

United Nations Development Account

Terminal Evaluation of Project 1819AB
*“Integrated Energy and Water Resources Management in Support of
Sustainable Development in South-Eastern Europe and Central Asia”*

Report completed on: May 2022

Evaluation conducted by: Mr. Dusan ZUPKA



Development Account
Department of Economic and Social Affairs

UNECE, Geneva

Evaluator: Mr. Dusan ZUPKA, Independent Consultant and Evaluator
Evaluation Manager: Mr. Oleg DZIOUBINSKI, Regional Adviser, UNECE, Sustainable Energy Division

Acknowledgements:

The author would like to thank all people and organizations that helped and provided support directly and indirectly in this terminal project evaluation for the generosity they displayed with their time and the open spirit which they showed during this exercise.

I am very thankful to Mr. Oleg DZIOUBINSKI, Ms. Charlotte GRIFFITHS, Mr. Harikrishnan TULSIDAS, and other colleagues from the UNECE Sustainable Energy Division for providing the comprehensive information and documents related to the project implementation and its background.

I appreciate the UNECE Programme Management Unit's (Mr. Nicolas DATH-BARON, Ms. Chiara GIAMBERARDINI, and Ms. Polina TARSHIS) guidance concerning the application of the latest UNECE Evaluation Policy and continued methodological support.

I am grateful to the individuals, organizations and government institutions of the recipient countries and the project's consultants for their availability, time and openness during the evaluation.

Effort has been made to faithfully reflect the responses of the stakeholders and the documentation reviewed.

DUSAN ZUPKA

This report was commissioned by the UNECE Sustainable Energy Division

The findings, conclusions and recommendations of this report are those of the external evaluator and do not necessarily reflect the views of UNECE

Table of Contents	
List of Acronyms and Abbreviations.....	4
Executive Summary.....	5
1. Introduction.....	7
2. Description of the Project.....	8
2.1 Background	
2.2 Project objectives and expected accomplishments/results	
2.3 Project strategies and key activities	
2.4 Beneficiaries and target countries	
2.5 Key partners and other key stakeholders	
2.6 Resources	
2.7 Link to Sustainable Development Goals	
2.8 Innovative elements	
3. Evaluation objectives, scope and questions.....	11
3.1 Purpose and objectives	
3.2 Evaluation scope, criteria and questions	
4. Methodology.....	12
5. Findings.....	13
6. Conclusions.....	23
7. Recommendations.....	23
Annexes	
1.Evaluation TORs	
2.Project document including Project result framework	
3.Evaluation questionnaire	
4.List of stakeholders participating in the survey and/or interviews	
5.List of documents reviewed	
6.Evaluation matrix	
7.Main lessons learned	

List of Acronyms and Abbreviations	
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
EFG	European Federation of Geologists
ESCAP	Economic and Social Commission for Asia and Pacific
GEWE	Gender Equality and Women's Empowerment
IAEA	International Atomic Energy Agency
ICE-SRM	International Centre of Excellence on Sustainable Resource Management
SDG	Sustainable Development Goal
UNDA	United Nations Development Account
UNDAF	United Nations Development Assistance Framework
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFC	United Nations Framework Classification For Resources ¹
UNRMS	United Nations Resource Management System
UNSDCF	United Nations Sustainable Development Cooperation Framework
WHO	World Health Organization
WRC	Water Research Commission

¹ <https://unece.org/sustainable-energyunfc-and-sustainable-resource-management/about-unfc>

Executive summary

This report results from the final evaluation of the “Integrated Energy and Water Resource Management in Support of Sustainable Development in South-Eastern Europe and Central Asia Project”, Project Code 1819AB, further referred to as the project. It was conducted from January to March 2022 following the UNEG “Ethical Guidelines for Evaluations”, the new ECE Evaluation Policy² and the latest Administrative Instruction guiding Evaluation in the UN Secretariat³.

- **A brief overview of the project**

Integrated and sustainable energy and water resources monitoring and management facilitating access to energy and water for all are essential to reduce poverty and ensure economic prosperity in the countries involved in this Project. Energy and water are at the centre of economic and social development, integrally related and strongly interdependent. They make possible the investments, innovation and new industries that are engines of jobs, inclusive growth and shared progress for entire economies.

The overall goal/objective of the project was to strengthen the national capacity of the recipient countries’ economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally. Its intention was to fill the persisting gaps such as lack of relevant information and data, limited policy/regulatory infrastructure, and slow implementation on various topics, including the application of UNFC in the UNECE and UNESCAP regions.

The objective of the project was pursued by achieving the following **results/accomplishments**:

- (EA1) Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management; and
- (EA2) Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources.

- **Evaluation purpose, objectives, scope, and intended users/audiences**

The primary purpose of the evaluation is to assess the extent to which the objectives of the UNDA 11th tranche project 1819AB, “Integrated energy and water resource management in support of sustainable development in South-Eastern Europe and Central Asia”, were achieved. It is an assessment of the UNECE Geneva support for enhanced energy and water resource management in six focus countries. The evaluation measures the extent of the relevance, coherence, effectiveness, efficiency and sustainability of the project in supporting recipient countries to strengthen their capacities in integrated energy and water resource management in the context of the Sustainable Development Goals (SDGs). The evaluation also looks at progress on human rights, gender equality results, disability inclusion, climate change and disaster risk reduction in this engagement. In addition, it looks at the activities repurposed to address the impact of the COVID-19 crisis and assess, to the extent possible, the UNECE’s COVID-19 early response through this project.

The evaluation covers the entire project implementation period from 1 January 2018- 31 December 2021 in six recipient countries (Bosnia and Herzegovina, Serbia, Kazakhstan and Kyrgyzstan as in the original project document; Tajikistan and Ukraine added to the list of beneficiary countries as part of repurposing to address the impact of the COVID-19 crisis).

The primary users/audience of the evaluation results are the UNECE and UNESCAP decision-makers and staff at all levels responsible for the integrated energy and water resources monitoring and management in support of SDGs. In addition, the intended users include the national institutions of the project’s six recipient countries involved in energy and water resource management, as well as pertinent entities of the other UNECE and ESCAP member states. The evaluation’s intended purpose is predominantly to assist learning and knowledge management and contribute to accountability by providing a clear evidence base to inform UNECE and its member States’ decision making.

- **Evaluation methodology**

The evaluation methodology is based on the principles outlined in the UNEG “Ethical Guidelines for Evaluations”, the UNECE Evaluation Policy issued in 2021 and the Administrative Instruction Guiding Evaluation in the UN Secretariat published in 2021. To cross-check and triangulate the information obtained from the key stakeholders, the evaluation applied mixed methods such as a desk review, focus groups session, interviews and online surveys. Data and information collected from the primary and secondary sources were carefully triangulated, analysed and synthesised.

- **A summary of key findings/conclusions**

- The Project’s most outstanding achievement was the growing awareness of the importance of the UNFC and UNRMS Systems for sustainable development in South-Eastern Europe and Central Asia. All the interviewees believed that the Integrated Energy and Water Resource Management and its positive effect on the economic and social development of the countries covered by the Project could be enhanced by applying the UNFC System accompanied by appropriate legislative modifications.

² new ECE Evaluation Policy (https://unece.org/sites/default/files/2021-12/Item%2010_ECE_EX_2021_35_Rev1_Evaluation%20Policy_as%20adopted.pdf)

³ ST/AI/2021/3 (<https://documents-dds-ny.un.org/doc/UNDOC/GEN/N21/223/08/PDF/N2122308.pdf?OpenElement>)

- **Relevance:** The project proved highly relevant based on quantitative and qualitative assessments. There was a solid process of consultation with stakeholders resulting in the identification of challenges and needs prior to the Project's commencing. The country-level works were tailored and focused on relevant issues and beneficiary countries' priorities.
- **Coherence:** The possibilities in achieving coherence between the Project and other initiatives on integrated energy and water resource management were partially explored.
- **Efficiency:** The Project delivered a substantive agenda of assessing existing gaps, training materials, national training, advisory missions, workshops, case studies, assessment reports and policy recommendations at a high-efficiency level. This was done within budget and mainly in good time.
- **Effectiveness:** This project was assessed as highly effective in achieving the expected objectives in identifying recipient countries' technical and policy agendas and developing institutional momentum on this topic. Understanding, knowledge and awareness about the advantages of integrated energy and water resource management and UNFC adoption were crucial objectives that were achieved.
- **Sustainability:** Momentum has been started at an institutional level. However, UNECE's continued support, remains critical. Some beneficiary countries have started mainstreaming the recommendations from the project (Kazakhstan, Ukraine, Kyrgyzstan), and more clarity is needed on what 'next steps' will involve regarding the development of evidence-based policies. Ongoing capacity building and advocacy after the termination of this project should be considered. Not doing so will limit sustainability opportunities.
- **Gender and vulnerable groups'** concerns were not significantly mainstreamed into the design and implementation of this Project concerning an industry sector, where women's participation has traditionally been low. However, it was clear from the interviews that UNECE had encouraged participants to think about these issues.

• **Recommendations:**

The issue of Integrated Energy and Water Resource Management in Support of Sustainable Development is broad in scope and encompasses a vast range of sub-components. Additionally, it appears from an external vantage that following the conclusion of this project, UNECE needs to decide how it wants to continue the momentum generated by this project, as well as how to focus its limited resources to the best advantage of its member countries.

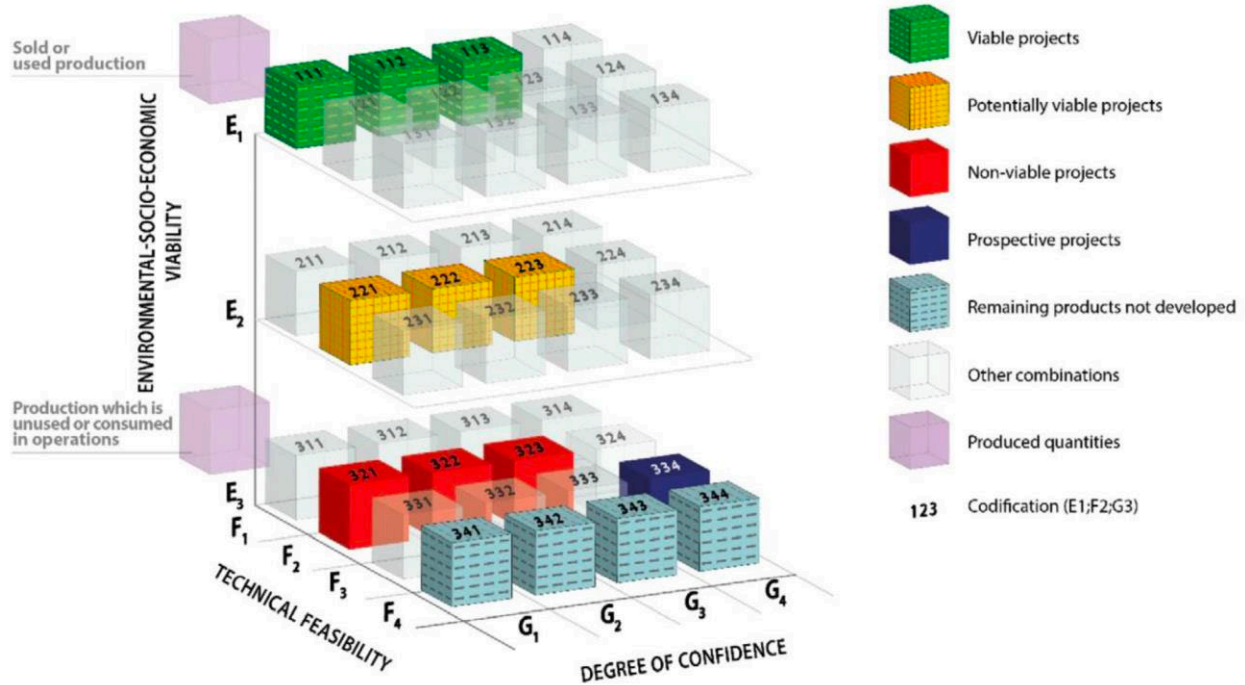
To this extent, the evaluation provides the following recommendations addressed to UNECE:

- 1) **Preserve and maintain the networks created by the Project:** While this may seem obvious, momentum from this project can only be carried forward if beneficiary countries are engaged at a close level and feel that they benefit from membership in this network. Internally, it will help establish UNECE as a serious counterparty on this issue for its member states. External benefits of this will be many, but not least, it will help develop further policy ownership from member nations and could work to enhance better institutional cooperation from line ministries.
- 2) **Continue country-level capacity building:** This project has been successful in discussing key areas of potential focus. While there was general appreciation of the work done on this project, there was some expectation from stakeholders interviewed that there should have been a greater element of 'hands on' capacity building. However, for this project it was not possible due to the Covid-19 crisis, where the majority of project activities were implemented online. For future projects, UNECE should launch a project with a presentation for all UN Country Teams (UNCT) of the project beneficiary countries and follow up with UNCTs in the process of project implementation. If further technical assistance is needed after the completion of the project, UNECE should work with UNCTs in the countries on providing such technical assistance and/or consider using other resources available internally for this purpose.
- 3) **Enhance focus on gender, vulnerable groups and human rights issues:** ECE should in its future activities related to water-energy-climate change-natural disasters nexus address more explicitly gender inequalities and the challenges faced by vulnerable populations, including by strengthening capacity building on gender mainstreaming and leaving no one behind, involving key UN partners such as UN-Women and OHCHR, as appropriate.
- 4) **Mitigate the Project's sustainability risks:** UNECE should guide the Governments of the beneficiary countries on how the activities related to UNFC application should be mainstreamed into the operations and programmes of the relevant Ministries. Specifically, the following actions are recommended:
 - o Maintain momentum to ensure continuity in the recipient countries by identifying ways to keep stakeholders motivated and engaged in the process and by keeping the issue of the integrated energy and water resource management high on the UNECE strategic and programmatic levels.
 - o UNECE should enhance dialogue and bilateral cooperation with the beneficiary countries aiming at a formal decision by the Governments of these countries to apply the UNFC system. As an initial step, consider supporting enhanced participation of national experts in the activities of the Expert Group on Resource Management.
 - o Water, geology, energy, economy, and ecology interconnectedness needs to be addressed and awareness-raising enhanced through future UNECE projects. To enhance the coherence of such future UNECE projects, efforts should be made to integrate into the Project Document a clear strategy for linkages with other similar initiatives by defining the nature of these linkages per each relevant activity in the work plan.
 - o Future UNECE efforts to strengthen the integrated energy and water resource management should focus on providing the beneficiary countries with practical examples and consultancy support on the institutional, legal and technical measures needed for the full implementation of the UNFC.
- 5) **Expand and standardize "post-Project" lessons learned and knowledge management:** Establish a sustainable platform/workspace for ongoing capture of the Project learning (lessons learned, good practices) and document these for adaptive management and future projects. Ensure adequate documentation of project activities and establish an archival system (SharePoint site) for storing and accessing data and information.

1. Introduction

In the decades following the collapse of the Soviet Union and the Social Federal Republic of Yugoslavia, several countries in South-Eastern Europe and Central Asia were facing increasingly serious challenges linked to integrated energy and water resources management. Therefore, a key issue in the project Integrated Energy and Water Resource Management in support of sustainable development in South-Eastern Europe and Central Asia was improving national capacity in six beneficiary countries for the assessment, classification and management of fossil energy and water resources resulting in statistics coherent with the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC).

Figure 1: UNFC approach



Energy production accounts for 1/6 of the global total water use. In addition, 75% of the water used in industry is also used to maintain energy production. Experts estimate that by 2035, water use for energy production will increase by 20%.⁴ Therefore, the effectiveness in the management of energy and water resources is a must worldwide. To be effective, integrated and sustainable energy and water resources, monitoring and management have to be based on the appropriate institutional framework, policy, strategy and regulatory infrastructure. During the project's design phase, its recipient countries declared not having sufficient policy and regulatory infrastructure addressing energy and water resource management. Therefore, **the overall goal/objective** of the project was to strengthen the national capacity of the economies in these countries to develop policy recommendations for integrated energy and water resources management, applicable nationally. The intention was to contribute to filling the persisting gaps such as lack of relevant information and data, limited policy/regulatory infrastructure and slow implementation on various topics, including the application of UNFC in the UNECE and UNESCAP regions. Where data existed in these countries, it was largely unreliable and incomplete, making it difficult to develop baseline conditions for both policy and measurement of progress.

The objective of the project was pursued by the achievement of the following **results/accomplishments**:

- (EA1) Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management; and
- (EA2) Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources.

⁴ Case Study prepared in the context of the Project by Tajikistan

Table 1: Project Summary

Project Title:	“Integrated Energy and Water Resource Management in Support of Sustainable Development in South-Eastern Europe and Central Asia”	
Project Code:	1819AB	
Countries covered:	Initially - January 2018	Bosnia and Herzegovina, Serbia, Kazakhstan, Kyrgyzstan
	Added - 2020	Ukraine, Tajikistan
Project duration :	January 2018 – December 2021	
Implementing entity :	UNECE, Geneva	
Cooperating entity:	UNESCAP	
Other project partners :	<ul style="list-style-type: none"> • National Ministries of Energy or Mining • National Ministries of Agriculture and Water Resources • National Ministries of Environment • National Energy, Mineral, Water, Development Agencies • National Financial institutions and Regulators • Universities/Educational Institutions 	
Project financing	At the senior management level, endorsement (USD)	Actual Expenditure at Terminal Evaluation (USD)
UNECE/UNDA Account :	490,000.00	490,000.00
Governments and other partners :	In-kind contributions Estimated at 100,000	In-kind contributions 100,000
Project total costs :	490,000.00 As planned	469,694.72 As of 31 December 2021

The project was funded through UNDA 11th tranche. UNECE, as implementing entity, selected the project to be evaluated in March 2021 in responding to the requirements of UNDA “Guidance Note on Planning of Terminal Evaluations of 11th Tranche Projects” of 16 February 2021. The project was initiated on 1 January 2018 and completed on 31 December 2021. The evaluation was conducted during the first quarter of 2022.

In line with the UNDA Project Evaluation Guidelines, the primary users of this UNDA-funded project evaluation are the implementing/cooperating entities themselves, UNECE as implementing entity and UNESCAP as a cooperating entity. In addition, the intended users include the relevant national ministries, central agencies and academia in the project’s six recipient countries, as well as in the other UNECE and ESCAP member states.

2. Description of the Project

2.1 Background

Energy and water management and securities are interlinked. Tackling consistently the economic, social, political, demographic and institutional challenges involved in this interlinkage from a systemic view allows for an analysis of the relationships and interdependencies which affect the achievement of sustainable resource management as a precursor of sustainable development. Additionally, utilising a system analysis perspective allows for the development of portfolios of solutions as opposed to linear, single-point solutions. For example, the Water Research Commission has identified the food-energy-water nexus as a focus “lighthouse” area of research moving forward (WRC, 2018) and that finding solutions that can positively impact the security and sustainability of each sector have the potential to accelerate the achievement of multiple SDGs.

An unbalanced food-water-energy supply and use have the potential for deep economic, social, political and demographic implications. Balanced food production, energy security and water availability have a direct influence on the three pillars of peace/security, development and human rights in any society. The adequate provisioning of energy and water are essential for the socio-economic development and attainment of SDGs in all the beneficiary countries of this project. Energy production is also intimately related to mining which has a significant impact on underground as well as surface water resources.

With the collapse of the Soviet Union and the Social Federal Republic of Yugoslavia, the unitary energy and water systems became transboundary overnight. The new national borders resulted in significant challenges to optimize asset operation and national and regional energy and water resources management. In addition, several countries in South-Eastern Europe and Central Asia were facing increasingly serious challenges linked to integrated energy and water resources management. In this context, a key issue in the project Integrated Energy and Water Resource Management in support of sustainable development in South-Eastern Europe and Central Asia was enhancing national capacity in six beneficiary countries for the assessment and management of fossil energy and water resources resulting in statistics coherent with the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC).

Even though some of the target countries had exposure to UNFC at the beginning of the project, there has been no concerted effort to use it effectively. This made the target countries disconnected from international best practices and had a negative impact on their levels of preparedness to overcome the energy and water resource management challenges and potential crises in the future.

The underlying issues faced by the target countries prior to the project inception were:

- Lack of coherent and systematic approach to the sustainable development of energy resources;
- Lack of planning and long-term vision in the management of water resources; and

- Lack of holistic approach to understanding and managing the energy-water dependencies.

