



Environmental Monitoring Report

Project Number: 40634-013
February 2019

PRC: Inner Mongolia Autonomous Region Environment Improvement Project (Phase II) (July to December 2018)

Prepared by Inner Mongolia Project Management Office and Energy and Environment
Development Research Center

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Asian Development Bank



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Submit by: Inner Mongolia Autonomous Region PMO
Prepared by: Energy and Environmental Development Research Center

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I. INTRODUCTION

A. Report Purpose and Rationale

EMP is very important, as an unnecessary part of Environmental Impact Assessment (EIA) report, proposes the necessary and appropriate mitigation measures, institution arrangements and environmental monitoring requirements for each phase of the project. It aims to monitor and ensure: (i) the requirements in accordance with environmental regulations; (ii) reduce potential adverse environmental impacts; (iii) implementation of environmental protection promise. To ensure the continuous implementation and improvement of EMP during project construction and operation, the project executing agency (EA) is required to compile the semi-annual environmental progress report, to describe the EMP implementation, environmental compliance and the improved measures. The reporting period of this report is from July to December 2019.

B. Project Components and Implementation Progress

The project components include 7 components: Hohhot, Baotou, Chifeng City, Harqin Banner, Xingan Meng Zhalaiteqi and Keyouqianqi central heating projects and Xingan Meng Keyouqianqi gas projects. The overall structure of this project has been changed when some subprojects quitted and local municipalities applied adjustments. In July 2013, Asian Development Bank (ADB) agreed the adjustments after the assessment of an ADB Review Mission. The two heating projects of original Harqin Banner and Keyouqianqi and gas project of Keyouqianqi applied to quit the project, increased three new heating components of Xingan Meng Arxan City, Tuquan County, and Chifeng City Wngniuteqi.

The project intends to change in July 2016: the cancellation Wengniuteqi component, new second heat source plant expansion project in Xingan Meng Zhalaiteqi and Hohhot heating network and boiler room expansion project.

The objective of this project is to improve the living environment of Hohhot, Baotou, Chifeng and Xingan Meng (Zhalaiteqi Inder Town, Tuquan County, Arxan Yi'ershi Town) and improve the institutional management capacity. The long-term and overall objectives of this project do not change in spite of somewhat adjustment.

The project total investment is about \$3.6831 billion, of which using the ADB loan of \$150 million, the remaining funds (about \$2.1831 billion) are from the municipal government budget and domestic commercial loans. The ADB loan will be used for construction, equipment, consulting services, training, construction period interest and finance charges, the government will provide the cost of land acquisition and resettlement, taxes and contingencies. The project implementation period is five years, from 2010 to 2014. According to the actual situation of the project, the loan closing date has been adjusted to Dec. 31 2018. The proposed project consists of four prefecture-level cities (Meng) in seven cities and towns of seven sub-projects, including Chifeng Wengniuteqi decided to quit. See the component description and implementation progress (by the end of December 2018) in the below table (**Table 1**).

Table 1: Subprojects Implementation Progress

Subprojects	Description of Outputs	Implementation Progress
Hohhot		
Hohhot heating network and boiler room expansion project	<ul style="list-style-type: none"> (i) Extension of 4 boiler rooms (rely on the bridge area G zone, Zhaojun village area F zone, Tuanjie community E zone, Nama Temple M zone), capacity expansion of boiler room (one unit of 3 × 58MW, 2 units of 3 × 29MW and one unit of 1 4 × 29MW) and ancillary facilities; (ii) New Class I pipeline of 41.13km, 303 km of pipe network transformation; (iii) 94 thermal stations; (iv) Close 144 small boilers. 	Completion of coal to gas boiler room: 1x29MW+2x46MW, 1, 1x29MW,2, laying of the primary and secondary pipe network about 20660 meters (pipe groove leng about 8400 meters); Upgrading 106 sets of heat exchanger units and ancillary equipments; new United Community Heat source Plant two sets of dedusting desulfurization facilities; one New Unite community heat source plant dry coal shed.
Baotou		
Baotou central heating expansion Project	<ul style="list-style-type: none"> (i) New heating pipes of 4. (ii) Transformation of 7 heating pipelines. (iii) New 54 thermal stations. (iv) The transformation of the old thermal stations 251, and expansion of existing schedule and monitoring system. (v) Transformation of 2 plants heat circulation pump, increase frequency control devices. (vi) Close 164 small boilers. 	All 11 main lines construction and renovation work have been completed; New construction of 52 heat exchanger stations, and the renovation of 251 Heat exchanger stations have been completed, complete 2 heat source plant recycling pumps, increase the conversion of variable frequency speed control device.
Chifeng		
Chifeng central heating network expansion project	<ul style="list-style-type: none"> (i) Construction scale is the new heating area of 24.20 million m²; (ii) New heating pipe network of 91.3km; (iii) 118 thermal stations, transformation of 76 thermal stations; (iv) The new heating network control center; (v) Close 37 small boilers. 	Already has completed the new heating pipe network 68 kilometers, 93 new Heat exchanger Stations, 60 renovation Heat exchanger Stations, and 1 New Heat network control centre.

Subprojects	Description of Outputs	Implementation Progress
Chifeng Wengniuteqi Wudan central heating project	(i) 2 New boilers, capacity 92x4=368 (MW). (ii) 15 thermal stations. (iii) 7.4 km of Heating pipeline.	Project Exit.
Xingan Meng		
Xingan Meng Zhalaiteqi Inder Town Central Heating Project	<p>Xingan Meng Zhalaiteqi Inder Town Central Heating Project (hereinafter referred to as First Heat)</p> (i) new 4×29MW chain grate stoker boiler, (ii) new Class I hot water pipe network of 9.252km (tube length), (iii) 20 thermal stations (27 units), (iv) Close 31 small boilers. <p>New Second Heat Source Plant Expansion Project in Xingan Meng Zhalaiteqi (hereinafter referred to as Second Heat)</p> (v) Heat source plant: build a new 3 x 58 + 1 x 29 MW chain discharge hot water boiler room. (vi) Pipe network: build new Class I hot water pipe network of 14.6km (tube length). (vii) new 22 thermal sub-stations (32 units). (viii) Close 27 small boilers.	<p>First Heat</p> <p>The project contains five packages, three international packages (two goods, a civil engineering) and two domestic packages (goods, a civil engineering), purchase has been completed. A 4×29MW boiler room, 20 heat exchanger stations and a total length of 18.5 kilometers of pipe network have been done and have been put into operation.</p> <p>Second Heat</p> <p>(i) There are two contracts. Contract of Boiler, Fan, Dust Removal and Desupphurization Equipment (ZLT-EP-06) and Contract of Heat Exchange Units Contract and ancillary equipment (ZLT-EP-07) were signed on August 25, 2017 and the procurement has been completed.</p>

Subprojects	Description of Outputs	Implementation Progress
Xingan Meng Tuquan Heating Expansion Project	<ul style="list-style-type: none"> (i) new 2×52.5 MW hot water boiler; (ii) one unit of 4 × 20MW absorption heat pump station; (iii) 24.7km of heating pipeline, 11.07km of integrated management ditch; (iv) 13 thermal stations; (v) the corresponding ancillary works; (vi) Close 33 small boilers. 	<p>The main plant building is completed, the equipment order is completed, and installation in succession, planning to complete the installment before heating, and put into operation, laying heating pipe network has been basically completed.</p>
Xingan Meng Arxan Yi'ershi "coal-to-wood"Central Heating Project Phase I	<ul style="list-style-type: none"> (i) Construction scale is the new heating area of 0.615 million m², (ii) new 3×14MW boiler room, (iii) 13.998km of heating pipe network, 6.994km of integrated management ditch; (iv) 13 thermal stations; (v) the corresponding ancillary works; (vi) Close 39 small boilers. 	<p>The main plant building is completed, the equipment order is completed, and installation in succession, planning to complete the installment before heating, and put into operation, laying heating pipe network has been basically completed.</p>

II. RESPONSIBILITIES OF ENVIRONMENTAL MANAGEMENT INSTITUTIONS AND IMPLEMENTATION STATUS

A. Environmental Management Institutions and the Responsibilities

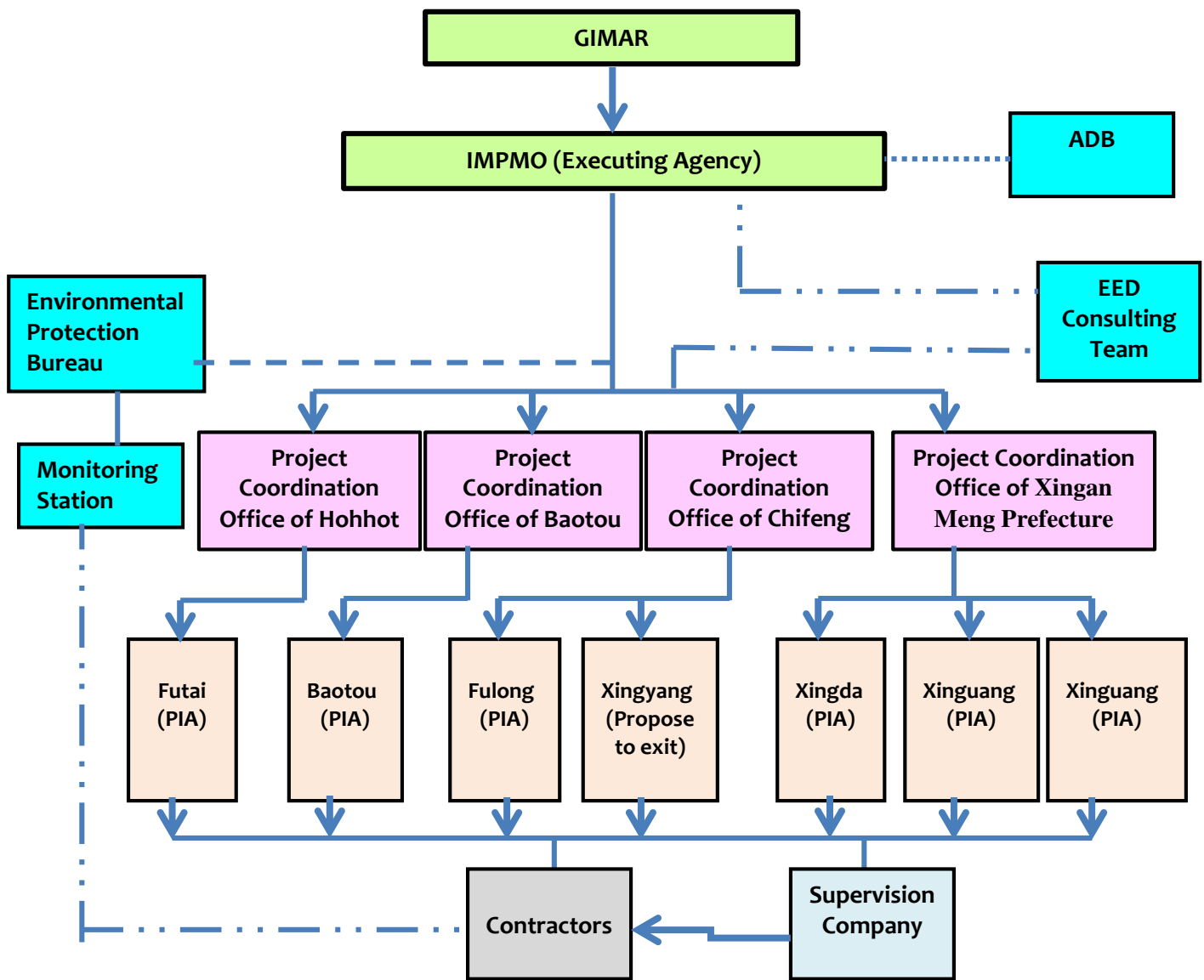
GIMAR is the EA of this project. And GIMAR has set up a project leading group, responsible for providing policy guidance and overall coordination in the implementation period of the project. Also, it has established a project management office (hereinafter called PMO) on behalf of the government, which is responsible for coordinating the implementation of project activities. PMO is responsible for the overall implementation of EMP. A qualified environmental official has been appointed in order to effectively manage all the activities in the EMP.

Each of the IAs has set up an environmental management team, including a leadership and the appropriate number of personnel, to coordinate the environmental problems with contractors, construction supervision companies and IMPMO. The environmental management group will get technical support of environmental expert, and accept the supervision of the local environmental protection bureau. The environmental engineers of construction supervision companies entrusted by each IA are responsible for the daily inspection, construction site supervision and assessment of mitigation measures.

Contractors are responsible for the implementation of the mitigation measures and monitoring under the support of construction supervision companies in accordance with the principle of EMP; and IAs is responsible for the implementation of mitigation measures and monitoring in the operation period.

The local Environmental Protection Bureau and the environmental monitoring station of each subproject will supervise the implementation and effectiveness of environmental protection measures by random monitoring, on-site inspection, to make construction projects comply with environmental standards and regulations in China. On behalf of the local environmental protection bureau, Environmental monitoring station will monitor and inspect the environmental situation, in accordance with the Chinese regulation. The local environmental protection bureau and environmental monitoring station will provide opinions and suggestions from time to time. ADB is responsible for overall environmental performance supervision project. ADB will also publish the project monitoring report on its website. ADB will review the semi-annual environmental progress report submitted by IMPMO and due diligence of the project during the inspection of environmental problems. If the EA and IA could not satisfy the requirements of environmental initial examination and safety policy, ADB will require corrective measures and inform the EA (IMPMO) to take follow-up action. According to the above arrangements, the environmental management responsibilities of each agency are formulated, to ensure implementation of the requirements of EMP. Institutional arrangements and responsibilities formulation positively respond to requirement of the Project Agreement and regulations of the EMP, in full compliance with the EIA report described during the preparation of the project.

