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Development of the renewable energy sector in the Russian Federation and in countries of the Commonwealth of Independent States (CIS): prospects for interregional cooperation

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Note by the secretariat

I. Introduction

1. This note contains the basic outcome of research done by the International Sustainable Energy Development Centre (ISED) under the project entitled “Development of the renewable energy sector in the Russian Federation and in countries of the Commonwealth of Independent States (CIS): prospects for interregional cooperation”. The project was implemented by the United Nations Economic Commission for Europe (ECE) from 2008 to 2010, and in 2011 is nearing completion. It is included in the Energy Efficiency 21 (EE21) project plan for 2009–2012 (ECE/ENERGY/2009/8).

II. Background

2. “Development of the renewable energy sector in the Russian Federation and in countries of the Commonwealth of Independent States” is a subregional project of the EE21 project. Its objective is to stimulate international cooperation to overcome barriers in the field of energy policy and legal, institutional and financial obstacles to the use of renewable energy in the Russian Federation and countries of the Commonwealth. The project assists

the national and local authorities in the CIS member States in creating conditions conducive to investment in renewable energy technologies.

3. Renewable energies are now developing faster than any other kind of energy in the world. The use of renewable energy as an alternative to traditional energy sources is now of strategic importance at the national and regional levels. The use of renewable energies has indisputable advantages: they are inexhaustible and environmentally clean; they help countries to ensure energy security by diversifying their use of fuel and energy resources; they contribute to reductions in harmful emissions; and they help conserve energy resources for future generations.

4. While there is substantial potential for the development of renewable energies in the CIS countries, such resources currently account for only a negligible share of overall energy consumption. The share of renewable energies can increase significantly in the long term.

5. In this connection, the Governments of the CIS countries are invited to consider the possibility of adopting a general strategy for the development of renewable energy – a type of energy that may significantly increase the reliability of energy resources both for importers and exporters of fossil fuels.

III. Development strategy for renewable energy in the CIS countries

6. Based on national reports and materials presented by the CIS member States, ISEDC has drawn up a strategy for the development of renewable energy with the aim of attracting investment to develop renewable technologies. This strategy is for submission to the national and regional authorities of the CIS countries.

IV. Main provisions of the strategy

7. The strategy is aimed at attracting investment in renewable energy technologies. It represents a collection of views agreed upon by the CIS member countries concerning shared goals, priorities and prospects for extending the use of renewable energies to improve economic relations between States and to transform the CIS into a full-fledged international player in the field of global energy.

8. The aim of this strategy is to provide an additional impetus to interregional cooperation among the CIS countries as they further increase their economic cooperation, to provide for sustainable energy development and energy security, to improve the population's welfare and standard of living and to enhance the competitiveness and strengthen the position in the world economy of the CIS member countries. Better cooperation in the field of renewable energy within the context of the CIS does not preclude the development of relations with other States, nor does it limit or restrict possibilities for bilateral relations.

9. The global financial and economic crisis adversely affected many energy companies, forcing them to abruptly change their business strategies and capital investment plans. While slower growth reduced worldwide demand for energy, which in turn resulted in a drop in greenhouse gas emissions, the volatility of energy prices clearly had a negative impact on the development of energy efficiency and of renewable energy sources.

10. In this connection, the national authorities must draw up policies and take additional measures to increase energy efficiency, develop local energy resources, diversify energy

delivery systems, reduce taxes on energy products and foster environmentally clean energy production.

11. Renewable energies are now the fastest developing type of energy in the world. Their annual growth rate is over 10 per cent, and it is forecast to continue at that pace. The use of renewable energies as an alternative to traditional energy sources is now a strategic objective at the national and regional levels. The advantages of using such energies are indisputable: they are inexhaustible and environmentally clean; they help countries to ensure energy security by diversifying their use of fuel and energy resources; they contribute to reductions in harmful emissions; and they help conserve energy resources for future generations.

12. This strategy is premised on the voluntary and independent action of the CIS countries in determining their orientations and the depth of their participation in integration processes, and also on the consistent and progressive implementation of energy development cooperation measures.

V. The place of renewable energy in global energy development today

13. In the past two decades the use of renewable energy in the world has been strongly linked with the energy security of energy importing countries. Fossil fuel prices have been high and unstable, and there has been a worldwide campaign to combat climate change and reduce greenhouse emissions.

