Resource Efficiency and Sustainable Human Development



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FOREWORD

For almost a decade now, UNDP Montenegro through its Human Development Reports has been drawing the attention of the country's policy-makers and civil society to Montenegro's socio-economic development. The reports have stimulated national debates and resulted in many initiatives promoting and strengthening human development. Through these reports we have offered focused perspectives and analysis of national circumstances and strategies for both economic growth and the advancement of human development. The aim of these reports has been to bring together human development facts, influence national policy and mobilize various sectors of the economy and segments of society. It introduces the human development concept into the national policy dialogue – not only through human development indicators and policy recommendations, but also through a country-led and country-owned process of consultation, research and report writing. As an advocacy tool designed to appeal to a wide audience, the report can catalyze public debates and mobilize support for action and change.

In line with one of the main priorities and "driving" forces of the Europe 2020 agenda, and being aware of the need for a change in development trajectory, the Montenegrin Government is now seeking to reassert its vision to become an "ecological state" and move towards a resource-efficient economy.

Resource efficiency means sustainable management and use of resources, throughout their lifecycle (from extraction, transport, transformation and consumption, to the disposal of waste). In plainer words, it means finding ways of producing more with fewer inputs and less impact and consuming differently, to limit the risks of scarcity or pollution. Moving towards a growth path which will have the dual benefit of stimulating the growth needed to provide jobs and wellbeing for its citizens and of ensuring that the quality of this growth leads to a sustainable future will require the country to tackle these challenges and turn them into opportunities. Preparing the Montenegrin economy for this transformation in a timely, predictable and controlled manner will enable it to further develop its wealth and wellbeing, whilst reducing the levels and impact of its resource use.

Resource management is 'basically common sense' – who, after all, wants to be ineffective in managing resources? We believe that environmental and economic interests can work together and contribute to the same objectives, rather than appear as opposing parties when deciding on the priorities of Montenegro and its society.

The report explains what it takes for Montenegro to reach a resource-efficient, greener and more competitive economy as per Europe 2020 with a strong positive and sustainable human development impact and it is a result of the analytical efforts to define a resource-efficient development agenda on the basis of the potentials, existing obstacles and limitations. The Report contains the proposal of policies and actions necessary to achieve the shift to a more resource-efficient, greener and more competitive economy that would be fully harmonized with the key priorities of the European Union and that would be fully in the function of promoting human development.

Past development patterns brought prosperity to Montenegro and its citizens, but through intensive and often inefficient use of resources. The role of biodiversity, ecosystems and the services they provide has been largely underestimated, costs of generating waste and pollution often were not reflected in prices and it is becoming increasingly evident that markets and public policies need to be improved in order to cope with rising demand and competition for strategic resources such as minerals, soil, water and biomass.

Ensuring a sustainable development path in Montenegro would mean making appropriate choices and finding compromises (trade-offs) between competing priorities (for example, energy security as opposed to the preservation of biodiversity, water resources and air quality) and ensuring the transformation of the economy in a way which makes possible a gradual transition towards achievement of European targets, competitiveness, permanent decoupling of economic growth from the use of resources and environmental impacts and keeping the promise to be an ecological state.

We hope this report will inspire decision makers in Montenegro on the way forward to shape a common response in terms of translating its findings into concrete action while contributing to a real change on the ground.

Rastislav Vrbensky UN Resident Coordinator UNDP Resident Representative to Montenegro

Human development is a development pattern that puts people as its ultimate objective. People's wellbeing – and not achieving a high level of gross domestic products – is the ultimate purpose of human development.

Human development and sustainability

The core topic of this report is resource efficiency – an issue of increasing significance from a human development perspective. Human development should be sustainable because it emphasizes the importance of paying the same kind of attention to future generations as to the current one so that the fulfilment of the current population's needs would not compromise the ability of future generations to meet their own needs. Unless development pattern is sustainable, it is not genuine human development.

The challenge of the sustainability of human development is becoming increasingly acute. On one hand, there are positive changes in improving sustainability, as public attention and policy focus are becoming more explicitly focused on the implications of GHG emissions and climate change. On the other hand, there are some negative effects to sustainability trends, such as biodiversity degradation, natural resource depletion, or piling up waste stocks that the natural ecosystems cannot otherwise contain. Humanity is reaching (and in some cases – has passed) crucial natural planetary boundaries and, unless the entire development concept is reconsidered, the hypothetical scenarios for a collapse may indeed materialize.

The report defines "sustainability" as the ability to meet the needs of the present generations without diminishing the opportunities of the next generation to enjoy the same (or better) guality of life and benefits of



Figure 1: HDI and ecological footprint of consumption globally

Source: HDRO and Global Footprint Network.



Photo: Aleksandar Jaredić

enjoying nature as the current (and the previous) generations have had. So far, the development patterns of most countries have not followed a sustainable path and, while progressing in human development, most countries are also increasing their environmental footprint (Figure 1). This entails the broader impact on the society (and not just CO_2 emissions). It also suggests that, for a sustainable development to materialize, people need to identify and adopt strategies for maintaining the capacity to provide non-declining wellbeing in a non-extensive way (achieving the desired wellbeing through different technological paths). Resource efficiency is a crucial element of such strategies.

