



Energy and sustainable development: challenges and opportunities  
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## *About project*

### *Respect of the principles of Ecological State in energy sector*

NGO Green Home is realized project "Respect of the principles of Ecological State in energy sector" during 2012/2013. The project aim is to raise awareness of public and decision makers on the principles of sustainable use of natural resources and the manner of their implementation through planned strategic documents and projects in the energy sector.

Through this project we wanted to increase transparency of the process of decision making related to key development opportunities in energy sector by monitoring of preparation a new Energy Strategy until 2030. One of the important elements of this project is the participation of citizen in the process of decision making.

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# **Energy and sustainable development: challenges and opportunities**

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## 1. Introduction

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The purpose of this paper is to analyze energy policies and practices in Montenegro, to assess the extent to which they contribute to or hinder attainment of sustainable development and ecological state goals, and to outline possible directions for the future. To that end, national energy policies are briefly examined and compared with the EU ones, views and recommendations of the civil sector (on global and regional levels) are presented, and implications of climate change are discussed. Particular attention is paid to linkages between energy and sustainable development and to opportunities for greening the energy sector. The key findings from the previous analyses on key accomplishments and challenges in implementing the ecological state concept are also included in the paper as a reference framework for the overall considerations.



## 2. Overview of energy policies and trends

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### 2.1. Montenegrin energy policies

The main documents that define energy policy in Montenegro include *Strategy for Energy Sector Development until 2025* (SESD, adopted in 2007), *Energy Policy of Montenegro until 2030* (EP, adopted in 2011), and strategies/ action plans on energy efficiency and utilisation of specific renewable energy sources. As a result of the process of updating the 2007 SESD, a document titled *Strategy for Energy Sector Development in Montenegro until 2030 (Green Book and draft White Book)* was released in June 2012 for public consultations (its finalisation and adoption is pending). The key pieces of legislation are the Energy Law (Official Gazette of Montenegro 28/10) and the Law on Energy Efficiency (Official Gazette of Montenegro 29/10).

Target for renewable energy has been set in October 2012 (under the Energy Community Treaty – ECT) at 33% share in the final energy consumption by 2020. The so far efforts to increase utilisation of renewable energy sources (RES) have focused on the electricity sector alone. The energy efficiency target is to achieve 9% energy savings by 2018 (set to ensure compliance with the ECT commitments). The law on energy efficiency and related action plan were passed in 2010 to set up a framework and outline actions needed to improve efficiency in energy use. Establishment of the implementation instruments (such as energy efficiency fund and agency) is still not on the agenda.

The latest available assessment on the progress in harmonising national with the EU energy legislation and policies (*Progress report for 2012*) stated that the alignment with the *acquis* was at an early stage and highlighted the need to adopt additional implementing legislation for the internal energy market, necessary acts



concerning oil stocks reserves, as well as the ten-year work programmes on the development of RES. Electricity market has been opened for all non-household consumers since 2009, but it is not active yet. Legal unbundling in the electricity distribution sector is yet to be implemented, and legal framework for the future gas market is still missing. Further adjustments of the legal and institutional framework and in particular strengthening of administrative and implementation capacities are needed. The main institutions include Ministry of Economy (with its energy sector and specific organisational units responsible for energy efficiency and RES) and Regulatory Energy Agency. The Agency acts as an independent regulator in the sector and has powers to control performance of energy sector entities. *Elektroprivreda Crne Gore* (EPCG) is licensed for production, distribution and supply of electricity, and is currently acting as the (only) public supplier in the country.

The 2007 SESD and related Action Plan advocated promotion and spread of renewable energy sources. The focus was however on utilisation of hydro potential, mainly through large (priorities were Komarnica and Moraca rivers) but also through small hydro power plants (HPPs). Potential for energy savings was not factored in the projections of energy needs sufficiently. Even though sustainability principles were recognised and formally endorsed, the documents failed to integrate them truly in defining strategies for the energy sector development.

In the first 5 years of the Strategy and Action Plan implementation, significant progress was only achieved with the development of small HPPs and to some extent with wind energy, while there were hardly any moves forward with the development of other sources. Incentives for the RES have been rather modest throughout the period and included, for example, provision of interest-free loans for installation of solar collectors in households.





Purchase tariffs for energy from small HPPs are considered to be unfavourable. Preparations for implementation of one of the Strategy's key projects – set of large hydropower plants on Moraca river – ended unsuccessfully after the tender to select an investor/ developer failed due to lack of interest. The project was also met with strong opposition of the civil sector and part of the expert/ academic community.

Energy policy (EP) from 2011 represented a step forward in terms of integration of sustainability principles compared to the 2007 SEDS. The main priorities of the EP include security of supply (through continuous, safe and diversified energy supply), development of competitive energy market (open, non-discriminatory and transparent energy market to allow competition in the provision of energy services and introduce market prices), and sustainable energy sector development (accelerated but rational use of domestic energy resources, environmental protection, increase in energy efficiency and the use of RES, considerations of socio-economic implications).

Unfortunately, draft materials for the updated Energy Strategy until 2030 (released in June 2012) are not promising when it comes to operationalization and implementation of the EP guidelines. Lessons learnt from the SEDS 2007 process (both formulation and implementation) do not seem to be integrated in the updated Strategy either, as it insists on more or less same objectives (primarily large expansion in generating capacities as a way to meet projected energy needs) as the “old” strategy. That is why the updated Strategy is highly unlikely to deliver a truly sustainable development of the energy sector in Montenegro (unless it is substantially revised in the next steps of its preparation). Some of the key arguments underpinning this assessment are discussed briefly in the following paragraphs.



First of all, the updated Strategy does not set a specific target on energy efficiency (EE) based on the analysis of the existing situation and quantification of the savings potential, and it does not have a proactive approach needed to align with the EU policies. The document endorses target (9% energy savings) previously set for the period until 2018, which is not sufficiently ambitious in longer-term, especially having in mind that Montenegrin economy is highly energy intensive. For example, the draft Strategy includes information (page 112) that Montenegrin energy intensity indicators are 6 to 8 times higher than comparable indicators in the EU Member States, and that combined losses in electricity transmission and distribution sectors are still at a very high level - ranging between 19.2% in 2009 and 14.9% in 2007 (page 99). Despite this, the potential energy savings have in offsetting the need for new generating capacities is not incorporated in the Strategy's energy scenarios in a satisfactory manner, and the significance attributed to EE in the EP 2011 (where EE is highlighted as a priority of the country's energy policy) is lost in this document.

Mild recommendations on EE contained in the updated Strategy will not deliver necessary improvements. Besides negative implications for energy sector sustainability, other opportunities (such as cutting energy costs and enhancing competitiveness) will be lost. The planned decrease in energy intensity<sup>1</sup> of 45% by 2030 (compared to 2010) is not sufficient to reduce current gap between Montenegrin and European economies and to ensure that pace is kept with ambitious and progressive EU policies on EE. The scope of the ambition projected for the next 20 years can be easily understood when compared with the fact that 25% decrease in energy intensity has actually been achieved during the past decade

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<sup>1</sup> Measured in MJ megajoules (MJ) of final energy consumed to produce unit of GDP expressed in thousands of 2000 euros (abbreviated: MJ/000 EUR-2000).



(2000 – 2010)<sup>2</sup>. In this period, EE measures were implemented practically on an *ad hoc* basis, without strong and systematic support, and the achieved decrease can to a large extent be attributed to high GDP growth rates in the period 2006 – 2008. The updated Strategy relies on the same or even lower intensity and effectiveness of the EE measures as those implemented during the past decade<sup>3</sup>, which is largely insufficient in light of EU accession and proclaimed sustainability goals.

From the sustainability point of view, scenarios on expected increase in energy consumption are also questionable. The Strategy projects doubling of final energy consumption over the course of the next 20 years – from 29.9 petajoules (PJ) in 2010 to 59.5 PJ in 2030. The largest increase (tripling) is projected for industrial sector, which is difficult to imagine given the fact that current industrial facilities operate with unsustainably high energy consumption and that possible new industrial installations would have to be based on new and by far more energy efficient technologies. Even if we assume that current industries will continue operating through to 2030 with existing energy intensities, consumption of more than 22 PJ of final energy in Montenegrin industry sector in 2030 (compared to current 7 PJ) would mean a highly industrialised country, which by all merits seems impossible to achieve over the course of 20 years. Consumption increases in transport and households/ services sectors are estimated at around 1.6 times, which is also questionable given the large rooms for EE improvements for both transport and buildings.

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<sup>2</sup> According to the draft updated Strategy, final energy consumption per unit of GDP fell from 26,388 in 2000, to 19,756 MJ/000 EUR-2000 in 2010.

<sup>3</sup> The Strategy projections are based on very high GDP growth rates: a flat annual rate of 6.5% would be needed to achieve predicted GDP of 5.6 billion euros in 2030.



