LEGAL PROTECTION FROM CLIMATE CHANGE IN THE REPUBLIC OF SERBIA IN THE PROCESS OF INTEGRATION TO THE EUROPEAN UNION

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ABSTRACT

In the recent decades, climate change, one of the greatest environmental, social and economic threats has taken great attention of the scientific and political public. In this paper are discussed legal frameworks relevant for the protection of the climate change both globally and within the Republic of Serbia borders. There was also emphasised the need for further harmonisation of national legislation with international trends in the field of climate change, as well as with the obligations arising from ratified international documents and the process of European integration. Although a significant progress in the fight against climate change in the Republic of Serbia began with the process of European Union integration and harmonisation of the national legislation with the European Union, the authors suggest that there is still a need to improve institutional and legal framework at both national and local levels. In Serbia, the energy sector is the largest source of GHG, but it is also the sector with the greatest potential for the application of mitigation measures.

Keywords: climate change, legal protection, European Union law, Serbian law.

AIMS AND BACKGROUND

Climate change is one of the greatest environmental, social and economic problems. In recent decades, data on average annual temperatures show an alarming situation, as until 2012, the temperature rose by 0.8% compared to the pre-industrial period,

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and in the past thirty years, there were recorded the highest temperatures in the past 1400 years and the growth rate of average global temperature increase to 0.1ºC per decade in the past 10 years up to 0.2ºC per decade in the past decades[1]. Average annual temperatures at the European level in the past 50 years have grown faster than the global average. The measured medium increase in temperature annually is 1.4ºC. The projections for the end of the 21st century show an annual increase in temperature from 2.1ºC to 4.4ºC, while in the Southern Europe the temperature may locally rise up to 6ºC (Ref. 2). Global climate changes are reflected in the climatic characteristics of the geographical area of the Republic of Serbia (RS), so that, based on measuring of the Republican Hydro-Meteorological Service of Serbia (RHMS), there was observed a positive trend of temperature[3]. The increase amounts up to 0.04ºC per year, while in some areas in the east and southeast Serbia a negative trend of –0.05ºC was recorded. The highest temperature rise was recorded in the autumn[4]. Climate change is a reality that is reflected in all aspects of life and brings into question the survival of plant and animal species. Given the fact that the atmosphere is the most unstable component of the climate system, which is prone to very rapid changes due to movement of air masses, the emphasis to the study of climate change is paid to this medium, i.e. atmosphere and temperature changes caused by natural and anthropogenic factors. However, in the past few decades, the Intergovernmental Panel on Climate Change (IPCC), the term climate change refers to changes caused by the presence of greenhouse gasses (GHG) whose presence is solely linked to human activities. Greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) (Ref. 5) as well as the chlorofluorocarbons (CFCs), the hydrochlorofluorocarbons (HCFCs), and the halons[6], absorb and re-emit heat, and thereby keep the planet atmosphere warmer than it otherwise would be. According to the data of the IPCC, the most important source of GHG emissions is electricity and heat production with a share of 25% in total emissions of greenhouse gases, followed by agriculture, forestry and other land use (AFOLU is the abbreviation for agriculture, forestry and other land use) with 24%, industry 21%, transport 14%, buildings with 6.4%, and other energies which refers to all GHG emission sources in the energy sector other than electricity and heat production with 9.6% (Ref. 7). Concentrations of the CO_2 in the atmosphere are constantly increasing since the period of the industrial revolution. The data indicate that the CO_2 emission with 910 $GtCO_2$ for the period of 1750–1970 increased to 2000 $GtCO_2$ for the period of 1740–2010. A noticeable increase was recorded in the period from 2000–2001. In this period, GHG emissions rose by an average of $GtCO_2$ eq/year, while for the period from 1970–2000 the increase was 0.4 $GtCO_2$ eq/year[8]. However, the consequences of climate change affect the other components of the climate system causing different effects such as acidification, climate change impacts on our health, environment and economy. The United Nations (UN) globally led the activities in the field of climate change. United Nation Framework Convention on Climate Change (UNFCCC) was adopted in 1922 at the Earth Summit in Rio de Ja-