The report introduces for the first time to Montenegro the Domestic Material Consumption (DMC) indicator and elaborates a number of possible scenarios related to different policy options. Optimizing material consumption is particularly important for a small country with fragile ecosystems still rich in biodiversity, such as Montenegro. The authors, however, go beyond the technical dimensions of the DMC indicators and put the issue into a broader context of quantifying sustainability and thus informing the policy-making process.

Although significant progress in defining sustainability has been made, there are major challenges in its measurement and monitoring. Currently, there are a number of approaches to measure sustainability in use: the World Bank's "Adjusted Net Savings" or "Genuine Savings" – the performance of capital stock of all forms of capital monitoring the investment in them, their depreciation and the depletion of a number of natural resources; greening the Human Development index and others.

The human development profile of Montenegro

Montenegro's HDI value for 2013 is 0.789— which is in the high human development category—positioning the country 51st out of 187 countries and territories. Between 2005 and 2013, Montenegro's HDI value increased from 0.750 to 0.789, an increase of 5.3 percent or an average annual increase of about 0.64 percent. The ranking is shared with the Bahamas.

Montenegro's 2013 HDI of 0.789 is above the average of 0.735 for countries in the high human development group and above the average of 0.738 for countries in Europe and Central Asia. From Europe and Central Asia, countries which are close to Montenegro in their 2013 HDI ranking and to some extent in population size are Latvia and Lithuania, which have HDIs rankings of 48 and 35 respectively (see Table 1). From the neighbouring countries of the former Yugoslavia, Croatia is the closest in ranking (47). The country's human development performance however might be even better if inequality in individual human development dimensions is decreased. When Montenegro's HDI (2013 in 0.789) is discounted for inequality, the HDI falls to 0.733, a loss of 7.2 percent due to inequality in the distribution of the dimension indices. This is a much lower loss than Croatia (11.2 percent), Latvia and Lithuania (both with 10.6 percent losses due to inequality), Serbia (a loss of 10.9 percent), FYR Macedonia (loss of 13.6 percent) or of Bosnia and Herzegovina (a loss of 10.6 percent). The average loss due to inequality for high HDI countries is 19.7 percent and for Europe and Central Asia it is 13.3 percent. The Human Inequality coefficient for Montenegro is equal to 7.1 percent – also one of the lowest in the region.

Inequality is not the only factor eroding progress in human development. Unsustainability is another, even

		HDI value	HDI rank	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (PPP US\$)
rs	Montenegro	0.789	51	74.8	15.2	10.5	14,710
l	Latvia	0.810	48	72.2	15.5	11.5	22,186
	Lithuania	0.834	35	72.1	16.7	12.4	23,740
	Croatia	0.812	47	77.0	14.5	11.0	19,025
	Serbia	0.745	80	74.1	13.6	9.5	11,301
	FYR Macedonia	0.732	84	73.9	13.3	8.2	11,475
	Bosnia and Herzegovina	0.732	86	76.4	13.6	8.3	9,431
	Europe and Central Asia	0.738	—	71.3	13.6	9.6	12,415
	High HDI	0.735	_	74.5	13.4	8.1	13,231

Table 1: Montenegro's HDI indicator for 2013 relative to selected countries and groups







Source: Global Footprint Network (2012). Mediterranean Ecological Footprint Trends.

more important one. One approach for estimating the degree to which the country is on a sustainable development path is measuring the "ecological footprint". It estimates the impact of human activity and Montenegro's footprint comes close to its biocapacity, which demonstrates that it is possible to achieve a high level of human development, while at the same time keeping a low environmental impact. Montenegro also appears to be the only country in the Mediterranean basin to have improved the proportion between its biocapacity balance and production footprint between 1961 and 2007 (Figure 2).

The report takes a novel approach and applies the idea of the "Affordable Human Development Index (AHDI)" to the country context. This is an index of the level of human development that individual countries can afford to maintain, given their economic, environmental, social and political performance. It adds an additional (fourth) dimension to the HDI to reflect the status of the environment but also introduces indicators of "affordability" outlining to what extent the level of human development reached can actually be sustained in the long run.

Applying this logic to Montenegro and the other countries of the former Yugoslavia reveals a worrying

picture. As the data shows, in 2013 the value of Montenegrin human development (with environmental aspects reflected in the index) should be discounted by 22% due to the unsustainability of the development outcomes – the same magnitude of "unaffordability loss" as Croatia.

The value of such indices is less in the rankings they produce but more in the insights into the processes that lead to their particular value (and consequently - place in the ranking). Figure 3 visualises the areas that contribute to losses in the value of the AHDI suggesting possible priorities for the future. It shows to what extent the human development progress achieved is genuine and sustainable. In the case of Montenearo, the highest losses in terms of sustainability of the human development outcomes come from healthiness of life and a decent standard of living. Although life expectancy at birth is 74.8 years, healthy life expectancy is more than 10 years lower). The unaffordability of standards of living comes primarily from high energy use per unit of GDP (131 kg of oil equivalent per US\$1,000 GDP in constant 2011 PPP). Addressing these three areas would significantly improve the value of AHDI bringing it closer to its potential level.



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Photo: Duško Miljanić

Finding the balance between economic growth and sustainability

Growth is needed to meet the needs of the expanding population. But it also needs to be balanced so that it is maintained within the sustainable development path. How to find that balance?

