



Funded by the
European Union



Central Asia Nexus Dialogue Project: Fostering Water, Energy and Food Security Nexus and Multi-Sector Investment (Phase II)

Demonstration project "Improvement of the control and monitoring system of electricity consumption at the pumping stations and modernization of the large pumping stations with the introduction of energy-efficient technology"

3rd Meeting of the Technical Working Group

6 April 2022 | 15:00-17:00 | online

PROTOCOL

The 3rd Meeting of the Technical Working Group (hereinafter, TWG) under the pumping station demo project for execution in Sughd Province, Tajikistan, was chaired by the Agency for Land Reclamation and Irrigation (hereinafter, ALRI) under the Government and Ministry of Energy and Water Resources (hereinafter, MEWR) of the Republic of Tajikistan, and was attended by the representatives of ALRI, EU Delegations to Kazakhstan and Tajikistan, World Bank, national experts and international partners.

The demo project is implemented within the framework of the Central Asia Nexus Dialogue Project with the financial support of the European Union and Project "Laboratory of Innovative Solutions for the Water Sector of Central Asia" under the Central Asia Water and Energy Program (CAWEP) in close collaboration with ALRI and MEWR.

The Meeting aimed to review the draft final analytical outcomes by the national experts during June 2021 and February 2022, in particular:

1. **Present** the key findings on all the demo project's objectives;
2. **Discuss** the acceptability and timeliness of the works performed;
3. **Review further plans** on behalf of ALRI, MEWR and international partners regarding the application of the results obtained and investment opportunities.

See the Meeting's Concept, Agenda and LoP in Annexes 1 and 2.

Mr Daler Abdurazoqzoda (Director, MEWR Water and Energy Policy Department) opened the event with the welcoming word emphasizing the great importance of the ongoing demo project for Tajikistan despite its small scale, as 38% of the irrigated land require pumping stations, these mainly located in Sughd Province. Mr. Abdurazoqzoda noted MEWR's direct interest in the demo projects' success, since power accounts for the largest share of irrigation costs. Overall, Tajikistan consumes 1.5 bln kWh, including 1 bln kWh in Sughd Province only. As the result, ALRI has accumulated a significant debt to electricity providers. The proposed automatic energy monitoring system for large pumping stations would ensure reliable data on the amount and location of power consumption, and the introduction of energy-efficient equipment at the Golodnostepskaya Pumping Station would allow cutting energy consumption, as well as reducing the net cost of supplied water in the future. Mr. Abdurazoqzoda likewise stated that the objectives of the demo project were in line with the ongoing water sector reforms inter alia aimed at enhancing water-related legislation, renovating and upgrading domestic water management infrastructure. The reforms also

encompass creating a national water information system to collect data on water resources formation and consumption

tion; in the future, it is anticipated to accumulate online monitoring data on the power used by pumping stations. Mr. Abdurazoqzoda concluded his speech wishing the participants further cooperation to achieve significant results.

Mr Bakhrom Gaforzoda (*Lead, National Expert Group*) delivered the welcoming speech on behalf of **Mr Shafolat Nazifov** (*Head, ALRI Basin Land Reclamation and Irrigation Department*) who had to join the Meeting late. Mr. Nazifov described irrigation is a sector of real economy fostering food security and employment. However, the corresponding infrastructure built in the 1950-60s requires upgrading. The demo project thus will help elaborate solutions to ensure sustainable water supply to *dehkan* farms and other end users. Seizing the opportunity, the ALRI representative expressed gratitude to the EU, World Bank Group and CAREC project team for supporting the demo project.

In the beginning of his address, **Mr William Lindberg** (*Program Manager, Delegation of the European Union to the Tajikistan*) reiterated the EU attaching great importance to WEF Nexus security and acknowledging the multisector approach as the key for efficient and effective resource use, especially against the backdrop of climate change. The EU supports the WEF Nexus approach as fully compliant with the EU's Green Deal and Strategy for Central Asia. In this regard, Mr. Lindberg praised the expert efforts under the demo project as providing a solid basis for devising measures on pumping station upgrading. Further on, Mr. Lindberg briefly described the planned EU projects. In particular, at the regional level the EU has been designing a Team Europe Initiative, which, among other things, aims to facilitate WEF security and support climate action in Central Asia. Also, the EU is launching a project to render technical support to Tajikistan's energy sector; the specific actions under this technical assistance package are still to be defined.

