LUND UNIVERSITY
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The European Union as an Engine for Innovation. A Case Study on Innovation in the European Union.

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Abstract: The President of the European Commission, Josè Manuel Barroso is demanding an innovation society in the European Union, while many of the citizens of the European Union are sceptical about the entire organization. This thesis deals with the question whether the European Union is an engine for innovation or not. Based on the four innovation indicators "Sustainability and Sustainable Development", "Regional Synergies", "Creative Cultural Exchange" and "Future Technologies" the policies and the budget of the European Union are analyzed regarding its degree of innovation.
The thesis shows that the European Union has made some effort towards more innovation; however, there is still enormous potential for improvement, especially in the budget distribution regarding large agricultural expenditures.

Key words: European Union, Innovativeness, Innovation Policy, Sustainability, Regional Synergies, Cultural Exchange, Future Technologies, European Budget, Seventh Research Framework Programme

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Preface

The second year in Lund….

In last years' thesis I wrote that going abroad can change one's life and after nearly two years in Sweden I have to say that my life has really changed.

The second year was completely different compared to the first year and I feel like I have spent it in a more Swedish way. The people who surround me now are rather Swedish than international students and this might be the reason why I am also currently preparing myself for the Swedish TISUS test, that I will hopefully pass on the 31st of May.

However, I am also still surrounded by friends from other countries besides Sweden and they have been an inspiration, when I was searching for my second year research question. They are either Europeans or are doing European studies and I have therefore decided to conduct my second year research on the European Union.

Innovation was part of my first year thesis and I want to apply this area now in a new context. Innovation in the European Union is therefore this year's research topic for me. Since I have many non European fellow students, who might have to comment on my thesis I will also elaborate the basic principles of the European Union in one chapter.

This thesis would not have been possible without some very important people. In particular without my parents Manfred and Gerlinde Wiederkehr, who are supporting me and my studies here in Sweden. Without their goodwill and financial help I would not be here at the moment and would not write this thesis. I really appreciate and thank them for their help!

Furthermore, I would like to thank my supervisor Lars-Olof Olander and our programme coordinator Jonas Ljungberg for their supporting advice and motivational help.

In addition I want to thank my friend Loni Russell, who was again supporting me with my thesis and all the other people, who made contributions to this piece of work. Their motivation was pushing me forward to finishing this thesis.

1 Introduction

The European Union and the membership of Austria belong to the most controversially discussed topics in Austrian politics and daily media. Directives for issues such as the curvature of cucumbers, the abolishment of light bulbs or the skiing lift funded by the European Union on the Danish island Bornholm[1] which hardly receives snow, are often used by opponents to argue against the European Union and the media is supporting such voices.

These are reasons why Austrians rather associate the European Union with negative aspects. A recent study conducted by Eurobarometer showed that 42% of the Austrians think that membership in the European Union is a good thing. This is more than 10 percent lower than the average support in the European Union; however Figure 1 shows that the trend in Austria is moving towards more support. This change in attitude can be explained by the economic crisis[2], however the recent developments in Greece and the troubles that the European currency is facing, might decrease the support for the European Union in the future.

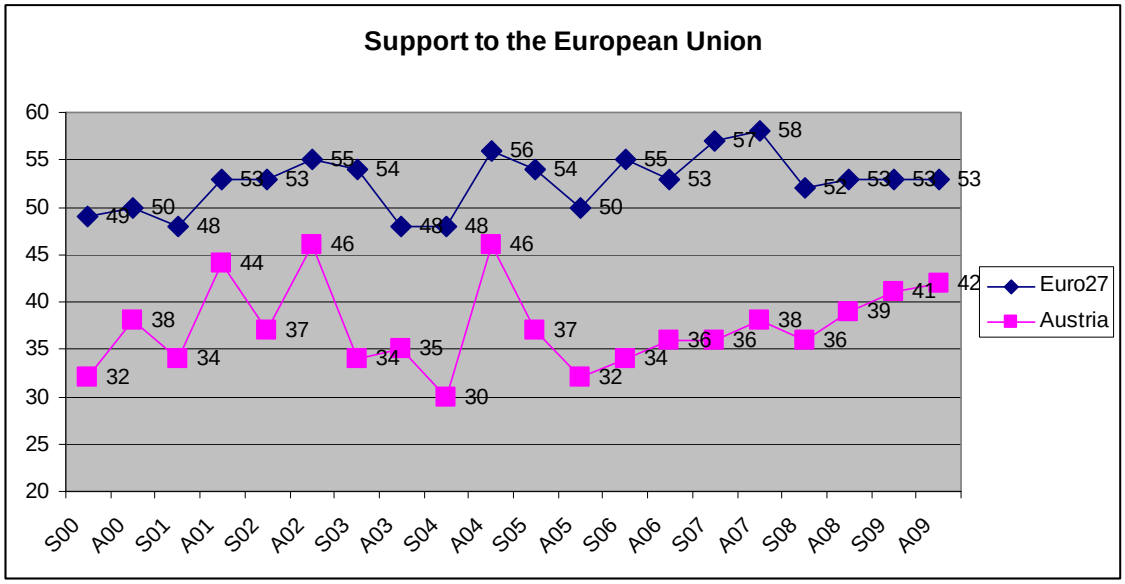

Figure 1: Support for EU membership in Austria[3]

[1] s. Focus, 2009, et. al.

[2] s. DerStandard, 2010, et.al.

[3] s. Eurobarometer, 2010, et. al.

But why are Austrians more sceptical towards the European Union than the average? Figure 2 shows what Austrians associate with the European Union. Most of the people think about the common currency the Euro, yet every second associates the European Union with more crime. Also a waste of money is associated by two out five people, and due to its geographical situation the claim for more border controls is getting louder and louder. Interestingly is that all the negative associations are lower on average in the entire European Union compared to Austria.

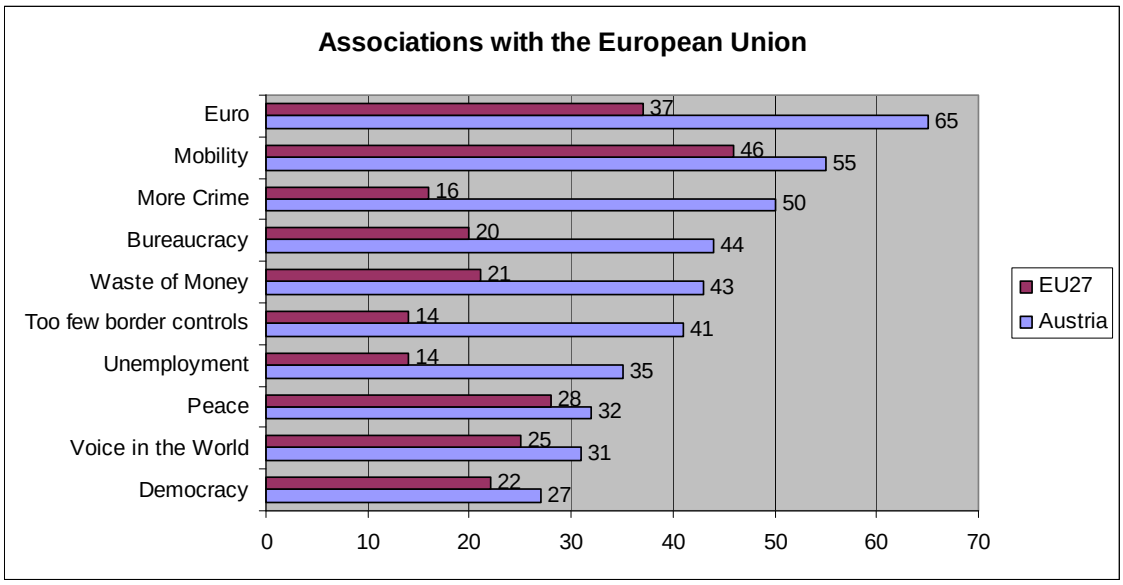

Figure 2: Associations with the European Union[4]

But does the European Union deserve such an image? I personally have a positive attitude towards the European Union and I want to find out whether these associations have a solid foundation or not. Therefore I take the point "Waste of Money" in an innovation perspective and formulate the research questions of this thesis in the following point.

1.1 Research questions

Forty three percent of all Austrians associate the European Union with a waste of money and indeed there are examples, such as the skiing destination on the island of Bornholm, which is rather known for summer tourism rather than winter, yet was financed by money from the European Union, which can be assessed critically.

The aim of this thesis is therefore to analyze and to evaluate whether the European Union's expenditures are spent on innovative areas or used to stimulate innovative activi-

[4] s. Eurobarometer, 2010, et.al.

ties. I will therefore have a look at the European budget and policies that might be oriented towards innovation.

The research questions are therefore formulated as followed:

What indicates innovation in the context of the budget and the policies in the European Union?

How is the European Union spending its budget and is the public funding stimulating innovativeness?

What innovative potential has the EU budget and is it going to innovative policies and initiatives?

And finally it should answer the question based on the title of the thesis:

Is the European Union an Engine for Innovation?

1.2 Limitations

The budget analysis of this thesis is limited to the year 2007, since there were no proper numbers for later years with statistics about the expenditure distribution yet available. Since the amount of policies, projects and initiatives are almost endless, this thesis is not claiming to comprehend a holistic and complete analysis of all aspects that the European Union is doing and standing for.

1.3 Outline

After an introduction about on what the European Union is, its history and how it works in Chapter 2, I will then present theory about innovation in the first part of Chapter 3.

In the next step I will focus on innovation indicators, which will be the foundation for an innovation indicator catalogue.

The second part of chapter 3 deals with innovation in the European Union and includes issues such as the history of innovation in the European Union and innovation policies and initiatives of the European Union in general.

Chapter 4 describes the method of this thesis, which is a case study and includes its structure in the form of the innovation catalogue mentioned above.

The fifth chapter shows an overview about the European budget expenditures and the innovation indicators presented in chapter 4 will be applied to it and on general innovation policies and programmes.

The final chapter 6 will summarize and conclude the thesis and in a final point the research questions from point 1.1 will be answered.

2 The European Union

In this chapter I will elaborate what the European Union is, how it was founded and how the Union works. I will therefore firstly give a brief overview about the history of the European Union, which is alongside the United States one of the most important and influential political actors in the world. Secondly I will give an overview on how the European Union works and about its policies.

In December 2009 the Lisbon Treaty, which amends the current EU treaties allowing for a more flexible framework and set of tools to meet future challenges, was finally ratified. As these changes are rather recent, the literature has not yet been developed in accessing how these changes affect the economic and political dynamics of the union. One example is that of the three pillar structure of the EU, which is in the process of changing into a more streamlined structure of competencies. Since the analysis of this thesis deals with the situation in the year 2007, the three pillar system of the EU will be used.

2.1 What is the European Union?

The European Union is a unique political arrangement and is much more than a conventional international organization, since it has greater powers and a strong impact on its member states.

McCormick sees the European Union as an experiment in regional integration and it is furthermore *"the product of declining faith in the state system, whose credibility has been undermined by a variety of problems: the failure of states to deal effectively with critical social problem …, the failure of states to address problems that transcend national boundaries, and most seriously the frequency with which states have to war with one another".*[5]

There are different attempts to understand the European Union and most of them have been driven by international relations theory. Another attempt is to look at the analyses offered by comparative politics and public policy. However, McCormack points out that no theoretical approach has yet provided the definite answer to clarifying the nature, origins and the possible future of the European Union and that the starting point to understand the European Union is to compare it to what he calls *"the state"*. The state is in this case the *"preferred channel through which humans have governed themselves"*.[6] A

[5] s. McCormick, 2004, p. 11.
[6] s. ibid, p. 13.

state is usually defined as an entity that legally and physically operates within a certain territory and has authority about this territory. It is furthermore legally and politically independent and it is recognized by the people who live in the territory and by other states.

However, a state rather tends to divide humans than to unite them and a state also encourages its citizens to place the interest of their home state above the broader interests of humanity, furthermore McCormick points out that this can lead to nationalism, which he defines as *"a belief that every state should be founded on a nation, and that national identity should be promoted through political action"*. McCormick furthermore states that *"at its worst, nationalism can lead to the aggressive defence of the interests of one state at the expense of other states, to a belief in national superiority, and even to ethnocentrism and racism".*[7]

This nationalism led amongst others to World War I and World War II and doubts about the value of the state, in particular after the two World Wars, have resulted into increasing international cooperation in the form of international organizations.

2.1.1 Regional Integration

McCormick sees intergovernmental organizations as the first step of international cooperation (see Box 1) and regional integration as well as regional integration organization as the following steps that are build upon it.

Box 1: Intergovernmental organizations[8]

- ***Intergovernmental organizations (IGOs)*** *consist of representatives of national governments and promote voluntary cooperation among those governments. IGOs generally lack autonomy in decision making, have few assets, lack of power to impose taxes or enforce their rulings, and are normally used as forums within which states can negotiate or cooperate with one another. Their methods include the gathering and sharing of information, the definition of standards and principles, the provision of financial or technical assistance, the enactment of treaties. Examples include all UN specialized agencies, the North Atlantic Treaty Organization (NATO), and the World Trade Organization.*

[7] s. McCormick, 2004, p. 13.
[8] s. ibid, 2004, p. 14.

Regional integration is achieved if states take international cooperation far enough to *"build institutions that control issues of mutual interest, transfer authority to those institutions, develop new bodies of binding international law, and reduce or remove barriers that surround their territories"* and that states *"pool authority in selected areas in the hands of one or more joint institutions"*.[9] However, McCormick points out that this does not mean that states surrender their separate identities – neither in a legal, political, economical, social or national perspective.

An ultimate expression of integration would be a full political union such as the United States, however the European Union has stopped before a full political union and is instead a regional integration organization, which is usually the result of the shift of authority from the member states to a new level of organization above the level of a national state. This can sometimes include a loss of sovereignty and can not be legally challenged by other authorities.

According to McCormick, regional integration organizations are authorized to coordinate the making of new rules and regulations to which their member states are subject and the member states have the collective final say on adoption and introduction of the common rules and regulations and states will typically integrate because of at least one of the following reasons:[10]

- *They may be forced together by a Napoleon or a Hitler.*
- *They may cooperate out of need for security in the face of a common external threat.*
- *They may share common values and goals.*
- *The may be encouraged by visionary leaders or political acts of will.*
- *They may come together out of convenience or efficiency, deciding that they can promote economic development or improve their quality of life more quickly and effectively by working together rather than separately.*

2.1.2 Intergovernmental, supranational or federalist?

According to the theory elaborated above, the European Union is neither a conventional international organization nor a European super state. McCormick sees the European Union as a politically organized system, which is being caught in a network of competing tensions.[11] This means that the key decisions within the European Union are still made by the member states. Their leaders or representatives are in ongoing negotiations

[9] s. McCormick, 2004, p. 15.
[10] s. ibid. p. 15f..
[11] s. ibid, p. 24.

and the European Union is therefore still an organization, which is controlled by the governments of the member states. These member states work with each other as partners and from this perspective the European Union is an intergovernmental organization. The European Commission with its currently 27 commissioners from 27 countries is a good example for the intergovernmental approach.

Another point of view is the supranational approach, where autonomously governing bodies exist and have the authority to make decisions above the level of the member states, based on the interests of the European Union as a whole entity. The European Commission can also be seen as an example for this approach. The actual goal of the commissioners are to work in the interest of the European Union, however member states still have the possibility to influence their own commissioner. The European Court of Justice can also be seen a supporting part for the supranational approach.

