

**15 Annex - Energy**

**71. ENERGY DEVELOPMENT STRATEGY OF  
MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012**

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*Crna Gora*

*Ministarstvo za ekonomski razvoj*

Ministry for Economic Development of Montenegro

# **ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025**

## **ACTION PLAN 2008-2012**

Podgorica, October 2008

**ENERGY DEVELOPMENT STRATEGY  
OF MONTENEGRO until 2025**

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**ACTION PLAN (2008 – 2012)**

**MINISTRY FOR ECONOMIC DEVELOPMENT  
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**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**ABBREVIATIONS**

AP	Action Plan
APD	Action Plan Directorate
BOR	Build-Operate-Remove
BOT	Build-Operate-Transfer
CANU	Montenegrin Academy of Science and Art
CC	Core Content
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
CIEE	Central Institution for Energy Efficiency
DBOT	Develop-Build-Operate-Transfer
DCF	Discounted Cash Flow
EAR	European Agency for Reconstruction
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMGS	Energy, Mining and Geology Sector (within the Ministry for Economic Development)
EPA	Environmental Protection Agency
EPCG	Electric Power Company of Montenegro
EU	European Union
EUROSTAT	Statistical Office of the European Communities
FA	Forest Administration
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GTZ	Gesellschaft für Technische Zusammenarbeit (German technical cooperation)
HPP	Hydro Power Plant
HVDC	High Voltage Direct Current
IFI	International Financial Institutions
IPA	Instrument for Pre-Accession Assistance
IPP	Independent Power Producer
IRR	Internal Rate of Return
JSC	Joint Stock Company
KfW	<i>Kreditanstalt für Wiederaufbau</i> (German Development Bank)
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MAFWM	Ministry of Agriculture, Forestry and Water Management
MED	Ministry for Economic Development
MEF	Montenegrin Employers Federation
MES	Ministry of Education and Science
MF	Ministry of Finance
MHLSW	Ministry of Health, Labour and Social Welfare
MNE	Montenegro
MONSTAT	Statistical Office of Montenegro
MTEP	Ministry of Tourism and Environmental Protection
NPV	Net Present Value
PPP	Public-Private Partnership
REGAGEN	Regulatory Agency for Energy of Montenegro
RES	Renewable Energy Sources
RMNE	Republic of Montenegro
SEA	Strategic Environmental Assessment
SHPP	Small Hydro Power Plant

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

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SEE	South East Europe
TPP	Thermal Power Plant
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
WA	Water Administration
WB	World Bank

## TABLE OF CONTENTS

1	INTRODUCTION.....	9
2	ACTION PLAN OBJECTIVES AND CONTENT .....	10
3	ENERGY POLICY AND ENERGY STRATEGY AS THE ACTION PLAN BASES.....	11
4	METHODOLOGY FOR ACTION PLAN PREPARATION.....	14
5	ACTION PLAN IMPLEMENTATION.....	22
5.1	LEGISLATIVE-REGULATORY FRAMEWORK .....	22
5.1.1	International obligations .....	22
5.1.2	Planning documents .....	22
5.1.3	Laws and regulations .....	23
5.2	INSTITUTIONAL-ORGANISATIONAL FRAMEWORK .....	25
5.2.1	Tasks of the Ministry for Economic Development with regard to Action Plan implementation.....	25
5.2.2	Montenegrin energy sector stakeholders .....	26
5.2.3	Central Institution for Energy Efficiency.....	29
5.2.4	Action Plan Directorate .....	30
6	OVERVIEW OF PROGRAMMES AND PROJECTS.....	34
7	ACTION PLAN TIMELINE .....	41
8	ACTION PLAN FUNDING SOURCES AND DYNAMICS (2008-2012).....	43
9	ACTION PLAN IMPLEMENTATION MONITORING, FOLLOW-UP AND UPDATES .....	53
10	PROGRAMMES AND PROJECTS.....	55
10.1	CC 1: INCREASE ENERGY EFFICIENCY AND USE OF RENEWABLE ENERGY SOURCES IN CONSUMPTION.....	55
10.1.1	Energy Efficiency Programme.....	55
10.1.2	Project for introduction of Energy Management System (EMS) in the public sector 57	
10.1.3	Project on energy saving in public sector .....	60
10.1.4	Project on promoting and performing Energy Audits .....	62
10.2	CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES .....	65
10.2.1	Programme for developing electric power networks.....	65
10.2.2	Project for revitalisation of small HPPs.....	68
10.2.3	Project for revitalisation of HPP Piva.....	70
10.2.4	Project for revitalisation of HPP Perućica – Phase II .....	73
10.2.5	Project for revitalisation of TPP Pljevlja I.....	76
10.2.6	Project for recovery and expansion of electric transmission network.....	79
10.2.7	Project for recovery and expansion of electric power distribution network.....	81
10.3	CC 3: DESIGNING A PLAN TO MITIGATE CLIMATE CHANGE EFFECTS .....	85
10.3.1	Project for energy inclusion in mitigation of global climate change effects in Montenegro.....	85
10.4	CC 4: CREATION OF INSTITUTIONAL FRAMEWORK AND PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF A COMPETITIVE AND MARKET ORIENTED ENERGY SECTOR.....	87
10.4.1	Programme for energy sector restructuring – market opening and social policy ..	87
10.4.2	Programme for the energy sector public relations .....	90
10.4.3	Programme on education and training in energy and ecology .....	93
10.4.4	Project for EPCG JSC restructuring and capital increase.....	96
10.5	CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES 98	
10.5.1	Programme for development of renewable energy sources (hydro potential excluded)98	
10.5.2	Programme for hydro potential use .....	101
10.5.3	Project of building small hydropower plants .....	103

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

---

10.5.4	Project of using wind energy for electricity generation (Rumija) .....	106
10.5.5	Project of using biomass for heat and electricity cogeneration .....	108
10.5.6	Project of using municipal waste for heat and electricity cogeneration .....	110
10.5.7	Project of building HPP Komarnica .....	112
10.5.8	Project of building HPP on the Morača river.....	115
10.6	CC 6: INCREASE CLEANER ENERGY PRODUCTION FROM FOSSIL FUELS .....	118
10.6.1	Project of TPP Pljevlja II with heating system for town of Pljevlja .....	118
10.6.2	Project for LNG terminal close to town of Bar.....	121
10.6.3	Project of gas system for town of Podgorica with the gas distribution network ..	123
10.7	CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO .....	125
10.7.1	Programme of oil and gas exploration in mainland.....	125
10.7.2	Programme of international agreement on the use of hydro-energy potential....	127
10.7.3	Project of oil and gas exploration in seabed – Blocks 1 and 2.....	129
10.7.4	Project of oil and gas exploration in seabed – Block 3 .....	131
10.7.5	Project of coal exploration in Pljevlja area.....	133
10.7.6	Project of coal exploration in Berane area.....	135
10.7.7	Project of Adriatic-Ionic gas pipeline .....	137
10.8.1	Programme of Action Plan monitoring and follow-up.....	140

<b>List of Tables.</b>	<b>Page</b>
Table 1: Core Contents relevant for with regard to envisaged measures in the European Union	9
Table 2: Action Plan Core Contents, Programmes and Projects	10
Table 3: Overview of Programmes and Projects	27
Table 4: Required funding for Programmes and Projects as per years (EUR)	38
Table 5: Government funding by sources (EUR)	41
Table 6: Parameters for Action Plan monitoring	44

<b>List of Figures</b>	<b>Page</b>
Figure 1: Structure, role and interest of individual stakeholders in Montenegrin energy sector	22
Figure 2: Organisational structure of Action Plan Directorate	25
Figure 3: Action Plan Timeline	34
Figure 4: Donors and international financial institutions present in Montenegro	36



## 1 INTRODUCTION

The commitment of Montenegro, as an independent and internationally recognized country, to continue with the initiated process of Euro-Atlantic integration, requires a responsible, comprehensive and complex development approach. This commitment and the approach are particularly manifested in the foreseen evolution of the Montenegrin energy sector as the foundation of overall development of the country, from ecological, social and economic aspects. As such, the energy sector development is of great, and maybe crucial, importance for overall progress of Montenegro.

Nowadays, when Montenegrin energy development faces new challenges, primarily due to the global upswing in global energy prices and to the effects of climate changes, the adopted **Energy Development Strategy of Montenegro by 2025** (hereinafter: the Strategy) represents the starting point for feasible and sustainable development model of Montenegrin energy sector, which is in line with European guidelines and best practices. The Strategy also provides the basis for the enactment of other necessary legislation and the institutional support for a successful implementation of Montenegrin energy policy.

The Action Plan (AP) represents an essential complement and a logical extension to the Strategy. The AP and Strategy both share one common objective: embodiment and accomplishment of the energy development vision.

The AP substance is reflected primarily in the definitions of activities, which are to be carried out during the following five-year period (2008-2012), in the methods of implementation and in the provision of insights into the implementation processes of each and every Strategy objective. Considering that numerous organisations, like government institutions, international organisations, professional associations, economic entities and NGOs, combined with other segments of the society, shall be involved in the implementation process, the AP provides the basis for efficient communication, while emphasizing the responsibility of the stakeholders for achieving the requested communication levels and fulfilling the aspired objectives.

The Strategy provides road maps and required measures to which Montenegro shall adhere during the implementation of the adopted Energy Policy objectives; whereas the AP provides the Strategy execution plan and the necessary steps to be undertaken consistently with the Strategy road maps. The AP contains numerous specific Programmes and Projects whose implementation will lead to the accomplishment of the Strategy objectives.

The energy sector is very dynamic and constantly changing, therefore it represents a special challenge for defining the AP and imposes the need for efficient control and flexibility while considering the most efficient options, that is, regular evaluations of the achieved results.

Therefore, the AP takes into consideration the distinguishing features of Montenegro, the powerful dynamics and the immanent priorities of its overall development, and paves the way for achieving the Strategy objectives while leveraging the most effective and efficient use of available energy resources in Montenegro.

Pursuant to Montenegrin legislation, the Ministry for Economic Development (MED) drafts and proposes the hereby provided AP for adoption to the Government of Montenegro.

## 2 ACTION PLAN OBJECTIVES AND CONTENT

The main AP objectives are to (i) lay down specific Programmes and Projects to be implemented in the period 2008-2012, (ii) define the prerequisites and the very implementation process with regard to activities, responsibility, timelines, funding, sources of funding, ecological and social effects, and (iii) propose mechanisms for the AP implementation monitoring and follow-up. In addition, the AP provides the basis for the creation of specific and viable implementation mechanisms based on the appropriate organisation of human resources and implementation methods of the targeted activities. The AP objectives are furthermore extended by the creation of conditions for the continuation of activities after the initial five-year period envisaged in this AP.

The road map to accomplishment of these objectives is presented in the following eight chapters of this document:

- The third chapter gives an overview of the concluding recommendations set out in the Energy Policy and the Strategy.
- The fourth chapter provides a detailed account of the methodology in defining mechanisms for the implementation of activities and their clustering in Core Contents, Programmes and Projects aimed at efficient implementation of the AP, with additional explanations provided to its beneficiaries.
- The fifth chapter gives the structure of mechanisms for the implementation of AP activities and the prerequisites for a successful instituting of this mechanism, such as the legal and institutional-organisational issues.
- The sixth chapter gives an overview of all Programme and Project activities with the main parameters of significance for their implementation: schedule, funding, objectives and responsibility.
- The seventh chapter is dedicated to the AP Timeline through the presentation of the basic Gantt chart.
- The eighth chapter contains an overview of potential ways of financing the AP implementation with the funding sources and schedules.
- The ninth chapter shows the mechanisms for AP implementation monitoring and follow-up with a view to defining the basis for a transparent monitoring of the AP implementation and provide for the AP updates as new requirements emerge.
- The tenth chapter provides descriptions of individual Programmes and Projects containing the basic information relevant for the AP implementation follow-up.

The Annex provides detailed schedule of every individual Programme and Project.

### **3 ENERGY POLICY AND ENERGY STRATEGY AS THE ACTION PLAN BASES**

Montenegro's Energy Policy objectives are the following:

1. Secure, quality, reliable and diversified power supply aimed at matching supply with demand for all forms of energy,
2. Maintenance, rehabilitation and modernization of the existing, and the construction of a new, reliable infrastructure required for energy generation and utilization ,
3. Reduction of import dependence, primarily through the creation of stable conditions for investments in research and construction of new power facilities (especially on the basis of already explored resources related to unused hydro potentials), as well as investments in other energy infrastructure,
4. Creation of the relevant legislative, institutional, financial and regulatory frameworks to encourage private sector involvement and investments in all aspects of energy infrastructure,
5. Creation of conditions for higher utilization of renewable energy sources, heat and power cogeneration (CHP) and the usage of fossil fuels based on clean technologies,
6. Establishment of a competitive market in order to provide energy in the fields where this is possible (generation and supply) in accordance with the concept of the regional energy market, with regulated monopoly network activities,
7. Provision of institutional and financial incentives to improve energy efficiency and reduce energy intensity in all sectors, from energy generation to consumption,
8. Sustainable energy production and utilization from the aspect of environmental protection and international cooperation in this field, especially with respect to the reduction of GHG emission,
9. Support to research, development and promotion of new, clean and efficient energy technologies, as well as the following of energy policy based on professional and scientific grounds.

In the period 2005 – 2006, the professional basis for the Strategy was finalized (Books A-E), and the Energy Development Strategy of Montenegro by 2025 was adopted in December 2007.

The main strategic commitments set out in the Strategy are as follows:

1. The Strategy based on Montenegro's Energy Policy (2005), Montenegro's existing international obligations, and the EU Energy Policy Guidelines,
2. Montenegro assumes obligations set out in the Energy Charter Treaty as the key document prescribing directions, rules, and measures for the future (re)organisation of

- the electro-energy sector and the gas sector, as well as the development of the regional market of these energy sources,
3. Montenegro will strive to undertake all the required measures for a successful implementation of the Acquis Communautaire in the fields of energy, environment, competition, and renewable energy sources in line with requests and dynamics set out in the Energy Charter Treaty,
  4. Identify energy as the mainstay of overall, sustainable, and long-term stable growth of Montenegro entailing positive macroeconomic effects,
  5. Improvement of energy efficiency in production and consumption to the level of moderately developed EU countries,
  6. Safe, secure, reliable and quality energy supply of consumers at real prices,
  7. Undertake resolute measures to maintain at least a 20% share of renewable sources in overall primary energy consumption in Montenegro,
  8. Rational and wise use of hydro-energy potentials at the river basins of Morača, Zeta, Lim, Piva, Tara, Ibar and Cehotina with full adherence to the applicable UNESCO declarations, decisions of the Montenegrin Parliament, and the principles of sustainable growth,
  9. Rely on the exploitation of domestic coal reserves as the second most important energy resource of Montenegro besides hydro power; the building of TPP Pljevlja 2 and the heating system in town Pljevlja. There is also a possibility of building TPP Berane if the investment proves to be cost-efficient;
  10. Revitalization and technical modernisation of the existing electricity generation, transmission, and distribution system,
  11. Improve business efficiency and reduce the impact of coal exploitation and thermal power objects on environment;
  12. Reduce energy import dependency and improve the safety of energy supply in Montenegro;
  13. Support development and accelerate the introduction of renewable energy sources, use the solar energy for heating, replace industrial and small boiler rooms with cogenerations of liquefied petroleum gas (LPG) and liquefied fuels, introduce other local energy systems in the country's energy system;
  14. Develop the system of LPG as the strategic precedent to natural gas,
  15. Develop a natural gas system (including the building of the regional gas pipelines, liquefied natural gas receiving terminals and facilities for natural gas use,
  16. Implement the strategic 90-day supplies of oil derivatives in accordance with the EU directive;
  17. Implement a program of regulatory, legislative, and operational inclusion in the process of EU accession with regard to energy and ecology, including the integration into the SEE and the EU energy markets;
  18. Continue with oil and gas exploration at the Montenegrin coast, coal exploration in Pljevlja and Berane basins, and carry on the study research on the exploitation of the remaining hydro potential;

19. Improve the regulatory process and professional independence of the regulatory body in line with Montenegro's energy policy,
20. Reach agreements with neighbouring countries (Bosnia and Herzegovina, Croatia, Serbia, and Albania) on the optimal utilization of the joint hydro potential and water use and management, as well as on planning new electric power interconnections with these countries,
21. Active inclusion of Montenegrin institutions in international cooperation in energy, research and development, and the introduction of energy on the curriculum at all educational levels;
22. Continue with the energy sector reform in line with Montenegro's Energy Policy and EU Energy Policy Guidelines with a view to creating conditions for safe, secure, reliable and quality supply of consumers with energy at competitive prices, simultaneously respecting the principle of sustainable growth and market operations;
23. Continue with the restructuring of the Montenegrin Electric Power Company JSC Nikšić, pass a development and privatisation strategies for this company;
24. With a view to creating conditions for following an active energy policy, establish the system for tracking data on energy generation, consumption, and losses in accordance with the EUROSTAT system of national energy information,
25. Based on the ratification of the Kyoto Protocol in March 2007, as a country outside the annex for developed countries at least until 2012, provide opportunities and support to foreign investors for the implementation of the so-called Clear Development Mechanisms projects (CDM).
26. Ensure social protection in the course of the energy sector changes that may affect the social status of certain segments of the society.

The Strategy defines the key programmes and projects as the bases for long-term energy generation and consumption balances of Montenegro. It also considers the effects of the energy sector development for environmental protection and social status of the Montenegrin citizens. This consideration had an important impact on defining the framework for the AP drafting and singling out the specific Programmes and Projects consistent with the main Strategy objectives and recommendations.

#### 4 METHODOLOGY FOR ACTION PLAN PREPARATION

The underlying principles for the AP preparation were the following:

- a) AP shall define all the main activities in the five-year period (2008-2012);
- b) AP shall be specific and pragmatic – exclusively implementation oriented;
- c) AP, as a an integral part of the Strategy, is a public and official document available and designed for the Montenegrin Government, its institutions, international entities and all segments of the Montenegrin society;
- d) AP shall be consistent with EU requirements in its methodological approach, simultaneously reflecting the specific requirements of Montenegro as an ecological state;
- e) AP implementation mechanism shall be transparent and clear and its results shall allow for precise follow-up, assessment and documenting;
- f) AP shall provide for clear delegation of responsibilities to all energy sector stakeholders and define forms of organisation with a view to successful and efficient launching of Programmes and Projects ;
- g) AP shall define modalities for its monitoring and follow-up, simultaneously defining the modalities for the Strategy objectives accomplishment;
- h) AP shall be prepared in the form (also in electronic form) to allow fast and efficient monitoring and follow-up of the implementation, with AP innovations when required.

Based on the Strategy recommendations and the aforesaid requests, the AP has defined the implementation mechanism with the following main components:

- Identification and detailed elaboration of Programmes and Projects planned for completion within the following five-year period, with the descriptions of activities and parties responsible for their implementation;
- Identification and detailed elaboration of other Programmes and Projects planned for completion during the period 2012-2025 and for which preparatory activities shall be initiated within the existing AP;
- Summary implementation schedule for all Programmes and Projects supplemented by individual implementation schedules for each Programme and Project;
- The assessment of various resources requirements for the implementation of Programmes and Projects (financial and human resources, adequate organisational structure and the like);
- Ecological and social impact;
- AP monitoring, control and updates;
- Prerequisites for successful implementation of Programmes and Projects (establishment of legislative and institutional-organisational frameworks, as well as other measures).

Thus the AP consolidates all the selected Programmes and Projects into one common management system for the implementation of the Strategy in the period 2008-2012. This enables (i) a project approach to the AP implementation and (ii) the use of computer supported project management technology, which means an automated monitoring and full control of the implementation of each and individual Programme and Project. The project management technology enables the monitoring of immediate activities of each Programme and Project, that is, an ongoing implementation control and timely correction activities.

For the purpose of the AP preparation and presentation, the following terms were used:

- **Programmes** represent a set of activities involving preparation, initiation and support of specific actions, which full realization is achieved only after the implementation of

activities and Projects following these Programmes. Pursuant to the law, the Strategic Environmental Assessment (SEA) shall be done for some Programmes set out in the AP (use of the hydro potential, development of renewable energy sources and the like), which provide a framework for future implementation of actual Projects that could have a serious impact on environment and for which the Law on Environmental Impact Assessment prescribes the carrying out of EIA. SEA shall not be carried out for all other Programmes defined in the AP (education, public relations, market opening and social policy, and the like) which do not provide framework for the implementation of actual Projects and for which EIA procedures are not envisaged in the Law. In the formal sense, the Programmes and Projects are elaborated and described using the same methodology.

- **Projects** are the basis for the energy sector development with immediate results in Montenegro's energy balance. Projects may vary substantially, from the preparation of energy overviews or energy saving projects to complex Projects for hydro power plant building. However, regardless of their different purposes, what they have in common is the elaboration and description methodology.
- **Activities** are actions undertaken within Programmes and Projects and their interconnections through the work breakdown structures. These breakdown structures determine the duration of each activity, including their beginning and ending. Activities are presented in groups broken down by the level of development of certain Programmes and Projects and by responsible parties for their implementation. Activities shall be further broken down, if required.
- In order to provide for the efficiency and completeness of AP with regard to its harmonization with the EU Energy Policy objectives, each Programme and Project have been defined through **Core Contents (CC)** which, in turn, have been defined in accordance with the EU Energy Policy<sup>1</sup>. CCs for the most part represent concrete groups of Programmes and Projects that respond to challenges and objectives set out in the Energy Policy and the Strategy. Such an approach has no direct impact on the very process of implementation of Programmes and Projects, but it relates the AP activities to the EU Energy Policy and its methodology, which enables a direct comparison and demonstrates compatibility.

The three main challenges of the EU Energy Policy also reflect in Montenegro's Energy Policy, these being:

- (1) **Sustainability;**
- (2) **Security of Energy Supply** and
- (3) **Competition on Energy Market.**

The EU Energy Policy based three strategic objectives on the aforesaid challenges:

- (1) **Reduce greenhouse gasses (GHG) emissions and use more clean, locally produced energy;**
- (2) **Mitigating the risk of increased volatility of supply and increased prices of imported energy products; and**
- (3) **Bringing about a more competitive EU energy market, stimulating innovation technology and jobs.**

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<sup>1</sup> *Communication from the Commission to the European Council and the European Parliament – An Energy Policy for Europe {SEC(2007) 12}*

The EU intends to achieve these objectives by implementing ten measures, of which seven are relevant for Montenegro and underlie the CC for Montenegro. The CCs contain concrete Programmes and Projects on one hand, and the EU Energy Policy envisaged measures, on the other hand, as presented in Table 1. Therefore, the implementation of Programmes and Projects represents a simultaneous implementation of the EU Energy Policy and the Strategy objectives.

CC for Montenegro already arise from objectives of the Energy Policy and respond to strategic commitments set out in the Strategy. Other EU Energy Policy measures relevant for Montenegro are those in the field of energy efficiency which is separated in two CCs (1 and 2) due to their importance.



**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

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**Table 1: Core Contents relevant for Montenegro with regard to the envisaged measures in the European Union**

<b>Core Content (Montenegro)</b>	<b>Envisaged measures in the European Union<sup>2</sup></b>
CC 1: Increase energy efficiency and use of renewable energy sources in consumption	(1) Measure 3.4 – An ambitious programme of energy efficiency measures at the EU, national, local and international level
CC 2: Increase efficiency of the existing generation and transmission facilities	
CC 3: Design a plan to mitigate climate change effects	(2) Measure 3.3 – A long-term commitment to greenhouse gases reduction and the EU Emissions Trading System
CC 4: Creation of the institutional framework and the public involvement in the development of a competitive and market oriented energy sector	(3) Measure 3.1 – The Internal Energy Market
CC 5: Development and exploitation of renewable energy sources	(4) Measure 3.5 – A longer term target for renewable energy
CC 6: Increase cleaner energy production from fossil fuels	(5) Measure 3.7 – Towards a low CO <sub>2</sub> fossil fuel future
CC 7: Create the basis for long-term energy industry development in Montenegro	(6) Measure 3.2 – Solidarity between EU Member States and security of supply for oil, gas and electricity
CC 8: Creation of mechanisms for effective monitoring and follow-up of the Action Plan implementation	(7) Measure 3.10 – Effective monitoring and reporting

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<sup>2</sup> Source: *An Energy Policy for Europe (2007)*.

Table 2 shows the methodological approach, structuring and logic connections between CCs, Programmes and Projects in elaboration and presentation of the AP.

**Table 2: Action Plan Core Contents, Programmes and Projects**

<b>CC 1: Increase energy efficiency and use of renewable energy sources in consumption</b>	
1.1 Energy Efficiency Programme	1.2 Project of introduction of Energy Management System in the public sector
	1.3 Project of energy saving in the public sector
	1.4 Project of promoting and performing energy audits
<b>CC 2: Increase efficiency of the existing generation and transmission facilities</b>	
2.1 Programme for developing electric power networks	2.2 Project of revitalisation of small HPPs
	2.3 Project of revitalisation of HPP Piva
	2.4 Project of revitalisation of HPP Perućica – phase II
	2.5 Project of revitalisation of TPP Pljevlja I
	2.6 Project of recovery and expansion of electric power transmission network
	2.7 Project of recovery and expansion of electric power distribution network
<b>CC 3: Designing a plan to mitigate climate change effects</b>	
	3.1 Project for energy inclusion in mitigation of climate change effects in Montenegro
<b>CC 4: Creation of the institutional framework and the public involvement in the development of a competitive and market oriented energy sector</b>	
4.1 Programme for the energy sector restructuring - market opening and social policy	4.4 Project for EPCG JSC restructuring and additional capitalisation
4.2 Programme for the energy sector public relations	
4.3 Programme on education and training in energy and ecology	
<b>CC 5: Development and exploitation of renewable energy sources</b>	
5.1 Programme for development of renewable energy sources (hydro potential excluded)	5.3 Project of building small HPPs
	5.4 Project of using wind energy for electricity generation (Rumija)
5.2 Programme of hydro potential use in Montenegro	5.5 Project of using biomass for heat and electricity cogeneration

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

- 5.6 Project of using municipal waste for electricity generation
- 5.7 Project of building HPP Komarnica
- 5.8 Project of building HPP on the Morača river

### **CC 6: Increase cleaner energy production from fossil fuels**

- 6.1 Project of TPP Pljevlja II with heating system for town of Pljevlja
- 6.2 Project of LNG terminal close to town of Bar
- 6.3 Project of gas system for town of Podgorica with the gas distribution network

### **CC 7: Create the basis for long-term energy industry development in Montenegro**

- |  |  |
|--|--|
| 7.1 Programme of mainland oil and gas exploration                      | 7.3 Project of seabed oil and gas exploration – Blocks 1 and 2 |
| 7.2 Programme of international agreement on the use of hydro potential | 7.4 Project of seabed oil and gas exploration – Block 3        |
|  | 7.5 Project of coal exploration in Pljevlja area               |
|  | 7.6 Project of coal exploration in Berane area                 |
|  | 7.7 Project of the Ionic-Adriatic gas pipeline                 |

### **CC 8: Creation of mechanisms for effective monitoring and follow-up of Action Plan implementation**

- 8.1 Programme of Action Plan monitoring and follow-up

Programmes and Projects are broken down by activities with key attributes: content, responsibility, timeline and cost. Such activity based approach is the basic element for the efficient management, monitoring and follow-up of the AP implementation. This approach, combined with the definition of responsibilities and available resources, constitutes the entire mechanism for the AP implementation. Individual Programmes and Projects (Chapter 10) are elaborated and presented using a five-step scheme (A-E):

- A. DESCRIPTION
- B. ACTIVITIES
- C. IMPLEMENTATION DYNAMICS
- D. FINANCING
- E. ECOLOGICAL AND SOCIAL IMPACT

After the description (A), all individual Programmes and Projects in step B are broken down to a certain number of activities with designated parties responsible for their implementation, and which are also time limited (C) to provide Timelines for individual programmes and projects; all programmes and projects together give overall dynamics of the AP implementation which is called the **AP Timeline**.

Step D, in addition to activities, provides rough assessment of the required financial resources and possible key sources of these funds (the budget, grants, loans or own funds of investors). The assessment of sources and the initial AP cost allocation could serve as guides for providing own and non-refundable resources (the budget and grants) for financing primarily preparatory activities of Programme and Projects that are the Government's responsibility. Funding of Programmes and Projects is presented as preferred implementation model (e.g. public-private partnership, BOT, DBOT, and the like) without the designated modality and source of financing as this is specific for every individual Programme and Project and decisions made by every individual investor.