The projections of future energy needs were used to justify proposals for an exceptionally high increase in electricity generating capacities (from 854 MW installed power in 2011 to 2,327 MW in 2030). Plans to increase capacities in coal-fired thermal power plants (TPPs) from current 219 MW to 800 MW and to almost double installed power in large HPPs by 2020 – 2022 are particularly questionable for energy sector sustainability. Projects that are primarily expected to deliver this increase are TPP Maoce and TPP Pljevlja II, as well as Moraca and Komarnica HPPs. Possible development of the two TPPs and resulting increase in CO<sub>2</sub> emissions would collide with the EU decarbonisation policies and commitment to reduce overall emissions of greenhouse gases (GHG). Even though Montenegro is currently not obliged to reduce GHG emissions<sup>4</sup> and relevant EU policies may allow certain emission increases in some countries (based on implementation of the revised Emission Trading Scheme – more details in the section 2.2), counting on more than doubling of power sector emissions does not seem to be realistic and acceptable. As for hydro power, the Strategy does not consider sustainability issues linked to development of large HPPs, does not seem to take into account possible impacts of climate change on availability of water resources (see section 2.5 for more information) and by insisting on Moraca system, it fails to recognise serious concerns related to profitability and environmental acceptability of this project expressed in the project preparation cycle that ended with unsuccessful tender in September 2011. In focusing energy sector development on large HPPs and TPPs the updated Strategy also neglects the fact that problems and delays with development of large HPPs and of TPP Pljevlja II have been recognised as one of the main reasons for updating the 2007 SESD in the first place.

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<sup>4</sup> *As a non-Annex I country under the Kyoto Protocol of the UN Framework Convention on Climate Change.*



On the other hand, the original SESD plans for development of small HPPs and wind energy were exceeded in the past period, which shows that such projects are more attractive and feasible. Coupled with current low level of utilisation of some renewable sources that have significant potential in Montenegro<sup>5</sup>, this fact suggests that much more attention should have been paid to the development of RES (other than large hydro) in the updated Strategy. Instead the document proposes modest 32 MW of installed power for photovoltaic plants by 2030 (their share in the total generating capacity would be at the level of 1.4%). Similarly, plans for biomass are set at a low level (39 MW). For electricity generation from wind, 190 MW of installed power is planned by 2020. The Strategy further recommends promotion of investments in RES without feed in tariffs whenever possible, which is highly problematic if substantial improvements are wanted in this area. Experiences in other countries clearly show that provision of incentives is of crucial importance for uptake and dissemination of RES technologies. Other recommendations on RES include further assessments on possibilities to generate electricity from waste, introduction of biofuels in transport sector etc. If the strategies outlined in the updated document from June 2012 are implemented, the overall target of 33% share of RES in final energy consumption is likely to be achieved. However, it will be mainly due to electricity generation and large HPPs, which is disputable from sustainability point of view and uncertain for feasibility reasons (as demonstrated through the experience with Moraca system).

Another reason for questioning the plans incorporated in the updated Strategy is linked to the fact that decentralised solutions and smart grids are not paid sufficient attention, even though their relevance is recognised. For comparison, it should be noted that

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<sup>5</sup> According to the results of 2011 population census, for example, only 109 out of the total number of 247,000 housing units had the equipment for solar energy utilisation.



development of smart grids is one of the key initiatives of the EU Energy Strategy 2020.

Finally, public participation and integration of environmental issues in the process of developing the updated Strategy are another reason for concern. Strategic environmental assessment (SEA) for the document has been initiated only once the draft document has been released for public consultations, which is rather late for a meaningful SEA and for inclusion of the opinions and suggestions of the public. Certainly, this will not contribute to achievement of sustainable solutions for energy sector development.

On the other hand, recognition of obligations linked to the EU accession, more attention (in comparison to the original SEDS from 2007) paid to EE and RES, as well as a more prominent place given to climate change and environmental protection represent some of the key positive features of the updated Strategy.

## 2.2 The EU policies

Ambitious energy policies were developed over the course of the past years to address emerging challenges and to create a framework for an efficient, secure, sustainable and climate friendly energy system in the EU. Climate change issues have progressively taken a central place in the energy sector planning and decision making as the EU endeavoured to become a lead actor in promoting a future of low-carbon energy in the world.

A milestone in the EU energy policy was the so called *20 - 20 - 20 energy and climate package* from 2009 when a set of goals was adopted aiming to reduce greenhouse gas emissions by 20%, to increase the share of renewable energy to 20% and to make a 20% improvement in energy efficiency by the year 2020. The climate



and energy package goals were translated into four pieces of complementary legislation, including:

1. Revised *Emissions Trading Directive*, comprising changes and strengthening of the provisions of the original Directive; the aim of the revision was to reform the EU Emissions Trading System (ETS) as the key tool for cutting industrial greenhouse gas emissions in the most cost-effective way. The changes are coming into effect in 2013, and the most important ones are introduction of a single EU-wide cap on emission allowances (instead of the previous system of national caps), replacement of free allocation of allowances by auctioning (starting with the power sector), and slight widening of the sectors and gases covered by the system. The EU-wide cap will be cut each year so that by 2020 emissions will be 21% below the 2005 level.
2. The so-called *Effort Sharing Decision* on binding national annual targets for reducing greenhouse gas emissions from the sectors not covered by the EU ETS (such as housing, agriculture, waste and transport without aviation). The national targets cover the period 2013-2020 and are differentiated according to Member States' relative wealth – ranging from a 20% emissions reduction (by the richest) to a 20% increase (by the least wealthy Member States).
3. The *Renewable Energy Directive*, with binding national targets for raising the share of renewable sources in energy consumption. These targets, which reflect Member States' different starting points and potential for increasing renewables production, range from 10% in Malta to 49% in Sweden. The national targets will enable the EU as a whole to reach its 20% renewable energy target for 2020 (therefore doubling the share of 9.8% from



2010), as well as a 10% share of renewable energy in the transport sector.

4. Directive on environmentally safe use of carbon capture and storage technologies (capturing the carbon dioxide emitted by industrial processes and storing it in underground geological formations where it does not contribute to global warming).

Energy efficiency target is addressed through the 2011 *Energy Efficiency Plan* and 2012 *Energy Efficiency Directive*. The Energy Efficiency Plan contains a set of energy savings measures. These are expected to create substantial benefits for households (for example, financial savings of up to € 1,000 per household every year), businesses and public authorities, improve the EU's industrial competitiveness and create new jobs (whereas job creation potential has been estimated at up to 2 million jobs). The 2012 Directive establishes a common framework of measures for the promotion of energy efficiency within the Union in order to ensure the achievement of the 20% target and to pave the way for further energy efficiency improvements beyond 2020.

To ensure attainment of the energy and climate goals, the European Commission proposed a new energy strategy. Following extensive debates within the EU institutions and wide-ranging public consultations, the new Strategy (*Energy 2020 - A Strategy for competitive, sustainable and secure energy*) was adopted in 2010 in order to consolidate the already undertaken measures and to step up activity in areas where new challenges were emerging. It is structured around five priorities:

- Achieving an energy efficient Europe;
- Building a truly pan-European integrated energy market;





- Empowering consumers and achieving the highest level of safety and security;
- Extending Europe's leadership in energy technology and innovation;
- Strengthening the external dimension of the EU energy market.

The Strategy recognizes the need for far-reaching changes in energy production, use and supply, highlighting, among other things, significant energy-saving potential in the buildings and transport sectors, relevance of energy savings for industrial competitiveness and the need for promotion and development of innovative and low carbon energy technologies.

Climate and energy interdependencies were further addressed in 2011 when Energy Roadmap 2050 (*Roadmap for moving to a competitive low-carbon economy in 2050*) was adopted. The Roadmap suggests that, by 2050, the EU should cut its emissions to 80% below 1990 levels, and that this goal is attainable through cost-effective measures, primarily in power generation, industry, transport, buildings and construction, and agriculture.

Transition to a low carbon society will, among other things, entail development of low-energy, low-emission buildings with intelligent heating and cooling systems, use of electric and hybrid cars and similar changes. These changes are expected to boost Europe's economy due to increased innovation and investment in clean technologies and low- or zero-carbon energy. A low-carbon economy will have a much greater need for renewable sources of energy, energy-efficient building materials, hybrid and electric cars, smart grid equipment, low-carbon power generation and carbon capture and storage technologies.



To make the transition possible, the EU would need to invest an additional € 270 billion or 1.5% of its GDP annually, on average, over the next four decades. It is estimated that up to 1.5 million additional jobs could be created by 2020 if governments would use revenues from CO<sub>2</sub> taxes and from auctioning of emission allowances to reduce labour costs. Energy efficiency is seen as the key driver of the transition. By moving to a low-carbon society, the EU could be using around 30% less energy in 2050 than in 2005. Households and businesses would enjoy more secure and efficient energy services. More locally produced energy would be used, mostly from renewable sources. As a result, the EU would become less dependent on expensive imports of oil and gas and less vulnerable to increases in oil prices. On average, the EU could save € 175-320 billion annually in fuel costs over the next 40 years.

### 2.3 *Energy Community Treaty*

The Treaty that established the Energy Community came into force in 2006. Montenegro is a Contracting Party to the Treaty, together with all the other countries of the region. By joining the Energy Community, countries have committed to implement relevant EU legislation on energy, environment and competition. The Energy Community has a three-fold purpose. First, it aims to create open and transparent national energy markets capable of attracting investments in power generation and networks. Secondly, the establishment of a regional energy market is foreseen to allow for cross-border trade in energy, guarantee energy supply and ensure that climate/ environmental and social considerations are integrated in the energy sector operation. Finally, in the long term, the objective of the Energy Community is to have this regional market fully integrated in the EU's internal energy market. With these underlying premises, the Energy Community could play a very important role in aiding the alignment of Montenegrin with the EU energy system.