Another approach is that of federalism, where governments on a local and national level coexist with a system of shared and also independent powers, but without having authority over the other. Austria and Germany are two examples of federalist countries in the European Union. According to McCormick, federalism has been one of the most important threads in the continuing debate about European integration; however he points out that the European Union is far away from being a federation, since the member states are still able to make independent decisions. One good example is the Euro, which is not the currency in all the member states and another one is the military aspect, with member states that are considered to be neutral and others that are members of NATO. However, federal aspects in policies can not be completely denied. Such aspects are:[12]

- *A system of European laws that coexists with national systems and is protected by the European Court of Justice.*
- *A directly elected European Parliament that coexists with national and sub national legislatures.*
- *A common budget and a single currency in 12 of the 25 member states.*[13]
- *A common executive body (the European Commission) that has the authority to oversee external trade negotiations on behalf of all the member states, and can sign international treaties on behalf of the member states.*
- *An arrangement in which the member states are increasingly defined not by themselves but in relation to their EU partners.*

[12] s. McCormick, 2004, p. 27f.

[13] This was the case when the book was published. In 2010 there are 27 member states and 16 states with the Euro as official currency.

As the above theory demonstrates, there is no accurate answer for the question what the European Union is. There are several approaches to answer this question and I think I want to leave this question to political scientists.

2.2 History of the European Union

After two World Wars and one Economic Crisis, there were reasons to aspire peace through cooperation between the different states and *"the idea that states should encourage opportunity, foster peace, and address common or shared problems by pooling authority and resources, opening markets, building common laws and policies, and working together in areas of shared interest"*[14] supported the idea of regional integration.

The initial focus of the European Union was thus peace and prosperity through economic integration and therefore France, the Netherlands, Belgium, Luxemburg, Italy and West Germany decided to create the foundation of today's European Union – the so called *"European Coal and Steel Community"* in 1951. The French foreign Minister Robert Schuman proposed this community to prevent further war between France and Germany. In 1957, those six member countries signed the Treaties of Rome, which was an extension of the cooperation in the European Coal and Steel Community and established the *"European Economic Community"* as well as the *"European Atomic Energy Community"*.

The three communities were enlarged when the United Kingdom, Ireland and Denmark joined them in 1973. In 1979 the first European elections were held for the European Parliament. Two years later Greece joined the communities and the Mediterranean countries Spain and Portugal became members in 1986.

[14] s. McCormick, 2004, p. 11f.

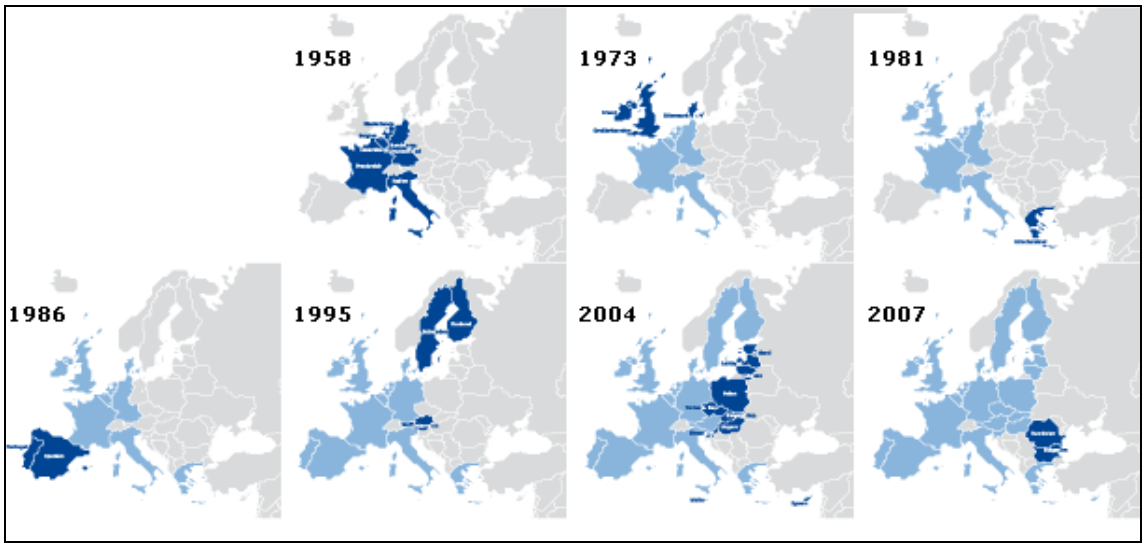

Figure 3: EU Enlargement[15]

Today's European Union was created when the Maastricht Treaty became effective on the 1st November 1993 and when Austria, Finland and Sweden became members in 1995. In 1999 the Euro was launched as the new European currency and in 2002 all members except the United Kingdom, Sweden and Denmark replaced their old currency with notes and coins from the new currency.

In 2004 Poland, the Czech Republic, Hungary, Slovakia, Slovenia, Estonia, Latvia, Lithuania, Malta and Cyprus joined the European Union in its biggest enlargement step. Those countries were followed by Rumania and Bulgaria in 2007 and Slovenia, Cyprus, Malta and Slovakia adopted the Euro as their new currency. Estonia will follow them in 2011.

The European Union received a new constitution in the form of the Lisbon Treaty at the end of 2009 and the Belgium Herman van Rompuy became the first president of the European Council, which is the institution that is responsible in defining the general political direction and priorities of the European Union.

2.3 How does the European Union work?

2.3.1 The three pillars of the European Union

The 1992 Maastricht Treated divided the activities of the European Union into three pillars or areas (see Figure 4).

[15] s. http://www.bundesregierung.de/Content/EN/HTML/Breg/Europafest/Bilder/seite11-grafik,property=default.gif [20.04.2010]

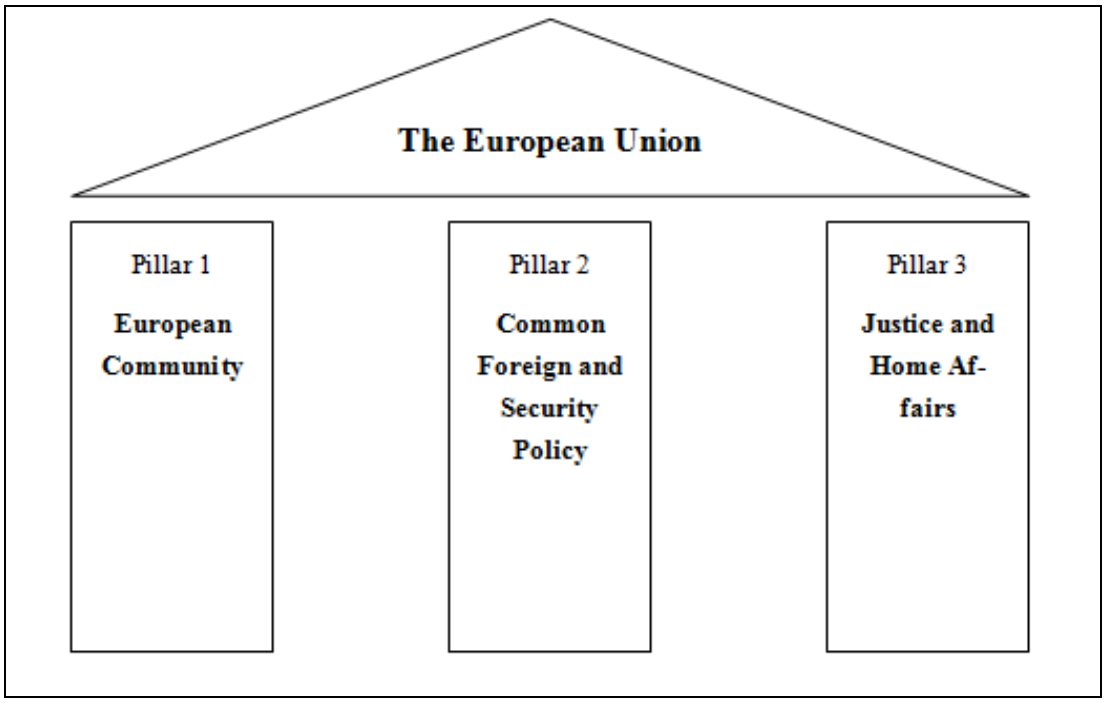

Figure 4: The three pillars of the European Union

2.3.1.1 Pillar 1: European Communities

The first pillar includes the policy responsibilities of the internal market, which includes competition and external trade. Furthermore it includes agriculture and competition policies as well as immigration, asylum and the monetary union. The decision making style is supranational and Bomberg and Stubb calls this pillar the busiest, since it incorporates the existing European Community and includes the vast majority of responsibilities of the European Union.[16]

This pillar is the most important one for this thesis, since I assume that innovation policies belong to this field of action.

2.3.1.2 Pillar 2: Common Foreign and Security Policy

The second pillar includes common foreign and security policy. This pillar is therefore responsible for common action to strengthen the security of the European Union in order to preserve peace and promote international cooperation. The decision making style is primarily intergovernmental, which means that the Parliaments have not much direct influence.

[16] s. Bomberg & Stubb, 2003, P. 5.

2.3.1.3 Pillar 3: Justice and Home Affairs

The objective of this pillar is to increase the cooperation between the member countries to i.e. fight against international or cross border crime by more police cooperation or criminal laws. The decision making is highly intergovernmental and for common action, unanimity is required for virtually all important decisions.[17]

With the introduction of the Lisbon Treaty the three pillars have been re-organized into three pillars of competences.

2.3.2 The European Institutions

In this point I want to describe the five most important institutions in the European Union briefly and point out what their objectives are. Again I would like to emphasize that there were some recent changes due to the Lisbon Treaty. Especially the European Parliament was assigned with more power.

2.3.2.1 European Commission

The European Commission is a crucial hybrid organization that has no counterpart on the national level of the member states. The Commission is responsible to initiate policies as well as being the guard of the Treaties. It furthermore represents the general interests of the European Union and ensures the correct application of its legislation. Also international trade and cooperation agreements with those outside the European Union, as well as the very important competition policy, are parts of the Commission's task portfolio.

The European Commission consists of 27 commissioners (one from each member state) and is currently lead by President Josè Manuel Barroso from Portugal. Each of the commissioners has been allocated to one portfolio (such as agriculture or environment) and is nominated by the national governments.

The commissioners meet once a week in order to develop and adopt proposals on new policies and legislation.[18] Bomberg and Stubb point out that the formal right to initiate policies is one of the most precious and fundamental powers of the Commission.[19]

2.3.2.2 Council of Ministers

The Council of Ministers is considered to be one of the most powerful institutions of the European Union and its primary decision making body. It consists of one representative at the ministerial level of each member country, who is authorized to commit the gov-

[17] s. Bomberg & Stubb, 2003, P. 6.
[18] s. ibid, 2003, P. 44.
[19] s. ibid, 2003, P. 49.

ernment of the member country. This means that those ministers should represent the interests of the national governments. The Council of Ministers is therefore responsible for making the major policy decisions for the European Union.

This institution is very dynamic, since the minsters can change at any given time and there is no permanent form or membership.

2.3.2.3 European Council

The European Council is a meeting among the head of states or head of governments plus the president of the European Commission and has the aim to solve problems that could not be solved at a lower level of decision making. It is also seen as the provider for political leadership for the European Union. These meetings are held three or four times a year and are major agenda setters.

In recent years the European Council has became a top hierarchical decision maker and has decided issues such as the monetary union or the Lisbon Treaty. Bomberg and Stubb emphasize that deadlock on budget agreements are also often solved by the European Council.[20]

2.3.2.4 European Parliament

The European Parliament is a directly elected parliamentary institution and is together with the Council of Ministers the highest legislative body in the European Union. It shares i.e. budgetary power with the Council of Ministers. The European Commission is accountable to the European Parliament and the members of parliament can veto against the body or let it resign.

With 736 members of parliament it is the second largest parliament in the world after India. The elections for the European Parliament are held every five years and the members of parliament sit according to political allegiance. The national appointment of the seats can be seen in Table 1.

[20] s. Bomberg & Stubb, 2003, P. 56.

Table 1: Seats in the European Parliament by country

Country	**Seats in the European Parliament**
Germany	96
France	74
Italy	73
United Kingdom	73
Spain	54
Poland	51
Romania	33
Netherlands	26
Belgium	22
Czech Republic	22
Greece	22
Hungary	22
Portugal	22
Sweden	20
Austria	19
Bulgaria	18
Finland	13
Denmark	13
Slovakia	13
Ireland	12
Lithuania	12
Latvia	9
Slovenia	8
Cyprus	6
Estonia	6
Luxemburg	6
Malta	6

2.3.2.5 European Court of Justice

The fifth major institution in the European Union is the European Court of Justice. Since it is not really relevant for this thesis I will not go into detail. The European Court of Justice encompasses the judiciary in the European Union and has the mission to ensure that European law is observed.

2.3.2.6 Dynamics between the institutions

The relationship between the five major and other institutional bodies in the European Union is consensual and conflictual. That means that the cooperation is unceasing since there is shared recognition that all institutions have to compromise and work to get decisions agreed or policies through.

A very good example of the dynamics between the institutions is the policy making process in the European Union.

2.3.3 Policy Making in the European Union

The policy makers in the European Union act on both – the national and the European – level in form of the main institution elaborated in the point above.

Figure 5 shows the policy making process with the European Commission (in blue), the European Parliament (in orange) and the Council of Ministers (in green) involved.

The European Commission has generally a monopoly over the right of initiative, where the European Union has the policy competencies. There are three different categories of competencies:

- Exclusive competencies of the European Union
- Shared competencies of the European Union
- Competencies mostly to the member states

Box 2 shows the policy competencies of the European Union and what areas they include.

As Figure 5 shows, the Council of Ministers is finally deciding after consulting the other institutions.

After the final decision the European Court of Justice has to resolve legal disputes and reinforces the power and prerogatives of the other institutions.

