

# Assessment and Status Report on Just Energy Transition in Mongolia

**giz**

## Executive Summary

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May 2024

### 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 five 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) and Wuppertal Institute für Klima, Umwelt, Energie gGmbH 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.

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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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Federal Ministry  
for Economic Affairs  
and Climate Action



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Co-funded by  
the European Union

on the basis of a decision  
by the German Bundestag



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Published by the Just Energy Transition for Coal Regions Knowledge Hub  
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## Acknowledgements

The authors would like to thank all those individuals and officials who provided inputs, insights, and information. This includes government officials from the region of Nalaikh, especially Mr. Ankhbayar Khurelchuluun (Head of the Emergency Management Department), Mr. Tserendash Sugarragchaa (consultant at GIZ Energy team), Dr. Dunja Hoffmann (GIZ), and Ana Gabriela Hermida Ortiz (GIZ).



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# 1. Mongolia's dependency on coal

Mongolia is a country where coal nowadays plays a tremendously important role. The energy system of Mongolia is mainly based on coal.

- **Power:** 90% of the domestic power generation comes from coal plants, only 10% from renewable energies (RE). Business and industry account for 69% of the total power consumption, of which 36% goes to the mining sector.
- **Heat:** 90% of generated heat energy is used exclusively for heating purposes; 57% of the total heat generated is used for space heating and water heating in residential buildings.

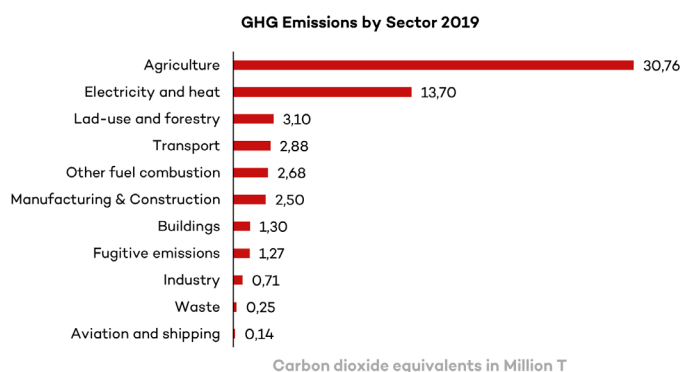
Further, the mining sector is of utmost importance for Mongolia's economy (25% of GDP; 76% of FDI)<sup>1</sup>. In 2021, 50% of produced coal was exported, of which 90% was going to China; coal exports accounted for ca. 26.5% of total exports of Mongolia. Coal is the backbone of Mongolia's energy system and also a major pillar of its economy. Despite its sufficient coal and oil reserves, Mongolia is 100% dependent on imports of petrol products (domestic refinery capacities are in development in Eastern Gobi Province) and 19% on electricity imports from Russia.

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Emissions from power and heat generation based on coal have increased dramatically since 2010.

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GHG emissions in Mongolia have increased over the past decade from 21.37 million Tonnes of CO<sub>2</sub> emissions in the year 2011 to 50.32 million tonnes in 2021. Due to methane emissions from livestock farming, the agricultural sector is by far the largest GHG-emitting sector. Electricity and heat generation cause the biggest but second share, mainly based on coal. While the number of livestock is decreasing due to the impacts of climate change (droughts, harsh Dzud winters, steppe fires), emissions from power and heat generation based on coal have increased dramatically since 2010.