In Central Asia and South-Eastern Europe, energy and water systems are inextricably intertwined. The hydrological interlinkages are determined by nature: multiple transboundary rivers, for example, the Danube and Sava in South-Eastern Europe and the Amu Darya and the Syr Darya in Central Asia, connect the territories of several countries. In both regions, the need and interest in what is called the “energy-water nexus” stem partially from the degree to which the peak demand for water for irrigation during the summer is out of synch with the peak demand for energy during the winter. In addition, in Central Asia, there is an uneven distribution of hydro-energy storage and generation potential (mainly in the upper basin, particularly in Tajikistan and Kyrgyzstan) and irrigated agriculture (mainly in the lower basin on the arid plains in Uzbekistan, Turkmenistan and Kazakhstan) and the dilemmas this causes for the development and operation of necessary water storages to support both of these economically vital water use. The project was designed to help the beneficiary countries with several of these water/ energy nexus challenges, including cross border system interlinkages and national and regional energy and integrated water resources management. A detailed recipient countries level situation analysis, as well as stakeholders' capacity assessment, are available in the project document (**annex 2**).

2.2 Project objectives and expected accomplishments/results

The overall **goal/objective** of the project was to strengthen the national capacity of economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally.

The project intends to contribute to filling some of the identified gaps outlined above, which are responsible for the barriers to integrated energy and water policies. These gaps include a lack of relevant information and data, limited policy/regulatory infrastructure, and slow implementation on various topics (Waste management, Circularity issues, Resource conservation and efficiency, Value-addition, Decoupling raw material use and development, Diversification), and including the application of UNFC in the UNECE and UNESCAP regions. Where data exists, it is largely unreliable and incomplete, making it difficult to develop baseline conditions for both policy and measurement of progress. Even though some of the target countries have exposure to the UNFC, there has been no concerted effort to use it effectively.

The project document contained eight activities/outputs that, if implemented consistently, should lead to the achievement of the objective and the expected accomplishments. Importantly, the project document defined clearly the indicators of successful accomplishments for both expected project results and outcomes means of verification, implementation of risks and mitigation actions, monitoring and evaluation arrangements, as well as management, partnership and coordination agreements. All these issues are described in more detail in the project results/logical framework (**Annex 2**).

There were no changes made to the project result/objective and expected accomplishments during the implementation phase. There were a few changes made concerning the nature of activities (mainly due to COVID-19), as described in the following section.

2.3 Project strategies and key activities

As already mentioned above, the overall goal of the project is to strengthen the national capacity of economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally.

The project designers planned to contribute to filling some of the identified challenges outlined above, which were responsible for the lack of integrated energy and water policies in the beneficiary countries. These gaps included, inter alia, lack of relevant information and data, limited policy/regulatory infrastructure, and slow implementation on various topics, including the application of UNFC in the UNECE and UNESCAP regions. Where data existed, it was largely unreliable and incomplete, making it difficult to develop baseline conditions for both policy and measurement of progress. Even though some of the target countries had exposure to the UNFC, there has been no concerted effort to use it effectively. This disconnected the target countries from international best practices and had an enormous impact on their preparedness to overcome the energy and water resource management challenges of the future.

The project design determined that its overall goal and the expected accomplishments would be achieved through the implementation of the eight activities. A detailed description of these activities is available in the Annex 2.

Due to the challenges imposed by the COVID-19 pandemic, a few changes were made concerning the approaches to the implementation of activities carried out in 2020 and 2021. COVID-19 excluded for a considerable period of time the possibility of international travel and physical meetings. Moreover, the emergency response to the pandemics resulted in mass-scale vaccine development and deployment that resulted in an increased demand for several critical raw materials. In this context, the importance of the UNFC and the United Nations Resource Management System (UNRMS) to build knowledge-based systems for assuring diverse supply chains (local, regional, global) for critical raw materials that are needed for the health emergency and for sustainable energy resources became critical. The same systems could be continued for the medium and long-term rebuilding of the economy and ensuring multiple aspects of resilience.

The project document made a brief reference to the challenges related to gender equality and women’s empowerment in the energy and mining sector by saying that: « Energy and mining industries historically excluded women, which is now progressively changing worldwide. Energy and good quality water access are more important for women, children and other vulnerable groups of society. The availability of clean energy can improve the health and well-being of women and children. Many groups of the rural populations still depend on unhealthy biomass use for cooking. Availability of clean water is an issue mostly with the disadvantaged sections of rural society. Better access to water improves life-expectancy in children and provides overall well-being of women and other disadvantaged sections of the society ».

However, the project document and project activities did not describe in which ways the project could concretely contribute to gender equality and women’s empowerment, as well as the realization of human rights, with an emphasis on “leaving no one behind”.

2.4 Beneficiaries and target countries

At the project inception phase, there were four beneficiary countries: two from South-East Europe (Bosnia and Herzegovina and Serbia) and two from Central Asia (Kyrgyzstan and Kazakhstan).

In 2020, two additional beneficiary countries were included, namely Tajikistan and Ukraine. All these countries were chosen on the basis of their demand to participate in the project and their energy and water resources management profiles, in particular transboundary water management. Since all selected countries possess hydro-energy potential, their work in the energy and water sectors could be improved and enriched by improved awareness about water-energy intersectoral links and impacts. Participation of countries from different sub-regions of the UNECE region facilitated the exchange of experience in tackling challenges in the management of water and energy resources. Since these beneficiary countries have shared basins (Syr Darya River for Kyrgyzstan and Kazakhstan; Sava River for Bosnia and Herzegovina and Serbia), it was thought that the project implementation would promote not only identification of intersectoral but also transboundary synergies that could be further explored and utilized in the different basins in the various UNECE sub-regions.

All six recipient countries do not have the necessary institutional, policy and regulatory infrastructure to enable progress to develop an integrated management and monitoring tool aimed at interconnecting energy and water systems and attracting significant foreign and domestic investments for employing advanced energy and water-efficient technologies with all related benefits. Therefore, the project was deemed to bring benefits to these countries by identifying best practices and specific measures and procedures to apply a cross-cutting approach to energy and water resource management with a particular focus on the cross-cutting nature of energy efficiency, renewable energy and water resources management.

2.5 Key partners and other key stakeholders

The implementing/executing entity of the project was the UNECE, Sustainable Energy Division, with UNESCAP as a co-operating entity. UNECE Sustainable Energy Division took advantage of the UNECE Environment Division, Transboundary Water Sharing issues, as part of Expert Group on Resource Management activities. While UNECE was responsible for the implementation of all project activities in all beneficiary countries, UNESCAP was invited as a co-operating entity to participate with relevant contributions in activities related to three countries that are members of both UNECE and UNESCAP, namely Kazakhstan, Kyrgyzstan and Tajikistan.

The key stakeholders were the policy makers responsible for the development of national policies on energy and water resources and private sector entities in recipient countries, which should play an active role in investments to employ advanced technologies for integrated energy and water resources management with all related benefits. A detailed analysis and capacity assessment of the stakeholders is available in the Project document.

UNECE solicited cooperation from other interested international agencies, e.g. from the European Federation of Geologists (EFG) and the International Atomic Energy Agency (IAEA), on selected parts of the project. IAEA and EFG participated in some training workshops and provided technical support. IAEA expert was present in person at the workshop in Kyiv in 2018 and virtually at the workshop in Geneva in 2021. EFG members and experts provided key inputs to all the workshops, and some EFG members provided support as international consultants. EFG advertised the project activities through its media channel.

UNECE informed that the offices of the Resident Coordinators of the beneficiary countries were informed about country-specific activities. However, no tangible evidence was provided to confirm this statement.

2.6 Resources

The project was funded by UNDA, accounting for a total amount of USD 490.000 -. In-kind contributions were provided by several other entities, mainly as support to the workshops. Supplementary funding (in-kind estimated value) was raised as follows:

Table 2: Supplementary funding:

Source/Donor	Purpose (with OC and OP where applicable)	Year	Amount raised		
			Cash (USD)	In-kind estimated value (USD)	In-kind description
Government of Ukraine	Venue and interpretation for the training in Kyiv	2018		2,000	Venue and interpretation for the training in Kyiv
UNECE	Venue and interpretation for the training and workshops in Geneva	2019, 2021		10,000	Venue and interpretation for the training and workshops in Geneva
Government of Kazakhstan	Venue and interpretation for the training in Nur-Sultan	2019		3,000	Venue and interpretation for the training in Nur-Sultan

2.7 Link to the Sustainable Development Goals (SDGs)

The project supported the achievement of the Sustainable Development Goals 6 « Ensure availability and sustainable management of water and sanitation for all » and 7 « Ensure access to affordable, reliable, sustainable and modern energy for all ». More concretely, the project activities supported the attainment of the following targets:

SDG 6 TARGETS:

6.3 “By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”,

6.4 “By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity”, and

6.5 “By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate”.

SDG 7 TARGETS

7.1 “By 2030, ensure universal access to affordable, reliable and modern energy services” and

7.2 “By 2030, increase the share of renewable energy in the global energy mix substantially”.

Achievement of the SDG 6 and 7 has special importance for Central Asian countries, as concluded by the United Nations Special Programme for the Economies of Central Asia’s (SPECA) of the Thematic Working Group on Water, Energy and Environment at its 20th Session:

(a)SDG 6 and SDG 7 are very closely interlinked, which is demonstrated by assessments of the water-food-energy-ecosystems nexus. Therefore, an intersectoral approach to implementing the SDGs, conscious of the interlinkages, synergies and trade-offs, is necessary, and (b) while developing their National Action Plans to meet SDG 6 and SDG 7, SPECA countries should pay attention to transboundary impacts and energy as well as water cooperation opportunities and consider their impact on the potential of the country’s energy resources, food production and the environment⁵.

2.8 Innovative elements

The project design and implementation were instrumental in testing new and innovative approaches to integrated energy and water resource management in support of sustainable development. Innovative ideas have been disseminated in the beneficiary countries and beyond through several UNECE publications, i.e.

“Natural Resource Nexuses in the ECE region” published in 2021⁶

“Leveraging integrated energy, mineral and groundwater resource management using UNFC » published in 2018⁷

“UNECE helps improve data integration for sustainable energy and water resource management in South-East Europe and Central Asia” published 4 July 2019⁸

“Securing critical raw materials supply is key to the response to COVID-19”, published in April 2020⁹

“Policy Brief on Accelerating achievement of SDG7 in the time of COVID-19”¹⁰ published in 2020

“United Nations Resource Management System: An overview of concepts, objectives and requirements (ECE ENERGY SERIES No. 68)” published in December 2020¹¹

“UNECE calls for integrated and sustainable natural resource use through a "nexus" approach” published in April 2021¹²

“Natural Resource Nexuses in the ECE region” published in 2021¹³

3. Evaluation objectives, scope and questions

3.1 Purpose and objectives

As formulated in the evaluation TOR (**Annex 1**), the primary purpose of this evaluation is to assess the extent to which the objectives of the project were achieved.

The objectives of the evaluation are to conduct a forward-looking assessment to increase accountability for results and provide information for decision-making and learning. The ultimate goal of the evaluation is to strengthen UNECE and project stakeholders’ ability to support sustainable development in South-Eastern Europe and Central Asia by increasing beneficiary countries’ capacity in integrated energy and water resources management. The evaluation conclusions and recommendations are intended to bring attention to the remaining knowledge gaps and challenges in

⁵https://unece.org/DAM/SPECA/documents/we_and_environment/20th_session_of_the_SPECA_WG_on_WEE_Report_ENGLISH_October_2016.pdf

⁶ https://unece.org/sites/default/files/2021-04/2016242_E_web.pdf

⁷ <https://unece.org/sustainable-energy/news/leveraging-integrated-energy-mineral-and-groundwater-resource-management>

⁸ <https://unece.org/sustainable-energy/news/unece-helps-improve-data-integration-sustainable-energy-and-water-resource>

⁹ <https://unece.org/circular-economy/press/securing-critical-raw-materials-supply-key-response-covid-19>

¹⁰ https://unece.org/sites/default/files/2020-12/HLPF2020_SDG7PolicyBrief.pdf

¹¹ <https://unece.org/info/Sustainable-Energy/UNFC-and-Sustainable-Resource-Management/pub/350876>

¹² <https://unece.org/circular-economy/press/unece-calls-integrated-and-sustainable-natural-resource-use-through-nexus>

¹³ https://unece.org/sites/default/files/2021-04/2016242_E_web.pdf

the subject field to be addressed in the future, as well as to the best practices that could be implemented in similar projects in the context of the COVID-19 pandemic limitations.

The evaluation report will be shared with all project stakeholders. Nevertheless, its intended audiences go beyond these stakeholders. Therefore, the report will be posted on the UNECE website so to be accessible to anyone interested in improving its knowledge and capacities in the field of integrated energy and water management in support of sustainable development.

3.2 Evaluation scope, criteria and questions

The scope of the evaluation includes Project activities carried out during the entire duration of the project implementation (2018-2021) in all six beneficiary countries (Bosnia and Herzegovina, Serbia, Kazakhstan, Kyrgyzstan, Tajikistan and Ukraine). It focuses on project results, experiences and key challenges met, lessons learnt and areas for improvement. It also takes into consideration issues of gender, human rights and leaving no one behind. The scope also includes recommendations of approaches and methods of possible future interventions by UNECE. The background information includes a holistic perspective covering the capture of the pre-existing structures in place, which has required looking further back.

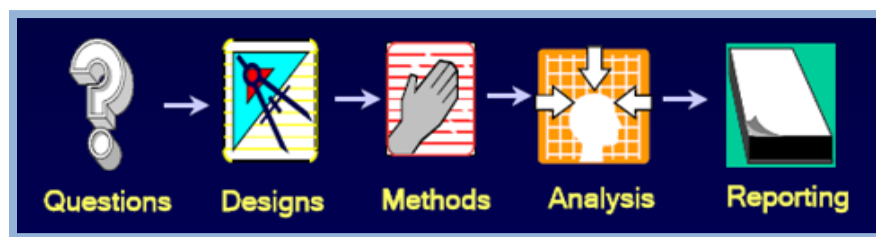
The evaluation is formative in nature and focuses on organizational accountability and learning. It covers all the mandatory criteria for Development Account evaluation reports (i.e. relevance, effectiveness, sustainability, coherence and efficiency). The evaluation TOR, including evaluation questions, are available in annex 1. The work-related to gender equality and women's empowerment (GEWE) was included in the evaluation, and, to the extent possible, an overview of the work was summarized in the section describing "Project strategies and key activities".

4. Methodology

The evaluation strived to take a rigorous methodological approach in order to maximize the quality, credibility and use of the evaluation. The evaluation methodology has systematically addressed the evaluation questions in a way that meets the dual purposes of accountability and learning. Evidence was an essential element of this evaluation. The evaluation was used to collect and generate evidence to support the evaluation process by engaging relevant partners in refining the theory of change in each programmatic element, testing assumptions and identifying causal relationships.

In general, the overall evaluation process consists of five main steps, i.e. 1) Evaluation Questions, 2) Evaluation Design, 3) Data Collection Methods, 4) Data Analysis and 5) Reporting.

Figure 2: Evaluation process



The evaluation questions selection followed the requirements determined in the evaluation TOR. The evaluation design was aligned with the UNEG "Ethical Guidelines for Evaluations", the ECE Evaluation Policy issued in 2021 and the Administrative Instruction Guiding Evaluation in the UN Secretariat ST/AI/2021/3 issued in 2021. For the purpose of cross-checking and triangulating the information obtained from the key stakeholders, the evaluation collected data from a range of sources and applied mixed collection instruments/methods such as desk reviews, interviews, focus group sessions and online surveys. The data and information collected from primary and secondary sources were carefully analysed, cross-checked and synthesised. The outcomes generated by desk reviews, interviews and online surveys were aggregated by main issues, and considerations were paid to the issues of convergence and divergence. The evaluation undertook a review of results as per the project-specific log-frame in order to validate achievements.

Data collection methods:

- Desktop review: Study and analysis of secondary resources, including project documents, annual progress reports, project activities and outputs, country assessments reports, country case studies, project document revisions, training workshop reports, strategic documents and others. The key purpose of the desktop review was to collect secondary data and information as potential evidence that underpins the evaluation. A detailed list of documents is available in **annex 5**.
- Interviews and online surveys: Interviews and online surveys were carried out with a number of UNECE staff involved in the project management, consultants hired by the project and the stakeholders from the recipient countries. Due to COVID-19 pandemic restrictions, all consultations were conducted virtually. The evaluation approached 23 key stakeholders with a request to participate in the interview and/or survey exercise. 17 of them accepted to be part of the evaluation (77% male, 23 % female).
- A focus group session was held with the Project's stakeholders from UNECE.

Table 3: Structure of key informants

Stakeholder group	No. of key informants
UNECE	3
International consultants	3
National partners and consultants from beneficiary countries	11
Total	17

The attention was consistently paid to gender and human rights perspectives integration in the data collection methods and tools and data analysis techniques. However, since these issues were not paid sufficient attention to during the Project’s design and implementation, it was not possible to assess the degree to which these perspectives were paid attention. All interviewed stakeholders provided the same explanation for the insufficient consideration of gender issues, i.e. that considering the highly technical nature of the work in the energy and water management domains, these sectors are very little attraction for female workers.

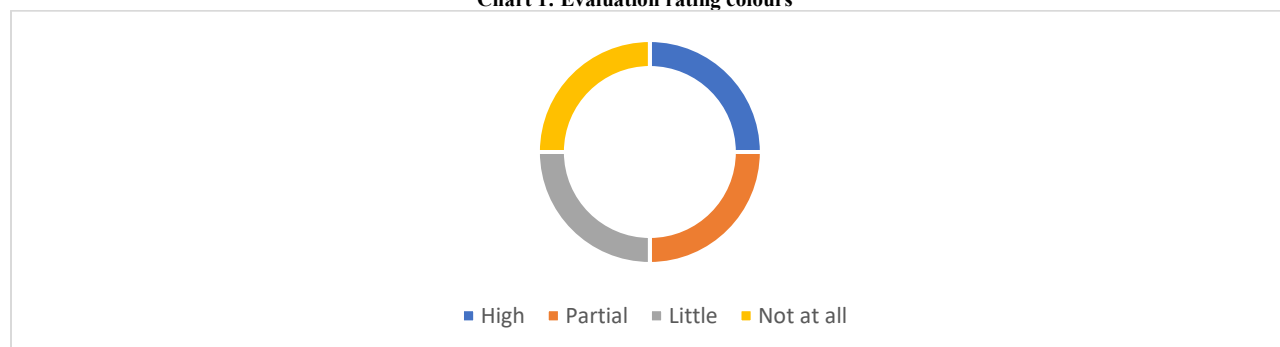
The evaluation designed the evaluation matrix (Annex 6) as a substantive element of the evaluation design, facilitating the systematic assessment of UNECE's contribution to sustainable development by developing capacities for integrated energy and water resource management in South-Eastern Europe and Central Asia.

5. Findings

Findings were defined following the careful analysis and triangulation of inputs collected from different sources of evidence. The sources of evidence are presented along with the evaluation criteria in detail in the evaluation matrix, which was developed by the evaluator. The evaluation findings are presented in relation to the evaluation criteria and questions, as defined in the evaluation TOR. The evaluation made several attempts to obtain from the sources of information data in a gender-disaggregated manner when there are significant differences between genders. However, these attempts were modestly successful due to the lack of relevant information provided by the stakeholders. Therefore, the gender analysis is reflected in the findings in a limited way.

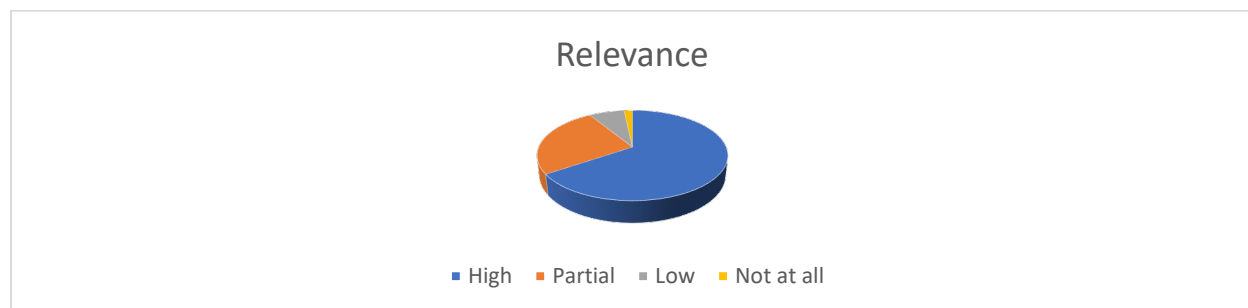
Below is a list of main findings grouped by evaluation criteria.

Chart 1: Evaluation rating colours



5.1. Relevance

Chart 2: Relevance



Overall relevance of the Project was high.

Results from the key informants interview, online survey and interviews suggest that the Project design and the activities planned/implemented within the Project **responded very well to the development priorities, needs and strategies of all six beneficiary countries** in developing and enhancing their capacities in the area of integrated energy and water resources management in the context of the 2030 Agenda. For example, the Tajikistan case study underlined the links to its

- National Development Strategy 2030.
- The concept of transition to sustainable development (2007-2030).

