LOCSEE
Low Carbon South East Europe

NAMAs in the West Balkans:
An overview of current proposals

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1 Concept of National Appropriate Mitigation Actions (NAMAs)

The term NAMA (National Appropriate Mitigation Action) was first defined in the Bali Action Plan as part of the Bali Road Map agreed at the conference of the United Nations Framework Convention on Climate Change (UNFCCC) in Bali in December 2007 ("Conference of the Parties", COP 13). It also formed part of the Copenhagen Accord adopted at the climate change conference in Copenhagen (COP 15) in December 2009. Following the "Copenhagen Accord", countries had to submit information on voluntary mitigation targets and actions including planned NAMAs.

NAMAs refer to a set of policies and actions that countries undertake as part of a commitment to reduce greenhouse gas emissions[1]. The term recognizes that different countries may take different actions on the basis of equity and in accordance with common, but differentiated responsibilities and respective capabilities. It also emphasizes financial assistance from developed to developing countries for reducing emissions. The "Cancun Agreements" (COP 16 in 2010) recognized two types of NAMAs – those developed with domestic financial resources ("unilateral NAMAs") and those requesting for international support ("supported NAMAs"). More than 100 NAMAs have been proposed since 2009 by developing and emerging countries. So far most of the NAMAs seek support but this may not be only support for implementing measures, but also technology transfer or capacity building. Financing may come from bilateral or multilateral donors or through facilities officially approved by the Conference of the Parties, such as the Green Climate Fund (GCF) or the Global Environmental Facility (GEF). Supported NAMAs could be co-funded through carbon offset credits generated for the amount of emission reductions achieved ("NAMA crediting") and traded on the carbon market. However, this concept of credited NAMAs is not currently officially defined under the UNFCCC[2].

The UNFCCC has created a NAMA registry, a publicly available online platform. The registry allows developing countries to record information for all NAMAs seeking support for development or implementation, whether they are smaller individual projects or larger national initiatives by sector[3].

1.1 Key differences between National Appropriate Mitigation Actions (NAMAs) and the Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) is one of the flexibility mechanisms defined in the Kyoto Protocol that provides for emission reduction projects in Non-Annex-I countries (developing countries), which generate carbon credits, so called "Certified Emission Reduction units" (CERs) which may be traded and used for target achievement of Annex-I countries

1 http://en.wikipedia.org/wiki/Nationally_Appropriate_Mitigation_Action
2 http://www.irena.org/DocumentDownloads/Publications/Handbook_RE_NAMAs.pdf
3 http://unfccc.int/cooperation_support/nama/items/8184txt.php

(industrialized countries with emission reduction targets). Significant potential differences between NAMAs and CDM projects exist (Perspectives, ALCOR, 2011; CCAP, 2012):

- While carbon credits from CDM activities are project specific, NAMA financial mechanisms are program- based and made available to an entire sector or industry. Here also valuable lessons from financing emission mitigation measures under "Green investment schemes" (GIS) could be drawn (see Box 2).
- NAMAs are most likely to be driven by national governments, and may be undertaken in a partnership with the private sector, whereas CDM projects are typically driven by companies directly involved in the carbon markets.
- At the moment, supported/credited NAMAs do not have any specific additionality rules, whereas the CDM has strict rules in testing each project for its additionality (additional actions compared to a situation without CDM financing).
- CDM projects generally have quite stringent monitoring, reporting and verification (MRV) requirements that require demonstration of emission reductions, whereas NAMA MRV requirements could vary significantly depending on the nature of the activity and the financing approach.
- NAMAs will not necessarily result in credits, whereas the CDM is designed to result in the creation of credits (CERs).

The various donor-driven sources of NAMA finance that exist right now are a combination of development banks, specific climate finance programs (mostly related to fast start finance), and multilateral institutions among others (CCAP, 2012). NAMA governmental funders currently include the German-British NAMA facility or the Austrian NAMA facility.

BOX 1: The German-British NAMA facility

The German-British NAMA facility founded in 2013 contributed jointly an initial €70 million of funding to support developing countries and emerging economies that show leadership on tackling climate change and that want to implement ambitious climate protection measures (NAMAs). It provides an additional amount of €50 million, to fund the second bidding round for NAMAs in 2014 (IKI, 2014). In 2015 there will be a third call for projects.

Four projects were pre-selected for funding in the first call in 2013 (Sach, 2014):

- Chile: Self-Supply Renewable Energy (SSRE)
- Colombia: Transit Oriented Development NAMA
- Costa Rica: Low Carbon Coffee NAMA
- Indonesia: Sustainable Urban Transport Program (SUTRI NAMA)

The German-British NAMA Facility doesn't focus only on greenhouse gas emission reductions, but aims at achieving "transformational" change, sustainable development impact and economic leverage.

Funding actions include (Helme, 2014):

- Alignment with low carbon development strategies
- Promotion of national or sectoral policy changes
- Catalyzing private sector investments and blending other public funds

By combining government policies with financial measures and focusing on programs, rather than on projects, limited climate finance resources could have a substantial impact (Helme, 2014).

1.2 The Clean Development Mechanism (CDM) in the West Balkans

Several Western Balkan countries have implemented projects under the UN Clean Development Mechanism (CDM).

The expectations regarding the CDM in the region were high, given significant greenhouse gas reduction potentials (Tuerk, 2006). However, in practice only a few projects were realized under this Kyoto protocol flexible mechanism in the West Balkans. This was partly caused by the long time that host countries needed to operationalize the national approval mechanisms for CDM projects (for instance, to establish the National Authority for CDM projects' approval).