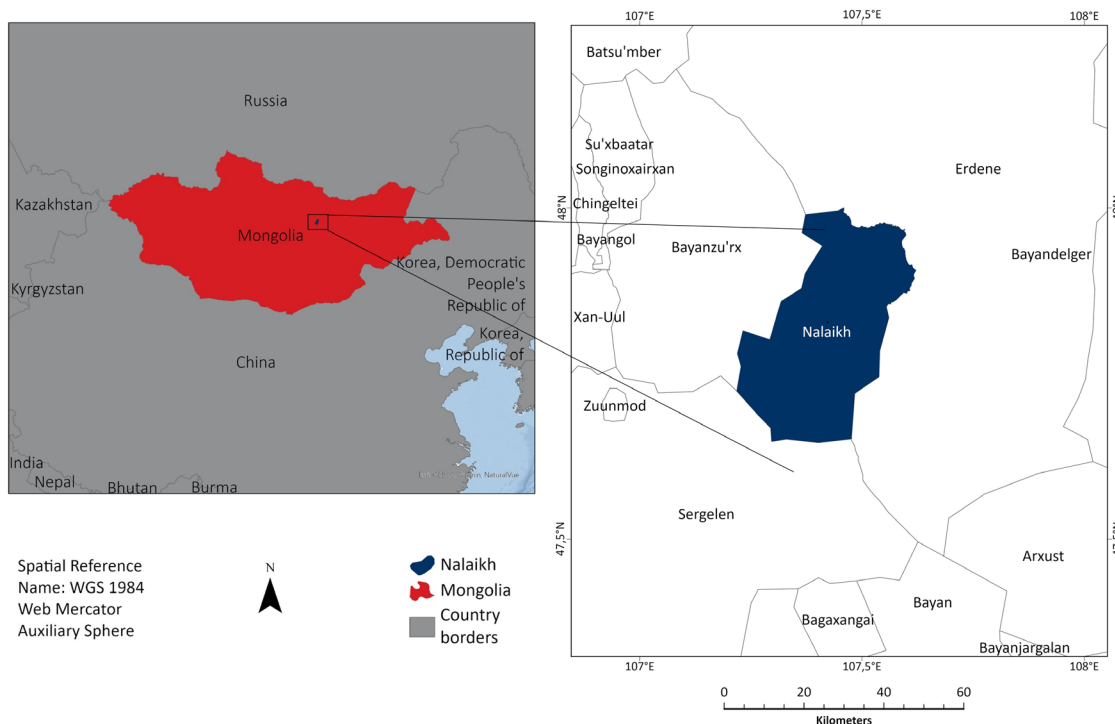


**Figure 1.** Greenhouse gas emissions by sector in Mongolia in 2019  
 Source: Source: Climate Watch, 2023 – with major processing by Our World in Data

<sup>1</sup> <https://montsame.mn/en/read/303405>

Large substandard peri-urban settlements, called ger areas, are common in Mongolia. Currently, ger areas in Ulaanbaatar city represent 60% of the 1.4 million of the city population or 30% of the entire country’s population. Unimproved individual coal stoves used in most ger areas during winters generate high air pollution levels, which makes Ulaanbaatar one of the most polluted cities in the world. UNICEF stated that this has become a public health crisis, especially among children.

Mongolia consists of vast highlands steppe plains and deserts with an average altitude of 1,580 meters (5,184 feet). Mongolia’s geographic location, extreme weather, and fragile ecosystems, coupled with prominent pastoral livestock and rain-fed agriculture sectors make its economy, livelihood, and traditional cultures highly vulnerable to climate change risks. Increases in climate-driven hazards like heat waves, droughts, and river floods are expected. Long-term warming will set Mongolia’s unique ecosystems under pressure with potential losses of forest cover and associated species. Mongolia’s food security is threatened by climate change which will lead to poorer harvests of crops (wheat).



**Figure 2.** Location of Nalaikh, Mongolia

Source: developed by Taurus ECO

## 1.1 Coal mining ceased in the Nalaikh region

The Nalaikh region is located in the central area of Mongolia, 36 km away from Ulaanbaatar City, and is one of the nine districts of the capital city. The total number of households in the Nalaikh district is 10,510 out of which 7,551 were located in the ger area by the end of 2022.