Various concepts and approaches to economic development that guarantee the stability of the natural environment in the long term are promoted globally and include the green economy, resource efficiency, the circular economy, sustainable consumption and production. The report introduces these concepts and claims that resource efficiency is indispensable in that context as the past development patterns brought prosperity, but through intensive and often inefficient use of resources.

The "circular economy" is a fast growing field of applied economics bringing economic processes closer to the logic of natural lifecycles. In the common understanding of the economic cycle, resources are seen as available goods that are not used vet. These goods need human activity to gain value and turn into commodities and they do so in the process of economic activity. However, taking into account the product's lifecycle and the technological processes applied, it is clear that this approach to defining the notion of a resource is neither comprehensive nor accurate. Today the global economy still follows a linear pattern of production and consumption: resources are used for production; production results in products: after their lifecycle the products become waste and as such are disposed of in the environment. This model, known as take-make-dispose model (presented in the Figure 4) is simply unsustainable and has to be transformed into a circular one, on the basis of the 4R approach (Figure 5).





Figure 5: The "4R" approach to treating waste





Photo: Saša Popović

IV

Montenegro's response

Montenegro expressed its commitment to the idea of an ecological state. The stated policy vision of the social and economic development of the country is rooted in the principles of sustainable development. As a political vision, this commitment fully corresponds with a growing level of awareness of the need to protect natural resources and to reduce the intensity of their use relative to the economic growth rates of the country and, in the broader sense, relative to human development. The commitment to the idea of an ecological state also includes the concept of cross-generation equity, i.e. the obligation not to deprive future generations of the right to benefit from an equally high-quality environment and resource base as the current ones have. The commitment was reconfirmed in 2012 in a document prepared in advance of the Conference on Sustainable Development in Rio de Janeiro in 2012

The country has some key achievements but in most cases they go hand-in-hand with unresolved challenges:

- A programme for biodiversity that recorded pressures and examples of degradation has been introduced. It lacks, however, sufficient data on the status and trends related to species diversity.
- A decrease in the level of some of the key pollutants in the air in urban areas of Montenegro has been achieved. The technologies used in industrial and energy plants, however, remain inefficient and polluting, generating high emissions in the environment.
- Awareness of the negative long-term implications of over-construction is improving but there are still obvious cases of excessive construction at the expense of valuable agricultural land and territories with high biodiversity, as well as territories important for their potential touristic value. The

lack of precise indicators to measure land use make it even more difficult to prevent over-construction.

- The territory covered in forest has increased, but incomplete data and the system for monitoring and control of changes in the field make it difficult to identify existing hot spots and effect a rapid response
- Some progress in improving marine water quality has been achieved but marine resources are still exposed to various pressures and pollution from untreated communal wastewaters, waste, ports, marinas, shipbuilding/refurbishment of ships, vessels and industry. Water quality in all locations outside of the Bay of Kotor is mostly good to medium except for Ulcinj (in Mala plaža and Port Milena) where the quality of the water is mostly poor.

Have the international principles of a green economy and the European focus on resource efficiency been adopted as key policy frameworks in Montenegro? Analysis of national policies concludes that the concept of the circular economy is far from being implemented in Montenegro, and that the efficient use of resources has not been directly integrated into Montenegrin policies and regulations. However, there are some positive developments. Issues such as stimulation of innovations and productivity, mitigation of the impacts of economic growth on the environment, sustainable management of natural resources and governance improvements are integrated into the development vision formulated in the National Sustainable Development Strategy (NSDS). The recently adopted national development plan -Montenearo Development Directions (MDD) 2013-2016 defines the priorities and measures for the total of 18 policy areas, giving a prominent position to the development of a green economy as a horizontal topic and underlying the connections and compatibility of the MDD with the Europe 2020 strategy. The National Environment Policy advocates rational use of natural resources, protection of ecosystems (and their

adequate valuation) and the implementation of the polluter/user-pays principles.

The inefficient use of natural and other resources (particularly energy and water) and a low level of technological development appear as major challenges to sustainable human development. Only an insignificant share of the generated waste is recycled and reused. In 2008, the Montenegrin economy used 1.7 times more energy than the Croatian one to produce one unit of GDP. This is almost three times more energy intensive than the EU economy.

Montenegro made positive progress in regards to EU energy and climate policy targets. The share of renewable energy sources in final energy consumption is already at 29%, while the national goal is set at 33% by 2020. Significant reductions in energy intensity and GHG emissions have been made.

Available data on the impact of agriculture on the environment have shown both positive and negative trends, including an increase in the territory used for organic production, but also a general increase (in spite of the decline in the last observed year) in the consumption of mineral fertilizers and a significant increase in the consumption of plant protection products in the period 2005–2011. The consumption of plant protection products was assessed on the basis of the imported quantities and in 2011 it was 1.6 times larger than in 2005. In 2011 the surface area used for organic production made up 0.6% of total agricultural land.

Sector-specific challenges

The report goes beyond the introduction of basic concepts and addresses a number of sector-specific challenges for resource efficiency in Montenegro.

Agriculture is extremely important and it is expected to ensure a stable and high-quality supply of food, reduce the trade deficit, encourage the development of other sectors (like tourism), develop conditions for a better quality of life of the rural population, etc. Within the analyses conducted in the process of preparation for Rio +20, agriculture has also been recognized as one of the priority sectors for greening the economy. Key opportunities for increasing efficiency in agriculture lie in technological improvements, transfer of knowledge and information about ways to preserve the fertility of the land, expansion of organic agriculture, diversification of the sources of income in rural areas and development of an efficient food industry sector.