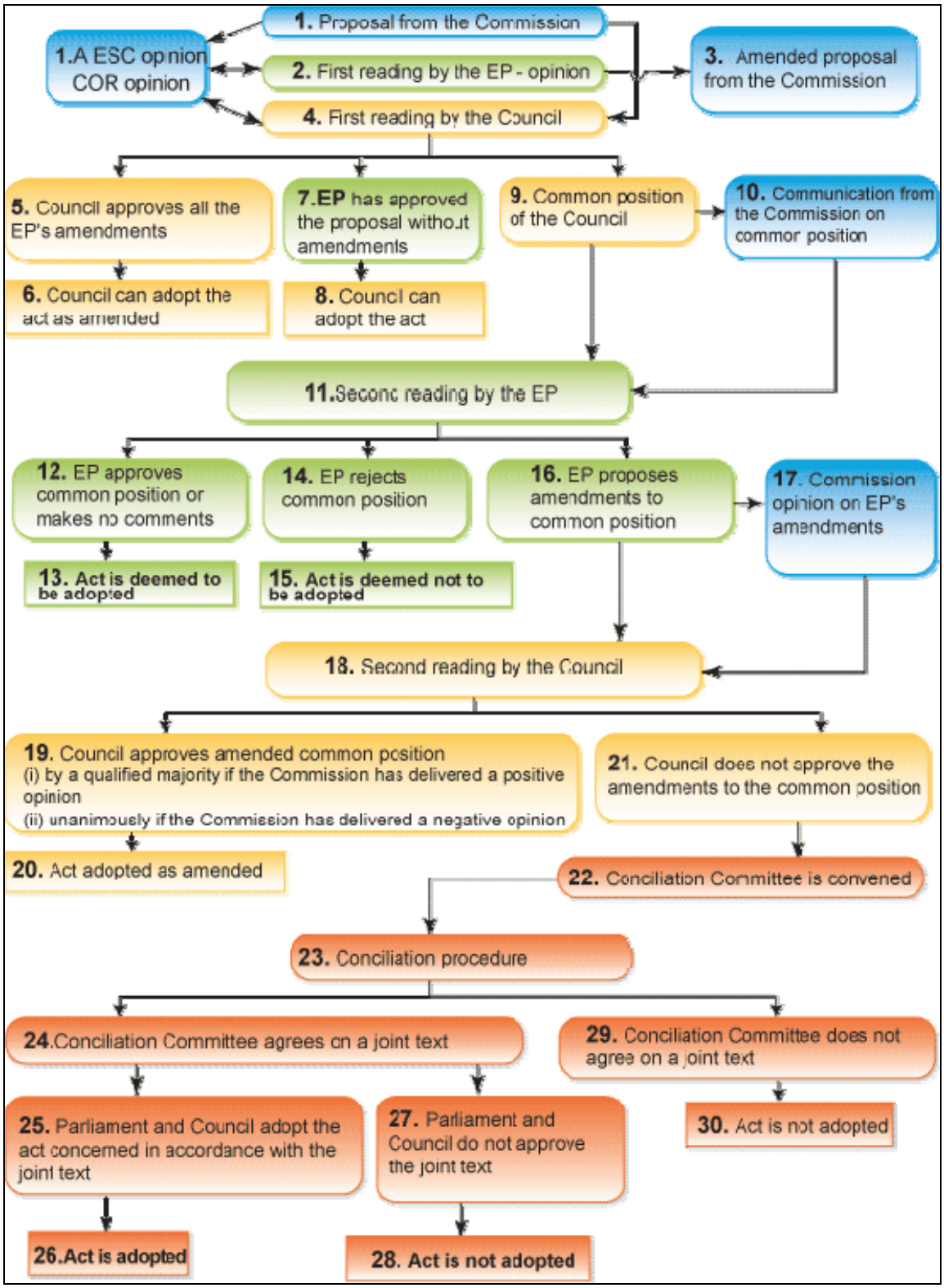

Figure 5: Decision making process[21]

[21] s. http://ec.europa.eu/codecision/images/diagram_en.gif [15.05.2010]

Box 2: The policy competencies of the EU[22]

1. *The European Union has **exclusive** competence in few, but important, policy areas: external trade in goods and some services, monetary policy, customs and fisheries.*
2. *The major of policy competencies are **shared** between the European Union and its member states. Shared competencies include, for example, environmental policy, consumer protection, mergers and acquisitions, development aid, transport policy, visas, asylum and immigration.*
3. *Finally there are policy areas where the **member states** are the main players, even if the European Union is involved in some general coordination or is engaged in a few specific projects. Education, culture, employment, public health, research, social and urban policy, and most foreign and security policy fall into this domain.*

2.4 The Budget

In this point I want to present the budget of the European Union. Its analysis will be done later in this thesis.

Every political unit needs an administration and a budget to pay for it. The European Union has i.e. an agreed budget of €864.3 billion for the period from 2007 to 2013 and the budget for the year 2007 was €120.7 billion.[23] Compared to the budgets of large countries such as Germany, France or the United Kingdom, the European budget is a rather small budget. The European Commission, the Council of Ministers and the European Parliament are setting the budget.

2.4.1 Revenue

The European budget is obtained indirectly by payments of the member states and these revenues are divided into four categories.[24]

2.4.1.1 Gross National Income (GNI) based own resources

Gross National Income based own resources contribute the largest amount to the European budget and the exact amount that every member state has to contribute is determined by a multiplier, which is applied to the Gross National Income. The GNI based

[22] s. Bomberg & Stubb, 2003, p. 117.

[23] s. http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/06/204&format=HTML [12.05.2010]

own resources are the last resources for raising funding for a budget year, this means that the actual amount of this revenue is adjusted between predetermined limits to obtain the required budget.

2.4.1.2 Value Added Tax (VAT) based own resources

VAT based own resources also come directly from the member states and are taxes on European Union citizens. This revenue is calculated by the total value added tax from a country and this is then adjusted by using a weighted average of VAT rates, which are applied in the member states. This leads to an intermediate tax base. Value Added Tax based own resources contributes the second largest amount to the budget of the European Union.

2.4.1.3 Traditional own resources

Traditional own resources are pure European Union revenues and result directly from its legislation. However, also in this case the member states have to collect resources and to make them available to the European Commission. Import duties on goods brought to the European Union are one example for this category. This point is the third largest part of the entire budget.

2.4.1.4 Other revenue

Other revenues account for the smallest part of the budget and mostly include interests on deposits and late payments or payments from non European organizations.

[24] s. European Commission, 2010, et.al.

2.4.2 Budget Composition 2007

The budget in the year 2007 (see Figure 6) consisted out of 64% GNI based own resources (73.917,7 EUR mill), 17% VAT based own resources (19.440,8 EUR mill), 14% traditional own resources (16.573,0 EUR mill) and 5% other revenues (5.467 EUR mill).[25]

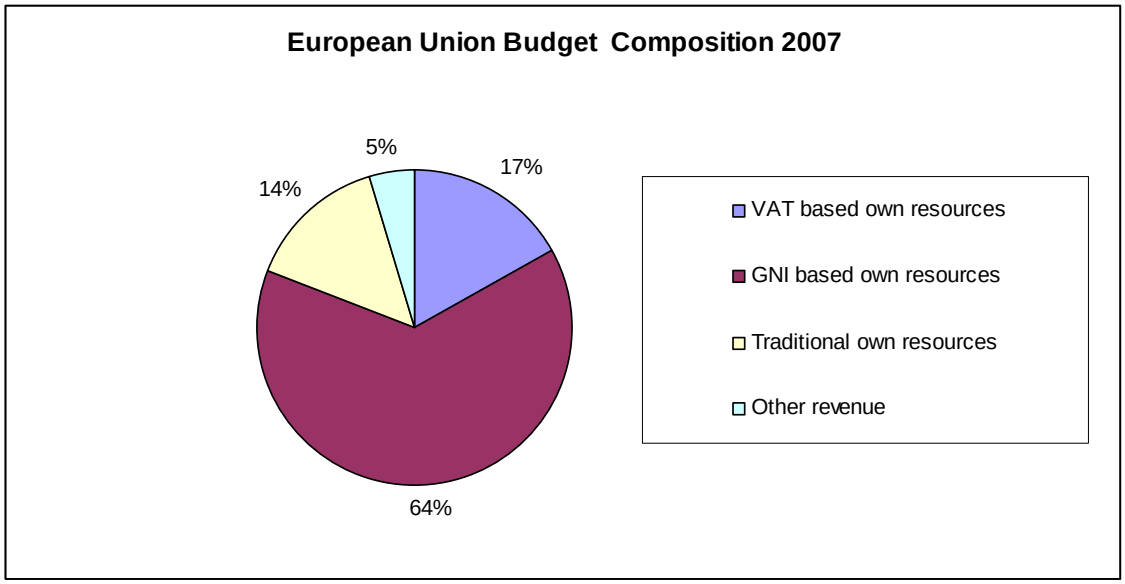

Figure 6: Budget Composition 2007

An overview over the more detailed budget composition for the year 2007 can be seen in Annex A.[26]

2.4.2.1 Contribution by member state

In general the member states can be distinguished between net contributors and net recipients. Net contributors pay more into the European budget than they get back and this is vice versa with net recipients.

Table 2 shows that the Netherlands contribute the most money per capita and that Luxemburg benefits the most per capita. The numbers shown for Luxemburg and also of Belgium are inflated by a large number of companies that are based there, but have their parent company or subsidiaries abroad. Therefore Greece was the biggest recipient per capita in 2007.

[25] s. European Commission, 2008, et.al.
[26] s ibid.

Table 2: State by State analysis for the year 2007

Member State	Money to EU[27] [bill €]	Money from EU [27] [bill €]	Net benefit [bill €]	Ratio of money	Population[28]	Net benefit per capita [€]
Belgium	4.372	5.679	1.307	1,30	10.584.534	123,47
Bulgaria	291	592	301	2,03	7.679.290	39,15
Czech Republic	1.167	1.721	554	1,47	10.287.189	53,85
Denmark	2.219	1.449	-770	0,65	5.444.242	-141,39
Germany	21.710	12.484	-9.226	0,58	82.314.906	-112,08
Estonia	177	377	200	2,13	1.342.409	149,13
Ireland	1.586	2.167	580	1,37	4.312.526	134,56
Greece	3.020	8.429	5.409	2,79	11.171.740	484,18
Spain	9.838	12.796	2.958	1,30	44.474.631	66,50
France	16.989	13.897	-3.092	0,82	63.392.140	-48,77
Italy	14.024	11.315	-2.709	0,81	59.131.287	-45,81
Cyprus	170	127	-44	0,74	778.684	-55,86
Latvia	199	675	476	3,39	2.281.305	208,65
Lithuania	271	1.044	773	3,85	3.384.879	228,30
Luxemburg	296	1.281	985	4,33	476.187	2.068,72
Hungary	870	2.428	1.558	2,79	10.066.158	154,73
Malta	57	89	32	1,57	407.810	79,20
Netherlands	6.303	1.916	-4.386	0,30	16.357.992	-268,15
Austria	2.218	1.598	-620	0,72	8.298.923	-74,67
Poland	2.809	7.786	4.978	2,77	38.125.479	130,56
Portugal	1.460	3.904	2.444	2,67	10.599.095	230,58
Romania	1.089	1.602	513	1,47	21.565.119	23,78
Slovenia	359	390	31	1,09	2.010.377	15,27
Slovakia	519	1.083	563	2,09	5.393.637	104,45
Finland	1.629	1.423	-206	0,87	5.276.955	-39,03
Sweden	2.915	1.659	-1.256	0,57	9.113.257	-137,84
United Kingdom	13.429	7.413	-6.016	0,55	60.816.701	-98,92

2.4.3 Budget Expenditures 2007

The budget expenditures for the year 2007 will be analyzed in chapter 5.1.

[27] s. European Commission, 2008, p.9.

[28] s. Eurostat, 2008, p. 4.

3 Innovation

There is probably no other word that has became so frequently and inflationary used during the last decade and most likely associated with something positive than the concept of innovation. It is hardly imaginable that a government or a company is not using this word in their agendas, promotion material or when they define their future goals. Companies have started to hire innovation managers in order to improve their efficiency, creativity and success.

Innovation is also a growing field in the scientific literature. The Norwegian researcher Jan Fagerberg showed that literature in innovation studies has emerged in recent years, since innovation became one of the words *"that seem to be on everybody's lips"*.[29] According to Fagerbergs and Verspagens research, the literature on innovation is based on a small number of leading scholars such as Joseph Schumpeter and Christopher Freeman. [30]

But what is an innovation? Fagerberg points out that there is an important distinction between invention and innovation, where invention *"is the first occurrence of an idea for a new product or process"* and an innovation *"is the first attempt to carry it out into practice"*.[31] Fagerberg furthermore argues that it is sometimes difficult to distinguish between invention and innovation since they are closely linked, however usually there is a considerable time lag between the two. Such a time lag can span out over several decades or even longer. Inventions might be carried out anywhere like in universities, innovations most likely occur in companies.[32] In order to turn an invention into an innovation a company needs to combine several skills, types of knowledge, resources and capabilities. Fagerberg points out that a firm may require *"production knowledge, skills and facilities, market knowledge, a well functioning distribution system, sufficient financial resources, and so on."*[33]

[29] s. Fagerberg & Verspagen, 2009, p. 218.
[30] s. ibid, p. 229.
[31] s. Fagerberg, 2005, p.4.
[32] s. ibid. p.4ff.
[33] s. ibid. p.5.

In general, researchers have distinguished between product- and process innovations. A product innovation is either a newly invented product or a product variation with modified features, which is usually an improvement compared to the older version of the product. A process innovation describes an improvement in the way something is done. This can be for example an improved mechanism or a completely new way to create something. Process innovations often go along with a decrease in production costs.

The Swedish scholar Charles Edquist defines innovation as either product innovation or process innovation, where product innovations *"are new – or better – material goods as well as intangible services"* and process innovations *"are new ways of producing goods and services. They may be technological or organizational"*. [34]

We now know what innovation is. But how do we know if something is also innovative? What indicates if something is innovative?

3.1 Measuring Innovation

As Wiederkehr has described, innovation or innovativeness is complicated to measure, since there are no common rules or definitions to quantify an innovation or the innovativeness of something in the literature. Wiederkehr points out that one way to quantify an innovation *"is to set the input of an innovation in contrast with its output"*[35], but this is, according to Wiederkehr, only useful with new products or processes. Wiederkehr continues to cite Smith, who is concerned over the key problems of innovation indicators. Smith formulates his concern as followed: *"the underlying conceptualization of the object being measured, the meaning of the measurement concept, and the general feasibility of different types of measurement. Problems of commensurability are not necessarily insoluble, but a main point arising from recent work is need for care in distinguishing between what can and what can not be measured"*. [36],[37]

As already mentioned, one possibility to measure or quantify innovations is to compare the input of an innovation with the output. However, this approach is rather useful when it comes to product or process innovations. In order to answer the research questions of

[34] s. Edquist, 2005, p.182.
[35] s. Wiederkehr, 2009, p.20.
[36] s. Smith, 2005, P.149.
[37] s. Wiederkehr, 2009, p.20.

this thesis, I have to create my own measurement for the innovativeness of the European budget and policies.

A first step for that is to see what the European Union itself considers to be innovative. I therefore look at the annually (by the European Commission) published European Innovation Scoreboard, which ranks the European countries after their innovativeness on a national level. The countries are ranked according to several dimensions of innovation performance of their national innovation systems, which can be seen in Box 3. Those dimensions consist of a variety of comparable innovation indicators, which are listed and defined in Annex B and Annex C.

Box 3: Dimensions of innovation performance (European Scoreboard 2008)[38]

- ***Enablers*** *captures the main drivers of innovation that are external to the firm as:*
  - ***Human resources*** *– the availability of high-skilled and educated people*
  - ***Finance and support*** *– the availability of finance for innovation projects and the support of governments for innovation activities*
- ***Firm activities*** *captures innovation efforts that firms undertake recognising the fundamental importance of firms' activities in the innovation process:*
  - ***Firm investments*** *– covers a range of different investments firms make in order to generate innovations.*
  - ***Linkages & entrepreneurship*** *– captures entrepreneurial efforts and collaboration efforts among innovating firms and also with the public sector.*
  - ***Throughputs*** *– captures the Intellectual Property Rights (IPR) generated as a throughput in the innovation process and Technology Balance of Payments flows.*
- ***Outputs*** *captures the outputs of firm activities as:*
  - ***Innovators*** *– the number of firms that have introduced innovations onto the market or within their organisations, covering technological and non technological innovations.*
  - ***Economic effects*** *– captures the economic success of innovation in employment, exports and sales due to innovation activities*

[38] s. European Innovation Scoreboard, 2008, P. 5.

These dimensions are indicators for systems of innovation, which Charles Edquist describes "*as the determinants of innovation processes"* or *"all important economic, social, political, organizational, institutional, and other factors that influence the development, diffusion, and use of innovations."*[39]

However, the dimensions of the European Scoreboard at least indicate trends. A closer look to Annex B and Annex C shows us that the European Commission agrees with Keith Smith when it comes to patents.[40] Patents per million population as well as community trademarks or design are part of the indicators.

More interesting for this thesis is the dimension "*Human Resources*", which includes among others the number of science and engineering – as well as the social science and humanities graduates at the first and second stage of tertiary education. Another point is the research and development expenditures in the government sector and in the higher education sector or the number of enterprises with ten or more employees with broadband access.

As part of the output dimension, the European Commission sees the number of small and medium sized enterprises who introduced new products or processes to the market. In addition marketing innovation and organizational innovations are also a point. The European Commission also analyzes the number of innovating firms with product or process innovations that have had effects on reducing labour and/or material and natural resources. Furthermore, the number of employed persons in medium- and high tech manufacturing sectors, as well as employees in knowledge intensive service sectors, is considered to be indicators for innovativeness.