neiro in Brazil, as a first step towards solving this problem. The Convention entered into force in March 1994 and has so far been ratified by 195 countries. The main objective of the UNFCCC is to stabilise concentrations of greenhouse gasses at a level that would prevent negative anthropogenic interference with the climate system. Such a level should be achieved within a time period that would allow ecosystems to adapt naturally to climate change, to disable jeopardising of food production and enable further sustainable economic development[9]. (UNFCCC Article 2). In addition to UNFCCC, in December 1997 in Kyoto, Japan was adopted the Kyoto Protocol aiming to achieve better implementation of this Convention. The Kyoto Protocol sets emissions targets for developed countries which are binding under international law. The main objective of the Kyoto Protocol is to reduce global anthropogenic GHG emissions by at least 5% compared to 1990 levels, in the first commitment period, 2008–2012. The peculiarity of the Kyoto Protocol is that it established three main mechanisms for realising the stated objectives: *joint implementation* – JI (Article 6), *clean development mechanisms* – CDM (Article 12) and *emissions trading* – ET (Article 17). The second commitment period under the Kyoto Protocol was launched when the Doha Amendment was signed in Doha, Qatar in 2012. During the second commitment period, the parties committed themselves to reduce emissions of greenhouse gasses by at least 18% below the level from 1990 during the period from 2013–2020. The changes from Doha have not entered into force yet. In addition to the Kyoto Protocol (and its amendment) and the Paris Agreement, parties to the Convention have agreed to further commitments during UNFCCC Conferences of the Parties. These include the Bali Action Plan (2007), the Copenhagen Accord (2009), the Cancún Agreements (2010) and the Durban Platform for Enhanced Action (2012). Copenhagen Accord (2009), among other things, is characterised by the fact that the global agreement on limiting the global rise in temperature to less than 2°C comparing to pre-industrial period is achieved, though the Agreement is not legally binding. The formal basis for setting adaptation among priorities present an Action Plan of the UNFCCC adopted at the Conference of the member parties in Bali in March 2007. Improvement activities related to adaptation was further elaborated through the Cancún Agreements, adopted at the UN Climate Conference in Mexico (2010). The basic international initiative in the area of disaster risk reduction represents International Strategy for Disaster Reduction of the UN (UNISDR). The basic document for this initiative is the Hyogo Framework of Action 2005–2015. The 21st regular annual session of the UNFCCC and the 11th meeting of the signatories of the Kyoto Protocol is the 21st Conference of Parties – COP21, held in Paris from 30 November to 20 December 2015. The Paris Agreement is a new global legally binding agreement on climate change for the period after 2020. The Paris Agreement includes a plan for action in order to limit the global temperature increase at less than 2°C. While the long-term goal of the governments is the agreement to keep a level of global temperature at a level less than 2°C compared to the pre-industrial level and will make efforts to limit the increase to 1.5°C. In addition to reducing emissions (mitigation),

the Paris Agreement also includes other key issues, or adaptation to changed climatic conditions (adaptation) and financing of mitigation and adaptation in the developing countries, as well as capacity building and development and transfer of technology. The Paris Agreement entered into force on November 4, 2016, thirty days after the conditions were met on October 4, i.e. after its ratification by at least 55 member states of the Convention, which make up at least 55% of global emissions of greenhouse gasses. The European Union (EU) ratified the Paris Agreement on climate change on 5 October 2016. The 22nd session of the Conference of the members of the UNFCCC was held in Marrakech, Morocco in 2016. It is expected that the conference would contribute to the formulation of the documents crucial for the implementation of the Paris Agreement. Activities in the fight against climate change and mitigating their effects have been identified as priorities in the EU (Ref. 10). Ever since 2007, the EU integrally regulates the fields of climate and energy through 'EU climate and energy package' which includes a set of binding legal instruments in this field. The objectives of the '20–20–20' set three key objectives for the EU by 2020: reducing emissions of greenhouse gasses by 20% compared to 1990 levels, increasing the share of energy consumption from renewable sources to 20% and increasing energy efficiency by 20%. These targets represent an integrated approach to climate and energy policy that aims to combat climate change, increase the energy security of the EU and strengthen its competitiveness. These targets were set by the EU leaders in 2007 in order to make Europe a highly energy-efficient economy with low carbon emissions, and they were adopted through climate-energy packet in 2009. EU proposes to increase its emissions reduction to 30% by 2020 if other key economies also commit themselves to take part in the reduction of global emissions. The EU climate and energy package consists of four legislative acts. The reform of the EU Emissions Trading System (EU ETS) as this system is a key instrument to reduce emissions of greenhouse gasses in a cost effective manner. EU ETS is a means to reduce emissions of greenhouse gasses from the industrial sector in an economically efficient manner, and it is currently in the third period of trade applicable to the period 2013–2020. Climate-energy package includes a comprehensive review and strengthening of legislation which is the basis of the EU ETS, or Emissions Trading Directive[11]. The changes include the introduction of a single limit of emissions units at the EU level instead of the previous national restrictions. This limit will be reduced every year so that by 2020 the emissions will be 21% below the 2005 level. As part of the Effort Sharing Decision, the Member States have taken binding annual targets to reduce their emissions of greenhouse gasses from the sectors not covered by the EU ETS, such as sectors of housing, agriculture, waste, and transport – which represents about 60% of total emissions in the EU. National targets range from 20% reduction of emissions in the richest Member States to 20% increase in emissions in the least wealthy Member States. Member States are required to submit annual reports on their emissions in accordance with the EU monitoring mechanism. After the Renewable Energy Directive, Member States have taken binding national targets for

