

Slovenia

« Green Mobility »
State of Play in the Region



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Abbreviations

KET	Key Enabling Technologies comprise technologies such as nanotechnologies, micro- and nanoelectronics including semiconductors, advanced materials, biotechnology and photonics.
RTDI	Research, Technological Development and Innovation
RDC	Research-driven cluster
ICT	Information- and Communication Technologies
SWOT	Strengths, Weaknesses, Opportunities and Threats
R&D	Research and Development
SME	Small and Medium-sized Enterprises

1 INTRODUCTION

The overall goal of **ELMOs – Electromobility Solutions for Cities and Regions** – is to promote more sustainable transport through the development of electromobility solutions for cities and regions. The project aims at delivering concepts for a better exchange of electromobility knowledge at regional and EU level, concepts for new business models and for cross-border field tests which should lead to an improved standardisation in electromobility technology and to new insights in applied science. The project therefore, contributes to enhance the regional capacities for a fostering of the sustainable transport-related economy.

Due to daily-congested roads in and around agglomerations with highly polluting stop-and-go traffic, electromobility with zero-emissions in cities will bring large and quick gains in greenhouse gas reduction and alleviation of air and noise pollution. Moreover, innovative green vehicle concepts will lead to new and sustainable mobility forms in urban mobility.

“*Electromobility includes all electric vehicles as well as plug-in hybrids in urban, sub-urban and rural areas. Range extenders are excluded.*”

However, a fast uptake of electromobility depends on appropriate regional infrastructures, a shift in user patterns, and intelligent vehicle-use concepts embedded in the urban transport environment. At first step towards the achievement of a modal shift for sustainable growth is to gather and analyse available knowledge in the regions as well as at the level of research-driven clusters (RDCs) and on EU level, and to conduct SWOT analyses to serve the formulation of joint research, policy actions and business strategies.

This State of Play report seeks to provide an overview of RTDI and Cluster Policies, Action Plans, R&D Infrastructures related to electromobility and to stimulate the debate on future «Green Mobility Solutions» that drive quality of life, competitiveness and sustainable growth in Slovenia.

2 REGION & SECTOR

Slovenia is one out of six regions across Europe joining forces to drive the uptake of green mobility solutions for cities and regions. To better assess the regional state of play in electromobility, some basic information on the region and automotive sector is presented in the following sections.

2.1 Slovenia – The Region at a Glance

Slovenia, officially the Republic of Slovenia is a nation state situated in Central Europe at the crossroad of main European cultural and trade routes. It borders Italy to the west, Austria to the north, Croatia to the south and southeast and Hungary to the northeast. It covers 20,273 square kilometres and has population of 2.05 million. It is a parliamentary republic and a member of the European Union and NATO. Relative to its geography, history, economy, culture and language, it is a very diverse country distinguished by a transitional character. It is characterised by a high economic and social level. Its capital and largest city is Ljubljana.

Table 2-1 Slovenia – Key Figures

	Slovenia
Basic Information	
Territory (km ²)	20 273
Population (2011 in 1 000)	2 055
Population density (inhabitants per km ²)	101.3
Economy	
GDP per inhabitant (2009 in €)	17 300
Total Employment (2011 in 1 000)	936
Employment Rate (2011 in %)	64.8
Unemployment Rate (2011 in %)	8,2

Research Infrastructure	
Universities (2011) / Academia - Faculties	4 / 70
Research Laboratories	na
Research* (2009 in % of EAP)	0.71
Total R&D Personnel (2009 in % of EAP)	1.19
Human Resources in S&T (2009 in 1 000)	440
Human Resources in S&T (2009 in % of EAP)	40.6
Intramural R&D Expenditure (2009 million €)	656
(% of GDP)	1.86
EPO Patent Applications (2009 by Priority Year)	34,5

* EAP = Economically Active Population

Source: EUROSTAT

2.2 Automotive Sector

Slovenia has a mature automotive market. Car density stands at an impressive 615 cars per 1,000 people, which brings it close to that of many Western European countries. Primarily due to its location, Slovenia was the trading hub of the former Yugoslavia, with most manufacturing taking place in Serbia, Croatia and Montenegro. From the point of view of the automobile industry, this makes the country an attractive gateway to the other former Yugoslavian countries. The port of Koper is used extensively, particularly by Asian automotive manufacturers.

Proof for the Slovenian automotive industry's success is the previous period. Based on their own knowledge and intensive investment in technology development, Slovenian automotive suppliers, grew from a small group of unrelated businesses and institutions in a closely linked network of development partners to the most of the world's top automobile manufacturers.

In Slovenia, the production of passenger cars involves only one company - Revoz, while the production of automotive components involves many companies, mostly they are all suppliers of first and second order. Among the most notable suppliers certainly falls Cimos, Prevent, TPV, Iskra Avtoelektrika, Hidria, Kolektor, Unior,.. The company's Novo Mesto plant today produces approximately 200,000 passenger cars per year.

Although Slovenia is small, its automotive sector is relatively extensive. Allowing us to drop through the supply chain a little bit lower, could be found that there are, in this industry, indirectly involved at least several hundred other companies. Today, Slovenian automotive industry unifies 85 companies, over 600 contractors and knowledge institutions with more than 24,500 employees and 147,000 people indirectly related. Companies create more than 5mlrd €, from which over 80% is exported. This represents 21% of total Slovenian export and 10% of total Slovenian GDP. On average, Slovenian automotive industry invests 5% of turnover in research and development and over 12% in the new technologies.

Slovene's automotive industry is highly-technologically developed and operates according to a number of modern organisational principles such as lean production, benchmarking and multifunctional production.

In Slovenia, we have development and pre-development suppliers, but most importantly we have competencies which can play an important role in seizing new opportunities: vehicle hybridisation and electrification, radical lowering of consumption in internal combustion motors, mechatronic systems, light-construction vehicles, etc.

ACSs core competences are technology development and innovation, marketing, business support for its member's needs and education and training. For each project we are looking to the following questions:

- What will be the technology and product development in the future?
- How this will be implemented (production process)?
- Materials needed to comply with above conclusions?

3 POLICIES & ACTION PLANS

Many actors are usually involved in the formulation and implementation of RTDI and cluster policies, requiring efficient coordination mechanisms to be well established. Therefore it is essential, to take into consideration the multilevel policy governance role in making RTDI and cluster policy interventions more efficient. As a matter of fact, interdependency of EU, MS, regions and players grows alongside the progress of globalisation; it follows that all of the basic factors that facilitate successful R&D and innovation can be affected by efficient and well-directed policies carried out by the EU, its Member States and European regions.

“*Multilevel governance (MLG) is used to describe situations in which governance and policy-making is best understood as a process not only dominated by actors centrally located in nation states. The term indicates that policy formation and political authority is significantly influenced or transferred to other levels; either upward to a supranational arena (i.e. EU), downward to local or regional contexts, or sideways to other networks of actors than traditionally in control of policy formation.*”

At all governance levels policy makers need to explore novel strategies and approaches to cope with the challenges posed by complex and rapidly changing socio-economic political environments, including globalisation, environmental challenges, changing innovation processes, and so on. The regional dimension is of key importance in innovation policies because interactive learning and innovation processes are often spatially bound, and are strengthened and improved by geographic proximity. With respect to ELMOs, Research, Technological Development and Innovation (RTDI) and Cluster Policies establish conditions to boost investment in research and development, innovation, resource efficiency and the uptake of sustainable green mobility.

Against this background, the subsequent chapters give an overview of electromobility-related RTDI and Cluster Policies as well as of Action Plans implemented in Slovenia.

3.1 RTDI Policies

Research, Technological Development and Innovation (RTDI) policies are understood as a form of public support of RTDI activities. RTDI programmes/measures provide a structural framework for the funding or other ways of support of a number of projects or initiatives. In most cases this framework is outlined in written programme guidelines or similar documents which are usually binding for the authority responsible for and entrusted with the programme. Generally, these documents set out the goals, rational and responsibilities of the actors involved, define activities supported by RTDI programmes, and so on. They have a limited timespan and are initiated/governed by one or more responsible authorities (e.g. key actors such as agencies, ministries or research councils).

The purpose of the RTDI policy mapping was not to capture all RTDI programmes at national and regional level, but those relating to electromobility and/or one of the three electromobility-constituent sectors Automotive, ICT and (Green) Energy. In the following the major policies are introduced.

In the following an overview of ongoing policy programmes/measures of regional and cross-regional relevance introduced by national, regional or local governments is provided. Measures carried out in the past are only listed, if they are of high importance for electromobility and their expiration date was no longer than 2 years ago.

3.1.1 Introduction – A First Impression

Slovenian innovation policy is largely generic or horizontally oriented. Policies and funding is not focused on specific (thematic or sectoral) priorities.

Slovenian R&D policy is the responsibility of the Ministry for Higher Education, Science and Technology (MHEST) through its Directorate for Science and Technology. Innovation policy is a shared responsibility of the MHEST, the Ministry of Economy and to some extent also the two Government Offices: the Office for Development and European Affairs and the Office for Local Self-management and Regional Development. MHEST is focused more on R&D based innovation including technology development activity in business sector and the Ministry of Economy, its Directorate for Entrepreneurship and Competitiveness looks after the promotion of entrepreneurship and innovation activity of businesses with specific focus on SMEs.

Both Ministries have their executive agencies through which most of the policy measures are executed. The implementation of majority of measures of MHEST is undertaken by Technology Agency (TIA) and Slovene Research Agency (SRA). SRA is focused on financing public R&D resources primarily to public research institutes and higher education institutions; TIA is the central agency in support of business sector R&D and technology development.

Ministry of Economy implements its programmes through the Public Agency for Entrepreneurship and Foreign Investment (PAEFI), through Technology Agency (TIA) and Slovene Enterprise Fund (SEF). Relatively new actor in the area of providing financial support is the SID Bank –Slovenian Export and Development Bank.³⁶ With its financial

services SID Bank supports investments in research and development of technological environment and technology. SID Bank refinances credits of banks and other financial institutions, co-finances transactions and investments or SID Bank finances projects directly.

The Government Office of Local Self-governance and Regional Development also play an important role in the implementation of the innovation policy. This Office monitors all the public calls issued either by the Ministries or the Agencies, where co-financing by European Regional Development Fund (ERDF) or European Social Fund (ESF) is envisaged.