The chart of environmental management institution of the project is shown in **Figure 1**. And responsibilities of each environmental management institution are shown in **Table 2**.



legend: supervision  coordination  cooperation  consultation and feedback 

Figure1: Environmental Management Institutions of IMAR

Table 2: Responsibilities of Environmental Management Institutions of IMAR

Name of Institutions	Main Responsibilities
Project Leading Group	To provide guidance and policy guidance during the implementation of the project in the project; to review progress in the implementation of the project and to take additional measures if necessary.
ADB	To supervise the overall project environmental performance, review semi-annual environmental progress report, announce project monitoring report on the ADB website, due diligence of environmental problems during the inspection items.
IMPMO	To entirely implement the EMP with the support of the consulting experts and IAs, to coordinate with the Inner Mongolia Department of Finance, IAs, contractors, tendering company, consulting experts and other governmental authorities.
PIAs	To establish environmental management group, provide supervision to the construction supervision company, to submit monthly report to IMPMO, to cooperate with design institute and the Tendering Company, to prepare tender documents, ensure the inclusion of environmental protection clause.
Local Environmental Protection Bureau and Monitoring Station	According to environmental management and monitoring plan, to start the regular and random monitoring and on-site inspection in construction period and operation period, supervising implementation and effectiveness of the environmental regulation measures, make construction projects comply with environmental standards and regulations in China, and discharge standards, regularly or irregularly provide opinions and suggestions.
Supervision Company	Responsible for daily inspection, each construction site supervision and assessment of mitigation measures.
Environmental Specialists	For the implementation of EMP, to provide technical guidance for IMPMO and the PIAs; to provide training for the PMO, IAs and construction supervision company. To help the PMO prepare the environment semi-annual progress.

B. Arrangement on Environmental Requirements in Project Contract

GIMAR is the EA of this project. And GIMAR has set up a project leading group, responsible for providing policy guidance and overall coordination in the implementation period of the project. Also, it has established a project management office (hereinafter called PMO) on behalf of the government, which is responsible for coordinating the implementation of project activities. PMO is responsible for the overall implementation of EMP. A qualified environmental official has been appointed in order to effectively manage all the activities in the EMP.

According to the Project Agreement, safeguard policy and monitoring actions in EMP are required in the tender documents as the terms the contractor must pledge to implement and would be incorporated into the civil contract for each program.

Table 3: Each Component Environmental Requirements in the Contractual Arrangements

Component	Bidding Documents	Contract
Hohhot Heating Network and Boiler Room Expansion Project	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP
Baotou City Central Heating Expansion Project	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP
Chifeng Urban Central Heating Pipe Network Expansion Project	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP
Xingan Meng Zhalaiteqi Inder Town Central Heating Project	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP
Xingan Meng Tuquan Heating Expansion Project	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP
Xingan Meng Arxan Yi'ershi "coal-to-wood" Central Heating Project Phase I	Incorporate into the safeguard policy and monitoring actions in EMP	Incorporate into the safeguard policy and monitoring actions in EMP

III. COMPLIANCE OF PROJECT ENVIRONMENTAL COVENANTS

The environmental covenants of the project in EMP have been or are about to perform. The implementation performance is shown in **Table 4**.

Table 4: Implementation of the Project Environmental Covenants

Covenants of the project correlated to EMP	Reference	Implementation Performance
Safeguard Policy		
GIMAR should ensure that the owners (i) according to the national and local environmental laws, regulations, procedures, and guidelines; and (ii) according to Environmental Policy Safeguard Policy (2009) and the Environmental Assessment Guidelines (2003) to design, construct and operate the project.	The 10 th paragraph of Execution of Project.	about to perform
The constructed boilers in the project should achieve the prescribed standards for pollutants discharge of Word Bank Pollution Prevention and Abatement Handbook (1998, Washington, DC).	The 10 th paragraph of Execution of Project.	about to perform
During the construction period of the project, submit two environmental progress reports annually and submit one report every two years in the operation period.	The 10 th paragraph of Execution of Project.	The present report is the Seventh environmental progress report.
The EMP in IEE (including mitigation measures, monitoring plan and institutional arrangements) should be updated in the project planning stage, in accordance with the tender documents and construction contract.	The 10 th paragraph of Execution of Project.	According to the due diligence report of Zhalaiteqi new subprojects and Hohhot coal-to-gas project, revised "Environmental Management Plan", due to the due diligence report and this report submitted with at the same time, so far the update time has not yet been confirmed.
GIMAR should ensure owners close 383 small coal-fired boilers in the subprojects region, and further confirm these small coal-fired boilers would not be reused in other places.	The 4 th paragraph of Execution of Project.	about to perform
Each of the subproject owners need to establish a security department, to coordinate environmental and management issues of immigration during construction and operation periods.	Item 44 of VIII Chapter B in EMP	about to perform

IV. IMPLEMENTATION OF ENVIRONMENTAL MITIGATION MEASURES AND COMPENSATION MEASURES

As shown in **Table 1**, "Subproject Implementation Progress," until the submit time of the report, each subproject of the civil works have been started, Xingan Meng Zhalaiteqi Inder Town Central Heating Project- First Heat and Baotou Central Heating Expansion Project has been completed and operated well, the remaining subprojects are under construction.

Table 5: Each Subproject Civil Engineering Progress and Implementation of Environmental Mitigation Measures and Compensation Measures (up to December 2018)

Subproject	Civil Engineering Progress	Implementation of Environmental Mitigation Measures and Compensation Measures
Hohhot Heating Network and Boiler Room Expansion Project	(i) Complete the coal-to-gas boiler room: one unit of 1×29MW+2×46MW, two units of 1×29MW (ii) Tuanjie desulfurization tower and dust is under construction.	Committed
Baotou City Central Heating Expansion Project	Basically completed	Committed
Chifeng Urban Central Heating Pipe Network Expansion Project	Completed the Class I heating pipe network is 32.875km, completed the program of 36%.	Committed
Xingan Meng Zhalaiteqi Inder Town Central Heating Project	First Heat: one boiler room and 4 thermal stations was built and put into operation. Second Heat: Boiler room has been built and put into trial operation.	Committed
Xingan Meng Tuquan Heating Expansion Project	The main plant building is completed, the equipment order is completed, and installation in succession, planning to complete the installment before heating, and put into operation, laying heating pipe network has been basically completed.	Committed
Xingan Meng Aershan Iershi "coal-to-wood" Central Heating Project Phase I	The main plant building is completed, the equipment order is completed, and installation in succession, planning to complete the installment before heating, and put into operation, The owner has drawn up a specific plan for commissioning, laying heating pipe network has been basically completed.	Committed

EMP of this project provides clear content and requirements of environmental management, environmental mitigation measures and compensation measures (see **Table 6**). According to

monitoring information monitored by external monitoring station and site visits of environmental consulting experts, the basic execution of each subproject mitigation measures in **Table 6**.

Table 6: Summary of Project Potential Impacts, Mitigation Measures and the Implementation of the Present Status (up to Dec. 2018)

Types	Potential Impacts	Mitigation Measures and Safeguard Policy	Responsible Party		Cost Estimate (CNY, 1000)	Sources	Implementation Status
			Implementation Party	Supervision Party			
A. Before Construction							
Design of mitigation measures and facilities	Subproject location and route selection	Confirm the location of the heat supply plant and heating pipeline route selection, to avoid or minimize the adverse impact on the surrounding environment and community. According to research during the preliminary selection, the proposed change the location of the station will be confirmed and designed again, as far as possible away from environmentally sensitive points, such as schools, hospitals, residential buildings.	Design Institute and IAs	IMPMO		Included in the design contract	➔Complied with
	The mitigation measures and monitoring plans included in engineering design	To all the subprojects, environmental mitigation measures of IEE and domestic EIA reports will be	Design Institute	IMPMO, IAs, Local Environmental Protection Bureau		Included in the design contract	➔Complied with

		<p>incorporated into the engineering design documents and tender documents. It will also be included in the civil construction and equipment installation contract documents.</p> <p>All contractors must strictly abide by EMP.</p> <p>The environmental monitoring plan will be incorporated into the project design, to ensure the environmental impacts and supervise construction and operation activities in accordance with the approval of the EIA reports.</p>					
	Waste and spoil disposal site	Consider the suitable spoil disposal site in engineering design.	Design Institute and IAs	Local Environmental Protection Bureau, IMPMO		Included in the design contract	→Complied with
Bidding and contract signing	Preparation of the tender documents and contract documents	Put the mitigation measures of EMP and EIA into the tender and construction contract	Design Institute and IAs	IMPMO, Local Environmental Protection Bureau		Included in the design contract	→Complied with

		documents of all the subprojects.					
Complaint settlement mechanism	Establish operational complaint settlement mechanism	In the IA office, it needs to establish project public complaints department, provide training for department personnel and the public and open the department telephone, fax and the email address.	IAs	IMPMO , Local Environmental Protection Bureau		Included in the business budget of IAs	➔Complied with
B. Construction Phase							
Soil	Soil erosion caused by construction activities	In the mining ditch and some infrastructure projects, as far as possible to reduce the use of active excavation, construction of suitable compaction technology. In the rainy and windy day, limit construction and material handling activities. To restore all the surface damage as soon as possible, after completion of construction site earthwork, not more	Contractor, Construction Supervision Company	IAs, Local Environmental Protection Bureau, IMPMO	680	Included in the construction contract	➔Complied with

		<p>than 14 days. Plant grass and trees in the heat source plant, to reduce soil erosion as far as possible. Suitable slope or vegetation restoration, such as trench after compaction. Build appropriate temporary construction camp and storage space, as far as possible to reduce the effects of soil erosion and land occupation.</p>					
	Soil pollution	<p>After the security and the coverage of the site of impervious ground, proper storage of petroleum products, chemicals, and hazardous waste, prevent soil pollution. By adopting the best management practices, to prevent oil and chemical spills, avoid direct contact with the soil. Safely clean away all construction waste</p>	Contractor, Construction Supervision Company	<p>IAS, Local Environmental Protection Bureau, IMPMO</p>	340	Included in the construction contract	<p>Oil and other hazardous chemicals storage site is not impermeable → Complied with</p>

		from the construction site, only in the waste disposal sites approved. In the construction site, provide spill cleanup measures and equipment, and require the contractor to leak emergency response procedures and training.					
Sewage	Surface water and groundwater polluted by construction waste water and sewage	To build sewage interception ditch, prevent the rainwater runoff into the construction site, construction site drainage runoff from the drainage system in the existing. In all construction equipment cleaning area, construct the sewage collection tank and sedimentation tank. Build sewage treatment and disposal system in the construction site, and provide appropriate maintenance and training. According to the	Contractor, Construction Supervision Company	IAS, Local Environmental Protection Bureau, IMPMO	1000	Included in the construction contract	Construction period of pipe trench excavation is short, and most of them are in the urban areas, the construction site is not set interception ditch, but sandbags for flood control also played a sewage interception effect. Inner Mongolia, the rainy season is short, less rainfall, and all the construction period avoid the rainy season, the heat source plant earthwork construction site has not been set

		monitoring plan, during the construction period, in each sub project city, monitoring of river water quality parameters is needed by local environmental monitoring station (SS, COD, Oil).					interception ditch. the river is far away from the construction site, during the construction the river water quality is not monitored.
Noise	Noise from the construction machinery operation and transportation activities	<p>Ensure the noise level from the equipment and machinery in accordance with the applicable national standards, and maintain the machines, as far as possible to reduce noise.</p> <p>Use the noise abatement device or method in piling equipment operation in the 500 meters away from the field with sensitive points (such as schools, hospitals and residential areas). No rock crushing, concrete mixing and similar activities</p>	Contractor, Construction Supervision Company	IAS, IMPMO, Local Environmental Protection Bureau	1000	Included in the construction contract	→ Complied with

		<p>within 1km radius of sensitive areas.</p> <p>In order to reduce the noise at night, to limit the high noise of mechanical operation.</p> <p>In the construction activities of the notice, take the inclusion of noise into considerations. Public complaints resolution information processing program.</p> <p>When necessary, during the construction, the noise source could be installed around the temporary sound barrier.</p> <p>Regularly monitor noise sensitive areas. If the noise exceeds the standard, check the construction equipment and construction conditions and take mitigation measures</p>					
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		to improve. Quarterly visit the construction site nearby residents, to determine whether there is a community complaint about noise, for the community residents to reduce noise intrusion suggestions.					
Noise	Noise from heat source plant (Coal, fan, air compressor and water pump)	Installation of equipment, sound insulation barrier or sound insulation cover, to reduce noise. Plant green belt around the heat source plant, further reducing noise. Install sound insulation cover and double window. Install sound insulation cover for boiler and fan and sound insulation cover for the motor, to reduce noise.	Equipment supply and installation contractor, IAs	Local Environmental Protection Bureau, IMPMO, Environmental Monitoring Station Consulting company	1400	Included in the equipment supply and installation contract	→Complied with
	Noise from HES	Install sound insulation cover and double window. Maintain the pump	Equipment supply and installation contractor,	Local Environmental Protection Bureau	1500	Included in the equipment supply and installation	→Complied with

		and other equipment from time to time, as far as possible to reduce noise.	IAs	IMPMO		contract	
Vibration	Vibration of compaction and rolling production	No vibration operation at night (such as compaction, trench piling and road rolling operation etc.)	Contractor, Construction Supervision Company	IAs, IMPMO, Local Environmental Protection Bureau		Included in the construction contract	→Complied with
Gas	Dust from the construction activities	If there is dust on the construction site, use handling route sprinkler. Pay special attention to sensitive points near the dust, such as hospitals or schools, residential area. Cover the transport vehicle, especially fine particulate material in order to avoid falling or generate dust. The storage of oil or other hazardous substances in suitable locations and coverage, as far as possible to reduce dust.	Contractor, Construction Supervision Company	IAs, IMPMO, Local Environmental Protection Bureau	850	Included in the construction contract	→Complied with
	Atmospheric emissions from vehicles	Ensure that the equipment complies with the relevant	Contractor, Construction Supervision	IAs, Local Environmental	800	Included in the construction	→Complied with

	and construction equipment	national standards for emissions. On vehicles and construction machinery for high standards to ensure efficient operation and maintenance, fuel combustion, and in accordance with Chinese emission standards.	Company	Protection Bureau, IMPMO		contract	
Solid waste	Solid waste by construction activities	Waste water from temporary storage or other environmentally sensitive areas, regularly transported to landfill or approved by the designated dumping site. Provide appropriate waste in the construction site storage container. Hire a qualified contractor, in accordance with the appropriate internal procedures, and transport all waste to the construction site from the approved disposal site. At the end of the construction, the contractor will be	Contractor, Construction Supervision Company	IAs, Local Environmental Protection Bureau, IMPMO	900	Included in the construction contract	→ Complied with