Ms Yulia Komagayeva (*Senior Operations Specialist, World Bank*) thanked all the participants and proposed to present the demo project's draft final outputs at the Water Conference planned for early June this year in Dushanbe, Tajikistan, to attract more attention towards the results on behalf of potential investors and experts. Ms. Komagayeva also stated that the World Bank lays special emphasis on WEF sectors comprising about 70% of the Bank's project portfolio in Tajikistan. In conclusion, Ms. Komagayeva assured that WBG would continue supporting the Tajik Government in this area, as well as informed the attendees that currently the Bank and EU are jointly designing 2 target projects.

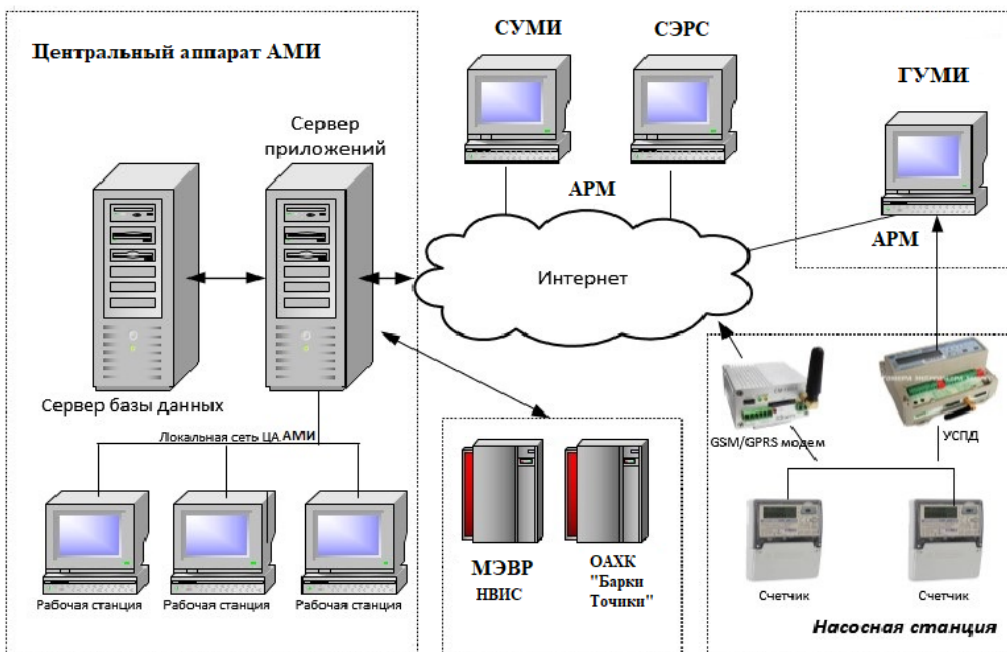
During Session 1, Mr. Bakhrom Gaforzoda presented all the draft final outputs and summarized the key findings as presented below.

1. Analytical report on pumping station operation. The socio-economic study conducted at the level of Sughd Province and Zafarobod District included a detailed description of the institutional and legal aspects of *dehkan* farming development, climate adaptation challenges, status of irrigation infrastructure including pumping stations, tariff analysis, as well as the financial standing of Zafarobod District Land Reclamation and Irrigation Department.

