

DG Research

**Monitoring Policy and  
Research Activities on  
Science in Society in  
Europe (MASIS)**

National Report, Lithuania

October 2011



COWI A/S

Parallelvej 2  
DK-2800 Kongens Lyngby  
Denmark

Tel +45 45 97 22 11  
Fax +45 45 97 22 12  
[www.cowi.com](http://www.cowi.com)

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Written by

Vidimantas Bumelis

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## 0 Introduction

The EU recognises the importance of ensuring that European research and research in Member States is firmly rooted in the needs of society, particularly in light of the constantly changing Europe. Efforts to reinforce the societal dimension of research are channelled through the 'Science in society' (SIS) programme. The SIS programme supports activities focusing on the governance of the research system, research ethics, public engagement in science, women in science and the promotion of scientific education and science communication.

The Monitoring Policy and Research Activities on Science in Society in Europe (MASIS) initiative is a major undertaking under the SIS programme. Its aim is to map, steer and monitor the SIS landscape in the European Research Area (ERA) ([http://ec.europa.eu/research/era/index\\_en.htm](http://ec.europa.eu/research/era/index_en.htm)), in order for EU citizens and society to benefit the most from SIS efforts. MASIS also covers the eleven Associated Countries.

The national MASIS reports are cornerstones in this endeavour, as they contain the knowledge gathered by a network of national correspondents on SIS. The reports will be updated every six months. The reporting format was developed on the basis of advice from the network of national correspondents, as well as discussions with authors of the initial MASIS report (see this [LINK](http://ftp.cordis.europa.eu/pub/fp7/sis/docs/sis_masis_report_en.pdf), [ftp://ftp.cordis.europa.eu/pub/fp7/sis/docs/sis\\_masis\\_report\\_en.pdf](http://ftp.cordis.europa.eu/pub/fp7/sis/docs/sis_masis_report_en.pdf)). In addition, the Commission and a network of national validators offered comments and advice.

In total, 38 national reports covering 38 (EU and associated) countries have been produced. This is the report on Lithuania. It consists of four main sections:

1. National context
2. Priority setting, governance and use of science in policy-making
3. Research related to SIS
4. Activities related to SIS
5. The Fukushima accident.

The intention of this report is to provide a good general overview of the SIS situation in Lithuania, including public engagement in science, different models and use of scientific advice and expertise for policy-making, activities related to assessment and ethical issues of science and technology, SIS research activities and scientific culture as well as trends, policies, actors and activities. The last

chapter on the Fukushima accident was added later to the original report and contains information on the national coverage and the role of scientific advice in connection with the accident.

Please note, in accordance with the terms of reference for the MASIS project, that the issue of ‘women in science’ is **not included** in the mapping as this has been extensively mapped and reported in other European projects. Please note also that the present report follows the initial MASIS report in using the term ‘science’ in its broadest sense, as in the German ‘Wissenschaft’, covering also the social, economic and human sciences. A few subsections are concerned only with the natural sciences, and in these cases it is explicitly indicated.

## Statistical data sheet, Lithuania

|   | 2000   | 2005   | 2006   | 2007   | 2008   | 2009  | 2010 | EU27 average/total, 2008 |
|---|--------|--------|--------|--------|--------|-------|------|--------------------------|
| <b>Research and development</b>   |        |        |        |        |        |       |      |                          |
| Gross domestic expenditure on R&D (GERD), in % of GDP <sup>1</sup>                        | 0,59   | 0,75   | 0,79   | 0,81   | 0,80   | -     | -    | 1,89                     |
| GERD by source of funds, % of total GERD <sup>1</sup> :                                   |        |        |        |        |        |       |      |                          |
| - Business enterprise sector  | 31,6   | 20,8   | 26,2   | 24,5   | 21,4   | -     | -    | 55,0                     |
| - Government sector   | 61,7   | 62,7   | 53,6   | 47,9   | 55,6   | -     | -    | 33,5                     |
| - Higher education sector   | -      | 5,7    | 5,3    | 7,5    | 7,2    | -     | -    | 0,9                      |
| - Private non-profit sector   | -      | 0,2    | 0,6    | 0,5    | 0,3    | -     | -    | 1,6                      |
| - Abroad  | 6,7    | 10,5   | 14,3   | 19,6   | 15,5   | -     | -    | 8,9                      |
| <b>GPD (million current PPP \$)</b>   | -      | -      | -      | -      | -      | -     | -    | 15285005                 |
| <b>Total researchers (FTE) per thousand labour force</b>                                  | -      | -      | -      | -      | -      | -     | -    | 6,3                      |
| <b>Total researchers (FTE) per thousand total employment</b>                              | -      | -      | -      | -      | -      | -     | -    | 6,6                      |
| <b>Gross Domestic Expenditure on R&amp;D -- GERD (million current PPP \$)</b>             | -      | -      | -      | -      | -      | -     | -    | 276734,4                 |
| <b>Public R&amp;D expenditures (% of GDP)</b>   | 0,47   | 0,60   | 0,57   | 0,58   | 0,59*  | 0,60* | -    | 0,66*                    |
| <b>Business R&amp;D expenditures (% of GDP)</b>   | 0,13   | 0,15   | 0,22   | 0,23   | 0,24*  | 0,25* | -    | 1,16*                    |
| Number of R&D personnel <sup>1</sup> , % 1000   | -      | -      | -      | -      | -      | -     | -    | -                        |
| Number of R&D personnel by sector of performance <sup>1</sup> , % of total R&D personnel: |        |        |        |        |        |       |      |                          |
| - Business enterprise sector  | 11.791 | 11.002 | 11.443 | 12.656 | 12.632 | -     | -    | 2.455.192                |
|   | 5%     | 11%    | 11%    | 17%    | 15%    | -     | -    | 52%                      |

|  | 2000 | 2005   | 2006 | 2007  | 2008  | 2009  | 2010 | EU27 average/total, 2008 |
|--|------|--------|------|-------|-------|-------|------|--------------------------|
| - Government sector  | 42%  | 28%    | 26%  | 24%   | 24%   | -     | -    | 14%                      |
| - Higher education sector  | 53%  | 61%    | 63%  | 59%   | 61%   | -     | -    | 33%                      |
| - Private non-profit sector  | -    | -      | -    | -     | -     | -     | -    | 1%                       |
| <b>Innovation indicators</b>   |      |        |      |       |       |       |      |                          |
| - S&E and SSH graduates per 1000 population aged 20-29                 | -    | 58,2   | 60,3 | 62,5* | 64,7* | -     | -    | 41,5*                    |
| - S&E and SSH doctorate graduates per 1000 population aged 25-34       | 0,74 | 0,54   | 0,61 | 0,68* | 0,77* | -     | -    | 1,26*                    |
| - Public-private co-publications per million population                | -    | 0,0    | 0,0  | -     | -     | -     | -    | -                        |
| - SMEs introducing product or process innovations (% of SMEs)          | -    | 22,5** | 19,7 | 17,2* | 15,1* | -     | -    | 32,0*                    |
| - Employment in medium-high & high-tech manufacturing (% of workforce) | 3,22 | 2,57   | 2,48 | 2,44  | 2,40* | 2,36* | -    | 6,78*                    |
| - Employment in knowledge-intensive services (% of workforce)          | 6,33 | 6,88   | 7,94 | 8,19  | 8,45* | 8,71  | -    | 14,80*                   |
| <b>Patents</b>   |      |        |      |       |       |       |      |                          |
| Patent applications to the EPO, total <sup>2</sup>                     | -    | -      | -    | -     | -     | -     | -    | -                        |
| Patent grants at the USPTO, total <sup>2</sup>                         | -    | -      | -    | -     | -     | -     | -    | -                        |
| Triadic patent families, total <sup>2</sup>                            | -    | -      | -    | -     | -     | -     | -    | -                        |
| Patent applications filed under the PCT, total <sup>2</sup>            | -    | -      | -    | -     | -     | -     | -    | -                        |
| <b>Human resources in science and technology</b>                       |      |        |      |       |       |       |      |                          |



|  | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | EU27 average/total, 2008 |
|--|------|------|------|------|------|------|------|--------------------------|
| Total, % of labour force <sup>1</sup>  | 16   | 16   | 17   | 18   | 19   | -    | -    | 16                       |
| - Scientists and engineers, % of labour force <sup>1</sup>   | -    | 6,5  | 6,5  | -    | -    | -    | -    | -                        |
| <b>Networks and projects</b>   |      |      |      |      |      |      |      |                          |
| National share of FP6 SiS budget   | -    | 2%   | 1%   | 0%   | -    | -    | -    | -                        |
| No. of FP6 SiS projects managed in Lithuania   | -    | 6    | 5    | 0    | -    | -    | -    | -                        |
| National share of FP7 SiS budget   | -    | -    | -    | 0%   | 0%   | 5%   | -    | -                        |
| No. of FP7 SiS projects managed in Lithuania   | -    | -    | -    | 0    | 2    | 3    | -    | -                        |
| <b>Tertiary/higher education</b>   |      |      |      |      |      |      |      |                          |
| Students at ISCED levels 5-6 enrolled in the following fields: science, mathematics, computing, engineering, manufacturing, construction - as % of all students <sup>1</sup> | 27,4 | 24,9 | 24,1 | 24,1 | -    | -    |      | 24,9 <sup>4</sup>        |
| Academic staff (ISCED 5-6), total in full time unit <sup>1</sup>   |      |      |      |      |      |      |      |                          |
| <b>Public Understanding of Science (only 2005 og 2010 data)</b><br><b>se pdf dokumenterne</b>  |      |      |      |      |      |      |      |                          |
| % of population very interested in new scientific discoveries and technological developments   | -    | 9    | -    | -    | -    | -    | 12   |                          |
| % of population very well informed about new scientific discoveries and technological developments   |      | 2    | -    | -    | -    | -    | 6    |                          |