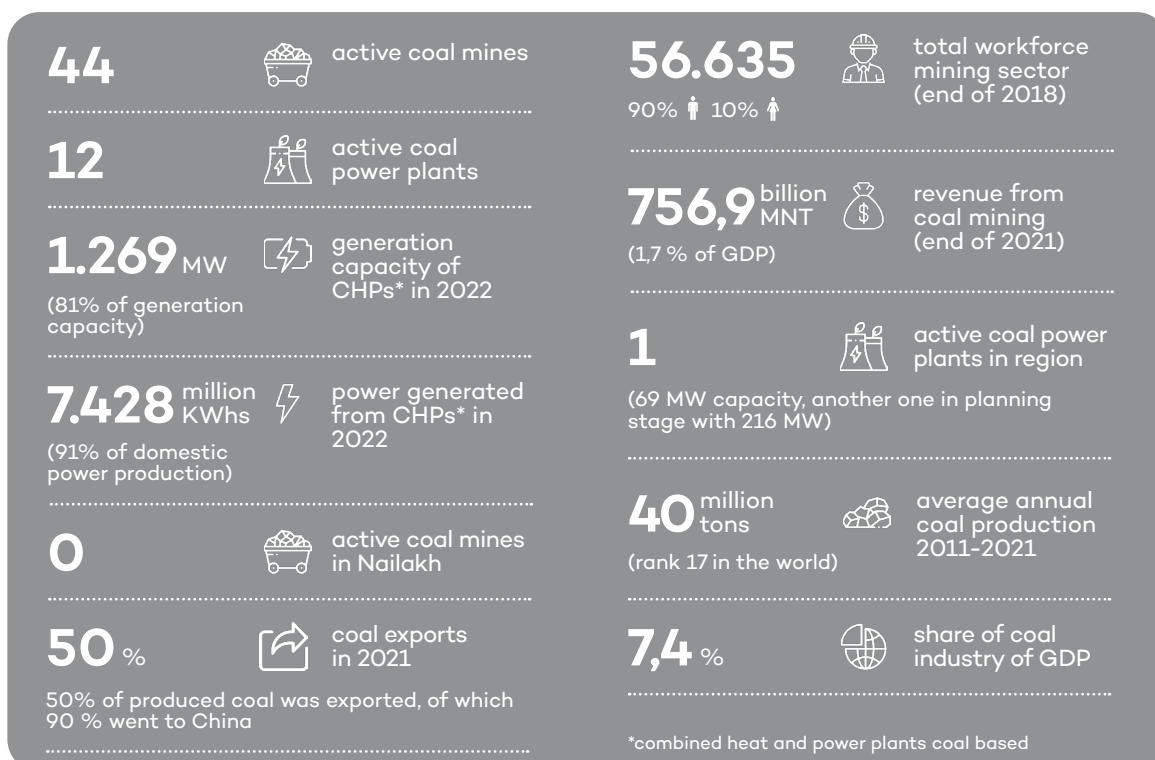
Coal mining and energy generation have played a very important role for more than a hundred years. The state-owned Nalaikh mine began in 1922 with 12 workers, grew to 1,500 employees

in 1950, officially ceased after the end of the communist government in the 1990s, grew again on a more informal base to 2,500 workers by 2011, and was completely shut down in 2022 due to safety hazards and regular accidents and the banning of raw coal in the Nalaikh district. 500 families lost their income source in the final phase of the shutdown. It is important to note that the mining closure did not happen suddenly but rather occurred gradually with warnings and reminders. Installation and operation of coal-based power plants for the generation of power and heat took place in parallel with mining activities.

Presently, Nalaikh depends completely on power supply by the national grid (90% coal-fired production). The supply of heat and hot water is completely reliant on coal, either on the coal-fired thermal plant or on individual stoves in the ger areas. The stoves used for burning coal in ger areas are the main contributor to GHG emissions and air pollution. Emissions estimates from the closed Nalaikh coal mine indicate that the mine workings are now completely flooded and there are negligible methane emissions from the abandoned mine.

## 2. Results from the analysis and recommendations for the JET process

In order to prepare the ground for developing fact-based ideas for the support of a coal phaseout and a JET process in Mongolia, key areas were analysed. In the following, the major results as well as the conclusions and recommendations deduced from the analysis are presented.



