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CORPORATE ENVIRONMENTAL AND SOCIAL DUE DILIGENCE OF JSC THERMAL POWER PLANTS AND ITS SEVERAL SUBSIDIARIES

Vital Infrastructure Support Programme: Electricity Support

NON-TECHNICAL SUMMARY



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Prepared by:
Ecoline International Ltd.
(Sofia, Bulgaria)
Director: Dr. Maia Gachechiladze-Bozhesku



**Ecoline
International**

in collaboration with



ATMS Solutions

IE Kochkin
Evgeny
Vasilievich

Mobile: +38095 11 00 727 / + 359 876 63 0522
E-mail: mgachechiladze@ecoline-int.org

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1.0	9 July 2020	Draft report for EBRD review
2.0	15 July 2020	Final draft report updated as per EBRD's comments, for submission to the EBRD and the Client for approval, as well as for translation into English
2.1.	16 July 2020	Final draft report with minor updates as per EBRD's comments and new information from the Client
3.0	25 March 2022	Updated report following the visits to the Project sites in November 2021

LIST OF ABBREVIATIONS

ACM	asbestos-containing materials
ACW	asbestos-containing waste
ADB	Asian Development Bank
BAT	Best Available Techniques
bln. kW.h	billion kilowatt-hours
CCGT	combined cycle gas turbine
EBRD	European Bank for Reconstruction and Development
EHS	environment, occupational health and safety
EIA	Environmental Impact Assessment
ESA	Environmental and Social Audit
ESAP	Environmental and Social Action Plan
GG	greenhouse gases
GWt	gigawatt
ha	hectare
GIP	Good International Practice
IE	Individual Entrepreneur
IFC	International Finance Corporation
IFIs	International Finance Institutions
ILO	International Labour Organization
JICA	Japan International Cooperation Agency
JSC	joint-stock company
JSCB	Joint Stock Commercial Bank
km.	kilometre
kW	kilowatt
kW-hr	kilowatt-hour
LLC	Limited Liability Company
m ²	square meter
m ³	cubic meter
m ³ /year	cubic meter per year
mg/dm ³	milligram per cubic decimetre
mln.	million
mln. Gcal	million gigacalories
mln. kW.h	million kilowatt-hours
MSDS	Material Safety Data Sheet
MW	megawatt
OHS	occupational health and safety
NTS	Non-technical Summary
PCB	polychlorinated biphenyls
PIU	Project Implementation Group
PJSC	public joint stock company
POPs	persistent organic pollutants
PR	performance requirements
RoU	Republic of Uzbekistan
SEP	Stakeholder Engagement Plan
SE	state enterprise
SPZ	sanitary protection zone
TashTPP	Tashkent Thermal Power Plant
toe	tonne of oil equivalent
TPP	thermal power plant
USD	US dollars

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1. INTRODUCTION

The European Bank for Reconstruction and Development (the EBRD or the Bank) provides finance to the Republic of Uzbekistan (RoU) (the Borrower) within the **Uzbekistan-Vital Infrastructure Support Programme: Electricity Support Facility**¹. The funding is a sovereign loan under the Programme's COVID-19 Solidarity Package in the amount of 81.6 million EUR² lent to the Borrower to finance working capital needs and operational liquidity of JSC Sirdarya Thermal Power Plant (Sirdarya TPP), JSC Tashkent Thermal Power Plant (TashTPP), JSC Navoi Thermal Power Plant (Navoi TPP), JSC Talimarjan Thermal Power Plant (Talismarjan TPP) and JSC Takhiatash Thermal Power Plant (Takhiatash TPP) ('the Project'). Each of these is owned by the state power generation company JSC "Thermal Power Plants" (JSC TPP).

Since the Project had been classified as belonging to Category B in line with the EBRD's 2019 Environmental and Social Policy, as well as given the nature of the proposed Project, related to the corporate finance and multifaceted operations of the Client, it was deemed necessary to conduct a corporate environmental and social audit (ESA). The EBRD entrusted its implementation to Ecoline International Ltd. ("the Consultant").

2. TASKS, METHODS AND PRODUCTS OF CORPORATE ESA

The following tasks were completed within the corporate ESA:

- The ESA of the current operations and environmental and social (E&S) management systems of the Client at the corporate level, as well as at the subsidiaries' level (TashTPP, Navoi TPP, Syrdarya TPP, Takhiatash TPP, and Talimarjan TPP³) to check compliance with: the national legislation, the relevant provisions of the EBRD's Environmental and Social Policy and its Performance Requirements (PRs) (2019), as well as E&S standards of the European Union;
- A study of the status of the transfer of existing E&S obligations on loans of various international financial institutions (IFIs) from JSC Uzbekenergo to JSC TPP;
- The screening of potentially significant E&S risks and impacts associated with the operations of the Client and its subsidiaries, based on the analysis of the available documentation; and
- Identification of areas of influence and sensitive receptors that are or may be affected by the operations of the Client and its subsidiaries.

The ESA results were summarized in this document - **Non-Technical Summary** (NTS). Apart from that, a corporate **Environmental and Social Action Plan** (ESAP) and a corporate **Stakeholder Engagement Plan** (SEP) were developed for the Project in 2020.

Given the 2020 limitations of the COVID-19 pandemic, the Consultant and the EBRD agreed a remote method for conducting the ESA, including the collection and analysis of documents, video / audio interviews with representatives of the subsidiaries, and virtual "tours" of the subsidiaries' facilities. A differentiated approach was taken to setting the scoping of the ESA activities with a greater emphasis being on TashTPP and Navoi TPP, whereas the activities of the Talimarjan TPP were considered with respect to the progress in implementation of its

¹ The RoU and EBRD signed the Loan Agreement on 9 December 2020.

² <https://www.ebrd.com/work-with-us/projects/psd/52135.html>.

³ Only with regards to the implementation status of the ESAP of this TPP as approved by EBRD in 2019.

ESAP approved within the framework of the EBRD investment project for this TPP (2019)⁴. Within the labour risk assessment, the analysis of labour relations and identification and assessment of potential risks of involuntary labour was completed for the subsidiaries.

In November 2021, the Consultant undertook site visits to the JSC TPP headquarters and Tashkent, Navoi and Talimarjan TPPs to verify the earlier ESA findings and to update the Project's E&S documents in line with EBRD policies.

3. INFORMATION ON AUDITED ENTERPRISES

As noted above, as part of the corporate ESA the activities of JSC TPP and its five subsidiaries were reviewed with special attention paid to the activities of JSC TPP, TashTPP and Navoi TPP. Brief information on these enterprises is given below.

3.1. JSC TPP

JSC TPP was established in 2019 during the reorganization of JSC Uzbekenergo with the aim of reforming the energy industry and switching to modern methods of generating heat and power, its transportation, distribution and sale. Three JSCs were established on the basis of JSC Uzbekenergo: Thermal Power Plants, National Electric Grids of Uzbekistan and Regional Electric Grids. Currently, JSC TPP is a state-run energy company responsible for generating gas-fuelled electricity in the country.

As of 19 June 2020, JSC TPP consists of 9 subsidiary generating enterprises (in form of JSC) that own gas-fuelled facilities, with each subsidiary enterprise managing a corresponding power plant (**Figure 1**). In addition, JSC TPP includes repair company JSC Uzbekenergotamir, trade and supply company JSC Uzenergotaminlash and electrical installation company Uzenergosozlash LLC.

In 2019, the thermal power plants of JSC TPP generated 56.4 billion kW of electricity, and 7.2 million Gcal of heat energy. In 2020, it is planned to increase generation up to 61.4 billion kW of electricity and 7.2 million Gcal of heat energy.

⁴ <https://www.ebrd.com/work-with-us/projects/esia/talimarjan-power-project.html>



Figure 1. Location of TPPs - subsidiaries of JSC TPP, Uzbekistan

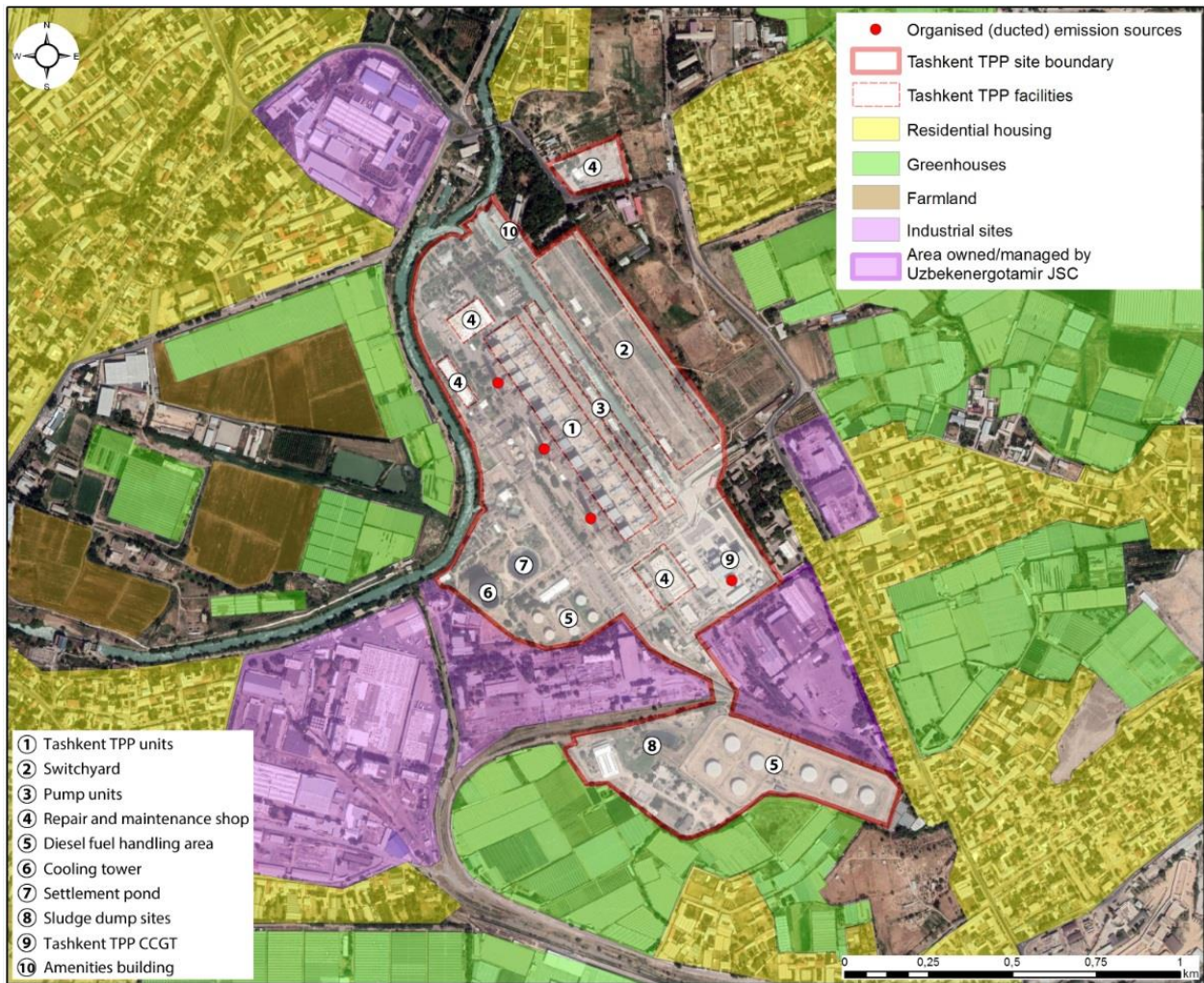
3.2. TashTPP

TashTPP is located in Salar urban type settlement, Kibray district, Tashkent region, 5-6 km northeast of Tashkent (Figure 2), and covers an area of 99.22 ha. It is designed to generate electricity supplied to the unified electric power system of Uzbekistan, as well as heat energy to supply the surrounding areas and the city. TPP consists of 12 old steam power units, running on natural gas as the main fuel and on fuel oil as a reserve, and one combined-cycle gas turbine unit (CCGT). 12 power units have a total capacity of 1,860 MW in condensation mode, and CCGT – 370 MW. TashTPP is the third largest electricity generator in the RoU with a total capacity of 2230 MW (12-13% of the country's electricity demand). In 2019, the annual volume of electricity sold amounted to 6571.3 million kWh; the sold heat energy volume constituted 124.4 thousand Gcal.