Table 1: *CDM projects in SEE countries. Source: UNEP CDM Piplene Overview (December 2014)*[4]

Country	Number of projects	Type of project
Albania	3 registered, 3 at validation, 2 validation terminated, 1 replaced at validation	reforestation (1), EE service (1), EE supply (2), hydro (5)
FYRO Macedonia	7 registered, 1 at validation, 2 replaced validation terminated, 1 validation terminated, 1 rejected	fossil fuel switch (4), hydro (4), biomass energy (2), wind (2)
Bosnia-Herzegovina	3 registered, 1 at validation, 1 replaced at validation	hydro (4), N2O (1)
Montenegro	2 registered	hydro (1), wind (1)
Serbia	7 registered, 2 replaced	biomass energy (1), wind (4),

[4] http://www.cdmpipeline.org/

	validation terminated, 3 validation terminated, 1 at validation	fugitive (1), methane avoidance (5), landfill gas (2)

Table 1 gives an overview of CDM projects at different validation status or already registered (approved by the UN) in the Balkans. It shows that Serbia and FYRO Macedonia have the most registered CDM projects. As there is no international demand for CDM credits since the end of the Kyoto period in 2012 except from least developed countries, no further CDM projects are being developed in the West Balkan region but the experiences can inform new greenhouse gas reduction mechanisms.

1.3 The possible role of NAMAs in the West Balkan countries

West Balkan countries are making progress in developing strategies to implement renewable energy sources as they have renewable energy targets for 2020 under the Energy Community Treaty (Tuerk et al., 2013). According to the currently available renewable action plans, countries mainly focus on hydro and wind energy expansion. Some renewable technologies such as biomass stoves are rarely available while there is large potential to increase efficient use of biomass for heating. In most countries there are no comprehensive climate strategies tying together the energy producing sector with other sectors. Climate policies are part of different policy strategies and regulations. Comprehensive policy packages in the area of transport or energy efficiency are often missing. There is a huge lack of funding in these sectors, this relates also to climate change adaptation. Not only funding for project development and implementation is needed but also for capacity building and the creation of an enabling institutional and administrative framework. This could be the strength of NAMAs compared to the CDM as the dysfunctional institutional and administrative framework was a main bottleneck for the CDM and for climate change measures so far in general.

Experiences with Green Investment Schemes (GIS) in Central and Eastern European countries may be of high value for developing NAMAs. The government based nature of GIS schemes resembles to the concept of NAMAs. Host countries targeted sectors that were of less interest for private investors and couldn't be targeted by other trading mechanisms but were of long-term strategic importance.

BOX 2: Green Investment Schemes (GIS)

Central and Eastern European countries – plus Russia and Ukraine – have an estimated 12.6 billion surplus of governmental carbon emissions rights under the Kyoto protocol (AAUs). This AAU surplus is often referred to as "hot air", as there is a common connotation that a major share of the corresponding emission reductions has not been reached through planned emission reduction efforts but is primarily the result of the economic downturn in energy intensive industries. Article 17 of the Kyoto Protocol provides for the trade of AAUs between industrialized countries with targets to comply with their emission reduction targets ("International Emissions Trading"). However, all potential buying countries have stated that they do not intend to achieve compliance through purchasing "hot air". Under GIS, revenues

from sales of AAUs are invested in “green” activities, ones designed to assist climate change mitigation. As no international rules for GIS exists, the programs or activities in which the revenues are to be invested must first be accepted by both the selling and buying governments (see Tuerk et al., 2010). Around 445 million GIS-backed AAUs have been on the market by 2014, representing a value of around 1.6 billion Euro.

In several seller countries with mature GIS schemes, such as the Czech Republic or Estonia, GIS enabled the early implementation of emission reduction measures such as thermal insulation for buildings or introduction of low carbon technologies (e.g. in the area of renewables or transportation) that will be important for them to meet their 2020 emission and renewable energy targets. In addition, in these countries GIS contributed to the creation of public awareness and know-how and the set-up of institutional structures (Tuerk et al., 2013). Experiences under GIS with simplified MRV-approaches under GIS compared to the CDM could be helpful for the development of fund-based NAMAs. Experiences show that approaches under GIS may not necessarily compromise the environmental integrity of the projects and programs (Tuerk et al., 2013).

2 Overview of NAMA proposals in West Balkan countries

2.1 Albania

Albania is a non-Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), and has ratified the Kyoto Protocol. Albania has already submitted the Initial and the Second National Communications in 2002 and 2009 respectively.

Albania has not officially submitted NAMAs to the UN but is in the phase of developing a set of NAMAs as part of the Third National Communication to the UNFCCC. Some of the possible areas for GHG reductions through NAMAs include energy efficiency in buildings, capacity building or sustainable transport. Apart from that, Albania has developed some more specific ideas for NAMA projects, two of them are described in more detail below.

Replacing fossil fuels with non-hazardous waste in cement industry in Albania

This NAMA proposes replacing coke, petroleum and coal for cement production with solid waste. In theory, some 1,000 Gg of CO_2 emissions resulting from fossil fuel combustion in cement kilns can be reduced. In addition to this, methane emissions from landfills amounting to 300 Gg CO_2 equivalents and emissions related to transport of fuels from overseas can be reduced.

Implementation of the National Energy Efficiency Action Plan (NEEAP) 2010 – 2018 in the residential and commercial sector

NAMA financing could help developing an action plan that will enable a more focused implementation of energy efficiency policies and better monitoring of its success. This would help in the transposition of the EU legal framework in Albanian law, the increase of air quality and reducing GHGs. The NAMA would include the following items:

(a) Establishment of the financial mechanism (Eco-fund)

This is a mechanism for disbursing government subsidies and loans for investments into emission reductions, energy efficiency, renewable energy and climate adaptation actions. The fund will be structured as a bank and will receive funds from the national budget, international grants and loans. The funds will be made available for investment in energy efficiency measures and technology and renewable energy sources in residential and commercial sector. The criteria for funding will be: state of the art of technology and/or measure, cost effectiveness and own contribution of the applicant.