Tourism (along with the agriculture and energy sectors) is the sector with the most significant opportunities for greening of the economy. Key issues for resource efficiency in tourism include long-term preservation of the attractiveness of destinations (protection of natural and landscape values) with careful planning and development of new capacities, efficient tourism capacities (particularly from the aspect of use of water and energy) with the implementation of new technologies for heating and cooling of buildings, raising the guality of services with a reduction of the impact on the environment (pollution control, particularly wastewater treatment), ensuring a higher degree of waste recycling, development of environmentally friendly forms of tourism, increasing the use of local food products in the tourist offer, etc.

The construction and housing industries in Montenegro both have significant potential to generate environmental savings. Although precise data on the status of thermal insulation of housing units in Montenegro does not exist, it is estimated that as many as 70% of residential buildings need adaptation to increase their energy efficiency. This estimate is based on the fact that a significant proportion of the total number of about 316,000 dwellings are located in collective housing units built in the 1960s and 1970s. These buildings are characterized by neglected and run-down external constructions – facades and (flat) roofs, as well as old internal installations.

The energy sector is a major challenge – and an opportunity for sustainable development. Energy consumption in buildings can be reduced through the introduction of energy-efficient designing and construction, the implementation of certification of buildings, use of construction materials and products improving the energy characteristics of the buildings, appropriate maintenance and reconstructions of buildings, etc. Further incentives are needed so that the positive trends in this sector (like the increased use of insulation on new and existing buildings) are stimulated, and a basis for achieving ambitious EU targets and standards is created.

Large amounts of energy can be saved through adequate infrastructure and urban planning. Although the principles and requirements of energy efficiency are established in the relevant legislation, current planning practices in Montenegro still do not generate adequate solutions for their integration into spatial and urban plans. *Sustainable towns* is one of the key themes in the document *The Future We Want* (adopted in Rio +20 summit). It is not only the savings of energy that are important for resource efficiency in the construction industry. Recycling of constructional waste, use of environment friendly materials (that meet sustainability criteria) and improved design of buildings are also extremely important.

Transport is another sector that can contribute to resource efficiency (i.e. sustainable transport). It will require, however, modernization of its vehicle fleet, as well as further development of the transport infrastructure, including ports and marinas. It will also require faster introduction of vehicles with low emissions and new technologies/alternative fuels, better control of the quality of fuels, promotion of environmentally friendly forms of transport and the implementation of instruments for minimizing the negative environmental impacts of transport (including standards, impact assessments, economic instruments, etc.).

Areas requiring further efforts

Against the background of sector-specific challenges, the report provides examples of policies which exist in Montenegro that might produce positive results in terms of resource efficiency. These examples include projects and initiatives aimed at using cleaner technologies, growing investment in research and development, stimulating efforts to introduce recycling, increasing energy efficiency, developing environmental indicators, harmonization with EU law, etc. However, good sporadic examples and experience are not sufficient.

Decoupling the use of resources from economic growth appears as a major challenge for resource efficiency and should be reflected in state policies. One immediate area is shifting the burden of taxation from labour to activities that degrade resources and damage the environment. This shift may even result in creating new jobs. Moreover, the experience of countries that joined the EU during the last decade show that revenue generated from environmental taxes and charges (disbursed, for instance, through environmental funds) can make a significant contribution to meeting European standards.

Proper valuation of natural capital and ecosystem services is another policy priority. However it is not widely implemented in Montenegro. As a result, ecosystem services, clean air and water continue to be treated as free resources, while charges for the exploitation of natural resources often do not cover the full costs incurred to the environment and society as a result of these activities. Moreover, there were no efforts to integrate the value of natural resources (or the damage resulting from degradation, or pollution) into the calculation of national wealth, nor into companies' business results. One of the core principles of European policy on resource efficiency – getting the prices right – is either not properly integrated into the Montenegrin laws and policies, or is not applied at all. Consistently implementing the polluter/user-pays

principle is needed. Montenegro's environment policy and the Law on Environment Protection lay down this principle, while the basis for the use of economic instruments (first and foremost, pollution charges) has existed since 1997. However, these instruments are not well designed and not properly and consistently implemented, therefore they do not provide the appropriate incentives for behaviour change and a transition to more efficient and less polluting production patterns.

Reducing and gradually abolishing environ-mentally harmful subsidies is a logical continuation of the *polluter/user-pays* principle. Such subsidies deeply distort the system of economic incentives and disincentives so that unsustainable production may look profitable, while subsidizing environmental damage with public resources. Phasing out environmentally harmful subsidies is one of the measures for which there is broad international consensus.

Finally, introducing procurement rules in the public sector that will include clear requirements for environmental sustainability may boost the chances of environmentally efficient options. More comprehensive measures aimed at raising consumer awareness about choosing products with lower environmental impact and improving waste management practices could be implemented.

Efficient use of resources is a horizontal issue that cuts across a number of sector policies – from ones on natural resource management, to science and research, statistics, fiscal policy, the environment and land use (spatial planning), to policies in economic sectors such as agriculture, energy, transport, construction, etc. Setting proper targets and defining relevant indicators for monitoring progress against these targets is critically important for translating policies into practical results.