In 2012, the Energy Community Strategy was adopted with the following key objectives:

1. Creating a competitive integrated energy market;
2. Attracting investments in energy sector;
3. Providing secure and sustainable energy supply to customers.

Actions required to meet the Strategy objectives have been also identified and elaborated in the document.

Despite the fact that significant attention has been paid to sustainability concerns in formulating the objectives, the document clearly lacks bold and visionary approach incorporated in the recent EU policy documents. A rather modest target on energy efficiency (at least 9% energy savings by 2018) is endorsed, whereas adequate safeguard mechanisms seem to be missing to ensure that a strong focus on energy security and new investments in energy supply are in fact achieved in a sustainable manner and not at the expense of environmental objectives.

Under the third objective, for example, it is stated that the “energy security is closely associated with timely investments in energy supply in line with economic development and environmental needs”, however actions related to environmental protection under this objective only include preparation of national road maps for the implementation of the *Large Combustion Plants Directive* and for GHG emissions reduction/ limitation. There is no mention of other critical aspects that the development of new energy generation facilities entails. This is especially important having in mind that the Strategy applies to a region where several countries are planning significant generating capacities in large hydropower plants and where environmental management systems,



as a rule, exhibit certain weaknesses. Furthermore, it can be questioned to what extent are projections of energy needs incorporated in the Strategy realistic and compatible with the EU policies, which among other things strongly advocate limitation of energy use. Even though the Strategy (to a limited extent) discusses transition to a low-carbon economy in the Energy Community, the tools needed to achieve such transition (e.g. investments in new technologies and innovation) are neglected. Finally a reason for concern is the fact that the Strategy was adopted with a limited consultative process.

With all of the above in mind, it remains to be seen to what extent will the Strategy be effective in supporting development of sustainable energy systems within the Energy Community.

## 2.4 Civil sector perspective

Civil sector has been playing an increasingly important role in formulation of energy and climate policies around the world, especially in the EU. In Montenegro, civil sector perspectives are often opposed to those of the national administration. As a rule, concerns and contributions of the civil sector are not thoroughly considered and integrated in the formulation of energy strategies and plans in Montenegro.

On the global level, several important reports analysing energy use and suggesting possible ways forward were produced by some of the leading international NGOs in recent years. The World Wide Fund for Nature (WWF) “Energy report” (2011)<sup>6</sup>, for example, laid out a vision of a world that is powered by 100 per cent renewable energy sources by the middle of this century. The authors of the report maintained that switching to renewable energy isn’t just the

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<sup>6</sup> The report was produced in collaboration with Ecofys consultancy and the Office for Metropolitan Architecture (OMA) and their counterpart think tank AMO.



best choice, but the only option humanity has. The scenario presented in the report is based on the two main assumptions: a) total final energy demand in 2050 will be approximately at the level of consumption in 2000, and b) 95% of energy will be from sustainable sources (meaning no nuclear, coal, gas and oil, and no significant increase in hydro power). Some of the key recommendations of the report pertain to clean energy, grids, investments, resource efficiency, technology, and sustainability, and are formulated in the following way:

1. Promote only the most efficient products. Develop existing and new renewable energy sources to provide enough clean energy for all by 2050.
2. Share and exchange energy through grids and trade, making the best use of sustainable energy resources in different areas.
3. Invest in renewable, clean energy and energy-efficient products and buildings.
4. Reduce, re-use, recycle – to minimise waste and save energy. Develop durable materials. And avoid things we don't need.
5. Develop national, bilateral and multilateral action plans to promote research and development in energy efficiency and renewable energy.
6. Develop and enforce strict sustainability criteria that ensure renewable energy is compatible with environmental and development goals.

Similarly, the Greenpeace and European Renewable Energy Council (EREC) report from 2010 presents long term scenario for a complete phasing out of fossil fuels in the second half of this century. The authors of the report speak of this 'Energy (R)evolution' as a necessary response to challenges posed by climate change. The five key principles behind the entire shift will be to:



- Implement renewable solutions, especially through decentralised energy systems;
- Respect the natural limits of the environment;
- Phase out dirty, unsustainable energy sources;
- Create greater equity in the use of resources; and
- Decouple economic growth from the consumption of fossil fuels.

According to Greenpeace and EREC, the following policies and actions need to be implemented to enable Energy (R)evolution:

1. Phase out all subsidies for fossil fuels and nuclear energy.
2. Internalise the external (social and environmental) costs of energy production through 'cap and trade' emissions trading.
3. Mandate strict efficiency standards for all energy consuming appliances, buildings and vehicles.
4. Establish legally binding targets for renewable energy and combined heat and power generation.
5. Reform the electricity markets by guaranteeing priority access to the grid for renewable power generators.
6. Provide defined and stable returns for investors, for example by feed-in tariff programmes.
7. Implement better labelling and disclosure mechanisms to provide more environmental product information.
8. Increase research and development budgets for renewable energy and energy efficiency.

Building on a set of similar ideas, sustainable energy advocacy paper entitled *Fairer, cleaner, safer: towards a more sustainable, people centered approach to energy development in South East Europe* was produced in 2011 by the SEA Change network of civil sector organisations (CSOs) from South East Europe



(SEE)<sup>7</sup>. Sustainable energy vision formulated in this paper rests on the assumptions that in 2050, the SEE region will be:

- energy efficient (current energy intensity levels will be brought down to level up with developed countries);
- clean and powered by renewable sustainable sources (the use of coal will be phased out, and other fossil fuels will make a negligible share of the total energy mix; new technologies will be widely applied and competitive);
- with decentralised and smart electricity networks;
- free from energy poverty and equitable;
- with a competitive and environmentally responsible energy sector;
- democratic and with strong governance structures;
- with changed behaviour patterns; and
- with people-centred approach to energy solutions, which will generate multiple benefits for the SEE citizens (including better living environment, preserved water resources, green economy employment and investment opportunities, transparency and accountability, etc.).

According to the SEA Change network, the key opportunities for the region are energy efficiency and renewable energy. Measures and investments for EE are a clear priority, and further decoupling between GDP and energy consumption needs to be achieved. Continuous, stronger and proactive (compared to what has already been initiated in some countries) policies on renewables are needed, together with appropriate financial backing, to create enabling environment for development, deployment and diffusion of the existing and new technologies. Small scale decentralised solutions should be promoted rather than large unsustainable

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<sup>7</sup> The network comprises CSOs from Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia.



plans, and stringent environmental and social sustainability criteria defined to minimise negative impacts.

The paper further advocates phasing out of coal and use of gas as a transitional fuel, alongside with significant behavioural changes and governance improvements. It also calls for improved environmental management systems, transparency and public participation in energy sector planning, regional solutions whenever possible (to capitalise on the economies of scale) and environmentally and socially responsible investments in energy sector.

## 2.5 Climate change and implications for the energy sector

Under the United Nations Framework Convention on Climate Change (UNFCCC), a global agreement was reached to limit the increase in global mean temperature since pre-industrial times to less than 2 °C by the end of this century, in order to prevent the most severe impacts of climate change. Current global actions to reduce greenhouse gas (GHG) emissions are however insufficient to deliver this, and even if the 2 °C limit is kept, substantial climate change impacts are expected to occur affecting human health, social and economic systems and natural environments. At the recent UNFCCC Conference held in Doha, countries have agreed on a new commitment period under the Kyoto Protocol<sup>8</sup>, a firm timetable towards adoption of a universal climate agreement by 2015 and on the ways to raise necessary ambition to respond to climate change. They also endorsed the completion of new institutions and agreed

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<sup>8</sup> Under Kyoto Protocol, industrialized countries and countries in transition to a market economy committed to emission reduction targets. These countries, known as Annex I parties under the UNFCCC, agreed to reduce their overall emissions of six greenhouse gases by an average of 5% below 1990 levels between 2008-2012, which represented the first commitment period.





ways and means to deliver scaled-up climate finance and technology to developing countries.



Energy sector is a central theme in the efforts to mitigate climate change (that is to reduce GHG emissions) as well as to adapt to its impacts: energy use is the main source of greenhouse gases, climate change is expected to affect precipitation patterns around the world and affect availability of water resources used for electricity generation, while as temperature changes are expected to have direct impact on energy demand – as a result of changing needs for both cooling and heating.

The IPCC *Climate Change 2007: Synthesis Report*, for example, states there is “...high confidence that many semi-arid areas (e.g. the Mediterranean Basin, western United States, southern Africa and north-eastern Brazil) will suffer a decrease in water resources due to climate change. Drought-affected areas are projected to increase in extent, with the potential for adverse impacts on multiple sectors, e.g. agriculture, water supply, energy production and health.” According to the IPCC’s projections<sup>9</sup>, significant decreases (ranging from 20 to 50%, depending on the area) in the runoff and electricity production potential can be expected from the mid-twenty first century onwards for the rivers in South East Europe.

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<sup>9</sup> As quoted in the UNDP and UNFCCC “Handbook for Conducting Technology Needs Assessment for Climate Change”, 2010.



