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in cooperation with Ministry of Agriculture of the Slovak Republic
and the United Nations Development Programme / Global Environment Facility

NATIONAL CAPACITY SELF-ASSESSMENT RELATED TO ENVIRONMENTAL MANAGEMENT OF GLOBAL CONVENTIONS

**The Thematic Assessment Report of Capacity Development Needs
for the United Nations Framework Convention
on Climate Change**

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Abbreviations

AAUs	Assigned Amount Units
APVT	Agency for Science and Technique
ASPEK	Association of Industrial Ecology
BAT	Best available techniques
CAFE	Clean Air for Europe – EU program
CBD	Convention on Protection of Biodiversity
CCAP	Clean Air Policy Centre
CDM	Clean Development Mechanism
CFC	ChloroFluoroCarbons
CIRCA	Communication and Information Resource Centre Administrator
CLRTAP	Convention on Long Range Transboundary Air Pollution
COP	Conference of the Parties
CRF	Common Reporting Format
CSE	Committee on Sustainable Development
ECB	Energy Centre Bratislava
EEA	European Environment Agency
EF	Emission factor
EFRA	Ecology and Forestry Research Agency
EK	European Commission
EU	European Union
GCOS	Global Climate Observing System
GEF	Global Environment Facilities
GPG	Good Practice Guidance
GWP	Global Warming Potential
HCFC	HydroChloroFluoroCarbons
HDP	Gross domestic product
HFC	HydroFluoroCarbons
IAEA	International Atomic Energy Agency
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
IIASA	International Institute for Applied System Analyses, Laxenburg
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
ISI	Institute for System and Innovation, Karlsruhe Germany
ISMŽP	Environmental Information and Monitoring System
ITPO	Investment and Technology Promotion Office
JI	Joint implementation
KP	Kyoto Protocol
LPG	Liquid Propane Butane
LUCF	Land use change and forestry
MDPT SR	Ministry of Transportation, Post and Telecommunications SR
MEAs	Multilateral Environmental Agreements
MERO	Colza-oil methyl ester
MF SR	Ministry of Finance SR
MH SR	Ministry of Economy SR
MP SR	Ministry of Agriculture SR
MŠ SR	Ministry of Education SR
MVRR SR	Ministry of Construction and Regional Development SR
MŽP SR	Ministry of Environment SR
NARMSP/NADSME	National Agency for Small and Medium Enterprises Development
NEAP	National Environmental Action Plan
NEIS	National Emission Information System
NFP	National Focal Point

NIR	National Inventory Report
NKP	National Climate Program
NPRR	National plan for Regional Development
NS	National Communication on Climate Change
NSTUR	National Strategy on Sustainable Development
ODA	Official Development Aid
OECD	Organization for Economic Cooperation and Development
OZE	Renewable Energy Resources
PCF	Prototype Carbon Fund
PDF	Project preparation and Development Facility
PEZ	Primary Energy Resources
QMS	Quality Management System
REZZO	Register of Emissions and Air Pollution Sources
RISO	Regional Waste Information System
RPIC	Regional Advisory and Information Centre
SARIO	Slovak Investment and Trade Development Agency
SAV	Slovak Academy of Science
SAŽP	Slovak Environmental Agency
SEA	Slovak Energy Agency
SEI	Slovak Energy Inspection
SHMÚ	Slovak Hydrometeorological Institute
SIŽP	Slovak Environmental Inspection
SNE	Single National Entity
SOP	Sector Operational Program
SOP PS	Sector Operational Program: Industry and Services
SOPK	Slovak Trade and Industrial Chamber
SPU	Slovak Agriculture University, Nitra
SREP	Section for Environmental Programmes Implementation of the Ministry of Environment SR
STU	Slovak Technical University, Bratislava
SZ CHKT	Slovak Association of Refrigeration and Air Conditioning Engineers (RACE)
ŠÚ SR	Statistical Office of the Slovak Republic
TEWI	Total Equivalent Warming Impact
TI SR	Technical Inspection of SR
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industry Development Organization
VEGA	Scientific Grant Agency of the Ministry of Education SR
VÚC	Higher Territorial Unit
VÚPOP	Soil Science and Conservation Research Institute
WCP	World Climate Program
WHO	World Health Organization
WMO	World Meteorological Organization
x/CP.y	COP Decision

Summary

The Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Droughts and/or Desertification, Particularly in Africa (UNCCD) (hereinafter “desertification”) often presented together as “Rio conventions” in because of their common association with United Nations Conference on the Environment and Development (UNCED) held in June 1992 in Rio de Janeiro. In May 1999, the *Capacity Development Initiative* (CDI) was launched as a strategic partnership between the UNDP, a leading entity within the UN system in the area of capacity development, and the Secretariat of the Global Environment Facility, representing a principal global funding mechanism for the environment. In January 2004, a project entitled “*National capacity needs self-assessment related to environmental management of global conventions*” (NCSA Project) was approved for the Slovak Republic by the Chief Executive Officer of the GEF under this new scheme.

This report presents the results of a detailed assessment of existing capacity of the Slovak Republic to meet a wide-ranging set of requirements and commitments under the United Nations Framework Convention on Climate Change. It also contains an assessment of capacity for commitments of the country under the Kyoto Protocol (KP), which defines direct reduction commitments of the Parties included in Annex I to the UNFCCC and mechanisms for the achievement of these reductions. In addition to the results of the capacity inventory, the report also provides recommendations on strengthening, mobilisation and development of new capacities allowing for long-term and effective achievement of the commitments under the Protocol and within the context of the other Rio conventions. The report has been prepared as a separate assessment document, which can be used for the upcoming National Communication and the Action Plan.

In Slovakia, the UNFCCC came into effect on the 23rd November 1994. The first National Communication of the Slovak Republic on Climate Change was published in May 1995 providing comprehensive information on policy and measures which had been adopted to mitigate adverse impacts of climate change. It also contained the inventory of greenhouse gas emissions and the projections of future development. Slovakia ratified the Kyoto Protocol in May 2002. The adopted reduction commitment of Slovakia for the period 2008-2012, quantified in Annex B to the Kyoto Protocol is

equal to 92% of the total national emissions of greenhouse gases in 1990 multiplied by five. According to the emission inventory (updated by April 15, 2004), Slovakia has achieved the reduction of total anthropogenic emissions of greenhouse gases, expressed as CO₂ equivalent, by 34.42% in comparison with 1990 (the basic year). In connection with the emission inventory and projected emission trends, it would seem that existing capacity of Slovakia for achieving the Convention targets can be assessed relatively quickly and positive results have been achieved. Moreover, the results have been achieved within the limited institutional capacities. However, the process is not so simple. It happens within the context of political and economic changes including accession to the OECD, EU, and the implementation of other treaty requirements. The inventory and assessment conducted in this project has brought a significant benefit to Slovakia since this is the first time that this information has been gathered for Slovakia. This is particularly important due to the fact that, Slovakia will realistically be able to meet the KP reduction requirements therefore there is no natural driving force for continual strengthening and development of capacities for improvement and sustainability in the field of climate change.

Current capacity framework to meet the requirements of UNFCCC and KP

The National Focal Point (NFP) at the Air Protection Department of the Ministry of Environment is the key expert and legal guarantor for the achievement of commitments and requirements of UNFCCC and KP. In addition to the NFP, also the Ministry of Economy, the Ministry of Agriculture, the Ministry of Construction and Regional Development, and the Ministry of Transport, Post and Telecommunication contribute to the mitigation of climate change impacts at all levels of the process. No separate state administration has been established to address only climate change, but the field has been incorporated into the state administration for air protection represented by the Ministry of Environment SR (MŽP SR), the Ministry of Transport (MDPT SR) and the Slovak Environmental Inspection, District and Regional Offices and municipalities. Non-governmental organizations (NGOs), academic institutions and interest groups are involved in the process of development and approval of interdisciplinary and strategic materials. Implementing agencies, scientific and research institutions, including laboratories, supervisory bodies, consulting companies and experts also play important roles in the process. The role of the

mass media and schools, supported by NGOs and civic associations, is very important in the dissemination of environmental information.

Generally, the capacity framework of Slovakia can be characterized as a flexible and not overly institutionalized system. Improvements can be achieved in using existing financial, human and information resources and in the creation of sustainable conditions. Human resources are particularly important. Good results, also attained within the international context, are primarily the results of initiatives and professional approach of individuals at the systemic, institutional and individual levels.

Detailed analysis of capacity for achieving commitments under UNFCCC and KP has resulted in the following findings:

- Political framework is suitable for the development of capacity to design and formulate policies and measures. The climate change issues have become a priority of the Slovak Government.
- The absence of closer cooperation of stakeholders has been identified in the development and formulation of strategy, policy, legislation and programs.
- Duplication of strategic theses has occurred due to lack of coordination; however the theses are not supported by adequate implementing tools and related implementing capacity.
- Existing capacity (financial, information and human resources) has often been used independently and inefficiently.
- Implementing capacity and the efficiency of measures implemented in relevant sectors lag behind the capability to develop and formulate strategies and programs.
- There is a scarcity of qualified and experienced experts for the implementation phase at the individual level. Appropriate qualification means a combination of technical, legislative, economic and language skills in permanently changing conditions.
- Insufficient experience of managers in preparing and formulation of projects has resulted in low efficiency and utilization of domestic financial sources and particularly international funds.
- Current inventory system of greenhouse gas emissions, based on sector divisions and cooperation with external experts, is not sufficiently reliable. Backup for the identified capacity is missing, with regard to finances (specifically dedicated finances for this activity), as well as personnel (formal appointment of individuals responsible for the communication with international organizations).
- Capacity for developing the greenhouse gas emission inventory at the individual level is critical with regard to sustainability. External organizations participating in the development of balance sheets are generally represented only by one expert.
- In the field of science, research and monitoring of climate change no separate strategy for achieving the commitments under UNFCCC and KP has been adopted. The issue has not become a priority of Slovak state policy of science and technology and the institutional support is missing in the sense of a clear mandate and authority to protect these interests at the governmental level.
- Slovakia has large number of qualified researchers and institutions with a long tradition of activities in research and development in this field. The problem is the scarcity of earmarked finances to climate change research.
- Coordination of research activities in the field of climate change and also in cross-cutting issues of all three Rio Conventions is missing.
- Analyses at the individual level show that a generation problem is developing, due to lower salaries and high qualification requirements. This results in an outflow of young scientists either to the private sector or abroad.
- Education and training of managers, experts and technicians on climate change is the critical point of capacity and sustainability. Needs in this field are satisfied only partially. There is no comprehensive strategy in place nor any mechanism to cover the issue in order to ensure the continuity of procedures and expertise.
- There are high qualified experts in Slovakia with experience in the development of methodology, inventories, emission projections, national communications and action plans. The effective use of expert capabilities is very important, *inter alia*, also in training of new experts. Good conditions for further development within international cooperation are also very important.
- There is little capacity available in the field of voluntary instruments and environmental technologies due to the lack of systematic support, scarcity of qualified managers and lack of information sources (databases). The change of political and economic conditions has also changed the position of Slovakia in relation to international aid and technology transfer. As a result of the accession to OECD and EU, Slovakia has changed its position from beneficiary of international aid and importer of various technologies to the position of donor. The institutionalization of ODA (Official Development Aid) has created better conditions for technology transfer particularly in underdeveloped markets.
- Slovakia has no comprehensive strategy, or program, of public training and awareness in relation to climate change. Many general documents focused on environmental education, training and public awareness have been developed, which also cover this issue. Both governmental and non-governmental institutions are involved in the process. However, no specific information campaign on climate change impacts, targeted at the local level, local governments and directly to property owners and users, managers and technicians in the energy, transport and waste sectors, has been developed.
- The possibility to use international funds to solve problems of climate change is known and information is publicly accessible. These forms are used at the national level, as well as the level of institutions and enterprises. However, the available tools are not used effectively and their use is uneven among various institutions. Reasons for this could be found in the lack of initiative and lack of experience with regard to the preparation of qualified proposals for new projects.

SWOT analysis

A wide range of obligations and commitments were identified as the result of the capacity inventory under UNFCCC and KP. These were analyzed by SWOT analysis. Strengths, weaknesses, opportunities and threats which were identified for the analyzed fields were grouped in five UNDP/GEF generic indicators of capacity assessment. With regard to the first generic indicator – capacity to conceptualize and formulate policies, strategies and legislation – a favorable political framework is a strength. An major change in the international context occurred during the course of the project when Russian Federation ratified the KP. The signature of Russia was the final condition for the treaty to come into force. Therefore a threat previously identified in the SWOT analysis now becomes an opportunity. The lack of capacity for mutual coordination in both directions (horizontal and vertical) can be acquired by mobilization of existing strengths and the use of sufficient potential of strengths as opportunities. It is important to note that through a relatively small adaptation of the first indicator, a distinct positive effect for the second generic indicator can be achieved.

In the classification of the second generic indicator – capacity to implement policies and measures, the importance is shifting towards managing, technical and technological skills. The output quality will depend much more on the quality of capacity at the institutional and individual levels, in particular on the ability to utilize existing opportunities (mainly the possibility to use existing experience and obtain new experience together with the financial sources within international projects). These opportunities in combination with strengths (e.g. evident positive effect of indirect tools) may compensate for the lack of direct legislative support and existing threat in the form of potentially ensured achievement of the commitment under KP.

The third generic indicator measures the capacity to engage and build consensus among all stakeholders. There is a lack of historical tradition with regard to developing a broader consensus building for various fields of strategic development in Slovakia. The strengths and opportunities identified by the SWOT analysis still are not sufficient to change the current, largely formal exercise of consensus building, towards a more dynamic and deep one. The motivation comes rather as the consequence of an urgent problem than the natural need and utilization of offered possibilities.

With regard to the fourth generic indicator – an assessment of capacity to mobilize information and knowledge, it was identified a relatively balanced situation between strengths and weaknesses or opportunities and threats. The wide-ranging field of identified problems may be compensated for by the mobilization of existing capacities including those relating to the other Rio conventions. This can be accomplished by more effective utilization of the existing qualified potential and targeted financing. But it is important to improve the capacity framework as quick as possible, since many of identified strengths are not sustainable.

The fifth generic indicator measures the capacity for monitoring, evaluation, reporting and education. Capacity and capability in this field are the key instruments for achieving the technical requirements of UNFCCC and KP. The expertise of stakeholders is a good starting point, but underestimation of the horizontal and vertical cooperation of the participants, as well as lack of a clear definition of legal and institutional mandates and inconsistencies with ongoing processes are the weak points. The current system of monitoring, reporting, assessment and education is highly vulnerable and even a small change could disrupt the continuity and consistency of the existing common procedures.

Assets, needs and limitations of the capacity framework in Slovakia

Flexibility of institutional arrangement, utilisation of supportive and indirect instruments, long-term continuity of participation of some institutions, implementing agencies, universities and experts are the assets of the current capacity framework of the Slovak Republic in achieving its commitments under UNFCCC and KP. Active participation of non-governmental organizations is also an asset. At the individual level, the key asset is the high level of expertise, international experience and prestige of the experts involved in carrying out the technical requirements of monitoring, reporting and the impact assessment of policy and measures. The coordination of activities at the level of the involved sectors, within the sectors (vertical) and between the Rio Conventions is the most frequently repeated requirement. The need for clear and publicly available mandates of institutions and experts for national and international activities has resulted from other proposals. The requirement of targeted allocation of finances and continuous training of new experts for climate change will be critical for inventory, emission projections and systemic observation.

Barriers and restrictions identified within the current capacity framework are the following:

- lack of a driving force for capacity development due to the relatively ensured achievement of the reduction commitment of Slovakia in the first period under KP
- gaps in coordination and effective use of financial and human resources and information
- a lack of financial resources for continually meeting the commitments.

Recommendations for the Action Plan

Recommendations regarding the strengthening, mobilization and building of capacity to meet the commitments under UNFCCC and KP are the output of the capacity assessment. The recommendations were developed using two methods. In the first case, the following criteria were used:

- cross-cutting or synergic nature of the proposed capacity in relation to the achievement of the commitments under the Rio conventions

- national priority¹
- EU priority
- "fast solution"².

A list of priorities to achieve the commitments under UNFCCC and KP has been developed, based on the experience and opinions of experts, without considering the broader context of Rio Conventions. In this method, the urgency, quickness and feasibility of implementation of the activity were taken into account. The capacity needs were ranked according to urgency:

1. Strengthening the capacity of NFP for climate change;
2. Establishment of an inter-sectoral group for climate change;
3. Systemic promotion (a legal measure) for the modification of the scope and the quality of official statistic data and deadlines within the context of meeting the commitments under UNFCCC, KP and EU;

4. Establishment of NIS pursuant to Article 5 of KP and Council Decision 280/2004/EC;
5. Promotion of the science in the field of climate change and adaptative measures;
6. Ensuring continuous training and education for managers and experts in climate change;
7. The need to implement the requirements of UNFCCC also at the local level, for example in developments plans of municipalities, towns and regions;
8. Development of information documents for the public that would present the climate change in the cause-consequence relationship and provide a chance for the public to contribute positively to dealing with the problem.

EDITORIAL COMMENT: The original NCSA report was developed in Slovak language and translated into the English. The Annexes are not translated.

¹ According to expert opinions.

² The recommendations that could be implemented in a short term period without significant financial and other sources.

1. NCSA context in Slovakia

The World summit of the UN on the Environment and Development (June 1992, Rio de Janeiro) and the adopted documents have global value and are cross-cutting in nature. Capacity strengthening and capacity building, that is to say global environmental management, are useful for all countries and they become the key words in all three Conventions. Binding documents of the summit are very important for developing and transition countries. However, national capacities of these countries to achieve the commitments required by the documents are limited.

In January 2004 a project entitled “National capacity needs self-assessment related to environmental management of global conventions” was approved for the Slovak Republic, based on the Capacity Development Initiative (UNDP and Secretariat of the Global Environmental Facility in May 1999).

The objective of the project is to determine the priority needs for capacity development in order to achieve the commitments of Slovakia under the Rio conventions. The project deals with issues that are common for all three conventions, while the purpose is to achieve as much as possible synergy in capacity development. Three thematic fields were assessed in detail: biological diversity, climate change and desertification. The aim is to provide a basis to determine cross-cutting and common questions. It is the ambition of the thematic assessment to analyze current capacity critically, using a holistic approach, at all levels of management.

1.1 Organizational context of NCSA in Slovakia

Prior to the launching of the NCSA project in February 2004, the following coordination structure was introduced:

- The Ministry of Environment acted as the executing agency for the project. In its capacity as executing agency, the MoE is responsible for the supervision of the project, production of outputs and management of UNDP funds.
- The Soil Science and Conservation Research Institute (Slovak abbreviation VÚPOP) was appointed as the implementing agency for the project and takes responsibility for the day to day management of the project.
- The Project Steering Committee was established to oversee the project. The steering committee is a political platform for strategic collaboration among relevant institutions, being responsible for policy input, functional guidance, and overall co-ordination of the project.
- The Project Board was established to oversee the daily operations of the project, discuss actual matters related to the implementation of the project's follow-up, such as the work plan, financial management and other matters.
- Four working groups, climate change, biodiversity, desertification, and cross-cutting issues were established based on existing working group structures for the Conventions and supervised by the National Focal Points.

2. Methods

2.1 Methodological aspects of capacity building and capacity development

The term “capacity building” has been used in many contexts, while it most frequently refers to the development of human resources and to the ability of individuals and institutions to make and implement decisions, perform functions, set and fulfill objectives. A new term “capacity development” shifts emphasis to the assessment of one’s own capability, so the assessment comes out of the system itself.

There are three levels of capacity building and capacity development: individual, institutional and systemic.

Capacity development at the **individual level** refers to the process of changing attitudes and behaviors, imparting knowledge and developing skills while maximizing the benefits of participation, knowledge exchange and ownership. It aims to investigate “individual” responsibilities and interests in plans and decisions including personal incentives and expertise. Capacity development at the **institutional level** focuses on the overall organizational performance and functioning capabilities of the single institution, as well as its ability to adapt to change. It also covers the specific nature of the institution, its competences and financial transparency.

Capacity development at the **systemic level** is the most difficult as it covers the creation of a favorable political, regulatory and financial framework, in which individuals and institutions operate. Traditionally, interventions at the systemic level have been focused on strengthening institutions.

According to the UNDP/GEF Manual (1), indicators focus on the following functions:

- general knowledge
- national policy, legal and regulatory framework
- institutional mandates, coordination and interactions, cooperation of stakeholders
- management of institutions
- management of information, monitoring and observation
- mobilization of scientific information to support the decision process
- financial resources and technology transfer
- incentive systems and market instruments
- negotiation skills
- capability and motivation of individuals.

The thematic assessment of capacities was conducted with the support of the Manual of the UNDP/GEF (1). The UNDP/GEF capacity development indicator

framework (2) includes the following Strategic Areas of Support organized according to 5 generic indicators (GI):

- **Capacity to conceptualize and formulate policies, legislations, strategies, and programs**

This category includes analyzing global conditions that may affect country needs and performance in a given area, developing a vision, long-term strategizing, and setting of objectives. It also includes conceptualizing broader sectoral and cross-sectoral policy, legislative and regulatory frameworks, including synergies between global environmental conventions. It further contains prioritization, planning and formulation of programs and projects.

- **Capacity to implement policies, legislations, strategies, and programs**

This category includes process management capacities that are essential in the implementation of any type of policy, legislation, strategy and program. It also includes execution aspects of program and project implementation. It includes mobilizing and managing human, material and financial resources, and selection of technologies and procurement of equipment.

- **Capacity to engage and build consensus among all stakeholders**

This category includes issues such as mobilization and motivation of stakeholders, creation of partnerships, awareness-raising and developing an enabling environment for civil society and the private sector, stakeholder identification and involvement, managing of large group process and discussion, including mediation of divergent interests, as well as the establishment of collaborative mechanisms.

- **Capacity to mobilize information and knowledge**

This category pertains to the mobilization, access and use of information and knowledge. It includes issues such as effectively gathering, analyzing and synthesizing information, identifying problems and potential solutions, as well as consulting experts and peers. It further covers specific technical skills including the capacity to carry out scientific and technical assessments.

- **Capacity to monitor, evaluate, report and learn**

This category pertains to the monitoring of progress, measuring of results, codification of lessons, learning and feedback, and ensuring accountability to ultimate beneficiaries and partners. It also covers aspects such as reporting to donors and global conventions. It natu-

rally links back to policy dialogue, planning and improved management of implementation.

2.2 Overview of methods and procedures used

The following methods published in UNDP/UNITAR Guide Book (2) were used within the projects:

Stocktaking, mapping

The basic starting point in identification of capacity was to take an inventory of the current status. The inventory and mapping were done in several phases in the following sequence:

1. *Inventory* of requirements and commitments of Parties included in Annex I under UNFCCC, KP and decisions adopted by COP;
2. *Mapping* of the achievement of commitments under UNFCCC and KP in categories: commitment, time schedule of fulfillment, monitoring, outcomes in Slovakia and the links to the EU process;
3. *Questionnaires* focused on the determination of priorities for detailed analyses and the proposal for capacity, as well as the selection of suitable instruments to modify the capacity framework in Slovakia. The questionnaire formats were taken from the UNDP/GEF (3). The questionnaires were distributed among the members of the working group, academic and research institutions, universities, associations and private sector at a meeting and via the Internet. Brief evaluation of questionnaire survey is presented in Chapter 5.
4. *Detailed analysis of the existing capacity framework* based on the holistic approach for the fulfillment of commitments under UNFCCC and KP. The range of evaluated parameters for the commitments is shown in Table 2.1. Not all fields were mapped in the same detail. Generally, it can be concluded, that we succeeded in the collection of very useful information and knowledge in this phase of the process. Not all the data and information are incorporated into the assessment report due to the size of the report, but it can be used in the assessment of capacity changes in future. Therefore the results in

a separate document on a CD will be provided to the Ministry of Environment. In this phase, the most important and relevant documents were evaluated. Detailed results of the capacity inventory are presented in Chapter 3.

5. *Interviews* and consultations with experts – key identified stakeholders. Interviews were held with representatives of the Ministry of Environment, Ministry of Economy, Slovak Energy Agency, Club 500 and the Slovak Environmental Agency. Electronic networking was used to contact representatives of international bodies, i.e. a special advisor of the Executive Secretary of UNFCCC in Bonn, a representative of Secretariat UNECE in Geneva, the secretary of Convention on Long-Range Transboundary Air Pollution, a representative of WMO in Geneva, a representative of European Centre for Environment and Health of World Health Organization (ECEH/WHO) in Bonn and an expert of Potsdam Research Institute on Climate Change Impact. Information is presented in Chapter 3.
6. *Seminars* organized within the projects completed and widened the information spectrum. In addition to the seminars, brainstorming at the working group meetings also was used. During the thematic assessment two workshops were organized in order to exchange information among experts for all three Rio Conventions (June 29, and November 11, 2004) in Bratislava.
7. *Email networking* within the working group and between working groups was used in the course of the project. It allowed provision of all stakeholders with updated information in all phases of the project and, at the same time, all members of the project team could actively contribute to the work and comment both the form and content of background documents, partial outputs of the project, as well as the main conclusions of the report.