Finally, step E deals with ecological impact, primarily providing information on the level of statutory requirements regarding environmental impact assessment of Programmes subject to such an assessment (SEA and individual Projects subject to EIA or the preparation of an elaborate on environmental impact assessment of a particular Project). Further elaborated, where relevant, is the social impact of individual Programmes and Projects.

An indicative economic analysis, where sufficient data exist, has been prepared for certain Programmes and Projects and covering the following:

- Net Present Value - NPV<sup>3</sup>
- Internal Rate of Return - IRR<sup>4</sup>
- Discounted Cash Flow – DCF presented in Programmes and Projects for which the calculations have been made.

Regardless of the fact that the future electricity prices cannot be precisely forecasted, the main parameters that affect the investment profitability have been assessed.

To this end, the following set of parameters has been used:

- Annual discount rate: 8 %<sup>5</sup>
  - Average electricity price (in 2008): 80 EUR /MWh<sup>6</sup>
- Average annual increase of electricity prices (period 2008-2025): 3 %<sup>7</sup>
  - Electricity transmission network tariff: 5.5 EUR /MWh<sup>8</sup>
- Electricity distribution network tariffs:
  - Medium voltage: 16 EUR /MWh<sup>9</sup>

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<sup>3</sup> NPV – a sum of future net Project revenues reduced to present value (year of the initial investment) discounted at the selected rate.

<sup>4</sup> IRR – a discount rate that results in NPV of zero.

<sup>5</sup> Source: *Office of Management Bureau, USA*

<sup>6</sup> Source: import electricity price in the South East Europe

<sup>7</sup> Source: Author's assessment

<sup>8</sup> Source: *ETSO tariff report* – average value

<sup>9</sup> Source: assessment based on *Benchmark of Electricity Transmission Tariffs - report for DG – TREN EU* – prepared by COMILLAS Madrid

- Low voltage: 16 EUR /MWh<sup>10</sup>
- Medium and low voltage together: 32 EUR /MWh
- Estimated annual fixed costs for:
  - TPP: 6 % of TPP investment value<sup>11</sup>
  - HPP: 3 % of HPP investment value<sup>12</sup>
- Assumed HPP and TPP facility lifetime is 35 years and 25 years, respectively.

The summarized Table 3 Chapter 6 gives the main envisaged outcomes of Programmes and Projects.

Programmes and Projects are processed by using MS Project which is an integral part of the AP. MS Project file is presented in the Gantt chart contained in the Annex and submitted to the MED in electronic format. Such an approach enables additional consideration of the AP recommendations (primarily through the Timeline analysis), simultaneously offering the opportunity for automatic support for the AP implementation monitoring and follow-up and, if required, the AP innovations. Database containing all the information on the AP implementation is envisaged to be located on a networked PC so as to enable the system user access over the Internet. There is also an option to use such a formatted AP in the project management platform, which is carried out within the Capacity Development Programme of the Montenegrin Secretariat for European Integration.

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<sup>10</sup> Source: assessment based on '*Benchmark of Electricity Transmission Tariffs - report for DG – TREN EU*' – prepared by COMILLAS Madrid

<sup>11</sup> Source: Author's assessment

<sup>12</sup> Source: Author's assessment

## **5 ACTION PLAN IMPLEMENTATION**

The AP implementation mechanism is defined by:

- a) Legislative-regulatory framework
- b) Institutional-organisational framework

and also by:

- c) Financial resources
- d) Timeline and
- e) System of implementation monitoring and follow-up

The first two elements are explained within this Chapter, while the last three elements are explained in Chapters 7 – 9.

### **5.1 LEGISLATIVE-REGULATORY FRAMEWORK**

With a view to implementing Programmes and Projects, it is necessary to address the drafting and enacting of the required legislation as the prerequisite for efficient and timely AP implementation.

#### **5.1.1 International obligations**

With regard to international obligations (treaties, conventions, memorandums, declarations, and the like):

- A report to the Government on the implementation of Montenegro's obligations arising from the Energy Community South East Europe Treaty (ECSEE) (Q III 2008, MED).
- The Montenegrin Government has already signed memorandums on joint water management with Albania and Croatia. Envisaged is signing of the pertinent agreements with Bosnia and Herzegovina and Serbia (31 March 2009, MAFWM).
- Passing of seven laws on the ratification of the Protocols to the Convention on Long-Range Air Pollution with regard to the emission control and/or reduction of: NO<sub>x</sub> (Sofia 1988), SO<sub>2</sub> (Helsinki 1985), heavy metals (Aarhus 1998), persistent organic pollutants (Aarhus 1998), abate acidification, eutrophication and ground-level ozone (Gothenburg 1999), volatile organic compounds (Genève 1991), further reduction of sulphur emission (Oslo 1994). (2010-2012 MTEP).
- Montenegro shall join the International Commission for the Protection of the Danube River - ICPDR and the International Sava River Basin Commission - ISRBC (2009-2010 MTEP).

#### **5.1.2 Planning documents**

The following is envisaged with regard to adoption of planning documents (policy, strategy, programmes, plans, special reports, and the like):

- Revision of the Energy Efficiency Strategy of Montenegro in accordance with the Energy Development Strategy of Montenegro by 2025, the National Strategy for Sustainable Development and the relevant EU Directives. (Q IV 2008, MED)
- Programme of development of the energy database in Montenegro (Q III 2008, MED)
- The annual energy balance of Montenegro for 2009, 2010, 2011, 2012 and 2013 (Q IV of the preceding year, MED)
- Review of Montenegro's waterbase (2011, MAFWM and WA)
- The Plan of water management in the Black Sea watershed areas and the Plan of water management in the Adriatic Sea watershed areas (2016, MAFWM and WA)

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

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- General plan of protection from detrimental impact of waters of importance for Montenegro (31 December 2008, WA and MAFWM)
- General plan of protection from detrimental impact of waters of local importance (31 March 2009, local authority)
- Operating plan for the protection from detrimental impact of waters important for Montenegro (31 January 2009, WA and MAFWM )
- Operating plan for the protection from detrimental impact of waters of local importance (30 April 2009, local authority)
- Operating plan for the protection of waters against diffuse pollution of waters important for Montenegro (Q II 2010, MAFWM)
- Strategy of Construction Development in Montenegro by 2020 (Q III 2008, MED)
- Biodiversity Strategy with the Action Plan (Q IV 2008, MTEP)
- National Environmental Protection Policy (2008, MTEP in cooperation with MAFWM, MHLSW)
- National Strategy for Air Quality Management (Q III-IV 2009, MTEP)
- Statistics Development Strategy of Montenegro in the period 2009 - 2012 (Q IV 2008, MF, MONSTAT)
- Statistical Research Programme in the period 2008 - 2012 (Q IV 2008, MF, MONSTAT)
- Annual balance per energy products (2012, MF, MONSTAT)

### 5.1.3 Laws and regulations

The following is envisaged with regard to the enactment of laws and regulations (decrees, rulebooks, rules of procedure, decisions, instructions, and the like:

- Verification of compliance of the Energy Law (Official Gazette of the Republic of Montenegro 39/03) with EU legislation and regulations, in accordance with the Strategy recommendations (Q III 2008, MED) and future amendments to the Law, if required (2009, MED)
- A new Law on Oil and Gas Prospecting, Exploration and Exploitation that will be partially harmonized with Directive 94/22/EC on the conditions for granting and using authorizations for the prospecting, exploration and production of hydrocarbons. (Q III 2008, MED)
- A new Law on Energy Efficiency that will prescribe the establishment of the CIEE which will have the leading role in the promotion of energy efficiency, the establishment of energy efficiency fund. The Law will also transpose the basic provisions of EU Directive 2006/32/EC and institute concepts of other relevant Directives. (Q IV 2008, MED)
- A new Law on Renewable Energy Sources. (Q IV 2008, MED)
- A new Law on Gas Market aimed at creating the conditions for the implementation of Directive 2003/55/EC and Regulation 1775/2005/EC on conditions for access to the natural gas transmission networks. (Q III 2008, MED)
- A new Mining Law to define the essential and quality changes in the planned ore wealth exploitation so as to prescribe the passing of the national plan of mineral ore exploitation and envisage the forming of the Mining Administration to be in charge of professional and administration issues and which will be supervised by the MED (Q II 2008, MED)
- A new Law on Fees for Oil and Gas Exploitation (Q III 2008, MED)
- 19 various bylaws regulating electric power industry (end-2008, REGAGEN):
  - Market rules of electric power sector

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

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- Establishment of a new regulated pricing policy for electricity
- Establishment of the Agency's policy in further engagement in the process of the legal unbundling of the Electric Power Company of Montenegro (EPCG)
- Granting approval to the "Rulebook for awarding (auctions) available transmission capacity"
- Granting approval to the "Methodology for establishing just and fair connection fees in distribution network"
- Granting approval to the "Standard connection fees in distribution network"
- Granting approval to the "Methodology for establishing just and fair connection fees in transmission network"
- Drafting and adoption of the "Regulation on safety of energy facilities, staff and property and the protection of environment"
- Drafting and adoption of the "Design of the wholesale electricity market"
- Drafting and adoption of the "Design of the retail electricity market"
- Granting approval to amendments to the "Rules for supply"
- Passing of the "Decision on the Coal Mine competitiveness and the coal pricing methodology"
- Granting approval to the "Market rules and balancing rules proposed by EPCG – Market operator "
- Granting approval to the "Rulebook on providing ancillary services"
- Passing of the "Rulebook on the manner in which the consumer changes the supplier"
- Passing of the "Rules of procedure of the public supplier"
- Drafting and passing of the "Decision on the opening, operating and phase development of the electricity market"
- Granting approval to the "Network Code" and the "Distribution Code"
- Approving the price of coal for electricity generation in 2009.
- Revision of the Program of subsidizing the most socially deprived citizens (Q III 2008, MHLSW)
- Transposition of provisions set out in Directive 2005/89/EC and Directive 2004/67/EC in the national legislation regarding measures to safeguard security of electricity supply and the security of natural gas supply (2010-2012, REGAGEN)
- Transposition of Directive 98/93/EC imposing an obligation to maintain 90-stock of crude oil and/or petroleum products (2010-2012, MED)
- Transposition of Directive on 2002/91/EC the energy performance of buildings in the Law on Spatial Design and Building Construction (Q II 2008, MED) and the new Law on Energy Efficiency (Q IV 2008, MED). Initiate activities to gradually adopt and develop legislative, regulatory and institutional frameworks for the energy performance of buildings (2008, MED).
- Transposition of Directive 2006/32/EC on energy end-use efficiency and energy services in the Law on Energy Efficiency (Q IV 2008, MED)
- Transposition of Directive on the promotion of cogeneration (CHP) (Directive 2004/8/EC amending Directive 92/42/EC) (2009-2011, MED)
- A new Company Law (2010., MED)
- Amending the Law on Profit Tax (Official Gazette of Montenegro 80/04) and its harmonization with Directive 90/434 EEC and Directive 2003/49/EC (2010, MF)
- A new Concession Law (Q II 2008, MED) to simplify the procedure of granting concessions and allow more private investments in the utilization of natural resources, goods and performance of activities of public interest. The Law will be in line with Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.



- A new Law on Spatial Design and Building Construction that will simplify the procedures of drafting and adopting planning and design documentation and the construction of facilities, and the following laws will cease to be in effect: Law on Spatial Planning and Design, Law on Building Construction, Law on Construction Land and Law on Urban and Construction Inspection (Q II 2008, MED).
- A new Environmental Law to transpose Directives 32004L0035 and 32006L0021 (on environmental liability with regard to the prevention and remedying of environmental damage) (during 2008, MTEP).
- A new Law on Nature Conservation (during 2008, MTEP).
- Transposition of Directive relating to a reduction of sulphur content in certain liquid fuels (Directive 1999/32/EC, as amended by Directive 93/12/EC) in the Regulation on the quality of liquid fuels of petroleum origin (Q II 2008, MTEP).

## **5.2 INSTITUTIONAL-ORGANISATIONAL FRAMEWORK**

### **5.2.1 Tasks of the Ministry for Economic Development with regard to Action Plan implementation**

Pursuant to the Energy Law (Official Gazette of Montenegro 39/03), the Ministry for Economic Development (MED) is responsible for the AP implementation, and the operating implementation is the responsibility of the Energy, Mining and Geology Sector (EMGS) within the MED.

The main tasks of the EMGS cover, inter alia, the following:

- Organisation, coordination, law drafting and proposing, and the drafting of regulations based on the laws governing energy, mining and geological exploration;
- Monitoring of the condition of and trends in production and business results in the fields of energy, mining and geological exploration, and the examining working conditions in these fields;
- Following of energy development policy; making proposals for the national energy policy and strategy for long term development;
- Preparation of long-term and annual energy balances, policies and strategies for the construction of new, or the reconstruction of the existing, energy capacities and the relevant procedures;
- Monitoring of the energy sector reform;
- Consider requirements for trade in electricity, natural gas, coal and petroleum products with the neighbouring countries, and the opportunities for utilization of domestic energy resources;
- Promote new technology in energy, renewable energy sources, energy savings and efficiency;
- Analyze natural resources and propose measures for the provision of optimum conditions for their exploration and exploitation;
- Define programmes of geological explorations of importance for Montenegro;
- Carry out the procedure for granting and revoking permits for geological explorations and exploitation of mineral raw material, and the procedure for granting approval for the use of mining facilities;
- Carry out activities involving awarding concessions for geological explorations, exploitation of mineral raw material, and activities with regard to examining wind and watercourse potential and technical-cost-efficient utilization of wind and water energy potential for electricity generation in wind power plants and small hydro power plants;
- Prepare reports with proposals for passing decisions and contract on awarding concession with regard to water potential; follow-up on the implementation of concession contracts and perform annual calculation of the concession fees;
- Monitor activities relating to the privatisation of enterprises in this field;

- Propose and is responsible for the implementation of the current economic policy measures and the system measures in energy, mining and geology;
- Harmonization of the national legislation with the relevant EU legislation in energy, mining and geology;
- Prepare analysis, reports, information and other materials regarding energy, mining and geology exploration;
- Supervise institutions within its jurisdiction and which administrative supervision is performed by the MED;
- Keeps required records, cooperates with other bides and organisations, scientific and professional institutions, associations of entrepreneurs;
- Performs other activities in line with regulations.

The aforesaid provides for the conclusion that the primary tasks of the MED with regard to the Strategy implementation are:

- **Coordination** between the main energy stakeholders (Chapter 5.2.2)
- **Supervision** of certain stakeholders (majority state ownership)
- **Preparation, monitoring and follow-up of implementation** of the Strategy and energy reforms contained
- **Reporting to the Government** on achieved results and proposing measures (legislative, organisational, financial, technical and the like) aimed at improving efficiency in the Strategy implementation
- **Fulfilment of international obligations** regarding energy (e.g. the Energy Community South East Europe Treaty (ECSEE), the Kyoto Protocol, other pertinent conventions)

The EMGS consist of three Departments:

- (1) Department for energy development and reform
- (2) Department for energy efficiency and renewable energy sources
- (3) Department for mining and geological exploration

The MED`s Rules of internal organisation and job systematization envisages eighteen positions in the EMGS, of which only eleven are filled. According to the current staffing capacity, the EMGS has objective difficulties in performing tasks within its mandate. Therefore, one of the main priorities in 2008 is the strengthening of staff capacity in the first two listed Departments, at least up to the level envisaged in the aforesaid MED Rules of internal organisation and job systematization, thus enabling the EMGS to fulfil its main tasks and duties.

Special attention in 2008 should be dedicated to the strengthening of the Department forenergy efficiency and renewable energy sources. This would create conditions for an accelerated improvement regarding the EE and RES Programmes and Projects, which is one of the priorities of both the Strategy and the AP.

The forming of CIEE (Chapter 5.2.3) is currently being considered. After the establishment (planned for the beginning of 2009), this institution will take over the majority of staff of the Department for EE and RES, as well as the implementation of Programmes and Projects under CC 1 hereof.

Besides the EMGS and the CIEE, in order to ensure the scheduled implementation of the Strategy, it is necessary to establish a professionally powerful unit, the Action Plan Directorate (APD), which is described in more detail in Chapter 5.2.4.

## 5.2.2 Montenegrin energy sector stakeholders

The main domestic stakeholders<sup>13</sup> in the Montenegrin energy sector and thus in the implementation of the Strategy and AP, can be divided in four groups:

- i. **Government institutions, state agencies and institutions;** Ministry for Economic Development (MED). Ministry of Finance (MF), Ministry of Agriculture, Forestry and Water Management (MAFWM), Water Administration (WA), Ministry of Tourism and Environmental Protection (MTEP), Ministry of Health, Labour and Social Welfare (MHLSW), Energy Regulatory Agency (REGAGEN), Agency for Environmental Protection (EPA), Secretariat for European Integration (SEI), Statistical Office of Montenegro (MONSTAT) and local governments, which act upon the mission and within their authority prescribed in laws and regulations of Montenegro;
- ii. **Energy companies;** (regardless of their ownership structure) EPCG (JSC and Ltd.), (Coal Mine Pljevlja and Coal Mine Berane, Jugopetrol, Montenegrobonus, and many other smaller companies;
- iii. **Educational and research institutions:** the Montenegrin Academy of Science and Art (CANU), the University of Montenegro, State Weather Bureau of Montenegro, the Institute for Strategic Studies and Prognoses, and many other institutions.
- iv. **Associations and NGOs:** e.g. Chamber of Commerce of Montenegro, the Montenegrin Employers Federation, Network for affirmation of the non-governmental sector (MANS), Green Home, Expeditio, Montenegro Business Alliance, NGO network Zeleni krug, and others.

Other stakeholders are international organisations and donors (EAR, GTZ, UNIDO, UNDP, bilateral donors) and international financial institutions - IFIs (EBRD, EIB, KfW, WB) as respectively presented and discussed in more details in Figure 4 and Chapter 8. Last, but not least important, are private investors that are continuously identified but cannot be listed in the AP.

Based on interviews of the major stakeholders and a general analysis of their activities in the past and the future activities until 2012, the existing interest of stakeholders in certain Montenegrin energy sectors are presented in detail in Figure 1. The role and/or interest of stakeholders are separated in three levels: "major, medium and minor":

- "Major" stakeholders are entities that are statutory or legally responsible for an individual sector and/or policy and strategy in certain areas.
- "Medium" stakeholders are entities that have a strategic cooperation with the "major" stakeholders and give substantial contribution to certain areas.
- "Minor" stakeholders are those who strategically monitor the energy sector activities and take part in them when required and in accordance with their current interest.

It is rather important to emphasize that interest of donors and IFIs may change over time, depending on political will and assistance opportunities of foreign entities, as well as on Montenegro's economic situation, its needs and interest for cooperation.

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<sup>13</sup> Institutions, organizations, companies, associations and other legal and natural persons which, pursuant to the Montenegrin laws and/or their institutional, political and/or commercial role, have the strategic interest in the Montenegrin energy sector.



### 5.2.3 Central Institution for Energy Efficiency

Due to the importance of energy efficiency emphasized in the Strategy, the CIEE shall be established by the beginning of 2009; this institution will be accountable to the Minister for Economic Development.

The CIEE mandate will be to promote energy efficiency (EE), the national strategy and policy in all economy sectors and the use of RES in consumption.

The main tasks of the CIEE will be to promote the national energy efficiency strategy and development plans for RES consumption, to advise the Government on the issues relating to the defining and implementation of sustainable, comprehensive and efficient policies, programmes, measures and financial incentives, as well as to initiate, manage and monitor these programmes and measures.

Special objectives of the CIEE are the following:

- Analysis and proposal of legislative, regulatory and institutional reforms, energy tariffs, taxation, fuel substitutes, and other measures aimed at promoting EE and RES;
- Identification, analysis and proposal of technically feasible and cost-efficient policies and measures to improve EE both in supply and in consumption, and preparation of national development action plans for EE and RES containing explicit objectives;
- Management, supervision, support and monitoring of the implementation of action plans for EE/RES, national and international programmes, incentive schemes, promotional and other activities aimed at improving EE and use of RES;
- Undertaking planned initiatives with a view to providing required funding for the implementation of the aforesaid programmes, regardless of the source of funding being the budget or other domestic and international sources, including donations, international financial support programmes, and the like;
- Managing statistical and information systems for EE and RES, and reporting to the Government and international organisations on achieved progress;
- Promotion of international cooperation and knowledge transfer in EE/RES, represent the focal point for EE/RES, coordinate activities between the European Commission, international organisation, the Government and the national energy and economic community with a view to improving coordination and facilitate cooperation in EE and RES among the parties;
- Boost foreign investments in EE and RES.

The CIEE will, *inter alia*, be in charge of the CC1 implementation (Increase energy efficiency and use of renewable energy sources in consumption) and activities under Program 5.1 referring to exploitation of solar energy.

The CIEE should be relatively small, yet dynamic organisation with an adequate system of staff remuneration, a good support and authority.

The CIEE should be legally defined within the proposed Law on Energy Efficiency. Its legal status, mission, objectives, special activities, organisation, operating modules, including rules of procedure, financing and the like, should be analysed in a separate study and presented to the Government in order to be transposed in the Law on Energy Efficiency and Law on Renewable Energy Sources.

The CIEE shall be supported by the state budget and international grants (at least in the initial stage). Additional flexibility will be required so as to allow the CIEE to acquire additional funds, whether from the state budget or international organisation (managing/monitoring programmes, project participation), thus enabling this institution to preserve its role without competition with the private sector.

There is also a need to establish a separate Fund for EE (and RES) and maybe local funds at the municipal level for financing preparations and support for the implementation of donation programmes and other similar activities.

The establishment of the Fund for EE may be prescribed in the envisaged Law on Energy Efficiency that would also envisage a separate bank account that will be managed by the Management Board of the Fund. Day-to-day operations could be the responsibility of the CIEE. It will be necessary to establish the system of reporting, verification and balancing in order to provide transparency.

The Fund's financing sources could be: the state budget, contributions by public utility services and energy suppliers, tariffs and fines, foreign grants, and separate EE and RES fees for conventional fuels, and the like.

A separate study should be prepared with a view to elaborating on the creation of the Fund, drafting its statute and preparing the required bylaws, and as a part of a wider study on the establishment of the CIEE and drafting of the Law on Energy Efficiency and Law on Renewable Energy Sources.

#### **5.2.4 Action Plan Directorate**

As previously mentioned, the primary responsibility for the AP implementation lies with the MED but in close cooperation with many other stakeholders in the Montenegrin energy sector.

##### ***Mission and institutional position of the Action Plan Directorate***

The AP implementation represents a complex task requiring a formal organisation of tasks and duties, engagement of sufficient resources and adequate bodies that will be able to respond to the task of managing and correcting planned activities.

The scope of Programmes and Projects contained in the AP has to be addressed through the activities of a separate organisational unit – the Action Plan Directorate (APD). The main APD tasks arise from the AP, and its activities involve (i) preparation, (ii) implementation, and (iii) monitoring and follow-up of the AP implementation and thus the implementation of the Energy Policy and the Strategy objectives.

The APD will be in charge of the implementation of the CCs 2-8, whereas the CC 1 and Programme under CC 5 will be the responsibility of the CIEE.

The main tasks of the APD shall be as follows:

- To plan, initiate, perform or supervise the performance of preparatory activities (analyses, measurements, studies, preparation of tender documents) for Programmes and Projects within the Government's competence;
- To communicate with the relevant participants in the implementation of Programmes and Projects and delegate them with tasks and responsibility for the implementation of certain activities in accordance with the MED procedures;
- To assist the MED in raising funds for the AP implementation (budget, grants, credits);
- To define and make operable (both regarding procedures and computer support) the system for the implementation monitoring and follow-up of all Programmes and Projects and the AP in general;
- Based on own assessments and/or periodic progress reports on Programmes and Projects which are not under the APD jurisdiction, analyze the progress of all Programmes and Projects, assess the quality of performed activities and proposes to the MED corrective measures in case of any deviations from the AP;
- To propose amendments to the AP implementation mechanism (legislative-regulatory, institutional-organisational and other frameworks) with a view to providing better

efficiency in the AP implementation;

- To prepare and submit to the MED periodic reports on the AP progress, with reference to potential implications for the Strategy, aimed at potential revisions of the AP, i.e. the Strategy
- To promote investments in the energy industry by the “one-stop-shop” principle, with the main objective to provide interested investors with accurate, updated and relevant information.

Considering that the MED will delegate the main responsibility for the AP implementation to the APD, the APD should, therefore, have adequate authority in line with its responsibilities. The Directorate should also be able to transfer its responsibility and tasks to other parties involved in the AP implementation, i.e. individual AP Programmes and Projects.

The APD establishes functional lines of communication with the relevant stakeholders that will be involved in Programmes and Projects in accordance with the procedures and when required. The AP implementation is closely connected with the efficiency of this communication and therefore this represents one of the important tasks of the APD and is of key importance for the AP.

The statutory responsibility of the MED with regard to the implementation of the Strategy and the scope of the envisaged activities points to the institutional requirement of the APD establishment within the MED. Such an organisational unit would have to be highly autonomous and that is why it is envisaged for it to be directly accountable to the Ministry for Economic Development.

In accordance with the Government’s decision on the adoption of the AP, in the initial phase of the APD establishment it is required to prepare a detailed plan for the APD establishment, drafting of job descriptions, defining of budgeting and addressing the main logistics issues. Considering the assumed availability of funds from the state budget (and grants, as required) for the establishment and launching of the APD during the AP implementation period, the APD is expected to fully assume its function within 6 months following the AP adoption.

The mission, responsibility and activities of the EMGS, APD and CIEE must not and shall not overlap but will be coordinated within the MED. Therefore, it is recommended to locate the APD and the MED in the immediate vicinity.

### ***Personnel structure***

The personnel requirements (staffing) for the APD arise from the aforesaid envisaged tasks and duties regarding the AP implementation. APD staff will mostly be recruited from Ministry for economic development.

The APD should be managed by an experienced manager of AP implementation, in cooperation with the team of at least ten experienced officers – “the key team” – from the very beginning of the APD establishment. A proposal of the personnel structure of the team is the following:

- Executive Manager – the team leader and responsible person;
- Programme and Project Manager – at least three officers/experts for different sectors and types of Programmes and Projects;
- Administrator – in charge of administrative and logistics support to the Executive Manager;
- PR Manager – in charge of public relations, education and the provision of the APD service “one-stop-shop” to stakeholders;
- Legal Expert – in charge of legal issues, drafting subcontractor contracts, preparation of tenders, assisting MED in negotiations with future concessionaires, interpreting laws and preparing proposals for amendments of laws and regulations relevant for the AP implementation;
- Financial Expert – in charge of collecting funds for the AP implementation (budget,

grants, credits and other financial assistance) and coordination of the pertinent activities; candidate/prepare proposals for funds from EU tenders;

- Economist - in charge of economic-financial analysis of Programmes and Projects and all other financial issues with regard to the AP and the APD;
- Planning Expert – monitoring and follow-up on the implementation of the AP objectives and activities: pace of utilization of resources and overall progress;
- Environmental Expert – in charge of environmental impact and spatial planning issues (in coordination with other authorized ministries).

It is envisaged that the group of three Programme and Project managers will gradually increase in accordance with the number and dynamics of Programmes and Projects to be included in the AP Timeline.

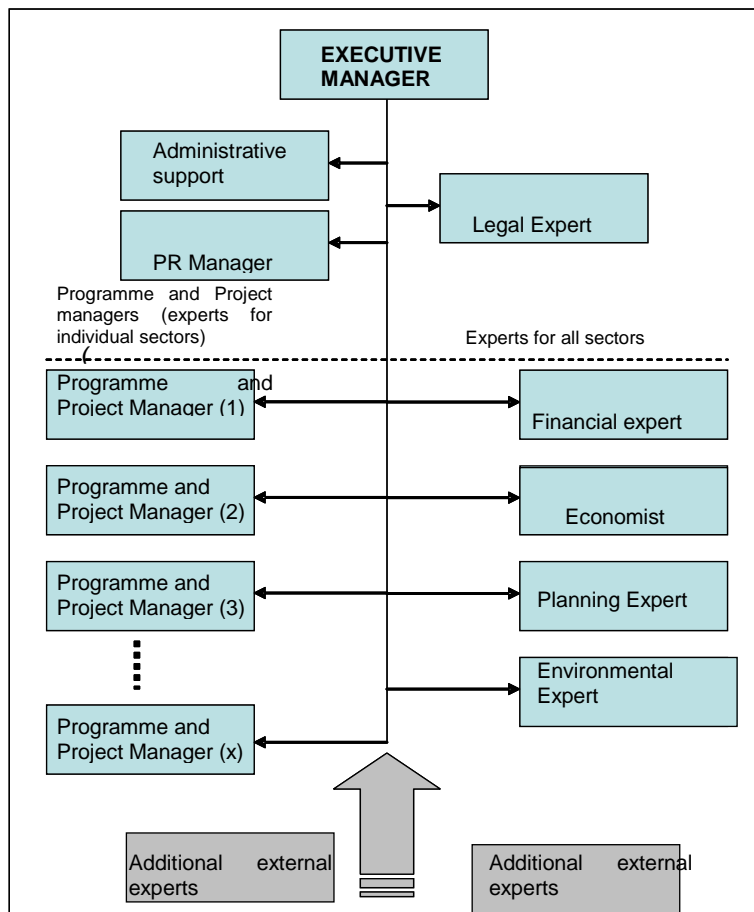
The APD “key team” would consist of full-time domestic experts (permanently employed or for at least three years with possibility for continuing employment). External experts (domestic and/or foreign) would be additionally contracted, if required. The APD should also be open to expert assistance provided by donors (consulting, twinning, expert exchange, and the like), at least in the initial three years.