14. At the same time, national renewable energy programmes have now been adopted in over 60 countries. Renewable energy is often the most rational way to provide energy to remote villages and regions where centralized heating and power grids are economically unfeasible. Renewable energy can provide the basis for regional and local energy systems.

15. Renewable energy is quite widespread in the world today, representing some 14 per cent of the energy balance. Traditional forms of renewable energy sources such as wood biomass (in developing countries) and large-scale hydroelectric power still predominate. The past decade has, however, seen significant growth in the use of non-traditional forms of renewable energy — solar and geothermal power, energy from wind power or waste, small-scale hydroelectric generation, tidal and ocean wave power. This growth has been brought about by a significant drop in the cost of renewable energy technologies and rising prices for fossil fuels. The European Union, the United States, Japan, China and India have made the most progress in using non-traditional forms of renewable energy.

16. According to various forecasts, with rational support policies, growth in renewable energies can be quite high in most countries of the world. In recent years, the Governments of the United States, Japan and the member States of the European Union have adopted special programmes to increase the use of renewable energies.

17. To determine the best way to develop renewable energy, a general assessment of the potential of such energy must be carried out at the national level, based on the existing technological possibilities for its use. Such work has already been done or is currently under way in practically all the countries of the CIS.

VI. The place of the Commonwealth of Independent States in the global renewable energy system

18. The Commonwealth has significant resources. It contains 16.4 per cent of the world's landmass, with approximately 4.4 per cent of the world's population. The Commonwealth has about 20 per cent of the world's oil reserves, 40 per cent of its natural gas and 25 per cent of its coal, and it produces 10 per cent of global electricity output.

19. The potential contributions of the main renewable resources in the energy systems of the countries of the Commonwealth are estimated as follows: biomass and biofuels: 20 megatons of oil equivalent (Mtoe); hydroelectric power – 10 Mtoe; geothermal power – 12 Mtoe; wind power – 15 Mtoe; and solar power – 6 Mtoe.

20. The main driving forces behind renewable energies in the energy markets of the Commonwealth countries are the following:

- Increases in the price of imported energies
- Declines in the cost of renewable technologies
- Improvements in the efficiency of renewable energy technologies
- The quest for energy security
- The desire to reduce greenhouse gas emissions

21. In all the countries of the Commonwealth, renewable energy currently accounts for only a small portion of overall energy consumption. In the long term, its share can grow considerably.

22. Wind power: The potential for the development of this renewable resource is high in all the countries of the Commonwealth. Most of these countries have officially adopted plans or programmes for the development of wind power.

23. Solar power: The greatest interest in solar power has been expressed by the countries of Central Asia, which have the highest number of sunny days among all the countries of the Commonwealth.

24. Hydropower: hydropower development is a top priority in most of the countries of the Commonwealth with significant water resources. Small hydroelectric power stations (with capacities under 10 MW) do not adversely affect the environment and may be considered a fundamental direction for the development of this resource.

25. Biomass: Two Commonwealth countries, Belarus and the Russian Federation, have enormous potential for power production from wood biomass. The use of wood biomass for furnaces is one of the basic priorities of the Belarusian Government. In the north-west of the Russian Federation a number of boilers use wood biomass, and there are good prospects for further development. Wood refuse may also be used for heating in other countries of the Commonwealth, such as the Republic of Moldova and Ukraine.

26. All the CIS countries have enormous potential for the use of agricultural waste for heating and biofuel production. The main resource of this kind in such Commonwealth countries as Belarus, the Republic of Moldova, the Russian Federation and Ukraine is straw from cereal crops (wheat, barley, oats, etc.), while the cotton-producing countries of Central Asia, for example Uzbekistan, can use waste from cotton production.

27. Geothermal power: There is serious potential for the development of geothermal energy in Azerbaijan, the Russian Federation and Ukraine. The Russian Federation has extensive experience setting up geothermal facilities in Kamchatka and can share its experience with other interested CIS member countries.

28. Tidal power: Among the CIS countries, only the Russian Federation has practical experience with tidal power and serious prospects for its use.

