

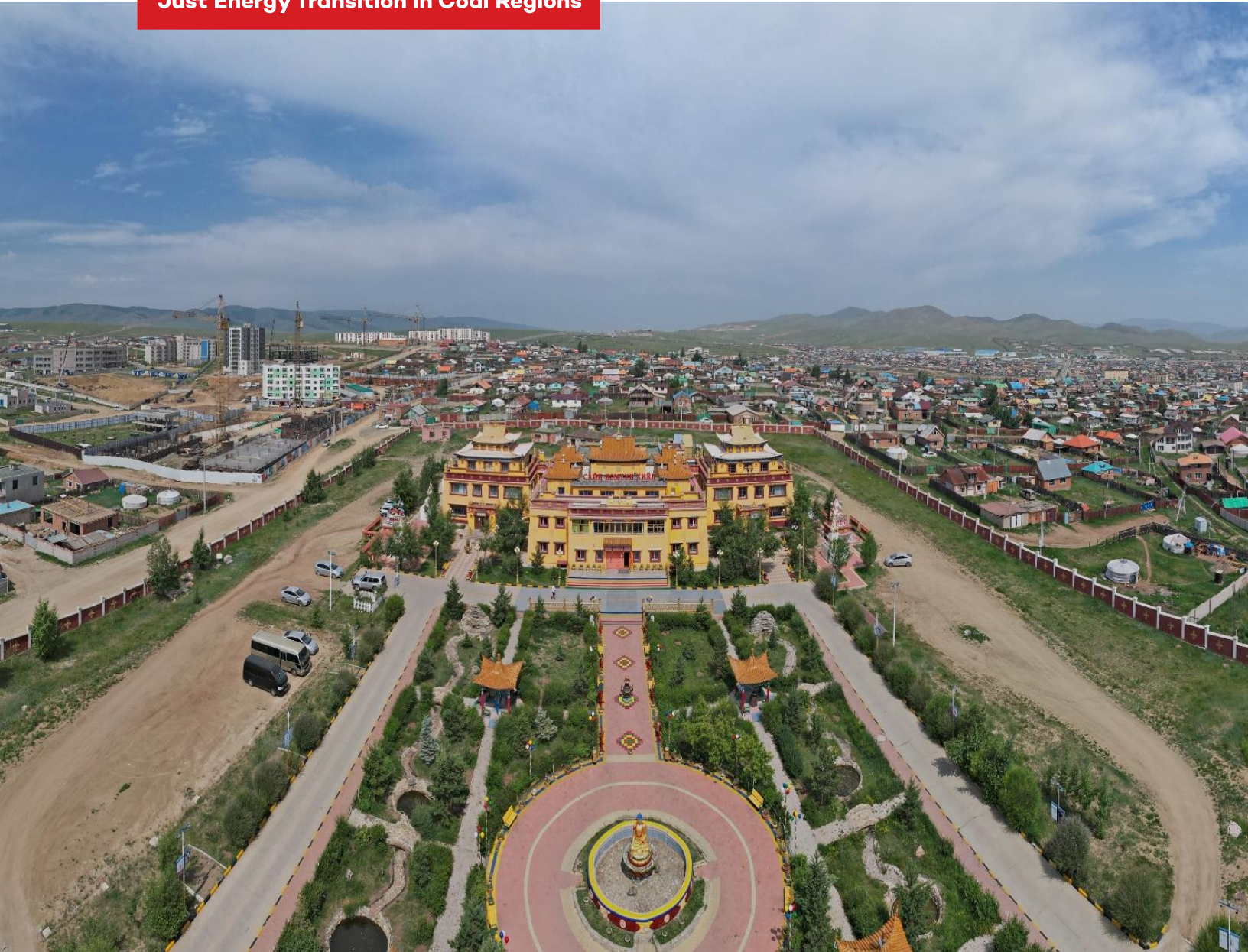
# Just Energy Transition Strategy Nalaikh 2040



Nalaikh District, Ulaanbaatar, Mongolia

December 2023

**Just Energy Transition in Coal Regions**



The Innovations Regions for a Just Energy Transition project is jointly funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK) under the International Climate Initiative (IKI) and by the European Commission's Directorate-General for International Partnerships (DG INTPA) for the Just Energy Transition in Coal Regions Interregional Platform (JET-CR). The project is implemented by a consortium of organisations led by GIZ as Joint Project Coordinator and with the Climate Action Network (CAN), International Institute for Sustainable Development (IISD), International Labour Organisation (ILO), Wuppertal Institute für Klima, Umwelt, Energie GmbH, Solidarity Center, and APHEDA as implementing partners.

IKI JET and its JET-CR Platform aim to support and accelerate just energy transitions away from coal to renewable energies and other sustainable economic activities in Colombia, Chile, South Africa, Indonesia, Vietnam, Thailand, and Mongolia.

The **Just Energy Transition in Coal Regions (JET-CR) Knowledge Hub** is an online platform building bridges between experts, policymakers, coal industry, trade unions and civil society organizations. It's a space to bring together different perspectives, share real stories and search for effective tools and solutions.

It aims to particularly amplify the voices of workers and communities dependent on coal showing how knowledge can work in practice. It also turns practice into knowledge by bringing local experience into global conversations and advancing just energy transition expertise.

Providing regular digests of articles, research papers, news stories and events it serves as a “one-stop shop” for collecting up to date information related to just energy transitions away from coal around the world.

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## Just Energy Transition Strategy Nalaikh 2040

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December 2023

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## Executive Summary

The Innovation Regions for Just Energy Transitions (IKI JET) project (2022-2027) aims to advance the transition from backward coal-based energy systems to net-zero and climate-resilient energy systems in selected coal regions of the world. In addition, the transition aims at reducing greenhouse gas emissions caused by coal and ensuring sustainable economic development that does justice to the participation of all parties, while creating decent jobs and social security. The Nalaikh District in Mongolia has been selected as one region out of 7 countries that have a historic opportunity to take a leading role in the global effort for a just energy transition.

**Situational analysis:** The Nalaikh district is based on coal mining and was closed after 70 years of operation due to a serious accident in 1990. However, small-scale mining was continued by individuals until 2019. The economy and employment in the district were based on mining. With the closure of the coal mine, the miners lost their jobs, which provided 1,500-2,500 jobs during the operation. A total of 338 hectares of land are affected by coal and small-scale mining. 140 hectares of land were rehabilitated from the city and district budgets and by the private sector. The remaining 198 hectares of land still need to be rehabilitated. Once rehabilitated, the land could be used for green spaces and renewable energy sites. The district's main economic sectors are currently industry, mineral mining and tourism. However, Nalaikh district is one of the 2 districts that receive subsidies from the national and municipal budget. In 2023, Nalaikh received 24% of the budget as subsidies from the government. Less than 9% of the total budget of the district was allocated for investment activities. However, Nalaikh district has the potential to diversify its economy through the development of tourism, agriculture, logistics and industry. The current energy system of Nalaikh district is entirely based on coal-based power generation. About 30% of households are connected to the Nalaikh thermal power plant and the remaining 70% of households have household stoves and heat with improved coal. About 98% of households are connected to the electricity grid. The existing infrastructure is outdated and there is insufficient capacity to cope with the new development. There are initiatives in the field of renewable energy sources, but they are too small and require large investments and support. Therefore, the local government is seeking to expand and redevelop the power sector and other renewable energy solutions in the energy sector. Several new industrial developments and socio-economic activities have been planned and implemented that have the potential to create new jobs and train and employ miners. The key issues related to JET and the SWOT analysis of the existing state of the district to develop and implement the JET strategy are summarized as follows.

**Legal and policy review and analysis:** The legal and policy documents are reviewed and analyzed as part of the study. The seven main laws regulating JET activities in the areas of local government, energy, budget, and policy were reviewed and analyzed. The policy documents on the JET thematic areas of economic sector, energy, mining, employment, urban planning, and infrastructure at national, municipal, sectoral and district levels were reviewed and analyzed.

The analysis of the legal framework shows that the district governor develops a four-year district governor's action program in accordance with the country's long-term and medium-term policies and the capital's medium-term policies and approves it in the council of citizen representatives. Districts are responsible for determining and implementing their development policies and planning, asset management, operation of public buildings, budget, landscape works and rehabilitation of roads at district level, waste management and other areas in accordance with the Law on Government and Regional Units of Mongolia and their Administration. Under the Law on Energy, Energy Conservation and Renewable Energy, the Governor of the district is empowered to develop a policy on energy supply and energy conservation in the district and implement it in collaboration with relevant organizations. The governor is also responsible for renewable energy projects and raising public awareness.

The policy document review and program review analyzed four national policy documents, one sectoral document, six municipal documents and four district level policy documents. The national and sectoral documents cover JET thematic areas at the national and municipal levels, and some JET activities are implemented at the national level. The development planning of Nalaikh district is reflected in the city and district policy documents, and many JET-related measures and activities are planned.

**Stakeholders survey and focus group discussions with residents:** Stakeholder meetings with public organizations and focus group discussions with residents are held between October 11 and 16, 2023. The aim of the stakeholder meetings was i) understand and discuss the key challenges related to the district's JET dimensions ii) discuss ongoing activities in the area of JET iii) discuss opportunities for JET and possible ways forward for JET. Public stakeholders include the Governor of Nalaikh District, Head of Citizen representative council of the district, Thermal Plant, Building Materials Industry Technology Park, Tavantolgoi Fuel Company Plant in the Eastern Region, and Ulaanbaatar Electricity Distribution Network Customer Service Center. Four focus group discussions will be held between October 9 and 15, 2023. The aim of the focus group discussions with residents was to identify (i) the challenges of heat supply in the ger areas (ii) the advantages and disadvantages of improved fuels (iii) the existing situation of households using renewable energy sources (iv) the employment of mining workers after the closure of mining. 5-12 residents were invited to each of the focus group discussions. A survey of 281 residents of Nalaikh district was conducted between October 2 and 8, 2023 to identify existing heating solutions, fuel use and future transition opportunities in the ger areas.

The key findings from the stakeholder meetings are: (i) the district has a major shortage of heat supply and is unable to meet the growing demand (ii) there is a lack of funding sources to implement and invest in projects (iii) new thermal power plants need to be built and energy efficiency measures taken at all levels (iv) manpower for renewable energy and other sectors needs to be provided and prepared (v) Nalaikh ITP and Tavan Tolgoi fuel companies will create employment opportunities for locals (vi) the local government supports JET and is willing to

discuss JET strategy and implementation. The key findings from the focus group discussions and surveys are: (i) the ex-miners are still struggling to find new jobs (ii) they need more job opportunities and decent salary (iii) they are willing to participate in the rehabilitation work in the coal mining sites (iv) the quality of upgraded coal is not good, so they are willing to reuse the raw coal from Nalaikh (v) they are aware of the benefits of energy efficiency and renewable energy but cannot insulate their houses due to their financial constraints (vi) the price of electricity is high if they use electric heaters (vii) infrastructure provision projects are delayed and they are willing to improve their housing conditions and connect to infrastructure.

**Formulation of JET strategy for Nalaikh district:** The JET strategy of Nalaikh district has been developed based on a situation analysis, legal and policy review and stakeholder discussion. The JET strategy is embedded in the framework of the JET thematic areas and the specificities of the local conditions of Nalaikh district. These include: i) economic diversification and regeneration, ii) coal mine rehabilitation and new development, iii) green and decent jobs and social protection, iv) transition from coal-based energy systems to low-carbon energy systems, and v) JET strategy and partnerships. The goal of the JET Strategy of Nalaikh district is to transition from backward, coal-based energy systems to climate resilient, low-carbon energy systems by 2040. The strategy includes the vision and mission of the strategy and five main strategic objectives. In addition, a detailed strategic action plan with financing options is drawn up for each goal. Indicators for monitoring and evaluation have been formulated, with the base year of the indicators being 2022 and milestone years with the expected targets. The management and organization of the implementation of the strategic activities are defined in the strategy. A detailed action plan for 2024 has been formulated and is recommended for the district's one-year economic and social directive for 2024.

**Introduction of the JET strategy to Nalaikh district council:** Within the existing legal framework and the powers of the Citizen Council and the Governor of the District, Nalaikh District approves its Annual Socio-Economic Directive and the District Governor's Four Year Action Plan. The Nalaikh District JET Strategy consists of two main parts: i) recommended detailed JET plans for the Nalaikh District Socio-Economic Directive for the year 2024, ii) Nalaikh District JET Strategy. The strategy and the one-year action plan will be discussed and approved in several stages. Both the strategy and the detailed action plan for 2024 are presented and discussed i) to a working group headed by the Deputy Governor and comprising the heads of the departments of the Governor's Office, relevant agencies including social protection, small and medium enterprises and energy, ii) to the Governor's Committee comprising the Governor and the head of the Governor's Office and relevant departments. Once the detailed action plan is set out in the District Annual Socio-Economic Directive for 2024, the entire document is discussed and approved by the District Citizens' Council. The Nalaikh District JET Strategy is presented and discussed in the District Citizens' Council.

