waste from leachate and poor rehabilitation of abandoned mining sites.

Table A5.4: Output of Selected Industrial Commodities

Commodities	Measurement	2003	2004	2005	2006
Coal	<i>t x 1,000</i>	5 666.1	6 865.0	7 517.1	8 074.1
Crude oil	<i>barrels x 1,000</i>	183.0	215.7	200.7	366.8
Copper concentrate with 35%	<i>t x 1,000</i>	372.2	371.4	361.6	370.5
Molybdenium concentrate with 47%	<i>tons</i>	3 836.6	2 428.0	2 528.0	2 987.0
Gold	<i>kg</i>	11 118.6	19 417.6	24 121.9	22561.3
Fluorspar concentrate	<i>t x 1,000</i>	198.4	148.2	134.1	137.6
Fluorspar	<i>t x 1,000</i>	488.2	468.2	507.9	521.9
Iron ore	<i>t x 1,000</i>	-	33.5	167.7	180.0
Zinc concentrate	<i>t x 1,000</i>	-	-	22.8	109.9
Salt	<i>tons</i>	280.5	258.5	196.7	166.7

t = ton, kg = kilogram.

Source: National Statistics Year Book-2006.

Table A5.5: Gross Industrial Output (% of GDP)

Divisions	2003	2004	2005	2006
Total	100.0	100.0	100.0	100.0
Mining and Quarrying	49.5	60.0	66.8	68.4
Mining of coal and lignite, extraction of peat	6.0	5.0	5.0	3.9
Extraction of crude petroleum and natural gas	0.6	0.3	0.7	1.1
Mining of metal ores	40.4	52.8	59.1	61.5
Other mining and quarrying	2.5	1.9	1.9	1.8

GDP = gross domestic product.

Source: National Statistics Year Book-2006.

¹¹ World Bank. 2006. *Mongolia: A Review of Environmental and Social Impacts in the Mining Sector*. Washington, DC.

19. **Agricultural and Animal Waste.** Agriculture, aside from forestry, is limited in Mongolia. Farming has a short summer season that restricts crop diversity. Water for irrigation is in short supply in most areas. With more than 150 organizations having animal operations in Mongolia that include cow, pig, and sheep farming, waste from 300,000 cattle is put into “holes” and likely leaks into local groundwater. There have been several reports of bacterial contamination of local waterways and/or water supply resulting from animal waste.

20. **Hospital Waste.** Currently, medical waste is mixed with solid waste and disposed of in landfills, where available. Some hospitals have thermal treatment systems to treat medical waste on-site. MOH has voiced increasing concern over the lack of a specialized facility or on-site treatment systems to treat medical, “red bag” wastes.

D. Non-Urban Environmental Issues

21. **River and Lake Water Quality.** Water quality in lakes and rivers is affected by wastewater discharges, animal waste runoff, and agricultural runoff (nonpoint source). A new water policy calls for a watershed approach to management and is focused on improving river and lake water quality. There are not many data on water quality, and virtually no data available regarding nonpoint source pollution loads.¹²

22. **Energy and Climate Change.** Mongolia has not yet ratified the Kyoto Protocol, which has limited the application of Clean Development Mechanism (CDM) funding for energy inefficiency investments.

23. **Protected Areas and Sustainable Development.** MNE manages most Global Environment Facility (GEF)-related activities, including protecting sensitive, biodiverse ecosystems; transboundary pollution; and climate change.¹³

24. **Pasture Degradation, Desertification, and Deforestation.** This is not an investment area for the Government, and there is not much information on the extent of land abuse and corresponding environmental risks. For example, two thirds of the logging is reportedly illegal, and thus the official figures are likely far below the actual deforestation area.

E. Challenges

25. One of the big challenges to reducing air, water, and solid waste pollution in Mongolia is enforcing existing regulations while not impacting the economic growth. Worldwide, urban environmental improvements have been shown to have a high economic rate of return but lower financial rate of return. Prioritizing of environmental issues based on health impacts, determining least-cost scenarios, and developing financing mechanisms are all important to a sustainable, result-orientated environmental program. Also, individuals and industry require education and awareness strengthening regarding how environmental improvement can help their business and their livelihood.

26. Air pollution is a serious threat to human health in Mongolia and especially to the poor living in ger areas. This is especially true in Ulaanbaatar. Investments in clean coal, energy efficiency, and alternative fuels are needed.

¹² ADB. 2004. Mongolia Country Environmental Analysis.

¹³ The World Bank USIP II project has a GEF-funded component for ger area stove replacement that is managed by the World Bank Project Management Office.

27. Private sector involvement is key to sustainable urban environmental improvements. The 2000 National Environment Action Plan's goal was to strengthen management through transfer of responsibility to the private sector. While the transfer has occurred for water and sanitation (PUSOs), the environment sector remains largely government sponsored.

28. Solid waste facilities need to be constructed in the aimag centers. The landfills in Ulaanbaatar should be tested for leachate discharge and secured, if possible. Also, methane emitting from the landfills has an energy value and should be collected. Methane is also a greenhouse gas and possibly could qualify for the CDM scheme for carbon sales. The city may have to consider closing these landfills and locating new, secure landfills.

29. Mongolia does not have treatment or disposal options for hazardous and toxic waste generators. New, environmentally safe disposal site(s); waste exchanges; treatment facilities; and reuse options are needed. Regional treatment (in the People's Republic of China) is also an option. To encourage private sector solutions requires investigation into financing mechanisms, incentives, and regulations.

F. Country Environment Assessment

30. In 2004, as an input to the 2005 CSP, ADB prepared a country environment assessment (CEA)¹⁴ for Mongolia. Below are presented selected relevant environment-related activities recommended by the CEA, together with comments regarding their current applicability.

- (i) Theme 1: Environment Management Capacity—Improved financing of local environmental management. Policies on ecotourism and hunting are currently not supported by hard data about the revenues generated, subsequent use of the revenues, and the economic costs and benefits of these activities. Choices involving grazing, mining, ecotourism, and hunting need to be better informed by appropriate economic valuation of each of these conflicting or complementary options. Here, Mongolia has yet to emulate work done in a number of other ecotourism and hunting-dependent economies.
- (ii) Theme 2: Urban Environmental Concerns
 - (a) Implementation of wastewater management strategy in Ulaanbaatar City—Japan International Cooperation Agency is now funding a wastewater master plan, and the World Bank has shown some interest. ADB may consider working with both and possibly look at financing an industrial, green estate.
 - (b) Solid (and hazardous) waste management in Ulaanbaatar—The city needs to upgrade and/or relocate its landfills. There may be a CDM opportunity at one or two of the current landfills.
- (iii) Theme 3: Water Management— Irrigation and water conservation should be built into urban and agriculture lending.
- (iv) Theme 4: Land Degradation/Forest Management—Mechanisms developed under the Central Asian Country Initiative for Land Management or ADB/GEF Partnership for Land Degradation in the PRC should be closely followed for possible applicability to Mongolia.
- (v) Theme 5: Energy, Climate Change—Consider use of the CDM in support of greater energy efficiency; alternative energy such as solar (Mongolia has one of the highest incidences of sunny days) and wind; and landfill gas.

¹⁴ Ruzicka, Ivan (consultant). 2004. *Mongolia Country Environment Assessment*. Manila.