(b) Building code requiring energy efficiency in new buildings

The energy related Building Code will be revised based on the EU Energy Performance of Buildings Directive (Directive 2010/31/EU).

(c) Awareness raising

Public awareness campaigns will be conducted to inform the public about the opportunities and benefits of energy efficiency in buildings as well as renewable energy. This will be done together with the promotion of the funding instruments of the Eco-fund.

(d) Capacity building for the designers, suppliers and builders

In collaboration with the business organizations and environmental NGOs, a capacity building program will be set up for the designers, suppliers of technology and builders. The objectives of this program will be:

- to promote the integration of state of art energy efficient and renewable technologies in the design and construction of buildings
- to facilitate the access of beneficiaries to the financial support of the Eco-fund,
- to improve the quality of designs, equipment and works.

This capacity building program will be mandatory for all who want to supply equipment or services under funding by the Eco-fund. It will be performed on a regular basis and also used as a feedback mechanism for the implementation of the NEEAP.

(e) Operation of the financial mechanism

Based on the available funds, the Eco-fund will offer grants and loans for energy efficiency measures and technologies, starting with those having lowest abatement costs and gradually expanding to all available measures. Funding will be subject to the quality implementation and financial contribution by the owner. The results will be reviewed annually and the funding program adjusted to the results of the evaluation.

2.2 Bosnia and Herzegovina (BiH)

Bosnia and Herzegovina is a non-Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), and has ratified the Kyoto Protocol. The country associated itself with the Copenhagen Accord, but has not yet put forward a mitigation commitment by 2020. The Initial National Communication to the UNFCCC was completed in October 2009, and has been adopted by the Council of Ministers and the governments of the two state entities of Bosnia and Herzegovina. It was submitted to the UNFCCC secretariat in May 2010.

In the Climate Change Adaptation and Low-Emission Development Strategy adopted in June 2013 NAMAs in Bosnia and Herzegovina are presented, both supported and potentially creditable. The proposed NAMAs include strengthening the institutional framework and capacity building, implementing EU acquis, or measures related to energy efficiency, reduced transport emissions and renewable energy generation. So far no NAMAs have been funded in Bosnia and Herzegovina. Despite of this, Bosnia and Herzegovina has already received funds for environmental protection, climate change mitigation and energy sector development from the Global Environmental Facility (GEF) and other donors.

The Low Emissions Development Strategy defines a large list of possible NAMAs in Bosnia and Herzegovina. Further details can be found in Annex 1.

BOX 3: Proposal for an urban NAMA in Tuzla

In the following paragraph a few details will be presented for a NAMA on urban development comprising building and transport efficiency in the town of Tuzla (Carrington, 2014). The project, developed by UNDP in 2013 is called "Complex Urban NAMA for implementation" and has a goal to reduce 440,777 tons of CO_2. The co-benefits are the creation of 23,516 man months of green jobs, reduced market-barriers for households, SMEs and investors. In addition the project will reduce environmental impacts and improve citizen´s health conditions. The actions planned to realize these goals are:

1. Increased capacity of the municipality in mainstreaming climate change challenges into development plans, Municipal Energy Efficiency and renewable revolving fund
2. Awareness: Tuzla CC&EE Educational-Centre
3. Increased EE (cogeneration) Tuzla District Heating
4. Increased EE of all Municipal public-buildings
5. Coal-heating replaced with biomass in 3,400 households with technical/geographical barriers for District-Heating connections
6. Overall public-lightning optimized
7. 1 MW photovoltaic power-plant constructed on 3 multi-purpose locations in city-center
8. 5 km bicycle-path constructed in city-center operational
9. Five electrical-cars

2.3 Former Yugoslavian Republic of Macedonia (FYRoM)

The FYR of Macedonia produced a Verbal of Agreement to the Copenhagen Accord. The document contains all the goals for the climatic policy of the country, and specific NAMA actions for several sectors (industrial energy transformation and heating, transport, waste, agriculture, forestry). NAMAs are based on the mitigation analyses and proposed actions within the Second National Communication on Climate Change (2008)[5]. In the energy sector new thermal and hydropower capacity is planned until 2025. There is a series of measures dealing with industrial energy transformation and heating in order to reduce GHG emissions such as the reduction of carbon intensive fuels, improvement of energy efficiency and saving, increasing of the contribution of renewable sources, introduction of economically viable prices of electricity and raising the awareness of the final consumers[6]. Several (additional) NAMAs are under deeper development in FYR of Macedonia as shown in Box 4.

[5] The country adopted the Third National Communication on Climate Change (2014) containing deeper analyses on mitigation potential using different scenarious

[6] http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/macedoniacphaccord_app2.pdf

BOX 4: NAMAs being developed in the FYR of Macedonia

Reduction of GHG emissions in the City of Skopje by improving and managing city's public transport

The scope of this proposal is to develop an efficient, modern, economic and environmentally friendly transport system in Skopje, the capital of FYRO Macedonia. The project envisages developing an eco-friendly public transport system, using trams and hybrid busses and improving the conditions for cycling. Below is a list of projects being proposed:

1) Upgrading the public transport system of the City of Skopje with electric sub-system (tram)
2) Improvement of public bus transport – addresses the need for additional infrastructure and physically separated bus lanes, development of service/user technical interface for data interchange, promotion of the usage of eco vehicles and public transportation.
3) Improvement of bicycle transport – construction of new bicycle paths and campaigns for increased usage of the bicycles as means of transport
4) Centre for Control and Management of the traffic – real time measurement data and establishment of a measurement data base, enabling timely and efficient transport management at the main city crossroads
5) Introduction of low carbon fuels technologies on the city public bus transport

Quick facts

- Cost of implementation: 182 million Euro Estimated duration of the initiative: 2014 – 2020
- Estimated emissions saved: 9.53 Mt CO_2 eq. in the period 2014 – 2020