2. Automated Power Consumption Monitoring System at pumping stations (hereinafter, **APCMS-PS**). The Concept for digitizing the energy monitoring system in Sughd Province – stemming from the results of the technical inspection of all pumping station meters across the province and economic calculations – was drafted under Objective 2. The Concept describes the institutional and legal frameworks for system implementation, its economic and environmental feasibility, financial performance and potential savings, as well as IT-architecture. It is proposed to establish the APCMS-PS at ALRI with real-time transfer of electricity consumption data to MEWR and Barki Tojik OJHC, national electric power

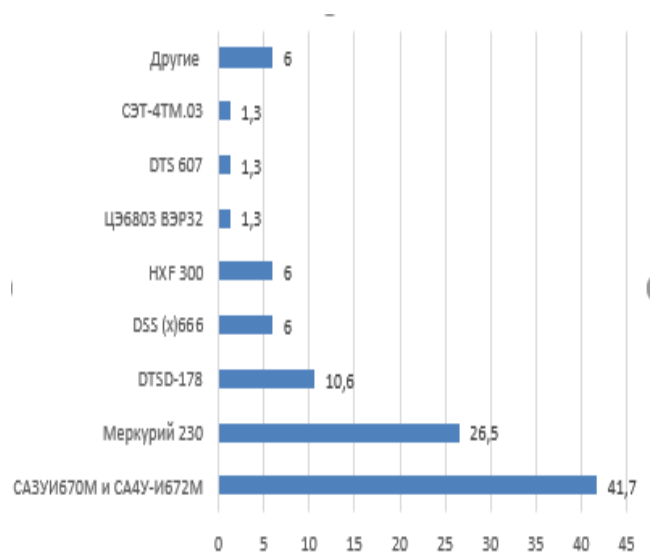
generation and transmission operators (Fig. 1.). Under the same Objective, the experts have digitized and GPS-mapped the meters.

Figure 1. Meter automation IT-architecture.



According to the expert calculations, a turnkey implementation of APCMS-PS by a Chinese vendor would cost \$767,695. Considering labor, fuel and energy monetary savings, as estimated the system could allow savings up to \$100,680.4 annually, thus making the payback period 7.62 years.

The technical inspection had revealed that SA3U-I670M and SA4U-I672M meters account for 41.7% of the total number of meters installed at the pumping stations in Sughd Province. These meters are not compatible with the Automatic Power Consumption Control and Metering System (APCCMS). Mercury 230, DTSD-178, DSS(x)666 and HXF300 meters supporting the APCCMS System make up 26.5%, 10.6% and 6% of the total meter fleet, respectively.



Thus, 51.7% of the meters in Sughd Province require replacement with electronic smart meters. The remaining 48.3% of meters are APCCMS compatible but come from different manufacturers – an additional interface converter is necessary to integrate them into APCCMS. The national experts recommended replacing the pumping station meters in bulk with single manufacturer models.

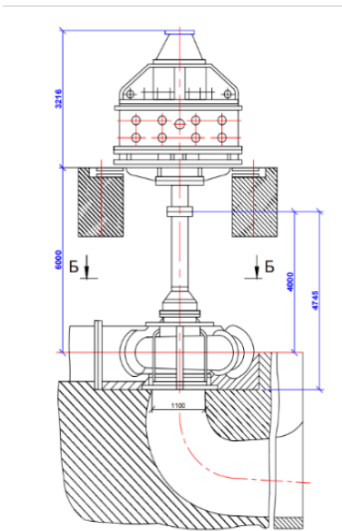
In this regard, the survey of potential meter producers in European countries¹, Russian Federation² and China³ was performed. It was found that the cost of e-meters by European vendors varies between \$215-320 per unit, and by Russian vendors between \$150-300. A Chinese

manufacturer charges \$67 per unit for similar devices. The technical specifications of all the aforementioned meters are similar, yet the net cost calculations were based on the lowest manufacturer quote for smart meters available on Tajikistan’s market. Likewise, the Chinese manufacturers have already produced, delivered and installed this type of electricity meters specifically for Barki Tojik OJHC across its system⁴

In addition to the Concept, the experts have also developed the detailed Terms of Reference for APCMS-PS implementation. However, the Guidelines for Data Transmission, Monitoring and Analysis should be developed later on subject to approval by ALRI, Barki Tojik OJHC, and MEWR.