Over the years, Slovenia has developed a rather complex scheme of institutions for R&D and innovation policy implementation, from technology parks and centres (1994), incubators (2003), clusters (2001), technology networks (2003), technology platforms (2004), centres of excellence (2005), different business information units like the Small Business Development Centre,²⁹ Innovation Relay Centres, Euro-Info-Centres, regional development agencies, Slovene Enterprise Fund, etc.

Database on Slovenia includes 22 measures, from the funding schemes for business and public R&D, to the measures promoting linkages between business and public R&D sector and the measures, supporting intermediary institutions:

1. Technology equipment subsidies for SMEs
2. Guarantees for subsidised bank credit to SMEs
3. Development of Centres of Excellence
4. Promotion of R&D projects in SMEs
5. Strategic R&D projects in enterprises
6. Voucher system for consultancy and training services
7. Innovation voucher
8. Support to VEM services
9. Research Group Programme Financing Scheme
10. Young Researchers' Programme
11. Technologies for Security and Peace 2006-2012
12. Targeted Research Programmes
13. Co-financing of start-up of innovative companies
14. Co-financing of employment of researchers in enterprises
15. Financial Assistance to institutions supporting in
16. Direct subsidies for joint development investment
17. Incentives to interdisciplinary teams for technology
18. Applied projects

19. Development of business incubators at universities
20. Young Researchers from business sector
21. Subsidies for technology centres/parks
22. Development of innovation infrastructure

The public research institutes, which are having the Republic of Slovenia as their founder, are entitled to institutional funding. For the research programme funding with their research groups Institutes can apply to Slovenian Research Agency, for the applied projects if they have co-financing from business sector and for the so-called targeted research projects. The funding is obtained also through direct contracts with the business sector and through international cooperation.

The sector of non-profit research organisations is very small in Slovenia. A relatively active non-profit organisations in the area of R&D in Slovenia are Peace institute and the Slovenian Science Foundation (SSF), which was established by several individuals to promote research in social sciences. The SSF is involved in the promotion of science and is providing scholarships for young researchers but does not provide direct research funding.

Slovenian companies are quite active in terms of innovation especially innovation focused on reduced use of material, energy and labour costs. The innovation system seems to be quite strong in terms of linkages between SMEs as well as in public – private cooperation in science, not necessary in technology development. Also, the absorptive capacity is enhanced by the high level of lifelong learning activities. In addition, the specialization of Slovenian manufacturing firms is relatively favourable with a high share of medium and high-tech manufacturing. On the other hand, the Slovenian economy, R&D and innovation system also show important weaknesses in knowledge intensive services (both export and employment), in frontier innovations including patents, trademarks, designs and new to market sales. This is accompanied by relatively low share of IT expenditures, low intensity of cross-border flows of licences and patents which is all further aggravated by very low share of private credit to firms. This latter factor may be partly responsible for quite weak entrepreneurial dynamism in terms of firm renewals.

3.1.2 Detailed Measures

In the following we give an overview of key aspects of the implemented RTDI policy measures.

Centres of Excellence		
Duration	Budget (€)	Scope
2009 to 2013	84 138 865	3 – national
Key Policy Actors		
Ministry of Higher Education, Science and Technology		
Sectors addressed		
<i>Transport</i> <i>ICT</i> <i>Energy</i> <i>KET</i> <i>Electromobility</i>		
Key Target Groups		
<i>SME</i> <i>Large Enterprises</i> <i>Research Entities</i> <i>Researcher</i> <i>Cluster</i> <i>Region</i>		
Sectors addressed		
<input checked="" type="checkbox"/> Transport <input checked="" type="checkbox"/> ICT <input type="checkbox"/> Energy <input checked="" type="checkbox"/> KET <input checked="" type="checkbox"/> Electromobility <input checked="" type="checkbox"/> Other		
Key Target Groups		
<input checked="" type="checkbox"/> SME <input checked="" type="checkbox"/> Large Enterprises <input checked="" type="checkbox"/> Research Entities <input checked="" type="checkbox"/> Cluster <input checked="" type="checkbox"/> Region <input type="checkbox"/> Other		
Rational		
<p>Centres of Excellence are a measure within the framework of the scientific and technology policy of the Republic of Slovenia aimed at promoting the concentration of knowledge at priority technological areas and horizontal linking along the entire chain of knowledge development, which is realised on the basis of strategic partnerships between the private sector and academia. This comprehensive inter-disciplinary research and development programme emphasises the horizontal objective of promoting the transition to an energy-efficient economy with low greenhouse gas emissions or strongly promoting the transition to a low-carbon society.</p>		
Main Outcomes		
<p>To promote the concentration of knowledge at priority technological areas and horizontal linking along the entire chain of knowledge development.</p>		
Policy Impact		
<p>Establishment of new centers of excellence, highlighted horizontal objective: the promotion of intensive transition to a low carbon society in all spheres of research and technological development.</p>		

Competence Centres (business initiatives focussing on market - oriented results)

Duration	Budget (€)	Scope
2010 to 2014	350 000	3 – national

Key Policy Actors

Ministry of Higher Education, Science and Technology

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

The competence centres are defined as development and research centres that are managed by partners from industrial sector and link partners from the industry and public research sector; they focus on the promotion of the development capability and the application of new technologies in manufacturing new competitive products, services and processes at priority areas of technological development. This function is complementary to that of the centres of excellence; together they constitute an autonomous whole in the area of research and development.

Main Outcomes

To promote of the development capability and the application of new technologies in manufacturing new competitive products.

Policy Impact

Establishment of new centers of excellence, highlighted horizontal objective: the promotion of intensive transition to a low carbon society in all spheres of research and technological development.

Development Centres of the Slovene economy (strong support to new business models)

Duration	Budget (€)	Scope
2010 to 2014	185.274.533	3 – national

Key Policy Actors

Ministry of Economy

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

Key purpose of tender was to encourage the establishment and operation of the centers of the Slovenian economy for long-term development in content areas. This is to support projects that include both development work and the necessary equipment and other infrastructure that enable the development of enterprises, their skills and long-term foundation for growth and development of the economy and will allow technological breakthroughs in the areas where Slovenia is already a critical mass of knowledge.

Main Outcomes

The Ministry's focus is on support to further strengthen the international competitiveness and research excellence of Slovenian companies and offensive changing the structure of the Slovenian economy in structure, most adapted to the requirements of the global economy.

Policy Impact

Preparation of policies and implement measures to promote entrepreneurship and development of small and medium-sized enterprises and to promote technological development and innovation.

Financial incentives for citizens and companies for investments for purchasing the battery-electric vehicles

Duration	Budget (€)	Scope
2012 to 2012	200.000	3 – national

Key Policy Actors

Eco Fund, Slovenian environmental public fund

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

Financial incentives for citizens and companies for new investments for purchasing environmentally friendly battery-electric vehicles, which include a new battery-electric vehicles and a new connection (plug-in) hybrid vehicles (with the internal combustion engine and battery) for road transport. Financial incentives for citizens and companies for new investments for processing of existing road traffic, which will be processed in a way that will replace standard electrical generator mounted on the internal combustion engine.

Main Outcomes

Purchasing environmentally friendly battery-electric vehicles, which include a new battery-electric vehicles and a new connection (plug-in) hybrid vehicles (with the internal combustion engine and battery) for road transport and processing of existing road traffic, which will be processed in a way that will replace standard electrical generator mounted on the internal combustion engine. Increased percentage of battery-electric and hybrid vehicles in Slovenian fleet.

Policy Impact

Laws and regulation governing environmental protection legislation and area of efficient energy use and renewable energy sources. There are also a number of environmental programs.

3.2 Cluster Policies

Striving for more evidence-based cluster policy in view of a new generation of improved and excellent clusters, the purpose of this mapping was to collect information on regions' priority areas, policy instruments and measures.

Cluster Policies can broadly be defined as specific governmental efforts aimed to support clusters. These efforts can be categorised in facilitating policies, traditional framework policies and development policies. **Facilitating policies** are directed towards the enhancement of specific conditions that could improve clusters' performance. **Traditional framework policies**, such as SME policies, research and innovation policies, and regional policy often use the cluster approach to increase the efficiency of a specific instrument. And **development policies** strive for creating, mobilising or strengthening business strategies and cooperation between organisations and people through knowledge sharing at regional or cluster level.

3.2.1 Introduction – A First Impression

The cluster initiative in Slovenia, beginning in 2000, was one of the top priority measures when introduced. The background of the cluster policy is interesting from the point of view of policy implementation and was set out as an example of good innovation governance where several consultations and meetings with foreign experts took place, prior to introducing the measure. The extensive assessment of the potential clusters, involving 1700 companies, was carried out in 1999. On this basis, a pilot programme was planned for the period 2000–2003. First year of the programme only three pilot clusters were established. In the subsequent year, their number increased to five, but a real breakthrough in clustering was achieved in 2003. Clusters were primarily sector based and linked together companies within the same industrial sector and research institutions in the particular field. The total 2003 budget for cluster policy was approximately 1.5 million EUR. The ME accepted 14 projects and was able to grant on average 21 % of the requested funds. The interest of the business sector far surpassed the ability of government to support this initiative, in spite of high priority assigned to clustering. Several more developed clusters also approached EU funds for financial support.

In 2004, 18 cluster offices were operational. All together 29 projects related to clustering were being supported: 3 pilot cluster projects, 13 early stage clusters and additional 13 cluster initiatives, bringing together 350 companies and 40 education/research institutes.

The ME was not only supporting the clusters themselves, it was actively promoting the cluster concept as such and co-funded several seminars, workshops and conferences and even study tours by the representatives of clusters abroad (in 2003, Great Britain and Sweden). Representatives of ME took part at international conferences,

presenting Slovenian experience in cluster support. With the assistance of business journal Podjetnik (Entrepreneur) ME hosted an international cluster conference in 2004 in Slovenia.

The success of the cluster initiative was not convincing enough and after the change of government in the end of 2004, the cluster support programme was discontinued. The clusters which have developed sufficiently by the time the programme stopped (like the automobile cluster) were able to apply for R&D project support, but not for their own operational costs. The promotion of clusters in Slovenia was a reflection of a transfer of an example good policy practice, observed abroad, but modified to be more in line with the needs of Slovenian businesses.

3.2.2 Programmes in Detail

In the following we give an overview of key aspects of the implemented cluster policy programmes.