The EC's White Paper *Adapting to climate change: Towards a European framework for action* (2009) also highlighted that hydropower production potential could decrease by 25% or more in southern Europe as a result of changing climate by 2070. One of the significant impacts identified for the Mediterranean region in the EEA's *Climate change, impacts and vulnerability in Europe 2012: an indicator based report* (2012) is that "... the hydropower sector will be increasingly affected by lower water availability and increasing energy demand".

Montenegro has still not formulated its climate policy, even though some important steps to that end have been made through the processes of preparing National Communications to the UNFCCC and of the Technology Needs Assessment. As a non-Annex I country, the country does not have binding commitments to reduce emissions under UNFCCC and Kyoto Protocol. However, as a Candidate Country for accession to the EU, it is obliged to gradually align legal and policy set up with ambitious and complex EU climate policies. Implications for the energy sector will be significant. The updated Energy Strategy is strongly advocating large hydropower and coal, both of which are debatable in the context of climate change (either as sources that directly contribute to climate change or are susceptible to its impacts).



### 3. Montenegro as an ecological state: goals and achievements 20 years on

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Montenegrin Parliament adopted Declaration on Ecological State in September 1991. The Declaration stated a high level of commitment to preservation of natural environment and to a balanced development, and these strategic determinations were later integrated in the Montenegrin Constitution. Provision defining the country as an ecological state is included in the current Constitution too. The adoption of the Declaration was recognised at the UN Conference on Environment and Development held in Rio de Janeiro in 1992, where it was enlisted as one of the Conference documents.

Marking the twentieth anniversary of the adoption of the Declaration, the National Council for Sustainable Development (NCSDD) prepared a report (*Analysis of the accomplishments and challenges of the ecological state: 20 years of ecological Montenegro*, 2011) on the key achievements and weaknesses exhibited in the implementation of the ecological state principles and on progress with sustainable development.

According to the NCSDD report, little has been done during the 1990s to operationalize and implement the concept of ecological state and Rio Summit recommendations due to profound crisis and instability in the country, additionally affected by the wars waged in parts of former Yugoslavia. The initial steps to set up a modern legal and institutional framework for environmental protection and integrate environmental concerns into development planning were nevertheless taken.

A more substantial progress to secure balanced development within three pillars of sustainability (economy -



environment – society) was made during the past decade. The progress can be primarily attributed to improvements in legal and strategic frameworks, as well as to certain steps forward with institutional solutions. This primarily refers to the establishment of National Council of Sustainable Development, the Office for Sustainable Development and the adoption of the National Sustainable Development Strategy, harmonisation of numerous national regulations with the EU legislation (and advancement in the EU integration in general), as well as to adoption of important documents for biodiversity, forests, climate change, waste and wastewater management, regional development, energy efficiency etc. Environmental Protection Agency has been established and decisions brought to remediate certain environmental *hot spots*<sup>10</sup>. The fifth national park (Prokletije) has been declared and there are further initiatives for expansion of the protected areas system. A progress has been achieved in the area of access to information and participation in decision making, and slight improvements in the overall development were recorded (as measured by the Human Development Index).

Assessments conducted in the course of national preparations for the Rio+20 Conference highlighted the fact that indicators showing progress (or opposite trends) with the attainment of sustainable development goals were not always available. Situation is somewhat better when socio-economic aspects of sustainable development are considered (including indicators such as poverty rate, human development index etc.). These indicators have been mainly revolving around same values during the past 7 – 8 years, with some variations in both directions (increases and decreases). Classical economic indicators (such as GDP, employment etc.) have exhibited positive trends throughout most of the last decade and have peaked in 2008, before the effects of economic crisis. In depth

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<sup>10</sup> Some of these decisions have been realised and remediation projects completed.



analysis on the extent to which this growth was sustainable is not available.

When it comes to environment, there are no composite indicators (such as ecological footprint or similar) that could show whether environmental performances of Montenegrin society/ economy are sustainable. Generally speaking, environmental statistics and indicators are not sufficiently developed. A more specific discussion on availability of sustainability indicators (with a focus on energy) is provided in the section 4.3 of this paper.

Analysing further weaknesses and impediments for the implementation of ecological state concept, the NCS D report noted that implementation of laws, policies and strategies was still not satisfactory and that it should be further improved. Other identified weaknesses include insufficient levels of harmonisation among sectoral policies, low level of integration of environmental concerns in sectoral/ economic policies, inadequate estimation and lack of financial resources necessary for implementation, lack of sufficiently developed monitoring and enforcement mechanisms, and similar.

Though the organisational infrastructure for sustainable development is in place, certain challenges persist. Some of the issues that decrease public sector capacities to adequately respond to challenges and requirements of sustainable development are overlapping competences, insufficient or ineffective coordination, and lack of necessary skills and preparedness for strict enforcement of regulations. The areas over which these deficiencies have had an impact so far and problems they generated include: deterioration of protected areas; illegal construction; illegal waste disposal; conversion of agricultural land; unsustainable forest cutting; poor enforcement of regulations for industrial pollution of air, water and soil; inadequate water management, etc.



Problem of insufficient capacities (human, technical and financial) in public administration bodies has been highlighted, especially on local level. Scientific and research capacities for numerous, often new and complex environmental, climate change and sustainable development issues can be also assessed as insufficient. This refers to human resources, equipment, assets and projects undertaken by scientific and research institutions.

Necessity of cooperation and partnerships among stakeholders based on the principles of transparency and participation has been recognised as a precondition for sustainable development. When reviewing developments over the past 20 years in Montenegro, positive examples of synergetic conduct of different stakeholders towards common sustainability objectives can be identified, as well as examples of opposite practices. Lack of integrated approaches is pronounced. Civil society has contributed significantly to formulation and implementation of sustainability policies, especially during the last decade. Nevertheless, its role needs to be further strengthened.

Overall, the NCS D report looked with a critical eye on the achievements with the implementation of ecological state during the past 20 years and recognised a number of areas where negative trends have been pronounced. To reverse such trends, the NCS D identified the main tasks and challenges for the next decade, and made recommendations on how to address them. Further harmonisation of national legislation with the EU *acquis*, international conventions and UN guidelines was recommended, as well as strengthening of commitment and capacities to implement regulations and undertake responsibilities fully and efficiently. Improvements in the governance system and implementation of educational and awareness raising programmes on sustainable development also ranked highly among the NCS D suggestions. Other recommendations included the need to provide



adequate financial support for implementation of sustainability policies and strategies, integrate climate change into sectoral policies, provide for continuous development of scientific, academic, business and administrative capacities for innovation, research and development, and to establish statistical system that will generate necessary sustainability indicators.

Improving energy efficiency (EE) and utilisation of renewable energy sources (RES) was singled out as one of the priority tasks for the next decade. The NCS D report highlighted the need to use the best experiences from other countries in using rich water resources as well as wind, solar irradiation, biomass and waste to generate clean energy. The need to introduce green/ sustainable construction standards was also emphasised. EE and RES were recognised as areas of the utmost importance for climate change mitigation, which at the same time open opportunities for generation of economic and social benefits. Even though the report recognised evident progress achieved with creation of the legal frameworks, adoption of strategies and plans and implementation of EE and RES programmes, it was also concluded that both energy efficiency and share of RES (wind, solar, biomass, small and medium hydropower – excluding large hydro) in energy production and consumption were very low. It is therefore necessary to undertake much more systematic and ambitious measures to ensure that national sustainability targets (set out in the National Sustainable Development Strategy) and obligations stemming from the EU and UN policies are fulfilled. The NCS D particularly recommended measures to ensure mandatory use of solar energy in public sector, to provide new incentives for small and medium hydropower plants and to develop facilities to use biomass and waste for energy generation.



## 4 Energy and sustainable development

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### 4.1. Sustainable development policies and practice in Montenegro

National Sustainable Development Strategy (NSDS, adopted in 2007) sets sustainability objectives for 24 areas (environmental, economic, and social). Objectives relevant to energy sector development include:

- Energy: rational use of electricity and increase of at least 10% in energy efficiency by 2010 in comparison with 2005; reduction in energy import dependence through optimal use of available national resources, priority to utilisation of renewable sources.
- New technologies: stimulation of research, development and innovations.
- Biodiversity: increase share of protected areas to 10% of the territory; establish an efficient protected area management system and improve legal framework and capacities for biodiversity protection.
- Water: ensure sufficient quantity of good quality drinking water and introduce integrated river basin management.
- Climate change: fulfilment of obligations under the international agreements on climate change.
- Public participation and governance: improve enforcement of laws and implementation of strategic documents, plans and programmes; ensure adequate public participation in the process of their preparation.

The NSDS action plan defines actions needed to achieve set objectives and includes indicators to monitor their implementation. Five years following the Strategy adoption, the progress





with the achievement of these objectives can be best described as mixed. In a formal sense, significant steps forward have been made. The findings of the NCS D report (discussed in the previous section) are also applicable here, as the progress is mainly linked to creation of favourable environment for achievement of sustainability objectives. The assessment of the real progress and sustainability of development is impeded by the (already mentioned) weaknesses in the statistical system and lack of outcome indicators.