All the measures suggested to increase resource efficiency have important implications for poverty and quality of life. For example, reducing energy subsidies – which currently channel benefits to more wealthy consumers and implicitly encourage inefficient consumption – are welcome. At the same time such measures need to be taken in a package with targeted support for poor households, to prevent them falling deeper into poverty.



Photo: Saša Popović

V

Looking into the future

The report makes assessments of future resource productivity under five scenarios for Montenegro. The analysis in this chapter (to the extent possible) targets different potential scenarios which are of relevance for the efficient use of resources. Official development documents, MONSTAT data, Tax Administration data and the data of individual businesses served as the background for developing them, along with statistical extrapolations of the trends of relevant indicators. Analysis of scenarios is not based on sophisticated statistical software, and the time series of the available data in Montenegro are not sufficiently long to enable reliable conclusions concerning the development of specific indicators. Instead of complex calculations, extrapolated data is compared - wherever possible with data from reference scenarios (e.g. for energy) or with the outcomes of other development paths that may be expected to materialize if the currently existing development documents of the EU and Montenegro are implemented.

The scenarios are not intended to "forecast the future". Instead, their purpose is to encourage reflection on possible options and to illustrate the possible outcomes of different policy choices related to the use of specific resources, identify challenges and enable comparison with EU trends. Based on this, the scenarios may serve as the basis for proposing specific targets and measures to achieve greater resource efficiency in the country (i.e. for drawing up the National Roadmap). In preparing scenarios, attention was focused on resource productivity (i.e. Domestic Material Consumption) as it is both a composite indicator for economic efficiency and a lead indicator of the EU Roadmap, while the energy sector and climate policy projections were developed with the intention of presenting additional arguments to support the selection of sustainable development options and trade-offs between conflicting targets.

Table 2: The realistic scenario – moderate reduction in the use of resources

compared to the average in the period 2005–2012					
20	2020				
Amount: GDP: €3,473 million DMC: 2,598,367 t (4.0 t per capita) RP: 1,337 €/t	Growth: total 28% -20% 60%	annually 5 3.5% 6 -2.5% 5 7.5%			
20	30				
Amount: GDP: €4,423 million DMC: 2,598,367 t (4.0 t per capita) RP: 1,702 €/t	Growth: total 63% -20% 103.8	l annually 5 3.5% 6 -1.1% 8% 5.8%			

Estimates of DMC and RP are indicative, based on a certain number of prerequisites in cases of incomplete data which is why they should be used only for illustration purposes.



Figure 6: Scenarios of energy intensity trends for Montenegro and the EU(27)

Data sources: draft Energy Development Strategy of Montenegro by 2030 and the EU Energy Pocket Book 2010

The report team concludes that Scenario 4: "Moderate reduction in the use of resources" emerges as an optimal one. It envisages an active and ambitious natural resource management policy in Montenegro. Under this scenario, by 2020, Montenegro would achieve an absolute reduction in the use of material resources by 20% compared to the average value recorded in the period 2005-2012. Resource productivity would grow at an average annual growth rate of 7.5% which corresponds to the average annual growth rates of 7.1% recorded in the period 2005–2012. Under this scenario, resource productivity in 2020 would increase by 60% compared to the average resource productivity in the period 2005-2012. A considerable decrease is also recorded in DMC per capita which amounts to 4 t/capita in 2020.

Finally, the report puts resource productivity analysis and the possible scenarios in the broader context of improving energy efficiency and decreasing CO₂ emissions. These are seen as inseparable from improving resource efficiency. Applying the modelling approach similar to the one used in the case of domestic material consumption, three possible scenarios for GHG emissions were developed:

- extrapolating the data on energy intensity for the period 2000–2010 for Montenegro (MNE EXT),
- extrapolating the data on energy intensity for the period 2000–2010 for the European Union (EU(27) EXT), and
- by using a reference scenario showing trends of this indicator on the basis of the Energy Development Strategy of Montenegro by 2030 (MNE SRE2030).

Figure 6 shows the three analysed scenarios and the EU(27) target value of energy intensity in 2020 (the two currently on the "policy drawing boards" and one based on targeted values determined in EU policies). The analysis suggests that neither of the two is acceptable if we assume that Montenegro will be part of the EU by 2030.

VI How to get there?

All this allows the authors to draw a number of important conclusions and policy-relevant recommendations. The report concludes that the development outcomes are important – but equally important is the way progress has been achieved and the price paid for it. In many cases the current level of human development is unaffordable and has been achieved running on debt – financial, ecological, and demographic. Too often the bill for the wellbeing of current generations is being passed on to the next. This is why adding the "affordability" perspective to human development analysis and policies is critically important for achieving sustained and sustainable human development.

Montenegro is a country with huge potential for following a sustainable development path. It also has a policy commitment in that regard with the claim of being an "ecological state". The evidence presented in this NHDR suggests that despite significant progress made in achieving these goals, there is still a long way to go.

Resource efficiency is an important means for achieving the goal of sustainable human development – and fulfilling the pledge to be an "ecological state". The policy frameworks for promoting it exist, at both the international and the national level. What needs to happen to achieve it, is bold action that includes the following:

 Consistent implementation of adopted regulations and plans is crucial for the further development of Montenegro in general, as well as for the improvement of resource efficiency. In addition, better coordination between different policies, strengthening the information base and further development of indicators for measuring sustainability of development and for monitoring progress are necessary.