SWOT analysis

SWOT analysis is a frequently used instrument for assessment and planning. Besides the analysis of strengths and weaknesses, it also specifies external factors, that being opportunities and threats that can influence the final implementation of proposed meas-

Table 2.1 Matrix for the assessment of capacity framework

Systemic level	Institutional level	Individual level
Policy framework in relation to the objective	Institutional adequacy	Division of work positions in relation to the objective
Legal and regulatory framework	Comprehensibility of their functions and mandates	Availability of training and conditions for further development of experts
Comprehensibility of responsibilities of institutions	Management effectiveness of institutions	Access to information
Coordination and cooperation of institutions	Adequacy and qualification of the staff /experts in institutions	
Financial and information sources	Financial resources and material equipment	
	Access to information	

ures or strategic objectives. The second phase of SWOT is the identification of possibilities/opportunities to overcome the weaknesses by using the strengths, or to overcome threats by using existing opportunities. The improvement of weaknesses should be subjected to strategic planning. The SWOT analysis was conducted at the end of the analytical phase. All commitments described in Chapter 3 were analyzed by SWOT analysis at a separate meeting of experts. The results were grouped in the way which allowed the qualification of the capacity framework in Slovakia to achieve its commitments under UNFCCC and KP by five generic indicators recommended by UNDP/GEF and described in Chapter 2.1.

Priority selection for capacity strengthening

Based on the recommendations of the Strategy of SR for achieving commitments under the KP, desk review and expert opinion of the working group, priority fields for capacity development were selected. The selected fields were assessed and the results are presented in Chapter 4. Key assets, needs and barriers of the capacity framework of Slovakia for the commitments analyzed have been identified.

Proposal of recommendations for the Action Plan, their prioritization, as well as the proposal of cross-cutting issues for joint use of capacity for the Rio Conventions are the outputs of the assessment. The results are presented in Chapter 5.

3. Background situation in Slovakia

3.1 Economic and environmental profile of the Slovak Republic

Since 1993 the Slovak Republic has registered positive economic development as demonstrated by the increase in GDP. A comparison of the GDP trend with the trend of aggregated emissions of greenhouse gases (figure 3.1) shows that Slovakia is one of a few countries where the trend of emissions does not replicate the GDP increase. However, by international comparison the generation of greenhouse gases per capita still remains one of the highest in the world.

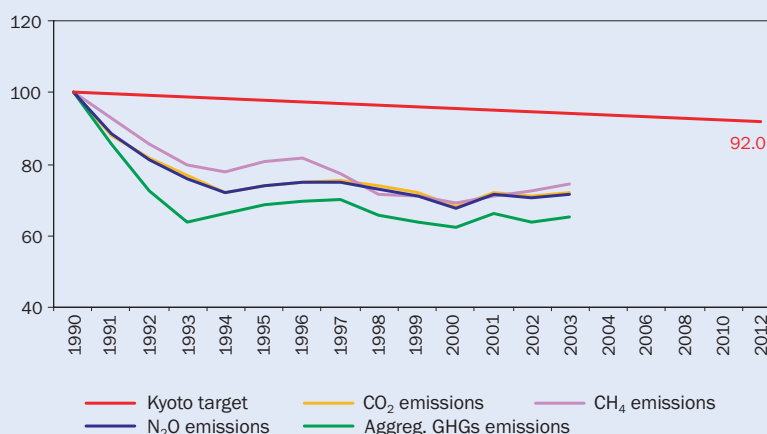
Slovakia has signed all important environmental conventions. The most significant change in political life of the country was the accession to the EU in May 2004. This step also implies an intensive transposition of a large framework of environmentally oriented legislation in all sectors.

The UNFCCC entered into force for the Slovak Republic in the 23rd November 1994. Since this date the country has been fulfilling basic obligations arising from the Convention. The First National Communication on Climate Change of the Slovak Republic (5) was published in May 1995 and it brought in the first and comprehensive information on the adopted policy and measures to mitigate adverse impacts of climate changes, the inventory of greenhouse gas emissions and projections of future development of the emissions. In May 2002 the Slovak Republic ratified the Kyoto Protocol (6). The quantified reduction commitment accepted by Slovakia for the period 2008 – 2012

in Annex B to the Kyoto Protocol is equivalent to 5 multiply of 92 % of total national emissions of greenhouse gases in 1990. In the Strategy of SR for Achieving the Commitments under of the Kyoto Protocol (7), the total quantity determined for the first target period (2008-2012) is reduced by an additional 5%, but not proportionally for all sectors (8). It is intended to create a reduction reserve that would allow compensating uneven economic development or other possible changes with potential impact on the generation of emissions. According to the latest projections of aggregated emissions of greenhouse gases in 2002 (9), it is realistic to achieve the commitments in all scenarios, also in case of dynamic economic development connected with the high increase of energy consumption. According to the emission inventory updated in April 15, 2004 (8), Slovakia has achieved a reduction of total anthropogenic emissions of greenhouse gases, stated as CO₂ equivalent, by 34.42% when compared the year 1990 (the base year). Achieving commitments under the KP is feasible and realistic with regard to the projected emissions trajectories, as well as the latest emission balance.

The decrease in generation of emissions, indicated in Figure 3.1 is the result of a number of impacts and processes occurring within the context of the transformation of Slovak economy to the market model. In this regard the following facts are significant: since 1993 gradual decrease in energy demands of the society; higher share of services in the generation of the GDP;

Figure 3.1 Trends of greenhouse gas emissions (CO₂ equivalent) in 1990-2002 in comparison with the Kyoto commitment, emissions determined by April 15, 2004



Source: National Allocation Plan for 2005-2007 to the Directive 2003/87/EC, MoE SR, June 2004(8)

higher share of gas fuels in the economy; structural changes in industry and the decrease of energy consumption in energy demanding sectors (without metallurgy), as well as in less demanding industries; and the impact of legislative measures influencing directly or indirectly the generation of greenhouse gas emissions.

3.2 Current capacity framework to achieve the commitments under the UNFCCC and KP

The National Focal Point (NFP) established at the Department of Air Protection of the Ministry of Environment (MŽP SR) is the key expert and legal guarantor for achieving the commitments and requirements under the UNFCCC and KP. Besides the NFP, also the Ministry of Economy, the Ministry of Finance, the Ministry of Agriculture, the Ministry of Construction and Regional Development, and the Ministry of Transport, Posts and Telecommunications are involved in the mitigations of climate change impacts at all levels. A specific state administration for climate change has not been established, but the issue is covered by the state administration for air protection represented by MŽP SR, MDPT SR, Slovak Environmental Inspection, regional and district environmental offices and municipalities. Non-governmental organizations, academic institutions and associations of interested groups are involved in the process of development and approval of cross-sector and concept documents. Implementing agencies, scientific and research institutions, inspections, consulting and expert companies are also very important for the achievement of the commitments. The very important role of the media and schools supported by many activities of NGOs should also be underlined in the process of dissemination of environmental information among the public including young people.

From the emission trends presented in Chapter 3.1, it would seem that the assessment of existing Slovak capacities responsible for fulfilling the Convention targets is an easy job, carried out very quickly by stating the positive current results and optimistic future trends of emissions. Moreover, these targets have already been met with limited and not strongly institutionalized capacity. But the process is more complex. It is implemented in the context of political and economic changes, the accession to other international conventions with direct or indirect environmental impacts also on greenhouse gas emissions. Obviously, the development of the country still cannot be considered to be characterized with simple extrapolations for the future. This will influence the development of capacity for achieving commitments under the convention. In contrast with proposals to build new capacity for specific targets, the assessment of existing capacity itself can be an asset. This is very important especially in cases, when fulfilling the target or commitment is realistic, which is the case in Slovakia, and when no natural driving force is emerging in order to mobilize and promote the development of capacity towards the sustainability.

The following section provides an overview of the detailed capacity assessment to achieve the commitments of Slovakia under the UNFCCC and KP. The inventory includes also a list of all commitments under the UNFCCC and KP, and relevant decisions of COP, presented in a separate annex to the report on a CD. Obviously, it is not possible to assess exhaustively the capacities for all commitments of signatory countries. In addition to the wide range of commitments assessed at all three levels of the process (Chapter 3), priority fields for capacity strengthen were selected. They were made up of capacity needs identified in the Strategy of Slovakia to achieve its commitments under the KP (7):

- quality enhancement of greenhouse gas inventories – completion of the national inventory system;
- implementation of policies and measures to reduce greenhouse gas emissions;
- development of projections and policy and measures including impact assessment;
- elaboration of national reports/communications and national action plans;
- implementation of flexible mechanisms, primarily emission trading.

Other commitments identified by the working group through a desk review were added to the above mentioned ones:

- research, systemic observation and monitoring of climate change;
- training of scientists, technicians and managers.

Chapter 4 presents the detailed evaluation of priority areas.

No project specifically focused on capacity assessment for climate change has been implemented up to now. By using the holistic approach, i.e. by analyses carried out at the systemic, institutional and individual levels, useful information were collected. The information can be used also in the future in the assessment of changes and needs in capacity backup of the process in Slovakia.

3.2.1 Formulation of national policy and measures to mitigate greenhouse gas emissions and to enhance removals by sinks

Commitment: Formulate national policy and measures to mitigate greenhouse gas emissions and to enhance removal by sinks

Reference:	UNFCCC- Article. 4, par.1 b)
Other reference:	NFCCC- Article 12, par.1 a 2
Fulfilment schedule:	Continuously
Monitoring:	The progress is monitored by in-depth review of national communications on climate change
Outcomes in Slovakia:	Detailed overview of activities is shown in Annex 3 (Slovak version only)

Systemic level

Climate change issue has become a priority of the Slovak Government. It is reflected in all conceptual documents of affected sectors and strategic objectives. In the Program Declaration the Slovak Government ...has pledged to apply the principles of sustainable development through a developing policy emphasizing balanced economic, social and environmental dimensions. The Slovak Government feels the shared responsibility with EU countries in dealing with global problems of air protection, ozone layer protection and climate change and it will support an increased share of renewable energy resources and control of technologies. The government will participate in the emission trade together with developed countries in order to achieve the commitments under the Kyoto Protocol on the reduction of greenhouse gas emissions...

The overview of strategic documents, programs and action plans that define direct and indirect instruments to promote achieving targets are presented in Annex 1. It can be concluded that the policy framework to formulate the national policy and measures in relation to climate change is definitely in place. The Strategy of SR to achieve commitments under the KP (7) is a complex document defining short-term objectives (up to 2002), medium-term objectives (2003–2008) and long-term key objectives (2008–2020) within the context of the adopted commitments and priorities for capacity strengthening. In contrast with a large number of strategic documents of different sectors, action plans are often missing, or only a few plans have been implemented consistently. Legislation directly supported this area has not been adopted yet. Legal support has been developed only for some specific issues (F-gases, waste). The formulation of the policy and measures is a part of strategies focused directly on the reduction of greenhouse gas emissions, or those supporting this objective indirectly (energy savings, increased energy efficiency, utilization of renewable energy resources, etc.).

Institutional level

MŽP SR is the responsible body for national policy formulation in climate change through the NFP. MŽP SR cooperates with other ministries (economy, agriculture, construction and regional development and transport, posts and telecommunication). Non-governmental organizations, academic institutions and associations participate in the development and approval of cross-cutting documents and conceptions. Coordination and cooperation of the institutions is inadequate. The objectives of the documents are often formulated very generally. Themes, even if they are common for several strategic documents, are not promoted adequately by implementing instruments and capacity (expert, technical and financial). Strategic documents of individual sectors are often independent and isolated. This is also the case for information sources, which influences the efficiency of the process. Isolated imple-

menting capacity within the individual sectors is the main reason that data reported to international institutions are inconsistent.

Individual level

The individual level is represented by qualified experts, but the issue is a priority field only for few of them. The scarcity of personnel (not their qualification or expertise) is the critical point of the NFP. There is not enough capacity in specific training courses on climate change. The participation of experts in international training, seminars, working group meetings is very often the only source of information. Further development of qualifications is more the result of individual initiative than a systemic approach. Improved communication, better exchange of experience and information among experts of affected sectors provide room for capacity mobilisation at the individual level.

3.2.2 Implementation of policy and measures to mitigate greenhouse gas emissions and to enhance removals by sinks

Commitment: Implement policy and measures to mitigate greenhouse gas emissions and to enhance removals by sinks

Reference:	UNFCCC – Article. 4, par.1 c)
Other reference:	UNFCCC-Article. 12, par. 2 a),b)
Fulfilment schedule:	Continuously
Monitoring:	The progress is monitored by in-depth review of national communications on climate change
Outcomes in Slovakia:	Overview of policy and measures published in National Communications SR on climate change (5), (10), (11)
Link to the EU:	Decision 280/2004/EC

Systemic level

The Strategy of the Slovak Republic to Achieve Commitments under the KP (7) is the key strategic document for the implementation of policy and measures to mitigate greenhouse gas emissions. In addition to defining strategic objectives it also presents a review of both direct and indirect measures to reduce greenhouse gas emissions in selected sectors³. Direct legislative support to implement the policy and measures in relation to climate change does not exist. The current trend of the reduction of greenhouse gas emissions has resulted from several changes – i.e. economic changes, changes in the sectors with dominant share in producing the emissions, structural changes in industry, and the impact of environmental legislation⁴ with a positive side effect on the reduction of CO₂ emissions. Using economic instruments is a real possibility to implement direct or indirect reduction

³ Energy production and consumption sectors, transportation, agriculture, forestry, water management, waste management, education and public information accessibility.

⁴ Act No. 478/2002 on air protection against pollutants.

measures. *The Programme of MŽP to promote the implementation of environmental measures* (www.srep.sk) allows the use of funds up to 30% of total investments (maximum 50 000 SKK) also for physical persons if they implement projects with the objective to change the fuels into more energy and environmentally acceptable ones. The Ministry of Economy has introduced a programme “*de minimis*” aiming at energy efficiency enhancement. The transposition of legal regulations related to the accession of Slovakia to the EU is a great incentive for more intensive application of direct and indirect regulatory measures that support the reduction of greenhouse gas emissions. Annex 2 presents an overview of EU Directives that will influence greenhouse gas emissions in IPCC sectors. Successful implementation requires the development of new capacity and the strengthening of current capacity in a relatively short time period.

Institutional level

The main responsibility for the implementation of policy and measures to mitigate climate change lies with the NFP (MŽP SR) and affected sectors. The NFP is responsible also for the evaluation of and reporting on reduction effect of adopted measures and estimated effect of planned measures. Table 3.1 presents an

overview of the institutions, their competences and responsibilities for the implementation of policy and methods to mitigate climate change impacts. Implementing capacity and the efficiency of implemented measures in relevant sectors lag behind the capability to formulate and propose strategies and programmes. There is no common and cross-cutting structure that would deal with strategic objectives comprehensively, coordinate the sector activities and avoid duplication. Another weakness is the absence of a specific information system that would continuously provide information on the actual status of the implementation of measures.

Individual level

At the individual level there is a scarcity of qualified and experienced experts with regard to implementation. Adequate qualification means a combination of technical, legislative, economic and language skills in a continually changing environment. Adequate financial support, that would motivate the development of such skills, is missing. Inadequate experience of officers in preparing and formulating projects have often resulted in the inefficient utilisation of national and international funds⁵ (for example pre-accession funds of EU).

Table 3.1 Implementation of policy and measures to reduce greenhouse gas emissions and to enhance removals by sinks – institutional framework of SR

Institution	Type	Competence and responsibility
Ministry of Environment SR NFP – Air Protection Department	State administration	<ul style="list-style-type: none"> • Formulation of and responsibility for the implementation of policy and measures with respect to climate change • Drafting strategy, objectives and programmes • Proposals for supporting systemic instruments to implement policy and measures – legal and economic measures • Monitoring and evaluation of the implementation of policy and measures – reporting to the UNFCCC Secretariat
Ministry of Environment SR – Section of Environmental Projects Implementation	State administration	<ul style="list-style-type: none"> • Responsibility for and coordination of the use of subsidies from national and international funds to implement environmental projects
Regional Environmental Offices	State administration – regional level	<ul style="list-style-type: none"> • Executing state administration in air protection at the regional level
District Environmental Offices, municipalities	State administration – local level	<ul style="list-style-type: none"> • Executing state administration in air protection at the local level
Ministry of Economy SR	State administration	<ul style="list-style-type: none"> • Formulating and implementing policy and measures to reduce greenhouse gas emissions in energy production and energy consumption • Drafting strategy and objectives • Proposals for supporting systemic instruments to implement policy and measures in energy and industry sectors – legislative and economic measures • Providing subsidies to motivate energy savings, including small and medium entrepreneurship • Developing legislation to introduce new standards and to tighten up current ones and to introduce obligatory labelling of electric appliances • Responsibility for implementing and monitoring measures with respect to energy savings and renewable energy sources utilisation

⁵ For example funds from programmes of EU, UNDP, GEF, UNIDO, etc...

Table 3.1: Continued

Institution	Type	Competence and responsibility
Ministry of Agriculture SR	State administration	<ul style="list-style-type: none"> Formulating and implementing policy and measures with respect to climate change in agriculture and forestry Drafting adaptation measures for climate change Drafting and preparing systemic tools to implement policy and measures Monitoring the implementation of policy and measures
Ministry of Transport, Posts and Telecommunication SR	State administration	<ul style="list-style-type: none"> Formulating and implementing policy and measures to reduce greenhouse gas emissions in transportation Drafting strategy and objectives Drafting and preparing systemic instruments to implement policy and measures – legislative and economic measures Responsibility for implementing and monitoring measures with respect to reducing emissions from transportation
Ministry of Construction and Regional Development SR	State administration	<ul style="list-style-type: none"> Formulating and implementing policy and measures leading up to energy savings in housing – public buildings and households Drafting strategy and objectives Drafting and preparing systemic instruments to implement policy and measures in housing sector – legislative and economic measures Responsibility for the implementation and monitoring of measures with respect to energy savings for buildings and houses
Regulatory Office for Network Industries (URSO)	State administration	<ul style="list-style-type: none"> Price regulation of network distribution sectors Drafting and implementing systemic instruments to eliminate price subsidies of energy carriers for industry and households Drafting and implementing systemic instruments to liberalise electricity market
Steering Committee for the Programme of Renewable Sources Development (representatives of MP, MŽP, MH, MVRR a MDPT SR, ÚRSO and SEA)	Cross-sector committee	<ul style="list-style-type: none"> Monitoring the implementation of the Strategy for the utilisation of renewable energy resources and preparing Progress report on the utilisation of renewable energy sources
Slovak Environmental Agency (SAŽP)	Implementing agency of MŽP	<ul style="list-style-type: none"> Support in the implementation and monitoring of policy and measures in air protection
Slovak Environmental Inspection (SIŽP)	Control body of NŽP	<ul style="list-style-type: none"> Inspection of compliance with legal regulations in air protection and the IPPC regulation
Slovak Energy Agency (SEA) and its regional offices	Implementing agency of MH	<ul style="list-style-type: none"> Coordinating the use of economic programmes of MH SR to support energy savings and utilisation of renewable energy resources Mediating the use of European Fund for Regional Development (Resolution of Slovak Government 678/2002)
Bureau for Metrology and Testing SR	Implementing agency	<ul style="list-style-type: none"> Ensuring the implementation of legal regulations with respect to standards for energy consumption and obligatory labelling of appliances
Self-governing regions (VÚC) Regional Advisory and Information Centres (RPIC) Slovak Chamber of Commerce and Industry (SOPK) Slovak Investment and Trade Development Agency (SARIO) and National Agency for Development of Small and Medium Entrepreneurship (NARMSP)	Regional self-government, professional associations implementing agencies	<ul style="list-style-type: none"> Partnership with SEA in promotion, information dissemination and technical assistance to prepare projects and applications for EU Structural Funds
PROFING, s.r.o., SCCP, s.r.o.	Consulting companies	<ul style="list-style-type: none"> Independent evaluation and verifications of projects with respect to using flexible mechanisms of the KP
LVÚ Zvolen, VÚPOP Bratislava, Lesoprojekt Zvolen	Research institutes	<ul style="list-style-type: none"> Project implementation
Non-governmental organisations and civic associations	National, regional and local levels	<ul style="list-style-type: none"> Activities with respect to environmental programmes and measures supporting the activities of official institutions (e.g. ECB in energy savings a renewable energy resources utilisation)

3.2.3 Implementation of measures to support energy efficiency in relevant sectors

Commitment: Implement measures to support energy efficiency in relevant sectors of the national economy

Reference:	KP – Article 2, a) i)
Other reference:	UNFCCC – Article 4, par.1 c)
Fulfilment schedule:	Continuously
Monitoring:	The progress is monitored by in-depth review of national communications on climate change
Outcomes in SR:	NSS for SR (12), Energy Efficiency Action Plan 2002-2020 (13)
Links to EU:	Directive 2004/8/EC Directive 2002/91/EC Directive 92/75/EC

Energy is a dominant sector representing 80% of total GHG emissions in Slovakia. Therefore it has been identified in the Strategy of SR to achieve commitments under the KP (7) as the key sector for the implementation of an effective policy and measures to mitigate GHG emissions.

The document (7) presents following measures for the energy production:

- enhancement of energy efficiency of electricity production;
- support of more effective technologies;
- increased share of electricity from renewable energy resources;
- increased share of combined production of heat and electricity.

Savings and better utilisation of energy on a demand side can be achieved by (7):

- eliminating subsidies for energy and motivating savings (including small and medium entrepreneurship);
- public access to information on saving energy;
- mandatory energy audits;
- implementing more stringent standards and obligatory labelling of electrical appliances.

Support of energy efficiency in energy production

The objective to enhance energy efficiency has been declared in the Energy Policy of Slovakia (14). In May 2002 a National Study on Energy Efficiency (12) was developed within an international project of NSS World Bank, supported by the Ministry of Economy SR. The study also includes an Action Plan on Energy Efficiency for 2002-2012 (13). Based on a Study, sectors of the population, industry and transport have been identified as the key fields for the implementation of an active policy of energy efficiency in Slovakia. Relevant legislation, (there was a long time prepared a proposal of the Act on energy efficiency/energy management) has not been adopted. The increased share of cogeneration of heat and power should have been covered

by the draft act on heat management. Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market represents the link to relevant EU legislation. With regard to renewable energy sources, it is Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market. Objectives that should be met by implementing the directives are described in detail in Annex 2.

Support of energy efficiency and energy savings in energy consumption

Elimination of subsidized energy prices and energy price distortion

The objective to phase out gradually subsidies, including cross-subsidies, has been defined in the Energy Policy of the Slovak Republic (14). The policy presents, *inter alia*, the Calendar of the modification of regulated prices, including energy (electricity, gas, heat for industry and households) up to 2002. The document has also stipulated the role and basic competences of the Regulatory Office for Network Industries (URSO), established in 2001. Act No. 267/2001 on Regulation in Power Distribution Sectors is the legal framework for the elimination of subsidized energy prices and price distortion. The cross-subsidies for electricity power were stopped by the decisions of URSO adopted in 2003. The transitional period ended on January 1, 2004 and since the date all subsidies for households and industry have been cancelled.

Motivation of energy savings, including small and medium entrepreneurship

The support of energy savings has been declared as an objective of the Energy Policy of the Slovak Republic (14). The Ministry of Economy SR is responsible for policy implementation. No direct legislation to motivate energy savings is in place, in spite of the long term effort and preparation. Key EU legal standards to motivate energy savings in energy consumption are Directive 2002/91/EC on the energy performance of buildings and draft Directive on energy end-use efficiency and energy services. The directive will cover the support and availability of energy audits also for small consumers.

Box 3.1 (15)

There are several reasons to prepare the draft directive. The main reason is a need to improve the functionality of energy market and to remove barriers of more effective allocation of both economic and natural resources. Noticeable motivation relates with the fact that non-realised potential of energy savings, due to market barriers, is estimated to be 17% of total consumption in industry, 22% in tertiary sphere and 14% in transport. However, it is estimated that 1% of energy saving annually represents almost a half of the EU commitment under the Kyoto Protocol.