VII. Aims and basic objectives of renewable energy development in the CIS countries

29. The CIS countries share the following strategic aims of interregional cooperation for renewable energy development:

- To rationally use existing fossil fuel resources and reduce their consumption, given the inevitable depletion of their reserves
- To ensure sustained growth of the national economy, making efficient use of energy resources
- To slow the increase in the ecological footprint and to combat climate change while meeting growing energy needs
- To reduce energy poverty, especially in isolated and remote areas of some CIS member countries, including by promoting their social and economic development
- To maintain the population's health and quality of life by slowing growth in environmental pollution attributable to the use of fossil fuels, and to reduce State health expenditures
- To increase energy security and energy supply reliability by decentralizing supplies
- To include additional resources in the fuel and energy balance
- To slow down increases in expenditure for electrical power and for fuel distribution and transport, and to reduce corresponding losses

30. The overall, strategic aim in implementing these objectives is to double the gross (total) renewable energy capacity in the general energy balance of the member States of the Commonwealth. The efforts made by the Commonwealth countries to achieve this will focus on the following:

- Ensuring efficient use of the CIS member States' energy potential and the sustainable development of the Commonwealth's overall energy potential through the development of renewable energies
- Ensuring that renewable energies have access to the electrical energy production market without discrimination
- Introducing fiscal and financial measures encouraging greater use of renewable energies (a flexible investment policy, tax incentives, subsidies to build new production capacity, financial incentives to encourage consumers to use renewable energies)
- Supporting new initiatives for the use of biomass for transport, heating and electricity production, including strengthening the market for biomass fuels, promoting biogas technologies and extending the use of solid biomass
- Supporting the use of renewable energies in building construction and renovation
- Training specialists in the energy sectors of the CIS member States in the field of renewable energy
- Developing a shared information resource in the field of renewable energy

VIII. Priorities for interregional cooperation by the CIS member States in the field of renewable energy

31. In achieving these objectives and addressing these problems, focus will be placed on the following priorities for interregional cooperation by CIS member States:

- Strengthening coordination mechanisms for the development of renewable energy, above all at the national level
- Establishing favourable conditions for attracting non-State investment to set up new and refurbished generators operating with renewable energy, using venture funds for investment in renewable energy equipment
- Supporting the development of small enterprises providing energy services in the renewable energy sector
- Supporting implementation of private-State partnerships in the field of renewable energy, including cooperation in establishing a renewable energy market
- Making information available on the adoption and implementation of measures for the development of renewable energy
- Monitoring and supervising technical and technological compliance with safety requirements in the use of renewable energies

IX. Basic aspects of interregional cooperation for the development of renewable energy in the CIS member States

32. Within this strategy, the priorities for interregional cooperation by the CIS countries should focus on the following key aspects of the development of the renewable energy sector:

(a) The legislative aspect. Experience has shown that when renewable energies are extensively introduced, the State initially plays a very important role, even in countries with developed market economies. The primary role of the State is to set general aims for the harnessing of renewable energy, to establish a legislative and legal basis and to adopt State programmes and cooperate in their implementation;

(b) The financial and economic aspect. Economic conditions and financial incentives are an important premise for the successful introduction of new technologies. It is important for policies aimed at supporting renewable energy producers to systematically provide guarantees to investors in this sector;

(c) The scientific and technical aspect. This includes educational activities in the field of renewable energy;

(d) The information aspect. Opportunities for development in this sector are limited when decision makers and potential users of renewable energy technologies lack knowledge or information on ways to capitalize on the use of such resources in specific situations.

33. The above list of aspects of the development of renewable energy in the CIS countries was compiled as part of a consolidated report drawn up by national experts and submitted to an international seminar held in Minsk on the ECE project entitled "Development of renewable energy sources in the Russian Federation and the CIS countries: prospects for interregional cooperation". The report identifies basic trends and highlights factors blocking the development of renewable energies in the CIS countries. It

includes a series of recommendations for the practical implementation of specific measures to encourage interregional cooperation.

X. Mechanisms for implementing the strategy for interregional cooperation among the CIS countries for the development of renewable energy and recommendations for practical implementation

34. International experience in the introduction of modern renewable energy technologies has shown that every country has faced specific legislative and legal, economic, technical, informational and other limiting factors hindering the development and introduction of such technologies. Identifying, eliminating or overcoming such constraints often calls for significant and lengthy efforts on the part of the State, and also the availability of organizations and specialists motivated to introduce and further promote renewable energy technologies.

35. The above list of aspects of the development of renewable energy in the CIS countries may be considered by the CIS member States as the basic tool for interregional cooperation in the context of implementation of this strategy.