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# I. Introduction - JET Thematic Dimensions

The thematic dimensions of JET for regional coal transitions considers on i) economic diversification and regeneration ii) green and decent jobs and social protection iii) community-based regional development plans iv) energy systems v) coal mine closure, ecological rehabilitation, and reuse of coal assets vi) JET strategies and participation mechanisms. Gender issues are considered in all these thematic areas.

Based on the specificities and findings of the legal and situational analysis of Nalaikh district, the thematic dimensions of JET at the Nalaikh level can be localized as follows:

- **Economic diversification and regeneration:** The district of Nalaikh was founded on the basis of the Nalaikh coal mining industry. Coal mining played the major role in the socio-economy and employment of the district. Due to a major coal mining accident, coal mining operations were stopped. However, illegal mining continued until 2019 when the government banned the burning of raw coal for residential purposes. The main economic sectors of the district are currently industry, mineral mining, and tourism. However, Nalaikh district is one of the districts that receive subsidies from the national and municipal administration. In 2023, Nalaikh received 24% of the budget as subsidies from the government. Less than 9% of the total budget of the district was allocated for investment activities. The district's main revenue comes from taxes and the main expenditure is the operating costs of local government and public institutions. Nalaikh district has the potential to diversify its economy through the development of tourism, agriculture, logistics and industry.
- **Rehabilitation of coal mine and new development:** Nalaikh coal mine is the first mining and industry in Mongolia that had been in operation for over 70 years, since 1922. Since 2019, all coal mining has ceased. A total of 338 hectares of land are affected by coal mining and small-scale mining, which, according to a 2017 study, requires an investment of MNT 3.1 billion for rehabilitation. So far, 140 hectares of land have been rehabilitated from the city and district budgets as well as from the private sector. The remaining 198 hectares of land still need to be remediated. After rehabilitation the areas could be used for green spaces and renewable energy site.
- **Green and decent jobs and social protection:** Coal mining was the main formal and informal employment sector for the people of Nalaikh. Coal mining met all the needs of the city of Ulaanbaatar and provided 1,500 jobs. Some of the families had been working in coal mining for generations. According to statistics, around 13% of the workforce worked in coal mining in 2018. After the official closure, around 2,500 people mined coal illegally until 2017. In 2020, the district conducted a comprehensive employment study. Based on the study, a sub-program was developed to promote employment in Nalaikh district

between 2020 and 2024 to create sustainable economic growth in the district by developing an innovation-based industry, creating more decent jobs, reducing the unemployment rate, and creating employment opportunities and alternatives for ex-miners. Several new industrial developments and socio-economic activities have been planned and implemented that have the potential to create new jobs and train and employ miners. As part of the sub-program to promote employment, animal husbandry, crafts and business start-ups were supported. A flour mills SME was set up to promote the employment of people with disabilities.

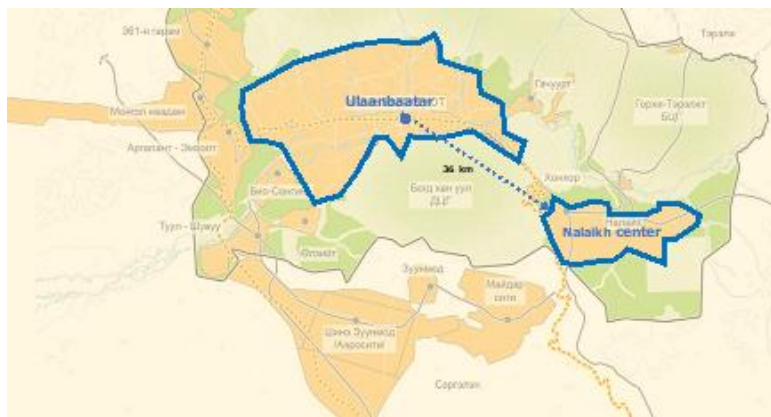
- **Transition from coal-based energy systems to low-carbon energy systems:** The current energy system of Nalaikh district is entirely based on coal-based power generation. About 30% of households are connected to the Nalaikh thermal plant and the remaining 70% of households have household stoves and heat with improved coal. About 98% of households are connected to the electricity grid. The existing infrastructure is outdated and there is insufficient capacity to cope with the new development. There are initiatives in the field of renewable energy sources, but they are too small and require large investments and support. Therefore, the local government is seeking to expand and redevelop the power sector and other renewable energy solutions in the energy sector.
- **JET strategy and partnerships:** Nalaikh District has approved and is implementing several programs and projects related to JET activities such as Medium-Term Sustainable Development Program, Heating Master Plan, Detailed Master Plan, Employment Promotion Program, and others. According to the Law on Development Policy, Planning and its Administration, the district government develops the District Governor's Four-Year Action Plan within the framework of the national government's long- and medium-term policies and the capital city's medium-term policies. Therefore, the JET Strategy follows the relevant provisions of the Law, and the JET Strategy is developed as the district's guideline for further action plans and the medium and short-term policies and programs. The Strategy's action plan is structured and developed so that it can be approved as part of the District Governor's four-year action plan. As a result, the JET Strategy Action Plan will be implemented by the relevant government and public agencies in partnership with non-government stakeholders.

## II. Situation Analysis

Ulaanbaatar, the capital of Mongolia, has six central districts and three remote districts (Figure 1). Nalaikh district is a remote district located 36 km southeast of Ulaanbaatar city. Nalaikh district became Nalaikh city in 1962 based on Nalaikh mine and changed to Nalaikh district in 1992 according to the Constitution of Mongolia. In terms of weather, the average air temperature is -20-25 degrees Celsius in winter and +23+26 degrees Celsius in summer.

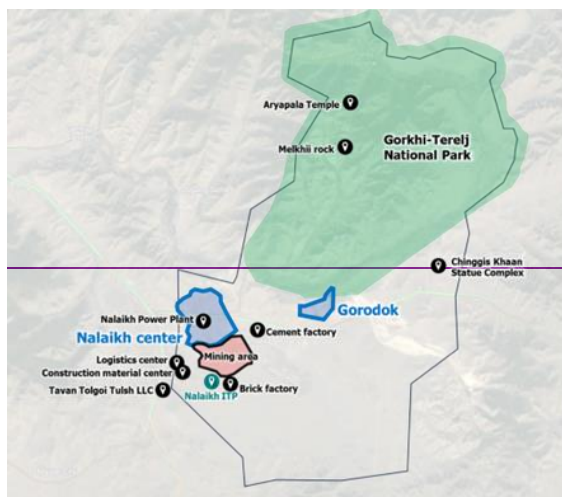
The district covers an area of 68,800 hectares and has 8 administrative units. 48% of its land is Gorkhi-Terelj special protected area, 24% is agriculture and farming land, 10% is mineral deposit land, 10% is state special purpose land, and 8% is urban land.

Figure 1. Location of Nalaikh district



Source: Author's diagram.

Figure 2 Zones and location of main objects of Nalaikh district



Source: Author's diagram.

## 2.1 Social and Economic Situation

The social and economic development of Nalaikh district and the employment of the population have always been linked with coal mining.

### 2.1.1 Population and households

As of 2022, 39,600 people from 10,510 households live in Nalaikh district. The population increased by 3.5% in 2000-2010 and by 2.6% in 2010-2022. It is 2.4 times lower than the average of the capital. 49.7% of the population are men and 50.3% are women. In terms of age structure, 33% of the population is 0-14 years old, 14% is 15-24 years old, 40% is 25-54 years old, and 12% is 55 years old or older. 29% of all households have 1-2 family members, 38% have 3-4 family members, 25% have 5-6 family members, and 8% have 7 or more family members.

### 2.1.2 Education level and employment

The literacy rate of the population aged 10 and over is 95%, which is the lowest compared to other districts. 46% of educated citizens are women. Citizens with technical and professional education are the highest (8.6%) compared to other districts.

As of 2022, the labor force in the district is 11,350 people. Compared to 2010, the labor force has decreased by 4 percent. Women make up 42% of the workforce. In terms of age structure, 21% of the workforce is 15-29 years old, 76% is 30-54 years old, and 3% is 55-59 years old. Only 34% of working-age women and 51% of men are employed. In particular, the employment rate of women aged 20-39 is 39% on average, which is twice as low as that of men. However, the employment rate of women aged 40-54 is relatively high, 68% on average. There are 226 registered unemployed people in the district, 48.2% of whom are women. According to the age group, 26% of unemployed citizens are 15-24 years old, 36% are 25-34 years old, 23% are 35-44 years old, 12% are 45-54 years old, and 3% are over 55 years old.

In 2018, more than 50% of all employees of the district worked in agriculture, mining, manufacturing, wholesale and retail trade. In 2018, the employment rate of the district decreased from 56% to 42%. This may be related to the 2019 mining closure. A detailed survey of employment at the district level has not been released as year of 2022.

### 2.1.3 Poverty and vulnerable groups

There are a total of 1,566 people with disabilities in Nalaikh District, which is 4.2% of the total population. 40% of the disabled population are women. As of 2011, the poverty head count index<sup>1</sup> of Nalaikh district was 46.8%, which was 2 times higher than that of the capital city.

## 2.1.4 Housing conditions

As of 2022, there are 10,510 households in Nalaikh district, of which 28% live in apartments, 72% live in ger areas (34% live in private houses, and 38% live in Mongolian traditional gers). A decision was made to re-plan ger areas and build a residential apartment area on 32 hectares of Nalaikh district.

## 2.1.5 The main sector of the economy

The main economic sectors of Nalaikh District are industry, widespread mineral extraction, and tourism. The share of agriculture and farming in the economy of Nalaikh district is relatively small. In the district, in 2022, 764 households with livestock and 247 agricultural households are registered.

The main industrial products of Nalaikh District are energy, lime, gravel, sand, building materials (bricks, cement, concrete, printing ink, etc.), and meat products. The most economically valuable products are produced: Electricity (produced 192.8 million kWh equals 36243.9 million MNT), heat (97.5 thousand kcal equals 4,227.9 million MNT), cement (29.2 thousand tons equals 5,666.1 million MNT) bricks (5,564.6 thousand units equals 1,383.8 million MNT), concrete (9.0 thousand tons equals 2,093.5 million MNT), hazardous waste disposal (1,017.8 tons equals 1,396.4 million MNT), meat (779.2 tons equals 6,409.8 million MNT)

Tourism: In the Gorkhi-Terelj National Park, which is considered one of the main tourist areas for domestic and international tourists, there are around 180 tourist camps and 35 vacation resorts. In addition, there are several historical, natural and sightseeing places in the district such as the Great Chinggis Khaan Monument, archaeological monuments from the ancient Tureg period, Ariyabal Monastery, Cave of 100 Monks, Turtle Rock, Mount Gandan, Tuul River Basin, Terelj River, etc.

## 2.1.6 Budget

In 2022, budget revenue of Nalaikh district was 10.9 billion MNT, while expenditure is 16 billion MNT, the budget deficit is 1.5 times high. Tax revenue accounted for 91% of the budget's revenue this year, and non-tax revenue accounted for 9%. In 2021-2022, 14 projects and measures were financed in the district with an investment of 50 billion MNT from the state budget, and 14 projects and measures were financed with 38 billion MNT from the capital budget.

According to the amendment of the 2023 budget, the revenue of the district budget is 13.2 billion MNT, and the expenditure is 20.1 billion MNT. 91% of the district budget revenue is planned to be tax revenue and 9% non-tax revenue. District expenses consist of current costs of district management and administrative organizations, fixed costs of schools and kindergartens, centers for supporting small and medium enterprises, cultural activities, differences in fuel and heating prices, street maintenance and services, fixed expenses for crime prevention and welfare

institutions. The capital budget provided 4.7 billion MNT in financial support to the district, and the balance of the district's previous year's budget was 2 billion MNT. 8.6% of the total budget of the district is spent on investment projects and measures. The investment projects and measures which consists of 67 projects are being implemented, such as designing roads and landscaping works, procurement of equipments and materials, supplies for schools and kindergartens, and connecting some households to electricity.

## **2.1.7 Entities and organizations**

As of 2022, more than 1,700 entities and organizations are registered in Nalaikh district, 37% or 630 entities are operating. The number of registered entities has increased 2.4 times over the last 10 years. As of 2022, 84% of registered enterprises have 1-9 employees, 13% have 10-49 employees, and 3% have more than 50 employees. According to the form of responsibility, the majority or 68% are limited liability companies, 11% are branch organizations, 10% are non-governmental organizations, and the remaining 11% are other types of organizations.

## **2.1.8 Social welfare services**

As of 2022, 15 kindergartens, 9 secondary schools, 1 technical and professional training institution, and 1 university are operating in Nalaikh district. As for the form of ownership, 13 kindergartens and 6 schools are state-owned. In terms of human resources, a total of 545 employees work in kindergartens and 645 employees in schools.