Funds from the programme of the Ministry of Economy (*de minimis*) “Scheme to support energy savings and renewable resources utilisation DM-003/03” can be used as an economic instrument. The budget is 30 mil. SKK per year⁶ (16). The programme was launched on January 1, 2003, and it is expected to be finished in 2006⁷. Another important source of information for decision making with respect to energy efficiency is the „Database of energy indicators ODYSSEE”, which has been managed by the International Energy Agency (IEA) since 1995. Slovakia has been an active partner since 2003 (17). Outcomes from an international research project ISED (18), coordinated by IAEA in cooperation with IEA, UNECE and CSE are also valuable information sources. Main objectives of the project are formulating a complex set of indicators of sustainable energy development and preparing consistent series of relevant indicators for individual countries.

At the individual level only limited financial means are available from the state budget for training courses and education of officers of the Ministry of Economy. The sources are used in accordance with actual needs; currently it is mainly the transposition of EU standards into national legislation.

Mandatory energy audits

No strategic document supporting energy audits is available. A provision on mandatory regular energy audit for large energy consumers was proposed in the draft act on energy savings (11). The act has not been adopted and hence no direct legislation supporting mandatory energy audits has been introduced. There is no institutional framework for energy audits, however they are done voluntarily and relatively rarely. The audits are compulsory, for example, when the application for the “*de minimis*” fund is submitted. The SEA is authorised to provide training for energy auditors⁸.

No institution with specific mandate and competence to carry out energy audits has been established. The SEA, besides training activities, carries out the energy audits. The State Energy Inspection (ŠEI) provides only energy counselling, as the obligatory activity (in relation to EU processes), but only within the extent of the Energy Act. Energy efficiency is not covered. In addition to the SEA staff, also certified energy auditors are involved in the process⁹.

Implementation of new standards and strengthening current ones and compulsory labelling of appliances
Legislative activities of Slovakia in strengthening current standards and compulsory labelling of domestic appliances, implemented without any strategic support, can be evaluated very positively. Government regulations, entering into force on May 1, 2002, have introduced compulsory energy labelling of household appliances in strict conformity with EU regulations. The Directive 92/75/EEC on energy labelling and its implementing directives, i.e. Directive 2002/31/EC for household air-conditioners, Directive 2002/40/EC for household electric ovens and Directive 2003/66/EC, which amends the Directive 94/2/EEC for refrigerators, freezers and their combinations have been transposed. The Slovak Office for Standards, Metrology and Testing is responsible for the implementation of legal regulations with respect to energy consumption and compulsory labelling of appliances.

3.2.4 Promotion, research, development and enhanced utilisation of new and renewable energy sources

Commitment: Promote research, development and enhanced utilisation of new and renewable energies

Reference:	KP – Article 2, par. 1, a) iv)
Other reference:	UNFCCC – Article 4, par.1 c)
Fulfilment schedule:	Continuously
Monitoring:	The progress is monitored by in-depth review of national communications on climate change
Outcomes in Slovakia:	Strategy for renewable energy utilisation (19) NSS for SR (12), Renewable Energy Action Plan 2002- 2020 (20)
Links to EU:	Directive 2001/77/EC Directive 2003/30/EC

Systemic level

Utilisation of renewable energy sources will have a positive impact on the Slovak economy¹⁰. Results of the process are expected as follows: enhanced utilisation of domestic energy sources, reduced dependence on imported energy, enhanced foreign trade balance¹¹,

⁶ MH SR – Project NCSA Interview, July 2004.

⁷ A campaign on preparing and submitting projects for the European Regional Development Fund (the EU Structural Funds) has just started. Only limited financial sources are currently available from the State Budget and the EU Structural Funds. Information can be found on www.economy.gov.sk and SEA web page www.sea.gov.sk.

⁸ First trainers for the trainings of Slovak energy auditors were trained within the PHARE Programme directly in EU countries: PHARE/1991/B1 – buildings and heating systems (France and Denmark); PHARE/1991/B2 – industry (Germany). A training course for energy auditors, organised in Slovakia but in the EU format, was also funded from PHARE budget.

⁹ In 2003, the SEA trained 18 energy auditors.

¹⁰ Biomass has the largest potential for the utilisation in Slovakia (44% of all renewable energy sources), followed by large hydro power stations (17,5%), geothermal energy (16,6%), solar energy (13,7%), waste management (9,3%), bio- fuels (6,6%), small hydro power stations (2,7%) and wind energy (1,6%).

¹¹ Primary energy sources represent almost 20% of total import.

enhanced safety and reliability of energy supplies, reduced GHG emissions and enhanced economic activities with respect to new production programmes and new jobs. The right location of renewable energy sources can become the key element of regional development and can contribute to better social and economic cohesion in the country (19).

The political framework for the development of activities related to renewable energy sources in Slovakia is positive, the support for research and utilisation is directly referred to in the Program Declaration of the Slovak Government and it is in compliance with priorities of the Slovak Energy Policy (14). The Conception of renewable energy sources utilisation in Slovakia (19) approved by the Slovak Government in February 2002 is the key strategic document. The Slovak Government considers the participation of the country in a communitarian programme "Intelligent Energy for Europe" very important. The programme provides economic and technological promotion of renewable energy sources at all levels, including capacity development. The Report on the progress in renewable energy sources development, prepared by the Steering Committee of the Programme for control of renewable energy sources development (approved by Slovak Government in June 2004), establishes that the indicative objective of EU – to cover 30% of electricity by renewable energy resources – is not feasible for Slovakia due to high costs. Stabilised 19% share of energy production covered by renewable energy sources was adopted as the realistic indicative objective. The Action plan for renewable energy sources for 2002-2012 (20) developed within the NSS Study on energy efficiency (12) has not been transformed (to the implementing tools). There is no direct legislative support for this area. Act No. 267/2001 on the regulation of energy distribution in its current wording stipulates only the obligation for regional distributing companies to buy electricity from renewable sources and the maximum purchasing price. The amendment should stipulate the minimum price. Legislative activities are currently focused on the implementation of EU directives, i.e. Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market and Directive 2003/30/EC on the promotion of bio-fuels and renewable fuels for transport. Direct economic instruments are available from the state budget (*de minimis*) and from the EU structural funds¹².

The research and development of renewable sources does not belong to the priority promotion at the systemic and institutional levels. Partial research projects, both national and international, are run in scientific and research institutes, universities and specific institutions. However, the comprehensive strategy, available funds and coordination across the country is not in place.

Institutional level

There is no specific institution with exclusive competence in this regard. Institutions and their competences are identical with the institutions in the field of energy efficiency. The Slovak Government proposed to establish a monitoring and evaluating system of national, bilateral and multilateral programs on renewable sources (MH, MŽP, Deputy Prime Minister). Activities of the Energy Centre Bratislava are important with regards to information sources (www.ecbratislava.sk)¹³. The Ministry of Education SR is the central body with cross-sector competencies in research and development. It is also a guarantor of state research and development programs, as well as the national coordinator of relevant EU programs. Due to the scarcity of national funds, research institutions often use the possibility to participate in international research activities, e.g. the 6th Framework Programme. Current situation, relevant fields and institutions in the context of research and development of renewable energy sources are described in Annex 4.

3.2.5 Reduction and phasing out of market imperfections and fiscal instruments counteracting the UNFCCC objectives

Commitment: Reduce or eliminate market imperfections, fiscal instruments, tax exemptions and subsidies counteracting the UNFCCC objectives

Reference:	KP – Article 2, par. 1, a), v)
Other reference:	UNFCCC – Article 4, par.1 c)
Fulfilment schedule:	Continuously
Monitoring:	The progress is monitored by in-depth review of national communications on climate change
Outcomes in Slovakia:	Calendar for the adjustment of regulated prices (14) and Electricity market liberalization
Links to EU:	Directive 2003/54/EC Directive 2003/55/EC

Political support for the liberalization of the market in electricity, gas and heat, as well as the elimination of all kinds of subsidies and tax relief running counter to free competition, was clearly declared in the Energy Policy of Slovakia (14). In addition to the Calendar for the adjustment of prices of appliances in industry and households, this document also provides the estimated range and time schedule for gradual liberalization of the market in electricity. As the Regulatory office and legislative support were established, there has been a liberalised internal market for the consumers of electricity over 100 GWh electricity since January 1, 2002, for the consumers over 40 GWh since Janu-

¹² Small and medium enterprises are the beneficiary of the support in the form of revolving funds, interest free loans, or irrecoverable aid to cover partially the loan or loan interests. Official information can be found at www.economy.gov.sk and www.sea.gov.sk.

¹³ ECB has prepared and distributes Atlas of renewable energy sources utilization in Slovakia, presenting complete information on individual sources including photo documentation. The ECB organises seminars, conferences, particularly focused on biomass issues. International Slovak Biomass Forum (organised for the fourth time in 2004) is the most important.

ary 1, 2003 and for the consumers over 20 GWh since January 1, 2004. The liberalization will continue with the implementation of relevant EU Directives (Directive 2003/54/EC concerning common rules for the internal market in electricity and Directive 2003/55/EC concerning common rules for the internal market in natural gas). Total liberalization to the level of households will result from the process and it could bring incentives also for the use of renewable energy sources.

3.2.6 Implementation of flexible mechanisms of the Kyoto Protocol

Commitment: Implement flexible mechanisms of KP to meet UNFCCC objectives

Reference:	KP – Articles 6, 12, and 17
Other reference:	COP – 2/CP.3, 10/CP.3, 6/CP.4, 13/CP.5, 14/CP.5, 1/CP.6, 16/CP.7, 7/CP.7, 18/CP.7, 18/CP.9
Fulfilment schedule:	Continuously
Outcomes in Slovakia:	The Strategy of SR to achieve the commitments under the KP (7), Procedure for submitting projects of joint implementation (21), Principles of trading implementation (22)
Links to EU:	Directive 2003/87/EC Decision 156/2004/EC

The Kyoto Protocol has extended the opportunities for countries to choose the most appropriate ways and instruments to achieve reduction commitments, taking into account the specific conditions of the countries through so called flexible mechanisms. Achieving the maximum reduction potential in the best economic way is the common feature of the new opportunities. Slovakia has actively joined the process since the beginning, in the phase of the Activities Implemented Jointly (AIJ). This phase allowed for the testing of modalities and rules for CDM and JI, without counting in already achieved emission reduction into the balance of the investing country. Based on the strategy resulting from the realistic evaluation of the country and the method of building practices for the system Cap & Trade through SO₂ quotas for pollution sources¹⁴ Slovakia has been involved in a use of flexible mechanisms without any exceptional demands on capacities. The process has resulted in 4 AIJ projects, 7 ongoing projects JI (23) and the first trade of GHG emissions in December 2002 (Box 3.2).

Systemic level

The first study for decision making with respect to the utilisation of flexible mechanisms of the KP was

Box 3.2

New York, NY (December 06, 2002) – The first trade of greenhouse gas emissions allowances under the compliance regime of the Kyoto Protocol was executed by the Slovak Republic and a major Japanese trading house. The trade of assigned amount units (AAUs) is the first to use the “International Emissions Trading” mechanism defined by the Kyoto Protocol. The buyer can use the allowances to comply with greenhouse gas emission reduction obligations under the Kyoto Protocol. The seller will use the proceeds to finance domestic emission reduction projects.

The Ministry of Environment of Slovakia, which is the authorized body of the Slovak government for Climate Change issues, has guaranteed to transfer AAUs out of their 2008-2012 greenhouse gas budget to the Japanese buyer. The total transaction size is 200,000 AAUs. Countries that are party to the Kyoto Protocol receive a five-year allocation of AAUs, each AAU reflecting the right to emit one metric ton of CO₂ equivalent. The AAUs will be transferred from the Slovak national registry to the buyer through Menert s.r.o., a Slovak engineering company. New York-based Evolution Markets LLC acted as exclusive broker for the transaction.

prepared in 1998 in the World Bank Project *National Strategy Studies*, funded by the Swiss and Slovak governments. The study contained the analysis of supply and demand with respect to the international trade of CO₂ emissions, the proposal for the national institutional set up, draft projects suitable for the KP flexible mechanisms, the complex methodology for evaluation, including risk analysis and potential social and economic analysis, and the first database of potential JI projects. Slovakia joined the process also in the phase of AIJ with projects funded by Norway and the Netherlands. In the Strategy (7), the trade of GHG emissions at the level of the company or at governmental level was declared as the country priority in the utilisation of flexibility mechanisms. In the project course the legislation was adopted to support the trade of GHG emission allowances (at the beginning only for CO₂)¹⁵. Joint implementation of the commitments (JI) will be used only marginally due to complicated administration and relatively high costs. Basic information sources are the web page of the Ministry of Environment. In addition to the document *Rules for the trade of greenhouse gas emissions* (22) also Slovak and English versions of the *Procedure on submitting the JI projects and criteria for their evaluation* (21) are available. The formal procedure has not been up-dated with respect to the organizational changes of the Ministry (e.g. the change of the

¹⁴ Act No. 478/2002 on air protection.

¹⁵ Act No.572/2004 on trade of emission allowances. The act stipulates trade conditions for emission allowances in Slovakia, EU and the countries of Annex B to the KP. In addition to terms and definitions, competences and trade participants, it also identifies basic technical standards for a national register.

organizational unit). This can cause problems with the identification of the “starting point”. The first phase of the process was implemented with substantial support of foreign funds within the either bilateral or multilateral aid. National funds contributed only insignificantly. The same situation occurred also in relation to information sources. The availability of information for Slovak experts was improved significantly thanks to the cooperation with international projects.

Institutional level

The Department of Environmental Projects Programming of the MŽP SR is the responsible body for the selection and approval of JI projects. The NFP for climate change and relevant ministries (of economy, transports and agriculture) act as consultants in the evaluation of the projects, depending on the project type. In addition to the state administration consulting companies and experts play an active role in the process. External experts verify and monitor independently the projects (SCCP, Bratislava) or prepare evaluating studies and technical ground documents for the decision makers according to UNFCCC methodology (PROFING). Coordination and cooperation among of the institutions is good also due to the small number of projects. The process is more dynamic due to the recent signature of the KP by the Russian Federation that finalizes the conditions for the validity of the KP and for Slovakia due to the accession to the EU. The activities within the Kyoto flexible mechanisms will continue in close connection to the EU scheme on trading. The current capacity (i.e. financial, human, material and information sources) must be significantly strengthened due to new obligations¹⁶ and must be completed at all three levels. Setting up an independent institution with clearly defined competences could be a solution.

Individual level

The process is inadequately institutionalised with few working positions, however, good results are achieved thanks to the initiative of individuals and international cooperation (AIJ, JI, projects and studies). Comparing the situation with other countries, the introduction of SO₂ emission allowances at the district level and individual source level with the trading possibilities, is an advantage. Even if the trade volume is not large (tens of trades because of the limited market), it can be a useful step forward in general implementation of the Cap & Trade principles at the individual level. Special training courses on the utilisation of the KP flexible mechanisms for experts and/or managers have not been organised in Slovakia. The participation in international cooperation is an important information basis at the individual level. The use of information sources by the operators has become more intensive in the connection with the preparation scheme¹⁷.

3.2.7 Implementation of a policy and measures to enhance the sinks and the implementation of projects in the sectors of forestry and land use

Commitment: Promote the application of technologies and processes to reduce emissions and to keep and enhance the number of sinks and reservoirs and to prepare for the adaptation to the impacts of climate change

Reference:	UNFCCC – Article 4 par. 1. c) d) e)
Other reference:	KP – Article. 3, par.3 a 4
Fulfilment schedule:	Continuously
Monitoring :	Within the inventory of greenhouse gas emissions
Outcomes in Slovakia:	Project CATAPULT is running (Carbon sink enhancement on afforestation of non-forested lands focused on private owners of forests) from the EU funds

The negative potential of emissions, that results from the fulfilment of commitments under UNFCCC for this area (emission removal by sinks) can be used to achieve the adopted reduction objective according to Article 3 of the KP. The article promotes the implementation of projects in forestry and land use in order to enhance CO₂ sinks according to the methodologies “Good Practice Guidance for Land Use, Land-Use Change and Forestry” (IPCC 2003). These procedures were worked out by the Ministry of Agriculture. Outputs are in the report “The use of specified methodological procedures to balance and evaluate forestry projects in achieving the commitments under the Kyoto Protocol” (LVÚ Zvolen 2003). A pilot project, currently implemented in Slovakia, on carbon sink enhancement on afforestation of non-forested lands focused on private owners of forests (CAPAPULT project funded by the EC). The system of project implementation is under development. The current institutional framework (LVÚ Zvolen, VUPOP Bratislava and Lesoprojekt Zvolen) is adequate to implement such projects. The problems are at the individual level, due to a scarcity of experts, who are capable to evaluate and implement these projects.

3.2.8 Limitation and/or reduction of methane emissions through recovery and use in waste management

Commitment: Introduce measures reducing methane emissions through recovery and use in waste management, as well as in the production and distribution of energy

Reference:	KP – Article 2 par.1 a), viii);
Other reference:	UNFCCC – Article. 4, par.1 c)

¹⁶ E.g. setting up and operating a national register, registration, monitoring, verification and validation, reporting.

¹⁷ Large number of companies, that participated in the seminar „EU GHG Trading Directive” organised by CCAP and EC in June 2003 in Bratislava, can be used as an example.

Fulfilment schedule:	Continuously
Monitoring :	Within the inventory of GHG emissions
Outcomes in Slovakia:	Waste Management Programme of SR until 2005 (26)
Links to EU:	Directive 1999/31/EC

Systemic level

The political framework to fulfil the obligation is positive. The support is outlined directly in the Programme declaration of the Slovak Government ..*"The Government shall enforce the Waste management programme of SR; environmentally sound material recovery of waste and the development of separate collection and recycling will be the environmental priorities...* The main instruments of the Strategy (7) to achieve commitments in waste management are the following:

- reduction of waste volumes (in particular the waste disposed at landfills);
- promotion low emission and energy saving technologies;
- promotion of biodegradable waste recovery.

The precondition for economically effective utilisation of methane is the capacity of a landfill that must be over 100 000 tons. Only a few landfills in Slovakia have the capacity of about 80000 tons but the landfill gas has not been utilised. Strategic objectives are defined in the Waste Management Programme of SR until 2005 (26). Similarly to other areas, it can be concluded that current implementing capacity in waste management (including financial sources) is not adequate with regard to the objectives. The legal framework for waste management is in place. Key regulations are Act No. 223/2001 on wastes as amended by later regulations and the Regulation No. 128/2004. The Recycling Fund, a non-state fund established by the Waste Act in order to collect money and support waste recycling, is an important economic instrument. There are two ways of allocating money: either through funding projects on waste recycling (non-obligatory) or through subsidies to municipalities (obligatory) to cover 95% of the costs concerning separate collection and recovery of municipal waste. The EU legal regulations are implemented by Directive 1999/31/EC on the landfill of waste, which stipulates the obligations to monitor landfill gas¹⁸. Relevant provisions of the directive have been transposed into Slovak legislation, in particular into the Regulation of the MŽP SR No. 283/2001 as amended by later regulations. To meet all obligations of the landfill directive a transitional period up to 31 December 2008 was accepted.

Institutional level

The MŽP SR is the responsible institution with legislative, organizational and economic competencies. The Ministry executes the state administration through regional and district environmental offices. The Slovak Environmental Agency is also involved in waste management activities, in particular the Waste and Environmental Management Centre in Bratislava. The Centre operates the Regional Waste Information System (RISO), the information system on packaging and cooperates in preparing and updating the Waste Management Programme of the SR. Another Centre of the Slovak Environmental Agency – the Centre of Environment and informatics in Banská Bystrica is also active in this issue. The SEA is the beneficiary for the PHARE Twinning project: *"Implementation of the Integrated Pollution Prevention and Control Directive"*. The Greek Ministry of Foreign Affairs is the Twinning partner and National Technical University of Athens is the expert organization.

Currently some other international projects¹⁹ are running. Participation of Slovak experts in the international projects is evaluated very positively, as the projects are not only financial sources, but also very valuable and useful sources of information, for example in the field of new technologies for the recovery of biodegradable wastes.

3.2.9 Planning and implementation of measures to mitigate expected impacts of climate change, including social and economical impacts

Commitment: Apply suitable methods in order to minimise adverse impacts of projects and measures adopted to mitigate the impacts of climate change on economy, human health and the quality of environment.

Reference:	UNFCCC – Article. 4, par. 1 e), f)
Fulfilment schedule:	Continuously
Monitoring :	Within the control of national communications on climate change
Outcomes in Slovakia:	Adaptation of agriculture to climate change (27), (28)

Systemic level

This area is covered by the Ministry of Agriculture and the Ministry of Environment, i.e. the sectors directly influenced by climate change. Agriculture, soil and forestry management are the areas over sighted by the MP SR and water management is supervised by the MŽP SR. A cross-sector study entitled *"Adaptation of*

¹⁸ According to the Directive appropriate measures shall be taken in order to control the accumulation and migration of landfill gas. Landfill gas shall be collected from all landfills receiving biodegradable waste and the landfill gas must be treated and used. If the gas collected cannot be used to produce energy, it must be flared. The collection, treatment and use of landfill gas shall be carried on in a manner which minimises damage to or deterioration of the environment and risk to human health.

¹⁹ Currently there two projects at the MŽP SR: PHARE Light Twinning project „Optimisation of Handling with Biodegradable Waste” in partnership with Italy and „ MATRA project on Packaging and Packaging Waste in Slovakia” in partnership with the Netherlands.

Agriculture to Climate Change” (27) was completed in 2000. The document was discussed and approved by the Slovak Government. The political framework for the evaluation of agricultural policy in relation to the impacts of climate change in the above mentioned fields is only partially positive. The issue was implemented indirectly also in the “*Middle-term agricultural policy for 2004-2006*”, approved by the Slovak Government (Resolution No. 1090/2003). No activities of the Ministry of Health SR have been implemented. The legal framework for planning and implementation of adapting and mitigating measures is not adequate. The implementation of the measures is relatively satisfactory, but it is the result of legislation with similar objectives.

Institutional level

Two institutions of the MP SR have been assigned to coordinate the activities: “Hydromeliorácie”, a state enterprise in Bratislava for agriculture and the Forest Research Institute (Lesnícky výskumný ústav) in Zvolen for forestry. Pursuant to the Declaration of the MP SR No. 7997/2000-300/b the Forest Research Institute in Zvolen is authorised to coordinate activities in relation to climate change. Other research, academic and non-governmental institutions also participate in the preparation of conceptual documents concerning climate change. Mutual coordination and cooperation of agricultural, forest and water institutions is relatively good. Activities of the National Climate Programme of SR and the project U.S. Country Studies (33) also contributed to the positive results. However, better coordination of the activities by the central body of state administration and better cooperation between the MP SR and MŽP SR are still missing. Setting up a cross-sector steering committee (or a board) with clearly defined competences could be a solution. At the institutional level there is a noticeable lack of capacity to evaluate social and economic impacts of climate change and to quantify environmental externalities. Institutes of the Slovak Academy of Science (prognostic and economic institutes) have developed several socio-economic studies. However, these studies do not address the coherence between socio-economic aspects and climate change.

Individual level

At the individual level the capacity is represented in particular by experts from scientific and academic institutions. The issue is a priority only for some of them. Experts at the level of medial management (state administration and self-governments), ministries, planning and designing institutions are almost missing. No specific training courses are available, the experts acquire knowledge mainly from international seminars, conferences, meetings.

3.2.10 Inventory of anthropogenic emissions of greenhouse gases, including uncertainties

Commitment: Develop, periodically update and publish national inventories of anthropogenic emissions of greenhouse gases

Reference:	UNFCCC – Article. 4, par.1 a)
Other reference:	UNFCCC – Art. 12, par.1 a); KP – Art. 5, par. 1,2 a 3, Art. 7, par. 1; COP – 3/CP.1, 9/CP.2, 3/CP.3, 11/CP.4, 3/CP.5, 3/CP.7, 11/CP.7, 18/CP.7, 19/CP.7, 20/CP.7, 21/CP.7, 18/CP.8;
Fulfilment schedule:	Annually before April 15, to the baseline year of 1990
Monitoring:	Desk review and In-depth review
Outcomes in Slovakia:	National emission inventories since 1995, in CRF format since 2000, NIR reports
Links to EU:	Decision 280/2004/EC

Systemic level

Inventories of GHG emissions for the Secretariat of UNFCCC have been carried out since 1995 and since 2000 they are submitted in the Common Reporting Format (CRF). NFP (MŽP) – the legal and expert guarantor for emission inventories, submits the complete inventory to the Secretariat UNFCCC every year prior to April 15. After an in-depth review, the report – Slovakia Centralized Review²⁰ is released. This stocktaking also contains the National inventory report (NIR), which has been in preparation since 2003. The NIR is released always by June 15.