The operating mode of TashTPP boilers is round-the-clock. Flue gases from the boilers of 12 power units are emitted into the atmosphere through three stacks with a height of 120 m and a diameter of 8m, the CCGT is equipped with a 60m high stack.

The service life of 12 old power units of the plant is from 47 to 55 years; they were put into operation in 1963-1971, and gradually become obsolete. In 2015, with the commissioning of a modern CCGT at TashTPP, the operational reliability of equipment and the provision of electricity to consumers increased, and the ecological state of the city's environment improved. The TPP has an Investment Project Implementation Unit (PIU) that is in charge of the plant modernisation projects.

The source of service water supply for TashTPP is the Bozsu channel and water from the city domestic and potable water supply system. During the power generation process, most of the water used (more than 98%) is returned through the TashTPP discharge channel to the Bozsu channel after treatment.



Source: Consultant based on information from JSC TPP and TashTPP

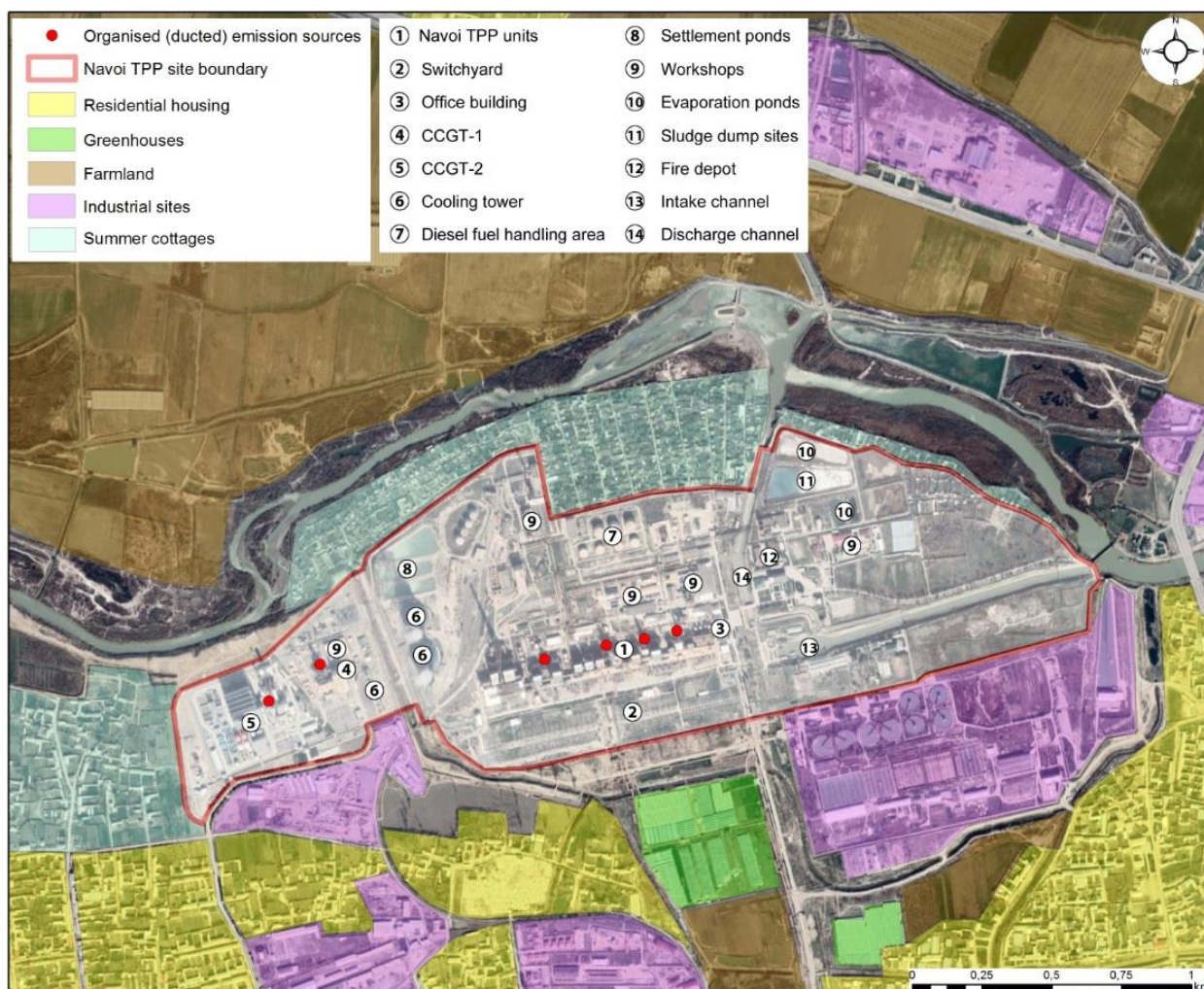
Figure 2. Location of TashTPP, Uzbekistan

3.3. Navoi TPP

Navoi TPP is located in Yangaryk settlement, Karmana district, Navoi region of the RoU (**Figure 3**) and occupies an area of 100 ha. The first power unit of the plant was put into operation in 1963, and in 1964 the TPP reached its design capacity. In 2012 and 2019, respectively, as part of the modernisation of the plant, CCGT-1 with a capacity of 478 MW and CCGT-2 with a capacity of 450 MW were commissioned. The CCGT supplier was Mitsubishi company.

Currently, the electric capacity of the plant is 1683 MW. In 2019, the annual volume of electricity sold amounted to 9073.56 million KWh, and the annual thermal energy sold constituted 2026.5 thousand Gcal. The main fuel at the Navoi TPP is natural gas, and the reserve fuel is fuel oil. Emissions are produced from five stacks with a height of 56m (three stacks), 60m and 180m.

The plant modernisation plans include the construction of two more power units – CCGT-3 and CCGT-4 with a capacity of 650 MW each, to be commissioned in 2023-2025. This project also includes the construction of a substation approximately 2 km from the TPP and a 220 kV power transmission line with a total length of 6.3 km from the CCGT to the open switchgear. For all three components, the EIA reports were completed and positive state environmental review conclusions were obtained in 2019. The TPP has a PIU that is in charge of the plant's modernisation projects.



Source: Consultant based on information from JSC TPP and Navoi TPP

Figure 3. Location of Navoi TPP, Uzbekistan

3.4. Investment Projects for Modernisation of the Reviewed TPPs of JSC TPP

Over the past two decades, a number of the subsidiaries of JSC TPP had implemented the modernisation projects with attraction of foreign investment. Currently, all TPPs have loan agreements with international and/or foreign financial institutions, in particular: JICA, ADB, EBRD, and State Development Bank of China⁵. The direct successors of E&S obligations under these agreements are JSC TPP and the corresponding TPPs (**Table 1**).

Table 1. Summary information on investment projects of the audited enterprises and on transfer of environmental and social obligations from JSC Uzbekenergo to JSC TPP

Investment Project	Installed capacity, MW	Year of construction / reconstruction	Investor	Conclusions / notes
JSC Tashkent TPP	http://www.toshkenties.uz			

⁵ According to the Decree of the President of the RoU No. PP-4249 of 27.03.2019 "On the Strategy for Further Development and Reform of the Electric Power Industry of the Republic of Uzbekistan", the relevant loan obligations raised for the implementation of investment projects of JSC Uzbekenergo are being reissued to the newly created JSC TPP and its constituent enterprises.

Investment Project	Installed capacity, MW	Year of construction / reconstruction	Investor	Conclusions / notes
Construction of a 370 MW combined-cycle gas turbine unit (CCGT)	2,230	1963-1971 370 mW in 2015	Japan International Cooperation Agency (JICA) China Development Bank National Bank for Foreign Economic Activity of the Republic of Uzbekistan (funding provided by the RoU Fund for Reconstruction and Development)	The legal successors are JSC TPP and Tashkent TPP. No additional environmental and social obligations / management plans were identified under these loans (other than compliance with national legislation).
JSC Navoi TPP http://www.nies.uz				
Construction of CCGT Unit at the Navoi TPP Site Expansion of electricity generation capacity at Navoi TPP by constructing a 450 MW CCGT-2 Unit Navoi TPP expansion with two 650 MW CCGT Units	2,068	1,140 MW in 1964-1981; 478 MW CCGT in 2012, 450 MW in 2019.	Japan International Cooperation Agency (JICA) National Bank for Foreign Economic Activity of the Republic of Uzbekistan (funding provided by the RoU Fund for Reconstruction and Development)	The legal successors are JSC TPP and Navoi TPP. JICA plans staged financing of the construction of CCGT units No. 3 and 4. The Environmental Action Plan for CCGT unit and power transmission line with a substation is currently under implementation. The 2019 Land Acquisition and Resettlement Action Plan is being implemented. JICA regularly organizes TPP audits, PIU reports on JICA progress.
JSC Syrdarya TPP http://www.sdtes.uz				
Phased Upgrade of Power Generation Units at the Syrdarya TPP	3,115	3 GW in 1972-1981 Partial rehab with 115 MW expansion in 2015-2019	National Bank for Foreign Economic Activity of the Republic of Uzbekistan (funds provided by the RF Vnesheconombank) PJSC Power Machines (ZTL, LMZ, Electrosila, and Energomashexport) EBRD (2001)	The legal successors are JSC TPP and Syrdarya TPP. No additional E&S obligations / management plans were identified under these loans (other than compliance with national legislation), however it is possible that such obligations are being elaborated in the framework of a project started in 2019 and financed by Vnesheconombank.
JSC Takhiatash TPP https://www.tahiyatosh-ies.uz				
Construction of two CCGT units with a capacity of 230-280 MW	730	28 MW in 1968 After the expansion in 2015-2020, the power capacity will rise to 930 MW	Asian Development Bank AKB UzPromStroyBank (funding from the RoU Fund for Reconstruction and Development)	The legal successors are JSC TPP and Takhiatash TPP. The latest monitoring reports are dated December 2019, according to them, the Corrective Action Plan is almost implemented, there are only 2 actions left, namely, action No. 10 - air quality monitoring during the commissioning of new CCGT units and action No. 15 - development of an asbestos management plan prior to the start of decommissioning of old power units.
JSC Talmarjan TPP https://taltes.uz/?lang=ru				
Talimarjan TPP1 expansion with construction of 2 CCGT units with a capacity of 450 MW each;	1700	2004 /commissioning of two CCGT units in 2016	Japan International Cooperation Agency (JICA) Asian Development Bank (ADB) and EBRD (since 2019)	The Power Line Project Completion Audit Report states that the Environmental Action Plan as well as the Resettlement Plan were implemented as required by the World Bank.

Investment Project	Installed capacity, MW	Year of construction / reconstruction	Investor	Conclusions / notes
Second expansion (TPP2) - 2 CCGT units with a capacity of 450 MW each Installation of an expander generator at Talimarjan TPP			AKB UzPromStroyBank National Bank for Foreign Economic Activity of the Republic of Uzbekistan (funding provided by the RoU Fund for Reconstruction and Development) World Bank	The EBRD ESAP is currently being implemented, as well as the plans approved by ADB and EBRD: Corrective Actions for TPP0 - Operation Phase, Corrective Actions for TPP1 - Operation Phase, Corrective Actions for TPP2 - Operation Phase.