**Figure 3.** Key data on Mongolia's power and coal sector

Source: Based on own research.

## 2.1 On the national level of Mongolia

### Governance

Although Mongolia has raised its Nationally Determined Contributions (NDC) commitments between 2016 and 2020 to a 22.7% reduction of GHG emissions by 2030, it has neither committed to a coal phase-out on an international nor on the national level, neither for energy production nor for mining and exporting coal. The Government intended an expansion of coal-based heat and power plants of up to 981 MW, but only an expansion of 15 MW wind and 35 MW solar power plants (Action Plan 2020-2024). This is counterproductive to climate mitigation objectives and a JET process. At the same time, the government is lacking funding for new coal-based capacities, so it is not expected that new coal-fired capacities will be installed within the next 4/5 years. The massive expansion of coal-based heat and power plants would also contradict the action plan for reducing Ulaanbaatar air pollution by up to 80%. While the potential for renewable energies is immense in the country, the limit for variable grid-connected renewable energy to be installed in Mongolia is the existing grid and a conflict about the feed-in conditions for renewable energies. A strength is the country's CO<sub>2</sub> reduction targets as laid down in the NDCs as well as its commitments to net zero targets by 2050. In its NDCs, Mongolia has raised the RE target for 2030 to 30% and commits itself to improve the efficiency of energy production.

Corruption has become the major obstacle to prosperity in the country. While significant legal and institutional frameworks, such as the Anti-Corruption Law (ACL) and the Independent Agency against Corruption, were put in place in the last decade, the implementation of anti-corruption policy has been plagued by deep-seated conflicts of interest in politics.

#### Conclusions and recommendations:

Support a revision of the energy plans towards an alternative energy scenario, allowing to superseding of additional coal-based plants and a massive increase in RE.

Need to create awareness for the possibilities from a coal phase-out planning and energy transition on the political agenda, legitimised by NDC and net zero CO<sub>2</sub> commitment.

Raise awareness on the real costs for existing and additional coal plants, the possibilities and benefits of RE expansion as well as energy saving and efficiency increase measures (e.g. for residential buildings, mining sector).

Current governmental action plans on the national and district levels are valid until the election in 2024. Use a window of opportunity to include political initiatives on Just Energy Transition when establishing new plans. Develop ideas on how to involve key actors from democratic institutions and civil society in that process.

Need to step up efforts to combat corruption like a stronger enforcement of the ACL in order to make Mongolia more trustworthy for private and public investment.



## Coal and energy sector / climate

The extremely high air pollution levels in Ulaanbaatar and other towns are mainly caused by coal use. In order to combat air pollution as well as CO<sub>2</sub> emissions, coal phase-out and energy transition are indispensable. With regard to climate change, Mongolia aims to achieve the target of reducing its greenhouse gas emissions by 22.7% (unconditional target) by 2030 in its 2020 NDCs. Yet, Mongolia's activities for climate protection stand in sharp contrast to many of the short-term activities planned in the Action plan of the Government of Mongolia for 2020-2024, which includes massive expansions of coal-based heat and power plants (CHP) and there is no net-zero long-term strategy yet.

Mongolia has superabundant RE sources for the production of renewable electricity: combined wind and solar power potential is estimated at 2,600 GW of installed capacity or 5,457 TWh of electricity generation per year. This exceeds the country's energy demand (ca. 7 TWh ) by far. However, the heating required during 8.5 months of the year - that is provided by the district heating grids of coal-fired combined heat and power plants - is crucial in the coldest capital of the world. Mongolia has vast coal resources, the country ranks 17th in the world in terms of coal production and before the outbreak of the coronavirus pandemic in 2019, a record-high of 57.128.600 tons of coal were mined in Mongolia. Consequently, the energy system of Mongolia is mainly based on coal. 82% of the installed power generation capacity is coal based; 17,5% on RE. Exploiting Mongolia's enormous RE potential could simultaneously mean switching the energy system from fossil to renewable sources and transforming the country from a coal exporter to a RE exporter, which could reduce economic dependence on China. However, the business environment for RE is not suitable yet for mobilising the vast RE potential due to the descendants of a socialist-designed energy market and the insecurity of RE investments, in part due to widespread corruption. In addition, the power grid cannot be run in a stable way when more and more fluctuating RE power will be fed in .

