Republic of Macedonia
MINISTRY OF
ENVIRONMENT AND
PHYSICAL PLANNING

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Development Programme

Constraints and gaps, and related financial, technical and capacity needs for climate change mainstreaming

SECOND BIENNIAL UPDATE REPORT ON CLIMATE CHANGE

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Constraints and gaps, and related financial, technical and capacity needs for climate change mainstreaming in Macedonia

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1.1. Scope and objective of the report

The scope of this assessment is:

- Collection and compilation of information and data on the gaps, constraints, level of support received and needs in the period 2014 – 2017;
- Summarization of the results from the stakeholder consultation process on constrains, gaps, and related technical and financial support needs for climate change aspects in R. Macedonia;
- Provision of recommendations for climate change mainstreaming in R. Macedonia.

The objective of this assessment is development of Chapter on constrains, gaps, and related technical and financial support needs, which will serve a guidance document for capacity development, technical and financial support for climate change considerations in R. Macedonia.

1.2. Methodological approach for the development of the chapter

According to decision 2/CP.17, annex III, section V, paragraphs 14, 15 and 15, Non-Annex I Parties should provide the following:

- Updated information on constraints and gaps, and related financial, technical and capacity-building needs.
- Updated information on financial resources, technology transfer, capacity-building and technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current biennial update report.
- Information on technology needs, which must be nationally determined, and on technology support received.

The methodological approach for the development of the chapter is in line with the Training Materials of the CGE (Consultative Group of Experts) for the development of BURs and the assessment of the Financial, Technical and Capacity-Building Needs and Support Received under the BURs.

The assessment is organised through the following tasks:

- Review and discuss the process of conducting the assignment;
- Determine roles and responsibilities;
- Identify preliminary background information related to the assignment, including procedure and arrangement to be adopted in the compilation of data and information;
- Detailed schedule of meeting and consultations;
- Conduct a literature review of the TNC and FBUR;
- Identify activities conducted, towards overcoming Gaps and Constraints in the FBUR process and the Stocktaking and Stakeholder consultations under the SBUR.
- Identify ways in which data collection and capacity needs in data management can be increased.

- Identify barriers to increasing data collection and data management capacity
- Identify financial, technical support received from national and other sources.
- Examine the financial resources needed by key agencies to execute their mandate.
- Highlight the limitations posed by lack of adequate finance in carrying out their mandate
- Identify sources of funding towards enhancing financial, technical capacity needs requirements to overcome constraints and gaps.
- Examine the barriers to mainstreaming climate change mitigation measures in national plans and programmes.
- Examine the adequacy of technical personnel involved in climate change planning and implementation.
- Assess the awareness and response of climate change at national level.
- Compile draft report.
- Present draft findings to the National Climate Change Committee and other Stakeholders
- Amend report based on recommendations received from key stakeholders
- Present final report to the Contracting Entity and MoEPP.
- Develop a summary chapter which will be integral part of the SBUR

In parallel the project team conducted direct interviews and meetings with relevant stakeholders regarding current situation with climate change adaptation projects, financial, capacity building and technical capacity building support needs and support received. In general, most of the stakeholders cooperated with the project team and responded to the request for meeting. Most of the respondents were women, 13 in total and only 1 is a man, the representative of the NGO sector. The data and information obtained are incorporated within different chapter of the report.

1.3. Addressing recommendations from the TA of the FBUR

In accordance with decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention (non-Annex I Parties), consistent with their capabilities and the level of support provided for reporting, have been encouraged to submit their first biennial update report (BUR) by December 2014. Further, in accordance with paragraph 58(a) of the same decision, the first round of international consultation and analysis (ICA) was conducted within six months of the submission of their first BURs. The process of ICA includes two steps: the technical analysis of the submitted BURs, followed by a workshop on the facilitative sharing of views under the Subsidiary Body for Implementation.

The results of the technical analysis of the first BUR of Republic of Macedonia (2015) were presented in a summary report available on the following link http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600008633. The recommendations of the technical analysis are summarized in Table 1.1 provided below this text:

Table 1.1 Recommendations of the technical analysis of the FBUR of Macedonia regarding the Chapter on Constrains, gaps and related technical and financial support needs

52. Macedonia reports that it received significant capacity-building or 'capacity

reinforcement' to assist with the preparation of its first BUR between September 2013 and December 2014. In its BUR, the Party provides an overview of assistance received from organizations, donors and regional exchange to support addressing climate change, including specific training by topic (e.g. the GHG inventory, mitigation, MRV, etc.).

53. Macedonia notes that further support is needed to continue to develop and consolidate existing technical and institutional capacities and to integrate addressing climate change into national policies plans and programmes to effectively meet the UNFCCC reporting guidelines on BURs. In particular, with regard to constraints and gaps, and related financial, technical and capacity-building needs, Macedonia highlights three specific capacity gaps: institutionalization of the national GHG inventory process, via permanent administrative and financial support; capacity reinforcement to access financing with consideration of gender mainstreaming; and training to ensure that the MRV processes are gender sensitive. With regard to finance received, the Party indicates that the main donors are: the EU (34.4 per cent), the United Nations (11.1 per cent) and the Global Environment Facility (GEF) (9 per cent).

54. The technical analysis conducted by the TTE indicates that insufficient information was reported on constraints and gaps, and related financial, technical and capacity-building needs. Information on the gaps and needs is not distinguished by type, for example, as financial, technical or capacity-building needs. Similarly, information on financial support needs is shown in a general way and classified generally only as small, medium and large budgets in the action plan for climate change mitigation. Needs for the capacity gaps raised in section 5.2 of the BUR are not estimated or provided. The TTE notes that the transparency of reporting would benefit from a more disaggregated analysis of needs, particularly with regard to financial and technology needs.

55. The Party did not provide information on the status and findings from technology needs assessment (TNA) or technology support received. In addressing areas of technical clarification from the TTE, Macedonia indicated that a national designated entity for technology transfer has not been appointed. The Party perceives a TNA as a key activity for successful climate change mitigation, taking into account that the previous TNA of Macedonia is outdated and unusable. Therefore, a project proposal for TNA is being developed, to be funded by the GEF.

56. The TTE notes that within its BUR, Macedonia has analysed support and finance received to date, that it notes various gaps and challenges, and that it also presents conclusions and recommendations to improve the effectiveness and tracking of this support. The TTE acknowledges and welcomes the Party's recommended actions for improvement of regular collection and analysis of this information, which will be introduced during the preparation of future BURs and national communications.

The constraints and gaps are provided in section 5 of the BUR and are appropriately addressed.

Although technical and capacity-building needs have been outlined, related financial support required has not been included in the BUR."

The assessment done in the framework of the development of the Chapter on Constraints and gaps, and related financial, technical and capacity needs for climate change mainstreaming in R. Macedonia in the framework of the SBUR has taken into consideration the comments and the recommendations provided during the technical analysis of the FBUR of Macedonia.

Since paragraph 54 of the technical analysis indicated that insufficient information were reported on constraints and gaps, and related financial, technical and capacity-building needs, as well as the information on the gaps and needs were not distinguished by type (financial, technical or capacity-building needs) in the FBUR, this assessment contains a comprehensive Chapter on Financial, technical and capacity building needs, containing most of the elements contained in the Handbook for the development of this assessment/chapter. Furthermore, in line with the recommendations provided by the TTE, the information on the financial support needs contain the indicative budget of the national action plan for climate change mitigation, as well as from the developed local climate change strategies developed, accompanied by a disaggregated analysis of needs, particularly with regard to financial, technical and technology needs.

Concerning the comments provided in paragraph 55, the situation remains unchanged since a national TNA project was still not implemented and a national designated entity for technology transfer has not been appointed. Macedonia still considers that the TNA is a key activity for successful climate change mitigation, and the project on TNA is listed under the financial and technical support needs.

The comments on the related financial support needs provided under paragraph 56 have been also addressed under the Chapter 2 which provides a comprehensive assessment of the financial, technical and capacity building needs.

To assure the sustainability of the process and the regular assessment of the gaps, constrains, financial, technical and capacity building needs, this assessment is proposing an institutionalised mechanism and template for collection on the relevant information for the development of this assessment.

1.4. Climate policy, legal and institutional setup

The Ministry of Environment and Physical Planning (MOEPP) has been designated as the National Focal Point to the UNFCCC and as a Designated National Authority (DNA) for the implementation of the Kyoto Protocol. Other ministries that have responsibilities related to climate change aspects are the Ministry of Agriculture, Forestry and Water Economy, the Ministry of Economy, the Ministry of Transport and Communication, the Ministry of Health and the Ministry of Finance.

The Cabinet of the Deputy Prime Minister for Economic Affairs is responsible for the achievement of the Sustainable Development Goals, and is also a National Designated Entity for the Green Climate Fund. Furthermore, as one of the strongest national institution in the country, the Cabinet for the Prime Minister of financial affairs is strongly supporting the implementation of the climate and energy related projects in the country.

The National Council for Sustainable Development is responsible for mainstreaming of the sustainable development aspects in the national economic policies.

The National Climate Change Committee (NCCC) provides high-level support and guidance for the overall climate change policies in the country. The National Climate Change Committee is an intergovernmental body, which consist of representatives from all relevant governmental institutions and academia.

A National Designated Entity for Climate Technology Center and Network (CTCN) of R. Macedonia is not designated.

The legal framework on climate change is incorporated into the Law on Environment, including the details for the development of the national GHG inventories. The Law also includes an action plan on measures and activities to abate the increase of the GHG emissions and to mitigate the adverse impacts of climate change.

In the past decade, number of other laws, regulations and strategies that incorporate mitigation considerations have been adopted. One of the most relevant are the Strategy for Energy Development in the Republic of Macedonia for the Period 2008-2020 with a Vision to 2030 (2010), the Renewable Energy Strategy of Macedonia until 2020 (2010), the National Strategy for Energy Efficiency in Republic of Macedonia until 2020 (2010), the Third Energy Efficiency Action Plan (EEAP) of the Republic of Macedonia (2016-2018) etc. The Law on Environment stipulates that a National Plan for climate change is to be adopted for the purpose of stabilizing GHG concentrations at a level that would prevent any dangerous anthropogenic impact on the climate system within a timeframe sufficient to allow ecosystems to naturally adapt to climate change, in accordance with the principle of international cooperation and the goals of the national social and economic development.

The law on climate is also one of the key milestone on the path towards sustainable development in general, and in particularly towards sustainable energy transition. The Law and Strategy on Climate Change project is programmed under the EU IPA funding mechanism (the Law and Strategy on Climate Change), but the implementation of the project is still pending.

The Ministry of Environment and Physical Planning has recently informed the public that the Government of the Republic of Macedonia upon proposal of the MOEPP, on its session held on July 25th 2017, adopted the Information about the ratification of the Paris Agreement on Climate Change. The Government of the Republic of Macedonia tasked the Ministry of Environment and Physical Planning to submit the text of the Agreement to the Ministry of Foreign Affairs in order to implement the procedure for ratification of the Paris Agreement in the Parliament of the Republic of Macedonia.

This confirms the commitment of the Government to join the global efforts for addressing climate change by implementing activities for reducing the GHG emissions in order to limit the rise of global temperature to maximum 2°C by the end of the century and to ensure low carbon growth and development.

Besides this, with the ratification of this Agreement new possibilities will be opened for using international assistance in order to support the adaptation process of the sectors most vulnerable to climate change (water resources, agriculture, forests, biodiversity, cultural heritage, tourism) etc.

An added value is the importance of this Agreement for the European Union, which is a leader globally in the fight against climate change, but also its value as a tool that will assist the state in responding to future obligations arising from the Energy Community in relation to climate.

Nevertheless, it should be noted that the political turmoil in the country and the instability of the Government resulting in constant pre-election situation, from the beginning of 2015 till the middle of 2017, resulted in significant delays in preparation and adoption of strategic documents, Laws, Bylaws and other legislation relevant for the topic. In addition, the political turmoil was slowing down the implementation of many projects as well as receiving support from international donor organizations.

The following table describes the forthcoming obligations of R. Macedonia towards the global climate change efforts and prospects:

Table 1.2 The forthcoming obligations of R. Macedonia towards the global climate change efforts

a) Obligations in terms of legislation that should be implemented
• Third Party Access - The Third Energy Package, including Regulation (EC) 714/2009, has not been transposed. (electricity)
• Transposition and implementation of Directive 2009/73/EC, with a focus on defining the appropriate unbundling model for GAMA (gas market)
• The requirement for ERC's statutes to be approved by the parliament represents an undue intervention in ERC's autonomy in terms of defining its internal organisation and needs to be abolished.
• Adoption of an intervention plan (decree) in the event of an emergency disruption to the supply of crude oil and petroleum products.
• Full compliance with Article 13 of Directive 2009/28/EC remains to be achieved (RES).
• Articles 17 to 21 of Directive 2009/28/EC related to sustainability of biofuels have to be transposed.
• Adoption of the amendments to the rulebook related to emissions into the air to transpose the relevant requirements of the Large Combustion Plants and Industrial Emissions Directives.
• The Law on State Aid Control, adopted in 2010, transposes the State aid acquis into national legislation. No decision on State aid in the energy sectors has been adopted by the (Commission for Protection of Competition) CPC since 2013.
• The Law on Environment includes an article in terms of MRV, which should be implemented in practice as soon as possible by defining more precise policies and

measures.
• The Annual Reports from the Energy regulatory Commission should contain the data in terms of GHG emissions.
• A Bylaw should be prepared and adopted in terms of defining the process for collection and submission of the data required for the annual reports on NEEAP progress.
• A Bylaw should be prepared and adopted in terms of providing information on energy consumption in public buildings, including the GHG emissions calculation.
• A Bylaw should be prepared and adopted in terms of motor vehicles data registry.
b) Obligations for Reporting towards the EC and the UNFCCC
• 1st of January 2020 – Report to Energy Community Secretariat in terms of the implemented activities as per low carbon development strategies.
• 15th of January (annually starting from 2019), report to Energy Community as per anthropogenic emissions from Annex I and data in accordance with the obligations for reporting towards UNFCCC.
• 15th of April (annually) updated GHG inventory report submitted to Energy Community
• 15th of April (annually) national GHG inventory submitted to UNFCCC (on a voluntary basis)
• 15th of April 2019 – full implementation of the national MRV systems

1.5. Bringing Innovative Approaches into the national climate change mainstreaming

The Faculty on information Science and Computer Engineering and the United Nations Development Program (UNDP) established a Social Innovation Hub in 2014. The hub acts as a catalyst for innovations in the country and has objective is to use the technology to the highest possible degree in order to promote human development through encouraging innovative solutions for social and economic problems.

Later on in 2014, UNDP, USAID, the Swedish Embassy and the Ministry of Environment and Physical Planning have launched the first Climate Challenge. The challenge was supposed to foster citizen involvement in the climate related activities and measures, and to raise the public awareness in regards to the importance of the general public in the climate change mitigation and adaptation. The campaign lasted for two months and involved Social Innovation Camp Methodology along with workshops in 5 cities. The challenge resulted with huge response on the social media, over 200 media reports, over 30,000 visitors to the website www.odtebezavisi.mk, 129 applications received, 10 finalists and 2 winners – “Smart sole” and “Viral climate change video”. The ‘smart sole’ winning idea enables shoes to generate small amounts of energy as their wearer walks. That might seem like a gimmick, but for some people traversing on foot and for whom the phone is a lifeline – the potential benefits are huge. This also opens up the opportunities for further development of the concept and enlarging of the concept for utilization of the kinetic energy generated in the everyday life. The second winning idea, the climate change video became viral with more than 80,000 views in just a few days after being published. By any means, the first Climate

Challenge was a success, from huge social media buzz, to the quality of the seventy entries, to the quality of engagement with the ideas. And that's was only the beginning of the innovation story in Macedonia. Many new players joined the game (additional fund of app.70.000 $ were mobilized) and started an avalanche of innovative events that contributed to raising awareness of the media and the citizens.

The second Climate Challenge was launched in 2015 and was more focused on the urban resilience to the climate change, with significant emphasis on the waste, transport and green area issues. The local authorities were more engaged, providing support to the best idea through issuing permits, licenses and fostering policy change. More investors also joined, piggy-backing on the Challenge process to find more ideas to invest. This second challenge was very successful from many aspects - quality of the ideas received (68 in total, 28 long listed, compared to 2014 when 129 were received, and only 28 long listed), the nature of the ideas and the phase of maturity, the quality of the finalists 9 ideas that were developed into solutions, the number of private companies that were attracted (33 mentors helped the 9 teams at a weekend camp), the outreach of the challenge with 120 media reports (out of 1900 total of the CO for the whole year) and over 0.5M social media impressions. The shortlisted projects were brought together at a final workshop. The purpose of this workshop was to ensure that the ideas were as best as they could be. Through the day, young innovators and entrepreneurs with green ideas got the change to network with a cast of policy-makers, investors and experts. Furthermore, the Mayor of the City of Skopje was present and was following the debates and the prototyping sessions. A solution for "smart recycling" - ReBot triumphed at this climate change contest, captivating the jury with a passionate and inspired presentation of an innovative solution for recycling and sorting plastic waste. As the prototype has already being built, the ReBot team conducted a nationwide recycling-awareness campaign so that people better understand the need to sort waste and to raise interest in the climate change aspects.

The City of Skopje Innovation Center – Skopje Lab[1] is an inter-institutional organization that works on encouraging innovations within the public sector. Established with UNDP support in the first half of 2017, Skopje Lab main goal is to enable cooperation between public, private, civil sector and the City of Skopje. By providing space, tools, knowledge and ideas around which different partnerships can be established, Skopje Lab aims to design and develop innovative services or solutions that will improve the quality of life in Skopje. Exploring the horizon for new opportunities and identifying citizen's needs, the work of Skopje Lab in the next few years will be focused on finding solutions to the two most pressing issues – waste and air-pollution. Developing insights on the problems, sharing results and bringing people on the table to mutually come to a solution enable easier cooperation and engage citizens on a more meaningful way that helps them become active participants in the process. Collaborating with the Social Innovation Hub describer bellow, Skopje Lab also serves to promote green business that come out from the Social Innovation Hub and connect them with decision makers in the city and the country.

In 2016, under the motto of this year European Mobility Week "Smart Mobility. Strong Economy", the City of Skopje in cooperation with the MOEPP and UNDP published a challenge for all citizens, calling them to send their ideas on what is the best way to spend a "green" and "carbon-free" day in Skopje. The main objective of the challenge is to encourage citizens of the biggest urban environment in the country to take initiative and actively participate in developing better transport solutions for the urban environment that will make

[1] http://skopjelab.mk/

the city more resilient to climate change and at the same time will contribute for strengthening the local economy.

The best idea was rewarded with a folding bicycle which perfectly fits the urban way of life and with a short video "One different green day in Skopje".

This year - 2017, the Challenge will be again enriched, since the IT Company “Seavus” is providing membership in an Accelerator programme to all finalists.

Out of many success stories in relation to climate change innovation we can highlight the two climate challenges #ОдТебеЗависи/ItDependsOnYou (in 2015 and in 2016), the mobile app Патувај зелено/The Green Route, as well as the series of TEDx events.

The only national entity which is permanently supporting the innovative projects in the country was established in December, 2013.

The mission of the Fund for Innovation and Technological Development is to encourage and support innovation activities in micro, small and medium-size enterprises (MSMEs) in order to achieve more dynamic technological development based on knowledge transfer, development research and on innovations that contribute to job creation, and to economic growth and development, while simultaneously improving the business environment for the development of competitive capabilities of companies.

The innovation fund is offering the following funding opportunities:

- Co-financed Grants for Newly Established Enterprises "Start-up" and "Spin-off"
- Co-financed Grants and Conditional Loans for Commercialization of Innovations
- Co-financed grants for Technology Transfer
- Technical Assistance through Business-Technology Accelerators

The purpose of this instrument is to encourage the transfer and implementation of new innovative and improved technologies, know-how and technological processes, and encourage various forms of cooperation between micro, small and medium enterprises, business associations, clusters and/or chambers of commerce, in order to achieve a positive impact on the sector. The instrument focuses on the application and adaptation of technologies and innovations which are not new to the world, but may nevertheless be new to the country, or new to the sector. Ultimately this will enhance the technological capabilities and capacities of existing industries and businesses, by bridging the gap between already available knowledge globally or nationally and in local industries. This instrument is expected to have a positive long-term contribution to the development of the national economy, and to enhance the competitiveness through technological and operational improvements.

More information regarding the specific activities and the funded climate related projects of the Fund can be found in Annex I of this report.

2. Financial, technical, technology and capacity building needs

2.1. National level

2.1.1. Technical and Capacity building needs

The climate change department of the Ministry has limited capacity and the national climate change reporting and assessments are depending on the donor projects. A roadmap for the development of necessary capacities of state administration and institutions as well as inter-institutional coordination for effective NDC has been approved by the Macedonian government. The climate mainstreaming in the country can be significantly improved by enhanced institutional capacities and inter-sectoral cooperation. Effective strategic planning and institutionalised mechanisms for efficient, hence coordinated implementation of a comprehensive and multi-sectoral climate policy are important aspects for fulfilling the international climate obligations and pledges.