		<p>responsible for the construction site of the residue materials, waste and contaminated soil removal and disposal right.</p> <p>After these substances were removed, start pavement or planting as soon as possible, to protect and stabilize the soil.</p> <p>Prohibit the burning of waste in the construction site nearby.</p>					
	Hazardous substances and pollutants by construction activities	<p>Formulate and implement hazardous substances and pollution treatment and disposal plan of building materials, including leakage prevention and emergency plan.</p> <p>Storage facilities, fuel oil and other hazardous substances should be located in a safe area of impervious surface, and is equipped with a cofferdam and</p>	Contractor, Construction Supervision Company	IAs, Local Environmental Protection Bureau, IMPMO	420	Included in the construction contract	→ Complied with

		<p>cleaning device. Vehicles and equipment should be placed in the designated area, to prevent soil and surface water pollution. The proper maintenance and fuel for vehicles, machinery and equipment, so that the material will not spill into the soil.</p> <p>Fuel supply contractors must have appropriate qualifications. They must comply with the fuel transport protocol and dangerous or hazardous goods transport and handling Regulations (JT 3145F1).</p>					
	Small boilers sites	Before the demolition of small boilers, under the supervision of the local environmental protection bureau, the IAs and local environmental			300		→ Complied with

		<p>monitoring station should investigate the small boilers. The evaluation includes soil, groundwater, and surface water structures (if nearby pollution).</p> <p>If the environment is polluted, the bank must refer to the construction and demolition of the environment, health and safety guidelines, formulate the site recovery plan, and supervision in the local environmental protection bureau by the implementing agencies to follow up.</p> <p>After the approval of the Municipal Environmental Protection Bureau, the municipal landfill or special construction and demolition landfill disposal of demolition waste.</p>						
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		Strictly prohibit the wastes in the river or other water disposal.					
Animals and plants	Vegetation protection, the destruction of the vegetation restoration area; planting and compensatory planting and grass.	Protect the existing vegetation in the area without construction and take temporary measures to protect the vegetation in the area under construction activities in future. Conduct trench backfill and compaction and proper re planting, after thermal pipeline laying. Protect the existing trees and grass during construction. If you have to remove trees or destroy the grass, restore the vegetation at the end of the construction. In accordance with the regulations for Chinese forestry, affected trees and vegetation, is the same or greater compensatory planting area.	Contractor, Construction Supervision Company	IAs, Local Environmental Protection Bureau, IMPMO	220	Included in the construction contract	→Complied with
Community	Traffic	In the construction	Contractor,	IAs,	660	Included	→Complied with

intrusion and security	congestion and accidents, impacting public facilities.	project, the contractor should consider the impact on traffic. Formulate the traffic control and operation plan, and get agreement by the local traffic management departments, before commencement of construction. Plan for the construction activities, as far as possible to reduce the service of public facilities infestation. Open the information of the project and let the affected people understand the construction activities and services of public facilities caused by infestation. Make a plan before the construction of temporary land use, as far as possible to reduce the impact of. After construction, restore to the original state area.	Construction Supervision Company	Local Traffic Bureau, IMPMO		in the construction contract	
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		Take safety measures in the construction site, to protect the public, including warning signs, warning the public security risk, potential barrier, organization of public access to the construction site.					
Occupational health and safety	Health damage and accidents caused by construction activities	Identify and minimize potential risk factors caused by the workers. Provide preventive and protective measures, including dangerous conditions improvement, replacement or elimination. Provide personal protective equipment suitable for workers, as far as possible to reduce the risk, including the earmuffs, safety helmet and safety boots. Provide adequate safety protection equipment, including fire control system. Provide adequate	Contractor, Construction Supervision Company	IAS, Local Environmental Protection Bureau, IMPMO	600	Included in the construction contract	→ Complied with

		<p>identification in hazardous areas. According to construction site noise standard of China (GB125232011) and international guidelines, provide exposure limit in high noise or high temperature working environment program.</p> <p>Provide training for workers, develop appropriate incentive measures to comply with health and safety procedures, the use of personal protective equipment. Provide training for workers on storage, handling and disposal of hazardous wastes. For the occupation accidents and diseases, provide recording and reporting procedures. Provide emergency response arrangements. Held a security</p>						
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		meeting before the appointment of each class.					
Cultural heritage resources		In accordance with the China regulations, strictly prohibit site destruction, concealment or hinder. If new sites are discovered, you must immediately stop the construction, immediately notify the implementation mechanism and the local cultural relics bureau.Only after the thorough investigation and obtaining license of the relevant institutions, resume construction.	Contractor, Construction Supervision Company	IAs, IMPMO	90	If the cultural relics were found, direct compensation to the contractor comes from special funds for the protection of cultural heritage.	➔Complied with
		Subtotal	11060				
C Operation Phase							
Air quality	Need to monitor emissions and ensure compliance	To start emission test and acceptance of environmental protection and correct continuous emission monitoring system.	Environmental Monitoring Station	Local Environmental Protection Bureau	150	Included in the operation budget of IAs	Currently, only Zhalaiteqi subproject of the heat source plant completes the construction, but due to the current technical innovation, it

							cannot be confirmed.
	Need to control the air pollution from the heat source plants	Proper operation and maintenance of emission control facilities (desulfurization, denitrification and dust removal equipments). Properly operate and maintain continuous emission monitoring system.	IAs	Local Environmental Protection Bureau	3000		Currently, only Zhalaiteqi subproject of the heat source plant completes the construction, but due to the current technical innovation, it cannot be confirmed.
	From coal dust and ash treatment	Use coal unloading sprinkler during transport and road dust suppression. Spray water in the coal heap, especially a windy day. In accordance with the requirements of coal heap compaction, as far as possible to reduce the possibility of spontaneous combustion air into, and the loss of volatile substances. The ash transported from the heat source to the building materials factory users when using closed trucks or on	IAs	Local Environmental Protection Bureau	2200	Included in the operation budget of IAs	→Complied with

		the ash covered.					
Noise	Noise from coal, fan, air compressor and water pump, impacting listening	The heat source plant and heat exchange station will have appropriate building insulation, to avoid noise pollution. The implementation of restricted access, provide personal protective equipment for the high noise areas of workers, such as earmuffs and earplugs.	IAs	Local Environmental Protection Bureau	10	Included in the operation budget of IAs	→Complied with
Solid Waste	<p>Flying ash and slag without appropriate management may affect soil and water quality.</p> <p>Removal of the boilers without proper management, may affect the soil, air and water.</p>	<p>Fly ash and slag all will be at the scene of the temporary storage, and then transported to the local building materials factory, as building material or road materials.</p> <p>Do not allow for permanent disposal of fly ash in the field. All the dismantling of waste will have appropriate qualifications waste management company for regular collection and reuse (such as equipment, steel and other</p>	IAs	Local Environmental Protection Bureau	300	Included in the operation budget of IAs	→Complied with

		<p>metals; recycled wood and building materials, etc.) or in the allowable waste facilities for final disposal (such as non recyclable materials). In consultation with local authorities, conduct the waste management. The landfill and waste incineration in the demolition site are not allowed. In consultation with the local environmental protection bureau, on-site pollution investigation, if necessary, will make specific plans to solve on-site pollution. Soil contamination will be transported to the approved sites, providing clean filling. According to the suitability of the future, restore the scene. The local environmental protection bureau will</p>					
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		<p>approve a recovery plan, and if necessary for recovery.</p> <p>The stove owners would get waste management services if they selected to remove the household coal stove.</p>					
Sewage	Water pollution and reuse from heat source plant	<p>The heat source plant sewage treatment and reuse will be in heat source plant.</p> <p>All heat plant living facilities sewage will be discharged into the municipal sewage pipe network to meet the relevant standards of the China. The runoff from the heat source plant will be discharged into the sedimentation tank, where possible, sewage will be back to dust.</p> <p>According to the requirements, the sediment in the sedimentation pond will be cleaned and</p>	IAs	Local Environmental Protection Bureau	1330	Included in the operation budget of IAs	→Complied with

		<p>transported to the landfill. For the regional emissions of oily wastewater, it is needed to install oil-water separator before discharging into the sedimentation tank. Collect the site leachate and drainage, and discharged them into the storage tank for water coal storage site.</p> <p>Oily sludge scraping from the treatment process will be collected, and in accordance with the China standard handed over to recovery.</p>					
	From HES	Regularly clean sedimentation tank in municipal landfill for disposal of sludge and sediment.	IAs	Local Environmental Protection Bureau, Environmental Monitoring Station	690	Included in the equipment supply and installation contract	→Complied with
	Backwash water from HES	In each heat exchange station, buildregulation tank and sedimentation tank. Before the	Equipment supply and installation contractor, IAs	Local Environmental Protection Bureau IMPMO	670	Included in the equipment supply and installation	Backwash water appears as clean water in domestic EIA, and therefore most of backwash

		backwash water discharging into the municipal sewage pipe network, conduct pH adjustment and precipitation (SS ≤ 400 mg/L).				contract	water of thermal station directly discharged into the municipal pipe network after precipitation.
Occupational health and safety	Occupation and community health and safety	Carry out regular inspection of the regional heating network, and the defects were repaired immediately. During the heat exchange station and heating network, as much as possible to reduce the intrusion of the community. Comply with applicable safety regulations for workers.	IAs	Local Environmental Protection Bureau, local Labor Bureau	120	Included in the operation budget of IAs	➔Complied with
Removal of small boilers	Economic exchange	Implement labor allocation plan, to comply with applicable laws and regulations China.	IAs	IMPMO	990	Included in the operation budget of IAs	➔Complied with
		C Part of Subtotal (annually)			9460		
D. Emissions Mitigation Measures							
Atmosphere	Emissions from heat source plant	Set up high chimney emissions and reduce emissions of	Equipment supply and installation	Local and provincial Environmental	22476.8	Included in the equipment	➔Complied with

		<p>a direct impact on the adjacent areas. Install and operate electrostatic precipitator, bag filter or other special control equipment, control of particulate emissions. Use desulfurization technology in fluidized bed boiler. For the large circulating fluidized bed boiler, use wet scrubber, further reduce sulfur dioxide emissions. Install continuous emission monitoring equipment in heat source plant chimney, monitoring emissions of sulfur dioxide and soot. Continuous emission monitoring data will be sent directly to the local and provincial environmental protection bureau.</p>	contractor, IAs	Protection Bureau		supply and installation contract	
		D、 Part of the subtotal			22476.8		
		B、 C、 D Part of the total			42,996.8		

After the implementation of the above measures, the project has not caused any significant environmental impacts. By the end of the reporting period, the implementation of subprojects environmental management plan is considered to be effective and satisfactory.

Consulting environmental experts examined all the subprojects, site management quite well, the photograph of each subproject environmental mitigation measures for the implementation are as follows:

(i) Hohhot Heating Network and Boiler Room Expansion Project



Demolition of Original Small Boilers in Kaoqiao Area



Boiler Room Equipment Maintenance System and Maintainer Job Responsibilities



Fire Extinguisher in the Gas Boiler Room



Warning Signs in Gas Boiler Room



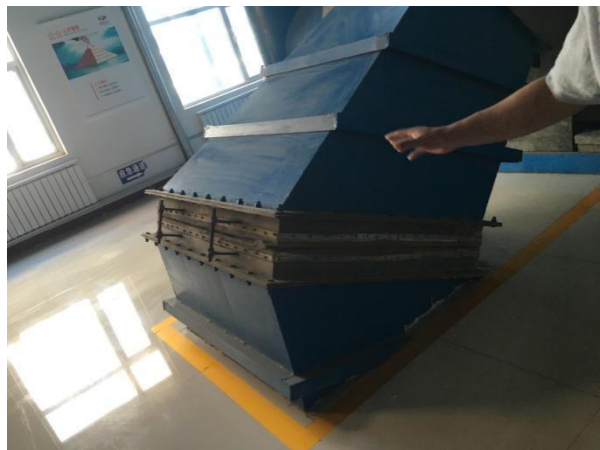
Gas Boiler in the Kaoqiao Area
(Indoor Cleaning)



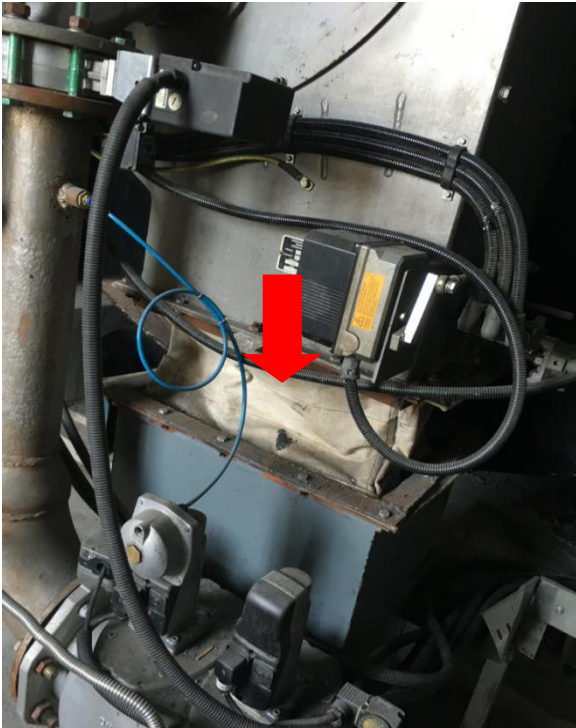
Disabled but not Removed Coal- Fired
Boilers in the Kaoqiao Area (Pollution)