### Conclusions and recommendations:

Need for mobilising RE potentials through the implementation of reliable energy market design and regulations to allow private investments to be attractive, for example through taxes, new feed-in tariffs or energy auctions, loans, or the implementation of existing energy efficiency standards.

Need for modernisation of the power grid in order to take up fluctuating RE and even export energy in the long-term.

Need for developing climate-friendly heating opportunities for residential buildings and the construction of energy-efficient buildings, in particular for ger areas.

Need for exploring and developing potentials for energy efficiency increases on the supply and demand side.

Need for a stronger awareness of the negative impacts of climate change for Mongolia caused by the continued massive use of fossil fuels for energy and heat generation.

Need for the introductions of stricter policies for land restoration and biodiversity protection on the national level to support the ecological regeneration of mining sites and mining areas post closure.

Raise awareness and foster political dialogue on the potentials and benefits of RE.

Support influential actors and activities for the energy transition, addressing the needs mentioned above.

Take measures to attract more domestic and foreign companies to the RE sector, e.g. special support programs for companies that promote the expansion of RE.

## Society

Coal mining as well as heat and electricity generated by coal seem to be deeply rooted in the present narrative of successful development and prosperity in Mongolia. Even high risks of an economic downturn due to the dependency on a coal-based development model in a global political situation aiming at phasing out coal, in the long run, are accepted. Key actors and stakeholders know the harm of it but hardly take any action or see any plans for phasing out coal in the short term. However, they have a basic awareness that in the mid- and long-term they must take steps for phasing out due to the heavy climate change impacts in Mongolia and potentially due to increasing international political pressure and restricted access to finance. In this regard, the democratic political system and the vibrant civil society are an asset.

The stakeholder analysis revealed that for now, Mongolia has no real driving force on the national level when it comes to JET. However, financial institutions, including private banks and development banks, seem to be the most active actors in fostering green investments in the country, but without a specific focus on JET. Academic actors, international organisations, and renewable energy associations support the JET targets in principle, but not yet proactively.

Attitudes and activities hampering a JET process are to be stated in regard to thermal power plants, mining companies, mining-related public actors (e.g. the Ministry of Mines and Heavy Industry), some business associations, coal mining companies' associations, and trade unions.

### Conclusions and recommendations:

Need to raise awareness of the negative impacts of coal mining and energy generation as well as showcase alternatives and develop pilot actions.

Mongolian society needs to be made more aware of the fact that the great RE potential is an alternative source for both heating and economic development.

Need to transform the basic awareness of key actors and stakeholders of the necessity for a coal phase-out in the long-run into the will to act accordingly.

Need to raise awareness of tackling economic risks by developing transformative development paths, focussing on the potentials for green growth in the sectors of energy, construction of residential buildings, restoration of mining areas, etc.

Raise awareness that phasing out coal sooner will improve access to international finance for climate mitigation and energy transition; showcases from other countries in the JET project like South Africa, Indonesia, and Viet Nam.

## Economy

Coal mining and energy generation are the backbone of Mongolia's economy. Since 2015 Mongolia has rather engaged in expanding the mining, use, and export of coal than in a phase-out. This development has only been interrupted by the coronavirus pandemic in recent years. The coal industry produces about 40 million tons of coal on average per year, estimated coal reserves are 37.2 billion tons. Mongolia has substantial high-quality coking coal reserves and is on track to become one of the world's largest coal exporters. As Mongolia has the fourth largest coal reserves in the world, this trend is extremely critical in regard to climate mitigation. In 2021, 50 % of produced coal was exported, of which 93% was going to China. Coal exports account for ca. 26,5 % of total exports of Mongolia, which, combined with the fact that many other Mongolian products are also mainly exported to China (ca. 73% of exports go to China), makes Mongolia extremely dependent on China economically.