- In order to capitalize on spontaneous improve-ments made in the previous period and to continue positive trends (for example, decoupling GDP growth from energy consumption, the amount of generated waste, GHG emissions, etc.), carefully designed targeted measures for increasing efficiency and reducing environmental impact are required.
- National climate policy should be formulated in line with EU targets, and energy policy should be aligned with it accordingly; solutions that considerably drive the country away from EU targets should not be promoted.
- 4. Changes to the policy of subsidies and state aid are crucial for the efficient use of resources, competitiveness and achievement of environmental targets; a plan to phase out harmful subsidies is necessary. At the same time, economic/market-based instruments should be developed and used so as to ensure that the prices of resource use and costs of pollution properly reflect the value of resources being depleted and/or degraded as a result of pollution. Possibilities of carrying out green tax reform should be explored.
- It is extremely important to develop and use a system of incentives for clean and efficient production processes and activities, and to provide proper support for research and innovation.
- 6. Urgent improvements in the spatial planning system (rational use of space and limiting expansion of builtup areas, particularly if these fail to provide significant effects), waste management (waste separation and recycling) and water management (integrated management and rational consumption) are a *condicio sine qua non* for resource efficiency in Montenegro.

- Protection of arable land and improvement of environmentally friendly forms of agricultural production are extremely important for the efficient use of resources.
- 8. Resource efficiency and sustainable development will not be possible unless biodiversity and ecosystem services are properly valued and their value integrated into the balance sheets and measures of economic success from the micro to the macro levels.
- 9. Proper control of air, water and soil quality and appropriate measures to prevent pollution directly contribute to the productivity of the economy (amongst other things, by preserving human health); lack of implementation of environmental standards results in considerable costs to society in both the EU and Montenegro.
- 10. Robust data and monitoring systems are important in that regard. Testing and implementing sustainable human development indicators and monitoring different aspects of sustainability are important elements of the roadmap towards keeping the promise of being an ecological state.

All these will require bold reforms in crucial sectors of the Montenegrin economy and will have their cost. The cost may be high in the short term, thus a renewed determination and stepped-up efforts are also needed from all the stakeholders. But the potential benefits from the development of a resource-efficient economy are many. Those that are particularly relevant for Montenegro, given its current level of development, include growth and new jobs, competitiveness, improvement of the quality of life by preserving the quality of the environment and contribution to the stability of the economy. Even though detailed analysis of potential effects of implementation of certain resource efficiency polices (*ex-ante* analysis) is unavailable, according to the existing estimates, the improvement of energy efficiency in the housing stock alone would stimulate investment, create new employment opportunities and result in significant energy savings.

The core topic of the report is resource efficiency – a topic of huge importance from a human development perspective. The link between resource efficiency and human development goes through sustainability but not only that. Improvement of resource efficiency may come through various ways affecting different dimensions of human development – poverty, consumption, employment, access to basic services and gender roles. All these aspects are important and deserve distinct in-depth analyses (or even NHDRs). In that regard the authors hope that the current report will be a starting point for further research and public debate on these issues.

6.1 Roadmap to a Resource-Efficient Montenegro

The Roadmap to a Resource-Efficient Montenegro sets targets and proposes actions and indicators in the following three areas: 1) horizontal topics and policies (such as: valuation of natural resources, fiscal measures and subsidies; statistics and data availability; measuring economic success; boosting competitiveness; support for research and innovation, etc.); 2) economic sectors; 3) environmental management, including waste. Prioritized issues are given strong emphasis (targets and actions that are shaded).

6.1.1 Horizontal policies and issues

Area	Targets and actions	Indicators
Valuation of natural resources and measuring of economic success	 Target: By 2020, availability of information about values of natural resources should improve and become progressively integrated into the systems of calculating economic success. Actions: Improve methodologies for resource valuation Integrate information about the value of resources into decision-making processes (e.g. those regarding public spending, approval of development projects) Design concessions for exploitation of natural resources in such a way that they reflect their true value, including the cost of degradation Keep track of EU trends in terms of modification of natural resources to creating added value in the national economy 	Scope of concessions awarded for exploitation of natural resources Modifications in the system of national accounts
Fiscal measures and subsidies	 Target: <i>By 2020, phase out environmentally harmful subsidies.</i> Actions: Identify harmful subsidies and draw up a plan to phase them out Design measures for providing support for businesses and those parts of the population that might be put at risk as a result of phasing out subsidies (in accordance with EU regulations and practice) Use state aid to promote resource-efficient activities Draw up a tax relief plan to stimulate resource efficiency and implement it progressively Explore feasibility of carrying out green tax reform Redesign the existing taxes and charges for environmental pollution and use of natural resources, and fully apply these instruments with the aim of drawing Montenegro closer to the average level of revenue generated from environmental fees and taxes in the EU countries by 2020. 	Share of budget spent on environmental measures and resource efficiency Share of environmental taxes out of total taxes and contributions