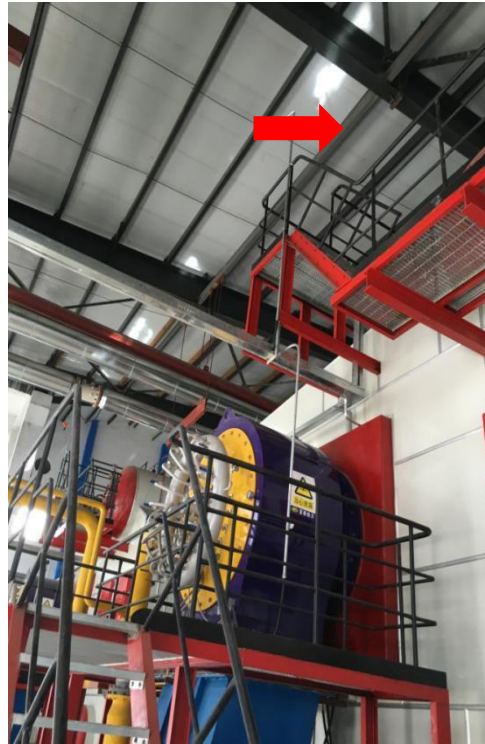
Gas Boiler Room in Motor Region



Vibration Damping Measures of Wind Casing



Flexible Connection of Fan



Gas Leak Detector



Boiler Room Emergency Exit Sign



Warning Signs in the Boiler Room



Tuanjie Community Construction Site Ground Moist



Construction Site Set Retaining Wall



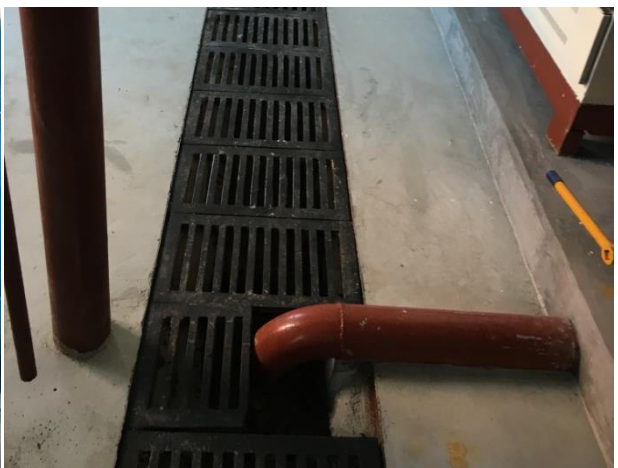
Construction Site Security and Identification System Signs



Secure Channel, Security Signs and Warning Signs



Thermal Stations Vibration Reduction



The Secondary Washwater Diversion

(ii) Baotou City Central Heating Expansion Project



Excavation of the Site Set Hard Channel (Completed)



Urban Construction Site Set up a Temporary Channel (Completed)



Wastewater Discharge Guide System in Thermal Station



Soundproof Window in Thermal Station

(iii) Chifeng Urban Central Heating Pipe Network Expansion Project



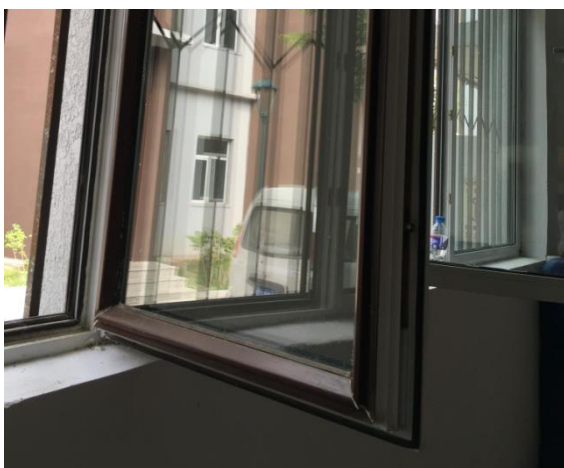
Pipe Laying Set up Warning Signs in Construction Site



Construction Workers Wearing Helmets



Ground Timely Recovery



Set up Soundproof Window in Thermal Stations



Warning Signs in Thermal Stations

(iv) Xingan Meng Zhalaiteqi Inder Town Central Heating Project



First Heat of Hear Source Plant



Greening within the First Heat of Hear Source Plant



Warning Signs and Fire Hydrant in First Heat of Hear Source Plant



Desulfurizer in First Heat of Hear Source Plant
Source Plant



Bag Filter Modification in First Heat of Hear



Coal Storage Yard in First Heat of Hear Source Plant



Desulfurization Two Heat New Source of
Plant Location



New Heat Source Plant East Side



New Heat Source Plant South Side



New Heat Source Plant West Side



New Heat Source Plant North Side

(v) Xingan Meng Tuquan Heating Expansion Project



Heat Source Air Filter Factory



Heat Plant Environmental Billboards



Heat Source Plant Uses the Same
Plant Ash and Fly Ash Cement



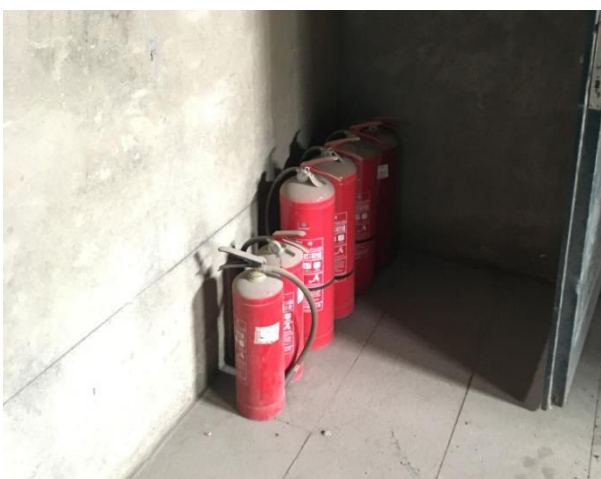
Road Transport Keep Moist



Construction Site Sprinkler



Heat Source Plant Sewage Collection Tank



Construction Site Fire Plug



Bag Filter under Construction



Thermal Station Location



Thermal Stations Damping Measures



Pipeline Construction Site



Removed Small Boiler Room for Temporary Residence

(vi) Xingan Meng Arxan Yi'ershi "coal-to-wood" Central Heating Project Phase I



Heat Source Plant Supplies Spaced Enclosure Alone



Transportation Road Hardening



Heat Source Plant Construction Site
Environmental Protection Slogan



Network Excavation Set up Dust Screen



Construction Staffing with Security Equipment



Disable Small Boilers

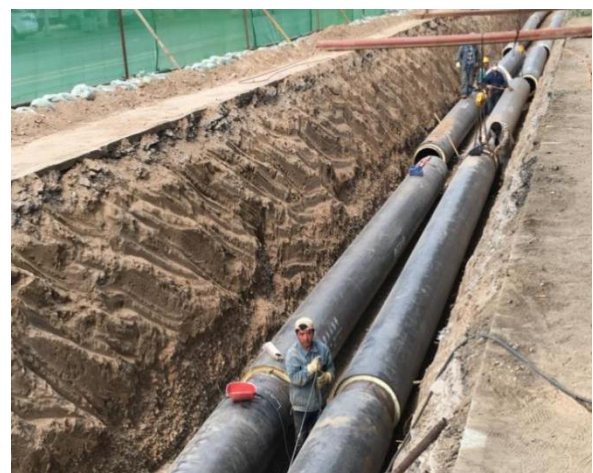
But each subproject has some common problems, garbage collection and processing, oil and other hazardous chemicals and other staging areas for improvement.



Oil and other hazardous chemicals staging wrong way, should be set up between compliance staging ground well seepage.



Placing of building materials is disorder, it should be pile up by classified; construction waste accumulation, it should be timely removal.



Hot weather, some workers do not wear helmets and other security measures, should strengthen publicity and education, to ensure that workers wear security measures.



Team of consultants and Chifeng Owners



Consulting Team of Experts to Inspect the Thermal Stations

V. ENVIRONMENTAL MONITORING RESULT CONCLUSIONS

A. Monitoring plan and responsibilities

As part of environmental management plan (see table 7), environmental monitoring plan include elements such as monitoring parameter, location, frequency, implementer, supervisor, cost and source of funding. Implementation agencies of sub-items are required to earnestly implement all contents of environmental monitoring plan, to facilitate evaluation of: i. the scope of extent of environmental influence; ii. the compliance with relevant laws and regulations; iii. the overall efficiency of environmental monitoring plan. Proper measures would be adopted according to monitoring results.

Table 7: Environmental monitoring plan

Project	Parameter	Location	Frequency	Implementer	Supervisor	Estimated cost (RMB 1000)	Source of funding
During construction							
Waste water	Wastewater mitigation measures review (sewage collecting tank and sedimentation basin, etc)	All construction field	Sewage disposal site, per month	Contractor Construction supervisor	Implementation agency PMO	90	Included in contracts with construction supervisor
	PH, SS, Oil	All construction field	Take sample once a month or once a day	Local environmental monitoring station	PMO Local EPA	30	Included in construction contract
Air	Dust mitigation measures review (water spraying, coverage of transport vehicles, etc.) maintenance of vehicles and construction	All construction field and nearby areas	Per month	contractor Construction supervisor	Implementation agency Local EPA PMO	90	Included in contracts with construction supervisor

	facilities						
	SO2、NO2 和PM	Chimney of heat source plant	Environm ental monitoring during business operation	Environme ntal monitoring station; implement ation agency	Local EPA	60	Included in the facility installation contract
	PM、PM10	All construc tion sites and sensitive points	Per month	Local environme ntal monitoring station	Local EPA PMO	90	Included in the constructio n contract
	SO2、NO2 、PM	Emissio n monitori ng from heat source plant chimney	online	Implement ation agency	Local and provincial EPA	450	Included in the operation budget of implement ation agency
Noise	Leq dB (A)	All sensitive points near construc tion sites	Per month: one day per month; two samples, one taken in daytime and one taken in nighttime	Local environme ntal monitoring station	Local EPA PMO	45	Included in the constructio n contract
Solid construct ion waste	Solid waste	Waste disposal sites	Once per year; after solid waste disposal	Local EPA	PMO	120	Included in the constructio n contract
Dismantl es of small boilers	Garbage	Small boiler house	When small boiler house dismantle s	Local EPA	PMO	100	Implement ation agency
Total						1075	
B. Durin g operation							

Heat source plant emission	SO ₂ , NO ₂ , PM	Sample monitoring by heat source plant chimney	Once per month during heating period	Local monitoring station	Local EPA	45	Included in the operation budget of implementation agency
Dust from Coal and slag storage	PM	One meter away from heat source plant	Once per month during heating period	Local monitoring station	Local EPA	30	Included in the operation budget of implementation agency
Safety and reliability of heating pipeline	Examine regional heating pipeline regularly and repair the defect immediately	Heating pipeline	Once before heating period and once after heating period	Implementation agency	PMO	60	Included in the operation budget of implementation agency
Noise from heat source plant	Leq dB (A)	One meter away from heat source plant	Twice per month during heating period	Local monitoring station	Local EPA PMO	60	Included in the operation budget of implementation agency
Noise from thermal station	Leq dB (A)	One meter away from thermal station	Twice per month during heating period	Local monitoring station	Local EPA Implementation agency; PMO	90	Included in the operation budget of implementation agency
Wastewater from thermal station	SS, BOD	Emission point	Once per month during heating period	Implementation agency	Local EPA; PMO	80	Included in the operation budget of implementation agency
Wastewater and mud from thermal station	Generation and discharge volume	Thermal station	Once per month during heating period	Implementation agency	Local EPA; PMO	20	Included in the operation budget of implementation agency

Total (annual ly)		385	
Grand total		1460	

B. Monitoring result conclusion

Leading group of ADB project in Inner Mongolia autonomous region government and experts in consulting cooperation reaffirmed the importance of monitoring report and made effective progress. So far, 6 sub-items have been carried out.

(1) Hohhot city heating network and boiler house reform and expansion project

On January 5 and January 10, 2017, the owner of this sub-item commissioned Inner Mongolia Lvjie Environmental Monitoring company to monitor the air quality of this sub-item. The monitoring results conform to the "Boiler Air Pollutant Emission Standard" (GB13271-2014). The results of monitoring are shown in the following table (Table 8, Table 9).

Table 8: Atmospheric monitoring results

Monitoring Point	Date	Item	Monitoring result	Standard limit
1#&2# Boiler Drain	2018.12.27	SO2 concentration	13.7mg/m ³	400
		NO2 concentration	165.7mg/m ³	400
		Dust concentration	15.1mg/m ³	80

Table 9: Noise Monitoring Results

Monitoring Date	Monitoring Point Location	Monitoring Result [dB (A)]		Standard Limit
		Daytime	Nighttime	
2017.1.5	East of the factory border 1#	54.4	47.0	Daytime 60dB; Nighttime 50dB
	East of the factory border 2#	54.6	46.3	
	East of the factory border 3#	55.2	46.9	
	South of the factory border 4#	58.6	48.4	
	South of the factory border 5#	58.3	47.8	

South of the factory border 6#	58.7	46.8
West of the factory border 7#	57.7	47.8
West of the factory border 8#	57.3	47.4
West of the factory border 9#	57.1	47.4
North of the factory border 10#	53.3	45.4
North of the factory border 11#	52.7	46.1
North of the factory border 12#	53.1	45.3

(2) Baotou city central heating renovation and expansion project

The owner of this project entrusted Baoto municipal environmental monitoring station to monitor noise of the construction site in Aug, 2014. The result is appropriate to the standard. No further environmental monitoring has been carried out since then. Further environmental monitoring are suggested to carried out to thermal station.