Cluster development programme		
Duration	Budget (€)	Scope
1999 to 2004	9.000.000	3 – national
Key Policy Actors		
Ministry of Economy		
Key Implementing Actors		
Ministry of Economy		
Sources of Funding		
<input checked="" type="checkbox"/> National Ministries <input type="checkbox"/> Regional Government <input type="checkbox"/> Structural Funds <input type="checkbox"/> Region <input checked="" type="checkbox"/> Enterprises <input checked="" type="checkbox"/> Other		
Sectors addressed		
<input checked="" type="checkbox"/> Transport <input checked="" type="checkbox"/> ICT <input checked="" type="checkbox"/> Energy <input checked="" type="checkbox"/> KET <input type="checkbox"/> Electromobility <input type="checkbox"/> Other		
Key Target Groups		
<input checked="" type="checkbox"/> Business Entities <input checked="" type="checkbox"/> Research Entities <input type="checkbox"/> Public Authorities <input type="checkbox"/> Citizens <input type="checkbox"/> Other		
Rationale		
<p>Slovenia Clusters was considered as one of the measures of the Entrepreneurship and Competitiveness Policy that the Ministry of Economy was implementing during 1999 - 2004. After that period, and starting from 2005 support to the cluster development programme stopped. From 2008 on the government does not support clusters as defined by EC, but is still supporting networking among enterprises, research institutions, academia through other organizational forms such as Centres of Excellence, Centres of Competence and Development Centres.</p>		
Main Outcomes		
<p>Out of six applicants three pilot clusters were selected: the automotive, toolmakers and transportation-logistics clusters.</p>		
Policy Impact		
<p>After the pilot project the programme continued and two calls for proposals were issued in 2002 and 2003. The interest for clustering increased and spread to other industries. In the second call eight new clusters out of 15 applicants were selected to receive governmental co-financing and in the third call 14 clusters out of 30. Until 2004 17 clusters had been supported in different phases of their development. The clustering initiative attracted more than 300 SMEs, 70 large firms, 80 knowledge institutions and almost 30 other support institutions, involving more than 66,000 employees. Through the years the programme became quite extensive and promoted more and more clusters. In order to get the feedback information on programme implementation and gain input for further policy intervention the government decided to carry out the evaluation phase.</p>		

3.3 Electromobility-related Action Plans

*“**Electrification** of mobility means embedding electric vehicles in a wider intermodal green transport system taking into account new usage patterns such as car sharing, leasing or transport on demand models, public means of transport as well as intelligent last mile freight.”*

In general, regional/national **Electromobility Action Plans** comprise a vision and strategy for electrification of mobility or in a wider sense sustainable green mobility, define thematic priorities, objectives, actions and measures while outlining the potential of electric/future mobility, challenges ahead and regional/national strengths.

By mapping regional/national electromobility-related Action Plans, ELMOs strives to gather information on the knowledge, competencies and experiences available in the region to compare strategies, activities and measures defined and goals achieved to identify good practices, areas of mutual learning, complementarities between the participating regions and areas for future activities to be defined in the Joint Action Plan.

3.3.1 Introduction – A First Impression

The historical chronology of activities of Slovenia in the field of energy efficiency goes back to the first year after the independence when the Slovenian government put its efforts into seeking an energy policy to replace the former supply oriented approach. In this way the first substantial budgetary allocations for energy efficiency and renewable energy resources were allocated in the new state budget for 1991.

In Slovenia the energy efficiency of all economic sectors improved over the period 1998 - 2007. The improvement of energy efficiency in Slovenia was 11% between 2000 in 2007. The improvement of energy efficiency was reached in all sectors: manufacturing, transport and households.

The improvement of energy efficiency in industry was about 16% in 2007 compared to 2000. The energy efficiency in chemicals and paper manufacturing decreased in the period 2000-2004 and then increased for 10% and 5% in comparison to 2000. The worse energy efficiency was in non-metallic industry.

The improvement of energy efficiency in the transport sector was over 8% in 2007 in comparison to 2000. The energy consumption in transport is still increasing since 1991, but the high consumption between 1994 and 1998 is a result of sale of fuels to consumers from neighbouring countries, due to low prices of fuels in Slovenia. The

improvements in consumption of specific cars related to the penetration of new, more efficient cars, was offset by the diffusion of larger cars and the decrease in the number of passengers using public transportation.

The principle tasks of the Agency for Efficient Energy (AURE) (established in 2002) and Department of Efficient Energy Use and Use of Renewable Energy Sources (from 2005) within the Ministry of Environment and Spatial Planning (MOP-AURE) are the implementation of national programmes for energy efficiency in industry, buildings and transport, stimulation of combined heat and power production (CHP) and utilization of renewable energy sources (RES). The Ecological fund (Eco-fund) is a public financial institution intended for the promotion of environmental investments in Slovenia. Its primary activity is providing favourable loans for investments in energy efficiency measures (EEM) and other ecological projects. Eco-fund supports (subsidizes) feasibility studies and preparation of documentation for projects on energy efficiency, utilization of RES and CHP. Targets of the Slovenian National Energy Programme (adopted in 2004) are to improve the energy efficiency by 2010 in comparison to 2004; in industry and service sectors for 10%, in buildings for 10%, in public sector for 15% and in transport for 10%, and to double the share of electricity production in CHP. The target of the adopted "National Energy Efficiency Action Plan for the Period 2008-2016" is to achieve cumulative savings of at least 9% or at least 4,261 GWh.

The implementation of different energy efficiency action programmes since 1991 was one of the priorities of AURE: energy audits; feasibility studies; energy consulting for larger companies; providing information; and demonstration of projects. The MOP-AURE also subsidizes energy audits and feasibility studies for investments in energy efficiency measures and RES. The Eco-fund supports the EEM through loans with favourable interest rates. The reduction of energy consumption also became one of the priorities of management in industry in order to reduce the payment of CO₂ tax.

The rapid increase of the energy consumption in transport presents a big challenge for Slovenia. Most measures implemented are related to the reduction of greenhouse gas emissions: control of exhaust gas composition and engine adjustment in motor vehicles, the rules on informing consumers of fuel consumption and CO₂ emissions of motor vehicles, promotion of biofuel and discharging biofuel of excise and other taxes. The government is also working on reducing the energy consumption through excise duties on motor fuels.

In addition in 2010 the Government also announced its intentions to prepare a funding scheme to support sales of electric and hybrid vehicles. Plans are also under way to create national programme to develop a national electric grid to support electrification of traffic. Until now all initiatives regarding the establishment of a electric vehicle power grid (powering stations) have been run independently on a local municipal level.

In the year 2012 within the CIVITAS ELAN project with the cooperation of the Task Force for Electromobility of the Ljubljana Urban Municipality (hereafter: MOL) and Etrek d.o.o. has been prepared the »Sustainable Electromobility Plan (SEP)«. The SEP document can be roughly subdivided into three main parts. The first part explains the basic concepts of electromobility and the reasons for its adoption. It is followed by the overview of current electromobility measures in transport policies on different scales. The third part introduces the planned measures to be implemented by MOL to promote and adopt electromobility.

The main goals of the Slovenian energy policy for renewable energy are: 25.3% of final energy consumption from renewable sources, with targets of 32.8% of the heating and cooling sector, 39.4% of electricity and 10.7% of the transport sector. Other targets include the slowing down of final energy consumption and the implementation of energy-efficiency measures.

Elements to encourage the achievement of the 2020 goals include continued support schemes for electricity production from renewables, introduction of a mandatory share of renewable energy in district heating systems, simplifying of procedures for investments in renewables, introduction of incentives and appropriate financial mechanisms, and measures for research and development and education and training.

3.3.2 Detailed Actions

In the following we give an overview of key aspects of the implemented electromobility-related action plans. For full details of each action plan, including activity areas and related measures, please see Appendix 1.

National efficiency energy action plan for the period 2008-2016 (NEEAP)		
Period of Plan	Budget (€)	Scope
2008 to 2016	409.000	3 – national
Key Actors		
Ministry of the Environment and Spatial Planning, Ministry of Finance, The Chamber of Commerce and Industry of Slovenia, the Chamber of Crafts of Slovenia, the Slovenian Chamber of Engineers, the Chamber of Architects of Slovenia, Ministry of the Economy, the Ministry of Transport, the Ministry of Higher Education, Science and Technology, and the Ministry of Education and Sport		
Key Target Groups		
<input checked="" type="checkbox"/> Business Entities <input type="checkbox"/> Research Entities <input checked="" type="checkbox"/> Public Authorities <input checked="" type="checkbox"/> Citizens <input type="checkbox"/> Other		
Vision		
On the basis of the NEEAP, Slovenia is to achieve cumulative savings of at least 9% in relation to the starting point for final energy consumption in the 2008–2016 period, or at least 4,261 GWh. Savings are to be achieved by means of various sectoral-specific, horizontal and multisectoral measures in all sectors (households, general consumption, industry and transport). In actual fact, greater cumulative savings in final energy consumption will be achieved since, under the NEEAP, a range of measures will also be carried out, primarily of a horizontal nature, whose effects will be capable of being clearly evaluated on the basis of a uniform methodology to be drawn up at the EU level.		
Strategy		
The NEEAP rests on the implementation of 29 sectoral, multi-sectoral and horizontal instruments that will ensure implementation of the measures proposed in Directive 2006/32/EC, Annex III. A large number of barriers will be removed by these instruments; these barriers are of an institutional, legislative, administrative, economic, financial, personnel nature, and also relate to awareness and information provision, etc. The NEEAP was drawn up in accordance with the requirements of Directive 2006/32/EC on the preparation of Member States' first energy efficiency action plan.		
Thematic Priorities		
renewable energy sources, renewable energy sources in the transport fuel balance; primary energy, efficient energy use,		
Objectives		
The ReNEP sets out the following targets in relation to efficient energy use and renewable energy sources:		
<ul style="list-style-type: none"> – an increase in energy end-use efficiency by 2010 in comparison with 2004: – in industry, general consumption and transport, by 10%; – in the public sector in particular, by 15%; – a doubling in the share of electricity from cogeneration from 800 GWh in 2000 to 1600 GWh in 2010; – an increase in the share of renewable energy sources (RES): – an increase in the share of RES in the supply of heat from 22% in 2002 to 25% in 2010; – an increase in the share of electricity from RES from 32% in 2002 to 33.6% in 2010; – a share of biofuels in transport of 5.75% in 2010. 		
In addition to energy and environmental policy objectives, the ReNEP is supposed to ensure realisation of the following:		
<ul style="list-style-type: none"> – an increase in the competitiveness of the economy in those areas in which Slovenia has expertise and tradition; 		

- technological development in the area of construction and other materials, fixtures and fittings, energy technologies and systems, information technologies, etc.;
- the creation of new high-quality jobs;
- the acceleration of regional development, particularly as a result of greater use of renewable energy sources;
- a lowering of energy costs, leading to an increase in economic competitiveness (primarily in energy-intensive branches), and a lowering of the public finance burden;
- the active involvement of a large number of people in the implementation of activities to reduce energy use, leading to a lowering of their energy costs; improvements in people's living and working conditions, leading to a reduction in healthcare costs.