Reduction of energy consumption and GHG emissions in the City of Skopje through implementation of Energy Efficiency measures in 20 public high schools

The City of Skopje has set a target to reduce the energy consumption by 20% over a period of 10 years. This application consists of energy efficiency measures defined in the City's Sustainable Energy Action Plan targeting 21 city-administered high schools. The technology interventions include:

1) High efficiency energy saving lighting
2) Installation of solar water heaters
3) Introduction of rock wool insulation beneath the roof constructions
4) Wall façade upgrading using polystyrene foam panels

5) Replacement of obsolete windows and doors

6) Introduction of an automatic thermal regulation within the heat substations

Quick facts

- Cost if implementation: 3.7 million Euro
- Estimated duration of initiative: two years
- Emissions saved: 600 t CO_2/y

2.4 Montenegro

Montenegro is a non-Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), and has ratified the Kyoto Protocol. The Government of Montenegro published in 2014 the Second National Communication on Climate Change which aims to strengthen the countries monitoring and reporting activities on greenhouse gases, implement climate change mitigation, reduce vulnerability and accelerate adaptation (Government of Montenegro, 2014).

The Communication includes a section on NAMAs listing possible projects in the area of energy, transport, industry and services, construction, agriculture, forestry and waste. The list of these projects is extensive and can be found in the Communication. However, the Communication concludes through a comprehensive cost benefit analysis that the projects with most net benefits are in industry including energy efficiency measures in an aluminum factory and ironworks. Considering the small size of the power system, these measures would bring substantial emission reductions; the aluminum factory for example consumes about 30% of the country's electricity demand. Annex 3 shows NAMAs that are seen as priority measures in Montenegro.

2.5 Republic of Serbia

Serbia is a non-Annex 1 Party to the United Nations Framework Convention on Climate Change (UNFCCC), and has ratified the Kyoto Protocol. Under the Copenhagen Accord it indicated a preliminary mitigation potential corresponding to emission limitations between 18% and 29% until 2020 compared to 1990 levels under the business as usual scenario, but mentioned that this is dependent on financial support from foreign investors. Serbia submitted its Initial National Communication in November 2010, with GHG limitation measures until 2012 and 2015 and is currently preparing its Second National Communication and First Biennial Report to the UNFCCC (mitigation program for the period until 2020 and 2030 should be included).

The project "Capacity Development Project on Nationally Appropriate Mitigation Actions (NAMAs)", which was funded by the Government of Japan and implemented by the Japan International Cooperation Agency (JICA) officially ended in 2013. One of the results of the

project was the development of the "NAMA Development Guideline of the Republic of Serbia" with a list of proposed NAMAs. Thirteen of the proposed NAMAs were sent to the NAMA registry. They deal with energy supply, transport and buildings. At the moment 12 of these projects are classified as NAMA seeking support for implementation, and one of them is classified as a NAMA for recognition for low-emission development in Serbia. Sectors of interest are energy efficiency, especially energy supply (8), energy supply and buildings (1), buildings (3) and transport (1). The list of proposed NAMAs shows that Serbia is proposing projects of strategic importance for the county's decarburization, taking into account that these sectors have significant mitigation potential at a national level. For example the introduction of a large number of biomass boilers should substitute the current inefficient biomass stoves, NAMAs could provide funding but also the needed technologies. Also the improvement of existing infrastructure and energy efficiency is important for the country in its pathway to stabilize its energy demand and move to a less fossil fuel based energy system. A project to install 1,000 MW of small biomass boilers is described in more detail in Box 5.

BOX 5: Introduction of 1,000 MW of small biomass boilers in Serbia (Source: Milanović, 2013)

The NAMA aims to install new biomass boilers totaling 1,000 MW that can provide around 3,150TJ of heat energy for residential, commercial and industrial sectors throughout the country that will be fueled by either wood waste (wood chips) or agricultural waste. The NAMA will include installing new biomass boilers and replacing the existing small inefficient boilers that are fuelled mainly by fossil fuels. There are no geographic limits where they will be installed; the only prerequisite is the availability of biomass. The project will involve 150 municipalities, who would be asked to determine potential project locations. The project funds will be used to support feasibility studies of selected locations. However, the majority of the 250 million EUR allocated for this NAMA would be used as loans with special conditions. This action will create an emissions reduction of about 10 million tons of CO_2 during the 25 years project lifetime.

Quick facts

- 1,000 MW (3,150 TJ)
- Total reductions: 10.36 Mt CO_2 equiv. for 25 years
- Expected range of boiler capacity: 100 kW – 1,000 kW
- Average capacity: 250 kW
- Total number around: 4,000
- Wood waste (wood chips) or agricultural waste
- Residential, commercial and industrial sectors
- Expected cost of implementation: EUR 250.5 million for loans and a feasibility study support

3 Synthesis and conclusions

Synthesis

The report showed that NAMAs target different sectors than CDM projects in the region did. While under CDM renewable energy projects or industrial projects were the main focus, focus areas of NAMAs include transport, energy efficiency in buildings or industry and renewable heat, or waste. These are areas that are of long-term strategic importance for decarbonizing the countries, however less attractive for private investors. This is in particular the case for measures that include a large number of individual projects, such as in the transportation and building sector. Measures in these areas cannot always easily be implemented, but often need supporting activities.

Table 2 shows a brief comparison of NAMA areas in the countries of the West Balkan region.

Table 2: *Comparison of NAMA areas by country*

	Transport	Energy Efficiency Industry	EE Buildings	Biomass heat	Land Use	RES Electricity	Industrial GHG reductions	Capacity building and transformation
Albania	X	X	X			X	X	X
FYROM	X		X	X		X	X	X
Serbia	X	X	X	X		X		
Montenegro		X		X	X			
BIH	X	X	X	X		X		X

The proposed NAMAs often have a broader focus than just the implementation of a specific measure, sometimes a broad set of measures and technologies in one sector is combined, some of them with more, others with less quantifiable greenhouse gas emission reduction effects. Some of the proposed NAMAs also aim to improve the institutional, legal or administrative capacities of countries to implement mitigation measures, thus create an enabling environment for implementing measures. Also the harmonization of the national legislative frameworks with the European Union directives is aimed to be part of NAMAs.