The GHG emissions have not been charged as there were no emission quotas (ceilings) and no systematic monitoring. Act No. 478/2002 on air protection stipulates the obligation for polluting sources to report data also on GHG, including CO₂. The obligations were significantly expanded when Slovakia joined the EU. This situation requires the strengthening of the capacities for monitoring and reporting. The inventory of GHG emissions is carried out by standard methodologies²¹. The emission factors comply with the methodologies²². The emission balances are performed for seven main sectors (listed in Annex A of the KP) and they are divided into sub-categories:

- Energy (fuel combustion, transport, fugitive emissions) ;
- Industrial processes (technologies, F-gases);
- Solvents and solvent use;
- Agriculture;
- Changes in land and forest use;
- Waste;
- Other.

²⁰ <http://unfccc.int/program/mis/ghg/indrev2003.html>.

²¹ IPCC (revised in 1996 and 2000), CORINAIR (revised in 2003), COPERT III (revised in 2002), national methodologies (for example wastes, NEIS), other methodologies and combinations.

²² IPCC default, national, specific and other factors transposed from literature.

The inventory process has not been certified (for example according to ISO 9001) and the quality system (QA/QC) has not been implemented.

The quality system according to IPCC requires:

- transparency (is kept, NIR);
- consistency (good, re-calculations since 1990 in case of change);
- comparability (default EF according to IPCC, in case of absence EF comparison with the Czech Republic);
- completeness (expert estimation about 95%), accuracy (not yet sufficiently assessed)
- use of good practice (according to the Good Practice Guidance, 2000).

The uncertainties of emission factors are not assessed consistently and usually expert estimates are used. Needs for capacity strengthening (human, financial and material sources) are closely related with demands for capacity development with regard to the completion of the inventory system NIS. The MŽP SR provides funds and the Slovak Hydrometeorological Institute (SHMU) also contributes with its own resources. The obligation of COP-20/CP.7 on setting up and operating an e-mail address and a web page for the national unit for emission inventories has not been met yet and the inventories are not released²³.

Institutional level

SHMU is the organization authorised by MŽP SR for the air quality and at the same time also the chief coordinator of the activities related to the annual inven-

tory of air emissions, including GHG emissions. Within the organizational structure of the SHMU, the Department of Air Quality performs all the activities. A detailed review of the institutions, including external experts, and their competencies for IPCC sectors are presented in Table 3.2. As all the activities, in relation to inventories, emission projections and national communications of climate change in Slovakia are performed by almost identical institutions, the table presents summary information about all three areas. In Slovakia the emissions of the sector “Others” are not assessed. Although a relatively high number of institutions and experts are involved, the process of GHG inventory is not adequately institutionalised. More exact specification of mandates for both national and international obligations would contribute to more effective performance. Annual inventories are based on the input data provided by the Slovak Statistical Office and the operators of air pollution sources through NEIS. It is difficult to meet the deadline for releasing official statistic data. Since Slovakia has joined the EU, the deadline for submitting emission inventories has been shifted forward to January 15. Based upon existing experience with the collection of energy data, the deadline cannot be met. Another urgent problem is the scope and form of statistic data to be provided in a way that allows as correct as possible balancing of all IPCC categories.

Individual level

Capacity at the individual level can significantly influence the country capability to meet obligations with

Table 3.2 Inventory and projections of GHG emissions, preparation of national communications, action plans and evaluation of policy effects and measures – institutional framework

Institution – name	Type of organisation	Competences and responsibilities
Ministry of Environment NFP – Air Protection Department	State administration	<ul style="list-style-type: none"> • Legislative guarantor the preparation and publication of inventory and projections of GHG emissions and national communications on climate change in compliance with the IPCC methodology and UNFCCC recommendations and COP decisions • Responsibility for preparing action plans to mitigate GHG emissions • Responsibility for regular submitting inventory reports and national communications on climate change to the Secretariat of UNFCCC in compliance with the convention and COP decisions • Responsibility for desk review and in-depth review of emission inventory and NS by the Secretariat of UNFCCC
Slovak Statistical Office	State administration	<ul style="list-style-type: none"> • Collection and publication of official statistic data used for inventory and projections of GHG emissions and national communications on climate change
Customs Directorate of the Slovak Republic	State administration	<ul style="list-style-type: none"> • Collection and providing data on import and export of fossil fuels for emission inventory in energy sector
Ministry of Economy, Ministry of Agriculture, Ministry of Trans- port, Posts and Telecommunica- tion, Ministry of Construction and Regional Development	State administration	<ul style="list-style-type: none"> • Providing documents and data for inventory and projections of greenhouse gas emissions and national communications on climate change

²³ Only similar web pages are available at the Department of Meteorology and Climatologic Faculty of Mathematics and Physics of Comenius University, the SHMU and the MŽP SR, where basic data and reports on climate change can be found.

Table 3.2 Continued

Institution – name	Type of organisation	Competences and responsibilities
Slovak Hydrometeorological Institute (SHMÚ)	State budgetary institution	<ul style="list-style-type: none"> • Authorised institution to perform annual inventories of air emissions, including GHG emissions • Preparing the inventory of GHG emissions for IPCC sectors in cooperation with external experts • Responsible jointly with the NFP for improving the quality of the inventory in compliance with UNFCCC recommendations and COP decisions • Completing inventories in CRF format • Determining emissions from combusting processes by the bottom-up method, i.e. from an operator to a sector • Preparing annual national inventory reports (NIR) • Responsible for active communication with the Secretariat of UN FCCC with regard to annual reviews • Preparing the projections of GHG emissions in waste management and the projections of fugitive emissions of CH₄ in cooperation with external experts • Coordinating and contributing to national communications on climate change
Air Quality Department (OKO)	Department of SHMÚ	<ul style="list-style-type: none"> • Ensuring all activities in relation with air quality – monitoring, measuring, evaluating and reporting air emission data in Slovakia • Operating the National Emission Information system (NEIS) functioning for the registration of emissions from operators of stationary sources of air pollution • Providing annual data on GHG emissions to the EEA through the national internet system CIRCA (Communication and Information Resource Centre Administrator)
Slovak Environmental Agency (SAŽP) Banská Bystrica	Implementing agency of MŽP	<ul style="list-style-type: none"> • NFP for the cooperation of Slovakia with EEA • Administering national internet system CIRCA
PROFING, Bratislava	Consulting company	<ul style="list-style-type: none"> • Cooperating in the inventory of emissions, including fugitive emissions in the IPCC energy sector • Projections of emissions in IPCC energy sector and total aggregated GHG emissions • Coordination and cooperation in the preparation of national communications on climate change • Preparing the action plan for CO₂ reduction in energy
EFRA Zvolen Forestry Research Institute Zvolen	Research	<ul style="list-style-type: none"> • Inventory and projections of GHG emissions in agriculture, forestry and landscape use • Sector documentation for national communications from agriculture and forestry
Engineering Faculty of STU Bratislava SZ CHKT Rovinka	University Professional association	<ul style="list-style-type: none"> • Inventory and projections of F-gas emissions • Documentation for national communications
SPU Nitra	University	<ul style="list-style-type: none"> • Inventory and projections of GHG emissions in agriculture • Documentation for national communications
Žilinský vzdelávací servis, Žilina Research Transportation Institute Žilina	Consulting company Research	<ul style="list-style-type: none"> • Inventory and projections of GHG emissions from transportation • Documentation for national communications
Faculty of Chemical technologies STU Bratislava	University	<ul style="list-style-type: none"> • Inventory of GHG emissions from industrial processes • Documentation for national communications
Detox, Banská Bystrica Eco-Team Slovakia, Pezinok	Consulting companies	<ul style="list-style-type: none"> • Inventory of GHG emissions from solvents
Ekotoxikologické centrum, Ivanka pri Dunaji	Consulting company	<ul style="list-style-type: none"> • Inventory of GHG emissions from waste management
SPIRIT Bratislava	Consulting company	<ul style="list-style-type: none"> • Development and maintenance of the database system NEIS
Department of meteorology and climatology MFFUK Bratislava	University	<ul style="list-style-type: none"> • Collecting and preparing documents for the evaluation of expected impacts of climate change and estimating the vulnerability for national communications on climate change
Department of bio-meteorology and hydrology FZKI Bratislava	University	<ul style="list-style-type: none"> • Collecting and preparing documents for the evaluation of the vulnerability and proposals for adaptation measures for national communication on climate change
Water Research Institute, Department of water and landscape of StF STU Bratislava Research Institute for Amelioration and Landscape Engineering Institute of Hydrology of the SAV Forest Faculty of TU-UTVS Zvolen	Universities and research institutes	<ul style="list-style-type: none"> • Collecting and preparing documents for national communications on climate change

respect to preparing, regular updating and publishing national inventories of GHG emissions. The quality of current outputs and their acceptability within the international review is the result of the high qualifications and initiative of individual experts. Obviously, the gaps in the systemic and institutional support are very often compensated by this individual effort. However, from the perspective of sustainability, the capacity for the inventory of GHG emissions at the individual level is critical. External organizations participating in the process are very often represented by a single expert. No systematic support (legislation, funds and material sources) for training and education of experts has been established²⁴. The valuable and qualified potential²⁵ of technically skilled experts in this area, is currently available in Slovakia but it is not systematically developed.

3.2.11 Development of a national inventory system

Commitment: Introduce a national inventory system of GHG emissions according to IPCC methodology

Reference:	KP – Article 5, par.1, 2 a 3
Fulfilment schedule:	before 2007
Monitoring:	Desk review and In-depth review of emission inventory
Outcomes in Slovakia:	Database NEIS for basic pollutants has been available since 2000
Links to EU:	Decision 280/2004/EC

Establishment of a national inventory system of emissions in compliance with the KP and Council Decision 280/2004/EC²⁶ is the priority of capacity development in Slovakia at all levels identified also as a middle-term objective (2003-2007) of the Strategy of SR (7). The problem is significant due to time schedule and the large volume of monitoring and reporting obligations contained in this requirement. Another reason to find the solution urgently is the formal relation to the obligations of the EU scheme of GHG emission trading. It has already been concluded in the analysis of the inventory of GHG emissions that current capacity is not adequate even for the current commitments under the UNFCCC. It can be anticipated that the new and extended system of monitoring and reporting of GHG emissions will use the capacity as the base, that must be improved (organizationally, personally, materially and financially). The quality management system (QMS) needs to be implemented into the inventory and current reporting on air emissions must be harmonised with various international databases (UNFCCC, CLRTAP, EPER).

Systemic and Institutional level

The SHMU – Department of Air Quality is authorised to operate the national emission information system (NEIS) that in 2000 replaced the former one (REZZO). The systematic monitoring of basic pollutants, i.e. SO₂, NO_x, CO and solid pollutants is required by legislation²⁷. Emission limits and quotas (allowances) for the pollutants (SO₂), have been adopted and the emissions are charged²⁸. The NEIS uses a domestic software to collect and evaluate data on pollution for the institutions responsible for monitoring and reducing emissions of pollutants. The information system consists of four elements:

- NEIS QF (questionnaire templates for the pollution source operators to prepare their emission declaration);
- NEIS BU (basic module, program for state administration bodies);
- NEIS CD (national central database at the server in SHMÚ, import of data from local databases, checking and updating in the central database);
- NEIS PL (presentation program allowing for the creation of needed sets and outputs for reporting to international organizations (CLRTAP, UNFCCC).

New obligations of monitoring and reporting pursuant to the EU Directives

The activities in relation to monitoring and reporting according to the Council Decision 280/2004/EC and Directive 2003/87/EC are not entirely identical with regard to the scope of GHG, sources of pollution and stakeholder institutions. But it is obvious that some of them will be developed in common, in particular, monitoring and reporting to the national register. The main difference has emerged from the defined obligations. While the Council Decision 280/2004/EC defines the obligation at the level of Member States, the Directive 2003/87/EC and Council Decision 156/2004/EC define the obligations in this context also for the operators integrated in the scheme for trading. According to Article 4 of the KP, the EU and its member states have decided to achieve jointly the reduction of emissions. The EEA is obliged to prepare the annual inventories of the European Community based on national systems of Member States. Also Slovakia, as a new EU country must fulfil all the obligations according to Council Decision 280/2004/EC:

- to apply the defined mechanisms for monitoring of all anthropogenic emissions by sources and removals by sinks of GHG;
- to evaluate progress towards meeting commitments with respect to the emissions;
- to implement national programmes, GHG emission inventories, national systems and registries;
- to ensure the timeliness, completeness, accuracy, consistency, comparability and transparency of reporting.

²⁴ Training and certification of experts in cooling and air-conditioning techniques is one exception.

²⁵ Many experts are directly involved in the international process of UNFCCC related to revisions and proposals of methodology, for example the cooperation in the IPCC 1996 Revised Guidelines – LUCF and GPG for LUCF, they are in databases of experts for in-depth review process, or in training activities and the development of legal and technical standards for F-gases emissions.

²⁶ Deals with monitoring of GHG emissions and the implementation of the KP by the EC.

²⁷ Act No. 478/2002 on air pollution.

²⁸ Act No. 401/1998 on charges for air pollution.

Table 3.3 presents the review of commitments.

Many parties are involved in trading emission allowances for CO₂ according to the EU schemes. They are represented by state administration, authorised verifiers

and traders at the national level. Competencies and responsibilities of stakeholders are stipulated by Act No. 572/2004 on emission allowance trading. Trading activities are directly linked with the existing inventory of emissions and uncertainties of GHG in Slova-

Table 3.3 Overview of requirements according to Council Decision 280/2004/EC

Requirement	Term	Comment
To submit inventories of anthropogenic emissions of GHG (CO ₂ , CH ₄ , N ₂ O, HFC, PFC and SF ₆) from all sectors, including LU&LUCF, annually in CRF format	January 15- annually for the year X-2	It is not clear from the decision in which year the obligation to report CRF inventories actually starts for the EU member states. It is assumed that the first date will be January 15, 2006 and reported data will be from the year 2004, as it is not realistic to meet the date January 15, 2005. If the coordination of collection and publishing of statistic data is not improved, it will be very difficult to collect the required data before January 15 each year, i.e. three months earlier than it has been done up to now. Emission inventories in some sectors (energy, industry) come out directly from the official data published in the Annual Statistics of SR. But the data were not available for the original deadline of UNFCCC (15 April)
To provide additional data on emissions of CO, SO ₂ , NO _x , VOC	January 15, preliminary for the year X-2, final emissions for the year X-3	
To provide all data and information for NIR, that are essential for the EU Inventory Report, as well as information about QA/QC of the Member Countries and their control plans and information on uncertainties and completeness and re-calculation	January 15- annually for the year X-2	The national inventory system shall be introduced, accredited and certified according to official ISO EN standards before December 31, 2005
To provide information from the national registry with regard to assigned amount units, removal units, emission reduction units and certified emission reductions for the year X-1; To inform about legal entities authorised to participate in mechanisms under Article 6, 12 and 17 of the KP	January 15- annually for the year X-1	
To inform about the step taken to improve emission inventory and about all adjustments in the national inventory system	January 15 – annually	
To communicate a national report to the Commission that shall contain: – information on a national policy and measures which reduce GHG emissions by sources or enhance removals by sinks, presented on sectoral basis for each greenhouse gas ; – national projections of GHG emissions for the years 2005, 2010 and 2015 (including the results of sensitivity analysis); – information on measures being planned for the implementation of relevant EN legislation	March 15, 2005 and every two years thereafter	National reports shall contain also information on legal, institutional, financial, personal and system backup to implement flexible mechanisms under the KP (including information on authorised institutions and persons).
To introduce a NIS according to Article 5 of the KP for the estimation of anthropogenic emissions of GHG	Not later than December 31, 2005	
To report information on the progress in achieving commitments under the KP for the year 2005 according to Article 3(3) of KP to the Secretariat UNFCCC	January 1, 2006	

nia. Identification of the competent authority is the most important task. The authority shall contact the operators in order to collect and store all emission data from selected operators. It also should provide consulting for the system of monitoring and implementation, in particular quality management systems QA/QC and QMS. The authority should assign codes for operational categories IPCC and EPER. These two forms of reporting must, in summary, report the same emissions (no other emission data must be reported as the data presented in the national emission inventory, prepared for UNFCCC) and they must be evaluated independently. Current the NEIS is not prepared to meet these requirements and to process such a large amount of new information.

3.2.12 Projections of greenhouse gas emissions – estimation of effects of policy and measures

Commitment: Communicate detailed information on anthropogenic emissions by sources and removals by sinks of GHG

Reference:	UNFCCC – Article. 4, par.2 b)
Other reference:	UNFCCC – Article 12, par.1 c), par 2 b);
Fulfilment schedule:	Identical with preparing national communications on climate change
Monitoring:	In-depth review NS
Outcomes in Slovakia:	Published in NS (5), (10), (11)
Links to EU:	Decision 280/2004/EC, Project of MŽP SR and SHMU of CAFE Programme – Testing RAINS (IIASA)

Systemic level

Projections of GHG emissions are prepared specifically within the preparation of national communications on climate change and also relevant decision processes. The preparation in countries with transforming economies is complicated by ongoing changes and uncertainties of future development that accompany the reforms. Therefore, it is not possible to use a simple extrapolation of historical data in modelling. The projections also contain the quantification of the reduction effect of approved or planned measures. Countries are obliged to publish the data in the national communications on climate change (30). The estimate of the effects of policy and measures, requested by UNFCCC directives, is still the problematic part of projections. General methodology is not available, therefore the expert approach is used. Slovakia is one of the countries that regularly prepare and publish the effects of policy and measures. According to UNFCCC directives (30) the projections of GHG emissions have to be prepared for all IPCC sectors, but also as trajectories of aggregated emissions of GHG in three sce-

narios: without any measures, with measures and with additional measures outlined in the First National Communication on Climate Change (5), in the second one (10) and the third one (11). The latest projections of GHG emissions, developed in November 2002 in a project of the MŽP SR (9), were also used in the preparation of the National Allocation Plan of Slovakia (8). Specific legislation, that would support the preparation of projections, is not in place. The projection of macro-economic development, population growth and expected consumption of heat and gas in industry and households, as well as the development plans of industrial sectors are used as input data (for example cement and lime production, nitric acid production, coal extraction). Expected trends in the purchase of HFC coolants, cattle breeding, waste treatment and the dynamics of the development of plant production in agriculture, expected impacts of selected measures in forestry and projection of waste production, as well as industrial and municipal waste water production, are also used as input data. Emission trajectories of GHG emissions in transport are calculated on the basis of expected types of vehicles in road transport and the fuel consumption according to IPCC and by using emission factors from the COPERT III program. Funds from the MŽP SR are very limited, and this can significantly influence the output quality. The preparation of projections is very demanding, with regard to the methodology, but mainly the volume and consistency of input data. The scarcity of financial resources is very often compensated by individual initiative in getting background documents and input data.

Institutional level

The NFP is the responsible body for preparing and publishing the projections in national communications. Companies and institutions such as Slovak Power plants, Slovak Gas Industry, Slovnaft, and the Slovak Energy Agency also provide input data, in addition to official statistical data. Table 3.2 presents the overview of institutions participating in the preparation of projections. Coordination and cooperation of the involved institutions can be evaluated positively, which relates to the relatively low frequency of implementations. If the criterion is the ratio between capacity participating in the process and achieved results, the efficiency is high. However, supporting mechanisms for sustainability are missing. Financial, information and material resources are limited and do not allow for the upgrading of models, software and methodology, nor extending the collection of input data in order to monitor other parameters (e.g. the impact of market liberalisation, social and economic aspects, etc.). Currently, in Slovakia a software product IAEA- ENPEP (32) (Windows modules BALANCE and IMPACT) is used to calculate the projections of CO₂ emissions from combustion and fuel transformation. It would be appropriate to adjust the software and test it in the new conditions in energy sector²⁹.

²⁹ Results of the project of the CAFE (Clean Air for Europe) project that is executed by the MŽP SR and implemented by SHMÚ. National projections of emissions should be compared with the projections calculated by model RAINS developed in IIASA, Laxenburg. Ensuring data consistency of EU Member countries is the main objective of the project.

Individual level

Working positions in the projection of emissions are represented by a minimum number of experts. Good results (internationally evaluated) have been achieved due to high qualifications and the initiatives of individuals. The critical point relates to the conditions for further training of experts, already working in the process, and the lack of systematic support for the education and training of new experts. Training courses organised within either bilateral aid (US Country Studies Program) or multilateral aid (training courses IAEA) are often only one source of information for experts. As national sources and conditions for expert training are not ensured it could result in a lack of qualified experts in the near future, in particular in the context of EU legal standards.

3.2.13 Preparation of national communications on climate change and action plans

Commitment: Detailed communication to the COP on achieving commitments under UNFCCC

Reference:	UNFCCC – Article. 4, par.2 b)
Other reference:	UNFCCC – Article 12, par. 1 and 2 COP – 4/CP.1, 11/CP.4, 4/CP.5, 5/CP.5
Fulfilment schedule	2NS–9/CP.2, 3NS–11/CP.4, 4/CP.5, 4 NS –4/CP.8
Monitoring:	In-depth review NS
Outcomes in Slovakia:	1NS (5), 2NS(10), 3NS (11)
Links to EU:	Decision 280/2004/EC

Systemic level

National communications on climate change are being prepared in compliance with the schedule stipulated by UNFCCC and COP decisions and in the format stipulated by UNFCCC directives (30). Pursuant to Article 4, par.2 b) UNFCCC (4) the First National Communication of the Slovak Republic on Climate Change was published in May 1995 (5) followed by the second national communication in June 1997 (10) and the third one in November 2001 (11)³⁰. While the first two reports are available only as hard copies, the third one is also available on the web page of the Ministry of Environment³¹. The process and related capacity development is formally declared in the Strategy of SR on Climate Change (7). The Secretariat of UNFCCC has evaluated the process positively by an in-depth review. In 2000, the MŽP SR developed the Action Plan for achieving commitments under the KP (34). The Plan includes also detailed analysis of potential measures to reduce CO₂ emissions from combustion and fossil fuel transformation. The document shows quantified data on CO₂ reduction potential, estimated investments, expected price for reduction, as well as the

average reduction achieved by the measure during the first target period of the KP. The Plan is not a mandatory document with regard to the appointed responsibility, time schedule and finance allocation. It is used as a background document for decision making. Action plans for other gases and sectors have not been prepared yet. No specific legislation has been adopted. Financial resources are provided from the budget of the MŽP SR, however, in a volume that is not sufficient for the required scope of the outputs.

Institutional level

The NFP is responsible for preparation and publishing national communications. All institutions involved in the preparation of national communications on climate change are presented in Table 3.2. Companies and institutions such as Slovak Power plants, Slovak Gas Industry, Slovnaft, and implementing agencies of relevant ministries regularly provide the input data. The SHMU coordinated with the development of the first and second national communications, the work on third one was coordinated by the consulting company PROFING.

In spite of limited funds and the lack of legislation, the coordination and cooperation of the involved institutions can be evaluated positively. This relates to relatively low frequency of implementations. If the criterion is the ratio between the capacity participating in the process and achieved results, the efficiency is high (in the international context), while the number of institutions and experts is low and financial resources are limited. Time intervals between the reports are relative long and supporting tools to improve the quality and to keep the continuity of the process³² are absent in the current capacity framework in Slovakia.

Individual level

The experts and officers are highly qualified, many of them work directly in working groups preparing methodologies or are listed in the UNFCCC database of experts for in-depth review process of national communications. In contrast with the highly qualified potential only a few experts (very often only one expert for a given area!) are available to develop technical documents – i.e. the inventory of emissions, the projections of emissions and the quantification of the impact of policy and measures. In the context of capacity assessment the critical point is that the conditions have not been established yet for increasing the number and continuous training of experts. This is necessary for sustainability and the quality of such complex processes as the preparation of national communications. In addition to the several training courses organised by the Secretariat of UNFCCC and IPCC activities, the important information sources for the experts are also training courses, seminars and workshops organised within bilateral and multilateral projects.

³⁰ The Fourth National Communication will be published in 2006.

³¹ www.enviro.gov.sk/ochrana_ovzdušia/zmena_klimy/.

³² Continual consultations of experts addressing changes in UNFCCC directives, IPCC methodologies and new reporting obligations could be the solution.