|   | 2000 | 2005  | 2006 | 2007 | 2008 | 2009 | 2010 | EU27 average/total, 2008 |
|---|------|-------|------|------|------|------|------|--------------------------|
| % of population regularly or occasionally attend public meetings or debates about science and technology  | -    | 12    | -    | -    | -    | -    | -    | 7                        |
| % of population regularly or occasionally sign petitions or join street demonstrations on matters of nuclear power, biotechnology or the environment  | -    | 4     | -    | -    | -    | -    | -    | 10                       |
| % of population 'agree' and % of population 'disagree' that thanks to science and technology, there will be more opportunities for future generations | -    | 87/2  | -    | -    | -    | -    | -    | 86/4                     |
| % of population 'agree' and % of population 'disagree' that science makes our ways of life change too fast  | -    | 56/24 | -    | -    | -    | -    | -    | 56/24                    |
| % of population 'agree' and % of population 'disagree' that we depend too much on science and not enough on faith                                     | -    | 50/18 | -    | -    | -    | -    | -    | 40/27                    |
| % of population 'agree' and % of population 'disagree' that because of their knowledge, scientists have a power that makes them dangerous             | -    | 51/22 | -    | -    | -    | -    | -    | 58/19                    |
| % of population 'agree' and % of population 'disagree' that in my daily life, it is not important to know about science                               | -    | 35/51 | -    | -    | -    | -    | -    | 23/62                    |

Notes: 1) Data from EUROSTAT, 2) Data from the OECD, 3) Data from EuroBarometer 73.1 (2010) and EB 63.1 (2005) 4) Data from 2007

\*: extrapolation of data

\*\* : imputed data

## 1 National context

This section sets the scene and describes political developments, public debates and policy initiatives of major relevance to the place of science in society in Lithuania.

### 1.1 The place of science in society - current debates

The importance of science and the role of Lithuanian research system while developing the knowledge based society have become a subject for discussion over the last 5 years. The public and political debates in Seimas (Parliament), through the media and other information sources, stressed the importance of science as the key driver for raising the economic competitiveness of the country. This was clearly expressed in planning the allocation of EU structural assistance for Lithuania for the period 2007-2013. The decision to allocate almost 10% of the total EU structural assistance for the priority area ‘Research and development for competitiveness and growth of the economy’ raised many discussions among the politicians and the media revealing the weaknesses of the national R&D system and the high expectations that were consequently formulated in the strategic documents.

The discussions concentrated on the issues related to human resources in the field of scientific research, that fail to satisfy the current and future needs of the economy and the undergoing “brain drain”. The percentage of the researchers as a share of the total working population forecasts great shortage of them in the near future and possible failure to replace the retired older-generation researchers with their young counterparts. Public debates in the media revealed that the profession of a researcher remains rather unattractive, and the undergoing “brain drain” might, in the future, considerably weaken the country’s intellectual potential and the economic development perspectives, especially in the fields requiring extensive knowledge.

Another area of discussions, that involved not only the academic community and politicians but also the representatives of business sector, is related to competitiveness of the national R&D system and its role in strengthening the national competitiveness and economic growth. The topics of debates ranged from the weak links of the public R&D system with private sector, low commercialisation of research outputs, insufficiently developed targeted applied research system, weak orientation towards the economic and public needs to the lack of cooperation between the educational establishments and universities, poor research infrastructure, low possibilities to attract foreign direct in-

vestments in the field of high and medium-high technologies and the development of joint business and research centres ('Valleys').

The decision to allocate significant share of financial resources to the R&D system has also intensified societal "control" over science and encouraged public debates related to R&D funding, salaries of researchers, research quality assessment, research management. The debates stressed the inefficient use of the public finances in the research system, very low private sector expenditure on the R&D activities and poor management of extensive network of research institutions.

The issues raised strengthened the need for reforms in the area of research and higher education. The new government started the reform by approving the new law on research and higher education in April 2009. The new law raised active discussions not only in the Seimas (Parliament), but also in the academic society, among student organisations and society itself.

## 1.2 Policy goals and priorities

During the last three years there have been a number of public and political debates, related to the reform of research and higher education, which has raised a number of important policy initiatives in the area and encouraged discussions on the role of science in society.

The reform of research and higher education in Lithuania was introduced by the adoption of the new law on science and studies in April 2009-04-30<sup>1</sup>.

The main aims of the new law are the following: establishment of state regulation of higher education and research; principles of quality assurance in higher education and research; legal basis of establishment, termination and restructuring of higher education and research institutions; awarding and recognition of higher education qualifications and scientific degrees; management of higher education and research institutions, organisation and supervision of their activities; rights and duties of the academic staff, research staff and students of higher education and research institutions; funding of higher education and research; principles of management, use and disposal of the assets of state higher education institutions.

The introduction of the new law provided with the possibilities to implement the main goals of the reform, that were oriented to create conditions and incentives, necessary for the substantial improvement in higher education quality, ensure accessibility, by provision of favourable conditions to all who want and are able to pursue studies, seek that higher education must become one of the

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<sup>1</sup> Republic of Lithuania, Law on higher education and research, ,30 April 2009 No XI-242, Vilnius, [http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=366717&p\\_query=science%20studies&p\\_tr2=2](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=366717&p_query=science%20studies&p_tr2=2)

strongest impetus for the rising prosperity of the country and to ensure efficient usage of the allocated resources.

Basic measures of the reform included the introduction of the new funding system of studies, management reform of the state universities, enlargement of the autonomy for the state run higher education institutions, switching to the long-term funding of research, orientation towards the external (international) expertise in tenders and in the evaluation of research results, increasing the share of the competition-based state funding of applied research, reform of the network of the research institutes, introduction of the qualification requirements and quality control, and reform of the financing model of the state research institutes.

The reorganisation plan for the network of state research institutions is related to the development of research, higher education and business centres (“Valleys”)<sup>2</sup>. According to this plan eight research institutes are incorporated into the universities and 13 research institutes will be merged and five research centres (“Valleys”) will be established.

Reacting to the need for closer synergy of research, studies and business, the Valleys<sup>3</sup> shall be developed with a view to building up research, studies and knowledge economy clusters of the international level in Lithuania, accelerating the development of knowledge society and consolidating the long-term foundation for the competitiveness of Lithuania’s economy. The development of Valleys has been carried out on the basis of their individual development programmes, using the funds of the state and municipal budgets, funds of science and studies institutions involved in the establishment of Valleys, as well as the funds of the EU structural support for 2007–2013. The development of Valleys fosters joint activities between the public and the private sector, by the development of the infrastructure for know-how and technology transfer from the public to the private business sector, and creation of the environment for establishing research branches of businesses, and for the formation of knowledge intensive business start-ups on the basis of commercialised results of research.

The reformed Lithuanian Research Council is responsible for implementation of the new system of competitive research grants. The purpose of the Global Grant Measure is to stimulate international-class research conducted by Lithuanian and foreign researchers at research and higher education institutions of Lithuania and encourage researchers’ mobility, to attract foreign researchers of

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<sup>2</sup> Resolution No 989 of 1 October 2008, On the approval of the reorganisation plan for the network of state research institutions related to the development of centres (Valleys) of science, studies and business,

[http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=335884&p\\_query=valleys&p\\_tr2=2](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=335884&p_query=valleys&p_tr2=2)

<sup>3</sup> Government of the Republic of Lithuania, Resolution on approval of the concept of the establishment and development of integrated science, studies and business centres (Valleys), 21 March 2007, No 321, Vilnius,

[www.smm.lt/.../valleys/concept%20of%20valleys.pdf](http://www.smm.lt/.../valleys/concept%20of%20valleys.pdf)

international excellence and world-class into Lithuania and this way to strengthen Lithuania's competitiveness in the world.<sup>4</sup>

The newest political initiative, related to the improvement of implementation and coordination of innovation policy is the establishment of the Agency for Science, Innovation and Technology, <http://www.tpa.lt/ENG/about.htm>. The Agency is responsible for business and science cooperation.

As all these initiatives are very recent it is far too early to assess their impact on the relationship between science and society.

### **1.3 National challenges, opportunities and trajectories**

In Lithuania political debates over science in society have been not important at all compared to other societal debates.

Though the reform of the national research and higher education system has foreseen great changes it has not gained great public attention. On the other hand, it must be noted, that the reform of research and higher education has been in the process for almost 20 years, and only during the last 3 years it has gained public attention. Some of the new initiatives were widely discussed in the national media (e.g. new funding system of studies, "Valleys"), but the majority of discussions were still held among the politicians and the academic society. The introduction of payment for studies attracted public attention, as it is personally important to the majority of families in the country.