Similar links have been mentioned in all case studies prepared by the Project.

The interviewed stakeholders from the beneficiary countries expressed appreciation for the opportunity offered by the Project to learn about the pertinent international standards and approaches. This new knowledge is expected to have a positive effect on the management of energy and water resources in these countries, classification of energy and mineral resources and the modernization of the present legislation covering these areas. The implemented activities also included a detailed analysis of the raw materials, energy status and water resources (much appreciated by all beneficiaries, especially by Tajikistan).

The Project design was reasonably justified and aligned with the priorities and needs of the beneficiary countries. The beneficiary countries were selected on the basis of their demand for the project and their energy and water resources management profiles, in particular transboundary water management. In addition, when the Project was designed, it aimed at addressing the challenges and needs of these countries, such as the absence of the necessary institutional, policy and regulatory infrastructure to enable progress to develop an integrated management and monitoring tool aimed at interconnecting energy and water systems. Since all selected countries possess hydro-energy potential, it was highly pertinent to keep the Project’s focus on improving awareness about water-energy intersectoral links and impacts to increase the benefits in these sectors.

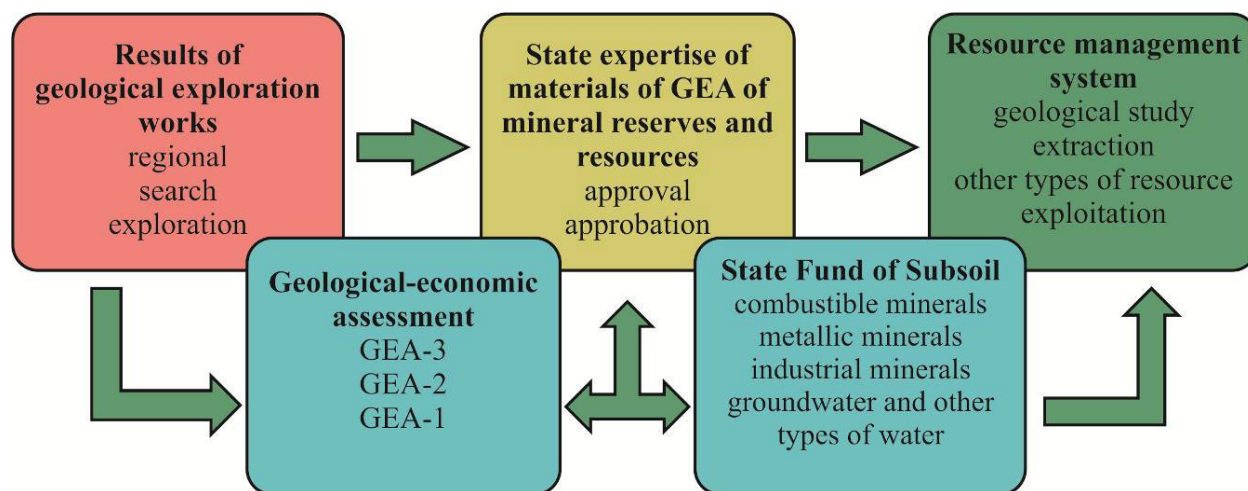
The six beneficiary countries of this project all have large hydro-energy potential. The Project identified solutions to how such potential could be improved and enriched through increased awareness about water-energy intersectoral links and impacts. The project brought together and promoted UNECE's internationally applicable framework for the classification, management and reporting of energy and mineral reserves and resources – the United Nations Framework Classification for Resources (UNFC), United Nations Resource Management System (UNRMS), as well as accumulated experience on the water-energy-food nexus within the framework of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

The Project’s focus on the development of national guidelines for integrated energy and water resources management in beneficiary countries was **fully relevant**, considering that the beneficiary countries were not having the necessary policy and regulatory infrastructure to enable progress on these fronts.

The Project activities were highly consistent with regional and global priorities considering their high relevance in the context of the 2030 Agenda¹⁴. They contributed to the attainment of SDG 7 and its targets 7.1 and 7.2 and SDG 6 and its targets 6.3, 6.4 and 6.5 .

The nexus of interconnected challenges of water and energy is well-acknowledged globally. The project added value was highlighting the intertwined problems of integrated water management/conservation, energy consumption/efficiency through a set of integrated activities, with a goal of achieving multiple benefits in different areas. Thus, improved water management was seen as leading not only to greater water availability but also to significant energy savings.

Figure 3: Mechanism of formation of the State Subsoil Fund and Mineral Resource Management in Ukraine (source: Project case study, Ukraine)



The Project activities were **consistently aligned with the UNECE Strategic Framework 2018-2019**, in particular with Subprogramme 5, “Sustainable Energy”¹⁵, which defined among its key accomplishments:

¹⁴ <https://sdgs.un.org/2030agenda>

¹⁵ A/71/6/Rev.1 Programme 17, Economic development in Europe

- Improved policy dialogue and cooperation among all stakeholders on sustainable energy issues, in particular energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, mineral resource classification, natural gas and energy security,
- Increased awareness of the role of energy efficiency and renewable energy in achieving sustainable energy development, and
- Strengthened implementation of ECE recommendations/guidelines, best practices and other normative instruments for sustainable energy development,

and with the UNECE Proposed programme budget 2020¹⁶ outlining a priority focus of UNECE on supporting the drafting UN resources management system based on the existing UN Framework Classification for Resources.

The Project Document identified the critical target groups in the recipient countries, their capacity assets and gaps, desired future outcomes, incentives for achieving these outcomes, as well as the type and level of their involvement in the Project. This carefully designed stakeholder analysis and their capacity assessment were instrumental in directing the activities towards addressing the target groups' critical needs and priorities. The evaluation TOR prescribed that the consideration of the most vulnerable people needs, gender, rights-based and disability approaches should be assessed under the relevance criterion.

The documentary review and interviews showed that the issues relevant to the most vulnerable groups, gender aspects and rights-based approaches were neither addressed in the Project's design nor reflected under monitoring indicators.

During the Project's implementation, the attention to gender, rights-based and disability inclusion was partial, focusing on awareness raising activities during the training workshops. **In all recipient countries, mainly in the Central Asia region, the challenge for the future is to address "gender gaps"-the inequalities that persist between women and men.** National Legal and policy frameworks do not yet provide a cohesive basis for gender-responsive governance. **This challenge, together with attention to the population with specific vulnerabilities and minorities, need to be addressed more consistently in the future.**

Similarly, the all-of-the-society approach has to be strengthened in the future in activities related to the water-energy-climate change-natural disasters nexus.

The limited attention to gender aspects reflected the reality that the energy and mining sectors globally excludes women worldwide. This situation has been changing progressively, however, at a limited speed. During the workshops (with limited participation of female participants), it was stressed that energy and good quality water access are highly important for women, children and other vulnerable groups. The availability of clean energy can improve the health and well-being of women and children. It was also underlined that an important percentage of rural populations still depend on unhealthy biomass use for cooking. Availability of clean water was recognized as an issue affecting most of the disadvantaged sections of an agrarian society, and that access to clean water improved the life expectancy of children and provided the overall well-being of women and other underprivileged sections of society. These needs have been accentuated during the Covid pandemic, as was also addressed by the project. **Applying a gender lens in designing socio-economic responses is essential, given the leading role women have and are playing in fighting the pandemic.**

During the Project's workshops, it was stressed that women are an integral part of society. Hence, it is essential to increase their participation in activities closely related to the energy and water sectors. The best practices implemented globally were shared. The possibility of combined attainment of SDG5 and SDG8, target 8.3 through resource management, was explored through an additional initiative to assess women's entrepreneurship opportunities in natural resource management. Initial signs of increased attention to gender aspects were reported by the Geological Service and the Ministry of Energy and Mining in Bosnia, which employs about 30% of female staff. It was also noted that women are employed mainly in the legal, economy and administrative functions and much less in technical positions. Therefore, their participation in the technically oriented workshops was very low. A similar situation was also reported in other beneficiary countries.

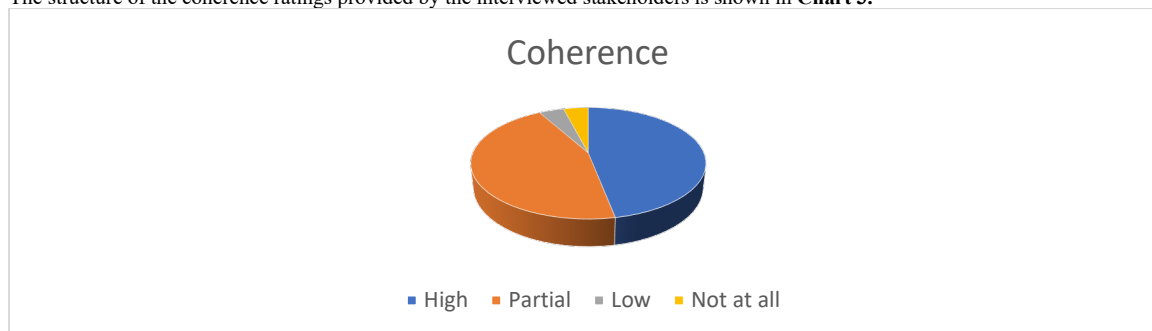
In order to enhance the meaningful consideration and integration of gender, rights-based and disability inclusion approaches in the design, implementation and results of the future UNECE projects, it is a must that UNECE senior management clearly articulate its commitments to these issues by the revision or adoption of a clear policy in these areas.

The training workshops and the case studies (for example, Serbia and Bosnia & Herzegovina) underlined the relationship between energy/water management, climate change and disaster risk reduction. The geological Department of Tajikistan was involved in disaster risk assessment concerning the refugee camps in cooperation with Agha Khan Foundation. However, in general, the attention to this relationship was limited. Several case studies (Bosnia, Serbia, Tajikistan, Kazakhstan) prepared in the framework of the Project drew attention to the interconnectedness among climate change, natural disasters and integrated energy and water management.

¹⁶ A/74/6/Sect.20

5.2. Coherence

The structure of the coherence ratings provided by the interviewed stakeholders is shown in **Chart 3**.



Overall coherence of the Project was partial.

The key coherence question is the one examining the extent of the collaboration with other entities in the UN system and other international organizations active in the areas similar to those covered by the Project, as well as the coherence of the Project's design and changes made during the lifetime of the Project.

According to the Project documents and as informed during the interview with UNECE staff, the project cooperated with ESCAP, the European Federation of Geologists (EFG) and the International Atomic Energy Agency (IAEA) as described in the 'key partners' section. These multiple cooperation arrangements were intended to ensure the Project's complementarity with similar initiatives carried out by the partners, e.g. with UNESCAP efforts in the integrated energy-water resources management for green industries.

However, **the interviews and responses to the survey received from the national stakeholders did not indicate any tangible and/or meaningful examples of a coherent collaboration with other entities of the UN system or other international organizations.** One example for all was a statement made by the stakeholders from two Central Asian countries: "During my participation in the project, I did not interact with other international organizations". Definitely, the Project could do better in exploring and utilizing synergies with other similar projects and initiatives. This was also the feeling of a great number of interviewees. The Project did not explore the possible added value of the cooperation with the UNDP country offices that are present in all beneficiary countries. UNDP is the lead UN development agency in the project beneficiary countries and is well placed to help implement SDG through its work in some 170 countries. For instance, the Decree of 11 October 2006, "On the Agreement between the Government of the Republic of Kazakhstan and UNDP on the National Integrated Water Resources Management and Water Efficiency Plan for the Republic of Kazakhstan", approved the development of the program "Integrated Water Resources Management and Improving Water Use Efficiency in Kazakhstan until 2025". UNDP Serbia was implementing the project "Energy Efficiency in Central Government Building" simultaneously with UNECE Project.

One interviewed stakeholder stressed that "the Project coherence could be improved by a broader "coalition" synergy for nexus approach" and that "a stronger impact at a recipient countries level could be achieved in the future by involving UNDP in promoting the integrated energy and water resource management agenda".

The project design, including the two key outputs (EA1, EA2), has been reasonably justified and aligned with the recipient countries' needs and priorities. In principle, the objective of the project and its outputs remain as relevant today as when the project was conceived. The countries covered by the Project genuinely requires capacity building outcomes in the areas covered by the project outputs, and the UNECE project was designed to deliver these outcomes. However, the overall design of the monitoring and evaluation framework is only partially satisfactory. The Project lacked meaningful Specific, Measurable, Achievable, Realistic, and Time-bound (SMART) Key Performance Indicators (KPIs) that would obtain robust evidence for the project's effectiveness and efficiency. The defined KPIs in the project document were insufficiently SMART, which is the key to effectively tracking the same outputs. Another minor shortcoming with respect to the coherence of the Project design concerns the indicator of achievement A.1.1. Considering the huge number of challenges and gaps prevailing in the recipient countries concerning the integrated energy and water resource management and relatively short duration of the Project, this indicator was far too ambitious.

The activities were implemented in the appropriate sequence needed to ensure the most significant impact of the Project. The sequence of activities was as follows:

- 1) Lessons learned from the previous Project 's phase addressing the integrated energy and water management resource
- 2) Identification of remaining gaps in the field of the integrated energy and water management resource during the workshops
- 3) Focus on the new areas for promoting integrated management of energy and water resources
- 4) Identification of possible approaches for the implementation of UNFC and UNRMS.

Studies on relevant best practices on policy development experience or application on each beneficiary country's existing energy and water resources management practices were prepared. These studies aimed to increase the knowledge and understanding of national authorities of best practices in the UNECE region and to help countries assess their applicability to national circumstances. Relevant case studies and best practices for energy and water resources management and the application of appropriate integrated management and monitoring tools interconnecting energy and water systems were discussed in project workshops. The workshops helped countries to assess the applicability of best practices to national circumstances and develop national models for improving sustainable energy policies.

Project activities included the development of policy recommendations for integrated energy and water resources management, applicable nationally, taking into account the specific needs of each country, and suggestions regarding the transboundary aspects were made by national consultants in close cooperation with international consultants. The final workshop reviewed and validated the policy recommendations for each beneficiary country's sustainable energy and water resources management. The majority of the interviewed stakeholders felt that the conducive atmosphere created by the project would be of motivation to the recipient countries in realising their targets and the objectives of integrated energy and water management. The outputs generated by the Project were well aligned with and relevant to its overall objective.

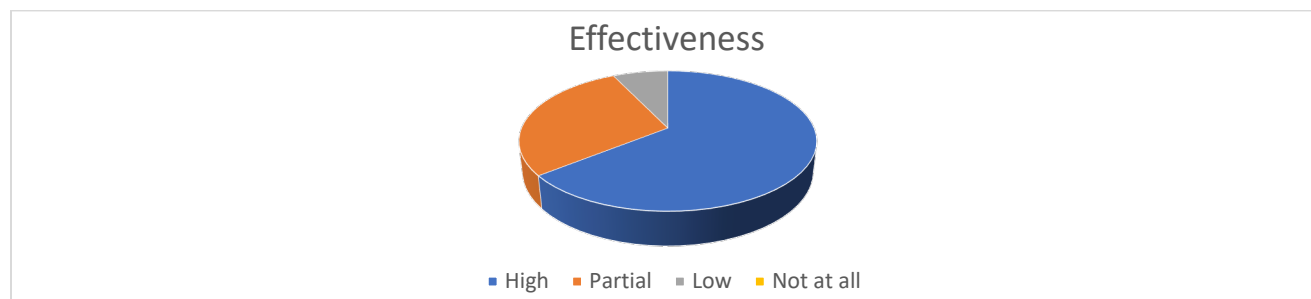
With the start of the COVID-19 pandemic, the project was re-oriented also in seeing how the tools developed could address the new situation. The COVID-19 pandemic has highlighted the need to ensure food security, access to clean water and sanitation, including the promotion of adequate hand hygiene and energy and raw material security. The integrated and indivisible management of the essential resources using a nexus approach enhances the resilience of societies when facing difficult situations such as Covid-19. Travel limitations resulted in the need to hire more consultants than anticipated. The work on the ground was carried out by the national consultants. National consultants kept a frequent interaction with the international consultant using online communication possibilities. The international consultants guided the preparation of the assessment reports and the case studies for all six recipient countries. These adjustments have been discussed and agreed upon with the recipient countries to make sure that they effectively respond to their new priorities that emerged in relation to COVID-19.

The coherence of the Project in addressing the emerging needs triggered by the COVID pandemics became evident since the application of UNFC and its expanded version UNRMS could support sourcing critical raw materials from conventional and unconventional sources, either in multi-metal or multi-mineral deposits. With the world under lockdown, the continued supply of certain critical raw materials needed for an effective health response to the COVID-19 pandemic has become a concern. Testing, personal safety equipment, drugs and vaccines required many critical raw materials. The project responded to the situation by including a special focus on raw materials required for combating the pandemic and in the post-pandemic economic recovery. Emphasis was also given to recycling of raw materials. UNFC's anthropogenic resource specifications can also be used to understand the social and environmental benefits of phosphate resources recovered from sewage sludge, compost and wastewater. UNFC and UNRMS are thus suited to increase options for quickly spreading production options between local, national, regional or global sources. The immediate response to the COVID-19 pandemic and the recovery from the severe economic downturn it was triggering would require a massive fiscal reaction. Many such measures have been announced by numerous countries and multilateral financial institutions. It can be concluded that the Project supported the beneficiary countries in their COVID-19 response by raising awareness directly or indirectly about the aforementioned issues.

With the majority of the world under lockdown, the emerging challenge of continued supply of certain critical raw materials is needed to effectively respond to the COVID-19 pandemic. The Active Pharmaceutical Ingredients (APIs) and excipients of several drugs, including antibiotics such as Azithromycin or Amoxicillin, incorporate minerals such as chromium, cobalt, copper, magnesium, manganese, molybdenum, sodium, nickel and many others. This is also the case of the four antivirals experimented in many countries as a preventive drug and treatment for COVID-19 under the WHO-led initiative working for global equitable access to COVID-19 vaccines-COVAX. Identifying alternative local or regional sources was vital in situations like the current pandemic with an immediate supply crunch.

5.3. Effectiveness

The structure of the effectiveness ratings provided by the interviewed stakeholders is shown in **Chart 4**.



Overall effectiveness of the Project was high.

The effectiveness questions examine the extent to which the results expected during the Project design were achieved in terms of planned activities, outcomes and impact.

The planned impact of the Project was to strengthen the national capacity of economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally. Its intention was to contribute to filling the persisting gaps such as lack of relevant information and data, limited policy/regulatory infrastructure, and slow implementation on various topics, including the application of UNFC in the UNECE and UNESCAP regions. UNECE informed that the effectiveness of the workshops regarding the suitability of the methods of instructions and the generation of increased knowledge was assessed through the feedback of the participants provided by the Evaluation Questionnaires.

The evaluation made efforts to obtain more evidence to this end. However, this was not possible since, according to UNECE, these completed Questionnaires (made only in hard copies) were lost during the Project's office move to a new premise. The stakeholders interviewed thought that the workshops effectively contributed to the creation of a conducive policy and increased attention to the regulatory environment in the targeted countries that were instrumental in achieving the planned impact/results.

The majority of the interviewed stakeholders suggested that the persisting gaps concerning the relevant information and data required for the resource classification purposes were considerably reduced by the training workshops and the preparation of the assessment reports and case studies in the beneficiary countries. The documents prepared by the Project defined the gaps in fossil energy and mineral resources statistics, the list of improvements required, as well as possible ways for overcoming the main obstacles (institutional, legal, technical, financial and human) standing in the way of improving fossil energy and mineral statistics. The possibility of replication of the best practices was supported by the dissemination of the case studies of the pilot activities.

The Project helped the beneficiary countries in:

- **Developing a coherent and systematic approach to the sustainable development of energy resources**
- **Developing a long-term vision in the management of water resources; and**
- **Developing a holistic approach to understanding and managing the energy-water dependencies.**

The following table shows the detailed review of the Project planned accomplishments:

Table 4: Review of Performance Indicators

Expected Accomplishment	Indicator of achievement (T0)	Indicator of achievement (T1)	Comments
EA1 Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management	IA 1.1 Four countries established national data collection systems on integrated energy and water resources management. The beneficiary countries have not established national data collection systems on integrated energy and water resources management	One country – Kazakhstan – established a national data collection system on integrated energy and water resources management. The other beneficiary countries have improved their capacity to develop national data collection systems on integrated energy and water resources management by developing the capacity to implement UNFC standards.	Three training events have been held before 2020. Due to the COVID-19 crisis, the fourth training was replaced with a training workshop under COVID-19 Amendment in Q2 2021.
EA2 Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources	IA 2.1 Four sets of policy recommendations for sustainable energy and water resources management were adopted/ included in national strategies by the beneficiary countries. National experts responsible for data collection and monitoring from relevant line ministries do not possess enough knowledge of policies and strategies for integrated energy and water resources management.	Six sets of policy recommendations for sustainable energy and water resources management tailored for inclusion into the national strategies by beneficiary countries have been developed.	Case studies in each of the beneficiary countries were developed and completed. The workshop on the case studies has been conducted. Six sets of policy recommendations for sustainable energy and water resources management have been developed and presented at the final workshop of the project.