In the first BUR submission three specific capacity support needs have been addressed at Ministry of environment and physical planning. This capacity support needs and the financial obligations arising from these needs are elaborated in Table 2.1:

Table 2.1. Estimated capacity building needs of the MoEPP (source FBUR)

	Activity	Requirements	Support needs per year in USD
1	Institutionalization of the national GHG inventory process via permanent administrative and financial support	Increase the number of staff	1 employee = 9,200
2	Capacity reinforcement to access financing with consideration of gender mainstreaming;	Increase the number of staff	2 employees = 18,400
3	Training to ensure the MRV processes	Capacity building and education Increase the number of staff	Trainings 2 per year =8,000 2 employees=18,400
		Total annual funds needed, in USD	**46,000**

Exchange rate: USD-MKD= 1 USD = 52.17 MKD

It is very important selected employees to be qualified and well educated for conducting their work activities related to climate change. Engineers with relevant education are minimum requirement as appropriate employees for the abovementioned activities and positions. Although the MoEPP has made significant efforts to address the above mentioned gaps and constrains, the same capacity constrains have been again identified as open issues.

In the Ministry of Economy the following capacity building needs are identified within the Energy Efficiency strategy relevant to climate change:

Table 2.2 Estimated capacity building needs of the Ministry of Economy (Strategy for Energy Efficiency)

	Activity	Requirements	Support needs per year in USD
1	Promoting strategies/propose policies	Increase the number of staff	1 employee – 9,200
2	Proposing fiscal policy measures to encourage EE and RES projects, promote technology and related services	Increase the number of staff	2 employees= 18,400
3	Guide the cooperation with local administrative units to help achieve their EE and RES programs	Capacity building and education	training for 2employees= 8,000
4	Developing long term scenarios for energy supply/demand for energy activities on state and local levels	Increase the number of staff Capacity building activities	2 new employees= 18,400 Training for 2 employees = 8,000
		Total annual funds needed, in USD	**62,000**

Exchange rate: USD-MKD= 1 USD = 52.17 MKD

In the Energy Agency the following needs have been identified as priority for successful implementation of the EE strategy and contribution to Climate change mitigation:

Table 2.3 Estimated capacity building needs of the Energy Agency (Strategy for Energy Efficiency)

	Activity	Requirements	Support needs per year in USD
1	Develop and maintain appropriate and transparent data bases on energy efficiency and renewable energy sources (monitoring and reporting services)	Increase the number of staff	1 employee = 9,200
2	Propose internationally harmonized standards for improving equipment efficiency	Increase the number of staff	1 employee = 9,200
3	Organize information dissemination campaigns for EE and RES	Increase the number of staff	1 employee = 9,200
4	Encourage private initiative and cooperation, as well as joint ventures in realization of EE and RES projects	Increase the number of staff Capacity building activities	2 employees = 18,400 Trainings 2 per year for key employees = 8,000
5	Promote the use of economically and	Increase the number of	1 employee = 9,200

	environmentally acceptable EE and RES technologies	staff	
		Total annual funds needed, in USD	**63,200**

Exchange rate: USD-MKD= 1 USD = 52.17 MKD

Conclusion regarding the Technical and Capacity building needs

Organizational and institutional needs and constraints are primarily linked to the potential *lack of institutional capacity among the key institutions responsible for climate change policy design and mainstreaming*.

Furthermore, the present institutional capacities responsible for implementation of the climate change policies, as well as for promotion, monitoring, evaluation and reporting regarding the climate change aspects in also weak and to a certain extend based on project activities and donor support.

The limited personnel of the Ministry of Environment, Ministry of Economy (Department of Energy), the Energy Agency, and the other relevant Ministries (Ministry of Health, Ministry of Agriculture and other agencies), cannot comply with the requirements regarding the proper implementation of the national climate change policies and the international climate requirements.

Furthermore, the legal framework on climate change is still placed under the Law on Environment, and as such is not providing a comprehensive basis for long term policy and strategic planning, as well as comprehensive legal and institutional setup.

2.1.2. Financial support needs

To address the financial support needs comprehensive analysis of the relevant strategic documents has been conducted where planned projects in the energy and environmental sector have been elaborated, as well as donor support planned in the forthcoming period.

Reference document: Climate Change Mitigation Assessment SBUR

According the Climate Change Mitigation Assessment within the SBUR, financial needs are identified for energy sector, transport sector and sector agriculture, forestry, land use. The financial needs are identified based on national strategic and planning documents where over 50 measures were identified out of which 43 measures were chosen for modelling purposes (35 from energy sector and 8 from agriculture and forestry sector). The financial needs are calculated for two scenarios (Scenario for mitigation and more ambitious scenario) and for the period 2017-2035). 7 mitigation measures for the Transport sector have been also analysed and presented.

Table 2.4 Financial support needs for climate change mitigation activities (Source: Mitigation assessment FBUR)

Energy Sector			
Policy/measure	Competent entity for realization	Investments (mil. €)	Source of funding
Reduction of distribution losses	► Electricity distribution companies ► Heat distribution companies	220.4	Distribution companies
Large hydro power plants	► JSC ELEM ► Ministry of Environment and Physical Planning ► Ministry of Economy, Energy Agency	1,152.6	JSC ELEM, Public Private Partnership
Small hydro power plants	► Government of the RM ► Energy Regulatory Commission ► Ministry of Environment and Physical Planning ► Ministry of Economy, Energy Agency ► Private investors	176.5	Private sector
Solar power plants	► Government of the RM ► Energy Regulatory Commission ► Ministry of Economy, Energy Agency ► Private investors	86.5	Private sector
Solar rooftop power plants	► Government of the RM ► Energy Regulatory Commission ► Ministry of Economy, Energy Agency ► JSC EVN Distribucija ► Electricity end-users	78.7	Private sector
Wind power plants	► Government of the RM ► Energy Regulatory Commission ► Ministry of Economy, Energy Agency ► JSC ELEM ► Private investors	332.0	JSC ELEM, Private sector
Biogas power plants	► Government of the RM ► Energy Regulatory Commission ► Ministry of Economy, Energy Agency ► Private investors	60.0	Private sector
Biomass power plants (CHP	► Government of the RM	24.9	Private

optional)	► Energy Regulatory Commission ► Ministry of Economy, Energy Agency ► Private investors		sector
Central heating of Bitola	► Government of the RM ► JSC ELEM ► Ministry of Economy, Energy Agency	50.0	JSC ELEM
Solar thermal collectors	► Ministry of Economy, Energy Agency ► End-users	85.2	Private sector
Labelling of electric appliances and equipment	► Ministry of Economy, Energy Agency ► manufacturers and vendors of household appliances and equipment ► End-users	77.5	Private sector
Public awareness campaigns and network of EE info centers	► Ministry of Economy, Energy Agency ► Energy suppliers ► End-users	324.8	Budget of the RM
Retrofitting of existing residential buildings	► Ministry of Economy, Energy Agency ► Donors and financial institutions ► Households	590.2	Private sector
Retrofitting of existing public buildings	► Ministry of Economy, Energy Agency ► Ministry of Finance ► Local self-government ► Public Utilities ► Donors and financial institutions	633.7	Central government, local self-governments, the city of Skopje
Retrofitting of existing commercial buildings	► Ministry of Economy, Energy Agency ► Ministry of Finance ► Commercial buildings owners	212.3	Private sector
Construction of new buildings	► Ministry of Economy, Energy Agency ► Donors and financial institutions ► Investors (households)	284.8	Private sector
Improvement of the street lighting in the municipalities	► Local self-government ► Ministry of Economy, Energy Agency	14.5	Budget of the local self-governments
Energy management in	► Ministry of Economy,	0	Private

manufacturing industries	Energy Agency ► Private companies		sector
Introduction of efficient electric motors	► Private companies ► Ministry of Economy, Energy Agency	113.7	Private sector
Biofuels 5%	► Ministry of Economy, Energy Agency ► End-users	/	Private sector
Increased use of the railway	► Government of the RM ► Ministry of Transport and Communication ► Ministry of Economy, Energy Agency ► JSC Makedonski zeleznici ► End-users ► Private companies	96.5	Budget of the RM
Renewing of the national car fleet	► Government of the RM ► Ministry of Transport and Communication ► Ministry of Economy, Energy Agency ► End-users	10,999.5	Private sector
Renewing of other national road fleet	► Government of the RM ► Ministry of Transport and Communication ► Ministry of Interior ► Ministry of Economy, Energy Agency ► Private companies	1,442.6	Private sector
Increased use of bicycles, walking and introduction of parking policy	► Ministry of Economy, Energy Agency ► Local self-government ► End-users		Private sector
Agriculture, Forestry and Other Land Use Sector			
Policy/ measure	**Competent entity for realization**	**Investments (mil. €)**	**Source of funding**
Enteric fermentation in dairy cows	► Ministry of Agriculture, Forestry and Water Economy	0.2	Private sector
Manure management in dairy cows	► Ministry of Agriculture, Forestry and Water Economy	1	Private sector
Manure management in swine farms	► Ministry of Agriculture, Forestry and Water Economy	1	Private sector
Decreasing the number and damaged are by forest fires	► PE “Makedonski sumi” ► Ministry of environment and physical planning	19	PE "Makedonski sumi", other

	► Ministry of Agriculture, Forestry and Water Economy		forest enterprises
Change of quality of forests by afforestation of transitive forest land	► PE “Makedonski sumi” ► Ministry of environment and physical planning ► Ministry of Agriculture, Forestry and Water Economy	47.5	PE "Makedonski sumi", other forest enterprises
Conversion of land use of field crops above 15% inclination	► Ministry of Agriculture, Forestry and Water Economy	1.5	Private sector
Contour cultivation of cropland on inclined terrains (5-15%)	► Ministry of Agriculture, Forestry and Water Economy	1	Private sector
Perennial grass in orchard and vineyards on inclined terrains (>5%)	► Ministry of Agriculture, Forestry and Water Economy	1	Private sector
Waste			
Policy/ measure	**Competent entity for realization**	**Investments (mil. €)**	**Source of funding**
Closure of the existing landfills	► Ministry of environment and physical planning ► Public utilities ► Inter-municipal board for waste management	20.5	Local self-government through Public Utilities, Public Private Partnership, Grants from the EU
Mechanical and biological treatment (MBT) in new landfills with composting	► Ministry of environment and physical planning ► Public utilities ► Inter-municipal board for waste management	70.5	Local self-government through Public Utilities, Public Private Partnership, Grants from the EU
Selection of waste - paper	► Ministry of environment and physical planning ► Public utilities ► Inter-municipal board for waste management	2	Local self-government through Public Utilities, Public Private Partnership, Grants from the EU
Total for all sectors		**17,222.1**	

Table 2.5 below provides overview of the identified financial support needs for those sectors that contribute the most to climate change mitigation:

Table 2.5Financial needs for mitigation scenario in mil EUR, for the period 2017-2035 (Source: Mitigation Strategy SBUR)

Sector	Financial needs for mitigation scenario in mil EUR, for the period 2017-2035
Energy	17,056.8
Agriculture, forestry and land use	72.2
Waste	93.0
Total	**17,222.1**

Conclusion regarding the financial support needs as defined in the Mitigation Strategy of the SBUR

According to the Mitigation Assessment (WEM Scenario), the investments of 17,222.1 mil. € are needed for the period 2017-2035 (an average of 906.42 mil. € annually) to implement the mitigation scenario. According to the mitigation strategy, the average yearly investments in WEM are approximately 6.75% of the total average annual GDP (13,000 mil. €). If the investments from the private sector are exempted, the remaining investments amount to 2,604.2 mil. €, or an average of 137.06 mil. € annually, and they would be provided by the Budget of the Republic of Macedonia, local self-governments, the City of Skopje, the government-owned utility JSC ELEM, public-private partnerships.

Reference document: Renewable Energy Sources Strategy of Macedonia till 2020

When it comes to the implementation of the other national strategic documents and plans relevant for climate change mitigation, the Renewable Energy Sources Strategy of Macedonia till 2020 (2010) was also assessed and elaborated in the scope of this assessment.

Table 2.6 Financial support needs for development of the RES (Source: Renewable Energy Sources Strategy of Macedonia till 2020 (2010);

Activity/project	Status (ongoing/planned/completed)	Overall support needed (a) (in mil. EUR)	Support received (b) (in mil. EUR)	Additional support needed (c) (in mil. EUR)
Revitalization of existing HPPs	2012-2015	70		
Construction of LHPPs, Chebren and Galiste	2012-2019	519		

Construction LHPPs Boskov Most	2012-2016	70		
Construction of LHPPs Lukovo Pole with HPP Crn Kamen	2010-2014	45		
Construction of LHPP Gradec	2014-2021	156		
Construction of SHPPs (100 MW)	/	200		
Geothermal energy	/	60		
WPPs (230 W)	/	230		
Photovoltaic system (20MW)	/	80		
Solar System for hot water (80000 households)	/	60		
TPP-HP using waste biomass and TPP using biogas (20MW)	/	30		
Total:		**1,520.0**		

Source: Renewable Energy Sources Strategy of Macedonia till 2020 (2010);

Conclusion regarding the financial support needs as defined in the Renewable Energy Sources Strategy of Macedonia

Total investments for the implementation of the program on RES development in the period until 2020 are estimated at around 1.5 billion EUR.

Anticipated investments for the revitalization of existing and construction of new generation facilities can be achieved with investments made by AD ELEM in the amount of 260 million EUR (own funds and credits), public-private partnership in the amount of 670 million EUR, the concession holders should secure 480 million EUR and from private investors in the construction of plants fuelled by waste biomass and biogas in the amount of 30 million EUR.

The budget should allocate an amount of around 20 million EUR to support research of geothermal potentials.

Investments in the implementation of solar systems for hot water will be made by households and private companies in the amount of 50 million EUR and will be supported from the budget in the amount of around 10 million EUR.

Reference document: Strategy for Energy Development in the Republic of Macedonia for the Period 2008-2020

The third strategic document which was assessed in the framework of this assignment was the Strategy for Energy Development in the Republic of Macedonia for the Period 2008-2020 with a Vision to 2030. Table 2.7 provides overview of the financial support needs for activities related to climate change mitigation, as defined in the Strategy for energy development of Macedonia.

The activity Revitalisation of the existing HPP is provided in both strategic documents, in the Strategy for Energy Development in the Republic of Macedonia for the Period 2008-2020 and in the Renewable Energy Sources Strategy of Macedonia till 2020 (2010). However, the cost of this activity differs in both strategies (70 mil. EUR in the RES Strategy and 67 mil EUR in the Energy Development Strategy).

Table 2.7 Financial support needs for development of the Energy sector (Source: The Strategy for Energy Development in the Republic of Macedonia for the Period 2008-2020 with a Vision to 2030 (2010))

Activity/project	Status (ongoing/planned/completed)	Overall support needed (a) (in mil. EUR)	Support received (b) (in mil. EUR)	Additional support needed (c) (in mil. EUR)
Revitalization of the equipment in the TPP Bitola, TPP Oslomej and TPP Negotino	2010-2012 2014-2017 2010-2012	260		
Revitalization of the existing HPP	2012-2015	67		
CHP using natural gas	2010-2014	250		
TPP Bitola 4, TPP Mariovo and TPP Negotino, lignite fired	2014-2018 2020-2024	1.120		
Development of the transmission grid	Planned	109.3		
Activities in the heating infrastructure	/	56.3		
Gasification	/	240		
Total:		**3.622,6**		

Conclusion regarding the financial support needs as defined in the Strategy for Energy Development in the Republic of Macedonia

The total investments in the energy sector in the period until 2030 are estimated on 3.6 billion Euros for the option with coal thermal power plants, and over 5 billion Euros for the option with construction of a nuclear power plant.

The fact that the investments lacked in this sector for a long period of time, led to a situation that on one hand, a serious investment cycle should start, and on other, mechanisms and methods to find funds have to be found. The maintenance, modernization and development of the energy sector requires significant capital investments and therefore it is needed to increase the involvement of the private sector and attract foreign capital to the energy market of Macedonia which, on one hand, is a necessity for a small country with limited financial resources and, on the other hand, this will increase the investment activity of the country and intensify the total economic development.

Reference document: National Strategy for Energy Efficiency in the Republic of Macedonia till 2020

The forth strategic document which was assessed in the framework of this assignment was the National Strategy for Energy Efficiency in the Republic of Macedonia till 2020. Table 2.8 provides overview of the financial support needs for activities related to climate change mitigation in regards to the Strategy for Energy Efficiency of Macedonia.

Table 2.8 Financial support needs for EE measures (Source: The National Strategy for Energy Efficiency in the Republic of Macedonia till 2020 (2010))

Activity/Project	Date	Mil. EUR/ktoe	Sector	Source
Promotional info campaign	2010-2020	0.267	Energy/Residential sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
New buildings (heating, solar systems, new appliances, lighting)- certification, energy codes		3.16	Energy/Residential sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Social housing		4.62	Energy/Residential sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Allocators for DH		2.561	Energy/Residential sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
EE building retrofit		7.26	Energy/Residential sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Information campaign and municipal EE network	2010-2020	1.25	Energy/Commercial and public building sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Inspections of boilers/air conditioning systems	2010-2020	0.27	Energy/Commercial and public building sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Energy management and corporate social responsibility	2010-2020	0.08	Energy/Commercial and public building sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020
Building energy performances improving- certificates		3.8	Energy/Commercial and public building sector	Energy Efficiency Strategy of the Republic of Macedonia until 2020

Conclusion regarding the financial support needs as defined in the National Strategy for Energy Efficiency in the Republic of Macedonia till 2020

According to the Energy Efficiency Strategy the cost of the measures and the investments in the EE are highly depended on the category and the activities foreseen. However, the most cost efficient investments are the awareness raising activities, the energy management and the inspections of the big consumers. The total cost of the mitigation activities foreseen in this strategy are estimated on 522.06 mil. EUR, from which the most significant part or 357.28 mil. EUR should be covered by the private sector.

Reference document: Waste Management Strategy of the Republic of Macedonia 2008-2020

For waste sector, financial needs are identified according to the waste management strategy of the Republic of Macedonia 2008-2020. Table 2.9 provides overview of the investments needed in the waste sector in the period 2008-2020.

Table 2.9 Financial needs for investments in the waste sector (Source: Waste Management Strategy of the Republic of Macedonia 2008-2020)

Activity	Financial needs (in mil. EUR)
Investment costs for remediation of the closed down municipal landfill	30
Remediation activities of the priority hot spots	77
Reduction of environmental impacts caused by waste, the priority investments in the transposition of legislation and in the basic municipal and hazardous waste infrastructure	4.89
Total capital/costs of transposing the key EU directives related to waste issues into the Macedonian legislation framework and their full implementation	400
Total	**511.89**

Conclusion regarding the financial support needs as defined in the Waste Management Strategy of the Republic of Macedonia 2008-2020

In order to reach the main goals regarding the reduction of environmental impacts caused by the sector waste, the priority investments in the transposition of legislation and in the basic municipal and hazardous waste infrastructure shall amount yearly to approximately 1,5% of the GDP (Reference value used is 5,77 billion US$ in the year 2005). More sophisticated technological facilities regarding biotechnological and thermal treatment of waste shall require additional capital investments; those investments will become unavoidable at the end of the implementation time of the waste management strategy. Approximately 10% of the yearly investments in establishment of the waste management system shall be spent to cover the personnel related costs for legal transposition and implementation and for technical assistance for legal transposition and implementation. The other 90% of financial amount shall be spent in the realisation of capital investments. According to the first estimation, approximately 40% of all investments shall be realised in the industrial sector

and approximately 60% of investments shall be realised in projects of establishing the municipal waste systems and infrastructure, which shall be financed from public financial

Cross cutting needs as defined by the EU/IPA planned projects in the programming period 2014-2020

The table below this paragraph represents the identified projects as support needs in the energy, transport and environmental sector that are planned for financing under new EU/IPA programming period 2014-2020.