Successful implementation of Programmes and Projects, i.e. the APD efficiency, primarily depends on quality and know-how of the APD personnel. This requires paying special attention and focusing the MED’s efforts on the selection and required additional training of the staff and competitive payroll scheme.

The proposed APD organisation is presented in Figure 2 below.



**Figure 2: Organisational structure of the Action Plan Directorate**



However, in spite of the fact that the successful AP implementation depends on the establishment of the APD, implementation activities should commence immediately and there is no reason why some preparatory activities (which have already been initiated) should not continue and later on assumed/implemented by the APD.

### **Rules of procedure**

The Rules of procedure represent the basis of the APD acting and provide concrete instructions for the implementation of the AP Programmes and Projects.

The following procedures will be prepared during the process of establishing and commencement if operations of the APD:

- Internal procedures of the APD functioning and administrating (including job descriptions)
- Procedure for Programme and Project implementation
- Procedure for implementation of Programme and Project individual activities
- Procedure for delegating duties and responsibilities to other participants in the AP implementation
- Procedure for Programme and Project progress reporting
- Procedure for the preparation of tender and contract documentation
- Procedure for the preparation and distribution of reports and other communication outside

the APD

- Procedure for the revision of Programmes, Projects and the AP
- Procedure for budget drafting, financing and approving Programme and Project implementation

## **6 OVERVIEW OF PROGRAMMES AND PROJECTS**

With all the preconditions having been fulfilled, the AP is implemented through concrete Programmes and Projects which implementation is the responsibility of the MED and which are implemented by the APD and the CIEE - both directly accountable to the Minister for Economic Development. As for Programmes and Projects which are not under the MED's competence, the APD delegates its responsibilities and tasks to other participants in the AP implementation and its individual Programmes and Projects.

Table 3 further on gives an overview of Programmes and Projects selected in accordance with the performed analyses and immediate insight into the required implementation of the Energy Policy and Strategy objectives.

Table 3: Overview of Programmes and Projects

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE	
		BEGINNING AT	ENDING AT						
<b>CORE CONTENT 1: Increase energy efficiency and use of renewable energy sources in consumption</b>									
1.1 Energy Efficiency Programme	MED (until CIEE is established), Government body responsible for privatisation, consumers, Generation, Transmission & Distribution	01.04.2008	31.12.2012	13.800.000	13.800.000	Law on Energy Efficiency, CIEE, Fund for Energy Efficiency; measures for increasing efficiency and reaching the level of moderately developed EU countries.	46	Programme continues even after 31.12.2012	
1.2 Project on energy management (Energy Management System) in the public sector	MED, CIEE, Public sector companies and institutions	01.09.2008	31.12.2012	165.000	165.000	Energy management in all government bodies, offices and public companies. Preparing measures for energy consumption reduction.	48	Investments in buildings are excluded from Project costs.	
1.3 Project on energy saving in the public sector	MED, government building maintenance services	01.09.2008	31.12.2011	1.065.000	1.065.000	Energy saving in government bodies and institutions.	50		
1.4 Project on promoting and performing energy audits	MED, authorized organisations	CIEE,	01.01.2008	31.12.2010	515.000	515.000	Implementing energy audits in companies and energy saving potential estimate.	52	
<b>CORE CONTENT 2: Increase efficiency of the existing generation and transmission facilities</b>									
2.1 Programme for developing electric power networks	MED, EPCG Transmission, EPCG Distribution	01.09.2008	31.12.2012	4.120.000	4.120.000	Guidelines for introduction of new technologies / solutions for performance improvement and preparation of projects by means of analyses and simulations for the following five-year period.	54	Programme continues even after 31.12.2012	

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012**

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE
		BEGINNING AT	ENDING AT					
2.2 Project of revitalisation of small HPPs	EPCG Generation and a new owner	01.09.2008	30.12.2011	4.000.000	4.000.000	Revitalisation of small hydro power plants.	56	
2.3 Project of revitalisation of HPP Piva	EPCG Production	01.04.2008	01.04.2014	70.000.000	55.000.000	Revitalised HPP Piva to remain operational for the next 35 years.	58	
2.4 Project of revitalisation of HPP Perućica – Phase II	EPCG Generation	01.04.2008	01.11.2013	49.000.000	43.000.000	Revitalised HPP Perućica to remain operational for the next 35 years	60	
2.5 Project of revitalisation of TPP Pljevlja	EPCG Generation (TPP Pljevlja), Coal Mine Pljevlja and other	01.01.2008	28.06.2013	127.000.000	122.300.000	Revitalised and ecologically recovered TPP Pljevlja I with the coal mine, to remain in operation for the next 20 years.	62	
2.6 Project of recovery and expansion of electric power transmission network	EPCG Transmission, MED (with support of EPCG Transmission)	01.07.2007	31.03.2014	79.300.000	78.100.000	Modernised and expanded electric power transmission (HV) network to achieve sufficient capacity.	64	Programme continues even after 31.03.2012 4 Total cot of the project is 199mio EUR
2.7 Project of recovery and expansion of electric power distribution network	EPCG Distribution, MED (with support of EPCG Distribution) and other	01.04.2008	31.12.2012	100.000.000	100.000.000	Modernised and expanded electric power distribution (MV and LV) network of sufficient capacity.	66	Programme continues even after 31.12.2012 Total cot of the project is 491 mio EUR.

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE
		BEGINNING AT	ENDING AT					
<b>CORE CONTENT 3: Designing a plan to mitigate climate change effects</b>								
3.1 Project of energy inclusion in mitigation of climate change effects in Montenegro	MED, MTEP, greenhouse gas emissions generators, WA	01.09.2009	31.12.2012	1.000.000	1.000.000	Greenhouse gas emissions inventory database from energy sector and preparation of emission reduction plan.	68	Programme continues even after 31.12.2012
<b>CORE CONTENT 4: Creation of institutional framework and public involvement in the development of a competitive and market oriented energy sector</b>								
4.1 Programme for the energy sector restructuring - market opening and social policy	EPCG Power Supply, Transmission, Distribution Regulatory agency, MHLSW, MED	01.04.2008	31.12.2014	11.900.000	10.800.000	Opened energy market , establishing a fund for the support of endangered consumers.	70	<a href="#">Costs of opening energy market do not include those of Regulatory Agency and technical assets.</a>
4.2 Programme for the energy sector public relations	MED, Statistical Office of Montenegro, EPCG (all companies), CANU and University of Montenegro	01.10.2008	31.12.2012	3.500.000	3.500.000	Creating positive public image of the energy sector and having clear perspective of public opinion regarding the sector.	72	Programme continues even after 31.12.2012 -
4.3 Programme of education and training in energy and ecology	MED, University of Montenegro based on consultations with MED, MTEP	01.09.2008	31.12.2012	1.200.000	1.200.000	Educational courses for primary and secondary schools, faculties and general public. Student books and other teaching materials. Having courses in schools and in public and in demonstration training centres.	74	-
4.4 Project for EPCG JSC restructuring and recapitalization	4 EPCG LTD, EPCG AD	01.01.2008	31.12.2009	1.550.000	1.550.000	Unbundled independent companies for transmission, distribution, generation and supply, acting as market stakeholders.	76	-

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE
		BEGINNING AT	ENDING AT					
<b>CORE CONTENT 5: Development and exploitation of renewable energy sources</b>								
5.1 Programme of development of renewable energy sources (hydro potential excluded)	MED, MAFWM, CIEE, Forest Administration, Investor	01.09.2008	31.12..2012	1.200.000	1.200.000	Basis and studies for more intensive development of renewable energy sources and identification of new projects. Defined project implementation model in specific areas of renewable sources. Information on the usefulness of renewable energy sources.	78	Programme continues even after 31.12.2012
5.2 Programme of hydro potential use in Montenegro	MED, MAFWM, WA	01.09.2008	30.06.2019	6.500.000	6.500.000	Study of Montenegrin hydro potential and decision of future projects on the use of hydro potential in Montenegro. Processing already identified projects at study and spatial plan level.	80	
5.3 Project of building small HPPs	MED, MAFWM, WA, Weather Bureau, Investor	01.09.2008	31.12.2012	30.000.000	30.000.000	Building several small HPPs.	82	Programme continues even after 31.12.2012 Total cot of the project is 120 mio EUR.
5.4 Project of using wind energy for electricity generation (Rumija)	MED, Concessionaire	01.09.2008	31.12.2012	10.000.000	10.000.000	Building a 10 MW wind farms in Rumija area..	84	
5.5 Project of using biomass for heat and electricity cogeneration	MED, FA, Investors	01.01.2009	31.07.2013	3.800.000	3.500.000	Building a 2-3 MW biomass combined power plant in Berane area.	86	
5.6 Project of using municipal waste for electricity generation	MED, Public Utility Services, Municipality of Podgorica	01.10.2009	31.12.2016	32.000.000	580.000	Building a 10 MW combined heat and power cogeneration facility using waste in Podgorica area.	88	

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE
		BEGINNING AT	ENDING AT					
5.7 Project of building HPP Komarnica	MED, MAFWM, WA, EPCG Generation, EPCG Transmission, Concessionaire	01.04.2008	31.12.2016	134.100.000	56.800.000	New HPP Komarnica	90	
5.8 Project of building HPP on the Morača river	MED, MAFWM, WA, Concessionaire	01.04.2008	30.06.2019	430.000.000	138.000.000	4 new HPPs on the Morača river	92	
<b>CORE CONTENT 6: Increase cleaner energy production from fossil fuels</b>								
6.1 Project of TPP Pljevlja II with heating system for town of Pljevlja	MED, EPCG Generation, Coal Mine Pljevlja, Municipality of Pljevlja, Concessionaire	01.07.2008	31.12.2025	263.610.000	217.460.000	New TPP Pljevlja II with heating system for town of Pljevlja and increased production capacities of the coal mine.	94	Project continues even after 31.12.2025 Total cot of the project is 266,61 mio EUR
6.2 Project for LNG terminal close to town Bora	MED, Concessionaire, EPCG Transmission	01.10.2008	31.03.015	1.650.000.000	357.000.000	Preparation of the project, spatial plan, SEA and the concession for the LNG terminal with thermal power plant in bar.	96	
6.3 Project of gas system for town of Podgorica with the gas distribution network	MED, REGAGEN, Municipality of Podgorica, Concessionaire	01.10.2008	31.12.2022	12.960.000	7.940.000	Gas distribution network for town of Podgorica.	98	
<b>CORE CONTENT 7: Create the basis for long-term energy industry development in Montenegro</b>								
7.1 Programme of oil and gas exploration in Montenegro's land	MED, Concessionaire	01.10.2008	31.03.019	25.000.000	5.010.000	Oil and gas exploration in the mainland.	100	Total cot of the project is estimated for 1 block

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

PROGRAMME/PROJECT	RESPONSIBLE	TIMELINE		FUNDING TOTAL (EUR)	FUNDING 2008-2012 (EUR)	ENVISAGED RESULTS	REFERENCE TO AP (PAGE)	NOTE
		BEGINNING AT	ENDING AT					
7.2 Programme of international agreement on the use of hydro potential	MED, MAFWM , WA, Government	01.07.2008	31.12.2010	433.000	433.000	Division of Water rights with neighbouring countries with a clear regime for the use of water in border regions.	102	Project shall be finished until 31.12.2012
7.3 Project of oil and gas exploration in Montenegro's seabed – block 1 and 2	Concessionaire	01.04.2008	31.12.2010	16.625.000	16.625.000	Oil and gas exploitation in Montenegro`s seabed.	104	
7.4 Project of oil and gas exploration in Montenegro's seabed – block 3	MED, MF, Concessionaire	01.10.2008	30.12.2012	27.590.000	27.590.000	Oil and gas exploitation in Montenegro`s seabed.	106	Total cost is estimated for 1 block
7.5 Project of coal exploration in Pljevlja area	Coal Mine Pljevlja, Concessionaire, MED	03.04.2008	29.12.2011	7.748.000	8.248.000	Determination of reserves and preparation for its exploitation	108	
7.6 Project of coal exploration in Berane area	Coal Mine Berane	01.09.2008	31.12.2008	30.000	30.000	Plan for further exploration of coal reserves in Berane area.	110	
7.7 Project of the Ionic-Adriatic gas pipeline	MED, Concessionaire and other	01.09.2008	31.12.2012	60.000.000	60.000.000	Creating conditions for Montenegro to connect to international gas pipelines.	112	
<b>CORE CONTENT 8: Creation of mechanisms for effective monitoring and follow-up of the Action Plan implementation</b>								
8.1 Programme of Action Plan monitoring and follow-up	MED, later on AP Directorate	01.09.08	31.12.12	4.050.000	4.050.000	AP implementation monitoring and follow-up.	114	



## **7 ACTION PLAN TIMELINE**

Figure 3 shows the AP Timeline as per individual Programmes and Projects in the period 2008 - 2012. Each Programme and Project in this plan is presented as a single activity. Activities of individual Programmes and Projects are separated in the main groups of activities that are described in detail in timelines of individual Programmes and Projects in Chapter 10.

Even more details, where possible, have been elaborated in the electronic file behind the Timeline. This file has been prepared in the programme tool MS Project and will serve as the basis for further elaboration of the Programmes and Projects and as automatic support for monitoring and follow-up of individual Programmes and Projects and AP as a whole. The tool and the prepared initial database will be primarily used by the APD, but also by other participants in the AP implementation, if required.

Detailed timeline is presented in the Gantt chart of the electronic format of this document, within AP Annex.



## **8 ACTION PLAN FUNDING SOURCES AND DYNAMICS (2008-2012)**

The implementation of Programmes and Projects, as well as the very functioning of the APD, require substantial financial resources.

The actual access to the sources of funding is confirmed through the interest of private and commercial investors, international community and EU institutions that are already present in the Montenegrin energy sector development to a large extent. In addition to these sources, Montenegro has certain financial potential of its own (through the regular budget and additional funds, e.g. planned increase of capital of EPCG) which can be efficiently used for the preparation and implementation of Programmes and Projects.

There are basically four potential sources of financing Programmes and Projects:

- Own resources - capital:
  - Energy companies (majority state ownership and privately-owned)
  - Private investors
- Montenegrin budget
- Credits and loans (IFIs, national financial institutions and commercial banks)
- Grants (irrevocable funds)

Financial engineering, aimed at providing required financial resources for the implementation of Programmes and Projects generally, has many alternative models in completing the financial structure:

- Use of financial potential of the existing power plants (access to capital) for financing construction of new electricity generation facilities;
- Investments by energy companies from additional capitalisation funds, own sources and support from financial institutions;
- Independent Power Producer;
- Financing through concession agreements;
- Use financing technology through public and municipal bond issues;
- Attracting private investments in the Montenegrin energy sector;
- Active development of the concept and terms and conditions for applying Public-Private Partnership (PPP) scenarios;
- Direct government investments (as supported by development banks) in Programmes and Projects of the highest priority and with a relatively low rate of return;
- Credit lines from IFIs.

The analysis of individual Programmes and Projects contains the consideration of Montenegro's participation in the AP implementation, with the estimate of funds that could be obtained from grants. It can be concluded that the continuation of active cooperation with international donation community and IFIs is of great importance for a successful AP implementation. Efficient and proactive attitude of the APD in applying for, coordinating and contracting incentive funds from international sources therefore represents one of the first priorities of the APD.

The analysis of donor assistance, projects completed in 2007-2008 and envisaged activities in the next 3-4 years are presented in Figure 4. It gives an overview of activities, donors and IFIs to provide future financial support to the Montenegrin energy sector. The overview is structured by individual sectors and thematic fields in accordance with Figure 1.

**Figure 4: Donors and international financial institutions present in Montenegro**





## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

STAKEHOLDER	Others (Int. Organisations and Int. Financing Institutions (IFI) and Donors)												
	EAR	EBRD	EIB	EU *)	GTZ	KfW	UNIDO	UNDP	WB	Italy	Norway	Slovenia	Spain
	1	2	3	4	5	6	7	8	9	10	11	12	13
<b>A) SECTOR</b>													
1 Coal													
2 Oil (Crude Oil, Oil Derivatives and LPG)													
3 Gas (Natural and LNG)													
3 RES: Small HPP													
4 RES: Wind Energy													
5 RES: Solar Energy													
6 RES: Geothermal Energy													
7 RES: Biomass and Waste													
8 RES: Communal Waste													
9 Power Generation (Large HPP)													
10 Power Generation (TPP)													
11 Power Transmission													
12 Power Distribution													
13 Power Supply													
14 District Heating (incl. CHP)													
15 Energy Efficiency													
<b>B) KEY ISSUE AREAS</b>													
1 Policy and Strategy (in respective Sector)													
2 Energy Markets													
3 European Integration													
4 Environmental Protection													
5 UNFCCC (Kyoto Protokol, CDM etc.)													
6 Water and Forest Management													
7 Spatial Planning and Construction													
8 Financing of Projects													
9 International Cooperation													
10 Legal-Regulatory Framework													
11 Education, Research and Development													
12 Other													

### List of Abbreviations:

EAR - European Agency for Reconstruction  
 EBRD - European Bank for Reconstruction and Development  
 EIB - European Investment Bank  
 EU - European Union  
 GTZ - Gesellschaft für Technische Zusammenarbeit (Germany)  
 KfW - Kreditanstalt für Wiederaufbau (Germany)  
 UNIDO - United Nations Industrial Development Organisation  
 UNDP - United Nations Development Programme  
 WB - World Bank  
 LPG - Liquefied Petroleum gas  
 LNG - Liquefied Natural Gas  
 HPP - Hydro Power Plant

AD - Share-holding Company  
 RES - Renewable Energy Sources  
 CDM - Clean Development Mechanism  
 IPA - Instrument for Preaccession Assistance

	<b>MAJOR Stakeholder</b>
	<b>MEDIUM Stakeholder</b>
	<b>MINOR Stakeholder</b>
	<b>FINANCING Options</b>

The comparison of investment opportunities in Montenegro with those in the South East Europe region (where substantial investments in the energy sectors is envisaged) is based on the three basic elements that determine decisions of potential investors:

- **Standard (general) risks of business operations:** Montenegro has very good indicators of investment quality from the aspect of risks considered by investors when deciding on placing funds, as viewed in relation to political, macroeconomic and financial stability. According to the Annual Report on Economic Freedoms of the Fraser Institute for 2005, Montenegro would score 6.0 and be in the first 86 countries of the world, and in 2006 this growth was the highest in the region, 25%.
- **Level of legislative reforms (fiscal, regulatory and financial incentives to attract investments):** Montenegro is very competitive from the aspect of achieved legislative reforms and fiscal incentives; it levies the lowest corporate profit tax in Europe (9%) and has adopted numerous laws that are harmonized with EU standards.
- **Level of the main operating expenses (cost of labour force, energy and other costs):** A rather high level of educated labour force in comparison with countries in the region. Taking into account general operating expenses in the region, Montenegro has a

relatively expensive labour force. However, Montenegrin labour market is competitive with regard to education, and it can be assumed that the high unemployment rate will keep labour costs at competitive levels for a longer term.

The energy sector is one of the most interesting sectors for foreign investors. Substantial investments in the period until 2025 are expected in forthcoming energy sector upswing, which will be mainly induced by adoption and initiated implementation of the Strategy. The main prerequisites for further development are the key investments envisaged in the Strategy, i.e. the Action Plan, which could be provided through various implementation models. In the analysis of the Montenegrin energy potential in comparison with the regional trends, the following country's strengths clearly stand out:

- Positive macroeconomic trends in the last few years (GDP, inflation, foreign investments, reduced unemployment, budget surplus, and the like);
- A clear commitment of Montenegro to European integration and taking an active role in international cooperation (Energy Community South East Europe Treaty (ECSEE), the Kyoto Protocol, Stabilisation and Association Process, and other);
- There is great potential and numerous opportunities for the use of RES, particularly hydro potential, both for domestic needs and for the regional electricity market;
- Montenegro is on the crossroads of electricity transmission lines as to the neighbouring countries, as well as to Kosovo-Italy and Bosnia and Herzegovina/Croatia – Albania ;
- Initiated privatisations in the energy sector;
- A relatively high level of the already acquired knowledge;
- There is an interest of international donors and investors in the energy sector development
- Small and rather open and flexible economic system;

whereas the opportunities are:

- Explicit readiness of most energy entities to fully implement energy reforms in the shortest time possible;
- Montenegro's challenge to successfully end the process of joining the European Union;
- Large potential for energy saving (20%-30%) supported by energy efficiency measures;
- Potentially commercial oil and gas reserves in the Montenegrin seabed;
- Opportunity for faster connection to the system of regional gas pipelines (Ministerial Declaration on the Ionic-Adriatic gas pipeline);
- Coal reserves for continued electricity generation with positive socio-economic development of the northern region and better situation regarding environmental protection;
- Opportunities for an accelerated use of RES: small HPPs, wind, sun, biomass, waste, and other.

A concrete financial arrangement will be determined on the basis of the most favourable parameters and by taking into account difficulties in forecasting energy prices. The required financial resources for the implementation of Programmes and Projects are presented in Table 4, as per years and institutions responsible for mobilizing overall required funds.

The State budget, credits and donations are the only to be considered for covering the AP expenses with regard to the State's obligations. Table 5 shows estimated funds that the State should provide from the aforesaid three sources for each Programme and Project over the period 2008-2012.

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

**Table 4: Required funding for Programmes and Projects as per years**

CORE CONTENT	PROGRAMME AND PROJECT	RESPONSIBLE	2008	2009	2010	2011	2012	TOTAL (2008-2012)
CC 1: Increase energy efficiency and use of renewable energy sources in consumption	1.1 Energy Efficiency Programme	MED (until established), Government responsible for privatisation, EPCG Transmission & Distribution CIEE is CIEE, body for consumers, Generation, &	370.000	3.465.000	4.630.000	4.065.000	12470.000	13.800.000
	1.2 Project on energy management (Energy Management System) in the public sector	MED, CIEE, Public sector companies and institutions	25.000	55.000	30.000	35.000	20.000	165.000
	1.3 Project on energy saving in the public sector	MED, government building maintenance services	25.000	240.000	400.000	400.000		1.065.000
	1.4 Project on promoting and performing energy audits	MED, CIEE, authorized organisations	275.000	125.000	115.000			515.000
<b>1. CC TOTAL</b>			<b>695.000</b>	<b>3.885.000</b>	<b>5.175.000</b>	<b>4.500.000</b>	<b>1.290.000</b>	<b>15.545.000</b>
CC 2: Increase efficiency of the existing generation and transmission facilities	2.1 Programme of developing electric power networks	MED, EPCG Transmission, EPCG Distribution	720.000	1.200.000	700.000	500.000	1.000.000	4.120.000
	2.2 Project for revitalisation of small HPPs	EPCG Generation and a new owner	100.000	1.050.000	1.550.000	1.300.000		4.000.000
	2.3 Project for revitalisation of HPP Piva	EPCG Production	8.000.000	8.000.000	10.000.000	15.000.000	14.000.000	55.000.000
	2.4 Project for revitalisation of HPP Perućica – Phase II	EPCG Generation	6.000.000	7.000.000	10.000.000	10.000.000	10.000.000	43.000.000
	2.5 Project for revitalisation of TPP Pljevlja	EPCG Generation (TPP Pljevlja), Coal Mine Pljevlja	34.500.000	27.500.000	29.500.000	14.800.000	16.000.000	122.300.000
	2.6 Project for recovery and expansion of electric power transmission network	EPCG Transmission, MED (with support of EPCG Transmission)	10.100.000	18.300.000	22.500.000	14.700.000	12.500.000	78.100.000

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

CORE CONTENT	PROGRAMME AND PROJECT	RESPONSIBLE	2008	2009	2010	2011	2012	TOTAL (2008-2012)
	2.7 Project for recovery and expansion of electric power distribution network	EPCG Distribution, MED (with support of EPCG Distribution)	15.250.000	20.750.000	23.000.000	20.000.000	21.000.000	100.000.000
<b>2. CC TOTAL</b>			<b>74.670.000</b>	<b>83.800.000</b>	<b>97.250.000</b>	<b>76.300.000</b>	<b>74.500.000</b>	<b>406.520.000</b>
CC 3: Designing a plan to mitigate climate change effects	3.1 Project for energy inclusion in mitigation of climate change effects in Montenegro	MED, MTEP, greenhouse gas emissions generators, WA		110.000	250.000	390.000	250.000	1.000.000
<b>3. CC TOTAL</b>				<b>110.000</b>	<b>250.000</b>	<b>390.000</b>	<b>250.000</b>	<b>1.000.000</b>
CC 4: Creation of the institutional framework and the public involvement in the development of a competitive and market oriented energy sector	4.1 Programme for the energy sector restructuring - market opening and social policy	EPCG Power Supply, Transmission, Distribution, REGAGEN, MHLSW, MED	1.300.000	2.800.000	2.600.000	2.100.000	2.000.000	10.800.000
	4.2 Programme for the energy sector public relations	MED, Statistical Office of Montenegro, EPCG (all companies), , CANU and University of Montenegro, EPCG and other	370.000	820.000	770.000	770.000	770.000	3.500.000
	4.3 Programme on education and training in energy and ecology	MED, University of Montenegro based on consultations with MED, MTEP	200.000	200.000	300.000	300.000	200.000	1.200.000
	4.4 Project for EPCG JSC restructuring and recapitalization	4 EPCG LTD, EPCG AD	550.000	1.000.000				1.550.000
<b>4. CC TOTAL</b>			<b>2.420.000</b>	<b>4.820.000</b>	<b>3.670.000</b>	<b>3.170.000</b>	<b>2.970.000</b>	<b>17.050.000</b>
CC 5: Development and exploitation of renewable energy sources	5.1 Programme of development of renewable energy sources (hydro potential excluded)	MED, MAFWM, CIEE, Forest Administration, Investor	120.000	310.000	380.000	250.000	140.000	1.200.000
	5.2 Programme of hydro potential use in Montenegro	MED, MAFWM, WA	270.000	1.550.000	2.130.000	1.950.000	600.000	6.500.000
	5.3 Project of building small HPPs	MED, MAFWM, WA, Weather Bureau, Investor	130.000	270.000	6.600.000	11.000.000	12.000.000	30.000.000

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

CORE CONTENT	PROGRAMME AND PROJECT	RESPONSIBLE	2008	2009	2010	2011	2012	TOTAL (2008-2012)
	5.4 Project of using wind energy for electricity generation (Rumija)	MED, Concessionaire	450.000	450.000	3.100.000	3.000.000	3.000.000	10.000.000
	5.5 Project of using biomass for heat and electricity cogeneration	MED, FA, Investors		100.000	80.000	1.320.000	2.000.000	3.500.000
	5.6 Project of using municipal waste for electricity generation	MED, Public Utility Services, Municipality of Podgorica		30.000	90.000	80.000	380.000	580.000
	5.7 Project of building HPP Komarnica	MED, MAFWM, WA, Concessionaire	3.200.000	3.100.000	10.500.000	20.000.000	20.000.000	56.800.000
	5.8 Project of building HPP on the Morača river	MED, MAFWM, WA, Concessionaire	1.500.000	3.550.000	1.950.000	61.000.000	70.000.000	138.000.000
<b>5. CC TOTAL</b>			<b>5.670.000</b>	<b>9.360.000</b>	<b>24.830.000</b>	<b>98.600.000</b>	<b>108.120.000</b>	<b>246.580.000</b>
CC 6: Increase cleaner energy production from fossil fuels	6.1 Project of TPP Pljevlja II with heating system for town of Pljevlja	MED, EPCG Generation, Coal Mine Pljevlja, Municipality of Pljevlja, Concessionaire	11.500.000	23.460.000	65.000.000	68.500.000	49.000.000	217.460.000
	6.2 Project for TPG terminal close to town Bara	MED, Concessionaire, EPCG Transmission	1.000.000	5.000.000	3.000.000	46.000.000	302.000.000	357.000.000
	6.3 Project of gas system for town of Podgorica with the gas distribution network	MED, REGAGEN, Municipality of Podgorica, Concessionaire	420.000	500.000	3.020.000	3.000.000	1.000.000	7.940.000
<b>6. CC TOTAL</b>		<b>12.92.000</b>	<b>28.960.000</b>	<b>71.020.000</b>	<b>117.500.000</b>	<b>352.000.000</b>	<b>582.400.000</b>	
CC 7: Create the basis for long-term energy industry development in Montenegro	7.1 Programme of oil and gas exploration in Montenegro's land	MED, Concessionaire	350.000	740.000	200.000	1.920.000	1.800.000	5.010.000
	7.2 Programme of international agreement on the use of hydro potential	MED, MAFWM, WA, Government	18.000	365.000	50.000			433.000
	7.3 Project of oil and gas exploration in Montenegro's seabed – block 1 i 2	Concessionaire	195.000	1.430.000	15.000.000			16.625.000