XI. Practical recommendations for developing interregional cooperation: Legal aspect

36. All the CIS countries recognize the importance of developing renewable energy, and they are all working on establishing the legal and institutional basis to do so. One of the most important aspects of policies that successfully support renewable energy producers is that they make sure that renewable energies are included alongside other policy and strategy considerations in long-term planning. In this connection, in drawing up this strategy for the successful development of renewable energy technologies, it is advisable to ensure that appropriate well-founded, integrated and targeted programmes are adopted.

37. The main aim for the development of renewable energies in the CIS countries, both in the framework of this strategy and following the subsequent adoption of integrated and targeted programmes, is to increase the share of production and consumption of electrical power from renewable resources. To achieve this goal, generating equipment (such as small hydroelectric plants, wind power generators, tidal power stations, geothermal electric power plants, thermal electric power stations using biomass as a fuel and other types of generators) must be introduced to produce renewable electric energy in the coming 10 to 15 years.

38. To achieve this objective, a comprehensive set of State policy measures is required in this field. These measures should provide systematic State support for such efforts, in keeping with the planned and actually implemented pace of development of renewable energy.

39. Within the legal framework, the organizational basis for developing renewable energies in the CIS countries consists in defining a national body (or agency) having overall responsibility for such efforts (hereafter referred to as the authorized body). Its functions should include: drawing up State programmes for the development of renewable energies, such as research and development projects, carrying out domestic and foreign market research, promoting and popularizing the extensive use of renewable energies, drafting legislative initiatives in this field (including a possible initiative for the conclusion of a special cooperation agreement between the CIS participant States on the development of

renewable energies) and coordinating cooperation in the field of renewable energies at the regional and international levels (for instance, cooperation with ECE, the European Union and the International Renewable Energy Agency (IRENA)). Decisions establishing the authorized bodies should be adopted by the CIS member States within a year of the adoption of this strategy. The specific organizational and operational characteristics of the authorized bodies should be agreed among the CIS member States before that time.

40. The CIS countries' legislative policies for the use of renewable energies should on the whole make provision for the following:

- Coordination of activities for the development of renewable energies
- Establishment of conditions conducive to non-State investment, with the aim of establishing new and refurbished generating facilities using renewable energies, and the use of a venture fund mechanism for investment in renewable energy facilities
- Establishment of conditions conducive to the creation of a market for renewable energies
- Support for the development of small enterprises working with renewable energies in the energy services market
- Support for the development of private-public partnerships in the field of renewable energies
- Provision of information on the creation and implementation of activities for the development of renewable energies
- Monitoring and supervision of technical and technological compliance with safety requirements in the use of renewable energy sources

41. In the initial stage, an analysis should be carried out within the CIS framework of experience acquired. The following should be produced:

- A collection of recommendations for the establishment of national renewable energy development strategies
- A collection of recommendations for the establishment of national comprehensive programmes for renewable energy use, integrated closely with the national strategies

XII. Practical recommendations for the development of interregional cooperation: Financial and economic aspect

42. The support strategy for renewable energy producers should be as simple as possible and involve low administrative costs. At the same time, it must be sufficiently flexible to succeed commercially and to ensure efficient expenditure, as this will gradually lead to a decline in prices. Separately, international experience with economic incentives for the development of renewable energies should be studied and applied to the CIS countries, as should their own experience with the use of economic incentives. A collection of recommendations should be prepared pointing to the most effective measures with which to regulate the development of renewable energy in national legislation.

43. Some of the specific types of support and incentive mechanisms may include the following:

- Implementation of special programmes and demonstration projects
- Preferential loans for the purchase of renewable energy equipment and partial payback of investment for consumers

- Accelerated depreciation of renewable energy equipment
 - Tax exemptions and incentives; fixing of tax rates for fossil fuels based on their CO₂ emissions, or a tax on electricity produced from fossil fuels
 - Establishment of special guaranteed rates for the purchase of electricity produced from renewable energies, and mandatory purchase by the grid of such electricity
 - Subsidies for investments in renewable energies
 - Funding for research and development to decrease costs of renewable energies
 - Establishment of State institutions and support for voluntary organizations whose activities are aimed at encouraging the use of renewable energies
44. The use of one or another mechanism will be determined by the aims and kind of investment in question. Effective plans for support and incentive mechanisms can be divided into four basic categories:
- Support and incentives for “independent power producers” (investors who are not part of the State structure or utilities) who best meet the development objectives for renewable energies
 - Incentives for the development of renewable energies for utilities and State structures
 - Attraction of private investment
 - Attraction of investment in the development of renewable energy for small cooperatives
45. In the medium term, consideration must be given to establishing, as part of the CIS cooperation structure, a special renewable energy fund. Such a fund would serve as a specialized financial mechanism to support joint efforts by the CIS countries to implement national strategies for the development of renewable energies and for intergovernmental programmes.

