

**dr. Mojca Golobič**

Assistant Professor Landscape Architecture at  
the University of Ljubljana  
Urban Planning Institute of the Republic of  
Slovenia  
Trnovski pristan 2, 1000 Ljubljana, Slovenia  
[mojca.golobic@uirs.si](mailto:mojca.golobic@uirs.si)

**Naja Marot**

Junior researcher, degree in geography  
Urban Planning Institute of the Republic of  
Slovenia  
Trnovski pristan 2, 1000 Ljubljana, Slovenia  
[naja.marot@uirs.si](mailto:naja.marot@uirs.si)

## **TERRITORIAL IMPACT ASSESSMENT: A POLICY DEVELOPMENT TOOL FOR TERRITORIAL COHESION**

### Abstract:

Territorial impact assessment (TIA) is one of the newest strategic assessment and evaluation tools. Although it can be related to Lisbon and Gothenburg strategies, the most explicit references for TIA are European Spatial Development Perspectives (1999) and Third cohesion report. The results of the first project phase have brought a computer-supported tool for evaluation of sector policy effects on territorial cohesion. Additionally, the tool enables an integrated evaluation of measures from different sector policies and identification of their antagonistic or synergetic impacts. This allows for improvement of their coherence.

The ongoing project further develops the TIA tool, with specific aim to enable the specified assessment for different spatial units and several levels and aspects of synthesis. The approach is conceptualized as a three dimensional matrix: (1) policy measures, (2) territorial cohesion elements (objectives) and (3) spatial units. The impacts are evaluated on each intersection which enables a comprehensive evaluation. Since the project finishes in April 2008, only intermediate results are presented. Some questions, for example a transparent and valid aggregation method still need to be discussed further on.

### **1 In a need of territorial impact assessment**

Spatial planning is an interdisciplinary field which includes different sectors' professionals. Basic function of spatial planning is a competition of the interest in land or space (Dabinett, Richardson, 1999). The land is both, a factor of production and an environmental resource. The demand for use of land and territory is a reflection of complex social and economic processes involving a multiplicity of private and public interests. It operates across a number of scales of government, often involving the need to balance local and wider interests, and planning seeks to achieve its aims through a variety of instruments which are not only part of territorial development policies. Directly or indirectly, there are several policy sectors strongly connected to the territory. The relationship among them should be mutual so that sectors would obey territorial principles and objectives when they set up their own policies and plans. Unfortunately, this is not a common practice and when we look for the causes for poor implementation of spatial planning objectives such as territorial cohesion, we come down to discrepancies between sector policies and corresponding measures. Like in other European countries, this phenomenon is recognized also in Slovenia. Policy documents are prepared separately which often leads to the contradictory objectives and impacts. The goals are not achieved although double human and financial resources have been spent by different sector governmental departments. To prevent that, especially in a territorial point of view, the territorial impact assessment method was presented by European Spatial Development Perspectives (1999) as a possible solution for better integration of territorial cohesion principals into sector policies.

Firstly, it was meant for assessment of large infrastructure projects, especially in the field of transport, management of water resources, and nature conservation programmes, and later on it also applied to better coordination between the sectors with any territorial effects, for example agriculture, which finally results in improvement of territorial cohesion. Also the Gothenburg strategy sees TIA as a tool for more justified and proofed policies which are based on preliminary assessments of their economic, social and environmental consequences.

The performance of the method is not regulatory obligatory, therefore different countries practice TIA in different scales, its tools and procedures vary in their purpose and emphasis. In Slovenia the closest studies to TIA are environmental impact assessments regulated by Environmental Protection Act (2008) and the impact assessments studies of project variants in the case of the preparation of national detailed plan for highways' construction. They covered all three major elements of sustainability: economic connected to technical, social in the sense of social acceptability, environmental and territorial characteristics of planned interventions. Additionally, the project named Territorial Impacts of the sector policies was conducted in the year 2007. With the purpose to support the design process of the policies it developed an interactive on-line decision-making tool which enables the evaluation of sector impacts on the territory. Thus it was used as the basis for the TIA model of the project we perform for the Ministry of Environment and Spatial Planning with its main purpose to develop an efficient TIA method adapted to Slovenian needs.