The growth of labour demand is not strong enough to reduce unemployment. Mongolia has relatively high unemployment rates, especially for young people. The economy has the potential for diversifying its production, notably agri-food (livestock, dairy products, meat, cashmere) and tourism. Further, Mongolia possesses abundant mineral resources, including strategic raw materials for information & technology industries, as well as vast RE potentials, which can be utilised for economic diversification and for export.

### Conclusions and recommendations:

Need for exploring economically viable options for a further expansion of RE including the possibilities for international finance and technical assistance and reducing fossil-based imports.

Need for developing mining and related value chains apart from coal in a sustainable way.

Need for developing opportunities for a climate resilient and GHG emission-reducing agriculture and food sector, including tourism.

Need for the diversification of the export structure in order to reduce economic dependency on China.

Need to explore the qualification demand of the workforce and the introduction of training schemes in regard to sectors for green transformation (named above).

## Gender

In Mongolia, boys are often left behind in education as they are deemed to be better suited for herding, yet there are still more men than women occupying high-level positions, for instance in the Energy sector. Women are predominantly found in retail sectors, and motherhood creates a disadvantage for them to pursue senior positions in their careers. Although country-specific data for the mining sector is not available, it is quite likely that women in Mongolia also suffer from mine closing. Experience from various countries on the impacts of coal phase-out on women proves that women are generally affected negatively in two ways: Firstly, the households of mine workers lose their jobs and their income due to the shut-down of coal mines. As miners are dominantly male, women often suffer as dependant spouses of laid-off miners. Secondly, people working in the informal sector around the mines to supply the miners with food and other services lose their jobs without any compensation. It is mostly women performing such informal jobs. In the energy sector, most high-level and decision-making positions are male. Despite a legal requirement for a quota of 30% of women in leading positions in the Ministry of Energy, the present quota is only 15%.

### Conclusions and recommendations:

Although the regulative requirements have improved, there is a lack of law enforcement as well as an understanding of gender equality at all levels, inter-sectoral coordination on gender issues, and the full use of donor research and financial support. The Government should raise its efforts in order to progress.

Need to raise public awareness on gender policies and issues. In addition to written policies, practical support and implementation are necessary for women's employment. This involves creating opportunities for women to take on high level positions, for instance.

Need to collect and analyse more disaggregated socio-economic data (by gender and other indicators), in order to obtain a solid and convincing knowledge base, from which recommendations for action can be derived.

In regard to coal phase-out and JET, opportunities should be created that allow women to pursue more chances in their career development.

## 2.2 On the regional level of the Nalaikh region

### Governance

The key institutions on the regional level in the Nalaikh region are the Nalaikh Governor's Office and Citizen's Council and the Parliament of Nalaikh district. Although there is no dedicated strategy for a coal phase-out and a JET process available for the region, the 'Action program of the district Governor for 2020-2024' as one of the key governance instruments for regional development is addressing actions relevant to a JET process indirectly. It aims to enhance adequate employment opportunities by facilitating citizen's access to permanent and temporary jobs in national and



regional large-scale projects concerning mining and construction. These projects include the railway, construction materials, an industrial technology park, an improved fuel factory, and opportunities for decent labour to decrease the unemployment rate. It also requires the development, approval, and implementation of measures targeted toward household manufacturers, small and medium-sized enterprises, and private entities that are tailored to the district's specific conditions.

There are no active communities or civil rights movement groups to bring their voices and demands in the district except the Nalaikh Mining NGO which has been inactive since the mining closed.

### **Conclusions:**

Need to align the key regional development programmes and plans like the 'Action program of the district Governor for 2020-2024' to transformative areas such as RE increase, restoration and reforestation of mining areas, agriculture, tourism, etc.

Need to develop a concrete plan and activities for the reforestation of the closed mining area.