Table 3.4 Review of projects on climate change in agriculture

Project	Funds	Research institution
Research of stocks and the balance changes of carbon in highlands	VEGA	LVÚ Zvolen
Impact of global climate change on forests of Slovakia	MP SR	LVÚ Zvolen
Progressive climate change and its impacts on the development of society	State research and development programme	Hydromeliorácie, š. p., Bratislava
Measures taking into account the adaptation of meadows and pastures on climate change	MP SR	VÚTPHP Banská Bystrica

3.2.14 Science, research, systematic observation and climate change monitoring

Commitment: Promote and cooperate in scientific, technological, technical and socio-economic research of climate change and systematic observation and international exchange of experiences

Reference: UNFCCC – Article 4, par. 1 g), h)
 Other reference: UNFCCC – Article 5 a), b), c);
 KP – Art. 2, par.1, Art. 10 d), f);
 COP – 8/CP.3,
 14/CP.4/5/CP.5, 11/CP.9
 Fulfilment schedule: Continuously
 Monitoring: In-depth review of national communications (NS)
 Outcomes in Slovakia: 1NS (5), 2NS(10), 3NS (11)
 Links to EU: Project POVAPSYS³³

Systemic level

The Ministry of Education SR³⁴ is the legislative guarantor with cross-sector competencies in research and development. No strategy specifically addressing science, research and development to achieve the commitments under UNFCCC and KP is available. The issue has not become either a priority of the state scientific and technical policy nor the subject of state demand. There is a network of universities, Institutes of the Slovak Academy of Science (SAV), sectoral research and development institutions and also the private research and development sector. The potential for a research base is relatively large, but the direct strategic support for the climate change area is missing. Act No. 478/2002 on air protection declares generally the obligation to achieve commitments under international conventions on air protection, as well as the obligation to support research. In 1991, the National Climate Programme (NKP) was established as a partner to the World Climate Programme (WCP) of the World Meteorological Organization (WMO). The NKP has been funded by the MŽP SR. Research results of the period 1993 – 2001 are summarised in 11 collections. Since 2001 NKP has stagnated due to the lack

of finances from MŽP SR. In 1992, the Slovak Government approved the Strategy of Environmental Monitoring in all environmental components³⁵ and the Strategy of Integrated Information System and Monitoring of the Environment (ISMŽP). The Information system, including the catalogue of sources, is publicly available at the web page of the MŽP SR. Currently the issue of climate change is not a priority of the Government Council for Science and Research. The Ministry of Education does not support the research on climate change and its impact systematically, only through grants VEGA and APVT. The institutes of the SAV address several partial problems. The agricultural sector is the only positive exception, where four projects (more details in Table 3.4) addressing climate change are conducted.

Institutional level

The SHMU is the assigned organization for completing several tasks in relation to achieving the objectives of the convention, including monitoring and the research on climate change. SHMÚ is the monopoly state organization in air and water monitoring in Slovakia (partial monitoring systems – air, water). SHMÚ performs monitoring of climate change and participates in the program of Global Climate Observing Systems (GCOS) without any financial support from the MŽP SR, only within its own, limited budget and without sufficient capacity (personnel and finance). The scope of SHMÚ activities in this area is large and it contains:

- development of basic climatic studies in Slovakia
- coordination of NKP, including cooperation with the WMO;
- ensuring Slovak participation in the programme GCOS;
- responsibility for the management and development of meteorological and hydrological networks (including monitoring of water quality and air quality);
- development and management of data archives;
- coordination of the project POVAPSYS (Flood warning and prognostic system)³⁶.

The enhanced care of GCOS stations is currently taken only within the available resources of the SHMU,

³³ Flood warning and prognostic system coordinated by SHMÚ. It is funded by the Slovak Government and by PHARE/ISPA/SAPARD and also will use EU Structural Funds.

³⁴ Pursuant to Act 575/2001 (so called competence act) and Act 132/2002 on science and technique.

³⁵ including air, water, forest ecosystems, soil meteorology and climatology.

³⁶ The nature of the project is research, development and implementation. Several institutions are involved.

the climate research stagnates and participation in international programs and projects is low. The national network of meteorological stations is being gradually automated and the archival system is being improved. Reporting to GCOS complies with the program requirements.

Monitoring of forest ecosystems has a long term tradition in Slovakia, either within special monitoring programs or in the preparation of forest management plans³⁷. Similarly, an intensive inventory of research on forest and/or agricultural soil is carried out. Monitoring in agriculture and forest management is conducted within the environmental information system supervised by the MŽP SR through two partial monitoring systems "ČMS Forest" and "ČMS Soil". However, the information spectrum of the partial monitoring systems only partially cover the needs of the commitments under UNFCCC and KP, specifically with respect to the inventory of GHG. Monitoring of forest ecosystems is being improved within the program of the EC "Forest Focus". It also includes the parameters for observation of the impact of global climate change on forests and parameters for balancing carbon reserves in forest ecosystems. The monitoring centre functions are performed by the institutes of the Ministry of Agriculture, i.e. LVÚ Zvolen (ČMS Forest) and VÚPOP Bratislava (ČMS Soil). These institutes have adequate material, financial and technical backup to collect the required information.

Climate research and related tasks³⁸ are implemented in a very limited scale at the SHMÚ and are funded from the current budget within the VEGA grant at the Department of meteorology and climatology of Comenius University.

In Slovakia the research on F-gases in the nineties only addressed the substitution of chlorinated cooling agents by F-gases. More recently some tasks connected with the introduction, manipulation, recycling and checking of coolants have been carried out. A number of organizations participated in this research, e.g. TSÚ Piešťany, STU Bratislava and SZCHKT Rovinka. The capacities and laboratories available at TSÚ Piešťany and STU Bratislava are used only sporadically.

The research on vulnerability, impact mitigation and adaptation of nature, water management, agriculture and forest management to climate change together with the climate research were conducted in the nineties within NKP and the US Country Studies Program (33)³⁹. NKP was funded from the budget of the MŽP and several institutes in the environmental and economic sectors were involved (SHMÚ, VÚVH Bratislava, LVÚ Zvolen, Hydromeliorácie Rovinka) in cooperation with some institutes of the SAV and universities (UH SAV, SPU Nitra, TU Zvolen and others).

Currently there is no research on the adverse health, economic and social impacts of climate change in Slovakia.

Technical and technological research and development is limited to renewable energy sources (more details in Annex 3).

Scarcity of financial sources is the common problem of the majority of research institutes. The process is disorganised due to the lack of systematic support, priorities are not determined and mandates of the research institutions are not defined. Mutual cooperation of the institutions is limited to personal initiatives. Since Slovakia has become the EU Member State, more research institutions make an effort to be certified and accredited in the quality management system according to ISO and CEN. Research and development activities are implemented partly within international projects and cooperation. In addition to the funding it is also an appropriate way to exchange information⁴⁰.

Individual level

Over 20 000 people still work in research and development in spite of recent decreases. The research community is able to establish specialised scientific teams. Participation in international projects is generally supported. However, to a certain extent, a generation problem has arisen. The lack of middle aged managers has an impact on the science. Scientific and research jobs are less attractive for the younger generation, mainly due to lower salaries in comparison with the jobs in the private sector. There is a lack of some professions in research institutes (for example informatics). The language barrier used to be a problem in the past, today the situation is getting better. The level of management and coordination differs from institute to institute, but generally it is getting better due to certifications according to ISO standards. Talented young researchers have opportunities for further development and career advancement. Various forms of scientific preparation and training are available. Accessibility of information for researchers is generally good. A typical problem of scientific and research activities is the scarcity of financial resources. The situation in international projects funded from foreign sources is much better. The outflow of young researchers abroad becomes to be a significant problem.

3.2.15 Training of scientists, technicians and managers

Commitment: Promote and allow training of scientists, technicians and managers

Reference:	UNFCCC – Article. 4, par. 1 i)
Other reference:	UNFCCC – Article. 6 a) (iv), b) (i), (ii); COP: 17/CP.5, 12/CP.8
Fulfilment schedule:	Continuously

³⁷ Purposeful inventories in Slovak forests have been carried out for over 200 years.

³⁸ Evaluation of climatology measuring climate variability, downscaling global and regional models and reducing uncertainty of climate change scenarios.

³⁹ Results are summarised in NKP collections and were used in preparation of national communications.

⁴⁰ In 2001 – 2003, SHMU was a partner to the European Topic Centre on Air Quality and Climate Change.

Systemic level

There is no specific document (strategy, action plan or program) that contains a strategy and measures to achieve the commitments under UNFCCC and KP in training of scientists, technicians and managers. Limited financial resources of individual sectors allocated for education and training activities of managers (according to Act on state administration) are used for the relevant priorities. Climate change has not been the topic of any specific training course. Training courses and registration of experts (ST EN 17024 and ST EN 13313) were organised for the area of cooling and air-conditioning techniques (F-gases) in accordance with Act No. 76/1998 on the protection of ozone layer of the earth. The SEA organises short-term courses to get authorisation for business activities in energy sectors according to Act No. 70/1998 on energy. Finances from the state budget have not been allocated for this activity and costs are covered only by the fees of participants. However, further resources are needed to equip the training centres. The SHMU and the Slovak Meteorological Society organise seminars on the occasion of the World Meteorological Day and World Water Day and the annual international conference Air Protection (in 2003 it was the 18th Conference).

Institutional level

The Slovak Association of Refrigeration and Air Conditioning Engineers (RACE/SZ CHKT) has been designated as authorized institution for training courses and examinations for experts in this area. The Association is authorised by MŽP SR to provide training courses and examinations according to the Act on the protection of ozone layer. In addition to these activities, SZ CHKT is responsible for the registration of experts according to ST EN 17024 and ST EN 13313. In partnership with TI SR, the Association trains experts for performance of specific pressure examinations to assure the safety of pressure vessels. The authorisation for handling specific substance and F-gases is supervised by the Slovak Environmental Inspection (SIŽP).

The agricultural sector has developed an advisory and training system and also established institutes for this purpose: Agroinstitute Nitra, ÚVTIP Nitra, Institute for personnel education and training LaVH Zvolen. None of the institutes is specified for training and promotion for climate change. The issue is currently covered only by universities and scientific and research institutes. The SEA⁴¹ provides advisory service and training with regard to the effective use of energy. The SEA activities are not well coordinated, positive outcomes are rather the result of the initiatives at the individual level. The SEA organises short-term training courses on the following topics: *Expert eligibility in energy* (most frequent training course), *Energy auditor*, *Energy manager in housing communal sphere*, *Renewable energy sources: use of solar energy, biomass and biogas*

and Manager of agricultural ecology (35). The SEA is accredited to organise long-term training courses, i.e. 4-semesters of specialised study in following areas: *Industrial energy and Water management*.

Activities of the Energy Centre in Bratislava are very useful for this area. This NGO developed and provided, within the Programme THERMIE and in cooperation with SEA, training courses for energy advisors for housing. The Energy Centre also, in partnership with INTECH, provided the training course on cogeneration of electricity and heat. These are mainly one-off activities, funded by sponsors. The main benefit of these activities is that they ensure the education of experts without any support from the state budget.

Individual level

In addition to the representatives of authorised implementing organizations, lecturers from academic institutions, officers (particularly for legislation), experts and technicians also including those from the private sector participate in the process. There is no earmarked systematic and institutional support of the process, that would guarantee its sustainability. The ongoing decrease of teachers could be a future risk.

3.2.16 Transfer of environmentally sound technologies and application of voluntary instruments

Commitment: Cooperate in the promotion, development, application and diffusion of environmentally sound technologies in all relevant sectors

Reference:	UNFCCC – Article. 4, par. 1 c), d)
Other reference:	KP – Article. 2, par. 1 a), Article. 10 c)
Fulfilment schedule:	Continuously
Outcomes in Slovakia:	BAT
Links to EU:	Directive 96/61/EC

Systemic level

Due to political and economical changes, the position of Slovakia has changed from point of view of international aid and the transfer of technologies⁴². Due to the membership in OECD and EU, Slovakia has moved from the role of recipient of international aid and *importer* of technologies to the role of donor. This has resulted in the development of new instruments such as the Official Development Aid (ODA). Further significant changes are associated with legislative and economic pressure on the quality and environmental impacts of and the installation of imported technologies. Due to the legal requirements in air protection and waste management, as well as the prices of input materials and energy, the old and obsolete technologies have become economically unviable. Together with the growing market for environmentally sound tech-

⁴¹ SEA was established by Decision of Ministry of Economy No. 63/1999 to ensure, inter alia, also advisory and consulting service, training and promotion of the effective use of energy, the enhancement of energy efficiency, renewable source utilisation.

⁴² It is useful to distinguish between horizontally applied technologies, processes and procedures, i.e. those that are applied in several industries (typical examples: energy production, waste landfills, emission treatment, waste water treatment) and vertically applied technologies, that are typical for one sector or for few sectors and products.

nologies in Slovakia, the potential of export – transfer of progressive technologies from Slovakia is also growing (e.g. in material and energy recovery of biomass and renewable sources). In the context of this report voluntary environmental instruments currently used in enterprises with links to public administration are particularly interesting. In this regard most important instruments are

- ecological symbols, eco-labelling of environmentally sound products (EVV) (Act No. 469/2002 on environmental labelling of products; Regulation No. 258/2003 and related regulations for environmental assessment of products and awarding eco-labels);
- voluntary participation of small and medium enterprises in emission trading.

Less used instruments are:

- Eco-Management and Audit Scheme – EMAS (Act No. 468/2002 and implementing regulation No. 90/2004);
- Energy audits;
- Life Cycle Assessment (LCA);
- so called Green procurement (almost unknown in Slovakia).

The definition and application of Best Available Techniques (BAT) are primarily addressed in the Act on integrated pollution prevention and control (IPPC)⁴³. The BAT issues are also addressed in legal regulations of air protection⁴⁴, waste management and waste water treatment. At the systemic level the transfer of technologies is not addressed in a comprehensive way with the exception of polluters covered by Act No. 245/2003 on IPPC. Legal framework for the implementation of the most relevant voluntary instruments has already been developed in compliance with EU legislation. However, climate change is not covered adequately. Up to now, 18 directives of the national programme of environmental assessment and labelling of products have been published, but only 7 of them contain relevant criteria⁴⁵. Public procurement does not explicitly require the application of environmental criteria and therefore the impact on climate change has not been considered up to now. Also emission trading is based on the voluntary principle. Financial resources, that would motivate in particular small and medium enterprises to use voluntary instruments on a larger scale are either missing or are inadequate. Moreover, the cost charged by the state administration, in relation to the participation of a company in the programmes EVV and EMAS are too high and are not balanced by assets. Information sources are limited, fragmented and not easily accessible (directives, BAT specifications, implementation procedures for companies, etc.).

Institutional level

With regard to responsibility, provision of information, and promotion of voluntary instruments the responsibilities of institutions are not explicitly specified, either within the environment sector (MŽP, SAŽP, SIŽP) or among sectors (MŽP, MH, MP, MVRR). An organizational unit UNIDO – ITPO (Investment and Technology Promotion Office) was established in Bratislava for the years 1999-2002, from national funds under the auspices of the Ministry of Economy and the Ministry of Foreign Affairs in cooperation with UNIDO, Vienna. Its role is to promote the two-way transfer of investments and technologies⁴⁶. The ODA is implemented through the UNDP RBEC in Bratislava. Environmental aspects are the priority objective for projects related to, technology transfer, but the issue of climate change is not a specific criterion in the assessment. SAŽP and SIŽP should be the main implementing institutions. However, both institutions are lacking in personnel, expertise and information due to unclear specification of their functions and roles and insufficient funding. Most of the affected sectors have already set up their own organizations and associations representing the sectors (chemistry, pharmacy, pulp and paper, food production, car industry, etc.). These organizations should be the most important connection link between the state administration and the private sector in the two-way technology transfer and the use of voluntary instruments. The ASPEK (Association for Industrial Ecology in Slovakia) is a cross-sectoral association addressing environmental aspects, but does not specifically deal with technology transfer.

Individual level

Insufficient potential has been identified at the individual level. Implementing agencies lack managers and experts with adequate theoretical knowledge and practical experience from industry.

3.2.17 Education, training and public awareness related to climate change

Commitment: Promote and facilitate the development and implementation of educational and public awareness programmes on climate change and its effects

Reference:	UNFCCC – Article. 4, par. 1 i)
Other reference:	UNFCCC – Article 6, a) b) KP – Article. 10 e), COP- 3/CP.7, 9/CP.9
Fulfilment schedule:	Continuously
Monitoring :	In-depth review and national communications

⁴³ Act No. 245/2003 on IPPC.

⁴⁴ Act No. 478/2002 refers to BATNEEC.

⁴⁵ Over 150 companies have implemented Environmental Management System (EMS) and have been certified according to ISO 14001, but only 5 companies have implemented EMAS, while the issue of climate change is dealt with only generally.

⁴⁶ Formally these activities should be managed by the Ministry of Economy, which today is focused on the import of investment through the agency SARIO, without assessing the impact of investment on climate changes.

Table 3.5 Institutions and their activities in environmental education and public awareness

Institution	Focus/Activities
SAŽP	<ul style="list-style-type: none"> Centres of environmental education (Teplý Vrch, Žilina, Košice, Banská Štiavnica, Drieň, Regetovka, Modra); Centres for environmental education and trainings;
SEA	<ul style="list-style-type: none"> Centrum Stodola (information, advisory and public awareness in energy savings, science and techniques, permanent environmental exhibition) <ul style="list-style-type: none"> Slovak centre for energy management and a network of departments of education at regional offices of SEA
PR office of the Ministry of Environment SR	<ul style="list-style-type: none"> Providing information, leaflets and brochures on the protection of the environment
State nature protection	<ul style="list-style-type: none"> Nature protection school (Varín)
IUVENTA (Ministry of Education SR)	<ul style="list-style-type: none"> Environmental activities in Spare time centres
SHMÚ	<ul style="list-style-type: none"> Seminars on the occasion of World Meteorological Day and World Water Day
Energy consulting and information centres	<ul style="list-style-type: none"> Consulting and information service in energy savings
Association of environmental-educational organizations "Špirála"	<ul style="list-style-type: none"> Association of 12 NGOs (CEEV Živica, CEA Trenčín, CMOP SZOPK, Daphne, Klub Kon-Tiki, OZ Ekoenergia, OZ Tatry, Sloboda zvierat, Sosna, SEV Dub, Strom života, Zelená linka)
National non-governmental organizations	<ul style="list-style-type: none"> MVO Ľudia a voda, A – projekt, Ekosofia, RIO 21 Centrum, SOVS, Vydra, ZO SZOPK Miniopiterus a ECB, focused on energy efficiency and use of renewable energy sources, in particular biomass
International NGOs (promoting environmental protection in relation also with climate change)	<ul style="list-style-type: none"> The World Conservation Unit (IUCN) with the status of UNESCO, GLOBE of EU, Greenpeace International and Friends of Earth International (FOEI)

Outcomes in Slovakia: Activities are published in national communication (5), (10), (11)

Links to EU: Directive 90/313/EC
Directive 2003/35/EC

Systemic level

No complex strategy or programme for education and public awareness on climate change is available. There is a large number of documents addressing environmental training, education and the increase of public awareness in general, which also contain incentives related to this commitment. The document Strategy, Principles and Priorities of the State Environmental Policy (36) presents a middle-term objectives (2000-2010) to create a comprehensive school and non-school system of environmental education. Similarly, other documents such as the National Environmental Action Plan I (NEAP) (37), NEAPII (38) and the National Strategy for Sustainable Development (NSTUR) (39), create conditions allowing for the development of environmental public awareness through the activities of expert organizations in the environmental sector. According to a measure stipulated in the NEAPI, the Concept of Environmental Education was developed. Backup documents include the curricula Environmental education at primary and secondary schools (Environmental minimum). The Ministry of Education SR has prepared a document the National Programme of

Education – Millennium, also covering the principles of sustainable development into the process of life-long education.

Institutional level

Both governmental and non-governmental organizations participate in the process. Table 3.5 shows an overview of their activities. Even without any specific legislative and institutional promotion education and public awareness on climate change is implemented through a number of activities.

Current situation in the dissemination of information, public participation in addressing the issue of climate change in the decision making process

Systemic level

The Constitution of the Slovak Republic⁴⁷ contains a section on basic rights and freedoms, including "the right to protecting the environment and cultural heritage". Article 45 of this section stipulates that "everybody has the right to timely and comprehensive information on the status of environment and on causes and effects of this status". The legal framework, which stipulates procedures, collection, evaluation and dissemination of environmental information, including information on climate change, consists of the following acts:

⁴⁷ Constitutional Act of the National Council of SR No. 462/2002.

- Act No. 211/2000 on free access to information;
- Act No. 205/2004 on the collection, registration and dissemination of environmental information;
- Act No. 17/1992 on the environment⁴⁸;
- Act No. 478/2002 on air protection⁴⁹
- Act No. 245/2003 on integrated pollution and prevention control (IPPC).

Furthermore, official documents are being prepared and published that contain updated information and data on air protection. The right of the public to environmental information is stipulated also by the EU Directives and related international conventions.⁵⁰

Institutional level

The process of providing information on climate change has not been institutionalised. The responsibility for the activities in this area lies with the NFP. Practical outputs are provided by SHMÚ and SAŽP and other implementing agencies. Activities of the institutions are not coordinated. Many of them are provided through the Internet. However, a specific information portal on climate change, with interlinks to relevant national and international web pages, is missing. Information and selected studies in relation to climate change are available from the web page of MŽP SR (www.enviro.gov.sk), SHMÚ (www.shmu.sk), SAŽP (www.sazp.sk) and Slovak Energy Agency (www.sea.gov.sk). Information and all official documents in relation to climate change can be found on the web page of the Secretariat of UNFCCC (www.unfccc.int), the Intergovernmental panel of climate change (www.ipcc.ch) and the European Environment Agency (www.eea.eu.int).

Public participation in addressing the issue of climate change and related decision-making

The Convention on access to information, public participation in decision-making and access to justice in environmental matters, the Aarhus Convention 1998, is the key document in the field of achieving human rights and freedoms in the environment.

It contains three pillars:

- Access to environmental information;
- Public participation in decision making in environmental issues;
- Public access to justice in environmental issues.

The Slovak Republic has not become a Party to the Aarhus Convention. Public participation in decision-

making in Slovakia is covered by Act No. 127/1994 on environmental impact assessment⁵¹. Public participation in decision-making is stipulated also in Act No. 245/2003 on IPPC. Slovakia has transposed all relevant EU directives in this regard⁵².

3.2.18 International cooperation and links to international organizations

Commitment: Cooperate with other Parties to enhance the effectiveness of adopted policies and measures and take steps to share their experience and information

Reference KP – Article 2, par. 1 b)

Other reference: KP – Article 10, e)

Fulfilment schedule: Continuously

Capacity use of the Secretariat of UNFCCC and other relevant international organizations

In addition to the cooperation of Parties, another feature of the implementation of the UNFCCC is the emphasis on the cooperation of relevant international institutions and organizations (including scientific institutes), UN agencies and other international conventions. In addition to the cooperation with the Secretariat of UNFCCC, there is a need to cooperate also with other international organizations or bodies of other international conventions focused on environmental issues, in particular with UNDP, UNEP, WMO, WHO, UN ECE, OECD, ICAO, IMO and non-governmental organizations.

Strengthening cooperation in achieving commitments under the Convention on Climate Change, the Convention on Biodiversity and the Convention on Desertification

The interrelationship of the three Rio Conventions (CBD, UNFCCC a UNCCD) refers particularly to cross-cutting areas and activities: technology transfer, training and education, research and systematic observation, capacity strengthening, reporting, impact assessment, adaptation possibilities and other fields (for example desertification risks, forest bio-diversity, agricultural sources, etc.).

⁴⁸ Pursuant to article 33, MŽP SR is obliged to publish annually the Report on the status of the environment in SR.

⁴⁹ Pursuant to article 29, MŽP SR is obliged to release information on air quality and the share of individual sources on the pollution through the authorised organization.

⁵⁰ Council Directive 90/313/EC on the freedom access to the information on environment, the Convention on trans-boundary EIA (Espoo Convention), the Convention on the trans-boundary effects of industrial accidents (Helsinki Convention), Council Directive 96/82/EC on the control of major accidents hazards involving dangerous substances (Seveso II) and Council Directive 96/61/EC on IPPC in articles 15 and 17.

⁵¹ The act stipulates the public rights in the environmental impact assessment of constructions, device and activities that might impact the environment. It also defines obligations of stakeholders with respect to the EIA procedures.

⁵² Directive 85/337/EEC on the assessment of the effects of certain private and public projects on the environment, Directive 2001/42/EC on the assessment of the effects of certain plans and programs on the environment Directive 2003/35/EC, providing for public participation in respect of the drawing of certain plans and programmes relating the environment.