Table 2.10 Financial support needs in terms of EU/IPA Planned projects in the programming period 2014-2020 (Source: http://cfcd.finance.gov.mk/?page_id=852 , http://www.sep.gov.mk/)

Activity/project Law and Strategy on Climate Change	Status (ongoing/planned/completed)	Overall support needed (a) (in mil. EUR)
Law and Strategy on Climate Change	planned	1.5
Construction of WWTP for Skopje and supervision activities	planned	120
Construction of the selected infrastructure facilities, closure of the noncompliance landfills/dumpsites and supply of equipment for handling and transferring of waste in the East and Northeast regions.	planned	24
Construction of waste management facilities in Pelagonia Region and supervision activities	planned	20
Construction of waste management facilities in Southwest Region and supervision activities	planned	20
Construction of waste management facilities in Polog Region and supervision activities	planned	20
Construction of waste management facilities in Vardar Region and supervision activities	planned	20
Construction of WWTP and upgrading and extension of the sewage network in Debar and supervision activities	planned	9.5
Construction of WWTP and upgrading and extension of the sewage network in Gostivar and supervision activities	planned	23.5
Construction of WWTP and upgrading and extension of the sewage network in Kavadarci and supervision activities	planned	12.5
Construction of waste management facilities in Southeast Region and supervision activities	planned	20
Construction of WWTP and upgrading and extension of the sewage network in Stip and supervision activities	planned	9.5
Construction of WWTP and upgrading and extension of the sewage network in Veles and supervision activities	planned	16.5
Clean-up Activities for Alpha-HCH, Beta- HCH and Lindane Contaminated Sites at OHIS	planned	35
Excavation and on or off site remediation of the chromium dumpsite in Jegunovce	planned	12.7
Excavation and off site remediation of the lead, zinc and cadmium dumpsite in Veles	planned	23.6
Sanation and recultivation of the lead and zinc dumpsite in Probishtip.	planned	4.2
Excavation and slag recycling of the dumpsite in Zelezara, Skopje	planned	8
Development of new natural friendly forms for accommodation in national parks Mavrovo, Pelister and Galicica	planned	5.05

Construction of bio-corridors of roads and railways in R. Macedonia	planned	2.5
Construction of wastewater treatment plants in towns with a population of 2.000 to 15.000 inhabitants (Centar Zupa)	planned	6
Construction of wastewater treatment plants in towns with a population of 2.000 to 15.000 inhabitants (Demir Kapija)	planned	6
Construction of wastewater treatment plants in towns with a population more than 15.000 inhabitants (Lipkovo)	planned	2
Construction of wastewater treatment plants in towns with a population more than 15.000 inhabitants (Tearce,)	planned	2
Construction of wastewater treatment plants in towns with a population more than 15.000 inhabitants (Negotino)	planned	2
Construction of Wastewater Treatment Plants for Settlements with Population over 2,000 in the Strumica River Basin District – Novo Selo	planned	2
Construction of Wastewater Treatment Plants for Settlements with Population over 2,000 in the Strumica River Basin District – Vasilevo	planned	2
Construction of Wastewater Treatment Plants for Settlements with Population over 2,000 in the Strumica River Basin District- Bosilovo	planned	2
Interconnection (South West of Macedonia) Bitola(Macedonia) – Elbasan (Albania), the Republic of Macedonia's part and 400/110Kv SS Ohrid	planned	63.7
Main gas pipeline section 3 branch Stip- Hamzali Main gas pipeline section 4 Hamzali- Stojakovo (border with Greece) , Main gas pipeline section 13 Hamzali – Novo Selo (border with Republic of Bulgaria)	planned	71
CENTRAL HEATING IN BITOLA, NOVACI, AND MOGILA – STAGE I	planned	47
Main gas pipeline section 1 Klechovce–Negotino, part Stip-Negotino	planned	17
Main gas pipeline section 5 Skopje- Tetovo-Gostivar-Kichevo	planned	50
Hydro Power Plant Boskov Most (Boskov Most, Tresonce village, near city of Debar)	planned	143.9
Hydropower Plant Cebren	planned	338.4
Wind Park Bogdanci - 2nd phase	planned	21
Main gas pipeline section 2 Negotino- Bitola	planned	40
Main gas pipelines: - Branch to Tetovo - branch to TEC Negotino - branch to Kavadarci	planned	10
Main gas pipeline sections II phase: Sveti Nikole-Veles - Branch to Gevgelija - Branch to DemirKapija - Matka – Gracani - Vrshakovo-Kocani-Razlovci - Branch to TEC Oslomej - Branch to Probistip - Klechovce-Sopot - Kicevo-Ohrid - Ohrid-Struga-Kafasan	planned	80
Lukovo Pole and intake of Korab waters (NP Mavrovo, Rostuse, Gostivar)	planned	83.7

Hydro Power Plant Galiste (Crna River)	planned	200
Hydro Power Plant Spilje II	planned	21.1
Modernization of Thermal power plant Oslomej (Oslomej, Kicevo)	planned	125.4
400/110 kV substation Kumanovo	planned	15
Modernization and rehabilitation of REK Bitola phase III – reduction of SOx and dust, expanded to include the impact of all harmful substances released from REK Bitola	planned	80
110 kV in-out connection to 110 kV OHTL HPP Vrutok – SS Skopje 1	planned	1.87
Revitalization/reconstruction of 110 kV transmission lines	planned	5.82
400 kV interconnection Skopje 5 - New Kosovo	planned	6
Hydro Power Project Tenovo Kozjak (Chanel from Tenovo to Kozjak Storage)	planned	6
Combined cycle gas power plant Energetika (Skopje, adjacent to ELEM's existing plant Energetika)	planned	120
Hydro Power System Vardarska Dolina (Vardar river valley)	planned	1,062
Hydro Power Plant Globocica II	planned	30
TESLA gas pipeline system	planned	415
Construction of the rail section Beljakovce-border with R. Bulgaria	planned	470
Construction of road section Gostivar- Kicevo	planned	280
Construction of road section Drenovo - Interchange Gradsko	planned	35
Construction works of the railway section Kicevo – Border with Albania	planned	470
Construction of road section Skopje - Kosovo border	planned	70
Rehabilitation of road section Negotino - DemirKapija	planned	9
Rehabilitation of road section Prilep - Raec Bridge	planned	4.78
Rehabilitation of road section Gevgelija - Greece border (Bogorodica)	planned	1.15
Rehabilitation of road section Medzitlija (Greece Border) - Interchange Krklino	planned	1.94
Rehabilitation of road Interchange Krklino - Prilep	planned	2.85
Reconstruction of road section from Katlanovo to Petrovec	planned	not estimated
Rehabilitation of road section Gradsko - Negotino	planned	4.4
Rehabilitation of road section Veles - Gradsko	planned	4.59
Rehabilitation of road section Miladinovci - Skopje	planned	5.49
Rehabilitation of road section Tetovo - Gostivar	planned	5.59
Rehabilitation of road section Kumanovo -Rankovce	planned	9
Rehabilitation of road section Skopje - Tetovo	planned	9.93
Construction and supply of ITS on Coridor X	planned	20

Rehabilitation of Local roads with an amount of 0.5-1 MEUR for each local road	planned	1
Construction of Regional roads with an amount up to 10MEUR for each project	planned	10
Construction of railway section along the corridor X Dracevo – Veles	planned	550
Reconstruction of road section from Kriva Palanka to Deve Bair	planned	not estimated
Construction of road section Trebeniste - Struga	planned	45
Construction of road section Struga - Kjafasan	planned	80
Revitalization of existing HPPs	2012-2015	70
Construction of LHPPs, Chebren and Galiste	2012-2019	519
Construction LHPPs Boskov Most	2012-2016	70
Construction of LHPPs Lukovo Pole with HPP Crn Kamen	2010-2014	45
Construction of LHPP Gradec	2014-2021	156
Construction of SHPPs (100 MW)	/	200
Geothermal energy	/	60
WPPs (230 W)	/	230
Photovoltaic system (20MW)	/	80
Solar System for hot water (80000 households)	/	60
TPP-HP using waste biomass and TPP using biogas (20MW)	/	30
Revitalization of the equipment in the TPP Bitola, TPP Oslomej and TPP Negotino	2010-2012 2014-2017 2010-2012	260
Revitalization of the existing HPP	2012-2015	67
CHP using natural gas	2010-2014	250
TPP Bitola 4, TPP Mariovo and TPP Negotino, lignite fired	2014-2018 2020-2024	1,120
Development of the transmission grid	Planned	109.3
Activities in the heating infrastructure	/	56.3
Gasification	/	240
Total		9,198.26

2.1.3. Nationally determined technology needs

Technology transfer plays a critical role in the effective global response to the climate change challenge. Since technology is a source of greenhouse gas (GHG) emissions, achieving global reduction of GHGs requires innovation to make current technologies cleaner and climate-resilient.

While there are many definitions of technology transfer, the GEF has adopted the concept of technology transfer as defined by the Intergovernmental Panel on Climate Change (IPCC) in

Methodological and Technological Issues in Technology Transfer, IPCC 2000, and embodied in the UNFCCC technology transfer framework.

Technology transfer is defined as: "...a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions..."

The national designated entity for technology transfer has not been appointed yet. The MoEPP perceives the TNA as a key activity for successful climate change mitigation, and it underlines that the previous TNA of Macedonia is outdated and no longer relevant for analysing and planning of the climate related technology need and mitigation actions. Therefore, a project proposal for TNA to be funded by the GEF or other donor organisation is considered to be developed and implemented.

2.2. Local level

2.2.1. Technical and Capacity building needs

There are several aspects of capacity building support needs at local level. One of the main issues is strengthening capacities for implementation of environmental legislation on local level where climate change takes place. According the Programme of reform developed within the EU IPA funded project "Strengthening capacities for implementation of environmental legislation on local level" implemented 2015-2016, there is a need for strengthening the capacities to implement the environmental legislation in integrated way, including climate change issues, taking into consideration all possible impact and necessary measures, providing guidance how to harmonize local environmental planning documents where climate change aspects are also included.

It would be important to develop a national support program on environmental compliance and enforcement, even in the form of joint inspections, trainings, manuals, handbooks (e.g.: on misdemeanour procedures), etc.

It is also recommended to include in the support program for the local inspectors a regular legal updating.

In regards to increasing capacities at LSGUs with the exception of the City of Skopje, in general the staff numbers currently in place are similar to the staff numbers foreseen in the systemisation of 2008, which indicates that staff numbers are insufficient. This is probably true, given the large number of competences (130 approx.) in the environmental and climate sectors that have been delegated to LSGUs and the current small number of staff in the environmental sector.

Beside the insufficient staff numbers, there is also a need of capacity building of their competencies. At present ZELS is the primary provider of training to LSGU staff. In addition, training has been provided on an *ad hoc* basis by both Twinning and TA Projects.

Having into consideration this information it is clear there is no systematic training programme aimed at ensuring that staff in the LSGUs have the capacity to implement the full range of competences placed on the LSGUs under the environmental and climate legislation.

Another issues is the lack of a systematic training programme and the lack of training records, as well as improvements that need to be done in Institutional Arrangements.

The identified technical and capacity building needs on local level are presented in Table 2.11 provided bellow this paragraph.

Table 2.11 Technical and capacity building needs on local level (on a level of municipality)

Activity/Measure	Resources	Support needs per year in USD
Staffing	1 environmental expert 1 authorized environmental expert	9200 9200
Resource and facilities	2 premises 2 PC Web site (domain, updating and hosting)	600 1200 840
Capacity building measures	Trainings * 2 Networking Coordination meetings with other institutions and sectors within the municipality	8000 150 200
Total annual funds needed		46,000

2.2.2. Financial support needs

City of Skopje

The financial support needs are assessed only for the City of Skopje as the biggest municipality that has highest needs and potentials for climate change mitigation. The financial needs given in the table below are part of the Climate Change Strategy, Resilient Skopje**.**

Table 2.12 Financial support needs of the City of Skopje regarding implementation of climate change mitigation activities (Climate Change Strategy of City of Skopje)

Policy/measure	Budget in mil EUR	Responsible institution for implementation	Sector
Solar collectors for the buildings of the City of Skopje and the municipalities.	4	City of Skopje and the municipalities	Energy supply
Creating conditions for measures to stimulate the installation of solar collectors by households	4	MoE, MoF, City of Skopje and the municipalities* and the citizens	Energy supply
Creating conditions for measures to stimulate the installation of photovoltaic systems (installed on municipal and	6	City of Skopje and the municipalities, citizens, the business sector, MoE, Energy Agency, EVN	Energy supply

private buildings)			
5% share of bio-fuels in transportation by2020.	6	MoE, manufacturers, importers and retailers in petroleum products, the citizens, Skopje and the municipalities*	Energy supply
Renovating hospitals and applying energy-efficiency measures	4	MoH. MoF, City of Skopje and the municipalities*	Buildings
Creating conditions for stimulating measures for improving the heat insulation of the commercial and service sectors" buildings of the City of Skopje and the municipalities.	4	Commercial and service sectors, City of Skopje and the municipalities	Buildings
Replacing incandescent light bulbs (modernisation of lighting in buildings owned by the city of Skopje and the municipalities, households and commercial and service sectors).	2	MoE, Energy Agency, retailers in household appliances, the citizens of the city of Skopje, City of Skopje and the municipalities	Buildings
Creating conditions for stimulating measures for greater penetration of heat pumps in households and in the commercial and service sector.	2	MoE, Energy Agency, retailers in household appliances, the citizens, City of Skopje and the municipalities*	Buildings
Penetration of devices with higher efficiency.	2	MoE, Energy Agency, merchants of household appliances, the citizens, City of Skopje and the municipalities*	Buildings
Application of the Energy Efficiency Rulebook for Buildings and the 2010/31/EU Directive when renovating residential buildings.	4	Citizens, private investors, City of Skopje and the municipalities	Buildings
Application of the Energy Efficiency Rulebook for Buildings and the 2010/31/EU Directive when	4	Citizens, private investors, City of Skopje and the municipalities	Buildings

building new residential buildings.			
To carry out a detailed survey about heating habits in Skopje in order to adopt informed policies, including collecting and analysing gender-disaggregated data	2	City of Skopje and the municipalities, BEG, EVN, municipalities	Buildings
Procurement of vehicles for the City of Skopje in accordance with Green Public Procurement criteria	2	City of Skopje and the municipalities, public enterprises	Transportation
Renewal of fleet vehicles	2	Citizens, City of Skopje and the municipalities*	Transportation
Total	48		

Table 2.13 Financial support needs of the City of Skopje regarding implementation of climate change mitigation activities, by sectors (Climate Change Strategy of City of Skopje)

Sector	Mil EUR
Energy Supply	20
Buildings	24
Transport	4
Total	**48**

3. Financial, technical, technology and capacity building support received

3.1. International donor organisations and developed countries

Macedonia receives significant financial, capacity building, technical and technological support by international donor organisations and developed countries, and this assessment report analyses the support received in the period 2014 – 2017. It should be also underlined that the country, through its national and local budgets, has funded number of projects with direct or indirect impact on the climate change mitigation of the country.

In this section, the team of experts responsible for the development of this report would like to express their view in regards to the directions for preparation of the chapter provided in the Training materials for reporting of the Financial, Technical and Capacity-Building Needs and Support Received. The training materials are not providing enough clear information regarding the selection of the projects which have to be considered in this summary tables, and if it is appropriate to include the projects with indirect impacts or co-benefits in regards to the climate change mitigation. Furthermore, the summary tables require project information for the projects/activities contained in the BUR, not specifying if it is about direct or indirect contribution, which can present ambiguous picture of the climate change investments in the country.

It has to be stressed that all projects that have been identified and captured in the summary tables of this chapter (Tables 3.1, 3.2, 3.3 and 3.4) have been awarded as climate projects with direct impact on the climate change mitigation of the country and are part of the activities listed in the BUR. Therefore, during the initial stage of the development of the assessments of this type, it is extremely important to identify/adopt specific criteria for selection of eligible projects for reporting in the following BURs/NCs as it is not currently clear whether it is appropriate to include projects with indirect impacts or co-benefits in regard to climate change mitigation.

Table 3.1 provides information about the support received from multilateral institutions, containing detailed information on the scope of the support received - financial, technology transfer, capacity-building or technical support received.

The fill extended list of funded climate related projects (with direct or indirect climate change impact) in Macedonia is presented in Annex I to this document.

Table 3.1 Funding sources from multilateral sources

Reporting period:		***2014 – 2017***							
Funding source		*Description of support, including the national contribution, in mil. United States dollars (USD)(exchange rate EUR to USD 1,2)*							
		Preparation of BUR				*Climate change activities contained in the BUR*			
		Financial	*Capacity-Building (Capacity Building + Technical support)*	*Technology support*	*Technology transfer*	*Financial*	*Capacity-Building(Capacity Building + Technical support)*	*Technology support*	*Technology transfer*
Multilateral sources									
1	**EU**	$ -	$ -	$ -	$ -	$ 0.717	$ 4.017	$ -	$ -
2	**IPA CBC**	$ -	$ -	$ -	$ -	$ -	$ 0.399	$ -	$ -
3	**EU Community Programmes**	$ -	$ -	$ -	$ -	$ -	$ 0.135	$ -	$ -
4	**GEF**	$ -	$ 0.673	$ -	$ -	$ 0.049	$ 0.717	$ -	$ -
5	**UNDP**	$ -	$ -	$ -	$ -	$ -	$ 0.038	$ -	$ -
Subtotal		$ 0.673				$ 6.071			
Total		**$ 6.745**							

3.2. International, regional and national financing institutions and development banks

The information about the financial support received by financial institutions and regional development banks is summarised in Table 3.2.

The summary of financial resources, technology transfer, capacity-building and technical support received from the Global Environment Facility (GEF), Parties included in annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions, as well as the national funds and contributions for activities relating to climate change, including for the preparation of the current biennial update report (decision 2/CP.17, annex III, section V, paragraph 15) are provided in the Tables 3.3 and 3.4.

Table 3.2 Support received by multilateral financial institutions, including regional development banks

Reporting period: 2014 - 2017								
Funding source	*Description of support, in million United States Dollars (USD)(exchange rate EUR to USD 1,2)*							
	Preparation of BUR				*Climate change activities contained in the BUR*			
	Financial	*Capacity-Building (Capacity Building + Technical support)*	*Technology support*	*Technology transfer*	*Financial*	*Capacity-Building(Capacity Building + Technical support)*	*Technology support*	*Technology transfer*
Multilateral financial institutions, including regional development banks								
1 KfW	$ -	$ -	$ -	$ -	$ 104.280	$ -	$ -	$ -
2 World Bank	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3 EBRD (European Bank for Reconstruction and Development)	$ -	$ -	$ -	$ -	$ -	$ 2.880	$ -	$ -
Subtotal	$ -							$ 107.160
Total	**$ 107.160**							

Table 3.3 Summary of financial resources, technology transfer, capacity-building and technical support received

Reporting period: 2014 - 2017					
Type	Description of support, including the national contribution, in United States dollars (USD)(exchange rate EUR to USD 1,2				
	Multilateral sources	Funding from Annex II and other developed country Parties	Party contribution	Multilateral financial institutions, including regional development banks	Other sources (FIT D + National Government)
Preparation of BUR	$ 0.673	$ -	$ 0.180	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
Climate change activities contained in the BUR	$ 6.071	$ 8.790	$ 18.665	$ 107.160	$ 0.543
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
				Total	$ 142.08

Table 3.4 Financial resources, technology transfer, capacity-building and technical support received

Reporting period: 2014 - 2017					
Type	Description of support, including United States dollars (USD)(exchange rate EUR to USD 1.2)				
	Global Environment Facility	Annex II and other developed country Parties	Multilateral institutions	Green Climate Fund	Other sources (Development Banks + National Sources + National Contribution)
Preparation of BUR	$ 0.673	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
Climate change activities contained in the BUR	$ 0.766	$ 8.790	$ 5.305	$ -	$ 126.548
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
	$ -	$ -	$ -	$ -	$ -
				Total	$ 142.083

3.3. All climate related support received (direct and indirect) for informational purposes

Table 3.5. Presents a summary of all projects having direct and indirect climate mitigation impact and climate co-benefits. The activities of this projects don't always consider the activities foreseen in the BUR and not all of the projects were approved/implemented as climate change projects.

The numbers presented in this table are for informational purposes only and have to be assessed with special attention in order not to obtain wrong impression that the country has received significant climate change support, which is not the actual case. Therefore, the criteria for support that must be reported in the summary tables for projects/activities contained in the BUR should be clarified, as it is uncertain whether this section relates to direct or indirect contributions.