Identified Potential for Future Mobility

In 2004, with a view to ensuring reliability of supply, the competitiveness of the energy industry, greater energy efficiency and environmental sustainability, the National Assembly of the Republic of Slovenia adopted the Resolution on the National Energy Programme (ReNEP).¹ This is the basic strategic document, and one which, in accordance with the principles of the Energy Act (EA),² plans and coordinates the operation of those entities involved in energy management. Slovenia's ambitious targets for reducing greenhouse gas emissions by 8% by the 2008–2012 period, in line with the Kyoto Protocol, were taken into account when formulating the ReNEP. In the 2000–2015 period, the ReNEP provides for a reduction in energy intensity of 30% (or 2.3% a year) with an increase in GDP of 60%. Among the important aims of the ReNEP are an increase in end-use efficiency throughout the entire energy chain, from primary to useful energy, and an increase in the share of renewable sources in the primary energy balance.

Identified Strengths

Slovenia placed energy efficiency high on its list of concerns in strategic documents relating to energy and environmental protection in the early 1990s. With the preparation of energy policy, which, in addition to ensuring supply, also gives equal status to reductions in energy requirements, targets for increasing energy efficiency, upon which efficient energy use programmes in Slovenia are based, were set. Efficient energy use programmes came to prominence when programmes to reduce greenhouse gas emissions began to be drawn up in the 1990s and when efficient energy use activities, which have played and will continue to play a significant role in reducing emissions, became part of the operational programme to reduce greenhouse gas emissions. The key energy programme was the National Energy Programme, which included important targets in the fields of efficient energy use and RES. The same targets were also included in preparations for the Operational Programme to Reduce Greenhouse Gas Emissions.

Since 1995 Slovenia has carried out a large number of programmes aimed at removing the barriers preventing an increase in energy efficiency and greater use of renewable energy sources. The main areas of activity are: informing, raising the awareness of and training energy users, investors and other target groups, providing energy advice, and promoting investment in efficient energy use and RES.

Impact

Slovenia has no direct influence on increasing energy efficiency in vehicle manufacture (the EU's role in concluding voluntary agreements for the car industry). However, the proposed additional instruments can have a significant effect on the vehicles market and on consumer choice, encouraging them to opt for vehicles employing the latest standards (EURO) that save energy and have a lower environmental impact.

The 'Sustainable Energy' priority, which could be defined primarily as an economic programme, will enable the purchase of fuels from abroad to be replaced by investments in and the use of domestic energy resources. The priority will have a wideranging impact on the national economy: an increase in competitiveness and technological development in areas in which Slovenia has expertise and tradition, the creation of high-quality new jobs, regional development, reduced dependence on energy imports, a reduction in energy intensity, a reduction in CO₂ emissions, lower energy costs, improved living conditions of the population, and so on.

Potential for Sustainability

The targets set in the NEEAP can only be reached with the active cooperation and high-quality coordination of all relevant participants: state bodies, local communities, energy consumers in the residential, industrial, public and service, small business and transport sectors, energy supply companies, suppliers of energy equipment and services, educational, research, development and financial institutions, nongovernmental organisations, the media, etc. Particular attention will therefore be devoted to informing and raising the awareness of various target groups regarding aspects of energy development. The Slovenian Government will implement the NEEAP through line ministries. Specialist, development and coordination tasks relating to the Action Plan will be implemented by the Ministry of the Environment and Spatial Planning, which is responsible for the area of efficient energy use. For NEEAP implementation, the Ministry will draw up detailed annual programmes by individual sector or instrument. The Ministry will adopt a detailed annual programme for NEEAP implementation by 15 January for the current year.

The NEEAP will be implemented through 29 instruments. The institutions responsible for individual instruments are responsible for achieving the targets laid down by those instruments. The Ministry of the Environment and Spatial Planning is responsible for most

of the instruments; for others, responsibility is held by the Ministry of Finance, the Ministry of the Economy, the Ministry of Transport, the Ministry of Higher Education, Science and Technology, and the Ministry of Education and Sport. Individual responsible institutions or providers of instruments will report to the Ministry of the Environment and Spatial Planning at least twice a year on implementation of the instruments. The responsible institutions and providers of individual instruments are given in Table 20.

A series of NEEAP measures constitute the involvement of aspects of sustainable energy development in other sectoral policy areas, which include, in addition to the environment and spatial planning: transport policy, the internal market and prices, fiscal policy, forestry and agriculture, regional development, technological development.

National Renewable Energy Action Plan (REAP)

Period of Plan

2010 to 2020

Budget (€)

Scope

3 – national

Key Actors

Government agencies and implementing institutions.

Key Target Groups

Business Entities Research Entities Public Authorities Citizens Other

Vision

In 2005 the share of RES in final overall energy consumption in Slovenia was 16.2 percent. Slovenia must achieve at least a 25-percent share in the balance of final energy by 2020. The most important renewable source of energy in the country is wood biomass, followed by hydroenergy, while in recent years development has been most dynamic in exploiting solar energy and biogas. The potentials of these energy sources, plus the potentials of wind and geothermal energy, will contribute to increased consumption of renewable energy sources.

Strategy

The National Energy Programme sets out the long-term developmental goals and trajectories of energy systems and energy supply in Slovenia. It defines the goals of energy policy and the strategic measures that the Slovenian Government will implement to achieve these goals. The strategic goals and measures in the area of RES under the valid National Energy Programme are summarised in the first chapter of this action plan. The NREAP is an implementing act that defines sectoral goals and measures for achieving the national target share of gross final energy consumption from renewable energy sources in 2020.

Thematic Priorities

heating and cooling, electricity, transport

Objectives

The objectives of Slovenia's energy policy for renewable energy sources are:

- ensuring a 25% share of renewable energy sources in final energy consumption and a 10% share of renewables in transport by 2020, which under current predictions will involve a doubling of energy generated from renewable sources relative to the baseline year of 2005, - halting the growth of final energy consumption,
- implementing efficient energy use and renewable energy sources as economic development priorities,
- in the long term, increasing the share of renewable energy sources in final energy consumption up to 2030 and beyond.

In order to achieve these renewable energy source objectives, the Slovenian Government will ensure an adequate support environment for:

- energy rehabilitation of existing buildings, mainly in the public sector, and construction of active buildings representing what are technologically advanced structures,
- replacing heating oil with wood biomass and other renewable energy sources
- district heating systems based on renewable energy sources and heat and power cogeneration,
- replacing electricity for producing sanitary hot water with solar energy and other renewable energy sources,
- generation of electricity from renewable energy sources,
- increasing the share of railway and public transport.

Identified Potential for Future Mobility

The NEP incorporates analysis of two energy policy strategies – reference and intensive – to promote efficient energy use and renewable energy sources. The reference strategy assumes a continuation of the current measures and a strengthening of their implementation with the aim of meeting the EU requirements, while the intensive strategy assumes a more active Slovenian policy in the areas of efficient energy use and renewable energy sources in order to step up the transition to a low-carbon society, meaning that in the intensive scenario Slovenia will exceed the requirements to which it is committed within the EU. The analysis

points to the advantages of intensive promotion of efficient energy use and renewable energy sources, in terms of energy, the environment and also the economy. An even greater contribution will be made towards improving the competitiveness of the economy by promoting measures for efficient energy use and renewable energy sources, if their promotion is classed as a priority in the national development strategy. Added value and physical product are provided in the form of medium value (highest probability) and possible range, while transport policy is provided in the form of two scenarios, sustainable transport policy and unsustainable transport policy. Slovenia's transport policy will affect the scope of transport works and the choice of means of transport, while Slovenian and European policies (transport policies etc., further EU enlargement, European goods market, taxing energy products) will affect the volume of transit through Slovenia and the purchasing of motor fuels in Slovenia and thereby the associated final energy consumption. Other external factors are presented in just one scenario, and projections of international prices are based on international analyses (IEA, World Energy Outlook 2009 etc.).

Identified Strengths

In transport, which in 2008 accounted for 39% of final energy consumption, the share of RES still amounted in the reference year of 2005 to just 0.27% and in 2008 to just 1.22%. Alongside the low value in the starting point and the very rapid growth in energy consumption in transport over recent years (18% growth in consumption in 2008), the target for 2020 is set at the minimal required value of 10%. There is little scope for obtaining raw materials in Slovenia, pressure on the cost of food production owing to competition for the use of arable land must be prevented, and sustainable criteria for biofuels must be ensured. This sectoral target will be verified once again upon a breakthrough of second-generation biofuels.

Impact

The assessment of achieving the set annual targets in the NREAP will use indicators in line with the international methodology prescribed for reporting in international agreements and at the EU level. The obligatory indicators for following up implementation of the National Renewable Energy Action Plan are as follows:

- the share of RES in final energy consumption in individual years,
- the share of RES in energy consumption in the heating and cooling sector in individual years,
- the share of RES in energy consumption in the electricity sector in individual years,
- the share of RES in energy consumption in the transport sector in individual years,
- total annual consumption of energy in the heating and cooling sector,
- total annual consumption of energy in the electricity sector,
- total annual consumption of energy in the transport sector,
- annual consumption of funds to promote EEU and RES.

Potential for Sustainability

The main goals of the Slovenian energy policy for renewable energy are: 25.3% of final energy consumption from renewable sources, with targets of 32.8% of the heating and cooling sector, 39.4% of electricity and 10.7% of the transport sector. Other targets include the slowing down of final energy consumption and the implementation of energy-efficiency measures.

Elements to encourage the achievement of the 2020 goals include continued support schemes for electricity production from renewables, introduction of a mandatory share of renewable energy in district heating systems, simplifying of procedures for investments in renewables, introduction of incentives and appropriate financial mechanisms, and measures for research and development and education and training.