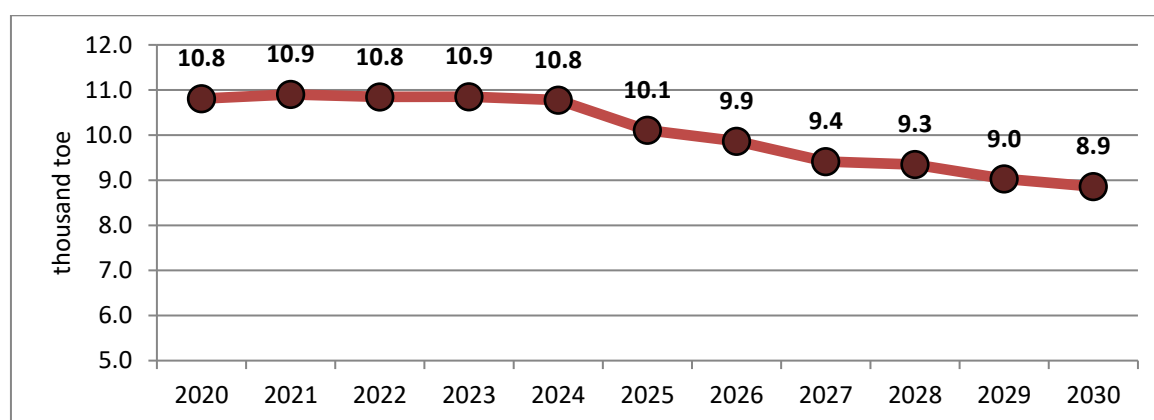
4. ENVIRONMENTAL PERFORMANCE

4.1. Corporate Level – JSC TPP

The environmental activities of JSC TPP are managed by the Environmental Impact Control Division, which consists of three employees. The main goals of the Division are to organise, coordinate and monitor the actions to reduce the harmful effects of energy production enterprises of JSC TPP on the environment and climate change. The Division also carries out planning of measures for environmental protection and efficient use of natural resources in the structural divisions of JSC TPP and monitoring of their implementation; monitoring of compliance with the requirements of environmental legislation; coordination of training of personnel of subordinate enterprises to meet the requirements within the framework of the operation of ISO 14001-2015 environmental management systems, etc.

The Department of External Economic Relations and Investment Attraction is responsible for corporate management of activities of contractors and suppliers, organisation of tenders at both national and international levels, as well as for the interaction with the IFIs. The environmental, occupational health and safety, and social (EHSS) requirements of JSC TPP are set out in the corporate document "Regulations on Tendering" and are reflected in contracts with foreign companies acting as General Contractors.

In accordance with the state policy of the RoU on improvement of energy efficiency, JSC TPP is upgrading generating capacities, decommissioning outdated power units and building new ones. The upgrade programme of the JSC TPP's subsidiaries covering the next 10 years provides for reducing the volume of fuel use while increasing the volume of electricity production. Thus, it is planned to achieve a reduction in specific emissions of pollutants into the air (Figure 4).



Source: compiled by the Consultant on the basis of the data from JSC TPP.

Figure 4. Specific emissions of pollutants into the air, thousand tonnes of fuel equivalent (toe), in 2020-2030

Retrospective data on individual plants for 2012-2019 show that the implementation of TPP upgrade projects is accompanied by significant savings in fuel burned, a significant reduction in specific indicators of pollutant emissions, both per unit of tons of fuel oil equivalent and per unit of generated electricity. For example, for TashTPP, this indicator decreased from 1.28 to 0.71 t/mln kWh. For Navoi TPP, the specific indicator decreased from 0.47 to 0.25 t/mln kWh. Upgrade of thermal power plants is also accompanied by a reduction in water consumption, mainly due to the use of water-saving cooling technologies for individual plant units.

Recommendations

- Develop the Plan for Implementing the Integrated Environmental, Occupational Health and Safety, and Social (EHSS) Management System, to be aligned with ISO 14001 (Environmental Management System), ISO 45001 (Occupational Health and Safety Management System), SA 8000 (Social Accountability), ISO 9001 (Quality Management System), and ISO 50001 (Energy Management System), and implement it across all TPPs managed by JSC TPP.
- Develop an Integrated Corporate EHSS Policy for JSC TPP, to be applicable across all its subsidiaries, and publish it on the Client's website.
- Engage staff members from the JSC TPP Environmental Impact Control Division in the discussion of and decision-making on environmental aspects of investment projects and monitoring of progress against ESAPs produced for the specific TPPs' upgrade projects
- Develop corporate documentation (guidance, procedures, instructions) for TPPs on how to implement environmental actions that are not required under the national legislation, but which are part of the E&S commitments under loan agreements (e.g., develop a Programme on Managing PCB-containing Waste, Regulation on Managing Asbestos-Containing Materials (ACM) and Asbestos-Containing Waste (ACW) and new ACM/ACW handling instructions). Organise monitoring and reporting to ensure that these documents are followed and updated in a timely manner.
- Compile an inventory of those facilities/areas at the TPP sites where ACM are known to have been used. Develop the ACM Phase-out Programme for the existing facilities that will include the ACM quantities and phase out deadlines for each facility. Exclude the use of ACM from design documentations prepared for the upgrade of the power generating units and for construction of new CCGTs.
- Develop the Decommissioning Impact Assessment Guidance for old power generating units and TPPs; agree it with EBRD and adopt across the TPPs. Impact assessment and decommissioning reports should be provided to EBRD.
- Monitor the fulfilment of contractual obligations for investment projects and other works, such as repair and maintenance, performed by contractors and subcontractors, develop a Corporate Contractor Management Plan, to include ongoing control procedures (internal audits and corporate audits), performance targets, briefings and training activities.

4.2. Level of the Subsidiaries

4.2.1. Environmental Impact Assessment and Reporting at the Subordinate TPPs

The studied TPPs belong to the I-st category of environmental impact, so the State Environmental Inspectorate strictly controls their activities. The subsidiaries of JSC TPP comply with the requirements of the environmental legislation of the RoU, including procedures for environmental assessment of upgrade projects and maintaining the necessary reporting on environmental impact and compensation payments.

As part of the submission of state statistical reporting forms, the enterprises annually prepare a "Nature Protection Report" (1-EKO form), which includes annual emission indicators, including compliance with established standards for emissions, discharges and waste

generation, as well as environmental pollution charges. The subsidiary TPPs annually submit to JSC TPP the Environmental Action Plans that are included in the General Corporate “Programme of Activities for Environmental Protection and Efficient Use of Natural Resources for 2017-2021”, which is approved and monitored by the State Environmental Protection Committee⁶.

Draft standards for emissions, discharges and waste generation are also approved by the State Environmental Review, and on their basis the limits are approved for 5 years.

Recommendations (for the subsidiary TPPs)

- Develop a system for evaluating the effectiveness of the measures developed to reduce emissions, discharges, and waste generation.
- Evaluate the effectiveness and adjust measures designed to reduce excess emissions, discharges, waste arisings, and the associated pollution fees⁷.
- Assess the TPP’s performance against the EU BAT Reference Document for Large Combustion Plants (2017).

4.2.2. Air Emissions at JSC TPP’s Subsidiaries

Combustion of fuel for electricity and heat generation is the main cause of emissions produced by the TPPs. The TPPs use natural gas from various fields and low-sulphur fuel oil as a reserve or emergency fuel.

Gas-fired TPPs are a source of relatively small emissions of pollutants compared to coal-fired TPPs, so gas cleaning systems were not provided for during the construction of the first power units (the initial stage of TPP operation). Taking into account that the remaining service life of old power units before their decommissioning is 3 to 5 years, their equipment with gas cleaning systems is currently economically unviable.

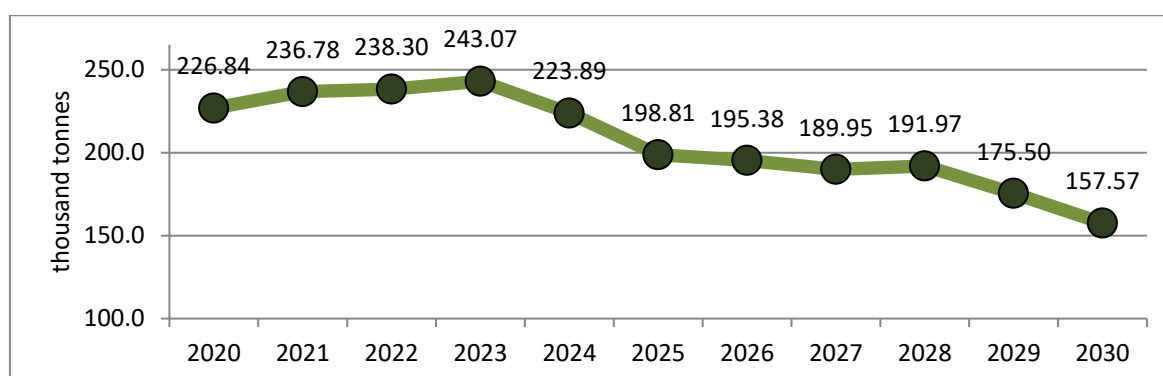
Emissions at old power units are monitored instrumentally once a quarter. The new CCGTs were equipped with automatic pollutant emission analysers. It should be noted that in the RoU the measurement of fine fractions of suspended solids (PM10 and PM2.5) is not yet included in the list of measured indicators, although this indicator is one of the most important indicators of air quality in the EU countries. It is necessary to initiate the measurement of this indicator both in the TPPs’ emissions (when using fuel oil as a reserve fuel) and in the air quality at the boundaries of the nearest residential areas. The requirement to conduct such monitoring by enterprises that have a significant environmental impact is defined at the legislative level⁸.

Installation and use of new CCGTs provides more efficient combustion of fuel, which leads to a reduction in emissions. According to the forecasts of JSC TPP, over the next decade (2020 – 2030) it is expected to reduce the volume of TPP emissions by 1.44 times in absolute terms (Figure 5), and by 1.22 times for specific emissions per 1 thousand tonnes of fuel oil equivalent (Figure 4).

⁶ Progress Report for the Sectoral Programme of Activities for Environmental Protection and Efficient Use of Natural Resources for 2017-2021 based on the results of the 4th quarter and the year of 2019. JSC TPP of 03.02.2020.

⁷ Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 820 of 11.10.2018 “On Measures for Further Improvement of Economic Nature Protection Mechanisms” (<https://lex.uz/docs/3971360#4015125>)

⁸ On improving the environmental monitoring system in the RoU. Resolution of the Cabinet of Ministers of the RoU No. 737 of 09/05/2019.



Source: compiled by the Consultant on the basis of the data from JSC TPP.

Figure 5. Emissions of air pollutants, thousand tonnes in 2020-2030

As part of the ESA, the specific emissions of the TPPs per unit of generated electricity were assessed. The results are summarized in the table below.

Table 2. Specific emissions of air pollutants at the JSC TPP subsidiaries, t/mIn kWh

Object (TPP)	Period					
	2014	2015	2016	2017	2018	2019
TashTPP	1.28	1.10	1.39	1.71	1.02	0.71
Navoi TPP	0.39	0.66	0.40	0.27	0.29	0.25
Syrdarya TPP	--	--	--	2.588	2.636	3.632
Takhiatash TPP	--	--	--	0.8184	0.6948	0.8108

Source: compiled by the Consultant on the basis of the data from JSC TPP.

Uzbekistan ratified the Paris climate agreement in 2018 and thus committed to take measures to reduce carbon dioxide emissions into the atmosphere. As part of this commitment, the country should develop and adopt a National Action Plan to Combat Climate Change by 01.06.2020. However, reporting and reduction programmes for greenhouse gas (GHG) emissions have not yet been adopted - neither at the national, not at the sectoral level.

As of 2016, the energy sector of Uzbekistan accounted for about 90% of all GHG emissions in the country. However, accounting for GHG emissions and developing programs to reduce them has not become part of corporate environmental practices for thermal power plants, due to the lack of national guidance documents for estimating GHG emissions.

Recommendations (for the subsidiary TPPs)

- Develop the Air Quality Monitoring Programme to measure air quality at the boundaries of the nearest residential areas as per the European Union requirements (daily monitoring, consideration of wind direction, determination of suspended solids PM10 and PM2.5, etc.) and national legislation.
- Organize air quality monitoring using instrumental measurements of air quality at the boundaries of the nearest residential areas with a seasonal periodicity (2-4 times a year). If necessary, develop a Programme for Reducing the Impact of Fugitive and Ducted Emissions on the Nearest Residential Areas.
- Implement the recommendations of [Sections 4.2.8](#) and [4.2.1](#).

