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USING SUSTAINABLE DEVELOPMENT TOOLS FOR SOLVING PROPERTY RIGHTS IN MONTENEGRO

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Abstract: In recent months Montenegro has been faced with serious budget problems , one proposed solution of which has been to reduce the number of employees in state administration. Additionally, the costs of living are above the disposable budget of most households, in particular the high cost of electricity. While the government warns about a lack of electricity, the citizens are hardly in the position to cover these costs. Montenegro is dealing with the double challenge of inefficient use of space (the country features over 100,000 illegal homes)*(I don't understand the link between inefficient use of space and illegal homes)* and inefficient energy use (Montenegro needs an average of 8.5 times more energy per unit produced than an average EU country).
How can these problems be solved in a way which pleases both sides?
In this paper, an approach is presented which links the solving of the problem of illegal construction with increasing the level of energy efficiency in households, businesses and other facilities. There is a model developed by UNDP Montenegro – an integrated policy solution to the double challenge of providing energy efficiency measures to incentivise households to legalise their homes. The legalisation of illegal buildings by the introduction of mandatory energy efficiency measures in them may at the same time result in an increase of revenue to the central and local budgets, the reduction of negative impacts on the environment, an increase in employment, the engagement of the economy, a reduction of electricity consumption and thereby to reduce the need to import electricity, and ultimately the increased welfare of the population.

Key words: energy efficiency, sustainable development, illegal construction, energy audits, retrofitting

Introduction

The world is currently experiencing three inter-related crises. The first is related to the trend of rising resource prices, the second to the global rise of inequality within countries, and the third is linked to the other two crises, as the world is at a tipping point with regard to the loss of vital ecosystem services and extreme events – both connected to the changing climate. The three crises are related, mutually reinforcing one another and creating a vicious cycle that impacts all segments of sustainable human development - economic competitiveness, social inclusion and environment. Any viable solution must match the complexity of the crises, addressing them in an integrated manner that will unleash economic growth and job creation, while at the same time conserving biodiversity and maintaining a balanced environment.

This paper will present one such integrated solution that aims to resolve the multi-dimensional development challenge of informal housing (connected to the issues of low economic empowerment, rising pressure on the environment, high exposure to extreme events, inefficient resource use, and low quality of life). It will demonstrate how UNDP plans to utilise the main principles of the green economy to provide economic empowerment to the citizens in Montenegro.

What is a Green Economy?

UNEP defines a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. In a green economy, growth in income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes.[1]

The development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and as a source of public benefits, especially for poor people whose livelihoods and security depend on nature.

The last two years have seen the idea of a "green economy" float out of its specialist moorings in environmental economics and into the mainstream of policy discourse. It is

[1]UNEP, Towards a Green Economy, Pathways to Sustainable Development and Poverty Eradication, 2011

found increasingly in the words of heads of state and finance ministers, in the text of G20 communiqués, and discussed in the context of sustainable development and poverty eradication.

Energy efficiency

Humankind is facing one of the greatest challenges in its history: developing in order to "meet the needs of present generations without compromising the ability of future generations to meet their needs"[2]. Increasing demands for natural resources, the weakening of ecosystems, global warming and soaring population growth are just a few of the global issues confronting us. Since the end of the 1960s there have been more and more global initiatives to reduce social and ecological imbalances. The movement is now speeding up: those involved are becoming aware of the role they can play within their sphere of influence and of the interdependence between the various aspects of sustainable development.

Improving energy efficiency is connected primarily with buildings, both residential and business; the main challenge now is to design, build and renovate buildings to reduce their environmental impact and create spaces that are healthy and comfortable for the occupants. Throughout their life cycle, buildings consume natural resources, generate waste and emit large amounts of CO_2, contributing significantly to global warming. A large proportion of the world's population, particularly in the developed countries, spends 90% of its time indoors (source: OECD). In this context, questions of hygiene standards inside buildings and the comfort of occupants are also central issues in the debate.

Energy efficiency retrofits provide an opportunity to reduce greenhouse gas emissions, generate economic activity, save billions in energy costs, and ensure the long-term viability of affordable housing. However, there is insufficient data on how much energy these upgrades actually save, and therefore little data on what the return on investment would be for lenders. Without this data, it is very difficult to secure upfront capital investments in retrofits, inhibiting this sector's capacity to scale.

Montenegro's legalisation problem

Over the past decade, Montenegro has witnessed rapid urbanisation fuelled by foreign direct investment on the Adriatic coast and in mountain resorts. This growth, which has significantly increased the GDP of the country for several years has, in parallel, caused negative effects such as urban sprawl in previously natural landscapes along the coast and around the capital Podgorica, resulting in large numbers of informally built constructions (that is without a construction permit), both commercial and residential, that have very low energy efficiency characteristics. This results in an overall increase in CO_2 emissions due to rising energy demand in buildings. According to one estimate, there are approximately 100,000 such informal constructions, though there are no clear statistics.