3.4 The Interplay of RTDI, Cluster Policies and Action Plans – A Summary

One of the activities of The Ministry of the Economy of the Republic of Slovenia is providing support for development and innovation processes in economy. Among other activities the Ministry offers support via public tenders to innovation activities, offers initial funding for start-up companies, financial sources to companies to employ new graduates from University programmes and is responsible for relocation of European funds to nationally important development programmes including instruments like centres of excellence and centres of competence which are substitute the cluster.

Ministry of Environment of the Republic of Slovenia has in the last years also been more actively involved in promoting the spread of use of EV and HEVs. A funding scheme is being prepared by the Ministry, the Ecofund (under the direct supervision of the Ministry of Environment) and Government Office of the Republic of Slovenia for climate change. The plans for subsidies are currently only in the making and their implementation form, implementation date, the total amount of subsidies and the size of subsidy per each vehicle is unknown.

The Ministry of Transport of the Republic of Slovenia is mainly responsible for management of state owned roads and motorway network in Slovenia and for management of the toll system on Slovenian motorways. On the field of automotive R&D it conducts its main activities regarding the organisation and coordination of attaining EU funds for the need of developing road infrastructure, intelligent transport systems and improving road safety.

In 2010 the SID bank financed many export oriented development projects in the Slovenian automotive industry (with funds gained from the European Investment Bank) in order to speed up the recovery of this industry sector that is vital to Slovenia's economic recovery.

Slovenia traditionally used to have a very sporadically organised automotive R&D projects. Even to-day Government and public institutions (such as Universities) usually work on specific separate projects involving only one or more companies from the private sector. However, in 2010 the Government decided to give substantial funding to the SiEVA Development Centre. SiEVA is one of the 17 so-called Development centres of the Slovenian economy. These are public-private partnerships (PPP) that include the Ministry of the Economy of the Republic of Slovenia as the public actor and various private stakeholders.

In addition in the same year the Government also announced its intentions to prepare a funding scheme to support sales of electric and hybrid vehicles. Plans are also under way to create national programme to develop a national electric grid to support electrification of traffic. Until now all initiatives regarding the establishment of a electric vehicle power grid (powering stations) have been run independently on a local municipal level.

Slovenian companies that produce mostly Tier-2 and partly also Tier-1 automotive components for the main European OEMs research activities mostly address industrial research and especially manufacturing process research. But in the recent years Slovenian companies slowly began to invest more and more funds into pre-production research activities in order to improve their position with the main European OEMs. Main actors in the automotive R&D in Slovenia come from the private sector, whether it is large companies or SMEs. Many research projects also include universities (especially both universities of mechanical engineering from Ljubljana and from Ljubljana and Maribor). Research cooperation is mostly sporadic and is made on specific projects with defined problem between one or more companies or a company and University.

Figure 3-1 Assessment of RTDI, Cluster Policies and Action Plans

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
Retain	Enable
<ul style="list-style-type: none"> – Government support – Cooperation between public research and innovative business – Acting as open system with clear demands for new members 	<ul style="list-style-type: none"> – More calls for proposals – Availability of R&D financial resources – Encourage the e-mobility
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
Eliminate	Avoid
<ul style="list-style-type: none"> – Reference strategy replace for intensive strategy 	<ul style="list-style-type: none"> – Low cost countries in Eastern Europe and Asia

3.5 Preliminary Appreciation

4 ELECTROMOBILITY-RELATED RTDI INFRASTRUCTURES

“Research infrastructures refer to facilities, resources and related services that are used by the scientific community to conduct research in their respective field. This definition covers research entities, investors and financial instruments as well as R&D projects carried out by multiple stakeholder.”

Research infrastructures play an increasing role in the advancement of knowledge and technology and their exploitation. Accordingly, an innovative regional infrastructure serves the needs of enterprises that aim to bring their innovations to market and to drive enterprises competitiveness and regions' welfare. Against this background, mapping the electromobility-related RTDI supply in the region not only provides an overview of the current state of play, but also allows for a matching of the supply and the demand side within the region and between regions.

4.1 Basic Information

The Slovenian government supported the establishment of the ACS as a priority pilot project for the development of clusters and cooperation between individual spheres in Slovenia, which was a part of a strategic sharpening of the competitiveness of one of the most important sectors of the Slovenian economy. The development strategy resulted from an intensive dialogue between government, automotive suppliers and research institutes and faculties. Although the cluster initiative was partly government-financed, the government is not directly involved in the planning of activities.

It is extremely important for Slovenian automotive industry to strengthen its position on global markets by means of innovation as well as investments in know how and technology. This should be done right now, as there are lots of

the opportunities for Slovenian suppliers, resulting from the transfer of R&D and production competence from vehicle producers to system suppliers. Therefore ACS intends to accelerate and intensify the area of developing more complex products such as electronics in passenger department, interior, pedal box, hand brake, brake system, body and lighting equipment, door systems, mirrors, exhaust system, chassis, window washing systems, air conditioning, heating, cooling seats, steering and safety systems, engine and gearbox components (including castings and forgings).

In order to develop environment which will help us to establish a more efficient environment which will help us to establish a more efficient development of new components, modules and other complex products with higher added value added, we answered the tender of the Ministry of economy and initiated the project "Polycentric technology centre as innovative system of Slovenian automotive suppliers industry. As we already have a well developed information, communication and education infrastructure and since the cooperation between industrial companies and R&D organisation is on high level, we can expect increase in innovations and further improved range of products and services offered by Slovenian suppliers, joined in the ACS, to the global automotive industry in the future. Project is co-founded by European regional Development Fund.

4.2 Research Entities

In general and, in particular in the case of RDCs, research entities are of high importance for innovation at entrepreneurial and regional level. These comprise «Universities» including Universities of Applied Sciences, «Public Research Entities» partly or fully publicly financed and «Private Research Entities» fully privately financed. While all three types of research entities, to a greater or less extent, are involved in basic as well as applied research, Universities are also engaged in higher-education training and education contributing to the future availability of highly skilled human resources in the region.

In Slovenian automotive industry the research and development are directed towards the market requirements and the increase of profit. Slovenian automotive industry is doing business under pressure of fast changes and therefore it has limited resources for the research and development which is then supplemented by using the resources from universities. Currently more than 1,000 registered researchers are connected with Slovenian automotive industry at faculties, independent R&D institutes and R&D centres in the companies.

Important automotive related independent R&D centres are:

- University of Ljubljana, Faculty for mechanical engineering, Laboratory for Structural Evaluation
- University of Maribor, Faculty for mechanical engineering
- University of Maribor, Faculty for electrical engineering
- TECOS, Slovenian Tool and Die Development Centre
- University of Ljubljana, Faculty for natural sciences and engineering
- University of Ljubljana, Faculty for electrical engineering

According to the historical development in Slovenia we have excellent RTDI infrastructure in the field of automotive electric drives, in the last few year we succeed to develop very good RTDI infrastructure in the field renewable energy, ICT, smart grids.

Figure 4-1 Electromobility-related Research Entities – Assessment of Structure, Intersections & Interplay

<i>Which aspects would you want to keep or improve?</i>		<i>Which aspects would you like to develop or strengthen?</i>	
Retain	<ul style="list-style-type: none"> _ Cooperation with research and public entities _ Resources for the researches _ Government support 	Enable	<ul style="list-style-type: none"> _ Cooperation with research and public entities _ New qualification training programmes for young researchers _ Linkage between industry and electrical distributors
<i>Which aspects would you want to abandon or replace?</i>		<i>Which aspects would you like to circumvent/stay clear off?</i>	
Eliminate	<ul style="list-style-type: none"> _ reducing greenhouse gas emissions of transport _ lack of money at banks for industrial credits 	Avoid	<ul style="list-style-type: none"> _ unrealistic expectations of the public

4.3 Financial Actors & Instruments

The allocation of financial resources to RTDI can play an important role in driving innovation in electromobility. It is therefore essential, to get a detailed overview of financial actors investing in innovation activities in the area of electromobility and such focusing on one of the electromobility-constituent sectors Automotive, ICT, (Green) Energy. Collecting information on financial actors, instruments, volumes, investment size, scope and beneficiaries allows for a better alignment of public and private investment in RTDI within the region and across regions as well as an improved utilisation of EU structural funds.

Please describe in detail the current state of play concerning financial actors and instruments, sectorial focus, volume (total budget of instruments), investment size, and beneficiaries. Please indicate the general conditions, funding processes, target exit time, interest rates, expected ROI, operational/strategic management involvement of financiers, collaterals (e.g. tangible, intangible assets). Please also outline good practices and gaps as regards RTDI investors and instruments.

All current financial actors in Slovenia are national involved and are:

- SID Bank with sectorial focus on Automotive, ICT, Energy, Mobility
- Slovenian Environmental Public Fund – ECO Fund, sectorial focus on Automotive, Energy, Mobility
- Slovene Enterprise Fund, sectorial focus on Automotive, ICT, Mobility
- Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments, sectorial focus on Automotive, ICT, Mobility
- Slovenian Technology Agency, not specified focus
- RSG Capital, not specified focus

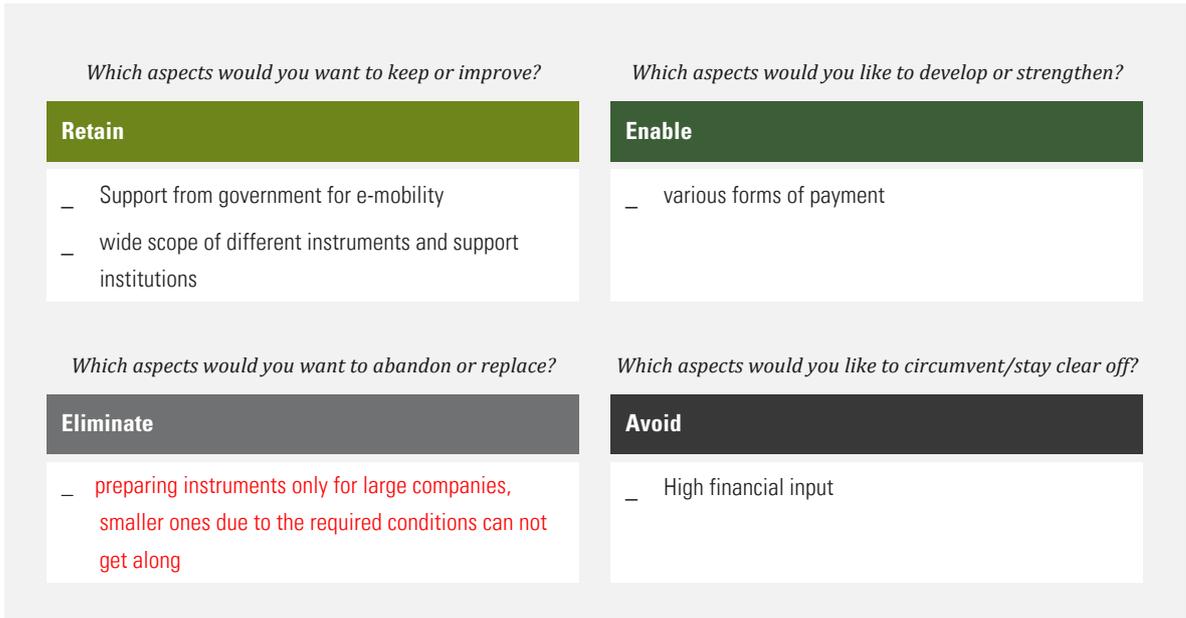
Except RSG Capital, where the instrument is VC Fund, all instruments are considered as others.