4.2.3. Water Use, Wastewater Discharge and Associated Environmental Impacts

The table below shows information about the sources of industrial and household water supply of the studied TPPs and the established water consumption limits.

Table 3. Information about TPPs' water supply sources

Subsidiary (TPP)	Source of technical water supply	Source of household water supply
	Water consumption limit [m ³ /year]	Water consumption limit [m ³ /year]
TashTPP	Bozsu Channel – diversion channel of Kadyrya HPP (the Chirchik River)	City water supply system
	1779,336•10 ⁶	2716 •10 ³
Navoi TPP	Zeravshan river and the water from Damkhodzhin water delivery structures	City water supply network of NMMC
	974710,11•10 ³	305.463•10 ³
Syrdarya TPP	Diversion channel of the Farkhad HPP (the Syrdarya river)	Navoi artesian water intake
	1988•10 ⁶	8532,019•10 ³
Takhiatash TPP	Waters of the Amudarya River (Suenli Channel)	City water supply system
	507374,45•10 ³	66328

Source: compiled by the Consultant on the basis of the data from JSC TPP.

The main water consumers at the TPPs are turbine condenser cooling systems and auxiliary equipment; steam boilers; fire water tanks, irrigation systems, etc.

The main sources of wastewater are water treatment systems, including desalination and cation exchange treatment; condensate treatment systems; makeup water treatment systems, etc.

The actual annual volumes of industrial wastewater discharge at the plants are as follows:

- **TashTPP** – 1056270•10³ m³ – into the Bozsu Channel;
- **Navoi TPP** – 931757.4 •10³ m³ – into the Zeravshan River;
- **Syrdarya TPP** – 1734326•10³ m³ – into the diversion channel of the Farkhad HPP;
- **Takhiatash TPP** – 75158.58810³ m³ – into the Suenli Channel.

In addition to chemical pollution at the TPPs, especially with direct-flow cooling system of units, a large amount of warm water is generated, which causes thermal pollution of water bodies, including those designated as fishery water bodies.

New CCGTs typically use closed-loop cooling systems that minimise thermal pollution. So, at the Takhiatash TPP with commissioning of two CCGTs with a capacity of 230 – 280 MW, the decommissioning of units III, IV and transfer to the reserve of units V, VI, which used a direct-flow cooling system for turbine generators, the annual water consumption will decrease from 507132,683 K m³/year to 80281,107 K m³/year that is, it will decrease by 85%.

The studied TPPs do not discharge untreated process effluents and provide wastewater treatment to remove petroleum products, fuel oil, lubricants and excess salt content. Acidic and alkaline wastewater is treated at neutralisation plants, where the two streams of wastewater are mixed in order to reduce the reagent consumption. Concentrations of pollutants in the treated wastewater are within the established limits.

Recommendations (for the subsidiary TPPs)

- As part of the assessment of plant performance for compliance with BAT requirements, compare the composition of discharged treated wastewater with the thresholds established by Directive 2010/75/EU and in accordance with the EU BAT Reference Document for Large Combustion Plants (2017).
- Assess the impact of climate change on the TPPs' water supply sustainability, taking into account the needs of the main regional water users, and develop a Programme for reducing water consumption per unit of electricity and heat output.

- Assess potential impacts of the discharged wastewater and heated water on the fishery characteristics of receiving water bodies. Determine the threshold temperature values for the discharged heated wastewater that would be safe for the ecosystems of the receiving water bodies.

4.2.4. Waste Management

The main waste streams arising at the TPPs include various types of sludges (sludge from acid treatment of boilers, sludge of calcium carbide, sludge of calcium and magnesium sulphate salts and waste sludge of water purification plants and waste water treatment), waste ion exchange resins (cationite and anionite), sulfocarbon; silica gel, waste oils (from turbines, transformers, engines and compressors), spent insulation and refractory materials (asbestos-containing products, paronite, fuel oil ash, scrap of ferrous and non-ferrous metals, batteries, fluorescent lamps and other waste, including household and construction waste. Aggregate data on hazard classes of wastes generated at the TPPs are shown in the table below.

Table 4. Information about the number of types of TPP waste by hazard class

Waste hazard class	Number of waste types by hazard class				
	I	II	III	IV	V
TashTPP	1	11	3	11	14
Navoi TPP	0	10	9	13	12
Syrdarya TPP	1	12	4	12	14
Takhiatash TPP	1	10	5	18	3

Source: compiled by the Consultant on the basis of the data from JSC TPP.

As a rule, TPP upgrade projects are not accompanied by generation of a large amount of new waste types, only waste quantity and, accordingly, the limits on its formation will increase.

Current waste management practice of the TPPs involves collection and temporary storage of waste with its subsequent transfer to the specialised waste management companies for waste recycling and/or disposal.

Asbestos-containing materials (ACMs) are a common problem for all TPPs included in the audit. National legislation does not prohibit the use of ACMs, but the IFIs require to exclude their use in their projects. Enterprises that plan to apply to the IFIs for an investment loan begin to develop in advance the measures for ACM phasing out, including a ban on the use of asbestos in the construction of new facilities. Currently, the Company does not have a corporate ACM Phase-out Policy, as well as special safety instructions for handling asbestos-containing waste (which should be developed in accordance with international requirements)⁹.

Old transformers and condensers containing polychlorinated biphenyls (PCBs) may still be used or stored at the TPPs. It is also possible that transformer oils treated in transformer oil recovery systems may be contaminated by contact with oils that have historically been contaminated with PCBs. Since there are currently no accredited laboratories in Uzbekistan that can detect PCBs in oils, this issue may be deferred to a later date, or these tests may be performed by properly accredited laboratories in neighbouring countries (for example, in the Russian Federation).

Recommendations (for the subsidiary TPPs)

⁹ ILO Convention No. 162 "On Occupational Health and Safety in the Use of Asbestos" (1986).
No. 0158-04 of 12.07.2004 Sanitary Rules and Regulations for Collection, Transportation and Disposal of Asbestos-Containing Waste in Uzbekistan

- Assess the potential for increasing waste disposal and reusing at plants and/or recycling at specialised waste disposal facilities; develop a programme aimed at increasing the waste recycling and reuse.
- Develop programmes for waste generation reduction and waste reuse.
- Develop Special Waste Management Plans both at the corporate level and at the level of TPPs, as well as instructions for the safe management of waste, including:
 - asbestos-containing waste;
 - mercury-containing waste (waste fluorescent lamps);
 - polychlorobiphenyl (PCBs)-containing waste.
- Compile an inventory of those facilities/areas at the TPP sites where asbestos-containing materials (ACM) are known to have been used. Develop the ACM Phase-out Programme for the existing facilities that will include the ACM quantities and phase out deadlines for each facility. Develop new Regulation on Managing Asbestos-Containing Materials (ACM) and Asbestos-Containing Waste (ACW) and new ACM/ACW handling instructions (the instructions should be developed taking into account the national and international requirements).
- Exclude the use of ACMs from design documentation prepared for the upgrade of the power generating units and for construction of new CCGTs.
- Compile the inventory of old condensers and transformers and check them for presence of PCB-rich oils. If PCB oils are found to be present, develop a PCB waste management procedure and PCB waste disposal programme.

4.2.5. Hazardous Substances

Hazardous substances (combustible, flammable, explosive and toxic) that are stored and used at the subsidiaries (TPPs) include solid, liquid and gaseous hydrocarbon fuels – natural gas, fuel oil, motor fuels (gasoline, diesel fuel), reagents for the treatment of used service water and waste water, chemicals and materials for maintenance of equipment and facilities (paints, solvents, lubricants, cleaning products)¹⁰.

Hazardous substances that are in large quantities at the **TashTPP** site include emergency fuel oil stored in large tanks (seven fuel tanks with a nominal geometric capacity of 10,000 m³ and six fuel tanks with a nominal geometric capacity of 5,000 m³). The checks of the fuel oil tanks for their mechanical integrity / tightness is carried out weekly during walks and visual inspections of the territory. A full integrity diagnostics of fuel oil storage tanks is performed annually by the TPP's own laboratory of metals using hydraulic testing methods and ultrasonic taufinometry.

Hazardous substances that are in large quantities at the **Syrdarya TPP** site include reserve fuel oil stored in large tanks (14 fuel tanks). Also, according to the information provided to the Consultant, the enterprise stores and uses such hazardous substances as hydrazine-hydrate, hydrochloric acid, sulphuric acid, caustic sodium, as well as a number of toxic chemical reagents in small volumes (mercury nitric acid, sodium silicofluoride, orthophenanthroline hydrochloric acid, barium chloride, cobalt chloride, chloroform, manganese chloride, etc.).

The **Takhiatash TPP** site hosts the following hazardous substances: hydrochloric acid – 40 tons, sulphuric acid – 40 tons, nitric acid – 20 kg, hydrazine-hydrate – 400 kg, ammonia – 3.9 tons, hydrogen – 12 receivers of 20 m³ (240 m³, pressure 1.0 MPa), mercury nitric acid – 0.5 kg, gasoline – 10 tons, diesel fuel – 10 tons, autol – 2 tons, nigrol, solidol 200 – 300 l.

¹⁰ The safety of storage and use of hazardous substances will be checked/confirmed during a visit to the production sites of some enterprises in autumn 2020.

Hazardous substances also include fire-hazardous and toxic waste. Particularly noteworthy is the lack of safe handling of asbestos-containing materials and waste.

It is also possible to find old transformers and condensers at TPPs, in which polychlorobiphenyl (PCBs) containing fillings were originally used. PCBs are extremely toxic substances and are persistent organic pollutants (POPs). Measures to reduce PCBs and eliminate their emissions are regulated by the Stockholm Convention on POPs. Uzbekistan ratified the Convention on May 8, 2019 and is obliged to develop a national action plan within 2 years after the entry into force of the law, which provides for the implementation of its obligations to ban, limit and remove persistent organic pollutants.

Since transformer oils are regularly treated (refined), their contamination with PCB impurities can occur during the treatment process, when the oils are mixed and treated in special installations. Therefore, any actions during dismantling, transportation and subsequent disposal of old transformers and condensers, as well as oil draining, require a set of measures to protect against environmental pollution and protect the health of personnel involved in dismantling and transportation.

Recommendations (for the subsidiary TPPs)

- Develop instructions on preventing and eliminating hazardous material spills. Ensure that material safety data sheets (MSDS) describing how to use and manage these materials safely **and/or** instructions for safe handling of hazardous materials are available in working areas.
- Implement the recommendations of “Waste Management” section regarding the management of hazardous waste.
- Develop a Hazardous Materials Management Plan, including procedures for their safe storage and use, conducting internal and corporate audits, training and accident prevention.

4.2.6. Noise and Vibration

The TPPs have sources of significant noise and vibration, so, when determining potential Areas of Influence, it is necessary to take these sources into account and calculate the total level of noise exposure, its dispersion on the territory both during the design of these facilities and during their operation. Special attention should be paid to assessing the noise exposure in cases where the plants are located near the residential areas.

The main sources of noise at TPPs include turbine generators and auxiliary devices, boilers, reciprocating engines, fans and air ducts, pumps, compressors, condensers, precipitators, including shakers and vibration plates, pipelines and valves, electric motors, transformers, circuit breakers, cooling towers¹¹, etc.

- **TashTPP**

For TashTPP, the results of the inventory of noise and vibration sources and calculations of its dispersion on the territory of the plant and beyond, including the boundaries of the nearest residential areas, have not been presented. In the project's Environmental Impact Statement (2012), it was stated that the expected equivalent noise level from the CCGT equipment would not exceed 80 dBA at a distance of 1m from the equipment edge or enclosure, which corresponds to SanPiN of the RoU No. 0325-16. Preliminary assessment showed that the total noise level in residential areas outside the TashTPP site would not exceed 45 dBA, i.e. the standard noise level for residential areas at night according to SanPiN of the RoU No. 0339-16.

¹¹ IFC, 2008. EHS Guidelines. Thermal power plants.