For example, national indicators on energy efficiency are not generated annually and based on the same methodology – they are rather calculated on an *ad hoc* basis (to meet the needs of various projects) and are often not readily comparable. It is therefore difficult to assess whether the NSDS objective of 10% increase in EE between 2005 and 2010 has been fulfilled. According to the data from the updated energy Strategy (draft from June 2012), per capita gross energy consumption increased for close to 6% over this period, while per capita final energy consumption fell by some 5%. Electricity losses in transmission and distribution remained on more or less the same level throughout the period (and were 0.5% lower in 2010 compared to 2005). As mentioned before, substantial decrease in energy intensity was recorded during the second half of 2000s<sup>11</sup>, but this decrease can be largely attributed to high GDP growth and not necessarily to implementation of EE measures. Assessment of the progress with utilisation of RES is easier to make, where some progress was recorded with preparation of small hydropower and wind projects, and limited incentives were provided for utilisation of solar technologies at household level.

By declaring Prokeltije as the fifth national park, a significant increase in the share of protected areas in the national territory was achieved, and the overall indicator is now slightly below the

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<sup>11</sup> In 2010, energy intensity was 23% lower compared to 2005.



NSDS 10% target. However, identification and designation of protected areas other than national parks is lagging behind, there are delays with identification of Natura 2000 sites, management of protected areas is still at an unsatisfactory level and the same can be said for the overall capacities for biodiversity protection. As regards integrated management of water resources, there was hardly any progress during the past five years except for the adoption of new water legislation and transposition of a part of the EU *acquis* on water. Budgets for science and research have increased substantially, but the actual results of research and innovation activities and their contribution to sustainable development are still to be seen. As for climate change, some steps to implement international obligations (under the UNFCCC) have been completed, but the alignment with the EU climate policies is at a very early phase. The case of updating the national energy strategy as well as many other processes in energy and other sectors testify that there is a large room for improvements when it comes to public participation in decision making. The same applies to implementation of laws, policies and plans, which is repeatedly highlighted as a significant weakness by both the EC Progress reports and other analysis on the progress with implementation of sustainability requirements.

Even though NSDS has made a significant impact on policy making in Montenegro and contributed to integration of sustainability requirements in sectoral policies, it can be said that commitment to sustainable development remains on a rather declarative level and that implementation of regulations and instruments to ensure sustainability is insufficient to deliver the NSDS goals. Furthermore, deviation from sustainability requirements is evident in everyday practice in many sectors, energy included.



## 4.2. Social and environmental issues linked to energy sector

A wide range of social and environmental issues, some of which have already been mentioned in the previous sections, are directly linked to energy sector policies and development. These issues include transparency in decision making and involvement of the public, equitable access to resources and equitable benefit sharing, management of natural resources, biodiversity protection and climate change mitigation. A common mistake made in the implementation of energy policies in Montenegro (not so much in the policy formulation phase) is that some of these issues are forgotten and forgone for the sake of purely economic and energy goals. Implementation of mechanisms to balance between social, environmental and energy objectives is necessary for sustainable energy sector development.



For the development of hydropower, for example, it is necessary to ensure coherence between energy, water and nature protection policies. In the context of EU accession and gradual uptake of EU environmental policies, this means that development of new HPPs should not jeopardise the achievement of the Water



Framework Directive (WFD) objectives of good ecological status or potential of water bodies<sup>12</sup>, and should not entail destruction of critically important nature reserves and biodiversity (determined in line with requirements of Habitat and Birds Directives). According to WFD, new modifications or alterations of water bodies causing failure to achieve good ecological status/ potential (or failure to prevent deterioration from high status to good status) can only be allowed if certain conditions are met. For example, proponents of new alterations or modifications have to demonstrate that planned interventions are of overriding public interest and bring higher benefits to environment and society than what would be the case if good ecological status was maintained. Similarly, provisions of the Habitats Directive impose stringent criteria for approval of projects in order to safeguard integrity of critically important natural habitats and species designated as the ecological network Natura 2000.

Transparent work of the lead institutions and involvement of stakeholders in policy making (as well as in all the stages of energy projects planning and execution) are prerequisites for achieving equitable outcomes, preventing conflicts of interest and corruption, and for sustainable development at large. Independent institutions and the professional integrity of civil servants and elected officials, together with effective provisions for access to information and public participation (as required under the EU legislation) are the

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<sup>12</sup> *The general objective of attaining good status by 2015 applies to all surface waters and it entails achievement of good ecological and good chemical statuses. The ecological status (or the potential) of a water body is expressed in terms of “classes” (e.g. high, good, moderate, poor or bad). Specific requirements for different classes are defined in the WFD annexes and refer to the quality of the biological community, the hydrological characteristics and the chemical characteristics. A less stringent objective of achieving good ecological potential and good chemical status applies for heavily modified and artificial water bodies.*



main means of ensuring that sustainable choices will be made. Enabling access to information and participation of the public are also highly prominent requirements of the environmental and social policies of International Financial Institutions (IFIs).

According to the World Commission on Dams (WCD) report<sup>13</sup> “...public acceptance of key decisions is essential for equitable and sustainable water and energy resources development”. Lack of equity in the distribution of benefits has called into question the value of many dams built in the past period. That is why the WCD suggests that all those whose rights are involved and who bear the risks associated with different options for water and energy resources development should be consulted early on in the project development cycle to reach mutually agreed approaches to benefits sharing<sup>14</sup>. Stakeholder involvement and securing equity in the rights to use water upstream and downstream are also at the core of the EU WFD concept of integrated river basin management.

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<sup>13</sup> WCD (2000), *Dams and Development: A New Framework for Decision Making*

<sup>14</sup> *Benefit sharing is not limited to one-time compensation payments or resettlement support. It includes equitable access to electricity services (project-affected communities are among the first to be able to access the benefits of electricity services from the project), non-monetary entitlements, and revenue sharing (project-affected communities should share the direct monetary benefits of hydropower projects).*



### 4.3. Sustainability indicators and international comparisons

As mentioned before, availability of indicators on sustainable development (in general and in energy sector) in Montenegro is limited, and this particularly applies to availability of series of data over time. Such a situation complicates international comparisons and blurs the picture on the direction the country is moving in.



Different indicators are used to assess sustainability of national energy systems, identify trends, inform policy makers and allow for international comparisons. International Energy Agency (IEA), for example, publishes Key World Energy Statistics (KWES) on an annual basis. Indicators section of the publication contains information on total primary energy supply (TPES), electricity consumption and CO<sub>2</sub> emissions for around 140 countries (in total, per capita, and per units of GDP – expressed in 2005 USD market prices and in PPP - purchasing power parity). Information from the KWES 2012 are presented in the table 1 below.



**Table 1: Selected energy indicators (2010) for the SEE region countries and OECD average**

Country/ region	TPES per capita (toe)	TPES/ GDP (toe/000 2005 USD)	TPES/ GDP in PPP (toe/000 2005 USD)	Electricity cons. per capita (kWh)	CO <sub>2</sub> / TPES (t CO <sub>2</sub> /toe)	CO <sub>2</sub> / GDP in PPP (kg CO <sub>2</sub> / 2005 USD)
<b>Albania</b>	0.65	0.19	0.08	1,771	1.81	0.15
<b>Bosnia and Herzegovina</b>	1.70	0.51	0.23	3,110	3.11	0.72
<b>Croatia</b>	1.93	0.18	0.12	3,808	2.23	0.27
<b>Kosovo</b>	1.34	0.50	0.20	2,592	3.47	0.70
<b>Macedonia</b>	1.40	0.41	0.15	3,590	2.84	0.43
<b>Montenegro</b>	1.30	0.29	0.13	5,552	2.54	0.33
<b>Serbia</b>	2.14	0.56	0.22	4,358	2.95	0.66
<b>OECD</b>	4.39	0.14	0.15	8,315	2.30	0.34

*Source: International Energy Agency, KWES 2012*

Data for Montenegro is available in the IEA database since last year, and this represents a very positive development for domestic policy making and international comparisons. As it can be seen from the above table, Montenegrin economy performed reasonably well in terms of energy intensity in 2010, when 0.13 tonnes of oil equivalent (toe) were used to produce a unit of GDP expressed in purchasing power parity USD from 2005. This was slightly better than the OECD average and somewhat worse compared to Albania's and Croatia's performances. As for the carbon intensity (measured by the ratio between CO<sub>2</sub> emissions and TPES) and carbon GDP intensity (CO<sub>2</sub> emissions per GDP in purchasing power parity), Montenegro again ranks as a third country in the region.



Countries like Bosnia and Herzegovina, Kosovo and Serbia had the highest carbon intensities due to inefficient energy use and more importantly due to high dependence on coal for domestic electricity and heat generation.

Energy statistics of the EU is very complex and it includes time series of data and indicators on *inter alia* energy taxes and prices, energy efficiency, share of RES (disaggregated for electricity generation, heating and cooling, and transport), GHG emissions and carbon intensities, etc. Final energy consumption in the EU-27 peaked in 2005 when it reached 1,191 megatonnes of oil equivalent (Mtoe)<sup>15</sup>. It is interesting to note that over the period 1995 – 2010, final energy consumption in the EU grew only by 8%. In the same period, GDP (at 2005 market prices) grew almost by one third, which shows how the energy efficiency measures implemented during the past 15 years have led to decoupling between energy use and GDP generation. Energy intensity in the same period fell by 20%, while per capita energy consumption remained on more or less the same level.