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<sup>4</sup> <http://www.lmt.lt/EN/DOCUMENTS/index.php>

## **2 Priority setting, governance and use of science in policy-making**

This section focuses on the different actors involved in shaping the relationship between science and society and the processes for governing science at national level. This includes government initiatives, institutions and organizations as well as public involvement and policy-making processes at all levels related to science and technology.

Different themes will be elaborated in the Lithuanian context, including ethics in science and technology, equality, diversity and inclusiveness in scientific institutions, and ethnic or social minority groups in scientific contexts and careers. Moreover, this section will highlight actors in science communication and technology assessment. Public involvement in science and technology decision-making as well as the use of science in policy-making at the national level will be covered in this section.

### **2.1 Public engagement in priority setting**

#### **2.1.1 Formalised procedures for citizen involvement**

The new law on research and higher education stresses the importance of public interest and public engagement both in setting research and higher education policy and in management of research and higher education institutions.

Openness and responsibility to the public is one of the key principles of higher education and research set in the new law on research and higher education. The law also clearly stipulates that research and higher education institutions must constantly announce in its website and in other ways the accurate quantitative and qualitative information about study programmes, awarded higher education qualifications, research activities, evaluation results, opinions of students, graduates and other interested parties about study quality, assessments of activities of the higher education institution performed by the accredited institutions, career indexes of graduates; it may also announce other data necessary to inform the public about studies.

The new law lays the ground for the management reform of the state research and higher education institutions. Before the reform membership of many expert institutions were elected, rather than appointed, which made them more accountable to the organisations they represent. The reformed Research Coun-

cil, <http://www.lmt.lt/EN/ABOUT/index.php>, has a responsibility to set priorities for the national research programmes, implements competition-based research funding programmes, organises evaluation of research activities. It is an advisory body to the Seimas (Parliament) and the Government. The members of the Research Council are proposed by the Government.

The Higher Education Council<sup>5</sup> is the advisory body on strategic issues of higher education to the Ministry of Education and Science. It has no permanent staff. The members of the Higher Education Council are proposed by various stakeholders and institutions. The Minister of Education and Science approves the final composition of the Council.

Before the adoption of the new law the academic community had a considerable power to manage the university without little or no explicit accountability to society. The impact of stakeholders on institutional governance has been quite limited. The new law did introduce important features that give stakeholders a more significant role. Students have a right to vote and participate in the academic self-governance and governance bodies of higher education institution. The university council, representing external stakeholders, has been introduced. The council becomes the highest governing body of higher education and research institutions, responsible for strategic decisions and having the power to approve the statute, makes decision on the mission statement and strategy, makes decisions on the structure, approves annual budget plan, elects the rector and vice-rectors, sets the rules for acceptance of the faculty members.

The Association “Knowledge Economy Forum”<sup>6</sup> brings together business people, scientists and politicians. They are active in public discussions related to research, higher education and innovation policy.

As the reform is very recent it is too early to assess how the changes introduced will broaden the public engagement in science and technology priority setting and assessment, nonetheless the involvement of external partners in higher education and research governance, demands for accountability have started to rise.

### **2.1.2 Citizen- or CSO-initiated activities with political impact**

In Lithuania, citizens are informed about S&T decisions and developments.

Decisions related to science and technology (S&T) are mainly taken by the institutions formally responsible for research, technology and innovation policy development and implementation, i.e. the Ministry for Education and Science and the Ministry of Economy. Still active individuals, public and non-governmental organisations are not only informed about the S&T decisions and developments via the public media and different events, they are actively involved in public discussions and are members of working groups, formed by

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<sup>5</sup>[http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=354154&p\\_query=auk%F0tojo%20mokslo%20taryba&p\\_tr2=2](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=354154&p_query=auk%F0tojo%20mokslo%20taryba&p_tr2=2)

<sup>6</sup> <http://www.zef.lt/zef/index.php?id=48>



the Ministries and the Government, concerning the decisions in the S&T area. The National Union of Student Representations of Lithuania<sup>7</sup>, the Lithuanian Students' Union, <http://www.lss.lt/>, the Knowledge Economy Forum, the association of Lithuanian researchers working worldwide "Futura Scientia", <http://futuraScientia.lt/>, have been actively involved in development and implementation of the current reform of research and higher education system.

Another example of citizens-initiated activities could be the activity of the Lithuanian Green Movement, <http://www.zalieji.lt/index.php/lt/about-lgm>. Lithuanian Green Movement was successful in raising public concern about genetically modified organisms (GMOs) and thereby influencing political decisions against the introduction of GMOs field trials in Lithuania.

The delegate of the Movement participates in the Supervisory Committee for the Management of Genetically Modified Organisms<sup>8</sup> by the Ministry of Environment of the Republic of Lithuania. Although the joint recommendation of the Supervisory Committee was positive in case of GMOs field trials, the Movement had significant impact to negative public opinion and thereby on political decision.

### 2.1.3 Importance of upstream engagement

The national discussions related to S&T priority setting and decision making are not clearly structured in 'upstream' or 'downstream' public engagement. The current debates are mainly focused on strengthening public engagement in S&T policy development in general. Public and non-governmental organisations as well as some individual experts are involved in discussions at early stages in scientific and technological developments, as priority setting is very closely related to decisions concerning funding of certain research, technology or innovation areas.

The initiatives in promoting 'upstream' engagement in terms of scientific or technological developments are local and involve participation of non-governmental organisations and individual experts in early debates and later as delegates in supervisory committees or work groups.

## 2.2 Public - private interaction

A number of measures were planned to stimulate interactions between research, higher education and business sectors while planning EU structural assistance.

The largest initiative in this area is the development of 5 Integrated Valleys, where research, studies and knowledge-based business potential is going to be concentrated in a single territory with a common or coherent infrastructure with a purpose to develop knowledge-based society and economy as well as to consolidate competitiveness of Lithuanian. The 5 valleys specialize in different

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<sup>7</sup> <http://www.lsas.lt/>

<sup>8</sup> [http://gmo.am.lt/page?page=itemList&entity=docinfo&a=documentType&b=docinfo\\_3](http://gmo.am.lt/page?page=itemList&entity=docinfo&a=documentType&b=docinfo_3)

scientific research fields (laser and light technologies, nanotechnologies, semiconductor physics, electronics and organic electronics, civil engineering, biotechnology, bio pharmacy, molecular medicine, ecosystems and safe environment, sustainable chemistry and bio pharmacy, mechatronics and biomedical engineering, energy, information and communication technologies, agriculture, forestry, food scientific research, marine business, natural resources and environmental protection). These projects aim to concentrate, upgrade and optimise R&D infrastructure, consolidate the links with research and studies, train researchers and other experts, provide favourable environment for transfer of scientific know-how and technology to business sector, set up centres for promoting research, studies and knowledge intensive business synergies and establish knowledge economy clusters on the basis of science, studies and knowledge intensive business.

A number of smaller measures are initiated by the Ministry of Economy and are financed by the European structural development fund:

The measure Idea LT<sup>9</sup> aims to increase the R&D activities in business sector. It supports the preparation for the implementation of R&D projects in enterprises, namely, the performance of R&D project feasibility studies and so to reduce the risk of R&D activities in enterprise. The supported action is the preparation of the planned R&D project related feasibility studies and risks assessment.

The measure Intellect LT<sup>10</sup> provides support for enterprises implementing R&D projects. Projects can be implemented together with science or business partners.

The Ministry of Science and Education initiated the support measure 'State aid for improvement high qualification specialists (researchers) in business enterprises', <http://www.esparama.lt/2007-2013/lt/taklasifikatorius?taid=090bdd53800d4d38>. The projects to be financed are aimed at increasing the number of researchers working in business sector.

As these measures are oriented for a long term structural changes and just a few projects have received the support, it is not possible to measure their impact now. The project will be finished by 2015 and impact analysis is planned afterwards.

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<sup>9</sup> [http://www.esparama.lt/2007-2013/lt/gaires/priemones/priemone?priem\\_id=000bdd5380001181](http://www.esparama.lt/2007-2013/lt/gaires/priemones/priemone?priem_id=000bdd5380001181)

<sup>10</sup> [http://www.esparama.lt/2007-2013/lt/gaires/priemones/priemone?priem\\_id=000bdd5380001182](http://www.esparama.lt/2007-2013/lt/gaires/priemones/priemone?priem_id=000bdd5380001182)

## 2.3 Use of science in policy making

### 2.3.1 Formal procedures and advisory bodies involved

Though there are no specific formalised procedures for using scientific advice in policy making processes, the majority of ministries, and other organisations, responsible for policy development and implementation carry out various research studies and finance research projects that should create science-based knowledge for decision making.

The majority of research is carried out following the procedures of public procurement. Different consultants, private and state research organisations may offer their services.

Some of the ministries have established state research institutions that serve to the ministries' needs for research and scientific advice. The Ministry of Agriculture has established the Agricultural Science Council under the Ministry, <http://www.zum.lt/lt/zemes-ukio-ministerija/mokslas--mokymas-ir-konsultavimas/zemes-ukio-mokslo-taryba-/zemes-ukio-mokslo-tarybos-nuostatai/>.