The broader focus e.g. in urban NAMAs should stimulate systemic changes including a range of low carbon technologies.

Conclusions:

After the limited success the CDM had in the Western Balkan countries, NAMAs offer a new opportunity to implement climate mitigation measures in sectors that are of high importance to the host countries such as energy efficiency and transport but also to provide new technologies that are of importance for a low carbon transition, such as biomass boilers to tackle the highly inefficient use of biomass in the region.

So far no NAMA in the West Balkans has been funded. To assist these countries in restructuring their energy policies towards “cleaner” supplies and more efficient technologies and reach their national and international energy and climate change goals, international support in developing and implementing NAMAs is crucial. This includes technologies but also an improvement of institutional, legal or administrative capacities that currently are main barriers for the implementation of renewable and climate change measures.

First pilot projects funded in the short term may be of critical importance for the West Balkan countries to develop and implement Climate Strategies assisting them to implement low carbon technologies. This would help these countries also to earlier align their climate policies with the EU’s 2020 and 2030 energy and climate goals.

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5 Annex Overview of proposed NAMAs

5.1 Annex 1: Proposed NAMAs for Bosnia and Herzegovina

Table 3: *Proposed supported and creditable National Appropriate Mitigation Actions in Bosnia and Herzegovina. Source: Climate change adaptation and low emission development strategy for Bosnia and Herzegovina (2013)*

Specific objective	Action	Reduction (Mt CO_2eq/y)	Preparation costs (EUR)	Implementation cost (EUR)	Time frame (years)	Type of support	Expected co-benefits
Capacity building							
Build the institutional and professional capacity for implementation, monitoring, reporting and verification of the strategy, the mitigation actions and for managing the process of EU accession and change of status under UNICCO (to Annex I) by 2025	Capacity building for country and entity level authorities responsible for various aspects of climate change mitigation policy including establishing annual emission statistics.	Enabling activity	-	1 million	2013-2015	Capacity building and financial support	Strengthening administrative capacities in BIH in general
	Establishment of Energy Efficiency Agencies of Republic of Sprska and of the Federation of Bosnia and Herzegovina (entity jurisdiction	Enabling activity	-	1 million	2013-2015	-	-

Specific objective	Action	Reduction (Mt CO_2eq/y)	Preparation costs (EUR)	Implementation cost (EUR)	Time frame (years)	Type of support	Expected co-benefits
Transpose and implement the EU Acquis Communautaire in the field of climate change, energy efficiency and environment by 2020.	Capacity building in EU climate, energy efficiency and environmental policy at all levels	Enabling activity		2 million	2013-2015	Capacity building and financial support	Contribution to EU Accession process leading to improved economic and social situation
	Establishing the country framework for EU ETS	Enabling activity	40,000	2 million	2013-2020	Capacity building and financial support	
Implement at least 10 supported and/or credited NAMAs by 2025	Designating, strengthening and operation of designated country authorities for the management of NAMAs.	Enabling activity	200,000	5 million	2013-2015	Capacity building and financial support	Mobilizing international financing and investment leading to "green" growth
Electricity generation							
Improve the efficiency of energy generation in all coal-fired power plants to at least 40% by 2025	Improvement of existing coal-fired power plants and construction of new ones	6.5	180 million	4.5 billion	2015-2014	Financial support and technology	Social security in mining regions, reduced air pollution

Specific objective	Action	Reduction (Mt CO_2eq/y)	Preparation costs (EUR)	Implementation cost (EUR)	Time frame (years)	Type of support	Expected co-benefits
	Installation of equipment for methane combustion and energy co-generation in underground coal mines	0.15	400,000	6.5 million	2013 - 2020	Financial support and technology	-
Install 150 MW new capacity for electricity generation using hydropower and wind	Use of renewable energy potential for electricity generation	> 0.26	40 million	300 - 400 million	2013 - 2025	Financial support and technology	Jobs, industrial development, competitive energy market
Buildings							
Reduce average heating demand of housing from over 200 kWh/m^2 to 100 kWh/m^2 by 2025	Transposition and implementation of the 2010 EU Directive on energy performance of buildings and training of professionals in the construction sector for the application of new legislation and the principles of designing energy-efficient and "green" buildings	0.21	20,000	1 million	2013 - 2015	Capacity building and financial support	Improved health of the population, lower heating costs
	"Green" public procurement in buildings	0.21	40,000	2 million	2015 - 2020	Capacity building and financial support	Energy cost savings, jobs, industrial development

Specific objective	Action	Reduction (Mt CO_2eq/y)	Preparation costs (EUR)	Implementation cost (EUR)	Time frame (years)	Type of support	Expected co-benefits
	New act on management and maintenance of multi-residential buildings	-	-	-	-	Capacity building and financial support	-
	Support to completing unfinished housings (initially refugees and internally displaced persons)	-	-	-	-	Capacity building and financial support	-
District heating							
Phase out fuel oil and coal from home and district heating and replace them with energy efficiency gains, biomass, thermo solar, geothermal and electricity by 2020	Law on production, distribution and supply of thermal energy	Enabling activity	20,000	1 million	2013 - 2015	Capacity building and financial support	-
	Use of biomass (wood waste) in distributed co-generation plants (including Livno, Gradiška and Prijedor)	0.88	-	-	-	Capacity building, financial support and technology	2.300 jobs, increased energy security, lower heating costs for families
Introduce individual metering for heat consumption in all district heating systems by 2020	Installation of individual heat meters in multiresidential buildings and creation of the conditions for payment based on actual consumption of heat	0.04	10 million	100 million	2015 - 2020	Capacity building, financial support and technology	Lower heating costs for families