The last available comparison of the SEE region's indicators on energy intensity with the EU data is the one from the SEA Change network report<sup>16</sup> and it paints a similar picture (in terms of countries' positions) as the IEA data. All the SEE countries used much more energy to produce a unit of GDP than the EU Member States. With energy intensity of 293 toe per million of GDP in 2000 euros (MEUR-2000), Croatia was the closest to the EU level of 169,

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<sup>15</sup> Data in this paragraph are from the publication *EU energy in figures: Statistical pocketbook 2012*.

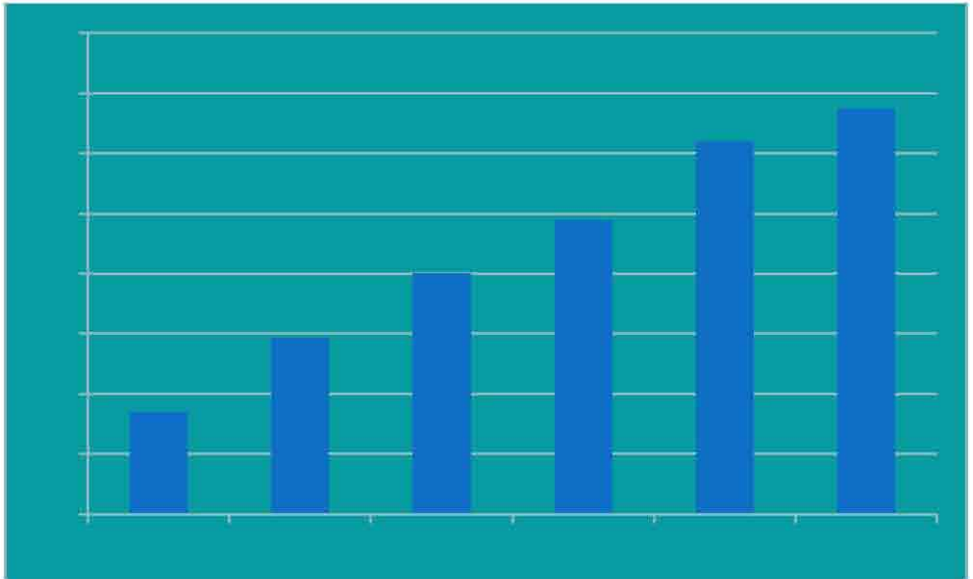
<sup>16</sup> The data sources used in the SEA Change report mainly referred to 2008 and included national energy balances, answers to the EC Questionnaires and [http://ec.europa.eu/energy/publications/statistics/statistics\\_en.htm](http://ec.europa.eu/energy/publications/statistics/statistics_en.htm)





followed by Albania (400 toe/ MEUR-2000). Energy intensity indicator for Montenegro was 2.9 times higher than the EU-27 average (as illustrated in the figure 1).

**Figure 1: Energy intensity in the SEE countries compared to the EU-27 (in toe/ MEUR-2000)**



In 2012, results of a joint effort of Yale and Columbia Universities to calculate Environmental Performance Index (EPI) was published, ranking 132 countries based on 22 performance indicators in the following ten policy categories:

- Environmental Health
- Water (effects on human health)
- Air Pollution (effects on human health)
- Air Pollution (ecosystem effects)



- Water Resources (ecosystem effects)
- Biodiversity and Habitat
- Forests
- Fisheries
- Agriculture
- Climate Change and energy

To aggregate EPI, different weights were assigned to policy areas and specific indicators in each area. Climate and energy area was assigned weight of 17.5% (the same as biodiversity and habitat area, and the single highest weight). Specific indicators used for climate and energy policy included CO<sub>2</sub> emissions per capita, CO<sub>2</sub> per dollar of GDP, CO<sub>2</sub> per kWh and renewable electricity. At the same time, the Pilot Trend EPI (Trend EPI) was calculated based on the same indicators as the 2012 EPI. The Trend EPI took into consideration available historical data to measure performance changes from 2000 to 2010. The countries that were not included in the report either failed to meet the so called materiality criteria (such as having a coastal area, a minimum of 100 km<sup>2</sup> of forested land, generating at least 130 kWh of electricity annually) or, as was the case for Montenegro, did not have sufficient data<sup>17</sup> to allow aggregation of EPI.

Switzerland (with an EPI score of 76.69) leads the world in addressing pollution control and natural resource management challenges. Its top ranking on the 2012 EPI is largely due to high performance in air pollution control. It also has high marks for

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<sup>17</sup> *Data sources for the 2012 EPI came from international organizations, research institutions, government agencies, and academia. Sources of data included: official statistics that are measured and formally reported by governments to international organizations; spatial data compiled by research or international organizations; observations from monitoring stations; and modeled data.*



access to drinking water and the biodiversity and habitat indicators. Latvia (70.37), Norway (69.92), Luxembourg (69.2), and Costa Rica (69.03) are among the five top ranking countries. These results show that it is possible for some middle-income countries, such as Latvia (per capita GDP USD 12,938) and Costa Rica (per capita GDP USD 10,238) to achieve impressive environmental outcomes. This means that income alone is not a sole determinant of environmental performance and that policy choices and good governance also matter. Albania is the best ranking country (15<sup>th</sup> place) from the SEE region. Its performance in the climate change and energy policy area is mainly responsible for the high result. At the low end of the 2012 EPI list are South Africa (34.55), Kazakhstan (32.94), Uzbekistan (32.24), Turkmenistan (31.75), and Iraq (25.32). These countries are water scarce and face significant sustainability challenges; the last three are also known for weak governance.



## 5. Specific developments in the energy sector in Montenegro over the course of the past 20 years

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Hydropower, petroleum products, coal, wood and imported electricity are the main items in the Montenegrin energy balance; gas is currently not used in the country in significant amounts as there is no gas infrastructure. Petroleum products have a major share in the overall energy mix (with close to 40% during past years), followed by coal (around 35%) and hydropower (less than 15%). Domestic production is roughly half the total primary energy consumption, with lignite being the most important source. All oil and petroleum products are imported.

Energy sector reforms were initiated in 2003 with the adoption of the previous Energy Law, which has set a foundation for the establishment of market conditions in the energy sector, unbundling of the then integrated electricity company (EPCG), establishment of independent regulator etc. The reforms were further stimulated in 2006, when the country ratified the Energy Community Treaty. Progress in the EU accession process is currently the main driving force behind legal and institutional changes in the sector. The reforms are of crucial importance for establishing an efficient, open and sustainable energy system, especially after conditions in the sector deteriorated to a large extent during 1990s. The period from 1990 to early 2000s was marked with weak management practices, lack of investments in electricity transmission and distribution infrastructure and new energy facilities, inefficient energy use, non-market prices and subsidies for large state owned industries.

A new Energy Law, mainly harmonized with the *acquis*, was adopted in 2010; adoption of several bylaws is still needed to provide for further transposition of the EU legislation



and to enable implementation. Electricity prices have increased substantially over the course of the past decade and are among the highest in the region for household consumers. Nevertheless, in the last EC Progress reports it is assessed that the prices are still not cost-reflective. Targeted subsidies were introduced for the most vulnerable population categories yet there are no analyses on their effectiveness. Subsidies for the Aluminium Plant are supposed to be phased out as of 2013.

EPCG was partly privatised (to the Italian Company A2A) in 2009, while the government maintained majority ownership in the company. Prior to EPCG privatisation, separate transmission company was established (also in 2009) which was recapitalised in 2011. Main shareholders of the Montenegrin Electricity Transmission System (CGES) are the state (with 55% of shares) and Italian operator Terna (22%). The distribution company remains integrated in the EPCG, even though the deadline for its legal unbundling was the end of 2012. Market Operator (COTEE) was established as a separate legal entity and started functioning in the beginning of 2012. Coal Mine Pljevlja also operates as a shareholding company with the key shareholders being A2A (around 40%) and the state (around 30%). The main companies on the oil and petroleum products market are Jugopetrol (privatised in 2002 to Hellenic Petroleum International) and state owned Montenegro bonus. Jugopetrol is licensed for research and exploitation of potential oil reserves in Montenegro. There has been no progress with regard to the development of a gas market.

When it comes to preparation and implementation of specific plans and projects in the energy sector during the past ten years, the government strongly advocated and worked on the development of large hydropower facilities, but the efforts have not yielded any concrete results yet. This fact can be qualified as a favourable in terms of sustainability, since these projects (most



notably Moraca system) were seriously questioned by the public, primarily on environmental and social (but also on economic) grounds. Preparatory steps in the elaboration of Moraca and Komarnica projects included developments of detailed spatial plans for the potentially affected areas as well as development of related Strategic Environmental Assessments (SEAs). These processes clearly showed weaknesses with integration of environmental and sustainability concerns, and with public participation in energy sector planning. Quality of both SEAs was unsatisfactory, and opinions and suggestions of the public have been repeatedly ignored.