It is too extensive, time and energy consuming to cross goals of all the territorially related sectors with the spatial development objectives so we have to focus just on one. Since the energy sector seems to be in the spotlight at the moment, and has a significant relevance to the territory, we decided to assess territorial impact of the energy policy for Slovenia. The major question we want to address is *What do or could energy sector policies add to better achievement of territorial objectives?*

In this paper we want to address this question with the proposed TIA method which is still under development, so only interim results are presented. The first part is a short introduction into history and the theory of the method, the second part upgrades the theory with the practice – a model is described in detail.

## **2 Background to the method and its approach**

Territorial Impact Assessment is not such a novelty as it looks on the first sight. One of the first assessment methods related to the environment or territory was performed by Luna Leopold in the American geological census in 1972. She designed a matrix – Leopold's matrix which was used for expert impact assessment of governmental policies on the environment (Munn, 1979). Horizontal axis is presented by 100 possible measures of economic policy and the 88 vertical fields are possible environmental effects. This principle is still used in newer, now obligatory environmental impact assessments (2001/42/EC), and territorial impact assessments performed by ESPON or individual countries, Norway for example. Other European countries with a longer tradition of TIA are Germany, where method is part of a legal procedure, Austria, Portugal, Belgium and Finland where it is very similar to Environmental Impact Assessment but also considers the broader social and economic impact (Schindegger, Tatzberger, 2004). OECD discussed the urban impacts of government policies in a number of countries, including Sweden, Canada and France already back in 1981 (Nijkamp, van Pelt, 1989).

The importance of inspection of sector policies was widely recognized in ESDP (1999), and two years later in the EU White Paper on European Governance (2001) which claims that territorial impacts of EU policies, such as transport, energy or environment, should be addressed. With the Third report on economic and social cohesion (2004), TIA got its formal framework as territorial cohesion was listed among the major development objectives of EU. Moreover, the proposal of the EU constitution equalizes territorial cohesion with economic and social targets, and with environmental protection. Article 3 of the draft says: ...shall

promote economic, social and territorial cohesion and solidarity among Member States (Faludi, 2004). With the legal and legitimate background the European Spatial Planning Observation Network (ESPON) tried to develop and practice the method in its previous programme period (2001-2006). They assessed different policy fields, one of which was also the energy sector.

As a result they showed beyond doubt that even if territorial impacts are not planned nor are the relations between the sectors clear, sector policies significantly influence the territorial cohesion in various ways. Firstly, through the share of budget and investments (subsidies in agriculture, for example, influence on the GDP, purchasing power and population distribution); secondly, with its own policy frameworks which influence the cooperation between public and individual actors when achieving the goals, and finally with the actual physical development, for example an infrastructure construction which results in a change of territorial characteristics. Consequently, the potential regional resources for development have been changed, so together with the primary ones, different types of territories are endowed with diverse combinations of resources and have various positions for contributing to the achievement of Lisbon and Gothenburg Agenda as well as to Cohesion Policy.

Moreover, the approach to the method varies as well as the impacts. Level of evaluation, methods and scheme of relations in between the policies all show there is no common agreement on how to proceed. A project, dealing with a certain parcel, and an intervention on the higher policy level such as action programme cannot be treated in the same way due to the content (Miklavcic, Weaver 2005). As already mentioned there are ex-ante and ex-post methods of TIA but none of them are regulatory binding. They can only be integrated into formal assessments within the governmental policy preparation process or produced independently as research projects. If included in the procedure, there is a higher chance that the sector policy proposal will be more directly and significantly influenced by spatial policy goals.