The Ministry of Education and Science often asks the Lithuanian Research Council or the Research and Higher Education Monitoring and Analysis Centre, <http://www.mosta.lt>, to develop research studies or implement research projects that could develop scientific ground for policy decisions. None the less, it should be noted that the majority of such studies are carried out ad hoc, to satisfy the current need for information and recommendations.

The Research Council is an advisor to the Seimas (Parliament) and the Government on the issues pertaining to research and preparation of researchers. The Higher Education Council is an advisory body for the Ministry of Education and Science on strategic issues of higher education development. Members of the Councils are actively involved in different governmental and ministerial working groups, related to research and higher education policy development.

Though national and international experts advised to strengthen the status and functions of the Commission for Science, Technology and Innovation Development under the Government, the Commission has been recently closed as a result of the reform of the Office of the Government.

### 2.3.2 Trends at national level

The last 5 years are marked by planning and use of the EU structural assistance. There are a number of measures planned to strengthen the role of science in social life and policy making. The projects will start to be implemented the coming years.

Due to reforms, related to new elections, that took place in 2008, a lot of changes are going on in a number of public sectors, and EU structural assis-

tance is widely used to implement them, a number of research projects and scientific studies have been carried out to provide science-based information for policy decision making.

There is also a widely used practice to invite researchers and other experts to work in different panels and expert groups, organised by the ministries and other governmental institutions, develop projects of legal acts or have discussions that are important in certain public policy areas.

## 2.4 Key actors

### 2.4.1 Ethics in science and technology

| Name of actor and web-link if possible  | Type of actor                          | Sector | Brief supplementary description   |
|---|--|--------|---|
| Lithuanian bioethics committee<br><a href="http://bioetika.sam.lt/index.php?-809972162">http://bioetika.sam.lt/index.php?-809972162</a>                                 | State institution                      | Public | Somewhat influential on public opinion and political decisions  |
| Regional Bioethics Information Centre (RBIC)<br>( <a href="http://www.rbic.mf.vu.lt/index.php?p=2&amp;page=74">http://www.rbic.mf.vu.lt/index.php?p=2&amp;page=74</a> ) | Other advisory bodies                  | Public | Not very influential on public opinion and political decisions  |
| Department of Medical History and Ethics ( <a href="http://www.mies.mf.vu.lt/en/">http://www.mies.mf.vu.lt/en/</a> )  | Unit of the Institute of Public Health | Public | Not very influential on public opinion and political decisions  |
| Research council of Lithuania<br>( <a href="http://www.lmt.lt/indexe.php">http://www.lmt.lt/indexe.php</a> )  | Research council                       | Public | Research council of Lithuania initiated the project “research ethics: current state analysis”.                                      |
| Ombudsman for academic ethics and procedures  | Independent state institution          | Public | It is foreseen in the new law on science and education to establish the office of the Ombudsman for academic ethics and procedures. |

### 2.4.2 Equality, diversity and inclusiveness in scientific institutions and in educational systems

| Name of actor and web-link if possible  | Type of actor   | Sector | Brief supplementary description  |
|---|---|--------|--|
| The Office of Equal Opportunities Ombudsperson <a href="http://www.lygybe.lt/">http://www.lygybe.lt/</a>          | Independent state institution accountable to the Parliament | Public | The Ombudsman investigates individual complaints on the grounds of gender, age, racial or ethnic origin, religion and beliefs, disability, sexual orientation, language, social status; submits recommendations and proposals to the Parliament and governmental institutions.   |
| Ministry of Education and Science ( <a href="http://www.smm.lt/en/index.htm">http://www.smm.lt/en/index.htm</a> ) | Government and ministries                                   | Public | The ministry in 2007 initiated the project on the social –economic situation of Lithuanian students. The issue of social mobility in higher education institutions was analysed in the project, <a href="http://www.smm.lt/svietimo_bukle/docs/tyrimai/kiti/eurostudent%20ataskaita.pdf">http://www.smm.lt/svietimo_bukle/docs/tyrimai/kiti/eurostudent%20ataskaita.pdf</a> (Project link) |

It should be noted, that issues on equality, diversity, and inclusiveness in scientific institutions and in educational systems related to social mobility in higher education, ethnic or social minority groups and less privileged groups in scientific contexts and careers are rare in Lithuanian research activities.

Lithuania is a quite ethnic homogeneous country, so there are not many issues concerning ethnic minorities in science. However, there are active researchers mainstreaming gender issues.

### 2.4.3 Science communication

| Name of actor and web-link if possible  | Type of actor                     | Sector | Brief supplementary description                          |
|---|-----------------------------------|--------|--|
| Ministry of Education and Science ( <a href="http://www.smm.lt/en/index.htm">http://www.smm.lt/en/index.htm</a> )               | Government and ministries         | Public | Domestic. Extremely influential on political initiatives |
| Research council of Lithuania ( <a href="http://www.lmt.lt/indexe.php">http://www.lmt.lt/indexe.php</a> )                       | Research Council                  | Public | Domestic. Very influential on political initiatives      |
| Lithuanian Academy of Science ( <a href="http://lma.lt/index.php?lang=en">http://lma.lt/index.php?lang=en</a> )                 | State budgetary institution       | Public | Domestic. Very influential on political initiatives      |
| Association Knowledge Economy forum ( <a href="http://www.zef.lt/zef/index.php?">http://www.zef.lt/zef/index.php?</a> )         | Other civil society organisations | Public | Domestic. Somewhat influential on political initiatives  |
| Lithuanian Scientific Society ( <a href="http://mokslasplius.lt/lms/?q=en/node/4">http://mokslasplius.lt/lms/?q=en/node/4</a> ) | Nongovernmental organisation      | Public | Domestic. Somewhat influential on political initiatives  |

### 2.4.4 Technology assessment

| <b>Name of actor and web-link if possible</b>   | <b>Type of actor</b>             | <b>Sector</b> | <b>Brief supplementary description</b>  |
|---|----------------------------------|---------------|---|
| Ministry of Health of the Republic of Lithuania<br>( <a href="http://www.sam.lt/go.php/lit/IMG/4">http://www.sam.lt/go.php/lit/IMG/4</a> )        | Government and ministries        | Public        | Very influential on public opinion.<br>Extremely influential on political decisions |
| Ministry of Environment of the Republic of Lithuania<br>( <a href="http://www.am.lt/VI/en/VI/index.php">http://www.am.lt/VI/en/VI/index.php</a> ) | Government and ministries        | Public        | Very influential on public opinion.<br>Extremely influential on political decisions |
| Ministry of Energy of the Republic of Lithuania ( <a href="http://www.enmin.lt/en/">http://www.enmin.lt/en/</a> )                                 | Government and ministries        | Public        | Very influential on public opinion.<br>Extremely influential on political decisions |
| The Communications Regulatory Authority<br>( <a href="http://www.rtt.lt/index.php?-1086225712">http://www.rtt.lt/index.php?-1086225712</a> )      | Independent national institution | Public        | Somewhat influential on public opinion and on political decisions                   |

### 3 Research related to Science in Society

This section is concerned with research activities related to science in society. The purpose is to describe the efforts in Lithuania, including the SIS research being undertaken and how SIS issues are embedded in mainstream research. The section will also elaborate on how SIS research is being funded and what the scale of funding is.

A distinction is made between *SIS research* on the one hand and *SIS issues embedded in mainstream research* on the other. SIS research are the studies particularly targeting public understanding of science, governance of science, science policy, science education, science communication, ethics in science and technology, the reciprocal relations of science and culture, young people and science and similar issues. However, SIS issues may also be present in other research activities, in which the main objectives of research are *not* SIS related issues, but in which SIS practices or perspectives are embedded. This could include studies within the natural sciences which apply innovative or extensive use of public involvement in the research process, new ways of communicating research results, ambitious efforts to bring ethical and societal issues into research, innovative ways of involving a variety of stakeholders (politicians, NGOs, industry, social scientists etc.). Such efforts are referred to as SIS issues embedded in mainstream research.

The section provides examples of Lithuanian research projects and funding programmes related to SIS, cross-cutting and emerging themes of SIS. Moreover, the role of SIS in evaluative practices of research programmes and institutions are elaborated.

It should be noted that this section is concerned with mapping research activities which are **not fully EU funded**. The subsections are concerned with national as well as international research efforts, but not activities funded solely under the European framework programs. Such research activities are already well-documented elsewhere.