Certain progress with development of other RES is evident. Assessment of potential for wind, solar and biomass was completed in 2007; assessments of potential for small HPPs have been completed in the first half of 2000s, whereas detailed measurements of flows continue until now (and will be conducted in the future too). The implementation of projects for small HPPs has advanced. Based on two tenders and issued energy permits, the government has given out 16 concessions for construction of 38 small HPPs since 2007. Construction permits have been meanwhile issued for nine of these projects (and they are in the construction phase). Implementation is often slowed down by complicated procedures, lack of data and ineffective coordination among different segments of administration (responsible for energy, water management, spatial planning, etc.). Furthermore, mechanisms to ensure sustainability in the development of small HPPs are either lacking or are not implemented in the right way. For example, there are no regulations on minimum ecological flows, consultations with other water users are, as a rule, not carried out in an early stage of project development to agree on equitable resource use and prevent conflicts, and enforcement of regulations and supervision of works are not on a satisfactory level. Recent adoption of bylaws for the promotion of electricity generated from RES



(including the establishment of differentiated feed-in tariffs) is expected to give further results and stimulate the process. Adoption of such regulations is a positive development and is in a way overriding recommendation of the updated energy Strategy to promote investments into RES without guaranteed simulative purchase prices.

As for wind energy, preparation of two projects is currently under way at Mozura (Ulcinj and Bar municipalities, 46 MW installed power) and Krnovo (Niksic municipality, 72 MW) locations. Construction of windmills is planned for 2013 and 2014.

Despite the fact that available assessments indicate significant potential for the use of solar energy, initiatives in this area are quite limited. Provision of interest-free bank loans (through Montesol project) for solar water heating systems for households is one of the incentivising mechanisms used at the moment. Another project supports (by covering 80% of the total project cost) instalment of photovoltaic systems on remote mountain cottages (around 90 systems installed so far). Specific plans for construction of photovoltaic plants are currently limited to the UN building in Podgorica (planned installed power around 130 kW). Podgorica and Budva municipalities have introduced reduced fees for construction permits for buildings with solar equipment, but these alleviations do not seem to be on the level sufficient to stimulate substantial uptake of solar technologies in households and services sectors. Projects on the development of other RES are also in the initial phases, and there are almost no activities to stimulate the use of renewable energy in transport.

Long lasting tolerance or even support for inefficient energy use (as was evident in the case of Aluminium Plant, either through implicit or explicit subsidies) sent wrong signals over time and created an unfavourable environment for implementation of EE



measures during 1990s and for much of the 2000s. This has somewhat changed during the past few years, when legal and policy frameworks were substantially improved and when rising prices stimulated implementation of energy conservation and savings measures. Nevertheless, strong financial support for EE is still lacking and is mainly provided through specific donor funded projects or IFI loans; institutional support is mainly extended through and energy efficiency sector of the competent ministry. The EE law adopted in 2010 contains provisions relating to energy end-use efficiency, energy performance of buildings, eco-design of products, labelling of household appliances, etc. However it does not foresee establishment of a specialised implementing body or an energy efficiency fund.

Specific projects that are being implemented include provision of funds to improve energy efficiency in buildings and support for EE awareness raising and capacity building. The World Bank loan (6.5 MEUR) is used to renovate 15 public buildings (schools, hospitals etc.) and turn them into energy efficient structures. The project started in 2009 and lasts until mid-2013. In cooperation with KfW, additional 13 MEUR have been secured to implement a programme of energy efficiency in public buildings through mid-2014. Since 2008, German development agency (with co-financing from Norwegian government) has extended assistance for improvement of the legal and institutional set up for EE, educational and awareness raising campaigns, training and certification of energy auditors, and similar activities. Total funding provided for these activities was around 5 MEUR, and the projects are coming to a close in March 2013.

Lack of investments into new infrastructure and for proper maintenance of the existing electricity transmission and distribution systems that characterised much of the 1990s has, together with weak management, resulted in poor





overall state of the networks, high electricity losses and occasional interruptions in power supply. Since 2000, maintenance and development of networks has somewhat improved, but significant investments are still needed to upgrade the system into reliable and efficient one. According to the updated energy Strategy (draft from June 2012) interconnections with other countries in the region are at a satisfactory level.

Current investment priorities for the transmission system include projects such as 500 kV undersea cable for interconnection with Italy and 400 kV transmission line Pljevlja - Lastva, which are mainly oriented towards transit and export of electricity. From sustainability point of view, better effects would be yielded by focusing on the projects for reliable and quality supply to all the consumers in the country, connections of new RES and minimisation of losses.

Significant investments are needed in the distribution network too. Recommendation of the updated energy Strategy is to develop distribution network to ensure security of supply and reduce losses (technical and commercial) below 10% by 2030. Such orientation and on-going activities on replacement of old electricity meters with 'smart' ones are commendable, however much more will be needed to reach a truly sustainable energy system and keep pace with developments in the EU. Smart grids, for example, should be one of the priorities for the forthcoming period, and much stronger policy and financial backing should be provided to that end compared to what is currently the case.



## 6. Potential for green economy development

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### 6.1 Green economy concept and linkages with sustainable development

In its 2011 report<sup>18</sup>, UNEP defines green economy as one that results in “*improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.*” In a practical sense, green economy is often described as activities that:

- Reduce emissions of greenhouse gases and pollution;
- Improve efficiency in the use of energy and other resources; and
- Prevent loss of biodiversity and ecosystem services.

The European Commission issued communication<sup>19</sup> on green economy in 2011 and recommended three policy areas where additional efforts were needed for transition to a green economy. These areas are: 1) investments in sustainable management of key resources and in natural capital; 2) establishment of adequate market and regulatory conditions; and 3) governance improvements and stronger involvement of private sector.

Green economy and linkages with sustainable development were one of the central topics of the 2012 UN Conference held in Rio de Janeiro (Rio+20 Conference) in 2012. In the final Conference document (*The future we want*), participating countries agreed that green economy was one of the important tools for achieving

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<sup>18</sup> United Nations Environment Programme (UNEP, 2011), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*

<sup>19</sup> EC, COM(2011) 363 final, *Rio+20: towards the green economy and better governance*



sustainable development. The document emphasized that green economy should contribute to poverty eradication as well as to sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's ecosystems.

One of the basic green economy assumptions is creation of new, green jobs. UNEP's study published in 2008<sup>20</sup> provided an overview of the current situation and analysed possibilities to create green jobs. The study defines green jobs as employment opportunities that reduce the environmental impact of enterprises and economic sectors to a sustainable level. Green jobs are found in many sectors of the economy – from energy supply to recycling, and from agriculture and construction to transport. They help to cut the consumption of energy, raw materials and water, to de-carbonize the economy and reduce greenhouse gas emissions, to minimize or avoid altogether all forms of waste and pollution, to protect and restore ecosystems and biodiversity. The study identified that significant potential for creation of green jobs exists in the following sectors:

- Energy supply (integrated gasification, cogeneration, renewables – wind, solar, biofuels, geothermal, small-scale hydro);
- Energy efficiency (especially in construction and retrofitting of buildings, green buildings, housing);
- Transport (fuel efficient vehicles, hybrids and electrical cars, public transport, non-motorised transport);

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<sup>20</sup> UNEP/ILO/IOE/ITU (2008), *Green Jobs: Towards decent work in a sustainable, low-carbon world*



- Agriculture (soil conservation, efficient use of water, organic production, decreasing the distance between farms and markets);
- Forestry (reforestation and afforestation projects, agroforestry, sustainable forest management and certification schemes);
- Industry, trade and materials management.

The study concluded that the highest potential for green jobs creation lies in renewable energy sources, recycling, public and rail transport, energy efficiency in buildings and households sectors, organic agriculture and small sustainable farming, and sustainable forest management.

In the course of preparations for the Rio+20 Conference, agriculture, energy and tourism were identified as priorities for greening Montenegrin economy until 2020. These sectors were assessed to have significant potential for a shift to green policies and practices, thus contributing to sustainable development. Research and development and climate change were identified as cross-cutting themes highly relevant for transition to a green economy. Possibilities to create new jobs, preserve natural capital and contribute to efficient use of resources were the key points assessed in the analysis of greening options in priority sectors.

## ***6.2. Possible areas for greening the energy sector in Montenegro***

National preparations for the Rio+20 Conference showed that greening of the energy sector was primarily possible through implementation of energy efficiency measures (for households, public and commercial sectors, manufacturing industry and transport) and better utilisation of renewable sources. Climate change and its impacts on the environment, economy and society were also assessed to be of crucial importance for



development of strategies for transition to a green economy. Greening of the economy is, on the other hand, expected to generate a range of economic and social (e.g. fulfilment of energy objectives, creation of new employment) as well as environmental benefits, and to contribute to the EU accession process.

Analyses conducted to support preparations for the Rio+20 and to help with identification of national priorities showed that green economy investments were providing high benefits. According to the UNDP study<sup>21</sup> results, for example, 52 kilotonnes of oil equivalent (ktoe)<sup>22</sup> energy savings could be achieved over the period 2012 – 2020 by investing on average 27 MEUR per year (1.5% of GDP) for energy efficiency measures in the buildings and transport sector. Compared to 'business as usual' scenario (development without these investments), energy consumption in transport sector would be reduced by 8.6% and in buildings sector by 11.8% in 2020. If reduced energy costs are taken into account, net investments needed to achieve the energy savings would fall to 1% of GDP. It was estimated that these investments would generate close to 3,000 new jobs.