[2]Our Common Future, Brundtland Report, 1987

Nearly all Montenegrin households (>99%) are connected to the electricity grid and metered. Based on the latest available data from 2001, the average monthly electricity consumption in Montenegro was 367 kWh per household. This means that the average monthly electricity bill per household amounts to around 100 Euros. According to the estimation of the Ministry of Economy of Montenegro, 80% of the electricity in the household is used for the heating. Most homes are heated through an electric radiator system, an electric thermal accumulator or an individual heating system. Wood is one of the most popular heating sources in individual houses in Montenegro, especially in the North, but is almost absent in the South and in apartment buildings.

In most cases, buildings constructed without building permits have not been subject to the process of verification of application of standards, neither in the course of design development nor during performance of works, particularly from the aspect of seismic risk.

In addition, Montenegro is faced with serious budget problems, the solution of which, among other things, is seen in reducing the salaries of employees through various instruments. On the other hand, the costs of living are significantly above the disposable budget of households. A particular problem is the high cost of electricity, which resulted last year in street protests by discontented citizens across (?) the country. Thus, on the one hand we have a government that alerts its citizens about a potential lack of electricity, and on the other hand we have citizens that are unable to cover these costs. Is there a feasible solution?

The UNDP office in Montenegro came up with the idea to link solving the big problems in Montenegro, such as the problem of illegal construction, with increasing the level of energy efficiency in households, businesses and other facilities. The UNDP proposes an integrated approach that includes an increase in the energy efficiency level of buildings and the use of financial resources made from savings in energy consumption to finance the legalisation process.

The UNDP approach to the legalisation problem

The formalisation of Montenegro's informal settlements represents a unique opportunity not only to insert EE considerations into the regulation of this building stock (for the first time ever), but also to integrate informal neighbourhoods and settlements into municipal governments' spatial planning in order to address urban-system GHG mitigation opportunities inside town areas.

At the beginning of 2011, the Ministry of Sustainable Development and Tourism of Montenegro and UNDP agreed on a joint implementation of three new pilot projects which deal with the problem of transforming informal settlements to formal ones. This is related to three municipalities, namely Zabljak, Bijelo Polje and Bar. The purpose of the energy audits was to determine a baseline for consumption and potential savings, giving the most basic renovation/retrofit measures. Every energy audit consisted of basic information

about the existing object, its current use, dimensions, number of inhabitants, heating periods during the day and the whole year, local climate characteristics etc.

The following most cost effective and most frequent basic EE measures have been suggested: **appropriate isolation of external walls; replacement of windows/ doors; roof insulation, floor insulation**. After a review of the conducted audits, a general conclusion was reached that on average, reconstruction (retrofitting) of illegal households in Montenegro could cut electricity consumption by 59%, which leads to a return period of less than 7 years.

In order to test the above estimations through demonstration, the UNDP team performed a prototype i.e. reconstruction of 4 illegal household facilities during 2012 in Bijelo Polje, measuring energy consumption before and after reconstruction.

Post reconstruction (retrofitting) audits showed even better results in relation to preliminary controls. Measurements conducted showed that energy savings vary from **50% to 82% (65% on average**), which means a period of return on investment from **5 to 6.3 years**.

This prototype showed that even implementing additional and relatively expensive measures such as the ***installation of a new central heating system***, which is not considered a measure which will improve EE performance, but will in general raise the level of comfort, is economically justified. In that case, the return on investment would be, in total, **7 years**.

Table 1. Basic prototype results

Savings in delivered energy	34763	kWh/god.
Net savings	767	€/year
Total investment (EE measures)	4,698	€
Return on investment	6,4	years

Source: UNDP estimate, prototype Resnik – Resovo, Bijelo Polje

Economic effects

The methodology used for calculation and analysis of EE measures and (word missing?) implementation in the formalisation process is based on putting forward a hypothesis, audit and data processing, the use of experiments in the economy, modelling and verification. The author further dwells on the general methodological procedures in economy, namely analytic, synthetic and historical methods, and macroeconomic and microeconomic analysis. The following hypothesis was put forward: *Can the implementation of EE measures on illegally constructed objects ensure the financial resources necessary for formalisation itself*?; the hypothesis is tested and approved by means of the above mentioned methods.

In order to test the hypothesis, an investigation (energy efficiency audits of illegally constructed buildings) was performed, as well as an experiment (prototype). Data obtained from the experiment were calculated and average values were determined (for a 100 m^2 building) and were transferred by linear extrapolation to the level of the entire economy and country (based on the assumption of the existence of 100,000 illegal buildings in Montenegro).