Beneficiaries of SID Bank are SME and other companies, ECO Fund beneficiaries are individuals and companies, Slovene Enterprise Fund beneficiaries are SME and spin-off, start-ups and other companies are beneficiaries of Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments, Slovenian Technology Agency beneficiaries are SME and other companies and the last one beneficiaries of RSG Capital are start-up companies.

Table 4-1 Financial Instruments available in the Region

Financial Instrument	Short Description	Availability			
		R	CR	N	EU
Seed Funds	Seed capital is the initial capital used to start a business. Seed capital usually comes from the founder's personal assets or investments by friends and family, but can also come from outside angel investors. Since the venture is usually in the conceptual stage, seed capital is used to sponsor research and development and cover basic expenses until the product or services can begin generating revenue.			X	
Business Angle Funds	An Angle Investor, also referred to as «Informal Investor» is a high net worth individual who invests in a business venture, providing capital for start-up or expansion, either in exchange for convertible debt or equity. They are thought of as bridges between loans from family and venture capital.			X	
Crowd Funding	Crowd funding refer to the funding of a company by selling small amounts of equity to many investors and therewith describes an collective effort of pooling financial resources; it addresses the equity gap between loans from family/friends and informal investors.			X	
Bank Loans	A debt-financing obligation issued by a bank or similar financial institution to a company or individual.			X	
Mezzanine Capital	A hybrid of debt and equity financing that is typically used to finance the expansion of existing companies. Mezzanine financing is basically debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full. It is generally subordinated to debt provided by senior lenders such as banks and venture capital companies.			X	
Venture Capital	Investment funds allocated to speculative activity. Risk capital refers to funds used for high-risk/high-reward investments. These funds are made available for start-ups and small businesses with exceptional growth potential.			X	
Guarantees	A promise made by a third party (e.g. bank, region) to provide payment on a bond, loan, or other liability in the event of default.			X	

Figure 4-2 Assessment of RTDI Financial Actors & Instruments



4.4 Electromobility-related R&D Projects

“**Basic research** (aka fundamental or pure) research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. Unlike basic research, **applied research** aims to address and answer the practical problems that exist in the modern world, rather than to just acquire knowledge for knowledge's sake. Importantly, applied research is, like basic research, based on previous theory.”

Currently we are involved in 9 projects, which are:

- PROSESC - Producer Services and Competitiveness for European Sustainability

Project focus on Networking and has involved participants from Research Entities and Public Authorities. The project seeks to improve the regional policy- making measures for sustainable road transport in Europe and establishes a network of regional and local policy- makers and development authorities.

- AUTOCLUSTERS - The International Cooperative Network of educational and Research Institution with Subcontractors and Other Bodies Active in Automotive Industry

Project topic is Networking in Automotive Industry. Involved actors are Business and Research Entities, Cluster and My Organization. The project's aim is to develop the network of existing SME facilities together with R&D or universities in automotive industry. The purpose of the project is to realize second level clustering activities with objectives to increase innovation capacities, increase effectiveness of technology transfer – improve the innovation circle in automotive industry, and through the project clearly address the global objectives – facilitating innovation, knowledge economy and information society. The budget available is 1,645,000.

- AUTO NET - Transnational Network of Leading Automotive Regions in CE

The thematic focus is on Networking in Automotive Industry. Actors who are involved in this measure are Research Entities, My Organisation and Cluster. Project AutoNet's specific objective is to promote CE region and its actors as an ideal area for creating new processes, materials or products in automotive industry. AutoNet project will propose trans-regional matchmaking opportunity by creating "AutoNet" as a permanent business network supporting actors of automotive industries from CE regions. Total budget of the project is 2,136,099.

- S_LIFE – European Synergies and co-operation for sustainable vehicle along the life cycle

Networking is main focus and involve Cluster and My Organisation. The S_LIFE project aims at developing the cooperation between European world-wide class clusters in order to help them developing new scientific (multi-disciplinary research environment), economic (new business models) and structural (RTD

and new technologies-oriented) coherent greening solutions all along the value chain. Budget for this measure is 2,406,661.

- UNIDO Serbia - Supporting Small and Medium-sized Manufacturers in the Automotive Component Industry in Serbia; Deepening and widening the services on cluster development and continuous improvement towards enhanced collective efficiency

Main topic is again Networking and Automotive Industry. Many actors are involved here: Business Entities, Cluster and My Organisation. The overall objective of the project aims therefore at strengthening its suppliers to meet the requirements of vehicle and 1st tier automotive component manufacturers so as to be able to access and sustain in global supply chains and international markets, in particular in the European Union. Total budget of the measure is 200,000.

- UNIDO Russia

This project is focused on Networking and Automotive Industry. Business Entities, Research Entities, Public Authorities, Cluster and My Organisation are involved in this project. Budget for this measure is 450,000. The overall objective of the project is to strengthen its suppliers to meet the requirements of vehicle and Tier 1 automotive component manufacturers so as to be able to access and sustainably participate in global supply chains and international markets, in particular in the European Union.

- SI.EVA - Synergistic Ecological Save Car

Project topic is Drive Systems. Actors who are involved in are: Business Entities and Research Entities. A consortium of 8 Slovenian suppliers companies (members of ACS), will create a new network of relationship and therefore exchange and obtain new knowledge and skills, develop new solutions for advanced internal combustion engines, hybridisation and electrification of cars, safety and comfort and business excellence. Measure budget is 250,000,000.

- HEADS - Hybrid and Electric Advanced Drive Systems

Also here the topic is Drive Systems. Budget for this measure is 14,500,000 and involve Business Entities and Research Entities. Expected development direction of these products: introduction of high system voltage, high output power, speed and output torque. Requirements: high fill factors above 70%, high efficiency above 95% and high specific power, for electrical motors 2kW/kg and for electronic controller over 10kW/liter. Solutions must provide high IP protection and EMC compatibility.

Slovenia's innovation policy decisions are based on analyses of high quality. However, there is no continuous system of evaluation and feedback in place for policy implementation. Learning based on policy implementation and its evaluation should be enhanced through 'dynamic learning cycles', which should include the different phases of policy development, execution and analyses of impacts. Slovenia should aim to build an effective monitoring and review system, which would make full use existing indicators and evaluations.

Half of the current Slovenian innovation policy instruments are focused on R&D and innovation in the business sector. This seems quite in line with challenges as revealed by the EIS data, which indicate a need for further growth of R&D investments in the business sector. A high share of these instruments reflects activities of both

Ministries (MHEST and MoE) and their agencies as well as a recent inflow of Structural Funds whose majority of funding for science and innovation is earmarked towards technology development.

Table 4-2 Number of Projects by Type of Projects by Thematic Focus

	DS	CH	SG	ICT	GE	MS	O
Basic Research							6
Applied Research	2						

DS = Drive Systems CH = Charging SG = Smart Grids ICT = ICT MS = Mobility Services O = Other

Petrol development of electric mobility plan coincides with the strategy for competitive transport system Transport 2050, by the European Commission on 28 March 2011. The plan is aimed at improving mobility and promoting growth and employment in the transport sector, while reducing energy dependence on oil imports and reduce carbon emissions by 60 percent by 2050. One of the three main objectives of this strategy is to ensure that the sites will not be cars that use "conventional fuels."

Figure 4-3 Assessment of electromobility-related R&D Projects

<p><i>Which aspects would you want to keep or improve?</i></p> <p>Retain</p> <ul style="list-style-type: none"> – Promote and encourage e-mobility – High environmental awareness – Competitiveness 	<p><i>Which aspects would you like to develop or strengthen?</i></p> <p>Enable</p> <ul style="list-style-type: none"> – Energy efficiency – Research infrastructure – Requires the development of young researchers in the field of batteries
<p><i>Which aspects would you want to abandon or replace?</i></p> <p>Eliminate</p> <ul style="list-style-type: none"> – Lack of raw material 	<p><i>Which aspects would you like to circumvent/stay clear off?</i></p> <p>Avoid</p> <ul style="list-style-type: none"> – High price of batteries in the world market

4.5 Summary – RTDI Infrastructures

The motorway density in Slovenia is higher than EU-27 average. The links with the neighbouring EU Member States and the southeast Europe is equally good as well. In other words, you will easily reach Slovenia from anywhere in Europe by car or lorry within a day or two.

Implementation of the National Motorway Construction Programme began in 1994 when Slovenia had less than 200 km of motorways. Currently, there are about 675 km of well-maintained motorways and around 800 km of trunk roads. In the period from 1994 till the end of 2011, 530 km of motorways, expressways and other roads have been built. The completion of the extended motorway network is scheduled for 2013.

Slovenia's energy sector is state-owned and derives most of its output from nuclear plants (38.2%), thermal plants burning fossil fuels (37.1%), and hydroelectric facilities (24.7%). Electricity production was 13.18 billion kilowatt hours (kWh) and consumption stood at 10.661 billion kWh in 1998. Slovenia also exports some energy.

When looking at the Slovenian innovation policy from the perspective of correctly identified challenges and the wide scope of different instruments and support institutions, one could assess the policy as relatively well conceptualised one. The innovation policy design has been under significant influence of the good practices seen in EU. Both, the challenges, identified by the policy papers as well as the measures proposed, can be assessed as the 'right' ones.