71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

CORE CONTENT	PROGRAMME AND PROJECT	RESPONSIBLE	2008	2009	2010	2011	2012	TOTAL (2008-2012)
	7.4 Project of oil and gas exploration on Montenegro's seabed – block 3	MED, MF, Concessionaire	60.000	6.060.000	6.000.000	5.470.000	10.000.000	27.590.000
	7.5 Project of coal exploration in Pljevlja area	Coal Mine Pljevlja, Concessionaire, MED	755.000	3.463.000	3.950.000	80.000		8.248.000
	7.6 Project of coal exploration in Berane area	Coal Mine Berane	30.000					30.000
	7.7 Project of the Ionic-Adriatic gas pipeline	MED, Concessionaire	600.000	1.750.000	3.650.000	30.000.000	24.000.000	60.000.000
<b>7. CC TOTAL</b>			<b>2.008.000</b>	<b>13.808.000</b>	<b>28.850.000</b>	<b>37.470.000</b>	<b>35.800.000</b>	<b>117.936.000</b>
CC 8: Creation of mechanisms for effective monitoring and follow-up of the Action Plan implementation	8.1 Programme of Action Plan monitoring and follow-up	MED, later on AP Directorate	250.000	900.000	1.100.000	1.100.000	700.000	4.050.000
<b>8. CC TOTAL</b>			<b>250.000</b>	<b>900.000</b>	<b>1.100.000</b>	<b>1.100.000</b>	<b>700.000</b>	<b>4.050.000</b>
<b>1. CC - 8. CC TOTAL</b>			<b>98.633.000</b>	<b>145.643.000</b>	<b>232.145.000</b>	<b>339.030.000</b>	<b>575.630.000</b>	<b>1.391.081.000</b>

**Table 5: Government funding by sources (EUR)**

CORE CONTENT	PROGRAMME AND PROJECT	BUDGET	GRANT	LOANS	TOTAL
CC 1: Increase energy efficiency and use of renewable energy sources in consumption	1.1 Energy Efficiency Programme	1.995.000	4.655.000	6.400.000	13.050.000
	1.2 Project on energy management (Energy Management System) in the public sector	30.000	75.000	20.000	125.000
	1.3 Project on energy saving in the public sector	490.000	325.000	250.000	1.065.000
	1.4 Project on promoting and performing energy audits	100.000	165.000		265.000
<b>CC 1: TOTAL</b>		<b>2.615.000</b>	<b>5.220.000</b>	<b>6.670.000</b>	<b>14.505.000</b>
CC 2: Increase efficiency of the existing generation and transmission facilities	2.1 Programme for developing electric power networks				
	2.2 Project for revitalisation of small HPPs				
	2.3 Project for revitalisation of HPP Piva				
	2.4 Project for revitalisation of HPP Perućica				
	2.5 Project for revitalisation of TPP Pljevlja				
	2.6 Project for recovery and expansion of electric power transmission network	200.000			200.000
	2.7 Project for recovery and expansion of electric power distribution network	500.000			500.000
<b>CC 2: TOTAL</b>		<b>700.000</b>			<b>700.000</b>
CC 3: Designing a plan to mitigate climate change effects	3.1 Project for energy inclusion in mitigation of climate change effects in Montenegro	200.000	630.000		830.000
<b>CC 3: TOTAL</b>		<b>200.000</b>	<b>630.000</b>		<b>830.000</b>
CC 4: Creation of the institutional framework and the public involvement in the development of a competitive and market oriented energy sector	4.1 Programme for the energy sector restructuring - market opening and social policy	6.500.000	2.000.000	1.000.000	9.500.000
	4.2 Programme for the energy sector public relations	310.000	3.190.000		3.500.000
	4.3 Programme on education and training in energy and ecology	600.000	600.000		1.200.000

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

CORE CONTENT	PROGRAMME AND PROJECT	BUDGET	GRANT	LOANS	TOTAL
	4.4 Project on EPCG JSC restructuring and recapitalization	550.0000			<u>550.000</u>
<b>CC 4: TOTAL</b>		<b>7.960.000</b>	<b>5.790.000</b>	<b>1.000.000</b>	<b>14.750.000</b>
CC 5: Development and exploitation of renewable energy sources	5.1 Programme of development of renewable energy sources (hydro potential excluded)	520.000	360.000		880.000
	5.2 Programme of hydro potential use in Montenegro	3.050.000	3.450.000		6.500.000
	5.3 Project of building small HPPs	250.000	250.000		500.000
	5.4 Project of using wind energy for electricity generation (Rumija)	450.000	550.000		1.000.000
	5.5 Project of using biomass for heat and electricity cogeneration	140.000	100.000		240.000
	5.6 Project of using municipal waste for electricity generation	40.000			40.000
	5.7 Project of building HPP Komarnica	1.100.000		3.300.0000	4.400.000
	5.8 Project of building HPP on the Morača river	900.000		5.100.0000	6.000.000
<b>CC 5: TOTAL</b>		<b>6.450.000</b>	<b>4.710.000</b>	<b>8.4000.000</b>	<b>19.560.000</b>
CC 6: Increase cleaner energy production from fossil fuels	6.1 Project of TPP Pljevlja II with heating system for town of Pljevlja	350.000			350.000
	6.2 Project for LNG terminal close to town Bara	1.000.000	1.900.000	7.000.0000	10.000.000
	6.3 Project of gas system for town of Podgorica with the gas distribution network	110.000		300.0000	410.000
<b>CC 6: TOTAL</b>		<b>1.560.000</b>	<b>1.900.000</b>	<b>7.300.000</b>	<b>10.760.000</b>
CC 7: Create the basis for long-term energy industry development in Montenegro	7.1 Programme of oil and gas exploration in Montenegro's land	310.000	400.0000	900.0000	1.610.000
	7.2 Programme of international agreement on the use of hydro potential	313.000	120.000		433.000
	7.3 Project of oil and gas exploration in Montenegro's seabed – block 1 i 2				
	7.4 Project of oil and gas exploration on Montenegro's seabed – block 3	120.000			120.000
	7.5 Project of coal exploration in Pljevlja area		500.0000		500.0000

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

CORE CONTENT	PROGRAMME AND PROJECT	BUDGET	GRANT	LOANS	TOTAL
	7.6 Project of coal exploration in Berane area				
	7.7 Project of the Ionic-Adriatic gas pipeline	600.000		5.400.000	6.000.000
<b>CC 7: TOTAL</b>		<b>1.343.000</b>	<b>1.020.000</b>	<b>6.300.000</b>	<b>8.663.000</b>
CC 8: Creation of mechanisms for effective monitoring and follow-up of the Action Plan implementation	8.1 Programme of Action Plan monitoring and follow-up	1.850.000	2.200.000		4.050.000
<b>CC 8: TOTAL</b>		<b>1.850.000</b>	<b>2.200.000</b>		<b>4.050.000</b>
<b>CC 1– CC 8: TOTAL</b>		<b>22.678.000</b>	<b>21.470.000</b>	<b>29.670.000</b>	<b>73.818.000</b>

## 9 ACTION PLAN IMPLEMENTATION MONITORING, FOLLOW-UP AND UPDATES

There are two main objectives of the AP implementation monitoring and follow-up. The first is to ensure implementation of the main objectives of the Strategy, and the second is to ensure the AP implementation (including appropriate corrective actions).

### ***Planned activities and reporting procedures***

The follow-up system is based on the previously defined organisational parameters:

- Adopted Timelines for Programmes and Projects  
Programmes and Projects with the pertinent timelines are considered to be adopted with the adoption of the AP.
- Defined Organisational structure in AP implementation  
The AP adoption implies the accepting of the obligation to establish the APD and the CIEE.
- Adequate Human resources  
The selection of personnel for the APD and the CIEE is based on the detailed job descriptions for both institutions.
- Defined delegation of responsibilities and powers for AP implementation  
The acts on establishing the APD and the CIEE will contain clearly defined responsibilities and powers vested in these institutions.

Communication with structures, which are directly engaged in the implementation of Programmes and Projects, will be performed according to established rules of procedure of the APD and the CIEE. These procedures will precisely define the type of data that should be provided, the manner of communication, reporting frequency and obligations of the sender/recipient in the process of data transfer.

Reports are the main APD and CIEE manner of communication with external parties, and the two institutions are required to document the AP implementation process. These reports are of internal nature and are subject to internal control. These reports also serve as the bases for reports to be submitted to the MED.

The APD should prepare the following reports and submit them to the MED:

- 1) Periodic reports on AP implementation progress: to be sent to the MED on quarterly basis, being concise and containing the previously agreed content;
- 2) Annual Report on AP implementation for the Government purposes: a detailed report submitted to the Government via the MED. It shall cover: (i) results achieved in the previous year in comparison with the set objectives, (ii) assessment of implications to AP in the following year, (iii) proposed measures to improve the current situation and (iv) the assessment of requirements for AP update and/or even the Strategy updates.

The measurement of the AP implementation effects should also include objective parameters for easier monitoring and follow-up of the AP implementation, and thus the attainment of the Energy Policy and Strategy objectives. The list of internationally recognised indicators will be applied so as to ensure the quantification of the AP implementation results, provide a fast assessment of the attainment of the main strategic objectives simultaneously enabling the comparison with other countries, primarily the EU member states.

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

Parameters for AP implementation monitoring are presented in Table 6 below.

**Table 6: Parameters for AP implementation monitoring**

Parameter	Definition	Unit	Source/ comment
<b>1. Energy intensity:</b>	Required primary energy/ GDP	Mtoe / EUR million	
	Electricity consumption / GDP	GWh / EUR million	
<b>2. Import dependence:</b>	Net imports / total primary energy consumption	%	
<b>3. Changes in final energy consumption</b>	Change in relation to the initial year	%, Mtoe	
<b>4. Renewable energy sources consumption (RES):</b>	Total RES consumption	Mtoe/a year	
	Share of RES in primary energy (RES/Primary energy total)	%	
	Share of electricity generation from RES in total energy consumption (Electricity from RES/ total energy consumption)	%	
<b>5. Electricity price on the market</b>	Price	EUR/MWh	EUROSTAT Methodology Questionnaire
<b>6. Parameters of energy quality in electricity supply</b>	Parameters defined in the standard	In line with parameters set out in IEC 50160 standard	IEC (EN) 50160
<b>7. Total CO<sub>2</sub> emission</b>	CO <sub>2</sub> emission caused by energy consumption	Mil. t CO <sub>2</sub>	

Source: Slovenian National Energy Programme – parameters harmonized with the EU methodology (*Framework of indicators for monitoring implementation of interrelated targets of the EU Sustainable Development Strategy*)

The periodic overviews on the AP implementation (one year, as a rule) should be carefully considered with regard to reasons for potential deviations from the AP and subsequent undertaking of appropriate measures to implement the envisaged AP objectives and timelines. Should the measured effects be insufficient or should the implementation deviate from the plan, corrective measures are to be undertaken in accordance with the newly occurred circumstances and identified problems.

### **Action Plan Updates**

Dynamics of changes in energy industry is very fast, thus inducing changes in parameters which affect energy needs and development. Owing to this and due to potential changes in implementation that call for the change of objectives and the AP itself, the Action Plan implementation should be regularly monitored and updated, if required. If the AP changes imply long-term changes, then the Energy Development Strategy should be updated as well.

## 10 PROGRAMMES AND PROJECTS

### 10.1 CC 1: INCREASE ENERGY EFFICIENCY AND USE OF RENEWABLE ENERGY SOURCES IN CONSUMPTION

#### 10.1.1 Energy Efficiency Programme

##### A. Programme /Project description

The energy system in Montenegro, especially distribution and final consumption, is characterised by a relatively low level of energy efficiency (EE). This allows further energy savings. EE is justified and economic way to increase efficiency and reduce energy import dependency to the lowest possible level, decreasing the imbalance between production and consumption, which would contribute to the safety of energy supply.

Gradual introduction of EU Directives into legislation in the EE area and adopting good work practices, adjusted to local conditions, is a logical process of EE implementation in the country. There are three crucial intervention axes for the EE implementation: establishing the EE regulatory framework, promoting investments in EE, and implementing the EE Programme by sectors. Action Plan for EE includes consideration and realization of “Energy efficiency year” project, which incorporates activation of support from MF and coordination body formation (represents of Ministry for Economic Development and interested donors) in order to increase awareness regarding the importance and effects of the energy efficiency measures implementation.

The following existing documents represent the basis for EE activities: Law on Energy (2003), the Energy Policy (2005), Energy Efficiency Strategy of Montenegro (2005), Energy Development Strategy by 2025 (2007), Action Plan for the implementation of the Energy Efficiency Strategy for 2008, the five-year AP for EE (2008-2012), Strategy for Household Heating, Cooling and Energy Efficiency in Residential Sector.

##### B. Activity plan

	Activity description	Responsibility
1.	<p><b>Establishing regulatory framework</b></p> <p>Preparing and adopting the Law on Energy Efficiency, establishing CIEE, establishing the EE fund.</p> <p>Gradual further development of necessary legislation, regulatory and institutional framework for EE and development of local capacities and services pertaining to EE.</p>	MED (until CIEE is established), CIEE
2.	<p><b>Work of CIEE</b></p> <p>Action Plan for EE implementation monitoring, reporting, correction activities in the case of deviation from the Action Plan, update of Action Plan for EE.</p>	CIEE
3.	<p><b>Investment promotion</b></p> <p>In the public sector, immediately start activities (following an example) relative to the realisation of small and simple projects (pilot projects). Prepare marketing and promotion activities which promote EE and inform the public on the results of specific pilot projects. Design and realization of “Energy efficiency year” project.</p>	MED (until CIEE is established), CIEE
4.	<p><b>EE Programme implementation in the construction sector</b></p> <p>Providing stimulations, technical support and promotion / marketing activities.</p> <p>Having in mind the structure of energy consumption and problems incurred in different sectors, it has been suggested that the realisation of EE measures should have the priority in the construction sector (residential, commercial and public buildings).</p>	MED (until CIEE is established), CIEE
5.	<p><b>EE Programme implementation in transportation sector and in privatisation</b></p> <p>Other from sector-related Programmes by priorities – the state</p> <p>a) Preparation of EE plans in the transportation area</p>	CIEE, Government body responsible for privatisation

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

	b) Inclusion of EE responsibilities into privatisation processes	
6.	<b>EE Programme implementation on consumer side and in EPCG</b> Other from sector-related Programmes by priorities a) Preparation of plans for larger energy consumers on consumer side (KAP, Steel Plant) for specific EE Programmes b) Preparation of EE plan in the EPCG	Consumers  EPCG Generation, Transmission and Distribution

Detailed activities and projects are defined in the five-year AP for EE (2008-2012). The Programme will continue after 31 December 2012. However, the activities, the timeline and financing are not yet defined.

### C. Timeline

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Establishing basic framework	MED (until CIEE is established), CIEE	01.04.2008	31.12.2011	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2. Work of CIEE	CIEE	01.04.2009	31.12.2012					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3. Investment promotion	MED (until CIEE is established), CIEE	01.09.2008	31.12.2012			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4. Implementation of EE Programme in the construction sector	MED (until CIEE is established), CIEE	01.01.2009	29.06.2012					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5. Sectoral EE Programme implementation in transportation and privatisation	CIEE, Government body responsible for privatisation	01.01.2009	31.12.2010					■	■	■	■	■	■	■	■								
6. Implementation of EE Programme on the consumer side and in EPCG	Consumers, EPCG Generation, Trans. and Distribution	01.10.2008	31.12.2010			■	■	■	■	■	■	■	■	■	■								

### D. Financing

Estimated Programme cost amounts to EUR 13.8 million for 2008-2012 period.

Activity	Responsibility	Sources of founding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Establishing basic framework	MED (until CIEE is established), CIEE	Budget	25.000	50.000	50.000	25.000	15.000	165.000
		Grant	250.000	115.000	115.000	115.000	115.000	710.000
		Loan						
2. Work of CIEE	CIEE	Budget		50.000	50.000	100.000	100.000	300.000
		Grant		350.000	450.000	400.000	300.000	1.500.000
		Loan						
3. Investment promotion	MED (until CIEE is established), CIEE	Budget	10.000	20.000	20.000	20.000	20.000	90.000
		Grant	35.000	30.000	30.000	30.000	30.000	155.000
		Loan						
4. Sectoral EE Programme implementation in the	MED (until CIEE is established), CIEE	Budget		50.000	600.000	650.000	40.000	1.340.000
		Grant		250.000	765.000	725.000	250.000	1.990.000



**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

construction sector		Loan		2.000.000	2.000.000	2.000.000	400.000	6.400.000
5. Sectoral EE Programme implementation in transportation and privatisation sector	CIEE, Government body responsible for privatisation	Budget		50.000	50.000			100.000
		Grant		150.000	150.000			300.000
6. EE Programme implementation on consumer side and in EPCG	Consumers, EPCG Supply		50.000	350.000	350.000			750.000
Total (1-6)			<b>370.000</b>	<b>3.465.000</b>	<b>4.630.000</b>	<b>4.065.000</b>	<b>1.270.000</b>	<b>13.800.000</b>

**E. Environmental and social effect**

Enhanced EE would enable economic growth and rise of the standard of living without the significant increase of energy consumption. This will have positive ecological impact through facilitating additional investments in environmental protection and positive social effects along with fulfilling prerequisites for increasing the standard of living.

Significant number of new job openings is to be expected as a result of activities in the area of EE and RES in energy consumption.

Having in mind the activities planned within the Programme, which relate primarily to the legislative and institutional framework in terms of adoption of the Law on EE, promotion of investments, implementation of the Programme in the construction sector and the like, SEA procedures need not be implemented.

**10.1 CC 1: INCREASE ENERGY EFFICIENCY AND USE OF RENEWABLE ENERGY SOURCES IN CONSUMPTION**

**10.1.2 Project for introduction of Energy Management System (EMS) in the public sector**

**A. Programme/Project description**

It is important that all consumers have the right attitude towards energy, even before it becomes an extremely expensive resource. In the decades to come, almost all companies will spend relatively more on energy than they used to. Adequate energy management contributes to efficient energy consumption and, in the long term, it leads to energy deficit decrease on the national level. This Project is going to be an example followed by many other, not only public, companies.

Energy Management System implies recognition and identification of energy flows in companies and institutions, evaluation of energy transformation in those flows and comparison of used technologies and energy forms with their alternatives. System for flow monitoring and energy transformation is similar and can be supported by automatic tools. In the end, there is the decision making regarding the changes related to these flows and transformations.

At the beginning of this Project, the Energy Management System is introduced into government buildings, where MED (that is, the Government) does not need Law on Energy Efficiency to start activities, because it has got a direct control over its Offices. Later on, after the adoption of Law on Energy Efficiency, the Project will be expanded on the rest of the public sector (for example, administrative buildings, schools, hospitals) which the Government owns and thus controls. The aim of this Project is, among others, to bring forward examples of good practice with results in identifying possible energy savings, so that the activities would eventually be expanded onto other private companies in Montenegro.

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

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B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<p><b>Energy management in administrative government buildings</b></p> <p>Introducing energy management system in all government buildings</p> <ul style="list-style-type: none"> <li>a) Preparing instructions, establishing deadlines and implementation monitoring</li> <li>b) Implementation</li> </ul>	MED
2.	<p><b>Energy management in the public sector</b></p> <p>Introducing energy management system in all public sector companies / institutions</p> <ul style="list-style-type: none"> <li>a) Preparing instructions, establishing deadlines and implementation monitoring</li> <li>b) Implementation</li> </ul>	CIEE, Public sector companies and institutions

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Energy management in administrative government buildings	MED	01.09.2008	31.12.2010																				
2. Energy management in the public sector	CIEE, Public sector companies and institutions	01.09.2009	28.12.2012																				

**D. Financing**

Estimated Project costs for the 2008 – 2012 period are EUR 165.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Energy management in administrative government buildings	MED	Budget	5.000	10.000				15.000
		Grant	20.000	20.000				40.000
		Loan		10.000	10.000			20.000
2. Energy management in the public sector	Companies and institutions				10.000	25.000	15.000	50.000
		Budget		5.000	5.000	5.000		15.000
	CIEE	Grant		10.000	5.000	5.000	5.000	35.000
		Loan						
Total (1-2)			25.000	55.000	30.000	35.000	20.000	165.000

The Project cost does not include investments into buildings.

**E. Environmental and social effect**

Having in mind the activities planned within the Project which primarily refer to establishing institutional measures with a view to decreasing energy consumption in the public sector and its most efficient consumption, EIA procedures and the study are not required.

The Project's social influence is not significant.

## 10.1 CC 1: INCREASE ENERGY EFFICIENCY AND USE OF RENEWABLE ENERGY SOURCES IN CONSUMPTION

### 10.1.3 Project on energy saving in public sector

#### A. Programme /Project description

In order to impose energy saving measures on all public sector institutions and companies, certain legal framework is required. It is planned that this framework will be prepared as a part of the Energy Efficiency Programme. However, there are several possibilities for saving energy without establishing legal framework and preparing extensive projects. Electric power that is consumed for lighting offices, corridors and premises will be significantly reduced by the use of energy saving light bulbs, and generally speaking, by an overall review of lighting and by replacing light emitting bodies. This is done as a part of regular building maintenance, only that now the funds for procurement of energy saving light bulbs should be provided. Replacement of old lights could be gradual and it should be done only when the use of an energy saving light bulb is economically justifiable.

Huge energy saving potential lies in the attitude of the employees regarding energy savings and on their workplace habits. Instructions given to the employees in various brochures and other supporting promotional materials might help change their habits and achieve energy savings. This measure could be implemented in the entire public sector and wider, because it does not set any obligations.

Heating, cooling and ventilation systems in government buildings should be revised in order to assess possibilities for their optimisation, energy saving potentials and the possibility of changing the system and introducing other more efficient energy sources.

The implementation of EE investments in the wider public sector (led by an example) will at first be performed mostly in government buildings and institutions, since no legislative measures are required and the implementation may start without delay. The Government should implement this Project in its own institutions as a Project which represents an example of good practice that would consequently spread over the entire public sector.

#### B. Activity plan

Activity description		Responsibility
1.	<b>Introduction of energy saving light bulbs</b> In Government buildings and other premises of Government Offices and bodies, energy saving light bulbs replace the old ones, wherever it is technically justifiable.	MED, Government building maintenance services
2.	<b>Instruction for energy saving</b> Brochures and other supporting materials containing instructions for the public sector employees will be prepared in order to save energy at their workplaces.	MED
3.	<b>Heating, cooling, ventilation optimisation and gradual transfer to other energy sources</b> Where possible, reconstruction projects for transferring to other energy sources (gas, petroleum), instead of electricity, for Government building heating, cooling and ventilation systems will be prepared; optimisation projects should be prepared when the first option is not viable.	MED, Government building maintenance services

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Introduction of energy saving light bulbs	MED, Government building maintenance services	01.09.2008	31.12.2009																				
2. Instructions for energy saving	MED	01.09.2008	01.06.2009																				
3. Heating optimisation and gradual transfer to other energy sources	MED, Government building maintenance services	03.12.2008	31.12.2011																				

**D. Financing**

Estimated Project cost is EUR 1.065.000 in period 2008 – 2012.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Introduction of energy saving light bulbs	MED, Government building maintenance services	Budget	5.000	20.000				25.000
		Grant	10.000	15.000				25.000
		Loan						0
2. Instructions for energy saving	MED	Budget	10.000	5.000				15.000
		Grant						0
		Loan						0
3. Heating, cooling, ventilation optimisation and gradual transfer to other energy sources	MED, Government building maintenance services	Budget		150.000	150.000	150.000		450.000
		Grant		50.000	100.000	150.000		300.000
		Loan			150.000	100.000		250.000
Total (1-3)			25.000	240.000	400.000	400.000	0	1.065.000

Funds include: EUR 50.000 light bulbs, EUR 15.000 instructions and EUR 1 million heating.

**E. Environmental and social effect**

Decreased energy consumption leads to lesser environmental impacts. Through these activities, the Government shall set an example for the public and identify and then remove obstacles that could prevent wider range implementation of these measures in order to enable citizens to do the same in their respective companies and households. Having in mind the activities planned within the Project, that primarily refer to the installation of energy saving light bulbs, making of brochures, heating optimisation and the like, EIA procedure is not required.

The Project does not have significant social influence.

## 10.1 CC 1: INCREASE ENERGY EFFICIENCY AND USE OF RENEWABLE ENERGY SOURCES IN CONSUMPTION

### 10.1.4 Project on promoting and performing Energy Audits

#### A. Programme/Project description

Many consumers are not aware of energy losses, inefficient energy consumption and of potential energy savings and consequent cost reductions. Energy Audits (EA) can help them recognise these potentials. Many of them are private persons who are not under direct influence of the state, whereas imposing certain activities by laws / regulations is not in line with the concept of the open market. Therefore, it is necessary to promote EA which could significantly help to promote and initiate energy savings, as well as smaller projects aimed at achieving energy efficiency. Mass implementation of small projects results in big results.

The Energy Audits are designed for those less informed consumers and for those who take less care of energy consumption. Interested consumers would soon opt for energy management plans, where the EA is the first stage in establishing management. In order to perform EA, certain preconditions must be fulfilled: on the one hand, consumers must have certain interest in order to perform EA in their companies / institutions, and on the other hand, qualified and adequately equipped teams which perform audits must exist. Hence this Project must organise development of skills and promotion of good practice examples in order to awaken the interest of passive consumers. At first, the EA would primarily be implemented in public companies and institutions, as a part of energy management introduction process. The examples would be used for promotion.

#### B. Activity plan

Activity description		Responsibility
1.	<b>EA promotion</b> Promotion of EA and their benefits is accomplished by intensive communication with business entities.	MED, CIEE later
2.	<b>Preparation of examples of good practice</b> On the basis of previous projects analyses (in case of companies that had Energy Audits in the past), calculations of economic, ecological and energy effects of recognised potential energy savings will be prepared.	MED, CIEE later
3.	<b>Development of skills</b> Rules and conditions for authorised organisations will be set which would help them get equipped, accompanying regulations will be prepared, training will be performed certificates awarded to energy reviewers.	MED, CIEE, later Authorised organisations
4.	<b>EA performance</b> EA will be performed in companies in various branches of economy and they will be subsidised, in order to gain experience and prove positive effects. For that period, subsidising of EA is planned as well.	Authorised organisations, MED, CIEE

After the realization of this Project, EA are continued to be performed, but without government subsidies.



Activities related to energy efficiency will also create new jobs.



## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.1 Programme for developing electric power networks

#### A. Programme/Project description

Numerous very significant network interventions are included in Projects that refer to the transmission and distribution network. Other, but urgent unresolved issues are also dealt with by this Programme.

Opening of the electric power market and introduction of numeric management and protection technologies are two areas which should be reviewed through appropriate studies, in order to prepare a plan for implementation of these systems in electric power networks.

Transmission network development by 2025 is planned as to allow electric power interchange with the neighbouring countries and to enable inclusion of new electric power sources. Using the model of European countries, that are increasing 220 kV voltage network to 400 kV which is the only voltage level they will be using, it is necessary to start writing a study that would confirm and determine optimal time period for making this transition, as well as the necessary resources and plans of neighbouring countries. Apart from connecting the transmission system with those of neighbouring countries at the 400 kV level, another outstanding challenge is to connect the Montenegrin system with the Italian, through a submarine direct current cable and to incorporate it in the Montenegrin system. Fast consumption growth in the littoral and Podgorica also requires additional interventions on the transmission and distribution network.