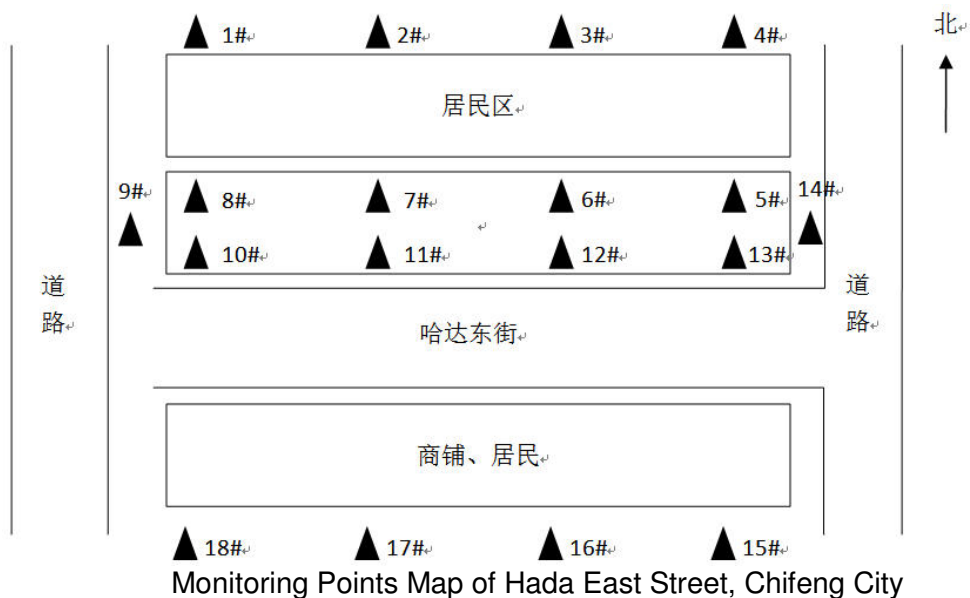
(3) Chifeng downtown central heating network renovation and expansion project

The owner of this project entrusted Beijing Aviation Peak Zhongtian detection Technology Services Co., Ltd. to monitor the noise on the construction site of Chifeng Harbin da Dong Street from August 3, 2016 to August 4, 2016. The result see follows (Table 10).

Table 10: Noise monitoring Results

Item	Monitoring Site	Monitoring Date	Monitoring Result [dB (A)]		Standard Limits
			Daytime	Nighttime	
Hada East Street	North of residential area 1#	2016/8/3	50.4	-	Daytime70dB
		2016/8/4	51.3	-	
	North of residential area 2#	2016/8/3	52.1	-	
		2016/8/4	50.6	-	
	North of residential area 3#	2016/8/3	49.7	-	
		2016/8/4	49.3	-	
	North of residential area 4#	2016/8/3	51.3	-	
		2016/8/4	52.1	-	

North of Construction site 5#	2016/8/3	62.4	-
	2016/8/4	63.5	-
North of Construction site 6#	2016/8/3	64.5	-
	2016/8/4	64.5	-
North of Construction site 7#	2016/8/3	59.8	-
	2016/8/4	61.3	-
North of Construction site 8#	2016/8/3	63.7	-
	2016/8/4	62.9	-
West of Construction site 8#	2016/8/3	60.7	-
	2016/8/4	61.3	-
South of Construction site 10#	2016/8/3	67.4	-
	2016/8/4	68.1	-
South of Construction site 11#	2016/8/3	70.0	-
	2016/8/4	68.9	-
South of Construction site 12#	2016/8/3	67.4	-
	2016/8/4	67.3	-
South of Construction site 13#	2016/8/3	68.1	-
	2016/8/4	69.2	-
East of Construction site 14#	2016/8/3	64.9	-
	2016/8/4	65.4	-
South of Comercial area 15#	2016/8/3	65.1	-
	2016/8/4	64.8	-
South of Comercial area 16#	2016/8/3	60.2	-
	2016/8/4	59.4	-
South of Comercial area 17#	2016/8/3	59.1	-
	2016/8/4	62.1	-
South of Comercial area 18#	2016/8/3	61.5	-
	2016/8/4	62.5	-



monitoring location: ▲ represents noise monitoring point, ○ represents air monitoring point and ★ is sewage monitoring point

(4) Zhalaite District Heating Subproject

a) First heating source plant project

Table 11: Noise monitoring result

Monitoring Date	Monitoring Site	Monitoring result [dB (A)]		Standard Limits
		Daytime	Nighttime	
2017./3./3	East of the factory border	51.3	43.7	Daytime 60dB; Nighttime 50dB
	South of the factory border	50.1	42.3	
	West of the factory border	53.2	44.6	
	North of the factory border	51.4	42.9	
2017./3./4	East of the factory border	53.1	44.6	
	South of the factory border	52.3	42.7	
	West of the factory border	54.7	45.0	
	North of the factory border	52.9	43.7	

Table 12: Air monitoring result

Monitoring Date	Monitoring Site	Monitoring Time	PM (mg/m ³)	SO ₂ (mg/m ³)	NO ₂ (mg/m ³)
2018/11/2	Up Wind 1#	2:00-3:00	0.123	0.012	0.013
		8:00-9:00	0.215	0.011	0.014
		14:00-15:00	0.159	0.012	0.009
		20:00-21:00	0.174	0.012	0.010
	Down Wind 2#	2:00-3:00	0.354	0.016	0.015
		8:00-9:00	0.295	0.020	0.020
		14:00-15:00	0.264	0.014	0.018
		20:00-21:00	0.267	0.018	0.015
	Down Wind 3#	2:00-3:00	0.295	0.017	0.016
		8:00-9:00	0.325	0.018	0.023
		14:00-15:00	0.248	0.017	0.017
		20:00-21:00	0.264	0.022	0.018
	Down Wind 4#	2:00-3:00	0.309	0.015	0.020
		8:00-9:00	0.296	0.020	0.017
		14:00-15:00	0.316	0.021	0.021
		20:00-21:00	0.305	0.018	0.020
2018/11/13	Up Wind 1#	2:00-3:00	0.205	0.013	0.011
		8:00-9:00	0.196	0.009	0.012
		14:00-15:00	0.209	0.010	0.010
		20:00-21:00	0.168	0.012	0.011
	Down Wind 2#	2:00-3:00	0.316	0.018	0.021
		8:00-9:00	0.295	0.021	0.017
		14:00-15:00	0.264	0.017	0.016
		20:00-21:00	0.195	0.019	0.017
	Down Wind 3#	2:00-3:00	0.362	0.021	0.023
		8:00-9:00	0.356	0.020	0.016
		14:00-15:00	0.293	0.021	0.021
		20:00-21:00	0.308	0.019	0.018
	Down	2:00-3:00	0.319	0.020	0.016

	Wind 4#	8:00-9:00	0.296	0.018	0.018
		14:00-15:00	0.322	0.019	0.017
		20:00-21:00	0.294	0.021	0.021
Standard Limits			1.0	0.4	0.12

Table 13: Air monitoring result

Monitoring Site	Monitoring Date	Monitoring Parameter	Monitoring Results	Standard Limits
Fixed monitoring port for desulfurization and dedusting facilities	2018/11/5	SO2 Concentration	101mg/m3	400
		NO2 Concentration	126mg/m ³	400
		Particle Concentration	17.7mg/m ³	80

b) Second heat source plant project

Table 14: Noise monitoring result

Monitoring Site	Monitoring Date	Monitoring Results[dB (A)]		Standard Limits
		Daytime	Nighttime	
Eastern of Boundary	2018/10/22	51.8	43.8	Daytime 60dB; Nighttime 50dB
Southern of Boundary	2018/10/22	52.7	43.1	
Western of Boundary	2018/10/22	53.4	44.3	
Northern of Boundary	2018/10/22	51.3	44.0	

Table 15: Air monitoring result

Monitoring Date	Monitoring Project	Sampling Frequency	Southwestern side of 1# factory boundary (upper wind position)	Northeast side of the 2# factory boundary (downwind position)	Northeast side of #3 factory boundary (downwind position)
2018/10/22	Sulfur Dioxide	1st	0.010	0.019	0.023
		2nd	0.013	0.024	0.033

	(mg/m ³)	3rd	0.017	0.029	0.036
		4th	0.009	0.027	0.031
	Nitrogen Oxide (mg/m ³)	1st	0.020	0.029	0.035
		2nd	0.028	0.037	0.041
		3rd	0.025	0.031	0.037
		4th	0.023	0.028	0.034
	Particle (mg/m ³)	1st	0.108	0.246	0.278
		2nd	0.129	0.288	0.304
		3rd	0.117	0.263	0.294
		4th	0.125	0.273	0.285

(6) Heating system renovation and expansion in Tuquan county, Hinggan League
Sub-project owners commissioned Chifeng Lvkang Environmental Monitoring Company to monitor the noise and air quality of heat source plant, thermal station construction plant and surrounding residential area on July 6, 2017. The construction site has set up sedimentation tank, which is used for water spraying and dust removal after sedimentation treatment of construction wastewater, no waste water is discharged, so the construction wastewater is not tested. The monitoring results are shown in table as follows.

Table 16: Noise monitoring result

Monitoring Site		Monitoring Date	Monitoring Result [dB (A)]		Standard Limits
			Daytime	Nighttime	
Construction site of Heat source plan	Eastern of Boundary	2017/7/6	61.6	49.6	Daytime70dB; Nighttime55dB
	Southern of Boundary	2017/7/6	58.9	47.5	
	Western of Boundary	2017/7/6	59.4	49.8	
	Northern of Boundary	2017/7/6	52.2	45.8	
	Residential Area	2017/7/6	58.9	47.1	
Thermal station construction	Eastern of Boundary	2017/7/6	51.6	45.3	
	Southern of	2017/7/6	53.3	45.5	

plant	Boundary			
	Western of Boundary	2017/7/6	49.5	43.1
	Northern of Boundary	2017/7/6	56.0	46.8
	Residential Area	2017/7/6	52.6	44.1

Table 17: Air monitoring result

Monitoring Site		Monitoring Date	TSP (mg/m ³)	Standard Limits (mg/m ³)
heat source plant	Upwind	2017/7/6	0.591	1.0mg/m
	Downwind No.1	2017/7/6	0.968	
	Downwind No.2	2017/7/6	0.975	
	Downwind No.3	2017/7/6	0.977	
	Residential Area	2017/7/6	0.993	
thermal station construction plant	Upwind	2017/7/6	0.297	
	Downwind No.1	2017/7/6	0.578	
	Downwind No.2	2017/7/6	0.572	
	Downwind No.3	2017/7/6	0.588	
	Residential Area	2017/7/6	0.609	

The construction noise monitoring results conform to the requirements of the environmental noise emission standard of the Building construction field (GB12523-2011), the results of the monitoring of TSP in the construction field conform to the requirements of the comprehensive emission standard of air pollutants (GB16297-1996), so the impact of construction on the environment is acceptable.

(6) Central heating project I replacing wood to coal in Irsch , Arxan City, Hinggan League. The owners of sub-project commissioned Chifeng Lv Kang Environmental Monitoring Company to monitor the noise and air quality of the construction plant on July 11, 2017. Construction site surrounding demolition work has been completed, surrounded by residential areas and other sensitive points. The construction site has set up sedimentation tank, which is used for water spraying and dust removal after sedimentation treatment of construction wastewater, no waste water is discharged, so the construction wastewater is not tested. The monitoring results are shown in Tables 17 and 18.

Table 18: Noise monitoring result

Monitoring Site		Monitoring Date	Monitoring Result [dB (A)]		Standard Limits
			Daytime	Nighttime	
Construction site of Heat source plant	Eastern of Boundary	2017/7/11	49.5	40.4	Daytime70dB; Nighttime55dB
	Southern of Boundary	2017/7/11	49.5	40.9	
	Western of Boundary	2017/7/11	54.6	41.2	
	Northern of Boundary	2017/7/11	58.7	43.4	

Table 19: Air monitoring result

Monitoring Site		Monitoring Date	TSP (mg/m ³)	Standard Limits (mg/m ³)
Construction site of Heat source plant	Upwind	2017/7/11	0.486	1.0mg/m
	Downwind No.1	2017/7/11	0.864	
	Downwind No.2	2017/7/11	0.867	
	Downwind No.3	2017/7/11	0.876	

The construction noise monitoring results conforms to the requirements of the environmental noise emission standard of the Building construction field (GB12523-2011), the results of the testing of the particulate matter in the construction field meet the requirements of the comprehensive emission standard of air pollutants (GB16297-1996), so the impact of construction on the environment is acceptable.

VI. CURRENT SITUATION OF SMALL BOILERS

A. Hohhot Heating Network and Boiler Room Expansion Project

Hohhot Heating Network and Boiler Room Expansion Project plans to closure 103 boiler rooms 144 small boilers, C and D zone were covered by the other heat sources units, so the closing information of small boiler is unknown, all small boilers of F, G, K have been shut down at the moment, now 8 units of 12 small boilers closed, in which 4 units of 5 transformed into thermal stations, 4 units of 7 demolished; 6 units of 6 small boilers are still running, 3 units of 3 small boilers are the coal-to-gas, and the rest is unknown. Subproject owners still investigated actively.