Table 3.5 Presents a summary of all projects having direct and indirect climate mitigation impact and climate co-benefits

Reporting period:		***2014-2017***							
Funding source		*Description of support, including United States dollars (USD)(exchange rate EUR to USD 1,2)*							
		Donor and national contribution for climate change activities in mil. USD							
		Financial (Donor Contribution)	*Financial (National Contribution)*	*Capacity - Building(Donor Contribution)*	*Capacity - Building(National Contribution)*	*Technical support (Donor Contribution)*	*Technical support (National Contribution)*	*Technology transfer (Donor Contribution)*	*Technology transfer (National Contribution)*
Multilateral sources									
1	**EU**	$ 125.628	$ 204.870	$ 0.874	$ -	$ 29.559	$ 3.541	$ -	$ -
2	**IPA CBC**	$ -	$ -	$ 0.249	$ -	$ 0.158	$ 0.070	$ -	$ -
3	**EU Community Programmes**	$ -	$ -	$ -	$ -	$ 0.135	$ -	$ -	$ -
4	**GEF**	$ 0.074	$ 0.108	$ -	$ -	$ 1.390	$ 0.285	$ -	$ -
5	**KfW**	$ 104.280	$ 18.120	$ -	$ -	$ -	$ -	$ -	$ -
6	**USAID**	$ 1.500	$ -	$ -	$ -	$ 6.899	$ 0.219	$ -	$ -
7	**SDC**	$ 31.069	$ -	$ -	$ -	$ 2.182	$ -	$ -	$ -
8	**Austrian Development Cooperation**	$ -	$ -	$ -	$ -	$ 1.200	$ -	$ -	$ -
9	**Norway**	$ -	$ -	$ 0.027	$ -	$ 1.182	$ 0.240	$ -	$ -
10	**German Cooperation**	$ -	$ -	$ 0.050	$ -	$ 0.240	$ -	$ -	$ -
11	**France**	$ -	$ -	$ 0.032	$ -	$ -	$ -	$ -	$ -

12	Government of R. Macedonia	$ -	$ -	$ -	$ 0.006	$ -	$ -	$ -	$ -
13	UNDP	$ -	$ -	$ -	$ -	$ 0.038	$ 0.026	$ -	$ -
14	UNIDO	$ -	$ -	$ -	$ -	$ 0.219	$ -	$ -	$ -
15	Fund for innovations and technology development (FITD) and company's own funding	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 0.537
16	World Bank	$ 70.980	$ -	$ -	$ -	$ -	$ -	$ 24.000	$ -
17	EBRD (European Bank for Reconstruction and Development)	$ -	$ -	$ -	$ -	$ 2.880	$ -	$ -	$ -
Subtotal		$ 333.531	$ 223.099	$ 1.232	$ 0.006	$ 46.080	$ 4.380	$ 24.000	$ 0.537
Total			$ -	$ -	$ -	$ -	$ -	$ -	$ 632.865

3.4. National and local authorities contribution

Regarding direct contribution from national and local authorities, as examples are taken budget allocations for activities contributing to climate change mitigation on local level - from the City of Skopje, the municipalities within City of Skopje and few other municipalities, as well as from the national budget allocations of the 2017 Budget of Republic of Macedonia.

3.4.1. National Budget

The table below this paragraph represents the budget allocations from the Budget of the Republic of Macedonia for all activities that contribute towards climate change mitigation (directly and indirectly). It is evident that budget is not given per programme but per sector, so particular activities cannot be clearly distinguished.

Table 3.6Foreseen budget allocations from the Budget of the Republic of Macedonia for all activities that contribute towards climate change mitigation (directly and indirectly)

	2017 budget (in mill USD)	Main budget (in mill USD)	Self-financing activities (in mill USD)	Loans (in mill USD)	Donations (in mill USD)
Ministry of environment and physical planning					
Investments in environment	3.098	2.139			0.958
Sewage and discharge channels	1.668	1.668			

Monitoring	0.469	0.276	0.192		
Environment protection	3.618	3.534			0.084
Total	**8.850**	**7.617**	**0.192**	**-**	**1.042**
Ministry of transport and communications					
Traffic and communications	3.777	3.777			
Project for water supply and discharge of waste waters	5.035	1.499		3.537	
Gasification	36.844	1.478		35.365	
Investment in railway infrastructure	22.776	11.530		11.246	
Total	**68.432**	**18.284**	**-**	**50.148**	**-**
National Hydro meteorological Service					
Hydrology and monitoring of environment conditions	0.199	0.169	0.029		
Forecast, warning, information and technics	0.444	0.440	0.004		
Total	**0.642**	**0.609**	**0.034**	-	-
Total for climate change related activities	**77.925**	**26.510**	**0.225**	**50.148**	**1.042**
Total budget	**3,952.827**				
% of expenses for climate change vs total budget	**1,97%**				

**exchange rate 1 USD = 52.17 MKD*

The assessed budget of Republic of Macedonia for climate related activities is consisted of budget for Ministry of Environment and Physical Planning, Ministry of Transport and Communication and National Hydrometeorological Service. For other Ministries and authorities the budget allocations are not clearly given and cannot be separately given in the table.

Table 3.7 Assessment of the overall national budget and the dedicated budget for climate change aspects, year 2017

Total for climate change	$77.924 mil USD
Total budget for 2017 of R. Macedonia	$3,952.827 mil USD
Percentage of expenditure for climate change mitigation in total budget 2017	**1,97%**

Conclusion regarding the financial investments of the National Budget

The assessment of the Table 3.7 shows that almost 2 % of the total national budget are allocated for climate change activities. The numbers are originating from the Budget of the Republic of Macedonia for 2017.

3.4.2. Innovation Fund

The Support Instrument of the Fond for Innovation and Technology Development - Co-financed Grants for Technology Transfer stimulates the transfer and implementation of new innovative and improved technologies, know-how and technology processes and encourages different forms of collaboration among SMEs, business associations, clusters and/or chambers of commerce in order to achieve sector impact. A new call for project proposals under the Instrument Co-financed Grants for Technology Transfer is expected by the end of 2017. There are no companies co-financed under this instrument yet. Through this instrument FITD shall provide financing of up to 50% of the total budget of the project, in a maximum amount of 200.000 EUR.

This instrument also gives opportunities for cooperation with the Ministry for environment and Ministry for Agriculture for supporting implementation of projects related to climate change.

Conclusion regarding the financial investments of the Innovation Fund

In regards to the climate technology transfer projects, the Fund for innovation has financed 5 climate related projects in the period 2015-2017 amounting to 447.592 EUR financial contribution. The projects are included in the Annex table on financial support received.

3.4.3. City of Skopje

In 2014 the City of Skopje and UNDP initiated the preparation of the Climate Change Strategy “Resilient Skopje” and since then the City allocate budget for concrete climate change mitigation measures and activities. Additionally, the City of Skopje shall support implementation of the activities planned within this Strategy, meaning that each year certain amount of funds shall be allocated specifically as climate change budget, thus showing their dedication and long term, strategic approach towards mitigating climate change and increasing urban resilience.

Table 3.8 Foreseen budget for climate change aspects as part of the budget for 2017 of the City of Skopje

Activity/project	Status (ongoing/planned/ completed)	Foreseen budget for climate change related activities in mil. USD
Promoting energy efficiency	planned	0.006
Preparation of three year programme for energy efficiency for the period 20182020	planned	0.010
Co- financing energy efficiency projects	planned	0.096

Updating national GHG inventory 2013 - 2015	planned	0.029
Activities related for Strategy for resilient Skopje	planned	0.029
Conducting research on consequences of air pollution on health care	planned	0.006
Preparation of elaborate of analysis of ambient air pollution from traffic	planned	0.052
Preparation of elaborate of analysis of ambient air pollution from wood burning for heating purposes	planned	0.018
Subsidies for citizens for purchase of pellets for heating purposes	planned	0.192
Organization of public event EARTH DAY	planned	0.002
Preparation of documentation for Vardarishte	planned	0.038
Purchase of various equipment necessary for fire protection brigade	planned	1.159
Projects for reconstruction of commercial objects of City of Skopje	planned	0.058
Reconstruction of commercial facilities of City of Skopje	planned	0.038
Projects for pedestrian and cycling paths and bridges	planned	0.029
Construction, maintenance and reconstruction of cycling paths	planned	0.192
	Total	1.952

Table 3.9 Assessment of the overall budget of the city of Skopje and the dedicated budget for climate change aspects, year 2017

Total planned expenditure from budget 2017 for climate change mitigation	$1.95
Total budget for 2017 of City of Skopje	$136.57
Percentage of expenditure for climate change mitigation in total budget 2017	**1.42%**

Conclusion regarding the financial support received by the City of Skopje

It is important to underline that City Skopje is providing 1.42% of the total budget for climate change mitigation actions. Huge efforts have been made by this institution in the past

several years. Starting with preparation of greenhouse gas inventory, air quality action plan, organizing European mobility week, joining the global action “Earth hour”, and preparation of the Climate Change Strategy “Resilient Skopje” together with UNDP, City of Skopje contributed seriously to the climate change mitigation actions.

3.4.4. Municipalities within the City of Skopje

As per the municipalities in the City of Skopje, a good practice example should be pointed out in terms of municipality of Karpos. Municipality of Karpos has adopted “Programme on energy efficiency in the Karpos Municipality 2013 – 2015”, as well as “Decision for investment incentives (subsidies) in terms of energy efficient buildings”. The subsidies includes 10% discount on municipality taxes while constructing an energy efficient building. In terms of using renewables, additional 5% discount is available (applicable only for buildings in A+, A and B energy class). Hence, such policies resulted in 164 buildings reconstructed with energy efficient facades till October 2016.

The Municipality of Strumica should be pointed out for its project of gasification started in 2011. Thus, Strumica is the first municipality in the country which is classified through a virtual gas system and correspondent decompression stations. The Strategy for Local economic Development of Strumica 2016 – 2020, which was adopted in May 2016, includes plans for further development of the gas distribution network as well as substitution of other more carbon intensive fossil fuels, by offering an investment incentives (subsidies) for connection of new customers. The total budget for this measure in the period 2016-2020 is projected to approximately 1,000,000 euros. Nearly 100,000 euros for the same period are foreseen for subsidies in terms of electric vehicles and e- mobility.

Table 3.10 presents the budget allocations for climate change related projects of the other municipalities within the City of Skopje.

Table 3.10 Foreseen budget allocations for climate change related projects of the other municipalities within the City of Skopje

Municipality	Total Budget in mil. USD	Foreseen budget for climate change related activities in mil. USD	Percentage from total budget
Municipality of Centar	**34.032**	**0.879**	**2.58%**
Waste management		0.335	
Environment protection		0.544	
Municipality of Butel	**8.183**	**0.326**	**3.98%**
Construction of transportation system and waste water treatment plant		0.326	
Municipality of Gjorce Petrov	**10.973**	**0.406**	**3.70%**
Waste management		0.130	

Waste water management		0.124	
Environment protection		0.056	
Projects for energy efficiency		0.096	
Municipality of Karposh	**45.904**	**0.316**	**0.69%**
Projects for energy efficiency		0.096	
Environment protection		0.048	
Construction of transportation system and waste water treatment plant		0.172	
Municipality of Aerodrom	**21.544**	**0.311**	**1.44%**
Construction of transportation system and waste water treatment plant		0.293	
Environment protection		0.018	
Municipality of Gazi Baba	**210.101**	**2.046**	**0.97%**
Waste management		0.177	
Waste water management		1.783	
Environment protection		0.086	
Total		**4.284**	

**exchange rate 1 USD = 52.17 MKD*

3.4.5. Other municipalities

Within the project Climate Change Strategies (included in the table in Annex I on financial support received), it is important to emphasize that eleven municipalities have developed climate change strategies. The Climate Change strategies were developed as a result of a USAID funded project (2.8 mil. USD), implemented by Milieukontakt Macedonia in the period September 2012 – September 2016.

In addition to the developed Climate Change Strategies within the same project are implemented pilot projects. The Table below shows the local contribution to each project per municipality.

Table 3.11 Local contribution for implementation of the developed Climate Change Strategies, by municipality and activity

Municipality	Pilot project	USAID contribution in mill USD	Local contribution in mill USD	Other contribution
Bogdanci	Water supply tank	0.118	0.022	
Bogovinje	Delivery and installation of water meters in fours settlements in the municipality	0.086	0.052	
Krivogastani	Energy efficient adaptation of public buildings	0.091	0.027	
Mavrovo Rostuse	Rehabilitation of landslides in Prisojnica village	0.084	0.019	
Pehcevo	Reduction of the CO2 emissions and the energy expenses in the municipality	0.103	0.008	0.044 (GEF-SGP)
Studenicani	Rehabilitation of the riverbed of Meritz river and landslide prevention in Studenicani village	0.086	0.021	
Tearce	Reconstruction of the riverbed and the damaged cascade cut off walls if Ponika river in the village of Dobroshte	0.078	0.020	
Vinica	Regulation of Osojnica riverbed downstream and upstream the bridge over Osojnica river in Jakimovo village	0.083	0.020	
Total		0.729	0.189	0.044
Urgent actions				
Mavrovo Rostuse	Reconstruction of the roof structure, replacement of windows and building an energy -efficient facade of the municipal building of the	0.022	0.004	

	municipality			
Bogdanci	Thermal insulation of the kindergarten rooftop	0.016	0.002	
Bogovinje	Cleaning of the riverbed in Pirok, Kamenjane and Palciste	0.021	0.008	
Delcevo	Construction of the sewerage and pavement of street in the settlement Milkovo brdo	0.063	0.033 0.098	
Krivogastani	Reconstruction of the roof and windows of the city hall		0.001	
Pehcevo	New filter in the municipal WWTP	0.020	0.001	
Studenicani	Renovation of the municipal storage tank for drinking water in Studenicani	0.028	/	
Tearce	Replacement of the traditional street light with energy efficient in the public lighting system in Tearce	0.016	In kind	
Vinica	Cleaning and regulation of the Kajanecki dol ravine in the village of Istibanja	0.017	/	
	Total	**0.215**	**0.147**	

**exchange rate 1 USD = 52.17 MKD*

GEF Small Grants Programme

There are also several climate change mitigation projects funded by GEF-SGP where local contribution by municipalities is significant. The list of funded projects under the GEF-SGP is presented in the Annex I. The share of the budget allocated for climate related projects is 34.40%. Regarding the share of the Climate related projects in the total allocated budget of the GEF SGP (Global Environmental Facility Small Grants Programme) per year, the allocation per operational phases is as follows (OP5 Y3-Y4 and OP6 Y1-Y3):

- GEF PMG allocated funds for projects (OP5 Y3- Y4 and OP6 Y2-Y3) – 700,000 US$
- GEF PMG realized funds for Climate related projects – 240,810 US$

3.5. Implemented capacity building activities

In addition to the projects implemented for capacity building, below are listed all direct measures for capacity building, which encompass training, seminars, etc.

Capacity reinforcement (training and education)

In the analysed period, Macedonia has received significant **support for capacity reinforcement by means of various trainings, seminars, conferences and workshops.**

Mitigation and GHG Inventory
✓ Conference "Deploying an Alternative Fuels Infrastructure for Transport in the EU" as a part of the Project "Stabilizing GHG Emissions from Road Transport through doubling of Global Vehicle Fuel Economy", 14-18 November 2016, Ljubljana Slovenia. Organized by JRC EU, REC and UNEP.
✓ A Series of The Renewable Energy Forums (15.04.2013-31.07.2017) as a mechanism for bringing together renewable energy project developers, investors, local associations, ministries, agencies, and international donors to generate new initiatives and act as a feedback channel for legal proposals. The Forums were part from the "Clean Energy Investment Project" funded by USAID and implemented by Winrock International. Project for supporting the Government of Macedonia's efforts to increase investment in energy generation from renewable sources, and reduce Macedonia's total final energy consumption and greenhouse gas emissions.
✓ 8 workshops to increase the public's knowledge and awareness of the impact of climate change on the agricultural sector in Macedonia. (08.03.2012 – 07.03. 2015). Project "Adaptation to climate change in agriculture" funded by USAID and implemented by Rural Development Network of the Republic of Macedonia.
✓ Ending phase of Integration of Environmental Education in Macedonian Educational System 2013 – 2015. The purpose of the project is integration of environmental education in the Macedonian educational system. (01.09.2013-31.12.2015). Funded by Switzerland.
✓ Strengthening the administrative capacity of the energy department in the Ministry of Economy and the Energy Agency. (06/2013- 06/2015). Consultancy services for training and education. IPA Funded.
✓ Towards the future - Study on the potential and utilization of renewable energy sources in the cross border region. (19.12.2013 - 18.06.2015) IPA funded. At least 10 managers from public utilities and 20.000 inhabitants from the Municipalities from the Southeast planning region of R. Macedonia and the Southwest region of R. Bulgaria acquainted with the Renewable Energy Sources through the Public Awareness Campaigns implemented on both sides of the border
✓ ECRAN: Regional Training Seminar on assessment of GHG Inventories in the Forestry and Other Land Use. 15-16 April 2015, Sarajevo
✓ ECRAN: Regional Training Seminar on National Systems for GHG inventories (and projections)14-16 October 2015, Zagreb
✓ ECRAN Workshop: Report on the Regional Training Seminar on the assessment of GHG inventories in Waste. 24-25 November 2015, Sarajevo
✓ ECRAN: Regional Training Seminar on National Systems for GHG inventories (and projections). 28-29 June 2016, Podgorica.

✓ ECRAN: Regional Training Seminar on the assessment of GHG inventories in agriculture. 21-22 June 2016, Zagreb

MRV
✓ MultiEE (Facilitating multi-level governance for Energy Efficiency) Horizon 2020: Regional Conference Organized by GIZ, MACEF and Energy Agency of the Republic of Macedonia. “Energy efficiency data treatment” – Skopje, 06.07.2017.
✓ ECRAN Workshop: OPERATING A COMPETENT AUTHORITY. 13 – 15 October 2015, Vilnius, Lithuania
✓ ECRAN: Advanced Technical Training Programme on Verification in the scope of the EU ETS. 12-13 April 2016, Belgrade.

Climate policies
✓ 5TH CONGRESS OF ECOLOGISTS OF THE REPUBLIC OF MACEDONIA WITH INTERNATIONAL PARTICIPATION, Ohrid, Macedonia. 19th -22nd October 2016. Organized by Macedonian Ecological Society.
✓ Third International Climate Change Conference, Skopje (03-05.02.2017). Organized by USAID, and Mileukontakt Macedonia.
✓ GREDIT Conference (Green Development, Infrastructure, Transport) 2016. (30.03.2016-02.04.2016). Organized by BENA (Balkan Environmental Association) & University Ss Cyril and Methodius, Skopje.
✓ Conference "JRC SUPPORT TO LOW CARBON SOCIETY. ENERGY POLICY (Modelling low carbon energy scenarios) and Climate Change. Organized by JRC & Faculty of Mechanical Engineering Skopje. (09.09.2015) Skopje, Macedonia.
✓ Macedonia's First Biennial Update Report: (completed on 28.02.2015). Support received from UNDP
✓ Reduce Energy use and Change Habits. (REACH) - (project participants: Macedonia, Croatia, Slovenia and Bulgaria). Empowering fuel poor households (vulnerable consumers) to take actions to save energy and change their habits, and to establish fuel poverty as an issue that demands structural solutions (tailor-made policies and measures) at local, national and EU. (01.03.2014-01.03.2017). A number of educational events have been performed. Final meeting of project participants was held in Zagreb on 28.02.2017.
✓ Development of the ENV.net in West Balkans and Turkey: giving citizens a voice to influence the environmental process reforms for closer EU integration: (31.01.2014 -31.05.2015). Funded by EU Programmes.
✓ ECRAN Workshop on Quantitative Models and Scenario Development in Climate and Energy Policy (support mission to Module 4)05-06 July 2016, Podgorica, Montenegro
✓ ECRAN Regional Workshop on climate legislation in relation to transport (cars and vans, labelling, renewables and fuel quality) Tirana, 13-14 April 2016.
✓ ECRAN Workshop Contributions to the Global Climate Agreement II – practical preparations.18 March 2015, Tirana.

✓ European Commission JRC: EU-AU-IIASA Evidence and Policy Event, (30 August to 2 September 2016, Ispra, Ital

Technical training
✓ Road-transport & Emissions Modelling (REM) workshop. Sustainable transport and e- mobility modelling workshop organized by JRC & Faculty of Mechanical Engineering Skopje. (10-11.09.2015) Skopje, Macedonia.
✓ Technical training as a part of the Project "Catalysing market transformation for industrial energy efficiency and accelerate investments in best available practices" Component 2 involves training for local IEE consultants on: energy management systems (EMS) in line with ISO 50001; steam system optimisation (SSO); and compressed-air system optimisation (CASO). The consultants' new skills will help partner companies to identify and implement IEE measures. Collaboration between consultants and partner enterprises takes place in so-called energy management teams, which participate in one-year energy management capacity-building programmes. Trainings in the area of EMS and SSO were completed in 2015, while CASO training will be completed in 2018. Significant energy and GHG reduction since the participants in the project are large combustion plants.
✓ "Conversion from HCFC – 141b in HFCs in the Manufacture of polyurethane foam for the commercial refrigeration units, sandwich panels and insulated doors", UNIDO Project (01.01.2014 -31.12.2016). Training of the technicians in refrigeration process and preparation of manuals and guidelines.
✓ EUREMPlus: Boost energy efficiency in manufacturing SMEs by extending European Energy Manager Training and Network. (01.05.2013- 31.10.2015). Funded by EU and Economic Chamber of Nuremberg, Germany.
✓ Promotion of energy efficiency in buildings and protection of the environment (PEEBPE) 4th IPA Seminar on the topic: "ENERGY AUDIT IN BUILDINGS" was held in Bitola, at the premises of Business Academy Smilevski – BAS, on 19/06/2014.
✓ Closing Event of the project «From Trash to Cash: Sustainable Development and Economic Empowerment of the Informal Waste Collectors through Waste Recycling in the Cross Border Region with Albania and Macedonia. 28th September, Korce Albania.
✓ Environment and Climate Regional Accession Network (ECRAN) Modelling: Support mission to Module 1. 16-17 March 2015, Tirana.
✓ ECRAN Practical hands on assistance on quantitative models and scenario development to be used to assess climate and energy policy options and to set emission targets. 01-03 April 2015, Belgrade, Serbia
✓ ECRAN Regional Training Workshop on SEA/EIA in industrial sector and the 3rd Training of Trainers (ToT) session.21-23 September 2016, Skopje, Macedonia.