Distribution network development by 2025 is planned as to facilitate the supply safety levels and to reduce electric power losses to the level of 10% or less. Besides enlarging the network and increasing its capacity, it is also necessary to prepare other measures that would help accomplish better efficiency, reliability and quality of the delivered electric power, such as: introduction of 20 kV voltage, automation of medium-voltage network, remote control and digitisation of secondary equipment, treatment of medium-voltage neutral point and new measurement systems in line with the energy market.

Preparation of the Project for the next five-year period (2013 - 2017) and the already set high standards regarding delivered energy represent challenges that need to be faced within this Programme.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Electric power network development studies</b> Transmission network study, Distribution network study, network transition from 220 to 400 kV study	EPCG Transmission, EPCG Distribution
2.	<b>Advanced measurement system implementation study and plan</b> The aim of study is to support the introduction of the electric power market. Besides the electricity meter, computer and software, data management issue should be appropriately dealt with to include data safety and protection.	EPCG Transmission, EPCG Distribution
3.	<b>Study and implementation plan for the digitisation of secondary equipment</b> Digitisation of the management and protection system is a precondition for having a modern network remote control system. To achieve this goal, it is necessary to prepare typification of signal lists, protocols, functions, operative instructions, etc. This would enable larger competition among equipment suppliers, which guarantees favourable procurement conditions, at the same time good, compatible solutions.	EPCG Transmission, EPCG Distribution
4.	<b>Increasing supply reliability and quality</b> Analysing possibilities for distribution network enlargement with a study to define: treatment of neutral point ( Low impedance ground connection, Compensation, Schent switch, etc.); automation of medium-voltage network with automated sectionalisation and remote control; semi-isolated conductors, fully isolated conductors, universal cables; introduction of 20 kV voltage into medium-voltage network, etc.	EPCG Distribution
5.	<b>Establishing connection with Italy through HVDC</b> Preparation of the conceptual design, preliminary feasibility studies, outline scheme, study of feasibility of studies on incorporation into the existing system, decision on further activities and implementation model.	EPCG Transmission
6.	<b>Project for the enlargement and reconstruction of transmission network 2013-2017.</b> Project definition for enlargement and reconstruction of transmission network for the next AP, in 2013 -	EPCG Transmission



**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

5 . Establishing connection with Italy through HVDC	EPCG Transmission		200.000	650.000	150.000			1.000.000
6. Project for enlargement and reconstruction of transmission network 2013-2017	EPCG Transmission					500.000		500.000
7. Project for enlargement and reconstruction of distribution network 2013-2017	EPCG Distribution						1.000.000	1.000.000
Total (1-7)			720.000	1.200.000	700.000	500.000	1.000.000	4.120.000

**E. Environmental and social effect**

Considering the activities that are planned as a part of the Programme, which are primarily related to planning, research for the introduction of new technologies and system performance improvement, there is no need for SEA. During the preparation of project documentation for individual projects (activities 5, 6 and 7), EPCG Transmission and EPCG Distribution must implement the EIA procedure.

Programme has no direct social impact; however, it improves electrical feeding for consumers.

## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.2 Project for revitalisation of small HPPs

#### A. Programme/Project description

Montenegro has seven small HPPs which are now the property of EPCG. These HPPs are: Glava Zete, Slap Zete, Rijeka Mušovića, Šavnik, Rijeka Crnojevića, Podgor and Lijeva Rijeka. The oldest one is HPP Podgor, which was built and started operating in 1939; the youngest one is HPP Lijeva Rijeka, which started to operate in 1987. All seven small HPPs are of the running type. Their total installed power is 9,025 mW, and expected annual generation is 21 GWh. HPP Glava Zete and Slap Zete will remain the property of EPCG, whereas the remaining 5 HPPs are to be sold to private investors. In HPP Šavnik, Rijeka Crnojevića and Podgor main and supporting equipment are reconstructed and these facilities are at present in a relatively better condition, whereas the state of HPP Glava Zete, Slap Zete and Rijeka Mušovića is poor and should be urgently revitalised. They have continuously been exploited since the time they were first put into operation, so their equipment is dilapidated and technologically obsolete and should be revitalised and modernized, which would prolong their exploitation period and eventually lead to the increase of power and potential production capacities of those HPPs. HPP Lijeva Rijeka is not in use since 1991 due to unresolved technical and organisational problems regarding the plant management, which should also be resolved.

#### B. Activity plan

Activity description		Responsibility
1.	<b>Documentation and preparatory activities</b> Preparation of reconstruction plan, together with the conceptual project, feasibility study, building permit is obtained, EIA procedure performed.	EPCG Generation and new owner
2.	<b>Tender for equipment and contractors</b> Preparation of tender documentation, initiation of tender procedure, work and equipment contracting.	EPCG Generation and new owner
3.	<b>Reconstruction works</b> Preparation of project documentation, equipment delivery and reconstruction.	EPCG Generation and new owner

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	Documentation and preparatory activities	EPCG Generation and new owner	01.09.2008	30.09.2009																				
2.	Tenders for equipment and contractors	EPCG Generation and new owner	01.01.2009	30.05.2011																				
3.	Reconstruction works	EPCG Generation and new owner	01.05.2009	30.12.2011																				

**D. Financing**

For the 2008-2012 period, estimated costs of the Project are EUR 4 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Documentation and preparatory activities	EPCG Generation and new owner		100.000	300.000				400.000
2. Tender for equipment and contractors	EPCG Generation and new owner			50.000	50.000	25.000		125.000
3. Reconstruction works	EPCG Generation and new owner			700.000	1.500.000	1.275.000		3.475.000
Total (1-3)			100.000	1.050.000	1.550.000	1.300.000	0	4.000.000

Financial costs comprise: EUR 2 million for small HPPs, which remain in the EPCG Generation and EUR 2 million for those HPPs that will be sold.

**E. Environmental and social effect**

During the preparation of Project documentation for individual projects, EPCG Production and the new owner must implement EIA procedure.

This Project does not have a significant social impact.

## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.3 Project for revitalisation of HPP Piva

#### A. Programme/Project description

HPP Piva has been operating for more than 30 years. Reconstruction, equipment modernisation and construction facilities are needed in order to increase reliability and work safety and to prepare the plant for another 35 years of exploitation.

HPP Piva basic technical specifications are: installed aggregate power: 3x120 MVA; total accumulation: 880 mil. m<sup>3</sup>; projected annual generation: 860 GWh.

In 2004, observed deficiencies and problems that occurred during exploitation in HPP Piva were initiated, which included generator excitation system, instalment of electrical brake system, replacement of high voltage switches in transformer fields and collecting dividers and switches in power line fields of 220 kV distribution facilities. These activities end in the fourth quarter of 2008.

In order to prepare for the following phase of reconstruction, an independent consultant prepared reconstruction technical study that refers to electro-mechanical equipment and generation aggregates. EPCG has prepared reconstruction measures for construction works and hydro-mechanical equipment. In line with previous analysis, a preliminary cost estimate for various components and measures has been prepared. In addition to this, and independent expert commission, financed by the German Development Bank, KfW, has completed a study and defined possible reconstruction measures in the Preliminary findings.

In 2008, second part of reconstruction and modernisation of HPP Piva is intended in two phases.

In the first phase of reconstruction, inspection of existing equipment and facilities will be performed and reconstructing activities will be defined.

In the second phase, in HPP Piva specific activities would be undertaken, aimed at reconstruction and modernisation of equipment and facilities. Construction works shall include: turbines, generators, transformers, 220 kV distribution facility, auxiliary feeding system, telecommunication system, protection relay system and measuring equipment that would probably be replaced. In terms of construction facilities, the Project requires water supply and drain facilities, hydro-mechanical equipment, a dam, overflow reservoir and a mechanical facility.

Infrastructure related works (roads, distribution network) are not needed.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>I. Phase - Consultant selection and definition of activities</b> Consultant selection, data gathering, equipment and facilities inspection, preparation of technical study, 'Final Report on Preparatory phase', 'Feasibility Study with conceptual project' and tender documentation, and issuing of tender for the replacement and reconstruction of the existing equipment which does not require additional testing.	EPCG Generation
2.	<b>II. Phase – Works</b> Work instalments: preparation of design specification, implementation of EIA procedure, equipment procurement, realisation of power plant revitalisation works.	EPCG Generation



During the preparation of project documentation, EPCG Generation must implement EIA procedure. The Project does not include building of new infrastructure in local-regional community and it does not plan employing new people.

This Project does not have a significant social impact.



## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.4 Project for revitalisation of HPP Perućica – Phase II

#### A. Programme/Project description

HPP Perućica has been in operation for 45 years and the equipment is approaching the end of its service life, or is already older. For that reason, HPP can no longer reach its nominal power. Therefore, the revitalisation is required, which would return its nominal power, which is now restricted to 285 MW, to 307 MW and the HPP would be operational for another 35 years.

HPP Perućica system consists of 6 km of dams, 20 km of supply lines, 3.5 km of pressure tunnels, 3 x 2 km of pressure pipelines, main mechanical facilities with aggregates and other supporting facilities. The overall system spreads over 30 km. Installed aggregate power of HE Perućica is 5x40 MVA + 2x65MVA, total accumulation is 225 mil m<sup>3</sup>.

It is planned to perform revitalisation of the power plant in two phases.

Phase one will be concluded by the end of year 2008. In the first part of Phase II, the consultant will prepare the overall study of Phase II activities, including financial and economic analyses. In 1984, a 'Project for modernisation and utilisation of HPP Perućica' was made aiming to modernise the plant and make it operate at nominal power of 307 MW. Since this Project is now obsolete, it is necessary to revise and innovate it. Phase II will include: reconstruction of electro-mechanical equipment of 40 MVA aggregate number 5 and 65 MVA aggregates 6 and 7, reconstruction and installation of a telecommunication system, installation of equipment for hydrological and hydraulic measurements, reconstruction of hydro-mechanical equipment, reconstruction and elevation of Opačica, Moštanica, Zeta II canals and a compensation reservoir, reconstruction of electric equipment in 220 kV and 110 kV distribution facilities.

Furthermore, an installation of a 65 MVA aggregate number 8 is planned during the revitalisation. In that manner, nominal power would be increased by additional 58.5 MW, reaching total nominal power of 365.5 MW. Generation will increase from 903 GWh per year (with nominal power of 285 MW) to 957.5 GWh (with nominal power of 307 MW) and 971 GWh (with nominal power of 365.5 MW).

Interventions on infrastructure (roads, transmission network) are not needed.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Consultant selection and definition of activities</b> Consultant selection, preparation of study and documentation, equipment and facilities inspection and definition of activities	EPCG Generation
2	<b>Works</b> Work activities: preparation of project documentation, implementation of EIA procedure, equipment procurement, activities on revitalisation	EPCG Generation
3	<b>Installation of aggregate number 8</b> Preparation of project documentation, implementation of EIA procedure, equipment procurement, construction work	EPCG Generation

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Consultant selection and activities definition	EPCG Generation	01.04.2008	30.09.2009	█	█	█	█	█	█	█	█												
2. Works	EPCG Generation	01.04.2009	01.11.2013					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
3. Installation of aggregate no. 8	EPCG Generation	01.04.2011	28.09.2012													█	█	█	█	█	█	█	█

**D. Financing**

Total estimated Project costs are EUR 49 million, whereas the estimated Project costs for the period 2008 – 2012 are EUR 43 million.

Activity	Responsibility	Source of funding						Total (2008-2012)
			2008	2009	2010	2011	2012	
1. Consultant selection and activities definition	EPCG Generation		6.000.000	4.000.000				10.000.000
2. Works	EPCG Generation			3.000.000	10.000.000	3.000.000	3.000.000	19.000.000
3. Installation of aggregate number 8	EPCG Generation					7.000.000	7.000.000	14.000.000
<b>Total (1-3)</b>			<b>6.000.000</b>	<b>7.000.000</b>	<b>10.000.000</b>	<b>10.000.000</b>	<b>10.000.000</b>	<b>43.000.000</b>

Financial costs comprise of: reconstruction EUR 35 million and installation of aggregate number 8 - EUR 14 million.

It is planned to finance the Project from a loan and from EPCG Generation own funds. KfW expressed willingness to grant a credit of EUR 30 million. EPCG shall provide remaining funding in the amount of EUR 19 million.

Although HPP Perućica is, according to the EPCG Generation data, 100% amortised, the remaining estimated value of EUR 180 million is included in the economic analysis.

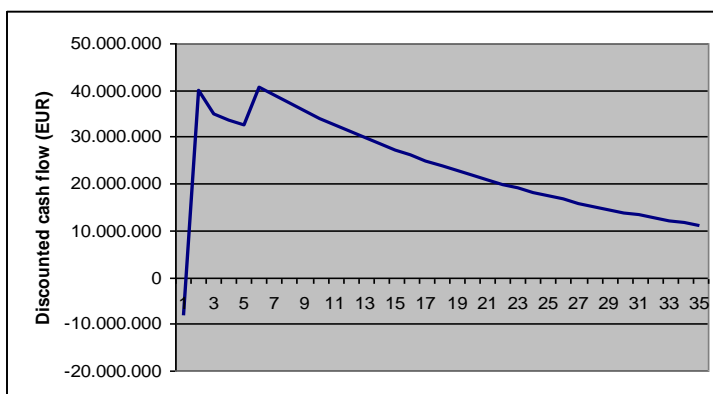
Results of the economic analysis are as follows: NPV=EUR 768 million, IRR=33%.

Economic analysis reveals high profitability of this Project.

#### E. Environmental and social effect

Basic HPP parameters will not change in the course of the Project. The only change that could have effect on the environment is the increase of downstream flow for 12.75 m<sup>3</sup>/s during HPPs maximum operation, if construction of aggregate 8 is realised. During the preparation of project documentation for the planned activity, EPCG Generation must implement EIA procedure.

This Project does not have a significant social impact.



## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.5 Project for revitalisation of TPP Pljevlja I

#### A. Programme/Project description

The existing TPP Pljevlja I has been in operation for more than 25 years, so it needs to be reconstructed in order to continue working for another 20 years. In order to assure future energy generation in this TPP, Pljevlja Coal Mine, which is for now a separate company, should invest in revitalisation of the mine, in order to maintain appropriate production levels. All these activities are regarded as a single Project, since they all need to be realised in order to continue production at the projected level. The installed power of the production block would be increased by 15 MW during the revitalisation of TPP Plevlja I (from 210 to 225 MW) and electric power generation would increase by around 100 GWh (from 1,200 to 1,300 GWh) per year. For the Project realisation no interventions on the infrastructure (distribution network, roads, as well as water supply from the Otilovići accumulation) are necessary.

Revitalisation of TPP Pljevlja I and RUP could mainly be financed by a foreign strategic partner in the form of recapitalization of EPCG Generation Ltd.

The revitalisation of TPP Pljevlja is technologically and economically justifiable only if done together with the RUP revitalisation, and vice versa.

Both the revitalisation of TPP Pljevlja I and the construction of TPP Pljevlja II with accompanying investment to RUP should be done simultaneously, therefore the implementation and financing model should be adjusted to take this into account. Due to technical conditions, TPP Pljevlja I and TPP Pljevlja II must be in the same company and together with RUP.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Block reconstruction</b> Preparatory activities, preparation of project and tender documentation, implementation of EIA procedure Control system replacement Cooling tower reconstruction Increasing block power (by 15 MW) and improving energy efficiency of the facility	EPCG Generation (TPP Pljevlja) and other
2.	<b>Activities on supporting facilities – ecological rehabilitation</b> Preparatory activities, preparation of project and tender documentation, implementation of EIA procedure Replacement of electric-filtering facility New location of the dump and new transportation system for cinder and ash Stabilisation and recultivation of the existing cinder and ash dump Partial replacement of water pipeline	EPCG Generation (TPP Pljevlja) and other
3.	<b>Installation of a desulphurisation system</b> Preparatory activities, preparation of project and tender documentation, implementation of EIA procedure Procurement of equipment and construction of desulphurisation facility – DESOx	EPCG Generation (TPP Pljevlja) and other
4.	<b>Coal mine revitalisation</b> Preparatory activities, preparation of project and tender documentation, implementation of EIA procedure Procurement of equipment and revitalisation activities.	RUP and other

Some activities in the coal mine are in the realisation stage since 2006.

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

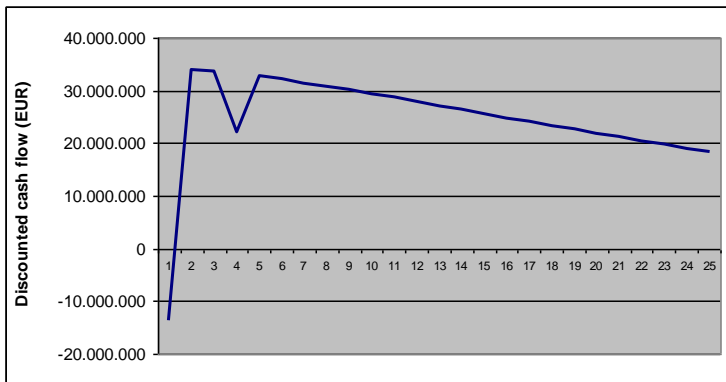
1.	Block reconstruction	EPCG Generation, (TPP Pljevlja) and other	01/05/2008	31/12/2009	
2.	Activities on supporting facilities – ecological rehabilitation	EPCG Generation, (TPP Pljevlja) and other	02/06/2008	31/12/2012	
3.	Installation of a desulphurisation system	EPCG Generation, (TPP Pljevlja) and other	03/01/2011	28/06/2013	
4.	Coal mine revitalisation	RUP and other	01/01/2008	31/12/2012	

**D. Financing**

Total estimated Project costs are EUR 127 million, and estimated costs for 2008-2012 period are EUR 122.3 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Block reconstruction	EPCG Generation (TPP Pljevlja) and other		4.000.000	10.200.000				14.200.000
2. Activities on supporting facilities	EPCG Generation (TPP Pljevlja) and other		3.000.000	5.000.000	7.000.000	7.000.000	6.200.000	28.200.000
3. Installation of a desulphurisation system	EPCG Generation (TPP Pljevlja) and other					2.500.000	9.000.000	11.500.000
4. Coal mine revitalisation	RUP and other		27.500.000	12.300.000	22.500.000	5.300.000	800.000	68.400.000
<b>Total (1-4)</b>			<b>34.500.000</b>	<b>27.500.000</b>	<b>29.500.000</b>	<b>14.800.000</b>	<b>16.000.000</b>	<b>122.300.000</b>

Financial costs: reconstruction of TPP Pljevlja I EUR 43 million, installation of desulphurisation system are estimated by the supplier at EUR 15 million on the basis of such an investment in TPP Trbovlje (which is not included in the Strategy), Coal Mine revitalisation estimated by the RUP at EUR 69 million (which is 10 million less than evaluation stated in the Strategy, on account of funds spent in 2008).



Although TPP Pljevlja I has, according to the EPCG Generation data, exceeded its projected life time and could therefore be considered 100% amortized, the remaining estimated value of EUR 150 million and reduced generation in years 2009 and 2010 are included in the economic analysis. Results of the economic analysis are as follows: NPV= EUR 246 million, IRR=18%

Economic analysis reveals high profitability of this Project.

#### E. Environmental and social effect

Should the preparation of spatial - plan documentation be needed, the SEA is required.

The replacement of electric-filtering facility will reduce dust emissions to required limits (below maximum permitted  $< 50 \text{ mg/m}^3$ ), and the system for desulphurising sulphur oxide emissions to permitted limits. NOx emission will be below maximum permitted limits. During the preparation of project documentation for planned activities, EPCG Generation (TPP Pljevlja) and RUP must implement EIA procedures.

Significant social impact of the Project is in reducing harmful influence of objects on the environment.

## 10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES

### 10.2.6 Project for recovery and expansion of electric transmission network

#### A. Programme /Project description

Due to the lack of investments in the previous years, the existing transmission network facilities should be reconstructed and new ones should be built. Although network capacity is, generally speaking, sufficient to enable transmission of required energy, some of its parts could be overloaded, which is why some parts of the network should be reinforced.

Montenegrin transmission network is mostly radial and lacking network-like structures; hence all of its parts must be in operation at all times (N-1 criterion is not met). As a result of that, operation safety is endangered and it is necessary to improve it so that it becomes network-like structure. At the same time, strengthening ties with other countries in terms of safety, market opening and stability in energy community is also desired, as well as implementing additional projects to satisfy the increasing demand, especially in the littoral and Podgorica.

To assure further development, communication infrastructure is a precondition for more intensive introduction of numeric measurement technology, protection, control and optimisation technology, which will be resolved with an optical network placed on power lines. Besides the communication system, measurement, automation and remote control system will also be developed from the national dispatch control centre with SCADA and EMS functions, as well as up-to-date numeric protection system.

Generally speaking, there are certain problems to fulfil conditions for Project realisation: incomplete project documentation, lack of building permits or their tardiness, incomplete financial resources. During several previous years there were numerous problems related to property rights which could have negative effect on Projects for reconstruction, development and construction of the transmission system. Therefore, EPCG Transmission should solve legal – property issues beforehand, and MED should initiate activities for preparation of regulations that would enable more efficient problem solving even in the Projects preparation stage.

#### B. Activity plan

	Activity description	Responsibility
1.	<p><b>Transmission network revitalisation and reconstructions</b></p> <p>Expansion: SS 110/35 kV Andrijeвица and connecting the 110 kV power lines EVP Trebješica-Berane; SS 220/110 kV Mojkovac and connecting power line 220 kV Podgorica-Plevlja ;SS 400 kV and SS 110/35 kV Ribarevine with new transformer 400/110 kV, 150 MVA; SS 110/35 kV Pljevlja 1 (construction of external field)</p> <p>Revitalisation: power line 110 kV Nikšić-Bileća in region Dragova luka; SS 110/35 kV Nikšić (portal); 220 kV power line Podgorica 1-Pljevlja 2 (section Podgorica 1-Bijelo Polje); 110 kV power line Bar-Budva (from post 33 to post 55); SS 220/110/35 kV Podgorica 1 (exchange of pneumatic switches); SS 110/35 kV Nikšić (exchange of pneumatic switches).</p> <p>New transformer installation: 110/35kV, 40 MVA in SS 110/35 kV Budva; 110/35kV, 40 MVA in SS 110/35 kV Nikšić; 400/110kV, 300MVA in SS 400/110kV Podgorica 2.</p>	EPCG Transmission
2.	<p><b>Expansion of network with new substations and power lines</b></p> <p>Construction: SS 110/35/10 kV Kotor (Skaljari) and 110 kV power line Tivat-Kotor; power line 110 kV Perućica-Kotor; power line 400 kV Podgorica 2 - Albania; power line 110 kV Bar-Ulcinj; SS 110/10 kV Podgorica 5, power line 110 kV Podgorica 5 - KAP and cable line 110 kV Podgorica 5 – Podgorica 3; SS 110 kV Kolašin (Drijenak) and power line 110 kV Mojkovac-Kolašin ( from 35kV to 110 kV); SS 110/10 kV Podgorica 6; SS 110/35 kV Nikšić (Kličevo) with connection to a 110 kV power line; SS 110/35 kV Žabljak and power line Pljevlja 1-Žabljak (from 35kV to 110 kV); SS 110/35 kV Rožaje and 110 kV Berane-Rožaje power line (from 35kV to 110 kV); SS 110/35 kV Virpazar with connection to 110 kV power</p>	EPCG Transmission





**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

	EPCG Transmission	Grant						
		Loan						
Total			10.100.000	18.300.000	22.500.000	14.700.000	12.500.000	78.100.000

Transmission network facilities are built for the following purposes: to support increased consumption, to establish connections within the energy community and create market conditions, to increase network safety, to maintain existing capacities and to connect new energy sources.

For a detailed economic analysis, the extent of their effect on individual purposes should be known, which is not clear for the proposed facilities. For now, there are no key parameters regarding, for example, the value of undistributed energy. Therefore, the economic analysis is based on investment possibilities. Energy transmission, including transit and increased consumption transmission calculated on the basis of given tariffs, generate cca EUR 27 million annually. Expenses, regular maintenance included, are EUR 9 million. Discount rate requires 8% profit of EUR 2.1 million. In this manner, EUR 15.9 million per year is left to EPCG Transmission for investment purposes, which covers planned investments (EUR 15.6 million annually on a 5-year average).

**E. Environmental and social effect**

During the preparation of Project documentation for individual transmission network reconstruction and expansion, EPCG Transmission must implement EIA procedure.

The Project improves safety and the quality of power feeding of consumers over the entire territory of Montenegro.

**10.2 CC 2: INCREASE ENERGY EFFICIENCY OF THE EXISTING GENERATION AND TRANSMISSION FACILITIES**

**10.2.7 Project for recovery and expansion of electric power distribution network**

**A. Programme/Project description**

At the distribution level, basic problems are network expansion with a view to satisfying growing consumption and reduction of losses. Reliable supply, network automation, and preparation for the introduction of energy market are other areas in which adequate activities should be undertaken. Distribution network development by 2025 is planned in a way that would lead to better supply safety and reduced electric power losses to the level of 10%. The construction of 110/35 kV substations is envisaged, 110/10 (20) kV substations, reconstruction of existing

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

110/35 kV substations, expansion of substation 35/10 (20) kV to 110/35/10 (20) kV and reconstruction directed to increase the power of the existing 35/10 kV substations. Substation reconstruction and construction will be performed in a manner that would prepare them for the remote control system, construction of control centres will commence, as well as the network remote control with performance optimisation. The Strategy did not correctly envisage consumption growth in the littoral and in Podgorica, which represents a problem. It is therefore necessary to start additional projects even today instead of waiting for long-term network development plans.

There are problems concerned with assuring conditions for Project realisation: incomplete project documentation, lack of building permits or their tardiness, incomplete financial resources. During several previous years there were numerous problems related to property rights, which could have negative effect on Projects for reconstruction, development and construction of the distribution system. Therefore, EPCG Distribution should solve legal – property issues beforehand, and MED should initiate activities for preparation of regulations that would enable more efficient problem solving in Project preparation stage.

### B. Activity plan

Activity description	Responsibility
<p>1. <b>Reconstruction and construction of a distribution medium-voltage (MV )network</b></p> <p>Reconstruction: SS 110/35 kV Podgorica 3 (voltage level of 10 kV); TS 35/10 kV Podgorica (35 kV voltage level and increasing power); SS 35/10 kV Humci (increasing power); SS 35/10 kV Kotor - Škaljari (increasing power); SS 35/10 kV Tuzi (increasing power and reconstruction of 35 kV voltage level); SS 35/10 kV Sutomore (increasing power); SS 35/10 kV Voloda; SS 35/10 KV Trebjesa (10 kV voltage level); SS 35/10 kV Bistrica (increasing power); SS 35/10 kV Podanje (35 kV voltage level); SS 35/10 kV Breza.</p> <p>Construction:</p> <p>SS 35/10 kV Baošići with 35 kV and 10 kV connecting cables; SS 35/10 kV Petrovac; 20 kV cable line Muo-Prčanj-Stoliv; 35 kV power line Podgor-Cetinje; construction of SS 35/10 kV Velje Brdo; power line 35 kV Ptič-Veruša (Podgorica)</p> <p>Neutral point grounding (Podgorica, Nikšić, Bar and Herceg Novi)</p> <p>Mobilna SS 35/10 kV</p>	<p>EPCG Distribution and other</p>
<p>2. <b>Introduction of modern measuring system</b></p> <p>New meters with remote reading, data gathering, analysis and control system</p>	<p>EPCG Distribution and other</p>
<p>3. <b>Works on low-voltage (LV) network</b></p> <p>Network expansion, rehabilitation, modernisation</p>	<p>EPCG Distribution and other</p>
<p>4. <b>Preparation and realisation of additional projects in relation to the Strategy</b></p> <p>Due to increased consumption, more projects, that are still not defined or envisaged in the Strategy, should be initiated.</p>	<p>EPCG Distribution and other</p>
<p>5. <b>Introduction of numeric technology in the MV network</b></p> <p>Systematisation of control and protection with new technology, typification of functionality of new systems, preparations for the realisation of centralised remote control.</p>	<p>EPCG Distribution</p>
<p>6. <b>Legal – property issues</b></p> <p>Resolving legal-property issues at the distribution network locations and preparation of efficient regulations relative to this area.</p>	<p>MED, supported by EPCG Distribution</p>

The Programme shall continue to exist after 31 December 2012, but the activities and the timeline after this period are not yet defined.