### 3.1 Research on Science in Society

#### 3.1.1 Research projects

| Name of project (incl. web-link or contact information)  | Local, national, or cross-country | Institutions participating  | Budget and funding source   | Field of study  |
|--|-----------------------------------|---|---|---|
| “Science management in face of globalization: priorities coordination and administration mechanisms” 2008<br>( <a href="http://www.smm.lt/smt/docs/eksp_stud/Galutine%20MRU%20ataskaita%20VMSF.pdf">http://www.smm.lt/smt/docs/eksp_stud/Galutine%20MRU%20ataskaita%20VMSF.pdf</a> ) | National                          | Responsible Institution: Mykolas Romeris University<br>Partners: Research and Higher Education Monitoring and Analysis Centre; Public Policy and Management Institute | Budget: 7,530€<br>Source: The Lithuanian State Science and Studies Foundation                             | Governance of science   |
| “Foresight for the Lithuanian Economy in the Light of Regional and Global Tendencies”, 2007<br>( <a href="http://www.izvalga.lt/lt/dokumentai/id/1844">http://www.izvalga.lt/lt/dokumentai/id/1844</a> )   | National                          | Non profit institution: Social and Economic Development Centre with set up team of experts  | Budget: 78,197€<br>Source: The Ministry of Economy  | Other: Finding the direction for the future development of Science and Technology |
| “Intellectual property rights in research and development” 2008( <a href="http://www.smm.lt/smt/docs/eksp_stud/IPR_2008_final_SMM.pdf">http://www.smm.lt/smt/docs/eksp_stud/IPR_2008_final_SMM.pdf</a> )   | National                          | Kaunas University of Technology, Law Firm Zabiela, Zabielaite & partners  | Budget: information not available<br>Source: The Lithuanian State Science and Studies Foundation          | Governance of science   |
| “Competitive funding schemes for research and development and innovation (RDI)”, 2007<br>( <a href="http://www.europarama.lt/NEW/">http://www.europarama.lt/NEW/</a> )   | National                          | UAB Europarama, The CIRCA Group Europe Ltd.   | Budget: information not available<br>Source: Research Council of Lithuania and European Social Fund       | Governance of science   |
| “Development and implementation of the system of measures for science popularisation”  | National                          | Lithuanian Academy of Sciences and 10 partners (universities and NGO)   | Budget: 0,87m. €<br>Source: EU Structural Funds and Lithuanian Government                                 | Public understanding of science<br>Science education<br>Science communication     |
| “Public education on genetically modified organisms”<br>( <a href="http://www.esparama.lt/lt/bpd/zemelapis/?id=6577">http://www.esparama.lt/lt/bpd/zemelapis/?id=6577</a> )  | National                          | Lithuanian Consumer Institute (NGO)   | Budget: 57,924 €<br>Source: Lithuanian Government: 14,481 €, European Regional Development Fund: 43,443 € | Public understanding of science   |



### **3.1.2 Trends in research**

The major emerging issue related to SiS in Lithuania is lack of understanding of importance of SiS research. At present major political decisions related to public understanding of science, governance of science, science education, science communication, equality and social inclusion in science, ethics in S&T in Lithuania do not have sufficient research based background. Topic of SiS related research is missing a systematic, programme based approach.

As can be seen from the list of research projects identified in the 3.1.1, the trends of SiS research related projects are addressed to specific emerging issues such as necessity of more targeted and prioritized research financing, low international competitiveness of Lithuanian researchers participating in EU Framework Programmes, the “brain drain” of young and experienced researchers, the public understanding of science and other specific science related emerging issues like potential human health and environmental impacts of the genetically modified food and organisms.

## **3.2 Main stream research embedding Science in Society issues**

### **3.2.1 Trends and good examples**

Most of SiS related programmes and projects in Lithuania are concentrated on science popularisation (science communication) activities. There no innovative or exemplary ways of embedding SiS practices that could be transferred from Lithuania to other countries. Main research activities in Lithuania with embedded SiS practices or perspectives are initiated by EU Research programmes such like Framework or COST programmes. Embedding issues related to SiS in research activities is the future challenge for Lithuanian research.

## **3.3 Funding for research on Science in Society**

There is no research funding programmes in Lithuania, specifically targeted at SiS, except European Framework or COST projects. It is usual in Lithuania to have funded projects that are covering different kind of activities, including SiS topics. For example, the Research Career Development Programme, [http://www3.lrs.lt/pls/inter3/dokpaieska.dok\\_priedas?p\\_id=25625](http://www3.lrs.lt/pls/inter3/dokpaieska.dok_priedas?p_id=25625), which aims to encourage permanent professional improvement of scientists and other researchers at all stages of their career and enhance abilities of human resources in the sphere of R&D in qualitative and quantitative aspects; encourage the mobility of scientists and other researchers. The Programme is funded by European Social Fund and Ministry of Science and Education

One of the tasks of Researchers Career Programme: promotion of science and technologies for youth and society.

Pre-planned actions (national projects initiation since 2009): measure Nr.7 “Improvement and dissemination of knowledge about science and technologies for pupils and youth”

The purpose of this measure is to establish and implement the system of identification and education of young researchers (pupils), promote gender equality in science. Activities foreseen in this programme are the following: creation of information system (IS) easily accessible to teachers and pupils (young researchers) and acquisition of the mobile and stationary research equipment; assistance to scientists, who are supervising young researchers; initiation and development of the national non-formal movement of young researchers; motivation of talented pupils to participate in scientific research activities; promotion of gender equality in science.

### **3.4 Importance of Science in Society issues as evaluative elements for national research programmes and academic institutions**

Lithuanian Research Council is responsible for the evaluation of national research programmes. One of important evaluation measure is called “Dissemination”, which covers not only dissemination of research results, but also interaction with the science community and the general public. The research programme can’t be financed without specified dissemination measures.

There are other SiS criteria included in the evaluation process, e.g. gender balance, but they are ‘tick the box’ type and they don’t play important role in selecting process.

## **4 Activities related to Science in Society**

This section relates to SIS as a field encompassing a variety of different activities particularly concerned with public communication of science and technology in Lithuania. The issues addressed are formats for science communication and the actors involved in science communication as well as trends at the national level.

### **4.1 National science communication trends**

Science communication concerning intensity of coverage is rather low in Lithuania. Despite few newspapers dedicated to science in society, few translated international science magazines and occasional TV programmes; scientific communication quality in other media is rather shallow due to the lack of analytical media and professional science journalism. The lack of professionals is evoked in the absence of the formal education programmes, and the lack of job opportunities, while the preparation of the professional science journalist takes time. The number of publications also depends on low flow of Lithuanian science discoveries and lack of interest from the science community to publicize. Other issue is the lack of scientist's and institutions ability to communicate in "comprehensive" language.

In comparison to the EU, Lithuanian citizens show less interest in scientific information, and feel less informed than average European citizen. The reason is that Lithuanian citizens are not used to getting information about science; the need for such information is not formed from early childhood. The demand of scientific information depends on level of education, so the more educated society the more information it needs. Still the most popular media informing about scientific achievements are television and press, which are more popular among the older citizens, while internet as a source of scientific information is more trusted by the younger generation. Young people are more tend to participate in discussions about science, though such method is less popular amongst older generation. Other, effective mean of science communication is through interactive communication which in Lithuania is underdeveloped. There is no permanent science popularising infrastructure in Lithuania.

The stakeholders have different opinions on situation of scientific communication, though general opinion is that not only reform of the whole system is needed, but the attitude change as well. In order to implement required changes, the significant qualitative changes in research system need to be done. The State should play an important role in declaring the science as the main state

development priority. Stakeholders of non-governmental and business sector noticed the lack of cohesion with the Ministry of Education in science popularisation field. There is a popular notion, that business is not interested in supporting science in general.<sup>11</sup>

#### 4.1.1 Good practises

Since 2003 the revival of science popularisation can be traced in Lithuania. Student scientific societies, other non-governmental organisations, scientists, and key individuals started to organise and create activities in order to make science and technologies more visible and inclusive.

The first science festival “Spaceship Earth” held since 2004 every year could be nominated as one of successful examples of public communication of science. The festival takes place in two cities Vilnius and Kaunas (and it is planned to include one more city - Klaipėda in the festival “Spaceship Earth 2010”) and this event consists of lecture cycle on cutting-edge areas of science held by scientists and set of interactive presentations. The festival is open to the whole society and attracts more attention every year.

As web-based communication becomes more influential at least among younger generation citizens, two internet portals should be mentioned as successful examples of public communication of science and technology in Lithuania. One of them is [www.mokslasplus.lt](http://www.mokslasplus.lt), which was designed by different scientific institutions based on their science popularisation experience in order to disseminate knowledge of science and education among broader society. This portal covers physics, astronomy, IT and informatics, Lithuanian terminology on informatics, multimedia training, new branch of science -physics of risks, virtual experiments online, science news and other interesting information. This portal enables to create additional interaction mechanisms among scientists of different areas, researchers, pedagogues, and other high level specialists.

Another successful example of dissemination of science and technology news is internet portal [www.technologijos.lt](http://www.technologijos.lt). This portal was created by Kaunas Technical College lecturers on a voluntary basis and it aims not only to present current news on technologies, but to fulfil such functions as: to give cognitive-consultative information, to popularise science, to review current education matters in Lithuania and in the world, and to encourage interactive communication on important as well as on interesting topics among different background users.

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<sup>11</sup> Source: Need Analysis Study on Popularisation of Science, 2007, performed by the Social Innovation Institute, pp. 17-23, [http://www.smm.lt/smt/docs/m\\_pop/Mokslo%20populiarinimo%20poreikio%20analize\\_internetui.pdf](http://www.smm.lt/smt/docs/m_pop/Mokslo%20populiarinimo%20poreikio%20analize_internetui.pdf)

The Ministry of Science and Education awarded these three initiatives a prize for popularisation of science in Lithuania.