Nalaikh district has a General health center and 4 family health centers. The general hospital has 4 main buildings: maternity ward, children's hospital, infectious disease, rehabilitation and outpatient department, and buildings are more than 40 years aged. The general hospital has 326 employees, and family hospitals have 56 employees and a total of 382 doctors and medical employees working in the health sector.

## **2.1.9 Transportation**

In 2022, 96% of the total 5,730 vehicles are registered as private vehicles in Nalaikh district. From the technical inspection, 4,585 (80%) of the total vehicles are passenger cars, 1,006 (17.6%) are trucks, 95 (1.6%) are buses, and 44 (0.8%) are special purpose vehicles. 93.5 percent of all vehicles that have been inspected in the district are old vehicles that have been used for more than 10 years. The number of vehicles increased by 19.4% in the last 9 years, from 2013 to 2022. Looking at this by vehicle type, passenger cars increased by 27.5%.

## 2.2 Situation of Infrastructure

### 2.2.1 Heat supply

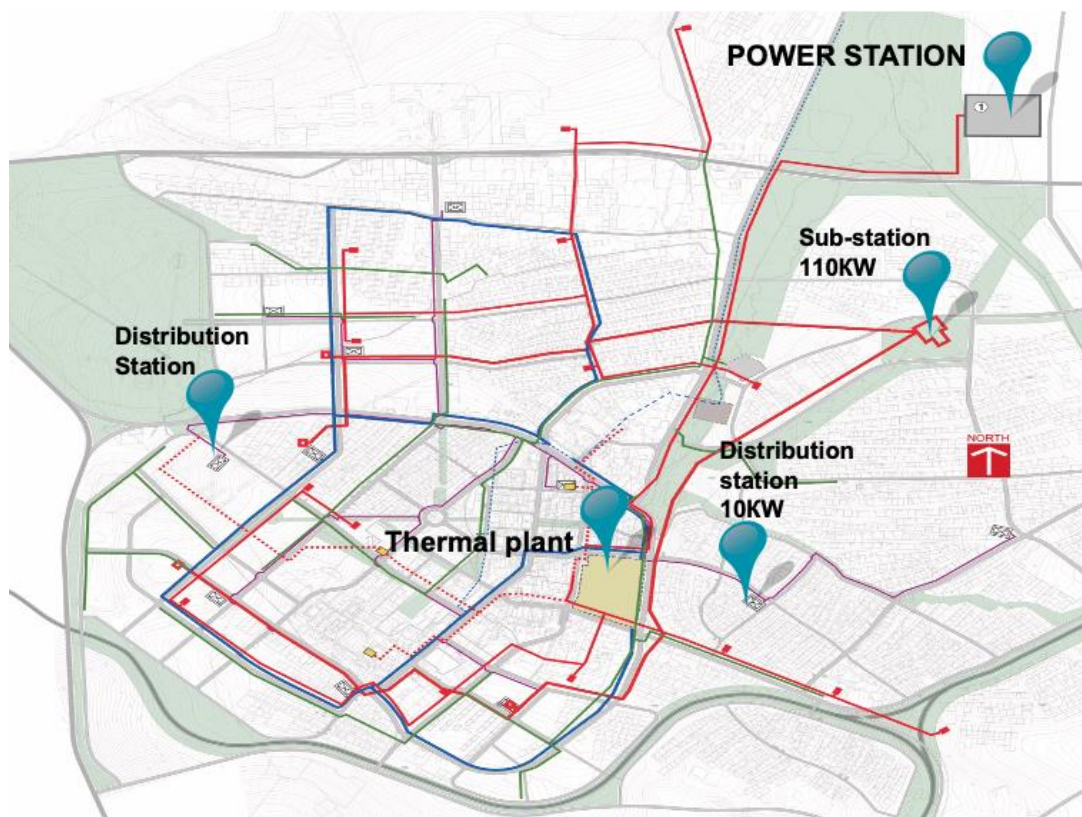
#### 2.2.1.1 Central heating system

The thermal plant, which is the main source of heat in Nalaikh district, has a capacity of 69MW and distributes heat energy to consumers through 7 heat distribution centers and 3.4 km of heat central lines. The thermal plant was commissioned in 1976.

The thermal plant produces 97-99 thou.GCal of thermal energy per year and revenue is 4,057 million MNT. The thermal plant provides heating and hot water to 33 state organizations, 330 entities, and 2,840 households (26% of all households).

There are 7 water heating boilers with a capacity of 7.6 Gcal/h that provide heat to 11 enterprises and 720 households in the 5th district committee or Gorodok village. Of these, 5 furnaces are idle and 2 are in regular operation. Previously, it was operated with fuel oil, but in 2000, it was switched to solid fuel. It has 1356m long fresh water and heat pipelines and is working with 19 wells.

Figure 3 Thermal plants and infrastructure



Source: Author's diagram.



### **2.2.1.2 A source of heating for households in the Ger area**

The households in Ger area are not connected to the central heat supply system and supply their heat with stoves. There are 7,600 household stoves in the district, 86% of which are conventional stoves and 24% are improved stoves. Households use an average of 12,500 tons of improved coal fuel per year.

## **2.2.2 Electricity supply**

Nalaikh district has a 110 kV 25 km air-transmission line, a 110/35/10 kV 2x25 MW Nalaikh substation, and a 110/10 kV 2x16 MW substation for supplying electricity to the capital's briquette factory. As of 2020, the electricity load of the district was 14.5 MW, and the electricity consumption was 65.4 million kWh. As of 2023, the electricity load of the district has increased to 32 MW, and the electricity consumption has increased to 192.9 million kWh. In total consumption, 49% was distributed for industrial purposes, 15% for residential purposes, and 36% for households in the Ger area.

In terms of electricity supply, 98.4% are connected to the centralized power system, 0.7% use renewable energy devices, and the remaining 0.9% use small-scale generators. There are about 200 households with power shortage.

## **2.2.3 Water supply and sewerage**

Nalaikh district is supplied with water from the central water supply line of Ulaanbaatar city. 40% of residential buildings in the district are 60-70 years old and are not connected to the hot water system. In terms of water supply, 25% of all households use centralized or independent systems, 61% use wells, and 14% use other sources of portable water, bottled water, etc. Since 2015, wastewater from the district has been supplied to the Central Treatment Plant of Ulaanbaatar. 70 percent of the total sewer network is old and overloaded. A treatment plant with a capacity of 1000m<sup>3</sup> is operating in Gorodok village of Nalaikh district. 97% of the households living in the Ger area have simple pit latrines, and the rest have improved sanitary facilities such as bio-toilets.

## **2.2.4 Waste**

97% of the waste is disposed of by waste service organizations, and the rest is disposed of at approved sites, incinerated, or landfill.

## **2.3 Mining and Industries**

### **2.3.1 Mining**

#### **2.3.1.1 Minerals**

Nalaikh district has coal deposits that were formed 130 million years ago.

#### **2.3.1.2 Mineral license**

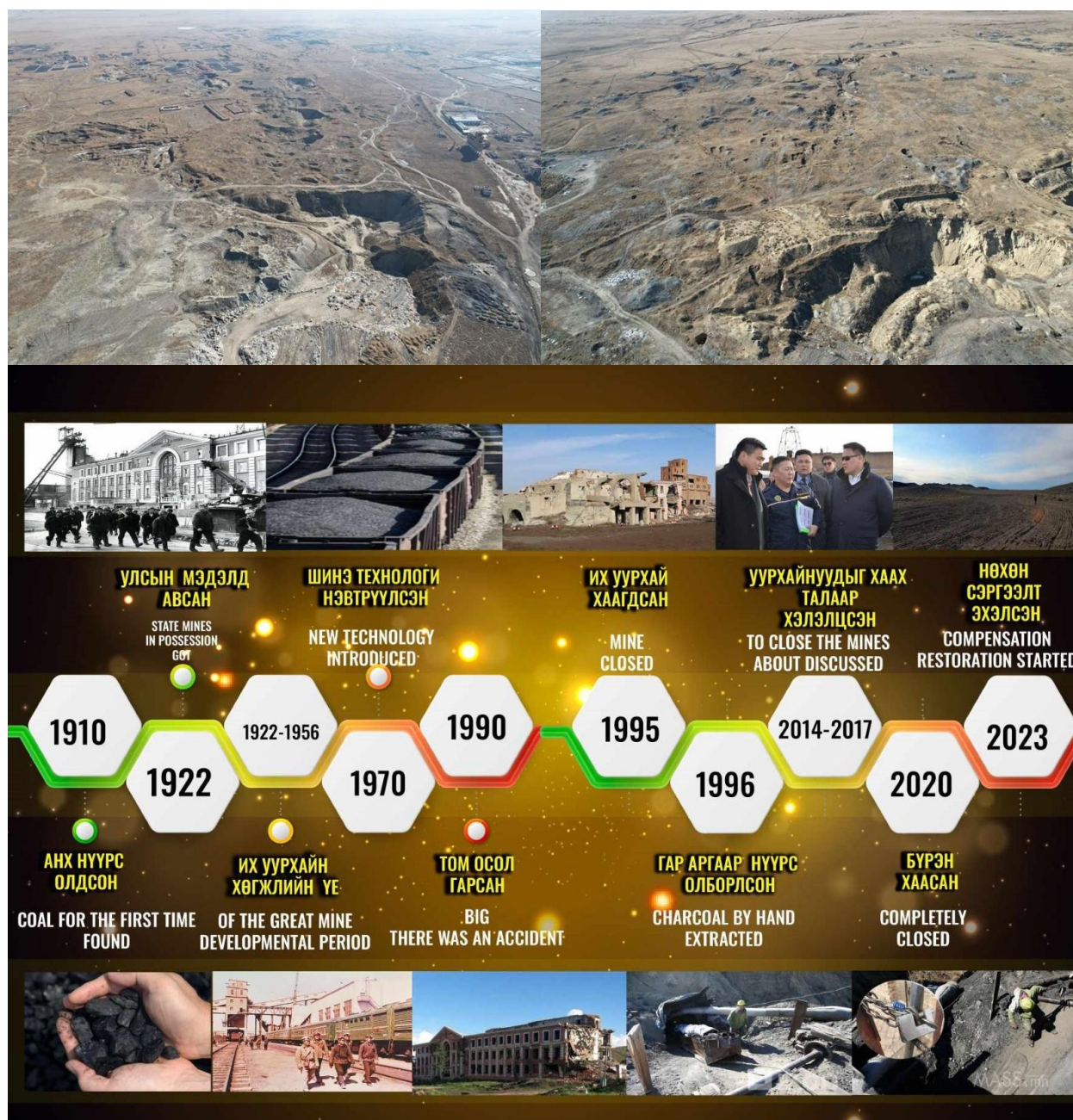
As of 2023, 10% of the total area of Nalaikh district or about 7,300 hectares has been granted special licenses for mineral exploitation. In total licences, 46% are mining licenses, 24% are widespread mineral exploitation licenses, and 30% are widespread mineral exploration licenses.

#### **2.3.1.3 Coal mine**

The Nalaikh coal mine originated during the first coal mining in 1910. It was made a state enterprise in 1922, and the Nalaikh big mine was established in 1954-1958. However, due to a large-scale accident caused by a methane gas explosion in 1990 and a number of subsequent accidents, the Nalaikh Big Mine was closed in 1995 and its operations stopped. The Big Mine had employed 1,600 workers and had an annual production capacity of 600,000 tons of coal. The mine alone supplied the capital with coal for more than 70 years, and was one of the main sources of the district's economic development, the livelihood of citizens, and the main source of fuel supply for the country.

Since the closure of the mine, there have been people mining coal manually without any supervision, and more than 2,500 people have been mining coal in more than 180 mine holes. In order to regulate this, in 2017, the Government issued a decree and organized manual miners into the partnerships. However, the number of people who lost their lives and lost their ability to work due to mining accidents did not decrease. From 2000 to 2018, 512 people were rescued and 214 people lost their lives in more than 520 emergency calls. In addition, 338 hectares of land has been damaged due to small-scale mining.

Figure 4 Areas requiring mine rehabilitation



Source: Author's diagram.

Due to the above reasons, according to Government Resolution No. 355 of 2019, small-scale mining activities were completely stopped. In 2018, the government also approved Resolution No. 62 to combat smog and ban the use of raw coal. According to the resolution, the use of raw coal was prohibited from May 15, 2019, except for the enterprises with a special license to produce electricity and thermal energy operating in the territory of 6 districts of the city center of

Ulaanbaatar. As a result, the market for selling coal extracted from small-scale mining has been completely closed.

As a result of the mining activities, a large amount of damages, holes, and boreholes were formed in the underground and were left without rehabilitation. People and animals fall into these abandoned pits and boreholes, causing injury, loss of life and health. Also, due to the excavation under the railway line, collapses occurred and the railway line is no longer usable. There was also a risk of collapse due to underground excavations in some residential areas. In addition, trucks that came to load coal dumped garbage in pits and polluted the environment. As of 2023, a total of 140.3 hectares of land has been rehabilitated, and further 197.7 hectares of land needs to be rehabilitated.