Climate finance
✓ European Commision. JRC: Workshop on Investment Vehicles and Financial Instruments supporting Technology Transfer and Innovation. Focus on the Danube Region and the Western Balkans countries. 1-2 March 2017, Belgrade, Serbia

4. State of the climate research and systematic observations in the country

4.1. Overview of the state of the climate research in Macedonia

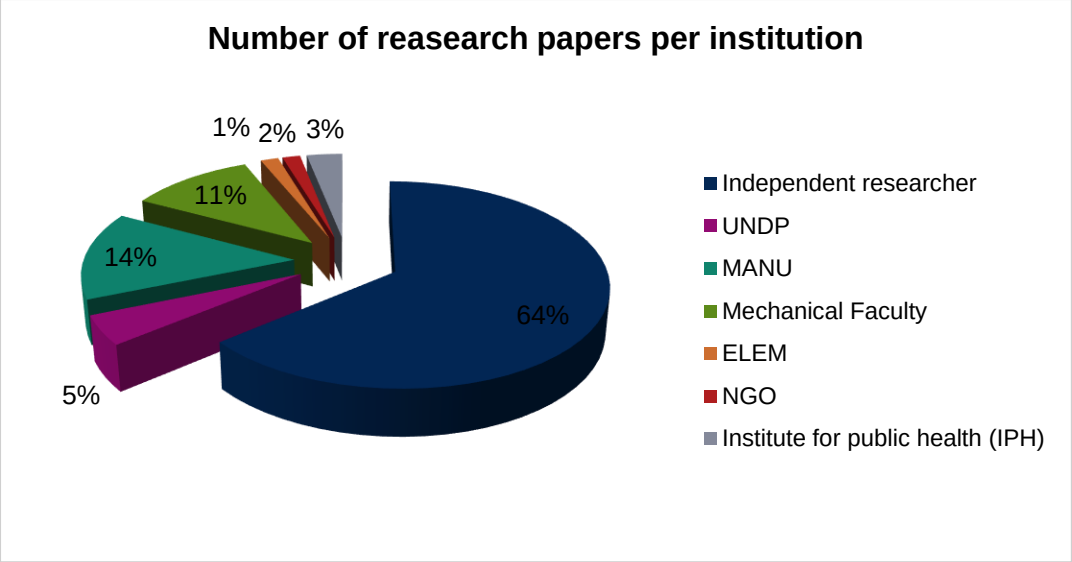
The Macedonian research community is mostly publishing its publications in the framework of national and regional conferences, while publications in international scientific journals are not very present. This is mainly owned to the general state of the research organisations in regards to the lack of financial resources for publishing research papers in the international scientific journals. The Government of R. Macedonia has spotted this problem and since the year 2012 started to provide subsidies for researches that in the previous year have published a research paper in international scientific journals with impact factor (500 EUR per paper). So far, more than one thousand subsidies for supporting published research papers of domestic authors in international scientific journals were provided. This measure is considered as a kind of reward for the efforts invested and stimulation for the research community, but also an opportunity for the researchers to publish their personal work in a magazine with impact factor.

The assessment of the scope of the published research papers of the Macedonian authors showed that the majority of research papers are related to the medicine and the general technical sciences. The climate change, as cross sectoral aspect, should gain more attention by the Macedonian research community.

The state of the climate research and systematic observations in the country is very important driver for the climate mainstreaming of the country. Macedonia as an EU candidate country is investing significant efforts to support the scientific community in the climate change related research activities, but a systematic approach for fostering of the climate research and systematic observations in the country is still not established. This should be done by: introduction of a climate change aspects into the official educational curricula, provision of additional funding for climate related research activities, raising of the public awareness and establishment of centers of excellence/research institutes for climate related issues.

From the other side, the scientific community in the country is very interested and active in performing climate related research activities, but since there is no continuous funding, the climate research is dependent on external funding and international donors and projects.

An overview on the scientific papers on climate change mitigation and climate change MRV is provided in Annex II of this document.



4.2. Comparison of with the EU and the developed countries

A global North-South[2] or Developed and Developing countries division in research, may have negative consequences in and its negative consequences, has been emphasised in various scientific disciplines. Northern domination of science relevant to climate change policy and practice, and limited research led by researchers from Southern countries has potential to delay further development and implementation of global climate change agreements and nationally appropriate actions. Most of the science underpinning agreements and policy instruments developed under the UNFCCC are generated by the Northern countries, which have participated in the setting the climate change policy agenda from the initial beginning of the international climate change efforts.

The new and until know the most promising international instrument for climate change mitigation, the Paris Agreement is a new bottom-up approach where Parties are providing their own Nationally Determined Contribution (NDCs). In this regards, the UN 2030 Agenda for Sustainable Development includes a number of relevant goals and targets in science and technology. However, the Northern domination may hinder the development and the implementation of the international climate pledges and efforts.

The North-South division can be simply and swiftly illustrated by the World Bank's Development indicators, complied with officially recognised international sources, which include various statistics by country. In the assessment done by a group of scientist from Sweden, it was found that authors affiliated to Northern institutions, specifically those from the OECD, also dominate the authorship of scientific papers that explicitly address climate change issues. During the period 2000 – 2014, more than 85% of the author affiliations of relevant scientific papers published (93584 publications) were from OECD countries, while less than 10% were from other high income economies.[3]

[2] The terms "North" and "Northern" refer to countries that are members of the OECD or are classified by high income economies by the World Bank, based on the estimates of gross national income per capita. The terms "South" and "Southern" refer to countries classified as upper-middle income, lower-middle income or low income economies.

[3] Reference: Steps to overcome the North–South divide in research relevant to climate change policy and practice; Malgorzata Blicharska,; Richard J. Smithers; Magdalena Kuchler; Ganesh K. Agrawal; José M. Gutiérrez; Ahmed Hassanali; Saleemul

The similar concussion can be brought from the IPCC Working Groups and the contribution to the IPCC assessment reports and guidelines. The statistic for the preparation of the Fifth Assessment Report is presented in Figure 4.1.

The IPCC AR5

Summary Statistics

Total Number of Coordinating Lead Authors, Lead Authors and Review Editors: **+830**

Total Number of Countries Represented on Writing Teams: up to **85**

Developing Country and Economy-in-Transition Writing Team Members: **301 (36%)**

Female Writing Team Members: **179 (21%)**

Writing Team Members New to the IPCC Process: **529 (63%)**

Regional Distribution (all AR5 author teams by WMO region): **8%** from Africa, **16%** from Asia, **6%** from South America, **28%** from North America, Central America and Caribbean, **7%** from South West Pacific, and **34%** from Europe.

- "New" connotes an expert not engaged in the AR4 or one of the two IPCC Special Reports released in 2011

Figure 4.1 Statistic regarding the Lead and contributing authors for the development of the Fifth Assessment Report

Despite the efforts by the intergovernmental organisations, IPCC, the donor organisations and the national governmental bodies, the progress of R. Macedonia has been moderate and additional scientific efforts have significant potential to bring the country closer to the implementation of the climate sound policies, NDCs, practices and technologies.

Huq; Silvia H. Koller; Sugata Marjit; Hassan M. Mshinda; Hj Hassan Masjuki; Noel W. Solomons;Johannes Van Staden & Grzegorz Mikusiński

5. Constrains and gaps

5.1. Capacity constraints and gaps

Unfortunately, despite the various forms of support in terms of capacity building, raising the awareness as well as projects funding (training, grants, education etc.), there are still significant gaps, constrains and problems regarding the mainstreaming of the climate related issues.

First of all, it should be addressed that although there a number of projects realized by means of IPA funding, GEF, EU (Horizon 2020), Energy Community, USAID, UNDP, UNIDO, etc., there are still a wide range of unused possibilities. The reasons for this condition are briefly elaborated as follows[4]:

- ✓ Limited institutional capacity of the public administration (political influence, bran drain from public institutions towards NGO and private companies[5], rule of law issues etc.). Lack of professional knowledge and skills of the employees in the public administration and public utilities, are significant barriers towards implementation of innovative solutions and acceptance of new practices. The current system of politically motivated promotions doesn't create a sound environment for competitiveness, acceptance of additional tasks and projects etc. Thus, for a number of competent professionals, working in private companies and NGO's is more challenging.
- ✓ Lack of capacity and knowledge for recognizing potential projects that are in line with the tasks and objectives of IPA funding. A number of employees in public institutions both at national and local level, are not very familiar with potentials and possibilities for implementation and financing of the climate changes related projects. Furthermore, there are no incentives for development of new project ideas.
- ✓ Non-existence of network (web) platform in terms of available data from all relevant institutions and companies. In Macedonia, there is no detailed legislation as an obligation to use IT solutions for the flow of information on this topic. Currently, the MVP tool is entered on the server of the Ministry of Economy, and the administrator is the Energy Agency. The vertical flow of information from the Municipalities to the Energy Agency and toward the Ministry of Economy is working with difficulties. The control of the reliability and quality of the received information is still at a low level. The application of this platform is a great step to significant improvement of the level of quality control of the received data. This is a solid base for further upgrades in order to use the same platform in terms of climate change projects and activities, as well as calculation of grid emission factor.
- ✓ As it is listed in section 3.4, there is a lack of capacity building activities in terms of climate financing, which could be identified among the weaknesses of the current status.
- ✓ As per Energy Community events and trainings, it could be notified that although EC is more focused on energy security, energy infrastructure and law requirements in these fields, it could be emphasized that by means of energy

[4]Институт за Европска политика: Користење на ИПА фондовите во Р. Македонија, Март 2013, Friedrich Ebert Stiftung

[5]Assessment, Republic of Macedonia 2012, Support for Improvement in Governance and Management: http://www.oecd.org/site/sigma/publicationsdocuments/fYRoM_Assess_2012.pdf

modelling and energy efficiency training, a significant improvement in capacity building could be achieved. For the time being EC was not quite focused toward enabling easier access for capacity building events in the member countries. The events were dominantly held in Vienna. Fortunately, in the past years the events in the region of SEE took place. Such an example is the newly established Energy Community Summer School. This year, this event took place in Ohrid, Macedonia (august-September) for the first time. It is a good approach towards more sustainable decision making in terms of energy issues among the students and young experts.

- ✓ In terms of EU funded project related with the topic, as per Horizon 2020 having Climate Action, Environment, Resource Efficiency and raw materials in its focus, it could be notified that capacity building is also needed. Moreover, due to the fact that there is a decreasing in used funding in Macedonia in 2015 compared to 2014. As per the share of participation in total funded grants, Macedonia's share in 2014 is 0.08%, while in 2015 the share is 0.04%, although the number of applications was increased from 112 in 2014 to 199 in 2015. Thus, Macedonia is the only associated country (out of 13), with decreased share of participation[6].
- ✓ The Green Climate Fund (GCF) as a new global fund created to support the efforts of developing countries to respond to the challenge of climate change, offers a possibilities for funding climate projects. Since Macedonia still didn't apply for projects financed or supported through this Fund, it is obvious that there is an urgent need for capacity building.
- ✓ Lack of public campaigns and information for the public. Although in the past two years the number of project and activities in terms of climate change awareness is increasing, there is still insignificant progress on the issue, since many other indicators affects the status quo situation and implementation of energy efficiency/ climate change mitigation measures. Both, increasing the awareness as well as financial incentives could be a solid approach, having in consideration the energy poverty and the quality of life in the country in general.
- ✓ Lack of transparency in terms of providing information from relevant institutions (required for projects preparation) In addition, despite the obligation for providing information that are subject of public disclosure (in accordance with the Law), the entities are very often not available for sharing information.
- ✓ Lack of cooperation between different sectors and Ministries in the country. It could be also related with the above mentioned constrains in terms of professionalism, promotion system, over employment, political influence etc. All these indicators, results in non-efficient daily operations affecting among others, the relations between the sectors. Thus, a human factor (mismanagement) has a significant role. On a contrary, the existence of network (web) platform in terms of available data from all relevant institutions and companies could be a solid base to overcome the situation.
- ✓ Lack of capacities for project management. Not only the lack of professionalism, but also the questionable ethic values and mismanagement of the responsible persons, could be a reason for weak management and even misuse of project finances.
- ✓ Finally, having in consideration the figures presented above, the decision makers

[6] Source: Horizon 2020, Two years on. European Commission, Directorate-General for Research and Innovation (2016). Brussels.

should be alarmed in terms of certain decreasing trends when it comes to capacity building availability versus using the opportunities. Moreover, a strengthen efforts must be focus on knowledge dissemination trough as many as possible individuals in public institutions, companies, universities, NGO's and other stakeholders.

5.2. Technical and technology transfer constrains and gaps

As per preparation of different Strategies and Feasibility studies, they not contain clear priorities in terms of using IPA funding, neither there is strong commitment, but significant fluctuation in setting the priorities[7]. Energy and environmental related decision making is divided in two separated Ministries. Thus, a close cooperation between the Ministries in terms of energy and climate issues is a must, which will result in solid cooperation with UNFCC, Energy Community, and other EU Institutions. Furthermore, the biggest company for electricity production in Macedonia (ELEM), as well as the biggest contributor in GHG emissions in the country, doesn't have a separate office on environment in their Department for development and investment. The environmentalists are integrated in one office dealing also with thermal energy issues (Office for thermal power and environmental protection) which often provides a conflicting tasks and goals.

The above mentioned constrains and gaps regarding IPA projects, could be noted in general for almost all types of projects that are listed above. Furthermore, one of the key problems is the inconsistency of the policy makers (both on the national and local level) to implement the chosen directions or scenarios addressed in the documents that are prepared by means of grants and other types of EU /other donors financing.

Another potential constrain to the effective utilization of policy and programmatic recommendation is the *lack of coordination between the responsible institutions* (Ministries and Agencies) and stakeholders. This can postpone or even suspend the realization of the climate mitigation plans and programmes. If this miss-coordination undermines the support necessary for the implementation of the relevant strategies and correspondent action plans, this could produce unexpected administrative constraints in the whole vertical hierarchy system of decisions. **This barrier can be remedied by establishment of a coordination scheme for an effective inter-sectoral cooperation in design and implementation of strategic actions for climate change mitigation.**

Other constraints include the absence of municipal energy efficiency planning framework that can stop realization of the energy efficiency policy, since a crucial step for implementation of the national strategy is the localization of the national measures to the community scale with specification of municipal authorities, entities, local consumer groups and financing schemes (national or local).

Also, there are number of constrains and gaps resulted from the continuously neglected institutional, legislative and even technical aspects which significantly affected GHG emission and climate changes in the responsibilities covered by the Ministry of Economy (energy sector, industry sector):

- ✓ Lack of long term and sustainable strategic planning (both on national and local level);
- ✓ Unfavourable combination of energy sources (carbon intensive fossil fuels prevail with decades)

[7] Ѓорѓиевски Мате, Станковиќ Мила, 2012 во „Користење на фондовите на ЕУ во Република Македонија: Ефикасност, влијание и апсорпциони капацитети – збирка на студии"

- ✓ Low energy efficiency in the generation, transmission, distribution and utilization of energy (absence of legal instruments to prevent this situation and to stimulate competitiveness trough energy efficiency)
- ✓ Incomplete legislation for energy efficiency and RES

The secondary legislation related to the efficient use of energy is still not complete to a level where it can be practically applied. There is no legislation which will define the national RES and energy savings objectives, as well as programs and action plans with regulatory and economic measures, specific roles of institutions, time schedules and financing. Increasing the share of renewable energy sources is not possible without adequate (incentive-providing) primary and secondary legislation. Therefore, the existing primary legislation should be improved and the necessary secondary legislation should be adopted. Also, it is recommended for future amendments to the Energy Law, as well as to the Electricity Market Code (that are to stipulate in detail the manner of electricity purchase from preferential generators), to stipulate adequate solutions that would simplify procedures on obtaining the status of preferential generator and would address certain shortcomings contained in the existing legislation. In addition to the existence of quality legislation, a key precondition to increase the share of RES in the final consumption is the enforcement of the existing regulation. In the past few years, several steps have been taken to remove some of the barriers related to administrative procedures linked to authorization, urban planning and property issues. Deadlines have been shortened, unnecessary procedural steps have been abolished and gaps in coordination between authorities have been overcome to some extent. Investor guides for various renewable energy technologies are published on the ministry's website. However, non-discrimination and objectivity are still not ensured. The creation of a one-stop shop for all permit applications does not exist. Full compliance with Article 13 of Directive 2009/28/EC remains to be achieved. To comply fully with Article 16 of Directive 2009/28/EC, MEPSO and EVN as network operators have to become more transparent towards producers of renewable energy with regard to information on the estimated costs and timeframe for connection. The regulator has to ensure that rules for connection and access to the networks are implemented in a non-discriminatory and objective way for private and state companies[8]. This is currently in doubt.

The provisions of the Large Combustion Plants Directive were transposed by the Rulebook on the Limit Values for the Permissible Levels of Emissions and Types of Pollutants in the Exhaust Gases and Vapours Emitted into the Air from Stationary Sources. The emission limit values for new and existing plants are aligned with those of the directive. The rulebook also includes the common stack approach. Since February 2016, amendments to the rulebook are being prepared to transpose the Industrial Emissions Directive which will be part of an IPA project. A Decree for Determining the Combustion Facilities That Have to Take Measures to Protect Ambient Air Pollution Quality requires operators of large combustion plants to prepare and implement a five-year plan (to be reviewed annually) to reduce the plants' emissions. The country should also proceed with the adoption of the amendments to the rulebook related to emissions into the air to transpose the relevant requirements of the Large Combustion Plants and Industrial Emissions Directives.

What is also worth mentioning is that the National Designated Entity for Transfer of Climate Technologies is still not designated. This is mainly owned to the limited institutional capacity of the Ministry of Environment to coordinate the national technology transfer activities, and the identified lack of relevant national authorities or academic institutions that can coordinate the National Technology Transfer.

[8] Energy Community Secretariat: Annual Implementation Report, September 2016

5.3. Financial constrains

In regards to financial constraints there are several aspects that are identified at institutional and intersectoral level:

Access to capital

Some consumers struggle to meet the initial costs of energy efficiency measures even though they are cost effective over time. This applies particularly to low income households who might find it difficult to finance the initial higher cost of more efficient appliances and other energy efficiency improvements. **Incentive programmes such as discounted products, and grants and loans can help overcome this. Low-income energy efficiency programs will alleviate investment burden on vulnerable households while mitigating the need for utility subsidies.** Another option would be providing dedicated loans (*The European Investment Bank*, EBRD) where the funds are subsequently redistributed via an intermediary financial institution through on-lending with more technical and economic expertise in the field of energy efficiency, or using technical outsources. Another opportunity is utilizing the financing models based on shared savings, such as Third-party Financing and Performance Contracting.

Weak price signals– Energy pricing does not yet fully reflect the environmental and economic cost of energy production and consumption. **Decisions around cost-recovery pricing and incentive programmes can help overcome this barrier.**

Transactions Costs - In the context of energy efficiency, the costs of obtaining and interpreting information can be particularly problematic in sectors where energy is a small part of the overall budget and items are purchased primarily for attributes other than their energy characteristics. For example, when purchasing a TV consumers may be more interested in the quality and size of the picture and the look and features of the appliance rather than in the standby power consumption. **Appliance labelling will help eliminate this barrier facilitating consumer choices.**

The external costs and the transparency of prices – The current pricing system for energy products does not create incentives for resource conservation and rational energy use. The current pricing system does not guarantee that external costs are included. Instead of an energy efficiency incentive, the current prices have been sending a market signal for uneconomical consumption. There is a lack of effort to allow for consumers to understand the price of their consumption. **A real-time metering system could bring down consumption.**

6. Recommendations for sustainable and comprehensive climate mainstreaming in the country

6.1. Institutional and legal development

The basic steps the country has to do to address this barriers, are divided on following set of measures/activities:

1. Policy development

a) Development of a long term Strategy on Climate Change which should define the long term priorities, plans and development goals of the country.

b) Development of a comprehensive Law on Climate Change, which should be based on the outcomes of the Long Term Strategy on Climate Action. The Law on Climate is supposed to provide a sustainable platform for sectorial mainstreaming of the climate change priorities and implementation of the national climate goals.

2. Institutional and capacity development

The capacity of the responsible institution(s) should be strengthened with provision of more employees, establishment of climate units in certain ministries and national entities (where needed), capacity building activities and provision of toolkits for implementation of climate related tasks and activities

To facilitate the implementation of this activities, the country is currently planning to use available resources under the Capacity Building Initiative for Transparency (CBIT). The activities under this initiative are divided on the following measures:

a) Activities to strengthen national institutions for transparency-related activities in line with national priorities

- Support to national institutions to lead, plan, coordinate, implement, monitor, and evaluate policies, strategies, and programs to enhance transparency, including identification and dissemination of best/good practices for institutional strengthening and establishment of national network of practitioners;
- Support of mechanisms for integration of the knowledge from transparency initiatives into the national policy and decision-making processes; and
- Assistance regarding deployment and enhancement of information and knowledge management structures in response to the needs of Article 13.

b) Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13:

- Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets and economic models needed for implementation of enhanced transparency-related activities;
- Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, adaptation monitoring, evaluation, and communication measures;
- Development of country-specific emissions factors and activity data;
- Assistance in quantifying and reporting impact of policy measures;

- Clarifying key NDC information, e.g. baseline projections including for business-as-usual targets, and reporting progress towards achieving their NDCs; and
- Assistance in quantifying and reporting on support provided and received

c) Activities to assist with improvement of transparency over time:

- Capacity needs assessment for transparency, in particular to *assess institutional arrangements for data collection, analysis, and reporting*, mapping of current baseline and planned reporting activities, including associated institutions, tools, methodologies, MRV systems, associated data systems; (
- Support to introduce and maintain progress tracking tools for transparency-related actions and progress towards targets/goals.