The basic results can be found below (experiment results –100 m^2house):

Energy audits of 34 objects (municipalities Bar, Bijelo Polje and Žabljak) showed that **average energy consumption** (electric energy, wood, and coal) amount to **57,416 KWh** annually, i.e. 63.619 KWh annually for a **100 m^2** household. **The average investment** needed for implementation of the stated measures is 4,698 Euro, i.e. **5,000 Euro** for a **100 m^2** building. In addition, an investment of 5.000 Euro creates **850 Euro of VAT**.

Savings in energy consumption that can be achieved through the above measures amount on average to 34.760 KWh annually or 767 Euro, i.e. for a **100 m^2 household to 37,900 KWh annually or 830 Euro. Thus, expressed in percentages, the average electrical energy saving is 63%.**

According to the records kept daily through the measurement book and reports of the supervision body, five workers were engaged in reconstruction every day (construction company); one employee was engaged for supervision works, and in the initial phase one employee for the development of project documents and another for the management of the entire process. In total, the **engagement of seven persons per object/building** is needed**.** Based on the obtained entry data, it is easy to calculate the **time period of return** on investment into retrofitting, which is on average **6.12 years**. In addition, EE measures can lead to a reduction of **CO_2** emissions of **1000 kg** annually per **object**.

The presented data represent inputs for further analysis into the effects of EE measures implemented on illegally constructed objects in Montenegro, based on macro-economic indicators, and for determining the possibility to use financial means made through savings in energy consumption on micro and macro levels, for financing the legalisation process. If the obtained data are estimated for the entire economy, taking into account the assumption that the number of illegally constructed objects in Montenegro is 100,000, the following macroeconomic implications are obtained[3]:

Level of investments – retrofit of 100,000 buildings would create around 470 million Euro direct investments in the construction sector and provide work for the entire construction sector in the Montenegrin economy. Also, in an indirect manner, this level of investment would stimulate an increase of activities in other sectors and economic branches. At the annual level, **47 million Euro of direct investments** is expected, which is **around 14%** in relation to the current level of construction work in Montenegro**;**

[3]Note: with regard to the size of the objects, the assumption is that it is not realistic to expect that all objects are reconstructed in one year. We start from the assumption that this is a long-term process, and that 10,000 objects can be reconstructed annually. This assumption was taken into account when calculating the annual data.

Amount of revenues from VAT – the direct effect of retrofitting would reflect an increase of revenues from VAT in the total amount of around 80 million Euro, i.e. **8 million** € at the annual level, which would increase budget revenues from VAT by **2.5%** at the annual level **over the following 10 years**;

Employment – when calculating the level of employment we took into account two scenarios. One is based on the results of the prototype and its extrapolation on the total number of objects. The second scenario starts from the fact which is the result of numerous investigations that tried to calculate the number of new jobs created by investments into energy efficiency, according to which an investment of one million dollars creates 10 jobs. The total number of jobs created by reconstruction of 100,000 objects, according to the first scenario, is assessed at around **60,000**. However, a precise estimation of the number of employees cannot be made without information related to the dynamics of reconstructions, number of objects at the annual level, number of companies performing reconstructions, project development, energy audits, supervision and the like. Due to lack of adequate information, we used data from the second scenario, according to which, the total number of new jobs that can be created by the above legalisation process **amounts to 6,200,** reducing the number of unemployed by **13%;**

Reduction of energy consumption in Montenegro – retrofitting 100,000 objects would lead to a reduction in the total energy consumption by around **3,476 GWH** for a period of 10 years, i.e. **347 GWh** annually. This would have enormous positive effects on the already highly loaded energy network in Montenegro, i.e. it would reduce the need for the import of energy by **27%** annually *(is this what you mean?)*, and after less than 4 years it would entirely eliminate the need to import electric energy and create capacity for the export of energy in the following years.

In addition, observed in the period of 20 years, which is the period of repayment of compensation for legalisation, two scenarios were calculated in terms of electric energy consumption. The first **basic scenario** envisages energy consumption which is unchanged in relation to the present moment. **The second scenario** calculates consumption taking into account measures for **increasing energy efficiency**. Moreover, since the price of electric energy is expected to rise in the following period, a calculation (trend) of electric energy price was made for both scenarios for a period of 20 years. The annual growth rate of 2% was used in the calculation.[4]

The following results were obtained: according to the basic scenario, total consumption of an average 100 m^2 household over a period of 20 years will amount to 1,280 MWh, i.e. 46,359 Euro. On the other side, the scenario that envisages EE measures implementation shows that the total consumption of an average 100 m^2 household over a period of 20 years will amount to 500 MWh, i.e. 18,223 Euro, which is **2,5 times less in relation to the basic scenario**;