Need to stimulate civil society participation in order to better identify needs and ideas for JET-related development of the region.

### **Recommendations:**

Raise awareness on the benefits of establishing the Nalaikh region as Mongolia's first and blueprint JET region, based on a comprehensive notion for phasing out coal for all energy purposes and going green.

Concretise ideas to foster civil society participation for a JET-related development of the Nalaikh region, for example by addressing the well-organised community of former miner workers.

## **Coal and energy / climate**

In 1992, the Nalaikh coal mine was formally closed. However, artisanal or rather illegal mining with considerable safety risks and regular accidents continued until 2022, when the mine was finally closed. Since then, the closed mining area stays without any reforestation or any other reutilization which causes significant harm to the environment and people. Some money from the district budget flows into regeneration activities annually, though these activities are unstructured and do not follow a comprehensive regeneration plan.

Despite having the coal mine closure, Nalaikh is still dependent on coal (imports) in the areas of electricity and heat production. Nalaikh's coal-based heat plant is operating at its limits. It is supplying more than 3,200 households and over 300 institutions and enterprises with heat and hot water. A new coal-based thermal plant with a capacity of 216 MW (three times as much as the existing one) is planned for which the feasibility study has already been done but approval is pending. This is included in the Action plan of Nalaikh in Vision 2050. There is no

plan for phasing out coal in the energy sector and to switch to renewable energy. The existing small RE park (wind and solar) is not functioning and is not connected to the grid.

**Conclusion:**

Need to bring RE-based opportunities into the discussion; for heating as well as for power generation, including possibilities for getting the existing RE park operational.

**Recommendation:**

Support the development of a regional JET strategy for Nalaikh as well as concrete steps to substitute additional demand for heat and power by RE.

Adopt a plan for the ecological regeneration of the former mining site, which could be part of the JET strategy.

## **Economy and Society**

Nalaikh district is the first to undergo a significant transformation away from coal mining, following the closure of its mine. The economic prospects and requirements for diversification in Nalaikh are different from other Mongolian districts due to the closed largest mining site, as well as the proximity to the city and national park, which is a popular tourist destination. The national economic plans and political strategies are all merging into a scenario of increasing coal exploration and exports (mainly to China) for the next 10 years whereas Nalaikh already officially phased out coal mining in 1992 (phase 1) and banned informal coal mining in 2022 (phase 2). The phase-out in 2022 had a relatively low economic impact. However, it destroyed the income source for the former mining families, declining more than 2000 families in the period from 1992 until 2010 to around 500 families in 2022.

Migration itself and unregistered migrants have become pressing issues for the district. 36% of Nalaikh's population live below the poverty line and it is estimated that 32% of the adult population is unemployed. The economy is still dependent on coal in the areas of electricity production, and centralised and decentralised heat production. Nalaikh has a high rate of unemployment. The current social protection programmes in Nalaikh do not specifically target former miners. Strengths are the technical and vocational education facilities of the German-Mongolian Institute of Technology (GMIT), opportunities for economic diversification due to its proximity to the capital city and tourist destination, and the request of Nalaikh's recovery plan until 2030 for regeneration of the former mining area. In terms of ecological regeneration and future opportunities for the former mining area, every year some money from the district budget goes into regeneration activities. The process and the activities are not fully structured. Nevertheless, based on the Vision 2050 and the new recovery plan until 2030 the district of Nalaikh has defined a future economic growth plan, with five main areas: Tourism (renaturation & museum), logistics, agriculture, SME development and an industry park.

**Conclusions and recommendations:**

Need for an in-depth analysis of specific regional potentials for transformative economic development, aligned to JET goals and dimensions. One focus should be on activities in the current action plan such as tourism, construction materials, residential buildings, and industrial parks.

Need for alignment of regional strategies, programmes, and plans to JET goals.

Need for qualifying the workforce and introducing training schemes as required by a future regional JET strategy, paying attention to GMIT and other available resources.

**Just Energy Transition in Coal Regions**