3. Provision of institutionalised mechanisms for sustainable climate change mainstreaming in the country

a) Development of a long term Action Plan on Climate Change, which should clearly define the institutional responsibilities, the timeframe for implementation of each activity, as well as the financial aspects relevant for the implementation of the climate related activities. The Action Plan on Climate Change should be realistic and coherent with the National Determined Contributions (NDC), the National and the Local Climate Change Strategies, as well as with the other relevant development strategies and plans.

b) Establishment of an inter-institutional coordination and cooperation mechanisms for sound implementation and monitoring of the climate related policies, activities and measures.

6.2. Provision of Climate funding

Together with the Paris Agreement, the Parties of the UNFCCC are faced with the challenge of preparing the implementation of the NDCs by 2020 and steadily increasing the ambition level of the climate protection targets as part of regular revisions. This also means that long-term decarbonisation strategies in the various relevant sectors must be developed, coordinated and integrated into the respective medium- and long-term development strategies.

The climate funding on national level should assure that the national mitigation targets will be achieved in the foreseen period of implementation. After the ratification of the Paris Climate Agreement, R. Macedonia will have to pledge its national mitigation targets (NDC), and the progress towards the achievement of this targets will be closely monitored by the NDC Implementation Committee of UNFCCC.

The national climate funding is considered as a cross sectoral topic and should be integrated into all sectoral policies and aspects To assure a coordinated approach and efficient intersectoral cooperation, the country should utilise a coordination mechanism for climate funding, as a tool for management of the climate finance on national level.

From the other side, the climate finance on local level should be coordinated with the national climate related investments, and in the same time should be in line with the local mitigation and adaptation plans. More emphasis on the local climate finance should be put on the adaptation aspects, since the local priorities and needs can be only recognised at the local level.

Fund matching mechanism (PPP and donor/public financing)

Green investments are often risky, costly, and require more capital up-front. In many countries, they are also disadvantaged by subsidies for fossil fuels. Improvements have been made, but investments in clean technologies are still insufficient to curb the effects of climate change, making it necessary to re-think how to green the global energy mix. Taking into considerations the above mentioned circumstances and the state of the economy in the R. Macedonia, the country should also elaborate on the possibilities for establishment for a Public-Private Partnership (PPP) Approach to Climate Finance.

According to the World Bank[9], the key features of the PPP Approach to Climate Finance should be as follows:

- Principles of project finance and environmental economics can be combined to lay out a simple, solid rationale for public support of low-emission projects;
- Effective use of scarce public funds must be ensured to leverage private financing through an equitable sharing of responsibilities among different stakeholders;
- Green growth can be supported by locking new investments into clean technologies, while displacing low-cost polluting alternatives;
- Valuing and monetizing global and local environmental externalities as well as distortions created through fossil fuel subsidies needs to be given priority;
- Sufficient support needs to be delivered to make low-emission projects bankable in an equitable and non-political manner;
- A country's policy environment should serve as the basis to help governments play a responsible role in creating a conducive investment climate and to level the playing field for low-emission projects;
- A country's public-private partnership framework of legally backed performance agreements and sanctions for non-compliance needs to serve as the foundation to provide a credible and effective legal, regulatory & monitoring, reporting and verification system for reducing third-party risks.

[9] http://documents.worldbank.org/curated/en/712651468025506948/pdf/758250WP0P12450h0to0Climate0Finance.pdf

6.3. Climate research and systematic observation

A set of practical steps in both Developed and Developing countries can be proposed to a wide range of actors to minimise the division between the climate science and the state of systematic observations, with examples of some actions already being implemented.

What was considered as huge progress ahead in the collaboration between the government of R. Macedonia and the research institutions and community is as follows:

- ✓ The financial support for publication of research papers in international research journals;
- ✓ The programme for provision of scholarships for students to obtain master and PhD degrees on the highest ranked universities in the World;
- ✓ The establishment of the national Fund for Innovations and Technology Development.

To position the country better in the international climate policy dialogue and to assure proper climate action in the country, the national governmental institutions should support the following aspects:

- Provision of long-term funding to improve working conditions and stability in academic institutions which are dealing with environmental and climate issues;
- Funding of necessary equipment, laboratory facilities and salaries for assistants and young researchers;
- Provide funding for “sandwich” graduate programmes where students spent time in North countries ;
- Organisation and financial support of online courses for climate related aspects;
- Lobby intergovernmental organizations and international donor organizations to fund southern research priorities and southern research institutions;

From the other side, the intergovernmental organisations, international donor organisations and Northern governmental institutions should support the country in the following aspects:

- Establish exchange research programmes and research networks between the academic institutions and the individual experts dealing with climate related issues;
- Encourage Southern researchers to return to academic institutions in the South to continue their research after completing postgraduate studies or research projects in the North;
- Support Southern researchers in Northern countries to contribute to research in their countries of origin;
- Encourage researchers affiliated to institutions in the vicinity to lead identification of regional, national and local research needs and engagement with policymakers and practitioners;
- Encourage researchers affiliated to institutions in the vicinity to coordinate review and synthesis papers that summarize findings and apply those findings to regional, national or local contexts;

The national research institutions and the research community of R. Macedonia should implement the following aspects to assure that a long term and sustainable climate mainstreaming in R. Macedonia:

- Build networks of South-South collaborations to strengthen researchers' capacities to cooperate with Northern researchers and with other Southern colleagues, and make use of existing experiences, knowledge and expertise within the South •
- Work together to address common research priorities that span several Southern countries in order to approach regional problems and maximize use of the existing research base
- Consolidate and create local graduate programmes in order to develop new generations of scientists
- Support young researchers to return from studies in the North so that they may continue to contribute to the generation of Southern knowledge
- Promote interdisciplinary and multinational projects incorporating Southern researchers •
- Provide conditions for testing innovative and creative methodologies that match the local context rather than reproduce Northern approaches
- Contribute to the development of global research frameworks and global models for climate change issues
- Be involved in the global review and synthesis of relevant scientific activities, for example the IPCC Assessment Reports
- Encourage citizen science in monitoring, reporting and verification, and monitoring and evaluation of the measures for climate mitigation.

6.4. Proposal for establishment of a sustainable mechanism for collection and assessment of the data

A sustainable mechanism for collection of data relevant for the assessment of climate change constrains, gaps and related technical and financial support needs should be supported with legally binding obligation to report on this data. This can be done as part of the development of the new Law and Strategy on Climate of R. Macedonia, or can also assured by endorsing a new rulebook on climate reporting.

The technical solution for gathering of the climate related data can vary, from a very simple one, towards much complex IT solution which can integrate more aspects of the climate reporting.

a) The simplest solution that can be considered is an annual delivery of a simple questionnaire on the issues relevant for addressing of Constraints and gaps, and related financial, technical and capacity needs for climate change mainstreaming. The questionnaires should be sent to all relevant institutions, municipalities, governmental bodies, academic organisations and NGOs.

b) The more complex solution should integrate the entire climate monitoring and reporting in the country in one IT tool that will be hosted on the server of the ministry. This option requires much more financial resources and allocation of efforts, but is a long term and sustainable solution that can integrate the entire climate MRV framework.

Annex I Overview of the climate related projects in the period 2015 – 2017

Table A.1 Overview of the climate related projects in the period 2014 – 2017, exchange rate 1EUR = 1.2 USD

Project	Description	Sector	Type of activity	Implementation period / Closing date	Donor	Budget USD	Donors Contribution USD	National Contribution USD
EUREMPlus: Boost energy efficiency in manufacturing SMEs by extending European Energy Manager Training and Network	European Energy Manager training program comprising courses, self-learning and practical work, combined with access to the European alumni network for continued knowledge exchange.	Energy/Energy Efficiency	Capacity building	31.10.2015	EU	64,212.00	64,212.00	0.00
Initiative to Enhance Public Dialogue on Sustainable Use of Energy	To create the ground and conditions for effective use of energy at local level through increased understanding and cooperation among local government units, business community, public and other relevant stakeholders.	Energy/Energy policy	Capacity building	15.06.2015	IPA-CBC	249,070.08	249,070.08	0.00
Triggering the market uptake of energy performance contracting trough street lighting refurbishment projects	Creates demand and supply for EPC projects in 9 regions by providing regional EPC facilitation services. These services deliver information and specific support to municipalities and (potential) ESCOs. The project partners aim to implement 36 EPC street lighting projects in the project's lifetime.	Energy/Energy Efficiency	Capacity building	01.04.2017	EU	93,962.40	93,962.40	0.00

Construction of new motorway section Demir Kapija - Smokvica, as a part of the Pan European Corridor X	The construction works of a new motorway section from Demir Kapija to Smokvica as part of the Pan-European Corridor X. Beside the earth works on cuts and embankments the works include construction of two double tube tunnels above 1km. length, six bridges, two interchanges, five overpasses and seven underpasses.	Transport/Road transportation	Financial support	07/27/2012 - 22/08/2018 (Works)	EU	252,177,812.68	$59,376,726.00	#############
Construction of Waste Water Treatment Plant (WWTP) and rehabilitation and extension of priority sewerage network in Municipality of Radovish LOT 1	Design and construction of Waste Water Treatment Plant for 25,000 PE, rehabilitation and extension of the priority sewerage network of 4.7 km, and supply and installation of one (1) pumping station in the Municipality of Radovish under the FIDIC 1999 Yellow Book Conditions of Contract.	Waste/WWTP	Financial support	04/28/2016 - 20/10/2018	EU	7,232,695.64	$ 6,147,791.26	$ 1,084,904.39
Construction of Waste Water Treatment Plant in Kichevo - LOT 2	The contract shall cover the design and construction of waste water treatment plant for 32 000 p.e. and construction of the main collector with 4 km length in the municipality of Kichevo under the FIDIC 1999 'Yellow Book' conditions of contract.	Waste/WWTP	Financial support	24.02.2016	EU	8,309,900.29	$ 7,063,415.24	$ 1,246,485.05
Construction of Waste Water Treatment Plant in Prilep	Design and construction of municipal Waste Water Treatment Plant (WWTP) meeting the requirements of Annex I of the Urban Waste Water Treatment Directive (91/271/EEC) for 95.000 People Equivalent, in accordance with FIDIC conditions of contract (Yellow Book). The works include design, civil works,	Waste/WWTP	Financial support	05/08/2014 - 22/06/2017	EU	11,601,328.55	$ 9,466,684.10	$ 2,134,644.45

	mechanical works, electrical works, access road and bridge, training of staff and commissioning.							
Construction of Waste Water Treatment Plant in Strumica - LOT 3	The contract shall cover the design and construction of waste water treatment plant in Strumica for 53 419 p.e. and extension of the existing main collector by 375 m under the FIDIC 1999 'Yellow Book' conditions of contract,	Waste/WWTP	Financial support	24.02.2016	EU	8,293,052.12	$ 7,049,094.30	$ 1,243,957.82
Construction of wastewater treatment plant and rehabilitation and extension of the priority sewerage network in the Municipality of Radovish - LOT 1	The contract shall cover the design and construction of waste water treatment plant for 25 000 p.e., rehabilitation and extension of the priority sewerage network of 4,7 km and supply and installation of 1 pumping station in the municipality of Radovish under the FIDIC 1999 'Yellow Book' conditions of contract,	Waste/WWTP	Financial support	12.02.2016	EU	7,232,695.64	$ 6,147,791.26	$ 1,084,904.39
Construction works for renewal with reconstruction of the railway section Bitola-Kremenica, as part of XD of Corridor X	Reconstruction of the non-electrified single –track railway section Bitola-Kremenica of a length of app. 17 km, as part of Xd of Corridor X in accordance with FIDIC1999 conditions of contract ('Red Book'). The contractor shall ensure that the construction work is in accordance with all the requirements in the detailed design, technical standard for quality and quantities, work progress, implementation of the environmental criteria	Transport/Railways	Financial support	19.12.2014 - 30.01.2018	EU	22,795,134.12	$19,375,864.01	$ 3,419,270.11

	during the reconstruction and defect liability period.							
District Heating Bitola	Construction of district heating system in Bitola Production of hot water from the existing thermal power plant REK Bitola). Construction of transport and main hot water pipeline, construction of hot water station and district heating network.	Energy/District heating	Financial support	2016 - 2020	KfW	55,800,000.00	$46,800,000.00	$ 9,000,000.00
Green Future for our kids	The projects operational objectives are thermal and hydro insulation of the kindergarten in Rusinovo village, municipality of Berovo; switch to eco pellets as a source of heating at the kindergarten and use of solar energy; switch to gas as a source of heating at the Gianni Rosary kindergarten; joint development of an education programme for children and their parents for building responsible and active attitude to the renewable energy sources and to the preservation of natural resources.	Energy/EE	Financial support	14.05.2014 - 14.05.2016	EU	595,800.00	$ 595,800.00	$ -
Municipal Climate Change Strategies Project	Strengthen civil society and raise awareness, boost activism, and bolster local resilience to global climate change.	Cross cutting/All climate Change issues	Technical support	26.09.2012 - 17.02.2016	USAID	3,518,681.00	$ 3,300,000.00	218,681.00

National and Regional Road Rehabilitation	To enhance the connectivity of selected national and regional roads, primarily to Corridors X and VIII, and to improve Public Enterprise for State Roads' capacity for road safety and climate resilience.	Transport/Road transportation	Financial support	01.11.2016 - 9.30.2019	World Bank	70,980,000.00	$70,980,000.00	
Reconstruction and upgrading of the motorway section Smokvica-Gevgelija, as part of Corridor X	Reconstruction and upgrading of app. 10.1 km of the motorway section from Smokvica to Gevgelija (app. 6.7 from on the left and 3.4 km on the right carriageway side). Works will include activities related to reconstruction and widening of the road in those sub-sections where it wasn't built previously. The widening of the carriageway will be done in the grass strip between the two carriageways. The scope of the planned works also includes marking of the pavement and installation of traffic signs.	Transport/Road transportation	Financial support	07/28/2015 -7/11/2016 (+12 months DNL up to 7/11/2017)	EU	4,984,680.70	$ 4,236,978.59	$ 747,702.11
Reduction of the CO2 emission in the Municipal Primary School "Goce Delchev" in Bosilovo by replacing fossil fuel with biomass	Replace the two oil boilers with boilers which operate on pellet as an energy source in order to generate heat	Energy/EE	Financial support	01/01/2017 31/12/2017	GEF	28,750.00	$ 9,540.00	$ 19,210.00
Refurbishment of the Public Building Stock Towards nZEB	Public building stock state-of-the-art assessment: country specific evaluation of the energy consumptions and CO2 emissions; reference building definition; a common framework for the definition of nZEB concept for public buildings.	Energy/EE	Financial support	01.03.2014 - 31.08.2016	EU	121,382.40	$ 121,382.40	$ -

Rehabilitation of the motorway section Veles-Katlanovo, as part of Corridor X	Rehabilitation of the motorway section Veles-Katlanovo, as part of Corridor X	Transport/Road transportation	Financial support	26.06.2014	EU	6,809,079.44	$ 5,787,717.53	$ 1,021,361.92
Supply of appropriate equipment to exchange and manage information and monitoring for water, waste, air management, nature and climate change (Lot 2 - Vehicles)	Supply, delivery, unloading, installation, putting into operation, testing and training of equipment to exchange and manage information and monitoring for water, waste, air management and nature for the Ministry of Environment and Physical Planning and National Hydro-meteorological Service - LOT 2	Cross cutting/Environment and climate change MRV	Financial support	11/11/2016 - 03/10/2018	EU	47,040.00	$ 35,280.00	$ 11,760.00
Supply of appropriate equipment to exchange and manage information and monitoring for water, waste, air management, nature and climate change (Lot 4 - Air Quality Management)	Supply, delivery, unloading, installation, putting into operation, testing and training of equipment to exchange and manage information and monitoring for water, waste, air management and nature for the Ministry of Environment and Physical Planning and National Hydro-meteorological Service - LOT 4 - Air quality management	Cross cutting/Environment and climate change MRV	Financial support	01/10/2017 - 05/10/2018	EU	297,675.01	$ 223,256.26	$ 74,418.76
Waste water Treatment Plant Gevgelija	Construction of the Waste Water Treatment Plant for Gevgelija, with financial contribution of Switzerland (Euro 6'800'000), Greece (Euro 1'860'000) and Macedonia (Euro 500'000)	Waste/WWTP	Financial support	2010 - 2017	Switzerland	8,160,000.00	$ 8,160,000.00	$ -
Wastewater Treatment Plant in Kocani	Through construction of a WWTP and a main collector for wastewater, the project will contribute to the sustainable development of the Kocani region and protection of the natural resources. The project will also strengthen the	Waste/WWTP	Financial support	2014 - 2019	Switzerland	22,909,090.80	$22,909,090.80	$ -

	capacities of the Public Utility through application of the SECOs' Policy Paper on Corporate Development of Public Utilities.							
Catalysing market transformation for industrial energy efficiency and accelerate investments in best available practices and technologies in the Former Yugoslav Republic of Macedonia	The project contributes to accelerating the transformation of the Macedonian market for industrial energy efficiency towards the increased use of, and demand for, best available practices and technologies such as energy management systems in line with ISO 50001, and a greater offer in terms of related consultancy services. During the project lifetime, annual GHG emissions reductions of 133,000 tonnes of CO2eq are anticipated.	Energy/IEM	Technical support	31.12.2014 - 31.01.2019	GEF	560,042.40	$ 560,042.40	$ -
Clean Energy Investment Project	Support the Government of Macedonia's efforts to increase investment in energy generation from renewable sources, and reduce Macedonia's total final energy consumption and greenhouse gas emissions.	Energy/RES	Technical support	15.04.2015 - 31.07.2017	USAID	2,300,000.00	$ 2,300,000.00	
Conversion from HCFC – 141b in HFCs in the Manufacture of polyurethane foam for the commercial refrigeration units, sandwich panels and insulated doors		IPPU/F-gasses	Technical support	31.12.2016	UNIDO	136,955.00	$ 136,955.00	

Development of the National Water Study	Support the development of the National Water Study, which is considered as a framework to complete planning system for implementation of national and EU water supply and waste water collection and treatment relevant requirements.	Cross cutting/Water management	Technical support	02/22/2016 - 08/22/2017	EU	2,100,000.00	$ 1,785,000.00	$ 315,000.00
Wind Park Bogdanci		Energy/RES	Financial support	7.2015	KfW	66,600,000.00	$57,480,000.00	$ 9,120,000.00
From Trash to Cash: Sustainable Development and Economic Empowerment of Informal Waste Collectors trough Waste Recycling in the Cross – Border Region of Albania and Macedonia	The project aim is to contribute to the Sustainable Development and Economic Empowerment of Informal Waste Collectors trough Waste Recycling in the Cross – Border Region of Albania and Macedonia.	Waste/Waste collection	Technical support	11.11.2013 - 30.04.2015	EU	227,598.00	$ 227,598.00	$ -
Further strengthening of the capacities for effective implementation of the acquis in the field air quality	To improve air quality by supporting the implementation of the air quality related legislation including Directive 2008/50/EC on ambient air quality and cleaner air for Europe and Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic hydrocarbons in ambient air.	Cross cutting/Air quality	Technical support	03/30/2015 - 01/01/2017	EU	1,320,000.00	$ 1,254,000.00	$ 66,000.00
HCFC phase-out management plan		IPPU/F-gasses	Technical support	31.12.2020	UNIDO	82,000.00	82,000.00	