Area	Targets and actions	Indicators
Statistics and data availability	 Target: Build capacity of competent institutions and publish developed resource efficiency indicators. Actions: Develop indicators envisaged by this study and by the National List of Indicators that are not available yet, identify needs and build capacity of institutions to produce the missing indicators Set quantifiable targets where possible Monitor development of a set of resource efficiency indicators in the EU and use new indicators as soon as possible Enhance further the quality and reliability of data, particularly of those on energy consumption, greenhouse gas emissions, water and land use and waste Build capacity for developing footprint indicators Improve data availability to all end users, including facilitated access and comprehensibility 	Number of available indicators (National List of Indicators, EU resource efficiency indicators)
Sustainable consumption and production	 Target: By 2020, promote sustainable consumption and production patterns and make one third of public procurement green. Actions: Specify green public procurement requirements and support their integration into tender pro- cesses; set criteria on the basis of which public procurement may be characterized as green Raise consumer awareness on the options they have about disposal in order to be able to sup- port resource-efficient products and processes Promote observance of the standards of quality, social responsibility and EMAS in private sector Keep track of and comply to the European Prod- uct Policy 	Percentage of value and a number of public procurement contracts containing green public procurement criteria Number of enterprises, by sectors and by size, receiving advice concerning improvement of environmental

Area	Targets and actions	Indicators
	Target: By 2020, double the amount of science and research budget allocations.	
Supporting research and innovation	 Actions: Improve availability and use of national and EU funds for research and innovation Increase private-sector expenditure Build the capacity of scientific research institutions Reinforce the communication between research centres and businesses Support the use of innovative solutions which reduce resource consumption in production and services 	Share of science and research budget al- locations out of total GDP Number of awards and amount of funds allocated under the European support programmes for research and innovation projects which predominantly promote resource efficiency and sustainable envi- ronmental management
	Target: Improve ranking on the competitiveness list of global economies by 25%.	
Boost competitiveness	 Actions: Improve technologies and cut the costs of using resources; enhance managerial systems; Increase energy efficiency in industry Support the development of small and medium-sized enterprises in new, prospective areas (including eco-industries) 	Ranking on global competitiveness list

6.1.2 Environmental management (including waste)

Area	Targets and actions	Indicators
	Target: By 2020, considerably improve the capacity for the valuation and availability of data on the value of ecosystem services and ensure that such information is integrated into the decision-making processes.	
Ecosystem services	 Actions: Build the capacity of the national statistical system and of independent institutions to carry out ecosystem valuation Improve information about the ecosystem status and services Ensure that information about ecosystem values is integrated into specific development projects (through environmental impact assessments, cost-benefit analyses) Enhance ecosystem protection financing, possibly through innovative instruments such as charges for ecosystem services Prepare a programme for remediation of endangered ecosystems 	Number and coverage of studies valuating ecosystem services Number of impact assessments and cost analyses which include ecosystem value
	Target: By 2020, halve losses in the water supply systems, improve considerably the information basis for water resources and ensure implementation of the Framework Directive.	
Biodiversity	 Actions: Build capacity for implementation of the Framework Directive By 2020, prepare management plans, properly carry out valuation of water resources, set effective and fair water prices Coordinate policies on using water resources (agriculture, energy, regional policy) Improve availability of data and indicators Set targets for efficient use of water and develop and implement more ambitious and more comprehensive measures to improve efficiency (measuring consumption, reducing the loss in systems, guidelines on reuse) Better water demand management by applying economic instruments (prices, taxes and charges, eco-labels etc.) Integrate climate change into the water management system 	Use of freshwater resources Water Exploitation Index Water loss

Area	Targets and actions	Indicators
	Target: By 2020, halve losses in the water supply systems, improve considerably the information basis for water resources and ensure implementation of the Framework Directive.	
Water	 Actions: Build capacity for implementation of the Framework Directive By 2020, prepare management plans, properly carry out valuation of water resources, set effective and fair water prices Coordinate policies on using water resources (agriculture, energy, regional policy) Improve availability of data and indicators Set targets for efficient use of water and develop and implement more ambitious and more comprehensive measures to improve efficiency (measuring consumption, reducing the loss in systems, guidelines on reuse) Better water demand management by applying economic instruments (prices, taxes and charges, eco-labels etc.) Integrate climate change into the water management system 	Use of freshwater resources Water Exploitation Index Water loss
Air	Target: By 2020, improve air quality in the most threatened areas (Pljevlja and Nikšić) and control GHG emissions.	
	 Actions: Carry out assessment of the damage caused by air pollution (impacts on health and the economy) Improve control of emissions from industry and transport Implement measures to improve air quality envisaged by relevant plans and strategies Set national targets in the area of climate change Implement measures to reduce GHG emissions (design measures adjusted to the national conditions and implement them) 	Air quality in urban areas GHG emissions

Area	Targets and actions	Indicators
Land and soils	 Target: Progressively reduce conversion of land to built-up areas with the aim of reducing land take to zero in the long term; protect arable land. Actions: Make improvements in carrying out environmental impact assessments related to producing spatial plans so as to ensure optimal land use and trade-offs Enhance spatial planning to ensure rational use of space, concentration of construction areas and use of reserves in them Protect arable land and land that is important for preservation of biodiversity against urbanisation and further expansion of building Implement biological measures (including green infrastructure) in protecting soils against erosion and floods Develop knowledge and information basis for the purpose of long-term preservation and improvement of the quality (fertility) of arable land 	Built-up areas Productivity of built-up areas Soil erosion Content of organic matter in soils
Minerals and metals	 Target: Reduce raw material consumption and minimize environmental impact resulting from exploitation of minerals and metals. Actions: Carry out remedial work on areas degraded by exploitation of minerals and metals Ensure that an adequate amount of charges are paid for exploitation of mineral and metal raw materials, phase out subsidies for environmentally harmful activities. Incentives for research, innovation and introduction of new technologies in the processing industry, construction industry and in other activities with the aim of reducing raw material consumption Keep track of and comply with the European Product Policy 	Resource productivity of minerals and metals