CBD and UNCCD, as well as other conventions (e.g. Ramsar Convention on Wetlands), participate actively in the implementation of UNFCCC, in particular in sharing experience and information. A number of actions have been implemented within the UNFCCC activities aimed at strengthening cooperation, including workshops attended by the representatives of other conventions. The Joint Liaison Group⁵³ (JLG), made up of members of committees of convention bodies and representatives of the secretariats, plays a meaningful role in strengthening capacity and reaching synergy⁵³ among the Rio Conventions. The objective of the JLG is to strengthen the coordination of the Conventions (in particular with regard to information exchange, a joint work-plan preparation addressing for example links between climate change and biodiversity and/or soil desertification) that would contribute to the harmonisation of approaches and higher effectiveness.

Systemic level

Key tasks in the implementation of Rio Conventions in Slovakia are carried out by the following bodies:

- NFP (MŽP SR) for UNFCCC and KP
- NFP for CBD; NFP for the Cartagena Protocol, and the Ramsar Committee at the MŽP SR,
- NFP for UNCCD at VÚPOP Bratislava.

Generally, special cross-sector panels or working groups are set-up to deal with cross-cutting issues, but the effectiveness of their outcomes is low. No joint working group or expert group covering all three Rio Conventions has not been set-up. The importance of cooperation in achieving commitments under the conventions on climate change, biodiversity and desertification has not been adequately underlined, in particular no detailed analysis of identical or related issues of UNFCCC, CBD, UNCCD has been carried out. Consequently, there is no objective control that would avoid duplication in fulfilling tasks and commitments under the conventions and that would examine if limited sources (financial, human and material) are used effectively. The cooperation of Slovak representatives with the Secretariat of UNFCCC and other relevant international organizations is basically limited to participation in the negotiations, COP meetings and providing required documents (national communications, emission inventories, etc.). The participation of national experts in expert meetings and Convention bodies is not adequately supported and coordinated.

Institutional level

The current structure of expert institutions and their highly qualified staff are the preconditions for more active contribution of Slovakia to the international activities related to the implementation of global environmental conventions. There is a lack of coordina-

tion of activities and the allocation of resources is a major problem with respect to the direct impact on providing stakeholders with information. It also limits expert representation of Slovakia in the international context.

Individual level

The effectiveness of the horizontal flow of information depends to a certain extent on the qualifications and availability of experts from the relevant sectors. A similar situation exists also in the vertical flow of information, from the MŽP SR to regional, district offices, and municipalities. The use of available information by experts on relevant international experiences is not satisfactory.

3.2.19 Mechanism of international financing of projects on climate change

Reference: UNFCCC- Article. 11;

Other reference: COP – 10/CP.1, 11/CP.1, 12/CP.2;

As has already been mentioned in the analysis of the capacity needed to achieve commitments under UNFCCC and KP, national funds for activities in the field of climate change are limited. Consequently, a number of actions can be implemented only within the bilateral and multilateral cooperation with financial support from international funds. With regard to the issue of climate change, the following activities are important: the US Country Studies Program (33), the Study on Slovak Strategy for GHG Reduction (24) and ongoing project UNDP „National Capacity Needs Self-Assessment related to Environmental Management of Global Conventions”, and participation in „Danube regional project UNDP/GEF”. Conditions for financing or co-financing projects on climate change in Slovakia from international funds are well known⁵⁴ and the information is publicly available. These financial opportunities are being used at the national level, institutional level and also at the level of the individual enterprise and institutes. The use of financial resources is not well coordinated, the disproportional participation of institutions frequently occurs. The main problems relate to a lack of initiatives and insufficient experience in the development of project proposals. Key international sources to finance environmental projects include the following:

Global Environment Facility

GEF is the international financial institution, established in 1991, which helps developing countries, and at certain conditions also EIT countries to fund projects and programmes protecting the global environment⁵⁵. GEF provides four basic categories of funding:

- Full-size projects, grants over 1 mil. USD;

⁵³ Synergy in this context means the effective cooperation aiming at enhancing the effectiveness of activities in implementation of the Conventions. Elimination of potential duplication and assuring maximum use of existing sources is a priority.

⁵⁴ Web page: “Nadácie – organizácie poskytujúce granty”, “UNDP RBEC Regional Support Centre”.

⁵⁵ GEF supports projects on biodiversity, climate change, international water, soil degradation, ozone layer and persistent organic substances.

- Medium-size projects, grants between 50.000 – 1 mil. USD;
- Enabling activities (national inventories, strategies, action plans in the context with UNFCCC, CBD and UNCCD);
- Project preparation and development facility PDF (three grant categories: PDF BLOCK A up to 25.000 USD, PDF Block B up to 350.000 USD and Block C up to 1 mil. USD).
- Promoting the adoption of renewable energy by removing barriers and reducing implementation costs;
- Reducing the long-term costs of low greenhouse gas emitting energy technologies
- Promoting environmentally sustainable transport

GEF also provides finances to cover additional costs in relation to the transformation of project with outcomes at national level to a project with outcomes relevant for the global environment. The Secretariat of GEF evaluates projects according to specific evaluation criteria, and in addition from the perspective of satisfying needs of the country. The first precondition of the evaluation process is that the GEF Focal Point of the country, where the project is to be implemented, supports the proposal.

The World Bank

The WB plays a key role in supervising the large investments of developed (OECD) countries that must be used to bring benefit to developing countries. The WB supports the GEF as an implementing agency and respects the decisions of UNFCCC and IPCC. Projects on climate change address the following issues:

- Removal of barriers to energy efficiency and energy conservation

The Prototype Carbon Fund (PCF) is important in relation to the use of flexible mechanisms according to the KP. The PCF has already initiated several CDM and JI projects based on a complex methodology for the evaluation and selection of projects. Slovakia signed the Memorandum of Understanding with the World Bank as a potential “*host country*” within PCF activities. The World Bank offers a number of other financial instruments, including loans and grants to combat poverty and support economic development⁵⁶.

European Union

The issue of global change and ecosystems is a priority of the 6th Framework Programme together with renewable energy sources and sustainable transport, partially financed from EU Funds. The EU Structural Funds are the other financial sources allowing for the implementation of both direct and indirect measures to achieve positive results in the reduction of greenhouse gas emissions at the regional level. The funds can be used to implement projects at the national level together with neighbouring countries, or other EU countries. However, the issue of climate change is not yet addressed.

⁵⁶ Investment loans, Development policy loans, as well as limited number of grants promoting innovations, cooperation with other institutions and participation of stakeholders at the national and local level.

4. Analysis of the key assets and needs of capacities to meet the objectives of the UNFCCC and the Kyoto Protocol

4.1 SWOT analysis and capacity assessment according to generic indicators

Chapter 3 introduced a detailed review of existing capacities at all three levels for a wide range of commitments that Slovakia must achieve as a signatory of the UNFCCC and the KP. In general, Slovakia is able to fulfil the basic requirements with relatively limited existing capacities. Weak “sustainability” of current capacities is a common problem and it varies among the obligations at the particular level or among the individual categories at the same level. SWOT analysis, an instrument often used in assessment and planning, was carried out as the next step. By determining the strengths and weaknesses of a process opportunities and threats, this method allows the quantification not only of the current limits of achieving objectives but also the potential of overcoming them in the future. The SWOT analysis was carried out in a separate meeting of the working group for the whole range of commitments described in Chapter 3. All information collected during the inventory phase was used, in particular, the detailed knowledge of the experts participat-

ing in the projects. The assessments were grouped into five basic topics according to generic UNDP/GEF indicators (1). The following section provides a synthesis of total capacity of the country acquired as indicated by the SWOT analysis.

4.1.1 Capacity to propose and formulate policy, strategies, legislation and programmes

The key positive incentive to develop capacity for proposing and formulating policy and strategies in climate change is a clearly declared favourable political framework. In the course of the project, an extraordinary change happened within the international context. The Russian Federation ratified the KP and hence the conditions allowing the KP to enter into force, were achieved. This parameter ceased to be the threat for proposing strategies and policies – it is becoming definitely an opportunity identified by SWOT analysis. Moreover, there is a strong link between capacity needs in relation to the membership of Slovakia in the EU and signing the KP. Inadequate coordination of activities related to achieving commitments under the KP

Table 4.1 SWOT analysis of formulating and proposing policy, strategies, legislation and programmes

S/Strengths	W/Weaknesses
Positive political framework for formulating national policy and measures related to climate change	Strategic priorities of the country are changing continuously, synergy of MEA is not taken into account in the development of concepts
Ability to formulate and develop concept materials as either cross-cutting or sectoral documents; ability to identify potential instruments to achieve strategic objectives	Strategies are not sufficiently transformed into action plans and sets of measures with identified responsibility, financial and human sources
High qualification of experts and technicians for developing technical background documents for decision making	Significant differences in qualification of managers as regards climate change
Concepts or programs for the area of climate change, and in some cases also action plans, are available in all relevant sectors	Insufficient capacity to monitor and assess the implementation of strategies and programmes
Programs in climate change area have been formulated also at the regional level (at least as indirect measures)	Insufficient capacity is devoted to the development of strategy and measures for non-energy sector- industrial processes
All relevant sectors are involved in the process; associations and NGOs participate in the development of strategies	Insufficient coordination of sectors in the development of strategies, low effectiveness of cross-sectoral associations

Table 4.1 Continued

O/Opportunities	T/Threats
The change of political priorities and strategic objectives of the country in connection with internal and external changes (for example entering the Kyoto Protocol into effect)	The Kyoto Protocol will not enter in force*
International reputation	The change of political and economical priorities of the country
Potential links to the policy of developing aid and the state policy to multilateral organisations	Missing feedback, results of monitoring, analyses and assessments are not transferred into the proposals for policy and strategy
Benefit from more effective use of current capacities	Extreme dependence of Slovakia on the import of primary energy sources
Growing pressure on taking externalities into account	Lack of expert capacity to update strategies according to new requirements and the need to take externalities into account
Involving local and regional governments in strategic decision making	
Political pressure on introducing innovations at the level of the EC	

* the SWOT analysis was completed before the ratification of the KP by the Russian Federation. Therefore, it is stated in a column "threats".

in both directions (horizontal and vertical) is the most frequently identified weakness of the capacity framework. According to the assessment of experts there is an adequate potential of strengths and opportunities connected with coordinating capacities in the field of climate change, as well as other environmental conventions and other related fields (developing aid policy, sustainable development, innovations and respecting externalities). It is important that by a relatively small modification of the first generic indicator a sig-

nificant positive effect can be achieved in the implementation of policy and measures.

4.1.2 Capacity to implement policy, legislation, strategy and programmes

The successful implementation of strategies, policies and measures will depend much more on the quality of the capacities at the institutional and individual lev-

Table 4.2 SWOT analysis of the implementation of policy, legislation, strategy and programmes

S/Strengths	W/Weaknesses
The Strategy for KP (7) includes concrete measures for selected IPCC sectors	Low capability to implement adopted strategies, policy and programs, lack of systemic support for the transformation of action plans into measures that really will be implemented
Direct legislative support has been adopted only for certain areas – for example waste management, F-gases	No direct legislation to support implementation of policy; measures for the whole field of climate change has not been prepared
Economic tools supporting the energy efficiency and use of renewable energy sources (from domestic and foreign sources) are available to a limited extent	No direct legislation to support the enhancement of energy efficiency and the use of renewable energy source has been adopted
The programme of progressive exclusion of matters damaging the ozone layer	The capacities for continual monitoring and evaluation of the implementation of policy and measures are not adequate
Indirect legislative tools have a positive side effect on the reduction of GHG emissions	The mandates of institutions involved in the process have not been always explicitly stipulated, there is a lack of financial and human sources and the institutions are often unable to ensure the continuity of their activities
SR has adopted the strategy, developed supporting tools and also has practical experience with flexible mechanisms under KP in the form of AIJ, JI a ET	Insufficient coordination of sectors in the implementation of policy and measures, low effectiveness of outcomes of cross-sectoral groupings
Active participation of NGOs	Lack of qualified and experienced experts in the field of implementation (the combination of technical, legal and economic knowledge is required)

Table 4.2 Continued

O/Opportunities	T/Threats
Possibility to use and acquire experiences from international projects	Relatively assured achieving the commitment of Slovakia during the first target period of KP
Possibility to get finances from international funds	Change of country priorities, missing political will to implement needed but unpopular measures
Creating pressure to introduce innovation and new environmental technologies	Failure of incentives for innovation and environmental technologies
Use of voluntary instruments	Significant reduction of energy prices from fossil sources
Unused expert and technical backup of the private sector and non-governmental organisations	

els. The emphasis is shifted towards management, managing and technical skills. The quality of outcomes will depend on the ability to use existing opportunities (for example argument and expert's own experience with additional ones using the financial resources from international projects). The opportunities in combination with the strengths (for example the evident positive effect of indirect instruments) may compensate for missing legislation and the existing subconscious threat of relatively certain achievement of the commitment under the KP. The mobilisation and the development of capacities in this area will be determined in the short term mainly by the KP entering into effect and by the recently transposed EU directives on energy efficiency and renewable energy.

4.1.3 Capacity for engagement and building consensus among all stakeholders

There has been no tradition in Slovakia of consensus building in various fields of strategic development of the country, including the protection of environment. The situation has changed significantly after 1989. The changes were initiated by national and international NGOs. Their activities have stimulated some positive steps at the systemic level, in particular, in legislation. New information technologies distinctly contributed to the change of attitude. The identified strengths and opportunities still are not sufficient to change current, very often formal use of consensus in Slovakia to more distinct and particularly informal engagement. It is not

Table 4.3 SWOT analysis of engagement and building consensus among all stakeholders

S/Strengths	W/Weaknesses
Active participation individuals from universities, associations and NGOs in the preparation and implementation of strategies and concepts	Formation of broadly based engagement and building consensus has no tradition in Slovakia
Public hearing tools on strategic documents on climate change (for example Energy Policy)	Low effectiveness of cross-sectoral groupings in the enforcement of common objectives
Legislation promoting the engagement of the general public in decision making	Public is not adequately informed and motivated to more actively influence relevant decision making
Establishment of the Third Sector Panel (1994), which represents the civic organisations and as a partner in negotiations with the government and parliament	Insufficient depth of information needed to achieve the commitments under the Convention
Establishment of "Ekofórum" (1989) as the informal association of environmental NGOs to implement their common position and requirements	Available capacities (information, material, human sources) are not used effectively; horizontal and vertical flows of information are not provided systemically
Number and activities of NGOs (national and international) in Slovakia	Low expert and managing level of already established information centres and public relation centres
Participation of representatives of VÚC, RPIC and municipalities	Slovakia has not become a Party to the Aarhus Convention
O/Opportunities	T/Threats
Raising public awareness at the individual level	Extremist opinions and activities
Development of communication and information technologies	Coercive enforcement of group interests
Transformation of public administration towards the regional and local levels	Reluctance or lack of competence to communicate and provide information
New and unusual forms of environmental awareness building	Low public interest to participate in decision making

only the case of the outcomes of existing cross-sectoral groupings but also for the participation and engagement of the general public in the decision making process. Motivation comes as the consequence of an urgent problem (for example floods, meteorological changes, etc.) rather than the natural need and use of existing opportunities. The use of new and innovative forms of environmental awareness raising is also a suitable opportunity to change the passive attitude.

4.1.4 Capacity to mobilize information and knowledge

Capacity assessment in the context of mobilising information and knowledge shows a relatively balanced situation between strengths and weaknesses, or op-

portunities and threats. The identified imperfections can be compensated by mobilisation of current capacities, or more specifically, by the coordination of scientific and research activities on climate change at the governmental level, also covering the other Rio Conventions. Funding needs to be addressed. Highly qualified experts can be used in the current system of education and training of specialists and technicians in capacity building. However, it is important to improve the capacity framework as soon as possible, as many of the strengths are not sustainable. The continuity of institutions and adequate number of qualified experts, capable to fulfil commitments under UNFCCC and KP, cannot be guaranteed, if the current arrangement continues. Moreover, the threats have a negative effect with respect to the outflow of young and talented scientists and the decrease in environmental teachers in schools.

Table 4.4 SWOT analysis of the mobilisation of information and knowledge

S/Strengths	W/Weaknesses
The obligation to support research and development exists in Slovak legislation	The research on climate change has not been a priority field of the state research and development programs
Long-term tradition of science and research institutions	The synergy of research activities within UNFCCC – CBD – UNCCD has not applied in Slovakia
Current scientific and research capacities cover much of the topic	Existing scientific and research capacities are not used adequately and effectively
There is a wide range of qualified experts who can participate in further scientific training	Coordination of research activities is insufficient, managing and researching skills do not exist
Financial mechanisms are available to support small scientific projects (VEGA, APVT, sector sources for science and research).	National funds, allocated for research, are very limited for the field of climate change
EU funds for science and research are available	Lack of initiative in searching new ideas for projects and lack of experience in developing new project proposals funded from international funds
There are two priorities in research and development directly linked to climate change (flood warning and prognostic systems POVAPSYS, and programs on energy savings and renewable resource use). In both cases the complementary funding from the EU funds is expected	The share of private funds in financing research activities is very low
Strategic and legislative support is available for providing and disseminating information on the effects of climate change	Information campaign on the impact of climate change on human activities, focused directly on soil owners and users, technicians and managers in the energy, transport and waste management sectors have not been addressed; Information campaigns for general public have been prepared unsystematically and without innovation
Concept documents, curricula and programs supporting environmental education are in place	Many teachers specialised in environmental education are leaving their jobs due to either retirement or low salaries
Limited number of qualified experts is available, who are technically skilled for achieving the commitments under UNFCCC and KP	Systemic support for specific and continuous education of new experts, technically skilled for achieving commitments under UNFCCC and KP, does not exist
O/Opportunities	T/Threats
Information and financial resources of the EU	Escalation of the outflow of young and talented scientists
International collaboration	Low competitiveness in the international context
Political pressure of the EC to introduce innovations	Insufficient supervision of allocated sources
Inflow of international investments followed by the transfer of research activities	Decreasing demands on highly qualified services

4.1.5 Capacity for monitoring, assessment, reporting and education

The scale and the quality of capacities for monitoring, reporting, assessment and education is an important and necessary tool for achieving the technical requirements of UNFCCC and KP. Meeting the commitments within the framework of current capacities was successful despite the fact, or perhaps due to the fact, that it was based particularly on the effort and professional approach of individuals at the systemic, institutional and individual levels. The level of expertise of all stakeholders is an excellent starting point to building the National inventory system (NIS) according to the requirements of 20/CP.7. The weaknesses of the process include lack of horizontal and vertical cooperation of relevant parties; in-

sufficiently specified mandates (legal and institutional) and incompatibility of ongoing processes with the common objectives. Building the NIS is a long-term process also due to a need to meet the requirements of accreditation, certification and implementation of QA/QC. The highest risk is associated with the adherence to the current “satisfactory” situation with respect to achieving the commitments under the KP. That alone however, does not ensure the development of the NIS. The current system of monitoring, reporting, assessment and education is highly vulnerable and even a small change could disrupt the continuity and consistency of the procedures currently used. On the other hand, the involvement of Slovakia in important European organizations is a great challenge, that can help to gain new experience, financial and information resources.

Table 4.5 SWOT analysis of monitoring, assessment, reporting and education

S/Strengths	W/Weaknesses
Legislative support of monitoring, assessment, reporting and education has been implemented, the concept of environmental monitoring has been adopted	The mandate for the emission inventory pursuant to the KP is not well defined with regard to legal and institutional aspects
Achieving commitments in the reporting of emission inventories	Mandates of experts that represent Slovakia according to the definition of KP are not well defined with regard to legal and institutional aspects
Achieving the commitment of the assessment of emission inventories – national communications, projections (assessment)	Inadequate financial, personnel, material and information capacities to achieve the commitments under UNFCCC and KP
Consistency of methodologies used for the assessment of emission information	Non-transparent collection of and analyses of information, high uncertainty of input data and lack of mandate to obtain the data on activities
Qualified experts with international experience for achieving the commitments under UNFCCC and KP (assessment, reporting)	Lack of capacity (financial sources and managers) for meeting the requirements of QA/QC process and for accreditation and certification
Existence of database NEIS, some national (specific) data (emission factors, methodologies)	Incompatibility of input data from different institutions due to different methodologies for data collection
Use of foreign financial aid	Maintenance of status quo, missing stimulation for further development of monitoring, assessment, reporting and education
Information system on environmental monitoring (at the Internet)	Obtaining input data from the private sector for reporting purposes is difficult
Participation in the GCOS program	
O/Opportunities	T/Threats
Emission trading under the KP as the opportunity for capacity building and capacity development	Lack of continuity of reporting, monitoring, assessing and education processes
Transposition of EU legislation and EU membership is the opportunity for capacity building	Results of the analyses and assessments are not reflected in the development of policy and strategies
The use of the synergy of global environmental conventions	Failure of management and coordination of data collection and reporting
Change of management practice, technologies, innovations, approaches	Comfortable situation with regard to achieving commitments of Slovakia for the first target period of KP
Use of national and international databases	No capacities have been created for possible external changes in methodology
Development in information technologies in the public sector in relation to stakeholders	Re-evaluation of commitments of Slovakia by UNFCCC or EU due to high emission reserves considering the European emission trading

4.2 Key assets and needs in priority areas in Slovakia for strengthening and developing capacity to achieve commitments under the UNFCCC and KP

Priority fields for strengthening capacity directly identified in the Strategy of SR for achieving commitments under the KP (7), are as follows:

- improvement of the quality of GHG emission inventories – completion of a national inventory system;
- implementation of policy and measures to reduce GHG emissions;
- preparation of projections and evaluation of the effect of policy and measures;

- preparation of national communications and action plans;
- implementation of mechanisms of flexibility and preferentially the emission trading.

Additional obligations were selected by the desk review and expert opinion in the working group:

- research, systematic observation and monitoring of climate change;
- training of scientists, technicians and managers.

The outcomes of the capacity analysis of these fields are described in detail in the following tables.

4.2.1 Implementation of policy and measures to reduce greenhouse gas emission and to enhance removals by sinks

Table 4.6 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> • Many strategic sectoral documents and action plans have already been precisely defined for the sectors, suitable tools and also a number of technical and economic data for decision making on climate change • Established systemic support to promote the liberalisation of the market for electricity and the elimination of subsidization of energy prices. • Indirect measures that significantly contribute to the current stabilisation in GHG production. • Economic instruments⁵⁷ are available for the implementation of environmental measures and projects in the form of national funds (MŽP SR and MH SR) or international funds. • Information sources and information campaigns on economic tools are available but they work mainly at the regional level. • Slovakia has implemented the EU directives introducing and tightening energy standards and mandatory labelling of all appliances. • The action programme of Slovakia for progressive exclusion of substances damaging the ozone layer approved by the Government, including the support for small and medium enterprises in selected fields⁵⁸. 	<ul style="list-style-type: none"> • Coordination of activities at the cross-sectoral level in the implementation of policy and measures, including the use of information, financial and human resources. • Cooperation of sectors in the implementation of EU environmental directives. • Systemic support for continual training of qualified managers and experts/ specialists for the implementation of policy and measures. • Systemic support for progressive monitoring and assessment of the measures implemented, including the development of an information portal for specialists and the general public. • The use of temporary institution of binding agreements on energy audits for specific fields, as preparation for the upcoming EU directive on energy efficiency. 	<ul style="list-style-type: none"> • Relatively “guaranteed” achievement of commitments does not provide motivation to enhance systemic and financial support for capacity development. • No direct legislation has been adopted to enhance the efficiency of energy production and consumption, which means for Slovakia a large time lag (in comparison with the EU) in establishing conditions for sustainable development of the process. • Insufficient awareness raising in energy audits, lacking more intensive documentation and promotion of benefits. • The broader use of renewable energy resources is limited due to the lack of legislation, long-term validity of the guaranty of a minimum purchase price, as well as the low level of publicly available information on the potential use of renewable energy resources. • The continuation of some market distortions – for example heat delivery and heat consumption are not separated.

⁵⁷ Usually limited as regards the time and scale.

⁵⁸ Technological upgrading of existing equipment, working with regulated substances; Instalment of new equipment containing alternative substances; Support of collection, recycling, recovery and disposal of used regulated substances.