International engineering audits by Grundfos have shown lower water pump performance against the one declared and indicated in the specifications – on average, 30% less water gets actually pumped for irrigation purposes compared to the planned water production. The potential power savings after adapting to the actual operation parameters of irrigation stations are tentatively estimated at 37-40%. The detailed report on the findings under the Grundfos survey is presented in the TWG Meeting Protocol of October 21, 2021⁵.

3. Preparation of investment proposal for Golodnostepskaya Pumping Station-1 and Golodnostepskaya Pumping Station-2 upgrading. Under this objective, the experts presented the investment proposals for upgrading large-scale above-mentioned pumping stations using energy-efficient technologies. Based on the technical survey results, the experts recommended replacing all pumping units, including 6 units at Golodnostepskaya Pumping Station -1 and 4 units at Golodnostepskaya Pumping Station -2.



The experts reviewed the potential equipment suppliers from Europe, Russian Federation, Ukraine and China, and compared equipment capacity and estimated prices from several manufacturers per 1 (one) set of vertical pumps and electric motors. A more detailed ROI assessment will be included in the Project Feasibility Study once the potential investor(s) and equipment supplier(s) are identified.

Given the strategic role of these stations in terms of water supply across Zafarobod District – which has almost no surface water and only very limited groundwater assets – their rehabilitation was included in the 2016-2020 State Investment Program endorsed by Government Decree of the RT №772 *On 2016-2020 State Investment Program* of December 30, 2015. The experts also noted that in addition to the cascade of large pumping stations, it was also necessary to upgrade and restore the entire irrigation system, including pumping

¹ ABB, Aclara, Emeter, GE Grid Solutions, IBM, Landis+Gyr, Opower, SEL, Siemens, Silver Spring and Networks.

² Kontsern Energomera JSC and SAURES Company.

³ Yantai Dongfang Wisdom Electric Co., Ltd.

⁴ [Dollar exchange rate of the National Bank of the Republic of Tajikistan as of 28 February 2022 \(\\$1USD=11.3000 Tajik somoni\)](#) to be applied at all costs given in currency in the Minutes

⁵ [Второе Заседание Технической рабочей группы по демо проекту в Таджикистане \(careesco.org\)](#)

stations Golodnostepskaya Pumping Station-3, Golodnostepskaya Pumping Station-3a, Golodnostepskaya Pumping Station-4, KV-4, Leninabad and 40 Years of Tajikistan, as well as automate the control systems at TM-1, TM-2 and TM-4 water supply canals.

During Session 2, ALRI and MEWR, i.e. the key clients of the demo project in the Republic of Tajikistan, confirmed the relevance of the works performed and the Project's contribution to achieving the long-term goals within the framework of the 2030 National Development

Strategy, and likewise stated their intention to apply its outputs and outcomes in their future work, in particular:

- MEWR recognized that the works were performed properly, including all the required specific figures and calculations, and invited Mr. Gaforzoda to make a similar short presentation at the donor conference on improving irrigation and water supply infrastructure scheduled for late June-early July this year in Sughd Province, Tajikistan;
- MEWR assured that it would build on the demo project's results in the course of the planned Sustainable Irrigation in Tajikistan Project funded by the World Bank and EU with components on irrigation and pumping station upgrading. MEWR also initiated including pumping station energy audits across the country for further use of their findings in the demo project. In conclusion, MEWR declared its willingness to recommend the uptake of the demo project results under the planned project as well as via various platforms;
- ALRI confirmed its readiness to apply the demo project's outcomes and outputs in the course of replacing pumping units in other similar large-scale stations in Sughd Province and while executing the feasibility study for financing Golodnostepskaya Pumping Station-1 and Golodnostepskaya Pumping Station-2 upgrading. ALRI, represented by Mr. Nazifov, also proposed to continue the demo project as part of the Nexus Project's Phase III.