The interviews, surveys and documentary review confirmed that the expected accomplishments have been reached and the planned implementation activities have been implemented in full. Concerning the accomplishment of EA2, its Performance Indicator was exceeded by 50 %. The Performance Indicator related to the accomplishment of EA1 was achieved partially. However, the evaluation believes that considering the relatively short Project duration, the complicated data collection environment in all recipient countries and the fact that the regulatory processes are by definition very lengthy, the definition of the Performance Indicator for EA1 was not realistically defined in the Project’s design. The establishment of the national data collection system on integrated energy and water resources management in Kazakhstan and Kyrgyzstan, the improved capacity to develop national data collection systems on integrated energy and water resources management by developing the capacity to implement UNFC standards in other 4 beneficiaries countries shows the sound effectiveness of the Project.

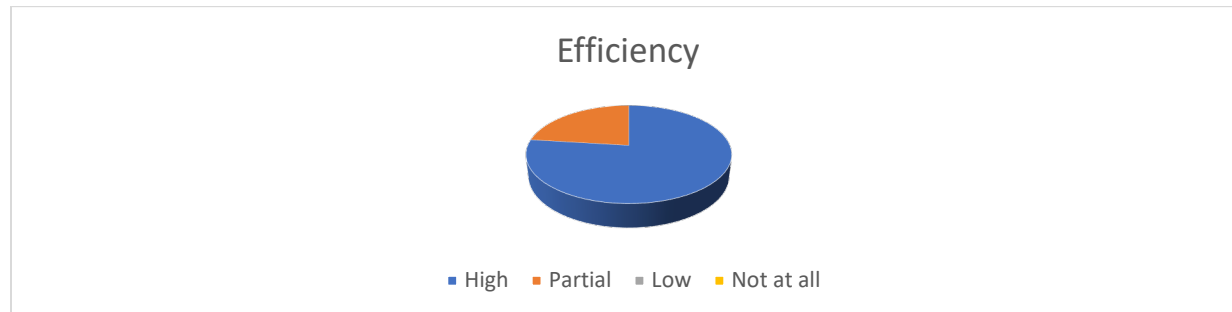
The Project should be seen as a step in a longer-term process. The prevailing feeling among the interviewees indicated that there was a need for the continuation of appropriate training in UNFC classification for the national experts to build a stronger consideration of this methodology as one of the possible reporting methods on a national level. In the absence of continued awareness-raising and training, the local experts and authorities will not consider the UNFC classification in national legislation as a priority in the near future. Alternatively, national experts must be integrated into the different UN structures (e.g. UNECE pertinent meetings/workshops) to receive accurate information about the methodology and to disseminate the methodology values at the national level. All activities planned in the Project Document were carried out and contributed effectively to the achievement of the expected outcomes

The major challenge faced was the Covid-19 pandemic. The negative impact of this challenge was eliminated by the effective re-orientation of the nature of some activities. , E.g. organization of the training workshop (A1.3) planned in the framework of the UNECE Resource Management Week 2020, 20-24 April 2020, Geneva, Switzerland, was not possible due to the Covid-19 crisis. A decision was taken to replace the fourth training with a training workshop under COVID-19 Amendment. It was held instead in April 2021 in a hybrid mode.

The work to develop the case studies under A2.1 was put on hold in Q4 2019 due to the liquidity crisis. Four case studies were successfully developed and completed in 2021.

5.4. Efficiency

The structure of the efficiency ratings provided by the interviewed stakeholders is shown in **Chart 5**.



The efficiency of the implementation process is rated as high.

Efficiency, as a measure of success, concerns the ratio of resources allocated to results achieved. The Project achieved its objectives and generated the outcomes/accomplishments with the resources (funds, expertise, time, etc.) as planned during its design. The total budget for the project was set up in the Project Document and gives a total budget of USD 490,000. The activities were implemented within the anticipated budget and allocation of resources. By the end of 2021, 95,9 % utilization of funding was achieved. The 4 % underspending was due to some travel costs saving and some of the planned operational costs saved due to last minute in-kind contributions. Considering the potentially negative impact of COVID-19, the attained implementation rate of about 96 % is very good and confirms the efficient management of the resources.

On March 11, 2020, the World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak a global pandemic, disrupting the project's original implementation plan. According to the project progress annual report, the proposed in-person regional meeting, which was previously scheduled for 2020, was postponed for 2021 in a virtual format.

While the overall funding of the project did not change, there were adjustments made between planned activities due to unforeseen circumstances occurring as a consequence of COVID-19. Staff travel has been reduced, training workshops modalities have been aligned to new conditions, and consultancy services have been increased to strengthen initiatives such as regional networks building, case studies/assessment report preparation and drafting of capacity development products. The additional consultancies were directed to the organizing a training workshop on the topic of assuring diverse supply chains (local, regional, global) for critical raw materials that are needed for a health emergency and for sustained vigilance, the developing of two additional case studies (one for each of the two additional beneficiary countries – Ukraine and Tajikistan) on the experience of policy development or application on the existing energy and water resources management practices and monitoring. On the top of originally planned activities, the international consultants developed a report concerning expanded COVID-19 recovery scope (new activity A2.5), and guidelines on mine closure, remediation, land value capture, water management, and repurposing with special reference to the beneficiary countries in the post Covid-19 green recovery (new activity A2.6).

However, these amendments were made within the planned budget and consideration of an efficient approach. **Overall, there was no negative effect with respect to the budget's total allocation of US\$490,000 or results as originally planned.**

Table 5: Financial information as at 31.12.2021

Object Class	Description	A. Budget/Allotment (as per project document) (USD)	B. Revisions to allotments (if any) (USD)	C. Explanations of revision to allotments (USD)	D. Total Expenditure (USD)
015	Other staff costs - General temporary assistance	0.00	0.00		0.00
105	Consultants	136,000.00	230,000.00		359,451.17
115	Travel of staff	77,000.00	(74,000.00)		2,983.54
120	Contractual services	58,000.00	(23,000.00)		24,466.80
125	General operating expenses	9,000.00	(8,000.00)		100.00
130	Supplies and materials	0.00	0.00		0.00
135	Furniture and equipment	0.00	0.00		0.00
145	Workshops/Study tours (Grants and contributions)	210,000.00	(125,000.00)		82,693.21
	Total	490,000.00			469,694.72

A minor efficiency-related shortcoming was linked to the achievement of the proportional yearly implementation rates during the duration of the Project. However, this situation was caused by circumstances occurring beyond the Project management team's control. E.g. Work to develop the case studies under A2.1 was put on hold in Q4 2019 due to the liquidity crisis, and this contributed to the implementation rate being below 35% at the end of 2020. Because of this unexpected obstacle, there was a challenge to significantly increase the implementation rate in the last year of the project. This challenge was successfully overcome by a significant increase in the implementation rate in 2021 (to over 95%), and the project was fully implemented by the end of 2021 with additional activities related to strengthening the supply of critical raw materials required for the health sector under the COVID-19 amendments.

COVID-19 related challenges for efficiency were overcome by assessment of the new conditions of COVID work culture and reinforcement of virtual approaches such as intensifying online communications and replacing some face-to-face workshops with virtual workshops.

Practical application of these “non-standard” approaches led to well-balanced implementation rates during the Project’s lifetime. In spite of the lengthy procurement system of the UN, the Project has not experienced any significant delays in the implementation of its activities.

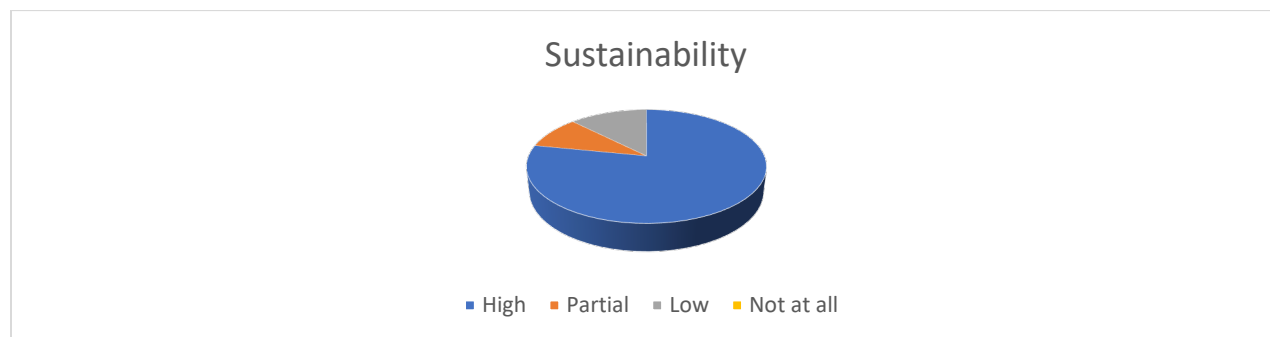
UNECE was efficient in the mobilization of the active stakeholder's participation. This is considered an important precondition for the efficient implementation of any technical cooperation initiative. Furthermore, the Project achieved efficiency in terms of the adequacy of stakeholders involved. The development of the collection of assessment reports and case studies involved experts from diverse organizations and geographic locations of the sustainability in the energy and water management sector in the UNECE region. These partnerships resulted in an effective manner for situational assessment and recommendations in the area of integrated energy and water resource management and classification of resources.

The UNECE project manager, the Regional Adviser of the Sustainable Energy Division was responsible for regular monitoring of the project implementation. The progress of the project was reported each year by annual progress reports, and the material and information related to the project were being shared on the website. In addition, a questionnaire was developed by the project manager to evaluate the impact, effectiveness and long-term sustainability of the project activities. **The human and financial resources allocated to the Project were used efficiently and commensurate with the results and outcomes achieved.** The project was supported by the Regional Advisor (P5) as Project Manager, Economic Affairs Officer (P4) and Team Assistant (G4). It needs to be underlined that a high level of efficiency was achieved in the situation when the Project’s management team lost one important staffing position – G-6. At the time of the evaluation, all deliverables had been completed (although the Project financial table has not yet been disseminated in its final version).

The stakeholders consulted believed that efficiency was achieved in terms of adequacy of the national partners and consultants involved and the creation of synergies among different stakeholders. Considering the adverse COVID19 circumstances, activities and functions were adequately repurposed and adapted to accommodate efficient response actions.

5.5. Sustainability

The structure of the sustainability ratings provided by the interviewed stakeholders is shown in **Chart 6**.



Overall sustainability impact of the Project was high.

In our case, sustainability can be defined as the likelihood of a continuation in the stream of benefits produced by the Project after the period of external support has ended. In general, the key factors that impact the likelihood of sustainability include (i) ownership by beneficiaries; (ii) policy support/consistency; (iii) institutional management capacity; (iv) economic and financial viability.

The growing understanding of the recipient countries that the integrated energy and water management resource contribute to the attainment of the 2030 Agenda for Sustainable Development raised the awareness of the governments in these countries about the importance of consistently optimizing their natural resources management. Achieving the 2030 Agenda requires integrated solutions that deliver environmental, economic, and social dimensions. Interviews showed that the governments understand their responsibility to play their role by cooperating and sharing best practices and the knowledge generated by the Project.

Documents review, survey and interviews with the main stakeholders demonstrated that there are very good perspectives for a continued engagement of the beneficiary countries in enhancing the integrated energy and water resource management activities in support of sustainable development. Commitment to scaling up and institutionalizing the Project's final recommendations was evident during the interviews with the beneficiaries. Documents review and interviews confirmed that stakeholders' participation was integral to the Project and has been evident in both the design and implementation phases. This constant commitment increases the perspective that the Project results will be sustained.

Many beneficiary countries are planning to establish International Centers of Excellence in Sustainable Resource Management (ICE-SRM) to continue the implementation of UNFC, UNRMS, and the nexus approaches. Policy and regulatory interventions are being recommended to further strengthen the approaches implemented through the project.

Feedback received by the evaluation from the stakeholders confirmed that the beneficiary countries are already progressing with implementing the recommendations from the project.

For example, the Ministry of Energy and the Ministry of Ecology, Geology and Natural Resources have decided to harmonize Kazakhstan's national petroleum classification to UNFC under the implementation of step 74 of the National Transition Plan. Kazakhstan has expressed interest in establishing an ICE-SRM for supporting the national application of UNFC and UNRMS.

Kyrgyzstan has communicated that the implementation of UNFC and UNRMS will be a priority for the country. The Ministry of Natural Resources, Ecology and Technical Safety is interested in having an MoU with UNECE to support the implementation of the programme.

Since 1997, Ukraine has mandated the use of UNFC as the foundation of its national resource management. Thanks to this Project, Ukraine has aligned with the latest version of UNFC, making it up to date with international standards and comparable globally.

Bosnia and Herzegovina, and Serbia are revising their resource policies and strategies, and it is expected that UNFC and UNRMS will be included. Kyrgyzstan and Tajikistan are expected to align their policies with CIS regional collaboration and are expected to align their policies with UNFC and UNRMS. However, the transition process in these two countries may take a considerable amount of time due to frequent government restructuring and staff rotation.

The final evaluation noted that since its inception, the Project has created multiple partnerships within and among beneficiary countries that create a platform for future replication and the progress to revise and update key legislation and update regulations and standards to continue national efforts to strengthen the enabling environment for adaptation of UNFC.

The perspective of the Project's philosophy replication is promising. In fact, UNECE is collaborating with the Secretary-General's UN Working Group on Extractive Industries to support other recipient countries to replicate the studies. The project's objectives have assumed greater validity in the post-Covid situation. If the beneficiary countries want to attain the 2030 Agenda, they must continue optimizing their natural resources management. Achieving the 2030 Agenda requires integrated solutions that deliver environmental, economic, and social dimensions. Governments must play their role by cooperating and sharing best practices and their knowledge and experience. In the post-COVID-19 times, the aim is to Build Back Better. Natural resources, including energy, water and critical raw materials, are required for a proper green recovery. This recovery should encompass all of society, including energy, mobility and other industrial sectors. For example, a typical electric car requires significantly more mineral inputs than a conventional car. An onshore wind plant requires nine times more mineral resources than a gas-fired power plant. The shift to a clean energy system is set to drive a massive increase in the requirements for these minerals, meaning that the energy sector is emerging as a significant force in mineral markets.

The project's activities aimed at a strong emphasis on capacity building and knowledge management, which represent the building blocks of sustainability.

The best practices, knowledge and lessons learned as stated in the case studies and assessment reports are pertinent for and can be replicated in the UNECE region as well as other regions. The same applies to the lessons learned from the COVID-19 related activities. In this context, UNECE collaborates with the Secretary-General's UN Working Group on Extractive Industries to support other UN Regional Economic Commissions and other UN entities in replicating the approaches from pertinent projects.

Sustainability can be further boosted through the reflection of the main lessons learned from this Project. According to the interviewed stakeholders, the main lessons learned during the project implementation can be summarized as shown in the Annex 7.

The evaluation activities identified several laws, regulations, policies or projects that have been developed so as a result of the strengthening of capacities of the beneficiary countries in the area of integrated energy and water resource management and the development of sustainable policies in this area. For example:

1. Ministry of Energy and the Ministry of Ecology, Geology and Natural Resources have decided to harmonize Kazakhstan's national petroleum classification to UNFC under the implementing step 74 of the National Transition Plan.
2. Kazakhstan has expressed interest in an International Centre of Excellence on Sustainable Resource Management (ICE-SRM) for supporting the national application of UNFC and UNRMS. On your second question about ICE-SRMs:
3. Kazakhstan has formally indicated that it is considering the establishment of ICE-SRMs. Bosnia and Herzegovina, Serbia, and Ukraine are interested in ICE-SRMs and are exploring possibilities of establishing such Centres in their respective countries.
4. Since 1997, Ukraine has mandated the use of the United Nations Framework Classification for Resources (UNFC) as the foundation of its national resource management. Due to this Project, Ukraine has aligned with the latest version of UNFC, making it up to date with international standards and comparable globally.
5. Beneficiary countries like Bosnia and Herzegovina, and Serbia are revising their resource policies and strategies, and it is expected that UNFC and UNRMS will be included in the revised policies and strategies.
6. Kyrgyzstan and Tajikistan are showing readiness to align their policies with CIS regional collaboration and to align their policies with UNFC and UNRMS.
7. In 2019, Kazakhstan decided to form a new ministry, called the Ministry of Ecology, Geology and Natural Resources, integrating and streamlining activities of some of the previous smaller ministries. The new ministry provides:
 - Leadership in the formation and implementation of state policy.
 - Coordination of management processes in environmental protection.
 - Development of the green economy.
 - Waste management.
 - Safety.
 - Control and supervision of the rational use of natural resources.
8. On November 2, 2021, the Committee on Water Resources of the Ministry of Ecology presented a draft Concept of Development of the Water Resources Management System of the Republic of Kazakhstan for 2021-2025. The concept will serve as a basis for improving the practice of integrated water resources management and the implementation of public policy in the use and protection of water resources, aimed at achieving the goals, objectives and approaches defined by the National Development Plan 2025 and the Sustainable Development Goals of the United Nations.
9. Serbia was exceptionally active in adopting pertinent laws and regulations such as:
 - Energy Balance for 2019, 2020
 - Law on Energy ("Official Gazette of RS" No. 145/2014, 95/2018 – other law, 40/2021).
 - Law on renewable energy sources ("Official Gazette of RS" No. 40/21)
 - Law on Energy Efficiency and Rational Use of Energy ("Official Gazette of RS" No. 40/21)
 - Law on Mining and Geology Exploration ("Official Gazette of RS" No. 101/2015 and 95/2018 - other law, 40/2021)
 - Law on Accounting ("Official Gazette of RS", No. 73/2019 and 44/2021 – other law)
 - Law on Climate Change (Official Gazette of RS No. 26/2021)
 - Strategy for energy development of the Republic of Serbia until 2025 with a projection until 2030
10. In Ukraine, as a continuation of the project, a monograph "Deposits of critical mineral raw materials of Ukraine - Status and prospects" was published in September 2021. Many stakeholders in Ukraine were acquainted with the project's results and this monograph during the 7th International Scientific and Practical Conference "Subsoil Use in Ukraine. Investment Prospects" (November 29 - December 1, 2021, Lvov, Ukraine).
11. In Ukraine, in 2021, the Government approved the Economic Security Strategy and the Energy Security Strategy of Ukraine, 2030 Strategy of Environmental Safety and Adaptation to Climate Change, Strategy of Regional Development for 2021-2027, which defined the primary tasks for achieving the strategic goals. The goal of energy transformation is the protection of national interests, access to reliable, sustainable, affordable and modern energy sources in a technically reliable, safe, cost-effective and environmentally friendly way under normal conditions and the conditions of a particular or emergency state.

The evaluation considers risks to the sustainability of the Project's results to be low. While sustainability is inherent in Project's outcomes and the UNECE Sustainable Energy Division management attaches importance to integrated energy and water resource management, the evaluation has identified the following potential risks to the continuation of the Project's benefits and results:

- Absence of a clearly-articulated and financed sustainability plan, with well-defined roles and responsibilities that have had agreement formed and signed off by the Ministries of the beneficiary countries that have a key role in the continuation of Project benefits and results beyond the project closure.
- The continued economic and financial fallout from COVID-19 may prevent the beneficiary countries from dedicating sufficient resources for the practical application of the Project's benefits.

Nevertheless, the Project should be seen as an initial step in a longer-term process. The prevailing feeling among the interviewees indicated that there was a need for the continuation of appropriate training in UNFC classification for the national experts to build a stronger consideration of this

methodology as one of the possible reporting methods on a national level. In the absence of continued awareness-raising and training, the local experts and authorities will not consider the UNFC classification in national legislation as a priority in the near future. Alternatively, national experts must be integrated with the different UN structures (e.g. UNECE pertinent meetings/workshops) to receive accurate information about the methodology and to disseminate the methodology values at the national level.