increasing the share of renewable in its energy consumption by 2020. National targets, which range from 10–49% (10% in Malta to 49% in Sweden) will enable the EU as a whole to reach its goals for renewable energy sources by 2020. In addition to this, these objectives will contribute to reducing emissions of greenhouse gasses and reduce the EU independence on imported energy. The fourth element of the climate-energy package is a directive that creates a legal framework for the environmentally safe use of technology for capturing and storing carbon (CSC). The objectives of the EU in the field of climate and energy until 2030 (Ref. 12) provide an integrated political framework for the period until 2030, which should provide a coordinated approach among all the Member States. In October 2014, the EU leaders reached an agreement on a political framework for 2030 in the field of climate and energy which should make climate and energy system of the EU prepared for the future and keep Europe competitive, safer, and that will enable progress in achieving economic development with low carbon dioxide emissions. It was built on the 2020 climate and energy package. It is also in line with the longer term perspective set out in the Roadmap for moving to a competitive low-carbon economy in 2050, the Energy Roadmap 2050 and the Transport White Paper. 2030 climate and energy framework sets three key targets for the year 2030. The first key objective of the framework is the obligation of reducing emissions of greenhouse gasses at the EU level for at least 40% below 1990 levels by 2030. This objective should enable the EU to find itself on the profitable path to fulfilling the universal goal of reducing emissions by at least 80% by 2050. To achieve the target of 40%, the sectors that fall under the EU ETS system should reduce emissions by 43% compared with 2005. The emissions of the sectors not included in the EU ETS should reduce emissions by 30% below the 2005 level, which should be transferred to national objectives as well. The second objective is the responsibility of increasing the share of renewable energy to at least 27% of total energy consumption at the EU level by 2030, which plays a key role in the transition towards the establishment of the more competitive, safe and sustainable energy system. The third objective is to increase energy efficiency by at least 27%. This target will be reviewed in 2020 having in mind a 30% target. The framework helps driving progress towards a low-carbon economy and builds an energy system that ensures affordable energy for all consumers, increases the security of the EU energy supplies, reduces EU dependence on energy imports and creates new opportunities for growth and jobs. It also brings environmental and health benefits – e.g. through reduced air pollution. In addition to this, EU ETS will be reformed and improved. The EU Roadmap[13] to 2050, towards an economy with *low emissions.* The European Commission is considering cost-effective ways to adapt the European economy to climate change. By 2050, the EU predicts to significantly reduce the majority of emissions of greenhouse gasses. The Roadmap to 2050 is a set of planning policies which should enable sustainable use of resources at the EU level. Clean technologies play an important role. The Roadmap indicates that by 2050, the EU at the national level should reduce emissions by 80% compared to 1990 levels. It defines cost-effective ways to achieve

this goal with the individual goals of 40% reduction by 2030 and 60% reduction by 2040. All sectors need to contribute.