Wiederkehr raised the question whether the creative class is an indicator for innovation, when he compared the national innovation systems of Austria and Sweden. Based on the concept and theory of Richard Florida on the creative class, Wiederkehr tried to include the capability of countries to attract this class into the concept of innovation systems.[41]

The concept of the creative class is, according to Florida, based on the assumption that the economic strength of a geographical entity correlates with its ability to attract people who Florida defines as the creative class. Florida categorizes groups such as musicians or artists, high tech workers, high bohemians or gays and lesbians as the socioeconomic creative class, which fosters an open and professional society. This class can be met

[39] s. Edquist, 2005, p. 182.
[40] s. Smith, 2005, p. 158.
[41] s. Wiederkehr, 2009, et.al.

very likely in occupation areas like engineering, media and computer programming, education or other knowledge based work.[42]

A geographical entity has the capability to attract this class, if it meets three requirements. Florida calls those requirements the three "Ts". Wiederkehrs descriptions of the three "Ts" can be seen in Box 4.

Box 4: The three "Ts" of the Creative Class[43]

- **Technology:** To attract entrepreneurial culture, a geographical entity needs a certain degree of infrastructure. This can be in the form of science parks or clusters, mainly in new technologies, such as software engineering, pharmacy or bio technology.
- **Talent:** This point stands for the highly skilled and talented population (human capital) of a geographical entity.
- **Tolerance:** A geographical entity has to connect its ability to attract people who are part of the creative class with the level of tolerance towards ethnic and social minorities. Such places have low entry barriers for talent in form of human capital. Tolerance can be measured by four indexes: the gay index, the bohemian index, the foreign born index and the composite diversity index.

3.2 Innovation in the European Union

The European Commission recently used a definition for innovation by Richard Nedis and Ethan Byler: *"Innovation is the ability to take new ideas and translate them into commercial outcomes by using new processes, products or services in a way that is better and faster than the competition"*[44] and points out that innovation can not be organized by decree. The Commission furthermore sees innovation as a precondition for a knowledge based and low carbon economy.

The president of the European Commission Jose Manuel Barroso demanded to transform the European Union into an innovation society in a speech held in 2009 in front of the European Innovation Summit. In this speech Barroso argued that innovation policies are successful, if they involve all actors in society.

[42] s. Florida, 2002, et.al.

[43] s. Wiederkehr, 2009, p. 24f.

[44] s. European Commission, 2009, p. 3.

3.2.1 History of European Innovation Policy

The origins of the European innovation policy can be traced back to the EURATOM (European Atomic Energy Community) treaty, where eight articles were devoted to research activities and provide the basic for today's work. While the innovation policies were rather industrial policies in the beginning of the European communities, they are nowadays more oriented towards a knowledge society that we are living in.

In 1965 the three communities (see chapter 2.2) set up a joint committee, with the aim to examine the merits of a community for coordinated research and development programs.[45] The collaboration most worth mentioning might be the European collaboration in aerospace during the 1960s and 1970s. From 1974 till 1982 there was no steady technological policy and therefore no apparent results.

After this period a more coherent strategy was developed as a part of the Maastricht Treaty and the European Union received formal power in the fields of research and technology. In 1984 the First Framework Programme for Science and Technology was launched and it included a double as high amount for research and development expenses than the budget before. In 1987 the Second Framework Programme for Science and Technology was launched and competitiveness related initiatives outside the energy field started to receive most of the money.

Korres points out that in practical terms the European Union has shown a tendency in the past to accumulate as many competencies as possible and in particularly in fields like technology policy. This is where the European Union had practically no mandate till the Single European Act of 1987 was passed.[46] However, there were initiatives from the European Union to stimulate learning processes between European regions in a benchmark system, where the less successful learn from the more successful.

3.2.2 European Innovation Policies

Lundvall and Borras see economic growth and international competitiveness as the major objectives of the European Union and argue furthermore that the Union discourses these objectives in a combination with social cohesion and equality. The main focus of innovation is thus clearly on the creation of economic growth, however it is also supposed to solve important problems, such as energy, pollution, urbanism and poverty. Instruments to achieve these goals are according to Lundvall and Borras the regulation of intellectual property rights and the access to venture capital.[47]

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[45] s. Korres, 2007, p. 108.

[46] s. ibid, p. 106.

[47] s. Lundvall & Borras, 2005, p. 612f.

Rodriguez and Montalvo describe the architecture of the European Union for innovation as multidimensional, in the form of supranational policy furniture with national, regional, sectoral and technological policy artefacts. [48] They furthermore argue that the European Union innovation policies have to follow the principles of subsidiary and European added value.[49] Subsidiary means that context in innovation policies have to be justified through supranational formulation and European added value requires a synergy effect not attainable within national borders.

Shapira and Klein point out in an analysis on innovation policy in the European Union and in the US, that the policies in Europe are multifaceted and wide ranging. They include initiatives in fields like science, research, education, technology, development and industrial modernization. Those points are also overlapping with social, industrial, environmental and labor policies.[50]

Rodriguez and Montalvo have scanned the documents of the European Union after innovation policies and the frequency distribution of documents on innovation, by the European Council, the European Parliament and the European Commission can be seen in Table 3. The table includes all documents with the term innovation in either the title or the text, which were published in English.

The table shows clearly that the European Commission is the driving force when it to comes to innovation within the European institutions. This is actually no surprise, since - as discussed in point 2.3.2.1 and visible in Figure 5 – the European Commission has the responsibility to develop and adopt proposals for directives and policies.

Table 3: Frequency distribution of documents on innovation[51]

Year	Council	Parliament	Commission
2000	21	25	52
2001	10	55	68
2002	29	43	99
2003	42	49	88
2004	19	17	87
2005	23	16	113
2006	51	41	106
Total	**195**	**246**	**613**

[48] s. Rodriguez & Montalvo, 2007, p. 467.
[49] s. ibid, 2007, p. 469.
[50] s. Shapira & Klein, 2001, p. 869f.
[51] s. Rodriguez & Montalvo, 2007, p. 470.

3.2.2.1 Taxonomy and Typology of Innovation Policies

Rodriguez and Montalvo have developed a neofunctionalist heuristic taxonomy for the European innovation policies. This includes a seven step deep construct with the following characteristics:[52]

a) **Content:** The content of innovation policies is a criterion, since innovation is pervasive and many policy areas have an impact on innovation. Innovation appeared in the study conducted by Rodriguez and Montalvo in documents related to *"agriculture, competition, culture, democracy, development, economy, education, employment, energy, environment, EU accession, EU neighbourhood, external relations, finance, fishery, food, health, human rights, information and communication technologies, manufacturing, intellectual property rights, media, networks, policy coherence, regions, science, security, social aspects, standardization, trade, transport and youth."*[53]

b) **Axis:** Innovation policies can be vertical or horizontal. Horizontal policies are essential for the coordination of policy domains in order to achieve better innovation policy in a multi sectoral approach. Vertical policies on the other hand are very important for implementation and depict relationships between different institutional layers. This includes i.e. sectoral policies for innovation depicts vertical policies.

c) **Time horizon:** Innovation policies can be short-, medium- or long term.

d) **Process:** Innovation policies can be made institutionally or collectively. Institutionally made policies imply matching institutions, behaviours and contexts, while collectively made policies is characterized by bargaining behaviour and policies as negotiated outcomes. Developing innovation in regions is an example of collective policy making, and the maintenance of innovation in the nuclear sector is an example of institutional policy making.

[52] S. Rodriguez & Montalvo, 2007, p. 472f.
[53] S. ibid, 2007, p.473.

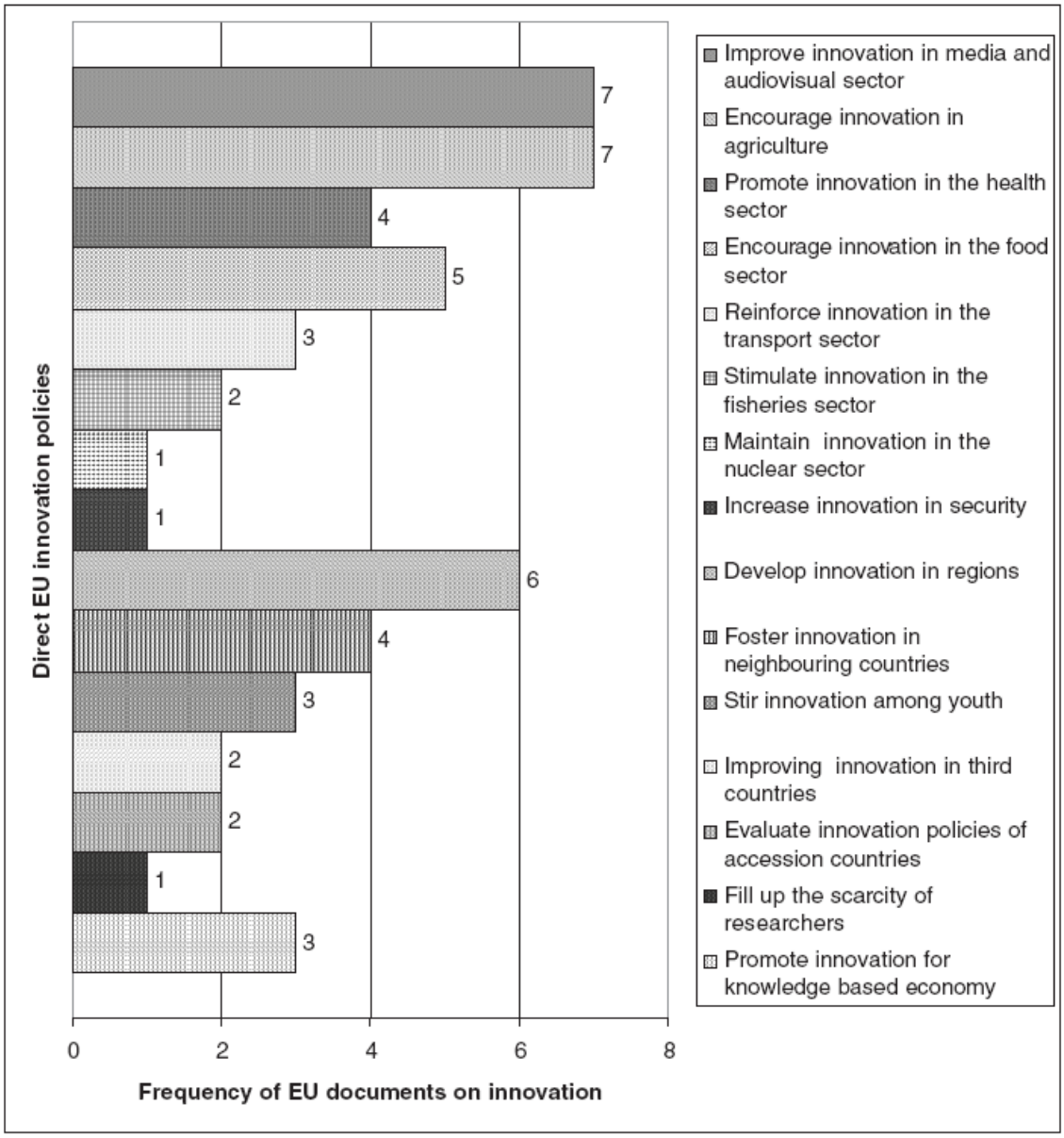

Figure 7: European Union Direct Innovation Policy Design 2006[54]

e) **Action:** Innovation policies can cover their design, implementation, assessment and management.

f) **Goals:** Policies regarding innovation can have direct or indirect goals. Figure 7 shows documents dealing with direct goals and includes sectoral, regional, labor, external and macroeconomic aspects. Figure 8 shows the documents that have dealt with innovation policy, which indirectly had innovation as a goal. It addressed topics such as education, environment, culture or standardization.

[54] s. Rodriguez & Montalvo, 2007, p. 474.

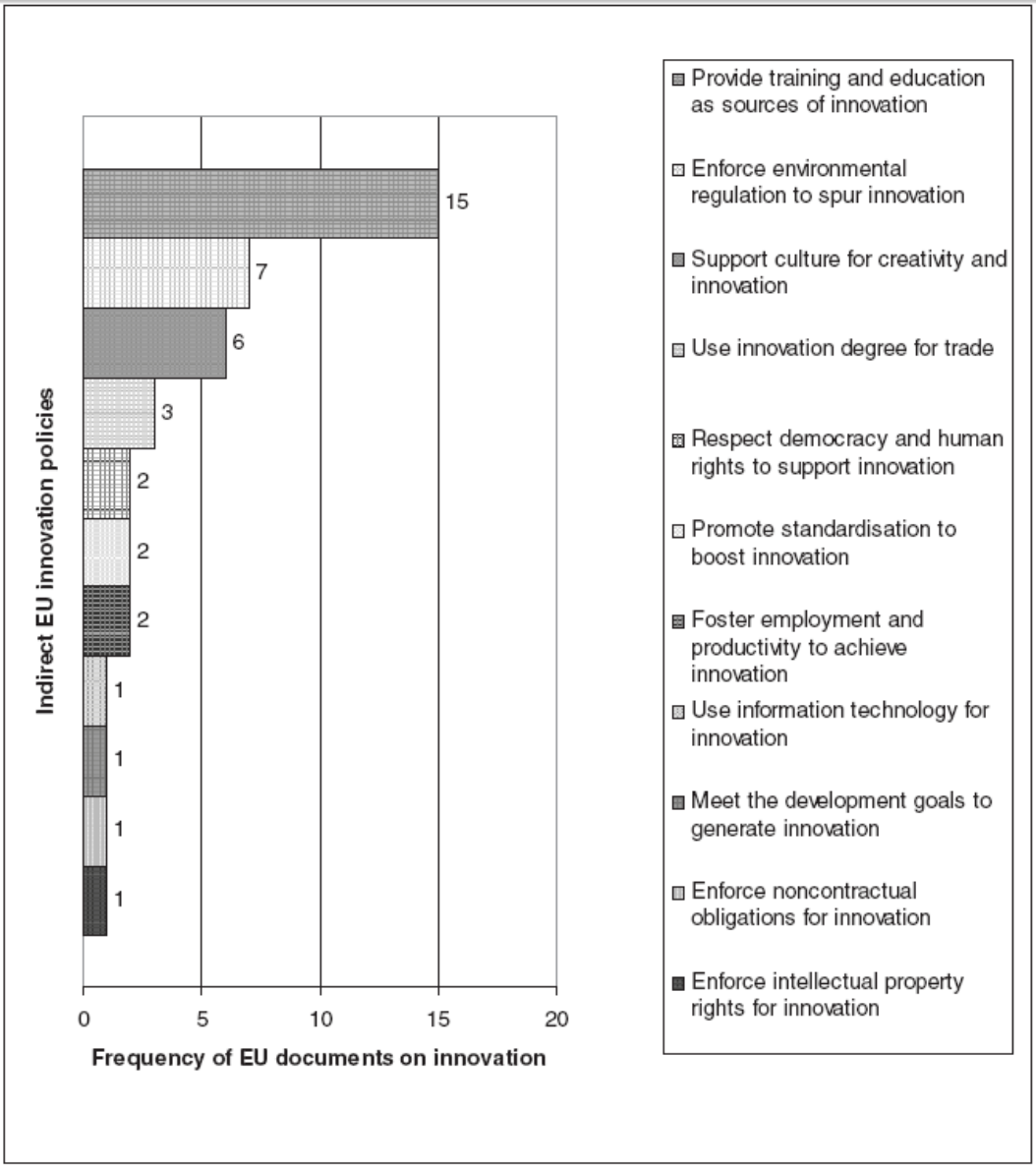

Figure 8: European Union Indirect Innovation Policy Design 2006[55]

g) **Division of Labor:** The last characteristic of an innovation policy is the division of labor. This means that policies can be classified by the governmental actors responsible for their design and implementation.