As already mentioned, the existing and forthcoming energy policies are paying substantial attention to utilisation of RES. For sustainable development and for greening the economy, it would be very important to shift attention from large HPPs (due to their potential to destroy or endanger critically important ecosystems and species and susceptibility to climate change/ reduced availability of water) to currently under-developed sources and

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<sup>21</sup> UNDP Crna Gora (2012), *Assessing the impact of green economy investments in Montenegro: a sectoral study focused on energy (transport and buildings) and tourism*

<sup>22</sup> According to updated energy Strategy, final energy consumption in Montenegro in 2008 was 855 ktoe (35,789 TJ), so this saving would represent 6% of the total energy consumed in 2008.



options (such as solar, wind, biomass and possibly waste, and introduction of biofuels in transport).

Findings of the Technology Needs Assessment (TNA) for Climate Change<sup>23</sup> reaffirmed that a range of energy supply and energy savings technologies were available and had significant potential for application in Montenegro to ensure fulfilment of sustainable development goals. Solar water heating systems have been prioritised as a technology that helps achieve significant energy savings, while photovoltaic panels and solar power plants were identified as priorities for energy generation. The TNA concluded that solar sources together with small HPPs could reach 200 MW installed power over the course of the next 25 years if adequate support was provided. By applying these technologies, emissions would be reduced for more than 15 Mt of CO<sub>2</sub> equivalent, which is roughly three times the total annual emissions (counting the 2009 level). Necessary investments (not taking into account expected lower prices of solar technologies over the time) would be in the range of € 26 million per year.

Together with application of technologies for efficient use of energy that have been prioritised in the TNA process (insulation of buildings, use of efficient air conditioners, automated energy management in buildings) and of other EE measures and technologies, such development in the energy sector would significantly contribute to a decrease of dependence on energy imports but also to fulfilment of other, very important goals such as harmonisation with the EU climate policy, increase in EE and competitiveness, market development and employment, reduction of pollution, improvements in the quality of housing conditions, and others. On the other hand, meeting the climate and especially the

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<sup>23</sup> The process for Montenegro was completed in autumn 2012, in line with the updated UNDP and UNFCCC TNA Handbook.



EU goal of reducing CO<sub>2</sub> emissions for 80 - 95% until 2050 can hardly be guaranteed if solutions such as TPPs are opted for in energy sector development. Likewise, mobilisation of necessary financial resources for incentives for EE and RES technologies can hardly be achieved if support (through direct or indirect subsidies) for energy and emission intensive industries such as aluminium production is continued. As for the transport sector, TNA recommended public transport improvements and development of alternative transport modes (such as cycling, for example), with gradual introduction of technological solutions for vehicles (hybrids, electric) and traffic regulation (intelligent transport system) that substantially contribute to emission reductions.

In order to ensure wide deployment of RES and EE technologies that contribute to green economy development, TNA recommended that following measures are implemented:

- Provision of fiscal (lowering of VAT and customs rates) and financial (subsidies, favourable loans) incentives;
- Awareness raising and educational campaigns (changing people's mind sets);
- Trainings to transfer and disseminate necessary specialists knowledge and skills;
- Discouraging unsustainable behaviours (by adopting and implementing appropriate instruments, regulations and standards);
- Improved cooperation and coordination among competent institutions as well as with other stakeholders (private sector, scientific and research community, civil society);
- Enhancing databases and information systems;
- Conducting studies, analyses and research for better understanding of implications of climate change for economy, society and the environment.



## *7. The key challenges and opportunities for sustainable energy sector in Montenegro*

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Even though it can be said that Montenegrin energy policies are oriented in the same direction as the EU ones, the level of ambition and the choice of measures, instruments and development options to deliver policy goals in Montenegro is substantially lagging behind. National approaches to renewable energy and energy efficiency are still somewhat conservative, and as evidenced by the available materials for the updated energy Strategy until 2030, priority is still given to large hydro and thermal power plants, despite negative experiences with previous attempts to implement some of these projects. Climate change policies are not well defined, and regardless of the fact that some improvements have been achieved with integration of climate change concerns into energy sector, the updated energy Strategy seems to grossly disregard both climate change mitigation and adaptation aspects and needs.

The distance between the official policies and civil sector's views does not seem to diminish with the latest evolvments in the energy sector planning in Montenegro – on contrary. Focus on large scale projects (some of which have a proven record of being opposed by the public) that should turn the country into an electricity exporter is not likely to yield results on consensus building, social acceptability and equitable development. Environmental concerns behind some of these projects also bear risks to undermine sustainable development in the energy sector.

Moreover, national energy policy and in particular current plans for its implementation do not seem to be capable of delivering harmonisation with the EU policies. As repeatedly emphasised by in the EC Progress reports, substantial improvements in the legal (both regulating and enforcement) and institutional





frameworks are still necessary to align with the EU energy *acquis*. When it comes to specific plans, the analysis presented in this paper showed that a much more determined and systematic orientation towards sustainable RES and energy efficiency is needed. Projections of future energy needs should be made on realistic assumptions and should take into account necessary decoupling between the GDP growth and energy consumption.

Over the course of the past 15 years, for example, energy consumption in the EU grew only by 8% as compared to more than 30% growth of GDP. This applies to economies that had a stable development over the period in question and much lower energy intensity (compared to Montenegrin economy) as a starting point. The EU nevertheless plans to limit its energy use further through implementation of efficiency measures, while at the same time providing for economic development (cutting costs, improving competitiveness, creating new jobs, etc.). Projections from our updated energy Strategy envisage almost doubling of final energy consumption to generate 3.6 times higher GDP over the course of the next 20 years (reference years are 2010 and 2030). Even though these estimations do predict that GDP will grow much quicker than energy consumption, they raise a question of how realistic the projections are. To reach the GDP of EUR 5.6 billion in 2030 in Montenegro would for example require continuous annual growth of 6.5% (assuming a flat rate), which is questionable having in mind current and the experiences from the past decade.

There is a high level of convergence between the EU and sustainability goals in the energy sector. Both include increased welfare, protection of water and biodiversity, compliance with global climate change commitments, transparent and participatory decision making process and others. In Montenegro, these complementary sets of goals will be best served if a favourable framework is created and strong support provided for



development of RES and substantial improvements in energy efficiency. As illustrated in the previous analysis, such development would be also beneficial for greening the energy sector and to overcoming the identified challenges for the implementation of ecological state goals.

Some of the main failures of the so far policies on sustainable development or, to be more precise, failures with their practical application include lack of implementation and enforcement of proclaimed goals and adopted regulations, policies and plans. The ideas of sustainable development and ecological state have thus, despite evident improvements in certain areas, remained on paper rather than being truly integrated in the social and economic fabric and providing for a balanced development that does not undermine environmental integrity. Lack of integrated and modern approaches and poor coordination is another factor that slowed down implementation of sustainable development policies, and the same goes for a lack of transparency and low level of stakeholders' involvement in decision making. Weak information basis and lack of indicators to monitor and evaluate developments, and inform policy making can be also singled out as a factor that contributed to weak implementation of sustainability requirements in general as well as in energy sector and related areas.

Despite weaknesses seen in the previous period and slow progress, there are significant opportunities ahead for achieving the inter-linked EU accession and green economy/ sustainable development goals in the energy sector, and to bring Montenegro shoulder to shoulder with the countries that have strong environmental performance. If these opportunities are used in the forthcoming period, declaration and constitutional provisions on ecological state could be justified.



In order to achieve this, a profound change in current energy thinking is needed alongside with strong actions to implement positive elements of the national energy policies (such as priorities outlined in the *Energy Policy of Montenegro until 2030*). The outdated approaches and proposals need to be reconsidered and replaced with a vision and priorities that will ensure compliance with global and especially with the EU attempts to develop sustainable energy systems capable of coping with climate change, resource scarcity and equity challenges. As highlighted in all the studies and reports mentioned in this paper – from those produced by the National Council on Sustainable Development to international and civil sector organisations and the EU – this vision needs to be focused on sustainable renewable energy sources and energy efficiency.

Views and recommendations of various stakeholders need to be taken into account in policy making, and potential of different sectors (private sector) need to be utilised to a full extent to deliver necessary improvements. Further opportunities lie in provision of strong support and enabling environment for sustainable energy. This includes creation of transparent and implementable regulations and standards and more importantly to introduction of adequate incentives. Several European countries have, for example, implemented ecological tax reforms where an emphasis is placed on taxing environmentally damaging and polluting activities while reducing tax burden related to labour. In this way and by eliminating subsidies for polluting and energy intensive activities, a large room is created to stimulate new, green activities and employment.

While a lack of data is still acting as a significant limiting factor, there is a growing body of knowledge and data to allow transition to a green and sustainable energy sector, and this too represents an important opportunity. Improvements in the statistical



system are nevertheless still needed. Further opportunities are linked to educational and awareness raising activities and cooperation with international community. Improving capacities for research and innovation and development of specific skills can contribute to development and deployment of small scale decentralised solutions and of new technologies for energy supply and consumption. Finally, the EU accession process in itself represents one of the key opportunities for sustainable energy sector development in Montenegro.



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