EXPERIMENTAL

Floods that shot RS in May 2014 showed the need for a more ambitious response to climate change in the RS (Ref. 14). In the RS, the first package of laws in the field of environmental protection was adopted in 2004 (Ref. 15). The RS ratified UNFCCC in 2001 (Ref 16) and Kyoto Protocol in 2008 (Ref. 17) and ever since it has established its legal, institutional and political framework aimed at fulfilling the obligations arising from the Convention and the Protocol. Cooperation with the UN aims at strengthening the institutional and human capacities in the RS in the area of climate change. As a non-Annex and Member State to the UNFCCC, the RS is under no obligation to reduce emissions of greenhouse gasses (GHG), but it submits information on emissions and removals of greenhouse gasses, as well as information on the activities undertaken in order to implement the Convention and activities aimed at integrating climate change issues into the broader planning of country development. Initial National Communication (INC) of the RS to the UNFCCC, as an important national strategic document was published in 2010. This report is important because it gives an overview of activities in the field of climate change, including information on current and expected levels of greenhouse gasses, on the possibilities and ways to reduce it, on the monitoring, reporting, and verification, as well as about the flaws and needs. The INC also contains concrete and adaptive measures for certain sectors, although it does not list institutions responsible for the proposed measures or stated deadlines for their implementation. The Second National Communication Report of the RS to the UNFCCC, which is under preparation, should include an inventory of greenhouse gasses, as well as screenings and action plan to mitigate climate change by 2020. This report should also include a long-term framework of the strategy to reduce emissions which monitors the EU Roadmap on climate change 2050, in the context of structural adjustment program will take into account the EU White Paper. Ministry of Agriculture and Environmental Protection published the First Biennial Updated Report (FBUR) of the RS to UNFCCC in February 2016. The FBUR provides the RS obligations towards UNFCCC, national characteristics of the RS, the inventory of greenhouse gasses, emissions projections up to 2020, the activities for their reduction, monitoring, reporting, verification and gaps and priority needs. In the FBUR of the RS to UNFCCC, inventories of greenhouse gasses have been revised and improved (including GHG inventory for 1990), and the GHG inventory for the period 2010–2013 was prepared. The largest share of the total GHG emissions in 1990 comes from the energy sector – 78.79% (Ref. 18). In the period of 2010–2013 the GHG emissions were varying according to sectors, but their share in total emissions remained almost unchanged.

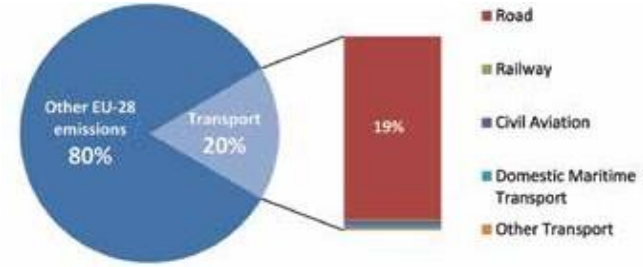

Fig. 1. EU-28 GHG emissions (t of CO_2 equivalent) by mode of transport in 2011 (Ref. 19)

Figure 1 shows over the 1990–2011 period, emissions from road transport and civil aviation grew by 21 and 17%, respectively; while emissions from domestic maritime transport presented a 1% growth. In contrast, emissions from railway transportation fell by 46%. A breakdown by sector shows that road transport has dominated emissions from this sector throughout this period (94% in 2011). The obligations of the Member States of the UNFCCC within the Paris Agreement are determined by the objectives of reducing GHG emissions the countries submitted as a preparation for the Conference (INDC). RS submitted its reduction target for 2030 in relation to 1990, which is 9.8% (Ref. 20). The most common gas of greenhouse gasses is carbon dioxide (CO_2) (Ref. 21) with a share of 78.9% in total GHG emissions in 2013. According to the International Energy Agency, RS emits about 60 million t of CO_2 per year. Out of this, production of electricity from the two largest lignite depots in Kolubara and Kostolac emit about 40 million t of CO_2. Total GHG emissions in 2013 were lower by 3.5% compared to the emissions in 2010, as a consequence of the global economic crisis. In 2010 the RS economy began its recovery, but in the period of 2010–2013, the recovery did not significantly affect the growth of emissions. At the same time, there started the activities for establishing the legislative framework and general atmosphere of affirmation and more efficient energy technologies, as well as a general increase in energy efficiency, i.e. use of renewable energy sources that would lead to further economic development accompanied by a reduction of GHG emissions. The FBUR also had a mitigation action plan by 2020 prepared. Projections of the total GHG emissions and GHG emissions for sectors were made through three scenarios: a baseline scenario, scenario 'with measures' and scenario 'with additional measures'. The projections were made by 2020, with a cross-section in 2015. The year 2010 was chosen as a starting point. Levels of total emissions in 2020, with a cross-section in 2015, determined on the basis of these three scenarios are presented in Table 1.