3.2.3 Progress achieved

Besides Barrosos speech, the achieved progress in the field of innovation was presented by the Commission and according to them, the following points were recently achieved.

[55] s. Rodriguez & Montalvo, 2007, p. 475.

3.2.3.1 Improved Framework Conditions

According to the report, the framework conditions for innovation were improved through cohesive policies, on the national and regional level. On a European level the access to the single market has been made easier and the conditions for entrepreneurship as well as for the growth of new venture has strengthened.[56]

3.2.3.2 Market Uptakes

In order to trigger more and quicker market updates for innovative products or services, the European Union has recognised and used regulation and standardisation as powerful tools to stimulate and provide incentives for innovative markets.

A focus was laid on sustainability and on the environment. Some examples for this development are new rules on car emission to trigger innovation in the European car industry or the European Emission Trading Scheme. This scheme is a stock exchange for emission certificates and is supposed to reduce carbon dioxide and should foster innovation in renewable energy production and should furthermore encourage the construction of more environmentally friendly power plants.

Another development was the Lead Market Initiative, which aimed to identify innovative markets. Innovative products and services in the identified markets, such as sustainable construction, protective textiles, recycling or renewable energies, should benefit from the market uptake initiatives.[57]

3.2.3.3 Building Synergies

The European Union has developed a European Research Area since 2000, which has led to several initiatives to encourage a more coherent innovation and research system within the Union. Knowledge should be accessible on an internal market and researchers should therefore be mobile to circulate, exploit and transfer knowledge.

To reinforce the collaboration on research and innovation, the European Union has established public-private partnerships in areas such as green cars or energy efficient buildings.

One initiative was the European Institute of Technology and Innovation, which is described in point 3.2.6 .

[56] s. European Commission, 2009, p. 4.
[57] s. ibid, p. 5f.

3.2.4 Recent developments and future plans

Jose Manuel Barroso promised to present a new European Union reform agenda in 2010, where innovation is at its heart, with a focus on four areas:[58]

3.2.4.1 Financial Support for Innovation

Out of the budget for the period from 2007 till 2013 are 86 billion Euros reserved for research and innovation in the structural funds (see chapter 5 for the year 2007). But Barroso claims that the Commission has to speed up access to funding and has to simplify the rules for participating projects.

A recent topic is the provision of venture capital and in doing so the Commission has to find a way to develop innovative financial models, which are based on existing models and cooperate with institutions such as the European Investment Bank.

3.2.4.2 Market Conditions to facilitate Innovation

The second area is market conditions that are needed to facilitate innovation. This includes the issue of intellectual property rights and a new state aid rules for research and innovation.

3.2.4.3 Market Uptake of innovative Products and Services

The third area includes market uptakes for innovative products and services. Barroso mentioned e-health, internal security, eco innovation and eco construction as such fields, where development and improvement has to be continued.[59]

This should ensure to harness the full potential of public procurement in times of steadily decreasing product life cycles. Barrosos goal is to make it easier for public authorities to access new technologies, i.e. to let them procure innovation together, which would be too expensive or too risky to purchase individually.[60]

3.2.4.4 The People

Barroso simply calls the fourth aspect “the People” and argues that innovation is needed in all walks of life. For example, education should according to Barroso be less focused on knowledge and instead more on creativity, organising work independently and working in teams. He therefore would like to develop a system similar to the PISA study, which evaluates school systems, to measure and compare creativity.

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[58] s. Barroso, 2009, et.al.

[59] s. ibid, p. 11.

[60] s. ibid, p. 11.

Other points of this area is life long learning, which is necessary in a society where people have to change their job more often than before and that the European Union has to attract the most talented people in the world. That means there has to be a common approach to economic immigration.

3.2.5 The European Innovation Monitoring System

The first attempts to measure or monitor innovation in the European Union were made in the 1990s, when the European Commission sponsored analytical studies to measure innovation in form of the European Innovation Monitoring System.

This system included 25 specific studies, which addressed a wide range of questions arising from innovation data and covered areas such as pharmaceuticals, telecoms, machine tools, service sector innovation and so on. Aim of these studies was to collect Europe-wide innovation expenditure patterns, innovation outputs or links between employment patterns.[61]

3.2.6 European Institute of Innovation and Technology

The European Institute of Innovation and Technology has been established to stimulate and also deliver world leading innovation, by combining higher education, research and business around a common goal.[62]

However, this institute has been criticised from the very beginning. The magazine Nature calls the European Institute of Innovation and Technology a farce.

According to Nature, the institute was supposed to recreate the Massachusetts Institute of Technology in Europe, where according to the magazine research in academic institutions fail to transfer to industry efficiently. The attempts of the European Union to create such an institute in a top-down manner, ended up in a small headquarter, due to the unwillingness of the member states to provide major institutional investment. [63]

3.2.7 Community Structural Funds

Innovation expenditures are often included in the Community Structural Funds of the European Union. The actual aim of the Structural Funds is to support the less developed and poorer regions of the European Union, as well as to support the European infrastructure for integration purposes.[64]

Box 5 shows the five different structural funds of the European Union.

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[61] s. Smith, 2006, p. 167.

[62] s. European Commission, 2009, p. 6.

[63] s. Nature, 2008, et.al.

Box 5: The five Structural Funds[65]

- *The European Regional Development Fund (set up in 1975) directs funds mainly to underdeveloped areas and inner cities, financing infrastructure, job creation, and aid for small firms. It is the biggest of the structural funds, and spending has grown rapidly – up from $ 11 billion in 1994 to $20 billion in 2002.*
- *The European Social Fund (1958) is designed to promote employment and worker mobility, combat long-term unemployment, and help workers adapt to technological changes. Money from the fund (nearly €9 billion in 2002) is intended to complement spending by national governments, and particular attention is paid to the needs of migrant workers, women, and the disabled.*
- *The Cohesion Fund was set up in 1994 under the terms of Maastricht to compensate poorer states (in practice, Greece, Ireland, Portugal and Spain) for the costs of tightening environmental regulations, and to provide financial assistance for transport projects. It is not usually listed by the EU as a structural fund, but rather as a "solidarity" fund. Spending in 2002 was nearly €3 billion.*
- *The Guidance Section of the European Agriculture Guidance and Guarantee Fund is part of the Common Agricultural Policy that helps reform farm structures and promote the development of rural areas, including measures to encourage diversification away from agriculture.*
- *Often overlooked in discussions about the structural funds, the Financial Instrument for Fisheries Guidance set aside about €560 million in 2002 to help modernize fishing fleets, and to invest in aquaculture, and the development of coastal waters, port facilities, processing, and marketing.*

Korres points out that for the allocation of the funds the principle of programming is used to achieve efficient decision making. That means that operations regarding the decision making for the Structural Funds are based on analytical tools, which should ensure a fair evaluation based on strengths and weaknesses within a framework of development objectives and criteria.[66]

[64] s. McCormick, 2004, p. 303.
[65] s. ibid, p. 305.
[66] s. Korres, 2007, p. 111.

The four main objectives are described in the following points:[67]

1. Objective 1: the first objective aims to promote the development and structural adjustments of the European regions that are less developed. This is a question of income per head and the regions with less than 75% of the European average are supported. 70% of the budget of the Structural Funds goes to this objective.
2. Objective 2: the second objective has the aim to support the economic conversion of areas with structural problems, which are mostly translated into high unemployment and related problems. Target regions for assistance can be industrial and rural regions as well as urban areas, which have to deal with inner city problems.
3. Objective 3: the third objective deals with human resources, which belong to the area of intangible investment. It therefore supports the adaption and modernization of training and education as well as employment policies and systems.
4. The fourth point is not an objective, it is the Cohesion Fund described in Box 5 and it deals with long term investments for countries.

3.2.8 Research Framework Program

Since the Maastricht Treaty 1994 the European research framework program covers all the European Union's research and development activities and since then the research framework programs have been the main financial tools to support research and development activities in almost all scientific disciplines. The framework programs are proposed by the European Commission and have to be adopted by the European Council and the European Parliament.

The research framework programs consist of various projects, which work on a competitive basis. This implies that the participation of the member countries depends on the criteria of quality and the strength of the applicants. The European research framework has therefore the following objectives:[68]

- *Enhance European industrial competitiveness*
- *Set up a vast unified market by promoting standardization and open procurement*

[67] s. Korres, 2007, p. 111.
[68] s. ibid, p. 112.

- *Improve the effectiveness of the European Union's scientific and technical co-operation*
- *Promote agricultural competitiveness*
- *Speed up the marketing of new technologies by carrying out programs for the application of information technologies*
- *Help the less developed regions of the European Union to obtain access to new technologies*
- *Encourage small and medium enterprises and continuing education and training*

Korres approaches the structural funds in an innovation perspective and points out that the European research framework program, which has the aim to stimulate and strengthen the international competitiveness of the European industry in the high technology sectors, is included in the funds. The European research framework program concerns the following points:[69]

- *The research and technological programs of joint research centres*
- *Direct-order research programs that are in collaboration and in co-financing with governments of the member states*
- *Training research programs*
- *International research programs*

Integrating research and regional development is also an issue in the research framework program and this is probably the part where the overlapping between research framework program and the Structural Funds is the largest. Korres emphasizes that the requirement of the involvement of partners from different member states in the framework program helps to improve the exchange of knowledge and the joint development of technologies.[70]

3.2.9 The Seventh Research Framework Program

Currently the seventh research framework program is the foundation of the European research and development strategy, which started in January 2007 and will expire in 2013. It aims to create a more intense European Research Area and to further develop the knowledge economy and society in Europe. With a budget of €50521 million[71] for

[69] s. Korres, 2007, p. 110.
[70] s. ibid, p. 111.
[71] s. European Commission, 2010b, et.al.

the period of 2007 to 2013 it is structured into four main programs corresponding to four basic components of European research. This structure can be seen in Box 6.

Box 6: Structure of the seventh European research framework[72]

- ***Cooperation***
  Support will be given to the whole range of research activities carried out in trans-national cooperation, from collaborative projects and networks to the coordination of national research programs. International cooperation between the EU and third countries is an integral part of this action.
  This action is industry-driven and organized in four sub-programs:
  - ***Collaborative research*** *will constitute the bulk and the core of EU research funding*
  - ***Joint Technology Initiatives*** *will mainly be created on the basis of the work undertaken by the European Technology Platforms*
  - ***Coordination of non-Community research programs***
  - ***International Cooperation***
- ***Ideas***
  This program will enhance the dynamism, creativity and excellence of European research at the frontier of knowledge in all scientific and technological fields, including engineering, socio-economic sciences and the humanities. This action will be overseen by a European Research Council
- ***People***
  Quantitative and qualitative strengthening of human resources in research and technology in Europe by putting into place a coherent set of Marie Curie actions.
- ***Capacities***
  The objective of this action is to support research infrastructures, research for the benefit of SMEs and the research potential of European regions (Regions of Knowledge) as well as to stimulate the realization of the full research potential (Convergence Regions) of the enlarged Union and build an effective and democratic European Knowledge society.

3.2.9.1 High level themes

The European Commission has identified ten high level themes that correspond to major fields in the progress of knowledge and technology, where research and development has to be supported and strengthen to address the European social, environmental, economic and industrial challenges.[73] The ten identified high level themes are listed in Box 7.

[72] s. European Commission, 2010b, et.al.
[73] s. ibid, et.al.

Box 7: High level themes of the seventh European research framework[74]

- *Health*
- *Security*
- *Food, Agriculture, Fishery and Biotechnology*
- *Information and Communication Technologies*
- *Energy*
- *Space*
- *Socio Economic Sciences and Humanities*
- *Environment*
- *Transport*
- *Nanosciences, Nanotechnologies, Materials and new Production Technologies*

In addition there are two further themes covered by the European Euratom Framework Program.

3.2.10 Competitiveness and Innovation Framework Programme

A more business focused programme provides the competitiveness and innovation framework programme, which is supposed to support innovation activities for small and medium sized enterprises.

The aim is to provide better access to finance for small and medium sized enterprises and to deliver business support services to regions.[75]

This framework programme is divided into three operational programmes with specific objectives:

3.2.10.1 The Entrepreneurship and Innovation Programme

This operational programme focuses on:

- Access to finance through financial instruments that support small and medium sized companies in different phases of their life cycles and supports investment in technology development and transfer, innovation and eco-innovation and the cross border expansion of business activities.

[74] s. European Commission, 2010b, et.al.

- Business services in form of service centres in whole Europe to stimulate and improve competitiveness.
- Support for improving innovation policies.
- Support through contract and grants.

3.2.10.2 The Information Communication Technologies Policy Support Programme

This operational programme with the rather long name has placed its focus on stimulating a wider uptake of information communication technology based services and the exploitation of digital content throughout Europe. Issues of public interest such as a low carbon economy or coping with an aging society should be addressed with new technologies.

3.2.10.3 The Intelligent Energy Europe Programme

The third operational programme should help to reach the self set climate change and energy targets of the European Union.

[75] s. European Commission, 2010i, et.al.

4 Methodical Framework

This thesis will be conducted in a case study format in order to analyze the innovativeness of the European Union's policies and budget expenditures.

Hakim recommends case studies as probably the most flexible research design, "*which achieve experimental isolation of selected social factors, when they are used in an intellectually rigorous manner. Used in that manner, this research design offers the advantages of experimental research within natural settings. Hakim furthermore argues that the range of case studies combines exploratory work, description and the testing out of hunches, hypotheses and ideas in varying combinations.*"[76]

Yin defines the strategy of a thesis as a case study, when the form of research question is starting with the adverb "why" or "how" and when there is no control over behavioural events is required[77] and furthermore defines a case study as an empirical inquiry that *"investigates a contemporary phenomenon within its real life context, especially when the bounders between phenomenon and context are not clearly evident"* or to say it in other words *"you would use the case study method because you deliberately want to cover contextual conditions – believing that might be highly pertinent to your phenomenon of study."*[78]

Furthermore, Yin sees *"the case study as a research strategy comprises an all encompassing method – with the logic of design incorporating specific approaches to data collection and to data analysis"* and points out that the case study inquiry *"copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis".*[79]

Yin sees five different applications in case study design:

- **Explain** causal links in real life intervention, which are too complex for a survey or experimental strategy
- **Describe** an intervention and the real life context in which it occurred
- **Illustrate** certain topics within an evaluation in a descriptive mode

[76] s. Hakim, 2000, p. 59.
[77] s. Yin, 1994, p. 6.
[78] s. ibid, p. 13.
[79] s. ibid.

- **Explore** situations in which the intervention being evaluated is not clear
- **"Meta-evolution":** a study of an evaluation study[80]

The general goal of a case study is to investigate and study at least one selected example of a social entity by using a variety of different data collection methods. Hakim gives organisations, communities, social groups, events, families, relationships or work teams as example for a social entity. [81]

The variety of different data collection techniques allows case studies a more holistic design than other comparable designs.

In order to answer my research question I will apply Yin's single-case design, which is defined by a single unit of analysis. A single case-study is a suiting design under several circumstances and it is analogous to a single experiment since a lot of the same conditions that justify a single experiment can also justify a single-case study.[82]

This thesis can to a certain extent be compared with Yin's theory on *"The Single Case Study as the Critical Case"*, which is based on the assumption that a single case represents the critical test of a significant theory.[83]

Furthermore I will apply Hakim's theory on *"Case studies of organisations and institutions"* which is a suiting research design for organisations and institutions for either public or private sectors - such as trade unions, workplaces, management and organisation issues, organisational cultures, schools and very important for this case policy implementation and evaluation. [84]

Unit of analysis will be on hand the amount of innovativeness in the budget expenditures of the year 2007, as well as the orientation towards innovation in the policies of the European Union, with self elaborated and chosen innovation indicators as subunits. The study will therefore be conducted in the form of an embedded case study, which is categorized and defined by several (sub)units of analysis. The subunits of analysis are based on the literature review and findings in chapter 3 and the structure of the case study is presented in the next point.