#### Science journalism and training activities

In Lithuania, there is no formal education in science journalism, because there is almost no need for such specialists also there is a lack of job opportunities. Due to that there is no formal science journalism association, though informally enthusiasts have a group in one of the social networks dedicated to science journalism and do communicate more or less privately. There are no courses aimed at increasing skills for science journalists, editors or translators as well. Due to the size of Lithuania, lack of need for professionals and lack of interest from scientific society, the science journalism in Lithuania is unsystematic and rather undeveloped.

In order to eliminate the gap between journalists, scientists and their discourses, some communication training is being performed, but referring to the size of Lithuania and lack of specialists, such trainings are rather rare. In November 2009, Vytautas Magnus University with Vilnius University (VU) Institute of Journalism, lead two day training on scientific communication, mainly for scientists and journalists. Young Researchers Association holds yearly (since 2008) two day training for doctoral students and young researchers in scientific communication as well. Also VU Institute of Journalism has a discipline “Scientific communication: science journalism discourse” available for Master students. In 2010 The Ministry of Education and Science under Researchers career programme announced an early call in order to promote science importance to society, and increase the prestige of researchers’ career. Due to this there is €868,860 of funds allocated to the above mentioned activity. Under this call, projects covering communication training among the scientists and journalists can be implemented.

## 4.2 Young people and science education in schools

### 4.2.1 Skills and interest

In 2009, Lithuanian Youth Information and Technical Creativity Centre with Lithuanian Centre of Young Naturalists (project partner) began to implement the project „Development of the System for Disclosure and Education of the Young Researchers (pupils)“, <http://www.jaunasis-tyrejas.lt/>, financed by European Social fund and Lithuanian Republic state budget. The project will last until 2011.

This project seeks to create an effective non-formal science and technology education and training system, aid to develop the scientific approach, the creativity of young people, to disclose and develop talents. Also, it is especially important to develop the qualification of the teachers, who could lead the young people to scientific research.

The project has three main goals and activities. One of them is to establish the young researchers consulting centre, which would provide the aid for young researchers to communicate with the experienced researchers and as well to create the info base of the young researchers' research works. Other goal is to create good conditions for teachers to work with young researchers and to improve their skills of researching. Third goal is to bring together young researchers.

While implementing this project, non-formal summer school for young researchers is organised. During the lectures and workshops, pupils are learning about creative thinking, visiting labs of physics, biomedical sciences and technology, improving research skills. This project covers all Lithuanian schools.

Other recent activity, aimed at fostering the science skills of children is „Children's University“. Two of Lithuanian universities (Vilnius University and Kaunas University of Technology<sup>12</sup>) are participating in European Children's Universities Network (EUCU.NET, <http://eucu.net/>). EUCU.NET is funded by the European Commission under the Seventh Framework Programme for Research and Technological Development (FP7), Science in Society.

The aims of these Lithuanian Children's Universities are to involve children in science, to popularise the science, to help children understand importance and interest of science, to help children find their talent, to share the experience and knowledge of the famous scientists and professors with children.

One more activity aimed at fostering interesting and interactive approach for pupils to get involved into science is the project of Education Development Centre. In 2006-2008 the Centre was implementing the project „Creation and Implementation of Education Content on the ground of Information Communication Technologies, according to the Example of Integrated Course of Natural Sciences for 5<sup>th</sup> and 6<sup>th</sup> classes“, financed by European structural funds and Ministry of Science and Education.

While implementing this project, ICT-based integrated course of natural sciences for 5<sup>th</sup> and 6<sup>th</sup> classes „Human and Nature“<sup>13</sup> was created.

In 2009, the course „Human and Nature“ was one of the five winners (in category e-Learning & Education) in a global e-Content contest „The World Summit Award“ (WSA), <http://www.wsis-award.org/index.wbp>.

#### 4.2.2 Societal issues and critical reflection

When Lisbon goals for competitive and dynamic knowledge-based economy became explicit, they were absorbed into Lithuanian political agenda. It became evident, that it is important to promote natural science in the schools, as science

<sup>12</sup> Vilnius University: <http://eucu.net/cu/projects?id=135>; Kaunas University of Technology: <http://eucu.net/cu/projects?id=133>

<sup>13</sup> <http://mkp.emokykla.lt/gamta5-6/>

per se is perceived to be highly important factor in creating high added value production. Therefore in Lithuania particular emphasis is being put on addressing the correspondence between general education curriculum and labour market, knowledge economy, and the needs of the society. The development of the competence in and motivation for natural science among pupils, as the endeavour of making learning more attractive, obtainable and qualitative is being fostered, in order that the pupils would prefer to continue studying the disciplines of natural sciences.

The EU-funded Lithuanian projects are focusing on interactive learning processes based on important theories and ideas of science, interdisciplinary communication, reflexion of everyday life and changes in the world of science, and application and relevance to Lithuanian context. The projects described in the previous section testify that Lithuania has already started to address these tasks.

### 4.3 Communication activities

Looking back over the last 5 years, the influence of listed means of science and communication is as follows:

| Means                       | Much less | Less | Same | More | Much more |
|-----------------------------|-----------|------|------|------|-----------|
| Science TV programmes       |           | X    |      |      |           |
| Radio                       |           |      | X    |      |           |
| Newspapers                  |           |      | X    |      |           |
| Magazines                   |           |      | X    |      |           |
| Large scale festivals       |           |      |      | X    |           |
| Web-based communication     |           |      |      | X    |           |
| Museums, exhibitions        |           | X    |      |      |           |
| Citizen- or CSO initiatives |           |      |      | X    |           |

#### 4.3.1 TV programmes

| Programme title (and web-link if possible)   | Frequency | Duration (in minutes) | Target audience          | Themes covered  |
|--|-----------|-----------------------|--------------------------|---|
| Klausimėlis,<br><a href="http://www.lrt.lt/tv/shows.php?id=7196&amp;no=0&amp;cid=1158&amp;grid=7196">http://www.lrt.lt/tv/shows.php?id=7196&amp;no=0&amp;cid=1158&amp;grid=7196</a>                      | Weekly    | 10                    | Pupils, Students, Adults | Different scientific or historical topics, which are explained by scientist |
| Gustavo enciklopedija,<br><a href="http://www.lrt.lt/tv/shows.php?id=7233&amp;no=0&amp;cid=1158&amp;grid=7233">http://www.lrt.lt/tv/shows.php?id=7233&amp;no=0&amp;cid=1158&amp;grid=7233</a>            | Weekly    | 30                    | Children                 | Different scientific, historical or daily life topics                       |
| Universitetai.lt   | Weekly    | 30                    | Students                 | Different topics from scientific and academic life of universities          |
| Tūkstantmečio vaikai,<br><a href="http://www.lrt.lt/tv/shows.php?id=4762767&amp;no=0&amp;cid=1158&amp;grid=4762767">http://www.lrt.lt/tv/shows.php?id=4762767&amp;no=0&amp;cid=1158&amp;grid=4762767</a> | Weekly    | 85                    | Children                 | Different scientific, historical or daily life topics                       |

|  |        |     |                  |   |
|--|--------|-----|------------------|---|
| <a href="#">grid=4762767</a>   |        |     |                  |   |
| Gamtos kodas,<br><a href="http://www.lrt.lt/tv/shows.php?id=5559588&amp;no=0&amp;cid=1158&amp;grid=5559588">http://www.lrt.lt/tv/shows.php?id=5559588&amp;no=0&amp;cid=1158&amp;grid=5559588</a> | Weekly | 40  | Adults, Students | Quiz type programme on themes covering nature, ecology, environment |
| Universitetų žinių lyga “Ateities lyderiai”  | Weekly | 100 | Students, Adults | Intellectual quiz on various scientific and popular science themes  |

#### 4.3.2 Radio programmes

| Programme title (and web-link if possible)   | Frequency     | Duration (in minutes) | Target audience                   | Themes covered  |
|--|---------------|-----------------------|-----------------------------------|---|
| Inovacijos nelaukia<br>( <a href="http://www.ziniur.lt/Laidos/245/inovacijos-nelaukia">http://www.ziniur.lt/Laidos/245/inovacijos-nelaukia</a> )   | Weekly        | 60                    | Pupils, Students, Adults          | Integration of new scientific ideas, products , etc. into business      |
| Pažinimo vartai<br>( <a href="http://www.lrt.lt/pazinimas/">http://www.lrt.lt/pazinimas/</a> )   | Weekly        | 60                    | Pupils, Students, Adults          | R&D, higher education, innovations, science                             |
| Tinklas<br>( <a href="http://www.ziniur.lt/Laidos/136/tinklas-naujausiu-technologiju-erdve">http://www.ziniur.lt/Laidos/136/tinklas-naujausiu-technologiju-erdve</a> )                                     | Weekly        | 60                    | Pupils, Students, Adults          | New technologies, innovations   |
| Radio paskaitos<br>( <a href="http://www.lrt.lt/radio/shows.php?id=932660&amp;no=42&amp;cid=1160&amp;grid=932660">http://www.lrt.lt/radio/shows.php?id=932660&amp;no=42&amp;cid=1160&amp;grid=932660</a> ) | Weekly        | 60                    | Students, Adults                  | Analysis of current problems of Lithuania and world development         |
| Žinių amžius<br>( <a href="http://www.lrt.lt/radio/shows.php?id=7704&amp;no=63&amp;cid=1160&amp;grid=7704">http://www.lrt.lt/radio/shows.php?id=7704&amp;no=63&amp;cid=1160&amp;grid=7704</a> )            | Weekly        | 30                    | Adults                            | Questions about technology, knowledge, creativity                       |
| Gyvoji istorija<br>( <a href="http://www.lrt.lt/radio/shows.php?id=272824&amp;no=7&amp;cid=1160&amp;grid=272824">http://www.lrt.lt/radio/shows.php?id=272824&amp;no=7&amp;cid=1160&amp;grid=272824</a> )   | Weekly        | 27                    | General audience                  | History, archeology, ethnography, cultural heritage studies             |
| Mokslininkų dirbtuvės<br>( <a href="http://www.ziniur.lt/Laidos/273/mokslininku-dirbtuves">http://www.ziniur.lt/Laidos/273/mokslininku-dirbtuves</a> )   | Twice a month | 30                    | General audience, Yong Scientists | Discussion type programme on science quality, mobility, competitiveness |