During the implementation of the TashTPP upgrade project, it was supposed to install a noise-proof gas turbine enclosure, which will have a shielding effect during its operation. Noise reduction will also occur due to buildings and green spaces. The decommissioning of two old power units with increased noise characteristics and the launch of a new CCGT with reduced levels of generated noise should have led to the achievement of the sanitary and hygienic standard for noise levels for residential areas. However, supporting instrumental measurement data were not provided.

The Environmental Impact Statement also does not contain the results of noise propagation calculations. Since there are residential buildings near the plant site, it is necessary to perform such calculations and carry out instrumental measurements of noise and vibration levels in the daytime and at night. It is possible that the residential area closest to the plant will require the development of noise reduction measures, which often includes the use of noise protection enclosures for noisy equipment, noise insulation for buildings where noisy equipment is located, noise screens, planting of vegetation, etc.

- **Navoi TPP**

Investigations of adverse impacts of noise and pollutant emissions on the nearby residential and suburban areas near Navoi TPP were carried out as part of an environmental due diligence organised by JICA. As a result, it was decided to acquire the garden plots belonging to the owners and provide them with other equivalent plots or monetary compensation¹².

Monitoring studies on the level of acoustic impact on the nearest residential areas in the daytime and at night should be continued to correct the calculation of the base level of noise exposure during the design of CCGTs No. 3 and 4.

- **Syrdarya TPP**

The results of noise source inventory and dispersion calculations have not been provided for Syrdarya TPP. Since there are residential buildings near the plant site (Kayrakum settlement located to the north-west of the TPP, behind the pumping irrigation channel; Farkhad settlement located to the south-west of the TPP; garden plots with residential buildings at the northern boundary of the TPP, behind the South Golodnostepsky Channel named after Sarkisov), it is necessary to perform such calculations and carry out instrumental measurements of noise and vibration levels in the daytime and at night. It may be necessary to develop noise reduction measures for the residential area closest to the TPP (see measures for TashTPP).

- **Takhiatash TPP**

The results of noise source inventory and dispersion calculations have not been provided for Takhiatash TPP. The Environmental Impact Statement for the two CCGT construction project also does not provide the results of noise dispersion calculations. Since the enterprise is located within the city limits, and the nearest residential buildings are located within 100 – 150m from the plant site, it is necessary to perform such calculations and carry out instrumental measurements of noise and vibration levels in the daytime and at night. It may be necessary to develop noise reduction measures for the residential area closest to the TPP (see measures for TashTPP).

Recommendations (for the subsidiary TPPs)

- Assess the impact of noise and vibration on the population of the nearest residential area:
 - a. Conduct an inventory of noise and vibration sources at all TPPs.

¹² http://www.nies.uz/wp-content/uploads/2019/10/A-LARAP_Final_RUS-1-1-50.pdf.

- b. Carry out a simulation of the propagation of noise and vibration on the territory of the industrial site and at the boundaries of the nearest residential area, using methods adopted in the European Union.
 - c. To check the results, conduct instrumental measurements of noise and vibration in the daytime and at night at the boundaries of the industrial site and at the nearest residential areas.
 - d. If exceedances are detected at the boundaries of the residential areas in relation to noise and vibration levels during the day and/or night, assess the risks to community health.
 - e. If necessary (when the noise level exceed or are nearing the threshold values, especially at night), develop and implement noise protection measures to suppress industrial noise and vibration.
 - f. Based on the results of the risk assessment of the effects of noise and vibration on the health of the population living in the immediate vicinity of the TPP, determine the need to establish a sanitary protection zone (SPZ) taking into account recommendations of authorized (sanitary) authorities.
- In case noise and vibration risk assessment carried out (under PR4/PR1) for people living near the TPPs confirms the clear risk to human health, a need for the relocation of people/properties and associated economic/physical displacement impacts, prepare and implement a Resettlement Plan (RP) in line with EBRD PR5 and national legislation.
 - If PR5 impacts are confirmed, put in place a grievance mechanism accessible to all displaced people and assign a person responsible for dealing with all complaints under PR5.
 - For future TPP modernisation and CCGT construction projects, consider ensuring the optimal location of planned buildings and facilities so that they could serve as additional barriers preventing the propagation of noise to the adjacent areas.

4.2.7. Environmental Emergencies

In the past 5 years, there have been no emergencies involving significant environmental consequences **at subsidiary TPPs**. However, in the **Emergency Preparedness and Response Plans**, all possible scenarios with significant environmental consequences should be reviewed when analysing the development and risks of all possible man-made and natural scenarios. If they are absent, make additions to the Plan and provide for preventive measures and the availability of materials for the containment and elimination of accidents, for example, when spilling fuel oil from tanks that have lost their tightness, there should be a reserve of special means, such as special mats that retain pollution, etc.

Recommendations (for the subsidiary TPPs)

- Follow the recommendations of [Section 5.2.8](#)

4.2.8. Greenhouse Gas Emissions

As noted in [Section 4.2.2](#), Uzbekistan had to develop a National Action Plan for the implementation of the Paris Climate Agreement by 01.06.2020. However, reporting on GHG emissions has not yet been introduced into the environmental practices of enterprises, and no programmes are being developed to reduce their emissions.

According to 2016 data, almost 90% of all GHGs in Uzbekistan are generated in the energy sector, but the **thermal power plants subordinate to JSC TPP** do not calculate greenhouse gas emissions, since the national methodology for calculating GHG emissions has not been developed and national legislation does not require annual reporting on emissions.

Recommendations (for the subsidiary TPPs)

- Compile the GHG inventory and develop a GHG Emission Reduction Programme.
- Annually estimate and report GHG emissions to the JSC TPP's Environmental Impact Control Division.

5. OCCUPATIONAL HEALTH AND SAFETY (OHS) PERFORMANCE AND MANAGEMENT

5.1. Corporate Level – JSC TPP

5.1.1. OHS Policy and Management System at the Corporate and Subsidiary Levels

The OHS management system, at both the corporate and enterprise-specific levels, is governed by Regulation No. IESH 34-400:2020 "On the JSC TPP Occupational Health and Safety Management System" (Regulation), according to which the main OHS activities at the JSC TPP subsidiaries include: planning of work, health and safety monitoring, development of corrective measures and monitoring of their implementation.

Such components of the OHS system as OHS policy and objectives; OHS trainings, briefings and knowledge checks; occupational incident management and investigation procedures; provision of personal protective equipment (PPE); analysis and evaluation of OHS performance, reporting; monitoring and optimisation of the OHS management system, etc., are mainly implemented at JSC TPP and its subsidiaries, but are not defined/regulated in Regulation No. IESH 34-400:2020.

Of all the enterprises that are part of JSC TPP, only Ferghana TPP has introduced an OHS management system, which is certified to OHSAS 18001/ISO 45001 international standard.

Recommendations

- Implement recommendations on the development and implementation of a corporate integrated management system and corporate policy ([Section 4.1](#)).
- Develop an OHS Management Plan, that will include the items below, and adapt it for each subsidiary:
 - OHS policy and objectives;
 - OHS trainings, briefings and knowledge checks;
 - Occupational incident management and investigation procedures;
 - Provision of PPE;
 - Analysis and evaluation of OHS performance, reporting;
 - Monitoring and optimisation of the OHS management system, etc.

5.1.2. OHS Activities at JSC TPP

The Chairman and the First Deputy Chairman of the Board of JSC TPP, the Reliability and OHS Service, the Main Generation Department of TPPs and CHPPs, as well as other production and support departments are involved in ensuring compliance with the OHS and fire safety requirements, norms and rules, creating safe and healthy working conditions at enterprises.

The JSC TPP Reliability and OHS Service coordinates the activities of Reliability and OHS Services of the subsidiaries, including: approval of OHS action plans and programmes of enterprises; analysis of the state and causes of occupational incidents, participation in the development of accident prevention activities; participation in the work of the Commission to check the knowledge of the maintenance and OHS rules and other regulatory documents of managers and leads of the Reliability and OHS Service, to investigate severe (including fatal) and group incidents; control of work on: certification of the sanitary and technical condition of subsidiaries, development and implementation of the OHS management system at JSC TPP subsidiaries, implementation of actions at enterprises to create healthy and safe working

conditions, etc., collection and analysis of information about incidents at JSC TPP subsidiaries.

5.1.3. OHS Procedures

Enterprises provide monthly, quarterly and annually certificates of work done in the field of OHS and fire safety to the Lead of the JSC TPP OHS Service. This information is used by the JSC TPP Reliability and OHS Service in the further planning of work aimed at ensuring safe working conditions at workplaces, compliance with the OHS rules and regulations, and prevention of occupational incidents.

The JSC TPP Reliability and OHS Service keeps records of occupational incidents that occurred at enterprises. According to the data provided over the past five years, four subsidiary TPPs (Tashkent, Navoi, Syrdarya, Takhiatash TPPs) have not recorded any fatalities; 12 accidents have occurred, in which 13 people were injured. Minor injuries and incidents are not recorded and reported at the subsidiary enterprises of JSC TPP.

Recommendations

- Develop an incident recording and reporting procedure to report (to the JSC TPP Reliability and OHS Service) near misses and minor injuries occurring at the subsidiary enterprises. The information should include a short summary of an incident, review of causes / circumstances of an incident, preventative and/or corrective actions taken.

5.1.4. OHS Trainings and Knowledge Checks

Organisation of training and professional development of employees responsible for the health, safety and environment is carried out at the expense of own funds of the JSC TPP enterprises in accordance with the needs of the enterprise.

In accordance with the approved training plans for 2020, it is planned to train 34 employees of the JSC TPP subsidiaries at the Geokontekhnazorat Training Centre on the subject of "Industrial Safety", and to upgrade the skills of 18 employees of the environmental departments at the Retraining and Advanced Training Centre of the Institute of Standards under the Agency of Standardisation and Certification of the RoU.

5.2. Level of the Subsidiaries

5.2.1. OHS Procedures

At the JSC TPP subsidiaries, the routine operational monitoring is performed to ensure compliance with the OHS rules and regulations. This is done by the Occupational Health and Safety Service at TashTPP, Navoi TPP, and Takhiatash TPP; and by OHS Service - at Syrdarya TPP. The activities of these services are regulated by the relevant internal regulations, and the duties and responsibilities of their employees are defined in the job descriptions.

For worker professions of the JSC TPP subsidiaries, the OHS instructions have been developed and approved, according to which the leads of the relevant departments periodically conduct OHS briefings/trainings.

When entering employment and then annually, the employees of the enterprises undergo medical examinations. In confirmation whereof the Consultant was provided with the copies of contracts of the subsidiary TPPs with medical service providers.

The TPPs conclude civil liability insurance contracts that are compulsory for the organisations operating hazardous production facilities and cover risks of harm to the human life, health or property of third parties and the environment in the event of an accident at hazardous production facilities.

Provision of employees of the subsidiary TPPs with special personal protection equipment (PPE) (ear plugs, protective glasses, helmets, masks, gloves, etc.), as well as special clothing

and footwear is carried out in accordance with the Order of the Minister of Labour and Social Protection No. 1934 of 02.04.2009 “On Approval of Standard Regulations of Free Distribution of Special Clothing, Special Footwear and Other Personal Protective Equipment for the Employees of Electric Power Companies”.

However, when the Consultant conducted video tours of the facilities of JSC TashTPP it was noted that workers did not have (when working on metal processing machines) PPE such as protective glasses and ear plugs; it was also noted that the protective covers mounted on metal processing machines were not used.

During the video tours of the facilities of JSC Navoi TPP, it was noted that the employees of the mechanical repair shop did not wear anti-noise PPE when working on metal processing machines.

In order to prevent the spread of COVID-19 infection, JSC TPP enterprises have taken the short-term and long-term measures to ensure disinfection, a safe place of work and the provision of PPE to employees.

Recommendations (for all subsidiaries)

- Provide all employees occupied in harmful and hazardous workplaces with the due PPE, special footwear and cloths as per the provision norms. In order to protect the health of personnel, conduct regular monitoring of the use of PPE, safety footwear and cloths among both employees of the JSC TPP’s subsidiaries and employees of contractors and subcontractors.
- When working on metal processing machines, ensure the use of protective enclosures and covers.