## **2.3.2 Industry**

### **2.3.2.1 Brick factory**

More than 20 brick factories are operating in Nalaikh district. The factories have the capacity to produce a total of 42 million units of bricks per year, and in 2022, they produced 37.8 million units of bricks.

These industries are responsible for paying land fees, widespread mineral royalties, water usage fees, and waste fees. However, 46% of the 19 enterprises eligible to pay taxes in 2017-2020 have paid taxes. In that year, a total of 18.2 million MNT was collected for water usage, 7.2 million MNT for waste, 202.4 million MNT for common mineral usage, and 204.2 million MNT for land use.

### **2.3.2.2 Improved briquette fuel factory**

As part of the 2020-2024 action program of the Government of Mongolia, which includes the goal of reducing air pollution by up to 80 percent, an improved briquette fuel plant was established in Nalaikh district in 2020. The plant has a capacity to produce 600,000 tons of improved briquettes per year. The factory has a capacity of 1100 employees totally, currently 760 employees are working. Of these, 520 employees are citizens of Nalaikh district, and more than 350 employees are people who worked in closed mines. In other words, after the mine was closed, the factory became one of the main workplaces for people who worked in the mine.

**Figure 5 Factory of improved briquette fuel**



Source: Author's picture.

### **2.3.2.3 Waste treatment plant**

Waste processing plants operating in Nalaikh district recycle scrap metal, aluminum alloy, plastic bags, plastic bottles, tires, sawdust, and glass.

## **2.4 Energy and Fuel**

### **2.4.1 Energy**

The installed capacity of the district is 129.2MW, an increase of 4.3 percent from the same period last year. 5.3MW capacity was added to 16 substations. Also, the load of 6 substations increased sharply due to the increase of 10MW load in the substation supplying the Ger neighborhood. In these parts, we are working on stacking SIP cables and equalizing the load. Currently, there is a heavy load of electricity supply in the 1st and 7th khoros.

The consumption of electricity supply in the district is increasing by 5 percent every year. 802 enterprises of 8 khoros, 7,600 households in Ger neighborhood and 2,894 households in apartment areas are connected to centralized electricity supply.

#### **2.4.1.1 Apartments**

There is a total of 113 residential apartment buildings in Nalaikh district. 38 of them are prefabricated buildings. There are 28 prefabricated residential buildings of 878 families built in 1977-2008 in the 2nd khoroo of Nalaikh District. The prefab buildings have a heat load of 4.8 Gcal/h and heat loss is around 30-35%. 31 prefab residential buildings were insulated. 7 prefabricated houses of 420 families built between 1969 and 1972 in the 5th khoroo have a total heat load of 1.7 Gcal/hour, and it is necessary to carry out thermal insulation work.

A total of 33 two-story brick buildings built between 1956 and 1976 have reached the end of their service life. The buildings need to be demolished and rebuilt, and the first phase of the

construction project of 280 household apartment requires a thermal energy consumption of 5.89Gcal/hour.

The total annual heat demand of residential buildings is 19.4 Gcal/h and electricity demand is 6.3 million kWh.

### **2.4.1.2 Enterprises and industrial sector**

According to the survey of the general development plan of Ulaanbaatar city in 2020, there were 5,856 workplaces and industrial buildings with an area of 1658,314 m<sup>2</sup> in Nalaikh district. The total annual heat demand of industrial and enterprise buildings is 23.5 Gcal/h, electricity demand is 160.3 million. kWh.

### **2.4.2 Fuels**

Nalaikh Thermal Plant consumes 37,000 tons of coal, 113,000 m<sup>3</sup> of water, 3,783,000 kW of electricity and 25,000 liters of gasoline fuel per year. Households in Ger areas who use stoves for heating use a total of 12,500 tons of fuel per year.

### **2.4.3 Renewable energy**

6 wind turbines and 21 solar panels capable of supplying 400 kW electricity to 80 households were installed in the 3rd khoroo in 2019-2020 with the support of the Republic of Korea, they have not yet been put into operation.

**Figure 6** Factory of improved briquette fuel



Source: Author's picture.

## 2.5 Challenging Problems

Based on the survey of the current situation of Nalaikh district, meetings with relevant organizations, focus group interviews, and citizen surveys, the following main issues related to JET were identified.

### 2.5.1 Social and economic challenges

- **Dependence on one economic sector:** The economy of Nalaikh district is highly dependent on mining and industrial sectors, and other sectors are not well developed. Therefore, the economy is weak compared to other districts and is likely to be easily affected by social, economic and natural changes due to government policies, epidemics and infrastructure provision.
- **Budget deficit and subsidies:** Nalaikh District's budget expenditure exceeds income, and since it cannot finance expenditure with income, it finances its activities and investments with subsidies from the state and the capital.
- **Sharp decline in labor force:** The economic engine of Nalaikh district was coal mining. However, due to the lack of adequate preparation and consideration of the impact on the economy, the miners lost their jobs. Consequently, compared to 2017, the number of labor force decreased sharply by 2,534 persons or 18%. There are not enough suitable jobs for unemployed miners.
- **Gender inequality:** The level of education and employment of women, especially young women aged 15-39, is almost twice as low as that of men.
- **Unemployment and poverty:** In 2017, the Economic Policy Competitiveness Research Center conducted a study on the competitiveness of the capital's districts. According to the study, Nalaikh district was the least competitive district of the capital.
- **Lack of kindergarten and school staff:** In Nalaikh district, there are 31 children per kindergarten teacher and 22 students per general teacher. This is more than the capital city.

### 2.5.2 Infrastructure challenges

- **The problem of the heat source:** The equipment of the Nalaikh thermal plant is outdated, which is the source of heat supply, the efficiency of the furnace has decreased (66%), and the network is worn out. 40% of the heating network is in need to be renewed. In addition, the thermal load of consumers exceeds the actual capacity of the plant, which is insufficient for adding new building to infrastructure network. Therefore, at present, technical conditions are not issued for buildings other than public service buildings.
- **Increasing demand for heat and electricity:** In the last 10 years, households have increased by 1.2 times and business entities increased by 2.4 times in Nalaikh district. In this regard, there is a need to increase the supply of heat and electricity.

- Heat supply for households in the Ger neighborhood: 7,600 households in the Ger neighborhood, which are not connected to the central heating network, they are burning coal in stoves to heat homes. Therefore, 12,500 tons of improved fuels are used for heating every year. However, when it comes to replacing heat supply with other solutions, people's knowledge and information, the financial capacity of households, and the supply of replacement equipment and fuel are limited.

### 2.5.3 Mining challenges

- Environmental pollutions: Due to small scale mining, 338 hectares of land has been damaged and the environment has been polluted. A significant amount of funding is needed to restore it.
- Size of factories and jobs: Most of the enterprises and factories currently operating in Nalaikh district are very small-scale factories with 1-9 employees.

### 2.5.4 Energy challenges

- **Heat loss of prefabricated buildings:** There are 7 prefabricated buildings of 420 families left in Nalaikh district that have not been renovated with thermal insulation. The buildings are 50 or more years old and the heat loss is 30-35%.
- **Heat loss of houses in ger areas:** Most households in Ger areas know that their homes have heat loss, but they do not take measures. There are various reasons for this, such as lack of knowledge and information or lack of financial resources. Therefore, in the future, there is a need to provide knowledge and information to people about heat loss and to support them in reducing heat loss in their homes.
- **Thermal plant fuel consumption:** The thermal plant consumes 37,000 tons of coal per year. In the future, expansion and modernization will be necessary to increase the heat and power load, and if conventional heat and power plants are built, the use of coal will increase.
- **The thermal plant is a source of air pollution:** Currently, the thermal plant emits about 20% of air pollution.
- **Use and management of renewable energy:** In order not to increase the consumption of coal in heat and power plants, it is necessary to create new sources of renewable energy and to run the operation of the plant in a stable, uninterrupted and efficient manner. Although a new solar plant has been built in the district of Nalaikh, it is not operational due to incompleteness and technical problems. According to this, there is an urgent need to train the workforce in the field of renewable energy.
- **Energy inefficient consumption and inefficient expenditure:** Saving energy is a priority in the energy transition, but energy inefficient consumption and expenditure occur. For example, Nalaikh district provides households with hot water from a thermal plant during the warm seasons, which consumes a lot of energy and costs inefficiently.



Therefore, in the warm season, there is a challenge of providing hot water for households with a reliable source of renewable energy.

- **Fuel quality problem:** The use of raw coal was banned and the use of improved fuel with low pollution and high calorific value was started. However, there are many complaints from citizens that improved fuel is of poorer quality and more polluting than raw coal.

## 2.6 SWOT Analysis

In developing the JET strategy, a SWOT analysis of the current situation of Nalaikh district was developed based on the current situation study, stakeholder meetings and research.

Table 1 SWOT Analysis

Strength	Weakness
The operation of the coal mine was completely stopped. Rehabilitation of the mine is being organized in stages.	The district is financially dependent on the capital, receives subsidies, and is financially unable to implement projects independently.
Building materials production technology park, Tavan Tolgoi fuel JSC plant's eastern region factory are in operation and new jobs are being created. Mine workers began to shift to work in those park and factories.	The miners who worked in the mines could not be fully provided with jobs, the unemployment rate is high.
The Polytechnic College and Joint Mongolian-German University of Mineral Technology were opened and the district has the opportunity to train skilled workers.	The district is unable to provide new energy sources.
Public kindergartens and schools have stopped using coal and have independent heat sources that are heated with gas.	Electricity supply is lacking, costs are high, and there are power shortages in some areas.
Most of the prefab residential buildings have undergone thermal insulation renovation.	Residents of Ger area are more interested in using crude coal than refined coal.
The work of connecting the neighborhood to the infrastructure has been started.	Poor understanding of the consequences of charcoal consumption and its avoidance, lack of training and promotion.

<b>Strength</b>	<b>Weakness</b>
There is a reserve area for the development of renewable energy, and the first initiative has been taken.	Lack of knowledge and financial difficulties about the use of renewable energy.
Feasibility study of 185 MW thermal plant has been completed.	The provision of infrastructure/basic urban service in ger areas is progressing slowly and households are struggling to afford it.
	Since heat meters are not installed in households, it is not possible to measure and adjust heat for energy savings.
	There are no charging stations for electric cars.
<b>Opportunity</b>	<b>Threats</b>
By developing tourism, agriculture, industries, and logistics, it is possible to diversify the economy and increase new jobs and green jobs. Certain measures are being taken.	If the government's work to improve electricity grid expansion slows down, there will be a shortage of electricity supply.
It is possible to rehabilitate the mine land, build green areas and renewable energy sources, and develop tourism by building a museum.	The construction of the new thermal plant could slow down or stop due to the constraints of state and municipal budget and political decision.
It is possible to increase sources of electricity and jobs within the framework of Building materials production technology park.	Rapid growth of energy consumption due to population growth.
There is a reserve land that can be developed for solar and wind renewable energy.	Change of district administrations, delay in support and implementation of projects of renewable energy.
To produce and use a new type of fuel that is cheaper and more efficient than the Tavan tolgoi fuel.	Increase of electricity prices: Some residents of the Ger areas are using electricity for heating, but the cost is high. If the government increases the heat and electricity bills, people are more likely to use coal.
The district authorities are supporting the just energy transition in the district.	

Source: Author's table

### III. Analysis of Legal and Policy Documents

Within the analysis of legal framework and policy documents, the legal documents in force in the fields relevant to JET were studied. The policy documents implemented at the level of the state, sector, capital and district were studied and evaluated and conclusions were drawn. It includes:

The current functions and regulations stipulated in the legal framework for just energy transition at the level of Nalaikh district have been defined. The study of policy documents was considered at 4 main levels, i.e. at the level of state and economic sectors, Ulaanbaatar city and Nalaikh district, and concluded from the aspects of social, economic, energy, mining, employment, urban planning and infrastructure sector policies related to just energy transition.

Nalaikh district is one of the 9 districts of Ulaanbaatar, the capital city, and one of the remote districts according to the Law on Administrative units, territorial units and their management of Mongolia

#### 3.1 Study of Legal Documents

7 legal documents related to legal grounds of district, energy, investment and development policy documents were studied.

Table 2 Provision of JET branches in relevant legal documents

Legal documents	JET thematic areas					
	Strategy	Governance	Energy	Industry	Mining	Job/employment
Law on administrative and territorial units of Mongolia and their management						
Law on development policy, planning and its management						
Law on Energy						
Law on Energy Saving						
Law on Renewable Energy						
Law on Budget						
Decision prohibiting the use and transportation of raw coal						

Source: Author's table

**The Law on Administrative and territorial units of Mongolia and their management** provides for the legal status, functions, budget and fund regulations of the district. According to the law, the district is responsible for development policy and planning, district property management, budget planning and implementation. It is also stated that the district can have non-budgetary funds other than the funds specified in the Budget Law.