GDP – increased activity in the construction sector would have a direct effect on the increase of GDP of **1,5% annually**, over the following 10 years;

Amount of revenue from legalisation – the fee for legalisation varies depending on a number of factors, such as the town in which the object is located, the construction zone, urban or rural environment and the like. In the settlement Resnik-Rasovo, where the experiment was conducted, the legalisation fee is 20 Euro per square meter. However, in Podgorica and the seaside towns it is considerably higher, while in some of the northern municipalities it is even lower. That is why in our analysis we started from the assumption that legalisation cost is 50 Euro per square meter, and in compliance with the provisions of the new Law on Regularisation of Illegal Objects, it is envisaged that legalisation cost can be paid over a long time period (min. 20 years), in monthly instalments. Taking into account all the above, we come to the conclusion that local self-governments in Montenegro can collect a total of **500 million Euro** of revenues from legalisation over a period of 20 years, i.e. **25 million Euro annually** or slightly over **2 million Euro at the monthly level**, which is a considerable inflow for small municipal budgets. This would ensure the sustainability of local budgets in the long run.

Increase of ***revenues from property tax*** – due to the lack of an inventory of illegal objects which would provide information important for defining property tax rate (location, number of floors, floor area, use and the like) it is not possible to determine the amount of property tax that would be collected; however it is evident that 100,000 objects that make one half of the total number of registered households in Montenegro can generate considerable revenues for the Montenegrin budget.

Financial mechanisms

For the implementation of the presented model of legalisation, the answer to the following question must first of all be given: *In what manner can funds for the reconstruction of objects be secured?*

The following financial mechanisms can be recognised:

- *Commercial bank loans* – on the Montenegrin market there are loan arrangements for households and companies for investment into energy efficiency. Loans are given for a period of 7 years at the annual interest rate of 7%. This is the most unfavourable form of financial mechanism, but the expected level of savings would be sufficient to cover the monthly instalments of the loan.
- *Loans from international financial institutions* (EIB; EBRD and the like) – the given mechanism implies organisation of a state programme, similar to programmes implemented by the Government of Montenegro so far (such as Program 1000+ for example), which foresees the state taking loans from an international financial institution according to favourable credit conditions (low interest rate, grace period, adequate repayment term), which would be offered to owners of illegal objects through a network of

[4]Source: Annual Energy Outlook, with projection to 2035, U.S. Energy Information Administration (EIA), June 2012

commercial banks. Savings in energy consumption would be sufficient for covering the loan instalment and costs for legalisation.

- *Entry of the ESCO company* – ESCO – Energy Service Companies do business in the world acting both as investors and contractors of works for energy efficiency improvement. These companies perform energy audits, invest financial resources in reconstructions-retrofits and carry out reconstruction itself, perform control energy audits, and monitor consumption over the following several years; they charge object owners for their services over a number of years (most frequently 8 to 10) at the monthly level, at the amount of savings made in energy consumption (or up to 80% of savings made).
- Loans taken from the republican Investment-Development Fund – this option is similar to the option of taking out a loan, where the municipality/state could act as an ESCO company, which performs works, and collects its claims from savings made. For this option, the existing capacities can be used (e.g. Agency for Construction of Podgorica, and so on) which would gradually be increased and strengthened.

The approach to the implementation of energy efficiency measures in the legalisation process is shown in the table below, taking into account one of the possible scenarios, for an illegal object of 100m^2.

Household size	Monthly expenses for energy	Savings	Legalisation cost (50 € per m^2)	Reconstruction cost (i.r. of 4.5% for a loan of 5,000 €)
100 m^2	110 €	63%	5000 €	7600 €
After retrofitting				
	Cost for energy	Legalisation cost for 20 years	Retrofitting cost (20 years)	Total
Monthly	47.30 €	20.80 €	32.00 €	99.8 €

The calculation shows that after reconstruction, every household applying for legalisation will have reduced expenses in relation to what it pays for energy, with the expenses now including legalisation, energy consumption and reconstruction costs. This means that even with a smaller amount of money, now they will have a legal and energy efficient object which is more comfortable and safer for living.

Conclusion

This idea the potential of using energy efficiency as an incentive to owners of illegal objects to start the process of their formalisation.

The first testing of the idea was carried out by UNDP, by means of the prototype. It was proved that the idea is based on sound grounds and that there is great potential for its successful implementation. However, the central and local authorities are at the helm. Successful implementation is possible only if there is ownership of the idea and the entire approach by municipalities themselves, with support from the central level of decision making.

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