

# Improving Methods for Legalization of Informal Settlements in Montenegro



*Empowered lives.  
Resilient nations.*

**Center for Sustainable Development  
Ministry of Sustainable Development and Tourism  
UNDP – United Nations Development Programme**



## Problem

Montenegro is dealing with a double challenge:

### Inefficient space use

- Official sources estimate that there are around 100,000 illegal constructions in Montenegro



### Inefficient energy use

- Montenegro is characterized by a high level of energy consumption - indicator of the energy intensiveness of MNE is 3.5 times higher than the EU average



# Proposal of solutions

UNDP and Ministry of Sustainable Development and Tourism propose an integrated policy solution to the double-challenge which consists of:

1

Improving level of energy efficiency of informal constructions



2

Use of achieved savings in energy consumption to finance the legalization process



## Advantages of this approach

- Increase of revenue to the central and local budgets
- Reduction of negative impact on the environment
- Increase of employment engagement of the economy
- Reduction of electricity consumption and thereby reducing the need to import electricity

## What is accomplished so far?

Research  
(energy  
audits of 30  
illegal  
buildings)

Prototype  
(retrofitting of 4  
buildings)

Joint work on  
providing funds  
needed for  
continuation of  
this initiative

# Research/ Energy Audits of Illegal Houses

In 2011 UNDP performed research (energy audits) on 30 illegal houses in three pilot municipalities (Bijelo Polje, Žabljak, Bar) which showed significant potential for saving in energy consumption

On average, €4,700 of investment in EE retrofitting brings around 59% of savings in energy consumption

Average payoff is in less than 7 years

Decrease of annual CO2 emissions for 1.000 kg per retrofitted building

These (basic) EE measures have been suggested:

- appropriate insulation of external walls;
- replacement of doors/windows;
- insulation of roofs;
- insulation of floors;
- replacement of light bulbs with energy efficient ones (LED)