The found innovation indicators will be applied on the European Budget of the year 2007 and on innovation related policies in the analysis part of this thesis. The original plan of this thesis to create an at least ten point long innovation catalogue had to be

[80] s. Yin, 1994, p.15.
[81] s. Hakim, 2000, p.59.
[82] s. Yin, 1994, p. 39.
[83] s. ibid, p.40.
[84] s. Hakim, 2000, p. 68.

withdrawn, since this would have gone too much into detail. Also Rodriguez and Montalvo faced that problem and stated that *"a catalogue of all aspects and instances of European Union policy innovation would obviously be quite unmanageable. It would merely demonstrate that innovation policies are too diverse, too protean, to be captured in full by a single categorization."*[85] Since a catalogue needs more than four points, I will call the catalogue innovation indicator a list instead.

4.1 Structure of the case study – Innovation Indicator List

Based on the discussion and findings in chapter 3, I have chosen the four following different areas for my innovation indicator list. The indicators are chosen from different areas to cover various fields. However, there is still overlapping to a certain degree between sustainability, future technologies and also regional synergies. Creative cultural exchange is standing a bit outside, but there can be a relation with regional synergies to be assumed.

4.1.1 Sustainability and Sustainable Development

I want to start this section with a short definition. Sustainable development and sustainability are two very popular buzz words yet they have two different meanings. While sustainability is a process in a system, sustainable development is a goal for a product.

The European Commission declares sustainability as the overarching aim of its seventh research framework program and I could not agree more with them.

Sustainability is the capability to endure, and the World Summit of the United Nations in the year 2005 noted that sustainability requires the reconciliation of environmental, social and economic demands. The three pillars of sustainability are visualised in Figure 9.

Sustainable development on the other hand is a pattern of resource use that focuses to meet human needs while the environment is preserved, in order to ensure that also the needs of future generations can be met. The Brundlandt Commission of the United Nations defined sustainable development as development that *"meets the needs of the present without compromising the ability of future generations to meet their own needs."*[86] The United Nations World Summit 2005 points out that sustainable development is also based on the three interdependent and mutually reinforcing pillars economic development, social development and environmental protection.[87]

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[85] s. Rodriguez & Montalvo, 2007, p. 470.

[86] s. United Nations, 1987, et.al.

[87] s. United Nations, 2005, et.al.

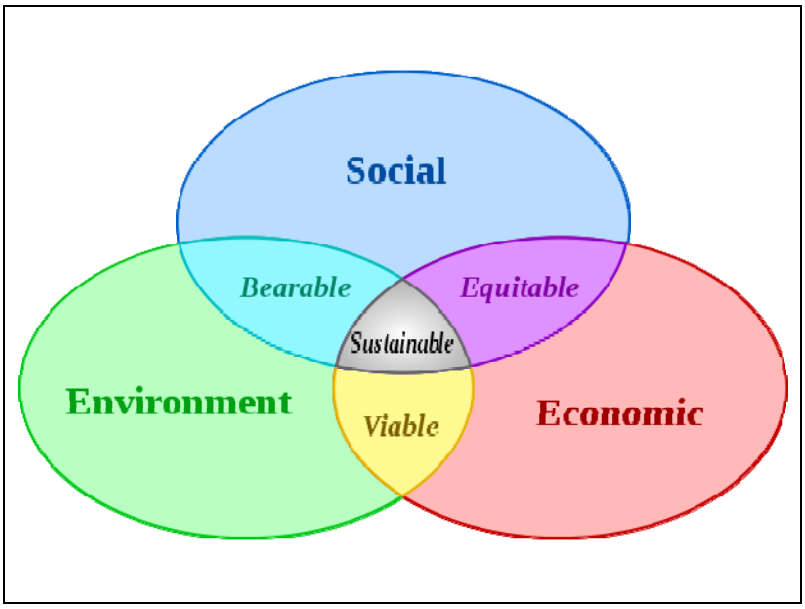

Figure 9: The three Pillars of Sustainability[88]

In the innovation indicator list for this thesis, I would like to focus on the environmental dimension of sustainability and sustainable development.

Environmental sustainability can be defined as the attempt to keep the environment as pristine as possible, when it is interacting with processes by the human being.

In the context of the European Union, sustainable development implies a contract between the community and development

In its ten high level themes list (see Box 7) the European Commission includes the themes food, agriculture, fishery and biotechnology, as well as energy and environment. These themes are highly related to sustainability and sustainable development and they will therefore be used as sub-indicators in the analysis part of the thesis.

4.1.2 Regional Synergies

Asheim and Gertler point out in their regional innovation system approach, that regions can become more innovative and as a result also more competitive, if they promote stronger systematic relationships between the region's knowledge infrastructure and the local firms and they define a regional innovation system as *"the institutional infrastructure supporting innovation within the production structure of a region."*.[89] To attract firms regions have to be developed with infrastructure and to attract human capital (such as the creative class) with the right atmosphere.

[88] s. http://en.wikipedia.org/wiki/File:Sustainable_development.svg [23.05.2010]
[89] s. Asheim & Gertler, 2005, p. 299.

Since innovative activity is heterogeneously distributed across geographical entities, less developed regions have to be specially supported to catch up with leading regions to increase general European innovativeness.

4.1.3 Creative Culture Exchange

Richard Floridas' theory about the creative class is amongst others based on cultural exchange, which is covered be the third T in Box 4 "Tolerance". Universities can be a source for cultural exchange and tolerance and Florida argues that *"universities help to create a progressive, open and tolerant people climate that helps attract and retain members of the Creative Class. Many college towns from Austin, Texas to Iowa City, Iowa have always been places where gays and other "outsiders" in those parts of the country could find a home."*[90]

Through the Bologna Process a common European tertiary education system was created by the European Union and due to European citizenship, which was introduced with the Maastricht Treaty, citizens of member states of the European Union have the right (with some exceptions like the labor market barrier in Germany and Austria for the new Eastern European member countries) to free movement and residence throughout the European Union. In Box 7 creative cultural exchange is most likely presented by the point socio economic sciences and humanities.

4.1.4 Future Technologies

Product and process innovations are most often based on technological progress and development. This means that without investment in research and development, Europe will fall behind other leading research regions such as the United States and Japan.

The innovation indicators in Annex B and Annex C show clearly that investment in future technologies, such as nanotechnology, biotechnology or new production techniques, is absolutely necessary.

Also the seventh European research framework has put emphasis on this issue and includes the high level themes space, biotechnology, information and communication technologies, energy and nanosciences, nanotechnologies, materials and new production technologies. All of these points can be considered as or related with future technologies.

[90] s. Florida, 2002, p. 292.

5 Analysis

In this chapter I am going to analyze the year 2007's budget of the European Union, by applying the innovation indicator list from point 4.1. Furthermore I will describe current initiatives by the European Commission regarding these indicators.

Since the initiatives, policies and directives of the European Union seem to be almost endless, this analysis is not holistic, but rather is oriented on the seventh European research framework program.

5.1 The Budget 2007

The European budget of the year 2007 was different from the budgets before. The numbers were of course different, but also the layout of the budget expenditures changed from 2006 to 2007. While the 2006 budget started with the point "Agriculture", the 2007 budget called this point "Preservation and Management of Nature". In 2006 "Agriculture" was the first expenditure in the list and in 2007 the budget showed "Sustainable growth" as first point.[91] This signalizes an increased awareness for the following point 5.2.

Figure 10 shows the European expenditures of the budget year 2007 with the six major points:

- Sustainable Growth
- Preservation and Management of Nature
- Citizenship, Freedom, Security and Justice
- The EU as Global Partner
- Administration
- Compensation

To answer this thesis' research question, only the first three points are of interest. The EU as a Global Partner, Administration and Compensation will therefore not be elaborated. Even though there might be potential to reduce costs that can be invested into innovative activities.

[91] S. European Commission, 2008, p. 8f.

2007 *(EUR million)*		Total
1	**SUSTAINABLE GROWTH**	**43.713,0**
1.1	**Competitiveness for growth and employment**	**6.738,2**
1.1.1	Seventh Research framework programme (incl.comp	4.059,4
1.1.2	Decommissioning (Direct research)	31,7
1.1.3	Ten	371,5
1.1.4	Galileo	0,0
1.1.5	Marco Polo	9,5
1.1.6	Lifelong Learning	958,8
1.1.7	Competitiveness and innovation framework program	267,4
1.1.71	*CIP Entrepreneurship and innovation*	*181,8*
1.1.72	*CIP ICT policy support*	*37,4*
1.1.73	*CIP Intelligent energy*	*48,2*
1.1.8	Social policy agenda	119,6
1.1.9	Customs 2013 and Fiscalis 2013	35,2
1.1.10	Nuclear decommissioning	37,9
1.1.11	European Global Adjustment Funds	18,6
1.1.DAG	Decentralised agencies	198,5
1.1.OTH	Other actions and programmes	630,2
1.2	**Cohesion for growth and employment**	**36.974,8**
1.2.1	Structural funds	32.699,6
1.2.11	*Convergence objective*	*23.521,6*
1.2.12	*Regional competitiveness and employment objectiv*	*7.835,2*
1.2.13	*European territorial cooperation objective*	*1.297,8*
1.2.14	*Technical assistance*	*44,9*
1.2.2	Cohesion Fund	4.275,2
1.2.DAG	Decentralised agencies	0,0
1.2.OTH	Other actions and programmes	0,0
2	**PRESERVATION AND MANAGEMENT OF NATU**	**54.648,4**
2.0.1	Market related expenditure and direct aids	42.650,1
2.0.11	Agriculture markets	42.413,2
	Direct Aid	*37.044,7*
	Export refunds	*1.444,7*
	Storage	*-106,7*
	Other	*3.477,5*
2.0.12	Fisheries market	24,7
2.0.13	Animal and plant health	212,3
2.0.2	Rural development	10.874,3
2.0.3	European fisheries fund	749,7
2.0.4	Fisheries governance and international agreements	217,8
2.0.5	Life+	114,4
2.0.DAG	Decentralised agencies	40,8
2.0.OTH	Other actions and programmes	1,3
3	**CITIZENSHIP, FREEDOM, SECURITY AND JUS**	**1.049,8**
3.1	**Freedom, security and justice**	**212,2**
3.1.1	Solidarity and management of migration flows	68,7
3.1.2	Security and safeguarding liberties	5,1
3.1.3	Fundamental rights and justice	2,3
3.1.DAG	Decentralised agencies	93,4
3.1.OTH	Other actions and programmes	42,7
3.2	**Citizenship**	**837,6**
3.2.1	Public health and consumer protection programme	70,8
3.2.2	Culture 2007-20013	38,1
3.2.3	Youth in action	124,7
3.2.4	Media 2007	98,2
3.2.5	Europe for Citizens	18,6
3.2.6	Civil protection Financial instrument	8,3
3.2.7	Communication actions	75,2
3.2.8	European Solidarity Fund	196,6
3.2.DAG	Decentralised agencies	76,6
3.2.OTH	Other actions and programmes	130,5
4	**THE EU AS A GLOBAL PARTNER**	**7.291,8**
4.0.1	Instrument for Preaccession (IPA)	2.510,5
	Other actions and programmes	4.781,3
5	**ADMINISTRATION**	**6.805,6**
6	**COMPENSATIONS**	**444,6**
TOTAL EXPENDITURE		**113.953,3**

Figure 10 European Budget 2007[92]

[92] s. European Commission, 2008, p. 9.

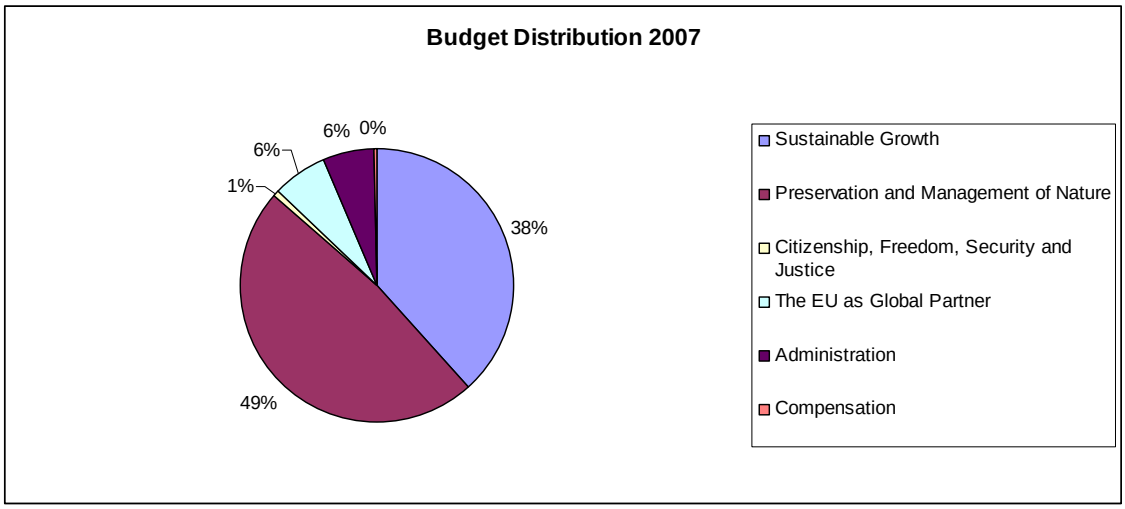

Figure 11: Budget Distribution 2007

Figure 11 shows that the budget for the point "Preservation and Management of Nature" nearly accounts for half of the European Budget, followed by the point "Sustainable Growth" with nearly 40%. The other parts of the budget are only minor sums.

5.1.1 Preservation and Management of Nature

The largest expenditure in the European budget "Preservation and Management of Nature" is actually just another name for "Agriculture". That is also how this point was called in the European budgets until 2006[93] and agriculture pretty much explains where the money is going. €42413 billion went to agriculture markets, and this is of the most controversially discussed topics in the European Union.

The Common Agricultural Policy of the European Union has the aim to offset market forces as well as to provide farmers with a reasonable standard of living and to preserve rural heritage. Alberta Sbragia points out that this policy *"is unique in the amount of money it receives from the EU budget, the degree of power the EU exercises, and the amount of contestation it causes"* and argues furthermore that *"although the Common Agricultural Policy created a market for agricultural goods within the European Union, its market correcting properties have been the most controversial outside the European Union because the policy distorts global prices for many agricultural products, thus affecting (negatively) non-EU agricultural producers."*[94]

The European Union themselves argue that the money of this policy goes directly to the places where it is most needed and show the example of a farmer who was hit by natural disasters or outbreaks of animal diseases. Furthermore they argue that they support

[93] s. European Commission, 2008, p. 8.
[94] s. Sbragia, 2003, p. 124.

farmers with supplements to their income to ensure that they have a decent living. But this assistance is linked to compliance with broader objectives in the areas of food safety, farm hygiene, animal health and welfare as well as the preservation of rural landscapes and bird and wildlife conversation.[95]

However, the reality looks different. Several studies have criticised that this funding is not goal oriented and precise. Instead of supporting small farmers, the largest amounts of this funding goes to industrial companies, mainly in the food industry (i.e. the Austrian company Red Bull) or to recipients like the British Queen.[96]

It seems that this part of the budget expenditures can not be considered as an engine for innovation. The European Union states itself that the innovation in the agricultural area is supported by the European research funds, which have the aim to further support innovation in agriculture by increasing productivity, while making farming more environmentally friendly.[97]

5.1.2 Sustainable Growth

The real engine for innovation in the budget of the European Union is the point "Sustainable Growth". It includes funding for Structural Funds (see point 3.2.7) and the funding for the seventh European research framework (see point 3.2.9) as well as the Competitiveness and Innovation framework presented in point 3.2.10.