Figure 4-4 Slovenia – Assessment of the regional electromobility-related RTDI Infrastructure

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p>Retain</p> <ul style="list-style-type: none"> _ High quality and cost competitive services _ Government support _ To promote cluster development through increased investments in support infrastructure 	<p>Enable</p> <ul style="list-style-type: none"> _ Cooperation between academia, public and private research entities _ Best practices from other regions _ To initiate cluster formation in practice.
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p>Eliminate</p> <ul style="list-style-type: none"> _ a lot of paper work _ too long term of projects or projects which start in middle of the year 	<p>Avoid</p> <ul style="list-style-type: none"> _ At present, electric cars and fuel cell cars are critically underrepresented in the market.

5 RDCs – AN ECONOMIC PERSPECTIVE

“Research-driven Cluster (RDC) can be defined as clusters that rely predominately on R&D as source of innovativeness and competitiveness. Like technology and innovation clusters they associate enterprises, universities, research organisations, public authorities, and other stakeholders. However, they but differ from those by the fact that they have a stronger science/research base, and by their ability to generate a greater frequency of innovative enterprises able to commercialise and exploit research. They play a vital role in strengthening the research and innovation potential of European regions and are seen as enabler for smart and sustainable growth.”

RDCs entail a high potential to stimulate (electromobility-related) RTDI activities at the regional level and increase the competitiveness of regional economies: highly trained workforce and R&D are among the key conditions for innovation and economic success of a country, a region or a cluster. At the same time, RDCs represents a response to the growing local demand for R&D organisations to contribute more directly with the business and the public administration sectors, by contributing to the creation of public-private partnerships at local level and by creating a bridge among R&D actors, regional administrations and the business community.

Electromobility is no discrete sector, but constituted of the three sectors Automotive, Energy and ICT, represented by the participating RDCs within the ELMOs project.

The purpose of the cluster mapping is to best identify the specific electromobility-related potential of the RDCs according to their sectorial focus sectors and to identify synergies and complementarities bearing the potential for smart specialisation and collaboration as well as for mutual learning.

5.1 Basic Information

In order to increase especially non-material factors of development in automotive suppliers industry the Automotive cluster of Slovenia was established in 2001. ACS is a network for businesses in the Slovenian engineering and manufacturing industries: metal working, mechanical, electrical and electronics, chemical, rubber, textile and transport equipment industries, as well as partners from R&D institutions and other services in the supply chains that create and deliver products and services for the automotive industry.

ACS is a business association based on economic interest of its members uniting Slovenian automotive suppliers. Its members share information, develop new market opportunities and create greater added value by joint research and development. ACS provides support for its members to integrate into global automotive industry and to improve the range of their products and services. ACS accelerates the development of its member's efficient business operations through related research and development and by establishing links with support and scientific institutions home and abroad.

Members of business association are automotive suppliers of components, modules and systems for OEM and aftermarket customers in the field of cars, industrial vehicles and special vehicles industry. Our members are also important suppliers of equipment, tooling, research and development, production, logistic and other services focused for automotive suppliers and automotive industry. ACS consist of 59 members, 54 of them are industrial and services companies and 5 independent R&D institutes and faculties.

ACS is also one of the founders of the national technological platform for vehicles, roads and traffic. As the first national platform within the framework of EU TP ERTRAC it will be given special attention and support since it is a pilot project. The technological platform is based on ERTRAC model – but it covers the field of energy and fuels, automotive producers, suppliers to automotive industry, users, research and development organisations, road infrastructure, intelligent transport systems, representatives of governmental and EU organisations, cities/towns and regions and also offers providers and service providers. The activities of all the partners involved are focused on the development and business opportunities within the framework of four pillars:

- Mobility, transport and roads
- Environment, energy and natural resources
- Traffic safety and general safety
- Planning and production systems

Founded in 2005, the cluster **Pôle Véhicule du Futur** (Vehicle of the Future) works with groups, companies, units and training centres, for innovative projects. The strategy of the cluster is focused on vehicles and technologies for urban and peri-urban mobility, with a view to achieve sustainable development.

This strategy is implemented through four development programs:

- (1) **Urban & peri-urban Mobility Solutions:** Please provide 1-2 sentences to describe this programme
- (2) **Intelligent Driving Systems:** Please provide 1-2 sentences to describe this programme
- (3) **Urban & peri-urban Vehicles:** Please provide 1-2 sentences to describe this programme
- (4) **Sustainable Technologies for Transportation:** Please provide 1-2 sentences to describe this programme

The cluster expands every year. The cluster is financed by membership fees, projects, events organisation. At the moment we have 56 members, 52 companies and 4 institutions. ACS is a network for business in the Slovenian engineering and manufacturing industries: metal working, mechanical, electrical and electronics, chemical, rubber, textile and transport equipment industries, as well as partners from R&D institutions. We collaborate very well with universities, research organisations and our members.

In 2011, 141 members joined the cluster, 170 in 2011. The cluster is well balanced as regards the share of members of the triple helix and pools the forces of enterprises, universities, research organisations and policy makers to expedite the market penetration of innovative future mobility solutions through collaboration projects.

Table 5-1 RDCs Finance by Source of Funding

		Share of Source of Funding (%)			
	Total Budget (€)	PUB	MF	SF	PRO
2009	223.270		31.1	51.2	17.7
2011	296.595		31.0	5.0	64.0

PUB = Public Funding MS = Membership Fees SF = Service Fees PRO = Projects

5.2 Foundation

With the significant amount of additional resources coming from the Cohesion funds, the business related R&D measures have gained in their importance. The EU Innovation Policy Trendchart database on Slovenia includes 22 measures, from the funding schemes for business and public R&D to the measures promoting linkages between business and public R&D sector and the measures, supporting intermediary institutions.

Figure 5-1 Assessment of RDCs Foundation

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
Retain	Enable
<ul style="list-style-type: none"> – To promote green mobility – Best practices – More expertise in human resources – Private investments in research 	<ul style="list-style-type: none"> – Focus on existing measures – promoting linkages between business and public R&D sector and the measures
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
Eliminate	Avoid
<ul style="list-style-type: none"> – Poor coordination – High level of user unfriendliness – Designing new measures 	<ul style="list-style-type: none"> – Non educated human resources – Public funding which does not bring sufficient results, if there is any at all – (government is reducing public funding)

5.3 Competitiveness

Please describe in detail your cluster’s competitiveness in terms of

- Sectors relative importance compared to the national level (location quotient),
- RDCs contribution to regional growth,
- Cluster’s competitiveness at national, regional and global scale
- Cluster’s core competencies and potential for future development
- International performance

In Slovenia, we have development and pre-development suppliers, but most importantly we have competencies which can play an important role in seizing new opportunities: vehicle hybridisation and electrification, radical lowering of consumption in internal combustion motors, mechatronic systems, light-construction vehicles, etc.

Thanks to our incessant innovation method in Automotive Cluster of Slovenia, we have managed to intensify activities in optimising production, identification and work on joint development projects. We run regular skills and education programmes, such as project management in automotive industry, ACS school of quality and development of new automotive products. So far, two consortia with ACS members have been successful in Slovenian Economy Development Centres bids, one in the automotive industry (Si.EVA) and the other in materials

and technologies (SIMIT). The crucial activity at the moment is the successful realisation of opportunities opened up by the cooperation of Renault-Nissan and Daimler in 2013/2014, carried out in Revoz.

We have intensified activities in the field of internationalisation through organising business delegations, cluster members' presentation to car manufacturers and system suppliers, successful joint presentation at fairs in Stuttgart, Togliatti (Russia), Kragujevac (Serbia), and Munich (Germany). We continue our cooperation with Japanese car manufacturers and system suppliers and have established cooperation with Korean partners. We have also signed a memorandum on cooperation with the Association of Ukrainian Motor Vehicle Manufacturers (Ukautoprom) and continue to work on the network of suppliers and support development institutions projects in Serbia and Samara region in Russia, which will enable us to enter Fiat and Avtoavaz global supplier chains.

Through Autoclusters and AutoNet projects we have developed cooperation with EU automotive clusters, mostly Central and Southeast European ones. These entail important inter-company meetings and thematic business conferences that offer new business opportunities. Together with interested cluster members we are participating in an EU project dealing with the use of recycled tyres in producing price-efficient plastic and rubber automotive products.

In 2012 we of course plan to carry on the work started in 2011. But we will also enhance activities in joint development projects, intensify work in the area of internationalisation and new markets developed over the past years. Particular attention will be devoted to celebrating ACS's 10th anniversary in March and to the inter-company meeting. Another key focus will be the JAMA-CLEPA exhibition in September 2012, which aims to create new business opportunities for Japanese car manufacturers and European suppliers as well as enhance existing ones.

The main developmental task must become the improvement of competitive ability and innovation of economic sphere which is a condition for the adjustment to the changes in the field of cooperation and connection and at the same time the governmental sphere must consider the significance of knowledge as a developmental factor and its role in innovation and competition.

With state-of-the-art production, high productivity, quality, and cost-efficiency, the Slovenian automotive industry can play the role of an equal partner to car manufacturers. We also have effective collaboration with the research sector and global connections in supplier chains. We have derived numerous innovations from the excellent collaboration with universities – some of these innovations place the Slovenian automotive sector at the very top end of the global automotive industry. We specialise in important areas such as energy efficiency, safety applications, locking mechanisms which improve passenger safety upon impact and car seats and head rests.

Figure 5-2 Assessment of RDCs Competitiveness

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
Retain	Enable
<ul style="list-style-type: none"> _ Network with companies, R&D institutions _ Cooperation with domestic and foreign stakeholders _ Confidence between the members and shared understanding of common operations _ Resistance to electric vehicles 	<ul style="list-style-type: none"> _ Sustainable funding _ Government support _ Awareness of e-mobility _ Improving the power network by incorporating renewable energy and battery electric vehicles
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
Eliminate	Avoid
<ul style="list-style-type: none"> _ Concerns of e-mobility 	<ul style="list-style-type: none"> _ Unreachable e-mobility for all population

5.4 Cluster Dynamics

The cluster development guidelines for 2006 dictate ACS activities in the terms of a regional innovative cluster, which creates competitiveness advantages with the help of an adequate concentration of specialized skills and knowledge, the critical mass of various organizations, competition, companies and integrated activities as well as excellent suppliers. The cluster will mainly focus its attention on helping in the development of small and medium-sized companies that present a critical group of economic subjects in further economic development. Small and medium-sized companies are the accelerator of opening new workplaces, yet due to their smallness they are unable to exploit the sources available. Private investments into R&D in small and medium-sized companies are relatively scarce. However, universities (especially technical faculties in the economic environment) play an important role in such situations. Individual help to such companies is perceived as the most sensible.