**The law on development policy, planning and its management** regulates the types of development policy and planning documents, the development policy and planning system and the rights and obligations of the parties involved in it, the stages of document development, and sources of funding. According to the law, the district governor shall develop a 4-year action program of the district governor in accordance with the long-term and medium-term policies of the country and the medium-term policies of the capital city, and approve it at the Citizen's Representative Council. The governor's action program needs to be coordinated with national, regional and local development goals aimed at improving local human, social and economic development, environmental balance and governance.

**The Law on Energy** regulates the district governor's powers, energy activities, energy distribution, special permits for construction of energy buildings, energy tariffs and the principles of their determination. According to the law, the district governor shall develop a policy on energy supply in the district and implement it in cooperation with relevant organizations.

**The Law on Energy Saving** regulates the powers of district governors and the rights and obligations of energy consumers. According to the law, the district governor shall determine the local policy on energy saving and implement it in cooperation with relevant organizations. The Law on Energy Conservation defines the major energy consumers and sets the thresholds for entering this category. In addition, large energy consumers are required to submit annual reports presenting their energy consumption and plans to reduce it.

**The Law on Renewable Energy** regulates the powers of district governors, special permits for the construction of renewable energy generators and production of renewable energy, and the prices and tariffs of renewable energy. According to the law, the district governor must include the location of renewable energy generators in the district's land management plan, defines land ownership and use issues, lease locally owned renewable energy sources to citizens and legal entities, advertise renewable energy to citizens and the public, etc. is responsible.

**The Law on Budget**, the district governor is the general governor of local budgets, except for the budgets of the Citizens' Representative Council and the budgets of organizations that report to it. District budget revenue consists of personal income tax, license fees for the use of natural resources other than minerals, widespread mineral royalties, land fees, oil exploration and exploitation license fees. Non-tax income consists of dividends from shares of locally-owned and locally-owned legal entities, fees for the use and sale of locally-owned property, interest, fines, and other income according to laws. A short-term loan may be granted from the capital budget to finance the seasonal shortfall of district budget revenue. The local development fund of the capital city shall allocate at least 50% of the income from the mineral exploration special license fee under this law to the local development fund of the district where the area granted the special license is located.

**Government Resolution No. 62 of 2018 on Banning the use of raw coal**, citizens and enterprises with a special license to produce heat and energy, except for the Nalaikh thermal station, are prohibited from using raw coal starting from June 15, 2022. However, the use of improved briquettes and middlings was allowed for enterprises and organizations that produce heat and steam by introducing environmentally friendly advanced technologies.

### 3.2 Study of Policy Documents

In the study of policy documents, national 4, sectoral 1, capital city’s 6, and district’s 4 documents were studied.

Table 3 Coverage of JET sectors in policy documents

Level	Policy documents	Strategy	Governance	Energy	Industry	Mining	Employment
National	Nationally Determined Contribution (NDC) for the Implementation of the Paris Agreement						
	"Vision-2050" long-term development policy of Mongolia						
	New Recovery Policy						
	Mongolia's Five-year Development Guidelines for 2021-2025						
Sector	Nationally Determined Contribution NDC Actions in the Construction Sector in Mongolia 2020-2030						
Capital	Concept of Ulaanbaatar Urban Master Plan 2040						
	Capital City's Five-year Development Guidelines for 2021-2025						
	Energy Master Plan of Ulaanbaatar City						
	Local Energy Efficiency Action Plan						
	Master Plan to Reduce Air Pollution in the Capital City 2018-2025						
	Green City Action Plan for the City of Ulaanbaatar						
District	Nalaikh Master Plan 2015-2030						
	Action Plan of the District Governor 2020-2024						

Mid-term Policy Document for Sustainable Development of Nalaikh District  
 Master Plan of Heat Supply, Water Supply and Sewerage Network 2020-2030


Note: Indicated whether the above documents contain policies and measures at the state/capital or district level as follows.

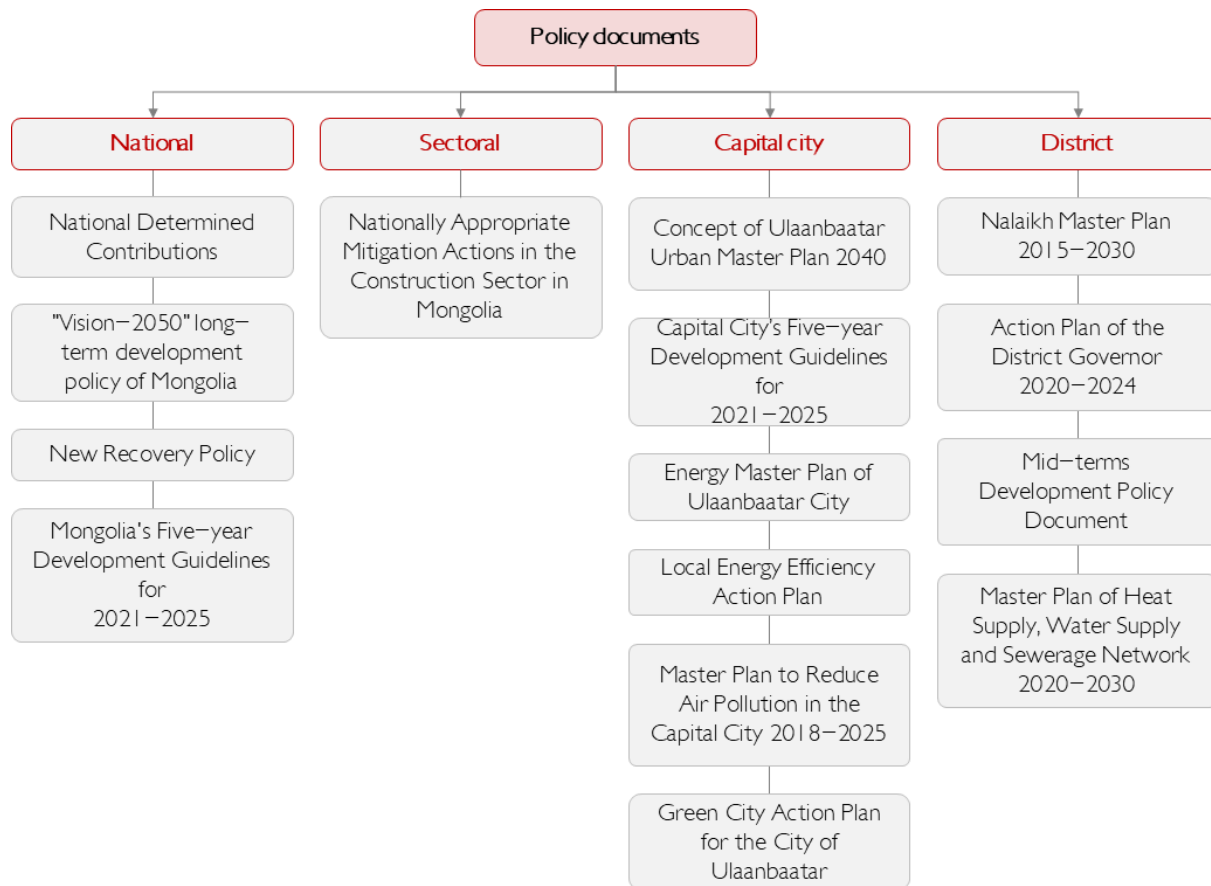
■ National/Capital ■ Nalaikh district

Source: Author's table

### 3.2.1 Analysis of national policy documents

The following national policy documents were examined in this study.

Figure 7 Policy Documents



Source: Author's diagram

**National Determined Contributions (NDC) for the Implementation of the Paris Agreement** include the creation of a legal, policy and planning environment, the creation of a financing mechanism, the introduction of environmentally friendly advanced and high-productivity technologies, scientific understanding and information within the framework of the common goal of greenhouse gas emissions. Methods for monitoring, evaluating, and reporting on the implementation of national, sectoral, and local policies, strategies, and action plans on climate change have been identified. In this document, Mongolia is determined to reduce greenhouse gas emissions by 11.5 million tons in the energy, industry, road transport, and construction sectors by 2030. In the energy production and supply sector, 8.34 million tons of CO<sub>2</sub> will be reduced by using renewable energy and improving the efficiency of energy supply. In the industrial sector, 1.2 million tons of CO<sub>2</sub> will be reduced through industrial energy efficiency, cement plant waste heat generation, and coal mine methane extraction to generate electricity. In the road transport sector, 1.05 million tons of CO<sub>2</sub> will be reduced by switching to Euro 4 and 5 fuel. In the construction sector, 0.83 million tons of CO<sub>2</sub> will be reduced by using improved fuels and insulating prefabricated housing.

**"Vision-2050" long-term development policy of Mongolia** has developed 9 main goals for Mongolia's development over a period of 30 years. In order to improve human development, every citizen has a job and income; In order to improve the quality of life and the middle class, provide households with affordable housing, support small and medium entrepreneurship, and provide financial support to the middle class; In the framework of the goal of economic development, the development of leading sectors of the economy and the development of a financial system connected to the international financial market; In order to improve governance, determine the structure and organization of state administrative institutions, and ensure the participation of stakeholders in national development policy, planning, and implementation; Contribute to international efforts to mitigate climate change by developing a low-carbon, productive and inclusive green economy within the framework of the Green Development Goals; In the framework of the development of regions and localities, connecting the regions with an integrated network of infrastructure; Within the framework of the development of Ulaanbaatar and satellite cities, goals such as the creation of good city governance and the development of satellite cities are included.

The document also outlines the future development trends of remote districts. For example, decentralization of Ulaanbaatar by creating jobs in satellite cities, relocating universities to satellite cities, moving factories in Ulaanbaatar to satellite cities to form clusters, building heat sources with environmentally friendly and advanced technology, and building industrial technology parks. operation is planned.

**In the framework of the New recovery policy**, the energy recovery policy was developed. In this context, it is stated that new energy sources and networks will be built, and renewable energy production will be developed by building hydro and storage power plants.

**Mongolia's Five-year Development Guidelines for 2021-2025**, it is included in the document to reduce greenhouse gas emissions by 12.3% within the framework of the goal of creating low-carbon, productive and accessible green development.

### 3.2.2 Analysis of sectoral policy documents

**In the Nationally Determined Contribution Actions in the construction sector in Mongolia 2020-2030**, 5 goals were set to reduce the negative impact of the construction and urban development sector on climate change and reduce greenhouse gas emissions. Within the framework of Objective 1 of the plan, which is the objective of creating a legal framework, it is stated to amend the existing legislation. Also, creating financial incentives for new green buildings, creating a legal framework for the evaluation of green cities and buildings, developing standards and regulations for green sustainable cities and buildings, studying the possibility of using waste ash from thermal power plants in the production of building materials, saving heat loss and energy for citizens. The work of promoting green construction and increasing demand for green construction is included. Within the framework of Goal 2, the goal of improving energy efficiency, creating a database on the annual consumption of coal, water, electricity, and heat by building materials factories, building resource-efficient infrastructure in Ger neighborhoods, renewing the heat of buildings with low-pressure furnaces using coal and renewable energy combined technology, and insulation works will be implemented for buildings classified as D and E according to the power audit. Within the framework of Goal 3, or the goal of developing urban planning resistant to climate change, assess cities and settlements according to the evaluation methodology of green cities and settlements, develop and implement adaptation plans by assessing the vulnerability and risk of climate change in urban areas, and develop and implement adaptation plans for consumer water and heat networks, install smart meters to measure and report greenhouse gas emissions of buildings, create evidence databases, conduct energy audits and certifications of buildings, and implement insulation of prefab homes. Financial incentives to support green buildings and building materials will be introduced as part of Goal 4, or the goal of increasing green financing. Within the framework of Goal 5, which is the goal of creating a system for measuring, reporting and proving greenhouse gas emissions in the construction and urban development sector, to empower government officials to work in this field, to provide homes, apartments, public and civil buildings with independent heat supply sources that are not connected to the electronic system of greenhouse gas counting. A system for registration and voluntary reporting of greenhouse gas emissions has been established and public awareness activities have been planned.



### 3.2.3 Analysis of the capital city's policy documents

The following policy documents were reviewed at the capital city level.

**In the Concept of Ulaanbaatar Urban Master Plan 2040**, a comprehensive study of the current situation of Ulaanbaatar city has been carried out and the problems are identified, and the city development strategy and regional development trends have been defined. The document defines 6 main development strategies of Ulaanbaatar city. In the framework of improving governance, creating a stable legal and governance environment, supporting the development of remote and satellite towns and villages through policies; Within the framework of improving the economy and industry, develop a multi-pillar economy, increase the capacity and availability of infrastructure, develop production and services based on advanced technology and innovation; Reduction of environmental pollution in the direction of fuel and energy, use of renewable energy resources; Economical and efficient use of depleting natural resources in the mining industry; Within the framework of employment support, strategic goals and objectives such as reducing the level of poverty and supporting and developing the quality of knowledge and consumption of the population have been defined.