### C. Timeline

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Reconstruction and construction of a distribution medium-voltage (MV)	EPCG Distribution and other	01/04/2008	03/03/2010	█	█	█	█	█	█	█	█	█	█	█	█								
2. Introduction of a modern measuring system	EPCG Distribution and other	01/04/2008	31/12/2012	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
3. Works on low-voltage (LV) network	EPCG Distribution and other	01/04/2008	31/12/2012	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
4. Preparation and realisation of additional projects in relation to the Strategy	EPCG Distribution and other	01/01/2009	31/12/2012					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
5. Introduction of numeric technology in the MV network	EPCG Distribution	01/07/2009	31/12/2012							█	█	█	█	█	█	█	█	█	█	█	█	█	█
6. Legal-property issues	MED supported by EPCG Distribution	01/09/2008	31/12/2009	█	█	█	█	█	█	█	█												

**D. Financing**

Total estimated cost of the entire Project is EUR 491 million, and for 2008-2012 period EUR 100 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Reconstruction and construction of a distribution medium-voltage (MV) network	EPCG Distribution and other		7.000.000	7.000.000	8.000.000	5.000.000	6.000.000	33.000.000
2 Introduction of modern measuring system	EPCG Distribution and other		6.000.000	6.000.000	6.000.000	6.000.000	6.000.000	30.000.000
3 Works on low-voltage (LV) network	EPCG Distribution and other		2.000.000	6.000.000	7.000.000	7.000.000	7.000.000	29.000.000
4 Preparation and realisation of additional projects in relation to the Strategy	EPCG Distribution and other			1.000.000	1.000.000	1.000.000	1.000.000	4.000.000
5 Introduction of numeric technology in the MV network	EPCG Distribution			500.000	1.000.000	1.000.000	1.000.000	3.500.000
6 Legal-property issues	MED, supported by EPCG Distribution	Budget	250.000	250.000				500.000
		Grant						
		Loan						

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

Total (1-6)	15.250.00 0	20.750.00 0	23.000.00 0	20.000.00 0	21.000.00 0	100.000.00 0
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Distribution Network facilities are built for the following purposes: to support increased consumption, to create conditions for the market, to increase network safety, to maintain existing capacities, and to connect new energy sources.

For a detailed economic analysis, the extent of their effect on individual purposes should be known, which is not clear for the proposed facilities. For now, there are no key parameters regarding, for example, the value of undistributed energy. Therefore, economic analysis is based on investment possibilities. Energy distribution, including increased consumption calculated on the basis of given tariffs generate cca EUR 49 millions annually. Expenses, regular maintenance included, are EUR 23.5 million. Discount rate requires an 8% profit of EUR 4 million. EUR 21.5 million per year is left to EPCG Distribution for investment purposes, which covers planned investments (EUR 20 million annually on a 5-year average).

E. Environmental and social effect

Since these are transformation stations with 110 kV voltage level or less, the EIA procedure is not prescribed, however for power lines EIA procedure is necessary.

This Project improves safety and quality of electrical feeding for consumers over entire region of Montenegro.

### 10.3 CC 3: Designing a plan to mitigate climate change effects

#### 10.3.1 Project for energy inclusion in mitigation of global climate change effects in Montenegro

##### A. Programme/Project description

There is significant evidence on causes and effects of the climate change. Extensive efforts have been made worldwide to reduce negative impacts of human activities on the environment. In Montenegro, however, there are not quite sufficient data gathering activities for potential better analysis of these effects. Nevertheless, according to available regional and international studies, Montenegro would be seriously affected by the expected changes in the short-run as well as in the long-run.

A fact is that Montenegro lacks energy and that the energy industry is a major generator of climate change. For this reason energy industry should get involved in activities that are mitigating climate change, which could be done by intensifying the construction of renewable energy sources and reducing greenhouse gas emissions, by improving energy efficiency and reducing all other negative effects on the environment. The Strategy clearly describes current situation and presents a vision which explains how to behave in this situation, having in mind that the country has a significant hydro-energy potential (only 17% of theoretically available hydro-potential is exploited).

Project refers to the management of greenhouse gas emissions, their reduction and the use of hydro-energy potential aiming to adjust to the existing climate change and reduction of its effects.

##### B. Activity plan

	Activity description	Responsibility
1.	<p><b>Information-institutional framework</b></p> <p>Follow-up, reporting, gathering information and cooperation with responsible institutions on national, regional and international level related to the impact of energy on the climate change</p>	MED, MTEP
2.	<p><b>Management of greenhouse gas emissions</b></p> <p>Supporting standardised GHG emission registry by supplying them with data.</p> <p>Preparing a detailed plan to reduce GHG emissions in the electro-energy sector.</p> <p>Reducing GHG emissions at the site of big energy consumers.</p> <p>Reducing GHG emissions in transportation sector</p>	MTEP, greenhouse emissions generators MED, gas
3.	<p><b>Programme on adjustment</b></p> <p>Designing an overall Programme on adjustments to expected climate change and designing a detailed plan for water management in terms of combining energy production with reduction of climate change effects.</p>	MTEP, MED, WA

Programme will continue also beyond 31 December 2012; however, the activities, timeline and financing after that period are not defined yet.

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012							
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
1.	Information-institutional framework	MED, MTEP	01.01.2009	31.12.2012																								
2.	Management of greenhouse gas emissions	MTEP, MED, greenhouse gas emissions generators	01.01.2010	31.12.2012																								
3.	Programme on adjustment	MTEP, WA, MED	01.01.2011	31.12.2012																								

**D. Financing**

Estimated cost for period 2008 – 2012 is EUR 1 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
Information-institutional framework	MTEP, MED	Budget		50.000	50.000	50.000	50.000	200.000
		Grant		60.000	50.000	50.000	50.000	210.000
		Loan						
Management of greenhouse gas emissions	MTEP, MED, greenhouse gas emission generators	Budget						
		Grant			150.000	90.000	50.000	290.000
		Loan						
Programme on adjustment	MTEP, WA, MED	Budget						
		Grant				200.000	100.000	300.000
		Loan						
Total P/P (1-3)				110.000	250.000	390.000	250.000	1.000.000

**E. Environmental and social effect**

During the preparation of documentation for individual projects (activities 2 and 3), EIA procedures need to be implemented.

Measures introduced within this Project are designed with a view to preparing measures for reduction of global climate change effects on Montenegrin territory and to monitoring and reduction of greenhouse gas emissions, thus indirectly affecting the quality of life (environment).

**10.4 CC 4: Creation of institutional framework and public involvement in the development of a competitive and market oriented energy sector**

**10.4.1 Programme for energy sector restructuring – market opening and social policy**

A. Programme/Project description

One of the Strategy objectives is to introduce electrical energy market to the energy sector. Critical prerequisites of this Programme are the following:

- Unencumbered preparation and adoption of necessary regulations that would accompany electric energy market liberalisation, the establishment and organisation of market operators and appropriate institutions and market participants. Some regulations have already been implemented, whereas others need to be amended.
- Improvement of the measuring system, in order to support the market introduction (activities have been undertaken as a part of distribution network recovery and expansion Project).

In line with the Energy Community South East Europe Treaty, liberalisation of the market for all non-household qualified consumers was planned for 1 January 2008. However, at the beginning of 2008, this deadline was prolonged to 1 July 2008, but Montenegro would still not be able to meet this deadline. Therefore, it is urgent to start activities that would assure market opening by 1 January 2009 the latest, the initial stage being for qualified consumers (around 250) with existing adequate measuring devices at 110 kV, 35 kV and 10 kV levels. The next step is to prepare load profile, to transfer other qualified consumers (somewhat less than 25.000) into the market that are to obtain the qualified consumer status by the 30 June 2009 at the latest. The final step of market opening is inclusion of households as well (by 1 January 2015, according to the Treaty).

Establishing a market requires adjusting electric energy prices to market conditions, which means their increase. Also, for the interim period a subvention plan for socially most endangered groups of consumers should be implemented. It is envisaged that the duration of the interim period is limited to 5 years, during which the number of required subventions should be reduced to the level which is covered by MHLSW regular Programmes.

B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<b>Market opening for qualified consumers with electricity meters (households excluded)</b> Market opening for qualified consumers with adequate electricity meters	REGAGEN, EPCG Transmission, Distribution, Supply
2.	<b>Market opening for the remaining qualified consumers (households excluded)</b> Market opening for the remaining qualified consumers, for whom adequate load profiles will be prepared	REGAGEN
3.	<b>Market opening for households</b> Final market liberalisation for all consumers, including households	REGAGEN
4.	<b>Plan for supporting socially most endangered consumer groups</b> Design and implement a support Plan for the most endangered consumer groups during the interim period, in order to prevent social and economic damage.	MHLSW, MED

C. Timeline

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Market opening for qualified non-household consumers with electricity meters	REGAGEN, EPCG	01.04.2008	31.12.2008	■	■	■	■																
2. Market opening for the remaining qualified non-household consumers	REGAGEN	01.01.2009	30.06.2010					■	■	■	■	■	■	■	■								
3. Market opening for households	REGAGEN	01.01.2011	31.12.2014													■	■	■	■	■	■	■	■
4. Plan for supporting socially most endangered consumer groups	MHLSW, MED	01.10.2008	30.09.2013					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

**D. Financing**

Total estimated costs of the Programme are EUR 11.9 million; estimated Programme costs for 2008-2012 period are EUR 10.8 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Market opening for qualified consumer with electricity meters (without households)	REGAGEN, EPCG		300.000					<b>300.000</b>
2. Market opening for the remaining qualified consumers (without households)	REGAGEN			400.000	200.000			<b>600.000</b>
3. Market opening for households	REGAGEN					100.000	300.000	<b>400.000</b>
4. Plan for support of socially most endangered consumer groups	MHLSW, MED	Budget	1.000.000	1.400.000	1.400.000	1.500.000	1200.000	<b>6.500.000</b>
		Grant		750.000	600.000	400.000	250.000	<b>2.000.000</b>
		Loan		250.000	400.000	100.000	250.000	<b>1.000.000</b>
<b>Total P/P (1-4)</b>			<b>1.300.000</b>	<b>2.800.000</b>	<b>2.600.000</b>	<b>2.100.000</b>	<b>2.000.000</b>	<b>10.800.000</b>

Total costs include: market opening EUR 1.9 million, plan for supporting socially most endangered consumer groups EUR 10 million, funds by 2012 for market opening EUR 1.3 million and for support plan EUR 9.5 million. The estimated cost of opening the market does not include REGAGEN operative expenses and funds for meters and other technical equipment.

**E. Environmental and social effect**

Having in mind the planned Programme activities related primarily to energy sector market opening, the SEA is not needed.

The Programme shall bring about market changes and a market model that is more cost defined shall be established, which will decrease energy price distortions. Furthermore, electricity prices



will rise, which will have significant social effect. This influence will be reduced by implementing the plan for supporting socially most endangered consumers.

## 10.4 CC 4: CREATION OF INSTITUTIONAL FRAMEWORK AND PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF A COMPETITIVE AND MARKET ORIENTED ENERGY SECTOR

### 10.4.2 Programme for the energy sector public relations

#### A. Programme/Project description

Energy sector development is crucial for the development of the society and the state. It is logical that the decisions related to this sector are made by the general consensus of the society. However, the decisions that need to be made are very proficient and therefore require experts to make them. It is therefore necessary to establish a continuous and an honest two-way communication between the public and the decision makers, to assure exchange of opinions and relevant information between these groups and to make decisions which reflect public opinion.

Experience of other countries with similar history has shown that often not enough energy is put into public relations, which leaves plenty of room for speculations. Public relations are needed to support Strategy implementation. The Programme consists of activities which are designed to inform the public on relevant problems and plans regarding the implementation of the Strategy and to gather public reactions and opinions on those issues. Therefore, a two-way communication is the aim of these activities. Having in mind that the level of public relations is low in this area, it is necessary to start activities pertaining to the realisation of this Programme as soon as possible.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Organising and preparing activities</b> Creating a team of experts that would realise this Programme and coordinate all activities with the interested parties, including EPCG and other energy sector companies.	MED, EPCG and other
2.	<b>Informing the public</b> A web page will be created to inform the public and receive feedback information through a forum; it will contain data on ecological parameters related to energy generation, delivery and promotion of clean energy and its introduction onto the market.	MED, EPCG and other
3.	<b>Gathering public opinion</b> Organising questionnaires and other activities on regular basis in order to gather public opinion and get its quantitative assessment.	MED, MONSTAT, supported by EPCG (all Ltd companies)
4.	<b>Communicating with the public</b> Press conferences on regular basis (every 1 or 2 months) and government officials press releases At least 3 round tables per year, on the state television, and even more within professional organisations and universities, also meetings with NGOs At least one highly expert article in newspapers per month, about problems regarding energy supply Organising actions which demonstrate environmental orientation of the energy sector (disposing communal waste and the like)	MED with EPCG support (all Ltd companies), CANU and University of Montenegro

The Programme will continue to exist after 31 December 2012; however, the activities, the timeline and financing after this period are not yet defined.



Having in mind the planned Programme activities, which primarily refer to communication with the public, questionnaires and the like, SEA is not needed.

Intensive public relations can increase public trust in the authorities and in energy development Programmes and Projects and their better participation in the decision making. Otherwise, the Programme does not have other significant social effects.

## 10.4 CC 4: CREATION OF INSTITUTIONAL FRAMEWORK AND PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF A COMPETITIVE AND MARKET ORIENTED ENERGY SECTOR

### 10.4.3 Programme on education and training in energy and ecology

#### A. Programme/Project description

Considering the fact that the Constitution of Montenegro defines Montenegro as an ecological state and that the country is faced with the lack of significant amount of electric energy and other energy forms, it is necessary to pay special attention to the energy sector development in line with environmental protection. It is not possible to succeed or make any improvement without initiating a programme for education of the general public, which would also be included in the decision making process, along with the experts. The public should receive adequate training for it.

To that end, mandatory energy and ecology related Programmes will be introduced in primary and secondary technical schools. Students, especially the ones studying energy related disciplines, will be included as well, and great priority will be given to special courses for the public. UNESCO`s Global Renewable Energy Education and Training Programme (GREET) aims to contribute to the realisation of sustainable energy sector development through education and training. Implementation of this Programme in Montenegro would represent a vital contribution through the support of development of renewable energy sources. Apart from that, conventional energy sources, environmental protection, energy transformation technology, rational energy consumption and energy conservation are all set as major priorities which should be included in the education process. We are facing a trend which promotes the change in consumers` behaviour, from being `energy consumers` to being `the ones who are saving energy`. It is necessary to start the education process and training of pupils and students and to train the general public in energy related matters and the effects on the environment.

MES and the University of Montenegro, after having consulted MED and MTEP, will form a team that will prepare a proposal of primary and secondary school educational plans and programmes, as well as educational plans for one or more subjects, which are intended for the students at the faculties of the University of Montenegro.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Introduction of additional mandatory education</b>  Deciding on the introduction of mandatory education relative to energy and ecology into primary and secondary schools	MES and University of Montenegro, based on consultations with MED i MTEP
2.	<b>Teaching plans and teacher training</b>  Creation and adoption of teaching plans and courses for all educational levels. Establishing a financial framework for the realisation of all relevant activities. Training school teachers and professors in energy and ecology related subjects. Innovating courses for technical faculties at the University of Montenegro.	MES and University of Montenegro
3.	<b>Student books and promotional materials</b>  Creating and adopting books for primary and secondary school education on energy and ecology. Making brochures; promotion and other activities required for the education of general public.	MES and University of Montenegro, based on consultations with MED i MTEP
4.	<b>Additional education and training in schools</b>  Gradual introduction of additional education and training in schools (school year 2010/11).	MES
5.	<b>Demonstration centre at the University of Montenegro</b>  Building of demonstration centre for educational and training purposes, for promotion of energy preservation, Energy Efficiency Programmes, renewable energy sources and for presentation of the impact fossil fuels have on the environment.	University of Montenegro

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Introduction of additional mandatory education	MES and University of Montenegro, based on consultations with MED and MTEP	01.09.2008	31.12.2008																				
2. Teaching plans and teacher training	MES and University of Montenegro	01.01.2009	31.12.2010																				
3. Student books and promotional materials	MES and University of Montenegro, based on consultations with MED and MTEP	01.07.2009	31.12.2010																				
4. Additional education and training in schools	MES	01.07.2010	30.06.2011																				
5. Demonstration centre at the University	University of Montenegro	01.01.2011	31.12.2012																				

**D. Financing**

Estimated costs for this Programme during 2008 – 2012 period are EUR1.2 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Introduction of additional mandatory education	MES and University of Montenegro, based on consultations with MED and MTEP	Budget	50.000					50.000
		Grant	50.000					50.000
		Loan						
2 Teaching plans and teacher training	MES and University of Montenegro	Budget	50.000	50.000	50.000	50.000	50.000	250.000
		Grant	50.000	50.000	50.000	50.000	50.000	250.000
		Loan						
3 Student books and promotional materials	MES and University of Montenegro, based on consultations with MED and MTEP	Budget		50.000	50.000			100.000
		Grant		50.000	50.000			100.000
		Loan						
4 Additional education and training in schools	MES	Budget			50.000	50.000		100.000
		Grant			50.000	50.000		100.000
		Loan						
5 Demonstration centre at the University of Montenegro	University of Montenegro	Budget				50.000	50.000	100.000
		Grant				50.000	50.000	100.000
		Loan						

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

Total (1-5)	200.000	200.000	300.000	300.000	200.000	1.200.000
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E. Environmental and social effect

Having in mind the Programme activities planned, which primarily address the preparation of educational programmes and materials, SEA is not needed.

Educational Programme on energy and ecology should provide the public with the elementary knowledge in order to enable them to make decisions on problems regarding energy and the environment. Educational Programme must promote learning process with a view to better understanding of energy related issues.

## 10.4 CC 4: CREATION OF INSTITUTIONAL FRAMEWORK AND PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF A COMPETITIVE AND MARKET ORIENTED ENERGY SECTOR

### 10.4.4 Project for EPCG JSC restructuring and capital increase

#### A. Programme/Project description

One of the basic conditions in the EU for energy market introduction is the reorganisation of vertically integrated companies into companies that are unbundled functionally, managerially, legally, and some time later they will probably unbundle ownership, as well.

EPCG is organised into 5 corporate entities with limited responsibility: Transmission Ltd, Generation Ltd, Distribution Ltd, Supply Ltd and Elektrogradnja Ltd. EPCG transferred the ownership over appropriate assets to these new companies, itself remaining in charge of 'strategic activities and coordination'.

According to the data as of November 2007, the book value is around EUR992 million (in 1,139million shares at 8.7 EUR/per share).

Additional capital formation will consider a strategic partner with a long-term development interest and adequate knowledge (*Know-How*). With additional shares emission the ownership structure of EPCG JSC will be changed, so that the state share in the company would be reduced from the existing 70,59% to the minimum of 55%. Capital Increase Contract shall contain the Management Contract which will grant special rights to the strategic partner.

Strategic partner selection in process of capital increase will be harmonized with realization procedure of project of construction HPP Morača and Komarnica.

Reorganisation of EPCG JSC is performed in 3 phases, where the first phase, that is, the formation of 5 daughter limited liability companies (Ltd), is already finished.

Legal unbundling of a vertically integrated company shall be conducted in line with the second package of relevant EU Directives.

In second phase 2 (deadline: 31 December 2008) Transmission Ltd will leave EPCG and transform into independent joint stock company.

Ownership unbundling will also be realised in line with the proposed third package of EU Directives, and neither Generation nor Supply can be (majority) owners of Transmission JSC.

In phase 3: (deadline: 31 December 2009) the remaining 4 companies will be transformed into independent joint stock companies.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>EPCG JSC capital increase</b> Writing and invitation for tenders, evaluation and signing contract with strategic partner	MER
2.	<b>Phase 2: Transformation of Transmission Ltd into an independent JSC</b> Transmission Ltd will be transformed into an independent JSC which is legally unbundled from EPCG and become an independent transmission network operator.	EPCG Transmission



71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

C. Timeline

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	EPCG JSC capital increase	MED	01.01.2008	31.03.2008	■	■																		
2.	Phase 2: Transformation of Transmission Ltd into an independent JSC	EPCG Transmission	01.04.2008	31.12.2008		■	■	■																
3.	Phase 3: Transformation of the remaining four Ltd companies into JSC.	EPCG Generation, Distribution, Supply, Elektrogradnja	01.01.2009	31.12.2009					■	■	■	■												

D. Financing

Estimated Project costs for 2008-2012 are EUR1.55 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. EPCG JSc capital increase	MED		150,000	400,000				550,000
2. Phase 2: Transformation of Transmission Ltd into an independent JSC	EPCG Transmission		400,000					400,000
3. Phase 3: Transformation of the remaining four Ltd companies into JSC.	EPCG Generation, Distribution, Supply, Elektrogradnja			600,000				600,000
Total (1-2)			550,000	1,000,000				1,550,000

E. Environmental and social effect

Having in mind the activities planned, EIA procedure is not required.

The Project does not have any significant social influence.

**10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES**

**10.5.1 Programme for development of renewable energy sources (hydro potential excluded)**

**A. Programme/Project description**

In 2000-2004 period, Montenegro produced around 25% of primary energy from renewable sources on its territory, 23% of which from hydro and the remaining 2% from wood fuel, which is significantly above the EU average. However, Montenegro has much more unused potential of renewable sources, which could be exploited with reasonable investments.

Wind energy: There is a good potential for using wind energy on locations along the Adriatic coast. (hills close to Petrovac and mountains in the area between Herceg Novi and Oraovac). Another interesting area is near Nikšić. Total potential is estimated at 100 MW, while the Strategy envisages the construction of wind power plants with minimum output of 60 MW. In case of increased investors' interest, the Strategy allows bigger capacities and a faster development. The proposal is to establish a concession model of BOR or BOT type.

Solar energy: This potential is very significant and can be compared to the ones of Greece and Italy. Coastal and central zones are most attractive for the utilisation of solar energy due to high number of sunny hours (2,000 – 2,500 hours/per year).

Biomass: Annual yield of wood quantities, being the most important energy product of this kind, has been estimated at around 2.06 m<sup>3</sup>/ha per year, whereas the current wood consumption levels are estimated at 1.03 m<sup>3</sup>/ per year. Estimated yield of wood is between 850 thousand m<sup>3</sup>/per year and 1,060 thousand m<sup>3</sup>/per year, which represents a good potential for the use of biomass for energy production. In that case, forest owners should assure that there is sufficient amount of waste left in forests for natural fertilization purposes, and they should also address other issues that refer to maintaining and managing forests.

Municipal waste: For the territory of Montenegro, the annual quantity of solid municipal waste produced is estimated between 200.000 and 250.000 tons, which enables the construction of 3 to 5 industrial facilities for its incineration, depending on their capacity. Potential locations for these facilities are in the vicinity of bigger towns (Podgorica and Nikšić).

Programme objective is to gradually prepare detailed projects for specific RES. Moreover, the Programme should encourage and accelerate the construction of RES, stimulate economic growth, especially in rural parts of the country, and to improve the future of the country in terms of ecology. Decisions on the models of project implementation for specific RES should be established. Detailed measuring, studies and estimates are needed in order to prepare a development strategy for the use of all sorts of RES and determine micro locations for potential facilities.

**B. Activity plan**

Activity description		Responsibility
1.	<p><b>Wind</b></p> <p>Decision on the implementation model of projects for wind energy exploitation.</p> <p>Performing measurements and additional studies on the exploitation of wind energy.</p> <p>Preparation of tenders for new projects.</p> <p>Periodic innovations of the Programme in parts referring to the exploitation of wind energy.</p>	MED, private investors
2.	<p><b>Solar energy</b></p> <p>Creating regulations, promotion, informative campaign.</p> <p>The development study on the use of solar energy in Montenegro.</p> <p>Realisation of pilot projects with a view to acquiring knowledge regarding the exploitation of solar energy potentials and its promotion.</p> <p>Changes of legislation that will condition the issuing of a building permit in all tourist facilities with the submission of the exploitation of solar installations study.</p> <p>Stimulating the use of solar energy with passive and active solar architecture (solar collectors for heating, water preparation and other low temperature processes).</p>	CIEE, private investors

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

	Periodic Programme improvement in part referring to the exploitation of solar energy.	
3.	<p><b>Biomass</b></p> <p>Decision on the implementation model for projects on the exploitation of biomass energy. Creation of development studies in this field.</p> <p>Promotion of biomass exploitation for energy production.</p> <p>Periodic Programme improvement in part referring to the exploitation of biomass energy.</p>	MED, MAFWM, FA, private investors
4.	<p><b>Municipal waste</b></p> <p>Decision on the implementation model for projects on the exploitation of the energy from municipal waste.</p> <p>Creation of development studies in this field.</p> <p>Periodic Programme improvements in part referring to the exploitation of municipal waste.</p>	MED, private investors

Programme will continue after 31 December 2012. However, the activities, the timeline and financing for the following period have not yet been defined.

### C. Timeline

					2008				2009				2010				2011				2012			
Activity	Responsibility	Start	End		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Wind	MED, private investors	01.09.2008	29.06.2012																					
2. Solar energy	CIEE, private investors	01.09.2008	31.12.2012																					
3. Biomass	MED, MAFWM, FA, private investors	01.09.2008	01.07.2011																					
4. Municipal waste	MED, private investors	01.09.2008	31.12.2010																					

### D. Financing

Estimated cost of these activities in 2008-2012 period are EUR1.200.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Wind	MED	Budget	10.000	30.000	30.000	30.000	30.000	130.000
		Grant	10.000	20.000	20.000	20.000	20.000	90.000
	Private investors		10.000	10.000	10.000	10.000	40.000	
2 Solar energy	CIEE	Budget	20.000	30.000	30.000	30.000	30.000	140.000
		Grant		20.000	20.000	20.000	20.000	80.000
	Private investors	20.000	30.000	30.000	30.000	30.000	140.000	
3 Biomass	MED, MAFWM, FA	Budget	20.000	50.000	100.000	50.000		220.000
		Grant		20.000	40.000	40.000		100.000
	Private investors	20.000	20.000	20.000	20.000		80.000	
4 Municipal waste	MED	Budget	10.000	20.000	20.000			50.000
		Grant	10.000	40.000	40.000			90.000
	Private investors		20.000	20.000			40.000	
Total (1-4)			120.000	310.000	380.000	250.000	140.000	1.200.000

E. Environmental and social effect

For this Programme, the SEA procedure is required, whereas in case of some projects which stem from the Programme private investors must implement the EIA procedure.

A mass use of renewable energy sources can contribute significantly to the reduction of greenhouse gas emissions and their impact on the environment. On the other hand, it can make a considerable contribution in terms of municipal energy sector development and the creation of new jobs.

## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.2 Programme for hydro potential use

#### A. Programme/Project description

Water is one of the key factors in every country and society. The Strategy envisages increased energy production from renewable sources and the exploitation of hydro potential as the first choice, considering the fact that Montenegro has got a significant unused hydro potential. The use of water in the generation of electric power can reflect other areas of water exploitation, which means that the research of hydro potential must be coordinated. Global climate changes will affect water management area, and on the other hand, water management represents one of the most efficient mechanisms for diminishing impacts of climate change on the reserves of underground waters, on the micro climate change, etc. If carefully planned and constructed, energy generation hydro facilities can contribute to achieving the aforementioned effects. Therefore, it is necessary to continue studying and researching the possibilities to use hydro potentials on all Montenegrin water courses and to prepare new projects for the future.

Watercourses elaborated in the Strategy, demand special attention.

Čehotina: exploitation of hydro potential of river Čehotina is implied in the construction of HPP Gradac and HPP Milovci. The second power plant has got a relatively large accumulation which might contribute to water regulation of river Drina. For that reason, prior to the construction of these plants, it is necessary to prepare and sign an international agreement with Bosnia and Herzegovina on the use of hydro potential. Up to now, several researches have been finalised, preparatory activities need to be continued and field researches conducted in order to prepare studies, the basis for the spatial plan and conceptual design.

Piva: HPP Kruševo is planned as a compensation reservoir for HPP Piva. Searching for location should start, the study and the basis for the spatial plan and concept should be prepared in order to create conditions for realisation of the project after 2025. This power plant, on principle, improves the downstream water regime, so it is so not complicated in terms of international agreement with Bosnia and Herzegovina on hydro potential exploitation.

Trebišnjica: the preparation of the conceptual design for hydro potential exploitation of the Montenegrin part of lake Bilečko is underway. An international agreement about Trebišnjica watershed hydro potential distribution, between Bosnia and Herzegovina and Croatia needs to be reached, especially because of the unresolved issues concerning the construction of a hydro-energy system on the Trebišnjica river, in order to create conditions for realisation of project after 2025.