### 4.3.3 Popular science articles in newspapers and magazines

Newspapers (science sections):

| Title of newspaper (and web-link if possible)  | Frequency of science section | No. of print runs | Target audience                                   | Themes covered  |
|--|------------------------------|-------------------|---|---|
| Mokslo Lietuva ( <a href="http://mokslasplius.lt/mokslo-lietuva/">http://mokslasplius.lt/mokslo-lietuva/</a> ) | Monthly (2/month)            | 550               | Academic society                                  | R&D, higher education, science, innovations, research policy, other academic issues |
| Lietuvos rytas ( <a href="http://lrytas.lt">http://lrytas.lt</a> )   | Weekly                       | 48000             | Pupils, Students, Adults                          | Daily news, including R&D   |
| Kauno diena ( <a href="http://www.kauno.diena.lt">www.kauno.diena.lt</a> )                                     | Weekly                       | 33600             | Pupils, Students, Adults                          | Daily news, especially from city life, including R&D.                               |
| Respublika ( <a href="http://www.respublika.lt">www.respublika.lt</a> )  | Weekly                       | 33000             | Pupils, Students, Adults                          | Daily topics, including R&D   |
| Klaipėda ( <a href="http://www.klaipeda.diena.lt">www.klaipeda.diena.lt</a> )                                  | Weekly                       | 5000              | Pupils, Students, Adults                          | Daily news, especially from city life, including R&D.                               |
| Mokslas ir gyvenimas ( <a href="http://ausis.gf.vu.lt/mg/">http://ausis.gf.vu.lt/mg/</a> )                     | Monthly                      | 2500              | Academic society                                  | R&D, higher education, science, innovations, research policy, other academic issues |
| Verslo ziniuos ( <a href="http://www.vz.lt">www.vz.lt</a> )  | Daily                        | 15000             | Pupils, Students, Adults (Especially businessmen) | Daily news: economy, market, business, also science, innovations                    |

Popular science magazines:

| Title (and web-link if possible)   | Frequency | No. of print runs | Target audience          | Themes covered  |
|--|-----------|-------------------|--------------------------|---|
| Iliustruotas mokslas ( <a href="http://www.iliustruotasmokslas.lt">www.iliustruotasmokslas.lt</a> )      | Monthly   | 9930              | Pupils, Students, Adults | Research, Science, Innovations                          |
| National Geographic Lietuva ( <a href="http://www.nationalgeographic.lt">www.nationalgeographic.lt</a> ) | Monthly   | 16 000 – 18 000   | Pupils, Students, Adults | Geography, History, Science, Innovations                |
| Mokslas ir technika ( <a href="http://neris.mii.lt/mt/">http://neris.mii.lt/mt/</a> )                    | Monthly   | 2400              | Academic society         | R&D, science, innovations, technologies                 |
| Veidas ( <a href="http://www.veidas.lt">www.veidas.lt</a> )  | Weekly    | 7000              | Pupils, Students, Adults | Popular magazine, where the R&D issues are also covered |

#### 4.3.4 Festivals, science weeks, etc.

| Activity title (and web-link if possible)  | Activity type        | Organiser   | Frequency         | Number of participants (approx) | Venue (city/region-/national) | Short description  |
|--|----------------------|---|-------------------|---------------------------------|-------------------------------|--|
| Erdvėlavivis Žemė<br>( <a href="http://www.mokslofestivalis.eu">www.mokslofestivalis.eu</a> )                        | Science Festival     | Public body<br>“Mokslas ir inovacijos visuomenei” | Yearly            | 10000                           | Vilnius, Kaunas               | Science festival, which consists of courses on research issues and interactive shows   |
| Langas į šviesą<br>( <a href="http://www.diluceinluce.eu/lt_index.php">http://www.diluceinluce.eu/lt_index.php</a> ) | Play                 | Ministry of Science and Education                 | Yearly            | 1000                            | Vilnius                       | A play, which shows how science is closely related to daily life, civilisation, etc.   |
| Scientific cafe  | Discussion club      | British Council in Lithuania                      | Yearly            | 100                             | Vilnius                       | Discussion club, where scientist and students discuss the raised problem issue, usually an internationally acknowledged researcher is invited.   |
| Pamatyk kitaip<br>( <a href="http://www.pamatykkitaip.vismis.lt">www.pamatykkitaip.vismis.lt</a> )                   | Festival             | Vytautas Magnus University and NGOs               | Yearly            | 500                             | Kaunas                        | Interactive shows about scientific developments  |
| Bitė Plius Laboratorija  | Festival/Competition | Ltd Bite  | Yearly            | 1000                            | The whole region              | A Lab show in the sector of telecommunication giving opportunity to each individual to create a challenging product for telecommunication sector |
| Protmušis<br>( <a href="http://www.protmusis.info">www.protmusis.info</a> )  | Competition          | Vilnius University                                | Every second week | 50                              | Vilnius                       | A competition, where students' teams compete answering the questions on different scientific topics and presenting them                          |

#### 4.3.5 National portals, blogs

| Activity title (and web-link)  | Activity type              | Number of users (if known) | Themes covered  | Short description   |
|--|----------------------------|----------------------------|---|---|
| Mokslas ir technologijų pasaulis<br>( <a href="http://www.technologijos.lt">www.technologijos.lt</a> ) | News portal                | 7711904                    | Science, Technologies, Research Policy, Innovations, etc. | It is a wide news portal and forum covering the issues of science and technologies. |
| Mokslas.Mokslininkai.Visuo   | Scientific and educational | -                          | Research and Development, sci-                            | Scientific and educational simulations on the webpage. Also news                    |

|  |                                     |   |  |  |
|--|-------------------------------------|---|--|--|
| menė<br>( <a href="http://www.mokslasplius.lt">www.mokslasplius.lt</a> )   | tional web-page                     |   | ence, technologies, higher education, innovations, research policy, etc.   | and forum.   |
| Lietuvos jaunujų mokslininkų sąjunga<br>( <a href="http://www.ljms.lt">www.ljms.lt</a> )                           | Scientific and Educational web-page | - | Science, Research, Doctoral Education, Research policy                     | The news portal and chat forum of Lithuanian Society of Young Researchers  |
| Lietuvos mokslininkų sąjunga ( <a href="http://www.lms.lt">www.lms.lt</a> )  | Scientific and Educational web-page | - | Science, Research, Doctoral Education, Research policy                     | The news portal of Lithuanian Scientific Society   |
| Studentai Moksleiviams, Moksleiviai Studentams<br>( <a href="http://www.smms.lt">www.smms.lt</a> )                 | Scientific and Educational web-page | - | Education, Research, Academic Societies                                    | The news portal and forum for students and pupils  |
| Elektronikos, informacinių ir ryšių portalas<br>( <a href="http://www.elektronika.lt">www.elektronika.lt</a> )     | News portal                         | - | Computer, Communication, Science, Education, Technologies, Innovation      | The news portal on computer science and communication  |
| Mokslo populiarinimo projektas<br>( <a href="http://www.popmokslas.projektas.lt">www.popmokslas.projektas.lt</a> ) | News portal                         | - | Webpages, Conferences, Forums, Events                                      | The news portal which covers the information on the events in academic society, new web pages about science and education, projects on the same issues |
| Žinių ekonomikos forumas ( <a href="http://www.zef.lt">www.zef.lt</a> )  | Scientific and Educational web-page | - | Research, Education, Innovations, Business and - Science, Entrepreneurship | The news portal and forum of Knowledge Economy Society   |
| Mokslo populiarinimo portalas<br>( <a href="http://www.mokslas.info">www.mokslas.info</a> )                        | News portal                         | - | Research, Education, Science, Academic society, etc.                       | The webpage informs about developments of research, education, science in Lithuania, touches the world wide issues as well.                            |
| Inovacijų portalas<br>( <a href="http://www.inovacijos.lt">www.inovacijos.lt</a> )                                 | News portal                         | - | Innovations, Science, Integration of technologies into Business            | The web page informs about inventions, new technologies and their integration into business  |