Apart from the importance of the level of recognition of the method, several others issues have to be covered during the method preparation. For example, whether we perform an ex-ante or ex-post method, which techniques are used for the estimations, which data is available, how are the causal relationships between the measure and the impacts defined and assessed, which territorial level is put into the focus. Mostly, qualitative methods are used, for example questionnaires, Delphi method, scientific panels, deduction, informed guess and approximations (Nijkamp, van Pelt, 1989), since it is very difficult to quantify impacts which are complex, complicated to measure, differ in significance and overlap with other impacts. If numeric models are preferred, usually macro economic models and models of equilibrium are used, such as GEM-E3, CGEEurope, SASI, STIMA (ESPON 2.1.1. 2004), and others. No matter what method we choose, we normally set up descriptive or numeric hypothesis in the beginning and define the major causal relationship in this order: measure-objective-the impact assessment. This presents the backbone of our model. Most of all, we have to be very careful that we do not end up with too detailed and too complex an analysis which can lead to a mess rather than solution. When we prepared our model we tried to take all the information listed above into account.

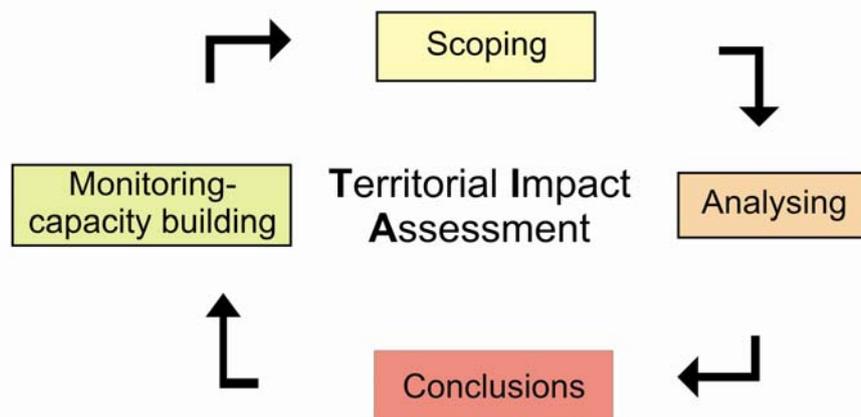
### **3 Conception of the model**

#### **3.1 Introduction**

At the beginning of a model description it is very important to stress that the subject of assessment are sector policies and the topic of assessment are impacts on territorial policies. Therefore it is not expected that the results will be given in a detailed description of impacts on spatial structures since this is not a spatial development project orientated TIA. We do not discuss whether the means applied in each case is the optimal means for reaching an energy policy target and what its alternatives are. We focus exclusively on

implementation of the national spatial planning policy set up under the jurisdiction of Spatial Planning Act (2003) with the help of the energy sector. Nevertheless, the general approach to the method stays the same as in the project orientated TIA, and consists of these four phases:

1. Scoping
2. Analysis
3. Conclusions
4. Monitoring of the results



**Figure 1: Four-level procedure of TIA (Miklavcic, Weaver 2005)**

The scope as a first step is important because the contextual and logistic framework is defined as a base for the model. If the policy and measures are not well described, causal relationships are badly predicted and the wrong spatial unit is chosen, the performance of the model can be very problematic. Once the typologies of measures and policies' objectives have been developed it is time to analyze the impacts. This is usually done by indicators relevant to the chosen territorial unit. Concretization of each impact is structured on the basis of the following presumptions which have been proofed in several projects:

- the impacts vary among regional characteristics
- intensity of measures' implementation is diverse in regions, some can even be left out in the realization period
- relevancy of the measurements of the impacts' evaluation is changeable