Area	Targets and actions	Indicators
Forests	 Target: Sustainable forest exploitation Actions: Enhance forest management system (knowledge, information, proper valuation of forest resources, integration of climate change issues) Increase efficiency in wood exploitation (enhance exploitation technologies, develop wood processing chain, use wood waste and foster more efficient forms of biomass use for heating) 	Forest cover Scope of forest exploitation Forest fires
Maritime resources	 Target: By 2030, achieve a good environmental status of marine waters. Actions: Integrated coastal zone management; implementation of the Marine Strategy Framework Directive by 2030 Preserve the natural and landscape values of the coastal area Align with the EU Integrated Maritime Policy, introduce maritime spatial planning; promote and support development of innovative business opportunities in maritime and coastal economy (blue growth) Strengthen the information base and knowledge of processes and changes in the coastal area Minimize pressures on sea water quality caused by pollutants in waste water, maritime transport and mariculture Sustainable exploitation of fish stock Integrate climate change into the coastal management system 	Quality of sea bathing water Mariculture production Number and size of maritime protected areas
Waste	 Target: By 2025, reduce considerably the amount of final waste disposal. Actions: Review the set targets of recycling certain types of waste and set ambitious, yet feasible targets Invest considerably in a waste separation system over the next 10 years, accompanied by appropriate awareness-raising programmes Identify opportunities and incentives for the development of recycling activities Stimulate markets for secondary materials and demand for recycled materials Develop a system for specific waste flow management 	Total amount of produced municipal waste Total amount of produced construction waste Recycling rates

6.1.3 Prioritized development sectors

Area	Targets and actions	Indicators
	Target: By 2020, come closer to the level of energy intensity in the EU, by 2030 reach the EU level.	
Energy	 Actions: Set ambitious energy efficiency targets and implement targeted measures for the purpose of their achievement Integrate climate change into energy plans and programmes, plan for alignment with the EU climate policy Strike a balance in the mix of renewable sources with the aim of minimizing environmental impacts; integrate biodiversity preservation targets and achievement of a good environmental status into energy development plans, programmes and projects Carry out remedial work on environmental damage caused by activities undertaken in the process of energy generation and consumption 	Share of renewable sources GHG emissions from energy sector
	Target: Rapid growth of agricultural production with more efficient use of resources and control of negative environmental impacts.	
Agriculture	 Actions: Technological advancements and improvement of efficiency in primary production and food processing Control the use of fertilizers and pesticides Increase the size of areas under organic farming Expand knowledge of and information about preserving soil fertility Composting and using biological waste in agri- culture Intensify measures and incentives for the devel- opment of rural areas 	Consumption of plant protection products Areas used for organic farming

Area	Targets and actions	Indicators
	Target: Raise quality of tourism services, while reduc- ing environmental impact.	
Tourism	 Actions: Diversify tourism offer and mitigate pronounced seasonality in tourism industry with the aim of mitigating pressures on the natural environment; develop environmentally friendly forms of tourism Plan and build new tourist facilities in a way that contributes to the rational use of space, protection of valuable ecosystems and energy and water savings Reduce pollution (waste and waste water) generated by tourism 	Tourism revenue Number of overnight stays by region,, by type of tourist service and by month
	Target: By 2025, achieve high level of resource effi- ciency in construction of structures and infrastructure	
Building and housing	 Actions: Allocate funds for enhancement of energy efficiency in building construction (in the government budget, from development loans or by means of alternative financial mechanisms) and develop incentive schemes (reduce VAT rate, guarantees or subsidies for loan interest rates, co-fund capital expenditure in certain investments, etc.) Progressively harmonize regulations and building standards with the relevant EU regulations and apply them in the new building construction; renovate the existing building stock Use environmentally friendly materials in the construction sector Use proper instruments for generating water savings, promote efficient devices 	Consumption of energy for heating and cooling of space

Area	Targets and actions	Indicators
Transport	 Target: Development of the transport system should contribute to resource efficiency, competitiveness and sustainability. Actions: Use new technologies (vehicles with lower emissions, lower fuel consumption, alternative fuels) and promote more environmentally friendly forms of transport; develop and implement incentive measures Use instruments for minimizing negative environmental impacts of transport Recycle vehicles after expiry of their lifecycle 	Structure of vehicles by age and by emission characteristics Energy efficiency in transport
Industry and entrepreneurship	 Target: Increase efficiency and boost competitiveness of industry and small and medium-sized enterprises. Actions: Enhance technologies and management processes in industry: modernize production, increase rates of production of final products, introduce new technologies, quality and environmental management systems, while changing the product range Incentive measures for resource efficiency and innovation Implement consistently environmental regulations as an instrument for moving towards cleaner technologies Integrate pollution damage and environment degradation into costs of enterprises Improve access to the sources of financing and build capacities (advice, consulting services) of SMEs in order for them to take resource-efficient approaches 	Quality of industrial waste water Air quality in industrial estates Number of jobs in new (eco) branches and activities