During Session 3, the international partners shared their feedback and suggestions in relation to the works performed:

- *GIZ (Mr Alexander Nikolayenko, Regional Adviser, Transboundary Water Management in Central Asia Programme)* recommended considering the PPP scheme for upgrading the target pumping stations. In response, ALRI explained that Tajikistan has the Law on PPP, however the national Water Code does not allow PPP application to strategic water management installations. Therefore, it was proposed to introduce and test the mechanism at small-scale stations. In addition, water tariffs are established by the country's Antimonopoly Service;
- *WECOOP (Mr Valts Vilnitis, Team Leader of the project "European Union-Central Asia: Water, Environment and Climate Change Cooperation")* proposed the following to make the investment proposals more attractive for potential donors/investors: i) develop indicators reflecting the progress in achieving the global SDGs; ii) business calculations should consider the costs associated with personnel training, capital costs, as well as operation costs; iii) detail project design emphasizing the overall condition of the entire system, including water supply and water transportation facilities; iv) instead of irrigated farmland expansion or enhanced water availability, ROI indicators should be based on the use efficiency of available water resources; v) in light of the current geopolitical situation, consider the origin of equipment suppliers, especially if it is expected to attract investments from the EU member states and/or USA;

- *USAID (Ms Ekaterina Strikeleva, Chief of Party, USAID Regional Water and Vulnerable Environment Activity (WAVE))* stressed the significance of the demo project for the entire region and importance of disseminating its results. Ms. Strikeleva recommended that the experts: i) add operation costs to capital costs when calculating the project payback period; ii) consider investment vehicles other than direct investment, such as revolving funds; iii) take into account the operation mode of the irrigation system to save energy; iv) focus on awareness raising among farmers while deploying novel energy-efficient technologies.

In conclusion, **Ms Snejana Popova** (*Project Officer, EU Delegation to the Republic of Kazakhstan*) reminded the participants that the ultimate goal of all demo projects implemented within the framework of the Central Asia Nexus Dialogue Project is to elaborate investment project proposals for potential financing from European banks, in particular by the Climate Fund Managers of the Dutch Development Bank (FMO), which has received special-purpose funds from the European Commission for financing WEF Nexus investment projects. Ms Popova also highlighted the importance of revising the results of the work done by the experts to incorporate a comparative analysis of the qualitative characteristics and cost of the equipment required for upgrading the target pumping stations, which can be supplied to Tajikistan from the EU producers.

Closing the Meeting, **Ms Lyudmila Kiktenko** (*Program Manager, CAREC*) thanked the participants for their active engagement and summarized the recommendations on behalf of government and donor agencies as presented below.

Recommendations:

- Submit the demo project's draft final results to MEWR and ALRI via official channels to facilitate subsequent application;
- Finalize the analysis of pumping equipment manufacturers/suppliers in the investment proposal with a focus on EU vendors;
- Supplement the investment feasibility studies with information demonstrating their potential to contribute to achieving global-level SDGs.

Meeting results:

- The representatives of ALRI and MEWR confirmed that all the expert works performed complied with the ToR, were duly and thoroughly executed, reflected Tajikistan's priorities, as well as contributed to the objectives of the National Program on Upgrading Water Management Systems;
- The participants of the meeting confirmed that the multi-sector approach helped conducting more comprehensive assessments and better understanding the specific challenges and opportunities in other sectors. In particular, the Project allowed realizing that power consumption reduction in the country's pumping network can both reduce the costs incurred by water companies and boost the income of power generation companies. In turn, this could become a driver behind involving energy companies in addressing water sector issues;
- The representatives of ALRI and MEWR confirmed their readiness to use both investment proposals (automation of power consumption monitoring systems at pumping stations in Sughd Province, and upgrading Golodnostepskaya Pumping Station-1 and Golodnostepskaya Pumping Station-2) in their negotiations with investors and international development partners.

List of appendices:

Appendix 1. Concept and agenda;
Appendix 2. List of participants;
Appendix 4. Presentation by Mr. Bakhrom Gaforzoda;
Appendix 5. Demo project draft final results (wetransfer).