Table 4.6 Continued

Level	Assets	Needs	Barriers
Institutional	<ul style="list-style-type: none"> • Long-term continual participation of SHMÚ and implementing agencies (SAŽP and SEA) in the implementation of legislative and other supporting measures for MŽP and MH SR. • Information database of energy indicators "ODYSSEE" or ISED (indicators of sustainable energy development). • Active participation of NGOs in the implementation of policy and measures – it is an asset not only with regard to the content but also the utilisation of new and progressive forms⁵⁹. 	<ul style="list-style-type: none"> • Establishment of a cross-sectoral working group to coordinate activities in relation with implementation of policy and measures (including financial and human resources). • Effective use of available information sources to analyse and compare trends of energy efficiency, exchange of information. • Collaboration in the standardization of the qualification of managers and specialists in relevant sectors. • Effective use of experts from the private sector and non-governmental organisations in the implementation of policy and measures. 	<ul style="list-style-type: none"> • Existing experience in the effectiveness of cross-sectoral committees is not the best. The low performance is influenced also by inconsistent participation of representatives of state administration in meetings. It is very difficult to enforce wider acceptance of results and decisions at the highest level without the involvement of state administration. • High cost of energy audits for small consumers of energy. • Large consumers are not interested in becoming authorised consumers (who can negotiate individual prices) and this hampers the establishment of a functional market (lack of experienced energy specialists, problems with accounting)
Individual	<ul style="list-style-type: none"> • Preparation of specialists for the operation of refrigerators (F-gases) and inspection of technical conditions of appliances (SIŽP). • Long-term experience and activities of SEA staff in using economic instruments in energy efficiency and renewable energy sources, counselling and consultancy in relation to the EU Structural Funds. • Increased interest of consumers in energy labels when they buy more expensive appliances. 	<ul style="list-style-type: none"> • Promotion of the system of regular training of employees on the implementation of policy and measures. • Promotion of the exchange of information and experiences of employees as regards the implementation. • Motivate financially the employees to attain adequate qualification for the implementation of policy and measures (the context combination of technical, legislative, economic and language skills in continuously changing conditions). 	<ul style="list-style-type: none"> • High costs of technologies (all technologies are imported except for sun collectors and boilers for biomass). • Long-term return on investments at current purchase prices. • Risk connected with the implementation of a project using renewable energy sources. • Lack of trust in the performance of these technologies, lack of organization in the sector (producers, service providers and spare parts suppliers). • Technologies are not difficult to install and only represent a small part of the investment;⁶⁰ this allows domestic suppliers enter the business; there is no stimulation for increased employment. • Regarding biomass, there is a problem with the guaranteed delivery of the required quantity and quality (easy solution – co-incineration with fossil fuel).

⁵⁹ ECB activities could be an example: Free of charge energy counselling – the contact address is on the Internet, for energy savings in houses and apartment houses. Portal on energy efficient construction: <http://www.e-filip.sk>; the handbook: Let us to build and live with Filip; Atlas of utilization of renewable energy sources in Slovakia – the comprehensive information on implemented projects, including pictures.

⁶⁰ In wind power stations it is about 10% of the total investment.

4.2.2 Improving the quality of greenhouse gas emissions inventory, completing national inventory system

Table 4.7 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> Emission inventories of GHG are reported by the required date (April 15 annually for the year X-2) and in the required format CRF according to the approved methodologies IPCC, requirements of UNFCCC and decisions of the COP. Legislation for preparing and publishing (annually) emission inventory of GHG (SHMÚ, OKO) is in place. The emission inventory has not been sufficiently institutionalised and to a considerable extent it relies on collaboration with external suppliers (legal and physical entities) that finally results in cost saving. 	<ul style="list-style-type: none"> To identify stakeholders and their competencies with regard to the inventory, including mandates to represent the country in international activities. To strengthen existing capacities (material, financial and human sources) to improve the quality of the current inventory in compliance with Decision 20/CP.7 (the establishment and operation of a web page, certification according to ISO 9001, consistent implementation of the quality system QA/QC, evaluation of uncertainty of emission factors) for meeting new, extensive and time consuming obligations of reporting according to Council Decision 280/2004/EC. In relation to the introduction of QMS the accreditation must be ensured, as well as the certification of the working process of the greenhouse gas inventory for the Secretariat of UNFCCC and EU according to European standards (ISO, EN)⁶¹. To launch the NIS before December 31, 2005. This means, based on the authorisation to, that the institution(s) entitled SNE should start to work and will be responsible for achieving the annual obligations under the UNFCCC, KP and EU legislation. To have binding financial capacity from the state budget that is needed for carrying out the annual tasks of the NIS according to the needs analysis. To re-define the scope and forms of outcomes and to ensure effective coordination of collection and releasing of statistical data for reporting (and other international statistical databases); to move towards gradual systemic interlinking of the reporting to databases CLRTAP, UNFCCC, EPER in the sense of consistency and comparability of emission data. 	<ul style="list-style-type: none"> Relatively "guaranteed" achievement of the commitments under KP and good results in the inventory, that Slovakia attains through the current flexible capacity framework. The current system of inventory is vulnerable, because it is based on individual sectors and experts. The lack of capacity at the systemic level are often compensated for by the initiatives from the bottom and by the high qualification of experts.

⁶¹ This *inter alia* means: to ensure QA/QC control by an independent team of experts or independent NIS audit, to ensure appropriate archiving documents according to principles „good practise“ to develop a system (software) to control input and output data of emission inventory for the quality control (QC) in the sense of keeping the consistency and accuracy, to identify key sources and uncertainties according to the methodology Tier 2 and more precisely, to improve existing system NEIS to cover needs of national legislation.

Table 4.7 Continued

Institutional	<ul style="list-style-type: none"> • The SHMÚ (OKO) has the legislative mandate and long-term experience in the preparation and coordination of the inventory of greenhouse gas emissions. • External institutions (experts) are contracted to carry out the inventory of greenhouse gas emissions for the IPCC sectors (this results in a reduction of total costs). • Within the limited resources (both financial and human), the inventory and the introduction of the revised methodology has been satisfactorily carried out – the emissions of key sectors and sources are reported with a higher priority, there is consistency in the reported emission data in key sectors (energy, industry) generally national emission factors are used. • Operators of mining activities are willing to cooperate in a re-evaluation of emission factors from mining and post-mining activities (long term measurements of methane concentration should be the base). 	<ul style="list-style-type: none"> • The expert base in the division according to sectors is the most frequently represented by only one expert! Therefore it is urgent to increase the number of experts for monitoring, assessment and reporting. • To define the relationship between the SNE, experts and the Statistical Office SR with regard to the deadlines for delivering and publishing official statistic data. • To stipulate the competencies of SNE in relation to individual operators of sources of GHG pollution in the sense of reporting raw material consumption and production, or the quantity and type of GHG. • To mobilise financial and expert capacity and use them to determine national emission factors for mining and post-mining activities of operators of brown coal mines (highly overestimated emissions) as well fugitive outflows of oil and natural gas during transport. • To implement national research projects (financed also from non-governmental sources) on the identification of emission factors for key sources and sectors, the results of research and measurements to be published in the database of emission factors, identification of other sources of air pollution producing GHG, that have not been included in the emission inventory. After the “warming” period 2005-2007, in 2008 the data of GHG emissions from NIS and National Registers for emission trading must be verified and compared (2008-2012). 	<ul style="list-style-type: none"> • Due to the lack of institutionalisation and specifically allocated finances, the current for the inventory is not being developed evenly, and problems are being only partially solved. • There is no legislation to control fugitive emissions that are not included in the emission trading scheme.
Individual	<ul style="list-style-type: none"> • Qualified experts are available for the inventory. They also actively contribute to international cooperation within the UNFCCC with regard to in-depth review, drafting and modifying IPCC methodology. • International cooperation in the sector Land Use Change and Forestry (LUCF) is coordinated by EFRA, which actively participates in the preparation and revision of the methodologies of IPCC⁶². 	<ul style="list-style-type: none"> • To provide further professional development of experts (education, training courses, workshops) and continuous training of new experts for emission inventories. • To promote the participation of national experts in meetings the TASK FORCE and EIONET Meetings on Emission Inventories and Projections organised by the EEA. • To allow national experts to participate in the activities of the working groups of UNFCCC: <ol style="list-style-type: none"> 1. ANNUAL INVENTORIES 2. EMISSION PROJECTION 3. EMISSIONS TRADING. 	<ul style="list-style-type: none"> • Emission inventory is a difficult and specialised task and attaining adequate qualifications is a long term process, requiring international experience. Current salaries in this field do not allow the recruitment and retention of a sufficient number of qualified specialists. A similar situation applies to the preparation of software experts who are able to develop and operate large databases.

⁶² 1996 Good Practice Guidelines a 2000 Good Practice Guidance.

4.2.3 Preparation of projections and assessment of measures effects

Table 4.8 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> • Projections of GHG emissions have been prepared and reported in national communications since 1995. • Projections have been prepared in the form and scope required by the UNFCCC directives. • Slovakia regularly assesses the projected reduction effect of measures for selected years according to the recommendations of the UNFCCC. • Projections of emissions published in three national communications on climate change are consistent in sense of used methodology and models. • MŽP SR and SHMÚ carry out a project within the programme CAFE. 	<ul style="list-style-type: none"> • To specify and make public the mandates of institutions and experts who participate in the preparation of the projections of greenhouse gas emissions⁶³. • To strengthen current capacity (financial, material and human sources) in order to allow further development of the assessment of the effects of policy and measures, model innovations or the purchase of new ones. • To appoint an expert for the projection of GHG emissions, to promote active participation of local experts in international projects, for example in methodology development, in the development of new models for emissions projections. • To ensure systemic support of continuous education and training of experts for preparing projections – a necessary condition for the sustainability and quality of the process. 	<ul style="list-style-type: none"> • The process is not institutionalised, there is minimum number of staff positions, good results are achieved due to the high qualification and the continuous initiative of individuals. • The scarcity of national/local funds; the process is demanding with regard to the scope and quality of input data. • There is a lack of systemic support for the further development of methodology, computer models and training.
Institutional	<ul style="list-style-type: none"> • The capacity framework for projections is not adequately institutionalised due to a low frequency of implementation. This form is financially less demanding. 	<ul style="list-style-type: none"> • Regular exchange of information and information sources among the institutions and experts. 	<ul style="list-style-type: none"> • The expert base for emission projections is similar to the base for inventory (often identical because of the expert). The problem is the same: 1 expert/ 1sector!
Individual	<ul style="list-style-type: none"> • Qualified experts for the projection of GHG emissions are available. Many of them have international experience including lectures in training courses on computer models for projections. 	<ul style="list-style-type: none"> • To ensure national sources and conditions for the continuous preparation of new specialists and the participations of the currently qualified experts for the producing the projections. 	<ul style="list-style-type: none"> • Projections of GHG emissions is a field that demands expertise, and complicated software. This is a long-term process also requiring international experience. Current salaries in this area do not allow the recruitment and retention of a sufficient number of qualified specialists. • National sources and conditions do not allow for further education and training. The majority of experts have obtained practical experience from bilateral and multilateral aid.

⁶³ Very important in collecting important input data from officially designated organizations.

4.2.4 Preparation of national communications on climate change and national action plans on emission reduction

Table 4.9 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> • Three national communications on climate change have been published (1995, 1997 and 2001) in accordance with the requirements of the UNFCCC. • The national communications also include the results of long-term research on the expected impacts of climate change, estimated vulnerability and adaptation measures. • Slovakia evaluates regularly the projected reduction effect of measures for selected years according to the recommendations of the UNFCCC. • The Action Plan for the reduction of CO₂ emissions from energy was prepared (the reduction potential along with specific costs were specified). 	<ul style="list-style-type: none"> • To identify a national work team for the development of national communications that continue the consistency, reproduction and transparency. • To identify national experts (formal appointment) for contact with international organisations, to represent Slovakia at international meetings and to participate regularly in the working groups of international institutions. • To appoint experts or organisations for each IPCC sector and gas, with specified responsibilities. • To participate in the international exchange of experience, for example by a cross-country review, e.g. with the Czech Republic. • To ensure the systemic support for continuous training and education of experts in the subject areas of the national communications. 	<ul style="list-style-type: none"> • Lack of national funds for the field; the process requires the coordination and cooperation of the relevant sectors and institutions, as well as the large scale of high quality input data. • Lack of systemic support for the further development of methodology, computer model innovations and training courses.
Institutional	<ul style="list-style-type: none"> • Capacity framework for projections is not adequately institutionalised; there is the continuous participation of institutions and experts, coordination needs to be improved. 	<ul style="list-style-type: none"> • To promote regular exchange of opinions and experience of experts (teams) beyond the framework of national communications. Continual consultation meetings of experts addressed to the up-to-date changes in the UNFCCC directives, methodological and technical documents of the IPCC, or new reporting requirements could improve the process. 	<ul style="list-style-type: none"> • Barriers to the preparation of national communication are the same as barriers identified for the inventory and projections.
Individual	<ul style="list-style-type: none"> • Qualified experts to prepare national communications on climate change are available. • Local experts participate in international cooperation and the exchange of information on methodology and also contribute to in-depth review of the UNFCCC. 	<ul style="list-style-type: none"> • To ensure national resources and conditions for the continuous training and education of new experts for the subjects of the national communications using current qualified experts. 	<ul style="list-style-type: none"> • Preparation of national communications demands individuals high level of expertise. Current salaries in this field do not allow recruitment and maintenance of a sufficient number of qualified specialists. • National resources and conditions for further development of experts are not available. The majority of experts has obtained practical experience in bilateral and multilateral aid, and participation in workshops

4.2.5 Implementation of flexible mechanisms under the Kyoto Protocol

Table 4.10 Identified assets, needs and barriers of the capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> • The Strategy SR for achieving the commitments under KP includes the strategy of international activities within flexible mechanisms. • Legislative support for GHG emission allowance trading has been adopted • The procedure on how to submit projects JI (21) was developed and published, along with the approval criteria of the SR which identifies the institutions and their competencies in this regard. • General principles of GHG emission savings (22) were published- The integration of Slovakia into the AU process. • as the preparatory phase for the JI mechanism. • In 1998 a complex background study was developed for decision making with respect to flexible mechanisms (24). • The Memorandum of Understanding with the WB, the Dutch PCF, Austria and other countries has been signed. • The world primacy and practical experience in CO₂ emission trading according to the mechanism of Article 17 of KP. 	<ul style="list-style-type: none"> • To strengthen the capacity of the NFP, or to establish a new one for flexible mechanisms under KP is interlinked with the EU Scheme for GHG emission allowance trading. • To create a separate information portal at the web page of MŽP SR with all available information on the flexible mechanisms according to the KP (including links to international information sources) – the topic should also be included briefly in the separate portal on climate change. • The Act on emission trading requires the establishment and operation of a national register – this means new capacity with regard to financial, material and human sources. 	<ul style="list-style-type: none"> • The long and rather difficult process of approving rules and modalities for the flexible mechanisms of the KP- A limited number of suitable projects in Slovakia, demands on the administration, expertise and cost of project preparation for the JI mechanism.
Institutional	<ul style="list-style-type: none"> • In addition to official institutions, also consulting companies and experts have been participating in the implementation, in particular with regard to independent project assessment, verification and monitoring. • The methodology developed for the assessment of project eligibility for the JI mechanism has been accepted internationally. • Slovakia participated in the first CO₂ emission trade, which is a positive incentive. • The introduction of SO₂ emission allowances at the level of districts and individual sources⁶⁴. • For operators of selected sources the emission allowances of CO₂ have been specified for the period 2005-2007, as well as the legislative framework for the trading within the country, with other EU countries, or the countries in Annex B to the KP. 	<ul style="list-style-type: none"> • To provide all stakeholders and the general public with comprehensive information on the use of flexible mechanisms – including legal and economic relationships. • To promote the exchange of information and practical experience from completed trades/projects. 	<ul style="list-style-type: none"> • Initial disbelief and lack of initiative of national operators and investors – often due to a lack of clearly presented information. • The lack of practical experience on the preparation and assessment of projects in CRF formats according to the UNFCCC – and an unwillingness of investors to accept additional (transaction) costs.
Individual	<ul style="list-style-type: none"> • Gradual involvement of Slovakia in the process of the AUJ, JI and ET has allowed national experts to obtain necessary qualifications and international experience. 	<ul style="list-style-type: none"> • To promote the education of new specialists and experts for flexible mechanisms of KP. 	<ul style="list-style-type: none"> • There are not enough resources for the education of specialists for flexible mechanisms.. The experts have received the information, financial and practical experience mainly through participation in international projects. There are few qualified national experts.

⁶⁴ For EU membership the European Trading Scheme and flexible mechanisms, this instrument can represent an advantage in the implementation of Cap & Trade principles.

4.2.6 Research, systematic observation and monitoring of climate change

Table 4.11 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> • Adopted concept of environmental monitoring of all environmental components. • Establishment of the Information system of environmental monitoring (available on the web page of the MŽP SR) • participation in the GCOS programme. • Mechanisms for funding research and small scientific projects have been developed through state orders, scientific grant agencies (VEGA, APVT), or sector sources for science and research. • The capacities at the Ministry of Agriculture SR have been provided for 4 projects directly focused on climate change. • The project “Progressive climate change and the impact on social development” has been implemented as a state research and development programme. • With regard to climate change, the capacities (financial, institutional and personnel) for two research and development areas are available (POVAPSYS and projects addressing energy savings and the use of renewable energy sources.) 	<ul style="list-style-type: none"> • General requirement to increase national funds for science, research and development. • To annually dedicate finances for the National Climate Programme. • In the budget of the MŽP SR allocate annually the finances for the SHMÚ for the purpose of monitoring the climate of Slovakia within the GCOS system and other global programmes and projects and to administer and improve the data archive. • Capacity support to GCOS program (personnel strengthening, implementation of QA/QC program, improving the archival system). • To improve the coordination of research and to use existing capacity of research institutes, universities and academic institutions, as well as the private sector more effectively (information and human sources). • To support the draft of the new state program for science and research (2006-2010) focused on the identification of climate scenarios and the complex assessment of impacts on agriculture, water management, nature and health protection, including emission inventories and socioeconomic analyses. • To define the framework of management responsibility at the governmental level for the implementation of UNFCCC in research, including setting-up a specialised steering institution together with dedicated financial resources. The implementation of the results of national and international research into action plans and practical sector policies should be a priority of the institution. 	<ul style="list-style-type: none"> • In general, the supportive pressure of central bodies in the research of climate change and its impacts is lacking. The reason is that competent organisations and experts are not adequately informed on the content and objectives of projects, as well as on the use of the outcomes. • The realistic assumption that Slovakia will achieve the commitment under the KP, and so far limited proven effects of climate change in Slovakia and weak information do not create the needed support for research of climate change. • Limited financial sources and poor coordination of research. Practically, the synergic effect (financial, institutional and human capacities) in the research within UNFCCC, CBD and UNCCD has not been used.
Institutional	<ul style="list-style-type: none"> • There is a long-term tradition of research and scientific institutions in monitoring of environmental changes in all components (air, soil, water, forest ecosystems, meteorology and climatology). • In 1991 the National climate programme (NKP) as a part of the World Climate Programme (WCP) and the WMO was established. • The SHMÚ – that has the legislative mandate to carry out many tasks of the UNFCCC and KP has been identified. The tasks are monitoring, climate research and the inventory of GHG emissions. 	<ul style="list-style-type: none"> • To enlarge current research according to requirements of the UNFCCC to cover further activities: climate change and human health, impacts of climate change on the economy and social activities and research on national emission factors. • To use official information sources for more intensive promotion of research and development activities and the results of private sector research. 	<ul style="list-style-type: none"> • Significant shortage of capacities at the institutional level for the assessment of socio-economic impacts of climate change and the quantification environmental externalities. • Lack of initiative and often insufficient experience in the preparation of project proposals is the reason, that there are big differences among institutions with regard to the participation in international financed projects.

Table 4.11 Continued

Level	Assets	Needs	Barriers
Institutional	<ul style="list-style-type: none"> Research activities cover a relatively large area⁶⁵. Besides research institutes and universities that have been active in this area for many years, also private companies begin to research the topic (concentrated on solar energy, sun collectors and boilers). 		
Individual	<ul style="list-style-type: none"> The potential of qualified researchers and experts on monitoring and assessment is used and is highly respected internationally. The research platform consists of experienced experts and there is potential to create specialised scientific teams. 	<ul style="list-style-type: none"> By an active financial policy to motivate young generation to participate in scientific and research programmes on climate change. To intensively support the participation of Slovak research teams and individuals in international programs and projects in order to gain experience particularly in management. 	<ul style="list-style-type: none"> Generation problem is increasing. Scientific and research work is less attractive for young generation, particularly due to lower salaries in comparison with remuneration in private sector. The absence of middle age managers is becoming being a problem in science.

4.2.7 Training of scientists, technicians and managers

Table 4. 12 Identified assets, needs and barriers of capacity framework

Level	Assets	Needs	Barriers
Systemic	<ul style="list-style-type: none"> Legislative, long-term tradition; institutional and expert conditions for the education and registration of experts for refrigeration and air condition (F-gases). SEA organises short-term and long-term courses on energy savings in production and consumption, as well as on the use of renewable energy sources. NGOs are also active in the training and education of technicians. They provide training in the fields that are not covered by official agencies and often use non-traditional training forms. Their activities are not funded from the state budget, which is a positive feature. Seminars for experts are organised on the occasion of the World Meteorological Day and World Water Day. 	<ul style="list-style-type: none"> To prepare a complex strategy for the education and training on climate change at all levels (for managers, experts, general public and students). To establish supportive instruments at the systemic level (legislative, regulatory and economic) to ensure continuous training of managers in the relevant sectors on climate change. To ensure capacity for continuous and complete training and education of experts and technicians on climate change (inventory, emission projections, preparation of national communications, assessment of effects of adopted measures, etc.). To motivate systematically practical performance in order to improve the requirement for services with a higher qualification. To promote the participation of NGOs as lecturers and trainers of technicians and to inform them about these activities. 	<ul style="list-style-type: none"> Currently there is no specific document (either concept, action plan or programme) available that outlines a strategy and measures for achieving commitments under UNFCCC and KP in the field of education of scientists, technicians and managers. Limited sources in the sectors allocated for the education and training of managers (according to the Act on public service) are being used for defined priorities, the climate change issue has not been the subject of any special training. The current situation in ensuring technical documents for meeting the requirements of the UNFCCC is critical with regard to the number of experts. It reflects the simplified scheme: 1 expert/1sector !

⁶⁵ Climate research; Vulnerability, mitigation and adaptation; Technical and technological research and development (for example in renewable energy sources) systematic observation and their archival storage; Research in F gases – in the 90th was focused only on the substitutions of chlorinated coolants by F gases, in recent years some developing tasks connected with the introduction, manipulation, recycling and inspection of coolants.

Table 4.12 Continued

Level	Assets	Needs	Barriers
Institutional	<ul style="list-style-type: none"> • The organisational structures with long-time tradition and experience in training and education of experts and technicians are available for some fields (either with direct link to climate change or without it) – SAŽP, SEA, SZ CHKT. 	<ul style="list-style-type: none"> • To establish conditions for capacity development at the level of institutions and experts for the evaluation and quantification of environmental externalities in relation with climate change. 	<ul style="list-style-type: none"> • There is a noticeable lack of capacity at the institutional level for the assessment of socio-economic impacts of climate change and quantification of environmental externalities. • Demands for services with higher qualifications are decreasing.
Individual	<ul style="list-style-type: none"> • There is a long-time tradition of experienced specialists and expert backup available for education and training in the fields. • With regard to F-gases, direct contacts have been made at the expert level, in particular in education and cooperation in the development of legal and technical standards⁶⁶. 	<ul style="list-style-type: none"> • To promote the availability of training courses and continuous education of experts and managers on all aspects of climate change. • To prepare a separate information portal on climate change for the general public (the UNFCCC Beginner at www.unfccc.int can be used as an example). 	<ul style="list-style-type: none"> • There is a decrease of specialised teachers due to the aging of current teachers and low salaries.

⁶⁶ UNEP RTOC – Commission for refrigeration dealing with gradual exclusion of chlorinated coolants; IIR – International Institute for Refrigeration in Paris; AREA – Association for refrigeration and air condition in Brussels and EPEE – European partnership for ecology and energy.

5. Recommendations

Suggestions and recommendations how to modify the capacity framework of Slovakia have been prepared on the basis of the outcomes of the in-depth inventory, questionnaires, interviews and SWOT analysis for the full range of commitments under UNFCCC, KP and COP decisions. Annex 1 contains a questionnaire that was used to obtain the opinions of respondents on the capacities needed to achieve the commitments. The questionnaire was published on the web page and therefore, along with the members of the working group, also scientists, researchers and experts from agriculture, climate change research, forestry and industrial associations could participate in the survey. The survey had two objectives: the first one related to the effort to define priority fields of Slovakia with respect to capacity development. The second one related to the selection of priority instruments that respondents would use to deal with the problem. The respondents quantified the capacity needs for the commitments under the Convention in the following categories:

- A. Supportive political framework
- B. Adequacy of legislation and enforcement
- C. Sufficiency and explicitness of institutions
- D. Effectiveness of management
- E. Adequacy, qualification and allocation of human sources

- F. Financial, material and infrastructural capacities
- G. Quality and availability of information

The first objective was not achieved by the questionnaire due to the large scope of activities of a specific nature on the one hand, and on the other hand very few respondents who had an understanding of the whole issue. However, the result of statistical analysis of respondent opinions with regard to priorities in the selection of instruments and measures, was very interesting. The survey results at chosen scale from 8 (the highest priority) to 1 (the least urgent solution) are presented in Table 5.1.