**Capital city's Five-year Development Guidelines for 2021-2025** is a document developed to implement the 9 main goals defined in the "Vision-2050" document at the capital level. In this document, the goals of making the capital a multi-pillar and independent economy, developing innovation, diversifying the economic structure, developing the creative economy, and expanding cooperation with international cities have been defined. In order to improve governance, the goal was to decentralize administration in the capital and connect 3 remote districts of the capital to electronic databases and networks. As part of the goal of creating green development, we will provide households in the Ger neighborhood with improved fuel and reduce air pollution. In the framework of the development of Ulaanbaatar and its satellite cities, goals such as insulation of prefabricated residential buildings, renovation of out-of-service lines, provision of stable electricity to the population through technological innovation, and creation of power reserves to fully meet the domestic needs of thermal energy have been set.

**In the Energy Master Plan of Ulaanbaatar City**, in 2050 energy and heat demand prospects of Ulaanbaatar City are calculated by sectors. Compared to the base level of 2016, it is estimated that Ulaanbaatar's energy demand will increase by 100% (1,564 GWh/J) in the residential area and 37% (1,618 GWh/J) in the enterprise and industrial sector by 2050. However, it is estimated that heat energy demand will increase by 36% to 13,824 GWh/J in 2050, of which 69% will be used for apartments, 6% for housing, and 25% for enterprises and industry. As for the transport sector, in 2050, electric vehicles will account for 30% of all passenger transport and 10% of cargo transport, and it is estimated that they will use a total of 161 GWh/J of heat. However, non-electric vehicles require a total of 2,748 GWh/J of fuel, which will emit 810 kton CO<sub>2</sub>eq/year of

greenhouse gases. In addition, the document predicts that the share of renewable energy production in the total energy production will reach 74% in 2030 and 77% in 2050.

**The Local Energy Efficiency Action Plan** defines the building renovation and energy efficiency improvement in Ulaanbaatar, as well as the necessary management structures and processes. As part of the goal of improving local energy efficiency, 15 main activities have been identified in the following categories: public buildings, single-family homes in residential areas, multi-family buildings, and new buildings.

**In the Master Plan to Reduce Air Pollution in the Capital City 2018-2025**, 5 goals to be implemented in 2020-2025 have been proposed. As part of the goal of decentralization of Ulaanbaatar city, it is planned to create favorable social and economic conditions in the satellite cities to attract citizens, provide jobs, and limit sand and gravel mining and production activities in the around of the city to restore the land. As part of the goal of banning the use of raw coal and reducing the waste of pollutants, measures such as banning raw coal for use other than thermal power plants and heat only thermal plants, promoting standards related to fuel and home stoves to citizens, and establishing a green loan fund will be implemented.

**According to Green City Action Plan for the City of Ulaanbaatar**, there are 4 main objectives: to improve air quality by changing the energy and transportation systems, to reduce the effects of climate change, to overcome climate problems with environmentally friendly solutions, to create a green environment, and to create a happy city by improving citizen participation set strategic goals. Within the framework of this strategy, 14 activities such as development of infrastructure and income-friendly green housing in ger neighborhoods, modernization of central heating, implementation of interdisciplinary green energy solutions, and energy saving of buildings are included.

### 3.2.4 Analysis of district policy documents

The following policy documents are reviewed in Nalaikh District.

**The Action Plan of the District Governor 2020-2024** was developed in coordination with the long-term and medium-term development policy documents of the national and the capital. In this document, within the framework of improving governance, the District Governor's Office and Citizens' Representative Council will increase citizen participation in decision-making and make government activities transparent. In the area of energy, measures have been planned to introduce the use of briquettes to households in the Ger neighborhood, to increase the number of households that use night heat storage and electric heaters for heating, and to reduce heat loss in homes. Also, measures were taken to increase, expand and renew the capacity of electricity and heat sources and pipelines, to connect independent state-owned heating boilers to centralized heating, and to switch heating boilers of enterprises that cannot be connected to centralized

pipelines to gas fuel. In terms of economy and industry, it is planned to reduce the financial support from the capital, build Construction Material Production Technology Park and innovation center, and develop intensive animal husbandry as a cluster. In the field of mining, it is planned to rehabilitate the damaged areas due to mining, turn the rehabilitated areas into green zones under special local protection, monitor the exploration and extraction of widespread minerals, and have them rehabilitated. In the area of employment support, the establishment of shared offices and incubator centers to support start-up businesses, the involvement of citizens in national-level mining, construction and development projects, and the training of diverse personnel in line with the labor market of the district are included.

**The Nalaikh Master Plan 2015-2030** includes the district's main development strategy, population, society, economy, infrastructure, social provision, housing perspective, necessary investments, management organization and implementation measures. In the document, when defining the main development strategy of the district, it is necessary to create an economy based on household farming, tourism, transportation logistics, building materials production, smokeless fuel production, vocational training, and developed production and service economy. It is reflected that by improving the conditions of the current residential areas, the creation of new residential areas and the structure of the industrial area will be improved. In the general development plan, it is estimated that Nalaikh District will have 54,000 people, 22,000 households, 30,000 workers and 17,000 housing units by 2030. It is also estimated that Nalaikh district will need 0.85 million tons of coal per year by 2030.

**The medium-term policy document of Sustainable Development of Nalaikh District** is planned to be implemented in the medium term, 2020-2028, in order to create a pleasant environment for living and well-developed infrastructure, develop eco-friendly industry, and become a tourist center and a benchmark for green development. In the document, the population of the district is estimated to be 47,700 by 2030, and it is determined that the implementation of the policy will increase decent jobs, reduce poverty, improve Ger neighborhood infrastructure and living environment, reduce air and environmental pollution, and improve the governance of public institutions. Within the framework of the goal of creating an environment friendly and comfortable environment to live, re-planning of residential areas, creation of partial infrastructure centers, construction of energy-efficient residential campuses, expansion of Nalaikh thermal plant, construction of new sources, heating, lighting and heating of remote districts measures were planned to support the solution of water with renewable energy, connect heating boilers to centralized and partial sources, fully introduce improved fuel to households in the Ger neighborhood, develop the production of bio-briquettes, and support the insulation of houses. With the implementation of this measure, it is estimated that by 2028, the number of households in the ger areas will be reduced by 1.7 times. In order to reduce air and environmental pollution, the widespread mineral mining areas will be restricted to residential areas, biological reclamation will be carried out, reclamation areas will be designated as green zones under local

special protection, and a public control system will be established for illegal mining. The implementation of this measure will bring air quality indicators to standard levels. As part of the goal of reducing poverty, we will take measures such as reducing social welfare, improving the education and skills of citizens, providing them with the necessary tools and equipment for employment, creating professional workers for social, gender, and family issues in khorroos, and supporting organizations that provide jobs to people below the subsistence level. In this way, by 2028, the living standards of 1,000 families will be improved and the number of poor people will be reduced by half. In order to promote decent employment, change the attitude of unemployed citizens and citizens who have lost their jobs due to coal mining, develop programs for the acquisition of professions and skills, employment promotion programs, create new jobs, support household production, provide suitable opportunities for women and disabled citizens who cannot work will be implemented. Thus, by 2028, the unemployment rate will be reduced by half. In the framework of the goal of development of production and construction, industry, animal husbandry and agriculture industry will be developed to environmentally friendly technologies. In doing so, the creation of a tax and legal environment that supports enterprises, the preparation of personnel in accordance with their necessary jobs, and the construction of buildings, parks, factories, and warehouses necessary for the production and services have been planned. Implementation of these measures will create 10,000 new jobs by 2028. Measures will be taken to make public institutions transparent and accountable, to empower employees, and to increase citizens' participation in the framework of the goal of creating good city governance. In addition to involving all types of stakeholders in all district policy and planning activities, gender equality will be ensured. This will improve the quality and availability of public services by 1.4 times by 2028. The "Sustainable Development Council" of the district will be responsible for deciding on the financing of the implementation of this policy, organizing, planning, distributing, and monitoring its implementation. Funds required for the implementation of the goals and activities of this policy will be decided by means of raising funds from a variety of sources: the government, the private sector, foreign and domestic sources.

**The Master Plan of Heat Supply, Water Supply and Sewerage Network 2020-2030** was developed in order to improve the conditions of existing stations and pipelines, increase the capacity of sources and pipelines, and thus support the constructions to be carried out in the district and improve the quality of life of citizens. According to the plan, in 2020-2030, construction of 2 heat sources with a capacity of 185 mW and 222 mW, 15 sets of heat transfer center with a capacity of 3-26 mW, 16 km of thermal network, and insulation work of 24 blocks of prefabricated buildings are planned.

### 3.2.5 The main activities planned at the capital and district level within the framework of JET directions

In the above policy documents, the following main activities and measures are planned within JET strategy.

Table 4 Main activities planned in the metropolitan area within JET branches

Planned activities		Documents
<b>Strategy</b>		
1.	Limiting and banning the exploration and extraction of widespread minerals in urbanized areas, organizing technical and biological rehabilitation of damaged areas	CUMP
2.	Development and implementation of the capital's renewable energy program and creation of a system of tax incentives to support the use of renewable energy	CUMP
<b>Governance</b>		
1.	To improve the mechanism of inclusion of citizens' participation and opinions in the general development plan	CUMP
2.	To improve the financing mechanism of urban planning activities	CUMP
3.	Determining preferential conditions for production and services in satellite cities and confirming them in the legal environment	CUMP
4.	To increase citizens' participation to 80% in capital city budget planning	MFYDG
5.	Organization of information campaigns and influence campaigns aimed at increasing public participation in reducing air and environmental pollution and training in correct practices.	MFYDG
6.	Introduction of energy management system in public buildings	UBEMP
7.	Introduction of mandatory energy performance certificates for new buildings	UBEMP
8.	Update/enforce building norms to meet energy efficiency requirements	UBEMP
9.	The city of Ulaanbaatar will introduce mandatory norms for connecting new buildings to centralized energy sources (if technically possible).	UBEMP
<b>Economy and industry</b>		
1.	Increase the share of the industrial sector to 45% in the total domestic product of Ulaanbaatar	CUMP
2.	Creation of knowledge-oriented and industrial clusters	CUMP
3.	Establishment of industrial parks together with universities	CUMP
<b>Infrastructure, energy and fuel</b>		
1.	Use a combination of renewable energy and centralized or partial systems for infrastructure. Also, the heat sources are a combination of renewable energy and various improved fuels.	CUMP
2.	30% of the population will have housing partially connected and 70% will be connected to centralized engineering infrastructure.	CUMP
3.	Insulation of 375 prefabricated houses	MFYDG
4.	Increase the use of renewable energy in the capital to 3-4%	CUMP
5.	30% of household electricity consumption will be provided by renewable energy sources	CUMP
6.	By 2050, imported energy will be used only if it is cheaper than domestic renewable energy sources	UBEMP

7.	Instead of using fossil fuel for vehicle engines, use fuel produced from renewable energy sources.	UBEMP
8.	Reach 85% of total renewable energy generation capacity by 2030 compared to the target of 30%.	UBEMP
9.	Create a reliable tariff system to attract investment in renewable energy sources and create a favorable environment for increasing financing.	UBEMP
10.	By 2024, Ulaanbaatar city will start energy billing based on meter data in multi-family buildings	UBEMP
11.	By 2030, replace inefficient coal stoves and all stoves that do not meet emission standards of Ger neighborhood in Ulaanbaatar.	UBEMP
12.	The city of Ulaanbaatar will implement a reform program with the goal of reducing the energy consumption of multi-family buildings by 5% by 2030 and by 15% by 2040.	UBEMP
13.	Ulaanbaatar City will introduce a reform program with the goal of reducing the energy consumption of public buildings by 10% by 2030 and by 20% by 2040.	UBEMP
14.	Implementation of the reform program with the goal of reducing the energy consumption of private homes of Ger neighborhood in Ulaanbaatar by 22% by 2030 and by 50% by 2040	UBEMP
15.	Ulaanbaatar will achieve the medium-term goal of reducing CO <sub>2</sub> , PM, CO, and SO <sub>2</sub> emissions: an average of 30% by 2030 and 60% by 2040.	UBEMP
16.	Full introduction of refined and improved fuel into use	CUMP
17.	Collecting tax based on the amount of carbon dioxide emitted per unit kilometer from vehicles in motion	CUMP
18.	Households in the Ger neighborhood will be fully supplied with improved fuel and air pollution has been reduced.	MFYDG
19.	Construction of gas fuel heat sources.	MFYDG
20.	Solid fuel heating boilers of enterprises and organizations that cannot be connected to centralized heat supply will be switched to gas fuel.	MFYDG
<b>Mining</b>		
1.	Restoration of damaged and polluted land due to mining, sand and gravel extraction	CUMP
<b>Workplace</b>		
1.	To create 160,000 jobs in wealth creation sectors through the development of small and medium industries, the establishment of industrial parks, the creation of knowledge-based products, and the development of the construction industry in connection with redevelopment	CUMP
2.	Increase jobs and employment rate to 95% of the economically active population	CUMP

Explanation:

1. GDPUB – General Development Plan of Ulaanbaatar 2040
2. 5YDDCC – 5 Year Development Directions of Capital City
3. UBEMP – Ulaanbaatar Energy Master Plan