Improvement of the Solid Waste Management Services in the Polog Region, Phase 1 (in a process of approval)	The first phase of the project will support preparation of local and regional waste management plans, preparation of designs and tender documents for short term measures and setting up the organisational and financial scheme for regional solid waste management services. The overall objective of the project (phase 1 and 2) is to contribute to the protection of human health and environment, as well as to the responsible utilisation of natural resources in the Polog region.	Waste/Waste collection	Technical support	2017 - 2019	Switzerland	2,181,818.40	$ 2,181,818.40	$ -
Improving of the energy efficiency of Municipality of Mavrovo and Rostushe	To create conditions for reducing climate change in the rural municipalities of Polog – Municipality of Mavrovo and Rostushe through improved energy efficiency in street lighting, awareness raising and capacity building of stakeholders involved in issues related to energy efficiency.	Energy/EE	Technical support	01/01/2017 31/12/2017	GEF	49,440.00	$ 24,720.00	$ 24,720.00
Increased rural economic development in cross border region by empowering agriculture through using waste straw for energy production/ STRAWPOWER	Increasing rural economic development in the cross border region, through the use of waste straw for energy production. Installation and operation of pilot heating installations powered on straw pellets, will show that using agricultural waste (straw) for production of (carbon neutral) fuel is economically (and environmentally) justified and can generate significant extra	Energy/RES	Technical support	06/30/2015 - 03/31/2017	EU	167,220.00	$ 142,137.00	$ 25,083.00

	incomes for farms.							
Industrial Management Project	The envisaged activities will improve Macedonia's competitiveness and energy security and reduce greenhouse gas emissions via greater clean energy investments, primarily through the introduction of a systematic energy management approach in the industrial sector	Energy/IEM	Technical support	13.01.2013 - 13.01.2016	United States of America	1,298,812.00	$ 1,298,812.00	
Macedonia's First Biennial Update Report	This First Biennial Update Report (FBUR) on Climate Change (CC) consolidates sectoral analyses on Greenhouse Gas (GHG) emissions and provides transparency for Macedonia's progress with mitigation actions and their effects.	Cross cutting/Climate Change Reporting	Technical support	28.02.2015	GEF	427,461.00	321,461.00	106,000.00
Macedonia's Second Biennial Update Report	This First Biennial Update Report (FBUR) on Climate Change (CC) consolidates sectoral analyses on Greenhouse Gas (GHG) emissions and provides transparency for Macedonia's progress with mitigation actions and their effects.	Cross cutting/Climate Change Reporting	Technical support	2017 - 2017	GEF	425,900.00	352,000.00	73,900.00
MultiEE (Facilitating multi-level governance for Energy Efficiency) Horizon 2020	To improve the consistency and quality of energy efficiency policy planning and implementation on different administrative levels in the	Energy/EE	Technical support	06.07.2017	EU	124,584.00	124584	

	beneficiary countries.							
Preparation of necessary documentation for upgrading the WWTP in Vranishta, extension of the collector system for Ohrid Lake and separation of the foal and storm priority water network in the Cities of Ohrid and Struga	The specific objective of this assignment is preparation of necessary documentation for upgrading the WWTP in Vranishta, extension of the collector system for Ohrid Lake and separation of the foul and storm priority water network in the Cities of Ohrid and Struga. This assignment comprises preparation of Feasibility Study, Cost-Benefit Analysis (CBA), design documentation and Volume 3, Volume 4 and Volume 5 of the tender dossier (TD) for the works contract for upgrading the WWTP in Vranishta, extension of the collector system for Ohrid Lake and separation of the foul and storm priority water network in the Cities of Ohrid and Struga.	Waste/WWTP	Technical support	12.11.2014	EU	341,484.00	$ 290,261.40	$ 51,222.60
Preparation of necessary documents for establishing of an Integrated and Financially Self-sustainable Waste Management System in Pelagonia, Southwest, Vardar and Skopje Regions	The project purpose is to support the establishment of an integrated regional waste management system in Pelagonia, Southwest, Vardar and Skopje Regions.	Waste/Waste management	Technical support	12/22/2015 - 12/22/2017	EU	4,296,000.00	$ 3,651,600.00	$ 644,400.00
Preparation of project documentation for Improvement of the Wastewater Collection and Treatment Infrastructure on the	The objective of the contract is to improve municipal wastewater infrastructure in compliance with the Directive 91/271/EEC through preparation of project	Waste/WWTP	Technical support	10.07.2014	EU	336,456.00	$ 285,987.60	$ 50,468.40

Municipality of Kichevo	documentation for the wastewater collection and treatment infrastructure in the Municipality of Kicevo.							
Preparation of project documentation for improvement of the Wastewater collection and treatment infrastructure in the Municipality of Radovish	The objective of the contract is to improve municipal wastewater infrastructure in compliance with the Directive 91/271/EEC through preparation of project documentation for the wastewater collection and treatment infrastructure in the Municipality of Radovish.	Waste/WWTP	Technical support	30.05.2014	EU	298,728.00	$ 253,918.80	$ 44,809.20
Preparation of project studies, design and tender documentation for establishing of an integrated and financially self-sustainable waste management system in East and Northeast Region	To contribute, via the development of integrated and financially self-sustainable waste management systems in selected regions of the country, to the sustainable and continuous improvement of the quality of the natural environment of the regions and of the country, in order to reach EU standards, especially in relation to public health and environmental protection.	Waste/Waste management	Technical support	12/17/2015 - 04/20/2017	EU	1,170,000.00	$ 994,500.00	$ 175,500.00
Preparation of regional waste management plans and strategic environmental assessments for east and north-east regions	The project purpose is to support the planning process for an integrated regional waste management system through preparation of Regional Waste Management Plans and Strategic Environmental Assessment (SEA) in East and North- East Region.	Waste/Waste management	Technical support	05.04.2013	EU	1,368,000.00	$ 1,162,800.00	$ 205,200.00

Preparation of studies (FS, EIA, CBA), design documentation and tender dossiers for wastewater collection and treatment investment projects in Municipalities of Veles and Shtip	This assignment comprises preparation of Feasibility Studies (FSs), Environmental Impact Assessments (EIAs), Cost-Benefit Analysis (CBAs), Sludge Management Plan, Design Documentation on a level of Detailed Designs (DDs) and Outline Designs (ODs), as well as preparation of Volume 3, Volume 4 and Volume 5 of the Tender Dossiers for construction of wastewater collection and treatment infrastructure.	Waste/WWTP	Technical support	11/18/2016 - 05/29/2016	EU	1,799,880.00	$ 1,529,898.00	$ 269,982.00
Preparation of studies (FS,EIA,CBA) design documentation and tender dossiers for wastewater collection and treatment investment project in the Municipality of Strumica, Bitola and Tetovo	To assist the Ministry of Environment and Physical Planning in preparation of wastewater collection and treatment investment projects in the municipalities of Strumica, Bitola and Tetovo.	Waste/WWTP	Technical support	07/22/2014 - 03/22/2017	EU	3,843,600.00	$ 3,267,060.00	$ 576,540.00
Preparation of technical and tendering documentation for closure of noncompliant landfills/dumpsites for the East and Northeast region	The specific objective of this assignment is preparation of technical and tendering documentation for closure, rehabilitation and after care of municipal non-compliant landfills and dumpsites in East and North-East Regions.	Waste/Waste management	Technical support	25.12.2014	EU	323,271.60	$ 274,780.86	$ 48,490.74
Preparation of technical and tendering documentation for closure of noncompliant landfills/dumpsites for the East and Northeast region	To further contribute towards achieving an integrated and financially self-sustainable waste management system in East and Northeast Regions. The purpose of the project is preparation of technical and tendering documentation for closure, rehabilitation and	Waste/Waste management	Technical support	12/29/2014 - 04/30/2016	EU	323,271.60	$ 274,780.86	$ 48,490.74

	after care of municipal non-compliant landfills and dumpsites in East and North-East Regions.							
Preparation of technical specifications for supply of equipment for waste collection and transferring of waste for East and Northeast region	The purpose of this assignment is preparation of technical specifications and related supporting documents for supply of equipment for waste collection and transferring of waste in East and Northeast Regions.	Waste/Waste management	Technical support	26.12.2014	EU	219,415.20	$ 186,502.92	$ 32,912.28
Preparation of technical specifications for supply of equipment for waste collection and transferring of waste for East and Northeast region	Achievement of an integrated and financially self-sustainable waste management system in East and Northeast Regions. The purpose of the project is Preparation of technical specifications and related supporting documents for supply of equipment for waste collection and transferring of waste in East and Northeast Regions	Waste/Waste management	Technical support	12/29/2014 - 04/30/2016	EU	219,415.20	$ 186,502.92	$ 32,912.28
Preparation of Terms of reference (ToR) for the Service Contract for TA for reform in the system for water supply, collection and treatment at local level	The specific objective of the project is providing of technical assistance for preparation of Terms of Reference for the Service Contract for reform in the system for water supply, collection and treatment at local level in the City of Skopje and in the Municipalities of Strumica, Bitola, Tetovo, Gostivar, Kavadarci and Debar.	Cross cutting/Water Resource Management	Technical support	20.02.2013	EU	67,588.80	$ 57,450.48	$ 10,138.32

Programme for Energy Efficiency and Renewable Energies Phase II		Energy/RES	Technical support	31.12.2014	EBRD (European Bank for Reconstruction and Development)	2,880,000.00	$ 2,880,000.00	
Promotion of energy efficiency in buildings and protection of the environment		Energy/Energy Efficiency	Technical support	13.08.2013 - 13.02.2015	EU	261,886.80	$ 261,886.80	
Protection of the environment through the promotion of biomass for substitution of fossil fuels in heating and power generation / Biofoss	Protection of environment and its resources, promotion of the conformity with the European Union and the national energy targets for 2020 and contribution towards the global effort to confront the climate change.	Energy/RES	Technical support	07/14/2015 - 12/28/2016	EU	162,615.60	$ 138,223.26	$ 24,392.34
Public Institutions - Energy Efficiency (Kriva Palanka)	This project is part of the Programme for Cross-Border Cooperation between the Republic of Macedonia and the Republic of Bulgaria.	Energy/EE	Technical support	22.04.2014 - 21.02.2015	EU	170,788.80	$ 145,170.48	$ 25,618.32
Reform in the system for water supply, collection and treatment at local level	To support the reform in the existing system, concerning organizational, managerial, financial and operational aspects at local level (City of Skopje and in the Municipalities of Tetovo, Gostivar, Bitola, Kavadarci, Strumica, Debar, Radovish, Kichevo, Berovo and Kumanovo) in order to enable an effective and efficient management of the water supply, collection and waste-water treatment. A total of 1 million citizens will be	Cross cutting/Water management	Technical support	12/22/2015 - 12/21/2017	EU	2,220,000.00	$ 1,887,000.00	$ 333,000.00

	impacted by the results of the project.							
Refurbishment of the Public Building Stock	The main objectives of the RePublic_ZEB project are: to support the South-Eastern European countries in capacity building and rising EE (Energy Efficiency) awareness of the nearly Zero-Energy Buildings (nZEB) policy	Energy/EE	Technical support	31.08.2016	EU	121,382.40	$ 84,967.68	$ 36,414.72
Soil degradation assessment and rehabilitation strategies for sustainable land use planning / TERRA MED	Developing a master plan with an aim to create a healthy and sustainable environment, to address degradation of soil ecosystems and the pollution of the soils due to human mismanagement.	LULUCF/Land use	Technical support	10/16/2015 - 01/15/2017	EU	203,850.00	$ 173,272.50	$ 30,577.50
Strengthening capacities for implementation of the environmental legislation at local level	The overall objective of the project is to contribute to improved environmental protection, monitoring and implementation of the national environmental legislation in the country, at both central and local level	Cross cutting/Environment	Technical support	2014 - 2015	EU	1,560,000.00	$ 1,500,000.00	$ 60,000.00
Strengthening the administrative capacities for implementation of Waste Framework Directive (WFD) and Special Waste Streams Directives (WEEED, WBAD and WPD)	To strengthen the administrative capacity and undertake measures for implementation of Waste Framework Directive (WFD) and Special Waste Streams Directives (WEEED, WBAD and PPWD) through further development of implementation of the	Waste/WFD	Technical support	10/01/2016 - 10/31/2018	EU	1,212,631.20	$ 1,151,999.99	$ 60,631.21

	legislation and provision of trainings.							
Strengthening the administrative capacities on central and local level for transposition and implementing new Industrial Emissions Directive	To increase the effectiveness of the country´s preparation for EU accession and to ensure efficiency of the EU programme in the country. Project purpose: To strengthen administrative capacities of the Ministry of Environment and Physical Planning/Administration of Environment and Local-self Government Units, for transposition and implementation of new Industrial Emissions Directive 2010/75/EU (IED).	IPPU/IED	Technical support	10/01/2015 - 01/01/2017	EU	1,080,000.00	$ 1,026,000.00	$ 54,000.00
Support in identification, assessment and selection of eligible projects for IPA Regional Development Component - part Environment	The specific objective is to provide assistance to develop the capacities of the Ministry of Environment and Physical Planning for developing sound and sustainable pipeline of investment projects, and to apply this capacity in the waste water collection and treatment and waste management area.	Cross cutting/Environmental protection	Technical support	09.12.2010	EU	125,740.80	$ 106,879.68	$ 18,861.12
Sustainable energy thematic network of cross-border local authorities / ENERGYNET	Overall objectives: A) Thematic networking of local authorities on the topic of Sustainable Energy. B) Introduction in the participating five municipalities of the sustainable energy planning.	Energy/Sustainable Energy Management	Technical support	05/13/2015 - 12/26/2016	EU	321,222.00	$ 272,630.70	$ 48,591.30
Technical assistance for strengthening the institutional capacities		Cross cutting/Water Resource	Technical support	01.2014-20.12.2015	EU	2,040,000.00	$ 2,040,000.00	

for approximation and implementation of environment legislation in the area of water management.		Management						
Technical assistance for supporting the Operating Structure of Ministry of Environment and Physical Planning in implementation of the OPRD 2007-2013 - LOT6	Provision of technical assistance (expert help) to the IPA structure staff within the MoEPP to review and assess the quality of the draft technical and tendering projects' documentation - Project Studies (Feasibility Studies, Cost Benefit Analysis, and Environmental Impact Assessments), Design Documentation and Tender Dossiers to be prepared by the on-going projects under Measure 3.1 and Measure 3.2 from the OPRD 2007-2013.	Cross cutting/Implementation MoEPP	Technical support	04/20/2015 - 11/06/2016	EU	334,592.40	$ 284,403.54	$ 50,188.86
Themis Network		Forestry	Technical support	12.01.2015 - 11.08.2016	Austrian Development Cooperation	1,200,000.00	1,200,000.00	
Towards the future - Study on the potential and utilization of renewable energy sources in the cross border region		Energy/RES	Technical support	18.06.2015	IPA-CBC	176,883.60	150,351.06	26,532.54
Skills Development and Innovation Support Project	The objective of the project is to improve transparency of resource allocation and promote accountability in higher education, enhance the relevance of secondary technical vocational education, and support innovation capacity in the country.	Cross cutting	Technology transfer	2017	World Bank/IBRD	24,000,000.00	24,000,000.00	

Improving energy management at Macedonian Industry	Main aim is reducing energy consumption and improving energy and environmental performances in small and medium enterprises from food processing industry in Macedonia.	Energy management	Technical support	2013-2014	Norwegian Embassy in Belgrade	41,596.80	$ 41,596.80	$ -
Promotion of waste management and energy efficiency practices in the Cross -border region	The project aims to promote waste management and energy efficiency practices in small and medium enterprises (SMEs) in the cross border region, in order to reduce the negative impacts of their economic activities.	Waste/Energy efficiency	Technical support	2014-2015	IPA-CBC	51,410.53	$ 7,711.58	$ 43,698.95
Reducing CO2 and financial saving through replacement of fossil fuel with renewable energy source in kindergarten in Pehchevo	Rebuilding the boiler room and warehouse for storing pellets as well as purchase and installation of boiler system that runs on pellets wood biomass and its connection to the existing central heating system in the kindergarten 7 Septemvri, Pehchevo, Training for the members of Eco Committee and kindergarten teachers through organized theoretical and practical lectures for energy efficiency and use of renewable energy sources sun and biomass.	Climate Change	Financial support	2014-2015	GEF	48,543.00	$ 20,000.00	$ 28,543.00
Reduction of the CO2 emission in the Municipal Primary School "Goce Delchev" in Bosilovo by replacing fossil fuel with biomass	To replace the two oil boilers with boilers which operate on pellet as an energy source in order to generate heat. Apart from the reduction of the pollution caused by the greenhouse gases, financial resources will also be saved, which can afterwards be used by the school or the local self-	Climate Change	Financial support	2017	GEF	28,750.00	$ 9,540.00	$ 19,210.00

	government in Bosilovo for similar initiatives or problems.							
CO2 reduction as a result of the replacement of the street lighting	This project offers new technology for the generation and storage of low-carbon energy, supplying of economical street lamps that through their use reduces greenhouse gases, generate new revenue through energy savings and dramatically reduces maintenance costs.	Climate Change	Financial support	2017-2018	GEF	26,540.00	10300	16,240.00
Promoting the protection of plant diversity, energy efficiency and education in the Botanical Garden at the Faculty Natural Sciences and Mathematics	Financial assistance for the reconstruction of at least one of the glasshouses in the Botanic Garden, hence providing suitable conditions for the plants' development.	Climate Change	Financial support	2017-2017	GEF	49,866.00	$ 24,785.00	$ 25,081.00
Stronger CSO for a participatory transposition and implementation of the EU 2020 climate and energy package	To build capacities of CSOs on the implementation and use of the EU 2020 climate and energy package, EIA and SEA procedures; to establish cooperation between CSOs and decision makers involved in the adoption of the EU 2020 climate and energy package; to ensure democratic preparation and adoption of the strategies/plans/programs and projects regarding EU 2020 climate and energy package,	Climate Change/Energy	Technical support	2016-2017	EU	336,600.00	$ 336,600.00	$ -

	with civil sector ownership and interest for full implementation.							
Strengthening administrative capacities for energy sector at Ministry of Economy and Energy Agency	To improve the regulatory framework for competitive, transparent and non-discriminatory energy markets, and as part of it several bylaws in the field of electricity and natural gas, that is to say, the supply rules for electricity and natural gas for a supplier of last resort, the market rules for natural gas, the network rules for transmission and distribution of electricity and natural gas, and the rules for monitoring of the operations of energy markets and more are being drafted and reviewed	Energy	Technical support	2013-2015	EU	2,013,600.00	$ 1,812,240.00	$ 201,360.00
Build Up Skills	The Build Up Skills project in Macedonia, FYR defines the path that needs to be followed in the next seven years for the upgrade of skills and qualifications of the building workers in the practical application of EE and RES measures as the national energy targets for 2020 could be met.	Energy efficiency	Capacity building	07.06.2012 - 07.02.2014	EU	214,863.60	$ 214,863.60	$ -
Build Up Skills BEET - Builders' Energy Efficiency Training	The BUILD UP Skills BEET project aimed at introducing voluntary qualification schemes as well as 5 different training programmes to build up the energy efficiency skills of building sector workers. The project focused on the 5 following occupational fields: 1)	Energy efficiency	Capacity building	18.07.2014 – 18.03.2016	EU	490,831.20	$ 490,831.20	$ -

	building envelope, 2) glassing, 3) roofing, 4) energy infrastructures/electrical installations and 5) HVAC systems.							
Strengthening the technical higher education for climate change and renewable energy sources in Macedonia and Kosovo		Climate Change Education/Waste Water Treatment	Capacity building	2016	German Cooperation	33,600.00	$ 33,600.00	$ -
Education and employment opportunities for young people in times of climate change and energy transition		Climate Change Education/Training & Research	Capacity building	2015	German Cooperation	16,632.00	$ 16,632.00	$ -
Inspiring youth to engage in building a democratic, environmentally friendly and climate resilient society		Climate Change Education/Youth Activism	Capacity building	2016	France	4,200.00	$ 4,200.00	$ -
Youth on bikes		Transport/Climate Change Education	Capacity building	2015	Government of Republic of Macedonia	6,000.00	$ -	$ 6,000.00
Reducing youth carbon footprint 2		Climate Change Education/Transport/Youth Activism/Green jobs	Capacity building	2015-2016	France	15,600.00	$ 15,600.00	$ -

Reducing youth carbon footprint		Climate Change Education/Youth Activism/Green jobs	Capacity building	2015	France	12,285.60	$ 12,285.60	$ -
Citizen initiative for education climate change and energy efficiency education		Climate Change Education/Energy Efficiency	Capacity building	2017	EU	9,846.00	$ 9,846.00	$ -
Youth Exchange: Wake Up - Take Action		Climate Change Education/Youth Activism/Green jobs	Capacity building	2016	Norwegian National Agency Aktiv Ungdom	27,168.00	$ 27,168.00	$ -
Open regional fund for Southeast Europe-Energy Efficiency	The regional networks supported by the Open Regional Fund – Energy Efficiency (ORF-EE) independently share their experiences of implementing energy efficiency measures and address issues of common interest. In so doing, they contribute towards the more effective implementation of energy efficiency policies in their respective countries.	Energy efficiency	Technical support	2008-2017	German Cooperation	240,000.00	240000	
REACH-Reducing energy consumption with changing habits		Energy efficiency	Technical support	01.03.2014 - 01.03.2017	EU Community Programmes	134,518.80	134518.8	