6. Conclusions

Based on the cross-checked evidence presented in the findings' section, its synthetization and analysis, the evaluation derived the following conclusions:

- The greatest achievement of the Project was the growing awareness about and understanding of the importance of the UNFC System in South-Eastern Europe and Central Asia for sustainable development. All the interviewees believed that the Integrated Energy and Water Resource Management and its positive effect on the economic and social development of the countries covered by the Project could be enhanced by the application of the UNFC System accompanied by pertinent legislative modifications.
- However, the degree of a paradigm shift catalysed by this Project can be fairly assessed a few years from now, depending on the extent of the practical reflection of the strengthened national capacities to develop evidence-based policies and strategies (as a main Project's accomplishment) in the modernization of the existing legislation and strategies for integrated management of energy and water resources.
- The Project had more success in its influence in changing mindsets on "how to do" integrated energy and water resources management than in implementing a tangible model. This remains an important challenge for a potential Project's continuation.
- **Relevance:** The project proved highly relevant based on both quantitative and qualitative assessments. There was a solid process of consultation with stakeholders resulting in the identification of challenges and needs prior to the Project's commencing, and the country level works were seen to be tailored and focused on relevant issues and beneficiary countries' priorities.
- **Coherence:** The possibilities in achieving coherence between the Project and other initiatives focussing on integrated energy and water resource management were explored partially. More frequent and results-oriented dialogue with pertinent partners (UNDP, WBG) would boost the coherence aspects.
- **Efficiency:** The project delivered a substantive agenda of assessment of existing gaps, training materials, national trainings, advisory missions, workshops, case studies, assessment reports and policy recommendations at a high level of efficiency. This was done within budget and largely in good time.
- **Effectiveness:** This project was assessed as highly effective in achieving the expected objectives in identifying recipient countries' technical and policy agendas and developing institutional momentum on this topic. Understanding, knowledge and awareness about the advantages of integrated energy and water resource management and UNFC adoption were key objectives that were achieved.
- **Sustainability:** Momentum has been started at an institutional level; however, without UNECE's continued support, this can fall. More clarity is also needed on what 'next steps' will involve. Ongoing capacity building and advocacy after the termination of this project should be considered. Not doing so will limit sustainability opportunities.
- **Gender and vulnerable groups'** concerns were not significantly mainstreamed into the design and implementation of this Project, though it was clear from the interviews that UNECE had encouraged participants to think about these issues.
- The importance of the positive achievement is high considering that the national classification systems in the majority of the recipient countries continue to apply legal and regulatory systems developed during the "Soviet" times in the former USSR countries and from the period of the former SFR Yugoslavia, as far as Serbia and Bosnia and Herzegovina are concerned. Kazakhstan uses the classification template of CRIRSCO for minerals.
- The modernization of the national minerals classification systems will be a long process since there are no official "bridging documents" or guidelines to clarify the relationship between the national classification of resources and UNFC System codes. So far, major progress in the harmonization of the national energy and water resources classification with the UNFC has been achieved in Ukraine.
- The recipient countries consider the harmonization of data concerning energy and water resources with the UNFC System as the important issues to be addressed by future cooperation activities with the UNECE in the near future.
- Encouraging initiatives undertaken by the independent experts in Serbia resulted in proposing a possible "Bridge" between the Serbian classification system and UNFC.
- A major impediment to the application of the UNFC is the need in all countries involved in the Project to introduce significant adjustments in their respective national legislation.
- A good mixture of international consultants and national experts with expertise and advanced knowledge of the realities in the beneficiary countries created momentum to adopt effectively the best international experience in the integrated energy and water resource management that is appropriate for the specific situation and local conditions in the countries.
- The case studies developed in the beneficiary countries identified possible solutions for ending the local and global environmental damage caused by energy and water sectors, including bolstering transparency and traceability and cleaning global value chains.
- The case studies developed in the beneficiary countries stressed the need for the energy and water sectors to provide adequate levels of revenue that allow the countries to invest in their populations and in long-term sustainable development.
- The effective continuation of the Project's benefits and results beyond the Project closure will depend on a clearly articulated and financed sustainability plan and legislation for the integrated energy and water resource management, with well-defined roles and responsibilities that have had agreement formed and signed off by the Ministries of the beneficiary countries.
- Several stakeholders from Central Asian countries stressed that the road from the "improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management" and the "strengthened national capacities to develop evidence-based policies and strategies" in the same area is a very lengthy process, often taking several years.

7. Recommendations

The issue of Integrated Energy and Water Resource Management in Support of Sustainable Development is broad in scope and encompasses a vast range of sub-components. Additionally, it appears from an external vantage that following the conclusion of this project, UNECE needs to decide how it wants to continue the momentum generated by this project, as well as how to focus its limited resources to the best advantage of its member countries.

To this extent, the evaluation provides the following recommendations addressed to UNECE:

- 6) Preserve and maintain the networks created by the Project: While this may seem obvious, momentum from this project can only be carried forward if beneficiary countries are engaged at a close level and feel that they benefit from membership in this network. Internally, it will help establish UNECE as a serious counterparty on this issue for its member states. External benefits of this will be many, but not least, it will help develop further policy ownership from member nations and could work to enhance better institutional cooperation from line ministries.
- 7) Continue country-level capacity building: This project has been successful in discussing key areas of potential focus. While there was general appreciation of the work done on this project, there was some expectation from stakeholders interviewed that there should have been a greater element of 'hands on' capacity building. However, for this project it was not possible due to the Covid-19 crisis, where the majority of project activities were implemented online. For future projects, UNECE should launch a project with a presentation for all UN Country Teams (UNCT) of the project beneficiary countries and follow up with UNCTs in the process of project implementation. If further technical assistance is needed after the completion of the project, UNECE should work with UNCTs in the countries on providing such technical assistance and/or consider using other resources available internally for this purpose.
- 8) Enhance focus on gender, vulnerable groups and human rights issues: ECE should in its future activities related to water-energy-climate change-natural disasters nexus address more explicitly gender inequalities and the challenges faced by vulnerable populations, including by strengthening capacity building on gender mainstreaming and leaving no one behind, involving key UN partners such as UN-Women and OHCHR, as appropriate.
- 9) Mitigate the Project's sustainability risks: UNECE should guide the Governments of the beneficiary countries on how the activities related to UNFC application should be mainstreamed into the operations and programmes of the relevant Ministries. Specifically, the following actions are recommended:
 - o Maintain momentum to ensure continuity in the recipient countries by identifying ways to keep stakeholders motivated and engaged in the process and by keeping the issue of the integrated energy and water resource management high on the UNECE strategic and programmatic levels.
 - o UNECE should enhance dialogue and bilateral cooperation with the beneficiary countries aiming at a formal decision by the Governments of these countries to apply the UNFC system. As an initial step, consider supporting enhanced participation of national experts in the activities of the Expert Group on Resource Management.
 - o Water, geology, energy, economy, and ecology interconnectedness needs to be addressed and awareness-raising enhanced through future UNECE projects. To enhance the coherence of such future UNECE projects, efforts should be made to integrate into the Project Document a clear strategy for linkages with other similar initiatives by defining the nature of these linkages per each relevant activity in the work plan.
 - o Future UNECE efforts to strengthen the integrated energy and water resource management should focus on providing the beneficiary countries with practical examples and consultancy support on the institutional, legal and technical measures needed for the full implementation of the UNFC.
- 10) Expand and standardize "post-Project" lessons learned and knowledge management: Establish a sustainable platform/workspace for ongoing capture of the Project learning (lessons learned, good practices) and document these for adaptive management and future projects. Ensure adequate documentation of project activities and establish an archival system (SharePoint site) for storing and accessing data and information.

Annexes

1. Evaluation TORs
2. Project document including Project results framework
3. Evaluation questionnaire (for interviews and surveys)
4. List of stakeholders participating in the survey and/or interviews
5. List of documents reviewed
6. Evaluation matrix
7. Main lessons learned

Annex 1: Evaluation TORs

TERMS OF REFERENCE

1819AB: Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia

I. Purpose

The primary purpose of the evaluation is to assess the extent to which the objectives of the UNDA 11th tranche project “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia” were achieved. The evaluation will assess the relevance, coherence, effectiveness, efficiency and sustainability of the project in supporting member States to strengthen their capacities in the area of integrated energy and water resource management, in the context of the Sustainable Development Goals (SDGs). The evaluation will also assess progresses on human rights, gender equality results, disability inclusion, climate change and disaster risk reduction in the context of this engagement. The evaluation will finally look at the activities repurposed to address the impact of the COVID-19 crisis, and assess, to the extent possible, the ECE’s COVID-19 early response through this project.

The results of the evaluation will allow improving capacity building services provided to member States through regular technical cooperation as well as the development and implementation of similar future projects and activities by the Sustainable Energy Division (SED) of UNECE.

II. Scope

The evaluation will include the full project implementation during the period of 1 January 2018- 31 December 2021 in six countries (Bosnia and Herzegovina, Serbia, Kazakhstan and Kyrgyzstan as in the original project document; Tajikistan and Ukraine added to the list of beneficiary countries as part of repurposing to address the impact of the COVID-19 crisis).

III. Background

The project supports the Expected Accomplishments (a) “Improved policy dialogue and cooperation among all stakeholders on sustainable energy issues, in particular energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, mineral resource classification, natural gas and energy security”, (c) Strengthened implementation of ECE recommendations/guidelines, best practices and other normative instruments for sustainable energy development” of the UNECE Proposed Strategic Framework for 2018–2019 of Subprogramme 5 “Sustainable Energy”, and Expected Accomplishment (a) “Improved response to environmental challenges by ECE constituencies” of the UNECE Proposed Strategic Framework for 2018–2019 of Subprogramme 1 “Environment”.

The project builds on outcomes of the UNECE/ESCAP UNDA project “Sustainable Energy for All (SE4All) in Eastern Europe, the Caucasus and Central Asia.”

The overall goal of the project is to strengthen the national capacity of economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally.

The target groups of the project were national policy makers (Ministry of Energy and/or Mining and Ministry of Agriculture and Water Resources (or their equivalents), national energy, mining and water endowment regulators (Ministry of Environment or equivalent), national financial reporting regulators, financial institutions, energy and mining industry and water resources development organizations, and Universities / Educational Institutions. Specific attention was paid to vulnerable groups.

In March 2020, the project was modified to involve additional studies to ascertain the impact of the COVID 19 on several critical materials that are required in the production of medical equipment and supplies. Testing, diagnostics, treatment, personnel safety, and protection of healthcare workers are being severely hampered or compromised due to supply-chain disruptions. Mass-scale vaccine development and deployment also requires several critical raw materials.

The budget of the project was \$ 490,000.00 funded from the 11th tranche of the Development Account. The project was implemented in cooperation with ESCAP.

The project was managed in 2018-2019 by Viktor Badaker, Economic Affairs Officer and afterwards by Oleg Dzioubinski, Regional Adviser, funded from the Regular programme on technical cooperation (Sect. 23 of the regular budget).

Issues

The evaluation will answer the following issues: Relevance; Coherence; Effectiveness; Efficiency and Sustainability.

Relevance:

1. To what extent did the Project respond to the priorities and needs of the beneficiary countries to develop and strengthen their capacities in the area of integrated energy and water resource management, in the context of the 2030 Agenda?
2. To what extent were the activities consistent with global and regional priorities? How relevant were the activities vis-à-vis the programme of work of the UNECE? What value has UNECE’s efforts added in this area?
3. How relevant was the project to the target groups’ needs and priorities? Was there a focus on the most vulnerable ones?
4. Did the project apply gender, rights-based and disability inclusion approaches in the design, implementation, and results of the activities?
5. How relevant was the project with regards to climate change and disaster risk reduction?

Coherence:

6. How coherent was the collaboration with other entities in the UN system and other international organizations?
7. How coherent was the project design? Were the activities implemented in the required sequence needed to ensure the greatest impact of the project? To what extent are the outputs consistent with and relevant to the overall objective and expected accomplishments?
8. What adjustments, if any, were made to the project as a direct consequence of the COVID-19 situation, and to what extent did the adjustments allow the project to effectively respond to the new priorities of Member States that emerged in relation to COVID-19?
9. How did the adjustments, if any, affect the achievement of the project’s expected results as stated in its original results framework?

Effectiveness:

10. Did the project achieve the results expected during the project design in terms of the planned activities, outcome, and impact?
11. What were the challenges/ obstacles to achieving the activities, objective and expected accomplishments?

Efficiency:

12. Did the project achieve its objectives within the anticipated budget and allocation of resources?
13. How could the use of resources be improved? Would you propose any alternatives to achieve the same results? If yes, which ones?
14. Were the human and financial resources allocated to the project used efficiently and commensurate the project results?

Sustainability:

15. How is the stakeholders' engagement likely to continue, be scaled up, replicated or institutionalized? To what extent do the partners and beneficiaries 'own' the outcomes of the work?
16. To what extent are the objectives of the activity still valid? How can the activity be replicated in the UNECE region or in other regions?
17. What are the lessons learnt from the COVID-19 related activities? Could they be replicated?
18. What are the laws, regulations, policies or projects that have been developed so far based on the strengthening of capacities of the beneficiary countries in the area of integrated energy and water resource management and development of sustainable policies in this area?

IV. Methodology

a) The evaluation will be conducted based on the following mixed methods to triangulate information:

- A desk review of all relevant documents, as the primary source of information. The desk review will include *inter alia*: the project document and information on project activities (monitoring data) including the UNDA draft final report; studies and reports (Project reports, reports of the Committee on Sustainable Energy, reports of the Expert Group on Resource Management, financial information), project workshops reports. The consultant will also research projects in the same area conducted by other UN agencies.
- Interviews (in person and/or by telephone/video) to be conducted with (i) national coordinators who acted as UNECE counterparts throughout the national assessments and follow up activities; (ii) representatives of government agencies responsible for the areas addressed in the studies; (iii) representatives of enterprise support institutions such as professional bodies and industry associations; and (iv) partners involved in the project. As deemed necessary, focus group discussions via online platforms can also be organized.
- Online survey of the key stakeholders and beneficiaries. The survey will be developed by the consultant on his preferred platform.

b) Norms and standards

The evaluation will be conducted in accordance with the ECE Evaluation Policy and the Administrative instruction guiding Evaluation in the UN Secretariat (ST/AI/2021/3).

Gender equality and human rights considerations are integrated at all stages of the evaluation: (i) in the evaluation scope of analysis, evaluation criteria and questions design; (ii) in the methods, tools, and data analysis techniques; (iii) in the findings, conclusions and recommendations of the final report.

c) Outline of the final report

The evaluation report will strive not to exceed 30 pages and follow the mandatory outline for UNDA report to be shared by the Programme Management Unit. An Executive summary (max. 2 pages) will summarize the methodology of the evaluation, key findings, conclusions, and recommendations.

V. Evaluation schedule

- A. Preliminary research: by 1 January 2022;
- B. Data collection: by 15 February 2022;
- C. Data analysis: by 15 March 2021;
- D. Draft report: 1 April 2022;
- E: Final draft report: 15 April 2022; F: Final report: 31 April 2022.

Final timetable to be agreed following engagement of the evaluator. The timing above is indicative.

VI. Resources and Management of the evaluation

An independent consultant will be engaged for a period of 40 days to conduct the evaluation, within a budget of \$19,600, inclusive of all costs. To enhance the relevance, quality and credibility of the evaluation process, an Evaluation Committee will support the evaluation process. The Committee will be comprised of two members:

- Project Manager, Sustainable Energy Division
- Programme Officer in charge of evaluations, Programme Management Unit (PMU)

Mr. Igor Shpurov, General Director, Russian State Committee on Mineral Reserves

The Evaluation Committee will be involved in the following steps:

- Review of the Terms of Reference
- Review of the proposed evaluator profiles
- Reception and review of the draft evaluation report

The Project Manager, Mr. Oleg Dzioubinski, in consultation with Mr. Scott Foster, Division Director, will be involved in the following steps:

- Provide all documentation needed for desk review, contact details, support and guidance to the evaluation consultant as needed throughout the timeline of the evaluation
- Advise the evaluator on the recipients for the questionnaire and for follow-up interviews
- Process and manage the consultancy contract of the evaluator, along the key milestones agreed with PMU

The Programme Management Unit will be involved in the following steps:

- Selection of the evaluator
- Prepare and clear the Terms of Reference
- Provide guidance to the Project Manager and evaluator as needed on the evaluation design and methodology
- Clearance of the final report after quality assurance of the draft report

VII. Intended Use/Next Steps

Findings of this evaluation will be used when possible to:

- improve direct project's follow up actions, implementation of products by project beneficiaries and dissemination of the knowledge created through the project;
- learn lessons from early response to the impact of COVID-19, to develop further related projects
- assess the gaps and further needs of countries in the area of this project;
- formulate a tailored capacity building projects to strengthen the national capacity in integrated management of energy, mineral and water resources;
- induce new project ideas, improving the planning and design of future capacity-building activities and projects on integrated management of energy, mineral and water resources in the UNECE region.

The results of the evaluation will be reported to the Committee on Sustainable Energy.

Following the issuance of the final report, the Project Manager will develop a Management Response and action plan for addressing the recommendations made by the evaluator. The final evaluation report, the management response and the progress on implementation of recommendations will be available on the UNECE website.

VIII. Criteria for evaluators

Evaluators should have:

- _An advanced university degree or equivalent background in relevant disciplines
- _Specialized training in areas such as evaluation, project management, advanced statistical research and analysis.
- _Demonstrated relevant professional experience in design, management and conduct of evaluation processes with the UN Secretariat, with multiple stakeholders, survey design and implementation, and project planning, monitoring and management, gender analysis and human rights due diligence
- _Demonstrated methodological knowledge of evaluations, including quantitative and qualitative data collection and analysis for end-of-cycle project evaluations.
- _Fluency in written and spoken English.

Evaluators should declare any conflict of interest to UNECE before embarking on an evaluation project, and at any point where such conflict occurs.

Annex 2: Project document including Project results framework

PROJECT DOCUMENT 11TH TRANCHE OF THE DEVELOPMENT ACCOUNT

EXECUTIVE SUMMARY

Project Code and Title :	1819AB Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia
Start date:	<i>January 2018</i>
End date:	<i>December 2021</i>
Budget:	490,000.00
UMOJA cost centre(s):	<i>13824</i>
UMOJA functional area(s):	<i>20AC0005</i>
Target countries:	<i>Bosnia and Herzegovina, Serbia, Kazakhstan and Kyrgyzstan</i>
Executing Entity/Entities:	UNECE
Co-operating Entities within the UN Secretariat and System:	ESCAP
Brief description: Energy and water are integrally related and strongly interdependent, and core to facilitating sustainable development. The proposed project aims to develop an integrated management and monitoring tool focused on interconnecting energy and water systems and helping to manage the impact of energy production on water systems. More specifically, the project will assist the beneficiary countries to identify and develop best practices and measures to apply a cross-cutting approach to energy and water resource management. There are four beneficiary countries of this project in South-East Europe and Central Asia that possess large hydro-energy potential, which could be improved and enriched by improved awareness about water-energy intersectoral links and impacts. The proposed project will bring together the UNECE internationally applicable framework for the classification, management and reporting of energy and mineral reserves and resources – the United Nations Framework Classification for Resources (UNFC), and accumulated experience on the water-energy-food nexus within the framework of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention). The key stakeholders will be policy makers responsible for development of national policies on energy and water resources, and private sector entities, which should play an active role in investments to employ advanced technologies with all related benefits. The project further seeks to help member States with economies in transition to identify best practices, measures and procedures relevant to sustainable energy transition with a particular focus on the cross-cutting nature of energy and water resources management applicable nationally. The proposed beneficiary countries do not have the necessary policy and regulatory infrastructure to enable progress on these fronts. The project will therefore assist the development of national policies for integrated energy and water resources management in Bosnia and Herzegovina, Serbia, Kazakhstan and Kyrgyzstan. Further this project directly links to UNECE efforts to support member States in the implementation of Sustainable Development Goal 6 and 7.	

BACKGROUND

1 Context

Energy and water are highly interdependent, and are core pillars for sustainable human development. Water is required in all phases of fuel production and electricity generation. It is also used to transport and store energy. Conversely, it takes energy to extract, treat, transport and purify water. The current energy and water demand and resource use trajectories, in particular in South-East Europe and Central Asia, threaten to undermine the attainment of sustainable development. However, integrated and more efficient use of energy and water resources and reduced wastage, combined with demand management can reverse this negative trend.

Traditionally, at the national and international levels, energy and water systems have been developed, managed and regulated independently. Many energy and water projects (municipal water supply, irrigation, flood control, hydropower) are facing major challenges with environmental and social acceptance resulting in stalled projects, conflict and financial write-downs in the UNECE region.

The proposed project aims to develop an integrated management and monitoring tool focused on interconnecting energy and water systems, which helps to manage the impact of energy production on water systems. The project will assist beneficiary countries to identify and develop best practices and measures to apply a cross-cutting approach to energy and water resource management.

