

**PROJECT DOCUMENT**  
**11TH TRANCHE OF THE DEVELOPMENT ACCOUNT**

**1 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.

## **2 BACKGROUND**

### **2.1 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.

## **2.2 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.

### **2.3 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.

## **2.4 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”.

## **3 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 km<sup>2</sup>, 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. It 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	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	Development of national framework for assessing energy-water interlinkages.  State system for determining coal resources and its impact on water resources using UNFC in selected areas; assessment of project maturity and

	<p>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</p>	<p>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>
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	<p>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>	
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 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</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 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>

	<p>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>	
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>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>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 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>	
Kazakhstan	<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</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>(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 km<sup>3</sup> per annum or 1,450 m<sup>3</sup> /sec. The proven reserves comprise 16.04 km<sup>3</sup> or 468 m<sup>3</sup> /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 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</p>	<p>Increased availability of clean and affordable energy and water in the country.</p>
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	<p>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>	
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### 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
<p><b>National Policy Makers</b> (Ministry of Energy and/or of Mines; Ministry of Agriculture and Water Resources)</p>	<p>Creation of policies for UNFC adoption as a tool for sustainable management of all energy, mineral and water resources.</p>	<p>Convening power knowledge and expertise in sustainable energy, mineral and water resource development programmes</p>	<p>Absence of a national system for unified management of all energy, mineral and water resources</p> <p>Lack of competent Officials &amp; Experts</p>	<p>UNFC adopted as a national system, or existing national systems bridged to UNFC</p>	<p>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.</p>
<p><b>National Energy, Mining and Water</b></p>	<p>Application of UNFC guidelines and best</p>	<p>National regulators for energy &amp; mining</p>	<p>Absence of a tool for managing energy and</p>	<p>UNFC applied to manage national resources</p>	<p>Universal system for sustainable resource</p>

<b>Endowment Regulators</b> (Ministry of Environment)	practices on environment	related activities	mining projects	endowments	management can attract investment for sectoral growth
<b>National Energy, Mineral, Water Development Agencies / Institutes</b>	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
<b>National Financial Reporting Regulators</b>	Develop UNFC compatible reporting standards & guidelines for financial reporting	Authority to define financial regulations for energy & mineral and water basin development investments	Absence of a global standard for universal reporting of energy, mineral & water projects	UNFC applied for financial regulations.	Use of universal standards for reporting by companies /organizations
<b>Energy and Mining Industry and Water resources development organization</b>	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
<b>Financial Institutions</b>	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
<b>Universities / Educational Institutions</b>	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



## **4 PROJECT STRATEGY: OBJECTIVE, EXPECTED ACCOMPLISHMENTS, INDICATORS, MAIN ACTIVITIES**

### **4.1 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.

## 4.2 Logical Framework

*Table 3 – Logical Framework*

<u>Intervention logic</u>	<u>Indicators</u>	<u>Means of verification</u>
<b>Objective:</b> 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		

<p><b>EA1</b> Improved national capacities for collection of consistent, coherent and reliable data related to energy and water resources management</p>	<p><b>IA 1.1</b> Four countries established national data collection systems on integrated energy and water resources management.</p>	<p>Project reports National statistical reports</p>
<p><b>A1.1:</b> 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. 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><b>A1.2:</b> 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><b>A1.3:</b> 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><b>A1.4:</b> 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><b>EA 2</b> Strengthened national capacities to develop evidence-based policies and strategies for integrated management of water and energy resources</p>	<p><b>IA 2.1</b> 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><b>A 2.1</b> 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><b>A 2.2</b> 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><b>A2.3:</b> 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>		

**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.

### 4.3 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.	<b>Provide mitigation measures for every risk</b> 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.

### 4.4 Sustainability

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

- a) 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;
- b) 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
- c) 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.

## **5 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.

## **6 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.

## 7 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		Amount (USD)
		Year (Y1, Y2, Y3, Y4)	Quarter (Q1, Q2, Q3,	<i>(Please use the budget classes listed in the table above.)</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.