Table20: Small Boiler Closed Information of Hohhot Heating Network and Boiler Room Expansion Project (By the end of December 2018)

No.	Boiler Units	Amount (Unit)	Closed Conditions	Recovery after Closing
	C Zone			
1	Second Construction	2		
2	Ethnic Articles	1		
3	Nanchafang	2		
4	Kuntai	2		
5	Hohhot Huanyu Environmental Protection Company	2		
6	Spring	1		
7	Hairi Woolen Mill	1		
8	Inner Health Cadre Training School	1		
9	Brewery	2		
10	Nanchafang Village Committee	1		
11	Social Welfare Clothing Factory	1		
12	Youyi Villi Plant	1		
13	City Morgue	1		
14	City Second Hospital	2		
15	Inner Mongolia Institute of Geology and Mineral Resources	1		
	D Zone			
1	Shiqi Group	2		
2	Taji Cashmere	2		
3	Jinyu Group	1		
4	Hohhot Cigarette Factory	1		
5	Fruit Market	1		

6	Dongyuan Community	2	Disable	Demolish
7	Shuangshu Village Primary School	1		
8	Shuangshu Village Community	2		
9	Hongfeng Food Factory	1		
10	National Mall Warehouse	2		
11	Shiqi Sixth Mill	1		
12	Nailun Property	1		
13	Barrel Factory	1		
14	Zhonghe Cashmere	1		
15	Electronic Components	1		
16	Shuangshu Cashmere Factory	2		
17	Mingde Primary School	1		
18	888 Paper Mill	1		
19	Transmission and Distribution Engineering Company in Inner Mongolia	1		
	F Zone			
1	Inner Mongolia Second Housing Management Office	1	Operation	
2	Boiler Factory	1	Operation	Coal-to-gas
3	The City 14 Middle School	1	Disable	Thermal Station
4	Art School	1	Disable	Thermal Station
5	Cable Factory in Inner Mongolia	1	Disable	Demolish
6	Motor Factory	1	Operation	Coal-to-gas
	G Zone			
1	Railway Admitting Office	1	Disable	
2	Railway Central Hospital	1	Disable	
3	Film Studio	1	Disable	Thermal Station
4	Inner Mongolia Bureau of Surveying and Mapping	1	Disable	
5	Nailun Wangxing Yuan	2	Disable	

6	Building Materials College	2	Disable	Thermal Station
7	Taoyuan Community	2	Disable	Demolish
8	Construction Survey and Design Institute of Inner Mongolia	2	Disable	
9	Inner Mongolia City Diaodui	2	Disable	
10	Inner Mongolia Institute of Metallurgy	1	Disable	
	K Zone			
1	Inner Mongolia Branch of Xinhua News Agency	2	Disabled	Demolished
2	Yongtai Commercial Buildings	1	Disable	
3	Baifang Group	2	Disable	
4	Erqing Hotel	2	Disable	
5	Muslim West Temple	2	Disable	
6	Yi Xing Cashmere Products Factory	1	Disable	
7	West Longwang Temple Community	1	Disable	
8	West Longwang Temple Village Committee	1	Disable	
9	City Bus Company	2	Disable	
10	Machine Tool Plant Four Plants	1	Disable	
11	Plastic Factory Dormitory	1	Disable	
12	Municipal Environmental Monitoring Station	1	Disable	
13	Children's Welfare	1	Disable	
14	Inner Mongolia Sanlian Chemical	2	Disable	
15	Jinwei Si and Chemical Fiber Company	1	Disable	
	M Zone			
1	Beiyuan Street Heating	1	Disable	
2	Housing Construction Company in Inner Mongolia	2	Disable	
3	The New City Heating	2	Disable	
4	Suhu Street Primary	2	Disable	

	School			
5	Inner Mongolia Education Press	1	Disable	
6	Hohhot CCB	1	Disable	
7	Inner Mongolia Cultural Cadre	1	Disable	
8	Inner Mongolia High Court Guest House	1	Disable	
9	Electronic Detection	1	Disable	
10	City Commercial Bank	1	Disable	
11	Wujin Store	1	Disable	
12	The New City Heating	2	Disable	
13	Inner Organs Centre	2	Disable	
14	Nailun	1	Disable	
15	Xincheng Hotel	2	Disable	
16	Venture Real Estate	1	Disable	
17	Inner Mongolia Procuratorate Hostel	1	Disable	
18	Teaching Equipment Supply Station	1	Disable	
19	Inner Mongolia Military	2	Disable	
20	Inner Mongolia Hotel	2	Disable	
21	Inner Mongolia Party School	2	Disable	
22	Inner Mongolia Institute of Education	2	Disable	
23	National Troupe of Inner Mongolia	1	Disable	
24	Experimental High School	2	Disable	
25	Inner Mongolia Animal Husbandry Department	1	Disable	
26	Inner Mongolia Tobacco Training Centre	1	Operation	Coal-to-gas
27	Inner Mongolia Coal Geology	1	Disable	
28	Hexi Property	2	Disable	
29	Hohhot Special Education College	1	Disable	
30	Wulan Hotel	1	Disable	
31	Inner Mongolia Mental Hospitals	2	Disable	
32	Inner Planning Commission Family	2	Disable	

	Wings			
33	Inner Mongolia China Construction Bank	2	Disable	
34	Inner Mongolia Statistical Bureau	2	Disable	
35	City Retired Cadres	1	Disable	
36	Security Department in Inner Mongolia	2	Disable	
37	City Cable Factory	2	Disable	
38	Transformer Plant in Inner Mongolia	1	Disable	
103	Total	144		

B. Baotou City Central Heating Expansion Project

The Central Heating and Expansion Project of Baotou City is planned to shut down the 164 small boilers , which is now fully closed, and is fully transformed into a thermal station.

Table 22: Small Boiler Closed Information of Baotou City Central Heating Expansion Project

No.	Names	Amounts(Unit)	Property Units	Location	Closing Progress	Recovery after Closed
1	Standard Factory	3	Baotou Standard Factory	Qing10#	Disable	Thermal Station
2	Song and Dance Troupe	1	Baotou Song and Dance Troupe	Qing 10#	Disable	Thermal Station
3	Steel Institute West Branch	3	Inner Mongolia University of Science and Technology	Qing 14#	Disable	Thermal Station
4	Movie Palace	1	Baotou City Film Company	Qing 15#	Disable	Thermal Station
5	Qiate Cinema	1	Qiate Cinema	Qing 17#	Disable	Thermal Station
6	Tuan 11	3	Baogang Property Office	Tuan 11 North Area	Disable	Thermal Station
7	Tuan 12	2	Kunqu Property Management Office	Tuan 12#	Disable	Thermal Station
8	Qing 17	1	Baotou Current Construction Co.	Qing 17#	Disable	Thermal Station
9	Zilidao North	3	Ronghua Property	Zilidao North	Disable	Thermal Station
10	Tuan 13	2	Kun Government	Tuan 13 East	Disable	Thermal Station
11	Tuan 13	2	Baogang	Tuan 13	Disable	Thermal

			Property Office	West		Station
12	Tuan 15 Nan	2	Baotou City Guangyuan Real Estate Development Company	Tuan 15 South	Disable	Thermal Station
13	Sanitation Department	1	Kunqu Sanitation Department	Tuan Jia16	Disable	Thermal Station
14	Post Office	1	Baotou City Post Office	Tuan Jia 16	Disable	Thermal Station
15	Tuan Jia16	1	Baotou City Post Office	Tuan Jia 16	Disable	Thermal Station
16	Tuan 18	2	Baotou City Cement Plant	Tuan 18#	Disable	Thermal Station
17	Baogang High School 25	1	Baogang High School 25	Tuan 18#	Disable	Thermal Station
18	Combined Boiler Room	3	Baotou Dijiu Real Estate Development Company	Tuan 12#	Disable	Thermal Station
19	Xinhua Bookstore Family Wings	1	Xinhua Bookstore	Tuan 15 South	Disable	Thermal Station
20	Building Research Institute	3	Baotou City Building Research Institute	Tuanjie Street	Disable	Thermal Station
21	Nanpai Community	1	Baotou City Hongda Real Estate	Across to the 24 th Primary School	Disable	Thermal Station
22	Longda Group	1	Longda Group	Tuanjie Street 183#	Disable	Thermal Station
23	Baotou City Shining Metal Products Co., Ltd.	1	Baotou City Shining Metal Products Co., Ltd.	Tuanjie Street 13#	Disable	Thermal Station
24	Baotou Kun District Croak Spices Ltd.	2	Baotou Kun District Croak Spices Ltd.	Tuanjie Street	Disable	Thermal Station
25	Baogang Honghu Printing Factory	1	Baogang Honghu Printing Factory	Youth 19#	Disable	Thermal Station
26	Tuanjie Avenue 1th Primary School	1	Tuanjie Avenue 1th Primary School	Tuanjie Street 19#	Disable	Thermal Station
27	Baotou City	1	Baotou City Third	38 Road	Disable	Thermal

	Third Transport Company		Transport Company			Station
28	Baotou City Longju Dairy Liability Limited Company	2	Baotou City Longju Dairy Liability Limited Company	Tuanjie Street 22#	Disable	Thermal Station
29	Steel 22	2	Baogang Heating Plant	Gang 22 Community	Disable	Thermal Station
30	First Affiliated Hospital	3	First Affiliated Hospital	Backyard of First Affiliated Hospital	Disable	Thermal Station
31	Tuan Jia 14	2	Baogang Heating Plant	Jia 14 Community	Disable	Thermal Station
32	Yiingbin Boiler Room	5	Baotou Property Office	Yiingbin Community	Disable	Thermal Station
33	Pay 7 Boiler Room	3	Baotou Property Office	Pay 7 Community	Disable	Thermal Station
34	Great Wall Company North Heavy Industry Group	2	Great Wall Company North Heavy Industry Group	Kangle	Disable	Thermal Station
35	Baotou City Seventh Hospital	2	Baotou City Seventh Hospital	Knagle	Disable	Thermal Station
36	Fuhua Cashmere Factory	2	Fuhua Cashmere Factory	Minzhu Road	Disable	Thermal Station
37	Xincheng Secondary School	1	Xincheng Secondary School	Jiaer Ba	Disable	Thermal Station
38	Chang Xingda Textile Mill	2	Chang Xingda Textile Mill	Fu 14	Disable	Thermal Station
39	Xiangda Furniture Company	1	Person	Xiwang Road	Disable	Thermal Station
40	Inner Mongolia-Power Electrical Equipment Company	1	Person	Xingfu South Road	Disable	Thermal Station
41	Guangzheng Electric Appliance	1	Person	Xitu Road	Disable	Thermal Station

42	Hope Feed	1	Group	Qinggong South Road	Disable	Thermal Station
43	Rong Shiya Cashmere	1	Person	Laodong Road	Disable	Thermal Station
44	Hydraulic Machinery Company	1	Group	Laodong Road	Disable	Thermal Station
45	The new Hitachi Electronics	1	Person	Xitu Road	Disable	Thermal Station
46	Zhang Yuzhi	1	Person	Youyi Street	Disable	Thermal Station
47	Raymond Rare Earth Chemical	1	Person	Xingfu South Road	Disable	Thermal Station
48	Nuclear Industry 208	1	State	Xingfu South Road	Disable	Thermal Station
49	Civil Foundry	1	Group	Youyi Street	Disable	Thermal Station
50	Tianfu Fan	2	Group	Youyi Street	Disable	Thermal Station
51	Farming School	2	Group	Xingfu South Road	Disable	Thermal Station
52	Post Office Family Wings	1	Group	Steel Street 64	Disable	Thermal Station
53	Mingtian Technology	2	State	Youyi 22 First Community	Disable	Thermal Station
54	Shengao Music Square	1	Person	Shaoxian Road	Disable	Thermal Station
55	Baogang Youyi Hotel	1	State	Youyi Street 15#	Disable	Thermal Station
56	Yunlong Orthopedics	1	Person	Aerding Street 61	Disable	Thermal Station
57	Financial Building	1	State	Steel Street 50	Disable	Thermal Station
58	Bus Company	1	State	Shaoxian 23#	Disable	Thermal Station
59	Cologne Hotel	1	Person	Steel Street	Disable	Thermal Station
60	Shenhua Real Estate	1	State	Aerding Street 1	Disable	Thermal Station
61	Defeng Trade	1	Person	Steel Street 52	Disable	Thermal Station
62	Baotou Medical School	2	State	Steel Street	Disable	Thermal Station
63	ICT Jianan	1	State	Caoyuan	Disable	Thermal

				Community		Station
64	Mingzhu Real Estate	1	Person	Youyi Street	Disable	Thermal Station
65	Huanghe Community Boiler Room	3	State	Linyin Zhong Road	Disable	Thermal Station
66	Youyi 31#	2	State /Baogang	Youyi 31#	Disable	Thermal Station
67	Youyi 18#	9	State /Baogang	Youyi 18#	Disable	Thermal Station
68	101#	4	State /Baogang	Youyi 26#	Disable	Thermal Station
69	East Youyi 22#	7	State /Baogang	Youyi 22#	Disable	Thermal Station
70	West Youyi 22#	4	State /Baogang	Youyi 22#	Disable	Thermal Station
71	114#	6	State /Baogang	Youyi 18#	Disable	Thermal Station
72	106#	8	State /Baogang	Youyi 13#	Disable	Thermal Station
73	Shaoxian 20#	3	State	Shaoxian 20#	Disable	Thermal Station
74	105#	4	State	Youyi 15#	Disable	Thermal Station
75	Erye Community	8	State /Baogang	Youyi West Community	Disable	Thermal Station
76	Yingbin Community	5	State	Yingbin Community	Disable	Thermal Station
77	Total	164				

C. Chifeng Urban Central Heating Pipe Network Expansion Project

Chifeng Urban Central Heating Pipe Network Expansion Project Planned closure of 37 boiler rooms and 39 small boilers, all of these has been closed down, including 7 heat transfer stations, 4 disabled, 25 removed.