## Prototype/ retrofitting of 4 houses

Retrofitting is performed in settlements Resnik and Rasovo in Bijelo Polje

*August  
2012*

- *Selection of 4 houses in Bijelo Polje which will be retrofitted*

*Sept  
2012*

- *Development of architectural designs for planned interventions*

*Oct/Nov  
2012*

- *Engagement of construction companies for reconstructions/adaptations*

*Nov  
2012*

- *Post-retrofit energy-audits (after performed retrofitting works)*

*Dec  
2012*

- *Economic analysis of implemented retrofitting measures*



# Prototype/ retrofitting of 4 houses

1



2



3



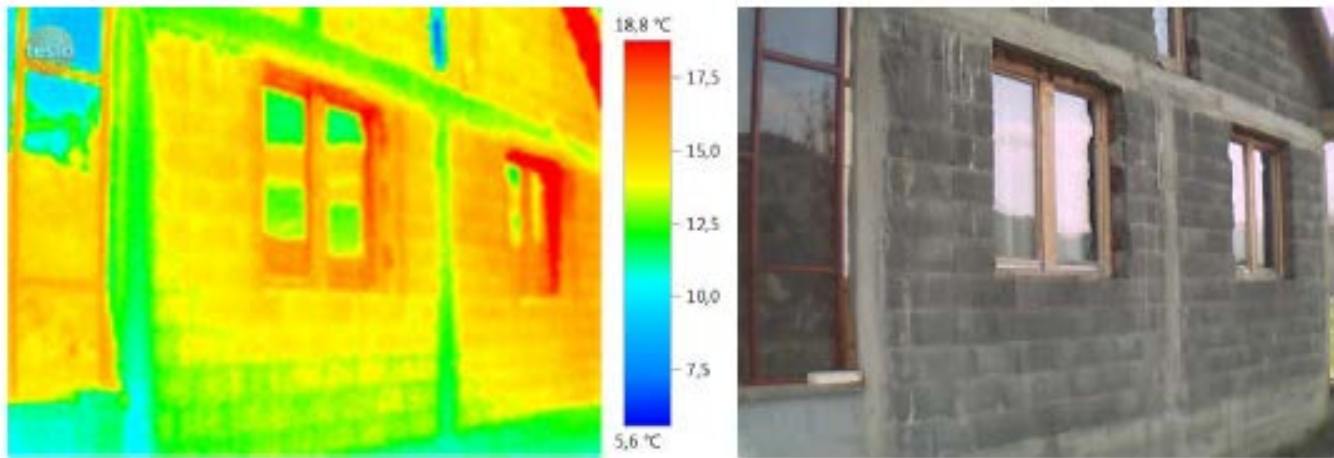
4



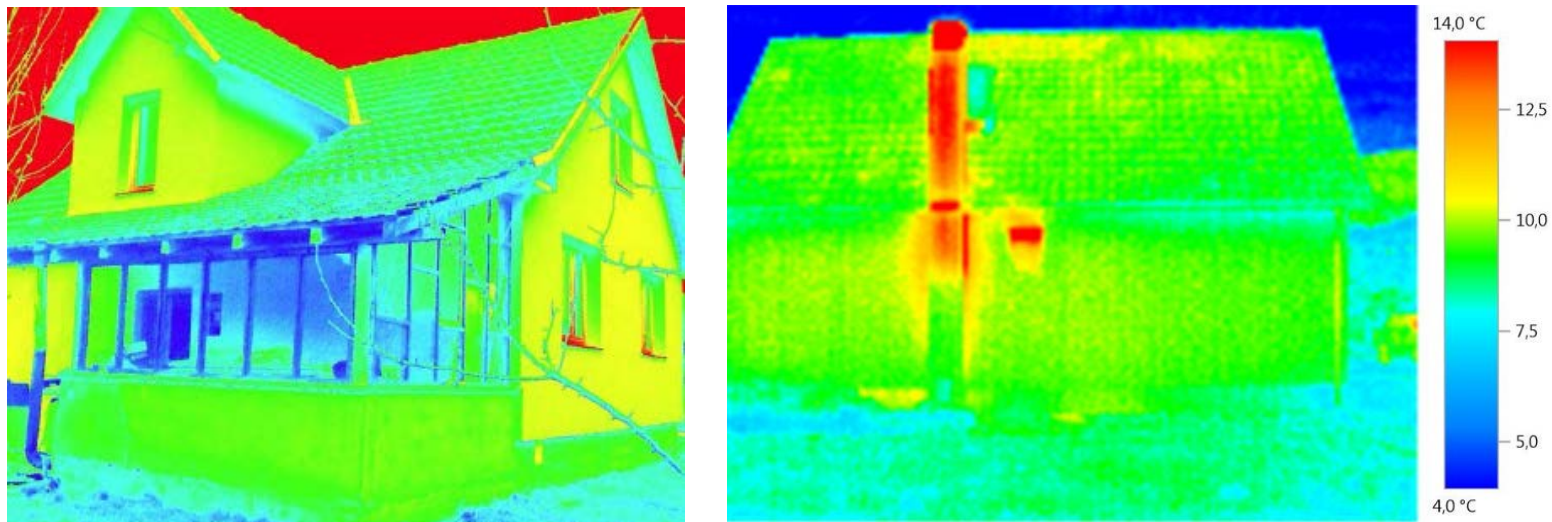


# Example – illegal house before and after intervention

October 2012, thermo-camera image before retrofitting



November 2012 , thermo-camera image after retrofitting



# Prototype/ retrofitting of 4 houses

1



## Prototype/ retrofitting of 4 houses

2



## Prototype/ retrofitting of 4 houses

3



# Prototype/ retrofitting of 4 houses

4



## Achieved results- for the house of 100m<sup>2</sup>

Average investment- 5.000 eur

Savings in energy consumption-37.900 KWh per year or 830 eur (63%)

Payback period - 6,12 years

Employed 6 persons per house- for 100 000 buildings  
60.000 employed persons or 6.200 new jobs, which  
decreases unemployment rate for 13%



Clip from the documentary movie presented on MIT competition



# Allocation of costs with the implementation of energy efficiency measures- one of the possible scenarios

Building area	Monthly bill for energy consumption	Savings	Legalization cost (50€ per m2)	Retrofitting cost (interest rate 4.5% for the loan of 5.000 eur)
100 m2	110 €	63%	5000 €	7.600 €
After retrofitting				
	Monthly bill for energy consumption	Monthly cost for legalization (20 years period)	Monthly cost for reconstruction (20 year)	Total
Monthly	47.30 €	20.80 €	32.00 €	99.8 €

## Macroeconomic indicators

### *Level of investments*

- Retrofit of 100.000 buildings would create around 470 mil euro direct investments in the construction sector and provide work for the entire construction sector in Montenegrin economy. Also, in an indirect manner this level of investment would stimulate increase of activities in other sectors and economic branches. At the annual level **47 mil euro of direct investments** is expected, which is **around 14%** in relation to the current level of construction work in Montenegro

### *Amount of revenues from VAT*

- direct effect of retrofit would reflect in 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 **in the following 10 years**;

## Macroeconomic indicators

### *Reduction of energy consumption in Montenegro*

- retrofit of 100.000 objects would lead to reduction in the total energy consumption by around **3.476 GWh** for the 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 by **27% import of** energy annually, and after less than 4 years it would entirely eliminate the need to import electric energy and create space for export of energy in the following years.

### *GDP*

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

# Next steps- possible donors and partners



THE EARTH INSTITUTE  
COLUMBIA UNIVERSITY

## Conclusions

- This idea shows potential for use of energy efficiency as an incentive to owners of illegal objects to start the process of their formalization.
- The first testing of the idea was done 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 the support from the central level of decision making.
- UNDP office has the capacities and mechanisms for providing technical support to municipalities and the competent ministry in the implementation of the presented model.



# GREEN FUTURE FOR MONTENEGRO: Energy Efficiency based National Formalization Program

The United Nations Development Programme (UNDP) approach to formalizing informal settlements in Montenegro

The Government of Montenegro is about to introduce penalties for illegalized houses. UNDP is proposing an approach to formalize informal settlements through implementing an energy efficiency system for households.



UNDP would like to encourage the citizens of Montenegro to legalize their houses along with improving their energy efficiency at no additional cost.



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Do you want to legalize your home SMART?



Continue paying high energy bills and even higher legalization cost

1

Pay up to 60% less for your energy consumption!



2

Use those savings to legalize your home



Do you also want to save money?



Continue throwing away €600 a year in energy bills

Do you want to increase comfort of your living?



Do you want to increase value of your property?



HOW ?

Your yearly price for energy consumption today:

€1000

Your yearly price for energy consumption after energy efficiency measures:

- €400

Yearly savings: used to pay for energy efficiency measures and legalization

= €600

# Thank you for your attention!

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