Specific objective	Action	Reduction (Mt CO_2eq/y)	Preparation costs (EUR)	Implementation cost (EUR)	Time frame (years)	Type of support	Expected co-benefits
Transport							
Reduce transport emissions by 10% in relation to the "take no action" scenario by 2025	Railroad transportation: improvement and promotion (RATIP)	0.25	20 million	350 - 400 million	2013 - 2025	Capacity building, financial support and technology	Less demand on roads, leading to lower investment and maintenance costs
	Public transport: introduction and improvement (PUTII)	0.15	2 million	100 - 200 million	2013-2025	Capacity building, financial support and technology	Improved air quality. Improved mobility and lower costs for poor people
	Promotion of Car-sharing (PRO-CASH)	0.1	20,000	200,000	2013-2015	Capacity building, financial support	-
	Urban planning in terms of transportation (UPITT)	Enabling activity	40,000	1 million	2013-2015	Capacity building, financial support	-

5.2 Annex 2: Proposed NAMAs for Serbia

Table 4: *Proposed supported and creditable National Appropriate Mitigation Actions in Serbia. Source: NAMA Database*

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Energy supply							
Thermal Power Project with Capacity and Efficiency Increase II - TTP Nikola Tesla – Unit A3	Revitalization, efficiency improvement and decrease of emissions	1.4	47 million	47 million	2013	Energy Efficiency	Improvement of quality of life for local population due to income increase; economic development of the region and employment, energy security, reduce electricity imports; decrease local air and water pollution

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Thermal Power Project with Capacity and Efficiency Increase I - TTP Nikola Tesla – Unit B2	Revitalization, efficiency improvement and decrease of emissions	5.3	111 million	111 million	2015	Energy Efficiency	Improvement of quality of life for local population due to income increase; economic development of the region and employment, energy security, reduce electricity imports; decrease local air and water pollution
Revitalization of the Existing Small Hydropower Plants and Construction of New Small Hydropower Plants (SHPPs)	The NAMA involves construction of 9 new small hydropower plants (HPP) throughout Serbia. The total capacity of 9HPP is 30.40 MW with possible electricity production of 108.3 GWh/year.	4.1	55 million	55 million	2013	Renewable energy - Hydropower	Creation of local employment opportunities; reduction of impact on environment and awareness raising among general

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
							public about clean energy
Replacement and Construction of a New Natural Gas Cogeneration Plant CHP Novi Sad	Construction of a new, energy efficient natural gas-fired cogeneration plant that will entirely replace the existing inefficient cogeneration plant, which is also fueled by natural gas and heavy oil.	36	250 million	127,5 million	2014	Low carbon fuels	Sustainable technology transfer, economic development of the region and employment, reduce electricity imports; reduction of waste from electricity generation

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Introduction of 1000 MW of small biomass boilers in Serbia	Installation of 1000 MW of new biomass boilers for all residential, commercial and industrial sectors throughout the country that will be fueled by either wood waste (pellets or wood chips) or agricultural waste.	10.36	250 million	250 million	2015	Renewable energy (biomass)	Help develop rural economy – biomass market, creation of local employment opportunities, energy security – reducing dependence on imported fossil fuels; improvement of local environmental condition – wood waste and agricultural waste would be used for heat generation

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Construction of a Super-critical Lignite Power Plant TTP Kostolac B	Decrease emission intensity of lignite thermal power plant and increase energy efficiency to 40% (compared to 33% in conventional plants)	56	954 million	954 million	2015	Energy efficiency	Life conditions improvement; sustainable technology transfer, economic development of the region, employment, energy security; decrease local air and water pollution

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Expansion of existing heating network in Valjevo	Installation of a hot water network in the length of 9.7 km and closure of 25 existing inefficient heating stations (boiler rooms) and individual furnaces in 94 residential buildings. 119 new heating substations will also be constructed in order to supply heat to the total surface area of 286,649 m^2.	252,270 t CO_2 equiv. (30 years)	6 million	6 million	2013	Energy Efficiency	Creation of local employment opportunities; reduction of local air pollution
Buildings							
Use of Solar energy for domestic hot water production in Heat plant "Cerak" in Belgrade	Installation of solar collectors to replace a part of the hot water generation, amounting for around 2,700 MWh which is supplied to 7,000 households	0.012	1.05 million	1.05 million	2013	Renewable energy (solar)	Saving fossil fuel consumption, creation of local employment opportunities

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Introduction of metering system and billing on the basis of measured consumption in district heating systems in Serbia	Enhance energy efficiency in households and commercial sector by installing adequate metering systems for district heat	6.6	212 million	212 million	2013	Energy efficiency	Development of heat billing methodology, creation of local employment opportunities; efficient use of domestic and imported energy sources
Improvement of old residential buildings envelope	Rehabilitation of about 10% of the existing residential buildings in Serbia that were built in the period from 1950's to 1980's, what is approximately 10 millions square meters of houses and apartments buildings	15.1	723,5 million	578,8 million	2013	Energy efficiency	Increased level of indoor comforts; increase of revenue and employment of local companies, reduction of energy consumption

Specific objective	Action	Cummulative GHG reductions ($MtCO_2eq$)	Total cost (EUR)	Financing requested (EUR)	Start of initiative	Sub sector	Expected co-benefits
Energy Efficiency Improvements in Public Buildings	The NAME involves refurbishment of 23 schools and 26 hospitals throughout Serbia.	208.15	12.5 million	12.5 million	2013	Energy efficiency	Improvement of public services; energy savings in public sector
Transport							
Rehabilitation of arterial roads in Serbia	This action includes rehabilitation of the 19 different arterial road sections throughout Serbia. Total length of all proposed road sections is 324 km.	5,234 t CO_2 equiv. (20 years)	139 million	139 million	2014	Energy efficiency	Improved infrastructure will ensure higher level on transport service on rehabilitated roads, creation of local employment opportunities