#### B. Activity plan

Activity description		Responsibility	
1.	<b>Preparation of new hydro-energy projects</b> Preparation of studies of Montenegro's hydro- energy potential, the result of which will be the determination of areas (water courses, watersheds), whose hydro potential could still be exploited in the future, and of those areas where this would not be possible from the economic viewpoint, environment protection and in terms of water exploitation. Based on the study , other prospective projects will be defined.	MED, WA	MAFWM,
2.	<b>HPP on the Čehotina river</b> Research, preparation of preliminary feasibility study and conceptual design, preparation of the basis for the spatial plan documentation. Preparation of the starting point for negotiations on the use of hydro-energy potential.	MED, WA	MAFWM,
3.	<b>HPP Kruševo</b> Research, preparation of preliminary feasibility study and conceptual design, preparation of the basis for the spatial plan documentation. Preparation of the starting point for negotiations on the use of hydro-energy potential.	MED, WA	MAFWM,
4.	<b>HPP Boka</b> Research, preparation of preliminary feasibility study and conceptual design, preparation of the basis for	MED, WA	MAFWM,



## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.3 Project of building small hydropower plants

#### A. Programme/Project description

Gross hydro-energy potential of small water courses is estimated between 800 – 1,000 GWh, 400 GWh of which is the estimated potential for the construction of SHPPs. This potential is significant enough and deserves serious consideration.

Estimated potential of SHHP is based on rather stable ecological and specific limitations which exist in a certain number of small water courses in Montenegro. Additional research is necessary to fully estimate the potential of SHPPs whose construction can realistically be expected. Effects of building and exploitation of SHPPs are still not sufficiently considered, but the construction of small HPPs could lead to the improvement of micro-climate, avoidance or mitigation of natural disasters and the increase of levels of surface waters. At the end of 2007, a tender for 42 water courses has been announced, and the government decided to award concession for 8 of them. This Project should result in exploitation of hydro potential of the part of remaining water courses with SHPP construction, in line with the general policy on water management.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Projects preparation</b> Gathering data and additional studies on possible locations for SHPPs.	MED
2.	<b>Determining building conditions</b> Determining hydrological, technical and ecological conditions for the construction of SHPPs on potential locations.	MAFWM, WA
3.	<b>Flow measurement</b> Flow measurement on potential SHPP locations in order to prepare technical conditions for the construction and optimum use of water flows.	Hydrological and Meteorological Service (HMS)
4.	<b>Tender and concessions</b> Preparation of conditions for construction, preparation and issuing of tender for concession rights and granting concessions to investors.	MED, MAFWM, WA
5.	<b>Project preparation and construction</b> Preparation of project documentation, obtaining permits and building of facilities	Private investors

The Programme will continue to exist after 31 December 2012. However, the activities and the timeline for the next period have not been defined yet.





Since the SHPP technology is simple, domestic companies can be involved, which would lead to new job openings for the local population.

**10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES**

**10.5.4 Project of using wind energy for electricity generation (Rumija)**

A. Programme/Project description

There is a good potential for using wind energy on locations along the Adriatic coast, and according to the Assessment of potentials of the renewable energy sources in the Republic of Montenegro (January 2007), the area of Rumija Mountain, between Bar and the Skadar Lake where the average wind speed is between 6-7 m/s, is the first choice for such a Project. There is an electro-energy network nearby, which simplifies the process of connecting to a network.

A construction of a 10 MW wind farm in the Rumija Mountain region is planned. The proposed model is BOR or BOT, and the decision should be made by the Government during 2008.

B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<b>Preparation of additional studies</b> For Rumija location, a micro – locations with strongest wind force should be determined.	MED
2.	<b>Conceptual design and spatial plan</b> Preparation of conceptual design for wind power plant and network connection, preparation of the basis for spatial plan documentation and the SEA.	MED
3.	<b>Tender and the concession</b> Preparation of construction conditions, preparation and issuing of tender for concession rights and granting concessions to the investor.	MED
4.	<b>Design and construction</b> Preparation of project documentation, obtaining permits and wind power plant construction.	Private investor

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	Preparation of additional studies	MED	01.09.2008	31.12.2008																				
2.	Conceptual design and spatial plan	MED	01.10.2008	30.06.2009																				
3.	Tender and concession	MED	01.01.2009	31.12.2009																				
4.	Design and construction	Private investor	01.01.2010	31.12.2012																				

**D. Financing**

Estimated Project costs for 2008-2012 period are EUR10 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Preparation of additional studies	MED	Budget	50.000					50.000
		Grant	350.000	50.000				400.000
		Loan						
2. Conceptual design and spatial plan	MED	Budget		300.000				300.000
		Grant	50.000	100.000				150.000
		Loan						
3. Tender and concession	MED	Budget			100.000			100.000
		Grant						
		Loan						
4. Design and construction	Private investor			3.000.000	3.000.000	3.000.000	9.000.000	
Total (1-4)			450.000	450.000	3.100.000	3.000.000	3.000.000	10.000.000

**E. Environmental and social effect**

During the preparation of special plan documentation, SEA procedure is required, whereas during the project documentation preparation, the investor must perform EIA.

A mass use of renewable energy sources can contribute significantly to the reduction of greenhouse gas emissions, which cause greenhouse effect, and thus reduce the influence of the energy sector on the environment. Nevertheless, renewable energy sources themselves have certain (minor) harmful effects.

Introduction of renewable energy sources can make a considerable contribution in terms of municipal energy sector development and the creation of new jobs.

## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.5 Project of using biomass for heat and electricity cogeneration

#### A. Programme/Project description

It is envisaged to speed up the construction of facilities using the biomass, in line with the Strategy and in accordance with the interests of potential investors and the Government. Role of the Government is to promote this type of energy generation in Montenegro and assist in finding the location and potential partners, especially if such exist in the public sector.

According to the study – The assessment of potentials of the renewable energy sources in the Republic of Montenegro (January 2007), Berane area has the most potential, and to that end the construction of first such facility is planned there.

#### B. Activity plan

Activity description		Responsibility
1.	<b>Preparation of the study</b> Preparation of the Feasibility Study regarding local conditions in terms of the economic potential of biomass exploitation in specific project variants.	MED, FA
2.	<b>Deciding on the location and conceptual design</b> Finding location with adequate heat energy consumption within the existing facilities, finding investors, preparing the conceptual design, contracting.	MED, FA, potential investors
3.	<b>Design and construction</b> Preparing project documentation, obtaining permits and construction of a combined biomass power plant of 2-3 MW for heat and electricity.	Investor

#### C. Timeline

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Preparation of the study	MED, FA	01.01.2009	31.12.2009					■	■	■	■												
2. Deciding on the location and conceptual design	MED, FA, potential partners/investors	01.01.2010	30.06.2011									■	■	■	■	■	■	■	■				
3. Design and construction	Investor	01.07.2011	31.07.2013																	■	■	■	■

#### D. Financing

Total estimated Project costs are EUR3.8 million, and estimated Project costs for 2008-2012 period are EUR3,5 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Preparation of the study	MED, FA	Budget		50.000				50.000
		Grant		50.000				50.000
		Loan						
2 Deciding on the location	MED / FA	Budget			30.000	60.000		90.000

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

and conceptual design	Grant			50.000			50.000
	Potential partners / investors				60.000		
3 Design and construction	Investor				1.200.000	2.000.000	3.200.000
Total (1-3)			100.000	80.000	1.320.000	2.000.000	3.500.000

**E. Environmental and social effect**

During the preparation of Project documentation, the investor must perform EIA procedure.

Generating electricity from biomass contributes to the development of municipal energy sector and regional economy, and it reduces and distributes the environmental effects of energy production in a more acceptable manner. In addition, it creates new jobs and improves local infrastructure.

## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.6 Project of using municipal waste for heat and electricity cogeneration

#### A. Programme/Project description

First power plant of 10 MW capacity is planned on the territory of Podgorica municipality. This power plant will be realised within the public company in charge of waste collection, which has got raw materials base, as well as an organized dump and a relatively good waste treatment system which is necessary for this kind of facility.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Designating person responsible for realisation</b> Decision, putting Podgorica municipality and its Public Utility Services in charge of Project realisation.	MED
2.	<b>Research activities</b> Realisation of research activities regarding the micro locations and the capacity of the facilities,	Podgorica municipality
3.	<b>Adaptation of waste treatment system</b> Adapting the waste collection, treatment and disposal system for the combustion process.	Podgorica municipality, Public Utility Services
4.	<b>Design and construction</b> Preparing project documentation, obtaining permits and construction of a combined waste power plant (for heat and electricity).	Podgorica municipality, Public Utility Services

#### C. Timeline

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Designating person responsible	MED	01.10.2009	31.03.2010																				
2. Research activities	Podgorica municipality	01.01.2010	31.12.2014																				
3. Adaptation of waste treatment system	Podgorica municipality, Public Utility Services	01.01.2012	31.12.2016																				
4. Design and construction	Podgorica municipality, Public Utility Services	01.01.2014	31.12.2016																				

#### D. Financing

Total estimated Project costs are EUR 32 million, and estimated costs for the 2008-2012 period are EUR 580.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Designating person responsible for realisation	MED	Budget		30.000	10.000			40.000
		Grant						
		Loan						
2 Research activities	Podgorica municipality			80.000	80.000	80.000	240.000	

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

3 Adaptation of waste treatment system	Podgorica municipality, Public Utility Services						300.000	300.000
4 Design and construction	Podgorica municipality, Public Utility Services							
Total (1-4)					90.000	80.000	380.000	580.000

**E. Environmental and social effect**

Waste power plants significantly reduce risks associated with waste disposal and corresponding environmental effects, but can be a source of bad smell due to evaporation of the organic mixture (VOC), Nox, Sox, PCBs and dust.

During the adoption of the spatial plan documentation, the SEA is required, and the investor must perform EIA during the Project documentation preparation phase.

Apart from the positive influences on the environment, this Project does not have a significant social impact.

## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.7 Project of building HPP Komarnica

#### A. Programme/Project description

River Komarnica, tributary of the Piva River, has got a big hydro-energy potential which needs to be optimally used with the construction of the dam in Lonci, 45 km upstream of HPP Piva. The study of the dam profile solution for the selected location has already been prepared, as well as the project documentation for research activities, with reports on activities performed up to now. At presents, research activities are underway, aiming to gather basis for the conceptual Project document and the Feasibility Study.

The construction of HPP Komarnica is included in Montenegrin spatial and waterpower engineering plans, so there are no obstacles for its realisation. The Project covers only uninhabited and infertile areas, and it does not endanger industrial capacities, roads, fields and households, and the accumulation would flood the inaccessible Komarnica canyon. Entire infrastructure has to be built on site (roads, water supply, electro-energy network connection).

Begining of prequalification procedure of construction HPP Komarnica will be harmonized with strategic partner selection in process of capital increase of EPCG.

Basic technical information: elevation 816 m asl, net fall 153 m, installed flow 130 m<sup>3</sup>/s, installed aggregate power 2x84 MW (2x97 MVA), average annual electricity generation 231,8 GWh. A 176 m high concrete arch dam is planned with a 177 m long crown, which would create a reservoir of 260 mil. m<sup>3</sup> of total volume and 160 mil. m<sup>3</sup> of usable volume. A power line should be built to connect to the 110 kV transmission network.

It is suggested that the implementation model of the Project is realised within the EPCG, since the planned HPP Komarnica is hydraulically connected to the existing HPP Piva, which is already the property of EPCG. Furthermore, EPCG has already finished some preparatory activities. EPCG could finance this Project from own resources and from commercial loans. If this is not enough, EPCG could enter a strategic partnership between the public and the private sector. The State should keep at least 51% ownership in this power plant.

It is recommended that the concession for the construction is given based on negotiations (authorisation).

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Preparatory phase</b> Finalisation of research activities, creation of the conceptual project for the power plant an network connection, feasibility study	EPCG Generation
2.	<b>Implementation model</b> The Government needs to decide on the implementation model	MED
3.	<b>Spatial plan and SEA</b> Preparation of basis for spatial plan documentation and a detailed spatial plan and SEA are made	MED
4.	<b>Concession</b> Procedure for granting of the concession	MED, MAFWM, WA
5.	<b>Building permit</b> Obtaining the building permit, study on environmental impact on the environmet.	Concessionaire
6.	<b>Construction</b> Preparation of project documentation, building of the power plant and the power line.	Concessionaire



**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

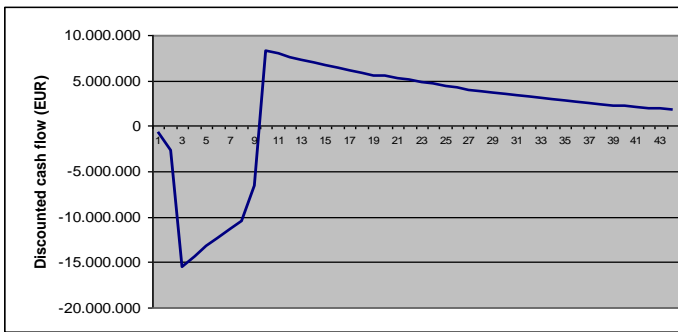
**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1 Preparatory phase	EPCG Generation	01/04/2008	31/12/2008	■	■	■	■																
2 Implementation model	MED	01/09/2008	01/01/2009		■	■	■																
3 Spatial plan and SEA	MED	01/12/2008	28/09/2009			■	■	■	■	■	■												
4 Concession	MED, MAFWM, WA	01/06/2009	30/09/2009					■	■	■	■												
5 Building permit	Concessionaire	01/10/2009	31/03/2010							■	■	■	■	■									
6 Construction	Concessionaire	01/04/2010	31/12/2016									■	■	■	■	■	■	■	■	■	■	■	

**D. Financing**

Total estimated Project costs are EUR 134.1 million, and estimated Project costs for the 2008-2012 period are EUR 53.6 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Preparatory phase	EPCG Generation		1.400.000					1.400.000
2 Implementation model	MED	Budget	150.000					150.000
		Grant						
		Loan	500.000	800.000				1.300.000
3 Spatial plan and SEA procedure	MED	Budget	150.000	150.000				300.000
		Grant						
		Loan	1.000.000	1.000.000				2.000.000
4 Concession	MED, MAFWM, WA	Budget		650.000				650.000
		Grant						
		Loan						
5 Building permit	Concessionaire		500.000	500.000			1.000.000	
6 Construction	Concessionaire			1.000.000	20.000.000	20.000.000	50.000.000	
<b>Total (1-6)</b>			<b>3.200.000</b>	<b>3.100.000</b>	<b>10.500.000</b>	<b>20.000.000</b>	<b>20.000.000</b>	<b>56.800.000</b>



Results of economic analysis: NPV= EUR 65 million, IRR=12%

Economic analysis indicates the profitability of the Project. The profitability will increase in the future due to higher prices of electricity.

#### E. Environmental and social effect

During the preparation of spatial plan documentation, the SEA is required, and the investor must perform EIA during the Project documentation preparation phase.

The Project assumes building of a new infrastructure in local-regional community and hiring new labour. In the construction stage, additional hiring of local population is expected. The accumulation will create possibilities for the development of additional activities in this area.

## 10.5 CC 5: DEVELOPMENT AND EXPLOITATION OF RENEWABLE ENERGY SOURCES

### 10.5.8 Project of building HPP on the Morača river

#### A. Programme/Project description

For the exploitation of available hydro potential of the Morača river, building of a cascade with four HPPs on the main course: HPP Andrijevo, HPP Raslovići, HPP Milunovići and HPP Zlatica is planned. For all HPPs an investment-technical documentation has been prepared, at the level of the conceptual design (1987), the Programme for geological, geo-mechanical and geo-physical research activities, Main projects for dams and decant tunnels, the Actualization of investment – technical documentation (1977), etc.

Construction of a HPP on the Morača River is included in the Montenegrin spatial and waterpower engineering plans, so there are no obstacles standing in way of Project realisation. Entire infrastructure needs to be constructed on site (roads, water supply, connection to electric network). In addition to previously stated, replacements on existing infrastructure and some facilities has to be done, since the Project realisation, among other things, sinks a part of the main road towards the north of Montenegro.

Begining of prequalification procedure of construction HPP on the Morača river will be harmonized with process of capital increase of EPCG.

Basic technical information: HPP Andrijevo, as the head accumulation with a dam 35 km from Podgorica, is the most significant object which enables seasonal flow levelling, reduction of flooding waves and increase of low water levels of the Morača River, which contributes to the rational production of all downstream HPPs and improves ecological situation. All four HPPs are of near the dam type, with two aggregates each, and the possibility of third aggregate instalment.

Facility	Elevation m asl	Usable volume. Hm <sup>3</sup>	Installed flow m <sup>3</sup> /s	Installed power MW	Annual generation GWh	Construction costs mil. EUR
Andrijevo	285	249	120	127,4	318,6	194,9
Raslovići	155	7,8	120	37	106,9	73,5
Milunovići	119	6,8	120	37	117,2	77,0
Zlatica	81	13	120	37	151,0	84,7
Total HPP on the Morača river				238,4	693,7	430,1

Next to the power plants, power lines also need to be constructed to connect with the network.

For Project realisation, BOT model is advised.

#### B. Activity plan

Activity description		Responsibility
1.	<b>Preparatory phase</b> Preparation of the conceptual project for network connection.	MED, MAFWM, WA
2.	<b>Implementation model</b> The Government needs to decide on the implementation model	MED
3.	<b>Spatial plan and SEA</b> Basis for spatial plan documentation, a detailed spatial plan and SEA	MED
4.	<b>Tender preparation, tender and concession</b> Preparation and issuing of tender, procedure for granting of the concession is implemented	MED, MAFWM, WA

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

5.	<b>Building permit</b> Obtaining the building permit, EIA elaboration	Concessionaire
6.	<b>Construction</b> Preparation of project documentation, building of the power plant and the power lines.	Concessionaire

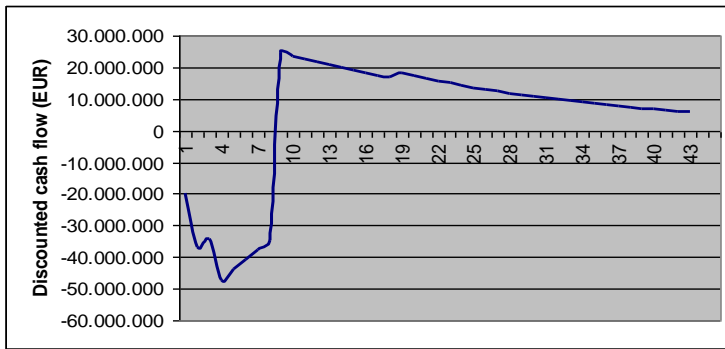
### C. Timeline

Activity	Responsibility	Start	End	2008			2009			2010			2011			2012			
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
1. Preparatory phase	MED, MAFWM, WA	01/04/2008	31/12/2009	■	■	■	■	■	■										
2. Implementation model	MED	01/09/2008	31/12/2008	■	■	■													
3. Spatial plan and SEA	MED	01/09/2009	01/07/2010				■	■											
4. Tender preparation, tender and concession	MED, MAFWM, WA	01/01/2009	30/06/2010				■	■	■	■	■								
5. Building permit	Concessionaire	01/07/2010	31/03/2011									■	■	■	■	■	■	■	■
6. Construction	Concessionaire	01/01/2011	30/06/2019																■

### D. Financing

Total estimated Project costs are EUR 430 million, and Project costs for the 2008-2012 period are estimated at EUR 138 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1 Preparatory phase	MED, MAFWM, WA	Budget	100.000	200.000				300.000
		Grant						
		Loan	1.100.000	2.000.000				3.100.000
2 Implementation model	MED	Budget	100.000					100
		Grant						
		Loan	200.000					200.000
3 Spatial plan and SEA	MED	Budget		70.000	70.000			140.000
		Grant						
		Loan		80.000				80.000
4 Tender preparation, tender and concession	MED, MAFWM, WA	Budget		200.000	160.000			360.000
		Grant						
		Loan		1.000.000	720.000			1.720.000
5 Building permit	Concessionaire			1000.000	1.000.000		2.000.000	
6 Construction	Concessionaire				60.000.000	70.000.000	130.000.000	
Total (1-6)			<b>1.500.000</b>	<b>3.550.000</b>	<b>1.950.000</b>	<b>61.000.000</b>	<b>70.000.000</b>	<b>138.000.000</b>



Results of economic analysis:  
NPV=EUR 180 million, IRR=11,3%

Economic analysis indicates profitability of this Project. The profitability will further increase by higher prices of electric power.

#### E. Environmental and social effect

During the preparation of spatial plan documentation, the SEA is required, whereas in case of project documentation preparation, the concessionaire must elaborate environmental impact assessment.

The Project assumes building of a new infrastructure in local-regional community and hiring new labour. Possibilities for tourism around the accumulations are created, fishing and sailing possibilities, supply of drinking water, in-house business opportunities and improving ecological situation downstream of Podgorica when the water levels are low and when waste waters are released.

## 10.6 CC 6: INCREASE CLEANER ENERGY PRODUCTION FROM FOSSIL FUELS

### 10.6.1 Project of TPP Pljevlja II with heating system for town of Pljevlja

#### A. Programme/Project description

Building of the second block of TPP Pljevlja II was planned during the construction the first block, but was not realised. Several facilities have already been built for Block II, within building of Block I: technical water supply from Otilovići reservoir, location, dump and coal storage, heavy oil fuel storage, chimney, electrolyses station, demineralisation and auxiliary facilities. Installed power of Block II is 1x225 MW, and projected annual electricity generation is 1.300 GWh.

During the construction of TPP Pljevlja II, the heating system for town of Pljevlja is also planned in order to increase efficiency and reduce environmental pollution caused by the existing coal boilers. To that end, the municipality is going to establish a public company that would be in charge of town's heating system. Within building of Block II, a heating generation system on the location, main line and primary distribution line to the substations, a pump station and a boiler for reserve and peak load will be built, whereas the substations and distribution network are the responsibility of Pljevlja municipally.

Also, additional investment in the Coal Mine is required in order to increase production capacity and enable both blocks to function simultaneously. Practically, the Coal Mine production should be doubled.

The proposed Project significantly influences the energy balance of Montenegro and it also significantly contributes to the reduction of pollution in Pljevlja and to the energy efficiency and quality of living improvement. Hence, this Project is the first priority of the Strategy and AP.

In order to avoid vagueness regarding coal value, to achieve more optimized techno-economic processes in the supply-chain, from coal excavation to electric power distribution, to achieve adequate and coordinated investing and greater financial and market strength, EPCG Generation Ltd and RUP are expected to form a joint company as the best solution for both partners. The set-up of one single company should be relatively prompt, otherwise all the major investments to facilities that generate and still use coal from RUP remain much less attractive for investors due to aforementioned technical-economical uncertainties.

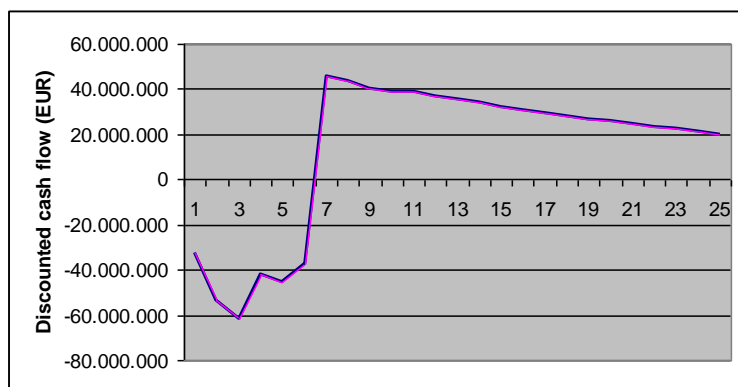
Both revitalization of TPP Pljevlja I and construction of TPP Pljevlja II with accompanying investment to RUP should be done simultaneously, therefore the implementation model and financial plan should be adjusted to take this into account. For technical reasons, TPP Pljevlja I, Pljevlja II must form a single organizational entity together with RUP.

#### B. Activity plan

	Activity description	Responsibility
1.	<p><b>Preparatory phase</b></p> <p>Decision regarding the Project implementation model</p> <p>Finding a strategic partner</p> <p>Preparation of basis for spatial plan documentation and SEA performing</p>	MED
2.	<p><b>Building of TPP Pljevlja Block II</b></p> <p>Feasibility study, along with the conceptual design</p> <p>Preparation of project documentation, EIA study</p> <p>Building permit, building of Block II, building of a new dump for Block II</p>	EPCG Generation
3.	<p><b>Heating system</b></p> <p>Feasibility study, along with the conceptual design</p>	EPCG Generation, Pljevlja Municipality



71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012



Total costs comprise of: building of TPP Plevlja Block II is estimated at EUR 175 million, according to Coal Mine Plevlja, costs of increasing of mine capacity are estimated at EUR 68.61 million, costs of building of heating system are estimated at EUR 20 million.

Results of economic analysis:  
NPV=EUR 328.5 million, IRR=17%

Results of economic analysis indicate

solid and relatively high profitability, which will further increase due to higher electricity prices.

E. Environmental and social effect

During the preparation of spatial plan documentation, the SEA is required, and the investor must prepare the EIA study (for activity 2) during the project documentation preparation phase or implement the EIA procedure (for activities 3 and 4). Due to the fact that the Project is to be carried out parallel to the Project of revitalization of TPP Pljevlja I, SEA should be done for both Projects jointly.

TPP Plevlja II will create new jobs in the Mine and in the power plant, and during the construction phase as well. This investment will, along with the rehabilitation of TPP Pljevlja I and the coal mine, significantly improve ecological situation in the Pljevlja region and thus make a positive social impact, as well.



## 10.6 CC 6: INCREASE CLEANER ENERGY PRODUCTION FROM FOSSIL FUELS

### 10.6.2 Project for LNG terminal close to town of Bar

#### A. Programme/Project description

Natural gas is one of the purest and safest fossil fuels. Liquefied natural gas (LNG) has been safely transported for more than 45 years all over the world. It is delivered in specially designed and constructed tankers. Building a LNG terminal might contribute to a huge change in the Montenegrin energy sector and significantly help reduce electricity generation deficit, as well as strengthen Montenegro's role in the energy sector in the region. Detailed Project economic feasibility studies have to be prepared. The concept lies on these preconditions:

1. Construction of the Adriatic – Ionic gas pipeline is planned to commence in the following three – four year period.
2. Preliminary analyses assume the construction of LNG terminal near the town of Bar, along with a TPP of 1,200 MW that would be built in the immediate vicinity.
3. Natural gas deposits in Montenegrin underwater regions have a very valuable growth potential.
4. Plans of Gasprom and the Russian Government with Bulgaria and Serbia refer to the building of a gas pipeline in the region, a gas transportation line between Serbia and Montenegro is expected.

Projects mentioned herein have reached various implementation phases. It is important to observe that a LNG re-gasification terminal with a 3,5 Mtpa capacity, a thermal power plant in its vicinity and the supporting infrastructure all make sense in relation to those projects. Commercial activities will be synchronized with the completion of the Adriatic – Ionic pipeline. Project location is envisaged to be near the town of Bar, close to the existing port facilities. LNG terminal consists of three basic components: ship unloading area, area for LNG storage tanks and re-gasification complex (evaporation area). Along with the terminal, a 1200 MW power plant would be built together with the transmission network for connecting the power plant to the electro-energy system, which would make the entire process energy efficient.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Studies</b> Preparation of preliminary study of feasibility and conceptual design (LNG terminal, a 1200 MW power plant with transmission network), studies related to connecting to prospective gas networks	MED, EPCG Transmission
2.	<b>Spatial plan and SEA</b> Preparing of basis for spatial plan documentation and SEA	MED
3.	<b>Tender and Concession</b> Preparation and issuing of Tender, procedure for granting of the concession is implemented	MED
4.	<b>Building permit</b> Preparation of the conceptual project, obtaining building permit, EIA	Concessionaire
5.	<b>Construction</b> Preparation of project documentation, building the terminal with a power plant and power lines for connecting to the network	Concessionaire



## 10.6 CC 6: INCREASE CLEANER ENERGY PRODUCTION FROM FOSSIL FUELS

### 10.6.3 Project of gas system for town of Podgorica with the gas distribution network

#### A. Programme/Project description

Using electricity for heating purposes is common in Montenegro, but this is not an efficient way of using energy resources. Converting to liquefied petroleum gas (LPG), and subsequently to the natural gas exploitation would improve the efficiency of primary energy use and reduce household heating expenses. Gasification should start in bigger towns first, due to large concentration of consumers.