Improving energy efficiency for the low income housing sector in Macedonia	To increase the standard of living in collective housing units in Macedonia through demonstration projects on energy efficiency improvements that significantly decrease energy consumption and operating cost.	Energy efficiency	Financial support	April 2011 - April 2014	USAID	1,500,000.00	$ 1,500,000.00	
Stabilizing GHG Emissions from Road Transport through doubling of Global Vehicle Fuel Economy	To support the development of national fuel economy policies in 20 countries, 6 countries through GEF-5 STAR Allocations and 14 without GEF funding, using existing tools developed with GEF-4 support (examples are the fuel economy baseline calculation methodology and online GFEI toolkit). In addition, to support coordination of the 20 country projects at the regional level to ensure that results are disseminated to other countries within the region. This will result in reduced vehicle fleet CO2 emissions in these 20 countries in line with the Global Fuel Economy Initiative's target of a 50% improvement of the overall global fleet fuel economy by 2050.	Environmental financing	Technical support	May 2015 - June 2018	GEF	212,000.00	$ 132,000.00	$ 80,000.00
Support to the Energy Regulatory Commission for the Introduction of the EU Legislation on Efficient Energy Market in the Republic of Macedonia		Energy efficiency	Technical support	December 2011 - December 2014	Kingdom of Norway	1,380,000.00	$ 1,140,000.00	$ 240,000.00

Resilient Skopje		Climate	Technical support	2014 - 2015	UNDP	63,253.00	$ 37,567.00	$ 25,686.00
Bioenergy villages (BioVill) - Increasing the market uptake of sustainable Bioenergy	The objective of the BioVill project is to transfer and adapt experiences gained in countries where bioenergy villages already exists (Germany and Austria) to countries with less examples in this sector (Slovenia, Serbia, Croatia, Macedonia and Romania). The project fosters the development of the bioenergy sector in selected target countries by strengthening the role of locally produced biomass as a main contributor for energy supply on local level, considering opportunities of market uptake or expansion for local farmers, wood producers or SMEs.	Environment	Technical support	March 2016-March 2019	EU	2,388,000.00	$ 2,388,000.00	$ -
Integrated Internet based information system for energy management (DTK Smart-tek DOO)			Technology support	15.12.2016 - 14.12.2017	Fund for innovations and technology development (FITD) and company's own funding	42,312.00	$ -	$ 42,312.00

Termo-liquid isolation (Metalotehnika DOO)			Technology support	01.02.2016 - 20.02.2017	Fund for innovations and technology development (FITD) and company's own funding	102,856.80	$ -	$ 102,856.80
Modular lightening arrester			Technology support	22.06.2015 - 21.06.2016	Fund for innovations and technology development (FITD) and company's own funding	40,452.00	$ -	$ 40,452.00
Waste water treatment for aerobic granulates-Granules			Technology support	01.03.2016 - 30.11.2017	Fund for innovations and technology development (FITD) and company's own funding	171,264.00	$ -	$ 171,264.00

Production line for purified waste glass granulate			Technology support	01.02.2016 - 31.07.2017	Fund for innovations and technology development (FITD) and company's own funding	180,225.79	$ -	$ 180,225.79
						632,865,392.80	$404,843,499.12	$228,021,893.68

Annex II Research activities related to the Climate Change aspects in R. Macedonia

Table A.2 Publications of the Macedonian researches related to climate change mitigation and MRV

Title of the research paper	Sector	Scope
Pavlina Zdraveva, Teodora Obradovic Grncarovska, Natasa Markovska, Elena Gavrilova, Emilija Poposka, Igor Ristovski, (2014): "Building a sustainable greenhouse gases inventory system in Macedonia", Management of Environmental Quality: An International Journal, Vol. 25 Issue: 3, pp.313-323, https://doi.org/10.1108/MEQ-11-2013-0131	MRV	Climate policy
ü P. Zdraveva, T. Obradovikj Grncharovska*, N. Markovska, E. Gavrilova, E. Poposka, I. Ristovski: Building a sustainable greenhouse gases inventory system in Macedonia. Management of Environmental Quality, An international Journal, Volume 25, Number 3, 2014	MRV	Climate policy
Grncarovska Obradovic Teodora, Markovska Natasa: Mainstreaming climate change mitigation into national sectoral policies, Policy Paper FYR of Macedonia. LOCSEE (Low Carbon South East Europe), November 2014	Mitigation	Climate policy
Gjoshevski Ivan: Decarbonising the Macedonian Economy Evaluating Consistency and Coherence of Climate and Energy Policies. Thesis for the fulfilment of the Master of Science in Environmental Management and Policy. The International Institute for Industrial Environmental Economics. Lund, Sweden, September 2016.	Mitigation	Climate policy
ü Atanas Kochov, Sara Srebrenkoska: CALCULATION OF CARBON FOOTPRINTING FOR PERSONS, HOUSEHOLDS AND ORGANISATIONS. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Cross cutting
Dominik Rutz[1], Rainer Janssen[1], JuanManuel Ugalde[1], Morten Hofmeister[2], Per Alex Soerensen[2], Linn Laurberg Jensen[2], Christian Doczekal[3], Richard Zweiler[3], Tomislav Puksec[4], Neven Duic[4], Borna Doracic[4], Rok Sunko[5], Blaž Sunko[5], Natasa Markovska[6], Meri Karanfilovska[6], Nikola Rajkovic[7], Ilija Batas Bjelic[7], Anes Kazagic[8], Alma Ademovic-Tahirovic[8], Izet Smajevic[8], Slobodan Jerotic[9], Bojana Mladenović[9], Emir Fejzovic[10], Amra Babić[10], Milada Mataradzija[10], Mitja Kolbl[11], Tomi Zrinski[11]: SMALL, MODULAR AND RENEWABLE DISTRICT HEATING & COOLING GRIDS FOR COMMUNITIES IN SOUTH-EASTERN EUROPE, IN EUBCE 2016 - 24TH EUROPEAN BIOMASS CONFERENCE AND EXHIBITION 2016: AMSTERDAM.	Mitigation	Energy
Aleksandar Dedinec, Borko Jovanovski, Andrej Gajduk, Natasa Markovska, Ljupco Kocarev: Analysis of renewable energy sources and electric vehicle penetration into energy systems predominantly based on lignite. DOI: 10.1140/epjst/e2015-50099-y, February 2016.	Mitigation	Energy

Aleksandar Dedinec [a]*, Verica Taseska-Gjorgievska [a], Natasa Markovska [a], Teodora Obradovic Grncarovska b, Neven Duic c, Jordan Pop-Jordanov [a], Gligor Kanevce [a], Gary Goldstein [b], Steve Pye [b], Rubin Taleski [c]: Low emissions development pathways of the Macedonian energy sector. Elsevier, Renewable and Sustainable Energy Reviews, Volume 53, January 2016, Pages 1202-1211.	Mitigation	Energy
Aleksandar Dedinec [a]*, Verica Taseska-Gjorgievska [a], Natasa Markovska [a], Teodora Obradovic Grncarovska [b], Neven Duic [c], Jordan Pop-Jordanov [a], Rubin Taleski [d]: Towards post-2020 climate change regime: Analyses of various mitigation scenarios and contributions for Macedonia. Elsevier Energy Volume 94, 1 January 2016, Pages 124-137.	Mitigation	Energy
Aleksandar Dedinec, Aleksandra Dedinec, Natasa Markovska: OPTIMIZATION OF HEAT SAVING IN BUILDINGS USING UNSTEADY HEAT TRANSFER MODEL. THERMAL SCIENCE, volume 19, issue 3, (2015)	Mitigation	Energy
ü Antonio Jovanovski[1] , Dame Dimitrovski[2]: USE OF NATURAL GAS AS CONTRIBUTION TO THE REDUCTION OF POLLUTION AND INCREASING ENERGY EFFICIENCY. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Energy
ü Biljana Petrevska[1] , Vlatko Čingoski[2]: CAN MACEDONIAN HOTELS BE GREEN: THE EVIDENCE OF HOTEL "FLAMINGO" – GEVGELIJA, MACEDONIA. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Energy
ü Done Tashevski, Igor Shesho, Dame Dimitrovski: BINARY CO-GENERATION POWER PLANT WITH SOFC – ENVIRONMENTAL ASPECTS. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Energy
ü Martina Dimoska, Nikolco Gošev, Anita Grozdanov, Mirko Todorovski: SMART SOLES, SHOE SOLES THAT PRODUCE ELECTRICITY. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Energy
ü Lazarevska A. M., Mladenovska D., 2016: "Multi-criteria assessment of natural gas supply options – The Macedonian case", International Journal of Contemporary Energy, Vol. 2, No. 1, pp 54-62 (2016) (DOI: 10.14621/ce.20160107)	Mitigation	Energy
ü Mladenovska D., Lazarevska A. M., 2016: "The impact of socio-economic indicators in assessing natural gas supply alternatives - Macedonian case", in Budzianowski W. M. (Ed.), Conf. Proc. – Book of Abstracts, Renewable Energy Sources - Research and Business (RESRB) 2016, June 22-24, 2016, Wrocław, Poland, pp. 67-68, (ID. RESRB2016.0027)	Mitigation	Energy

ü **Lazarevska A. M., Filkoski R., Mladenovska D., Tanchevski G., Gjurchinoski Z., Grozdanov A., Nacevski G., Gechevski G., Chebotareva Zh., Trajkovski Lj., Petrovska A., Matteini M., 2016: "What are the feasible impacts towards a more Energy Efficient and Low Carbon industry via implementing Energy Management Systems?", Proc. International Conference & Workshop REMOO-2016: "Science and Engineering for Reliable Energy", 18-20 May 2016, Budva, Montenegro, ID.1.51.**	Mitigation	Energy
ü **Mladenovska, D., Lazarevska A. M., 2015: "Decision making concept for creating policies related to natural gas supply chain in Macedonia", Proc. 10th Conference on Sustainable Development of Energy, Water and Environment Systems, 2015, Dubrovnik, Croatia (electronic CD version)**	Mitigation	Energy
ü **Lazarevska A. M., Kochov A., 2015: "To what extent can lighting refurbishment contribute to environmental protection via sound energy management?", Proc. V Regional Conference "Industrial Energy and Environmental Protection (IEEP) in South Eastern Europe (SEE)", Zlatibor, Serbia, June 24–27, 2015 (electronic CD version)**	Mitigation	Energy
ü **Lazarevska, A. M., Mladenovska, D., 2015: "What is the potential for introducing low carbon technologies via diversification of the natural gas supply in the R. Macedonia?", invited lecture for the JRC Support to Low Carbon Society, JRC Conference, 9 Sep, 2015, University Ss Cyril and Methodius, Skopje**	Mitigation	Energy
ü **D. MLADENOVSKA[a] *, A. M. LAZAREVSKA[b] , M. KOCHUBOVSKI[c]: ASSESSING ALTERNATIVES FOR NATURAL GAS SUPPLY IN MACEDONIA VERSUS ENVIRONMENTAL INDICATORS. Journal of Environmental Protection and Ecology 18, No 2, 632–640 (2017).**	Mitigation	Energy
ü **Gligor Kanevče, Aleksandar Dedinec, Aleksandra Dedinec: OPTIMAL USAGE OF BIOMASS FOR ENERGY PURPOSES TOWARD SUSTAINABLE DEVELOPMENT - A CASE OF MACEDONIA. THERMAL SCIENCE, volume 20, issue 11, (2016).**	Mitigation	Energy
ü **V. Strezov: System Approach to Sustainable Biofuel Production. 1st South East European Conference on Sustainable Development of Energy, Water and Environment Systems, 29 June - 3 July, 2014, Ohrid, Macedonia.**	Mitigation	Energy
ü **Aleksandra Dedinec[1] , Igor Tomovski[2] , Ljupčo Kocarev[1]: OPTIMIZATION MODEL FOR VARIABLE RENEWABLE ENERGY SOURCES GENERATION: MACEDONIAN CASE STUDY. Contemporary Materials (Renewable energy sources), VI−2 (2015). pp. 204 – 212.**	Mitigation	Energy
ü **Markovska, Natasa; Dedinec, Aleksandar; Taseska-Gjorgievska, Verica; Obradovic Grncarovska, Teodora; Duić, Neven; Pop-Jordanov, Jordan; Kanevce, Gligor: Towards post-2020 climate change regime: Comparative assessment of various scenarios and contributions. 1st South East European Conference on Sustainable Development of Energy, Water and Environment Systems, 29 June - 3 July, 2014, Ohrid, Macedonia.**	Mitigation	Energy

ü Markovska, Natasa; Taseska-Gjorgievska, Verica; Dedinec, Aleksandar; Obradovic Grncarovska, Teodora; Duić, Neven; Pop-Jordanov, Jordan; Kanevce, Gligor: EU 2030 climate targets - a perspective of an EU candidate country. 1st South East European Conference on Sustainable Development of Energy, Water and Environment Systems, 29 June - 3 July, 2014, Ohrid, Macedonia.	Mitigation	Energy
ü Suzana ZIKOVSKA, Slave ARMENSKI ENERGY AND ENVIRONMENTAL EFFECTS OF APPLICATION OF COMBINED COGENERATION NATURAL GAS FOR HEATING OF BITOLA. INTERNATIONAL SYMPOSIUM "ENERGETICS 2016", 6-8 October 2016, Ohrid, Macedonia.	Mitigation	Energy
ü Dusko Villarov, Shpresa Durguti: THERMO PP - HEAT, EXPANDING CONSUMPTION, ENERGY EFFICIENCY NIGHT WITH ACCUMULATOR OF HEAT. INTERNATIONAL SYMPOSIUM "ENERGETICS 2016", 6-8 October 2016, Ohrid, Macedonia.	Mitigation	Energy
ü Konstantin Dimitrov, Sashe Panevski, Jasminka Dimitrova Kapac, Ognen Dimitrov: DE-CARBONIZATION OF THE ELECTRICITY SECTOR, UTOPIA OR CHALLENGE FOR MACEDONIA?. INTERNATIONAL SYMPOSIUM "ENERGETICS 2016", 6-8 October 2016, Ohrid, Macedonia.	Mitigation	Energy
ü Mirko STOJANOVSKI, Caterina BUKRSHLIEVA, Darinka MITEVA: STATIONS FOR COMPRESSED NATURAL GAS (CNG) IN MACEDONIA. INTERNATIONAL SYMPOSIUM "ENERGETICS 2016", 6-8 October 2016, Ohrid, Macedonia.	Mitigation	Energy
ü N. Bakreska Kormushoska[1] , A. Kochov[2] , G. Cvetkoski[1]: IMPLEMENTATION OF RECP IN CEMENT INDUSTRY – USJE CEMENT PLANT CASE STUDY. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	IPPU
ü Maja Peceva, Tashko Rizov, Atanas Kochov: CHEMICAL LEASING AS A NEW BUSINESS MODEL CONTRIBUTING TO SUSTAINABLE INDUSTRIAL DEVELOPMENT. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	IPPU
ü Lazarevska A. M., Bakreska Kormushoska N., Kochov A., 2015: "Complementarity and Overlapping among Energy Performance Indicators as part of the Sustainable Development and RECP Indicators in Cement Industry", International Journal of Contemporary Energy, Vol. 1, No. 1, pp 20-26 (2015) (DOI: 10.14621/ce.20150203)	Mitigation	IPPU
D. DIMITROVSKI, V. DJINLEV, M. M. DIMITROVSKI, Z. SAPURIC: Determining Hot Carbon Monoxide (CO) Emissions from Passenger Vehicles as a Parameter for Multisectoral Decision Making Process. Journal of Environmental Protection and Ecology, Vol. 16, No. 4 (2015).	Mitigation	Transport

ü Mile Dimitrovski: AIR POLUTION FROM TRANSPORT IN URBAN AREAS – CASE STUDY SKOPJE. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Transport
ü Dario Gechevski, Radmil Polenakovik, Valentina Gecevska: INFLUENCE OF REVERSE LOGISTICS AND GREEN LOGISTICS AS PART OF SUPPLY CHAIN TO ENVIRONMENTAL SUSTAINABILITY. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Transport
ü Atanas Kochov[1] , Kjosevski Stevan[1] , Marina Malish Sazdovsk[a2] , Latif Latifi[3]: CHALLENGES OF INTRODUCING ELECTRIC VEHICLES IN REPUBLIC OF MACEDONIA. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Transport
Aleksandar Dedinec [a],* Natasa Markovska [a], Igor Ristovski [b], Gjogi Velevski [c], Verica Taseska Gjorgjievska [a], Teodora Obradovic Grncarovska [b], Pavlina Zdraveva [c]: Economic and environmental evaluation of climate change mitigation measures in the waste sector of developing countries. Journal of Cleaner Production 88 (2015) 234-241.	Mitigation	Waste
Dedinec, Aleksandar, Markovska, Natasa, Ristovski, Igor, Velevski, Gjogi, Gjorgjievska, Verica Taseska, Grncarovska, Teodora Obradovic, Zdraveva, Pavlina Economic and environmental evaluation of climate change mitigation measures in the waste sector of developing countries. Elsevier, Journal of cleaner production 2015 v.88 pp. 234-241.	Mitigation	Waste
Z. SAPURIC, D. DIMITROVSKI, M. DIMITROVSKI, M. KOCHUBOVSKI: European Union Regulations and Standards of Waste Management and Its Implementation in FYR Macedonia. Journal of Environmental Protection and Ecology, Vol. 16, No.2 (2015).	Mitigation	Waste
Zoran Sapuric, Filip Ivanovski: Opportunities for the improvement of waste management in landfill 'Drisla' in Skopje. 6th INTERNATIONAL CONFERENCE "Protection of Natural Resources and Environmental Management: The main Tools for Sustainability"(PRONASEM), 10-11 November, Bucharest, Romania	Mitigation	Waste
ü F. Ivanovski[1] , Z. Šapurić[1] , D. Dimitrovski[2]: RELATIONS BETWEEN WASTE INFRASTRUCTURE AND PACKAGING WASTE RECYCLING: A CASE STUDY OF CITY OF SKOPJE. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Waste
ü Vesna Miloshevska, Borka Kovacevikj, Bojan Muratovski: UTILIZING OF LANDFILL GAS AS ENERGY SOURCE. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Waste

ü Gj. Sherovska: MUNICIPAL WASTE MANAGEMENT IN SKOPJE: OPPORTUITIES AND PERSPECTIVES. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Waste
ü Vladimir Arsov[1] , Marko Dimitrovski[2] , Vančo Donev[3]: RANKING OF THE CRITERAI FOR MULTICRITERIAL MODELING OF THE SISTEMS FOR MUNICIPAL SOLID WASTE MANAGEMENT IN URBAN AREAS. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Waste
ü Tashko Rizov, Petrika Janeku, Atanas Kochov: IMPLEMENTATION OF LOW CARBON TECHNOLOGIES IN THE MACEDONIAN AGRO INDUSTRY. International Conference "Green development, infrastructure, technology (GREDIT) 2016", 30 March – 02 April, 2016 Skopje, Macedonia.	Mitigation	Agriculture
D. Dimitrovski, M. Vilarova, E. Gavrilova: Some aspects of air quality planning for the city of Tetovo. 6th INTERNATIONAL CONFERENCE "Protection of Natural Resources and Environmental Management: The main Tools for Sustainability" (PRONASEM), 10-11 November, Bucharest, Romania	Mitigation	Air quality
Kristina Petrovska, Fana Hristovska, Aneta Kitevska: Estimating GHG emissions from "Bunardere" landfill in Municipality of Veles", Third International Climate Change Conference 2016, Skopje, Macedonia	MRV	Waste
Ristovski Igor, Milosevska Vesna, Filkoska Tanja, Blinkova Martina, Macanovski Ivan, Lazarevska: Methodology to include indirect greenhouse gas emissions in inventories, mitigation options on both national and local level, Third International Climate Change Conference 2016, Skopje, Macedonia	MRV	Cross sectoral
Antonio Jovanovski, Aleksandar Trpkovski "Opportunities for young people in times of climate change and energy transition" - Macedonia, Kosovo, Serbia and Croatia	Mitigation	Cross sectoral

Annex III List of entities that were met and consulted during preparation of the report

Table A.3 List of stakeholders that were consulted during preparation of the report

Institution	Name and Surname	Position	Contact details
MANU	Natasa Markovska	Chief Technical Advisor	natasa@manu.edu.mk
Ministry of Environment and Physical Planning	Jadranka Ivanova	Head of EU department and IPA coordination	J.Ivanova@moepp.gov.mk
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Ministry of Economy	Milica Karafilovska	Advisor at Energy Sector	milica.karafiloska@economy.gov.mk
Ministry of Finance	Ana Nikolova		Ana.nikolova@finance.gov.mk
Government of the Republic of Macedonia, Prime minister cabinet	Sandra Andovska	Advisor	Sandra.andovska@gs.gov.mk
Ministry of Education and Science, Skills Project	Jasminka Janakieva	Business and Innovation Coordinator	Jasminka.janakieva@mon.gov.mk
Fond for innovation	Jasmina Popovska	Director	Jasmina.popovska@fitr.gov.mk
Government of the Republic of Macedonia, Secretariat for European Affairs	Sofija Zafirova	Bilateral cooperation	
GEF - SGP	Melita Ristova	Project assistant	
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		protection	
City of Skopje	Liljana Oncevska Nadzinska	Deputy Head of the department for environmental and nature protection	Liljana.Oncevska@skopje.gov.mk
Milleukontakt	Igor Slavkovski	Director	Igor@mkm.mk
Skopje Lab	Sofija Bogeva	UNDP Innovation consultant	sofijabogeva@gmail.com