There are four beneficiary countries for this project in South-East Europe and Central Asia that possess large hydro-energy potential which could be improved and enriched by improved awareness about water-energy intersectoral links and impact. The proposed project will bring together UNECE internationally applicable framework for the classification, management and reporting of energy and mineral reserves and resources – the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC), and accumulated experience on the water-energy-food nexus within the framework of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

The UNECE Water Convention assists Parties in preventing, controlling and limiting the transboundary impacts of development, activities and protecting water resources and the environment, while promoting the equitable and reasonable use of water resources and cooperation between countries, including through exchange of data and information.

Application of the UNFC, with its focus on the total resources available in any basin, will facilitate comprehensive extraction and allow any geological, technical or socio-economic barriers to be identified, to ensure maximum efficiency and minimizing waste. It will also ensure that the data is available to make informed and transparent decisions for the development and sustainable management of energy and water resources. Consistent, coherent and reliable data and other information provide the basis for better planning and management of energy and water resources, and hence sustainable development. In implementing this project, UNECE will work closely with UNESCAP (in Kazakhstan and Kyrgyzstan) and relevant international and non-governmental organizations dealing with the energy-water nexus.

2 Mandates, comparative advantage and link to the Programme Budget

Mandates

The Committee on Sustainable Energy in 2013 mandated the Expert Group on Resource Classification (EGRC) to carry out concrete results-oriented activities in the work areas in the classification and management of natural resources. The EGRC is encouraged, drawing exclusively on extra budgetary resources, on the development of capacity building programmes on UNFC and facilitate development of case studies.

The project is directly linked to Expected Accomplishments (a) “Improved policy dialogue and cooperation among all stakeholders on sustainable energy issues, in particular energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, mineral resource classification, natural gas and energy security”, (c) Strengthened implementation of ECE recommendations/guidelines, best practices and other normative instruments for sustainable energy development” of the UNECE Proposed Strategic Framework for 2018–2019 of Subprogramme 5 “Sustainable Energy”, and Expected Accomplishment (a) “Improved response to environmental challenges by ECE constituencies” of the UNECE Proposed Strategic Framework for 2018–2019 of Subprogramme 1 “Environment”.

The project is linked to the Programme of work for 2016–2018 of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes adopted by the 7th Meeting of the Parties (a part of the Environment subprogramme), and in particular Programme area 3: Water-food-energy-ecosystems nexus in transboundary basins.

The project is directly linked to the Expected Accomplishment (a) “Improved policy frameworks to ensure access to affordable, reliable, sustainable and modern energy for all, including gender perspectives” of the Subprogramme 9 “Energy” of the ESCAP Proposed Strategic Framework for 2018-2019.

Comparative advantage

UNECE has the comparative advantage to support and provide assistance to member countries on the development of an integrated management and monitoring tool aimed at interconnecting energy and water systems and helping to manage the impact of energy production on water systems. In particular, UNECE and UNESCAP have the comparative advantage to support and provide assistance to member countries on development of National Action Plans for Sustainable Energy for All (SE4All) in the context of the post 2015 Sustainable Development agenda. UNECE/ESCAP outcomes of the project “Sustainable Energy for All (SE4All) in Eastern Europe, the Caucasus and Central Asia” along with UNESCAP analytical reports including the annual Regional Energy Trends Report in Asia-Pacific have showed how member countries with economies in transition are driving the sustainable energy agenda with enhanced sustainable use of energy resources.

The UNECE Water Convention helps its Parties in preventing, controlling and limiting transboundary impacts from development, activities and protecting water resources and the environment, while promoting the equitable and reasonable use of water resources and cooperation between countries, including through exchange of data and information.

Application of the UNFC (developed and managed by UNECE) with its focus on the total resources available in any basin, will facilitate comprehensive extraction and allow any geological, technical or socio-economic barriers to be identified, to ensure maximum efficiency and minimizing waste. It will also ensure that the data is available to make informed and transparent decisions for the development and sustainable management of energy and water resources. Consistent, coherent and reliable data and other information provide the basis for better planning and management of energy and water resources, and hence sustainable development.

3 Country demand and target countries

There are four beneficiary countries for this project: two from South-East Europe (Bosnia and Herzegovina and Serbia) and two from Central Asia (Kyrgyzstan and Kazakhstan). The countries were chosen on the basis of their demand for the project and their energy and water resources management profiles, in particular transboundary water management. Since all selected countries possess hydro-energy potential, their work could be improved and enriched by improved awareness about water-energy intersectoral links and impacts. Participation in the project countries from different sub-regions of UNECE will make it possible to exchange broadly experience in tackling challenges in the management of water and energy resources. In addition, selected countries represent the riparian countries sharing the basins: Syr Darya River for Kyrgyzstan and Kazakhstan; Sava River for Bosnia and Herzegovina and Serbia. The project will promote not only identification of intersectoral but also transboundary synergies that could be further explored and utilized in the different basins in the various UNECE sub-regions. All countries expressed their interest to participate in the project. As for the Central Asian countries, the United Nations Special Programme for the Economies of Central Asia (SPECA) 20th Session of the Thematic Working Group on Water, Energy and Environment concluded that: (i)

SDG 6 and SDG 7 are very closely interlinked which is demonstrated by assessments of the water-food-energy-ecosystems nexus. Therefore, an intersectoral approach to implementing the SDGs, conscious of the interlinkages, synergies and trade-offs, is necessary, and (b) while developing their National Action Plans to meet SDG 6 and SDG 7, SPECA countries should pay attention to transboundary impacts and energy as well as water cooperation opportunities and consider their impact on the potential of the country's energy resources, food production and the environment.

all four targeted countries expressed their interest during the Expert Group on Resource Classification meetings on application of UNFC as an interconnected tool with other systems to manage impacts on water systems and monitor progress during resource extraction. Trans-boundary sharing of water infrastructure can be part of the mitigation plans, which UNFC can contribute for integrated management and monitoring. UNFC is used in many countries for effective management of national resource endowments and socio-economically efficient development of the energy resources contributing to sustainable development.

These four countries do not have the necessary institutional, policy and regulatory infrastructure to enable progress to develop an integrated management and monitoring tool aimed at interconnecting energy and water systems and to attract significant foreign and domestic investments for employing advanced energy and water efficient technologies with all related benefits. The project will also identify best practices and specific measures and procedures to apply a cross-cutting approach to energy and water resource management with a particular focus on the cross-cutting nature of energy efficiency, renewable energy and water resources management.

Beneficiary countries do not have the necessary policy and regulatory infrastructure, to enable progress on these fronts. The project will assist member States in the development of sets of policy recommendations for sustainable energy and water resources management to be adopted/ included into national strategies by beneficiary countries. Furthermore, it will help to convert new policies into effective national policy frameworks.

4 Link to the SDGs

Relationship to the SDGs and targets: 6.3, 6.4, 6.5, 7.1 and 7.2

The project will support attainment of:

(i) Sustainable Development Goal 7 (Ensure access to affordable, reliable, sustainable and modern energy for all) and its targets:

7.1 "By 2030, ensure universal access to affordable, reliable and modern energy services" and

7.2 "By 2030, increase substantially the share of renewable energy in the global energy mix";

(ii) Sustainable Development Goal 6 (Ensure availability and sustainable management of water and sanitation for all) and its targets:

6.3 "By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally",

6.4 "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity", and

6.5 "By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate".

ANALYSIS

3.1 Situation Analysis

Balancing the food-water-energy supply and use has deeper implications than usually appreciated. Even a slight imbalance in one aspect of this essential triangle can have strong unintended implications to societies. The rise and fall of human settlements from the Neolithic times are intimately related to these three variables. There are several current examples where total societal breakdown and intense strife have resulted from an imbalance created by food, water or energy security. The three pillars of peace and security, development and human rights in a society have essential linkages to balanced food production, energy security and water availability.

Uninterrupted provisioning of energy and water are essential for the socio-economic development and attainment of SDGs in all the beneficiary countries. Energy production is intimately related to mining which has a significant impact on underground as well as surface water resources. Water is a source of energy, in the form of hydropower, which is also an option for energy storage. The availability and supply of water for food production or domestic consumption requires energy. There is a strong water-energy nexus that is well understood. Both are resources that need to be nurtured, utilized, conserved and protected with the right intentions of sustainable development. However, finding the proper balance in energy and water resource management has become a major challenge in many countries.

While recognizing that energy and water are direct and essential inputs to food production, it is seen that there is a lack in beneficiary countries to have the required capability to develop policy recommendations and an action plan for integrated energy and water resources management. A part

of this difficulty stems from lack of knowledge or understanding of the application of United Nations Framework Classification for Resources (UNFC), an international standard and management framework for the balanced development of natural resources like petroleum, mineral and water resources. Because of the absence of an overarching framework, the beneficiary countries lack capacities for collection of consistent, coherent and reliable data related to energy and water resources. This has led to gaps in evidence-based policies and strategies for integrated management of water and energy resources. Moreover, the lack of standards are acutely evident in focus on process, rather than actual results of developmental programmes related to energy and water management.

In responding to country situations as above, it is also necessary to build on existing capabilities and resources. The four identified beneficiary countries have significant natural resource potential, which have been utilized to maximize economic and social returns. The proceeds from energy and mineral resources continue to provide the necessary revenue that has been channeled for overall socio-economic development, especially in areas such as health, education and women welfare. While drawing upon these strengths, it is essential to see how capacities could be strengthened for integrated development, rather than a fragmented approach currently common in the beneficiary countries.

Energy resource management: The current energy mix of the target countries is dominated by fossil fuels in all countries. The dependency of fossil fuels is the highest in Bosnia and Herzegovina (91.8 per cent), Serbia (87.4 per cent), Kazakhstan (99.1 per cent) and Kyrgyzstan (73.8 per cent). Hydropower has a significant contribution in Kyrgyzstan (26.2 per cent), while it is marginal in Bosnia and Herzegovina (5.4 per cent), Serbia (5.8 per cent) and Kazakhstan (0.8 per cent).

All the countries expect significant growth in the future; yet have only 19 to 51 ranking out of 106 in per capita electricity consumption among non-OECD countries. The demand for energy is therefore expected to grow as urbanization progresses in these countries. To balance the energy fuel imports and assure energy security is a major challenge in most countries. Reducing dependence on fossil fuel, especially coal and lignite is a major problem. Increasing the contribution of hydropower will be keenly sought in most countries in their quest for an optimal energy mix that considers a balance between energy security, environmental impacts, including reducing the carbon footprint.

All the countries have a significant contribution to the GDP from mineral-based industries including energy (coal, oil and natural gas) and non-energy materials (base metals, phosphates, limestone, etc.). In some countries, mining is a source of considerable export revenue. Significant levels of industrial employment are generated from the mining industry. The outlook in all the countries shows increased mining activities, especially coal, petroleum and natural gas.

Mining will be accompanied by significant environmental impacts in the absence of long-term planning and management. Current mining patterns show a significant reduction in productivity as readily available resources are exhausted, and grades are lowered. This also causes an exponential increase in the mining footprint, wastes generated and growth in the land, water and material resources consumed. Due to efficiency losses, mining is impacting the environment more, especially in water pollution, acid mine drainage and other waste issues. Along with increasing population pressures, mining projects are coming into conflicts other land uses such as agriculture and city development.

Recent years, since 2010, saw a massive downturn in mineral commodity prices. This has introduced considerable stress in the mining depended economies and in the profitability of companies and projects. Many mining centres had to reduce production, layoff employees and cut costs in various ways. Safety and environmental controls which in recent years have a significant impact on the costs are usually threatened by cost cutting measures. In some extreme cases, mining projects were abandoned without proper remediation. There were unattended wastes lying around and public exchequers, which were already impacted by reduced revenues, saw additional burden thrust on them for cleaning up abandoned sites.

This had made the public very hostile to mining projects. As the countries are under pressure to increase mine production, the low commodity prices has become a reality. The old paradigm of mineral rents based on the low unit cost of production and high commodity prices is no longer valid. Rent sharing in the form of royalties and cooperate profit sharing is becoming more and more disputed today. Increased under performance by the industry due to declining grades and challenging mining situations added to the market pressures has made mining a questionable activity everywhere.

Water resource management: Globally, more than 2 billion people live in countries with excess water stress, defined as the ratio of total freshwater withdrawn to total renewable freshwater resources above a threshold of 25 per cent. The situation in some of the target countries is no different, especially in rural agricultural based communities. All the beneficiary countries have some form integrated water resources management plan, though there is diversity in how they are formulated and actually implemented. In some countries, such plans are at an early stage of implementation and hence face considerable difficulties due to lack of experience and competencies.

Even though most countries have sufficient water resources increasing consumption and pollution are putting stress on the aquifers and surface water systems. A major example of the lack of foresight and planning in the past is the near disappearance of the Aral Sea (shared by Kazakhstan and Uzbekistan), often referred as one of the planet's worst environmental disasters. Formerly one of the four largest lakes in the world with an area of 68,000 km², the Aral Sea has been steadily shrinking since the 1960s after the rivers that fed it was diverted for various uses. Currently, only three small lakes remain, and desertification is rapidly setting in. The eastern part of Aral Sea is now called the Aralkum Desert. Even though there is an ongoing effort in Kazakhstan to save and replenish the North Aral Sea, this is a stark example of what can happen when water resources are improperly managed.

Large populations, especially in rural areas lack access to good quality drinking water. Agricultural runoff and mining wastes are polluting the river systems in many countries. Proper management of mining impacts on water bodies is necessary to conserve and rejuvenate the water systems in many countries.

In many countries, climate change is a grave threat to water resources. Many glaciers that are the sources of water supply are under retreat. In has reduced water flow in river systems. Additionally, increased use for agriculture and damming for hydropower projects is also creating an impact. Dams not only degrade the downstream riverine systems by increased side bank erosion and have impacts like acidification of the water.

Interdependencies: There is a need for integration of energy provisioning policies in target countries based on international best practices and local realities and improving them based on shared experience. While increased demand for energy is foreseen in all countries, especially in improving the per capita consumption of electricity, policies are not usually fully aligned to balance the new environmental and technological realities. This gap is more acute in the development and production of fuels and non-fuel structural materials required for energy expansion.

Improved integration of water management policies and practices are necessary. While there should be a thrust for further development of hydropower, there should be a full appreciation of impacts this could have on the water resources of the country. Groundwater resources are a category of its own, which needs to be defined and managed sustainably as an energy resource. Already there is a good example of Kazakhstan defining their water resources as “reserves” and “resources”, though the classification may not be entirely consistent with international best practices.

Development of energy resources could have an impact on the availability of underground water resources, which should be figured in throughout the life cycle of a mining project. This could stem from the necessary use of fresh water in the production of petroleum or minerals, the pollution of groundwater aquifers and contamination of fresh water sources due to mine wastewater run-offs. Complete recycling of water used in petroleum and mineral production cycle though has been demonstrated successfully in many countries has not been fully adopted everywhere.

The impact of energy on water resources become acute when new sources of energy are found and developed. There is a thrust in the target countries to develop shale gas as an alternative source of energy. However, the production of shale gas requires large quantities of fresh water. The back flow from such operations could contaminate local groundwater as well as surface water sources.

A similar caution could also apply to the development of green technologies like wind power or solar energy. All these technologies require large quantities of critical materials like rare-earth elements, cadmium and lithium, the production of which will have an impact on water resources. Solar photovoltaic panels require large amounts of fresh water for cleaning the dust that settles on them and thus reduces its efficiencies. Concentrated solar power can raise local temperatures that can disturb the water balance in the locations lower of the water tables. Lowering of the water tables and aggravated loss of soil moisture could be caused by such projects.

The interdependencies of energy and water resources are therefore well understood and demonstrated. However, the problems are so complex that there has been a difficulty in finding a common approach to finding and implementing appropriate solutions. Clearly, there is a need to differentiate the approach for tackling resource management into two: the structure and the content. The structure of a natural resource entity (petroleum accumulation or a ground water aquifer) is the standard framework or logic that can define it in a universally understandable manner. The content, or in other words, the super structure, are the unique factors that are associated with a particular resource entity.

The UNFC provides a critical tool to differentiate between the structure and the content of resource entities. This approach provides the most efficient method for sustainable resource management by identifying interrelations among the social, economic, technological and physical aspects of a resource base. These interrelationships are defined by three fundamental criteria of socio-economic viability, project feasibility and uncertainties in estimates. The attributes of an individual resource are determined by these three structural elements and classified based on its utility value. The classification based on the unique features of a resource is essentially a method of mapping its progress in sustainable development pathway.

Such an understanding derived from three interlinked criteria and unique features determine its status in a sustainable resource development pipeline. It provides a tool for decision makers to determine what the resource development project has achieved so far, and what needs to be done to improve the situation. This can then be the basis of decision-making on why, by whom, when, where and how much to invest and what are the expected financial, social and environmental returns will be. UNFC thus becomes an important tool for policy and strategic decision making and can be used by Governments, companies and financial stakeholders.

UNFC provides this natural resource management functionality through a three-tiered set of documentation – definitions, rules and guidelines. Best practices and case studies are further provided to help in the application. UNFC has been proven to be applicable for all resources such as petroleum, minerals, renewable energy, secondary resources from waste, as well as projects for geological storage of carbon dioxide. It has been used successfully in managing water resources in many countries. UNFC encompasses Sustainable Development Goals (SDGs) in its core. Hence, the UNFC is a unique and the only available tool today that enables an understanding of the complex interdependencies in energy and water resource management.

Even though some of the target countries have exposure to UNFC, there has been no concerted effort to use it effectively. This makes the target countries disconnected from international best practices and has an enormous impact on their preparedness to overcome the energy and water resource management challenges of the future.

The underlying issues in the target countries can be summarized as:

1. Lack of coherent and systematic approach to sustainable development of energy resources;
2. Lack of planning and long-term vision in the management of water resources; and
3. Lack of holistic approach to understanding and manage the energy-water dependencies.

Energy and mining industries historically excluded women, which is now progressively changing worldwide. Energy and good quality water access are more important for women, children and other vulnerable groups of the society. Availability of clean energy can improve health and well-being of women and children. Many groups of the rural populations still depend on unhealthy biomass use for cooking. Availability of clean water is an issue mostly with the disadvantaged sections of the rural society. Better access to water improves life-expectancy in children and provides overall well-being of women and other disadvantaged sections of the society.