5.3 Annex 3: Proposed NAMAs for Montenegro

Table 5: *Proposed supported and creditable National Appropriate Mitigation Actions in Montenegro. Source: Government of Montenegro (2014)*

Specific objective	Action	Emission reduction (Mt CO_2/y)	Total cost (EUR)	Start of initiative	Implementing body	Financing	Expected co-benefits
Energy production							
Construction of TE Maoče	Construction in vicinity of Pljevalja TPP with an installed capacity of 350 MW	2.288	426 million	2018	Ministry of Economy	International	-
Construction of TE Pljevlja	Second block of Pljevlja TPP with installed capacity of 225 MW	1.509	175 million	2022	Elektroprivreda Crne Gore/Ministry of Economy	International	-
Forestry							
Reforestation project	Reforestation of 40,000 ha over a longer time period	N/A	5.5 million	2014 - 2024	Ministry of Agriculture and Rural Development	50/50 domestic and international	-

Specific objective	Action	Emission reduction (Mt CO_2/y)	Total cost (EUR)	Start of initiative	Implementing body	Financing	Expected co-benefits
Energy production based on forest woody biomass	Feasibility of such projects was determined based on two previous feasibility studies of biomass heating and 10 business plans for wood pallet and bricket production	N/A	1 million per year	2014	Ministry of Agriculture and Rural Development and local authorities	40/60 domestic and international	-
Waste							
Construction of a plant for landfill gas collection and utilization	Landfill gas to energy conversion with plant or installed capacity between 600 - 3000 kW.	N/A	150,000	2014	Možura d.o.o.	50/50 domestic and international	-

5.4 Annex 4: Proposed NAMAs for FYRO Macedonia

Table 6: *Proposed supported and creditable National Appropriate Mitigation Actions in FYRO Macedonia. Source: Former Yugoslavian Republic of Macedonia (2010)*

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Electric power						
Harmonization and implementation of EU legislation in Energy and Climate	- Energy and Climate Package - Liberalization of energy markets (electricity and gas)	Government of RM, Ministry of Economy	-	In parliamentary procedure	Administrative	-
Ensuring stability in energy supply with investment activities for building new big hydro power plants	- HPP Boskov Most - HPP Galiste - HPP Cebren	Government of RM, Ministry of Economy, ELEM - Boskov Most/Galiste/Cebren: Concession, Private investors	- Boskov Most: € 70 million - Galiste: € 200 million - Cebren: € 320 million	- Boskov Most: short-middle term up to five years; tender procedure in progress - Galiste/Cebren: middle term up to ten years; tender procedure	Technical Energy, Economic	No GHG emission; Obligatory EIA

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Ensuring stability in energy supply with investment activities for building new thermal power plants on gas	- CHP Skopje 230 MW - CC gas (200-300 MW)	Goverment of RM, Ministry of Economy, ELEM - CHP Skopje: AD Toplifikacija Skopje - CC Gas: Government of RM, Ministry of Economy, ELEM	- CHP Skopje: € 135 million - CC gas: € 250 million	- CHP Skopje: Under Construction - CC gas: Middle term up tot en years	Technical Energy, Economic	-
Increasing the share of renewables in the energy sector	- Small hydro power plants (SHPP) - Wind power plants (WPP) - Biomass electricity and PV panels	Government of RM, Ministry of Economy, Local self-government - SHPP/WPP: Concession, private investors - PV: Private investors and initiatives, Stimulations form the Government	- SHPP: 1500 €/kW	Short- middle terms - SHPP/WPP/PV: Continual construction process	Technical, Energy, Stimulating for sustainable development	No GHG emission