Source: Author's table

Table 5 Main activities planned in Nalaikh district within JET sectors

<b>Planned activities</b>		<b>Documents</b>
<b>Strategy</b>		
1.	Construction projects that require large investments will be financed from the state budget, ranking the activities included in the district's SDG policy documents in order of importance.	NDSDMTP
2.	Provide information and knowledge to citizens about the measures that can be implemented in the field of improving their living environment, and enable them to vote on Local Development Fund spending.	NDSDMTP
3.	On the initiative of the District Governor's Office and the Department of Labor, Welfare, and Services, calculate the costs of the works that can be implemented from the special funds of the Government, determine the scope of targets, and submit the cost budget proposal to the General Department of Labor and Welfare Services and the Ministry of Labor and Social Security.	NDSDMTP
4.	Seeking opportunities to finance the activities included in the district's SDG policy plan by such as environmental and climate fund, health insurance fund, small and medium enterprises development fund, in cooperation with the capital and district agencies and departments responsible for the activities of these funds, and reflect district proposals in their policy planning.	NDSDMTP
5.	Investigate and implement the possibility of financing the large funds required for the implementation of the activities included in the SDG policy plan with the assistance of foreign loans and aids.	NDSDMTP
6.	To make production and construction investments made by the private sector efficient, to provide the opportunity to use more innovative and environmentally friendly technologies.	NDSDMTP
<b>Governance</b>		
1.	Creating a public control system for illegal mining	NDSDMTP
<b>Infrastructure, energy and fuel</b>		
1.	Establish at least 4 renewable energy stations in cities and towns of Ulaanbaatar region	CUMP
2.	The technology of independent renewable energy sources has been introduced in the remote Ger neighborhood.	MFYDG
3.	The improved fuel plant No. 2 will be put into operation, and the households of Ger neighborhood will be provided with improved fuel that meets the standard requirements, and air pollution will be reduced.	APDG
4.	Investigate the possibility of supply the heating of households in Ger neighborhood with night heat storage electric heaters with advanced technology, provide the decisions and professional methods from time to time, and increase the number of households.	APDG
5.	Multiple measures to reduce the heat loss of houses in Ger neighborhood will be organized in stages.	APDG
6.	The electricity network will be updated, capacity will be increased, conditions will be created to meet the growing needs, and households without electricity and voltage drop will be fully supplied with reliable electricity.	APDG
7.	Expand and modernize the Nalaikh Thermal Plant and increase its capacity.	APDG
8.	Increase the length and thermal conductivity of the thermal main pipeline.	APDG
9.	The number of solid fuel heating boilers will be gradually reduced by connecting to central heating and switching to gas.	APDG

10.	Hot water supply will be replaced by using rapid water heaters on tap, renewable energy such as solar and wind	NDGDP
11.	To create price-tariff system that will create economic interest in the efficient use of thermal energy	NDGDP
12.	Create partial infrastructure centers in Ger neighborhood and increase citizens' participation in the development of low-rise and private residential areas.	NDSDMTP
13.	Private green housing project will be implemented and planned as an eco-friendly, energy-efficient, and clean-technology housing town, and developed with the participation of the private sector and citizens.	NDSDMTP
14.	Implementation of the project of expansion of the thermal power plant of Nalaikh district and construction of new sources will provide the households of Ger neighborhood with a reliable heat source.	NDSDMTP
15.	Support the technological research of renewable energy sources (solar, wind, underground water, heat) and support the solution of heat, lighting and hot water consumption in remote districts with environmentally friendly, efficient and advanced technologies.	NDSDMTP
16.	The heating furnaces will be reduced in stages and consumers will be connected to centralized and partial sources.	NDSDMTP
17.	Complete distribution of improved fuel to the households in Ger neighborhood, create reserves and provide regular purchase opportunities.	NDSDMTP
18.	To support the development of bio and briquettes production and organize the supply to households.	NDSDMTP
19.	Support for the insulation of houses and apartments, training and education of residents will be organized.	NDSDMTP

### Economy and industry

1.	Construction of a specialized warehouse for meat and by-products	CUMP
2.	Industries that have a high negative impact on the environment will be banned in the territory of Ulaanbaatar city, and existing industries of this type will be relocated to Baganuur, Bagahangai, Nalaikh, and Argalant-Emeelt cities.	CUMP
3.	Nalaikh district is planned to be developed as a satellite city specialized in production, trade and services, tourism, culture and education. Including food and light industry. /Completely meet the needs of own city / - Technology localization park - Tourism industry - Small and medium industry - Transport logistics, large warehouse (establishment of logistics center) - Construction material production and wholesale - Smokeless fuel production - University, Vocational training production center - New technology localization park - State-level large hospital complex - Household/tenant park/small and medium industry	CUMP
4.	Freight transportation will be carried out along the route from Nalakh integrated logistics centers to rural areas, to distribution centers within the city, and to large consumers and producers, and a special road for heavy-duty vehicles will be established.	CUMP
5.	A logistics center will be established.	CUMP
6.	Establishment of Construction materials production and technology park in Nalaikh	CUMP, MFYDG
7.	Increasing the budget organization's own income, reducing the loss of local enterprises and increasing the efficiency of the budget.	APDG
8.	Reduce the financial support from the capital, increase the tax revenue from the previous year, reduce the debt balance and fulfill the criteria specified in the budget law.	APDG



9.	The small and medium industry support center will support household producers by providing information, training, providing workplaces, assistance of finance and necessary equipments and other required supports.	APDG
10.	In Nalaikh district, a logistics center with a variety of wholesale trade, a road and railway terminal and fuel warehouses is planned to be located on 180 hectares of land.	NDGDP
<b>Mining</b>		
1.	Mining rehabilitated areas will be taken into special protection by local communities and developed as green zones, and creating a public control system to ensure that illegal mining is not repeated.	APDG
2.	Monitor the exploration and exploitation of widespread minerals and ensure compulsory technical and biological rehabilitation on affected lands.	APDG
3.	Land damaged by mining will be rehabilitated and recycled so that it can be used again for agricultural purposes, and user responsibility will be increased.	APDG
4.	Exploration and extraction of widespread minerals will be limited to residential areas and biological restoration will be made mandatory.	NDSDMTP
5.	Places where mine rehabilitation has been carried out will be taken under local special protection and will be landscaped as green zones.	NDSDMTP
<b>Workplaces</b>		
1.	Reduce the poverty rate to 18.4% and the unemployment rate to 5%.	CUMP
2.	Campuses of universities and colleges: Some parts of universities will be relocated from Ulaanbaatar city to the following satellite cities by establishing "University campuses" in regard with their fields of study. - Baganuur - Nalaikh	CUMP
3.	It is estimated that in 2025, 16,000 of the 28,300 working-age people in Nalaikh District will be employed, and in 2040, 30,000 of the 52,900 working-age people will be employed.	CUMP
4.	It is estimated that the number of jobs will increase to 29,970 by 2040.	CUMP
5.	The workplace area is 165,000 m <sup>2</sup> as of 2020. It is planned to build 1.5 million m <sup>2</sup> of new jobs by 2040, of which 47% will be used for industry, 51% for services, and 2% for agriculture.	CUMP
6.	Reduce the level of unemployment by involving citizens in permanent and temporary jobs in national-level mining, construction and development projects such as railways, construction materials, industrial technology parks, and improved briquette factories.	APDG
7.	In line with major development and district development goals, vocational education and training will be diversified to meet the demands and needs of the labor market, and graduates will be supported in finding jobs.	APDG
8.	It is estimated that about 3,500 new jobs will be created by the establishment of a logistics center, 1,950 by the establishment of a construction material production and technology park, and 3,000 by the establishment of a construction material purchase and sale center.	NDGDP
9.	Reducing the social welfare provided to working-age and workable citizens of poor families, including them in programs to change their awareness, behavior, attitudes, and beliefs in life, and prepare them for employment.	NDSDMTP
10.	Unemployed heads of households and adult members with low educational level of poor families will be included in basic education, vocational education, vocational training, and skill improvement training.	NDSDMTP
11.	Staff responsible for family development and social welfare of the khoros will be trained in gender-sensitive counseling service methodology.	NDSDMTP

12.	Implement a target program for non-formal education centers and vocational training centers to provide general education to adults who have not received basic education.	NDSDMTP
13.	In order to protect the health and lives of people who are illegally mining coal, the part of the mine that does not meet the mining requirements will be completely closed, the area will be rehabilitated, and a safe environment will be created.	NDSDMTP
14.	Citizens who have lost their jobs due to the mine closure will be trained to change their attitudes, practices and habits, and create opportunities to work and start small and medium industries by implementing projects and programs.	NDSDMTP
15.	The "Employment Support Program of Nalaikh District" will be developed and implemented.	NDSDMTP
16.	Construction of a new "2nd factory of improved briquettes" and the workforce of the factory will be made up of residents of Nalaikh district.	NDSDMTP
17.	In cooperation with vocational training and relevant training institutions, to train unemployed citizens in jobs and professions that are in demand in the labor market.	NDSDMTP
18.	Various supports will be provided to citizens who create jobs for themselves through household production, providing them with information and training, providing workplace for production, providing financial and necessary equipment assistance, and creating a model factory that meets the local characteristics.	NDSDMTP
19.	Provision of part-time employment opportunities for the elderly, disabled citizens, and women who are unable to work full-time while taking care of their young children at home shall be organized in cooperation with enterprises operating in the district.	NDSDMTP

Explanation:

1. CUMP – Concept of Ulaanbaatar Urban Master Plan 2040
2. MFYDG - Mongolia's Five-year Development Guidelines for 2021-2025
3. UBEMP – Energy Master Plan of Ulaanbaatar City
4. APDG – Action Plan of the District Governor 2020-2024
5. NDSDMTP – Nalaikh District Sustainable Development Mid-Term Policy
6. NMP- Nalaikh Master Plan 2015-2030

Source: Author's table

# IV. Jet Strategy of Nalaikh District

## 4.1 Vision

Nalaikh will become a model district (satellite city) for green development based on sustainable and green production.

## 4.2 Mission

The economy, employment, and energy sector based on mining and crude fuel will be developed based on the just energy transition mechanism and create healthy and safe living and working conditions for the people of Nalaikh district.

## 4.3 Strategic Objectives

Nalaikh District's Just Energy Transition Strategy will be implemented within the following objectives.

**Objective 1.** To diversify the local economy and ensure economic growth

**Objective 2.** Support new development by carrying out ecological rehabilitation of coal mines

**Objective 3.** Create decent green jobs and workplaces

**Objective 4.** Phased transition from coal-based energy systems to systems with low greenhouse gas emissions

**Objective 5.** Implement a just energy transition strategy based on cooperation and community participation

# V. Draft Action Plan

## Strategy Action Plan

Within the objectives, the following activities will be implemented.

### **Objective 1. To diversify the local economy and ensure economic growth**

- 1.1. Development of industry, animal husbandry and agricultural production with innovation-based environmentally friendly technologies.
- 1.2. Develop and improve the infrastructure necessary for doing business.
- 1.3. Support for green entrepreneurs, small and medium-sized enterprises (SMEs) in various sectors.
- 1.4. Provide entrepreneurs with support and potential resources by creating incubator programs, mentoring and funding opportunities.
- 1.5. Create a favorable business environment by streamlining district policies and procedures, reducing bureaucracy and facilitating market access in all aspects.
- 1.6. Develop investment promotion campaigns and initiatives by identifying and promoting the district's unique strengths and competitiveness to attract domestic and foreign direct investment into the district's economy.
- 1.7. Create knowledge-based and industrial clusters.

### **Objective 2. Support new development by carrying out ecological rehabilitation of coal mines**

- 2.1. Rehabilitate the affected land affected by coal mining.
- 2.2. Reuse of coal mine land for sustainable development such as eco-tourism, mining museum, agriculture, research and development center etc.
- 2.3. Support the people who have worked in the mines and place them in decent jobs.
- 2.4. Limiting and banning widespread mineral exploration and extraction in urbanized areas, developing technical and biological rehabilitation of damaged areas.

### **Objective 3. Create decent green jobs and workplaces**

- 3.1. Encourage entrepreneurship and increase employment by attracting investment
- 3.2. Increase human resources, develop skills and strengthen cooperation networks
- 3.3. Raise awareness of green jobs and promote innovation
- 3.4. Promote green job creation and develop workforce skills
- 3.5. Provide decent working conditions and social security
- 3.6. Reducing welfare for working-age and workable citizens of low-income households, including programs to change their attitudes and prepare them for employment.
- 3.7. Increase the skills of household producers, provide financial and equipment support, and assist them to become as employers.
- 3.8. Create conditions for citizens to work part-time.