#### 4.3.6 Science museums and centres

| Activity title (and web-link if possible)  | Activity type | Number of visitors/year   | Themes covered  | Venue (city) | Short description  |
|--|---------------|---|---|--------------|--|
| Museum Energy and Technology<br><a href="http://technikosmuziejus.lt/muziejus">http://technikosmuziejus.lt/muziejus</a>                | Museum        | 2008 – 7.836<br>2009 – 14.055   | Energy, Transport, The history of Vilnius industry and technology, Technology for children and science, | Vilnius      | Established in 2003 In 2008 Museum used EU SF support, and became largest Energy museum in Lithuania, covering Energy, Transport, Lithuanian industry and other themes   |
| Infobalt<br><a href="http://www.infobalt.lt/sl/index_en.php">http://www.infobalt.lt/sl/index_en.php</a>                                | Exhibition    | 1994 – 30.000<br>1995 – 35.000<br>1996 – 45.000<br>1997 – 79.700<br>1998 – 80.000<br>1999 – 71.300<br>2003 – 65.000 | IT, Telecommunications,   | Vilnius      | International ITC exhibition held in Spring or Autumn since 1994.  |
| Lithuanian Museum of Ethnocosmology<br><a href="http://www.cosmos.lt/ethnocosmology.html">http://www.cosmos.lt/ethnocosmology.html</a> | Museum        | 2008 – 25.000   | Ethnocosmology, Cosmic World, Observation of sky bodies   | Molėtai      | The museum is established in 1990 and reconstructed in 2008. The main goal of this museum is to collect and provide information to visitors about the human relationship with cosmic world.  |
| Lithuanian Sea museum<br><a href="http://www.muziejus.lt/en/index.html">http://www.muziejus.lt/en/index.html</a>                       | Museum        | 2009 – 169.717<br><br>In the Dolphinarium were 206 092 visitors (127 649 adults and 78 443 children). In 2009)      | Sea creatures, Aquarium, Marine fauna, Navigation history, Dolphinarium,                                | Klaipėda     | Established in 1975. In 1994 museum was extended with dolphinarium. This museum is the only Lithuanian museum dedicated to maritime nature and history. The museum presents multiform exhibitions containing sea-life, fishing, navigation and maritime. |

### 4.3.7 Citizen- or Civil society organisations initiatives

| Activity title (and web-link if possible)   | Activity type                     | Frequency                 | Number of participants   | Short description   |
|---|-----------------------------------|---------------------------|--|---|
| Spaceship Earth<br><a href="http://mokslofestivalis.eu/lt/">http://mokslofestivalis.eu/lt/</a>  | Science festival                  | Annual                    | 2008 – 5.000-7.000<br>2009 – 5.000-7.000<br>Estimates 8.000 – 2010 | Festival has been held for six years already, covering most science fields and involving Universities, SMEs and secondary education institutions. While main audience are school children, admission is free for everyone   |
| PamatyKitaip<br><a href="http://pamatykitaip.viesiems.lt/">http://pamatykitaip.viesiems.lt/</a> | Science festival                  | Annual                    | 2010 – 2.000~  | Festival has been held for five years covering Natural Sciences and Social sciences and Humanities. The initiative of this festival belongs to the secondary school students  |
| Students Scientific Society Physics show  | Mobile Laboratory                 | Annual (Spring or Autumn) | 10-15 schools per season   | Physics show consists of few demonstrative and popular experiments in most of science fields having relations with physics, covering electricity use, molecular physics, mechanics and few others.  |
| Light in Light<br><a href="http://www.vinostella.eu/">http://www.vinostella.eu/</a>             | Exhibition, Optics show           | Once                      | 2007 – 15.000 (one month audience)                                 | Project Light in Light was organised by Vilnius University Physics Faculty Alumni Society and directed and coordinated by a visiting professor from Marie Curie programme, and lasted for one month. The realization of the project gathered together more than one hundred people - students, professors, artists, poets, actors, photographers. Project covered various themes connected to optics and light. |
| Mobile Science Laboratories   | Mobile demonstrational laboratory | Weekly                    | Estimates total 140.000 – 2010-2012                                | Project is implemented by Pupil Information and Technical Creativity Centre. Mobile Science Labs is a part of informal education infrastructure, which should help Lithuania find and teach young researchers more efficiently. Covers Natural sciences, Biosciences and Technology.  |
| Café Scientifique   | Discussion                        | Monthly                   | 70-80  | Café Scientifique first brought to Lithuania by British Council in 2006 to promote discussions on climate change and now held by Vilnius University Physics Faculty Students Scientific Society. Aimed not only at University students but  |

|        |                                   |      |                    |  |
|--------|-----------------------------------|------|--------------------|--|
|        |                                   |      |                    | to broader audience  |
| MIM'as | Mobile demonstrational laboratory | Once | 2009 – 7-9 schools | In 2009 Vilnius University Physics Faculty Alumni Society implemented mobile laboratory project MIM. Project goal was to break old stereotypes of boring scientist image through popular experiments in physics. |

## 5 The Fukushima accident

### 5.1 Media coverage and public debate

*Coverage.* The accident was extensively covered in the daily news' announcements and commented by politicians (mainly), analysts, official institutions, academics and publics. The accident coincided with and revived public debates regarding the plans of the Government to construct a nuclear power plant (NPP) and similar plans of neighboring countries in the territories close to the Lithuania's border. The discussion was focused on the risks of nuclear accidents, the safety of NPPs, advantages and overall costs of nuclear energy; energy as a tool for political pressure, energy independence and political safety; the impact of Fukushima to world and local economies, oil prices, fossil fuel consumption (and pollution) and energy deficiency; the impact to human health and environment, the consequences of Chernobyl accident. On the other side, regardless its risks, nuclear energy was considered as an alternative source to fossil fuel: the issue was framed as political agenda related to the need of the country to establish diverse resources of energy.

*Risks.* The risks of accidents and continuous radioactive contamination because of insufficient safety of NPPs, technological and engineering limitations or deficiencies, and lack of control of compliance with international safety standards were emphasized as the main risks, especially associated with Belarus and Kaliningrad NPPs. The location of neighboring NPPs close to the main rivers and the capital of Lithuania were considered as posing contamination risks of the region and the Baltic Sea, and endangering the stability of the country. The risk of earthquake or other natural disasters was not considered high although some of the NPPs are situated over the tectonic fracture.

*Climate concerns.* The discussion about nuclear energy as alternative source often was framed as political and economic issue and had little concern about the climate change. The use of nuclear energy as the main source of alternative energy, which would reduce the dependence on Russian gas, the use of renewable energy, the balance of energy sources, the assurance of sufficient energy sources, the pollution by traditional energy sources were the main issues in the debates.

*Governance and ethics issues.* The Government held on to the [plan](#) of constructing the new NPP although the society's support has dropped significantly after the accident in Fukushima Daiichi. According to the [survey](#) by weekly

journal „Veidas“ the support of the large towns’ residents to the new Lithuania’s NPP decreased from 44,2% in January 2011 to 10,6% after the accident in March and the percentage of opponents raised from 47,4% to 88,2% [respectively](#). However, new survey to assess the dynamics of public opinion is needed. Public involvement in protests against nuclear energy was not high. Public and green organizations initiated the [petition](#) and protest demonstrations against the three NPPs in Lithuania and neighboring countries (Belarus and Russian Federation), which coincided with the commemoration of Chernobyl accident. Some politicians expressed plans to initiate the [referendum](#). The Parliament issued the [resolution](#) concerning the safety of NPPs that are planned to be constructed in neighboring countries. On the other hand, the Parliament adopted the [Law on renewable energy](#), with the aim to promote the use renewable energy sources up to 23% by 2020.

*Research and technology.* The attempts to provide scientific reasoning of Fukushima Daiichi accident as well as the risks and advantages of nuclear energy to the public were made mostly by the energy specialists and academics. Issues of research and technology were not debated although needs for more safe technologies of NPPs and more effective technologies of renewable energy were expressed and nuclear safety related research was included in National research programme [“Future Energetics”](#), approved in June 2011.

## 5.2 Levels and modes of public involvement

After Fukushima Daiichi accident quite intense discussion was led mainly by politicians, analysts, energy specialists by means of comments and publications in media (portals, blogs, and commentaries). Participation of the broad public in discussions about the accident was very moderate. Commentaries in news portals or blogs were published. Other forms of public involvement included petition and protest demonstrations against construction of new NPP’s. Participation rate in the protest demonstrations was relatively low and took place in large towns (Vilnius, Klaipeda).

## 5.3 Political responses and scientific advice

The political responses rely on the complex issue of nuclear energy and political situation in the country. Generally, the Government and the President support the development of nuclear energy as a source of cheap and clean energy which guarantees the independence of Russian fossil fuel energy. The position is supported by some energy specialists’ arguments on the technological safety advancements of new NPPs, limited capacities of renewable energy and pollution by the use fossil fuel energy. The Government announced the prime investor in the new country’s nuclear power plant. In May 2011 the Parliament adopted the [national plan](#) of preparation of nuclear energy specialists.

On the other hand the opposing politicians and energy specialists argue that overall costs of nuclear energy are too high and that other types of energy fully satisfies the needs. In July 2011, the member of the Parliament [proposed](#) to initiate referendum on moratorium on nuclear energy.