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Improvement of the Energy Efficiency	- Building plants for production of combined heat and electrical energy (CHP) - Measures for reducing the losses in transmission and distribution of electricity - Measures by the electricity consumers by introducing more efficient lamps, more efficient electric appliances etc. - Animation of the interested investors with favorable legal regulations and tax relives	Enterprises, Institutions, Households	-	Middle-long term	Economic, Energy Stimulating for sustainable development	Saving energy and reduced GHG emission
Industrial energy transformation and heating						
Reduction of the use of carbon intensive fuels	Replacement of coal with liquid or gaseous fuels, replacement of liquid fuels with gaseous fuels	MOEPP, ULSG, Industrial subjects, Subjects in the public sector	Possibility for carbon financing and loans through the Program for renewable energy	Short-middle term	Technical, Economic, Regulatory	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Improvement of the energy efficiency and energy saving	- Improvement of the energy efficiency of the boiler plants with permanent maintenance - Replacement of old equipment in boiler rooms, with regular revitalization works - Installation of measurement-regulation equipment and automatic control systems - Better insulation, maintaining clean heat exchanging surfaces - Utilization of heat content in flue gases - Reduction of loses in systems for transportation of fluids - Heat insulation of pipelines for transport of water, steam, fuels, etc. - Reduction of specific consumption of energy in the industry by introduction of up-to-date technologies and processes - Improvement of the standards for construction of buildings, better	MOE, Energy Agency, MOEPP, MOTC, ULSG, Industrial subjects, Heating plants	Possibility for carbon financing and loans through the Program for Renewable Energy, programs with support of donors community	Short-middle term	Technical, Economic, Regulatory	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
	insulation, use of high quality materials					
Increasing of the contribution of renewable energy sources in the countries energy balance	- Utilization of waste biomass as an energy source and as a raw material for production of briquettes and pellets - Installation of tens of boiler units on waste biomass in the agro-industry complex, industry sector an in households - Rehabilitation, revitalization and expanding of the geothermal system Geoterma-Kochani - Revitalization of other systems on geothermal energy - Introduction of solar energy systems for heating and hot water supply (in hotels, hospitals, schools, public buildings, health resorts etc.)	MOE, Energy Agency, MOEPP, MOTC, ULSG, Industrial subjects, Public enterprise, Households	Possibility for carbon financing and loans through the Program for Renewable Energy	Short-middle term	Technical, Economic, Organizational	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Awareness raising of the final consumers	- Reduction of energy consumption in the households with measures of energy saving - Reduction of electricity use for heating - Introduction of measurement equipment and charging in accordance to the consumption	MOEPP, MOE, Energy Agency, NGOs, Media	National budget	Continuous	Organizational	-
Transport						
Improvement of the overall efficiency in the transport sector and energy efficiency of the vehicles	- Revitalization, extension and better maintenance of the road and railway infrastructure - Extension-spreading of the electrification of the railway network - Modernization of the vehicle fleet - Motivation for wider use of alternative fuels and other power systems (LPG, CNG, biodiesel, hybrid vehicles etc.)	MOTC, MOE, MOEPP, Institutions, Public and private enterprises, Citizens	- National budget - Budget of the municipalities - Finances from the enterprises (public and private) - Foreign donations	Middle term, continuously	Technical, Economic, Legislative	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Improvement of the public urban and inter-city transport	- Improvement in the planning, organization and control of the traffic - Measures for regulation of the traffic in central urban areas - Modernization of the transport equipment for the public traffic - Synchronization of the road signalization in the towns - Introduction of electronic pay toll charging - Introduction of electrically driven types of transport, i.e. tramway - Railway transport – electrification of the railway network	Fund for national and regional roads, MOTC, MOE, MOEPP	- National budget - Budget of the municipalities - Finances from the enterprises (public and private) - Foreign donations	Middle and long term	Technical, Economic, Legislative	-
Harmonisation of the national legislative, regarding the transport sector, with the European Union directives	- Energy and Climate Package (biofuels) - Regulation on fuels quality in accordance with the European Union norms	MOE, MOTC, MOEPP, Legislative institutions, Other institutions	-	Short-middle term	Legislation	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Waste						
GHG reduction at the existing landfills	- Technical improvement of the existing landfills - Installation of methane recovery and flaring systems at selected landfills	Public enterprises, Local authorities	Municipal budgets, carbon financing (CDM)	Short-medium term	Technical	-
Improvement of the possibilities for efficient methane collection	- Construction of regional solid waste disposal sites	Local authorities	- National budget - Municipal budgets - Foreign investments	Short-medium term	Technical	-
Reduction of the nitrous oxide (N_2O) emissions	- Implementation of legal measures for restriction of the economic activities that include uncontrolled burning of the waste - Raising public awareness for restriction of the uncontrolled burning of waste	MOEPP, Local authorities	-	Short term	Legislation, Regulation	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Reduction of the methane emission from the wastewater	Expansion of the wastewater treatment plant network	MOEPP, Local authorities	- National budget - Municipal budgets - Foreign investments	Short-medium term	Technical	Protection of the surface water thus protecting the water flora and fauna
Enabling favorable pre-conditions for GHG emission reduction (laws, bylaws, institutional measures, support measures)	- Transposition and implementation of EU CAP legislation - Completion of institutional and legal reforms in irrigation sector - Increasing of the institutional and individual capacities for application of the available EU funds - Development of system for application of Good Agricultural Practices - Financial support for motivating the farmers to use mitigation technologies -	MOEPP, Locl authorities, non-governmental sector, media	- National budget - Donations	Continuous	Public awareness	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Agriculture						
Introduction/development of GHG mitigation technologies in agriculture	Installation of methane recovery and flaring systems at selected farms	MOEPP, MOAFWE, Public enterprises, Local authorities, Farms	Foreign investments, Municipal budgets, Agriculture support mechanism, Carbon financing	Short-medium term	Technical	-
	Research support program for development of new mitigation technologies and transfer of the existing ones	MOES, MOAFWE, MOEPP, Foresting donation, Research community	National budget, Foreign donations, EU Research programs	Short-medium term	Research	-
	Program for introduction of practices that use the agriculture potential for renewable energy and carbon sequestration, Programatic CDM projects	MOAFWE, MOEPP, MOE	National budget, Foreign donations, Private investments, Carbon financing	Short term	Development	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
Strengthening the national and local capacities for carbon financing	- Training for CDM potential in agriculture - Training for preparation of CDM documentation	MOEPP, NGOs	- Foreign donation - Bilateral projects	Medium term	-	-
Education (of experts/farmers/decision makers) for application of mitigation measures/technologies in agriculture	Current curricula and syllabuses upgraded with CC mitigation issues	MOES, Universities, Vocational schools	National budget, Foreign donations	Short-medium term	Education	-
	Training of farmers for adopting new technologies	MOAFWE, Agency for development of agriculture, Educational institutions	National budget, Foreign donations	Short-medium term	Education	-
	Familiarization of public and institutions with the problem of CC mitigation	MOAFWE, MOEPP, NGOs, Relevant scientific and educational institutions	National budget, Foreign donations	Short-medium term	Public awareness	-
Implementation of the national strategic documents in the forestry	Forestation and re-forestation	MOAFWE, PE Macedonian Forests	National budget, Foreign donations	Continuous	Policy, Technical	-
	Prevention measures against fires	MOAFWE, PE Macedonian Forests, Inspectorate	National budget	Continuous	Policy, Legislation, Public Awareness	-

Specific objective	Action	Involved subjects	Finances	Time frame	Type of support	Expected co-benefits
	Prevention of illegal cut	MOAFWE, PE Macedonian Forests, Inspectorate	-	Continuous	Legislation, Public Awareness	-