The results indicate a consistency of opinion that support strengthening or mobilising existing capacities rather than setting-up new ones. The sequence of other priorities indicates the reservations about management efficiency, communication and human sources management. It is interesting that respondents did not consider financial sources as a universal priority instrument for the development of the capacity framework. This provides the opportunity to implement suggestions from the group of “fast” and effective solutions, without any additional specific demand on financial sources.

Table 5.1 The result of statistical survey of opinions on the selection of instruments for capacity adjustment

Measure to adjust the capacity framework	Score
Strengthening existing capacity for climate change (financial, material and human sources)	7.00
Improving coordination of involved sectors (horizontal communication)	6.00
Defining responsibility and competences of involved sectors more explicitly	4.38
Ensuring adequate human sources for this area (with regard to the number qualifications)	4.25
Improving regulatory and legislative framework for the vertical management and communication (from central bodies to the individual level)	4.13
Ensuring adequate financial sources for this area	4.13
Legislative support for the establishment of a new and autonomous central institution for climate change	3.38
The improvement of continuous monitoring of the implementation of policy and measures for climate change	3.25

5.1 Recommendations for capacity strengthening, mobilisation and capacity development at the systemic level

Measure 1 – Strengthening capacity of the NFP on climate change

Current situation:

The NFP on climate change is currently represented by the staff of the Department of Air Protection of MŽP SR without formal releasing of the number of officers, mandates and competences at the national and international levels. Information on the activities and processes in relation to climate change are published on the web page of the MŽP SR within the framework of the information of the Department of Air Protection section on climate change⁶⁷.

Suggestions for strengthening:

1. Clear identification of the NFP on climate change within the organizational scheme of the MŽP SR;
2. Personnel strengthening of the NFP on climate change;
3. Releasing the mandate of the NFP for international representation and ensuring continuity in this area;
4. Releasing the competence scope of the NFP at the national level;
5. Appointing national experts in the area of emission inventory and emission projections to be contact persons for international organizations, should be in the competence of the NFP.
6. NFP should initiate the development of a long-term concept for cooperation with developing countries in the implementation of UNFCCC and KP, including the determination of responsibilities for individual areas;
7. Management responsibility for the implementation of UNFCCC in science and research;
8. Establishment of a separate information portal on climate change (it would be appropriate to divide it into two sections: a section for experts and a section for the general public⁶⁸).

The requirements of NFP capacity strengthening are connected with the requirements for financial, material and human sources.

Measure 2 – Establishment of a cross-sectoral group for climate change

Characteristics of the proposed capacity:

The members of the group should consist of the NFP representatives, managers from all relevant sectors responsible for the climate change and a representative of the Statistical Office SR.

The main task of the group should be the coordination of the national activities connected with issues of climate change.

Proposed competences of the group:

1. Support of the transparent institutional division of responsibilities for the topics/fields and creating conditions to implement them;
2. Coordination of sectors in suggesting strategies and implementation of policy and measures to mitigate climate change impacts;
3. Coordination of activities within the UNFCCC, CBD and UNCCD at the national level, running on the basis of detailed analysis of identical or similar topics;
4. Continual monitoring and assessment of implemented policy and measures in the sectors, releasing information on the current status of implementation;
5. Ensuring feed-back in relation to the change of strategy and policy based upon the results of monitoring and assessment;
6. Coordination and support for the effective use of knowledge, information sources, experience and financial sources among the sectors, with the stress on minimising duplication;
7. Promotion of the exchange of information connected with the use of environmentally sound technologies and innovations;
8. Ensuring the strategic approach and expertise of the Slovak representatives, who participate in international meetings on UNFCCC a KP.
9. Coordination of participation of the relevant sectors in cooperation with the developing countries in the implementation of UNFCCC and KP.
10. Ensuring the accessibility of information sources at the regional and local levels.

The proposed measure is connected with requirements for material and information sources; it does not require additional resources from the state budget.

Measure 3 – Systemic support (regulatory measure) of the adjustment of scope, quality and deadlines of providing official statistical data according to the requirements of UNFCCC, KP and EU

Current situation:

The Statistical Office of SR performs the statistical surveys according to their legislative mandate and in compliance with its main task to provide information on the status and development of national economy and society. The main problem which emerged during the development of outputs, is a large time lag in the releasing of official data in relation to the deadlines of the UNFCCC, as well as inconsistency of the statistical sectors and the IPCC sectors (due to compulsory protection of data in sectors with small number of enterprises).

The emission inventory in some sectors (energy, transport and industry) directly depends on the official data from the statistical yearbook. The data have never been available even for the original deadline of UNFCCC

⁶⁷ It is quite difficult for common users to search information on climate change.

⁶⁸ The web page of the UNFCCC Beginner could be the inspiration (www.unfccc.int).

(April 15). If the coordination of data collection and data release is not changed, it will be very difficult for Slovakia to collect statistic data before January 15 each year, as Council Decision 280/2004/EC requires. The current situation is complicated also by the transformation of the Statistical Office of SR into the system of EUROSTAT, that monitors and evaluates, to a certain extent, different statistical categories. This causes the introduction of some new categories and omitting others. This situation seriously endangers the consistency and compatibility of emission inventories and reporting.

Proposed adjustment of data collection and publishing:

1. To define the mandate for getting input data and to ensure the transparent use of the data;
2. To adjust deadlines for the collection of statistical data in a way which allows the smooth meeting of the requirements of UNFCCC, KP and EU – the data should be released not later than June of the next calendar year (2005)
3. To ensure the assessment of input data quality;
4. To extend and adjust the collection of statistical data in order to allow balancing national totals in the combustion sector and transformation of fossil fuels based on direct consumption (“bottom-up”);
5. To extend the reporting obligation of polluting sources to the NEIS also for “non-charged gases” (it would provide more complete activity data);
6. To introduce a consistent statistical survey of the consumption of fossil fuels in non-road mobile sources in relevant sectors (agricultural devices, forestry devices, garden machines, communal devices and industrial machines);
7. To ensure the registration and accessibility of data on the volumes of cylinders and fuel types and in case of vehicles also their weights (it would allow better categorisation of vehicles and a more precise inventory of emissions from transport);
8. To register the distribution/sale of fuels for aircraft in domestic flights and international flight categories.

The proposed measure requires additional financial, human and material.

Measure 4 – Systemic support – to establish a National Inventory System pursuant to Article 5 of KP and decision 20/CP.7

Current situation:

The situation is characterised by low coordination of the responsible institutions, NFP and individual experts. No legislation is in place to ensure the availability of expert, financial, material and information capacities.

Characteristics of the proposed capacity:

As soon as possible but not later than on 31 December 2005

- to define a National inventory system (institutions, competences), which will group the experts

from all sectors according to IPCC (NFP, SNE, scientific institutions, universities, research institutes, private sector, NGOs, and the Statistical Office).

- to establish an independent working unit entitled the Single National Entity (SNE – according to the COP recommendation), which will coordinate the NIS and have competencies and responsibilities stipulated by law. The SNE will be supervised directly by NFP (MŽP SR), including financial resources
- the SNE should interlink all stakeholders at the horizontal level with regard to expert, financial, legal and information issues. The SNE should also be responsible for achieving the commitments under the UNFCCC and KP in the area of reporting, assessment and providing information to all stakeholders, administration of national databases (NEIS, IPPC – air, NEC directive, EPER), implementation of QA/QC process, accreditation and certification, organization of “cross-country” meetings and communication with international organizations
- to appoint experts or organizations for each IPCC sector or gas, and explicitly determine their responsibilities; to appoint a team for the work on national communications, modelling and projections of emissions (RAINS, CAFE) in order to keeping consistency, reproducibility and transparency
- to obtain earmarked continuous finances from the state budget for achieving the commitments under the UNFCCC and KP on annual basis and in an appropriate amount (according to actual needs and analysis)
- to determine the competencies of the NIS and the operators of polluting sources, with regard to the dissemination of information.

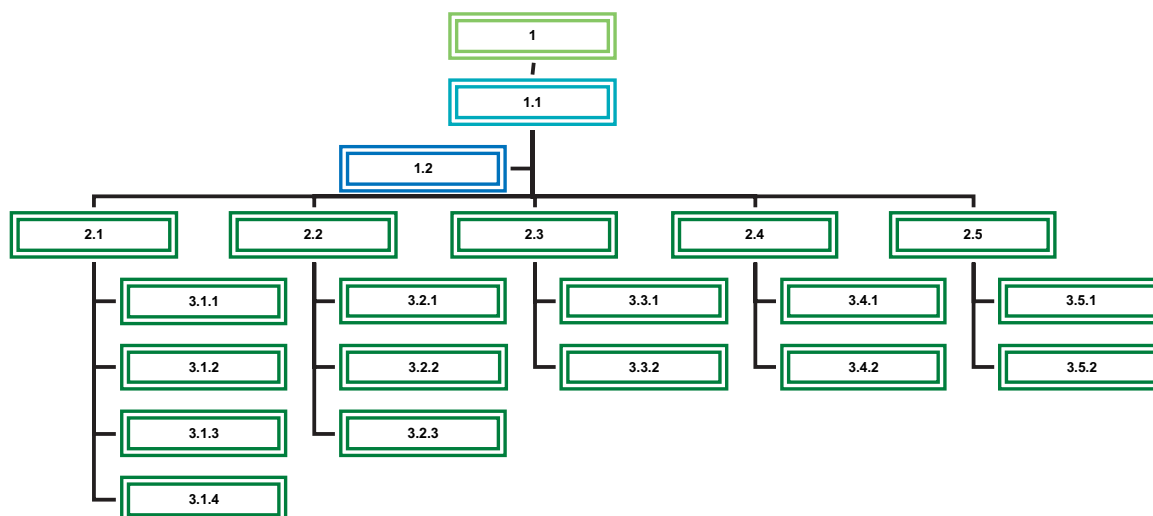
Measure 5 – Systemic support of the education and training of managers and experts in the field of climate change

Current situation:

There are some gaps in the qualification and skills of managers of the relevant sectors, in particular with regard to implementation capabilities. Therefore, the level of utilisation of financial and information sources is often very low. No conditions have been created for capacity maintenance and capacity development in the technical skills for achieving the commitments under the UNFCCC, KP and EU.

Proposed changes:

- To regularly educate and train the managers of the relevant sectors on climate change;
- To ensure earmarked finances from the state budget for continuous training and education of experts and technicians with respect to climate change (inventories, projections, the impact assessment of policy and measures, national communications and action plans);
- To use the existing highly qualified potential of researchers and specialists in the training of managers.

Figure 5.1 The proposal of the organizational structure of the National Inventory System in Slovakia

1 – NFP – the controlling unit of MŽP

Single National Entity =

1.1 – The chief coordinator of GHG inventories 1.2 – The coordinator of quality, uncertainties and projections

2.1 – Coordinator of the energy sector

- 3.1.1 – NEIS bottom-up methodology expert
- 3.1.4 – Top-down methodology expert
- 3.1.2 – Transport expert
- 3.1.3 – Fugitive emissions expert

2.2 – Coordinator of the industrial sector

- 3.2.1 – Industry expert
- 3.2.2 – Expert F-gases
- 3.2.3 – Solvents expert

2.3 – Coordinator of the agricultural sector

- 3.3.1 – Animal production expert
- 3.3.2 – Plant production expert

2.4 – Coordinator of the LUCF sector

- 3.4.1 – Landscape use expert
- 3.4.2 – Forestry expert

2.5 – Coordinator of the waste sector

- 3.5.1 – Expert on waste landfills
- 3.5.2 – Expert on waste water

The proposed organizational structure can be easily extended to include the inventory obligations for other pollutants (basic pollutants, ammonia, volatile organic matters, POPs, heavy metals and solid particles) within the framework of the international conventions and the EU directives (CLRTAP, NEC, IPPC and EPER). This proposal will have to be discussed in the future, as the EU plans to interlink the reporting under the conventions into one system in order to simplify and streamline the reported data sets.

The proposed capacity requires financial, information and human resources. Partial use of limited financial sources of relevant sectors according to Act No. 312/2001 on the state service for education and training of managers could be an option for funding (financial sources of the sector should be combined).

Measure 6 – Cross-cutting programme of science and research “National Climate Research Programme”

The objective is to gain information for the national database on environmental externalities through the

integrated approach and results of climate research. The complex impact of climate change assessment on agriculture, forestry, water management, biodiversity and human health, including the improvement of methodologies for GHG inventories and socio-economic analyses, would be the outcome of the programme. Program results should be used in decision making, for actions plans of sectors and in the implementation of adaptation policy. The Forest Research Institute in Zvolen should be the programme coordinator. Relevant sector research institutes, the institutes of Slovak Academy of Science and universities should participate in the program. The proposed period is from 2006 to 2010.

5.2 Recommendations for capacity strengthening, capacity mobilization and capacity development at the institutional level

Measure 7 – Establishment of an expert group for climate change

Current situation:

The expert capacity for climate change is not used adequately. The potential is used only in particular tasks in the development of the general strategy for climate change.

Proposed scope of responsibilities of the expert group:

- The exchange of experience and information among the experts;
- The cooperation with the NFP in achieving the commitments (emission inventory and projections, national communications on climate change) and also specific needs;
- Cooperation with the cross-cutting cross-sectoral group on climate change in the preparation of strategies and in methodological and technical issues;
- Expert assistance in the training of experts for achieving commitments under the UNFCCC and KP.

The suggested capacity requires material and information sources.

Measure 8 – Capacity support of the National Climate Programme

Current situation:

Since 1993, the NKP has been funded by the MŽP SR and coordinated research activities on climate change and its impacts. Since 2001 the research activities of the NKP have stagnated due to of the removal funding for the activities from the budget of MŽP SR.

The proposed capacity mobilisation and capacity strengthening:

- To allocate annually earmarked finances from the budget of the MŽP SR to the coordinating institution (SHMÚ);
- Activities of the NKP should be strengthened by 3 new experts.

The proposed capacity requires financial and human resources.

Measure 9 – Capacity support for the implementation of the GCOS (Global Climate Observing Systems)

Current situation:

The Slovak participation in the international program GCOS is coordinated by SHMÚ. Within the national network of meteorological stations of the GCOS there are 33 reference climatological stations and 203 reference rainfall/precipitation measuring stations. The SHMÚ performs the activity from its own limited budget.

Proposed capacity strengthening:

- To allocate annually earmarked finances from the budget of the MŽP SR to the SHMÚ in order to implement the program GCOS;
- The finances will be used for the gradual up-grade and modernisation of the network of climatological stations of GCOS, the consistent implementation of a quality management system, data processing and archiving and international reporting, including international cooperation.

The proposed capacity requires financial and human resources.

Measure 10 – Capacity support of the development of methodology for the assessment of policy and measures impacts, including the assessment socio-economic impacts of climate change and the quantification of environmental externalities

Current situation:

Directives of UNFCCC and Council Decision 280/2004/EC require the evaluation and projections of effect of policy and measures to reduce GHG emissions, including the assessment of socio-economic impacts of climate change and the quantification of environmental externalities. No generally applied methodology is available for this highly demanding area. Therefore the expert approach has been used in Slovakia, as well as in other countries.

Proposed project/study:

The project objective is to select (based upon the analysis of the published procedures) a suitable methodology for the impact assessment of policy and measures; by using international databases and software (ExterE) and the cooperation within the EU projects (NEEDS) to address the other required parameters (socio-economic, health and others).

The proposed capacity requires financial, material, human and information resources. The project should be funded from the state budget. Due to the importance of the issue, it would be appropriate to examine possibilities of financing from international funds (EU, bilateral, or multilateral sources).

Measure 11 – Capacity support for more precise inventories of fugitive emissions from mining

Current situation

The active improvement and definition of national emission factors, methodologies, inventories, projections, measurements and data reporting is a requirement under UNFCCC and KP. Slovakia uses „default“ input data and methodologies, that do not reflect the conditions of the Slovak economy.

Proposed project:

Determination of the emission factors for fugitive methane emission from brown coal mining in the selected

mines. The project should be implemented according to the following schedule – an agreement with the stakeholders (mine owners), preparation of the plan for measurements, selection of the most suitable measuring method, measurement by an authorised group *in-situ*, statistical evaluation of the measurements, determination of emission factors, determination of uncertainties, publication of results in several journals, international presentation of results (lecture, poster), the use of the EF to calculate the fugitive methane emissions, re-evaluation of the time series.

The proposed capacity requires financial resources. The project could be financed from the budget of MŽP SR, or from international sources. The project does not require additional human resources. After completion, the annual costs for the development of reports by external specialists would be reduced. It would be easy to determine the fugitive emissions by emission factors and activity data from the operators.

Measure 12 – Capacity support for uncertainty analyses and key emission sources

Current situation:

The same as in measure 11.

Proposed project:

Development of the analysis of uncertainties and key sources of emission inventories according to the methodology Tier 2 modified Monte Carlo (according to IPCC). The analysis should include in-depth determination of input parameters, that is very complicated due to the variability of sectors and by the availability of information. The degree of uncertainties influences significantly the value of emission inventories.

The proposed capacity requires financial, human, material and information resources. The project should be funded from the state budget. It should be accomplished by the contracting of experts (minimally 1 expert on statistics).

Measure 13 – Capacity support of the development of F-gases database

Current situation:

The work has already started, currently the main flow of information from the involved companies is being addressed. There is no legislation for these substances in place (currently being prepared), their movement across the country is not recorded and observation is on voluntary base.

Proposed project:

The development of a national database of F-gases movements that are not controlled by the Montreal Protocol due to the large number of importers, sellers and distributors of appliances containing F-gases. The national database should include a registry of appliance disposal.

The project could improve the collection of input data and the costs for annual reports would be eliminated.

The project needs additional finances to be completed. It does not require strengthening other capacities.

Measure 14 – Capacity support of the methodology modification in the LUCF and agriculture sectors

Current situation

The current emission inventory from LUCF and agriculture is based on the IPCC methodology revised in 1996. There are separate inventories for both sectors.

Proposed project:

There is a need to re-evaluate currently used methodologies in relation to the use of IPCC methodology in LUCF sector and agriculture. In these sectors, recalculation of the data of time series according to new a methodology, adaptation and analysis of new methodologies. As these sectors are related to each other, a complex solution based on in-depth analysis of available input information is needed.

The modification of the methodology in agriculture and LUCF requires additional costs. The project requires the extension of human capacity, i.e. additional experts in both sectors.

Measure 15 – Capacity support of an information campaign on impacts of climate change

Current situation:

Information materials and campaigns on climate change including causes and impacts has not yet been available for the general public.

Proposed activity:

- A specific information campaign on the impacts of climate change, focused directly on land owners and land users, technicians and managers in the energy, transport and waste management sectors;
- An innovative information campaign for the general public to explain the climate change issue in the cause-impact relationship.

The proposed capacity requires financial and human resources. It would be optimal to use the human and information potential of NGOs.

The proposed recommendations for achieving commitments under the UNFCCC and KP were developed using the following criteria:

- cross-cutting or synergic characteristic of a suggested capacity in relation to achieving commitments under the Rio Conventions
- national priority⁶⁹
- a priority linked with the EU
- “fast solution”.⁷⁰

⁶⁹ According to expert opinion.

⁷⁰ These recommendations can be implemented in a short time without significant financial and other requirements.

Table 5.2 Recommendations for the short-term time horizon (2005-2006)

Measure	Description	Strategic importance in relation to EU	National ⁷¹ priority	Cross-cutting and synergic character	Financial resources	"Fast" solution ⁷²	Type of capacity change
1	Strengthening capacity of the NFP on climate change	+++	+++	++	State budget	++	Strengthening
2	Setting up a cross sectoral group for climate change	+	+++	+++	State budget	+++	Development
3	Systemic support – regulatory measure – for the adjustment of scope, quality and deadlines for providing official statistical data	++	+++	+++	State budget	++	Development
4	Establishing the NIS	+++	+++	+	State budget	+	Development and mobilisation
7	Establishing an expert group for climate change	+	+	+++	State budget	+++	Development
8	Capacity support for the National Climate Programme	+++	+++	+++	State budget (MŽP)	++	Mobilisation and strengthening
9	Capacity support for the implementation of GCOS program	+++	+++	+	State budget (MŽP)	+	Strengthening
11	Capacity support for more precise fugitive emission inventories from mines	+	+++		State budget (MŽP)	+++	Mobilisation
13	Capacity support for the development of F-gases development	+	+++	++	State budget (MŽP)	++	Mobilisation
14	Capacity support for the methodology modification in the LUCF sector and in agriculture	+	+++	+++	State budget (MŽP)	++	Mobilisation

Table 5.3 Recommendations for the middle term time horizon (up to 2009)

Measure	Description	Strategic importance in relation to EU	National priority	Cross-cutting and synergic character	Financial resources	Type of capacity change
5	Systemic support of the education and training of managers and experts in the field of climate change	+	+++	+++	State budget (MŽP in cooperation with relevant sectors)	Development
6	A cross-cutting programme of science and research in the "National Climate Research Programme"	+++	+++	+++	State budget (MŠ SR)	Mobilisation
12	Capacity support of uncertainty analyses and key emission sources	++	+++		State budget (MŠ SR)	Mobilisation
15	Capacity support for an information campaign on the impacts of climate change	+	++	+++	State budget, private sector, international sources	Mobilisation

⁷¹ Expert opinion.⁷² Recommendations that do not require additional financial resources and can be solved by (for example) re-allocation of existing capacities, more effective management and better coordination.

Table 5.4 Recommendations for the long term time horizon (up to 2012)

Measure	Description	Strategic importance in relation to EU	National priority	Cross-cutting and synergic character	Financial resources	Type of capacity change
7	Capacity support of methodology development for the assessment the impact of policy and measures (externality)	++	+++	+++	State budget EU, UNDP, GEF and others	Mobilisation and strengthening
4	NIS – organisation of “cross-country” seminars	++	++	+	State budget EU, UNDP, GEF and others	Development
4	NIS – systematic interlinking of the UNFCCC, CLRTAP and EPER	+++	++	+++	State budget	Development
4	NIS – implementation of QA/QC system	+++	+++	+	State budget, EU	Development

In addition to the above mentioned criteria also the time schedules proposed for the implementation of measures were taken into account. The results of the evaluation are presented in tables 5.2 – 5.4.

Complementary to the assessment against the criteria, also the priorities for the capacity framework for achieving commitments under UNFCCC and KP were ranked. The rank reflects the practical experience of experts in the working group. The emphasis was put on urgency and feasibility of a suggested measure. The list of capacity needs is the following:

1. Strengthening the capacity of the NFP on climate change;
2. Setting up the cross-cutting cross-sectoral group on climate change;
3. Systemic support (regulatory measure) for the adjustment of the scope, quality and deadlines for releasing official statistical data for achieving the commitments under UNFCCC, KP and EU;
4. Establishing the NIS;
5. Promotion of science and research on climate change and adaptation measures;
6. Ensuring continuous training and education for managers and experts on climate change;
7. Developing information materials for the general public that would present the issue of climate change in cause-impact relationships and document the opportunities for the public to contribute to solutions in the field of climate change.

5.3 Identification of cross-cutting problems and fields of UNFCCC-CBD- UNCCD

The identification of cross-cutting problems and fields of the three Rio Conventions has been an important part of the inventory of capacities within the NCSA project. The identified selection of cross-cutting issues resulted from the discussion of the experts in the working group about effective collaboration without any prioritisation and other qualification criteria:

- Science, research and systematic observation (monitoring) of the environment;
- Data collection and processing from monitoring, interpretation of environmental changes, reporting;
- Exchange and mutual use of information databases and expert capabilities;
- Dissemination of information, public participation in handling the issue of climate change and related decisions;
- Research, use and transfer of new environmentally sound technologies;
- Implementation of policy and measures with positive impact on monitored parameters;
- Evaluation of the impacts of policy and measures and adaptation possibilities (for example risk of desertification, bio-diversity of forest, agriculture, etc.);
- Use of national and international mechanisms of funding;
- International cooperation and links to international organizations.

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