5.2.2. Hazardous Production Facilities

According to the Law of the RoU “On Industrial Safety of Hazardous Production Facilities” No. ZRU-57 of 28.09.2006 and the “Regulation on the Procedure for Identifying Hazardous Production Facilities” (Annex 1 to the Decree of the Cabinet of Ministers No. 271), the subsidiary TPPs are identified as hazardous production facilities belonging to the first type¹³.

At the plants, there are orders on the appointment of persons responsible for supervision, safe operation and maintenance of hazardous production facilities.

5.2.3. OHS Briefings and Knowledge Checks

When hiring new employees, each subsidiary conducts an OHS induction, and its results are recorded in the induction OHS log-books of the enterprises. Inductions, regular and extraordinary / repeated trainings are conducted at work places, in workshops and divisions, and are recorded in the workshop training logs.

OHS training of personnel at the subsidiary TPPs is carried out during the annual cycle of technical and economic training. OHS training programmes are compiled individually for each workshop and division.

OHS training and retraining of personnel is carried out at the enterprise and in training centres:

- “Kontekh Nazorat Ukuv” Scientific and Technical Centre, and
- Training centre of JSC Navoi TPP.

¹³ Hazardous production facility of the first type is high-risk facilities where dangerous substances are used, produced, processed, formed, stored, transported, destroyed in quantities equal to or exceeding their limit standards.

The knowledge check for obtaining electrical safety access qualification is carried out in the course of checking the knowledge of staff in accordance with the “Rules of Technical Operation” and “Safety Regulations” by the Permanent Examination Commission. The results are documented in the knowledge check logbook and are recorded in the individual qualification certificate of the employee.

Emergency response training sessions are conducted in accordance with the annual training plans. Once a quarter, all-plant emergency response and fire drills are held. In the workshops, emergency response and fire drills are conducted monthly according to the workshop plans and individual plans of employees.

5.2.4. Reporting, Checks, and Inspections

The JSC TPP subsidiaries annually submit statistical reports on the state of working conditions and occupational incidents (1-MSh annual form) to the State Statistics Committee of the RoU.

The state of fire safety at the facilities is periodically checked by the relevant authorised bodies.

The three-tier OHS control system has been implemented at all audited plants.

At the TashTPP, the third tier of OHS control is implemented once a month. According to the procedure adopted at the TPP, the outcomes of the third tier of control should be documented by a corresponding protocol that should discuss the identified violations / non-compliances and measures to eliminate them. However, according to the information provided, the check outcomes are recorded in the three-tier control log-book, which is contrary to the provisions of the procedure.

At the Navoi TPP, the outcomes of the first and second control tiers are recorded in the appropriate workshop log-books, and the outcomes of the third tier of control are documented in the OHS state inspection certificates.

No information has been provided about checks / inspections of state control bodies at the Syrdarya TPP over the past five years, as well as about inspections of the state of labour protection at the enterprise as part of the three-tier control system.

Order No. 47 of 16.01.2019 approved the Commission of Takhiatash TPP for the performance of the third tier of the three-tier control over the OHS state. This order also approved a list of issues that should be considered when conducting a three-tier control of OHS state.

The subsidiary TPPs submit the relevant certificates on the OHS work to the JSC TPP Reliability and OHS Service on a monthly, quarterly and annual basis, as well as at request.

Recommendations (for TashTPP)

- Improve efficiency of the three-tier OHS control procedure by documenting the Tier 3 outcomes in a special protocol, discussing the identified non-compliances, conduct trainings / workshops to identify appropriate corrective actions, and provide adequate control to ensure that corrective actions are implemented.

5.2.5. Assessment of Working Conditions

In 2018, TashTPP, Navoi TPP and Syrdarya TPP conducted regular periodic **certification of workplaces in terms of working conditions and equipment injury hazard** in accordance with Annex No. 1 (Regulation on the Procedure for Certification of Workplaces in Terms of Working Conditions and Injury Hazard of Equipment) to the Decree of the Cabinet of Ministers No. 263 of 15.09.2014. In particular, TashTPP certified 75 workplaces, Navoi TPP – 244 workplaces, and Syrdarya TPP – 235. The information on workplace certificate for Takhiatash TPP has not been provided; the certification was reportedly carried out. *This issue will be further investigated by the Consultant during a field visit to JSC TPP.*

5.2.6. Major Accidents and Occupational Incidents

The JSC TPP enterprises keep records/statistics of occupational incidents. Accident statistics are provided in [Section 5.1.3](#). Based on the results of occupational incidents, the relevant commission investigates the causes and draws up an Accident Investigation Act in N-1 form. Occupational incidents are recorded in the Accident Logbooks. The near misses (injury-risk situations), as well as minor injuries of personnel at enterprises are not recorded.

Recommendations

- Keep record of near misses/ incidents and minor injuries at enterprises. Use the near miss and small injury recording and reporting procedure to prepare a short summary of each near miss or minor incident describing its causes and circumstances, and actions taken, and submit it to the JSC TPP's Reliability and OHS Service.
- Discuss all near miss incidents and minor injuries with employees to prevent similar/more serious incidents from occurring in the future.
- Keep record of accidents, fires and ignitions in the special Accident, Fire and Ignition Logbook.

5.2.7. Fire Safety

During the video tours and video re-interviews with representatives of JSC TashTPP and JSC Navoi TPP, the state of affairs in the field of fire safety at these enterprises was assessed.

The main production and technological divisions and equipment, fire-hazardous facilities at the plants are equipped with automatic fire extinguishing systems and mobile primary fire extinguishing means (foam and carbon dioxide extinguishers) and fire plugs / valves. According to the information provided, fire extinguishers are periodically checked and tested.

Service and office buildings are equipped with fire valves, carbon dioxide extinguishers and fire alarms.

Some of the warning signs / labels on the equipment are available only in English.

Recommendations (for all TPPs)

- Install duplicate plates in the Uzbek (Russian) language for those safety or warning signs on foreign-made equipment that are currently available only in foreign languages, check knowledge of the purpose of these signs when instructing personnel.
- Ensure the availability of all Manuals for using foreign equipment in a language understandable to personnel.

5.2.8. TPP Emergency Preparedness, Including Protection of Local Communities from Consequences of Emergencies

As part of measures to improve emergency preparedness at TPPs, potential accidents of both technogenic and natural origin are identified and the following documents are developed:

- Industrial Safety Declaration;
- Technogenic and Natural Emergency Preparedness and Response Plan;
- Technogenic Emergency Evacuation Plan for the TPP personnel; and
- Guidelines on Emergency Prevention and Response for the TPP facilities.

Emergency response drills are conducted once a quarter, and fire drills are held once every six months. During such drills the emergency response actions are practiced. Once a year each employee of the core operations (taking into account shifts) participates in fire and emergency response drills.

Recommendations (for all TPPs)

- Bring the existing Emergency Preparedness and Response Plan in line with the EBRD requirements and good international practice. If needed, supplement the Plans with the identification of all potential scenarios of both technogenic and natural origin, their involvement and analysis of potentially affected areas, including local communities and industries located in the surrounding areas. The Plan¹⁴ should include the following:
 - preventative actions designed to reduce the likelihood and magnitude of an emergency or an accident and its involvement (containment);
 - clear instructions on actions to be taken by plant employees, regional and local authorities and emergency services;
 - requirements for the availability of means for the rapid elimination of emergencies that can be accompanied by severe environmental consequences (for example, fuel oil spills due to violation of the tightness of the tanks)
 - actions designed to protect communities and employees of adjacent enterprises, and estimated number of potentially affected people which should be reflected in the Emergency Preparedness and Response Plan, emergency alert and evacuation plans with an estimate of the required number of additional vehicle units.

Additionally for TashTPP:

- Maintain regular updates to the Emergency Preparedness and Response Plan in accordance with the national legislation (at least once every three years)¹⁵.

Additionally for Navoi TPP:

- Update and approve the Industrial Safety Declaration held by the Navoi TPP, as a hazardous facility, to reflect technical and organisational changes in the TPP operations
- Include in the updated Emergency Plan the scenarios for the emergencies and the accidents that may occur at the neighbouring enterprises of JSC Navoi Mining and Metallurgical Combine and JSC NavoiAzot containing hazardous production facilities and using hazardous substances (chlorine gas, hydrocyanic acid, etc.)

5.2.9. Sanitary Protection Zones, Public Health and Safety

In accordance with the Sanitary Classification of Enterprises and Industries, Thermal Power Plants, Warehouse Buildings and Structures, the size of the SPZ for TPPs with an equivalent electrical capacity of 600 mW or higher, operating on gas and gas-fuel oil (class II), is 500 m from the emission source (a stack). Thus, all TPPs included in this Project belong to Class II and should have a standard SPZ of 500 m. However, the SER opinions indicate that the calculated concentrations of pollutants at the boundaries of the TPPs' industrial sites are less than the maximum permissible concentrations and correspond to the established emission quota, which allows the plants not to establish SPZs in connection with the expected concentrations of pollutants.

According to information from the TPPs, health and sanitation authorities did not oblige them to install SPZs based on noise emissions.

It should be noted that in the urban development norms and rules set out in the document ShNK 2.07.01-03¹⁶: *"52. Sanitary protection zones should be provided if, after carrying out all technical and technological measures to clean up and neutralize harmful emissions and*

¹⁴ Or an "addendum" to the plan.

¹⁵ <https://lex.uz/uz/docs/1889040>

¹⁶ ShNK 2.07.01-03¹⁶ "Urban Development. Planning of Development and Building on Territories of Urban and Rural Settlements"/ State Architecture and Construction Committee of the Republic of Uzbekistan – Tashkent, 2009.

reduce noise, the maximum permissible concentrations of harmful substances and maximum permissible noise levels are not provided in the residential area.” Therefore, the issue of the need to establish a noise SPZ should be resolved after the development and implementation of all noise protection measures and instrumental verification of their effectiveness.

Recommendations on additional assessment of noise and vibration impact on the communities of the nearest residential area are given in [Section 4.2.6](#).

6. LABOUR RISK ASSESSMENT OF CURRENT OPERATIONS OF JSC TPP AND ITS SUBSIDIARIES

6.1. General Information

The total number of JSC TPP employees is 12,860, of whom 116 are based in its Executive Office and the remaining 12,744 are spread across its subsidiaries¹⁷. Of 12,744 staff, 79.1% are males and 20.9% are females. Of 116 JSC TPP staff, 43 (37%) are females.

6.2. Human Resource Policy

The JSC TPP's Human Resource policy is focused on compliance with international labour standards and the labour legislation of the RoU, which is reflected in JSC TPP Regulation on Human Resource Policy, Collective Agreement for 2020–2021, and Internal Labour Rules.

JSC TPP subsidiaries develop their internal labour rules and policies based on the policies provided by the Executive Office. At the JSC TPP subsidiaries, working conditions are regulated by the Collective Agreement, the Internal Labour Rules and local regulations/documents.

A written labour contract is signed with all employees individually within JSC TPP and its subsidiaries. It defines their working conditions; namely, start time, working hours, wages, leave entitlement, rights, and obligations of the employee and the employer. The employees can access their personnel files and their workbooks at any time, upon request.

JSC TPP and its subsidiaries do not hire temporary or seasonal workers.

6.3. Child Labour Risks

JSC TPP has taken measures to prevent child labour in accordance with ILO Conventions 138 and 182. The collective agreement obliges the employer to strictly observe the minimum age for admission to work to prevent child labour. Only people older than 18 years are employed by the JSC TPP and its subsidiaries. The Human Resource departments of JSC TPP and its subsidiaries verify the age of the candidate by requesting and checking identity documents.