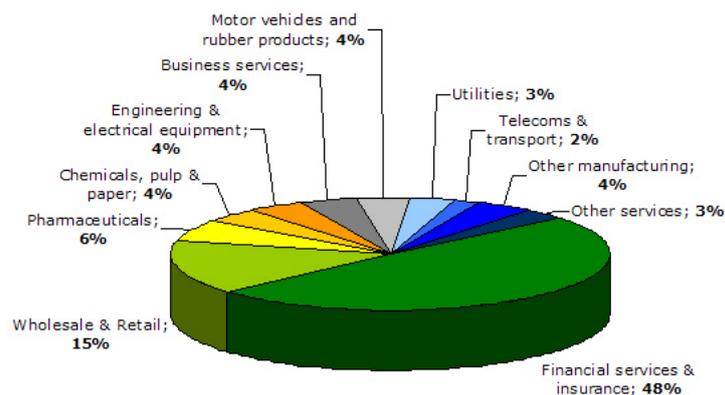
Another task is an accelerated identification of needs in various areas, such as mutual projects that will enable optimal access to new products and technologies on the one hand and possibilities of other accessible (in the terms of location) technologies and training on various areas on the other. By doing so, the establishment of new technological centers will lead to a better exploitation of sources and services that are offered to small and medium-sized companies. This will assure the same opportunities of access to new findings in research and to new technologies. What it takes, is the companies' orientation into a exploitation of domestic innovative potential and replacement of the conservative forms of management with new, contemporary forms of strategic leadership and management. The latter requires the lateral transfer from the universities that are developing key contemporary organizational approaches.

Currently the most important for Cluster is process innovation. Followed by Product Innovation and Social Innovation (it can be a product, process, or technology-much like innovation in general-but also be a principle, an idea, a piece of legislation, a social movement-e.g. change in mobility patterns-an intervention, or some combination of them) and the least important for the Cluster are Service and Design innovation.

We do monitor/evaluate the Cluster development on a regular basis. We use :

- Implementation of joint projects (domestic and foreign projects)
- The number of ACS members The combined attendance at the fair
- Number of workshops
- Performances at home and abroad
- Establishing contacts with potential customers

The largest recent FDI inflows are the post-privatisation takeovers (Goodyear) or classic takeovers (Lek-Novartis, Simobil-Mobilkom, SKB-Societe Generale, NLB-KBC etc). (Source: Bank of Slovenia 2011)



Business policy of the Automotive Cluster of Slovenia is further on orientated into the direction of identification and formation of mutual R&D projects, new products and technologies (virtual companies) and into the direction of international connections with companies and institutions in the field of automotive industry. The importance of integration into automotive industry suppliers' associations will contribute to a better identification of ACS in Slovenia and abroad and in addition to this the connection of ACS members with the external environment increase the level of technological development and the competitiveness on the global market.

Figure 5-3 Assessment of RDCs Dynamics

<p><i>Which aspects would you want to keep or improve?</i></p>	<p><i>Which aspects would you like to develop or strengthen?</i></p>
<p>Retain</p> <ul style="list-style-type: none"> _ Process innovation _ Measures we use for monitor and evaluate _ Cluster Management Competencies 	<p>Enable</p> <ul style="list-style-type: none"> _ Infrastructure _ Linkage between industry and electrical distributors _ Cheaper batteries in the world market _ Investments
<p><i>Which aspects would you want to abandon or replace?</i></p>	<p><i>Which aspects would you like to circumvent/stay clear off?</i></p>
<p>Eliminate</p> <ul style="list-style-type: none"> _ eliminate the monopoly of one manufacturer and set up a second one 	<p>Avoid</p> <ul style="list-style-type: none"> _ failure to comply with global trends _ risk of loss of competitive position on the market

6 ENTREPRENEURIAL BASE

With a Sustainable Electromobility Plan (SEP) Ljubljana (capital of Slovenia) will become the first city in the country and one of the first in the new EU member states with a municipal plan on electromobility. The plan will help the municipality to incorporate into Ljubljana long-term mobility policy the challenges arising from introduction of new technologies in modern mobility.

Elektro Maribor is one of the leading companies in the field of e-mobility in Slovenia. As such, it is more than suitable for the Slovenian environment, which is considered to be 70 to 90 percent of all trips at distances up to 30 kilometers, because the distances between settlements or from rural to small urban centers. In 2011, we introduced Elektro Maribor brand E-Mobil.

Its primary purpose is to bring electric vehicle technology to prospective customers and enable them to acquire their own experience and knowledge on the use of electric vehicles. To this end, Elektro Maribor as the first company in Slovenia in its fleet include two fully electric car. The automotive sector in Slovenia today is represented by the production of personal vehicles Renault in company Revoz where 900 Clio Stora and Twingos are produced per day and a well-developed automotive suppliers industry with about 95 big, medium-sized and small companies that are followed by over 100 specialized small companies that they cooperate with. The production of commercial vehicles has been becoming more active and has been gradually spreading its suppliers' net.

Figure 6-1 Assessment of Entrepreneurial Base

<p><i>Which aspects would you want to keep or improve?</i></p> <p>Retain</p> <ul style="list-style-type: none"> – Look for wishes and needs of customer – Public awareness – Encourage the cooperation between companies and institutions with the intention of developing 	<p><i>Which aspects would you like to develop or strengthen?</i></p> <p>Enable</p> <ul style="list-style-type: none"> – Boost awareness of the importance of e-mobility – Learn from best practices from other regions – Development and production competencies move from manufacturers to suppliers
<p><i>Which aspects would you want to abandon or replace?</i></p> <p>Eliminate</p> <ul style="list-style-type: none"> – Companies with knowledge are limited in operation in the market due to price 	<p><i>Which aspects would you like to circumvent/stay clear off?</i></p> <p>Avoid</p> <ul style="list-style-type: none"> – No political willingness to support e-mobility – migrate to places that allow lower costs

Appendices

A1 List of Electromobility-related Research Entities

Name of Organisation	Type of Organisation*						Number of Researchers	Sector**			
	SF	UAS	PUB	PRIV	CRC	TTC		A	I	E	M
University of Maribor, Faculty of Mechanical Engineering	x						3	x			
University of Ljubljana, Faculty of Mechanical Engineering	x						6	x			
National Institute of Chemistry Slovenia, Public Research Institute			x				84			x	
Institute Jozef Stefan, Public Research Institute			x				77		x	x	
University of Ljubljana, Faculty of Chemistry and Chemical Technology	x						18			x	
TECES, Research and Development Centre for Electrical Machines					x		14	x	x		
University of Maribor, Faculty of Electrical Engineering and Computer Science	x						1		x		
University of Ljubljana, Faculty of Electrical Engineering	x						5		x		
University of Nova Gorica, Center for systems and information technologies	x						8			x	

(*) U = University UAS = University of Applied Sciences PUB = Public Research Entity PRIV = Private Research Entity CRC = Collaborative Research Centre TTC = Technology Transfer Centre

(**) A = Automotive I = ICT E = Energy M = Mobility

A2 List of Financial Actors & Instruments

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
SID Bank										x			x	x	x	x	x	
Slovenian Environmental Public Fund - ECO Fund										x			x	x		x	x	
Slovene Enterprise Fund										x			x					x
Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments										x			x	x	x		x	
Slovenian Technology Agency										x			x					x
RSG Capital									x				x					x

(*) SF = Seed Fund AF = Business Angel Fund CF = Crowd Funding BL = Bank Loan VC = Venture Capital G = Guarantee

(**) A = Automotive I = ICT E = Energy M = Mobility

A3 Electromobility-related Projects

Name of Project	Duration		Budget			Type of Instrument*				Involved Actors**						Thematic Focus***						
	Start	End	Total (€)	Pub (%)	Priv (%)	BR	AR	FT	AT	B	R	P	C	CL	O	DS	CH	SG	ICT	GE	MS	O
PROSESC - Producer Services and Competitiveness for European Sustainability	2010	2013	1.295.594		100,0	x					x	x		x								x
AUTOCLUSTERS - The International Cooperative Network	2009	2012	1.645.000	15,0	85,0	x				x	x			x								x
AUTO NET	2010	2013	2.136.099	15,0	85,0	x					x			x								x
S_LIFE - EUROPEAN SYNERGIES AND CO-OPERATION FOR SUSTAINABLE VEHICLE ALONG THE LIFE-CYCLE	2012	2014	2.406.661	15,0	85,0	x								x								x
UNIDO Serbia	2009	2012	200.000		100,0	x				x	x			x								x
UNIDO Russia	2010	2013	450.000		100,0	x				x	x	x		x								x
SI.EVA - Synergistic Ecological Save Car	2010	2015	250.000.000	60,0	40,0		x			x	x					x						
HEADS - Hybrid and Electric Advanced Drive Systems	2009	2011	14.500.000	66,0	34,0		x			x	x					x						

(*) BR = Basic Research AR = Applied Research FT = Field Tests AT = Application Testing

(**) B = Business Entities R = Research Entities P = Public Authorities C = Citizens CL = Cluster O = Other

(***) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

A4 List of Enterprises

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
Iskra Avtoelektrika d.d.	x						
Hidria Rotomatika d.o.o.	x						
Kolektor d.d.	x						
Domel d.d.	x						
Iskra mehanizmi d.o.o.	x						
MLM d.d.	x						
Cimos d.d.	x						x
Polycom d.o.o.	x						
TALUM d.d.							x
Iskra ISD d.o.o.							x
LTH Uliitki d.o.o.							x
UNIOR d.d.							x
TPV d.d.	x						
HIDRIA AET d.o.o.	x						
ELAPHE d.o.o.	x						
ETREL d.o.o.		x					
Pipistrel d.o.o.	x						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
Stoja d.o.o.	x						
Seaway d.o.o.	x				x		x
Oprema Ravne d.o.o.	x						
Elektro Ljubljana d.d.	x						
Revoz d.d.							x
SWATYCOMET d.o.o.							x
AMIT d.o.o.							x
TELKOM Đ OT d.o.o.							x
ORTOTIP d.o.o.							x
HTS IC d.o.o.							x
ALPRA Design	x						
Sistemi IN-ES d.o.o.	x						
INTESI, Jure Merka. s.p.	x						
Tehnoski center Poli-Eko	x						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other