The largest amount of funding goes to Lifelong Learning, which will be elaborated in the following sections as part of this budget expenditure.

5.1.3 Citizenship, Freedom, Security and Justice

The third relevant point of the budget is with only around 1% of the total expenditures rather small; however it has some innovative potential in the form of the issues that are included in the citizenship section.

The field Citizenship, Freedom, Security and Justice deals in general with issues such as children, immigration, asylum and issues regarding movement and residence within the European Union.

5.2 Sustainability and Sustainable Development

The European Commission states that sustainability and sustainable development is a core objective of the European Union, in order to ensure that the present socio economic

[95] s. European Commission, 2008a, et.al.
[96] s. DerStandard, 2010a. et.al.
[97] s. European Commission, 2008a, et.al.

is not going to compromise our future. According to the European Commission, the seventh framework programme (presented in point 3.2.9) has been set up to allow Europeans to live up to the research and development needs of the European Union's renewed sustainable development strategy.[98]

The renewed European sustainable development strategy recognizes *"the need to strengthen research and technological development in helping to translate the key challenges and objectives of strategy into concrete action, and to promote a forward looking and integrated approach to sustainability."*[99]

5.2.1 Sustainability and Sustainable Development in the context of food, agriculture and fishery, and biotechnology

The primary aim of the funding for the high level theme "food, agriculture and fishery, and biotechnology" is to build a European knowledge based bio economy which addresses the needs for:[100]

- *Growing demand for safer, healthier, higher quality food*
- *Sustainable use and production of renewable bio-resources*
- *Increasing risk of epizootic and zoonotic diseases and food related disorders*
- *Sustainability and security of agricultural, aquaculture and fisheries production*
- *Increasing demand for high quality food, taking into account animal welfare and rural and coastal contexts and response to specific dietary needs of consumers*

The Commission states that the term "bio" includes all industries and economic sectors, which are producing, managing and exploiting biological resources.[101]

5.2.2 Sustainability and Sustainable Development in the context of energy (non nuclear)

Since my personal opinion is that nuclear energy is not compatible with sustainability I will limit this point to non nuclear energy.

The current objective of the European Union in the field of sustainable energy is to aid the creation and establishment of technologies, which are necessary to shift the current

[98] s. European Commission, 2010c, et.al.
[99] s. European Commission, 2010d, et.al.
[100] s. European Commission, 2010e. et.al.
[101] s. European Commission, 2010f. p.1.

energy system to a more sustainable and secure one. The emphasis of the seventh framework program is therefore given to the following activities:[102]

- *Hydrogen and fuel cells*
- *Renewable electricity generation*
- *Renewable fuel production*
- *Renewables for heating and cooling*
- *CO2 capture and storage technologies for zero emission power generation*
- *Clean Coal Technologies*
- *Smart energy networks*
- *Energy efficiency and savings*
- *Knowledge for energy policy making*

5.2.3 Sustainability and Sustainable Development in the context of environment

The European Commission has put the issue climate change into the high level theme "environment" and this is a sign for how important this theme is. The aim of this seventh research framework in this field is to focus sustainable development on a better understanding of the climate change phenomenon. This includes environmental impacts on health, natural hazards and biodiversity.

According to the European Commission, the environmental research within the seventh research framework has a twofold objective. On the one hand it has to promote the sustainable management of the environment through increasing knowledge about the interaction climate, humans, bio-sphere and ecosystems and on the other hand it is supposed to support the development of new technologies and tools to address the challenges of the global environmental issues.[103]

5.2.4 Budget expenditures on Sustainability and Sustainable Development

It is difficult to exactly determine the expenditures for sustainability and sustainable development, since this area is covered by point 5.1.1 and 5.1.2. The problem is that the point "Preservation and Management of Nature" is rather unclearly defined and also agricultural initiatives that do not necessarily have sustainability as goal are funded.

[102] s. European Commission, 2010g, et.al.
[103] s. European Commission, 2010h, et.al.

There are unfortunately no accessible numbers to what extent the money was given to sustainable objectives.

However, in the "Sustainable Growth" point, sustainability and sustainable development play a larger role. The seventh European research framework programme is highly oriented towards sustainability and the European Union has plans to shift money from the agricultural sector to the more future oriented fields in the Sustainable Growth point.

Also the current Commissioner for agriculture Janez Potočnik called for a profound greening of the European agricultural policies and a new policy titled "Common Agricultural and Environmental Policy".[104]

This means that also this budget and policy area is going towards a more sustainable and therefore also innovative direction.

5.3 Regional Synergies

Regional development is one of the most important objectives in the European Union and due to efficient support countries or regions like Ireland or the most Western part of Austria could catch up to the leading European countries and regions.

5.3.1 Convergence Objective and the European Competitiveness and Employment Objective

In point 3.2.7 the Structural Funds of the European Union are described and part of it were the three different objectives in which the European regions are divided according to their development until the year 2006.

Since 2007 there are two new objectives: the Convergence Objective and the European Competitiveness and Employment Objective with four different kinds of categories (see Figure 12):[105]

- Convergence Regions (in red)
- Phasing-out Regions (in light red)
- Phasing-in Regions (in turquoise)
- Competitiveness and Employment Regions (in light turquoise)

The Convergence Objective has the aim to cover the regions (see the red and light red regions in Figure 12), which have a GDP per capita below 75% of the average GDP of

[104] s. Potocnik, 2010, et.al.
[105] s. European Commission, 2010m, et.al.

the 27 member states, with priorities in innovation, knowledge society, physical and human capital as well as environment. This was formerly objective 1.

The phasing out regions would have been below the 75% of the average GDP per capita, if it would have been the average of the old 15 member states. The phasing in regions are those regions, which would have been eligible for Objective 1, but their GDP exceeds the 75% average of the 15 old member states.

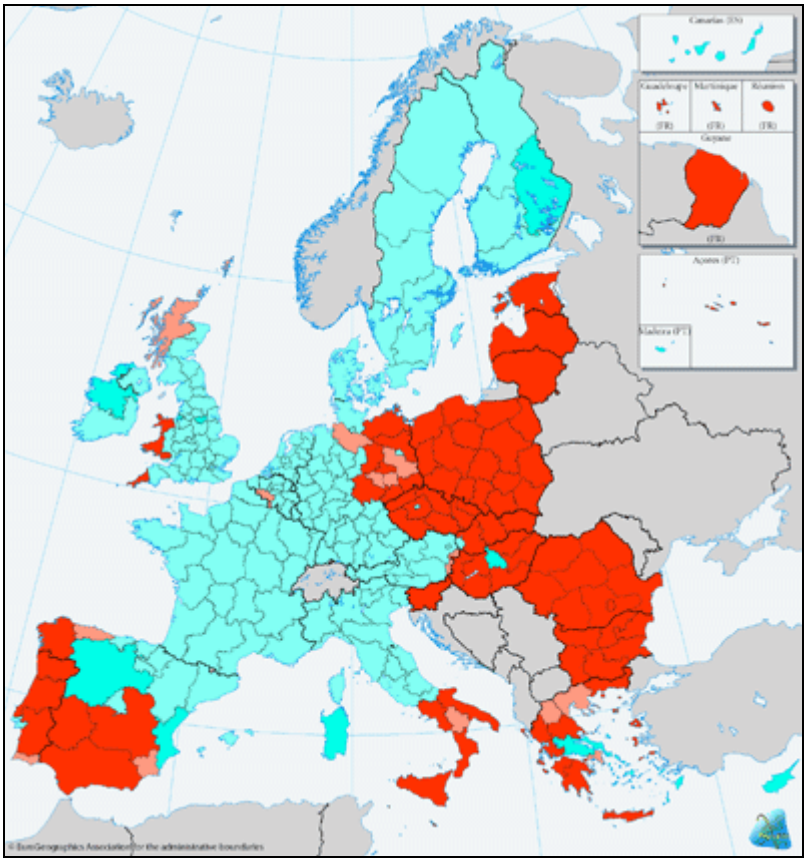

Figure 12: Regional Policy in Europe[106]

The Regional Competitiveness and Employment Objective were formerly objective 2 and cover all the territory of the European Union which has not been covered by the Convergence Objective. The aim is to reinforce competitiveness, attractiveness and employment to the regions, and its main themes are innovation and entrepreneurship.

5.3.2 Cross-border programmes under the European Territorial Cooperation Objective

This programme includes 52 cross-border programmes with the aim to “fill the gap” between two countries. It is difficult to formulate a general goal of the 52 programmes

(see Figure 13), since all of them face their own problems, but they deal with issues such as entrepreneurship, urban and rural areas, infrastructure, employment or transport and communication.

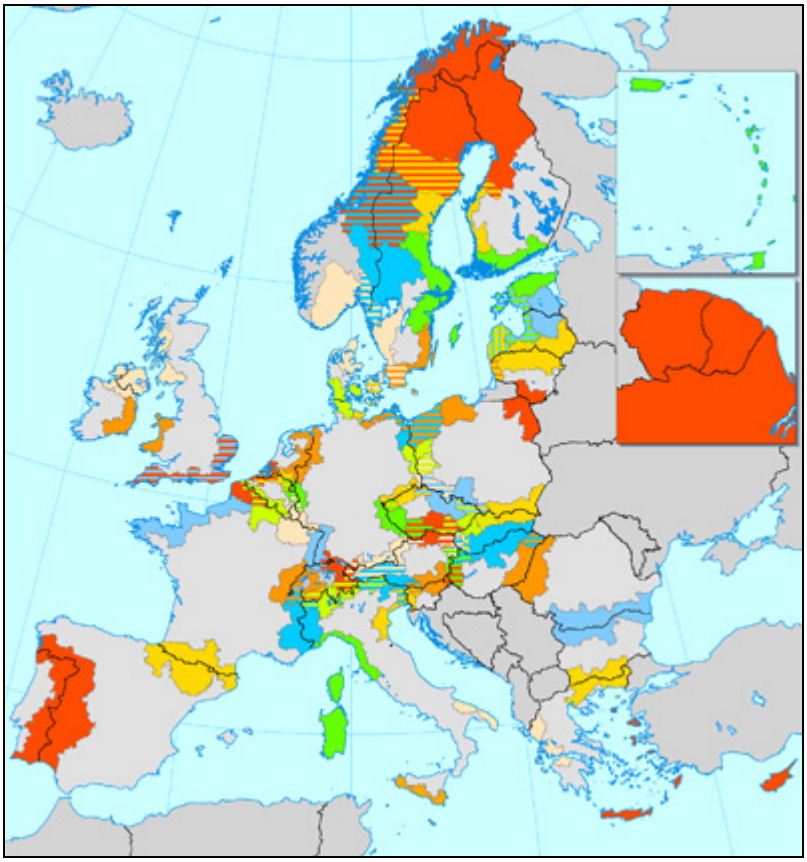

Figure 13: Cross-border programmes[107]

To illustrate what this programme can include, I have chosen the Danish/Swedish/Norwegian *"Öresund - Kattegatt – Skagerrak"* as an example.

[106] s. European Commission, 2010m, et.al.

[107] s. http://ec.europa.eu/regional_policy/atlas2007/eu/crossborder/index_en.htm

Figure 14: Öresund - Kattegatt – Skagerrak[108]

In Box 8 is the description of the Scandinavian cooperation, which even includes a non European Union member Norway with the goals to promote sustainable economic growth, tying the regions together, promoting everyday integration and technical assistance.

Box 8: Operational Programme Öresund – Kattegatt - Skagerrak[109]

On 27 March 2008, the European Commission approved a Cross-border Cooperation Programme for Sweden, Denmark and Norway for the period 2007-13. The programme will build on the work of the Öresund Operational Programme, which currently runs as a partnership between Denmark and Sweden. A number of new coastal regions have been added to the new programme – these run along the entire Danish east coast, the Swedish west coast and the south coast of Norway. The Programme is sub-divided into two sub-programmes: one covers Öresund, the other Kattegatt-Skagerrak.

The Programme falls within the framework laid out for the European Territorial Cooperation Programme and has a total budget of around €223 million. Community investment through the European Regional Development fund (ERDF) comes to about €112 million, which represents approximately 1.3% of the total EU investment earmarked for the European Territorial Cooperation Objective under the Cohesion Policy for 2007-13. In addition to the ERDF allocation and contributions from Denmark and Sweden, Norway provides its own funding to the Programme.

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108 s. http://ec.europa.eu/regional_policy/country/prordn/details_new.cfm?gv_PAY=DK&gv_reg=ALL&gv _PGM= 1279&gv_defL=7&LAN=7 [29.05.2010]

109 s. http://ec.europa.eu/regional_policy/country/prordn/details_new.cfm?gv_PAY=DK&gv_reg=ALL&gv_PGM=1279&gv_defL=7&LAN=7 [29.05.2010]

5.3.3 Transnational programmes

The 13 transnational programmes in Figure 15 cover larger areas of co-operation.

Figure 15: Transnational cooperations[110]

[110] s. http://ec.europa.eu/regional_policy/atlas2007/transnational/index_en.htm [29.05.2010]

The goals are different once again from case to case, but they deal with issues like international business and research linkages, flood management, network of universities, sustainable urban development, water resources and so on.

5.3.4 Budget expenditures on Regional Synergies

Regional, cross border and transnational development in the European Union is funded by the Structural Funds of the European Union and is after the agricultural markets the second largest budget sector with €32.699,6 mil.

5.4 Creative Culture Exchange

5.4.1 Lifelong Learning

As part of the "Sustainable Growth" expenditures of the European Budget, the point "Lifelong Learning" includes several policies and programmes that are clearly related to creative cultural exchange.

The Lifelong Learning policy includes the European strategy and cooperation in education and training with the long term strategic objectives to make lifelong learning and mobility a reality. Furthermore, this policy should improve the quality and efficiency of education and training and it should promote social cohesion, equity and active citizenship.

The benchmark goals of this policy for the year 2010 are:[111]

- *at least 95% of children between the age of four and the age for starting compulsory primary education should participate in early childhood education;*
- *the share of 15-years olds with insufficient abilities in reading, mathematics and science should be less than 15%;*
- *the share of early leavers from education and training should be less than 10%;*
- *the share of 30-34 year olds with tertiary educational attainment should be at least 40%;*
- *an average of at least 15 % of adults (age group 25-64) should participate in lifelong Learning*

[111] s. European Commission, 2010k, et.al.

5.4.2 The Erasmus Programme

The European Commission calls the Erasmus Programme the flagship of European education and training programs, which enables more than 180.000 students and professors per year to study or work abroad. The programme is part of the Lifelong Learning Programme. There are currently plans to expand the Erasmus programme at the high school level.[112]

Jose Manuel Barroso points out in the magazine "Foreign Policy" that *"Erasmus has developed beyond just being an educational program. It gives many European university students the chance of living for the first time in a foreign country, and it has reached the status of a social and cultural phenomenon."*[113]

I have experienced the Erasmus Programme myself here in Lund and I feel like it is a huge source for innovation. It increases cultural awareness and participating students can gain benefits for their future career.