It is estimated that in the town of Podgorica first the mixed LPG gas will be used, and later it will be replaced by the natural gas, with the construction of a high compression mixing station. Construction of two mixed LPG production lines is planned, each with capacity of 5.000 m<sup>3</sup>/per hour. The first should be constructed in the first year of construction, the second in the eleventh year. To support the system, two storage units are planned, one of 1.000 m<sup>3</sup> capacity has already been finished, whereas the second one, whose capacity is 600 m<sup>3</sup>, will be built in the twelfth year. It is planned that the households will be connected at the annual rate of 3% until the coverage of 30% is reached, while the dynamics of connecting apartments will be twice as slow, with maximum of 15% connected. Total length of the distribution network for the town of Podgorica, being one distribution area, will be 344.8 km of street pipelines.

The BOT model is suggested for the implementation, whereas the Project realisation is the responsibility of Podgorica municipality.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Nomination of responsible authority for realisation</b> Decision to assign Podgorica Municipality for Project realisation. Decision on the implementation model	MED
2.	<b>Plan for gas market deregulation</b> Preparation of the market deregulation plan, that should be entirely liberalised by 1 January 2015, the latest	REGAGEN
3.	<b>Preparation phase</b> Preparation of feasibility study and conceptual project	REGAGEN
4.	<b>Tender and concession</b> Preparation and issuing of Tender, procedure for granting of the concession is implemented	Podgorica Municipality
5.	<b>Construction of gas system network</b> 1. Phase: <ul style="list-style-type: none"> <li>• Preparing documentation, implementation of EIA procedure and obtaining of building permit,</li> <li>• Building the first high compression mixing line,</li> <li>• The existing storage capacity put into operation,</li> <li>• Building primary gas system with all necessary technical elements.</li> </ul> 2. Phase: Building of secondary gas network and connecting consumers at a 3% annual rate 3. Phase: building the second high compression mixing line 4. Phase: building of an additional storage facility	Concessionaire



## 10.7 CC 7: Create the basis for long-term energy industry development in Montenegro

### 10.7.1 Programme of oil and gas exploration in mainland

#### A. Programme/Project description

Geological oil explorations in Montenegro's mainland started in 1949 in Crmnica and Ulcinj area. They were instigated by the appearance of bitumen and gas in Crmnica, whereas a geological analysis indicated that Ulcinj region is structurally autochthonous territory with many clearly defined anticlines and synclines. Between 1949 and 1966, 16 wells (900 – 4,600 m) were explored and geomagnetic and gravimetric maps of Montenegro were charted, and around 800 km of reflective seismology. Between 1973 and 2002, not only that 1,220 km of modern reflective seismic surveys were made, but also explorations of UK-1 well at the depth of 5,309 m. In addition, numerous studies, analyses and detailed expert reports have been prepared. All this data represent a well grounded basis for further research. Continental flanks are much less explored than the underwater ones and the structural – tectonic relations are more complex. This fact implies the need for intensive exploration programmes.

A new Law on Oil and Gas Exploration and Production is underway, which will direct new distribution of blocks on the mainland (maximum 1,000 km<sup>2</sup> per block) and underwater (maximum 1,500 km<sup>2</sup>). The new Law also allows granting concessions for up to 2 years for exploration. Since the mainland is not that well explored, this option will be selected before the concession for production is granted. The production concession covers exploration (up to 4 years), verification (up to 2 years), engineering (up to 2 years) and production (up to 12 years).

#### B. Activity plan

	Activity description	Responsibility
1.	<b>New distribution of blocks</b> New distribution of blocks in line with the new Law on Oil and Gas Exploration and Production.	MED
2.	<b>Tender for exploration</b> Preparing tender for concession granting for the first group of blocks, performing of tender procedure, selection of concessionaire and granting of concession	MED
3.	<b>Exploration</b> Explorations on the blocks.	Concessionaire
4.	<b>Tender for production</b> Preparing the tender and granting concession for the first group of blocks and for exploration of remaining blocks, performing of tender procedure, selection of concessionaire and granting of concession	MED
5.	<b>Preparatory production-related activities</b> Further explorations, drilling and verification of stocks, as well as prospective preparations for the production.	Concessionaire

#### C. Timeline

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	New distribution of blocks	MED	01.10.2008	30.12.2008																				
2.	Tender for exploration	MED	01.01.2009	31.12.2009																				
3.	Exploration	Concessionaire	01.01.2010	31.12.2011																				
4.	Tender for production	MED	01.01.2011	31.12.2011																				
5.	Preparatory production activities	Concessionaire	01.01.2012	31.03.2019																				

**D. Financing**

Estimated cost for the Project for one block are EUR 25 million, estimated cost for the Project for the period 2008 – 2012 are EUR 5.01 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. New distribution of blocks	MED	Budget	50.000	20.000				70.000
		Grant	100.000	100.000				200.000
		Loan	200.000	200.000				400.000
2. Tender for exploration	MED	Budget		120.000				120.000
		Grant		100.000				100.000
		Loan		200.000				200.000
3. Exploration	Concessionaire			200.000	1.400.000		1.600.000	
4. Tender for production	MED	Budget				120.000		120.000
		Grant				100.000		100.000
		Loan				300.000		300.000
5. Preparatory production activities	Concessionaire					1.800.000	1.800.000	
<b>Total (1-5)</b>			<b>350.000</b>	<b>740.000</b>	<b>200.000</b>	<b>1.920.000</b>	<b>1.800.000</b>	<b>5.010.000</b>

**E. Environmental and social effect**

During the preparation of spatial plan documentation the preparation of SEA is needed, and during the preparation of Project documentation for explorations, the concessionaire must implement the EIA procedure.

Programme does not have significant direct social influence, but finding of oil and gas reserves would accelerate intensive economic development.

## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.2 Programme of international agreement on the use of hydro-energy potential

#### A. Programme/Project description

When talking about significant water resources in Montenegro, one should bear in mind that waters that come from the upstream countries make only 5%, whereas the remaining 95% of total water outflow belongs to waters that originate in Montenegro. In this respect, Montenegro is unique in relation to other countries in the SEE region, and it also represents Montenegro's significant comparative advantage. However, it should be emphasized that the water regimes are very imbalanced, which qualifies them as one of the least favourable in Europe, when analysing this imbalance over a period of time. Exploitation of available water resources (hydro potentials, human consumption, agriculture, tourism, etc), with prevention of floods and uncontrolled damages, mitigation of climate change etc., is the key development issue in Montenegro. Developing potentials within the sustainable development scenario to their fullest, requires international memorandums on the issue of distribution of water rights with all neighbouring countries (Albania, Croatia, Bosnia and Herzegovina, and Serbia), with earlier conclusion of corresponding memorandums. Having concluded these memorandums (already signed with Croatia and Albania), interested parties form a joint commission (parity-based), with an option which allows the commission to form its sub-commission or expert or working group that would solve particular issues and prepare basis for reaching agreements.

Programme consists of several components and goals, such as: finalisation of harmonization of domestic regulations with international agreements and the EU Water Framework Directive; promotion of sustainable water management, mitigation of effects of global climate change; prevention or limitation of negative impacts of floods and droughts, procedure in case of dangerous circumstances and in case of incidence involving substances hazardous to waters; providing monitoring and supervision of the implementation of laws, agreements, regulations and standards; however, this Programme is focused on the exploitation of hydro potentials.

The Programme includes: the initiative from the Montenegro's side for reaching agreement on water rights, preparation of initial documentation (basis) for the distribution of water rights in Montenegro, review of existing / similar agreements, analysis of related questions, analysis of the existing international programmes (International Commission for the Protection of the Danube – ICPDR, International Sava River Basin Commission - ISRBC, South East Europe Disaster Risk Management Initiative – SEEDRMI) and relevant components, establishing relevant organisation(s) and institution(s) in all involved countries, determining international organizations which can assist in preparing necessary documentation and which could also be included in inter-regional negotiations (UNESCO Centre for Water Law – University of Dundee), preparing reports, project documentation, draft and final agreements and procedures and a detailed negotiations timeline; organizing appropriate logistics for the entire operation and coordinating all these activities with the already existing regional and domestic Programmes and Projects. The possibility of controlling the flow of river Drina could be a good argument and a useful fact for downstream regions, and for coming to an agreement.

#### B. Activity plan

	Activity description	Responsibility
1.	<b>Initiative</b> Giving the initiative from Montenegro's side for memorandum. Signing memorandums with Bosnia and Herzegovina and Serbia	MED, MAFWM, WA
2.	<b>Basic documentation</b> Preparing basic documentation for preparing water right memorandum, with the timeline, preparing expert	MAFWM, WA, MED

## 71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN 2008-2012

	analyses, studies and data, hiring a consultant	
3.	<b>Negotiations</b> Start talks on unresolved issues with goal of reaching the memorandum.	Government

The Programme should be finalised by 31 December 2012. The activities and their timeline after 31 December 2010 will be defined after starting the talks.

### C. Timeline

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Initiative	MED, MAFWM, WA	01.07.2008	31.12.2008																				
2. Basic documentation	MAFWM, WA, MED	01.01.2009	31.12.2009																				
3. Negotiations	Government	01.10.2009	31.12.2010																				

### D. Financing

Total costs would be divided among all countries. Estimated costs for the Montenegrin side for the Project in period 2008 - 2012 are EUR 433.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Initiative	MED, MAFWM, WA	Budget	18.000					18.000
		Grant						
		Loan						
2. Basic documentation	MAFWM, WA, MED	Budget		200.000				200.000
		Grant		120.000				120.000
		Loan						
3. Negotiations	Government	Budget		45.000	50.000			95.000
		Grant						
		Loan						
Total (1-3)			18.000	365.000	50.000			433.000

### E. Environmental and social effect

The aim of the Project is to clearly define water consumption rights for those regional countries that do not have these rights identified. This will enable the use of those water resources which have not been exploited so far, due to undefined rights.

Having in mind the activities planned herein, which primarily refer to preparation of memorandums, documentation, talks and international cooperation etc., the SEA is not required.

Programme does not have significant direct social influence.



## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.3 Project of oil and gas exploration in seabed – Blocks 1 and 2

#### A. Programme/Project description

Oil and gas exploration in the seabed - blocks 1 and 2 – that have been performed so far, indicate a great potential of this region. The existence of basic preconditions for oil and gas production in the South Adriatic geological basin has been proven, and the production in the Italian and Albanian part of the basin confirms this. The existence of source rocks has been proven – permotrias clastites, mesozoic carbonate sequences, paleogenic sediment complex; reservoir rock – sequences of mesozoic carbonates, paleogenic sandstones and conglomerates. In the area of Blocks 1 and 2, over 5,000 km of 2D reflective seismic profiles have been made, processed and interpreted. Using this data, depth structure maps have been charted for all interesting geological horizons and objects up to the „*Prospects and Leads*” level have been singled out. Two deep exploration wells have been drilled: JJ-1 (4,700 m) and JJ-3 (4,600 m). In the JJ-1 well significant quantities of natural gas have been registered, whereas JJ-3 produced mobile oil, 167 bbls, during a test. The objective of the programme of future activities is to additionally define, using a 3D seismic program, these interesting geological structural formations where the aforementioned wells have been drilled, and then to locate and drill the exploration well. To sum up, in the area in question, explorations are well underway and the results are encouraging. With the Project, and by applying the essential 3D seismics, the most perspective structural object should be defined and verified by the explorative drilling. Realisation of the Project is of foremost importance for the potential production of oil and gas in this region.

The new Law foresees a new distribution of blocks 1 and 2, but for the time being, Jugopetrol is the concessionaire, and respective activities are planned accordingly.

Activities will be performed in line with the following international and Montenegrin regulations on environmental protection: International Convention On The Prevention Of Sea Pollution By Carbohydrates, London, 1954/62; International Convention Relating to Intervention on the High Seas in Cases of Carbohydrate Pollution, Brussels, 1969; Geneva Convention on the High Seas, 1958; Environmental Protection Law (Official Gazette of Montenegro 12/96); the Water Law (Official Gazette of the Republic of Montenegro 27/07).

#### B. Activity plan

	Activity description	Responsibility
1.	<p><b>Phase 1</b></p> <ul style="list-style-type: none"> <li>a) Reviewing the existing blocks` data,</li> <li>b) Reprocessing of the old seismic 2D profiles, cca. 1,000 km,</li> <li>c) Another interpretation of well logs,</li> <li>d) Reinterpretation of reprocessed seismic profiles,</li> <li>e) AVO (<i>Amplitude Versus Offset</i>) seismic analyses on selected seismic profiles,</li> <li>f) Final report with recommendations.</li> </ul>	Concessionaire
2.	<p><b>Phase 2</b></p> <ul style="list-style-type: none"> <li>a) 100 km<sup>2</sup> of new 3D seismic surveys,</li> <li>b) Processing and interpretation of new seismic shootings,</li> <li>c) Final report with recommendations.</li> </ul>	Concessionaire
3.	<p><b>Phase 3</b></p> <p>Drilling exploration well.</p>	Concessionaire

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

C. Timeline

					2008				2009				2010				2011				2012			
	Activity	Responsibility	Start	End	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	Phase I	Concessionaire	01.04.2008	31.12.2008	■	■	■	■																
2.	Phase II	Concessionaire	01.01.2009	31.12.2009					■	■	■	■												
3.	Phase III	Concessionaire	01.01.2010	31.12.2010									■	■	■	■								

D. Financing

Estimated costs of the Project for the period 2008-2012 are EUR 16.625 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Phase I	Concessionaire		195.000					195.000
2. Phase II	Concessionaire			1.430.000				1.430.000
3. Phase III	Concessionaire				15.000.000			15.000.000
Total (1-3)			195.000	1.430.000	15.000.000			16.625.000

E. Environmental and social effect

The concessionaire must implement the EIA procedure during the preparation of Project documentation for explorations.

Programme does not have direct social influence, but finding of oil and gas reserves could accelerate intensive economic development.

## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.4 Project of oil and gas exploration in seabed – Block 3

#### A. Programme/Project description

Oil and gas exploration in the seabed Block 3 that have been done so far, indicate a great potential of this region. The existence of basic preconditions for oil and gas production in the South Adriatic geological basin has been proven, and the production in the Italian and Albanian part of the basin confirms this. The existence of source rocks has been proven – permotrias clastites, mesozoic carbonate sequences, paleogenic sediment complex; reservoir rock – sequences of mesozoic carbonates, paleogenic sandstones and conglomerates. More than 6,000 km of 2D reflective seismic profiles have been made, processed and interpreted. 311 m<sup>2</sup> of 3D seismic surveys have been completed on the perspective Pliocene objects potentially containing gas, as well as special processing methods (AVO, GeoQube). Complete records have been made, projects and the study containing results and recommendations for explorative drilling.

Two deep exploration wells have been drilled: JJ-2 (3,700 m) and JJU-1 (4,000 m). In the JJ-2 well, oil was registered in the carbon complex, whereas JJU-1 contained oil traces, but for technical reasons it was abandoned at the depth of 4,600m. During the exploration of Block 3, a large number of wide range stratigraphic units were established. In the 3D recording zone, 15 Pliocene prospects were identified at the depth of 700 m to 1,300 m, with GIIP potential of 721 Bcf. Water levels are between 75 m and 100 m in the prospect zone. AVO seismic analyses have been completed and they estimate that the gas-related exploration risk is low. In terms of oil and geology, prospects are ready for explorative drilling. Three alternative locations have been suggested for the first exploration well.

Project realisation is based on the concession model. In line with the new Law, Block 3 will be divided into several blocks, most likely three.

Activities will be performed in line with international and Montenegrin regulations on environmental protection: International Convention On The Prevention Of Sea Pollution By Carbohydrates, London, 1954/62; International Convention Relating to Intervention on the High Seas in Cases of Carbohydrate Pollution, Brussels, 1969; Geneva Convention on the High Seas, 1958; Environmental Protection Law (Official Gazette of Montenegro 12/96); the Water Law (Official Gazette of Montenegro 27/07).

#### B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<b>Division of blocks and the concession</b> New division of Block 3 into 3 smaller blocks, preparation of the tender for concession granting, executing of tender procedure, selection of concessionaire and concession granting.	MED, MF
2.	<b>Exploration</b> Detailed review of all relevant exploration data, determining definite location for the exploration well, writing all necessary studies and the mining project, obtaining permits required to start drilling, drilling the exploration well up to 1,500 m deep, prospective well testing, final report with recommendations.	Concessionaire
3.	<b>Verification</b> Contouring the reservoir by drilling contour wells and other detailed geological, geophysical and geochemical researches.	Concessionaire

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Division of blocks and concession	MED, MF	01.10.2008	30.06.2009																				
2. Exploration	Concessionaire	01.07.2009	30.06.2011																				
3. Verification	Concessionaire	01.07.2011	31.12.2012																				

**D. Financing**

Estimated costs for the Project for one block for 2008 – 2012 period are EUR 27.59 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Division of blocks and concession	MED, MF	Budget	60.000	60.000				120.000
		Grant						
		Loan						
2. Exploration	Concessionaire		6.000.000	6.000.000	470.000		12.470.000	
3. Verification	Concessionaire				5.000.000	10.000.000	15.000.000	
<b>Total (1-3)</b>			<b>60.000</b>	<b>6.060.000</b>	<b>6.000.000</b>	<b>5.470.000</b>	<b>10.000.000</b>	<b>27.590.000</b>

**E. Environmental and social effect**

The concessionaire must implement the EIA procedure during the preparation of exploration Project documentation.

Programme does not have direct social influence, but finding of oil and gas reserves could accelerate intensive economic development.

## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.5 Project of coal exploration in Pljevlja area

#### A. Programme/Project description

Montenegro disposes of two registered types of coal: lignite in the broader Pljevlja region and brown coal in Berane municipality. Lignite is exploited on the surface in the Pljevlja region. From the energy and technical-technological aspects, coal deposits in the Pljevlja region could be separated into the Pljevlja basin and the Maoče basin.

Geological balance reserves have been identified in the following depositories: Potrlica, Kalušići, Bakrenjače, Šumani I, Otilovići, Rabitlje, Grevo and Maoče. Coal reserves have been defined on the basis of the elaborate on coal quality and reserves verified by the competent public authority. Coal deposit basin "Mataruge" has been only partly defined on the basis of 1982 geological research and the subsequent researches in 1991. Concessions for some of the deposits (Mataruge, Maoče and some other) have yet to be awarded.

Besides the basins presented in the table, the Pljevlja region also covers the so-called small basins (Glisnica, Brvenica, Bušnje, Tješanj, Jugovo and others) which had not been sufficiently explored or whose geological reserves had been defined, but whose coal deposits have been occupied in the meantime by industrial facilities, or archaeological findings have been discovered on the sites (Radosavac, Komini).

Region	Basin	Deposits	Balance reserves (t)	Exploitation reserves (t)
Pljevlja	Central	Potrlica	42.480.310	40.457.438
		Kalušići	13.808.391	13.150.848
		Grevo	2.288.757	2.265.373
		Rabitlje	5.486.126	5.224.882
	Other – gravitational	Šumani I		583.000
		Otilovići	3.421.000	3.258.952
		Mataruge	7.749.000	7.044.545
	Bakrenjače	1.332.313	1.199.082	
Maoče		Maoče	109.900.000	104.666.667
Total value	Central		64.063.584	61.098.541
	Other		12.502.313	12.085.579
	Maoče		109.900.000	104.666.667
<b>Total</b>			<b>186.465.897</b>	<b>177.850.787</b>

Planned activities are separated into geological and mining techno-economic activities.

#### B. Activity plan

Activity description	Responsibility
1. <b>Concessions</b> Concession awarding and developing Maoče basin for exploitation	MED
2. <b>Geological activities</b> 1. Water-geological exploration in coal deposit Maoče 2. Establishment of reserve amounts in coal deposits Komina and Radosavac 3. Programme for smaller coal deposits findings exploration	Coal Mine Pljevlja, Concessionaire
3. <b>Mining techno-economic activities</b> 1. Main projects of coal mining in coal deposits Maoče and Otilovići 2. Main project of coal mining in central deposit Pljevlja (without Potrlica) 3. Coal homogenisation for TPP Pljevlja to reach the constant calorific value of coal at the thermal power plant entrance.	Coal Mine Pljevlja, Concessionaire

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

	Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	Concession	MED	01.09.2008	31.12.2008																				
2.	Geological activities	Coal Mine Plevlja, Concessionaire	01.09.2008	30.12.2010																				
3.	Mining techno-economic activities	Coal Mine Plevlja, Concessionaire	03.04.2008	29.12.2011																				

**D. Financing**

Estimated Project costs for 2008 – 2012 period are EUR 7.748 million.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Concession	MED		30.000					30.000
2. Geological activities	Coal Mine Pljevlja, Concessionaire		25.000	2.480.000	2.450.000			4.955.000
3 Mining techno-economic activities	Coal Mine Pljevlja, Concessionaire		200.000	983.000	1.500.000	80.000		2.763.000
<b>Total (1-3)</b>			<b>25.000</b>	<b>3.463.000</b>	<b>3.950.000</b>	<b>80.000</b>		<b>7.748.000</b>

**E. Environmental and social effect**

Planned activities refer to explorations for which EIA procedure is not required, whereas while during preparation of project documentation for individual projects, the investor must implement EIA procedure.

Project does not have any significant direct social influence.

## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.6 Project of coal exploration in Berane area

#### A. Programme/Project description

Montenegro disposes of two registered types of coal: lignite in the broader Pljevlja region and brown coal in Berane municipality. Brown coal (Berane region) is mined using shaft mining exploitation technology. Currently, there is no coal exploitation in the Berane region.

Coal quality and reserves in the Berane basin have not been properly documented. Although research activities during and following the exploitation were performed in different time periods and to a considerable extent, generally they have not been performed in a cost-efficient manner. A substantial portion of the research activities has not been elaborated upon or verified by the competent public authority. Structural bores were not supplemented with the obligatory analyses of coal quality and the required hydro-geological, technical-geological and other elaborates and studies. A legally-binding review of the previously prepared documentation has not been performed either. Therefore, this should be done before defining any further development plans for the Berane region.

Region	Basin	Deposits	Balance reserves (t)	Exploitation reserves (t)
Berane		Petnjik	13.165.945	10.532.756
		Police	11.795.423	8.846.567
		Zagorje	3.348.690	
		Ostalo		
<b>Total</b>			<b>28.310.058</b>	<b>19.379.323</b>

An average calorific value of coal in the basin is 1.68 MJ/kg. The estimated geological reserves of coal in the Berane region amount to 160 million tons. In the available documentation analyses, treatment of the Berane region from the aspect of coal classification, coal reserves and quality show some significant discrepancies. The data was prepared by different authors and at different times.

The aforesaid indicates that it is necessary to prepare an assessment of research activities to be followed by definition of the scope and type of activities.

#### B. Activity plan

Activity description		Responsibility
1.	<b>Geological activities</b> Geological exploration of reserves, review of documentation, analyses	Coal Mine Berane

71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

C. Timeline

	Activity	Responsibility	Start	End	2008			2009			2010			2011			2012		
					1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
1.	Geological activities	Coal Mine Berane	01.09.2008	31.12.2008															

D. Financing

Estimated costs for Project for 2008 – 2012 period are EUR 30.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Geological activities	Coal Mine Berane		30.000					30.000
Total (1-1)			30.000					30.000

E. Environmental and social effect

Planned activities refer to explorations for which EIA procedure is not required.

Project does not have significant social influence.



## 10.7 CC 7: CREATE THE BASIS FOR LONG-TERM ENERGY INDUSTRY DEVELOPMENT IN MONTENEGRO

### 10.7.7 Project of Adriatic-Ionic gas pipeline

#### A. Programme/Project description

Montenegro still does not have access to international sources of natural gas. If local production is not initiated in the near future, there are several supply access routes: through Serbia, Albania and Croatia. In September 2007, the Montenegrin, Croatian and Albanian governments signed the ministerial declaration on the construction of the Adriatic-Ionic gas pipeline that envisages the pipeline connection to the "Trans Adriatic Pipeline - TAP", through which a Swiss-based EGL company plans to connect gas resources of the Middle East, the Caspian Sea and Russia with Greece, Albania to Italy (undersea transport routes). The Adriatic-Ionic gas pipeline is expected to become operational by the end of year 2012.

During the signing of the declaration, EGL confirmed its readiness to award a part of the TAP capacities of 5 billion m<sup>3</sup> for the regional market needs of Albania, Montenegro, Bosnia and Herzegovina and Croatia.

The construction of the gas network and a gas pipeline is of great interest to Montenegro. However, Montenegro has little influence on whether this gas pipeline will become operable or not, so it is necessary to work out other options as well. One of them is the project of South East Europe gasification through the construction of the Energy Community Ring, whose integral part could also be the Adriatic-Ionic gas pipeline.

There is a low potential for gas consumption in Montenegro and the envisaged investments in the gas network development are rather large. Therefore, the gas network system and consumption of LPG, as the precedent to natural gas, are envisaged to be developed first.

#### B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<b>Preparatory activities</b> Preliminary preparation of feasibility study and conceptual design, selection of potential routes	MED and other
2.	<b>Spatial plan and SEA</b> Preparation of basis for spatial plan documentation and SEA	MED and other
3.	<b>Connection of gas networks</b> Preparation of study on the connection of consumers to the gas pipeline and development of distributive gas networks	MED and other
4.	<b>Tender and concession</b> Preparation and issuing of tender, procedure for granting of the concession is implemented	MED
5.	<b>Construction</b> Preparation of project documentation, obtaining building permit, preparation of environmental impact elaborates, gas line construction	Concessionaire



71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012

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This Project can strengthen Montenegro's position in regions energy sector, thus intensively boosting general economic growth. Higher demand for gas for heating purposes is possible, and new jobs during the construction phase and afterwards are created.

## 10.8 CC 8: CREATION OF MECHANISMS FOR EFFECTIVE MONITORING AND FOLLOW-UP OF ACTION PLAN IMPLEMENTATION

### 10.8.1 Programme of Action Plan monitoring and follow-up

#### A. Programme/Project description

The description of AP monitoring and follow up, as well as its innovation, is presented in Chapter 5 – AP Implementation and Chapter 9 – AP Implementation monitoring, follow-up and updates.

#### B. Activity plan

	<b>Activity description</b>	<b>Responsibility</b>
1.	<b>Establishing APD</b> Within MED, APD is established as an independent unit.	MED
2.	<b>Monitoring and reporting</b> Monitoring of AP implementation and reporting to MED and the Government.	MED, later APD
3.	<b>Follow-up</b> Initiating corrective activities in case of deviations from the implementation plan.	MED, later APD
4.	<b>AP Updating</b> AP updating in line with changes in the energy industry and deviations from the implementation plan.	MED, later APD

The Programme is to be continued after 31 December 2012. However, the activities, the timeline and financing are not defined after that.

**71. ENERGY DEVELOPMENT STRATEGY OF MONTENEGRO UNTIL 2025 ACTION PLAN  
2008-2012**

**C. Timeline**

Activity	Responsibility	Start	End	2008				2009				2010				2011				2012			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Establishing APD	MED	01.09.2008	31.12.2008																				
2. Monitoring and reporting	MED, later APD	01.09.2008	31.12.2012																				
3. Follow up	MED, later APD	01.09.2008	31.12.2012																				
4. AP updating	MED, later APD	01.01.2009	31.12.2012																				

**D. Financing**

Estimated total cost for the 2008-2012 period is EUR 4.050.000.

Activity	Responsibility	Source of funding	2008	2009	2010	2011	2012	Total (2008-2012)
1. Establishing APD	MED	Budget	100.000					100.000
		Grant						
		Loan						
2. Monitoring and reporting	MED, later APD	Budget	100.000	150.000	200.000	200.000	200.000	850.000
		Grant		300.000	300.000	300.000	100.000	1.000.000
		Loan						
3. Follow-up	MED, later APD	Budget	50.000	50.000	150.000	150.000	150.000	550.000
		Grant		300.000	200.000	200.000	100.000	800.000
		Loan						
4. AP updating	MED, later APD	Budget		50.000	100.000	100.000	100.000	350.000
		Grant		50.000	150.000	150.000	50.000	400.000
		Loan						
<b>Total (1-4)</b>			<b>250.000</b>	<b>900.000</b>	<b>1.100.000</b>	<b>1.100.000</b>	<b>700.000</b>	<b>4.050.000</b>

**E. Environmental and social effect**

Having in mind the activities planned within the Programme, which relate particularly to monitoring and follow-up of AP implementation, SEA is not required.

The Programme does not have any direct social impact.

**ANNEX**

Detailed timeline