There is a practice of accepting interns from subordinate colleges by JSC “TPP subsidiaries. Some of the students can be younger than 18 years of age. The duration of the internship can vary from 1 to 2 months. Students spend 4 hours a day on the factory sites (except holidays and weekends), and a responsible official is appointed to conduct safety briefings, as well as supervise and accompany the students. Students do not perform any work duties, do not come to the plant on weekends or holidays, and are involved in learning/practice activities only during the day shifts. The internships of students cannot be classified as child labour by ILO definition¹⁸. In particular:

¹⁷ The data were provided to the Consultant before two subsidiaries (Angrensk and Novo-Angrensk TPPs) have been withdrawn from the JSC TPP's structure.

¹⁸ See ILO definition of Child Labor <https://www.ilo.org/ilostat-files/Documents/Statistical%20Glossary.pdf> and also at <https://www.ilo.org/ipec/facts/lang--en/index.htm>.

- Students are involved only in learning activities.
- Students are not involved in productive activities and do not perform duties that can be classified as work.
- The activity does not harm their health and personal development or interfere with their schooling.
- The activity contributes to their personal development by providing access to new skills and experience.

6.4. Forced Labour Risks

Uzbekistan was criticised for using forced labour. In particular, the employees of state-owned and private organisations face involuntary labour risks when being recruited at their employment places as cotton pickers during the cotton harvesting period, under threat of penalties or being forced to pay a substitution fee for the work to be done instead by local pickers¹⁹.

The Government of the RoU started to collaborate with the ILO and to monitor the cotton sector, with the aim of eradicating the practice. The risks of forced labour have declined as a result of a number of efforts, including national and international third-party monitoring, increases in rates of pay and prices of cotton, strengthened control, and investigation of forced labour cases. However, as assessed by the third-party monitoring conducted in Uzbekistan by the ILO, there were still cases of forced labour during the last harvest, with about 5.9% of people involved in the harvest being involved in forced labour (about 102,000 people)²⁰.

As indicated by ILO TMP monitoring from 2018–2019, the risk of forced labour is unevenly distributed across the country²¹. According to the report, in some regions there were cases of mass recruitment at the place of employment and complaints submitted to the official feedback mechanisms more prevalent than in others. Some of the clients' subsidiaries (TashTPP and Syrdarya TPP,) are located in the regions with a high number of complaints about forced labour during the cotton harvest submitted to official feedback mechanisms and where cases of mass recruitment were observed by ILO monitors in 2019.

There were significant changes in national legislation in 2019 and 2020. In March 2020, the Government of the RoU passed a decree increasing the role of market principles in cotton production and decreasing state control over the cotton production sector. In addition, the Government of the RoU introduced the criminalization of forced labour in January 2020. The penalties for forced labour offenses include the deprivation of a certain right for up to three years or correctional labour of up to three years. Both documents officially come into force with the 2020 harvest and aim to decrease the risks. Until the cotton harvest for 2020, the complete eradication of forced labour as a result of the new legislation has not been definitively observed.

¹⁹ Sources: 1) UNCTAD, 2015. Golub, S., Kestelman, S. Uzbekistan's Cotton Value Chain: https://www.swarthmore.edu/sites/default/files/assets/documents/user_profiles/sgolub1/LLDCSUzbekistanCotton-final.pdf, 2) Uzbek German Forum (UGF), 2018. "We want farmers to have full freedom": No Need for Forced Labor when Farmers are Empowered to Pay Decent Wages. Spring Cotton Fieldwork 2018. September 2018: http://uzbekgermanforum.org/wp-content/uploads/2018/09/Spring-Cotton-Fieldwork-2018_Klein.pdf ³⁾ World Bank, 2016. Swinkels, R., Romanova, E., and Kochkin, E. Assessing the Social Impact of Cotton Harvest Mechanization in Uzbekistan. Final report. <http://documents.worldbank.org/curated/en/753131468301564481/Assessing-the-social-impact-of-cotton-harvest-mechanization-in-Uzbekistan-final-report>.

²⁰ ILO TPM (Third-party monitoring) 2019. https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_735883/lang--en/index.htm.

²¹ *Ibid.*

Considering that risks of forced labour are still present in the country and some of the client's subsidiaries are located in zones where there is a higher risk of forced labour, a number of measures were developed in order to monitor and exclude the risk of the client's employees being involved in involuntary labour practices.

6.5. Non-Discrimination and Equal Opportunity

The salary at JSC TPP and its subsidiaries for each employee is calculated according to the Unified Tariff Schedule. The schedule takes into account the employee's educational qualifications, work experience, type of work duty, and skills, disregarding gender. There is no difference in salary for men and women who perform the same work. No cases of harassment of female employees by male personnel were reported during the labour risk assessment.

6.6. Workers' Organisations

The trade union committee is present at JSC TPP and its subsidiaries. The share of workers in the union is 100%. Membership trade union contributions make up 1% of wages.

In the executive office and at each subsidiary of JSC TPP, women's committees have been created, and the chairperson of each committee is a woman. In the event of problems or complaints about working conditions, a woman staff may contact the chairperson of the women's committee.

6.7. Collective Dismissals

In accordance with the norms of labour legislation, "collective dismissal" is considered the simultaneous release of at least 10% of the payroll number of employees. The collective agreement regulates the norms protecting the interests of workers during the reduction procedures.

Currently, the company is pursuing a policy aimed at preserving jobs in order to socially protect employees. Production is carrying on in full at all subsidiaries and production has not decreased, so there is no plan on the part of JSC TPP and its subsidiaries to reduce jobs. However, the commissioning of new CCGT units and decommissioning of old power generation units may lead to layoffs in the future and dedicated measures will need to be taken in advance to minimize and mitigate their labour impacts.

6.8. Wages, Benefits, and Conditions of Work

Salary is paid twice a month to the employee's bank account. There were no reports of wage payment delays or debts owed to the workers during the labour risk assessment. In addition to bonuses, the Collective Agreements at JSC TPP and its subsidiaries provide for the payment of further benefits to employees: financial assistance, cash compensation for food, cash incentives, payment of entrance tickets to sanatoriums and children's camps.

6.9. Hygiene and Safety at Work

In response to the COVID-19 pandemic, the employees of JSC TPP and its subsidiaries were transferred to a rotational shift work (15 days/night and day shifts). Conference halls and workshop premises are equipped to temporarily accommodate the staff (see also the next subsection). The premises of the subsidiaries are disinfected through a thorough treatment with chlorine solution, and employees are provided with hygiene products, antiseptics, and protective equipment. The medical units of the subsidiaries monitor the health state of the staff and measure their temperature during the day. Additionally, at JSC Navoi TPP, the employees are tested for coronavirus prior to starting their rotational shift.

6.10. Worker Accommodation

JST TPP has no own dormitory. Only few of the TPPs own dormitories for the staff, however these dormitories and other non-productive facilities are being moved off the balance of the TPPs.

As noted, in response to the COVID-19 pandemic, the workers of JSC TPP and its subsidiaries were transferred to a rotational shift work (15 days) and stay in the temporarily provided premises. According to EBRD PR2, any temporary accommodation provided by the client to the workers should comply with the principles of good international practice, in particular with the IFC and EBRD guidance note on workers' accommodation (2009)²² and temporary national sanitary rules and regulations in the context of restrictive measures pertinent to the COVID-19 pandemic - SanPiN RoU No. 0372-20 of 11 May 2020.

6.11. Grievance Mechanism

In the event of a violation of labour rights, the employees of JSC TPP can address both written and oral complaints to the trade union committee, line manager, and general director. There is a feedback option on the websites of JSC TPP and its subsidiaries. JSC TPP organizes the work of "hot lines" (phone lines). In addition, employees can submit their complaints to the Inspectorate of the Ministry of Employment and Labour Relations (MELR) as well as the hotline of the Federation of Trade Unions of Uzbekistan (FTUU).

The complaint is registered in a journal, then it is examined and a response is provided to the applicant within 10–15 days. Documents regulating the procedure for receiving and considering anonymous complaints are currently under development. Work in this direction was suspended due to the pandemic but will resume at the end of the pandemic. An option for submitting anonymous grievances was found to be in place at three out of five considered subsidiaries (TashTPP, Takhiatash TPP, and Talimarjan TPP).

6.12. Supply Chain

Agreements/contracts signed with suppliers and service provided are structured to comply with national laws. At the same time, the client will work to include PR2 provisions to the new contracts with its suppliers, prohibiting any use of involuntary labour practices across Client's supply chains'.

Recommendations for the whole labour section:

- Undertake an external Labour Risk Assessment to be conducted by a competent labour professional twice during the project cycle and assess compliance against EBRD PR2 at the Client level and across its subsidiaries and contractors.
- Complete an annual external labour monitoring of JSC TPP's and its subsidiaries' direct and contracted workers during the cotton harvesting season to ensure none of the workforce is involved in cotton picking, and any other involuntary labour practices.
- Provide an induction training to all employees on labour and human resource documentation (human resource policy, latest amendments to labour laws) and grievance/feedback mechanism used to report on forced labour risks (which is managed by the Uzbekistan Ministry of Labour and Federation of Trade Unions).
- Extend an employee grievance mechanism to include the possibility of anonymous / confidential complaint and extend this mechanism to direct employees and contractor's workforce.
- Ensure that any temporary accommodation (included for the COVID-19 period) provided to the JSC TPP staff (if needed) and those of the subsidiaries is compliant with the

²² IFC (International Finance Corporation) and EBRD (European Bank for Reconstruction and Development). 2009. Guidance note: Workers' accommodation: processes and standards, available at: https://www.ebrd.com/downloads/about/sustainability/Workers_accomodation.pdf

requirements of IFC and EBRD guidance note on workers' accommodation (2009)²³ and national SanPIN RoU No.0372-20 dated 11.05.2020²⁴.

- The standard terms and conditions of the contractor agreements to include the provision banning child and forced labour, along with a unilateral termination clause to be affected upon a contractor/subcontractor found to use child or forced labour. JSC TPP to advise its subsidiaries to include this clause in their standard contractor agreements and bidding documents.

Develop a generic (standard) Staff Retrenchment Policy, and, at each TPP where a staff reduction is expected develop concrete retrenchment plans including actions on notifying employees of potential layoffs in a timely manner, training or re-training employees to operate and maintain new CCGT units, transfer to a new position or relocation to another TPP etc.

7. INFORMATION DISCLOSURE AND STAKEHOLDER ENGAGEMENT

7.1. Corporate Level - JSC TPP

JSC TPP is a young company and it has not yet developed a stakeholder engagement policy / strategy. However, its management / staff do realize the importance of the aspect and plan to start the communications with different stakeholders in the near future.

Taking into account the current epidemiological situation with the COVID-19 pandemic, it is supposed to start applying the remote methods of communication such as the Internet and mass-media. One of the initial measures planned by the Company is to conduct surveys of the population including on E&S topics related to the TPP's activities. Another step is to reach out to the wider public by setting up accounts/pages in the social networks.

The Client developed the **Appeal Procedure IESH-34-303:2019** as per the legislation of Uzbekistan and, in September 2019, adopted an order that requires the Procedure to be applied to all subsidiaries. According to this order, the Procedure should be brought to the attention of all subsidiaries; and the statistics on appeals, *including* complaints, suggestions, statements from citizens and legal entities (including employees and contractors), should be regularly submitted to JSC TPP (**Table 5**).

Table 5. Appeals considered in 2019 in JSC TTP and its subsidiaries

Subsidiary	Number of appeals	Comments
JSC TPP	159	1. Not a single appeal was received through the website, only one was received via e-mail. 2. From 13% to 70% of appeals received by enterprises in writing. 3. From 19% to 87% of appeals received at the office directly by the heads of units. 4. JSC TPP received about 50% of its appeals through the virtual reception of the President, other enterprises - from 2% to 10%.
JSC TashTPP	35	
JSC Navoi TPP	179	
JSC Syrdarya TPP	221	
JSC Takhiatash TPP	171	
JSC Talimarjan TPP	137	

Source: compiled by the Consultant on the basis of the data from JSC TPP.