### **Objective 4. Phased transition of coal-based energy systems to systems with low greenhouse gas emissions**

- 4.1. Develop renewable energy sources and production.
- 4.2. Improving energy and heat savings, reducing heat loss in residential and public buildings.
- 4.3. Extension and renovation of energy and heating infrastructure
- 4.4. Provision of basic urban services in ger areas
- 4.5. Promote off-grid system and decentralized system in ger areas
- 4.6. Phase out the number of solid fuel heating boilers
- 4.7. Supply domestic hot water by using independent instant heaters and renewable energy instead of centralized systems.
- 4.8. Support the development of high-efficiency briquettes and biofuel production.
- 4.9. Set incentives for organizations and enterprises to use renewable energy for their consumption.
- 4.10. Build a new heat source plant, increase number of consumers connected to the centralized heating network and reduce the number of chimneys.

## Objective 5. Implement a just energy transition strategy based on cooperation and community participation

- 5.1. Improve public awareness and commitment to energy efficiency and renewable energy
- 5.2. To organize advocacy work for citizens to improve their living environment and increase their participation in local development
- 5.3. Increasing citizens' participation in building their homes in an environmentally friendly, energy efficient, and clean technology manner
- 5.4. Promotion of use of low-carbon, electric vehicles with the participation of citizens
- 5.5. Increase the awareness of civil servants responsible for ensuring the sustainability of a just energy transition, and ensure the succession of strategic implementation and policy documents.
- 5.6. Promote healthy lifestyles and encourage walking and cycling in the streets to reduce both emissions and traffic congestion and build required infrastructure.

## Timeline of Strategy Implementation

The strategy will be implemented in the following stages:

**Phase I: 2024-2025** – Plans for this phase are developed in this strategy and will be proposed to include in 2024 Action Plan in the framework of implementation of the District Governor's 2020-2024 Action Program.

**Phase II: 2025-2030** – Planning for this phase will be selected from this strategy and included in the Governor's 4-year action program.

**Phase III: 2030-2040** – The planning of this phase will be evaluated and improved on the implementation of the previous phases and reflected in the Governor's 4-year action programs.

**PROPOSAL TO INCLUDE SHORT-TERM ACTION PLAN FOR THE IMPLEMENTATION OF JUST ENERGY TRANSITION STRATEGY  
IN THE DISTRICT GOVERNOR'S ACTION PLAN**

No.	Provisions of the action program of the District Governor for 2020–2024	Activities	Indicators	Outcomes			Budget for 2024			Organizations in charge	
				Base line	Target line	Budget	Source	Main	Partner		
1.	1.5.2.4. Nalaikh district will develop and implement measures aimed at supporting employment, transitioning to decent work, private and household production, entrepreneurs, and wealth creators in the district.	Transferring and retraining people who worked in mines to decent jobs	Number of people involved	15	30	2 million	Special fund	Department of Labor and Welfare	Nalaikh Polytechnic college		
2.	2.1.3.1. Investigate the system of implementing asset management through a unified policy, providing financial support for financially efficient projects and programs, and creating opportunities to attract investment through tax policies and other conditions of public services.	Develop investment promotion campaigns and initiatives by identifying and promoting the district's unique strengths and competitiveness to attract domestic and foreign direct investment to the district's economy.	Number of activities	0	2	0	0	Governor's office	International organizations		
3.	2.2.3.1. The small and medium enterprises support center will study and support the work of providing information and training, providing workplaces for production, providing financial and necessary equipment assistance, and various support to the SMEs entitled to household production.	Increase awareness of green business among SMEs	Number of people involved	0	50	1 million	Special fund	SME center	Department of Labor and Welfare		

4.	4.3.5.3. Land degraded due to mining will be rehabilitated and re-used for agricultural purposes and increasing the user's responsibility.	Develop a comprehensive plan for re-using of mined areas	Number of documents	0	1	50 million	Local budget	Governor's office	Professional consultants
5.	5.1.1. Implementation of partial general plan of the district in accordance with the General development plan of Ulaanbaatar until 2040 will be organized in stages.	Testing and commencement of the renewable energy plant  Increase citizens' knowledge about heating and energy saving  Conduct basic research on energy and heating  Provide proposals to partners for just energy transition and establish cooperation	Number of activities  Number of people involved  Number of documents  Number of proposals	0  0  0  1	1  385  1  2	0  3 million  50 million  10 million USD	0  Local budget  Donor organization  Donor organization	Governor's office  Governor's office  Governor's office  Governor's office, Nalaikh Thermal plant	Company in charge of station  Power distribution center, Nalaikh Emergency management, monitoring and information center  Int'l organizations, Consultants  Int'l organizations
6.	5.1.6.1. Focusing on the provision of necessary engineering and social infrastructure for housing redevelopment and construction, the works of connecting to the centralized network will be organized in stages.	Intensify and acceptance of partial engineering infrastructure works	Number of households connected to centralized infrastructure	0	214	0	0	Governor's office	Company in charge of work



## Financing for Strategy Implementation Activities

Strategic objectives and activities will be financed by 4 sources: state, capital, and district budgets, special government funds; foreign loans and aid; public-private partnerships; and private sector investments. It includes:

Source of funding		Conditions of funding
Budget	State	<ul style="list-style-type: none"> <li>The costs of investment projects and measures related to local functions are shown in the list of investment measures (by type and funding source) and the list of investment projects and measures in the appendix can be financed from the state budget. (name, location, capacity, project code, implementation period, budget cost, initial budgeted cost, financing source, amount of financing for the current fiscal year).<sup>2</sup></li> <li>The state investment program will include infrastructure and development investment projects and measures with a cost of more than 30 billion MNT over a period of more than one year aimed at ensuring economic and social development..<sup>3</sup></li> <li>It is possible to implement the tasks included in the long-term, medium-term and short-term development documents of Mongolia with state budget investments.<sup>4</sup></li> <li>Projects of new buildings and structures to be implemented with budget investment must meet the requirements of the Law on the Budget and other laws, be evaluated by criteria according to the relevant methodology, be economically efficient, have social significance, and be priority projects.<sup>5</sup></li> </ul>
	Capital	<ul style="list-style-type: none"> <li>Short-term loans can be granted from the provincial and capital budgets in order to finance seasonal shortages in sum and district budget revenues.<sup>6</sup></li> </ul>
	District	
	Local Development Fund	<ul style="list-style-type: none"> <li>LDF can receive incentives and support from domestic and foreign donations and aid given to support the development of the local area, projects and programs of international organizations implemented in cooperation with higher level organizations.<sup>7</sup></li> <li>The local development fund of the province and capital shall allocate at least 50% of the revenue from the mineral exploration license fee to the local development fund of the sum and district where the mineral exploration and exploitation license is located.<sup>8</sup></li> <li>It is possible to finance the project submitted for implementation with the funds of the capital's LDF, since it is not possible to implement it independently with the funds of the capital's LDF, which is supported by the citizens of the district.<sup>9</sup></li> <li>Implement projects supported by the local community's suggestions and coordinated with the development policy documents with the funds of the district LDF.<sup>10</sup></li> </ul>
Government Special Funds	Environment and Climate Fund	<ul style="list-style-type: none"> <li>Measures to support climate change mitigation and adaptation, support for greenhouse gas reduction, and implementation of integrated measures to reduce air and environmental pollution can be financed.<sup>11</sup></li> </ul>

		<ul style="list-style-type: none"> <li>Encouraging the activities of citizens, enterprises and organizations that have introduced advanced methods of protecting the environment, proper use and restoration of its resources, reducing harmful effects on the environment, non-toxic, pollution-free, waste-free and energy-efficient technologies<sup>12</sup></li> </ul>
	Employment Promotion Fund	<ul style="list-style-type: none"> <li>Funds allocated to sub-funds from the provincial, capital and district budgets will be used for the direction and target measures for employment promotion activities in the locality.<sup>13</sup></li> </ul>
	Small and medium enterprise development fund	<ul style="list-style-type: none"> <li>Granting loans to support small and medium-sized industries, subsidizing interest rates if small and medium-sized industries export their products<sup>14</sup></li> </ul>
Foreign loans and aid	Foreign direct investment	<ul style="list-style-type: none"> <li>Transnational corporations</li> </ul>
	International organizations and donor countries' loans, aid and financing of projects	<ul style="list-style-type: none"> <li>It is possible to receive programs, projects, and loans from countries such as the International Monetary Fund, the World Bank, the Asian Development Bank, the European Investment Bank, specialized organizations of the United Nations, Japan, China, and Germany.<sup>15</sup></li> <li>Investigate and implement the possibility of solving the financing of major projects necessary for the implementation of strategic goals and activities through foreign loans and aid.</li> </ul>
	Green financing	<ul style="list-style-type: none"> <li></li> </ul>
Public-private partnerships and private investment	Private sector investment	<ul style="list-style-type: none"> <li>To attract investment by providing the policies, laws and conditions for the private sector to operate, improving the participation of citizens and the private sector, and making the development activities transparent to the public, and increasing the participation of citizens and enterprises in the goals and activities.</li> </ul>
	Public-private partnership	<ul style="list-style-type: none"> <li>The project implemented by public-private partnership is consistent with development policy documents, has priority for development, and is based on private sector investment, to improve the quality and accessibility of public services by building and maintaining infrastructure, providing public services, and innovation and new technologies. which can be introduced, has no negative impact on the environment, is aimed at reducing climate change, and supports the development of the green economy.</li> </ul>
	Sustainable Financing of Mongolian Banks, Green Credit Fund	<ul style="list-style-type: none"> <li>Investigate the possibility of obtaining green loans from commercial banks</li> </ul>
	Donations from non-governmental organizations, enterprises, organizations and citizens	

Source: Author's table

## VI. Draft Monitoring and Evaluation Plan

### Indicators, Baselines and Targets for Measuring Strategic Goals

№	Criterias	Indicators	Baseline 2022	Targets		
				2025	2030	2040
<b>Objective 1. To diversify the local economy and ensure economic growth</b>						
	Share of non-mining industries in district economy	Percentage in district economy		7%	10%	15%
	<ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Farming</li> <li>• Tourism</li> <li>• Logistics and transportation</li> <li>• Industry</li> <li>• Trade and service</li> </ul>		5%	-	-	-
			-	33%	35%	40%
			30%	-	-	-
			-	25%	25%	30%
			20%	35%	30%	15%
			30%			
	Industrial projects planned in the district		3	6	16	46
	Number of green businesses		12	50	115	200
	Numbers of SME		366	400	470	550
<b>Objective 2. Support new development by carrying out ecological rehabilitation of coal mines</b>						
	The ecological rehabilitation area of the coal mine	hectares	142,3	100	95,7	
	Mining rehabilitation area under special protection	hectares	100	100		
	Areas that have been rehabilitated by mines have been converted into green zones	hectares	45,8	20	50	50
	Total new development on rehabilitated land	hectares	0	2	3	5
<b>Objective 3. Create decent green jobs and workplaces</b>						
	Number of newly created jobs	numbers	150	170	170	180
	Decent, green jobs	numbers	0	25	125	250
	Retraining of former mine workers and training them in new professions	numbers	15	30	40	
<b>Objective 4. Phased transition from coal-based energy systems to systems with low greenhouse gas emissions</b>						
	Share of renewable energy sources in the energy system	percentage	0	5	30	40
	Households connected to the central heating network	number of households	3100	3400	3800	4800
	Households using renewable energy	number of households	50	100	200	700
	Number of electric vehicle charging stations	numbers	0	1	5	20

Replace public transportation by electric vehicles	numbers	0	5	10	15
Number of reinsulated multi family buildings	number of building	31	38		
Number of reinsulated houses in ger areas	number of houses	1200	1320	1900	4800
Public buildings involved in the thermal insulation project	building	3	5	13	
<b>Objective 5. Implement a just energy transition strategy based on cooperation and community participation</b>					
Citizens involved in energy transition activities of the Strategy implementation	numbers	0	100	500	3500
Citizens involved in Just Energy Transition awareness activities	numbers	0	385	3385	33385
Projects implemented in public-private partnership	numbers	0	2	11	31
Projects implemented with non-budgetary investments	percentage in total budget	0	5	10	30

Source: Author's table

## Management and Organization of Implementation of Strategic Activities

Social Development Department of the District Governor's Office will be responsible for the functions of planning, distribution, and monitoring of the strategic implementation such as incorporating the short, medium and long-term activities included in the strategy into the district policy documents, coordinating the collective activities of governmental and non-governmental organizations, research and analysis organizations, international organizations, enterprises, the private sector, and civil society deciding on financing, and providing management and coordination.

The Social Development Department of the District Governor's Office, the Department of State Administration and Management are responsible for the inclusion of short-term strategic measures or the main social and economic directions of the district for the current year, and the inclusion of medium-term measures in the development programs of the district sector and the four-year action program of the district governor. responsible respectively.

The task of organizing and implementing the implementation of the strategy is the Office of the District Governor, the bodies under the Governor, such as the Land Management Office, the Thermal Plant, the Power Distribution Center, the Family, Children and Youth Development Department, the Small and Medium Enterprise Support Center, the Social relevant institutions such as the insurance department and the department of labor and welfare services will be responsible.

**Just Energy Transition in Coal Regions**