Table 1. Levels of total GHG emissions based on three scenarios for 2015 and 2020 (Ref. 22)

Total emissions (Gg CO_2eq)	2015	2020
Basic scenario	70783.23	79442.37
Scenario with measures	68410.42	70966.54
Scenario with additional measures	66015.15	65164.09

In 2020, the reduction of GHG emissions obtained by scenario 'with measures' is 11% and by scenario 'with additional measures' is 18% compared to the baseline scenario emissions obtained by the basic scenario[23]. In the FBUR of the RS to UNFCCC special attention, which would lead to achieving GHG emissions reduction estimated by two scenarios of GHG emissions ('with measures' and 'with additional measures') was paid to the Energy sector due to its share, as well as the potential for total GHG emissions reduction. There was assumed production capacity of renewable energy sources that will be achieved in final energy consumption and energetic at each of the two developed scenarios on GHG emissions reduction by 2020. Planned measures that lead to an increase in energy efficiency include measures in the residential sector, public sector and commercial services, industry sector and transport sector. They include legislative and infrastructural measures that lead to a reduction in final energy consumption. Specific activities that will ensure the reduction of GHG emissions were identified through the NAMA projects. In addition, there was established a Central Registry of Energy Passports (CREP). However, the level of knowledge and quality of data on climate change has significantly promoted the formation of the South East European Virtual Climate Change Centre in Belgrade. The HMSS, where the centre is located, has significantly improved its capacities so that today it is one of the key institutions for the monitoring of climate change, as well as for planning adaptation. Besides the RHMS, the Serbian Agency for Environmental Protection, which focuses part of its activities on the problem of climate change, also provides significant information. Activities in the field of climate change, especially adaptation have not been developed on the local level so far so that the availability of information on locally specific consequences of climate change is very limited.

RESULTS AND DISCUSSION

As a non-Annex and Member State of the Convention, the RS has access to the Clean Development Mechanism (CDM). In accordance with the obligations, there was established a National Authority for the implementation of the CDM of the Kyoto Protocol (DNA). So far, there have been registered seven CDM projects in RS. Besides, following new features to combat climate change under the auspices of UNFCCC, the RS has developed National Appropriate Mitigation Actions ($NAMA_s$). The concept of nationally adjusted mitigation actions is one of the key components of climate change mitigation at the international level and it involves policies and actions to reduce emissions of greenhouse gasses, in accordance with their capacities and different responsibilities. The RS has developed 12 NAMA projects and submitted them to the NAMA Secretariat of the Convention[24]. The Government of the RS drafted a 'National Strategy for the Inclusion of the Republic of Serbia in the Clean Development Mechanism' in 2010. EU ETS is a tool for reducing GHG emissions from the industrial sector in an economically efficient manner. Effective monitoring, reporting and verification (MRV) of GHG emissions are crucial for monitoring process

in achieving objectives of reducing emissions. In the context of the EU accession of the RS, and in order to implement Directive 2009/29/EC on the system of emission trading, there was established a system for monitoring, reporting, and verification (MRV) indispensable for the successful implementation of the EU ETS. The purpose is to establish a sustainable system of MRV necessary for the implementation of the Directive 2009/29/EC. This requires implementation of the legislative and institutional framework for the implementation of the Directive. So far, there were prepared a preliminary list of installations falling under the EU ETS, preparation of relevant laws and regulations necessary for full implementation of this system; there was also made an estimate of possibility of transitional measures to comply with the system, cost analysis for the energy sector and the implementation plan for stationary equipment and airline operators for the period prior to EU accession. The law on the system of monitoring, reporting, and verification needed for EU ETS, which should introduce the obligation of monitoring, reporting, and verification of data on GHG emissions from industrial and power plants, has not been adopted. The transposition of the Directive on Emissions Trading in our legislation and transposition of the Directive 2009/31/EZ on the Geological Storage of Carbon Dioxide have not started yet. Significant progress in the fight against climate change began with the process of the RS integration in the EU and harmonisation of its national legislation with the EU laws, especially bearing in mind that the basic principles of the EU legislation are based on the fight against climate change. Within the RS obligations towards the EU in the field of climate change, further alignment with EU policies is necessary, such as objectives 20–20–20 as well as requirements for monitoring and reporting. In order to contribute to the implementation of the EU Acquisitions in the RS in the field of climate change, as well as to meet obligations under the UNFCCC, there was launched a Twinning project 'Establishment of a Mechanism for Implementation of MMR' (IPA 2013) in accordance with Regulation 525/2013ES on the monitor- ing mechanism. The main objective is to establish a system to collect the necessary data and information in the field of climate change. The RS has enacted laws and by-laws that are important to mitigate climate change, arising from obligations in the process of EU integration. In addition to this, alliterations were neglected. Although adaptation to climate changes in the past few years have been the focus of scientists and politicians, because the IPCC reports have shown that climate change and their effects cannot be stopped in the short term. It is necessary to develop specific adaptation systems, i.e. adaptation to emerging climate conditions[25]. The power sector has the biggest potential for cutting emissions. Adaptation means anticipating the effects of climate change and taking appropriate action to prevent or minimise the damage they can cause or exploit opportunities. Adaptation strategies are needed at all levels of administration, from the local to the international level.