Table 22: Small Boiler Closed Information of Chifeng Urban Central Heating Pipe Network Expansion Project

No.	Names	Location	Units	Services Scope/ Region	Closed Time	Recovery after Closed
1	Dongchen Power Boiler Room	Hongshan Area	Dongchen Power	Dongchen Power / Near	2013.8.6	Disable
2	Hongshan Driving School Boiler Room	Hongshan Area	Hongshan Driving School	Institutions of Excellence / Near	2014.7.4	Disable
3	Hongshan Area Quality	Hongshan Area	Hongshan Area	Hongshan Area Quality	2013.4.3	Disable

	Boiler Room		Quality			
4	Hongshan Area Forest Police Detachment Boiler Room	Hongshan Area	Hongshan Area Forest Police Detachment	Hongshan Area Forest Police Detachment	2013.3.6	Disable
5	Longshang Mountain Villa Boiler Room	Hongshan Area	Longshang Mountain Villa	Eastern Suburbs of Forest Police	2013.4.1	Disable
6	Chifeng Boyue School Boiler Room	Songshan Area	Chifeng Boyue School	Chifeng Boyue School	2010.5.6	Disable
7	Songshan Civilian Residential Boiler Room	Songshan Area	Songshan Area Housing Authority	Civil Affairs / Near	2011.6.3	Disable
8	Original Bearing Factory Office Boiler Room	Songshan Area	Original Bearing Factory	Bearing Factory Building	2012.4.22	Disable
9	Songshan Erxiao Boiler Room	Songshan Area	Songshan Education Bureau	Songshan Erxiao	2012.6.23	Disable
10	Inner Mongolia Geological Second Middle School Boiler Room	Songshan Area	Songshan Education Bureau	Geological Second Middle School	2010.4.12	Disable
11	Songshan Administration Boiler Room	Songshan Area	Housing Authority	Songshan Administration / Near	2009.8.6	Disable
12	Mujiaying Village Committee Boiler Room	Songshan Area	Mujiaying Village Committee	Mujiaying New Village / Year	2010.11.2	Disable
13	Qunguan Real State Building Boiler Room	Songshan Area	Qunguan Real State	Mujiayingzi Government / Near	2012.3.2	Disable
14	Geological Prospecting Ten Boiler Room	Songshan Area	Geological Prospecting Ten	Geological Prospecting Ten / Near	2013.9.3	Disable
16	Songshan Hongqi Store Boiler Room	Songshan Area	Songshan Hongqi Store	Songshan Hongqi Store / Near	2009.7.4	Disable
17	Songshan	Songshan	Songshan	Songshan World	2010.6.28	Disable

	World Today Boiler Room	n Area	n World Today	Today		
18	Songshan Activated Carbon Residence Boiler Room	Songsha n Area	Original Songsha n Activated Carbon	Songshan Activated Carbon Residence / Near	2011.3.25	Disable
19	Songshan Labor Camp Building Boiler Room	Songsha n Area	Songsha n Labor Camp	Songshan Labor Camp Building	2012.4.14	Disable
20	Songshan Fangxiao Boiler Room	Songsha n Area	Songsha n Fangxiao	Songshan Fangxiao	2010.6.7	Disable
21	Songshan Zhuye Guocai Hotel Boiler Room	Songsha n Area	Songsha n Zhuye Guocai Hotel	Songshan Zhuye Guocai Hotel / Near	2010.8.3	Disable
22	Laosan Residential Construction Boiler Room	Songsha n Area	Original Laosan Residenti al Construc tion	Laosan Residential Construction	2012.7.4	Disable
23	Songshan Supply and Marketing Cooperative Boiler Room	Songsha n Area	Original Songsha n Supply and Marketin g Cooperat ive	Songshan Supply and Marketing Cooperative	2010.3.2	Disable
24	Qiaoxi Hotel Boiler Room	Songsha n Area	Qiaoxi Hotel	Qiaoxi Hotel	2012.5.5	Disable
25	Songshan Laoliu Hospital Boiler Room	Songsha n Area	Songsha n Laoliu Hospital	Laoliu Hospital	2010.3.6	Disable
26	Songshan Geological Prospecting Hospitals Boiler Room	Songsha n Area	Songsha n Geologic al Prospecti ng Hospitals	Songshan Geological Prospecting Hospitals / Near	2011.7.19	Disable
27	Industrial and Commercial Bank branch of Songshan Chifeng Boiler	Songsha n Area	Industrial and Commer cial Bank branch of	Industrial and Commercial Bank branch of Songshan Chifeng	2011.6.20	Disable

	Room		Songshan Chifeng			
28	Tehu Sheng Old Building Boiler Room	Songshan Area	Tehu Sheng Company	Tehu Sheng Old Building	2010.7.22	Disable
29	Cement Boiler Room	Hongshan Area	Original Cement	Cement / Near	2010.6.4	Disable
30	Er East Street Health Bureau Boiler Room	Hongshan Area	Health Bureau	Er East Street Health Bureau	2011.8.7	Disable
31	Northern Pharmaceuticals	Hongshan Area	Northern Pharmaceuticals	Northern Pharmaceuticals / Near	2013.6.4	Disable
32	Woolen Mill Factory Boiler Room	Hongshan Area	Original Woolen Mill Factory	Woolen Mill Factory	2012.8.8	Disable
33	Rhine Boiler Room	Hongshan Area	Rhine River Bath	Rhine / Near	2013.3.20	Disable
34	Chifeng Third Experimental Primary School Boiler Room	Hongshan Area	Chifeng Third Experimental Primary School	Chifeng Third Experimental Primary School / Near	2014.8.6	Disable
35	Songshan Fouth Primary School Boiler Room	Hongshan Area	Songshan Fouth Primary School	Songshan Fouth Primary School / Near	2014.9.25	Disable
36	Songshan Public Security Bureau Boiler Room	Songshan Area	Songshan Public Security Bureau	Songshan Public Security Bureau / Near	2014.6.20	Disable
37	Songshan Fifth Middle School Boiler Room	Songshan Area	Songshan Fifth Middle School	Songshan Fifth Middle School / Near	2014.7.15	Disable

D. Xingan Meng Zhalaiteqi Indeer Town Central Heating Project

Xingan Meng Zhalaiteqi Indeer Town Central Heating Project plans to close 31 units of 37 small boilers, it has been closed down, of which the 7 units of 10 transformation to heat transfer stations, 2 units of 2 is disabled, the rest removed.

Table 23: Small Boiler Closed Information of Xingan Meng Zhalaiteqi Inder Town Central Heating Project

No.	Names	Small Boiler Room (t)	Type	Amount	Closed Conditions
1	Original Plant Identification Oil Plant Building	2	DZL1.4-0.7/95/70-AII	1	Disable
2	Traffic Police	1	QXG60-8/95/70-A	1	Disable
3	Inder Fourth Middle School	4	DZL1.4-0.8/95/70-AII	2	Disable
4	Meng Hospital	4	DZL1.4-0.7/95/70-AII	2	Disable
5	District Procuracy	1	QXG60-8/95/70-A	1	Disable
6	Inder Sixth Middle School	2	DZL1.4-1.0/95/70-AII	1	Disable
7	Fire Fighting Unit	1	QXG60-8/95/70-A	1	Disable
8	Party School	2	DHL1.4-0.7/95/70-AII	1	Disable
9	Inder Fifth Middle School	2	DHL1.4-0.7/95/70-AII	1	Disable
10	Inder Fifth Primary School	1	QXG60-8/95/70-A	1	Disable
11	Vocational High School	2	DZL1.4-0.7/95/70-AII	1	Disable
12	Sports School	1	QXG60-10/95/70-A	1	Disable
13	Inder Second Middle School	4	DZL1.4-1.0/95/70-AII	2	Disable
14	Inder Middle School	4	DHL1.4-0.8/95/70-AII	2	Disable
15	Agricultural Bank	4	QXG120-8/95/70-AII	2	Disable
16	Immigration Office	1	QXG60-8/95/70-A	1	Disable
17	Running-water Company	1	DZL0.7-0.8/95/70-AII	1	Disable
18	Credit Union	1	DZL0.7-0.6/95/70-AII	1	Disable
19	Transportation Control Station	2	DHL1.4-0.7/95/70-AII	1	Disable
20	Quality and Technical Supervision Bureau	1	QXG60-8/95/70-A	1	Disable
21	Inder Fourth Primary School	2	DZL1.4-0.7/95/70-AII	1	Disable
22	Inder Third Middle School	4	DZL1.4-0.7/95/70-AII	2	Disable
23	Oil Company	2	QXG120-8/95/70-AII	1	Disable
24	Agricultural Bureau	1	DZL0.7-0.6/95/70-AII	1	Disable
25	Original IESS	1.5	QXG90-8/95/70-AII	1	Disable

26	Mobile Company	0.3	QXG20-7/95/70-A	1	Disable
27	Zhongfa Appliance City	0.5	QXG30-8/95/70-A	1	Disable
28	Sanjiang Department Store	0.5	QXG30-6/95/70-A	1	Disable
29	Medical Hospital	0.2	QXG12-6/95/70-A	1	Disable
30	Iner Town	0.2	QXG12-6/95/70-A	1	Disable
31	Shenshan Hotel	0.2	QXG12-6/95/70-A	1	Disable
	Total	53.4		37	Disable

Table 24 Small Boiler Closed Information of Xingan Meng Zhalaiteqi Indeer Town Central Second Heating Project

No.	Name	Small boiler room tonnage (t)	Amount	Closed Conditions
1	Liu Zhong	2	1	Disable
2	Er Zhong	2	1	Disable
3	Oil company	2	1	Disable
4	Food Bureau	4	1	Disable
5	Mongolian hospital	2	1	Disable
6	Transport company	2	1	Disable
7	Shenshan Group Development Building	4	1	Disable
8	Grain depot 1	1	1	Disable
9	The People's Hospital	4	1	Disable
10	Guesthouse	2	1	Disable
11	Si mao	1	1	Disable
12	San zhong	2	1	Disable
13	Water conservancy bureau	2	1	Disable
14	Er mao	2	1	Disable
15	Grain depot 2	1	1	Disable
16	Grain depot 4	4	1	Disable
17	Party school	2	1	Disable
18	Wu zhong	1	1	Disable
19	Winery	0.5	1	Disable
20	Yi zhong	2	1	Disable
21	land board	4	1	Disable
22	Indeer Town	2	1	Disable
23	Bureau of Commerce and Trade	1	1	Disable

24	Oil hotel	0.5	1	Disable
25	Prison	1	1	Disable
26	Feed company	0.5	1	Disable
27	Si zhong	1	1	Disable
28	Vegetable oil plant	4	1	Disable
29	Transport company	1	1	Disable
30	Zhongfa Home Appliances	0.8	1	Disable
	Total	58.3	30	

E. Xingan Meng Tuquan Heating Expansion Project

Xingan Meng Tuquan Heating Expansion Project plans to close 33 boilers and 36 small boilers in the boiler room have all been shut down.

Table 25: Small Boiler Closed Information of Xingan Meng Tuquan Heating Expansion Project

No.	Name of Small boilers	Amount	Location	Unit	Service Area	Closed Conditions
1	Central heat source factory of Xinguang thermal co., Ltd	1	249 huafeng Street	Xinguang thermal co., Ltd.	Supply Heating	Disable
		1				
		1				
		1				
2	County hospital	1	Kang Le Street	county hospital	Supply Heating	Disable
3	Passenger depot	1	Huafeng Street	passenger depot	Supply Heating	Disable
4	County credit cooperative	1	Xinhua Road	County credit cooperative	Supply Heating	Disable
5	Tianyu co., Ltd.	1	Limin street	Tianyu co., Ltd.	Supply Heating	Disable
6	Tianquan co., Ltd.	1	Industrial road	Tianquan co., Ltd.	Supply Heating	Disable
7	Bureau of Education Materials Factory	1	Zhenxing Road	Bureau of Education Materials Factory	Supply Heating	Disable
8	Yi zhong	1	construction street	Yi Zhong	Heating 2 units	Disable
9	Er zhong	1	Kang Le Street	Er Zhong	Heating 2 units	Disable
10	Water company	1	Industrial road	Water company	Supply Heating	Disable
11	Forestry bureau	1	Yuwen Street	Forestry bureau	Supply Heating	Disable
12	Livestock tube station	1	Industrial road	Livestock tube station	Supply Heating	Disable

13	Tuquan Town Government	1	Limin street	Tuquan Town Government	Supply Heating	Disable
14	Anda husbandry	1	Huafeng Street	Anda husbandry	Supply Heating	Disable
15	Farm machinery co., Ltd.	1	Huanfeng Street	Farm machinery co., Ltd.	Supply Heating	Disable
16	Persuasive market	1	Zhenxing Road	Persuasive market	Supply Heating	Disable
17	Ruyi hotel	1	Hua feng Street	Ruyi hotel	Supply Heating	Disable
18	Second outpatient of county hospital	1	Xinhua Road	Second outpatient of county hospital	Supply Heating	Disable
19	National Tax Bureau	1	Huafeng Street	National Tax Bureau	Supply Heating	Disable
20	Oil company	1	Xiangyang Street	Oil company	Supply Heating	Disable
21	Industrial and commercial bureau	1	National street	Industrial and commercial bureau	Supply Heating	Disable
22	Bureau of education	1	Xingan Street	Bureau of education	Supply Heating	Disable
23	Second kindergarten	1	Nanxiang Street	Second kindergarten	Supply Heating	Disable
24	Longxing hotel	1	Xingan street	Longxing hotel	Supply Heating	Disable
25	Vocational high school	1	Xiangyang Street	Vocational high school	Supply Heating	Disable
26	County local road maintenance station	1	Yuwen Street	County local road maintenance station	Supply Heating	Disable
27	Xinhua Road personal Villa	1	Xinhua Road	Xinhua Road personal Villa	Heating 2 units	Disable
28	Personal building	1	Xinhua Road	Personal building	Supply Heating	Disable
29	Dongshan gas station	1	Huafeng Street	Dongshan gas station	Supply Heating	Disable
30	Oil company residence	1	Xiangyang Street	Oil company residence	Supply Heating	Disable
31	Happy neighborhood committee	1		Happy neighborhood committee	Supply Heating	Disable
32	Shengli Community Health Station	1		Shengli Community Health Station	Supply Heating	Disable
33	Personal building	1		Personal building	Supply Heating	Disable
Total		36				

F. Xingan Meng Aershan Yiershi “coal-to-wood”Central Heating Project Phase I

Xingan Meng Arxan Yi'ershi “coal-to-wood”Central Heating Project Phase I plans to shut down 27 boiler rooms and 34 small boilers, by the current situation, all have been shut down.