Based on the documentary review, the largest number of the individual appeals relate to requests for employment and for provision of financial assistance, sanatoriums tickets, advance payments of salaries due to family reasons, dismissal applications; the appeals from organizations are mainly proposals for cooperation on TPPs' modernisation / expansion

²³ *Ibid.*

²⁴ <https://www.minzdrav.uz/m/docs/detail/59397/>.

projects and/or requests to consider commercial offers for the provision of services / supplies. JSC TPP reviews each registered appeal.

It should be noted that according to the national regulations *“appeals recognized as anonymous are removed from control or execution from the moment of making the opinion and are not subject to consideration”*²⁵. This is not fully in line with the EBRD requirements, according to which it is mandatory to envision a possibility for submitting and considering anonymous grievances. To accommodate these requirements JSC TPP intends to revise its procedures.

The Company maintains an informative website at <http://www.tpp.uz/> in the Uzbek, Russian and English languages, as well as a Youtube channel, an account in Telegram (messenger), and pages in popular social networks such as Twitter and Facebook.

Recommendations

- Develop a corporate Stakeholder Engagement Plan (SEP) and review, update and disclose it on an annual basis.
- Appoint a person responsible for implementing the corporate SEP, who will also provide advice to the subsidiaries and assist them with implementing their adapted SEPs. Disclose the name and contact details of this responsible officer.
- Build stakeholder engagement capacity at JSC TPP through workshops / trainings.
- Disclose documentation on the EBRD-funded projects (i.e. corporate SEP and NTS) by publishing them on the corporate website, and ensure the disclosure of project-specific SEPs and NTSs for projects supported by international lenders on a website of each specific TPP.
- Compile an annual summary of complaints received by the enterprises, including their status (open, pending, closed, other) and include it in the annual monitoring report for EBRD.

7.2. Level of the Subsidiaries

All TPPs have experience in interacting with stakeholders both when conducting national EIA procedures for modernization projects, and as part of the development projects supported by international banks. Two of the TPPs under consideration (Takhiatash and Talimarjan) have SEPs or similar documents developed as part of the EBRD and ADB projects, but these documents are not published on the websites of the corresponding TPPs. Other TPPs do not have procedures that would regulate their engagement with stakeholders on E&S or other issues. The employees of some TPPs have certain understanding of stakeholder groups and how to engage with them. It should be noted that the TPPs interact with the local community on issues that go beyond the investment/modernisation projects, for example, they support local public schools (provide them with stationery) and technical colleges.

The ongoing JICA-funded project of Navoi TPP includes a resettlement component, which is being accomplished as per the Resettlement Plan (2019) and has its own community engagement programme. The conducted meetings are documented and the materials are disclosed on the Navoi TPP's website²⁶.

²⁵ Resolution of the Cabinet of Ministers of the RoU No. 341 05/07/2018 "On approval of the typical regulation on the procedure for handling appeals of physical and legal entities at state bodies, state institutions and organizations with state participation".

²⁶ <http://www.nies.uz/%d0%b2%d1%81%d1%82%d1%80%d0%b5%d1%87%d0%b0-%d1%81-%d0%bf%d0%b5%d1%80%d0%b5%d1%81%d0%b5%d0%bb%d1%8f%d0%b5%d0%bc%d1%8b%d0%bc-%d0%bd%d0%b0%d1%81%d0%b5%d0%bb%d0%b5%d0%bd%d0%b8%d0%b5%d0%bc/>

According to the interviews, the subsidiaries are not aware of the Appeal Handling Procedure (IESH-34-303:2019), however they do abide with its provisions that are compliant with the national regulations.

The stakeholder appeals and complaints are accepted both in the written and oral forms; however, oral complaints are not always registered²⁷. Each subsidiary typically maintains two logbooks: i) a logbook for appeals, complaints, suggestions and letters from physical persons, and ii) a logbook of registration of reception of citizens by general director / head of the subsidiary. The logbooks contain entries from both, the staff of the TPPs and any other citizens (the latter prevail). No analysis of the stakeholder complaints has been conducted yet and no formal conclusions/lessons learned are available

All subsidiaries maintain web-sites in the Uzbek and Russian languages, and some of them – also in English (**Table 1**). All websites contain the contact details of the subsidiaries, 'open' visiting hours, and 'News' pages with both, news announcements and the information for power users and potential sub-contractors (e.g. tender announcements). Some websites lack the content in different languages. The websites contain no information on E&S performance of the TPPs or their engagement with stakeholders. Differently from other subsidiaries, Navoi TPP posts the Citizens Appeal Regulation, as well as the statistics of appeals and the status of their resolution, on its website²⁸.

Recommendations

- Disclose environmental and social documentation including this non-technical summary (NTS) of the environmental and social analysis/impact assessment for investment projects including the proposed EBRD project on the TPP website under a relevant heading.
- Adapt the corporate SEP to the needs of each specific TPP; appoint a person responsible for implementing the adapted SEP and provide training to this person on, among other things, reporting and monitoring the SEP progress. Disclose and implement SEP. Make public the name and contact details of the responsible officer.
- Maintain record of oral grievances / queries made by stakeholders; review stakeholder grievances / queries, assess their satisfaction etc. and draw lessons / trends.
- Establish a formal grievance mechanism in line with EBRD PR10 to deal, inter alia, with anonymous grievances / complaints.

8. AREAS OF INFLUENCE AND SENSITIVE RECEPTORS

The TPPs are complex enterprises with hazardous production facilities and sources of significant pollutant emissions, wastewater discharges, and acoustic effects. The operations of the TPPs are accompanied by the generation of a significant amount of waste, as well as by the consumption of significant volumes of water from surface watercourses. The TPPs are also important infrastructure facilities that meet the needs of enterprises and the population for electricity and heat.

²⁷ It is not required to register the oral appeals received by the head (director) or other authorized official of the state body during public visiting hours and resolved on spot. In this case, the surname (name, patronymic) of an individual or representative of a legal entity, information about his place of residence, a summary of the appeal, as well as the result of its consideration are indicated in the minutes of public reception. Also, a written response or an electronic response to oral appeals are not required (Resolution of the Cabinet of Ministers of the RoU No. 341 05/07/2018).

²⁸ <http://www.nies.uz/jismoniy-va-yuridik-shaxslarning-murojaatlari/>

The operations of the TPPs are associated with various types of impacts on the environment, the health and safety of personnel and the population living near the plants, the socio-economic indicators of the areas where the enterprises are located, etc.

The table below shows the presence of zones of influence for each TPP, as well as their intensity and extent. The identification and verification of the zones of influence for the TPPs will be adjusted based on the results of the Consultant's visit to the plants' production sites.

Table 6. Areas of influence of the JSC TPP plants' operations on the environment, health and safety of personnel and local population, and social responsibility

Indicators	TashTPP	Navoi TPP	Syrdarya TPP	Takhiatash TPP	Talimarjan TPP
Main sensitive receptors	1. Population of the nearest residential areas 2. Owners and personnel of greenhouses and other small enterprises located near the TPP site 3. Owners of and workers on the nearest agricultural lands 4. Ichthyofauna of the watercourses receiving treated waste water and warm water from the TPP	1. Population of the nearest residential areas 2. Owners of garden plots 3. Owners and personnel of greenhouse and other small enterprises located near the TPP site 4. Large enterprises of Navoi 5. Ichthyofauna of the watercourses receiving treated waste water and warm water from the TPP	1. Population of the nearest residential areas (Kayrakum and Farkhad settlements, Shirin city) 2. Owners of garden plots 3. Owners of and workers on the nearest agricultural lands	1. Population of the nearest residential areas (Takhiatash city and Keneges settlement) 2 Owners and personnel of enterprises, organisations, and farms (Naiman and Khamza) located near the TPP 3. Ichthyofauna of the watercourses receiving treated waste water and warm water from the TPP	1. Population of the nearest residential areas 2. Owners of and workers on the nearest agricultural land 3. Ichthyofauna of the watercourses receiving treated waste water and warm water from the TPP
Pollutant emissions and ambient air quality	Instrumental measurements are required to assess actual air pollution at the boundaries of the industrial site and/or at the boundaries of the nearest residential areas			To assess the actual air pollution at the boundaries of the industrial site and/or at the boundaries of the nearest residential areas, it is necessary to use instrumental observations from the installed weather stations and air quality monitoring stations.	Instrumental measurements are required to assess actual air pollution at the boundaries of the industrial site and/or at the boundaries of the nearest residential areas
Acoustic impact on the population of the nearest residential areas	Calculations of noise impact outside the boundaries of TPP sites and instrumental measurements of noise levels at night and day time are required	It is necessary to revise the calculations taking into account two new CCGTs and perform instrumental measurements of noise levels at night and day time	Calculations of noise impact outside the boundaries of TPP sites and instrumental measurements of noise levels at night and day time are required		
Availability of SPZ	The need to establish an SPZ will be determined on the basis of joint calculations on the dispersion of pollutant emissions and acoustic effects, as well as based on the results of instrumental monitoring				

Indicators	TashTPP	Navoi TPP	Syrdarya TPP	Takhiatash TPP	Talimarjan TPP
Water use	With reduction in access to water resources due to climate change, it is necessary to provide alternative options with low water consumption for cooling systems. The main receptors in this case are both the enterprises themselves, as well as the ichthyofauna living in the water bodies used for water intake and wastewater discharge, and the local population who use water from watercourses in the zone of influence of the TPP	Decommissioning of old units with water-intensive cooling systems and construction of new CCGTs with an air cooling system significantly reduces the plant's water consumption	With reduction in access to water resources due to climate change, it is necessary to provide alternative options with low water consumption for cooling systems.		
Wastewater discharge	Impact on aquatic ecosystems and fisheries indicators of receiving watercourses – additional studies of ichthyofauna of watercourses are required				
Disposal of generated waste, including sludge contaminated with petroleum products and other chemicals	Revise based on the results of water analysis for monitoring wells	The high level of ground water causes the possibility of its contamination and further spread of pollution in the direction of groundwater flow. Revise based on the results of water analysis for monitoring wells	Revise based on the results of water analysis for monitoring wells		
Specially protected natural areas and wetlands	Information is not provided.				
Land acquisition and resettlement	none	Being implemented as part of the modernisation	none		

Indicators	TashTPP	Navoi TPP	Syrdarya TPP	Takhiatash TPP	Talimarjan TPP
		project funded by JICA			
Greenhouse gas emissions / climate change	It is necessary to conduct an inventory of GHG emission sources, calculate their annual emissions, and develop a programme to reduce GHG emissions				
Risks of accidents and emergencies Risks of natural disasters and natural hazards	It is necessary to study in detail the emergency scenarios with significant environmental consequences and wide areas of impact / damage, including the nearest settlements and nearby enterprises				
Occupational health and safety	Work with hazardous production facilities, including work with hazardous materials (combustible, flammable, explosive substances) requires the development of a Hazardous Materials Management Plan, which includes rules for their safe storage and use, internal and corporate audits, training and accident prevention.				

9. PROJECT COMPLIANCE WITH EBRD ENVIRONMENTAL AND SOCIAL REQUIREMENTS

Some aspects of the activities of the considered Project enterprises fully comply with the EBRD's E&S requirements, in particular: human resource policy and labour relations, worker organisations; setting up of wages, benefits and working conditions; non-discrimination and equal opportunities; and infrastructure, building, and equipment design and safety.

At the same time, a series of issues and potential E&S risks of the Project have been identified that do not meet the EBRD requirements and call for additional actions to be taken by JSC TPP and its subsidiaries. In particular, they relate to: a) E&S management systems and the lack of a corporate E&S policy; b) management of contractors in terms of their EHS performance; c) E&S monitoring and reporting; d) extension of the EBRD requirements to the employees that are not in direct labour relations with the Company; e) the provision of temporary accommodation taking into account the pandemic-related restrictions as per national sanitary standards; f) prevention, control and monitoring of pollution of the environment and nearby residential area, waste management, and handling of hazardous substances and materials; g) public health and safety issues and preparedness to protect the communities from emergency situations (of both technogenic and natural origin) and response to them; and h) meaningful stakeholder engagement.

To achieve compliance with the requirements of the EBRD and the European Union, JSC TPP and its subsidiaries intend to implement the recommendations of this report, ESAP and SEP.