CONCLUSIONS

The fight against climate change is one of the priorities in the policy of the international community. Ever since the ratification of the Kyoto Protocol, the RS established a legal, institutional and political framework which aims at fulfilling the obligations arising from the Convention and the Protocol. Since it belongs to the developing countries (non-Annex I countries), RS is not obliged to reduce GHG emissions, nut it is obliged to submit regular reports to the Conference of the Parties to the Convention, which include the assessment of the sector and the system to changed climate conditions, calculations of GHG emissions, proposed measures of mitigation, as well as including the problem of climate change into sectoral and national development strategy. RS reports on their activities aimed at fighting climate change and changes and adjustments (adaptation) to changed climate conditions. In its INC of the RS to UNFCCC, as an important national strategic document, among other things it was noted that the energy sector is the largest source of GHG, but it is also the sector with the greatest potential for the application of mitigation measures. Also, there was published the FBUR with the results that the inventory of the greenhouse gasses for the period of 2010–2013 is prepared as well as an action plan for mitigation by 2020, and promoted national system of monitoring, reporting, and verification. Within the preparation of the Second National Communication Report of RS to UNFCCC, the goal is to prepare GHG inventories for the period of 2000–2009, to carry out assessment of mitigation measures and an action plan of mitigation up to 2030 and 2050, to analyse the vulnerability of sectors and systems and adaptation to changed climate conditions, especially in the sectors of agriculture, forestry and water resources, to strengthen national capacities for the implementation of the Convention, and to involve the problem of climate change more effectively into all sectoral and national priorities. The introduction of reporting after the UNFCCC has significant implications for strengthening of technical and institutional national capacities in the field of climate change. However, although it is strongly committed to the implementation of the Convention, the RS is faced with many restrictions such as lack of capacity and lack of complete operational system for monitoring, reporting, and verification (MRV) activities in the field of climate change. However, as a non-Annex I Member State of the UNFCCC, the RS has access to CDM and so far, there have been 7 CDM projects in the RS through which industrialised countries (Annex I countries) invest in projects that contribute to sustainable development and the reduction of GHG emissions in the developing countries (non-Annex I countries). In addition, the RS has developed 12 NAMA projects. But there is no comprehensive strategic document dealing with climate change in RS yet. Activities in the field of climate change, in particular, adaptation have not been developed at the local level in RS yet so that access to information on locally specific consequences of climate change is very limited. In the RS, a significant progress in the fight against climate change started with the initiation of the process of EU integration and harmonisation of national legislation with the EU law, especially

given EU leadership in the fight against climate change. Within the RS obligations towards the EU in the field of climate change, further alignment with EU policies is necessary such as objectives 20–20–20 and requirements for monitoring and reporting. Preparations for harmonisation of legislation in the field of trade with emissions show progress with the support of Instruments for Pre-accession Assistance (IPA). Since it is necessary to assign priority to the establishment of a system for monitoring, reporting, and verification (MRV) of GHG emissions, the RS has initiated and implemented IPA projects and activities. RS has established important components of the institutional and legal framework for the purposes of the fight against climate change. At the same time, there remains a need for their improvement, as well as capacity and knowledge building within relevant and competent institutions both at national and local levels, but also at the level of general public.

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