Table 26: Small Boiler Closed Information of Xingan Meng Arxan Yi'ershi “coal-to-wood”Central Heating Project Phase I

No.	Name of Small boilers	Amount	Location	Unit	Closed Conditions
1	Aershan Forestry Bureau Life Services Office-First Heating Station	2	Xincheng Street	Aershan Forestry Bureau Life Services Station	Disable
2	Aershan Forestry Bureau Life Services Office-Second Heating Station	2	Xincheng Street	Aershan Forestry Bureau Life Services Station	Disable
3	Aershan Forestry Bureau Life Services Office-Third Heating Station	2	Xincheng Street	Aershan Forestry Bureau Life Services Station	Disable
4	AershanForestry Bureau Life Services Office-Fourth Heating Station	2	Lin Hai Street	Aershan Forestry Bureau Life Services Station	Disable
5	AershanForestry Bureau Life Services Office-Fifth Heating Station	2	Xincheng Street	Aershan Forestry Bureau Life Services Station	Disable
6	Hongbolou heating station	1	Xincheng Street	Individual unit	Disable
7	Er zhong	2	Lin Hai Street	Er zhong	Disable
8	Turntable heating station	1	Xincheng Street	Individual unit	Disable
9	TV station	1	Lin Hai Street	TV station	Disable
10	Qinghuayuan heating Station	1	Xincheng Street	Individual unit	Disable
11	Cozy House Hotel	1	Xincheng Street	Cozy House Hotel	Disable
12	Transport Management Service	1	Lin Hai Street	Transport Management Service	Disable
13	Cenxing Building Engineering Company	2	Lin Hai Street	Cenxing Building Engineering Company	Disable
14	Xingan meng Frontier detachment	1	Lin Hai Street	Xingan meng Frontier detachment	Disable
15	Local tax office	1	Lin Hai Street	Local tax office	Disable

16	Administrative office for industry and commerce	1	Lin Hai Street	Administrative office for industry and commerce	Disable
17	Fire brigade	1	Lin Hai Street	Fire brigade	Disable
18	Military grain supply station	1	Xincheng Street	Military grain supply station	Disable
19	Er zhong	1	Lin Hai Street	Er zhong	Disable
20	lumber storage yard	1	Xincheng Street	lumber storage yard	Disable
21	Mineral water plant	1	Xincheng Street	Mineral water plant	Disable
22	San primary school	1	Lin Hai Street	San primary school	Disable
23	Forestry Bureau Detention Centre	1	Lin Hai Street	Forestry Bureau Detention Centre	Disable
24	Rich business building	1	Lin Hai Street	Rich business building	Disable
25	Forestry police station	1	Lin Hai Street	Forestry police station	Disable
26	East gas station	1	Lin Hai Street	East gas station	Disable
27	Second wood factory	1	Xincheng Street	Individual unit	Disable
Total		34			

VII. . PUBLIC CONSULTATION

In the preparation stage of this project, the plan on information disclosure and public participation had been formulated. According to the public participation plan, implementing agency (IA) would open the project information, inform the affected people, introduce the complaints settlement mechanism to the affected residents and guarantee the effect of publicity in the project area.

In the construction stage, maintain a smooth channel of dialogue between the IAs and the affected population and the main stakeholders, by continued public participation (such as questionnaires, interviews, seminars, public hearings etc.). This kind of public participation activities is needed at least once a year. During the construction period, the environmental engineer contractor and construction supervision company will conduct monthly informal interviews of the affected residents. Through these activities, understand the matter of public concern and ensure timely treatment of complaints or unforeseen negative environmental impact.

All complaints received (including community leaders, nearby institutions, local authorities, the local environmental protection bureau and the Contractor) and public complaints unit contact information should be open at least on the construction site of the information bulletin board publicly.

Additional public participation will be based on the inspection and monitoring during construction and operation of the impact and mitigation measures, and further evaluation results of economic and social impact on the environment to decide whether to implement.

According to the requirements in the plan on information disclosure and public participation, the task content in the preparation stage has been completed. However, the requirement content during construction has not been implemented. The detailed public participation plan is shown in table 27 and detailed implementation status is shown in table 28.

Table 27 Public participation plan

Organizer	Measure/Time	Theme	Participants
A. Project preparation period			
IMPMO, Subproject coordination office, IAs, EIA unit, Resettlement planning unit	The EIA public opinion survey: Once for each subproject	Priority, design, environmental benefits and impacts, social benefits and impacts and mitigation measures, attitude and suggestion on the subprojects	IMPMO, Subproject coordination office, IAs, Design Institute, EIA unit, resettlement planning unit, environmental protection bureau, the relevant government departments and the community government and community representatives
	The expert group review: Once for each the subproject		
	The social economy and the affected population survey		
	Public participation meeting and questionnaire survey; Once for the whole project		
	Site investigation : Many times		
B. Construction Period			
Subproject coordination office, IAs	Public participation and site review :At least once a year	Adjust mitigation measures, construction impact, opinions and suggestions in accordance with actual needs	Residents in the vicinity of the construction area
Contractor and construction supervision company	Informal interviews of the affected residents:At least once a month	collect public opinions and suggestions to adjust mitigation measures accordingly	Residents in the vicinity of the construction area
Subproject coordination office, IAs	Information publicity: At least once a year	Adjust mitigation measures, construction impact, opinions and suggestions in accordance with actual needs	Residents and representatives of the society

Table 28: Implementation status of subprojects

Project	Preparation period	Construction period
Hohehot city heating network and boiler house reform and expansion project	Public survey started in Dec. 2007. Investigated people through newspaper or questionnaire are mainly nearby residents. They show different understandings to the project and fill in the questionnaire carefully. 101 questionnaires were collected. Investigated people include cadres, workers, farmer, freelances and etc. Among the 101 investigated people, 79 show approvals to the project construction, 10 stay neutral and 10 express objections. Their major concern is the noise impact after operation to their life. After patient explanation and positive promise of staff from Futai Corporation they show acceptance to the project construction.	Informal interview to affected residents at lease once a month
Baotou city central heating renovation and expansion project	250 questionnaires were distributed in Sep.(50) and Nov. (200)2007. Investigations were carried out to relevant groups. In the questionnaire, both basic situation of the project construction and the purpose of investigation are listed. The investigated people included nearby residents, workers, students, cadres, businessmen and so on. A large majority of people show positive approval to the project construction.	Informal interview to nearby residents at least once a month
Chifeng downtown central heating network renovation and expansion project	Questionnaire survey were carried out to 50 nearby residents including Zhao Lihong and Dai Junying on Sep. 2007. All of them show approval to the project. They regard the project as environmental friendly, livelihood beneficial and energy conserving. On Oct. 2007, experts from Chifeng Environmental Science Research Institute ,Chifeng Academy of Environmental Sciences and EPA carried on expert discussion on the environmental impact of the project.	In Jul. 4 2012, experts from many sections study on environmental impact related matters of heat engineering construction in Changqing street and Songzhou Road. Those experts include Yao Xiangmin,Chifeng Municipal government Housing and construction Committee,Zhao Mingquan in Planning Bureau; Wang Pinzhong in SARFT; Hao Lihua in Civil Air Defense Office; Li Jiwei from river and road division; Pang Xuesong from heat supply office; Zhao Hongguang, Chifeng Electric Power Bureau; Wang Hongbin from China Mobile; Sun Lifeng from China Telecommunication;Zhang Jian from China Unicom;Zhang Xiaodong from

		Public transport cooperation; Liu Fujun, Yu Zhikui, Jiang Limin, Yu Guohui from Fulong heating company; Zhang Zhiliang from Hongshan District; Zhang Xin, Zhang Shufeng, Xu Chunhua from Songshan District; Informal interview to nearby residents at least once a month.
Central heating project in Yindeer town, Jalaide banner, Hinggan League	Central heating project requires long pipeline with heat exchange station between, so the investigation were carried out in Nov. 2007. The investigation scope include people from nearby residences, government agencies, schools and enterprises. The living address of investigated people is in the vicinity of boiler houses. The nearest distance between boiler house to residence is 20-30. The total number of investigated people was 24, 98% out of which approve the project construction and only one people stay neutral. A large majority of people approve the direction of central heating project, regarding it beneficial to the development of Yindeer town.	Informal interview to nearby residents at least once a month
Heating system renovation and expansion in Tuquan county, Hinggan League	The first publication of environmental assessment information were done from Mar. 5-16, 2012 through the government website of Tuquan County. During Mar. 19-30, publication of environmental impact of the project were done in the government website of Tuquan county. Contractors visited nearby villages and enterprises during Mar. 20-30 and solicit public opinions. They distributed and collected 50 efficient questionnaires. The investigated people basically approve the project construction. Local residences show great expectations to the project.	Informal interview to nearby residents at least once a month.
Central heating project I replacing wood to coal in Irsch, Arxan City, Hinggan League.	The first publication of environmental impact assessment was done during Aug. 5-16, 2011 through the website of Arxan government; the second publication was done in the same way during Aug. 19-30, 2012. Contractors visited nearby villages and enterprises during Mar. 20-30 and solicit public opinions. They distributed and collected 50 efficient questionnaires. The investigated people basically approve the project construction. Local residences show great expectations to the project.	Informal interview to nearby residents at least once a month.

VIII TRAINING AND INSTITUTIONAL STRENGTHENING

To enhance the environmental management and monitoring abilities for the six PIAs, training plan on institutional enhancing had been formulated in the early stage of this loan project (Table 29). In the consulting inception stage, training on environmental management and monitoring requirements had been carried out for PIAs by the environmental specialist.

According to the data obtained in the field, the training requirements proposed before has been implemented during the period of this report. And other training plan will be carried out in future.

Table 29: Training Plan on Institutional Strengthening

Training	participant	Content	Time	Day	Number of people	Budget (CNY) 10,000	Source of Funds	Implementation situation
Environmental regulations and policies of the ADB and China	PMO, PIAs, Contractors	The security policy and other environmental regulations of ADB; Chinese Environmental laws, policies, standards and regulations; International environmental management practices on civil construction	2	1	30	4	Included in the loan implementation consulting package	Date: Jan. 20, 2016 Place: Xi'an Training teacher: Dr. Liu Jinsong Theme: introduction on ADB environmental policies and measures
Complaint settlement mechanism	PMO, PPCU, PIAs, local Environmental Protection Bureau, the community and the main stakeholder	Complaint resolution structure, responsibilities and time frame; Type of the complaint and qualification assessment	2	1	30	4		Will conduct

	olders							
Implementation of environmental monitoring plan	PMO, PIAs, Contractors, Construction Supervision Company	Impact and mitigation measures in construction and operation period; Monitoring and audit mechanism; Reporting requirements; EMP' corrective action	4	1	40	10		Date: Jan. 20,2016 Place: Xi'an Training teacher: Dr. Liu Jinsong Theme: Environmental management plan and monitoring plan
International good practice and technology on central heating	PMO, PIAs	best practices on the operation and maintenance of central heating system; New heating technology	2	2	30	6		Date: Jan. 19 2016; Place: Xi'an Training teacher: Dr. Prof. Dang Xiaoqing Theme: Heating situation and updated heating techniques in Xi'an Date: Jan. 20 2016 Training teacher: Prof. Qiu Xiaozhen Theme: Energy saving and emission reduction status and techniques in Shanxi Province. Date: Mar 29 2016 Training teacher: Xu Guofu Theme: New energy saving techniques and application Training teacher: Ma Yan Theme: Application of water source heat pump technology in heat supply system
Total			10	5	130	24		

IX KEY ENVIRONMENTAL ISSUES

As described above, no major environmental problems were found during the period of this report. EMP has got proper implementation and mitigates the environmental impact to controllable situation.

At present, dust-proof measures such as open-air coal yard and coal shed have not been completed. It is suggested that dust-proof cloth should be used to cover the coal-pile area before the completion of coal-shed, and dust-proof and dust-reducing measures should be taken in the surrounding area in order to reduce the influence of dust-raising on the surrounding environment.



The boilers and environmental protection equipment in some sub-project heat source plants have not been built or are being debugged during the heating period, so they cannot achieve stable operation and do not have the monitoring conditions for boiler pollutant emissions. After the boiler operation is stable, the owner shall monitor the boiler in time. Ensure boiler pollutants discharge up to standard.

X. CONCLUSIONS AND SUGGESTIONS

During the period of this report, no major environmental problems were found in the project. Different degrees of environmental management and monitoring were carried out in subprojects. Under the joint efforts of IMPMO, consultation experts of EED and owners of subprojects, Environmental Management Plan was implemented thoroughly and appropriately. But there are still spaces for further perfection. The following tasks are suggested to accomplish in the next step:

- (1) sign contracts with professional environmental monitoring agencies for external environmental monitoring; realize the responsibilities of supervision company;
- (2) ensure the normal operation of environmental protection facilities in subprojects;
- (3) enhance the management of construction sites; perfect environmental mitigation measures; solve the environmental problems in compensation measures.