3.2 Country level situation analysis

Country	Status of Affairs	Realistic outcomes
Bosnia and Herzegovina	<p>Total primary energy supply from Coal 65.5 per cent, Oil 23.2 per cent, Gas 3.1 per cent, Hydro 5.4 per cent and Other Sources 2.7 per cent. Total electricity generated per annum is 14 TWh. Per capita, electricity consumption of 2,893 kWh (34/106 in Non-OECD countries) has grown ~ 3 per cent annually in the last 5 years. Mining account for 2.19 per cent of the GDP, 1.4 per cent of exports and 11.2 per cent of imports. 80 per cent of the total imports is crude petroleum and natural gas. The country's dependence on crude oil and gas imports will likely continue, and no domestic production is expected in the short term. Significant coal and lignite producer, about 12 million tonnes/year. Coal production is projected to increase in the coming years owing to the modernization projects at mines and the demand from proposed new thermal power generation capacity. Decreasing the dependency of fossil fuels, addressing the environmental impacts of coal mining and increasing the contribution of hydropower are the major issues.</p> <p>Despite the abundant water resources in Bosnia and Herzegovina, access to safe drinking water is well below EU standards: currently, around 65 per cent of the population is connected to public/municipal water utilities (compared to the EU average of 90 per cent). Drinking water supply in terms of quantity and quality is only satisfactory in the major urban areas. In the countryside, where most of the poor and vulnerable people live, the situation is much harder. There are no existing water management facilities, which is a significant disadvantage to the potential of water exploitation in the country, as well as maintaining the quality and quantity of water.</p> <p>Despite the importance of energy security for Bosnia and Herzegovina, development planning for the energy sector is not necessarily connected with water management planning, especially in ensuring necessary water for agriculture and other water uses. The Sava River Basin is a major source of hydropower in the country. To meet the long-term renewable energy targets set by the European Union heavy dependence on the Basin's water resources are foreseen. This calls for increased coordination and cooperation between entities managing the energy and water resources.</p> <p>Ministry of Foreign Trade and Economic Relations is responsible for defining energy policy general principles and coordinating activities. Ministry Of Agriculture, Water-Management And Forestry is responsible for water resources.</p>	<p>Development of national framework for assessing energy-water interlinkages.</p> <p>State system for determining coal resources and its impact on water resources using UNFC in selected areas; assessment of project maturity and sustainability of hydropower resources using UNFC; Assessment of groundwater resources in selected basins using UNFC.</p> <p>Increased availability of clean and affordable energy and water in the country.</p>
Serbia	<p>Total primary energy supply from Coal 52.5 per cent, Oil 22.5 per cent, Gas 12.4 per cent, Hydro 5.8 per cent and Other Sources 6.9 per cent. Total electricity generated per annum is 36.7 TWh. Per capita, electricity consumption of 3,754 kWh (22/108 in Non-OECD countries) has grown ~ 1.3 per cent annually in the last 5 years. Refined petroleum products industry is significant, which is being</p>	<p>Improved policy framework for the sustainable and holistic development of energy, mineral and water resources.</p> <p>Assessment of mineral resources and its impact on water resources in selected areas using</p>

	<p>modernized and expanded. Mining accounts for 2 per cent of the GDP. In the longer run, new projects in the nonfuel mineral sector are likely to provide a significant source of revenue to the Government and a boost to the GDP. Increasing the share of hydropower and tackling the concerns of increased mining are the major issues.</p> <p>Domestic water resources in Serbia are insufficient, characterized by unequal spatial and temporal distribution. The most water supply systems are at risk for microbiological or physical-chemical malfunction. The quality of drinking water according to certain parameters is unsatisfactory.</p> <p>Currently the development planning for the energy sector is not necessarily connected with water management planning. The Sava River Basin is a major source of energy as well water for agriculture and other uses. With the current energy sector outlook, the balance between hydropower development and agricultural expansion needs to be carefully managed. Significant crop yield increases could be obtained by optimizing irrigation. However, increased irrigation might have substantial effects on surface water and groundwater flow, especially during dry periods. Higher levels of irrigation could also reduce water availability for hydropower generation on some of the tributaries. These issues have not been properly addressed now.</p> <p>Ministry of Mining and Energy is responsible for mining and energy. Ministry of Agriculture, Forestry and Water Economy is responsible for water resources in Serbia</p>	<p>UNFC system; Assessment of hydropower potential in the country; Assessment of groundwater resources in selected basins using UNFC system.</p> <p>Increased availability of clean and affordable energy and water in the country.</p>
Kyrgyzstan	<p>Total primary energy supply is from Coal 25.3 per cent, Oil 39.9 per cent, Gas 8.6 per cent, Hydro 26.1 per cent and other sources 0.1 per cent. Total electricity generated: 13.3 TWh. Per capita, electricity consumption of 1,710 kWh (51/106 in Non-OECD countries) has grown ~ 7 per cent annually in the last 5 years. The country had 380 mining enterprises. Kyrgyzstan has limited natural gas resources, and some of the gas fields remained undeveloped owing to the lack of infrastructure. Coal production has increased to reduce dependency on gas imports. Mining production is valued at \$125 million per year, and gold production has significantly contributed to the growth in recent years. Kyrgyzstan is intensifying its efforts to increase mineral production and to attract foreign investors in its mining industries. Managing the sustainable development of fossil fuel resources including coal and natural gas and further increasing hydropower contribution are the biggest challenges. Kyrgyzstan has significant legacy mining waste issues, which poses a direct threat to the environment of both Kyrgyzstan and neighbouring countries.</p> <p>Kyrgyzstan has an adequate supply of high-quality water for future use, provided the resource is prudently managed. Sharing of water resources from the Amu Darya and Syr Darya rivers is a significant issue with the neighbouring countries. Some of the heavily polluted regions have low water</p>	<p>A holistic framework for assessing the domestic resources of energy, mineral and water resources.</p> <p>Assessment framework for hydropower potential of the country using UNFC; Assessment of mineral resources using UNFC and its impact in selected areas; Assessment of groundwater resources using UNFC in selected basins.</p> <p>Increased availability of clean and affordable energy and water in the country.</p>

	<p>qualities. The primary sources of toxic waste in the water supply are from the mining operations.</p> <p>Kyrgyzstan has a challenge in pursuing effective management of energy and water resources. This has been aggravated since 2008 by seasonal water and energy shortages. The need for an integrated approach towards managing pollution of the Chu River has been recognized for long, but lack of coordination between several ministries and departments could slow the implementation of such programmes.</p> <p>Management of national energy and fuel policy is distributed among several ministries and other state agencies such as State Geological Commission and State Committee on Industry, Energy, and Subsoil Management. The Ministry of Agriculture, Food Security and Land Reclamation of the Kyrgyz Republic, Department of Water Resources and Land Reclamation is responsible for water resources.</p>	
<p>Kazakhstan</p>	<p>Total primary energy supply from Coal 45.9 per cent, Oil 22.1 per cent, Gas 31.1 per cent, Hydro 0.8 per cent and Other Sources 0.1 per cent. Total electricity generated per annum is 94.6 TWh. Per capita, electricity consumption of 3,889 kWh (19/108 in Non-OECD countries) has grown ~ 2.4 per cent annually in the last 5 years. World's leading uranium producer providing about 40 per cent of the world production. The mineral industry accounted for a significant share of the country's gross domestic product (GDP) and export revenue; petroleum and natural gas were the leading commodities regarding production value. Mining activities are estimated at \$70 billion annually. Interest in Kazakhstan's mineral industry will likely continue to increase along with an increase in the number of projects aimed at exploiting the country's significant mineral resources.</p> <p>Kazakhstan has limited renewable water resources. This may become a serious limiting factor for development of Kazakhstan's very rich natural resources, its economy as well as its sustainable development. The total probable and explored ground water reserves in Kazakhstan are estimated to be 45 km³ per annum or 1,450 m³ /sec. The proven reserves comprise 16.04 km³ or 468 m³ /sec. Some of Kazakhstan's water supply has been polluted by industrial and agricultural runoff. The Aral Sea, which is shared with Uzbekistan, has shrunk to three separate bodies of water because of water drawdowns in its tributary rivers. The reduction in the Aral Sea's water surface has exacerbated regional climatic extremes, and agricultural soil has been damaged by salt deposits and eroded by the wind. Desertification has eliminated substantial tracts of agricultural land. Kazakhstan uses in-situ leach method for mining uranium, which has a large impact on ground water.</p> <p>Common energy and water resources management policies are seen as a priority in Kazakhstan. Even though considerable progress has been made, the lack of an overarching energy and water resource</p>	<p>National sustainable energy, mineral and water resources management framework.</p> <p>Assessment of energy and mineral resources using UNFC in selected areas; Assessment of the impact of mining on water resources in selected areas; Assessment of groundwater resources using UNFC in selected areas.</p> <p>Increased availability of clean and affordable energy and water in the country.</p>

	<p>management system has slowed down its progress and lessened the real impact. Kazakhstan's agricultural researchers have expressed a great deal of concern over a disconnect with energy and water policies. They pointed out that due to an integrated approach about 66% of the country's 180 million hectares of agricultural land have slowly been turning into deserts over the past several decades.</p> <p>Ministry of Energy is responsible for the energy sector. Ministry of Agriculture, Committee on Water Resources is responsible for water resources.</p>	
--	--	--

3.3 Stakeholder analysis and capacity assessment

Non-UN Stakeholders	Type and level of involvement in the project	Capacity assets	Capacity Gaps	Desired future outcomes	Incentives
National Policy Makers (Ministry of Energy and/or of Mines; Ministry of Agriculture and Water Resources)	Creation of policies for UNFC adoption as a tool for sustainable management of all energy, mineral and water resources.	Convening power knowledge and expertise in sustainable energy, mineral and water resource development programmes	Absence of a national system for unified management of all energy, mineral and water resources Lack of competent Officials & Experts	UNFC adopted as a national system, or existing national systems bridged to UNFC	Aspiration of attaining integrated energy and mineral policy development and having a management system aligned to an internationally-recognized best practice. This will increase coherence of policies across food-water-energy resources and the linkages to SDGs. Such an approach will strengthen country's vision of peace and security, development and human rights.
National Energy, Mining and Water Endowment Regulators (Ministry of Environment)	Application of UNFC guidelines and best practices on environment	National regulators for energy & mining related activities	Absence of a tool for managing energy and mining projects	UNFC applied to manage national resources endowments	Universal system for sustainable resource management can attract investment for sectoral growth
National Energy, Mineral, Water Development Agencies / Institutes	Application of UNFC for national energy, mineral and water development projects	Access to research, development & innovative projects	Absence of coherent framework to manage development projects	UNFC applied on a case to case basis to innovative projects	Use of a flexible & universal tool for resource assessment & technology development
National Financial	Develop UNFC	Authority to	Absence of a	UNFC applied for	Use of universal

Reporting Regulators	compatible reporting standards & guidelines for financial reporting	define financial regulations for energy & mineral and water basin development investments	global standard for universal reporting of energy, mineral & water projects	financial regulations.	standards for reporting by companies /organizations
Energy and Mining Industry and Water resources development organization	Capacity Building in the application of UNFC	Operators of energy and mineral extraction projects	Absence of skilled human power to correctly assess & manage projects	UNFC applied as a tool for internal resource & public reporting functions	Availability of skills to handle modern problems of energy/water resource management
Financial Institutions	Adoption of UNFC standards & guidelines for financial reporting	Access to funding for energy & mineral extraction projects and water management projects	Absence of a universal tool to assess the performance of energy, mineral and water resource projects	UNFC utilized as an assessment tool	Availability of an accessible tool for evaluation of energy, mineral and water management projects
Universities / Educational Institutions	Incorporating UNFC in the curriculum and providing education and training inputs	Direct involvement in the development of energy, mineral & water resources curricula Undertake industry consultations	Conflicting international standards for classification & management of energy, mineral and water resources	UNFC & the basic resource classification & management system included in the educational system.	Close association with UNFC experts on the inclusion of UNFC in course & research programmes

PROJECT STRATEGY: OBJECTIVE, EXPECTED ACCOMPLISHMENTS, INDICATORS, MAIN ACTIVITIES

5 Project Strategy

The overall goal of the project is to strengthen the national capacity of economies in transition to develop policy recommendations for integrated energy and water resources management, applicable nationally.

The project intends to contribute to filling some of the identified gaps outlined above which are responsible for the lack of integrated energy and water policies. These gaps include lack of relevant information and data, limited policy/regulatory infrastructure, and slow implementation on various topics, including the application of UNFC in the UNECE and UNESCAP regions. Where data exists, it is largely unreliable and incomplete, making it difficult to develop baseline conditions for both policy and measurement of progress. Even though some of the target countries have exposure to the UNFC, there has been no concerted effort to use it effectively. This disconnects the target countries from international best practices, and has an enormous impact on their preparedness to overcome the energy and water resource management challenges of the future.

The objective of the project will be pursued by achieving the following results:

(EA1) Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management; and

(EA2) Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources.

Both the objective and the expected accomplishments will be achieved through the implementation of the following activities:

(A1.1) Conduct an assessment of the existing gaps in data collection related to water and energy resources management and monitoring;

(A1.2) Develop guidance/or training materials on data collection related to energy and water management and monitoring;

(A1.3) Provide four national trainings on data collection related to sustainable energy and water resources management and monitoring and UNFC application as tool for policy and strategic decision making;

(A1.4) Undertake advisory missions to support the beneficiary countries in establishing and maintaining energy and water management and monitoring through UNFC application;

- (A2.1) Develop four case studies on the experience of policy development or application on the existing energy and water resources management practices and monitoring;
- (A2.2) Conduct one project workshop to share case studies and best practices for energy and water resources management appropriate to the national circumstances and to apply appropriate integrated management and monitoring tools interconnecting energy and water systems;
- (A2.3) Develop policy recommendations for integrated energy and water resources management, applicable nationally, taking into account the particularities of the countries, and recommendations regarding the transboundary aspects; and
- (A2.4) Conduct a final workshop to present, discuss and validate the policy recommendations for sustainable energy and water resources management for each beneficiary country and disseminate the project results to other countries in Central Asia and South Eastern Europe.

Existing gaps in data collection in beneficiary countries identified in A1.1 will help to develop training materials and conduct four trainings to the national officials and experts responsible for data collection related to energy and water management and monitoring, as well as the UNFC application as a tool for policy and strategic decision making (A1.2 and A1.3). The training will be conducted by an international consultant and will focus on methods for collection, verification, aggregation and reporting of data, as well as statistical indicators relevant for monitoring of energy and water management and monitoring. The training will increase the knowledge of national experts on relevant best practices for each beneficiary country on the collection and monitoring of national data on energy and water management and monitoring in compliance with UNFC. Establishing and maintaining energy and water management and monitoring through the application of the UNFC will be achieved through advisory missions (A1.4).

Studies on relevant best practices on the experience of policy development or application on the existing energy and water resources management practices for each beneficiary country which will be prepared through A2.1. These studies aim to increase the knowledge and understanding of national authorities of best practices in the UNECE region, and will help countries to assess their applicability to national circumstances. Relevant case studies and best practices for energy and water resources management, and the application of appropriate integrated management and monitoring tools interconnecting energy and water systems will be discussed in a project workshop (A2.2). The workshop will help countries to assess the applicability of best practices to national circumstances and develop national models for improving sustainable energy policies.

Development of policy recommendations for integrated energy and water resources management, applicable nationally, taking into account the specific needs of each country, and recommendations regarding the transboundary aspects will be conducted through A2.3 by national entities in close cooperation with national and international consultants. When drafts are prepared, a final workshop will review and validate the policy recommendations for sustainable energy and water resources management for each beneficiary country, and disseminate the project results to other countries in Central Asia and South Eastern Europe through the regular UNECE intergovernmental processes and technical assistance provided within Section 20 and Section 23 of UNECE programme budgets.

Integrated development of energy and water resources are critical for sustainable development, and contribute to overall wellbeing and prosperity. Food, water and energy security are essential requirements for a society that aspires peace and security, development and human rights. As population grows in many countries provisioning of all the three becomes increasingly challenged. The UNFC has a strong focus on future societal aspirations. The UNFC is a tool that aims to optimize the management of national endowments of energy and water resources, with positive implications for local economies from a sustainable development perspective. Trans-boundary sharing of water infrastructure can be part of mitigation plans, which the UNFC can contribute for integrated management and monitoring. The management of macro and micro soil nutrients like potassium and phosphorous sources are important for food production and can be done effectively thanks to the UNFC. Thus the food-water-energy nexus is fully addressed within the framework of the UNFC.

6 Logical Framework

Table 3 – Logical Framework

Intervention logic	Indicators	Means of verification
Objective: To strengthen national capacities of selected countries in South-East Europe and Central Asia to implement integrated energy and water resource management in support of sustainable development		
EA1 Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management	IA 1.1 Four countries established national data collection systems on integrated energy and water resources management.	Project reports National statistical reports

<p>A1.1: Conduct an assessment of the existing gaps in data collection related to water and energy resources management and monitoring. Reviews will be prepared by national and international consultants and serve as a basis for the development by a consultant of training materials for sub-regional trainings.</p> <p>National and international consultants will review the country situation and identify the existing strengths, as well as gaps, in integrated management of water and energy resources. The assessment will critically examine the obstacles to the sustainable development of energy and water resource both at policy as well as operation levels. The assessment will have a particular focus on what the beneficiary countries situations truly require, building on the capacities and resources available. The evaluation will include the full life-cycle of the resource projects and will consider the overarching requirements of Sustainable Development Goals (SDGs). Particular emphasis will be given to social and environmental net-benefits in the integrated development of water and energy resources. The results will be available in the form of reports and case studies that will serve the basis of development of training curricula and materials that will be used in the sub-regional training courses.</p>		
<p>A1.2: Develop guidance/or training materials on data collection related to energy and water management and monitoring. International consultant will develop training materials, which will be based on assessment of the existing gaps in data collection related to water and energy resources management and monitoring in each country. Based on an assessment of gaps in data related to the integrated development of water and energy resources and monitoring in each country that are to be addressed, as well as the availability of local resources, the international consultant will develop training materials. The training materials will include as aspects of integrated energy and water management, including, but not limited to policy framework, regulations, economics, social and environmental considerations, capability based competency, operational issues, final site closure and regeneration. The training materials will be developed appropriate to expert cohorts that need to be trained to overcome the current and anticipated future obstacles of integrated energy and water management and aim to develop dynamic competency in beneficiary countries. The materials will be widely disseminated for the benefit of all stakeholders in the energy and water sectors.</p>		
<p>A1.3: Provide four national trainings (one in each of the four countries) on data collection related to sustainable energy and water resources management and monitoring and UNFC application as a tool for policy and strategic decision making. Trainings will be conducted by an international consultant and will focus on methods for collection, verification, aggregation and reporting of data, as well as statistical indicators relevant for monitoring of sustainable energy and water resources management. The trainings will increase knowledge of national experts on relevant for each beneficiary country best practices on collection and monitoring of national data on energy and water resources management and monitoring in compliance with international standards. Based on knowledge acquired during trainings, national experts will be able to organize data collection in their countries in accordance with United Nations Fundamental Principles of Official Statistics and the UNFC.</p>		
<p>A1.4: Undertake advisory missions to support the beneficiary countries in establishing and maintaining energy and water management and monitoring through UNFC application. These missions will help countries to assess applicability of the best practices to the national circumstances and develop national models for improvement of sustainable energy and water management policies.</p>		
<p>EA 2 Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources</p>	<p>IA 2.1 Four sets of policy recommendations for sustainable energy and water resources management adopted/ included into national strategies by beneficiary countries</p>	<p>Number of best practices documented and submitted to national authorities; number of draft policy recommendations for integrated energy and water resources management</p>
<p>A 2.1 Develop four case studies (one for each of the four countries) on the experience of policy development or application on the existing energy and water resources management practices and monitoring. The case studies prepared by well recognized national institutions will consider best practices in the their countries. These national case studies will increase knowledge and understanding of the best practices in the targeted countries, and assess their applicability to the national circumstances of the beneficiary countries. They will serve as a basis for assessment of their applicability to the national circumstances of the beneficiary countries and further development of the policy recommendations.</p>		

<p>A 2.2 Conduct a project workshop to share case studies and best practices for energy and water resources management appropriate to the national circumstances of the four countries, and to apply appropriate integrated management and monitoring tools interconnecting energy and water systems. The participants of the workshop will consider case studies for each of the four countries to identify the energy and water resources management and monitoring including the application of the UNFC with its focus on the total resources available in any basin to facilitate comprehensive extraction and allow any geological, technical or socio-economic barriers to be identified, to ensure maximum efficiency and minimizing waste.</p>
<p>A2.3: Develop policy recommendations for integrated energy and water resources management, applicable nationally, taking into account the particularities of the countries, and recommendations regarding the transboundary aspects. Policy recommendations will be prepared by national entities nominated by the relevant ministries, in close cooperation with the national and international consultants as well as UNECE and ESCAP to support country ownership and future endorsement and implementation. Policy recommendations will be further submitted for the governmental approval and inclusion into relevant governmental strategies for further implementation. Policy recommendations will identify best practices, measures and procedures relevant to energy and water issues, with a particular focus on the cross-cutting nature of energy and water management.</p>
<p>A2.4: Conduct a final workshop to present, discuss and validate the policy recommendations for sustainable energy and water resources management for each beneficiary country and disseminate the project results to other countries in Central Asia and South Eastern Europe. The national experts from each beneficiary country involved in developing the energy and water resources policies will undertake a final review and validate the policy recommendations. The main objective of the final review will be to ensure availability of all necessary incentives for sustainable energy and water resources development in the draft plans and their applicability to the national circumstances of the beneficiary countries. Experts will also identify a pathway to convert the recommendations into effective national policy frameworks. National and international consultants will prepare recommendations based on the undertaken review and submit them to the national governments for endorsement and subsequent implementation.</p>

7 Risks and mitigation actions

Table 4 – Risks and mitigation actions

Risks	Mitigating Actions
The implementation of the project does not include considerable risks. The technologies, regulation and policies discussed are in the public domain and as such do not contain anything which could provoke a controversy both for the project execution and its effects. While possible political instability in selected countries could not prevent the participation of the government and energy and water sectors experts in most of the project activities, it could delay the effective implementation of the project recommendations and the attraction of the desirable investment, which is out of the immediate scope of the project.	Provide mitigation measures for every risk The project will be executed at the level of high-level governmental officials. It will ensure successful implementation and sustainability of the project.
Lack of political support/regulations Lack of transparency	Holding of regular consultations and bilateral and multilateral meetings with stakeholders
Lack of established mechanism for effective sharing of experience and lessons learnt among concerned countries.	Holding of regular consultations and bilateral and multilateral meetings with stakeholders.

8 Sustainability

In line with the project objectives and activities described before, the project will ensure its sustainability by:

- Assisting governments in providing incentives for and supporting national institutes for data collection and monitoring of progress on energy and water management related sustainable development goals;
- Building national knowledge of best practices for the development of national sustainable energy and water management policies for supporting the progress on energy and water related sustainable development goals; and
- Enhancing the capacity of governments to define the best strategies to promote sustainable energy and water management in each beneficiary country and prepare policy recommendations for sustainable energy and water resources management.