XIII. Practical recommendations for the development of interregional cooperation: Scientific and technical aspect

46. Scientific research and product commercialization. The CIS States may choose various forms of cooperation:
- Implementation of joint projects and programmes
 - Establishment of a common information clearing house and libraries of legal and other literature, and analytical reviews of the leading achievements and experiences in renewable energy equipment and systems in other countries
 - Scientific exchanges and traineeships for specialists
 - Publication of scientific journals and production of regional manuals, handbooks and brochures on how to develop renewable energies
 - Conferences and seminars for experts, specialists and the public, devoting special attention to the training of government specialists and decision makers, and also to extensive cooperation with scientists, educators, representatives of civil society and the media
 - Scientific cooperation

47. To make the results of the research commercially viable, consideration should be given to establishing an international CIS scientific and technical centre for renewable energies. Such a centre would implement joint research programmes and harmonize renewable energy standards for the Commonwealth area.

48. Development of educational activities and training of supervisory staff. Training of supervisory staff in renewable energies is decisive in the development of this sector. The CIS countries should broaden their cooperation in the field of education and make provision for specific cooperation programmes for the training and skill enhancement of renewable energy specialists, including exchanges of teaching materials and texts for renewable energy students and specialists. Additionally, it is necessary to generalize and disseminate best educational experiences in the use of renewable energies and to better enlist the regular school system in this field.

49. International cooperation must be actively developed for the training and skill enhancement of specialists working with renewable energies. Demonstration sites and the training facilities of the leading educational institutions in the CIS area should be used extensively to hold seminars and to improve specialists' skills. International cooperation in this field should also be developed by means of joint participation in appropriate educational programmes.

50. The development of new technologies and equipment for the production of renewable energy. Lack of modern technology and equipment is one of the basic obstacles to the development of renewable energy in the CIS countries. Such equipment is either not produced in the CIS countries or its quality needs improvement. To ensure the successful development of this sector, a single database should be set up with information on modern equipment required for the use of renewable energies and on suppliers and pricing.

51. In addition, international organizations should start implementing new renewable energy technical assistance programmes for the CIS countries. A key role in the transmission of renewable energy technologies can be played by the Sustainable Energy Division of the United Nations Economic Commission for Europe (ECE). In the framework of ECE cooperation a special working group on renewable energy should be set up with the aim of optimizing the transfer of technology and interregional cooperation in this field within the CIS countries.

XIV. Practical recommendations for the development of interregional cooperation: Information aspect

52. Opportunities for the development of the renewable energy sector are limited by a lack of knowledge of the specific economic advantages of renewable energy and technologies among potential users. Only a few companies and organizations have experience with renewable energy systems (such as small hydroelectric power stations or solar heating facilities).

53. In relation to information, it is essential to the success of this strategy that specialists and the population actively take part in extending the use of the renewable energies available in the CIS countries; it is crucial that they have a knowledge of renewable energy and understand its role and possible economic and environmental advantages. Over and above measures taken at the State level, actions must be undertaken and systematically implemented to provide clarifications and assistance to local authorities and to physical and legal persons. Support should also be provided to voluntary organizations and initiatives to harness and use renewable energies.

54. Consideration should be given to establishing a single system for the exchange of experience and information on the development of renewable energies in the CIS countries, so as to provide a concrete mechanism for the implementation of this kind of interregional cooperation. Such a system can be established on the basis of a unified Internet portal containing a database with information on the following:

- Implementation of specific projects and technical solutions
 - Policies and measures taken by participating countries to provide incentives for the use of renewable energies
 - Legislation relating to the development of renewable energies and the drafting of the relevant standards and regulations
 - Environmental impact assessments of renewable energy facilities
 - Implementation of pricing policies
 - Cooperation with the appropriate international organizations
-