A study conducted by the Swiss researchers Messer and Wolter showed that there is a positive correlation between mobility of students and their entry salary, however they point out that today only those who can participate have enough financial means to afford a term or two abroad.[114]

5.4.3 Youth in Action

Youth in Action is a programme set up by the European Union for its youth. The aim is to inspire a sense of active European citizenship, solidarity and tolerance among the youth of Europe and to motivate them to help to create the future of the European Union.[115]

5.4.4 Creative Cultural Exchange in the context of Socio-Economic Sciences and Humanities

The seventh research framework programme puts emphasis on socio-economic sciences and humanities in the following eight areas:[116]

1. *Growth, employment and competitiveness in a knowledge society:*
    - *innovation, competitiveness and labour market policies;*
    - *education and life-long learning;*

[112] s. DerStandard, 2010b, et.al.
[113] s. Foreign Policy, 2007, p.6.
[114] s. Messer & Wolter, 2007, 660f.
[115] s. European Commission, 2010l, et.al.
[116] s. European Commission, 2010j, et.al.

- *economic structures and productivity.*

2. *Combining economic, social and environmental objectives in a European perspective:*
   - *models within Europe and across the world;*
   - *economic and social and cohesion across regions;*
   - *social and economic dimensions of environmental policy.*
3. *Major trends in society and their implications - demographic change, reconciling family and work, health and quality of life, youth policies, social exclusion and discrimination.*
4. *Europe in the world - trade, migration, poverty, crime, conflict and resolution.*
5. *The citizen in the European Union - political participation, citizenship and rights, democracy and accountability, the media, cultural diversity and heritage, religions, attitudes and values.*
6. *Socio-economic and scientific indicators - the use and value of indicators in policymaking at macro and micro levels.*
7. *Foresight activities - the future implications of global knowledge, migration, ageing, risk and the emerging domains in research and science.*
8. *Strategic activities - including research for policy support and international cooperation.*

5.4.5 Budget Expenditures on Creative Cultural Exchange

The budget expenditures for Creative Cultural Exchange can primarily be found in the section “Lifelong Learning” and again in the seventh European research framework. In addition, the “Citizenship, Freedom, Security and Justice” section is also contributing a minor amount with its initiative Youth in Action.

5.5 Future Technologies

The European Union takes future technologies seriously and claims i.e. to be the largest public investor in nanotechnology and the funding for future technology has been increased in the seventh research framework.[117]

[117] s. Engineers Journal, 2007, et.al.

5.5.1 Future Technologies in the Seventh European Research Framework

The seventh European research framework includes several future technology aspects. The most obvious one might be the point nanosciences, nanotechnologies, materials and new production technology. Another one is the point energy, which is elaborated in point 5.2.2 as well as the high level theme “space”, which goes too much into technological detail to be presented here.

5.5.1.1 Nanosciences, Nanotechnology, Material and new Production Technology

The objective of this point in the framework is to improve the position and competitiveness of European industries by generating the knowledge that is needed to transform it to knowledge intensive industry from today’s resource intensive industry.

According to the European Commission, the following points will be especially funded by the seventh research framework:[118]

- *Nanosciences and nanotechnologies - studying phenomena and manipulation of matter at the nanoscale and developing nanotechnologies leading to the manufacturing of new products and services.*
- *Materials - using the knowledge of nanotechnologies and biotechnologies for new products and processes.*
- *New production - creating conditions for continuous innovation and for developing generic production 'assets' (technologies, organisation and production facilities as well as human resources), while meeting safety and environmental requirements.*
- *Integration of technologies for industrial applications - focusing on new technologies, materials and applications to address the needs identified by the different European Technology Platforms.*

5.5.1.2 Information and Communication Technologies

Information and communication technologies as part of the seventh research framework should have a positive impact on productivity and innovation as well as the modernization of public sectors like health.

5.5.2 Budget Expenditures on Future Technologies

The future technologies funding is covered by the seventh European research framework, and the research framework is part of the “Sustainable Growth” section.

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[118] s. European Commission, 2010n, et.al.

6 Summary and Conclusion

The European Union should turn into an innovation society as demanded by the President of the European Commission Jose Manuel Barroso[119] and indeed the European Union has put quite some efforts in order to reach this goal.

The European Union is competing with other highly developed regions like the United States or Japan on the one hand, and with new global players in the world economy like China, India, Russia or Brazil on the other. To be able to maintain a high standard to compete with the highly developed regions and to stay advanced compared to the new players, the European Union has to orient itself towards sustainable innovation. Research and development is necessary for technological progress, which is the foundation of product or process innovations.

The awareness for these issues has clearly risen in recent years and might be best signalized by the new structure of the European budget. “Sustainable Growth” is now the first point of the European budget, followed by agriculture, which is re-named to preservation and management of nature.

However, re-naming is not sufficient, action must follow. The European Union is still spending nearly half of its budget on agricultural issues with little innovative potential and no orientation towards innovativeness. If only the raw numbers of the year 2007 budget are taken into consideration, only 40% or two out five Euros were invested into innovative issues and this is clearly not enough. However, there is a re-thinking in this area and money from the agricultural section will be shifted to the “Sustainable Growth” section in the next couple of years, when the often criticised budget for agriculture will be steadily decreased

The “Sustainable Growth” section of the European budget is clearly oriented towards innovation and the four relevant innovation indicators for this thesis “Sustainability and Sustainable Development”, “Regional Synergies”, “Creative Cultural Exchange” and “Future Technologies” were found in several initiatives such as the Structural Funds, the Lifelong Learning programme or the seventh European research framework programme.

Especially the seventh research framework programme deserves the labelling “Engine for Innovation” and the decision to increase its budget can be highly appreciated. With a clear orientation towards sustainable innovation in a large variety of fields, this pro-

[119] s. Barroso, 2009, et.al.

gramme can - if it is implemented efficiently - be the heart or the engine of an innovative European Union in a social and economical context.

With the Youth in Action programme and especially the Erasmus student exchange programme, the European Union is creating and stimulating a European identity among the European future generation and the decision to expand to programme to the high school level gives those teenagers the chance to experience Europe who do not want to continue with tertiary education.

In a last point I want to answer the research questions raised in the first point briefly:

What indicates innovation in the context of the budget and the policies in the European Union?

The classical literature about innovation indicators compares input with output, but is oriented on classical product- or process innovations. In the context of the European Union also social and environmental dimensions have to be considered and I have therefore chosen “Sustainability and Sustainable Development”, “Regional Synergies”, “Creative Cultural Exchange” and “Future Technologies” as suiting indicators for this thesis.

How is the European Union spending its budget and is the public funding stimulating innovativeness?

The European Union budget expenditures are often criticised as not being efficient and to a certain degree I have to agree with these voices. In 2007 only two out of five Euros were spent on projects and programmes with an orientation towards innovativeness. However, recent decisions show a trend towards the expenditure of more money on innovative areas and away from the large agricultural spending.

What innovative potential has the EU budget and is it going to innovative policies and initiatives?

The budget of the European Union had some innovative potential in the year 2007, but as already mentioned in the question above, there is space for improvement. The shift away from an agriculturally oriented European Union towards an innovative society is on track and the ability to support innovation and to innovate is increasing.

Is the European Union an Engine for Innovation?

The European Union can be considered as an engine for innovation. However, on a scale from Fiat to Ferrari, the European Union might be a middle class car with the intention to get a hybrid motor.

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Annexes

Annex A: Budget Composition 2007

VAT-based own resource	**19.440,8**
GNI-based own resource	**73.914,7**
UK correction	**58,9**
JHA adjustment for Denmark, Ireland and the United Kingdom	**0,1**
TOTAL national contribution	**93.414,5**
Traditional own resources (TOR) (75%)	**16.573,0**
Agricultural duties (100%)	*1.872,1*
Sugar levies (100%)	*-40,9*
Customs duties (100%)	*20.266,2*
Amounts (25%) retained as TOR collection costs	*-5.524,3*
TOTAL own resources	**109.987,5**
Surplus from previous year	1.847,6
Surplus from EAGGF-Guarantee	0,0
Surplus external aid guarantee fund	260,9
Other revenue	5.467,0
TOTAL REVENUE	**117.563,0**

Annex B: Indicators for the European Innovation Scoreboard 2008

	EIS dimension / indicator	Data source (reference year)
	ENABLERS	
	Human resources	
1.1.1	S&E and SSH graduates per 1000 population aged 20-29 (first stage of tertiary education)	Eurostat (2006)
1.1.2	S&E and SSH doctorate graduates per 1000 population aged 25-34 (second stage of tertiary education)	Eurostat (2006)
1.1.3	Population with tertiary education per 100 population aged 25-64	
1.1.4	Participation in life-long learning per 100 population aged 25-64	Eurostat (2007)
1.1.5	Youth education attainment level	Eurostat (2007)
	Finance and support	
1.2.1	Public R&D expenditures (% of GDP)	Eurostat (2007)
1.2.2	Venture capital (% of GDP)	EVCA / Eurostat (2007)
1.2.3	Private credit (relative to GDP)	IMF (2007)
1.2.4	Broadband access by firms (% of firms)	Eurostat (2007)
	FIRM ACTIVITIES	
	Firm investments	
2.1.1	Business R&D expenditures (% of GDP)	Eurostat (2007)
2.1.2	IT expenditures (% of GDP)	EITO / Eurostat (2006)
2.1.3	Non-R&D innovation expenditures (% of turnover)	Eurostat (2006)
	Linkages & entrepreneurship	
2.2.1	SMEs innovating in-house (% of SMEs)	Eurostat (2006)
2.2.2	Innovative SMEs collaborating with others (% of SMEs)	Eurostat (2006)
2.2.3	Firm renewal (SME entries plus exits) (% of SMEs)	Eurostat (2005)
2.2.4	Public-private co-publications per million population	Thomson Reuters / CWTS (2006)
	Throughputs	
2.3.1	EPO patents per million population	Eurostat (2005)
2.3.2	Community trademarks per million population	OHIM / Eurostat (2007)
2.3.3	Community designs per million population	OHIM / Eurostat (2007)
2.3.4	Technology Balance of Payments flows (% of GDP)	World Bank (2006)
	OUTPUTS	
	Innovators	
3.1.1	SMEs introducing product or process innovations (% of SMEs)	Eurostat (2006)
3.1.2	SMEs introducing marketing or organisational innovations (% of SMEs)	Eurostat (2006)
3.1.3	Resource efficiency innovators, unweighted average of:	
	•Share of innovators where innovation has significantly reduced labour costs (% of firms)	Eurostat (2006)
	•Share of innovators where innovation has significantly reduced the use of materials and energy (% of firms)	Eurostat (2006)
	Economic effects	
3.2.1	Employment in medium-high & high-tech manufacturing (% of workforce)	Eurostat (2007)
3.2.2	Employment in knowledge-intensive services (% of workforce)	Eurostat (2007)
3.2.3	Medium and high-tech manufacturing exports (% of total exports)	Eurostat (2006)
3.2.4	Knowledge-intensive services exports (% of total services exports)	Eurostat (2006)
3.2.5	New-to-market sales (% of turnover)	Eurostat (2006)
3.2.6	New-to-firm sales (% of turnover)	Eurostat (2006)

Annex C: Definition of Indicators of the European Innovation Scoreboard 2008

Indicator (see Annex B)	**Numerator**	**Denominator**
1.1.1	Number of S&E (science and engineering) and SSH (social sciences and humanities) graduates at first stage of tertiary education (ISCED 5)	Population between 20 and 29 years
1.1.2	Number of S&E (science and engineering) and SSH (social sciences and humanities) graduates at second stage of tertiary education (ISCED 6)	Population between 25 and 34 years
1.1.3	Number of persons in age class with some form of post-secondary education (ISCED 5 and 6)	Population between 25 and 64 years
1.1.4	Number of persons involved in life-long learning. Life-long learning is defined as participation in any type of education or training course during the four weeks prior to the survey	Population between 25 and 64 years
1.1.5	Number of young people aged 20-24 years having attained at least upper secondary education attainment level, i.e. with an education level ISCED 3a, 3b or 3c long minimum	Population between 20 and 24 years
1.2.1	All R&D expenditures in the government sector (GOVERD) and the higher education sector (HERD). Both GOVERD and HERD according to the Frascati-manual definitions	Gross Domestic Product
1.2.2	Venture capital investment is defined as private equity being raised for investment in companies. Management buyouts, management buyins, and venture purchase of quoted shares are excluded. VC includes Early stage (seed + start-up) and Expansion and replacement (expansion and replacement capital) capital	Gross Domestic product
1.2.3	Claims on the private sector by commercial banks and other financial institutions that accept transferable deposits such as demand deposits (line 22d of IMF International Financial Statistics)	Gross Domestic Product (line 99b of IMF International Financial Statistics)
1.2.4	Number of enterprises (excluding the financial sector) with 10 or more employees with broadband access	Total number of enterprises (excluding the financial sector) with 10 or more employees
2.1.1	All R&D expenditures in the business sector (BERD), according to the Frascati-manual definitions	Gross Domestic Product
2.1.2	Total expenditures on IT. IT expenditures capture hardware, software and other services. The data cover the total market, including expenditure of the public and private sector (enterprises, as well as those of individuals and households)	Gross Domestic Product
2.1.3	Sum of total innovation expenditure for enterprises, in national currency and current prices excluding intramural and extramural R&D expenditures	Total turnover for all enterprises
2.2.1	Sum of SMEs with in-house innovation activities. Innovative firms are defined as those firms which have introduced new products or processes either 1) in-house or 2) in combination with other firms	Total number of SMEs
2.2.2	Sum of SMEs with innovation co-operation activities. Firms with co-operation activities are those that had any co-operation agreements on innovation activities with other enterprises or institutions in the three years of the survey period	Total number of SMEs
2.2.3	Sum of the number of births and deaths of SMEs. Only SMEs with at least 5 employees and who are active in NACE classes C, D, E, G51, I, J and K are included	Total number of SMEs
2.2.4	Number of public-private co-authored publications. “Public-private co-publications” are defined as all research-related papers (document types: ‘research articles’, ‘research reviews’, notes’ and ‘letters’) published in the Web of Science database.	Total population
2.3.1	Number of patents applied for at the European Patent Office	Total population

	(EPO), by year of filing. The national distribution of the patent applications is assigned according to the address of the inventor	
2.3.2	Number of new community trademarks. A trademark is a distinctive sign, identifying certain goods or services as those produced or provided by a specific person or enterprise	Total population
2.3.3	Number of new community designs. A registered Community design is an exclusive right for the outward appearance of a product or part of it, resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation	Total population
2.3.4	Royalty and license fees, receipts (Balance of Payments, current US$) plus Royalty and license fees, payments (Balance of Payments, current US$)	Gross Domestic Product (current US$)
3.1.1	Number of SMEs who introduced a new product or a new process to one of their markets	Total number of SMEs
3.1.2	Number of SMEs who introduced a new marketing innovation and/or organisational innovation to one of their markets	Total number of SMEs
3.1.3		
•	Reduced labour costs (% of firms)	Number of innovating firms who replied that their product or process innovation had a highly important effect on reducing labour costs per unit of output
•	Reduced use of materials and energy (% of firms)	Number of innovating firms who replied that their product or process innovation had a highly important effect on reducing materials and energy per unit of output
3.2.1	Number of employed persons in the medium-high and high-tech manufacturing sectors	Total workforce
3.2.2	Number of employed persons in the knowledge-intensive services sectors	Total workforce
3.2.3	Value of medium and high-tech exports	Value of total exports
3.2.4	Exports of knowledge-intensive services are measured by the sum of credits in EBOPS (Extended Balance of Payments Services Classification) 207, 208, 211, 212, 218, 228, 229, 245, 253, 254, 260, 263, 272, 274, 278, 279, 280 and 284	Total services exports as measured by credits in EBOPS 200
3.2.5	Sum of total turnover of new or significantly improved products for all enterprises	Total turnover for all enterprises
3.2.6	Sum of total turnover of new or significantly improved products to the firm but not to the market for all enterprises	Total turnover for all enterprises