Draft recommendations for sustainable energy and water resources management for each beneficiary country will be a final product of the project. They should be endorsed by the respective national government. After such endorsement, the national governments will be supported in the implementation of the recommendations by advisory missions, in-kind contribution from the intergovernmental bodies responsible for energy in UNECE, and potentially new projects funded through extrabudgetary resources

The project activities are expected to have multiplier effects at the regional level through their linkages with the political framework of the UNFC Expert Group activities and annual International Forums on Energy for Sustainable Development organized by UN Regional Commissions in cooperation with other partners. The project impact and dissemination of results, including support for the countries to introduce policy recommendations for sustainable energy and water resources management for each beneficiary country and disseminate the project results to other countries in Central Asia and South Eastern Europe, will also benefit from the earlier work undertaken by UNECE and ESCAP to promote implementation of the provisions of the

Astana Ministerial Statement on Sustainable Energy adopted on 11 June 2017 under the framework of the Eighth International Forum on Energy for Sustainable Development. This Statement along the other documents adopted at previous annual Fora expresses readiness to assist member States in the development of sustainable energy and water management policies that are tailored to their individual needs in the post-2015 development context.

MONITORING AND EVALUATION

The UNECE project manager will be responsible for regular monitoring of the project implementation. The progress of the project will be reported each year by annual progress reports, and the material and information related to the project will be shared on the web site. In addition, a questionnaire will be developed by the project manager to evaluate the impact, effectiveness and long-term sustainability of the project activities. The questionnaire will be circulated regularly, after each workshop in the beneficiary countries among participants in the workshops. The evaluation of the project will be conducted by an external evaluator during the last six months of the project (2021). The evaluator will have access to project progress reports, workshop reports, as well as evaluation forms, which include a basic set of workshop evaluation questions in UNECE and, are completed by all participants in the workshops. The evaluator will also conduct interviews with key project stakeholders from target countries and partner organizations, conduct desk research and prepare the evaluation report. The evaluation will be completed in line with the UNECE Evaluation Policy.

MANAGEMENT, PARTNERSHIP AND COORDINATION AGREEMENTS

- The project will be executed by UNECE in cooperation with UNESCAP. While UNECE will be responsible for implementation of all project activities in all beneficiary countries, UNESCAP will be invited as a co-operating entity to participate with relevant contribution in activities related to two shared countries: Kazakhstan and Kyrgyzstan.
- UNECE will solicit cooperation from other interested international agencies and first of all from European Federation of Geologists (EFG) and International Atomic Energy Agency (IAEA) on selected parts of the project.
- The project activities will be integrated, as appropriate, into UNDAFs of relevant beneficiary countries.

ANNEXES

ANNEX 1: RESULT-BASED WORK PLAN AND BUDGET DETAILS

Table A1. – Results based work plan and budget

		Timeframe by activity		Budget class and Code <i>(Please use the budget classes listed in the table above.)</i>		Amount (USD)
		Year <i>(Y1, Y2, Y3, Y4)</i>	Quarter <i>(Q1, Q2, Q3, Q4)</i>			
EA	A1.1	Y1	Q3	International Consultants	105	\$ 20.000
				National / Regional Consultants	105	\$ 12.000
				Consultant Travel	105	\$ 14.000
	A1.2	Y1	Q3-Q4	International Consultants	105	\$ 20.000
	A1.3	Y2	Q2	International Consultants	105	\$ 10.000
				Consultant Travel	105	\$ 12.000
				Travel of Staff	115	\$ 24.000
				Grants and Contributions	145	\$ 50.000
	A1.4	Y1-Y3	Q1-Q4	Travel of Staff	115	\$ 32.000
	A.2.1	Y2	Q2-Q3	Contractual services	120	\$ 48.000
				<i>Travel of Staff</i>	<i>115</i>	<i>\$ 9.000</i>
				Contractual services	120	\$ 5.000
				Grants and Contributions	145	\$ 64.000
	A2.3	Y3	Q2	International Consultants	105	\$ 20.000
				National / Regional Consultants	105	\$ 15.000
	A2.4	Y3	Q3	Consultant Travel	105	\$ 3.000
				Travel of Staff	115	\$ 12.000
				Contractual services	120	\$ 5.000
				Grants and Contributions	145	\$ 96.000
				General Operating Expenses	125	\$ 9.000
External Evaluation				Consultant and experts	115	\$10,000

ANNEX 2: DETAILED JUSTIFICATION BY CODE

1. **Consultants and Experts (105): \$ 136,000 Total (28%)**

(Provide separate breakdown by national/regional consultants and international consultants)

(a) International consultants

International consultants for the task(s) of the project implementation in support of activities:

A1.1 to conduct an assessment of the existing gaps in data collection related to water and energy resources management and monitoring in each beneficiary country (4 months) x (\$5,000 per month) = \$20,000;

A1.2 to develop guidance/or training materials on data collection related to energy and water management and monitoring (4 months) x (\$5,000 per month) = \$20,000;

A1.3 to conduct a training on data collection related to sustainable energy and water resources management and monitoring (2 months) x (\$ 5000 per month) = \$10,000;

A2.3 to develop 4 sets of policy recommendations for the integrated energy and water resources management for each beneficiary country (4 months) x (\$5,000 per month) = \$ 20,000

In support of the evaluation of the project: (1) x (10,000 per work month) = \$ 10,000.

(b) National / Regional consultants

National / Regional consultants for the task(s) of project implementation, in support of activities:

A1.1. for preparation of an assessment of the existing gaps in data collection related to water and energy resources management and monitoring in each beneficiary country (4 months) x (\$3,000 per month) = \$12,000;

A2.3. to develop national policy recommendations for the integrated energy and water resources management for each beneficiary country (5 months) x (\$3,000 per month) = \$15,000.

Evaluation Consultant

(c) Consultant travel

4 missions by consultants in support of activities A1.1. (4 missions) x (\$ 3,500 average mission cost) = \$14,000;

4 missions by consultants in support of activity A1.3. (4 missions) x (\$3,000) = \$12,000.

Travel of evaluation consultant to the final workshop (1mission) x (\$3,000) = \$3,000 in support of activity A2.4

2. **Travel of Staff (115): \$ 77,000 Total (16%)**

(a) UN Staff from the implementing entity

(8 missions) x (\$ 3,000 per mission) = \$24,000 for the purpose of conduct of trainings on water and energy data collection in support of activity A 1.3;

(3 missions) x (\$3,000 per mission) = \$9,000 to organize a workshop in support of activity A2.2;

(4 mission) x (\$ 3,000 per mission) = \$12,000 to organize a final workshop for each beneficiary country in support of activity A 2.4;

(8 mission) x (\$ 4,000 per mission) = 32,000 to undertake 8 advisory missions (2 in each beneficiary country) in support of activity A1.4

3. **Contractual services (120): \$ 58,000 Total (11%)**

A provision of \$48,000 is required for contractual services in support of activities A2.1 to award national entities to develop four (1 per beneficiary country) case studies (2 months) x (4 entities) x (\$6,000) = \$48,000.

In support of activities A2.2. and A2.4: \$5,000 per workshop x 2 workshops = \$10,000

4. **General operating expenses (125): \$ 9,000 Total (2%)**

Operating expenses: publishing training materials = \$9,000.

5. **Grants and Contributions (145): \$ 210,000 Total (43%)**

(a) Workshops & seminars

4 trainings for the national officials and experts in support of A1.3. Duration of a workshop: 2 days: (\$500 per participant) x (25 participants) x (4 trainings) = \$50,000;

Workshop in support of A2.2. Duration of a workshop: 2 days: (\$2,000 per participant) x (8 participants) x (4 countries) = \$64,000;

Final workshop in support of A2.4. Duration of a workshop: 2 days: (\$2,000 per participant) x (4 participants) x (12 countries) = \$ 96,000.

Annex 3: Evaluation questionnaire

External evaluation to assess the extent to which the objectives of the UNDA 11th tranche project 1819AB “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia” were achieved.

Prepared by Dusan ZUPKA, UNECE independent consultant and evaluator

Note to the respondents:

The data collected from the responses to this survey’s questions will be used to analyze and assess the relevance, coherence, effectiveness, efficiency and sustainability of the project in supporting member States to strengthen their capacities in the area of integrated energy and water resource management, in the context of the Sustainable Development Goals (SDGs). The evaluation will also assess progress on human rights, gender equality results, disability inclusion, climate change and disaster risk reduction in the context of this engagement. It will include the full project implementation during the period of 1 January 2018- 31 December 2021 in six countries (Bosnia and Herzegovina, Serbia, Kazakhstan and Kyrgyzstan as in the original project document; Tajikistan and Ukraine added to the list of beneficiary countries as part of repurposing to address the impact of the COVID-19 crisis). The evaluation will finally look at the activities repurposed to address the impact of the COVID-19 crisis and assess, to the extent possible, the ECE’s COVID-19 early response through this project.

The evaluation is commissioned by the UNECE secretariat in order to analyze and use its results for improving capacity building services provided to the member States through regular technical cooperation as well as the development and implementation of similar future projects and activities by the Sustainable Energy Division (SED) of UNECE. The analysis, findings, conclusions and recommendations based on information collected through this questionnaire complemented by interviews and documentary review will be presented in an external evaluation report.

The information provided by the respondents as well as their personal data and contact details will be treated as confidential.

The respondent:

Family name: where you work: Your mobile telephone linked to WhatsApp:	First name:	Your e-mail:	Institution
--	-------------	--------------	-------------

The evaluation focuses on the following criteria:

Relevance:

1. To what extent did the Project respond to the priorities and needs of the beneficiary countries to develop and strengthen their capacities in the area of integrated energy and water resource management in the context of the 2030 Agenda?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

2. To what extent were the activities consistent with global and regional priorities? How relevant were the activities vis-à-vis the programme of work of the UNECE? What value has UNECE’s efforts added in this area?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

3. How relevant was the project to the target groups’ needs and priorities? Was there a focus on the most vulnerable ones?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

4. Did the project apply gender, rights-based and disability inclusion approaches in the design, implementation, and results of the activities?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

5. How relevant was the project with regards to climate change and disaster risk reduction?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

Coherence:

1. How coherent was the collaboration with other entities in the UN system and other international organizations?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

2. How coherent was the project design? Were the activities implemented in the required sequence needed to ensure the most significant impact of the project? To what extent are the outputs consistent with and relevant to the overall objective and expected accomplishments?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

3. What adjustments, if any, were made to the project as a direct consequence of the COVID-19 situation, and to what extent did the adjustments allow the project to effectively respond to the new priorities of Member States that emerged in relation to COVID-19?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

4. How did the adjustments, if any, affect the achievement of the project's expected results as stated in its original results framework?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

Effectiveness:

1. Did the project achieve the results expected during the project design in terms of the planned activities, outcome, and impact?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

2. What were the challenges/ obstacles to achieving the activities, objective and expected accomplishments?

Efficiency:

1. Did the project achieve its objectives within the anticipated budget and allocation of resources?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

2. How could the use of resources be improved? Would you propose any alternatives to achieve the same results? If yes, which ones?

3. Were the human and financial resources allocated to the Project used efficiently and commensurate the project results?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

Sustainability:

1. How is the stakeholders' engagement likely to continue, be scaled up, replicated or institutionalized? To what extent do the partners and beneficiaries 'own' the outcomes of the work?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

2. To what extent are the objectives of the activity still valid? How can the activity be replicated in the UNECE region or in other regions?

Mark your option in bold:

HIGHLY PARTIALLY LITTLE NOT AT ALL NO ANSWER

Justify your option in writing:

3. What are the lessons learnt from the COVID-19 related activities?

Name the lessons:

Could these lessons be replicated?

4. What are the laws, regulations, policies or projects that have been developed so far based on the strengthening of capacities of the beneficiary countries in the area of integrated energy and water resource management and development of sustainable policies in this area?

Name the laws, regulations, policies or projects:

Annex 4: List of stakeholders participating in the survey and/or interviews

Name	Organization	Survey/interview
Mr. Aziz Gulamadshoev	State Commission on Mineral Reserves, Tajikistan	Survey/interview
Mr. Viktor Babashev	Timal Consulting Group, Kazakhstan	Survey/Interview
Ms. Ana Dajovic	Ministry of Energy and Mining, Serbia	Survey/Interview
Mr. Boban Jolovic	Consultant in Energy and Water Resources, Bosnia Herzegovina	Survey/Interview
Ms. Mansiya Babasheva	Consultant, Impact of COVID-19 on raw materials supply, Kazakhstan	Survey
Mr. Stanislav Litviniuk	State Commission on Mineral Resources, Ukraine	Survey
Mr. Heorhii Rudko	State Commission on Mineral Resources, Ukraine	Survey
Mr. Radoslav Vukas	Consultant in Geology, Serbia	Survey/Interview
Mr. Jeremy Webb	Consultant, Integrated energy and water management	Survey
Mr. Georgiy Freiman	Consultant, GeoMineProject, Kazakhstan	Survey
Mr. Dmitrii Plaksin	Consultant, Energy and mineral statistics, Kyrgyzstan	Survey/interview
Mr. Robert Smith	Consultant, Fossil Energy and mineral resources, Canada	Survey/Interview
Mr. Rahmonbek Bakhtdavlatov	State Commission on Mineral Reserves, Tajikistan	Survey/Interview
Mr. Oleg Dzioubinski	UNECE, Sustainable Energy Division	Survey/Interview
Ms. Charlotte Griffiths	UNECE, PMSS Division	Interview
Mr. Harikrishnan Tulsidas	UNECE, Sustainable Energy Division	Survey/Interview
Mr. Sigurd Heiberg	Consultant, PETRONAVITAS	Survey

Annex 5: List of documents reviewed

1. Terms of reference for the external evaluation of the UNECE Project 1819AB “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia”
2. Project document, 11th tranche of the UNDA account of the UNECE Project 1819AB “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia”
3. UNECE Project 1819AB “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia” Draft final report, January 2022
4. UNECE website concerning the Project 1819AB “Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia”, (further Project): <https://unece.org/integrated-energy-and-water-resource-management-project-0>
5. Case study concerning UNFC system developed by the Project in the Republic of Srpska, Bosnia and Herzegovina
6. Case study concerning UNFC System developed by the Project in Serbia
7. Case study concerning UNFC System developed by the Project in Kazakhstan
8. Case study concerning UNFC System developed by the Project in Kyrgyzstan
9. Case study concerning UNFC System developed by the Project in Tajikistan
10. Case study concerning UNFC System developed by the Project in Ukraine
11. Assessment report covering the review of official statistics of fossil energy sources and mineral resources of Kazakhstan
12. Assessment report covering the review of official statistics of fossil energy sources and mineral resources in the Republic of Srpska, Bosnia and Herzegovina
13. Assessment report covering the review of official statistics of fossil energy sources and mineral resources in Kyrgyzstan
14. Fossil energy and mineral reserve statistics in Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan and Serbia – A baseline review of quality
15. Assessment report covering the review of official statistics of fossil energy sources and mineral resources
16. Assessment report covering the review of official statistics of fossil energy sources and mineral resources, SMITH/BADAKER 2019
17. UNECE Guidelines and best practices for MSMEs to assure resiliency and progress towards a circular economy in sustainable resource management and critical raw material supply chain solutions, 2020
18. UNECE Project progress report covering activities implemented in 2018
19. UNECE Project progress report covering activities implemented in 2019
20. UNECE Project progress report covering activities implemented in 2020
21. Report prepared for the Expert Group on Resource Management “Application of the UNFC in different geographical contexts, VUKAS, 2022
22. Report of the First Training on using UNFC, Kyiv, 2018, <https://unece.org/sustainable-energy/news/leveraging-integrated-energy-mineral-and-groundwater-resource-management>
23. Training workshop on UNFC application, Nur-Sultan, June 2019, Agenda
24. Report of the Second (Geneva) and Third (Nur-Sultan) Training Workshops undertaken under the project Integrated energy and water resource management in support of sustainable development in South-East Europe and Central Asia, June 2019
25. Report on the Workshop on policy recommendations for food-water-energy resource management in Eastern and South-Eastern Europe and Central Asia, Geneva, October 2021
26. All presentations from the Workshop on policy recommendations for food-water-energy resource management in Eastern and South-Eastern Europe and Central Asia, Geneva, October 2021, at <https://unece.org/info/Sustainable-Energy/UNFC-and-Resource-Management/events/360348>
27. UN Regulations and Rules Governing Programme Planning, the Programme Aspects of the Budget, the Monitoring of Implementation and the Methods of Evaluation, Secretary-General’s bulletin, 2018
28. UNECE Evaluation Policy, 16 December 2021
29. UNECE Proposed Program Budget for 2020, April 2019
30. UNECE Proposed Strategic Framework, 2016-2017
31. UNECE Proposed Strategic Framework, 2018-2019
32. UNECE On-line training course on UNFC and UNRMS, April 2021
33. 17 completed Survey Evaluation Questionnaires, received from the Project’s key stakeholders
34. Presentations from the Training on Sustainable energy and water management, Kyiv, 15/11/2018 <https://unece.org/info/Sustainable-Energy/International-Forum-on-Energy-for-Sustainable-Development/events/19912>
35. Presentations from the Workshop on policy recommendations for food-water-energy resource management in Eastern and South-Eastern Europe and Central Asia, Geneva, 8/10/2021 <https://unece.org/info/Sustainable-Energy/UNFC-and-Resource-Management/events/360348>
36. Reports of the UNECE committee on sustainable energy 2018, 2019, 2020, 2021 [Committee on Sustainable Energy](#).
37. Reports of the Expert Group on Resource Management, sessions 2018, 2019, 2020, 2021 <https://unece.org/sustainable-energy/unfc-and-sustainable-resource-management>
38. Reports of the International Forum on Energy for Sustainable Development, 2018, 2019, 2021 <https://unece.org/annual-fora>

Annex 6: Evaluation matrix

Evaluation criteria	Data sources	Data collection and analysis method	Indicators of success/Judgement criteria
Relevance	Project's progress reports, case studies, country assessments, stakeholders' opinions/beneficiary countries, consultants, UNECE staff, workshops' reports	Documentary review, individual interviews, focus groups session, online survey, analysis, synthesis, triangulation, cross-checking of views expressed	The degree to which the project responded: to the priorities and needs of recipient countries; the UNECE, target groups and global priorities. The extent of application of gender, rights-based and disability inclusion consideration. Degree of relevance with regards to climate change and disaster risk reduction.
Coherence	Project's progress reports, case studies, country assessments, stakeholders' opinions/beneficiary countries, consultants, UNECE staff, workshops' reports	Documentary review, individual interviews, focus groups session, online survey, analysis, synthesis, triangulation, cross-checking of views expressed	Level of coherence of the Project's design and of the collaboration with other international organizations. Degree of consistency between the Project's outputs and its outcomes and overall objective. The coherence in the implementation of activities according to the required sequence. Degree of coherence of the adjustments due to the COVID-19.
Effectiveness	Project's progress reports, case studies, country assessments, stakeholders' opinions/beneficiary countries, consultants, UNECE staff, workshops' reports	Documentary review, individual interviews, focus groups session, online survey, analysis, synthesis, triangulation, cross-checking of views expressed	The extent to which the planned activities and accomplishments of the Project have been achieved. The extent to which the challenges/obstacles during the implementation of the Project have been addressed successfully.
Efficiency	Project's progress reports, case studies, country assessments, stakeholders' opinions/beneficiary countries, consultants, UNECE staff, workshops' reports	Documentary review, individual interviews, focus groups session, online survey, analysis, synthesis, triangulation, cross-checking of views expressed	The extent to which human and financial resources have been used wisely to achieve expected results. The extent to which activities have been implemented according to the planned schedule.
Sustainability	Project's progress reports, case studies, country assessments, stakeholders' opinions/beneficiary countries, consultants, UNECE staff, workshops' reports	Documentary review, individual interviews, focus groups session, online survey, analysis, synthesis, triangulation, cross-checking of views expressed	The degree to which the stakeholders' engagement is likely to continue, be scaled up, replicated or institutionalized. The extent to which the activities can be replicated in the UNECE region and beyond. A number of pertinent regulations, laws, policies developed in the beneficiary countries.

Annex 7: Main lessons learned

1. It is important to integrate the circular economy throughout the integration of energy and water sectors.
2. There is a need to secure a just transition from fossil fuels to renewable energy, including for coal-dependent economies and local communities affected by this change, including women, youth, minorities and the most vulnerable groups.
3. Align all public and private finance forms in the energy and water sectors with the SDGs, Sendai Framework for Disaster Risk Reduction and Paris Agreement and build on pre-existing efforts to create a sustainable energy and water resources management.
4. Mitigate the local and global environmental damage caused by energy and water sectors, including bolstering transparency and traceability.
5. Ensure that green technology and widely available data monitor carbon emissions and air pollution is a global public good.
6. Ensure that energy and water sectors provide adequate levels of revenue that allow the countries to invest in their populations, including attention to gender equality, vulnerable groups and long-term sustainable development.