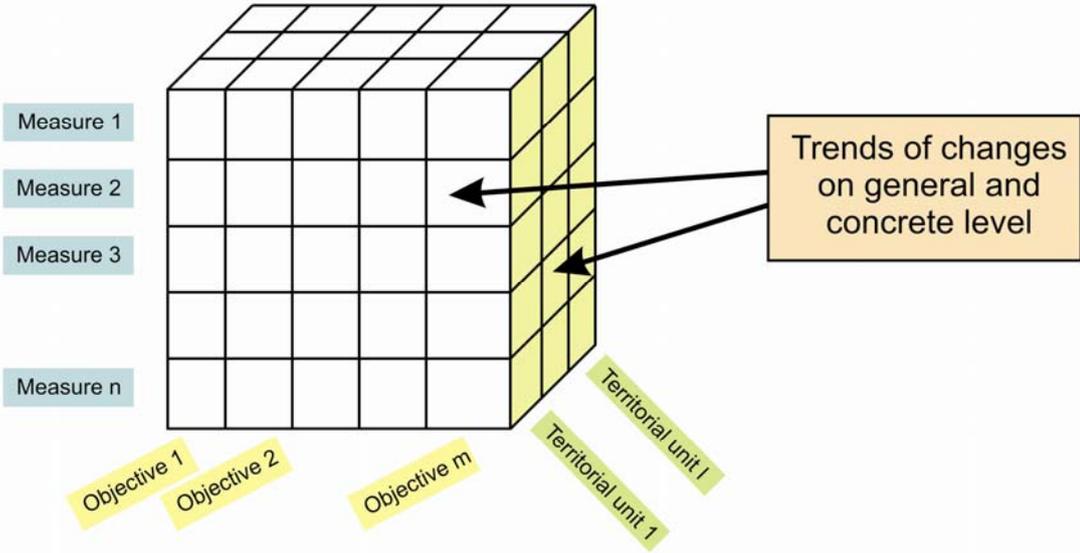
Beside the estimation of the regional indicator of sensibility (ESPON 3.2 2006) which can be used to alter the impact assessment in each territorial unit, a so-called Territorial Impact Message (TIM) is prepared as a result of the analysis. It summarizes weaknesses and strengths of policy results regarding their impact on the territory. On the basis of that, the recommendations for the policy makers are prepared. In the case of ex-post TIA the outputs are used for the improvement of the new version, in the case of ex-ante TIA they interfere with the preparation procedure. Normally, the outputs are relevant to different areas, so one TIA can effectively assist to improve policy coherence in different fields. The last or the first phase of the TIA is an on-going sound and careful monitoring which enables individual evaluation of measure during and after the implementation period and can significantly add to improved sector policy adopted later on.

As it is usual, model for territorial impact assessment is designed as a three-dimensional matrix whose axes are defined by: (1) measures of sectoral policy, (2) objectives of territorial cohesion and (3) parameters of the spatial context. The final value is a sum of all three parameters. Because present and future impacts are evaluated, so this is nor ex-ante nor ex-post but a mixture of both, we have to consider also the external factors such as general trends of changes. Especially the second and the third dimension are crucial for the whole analysis. Eventually, not every measure influences each and every cubical part. First phase

of the analysis is a general estimation applied to the abstract territory which identifies potential impacts with certain relevancy.

The first dimension derives from the EU long-term objective – territorial cohesion which is one of the major conditions for sustainable economic growth, social and economic cohesion to be implemented. It favours polycentric territorial development, better use of available resources, territorial integration of the areas, better living conditions and quality of life, and finally better opportunities. The main source of the development should be regional and local potentials. Regarding the chosen sector, the territorial cohesion related to the energy is explained in the Article 22 of Territorial Agenda:

- development of decentralized, efficient, safe and environmentally friendly production of energy from renewable resources, the potential of which is underused
- improvement of networks and coordination of condition of energy sector with the purpose of better use of regional potential which can create development opportunities especially in the countryside



**Figure 2:** Concept of TIA

Additionally, the simulation packet TEQUILA (Territorial Efficiency QUality Identity Layered Assessment), developed as a programme support and content concept of the analysis (Camagni 2004), was used to structure territorial objectives and to adapt the concept of sustainability on the territorial level. Three major components – efficiency, quality and identity are further described by partial targets. For example, Territorial Efficiency consists of following goals: resource efficiency with respect to energy, land and natural resources, competitiveness and attractiveness of the local territory and internal and external accessibility. The quality of the living and working environment, comparable living standards across territories and similar access to services of general interests and to knowledge are part of Territorial Quality.

The second dimension basis on the sector policy, in our case the energy sector which is described with its measures. The last dimension makes the method concrete since the values are evaluated in the real territorial dimension, in NUTS3 statistical regions.

### **3.2 Territorial policy as a framework**

In this phase of the scope we try to find a perfect and an exclusive list of objectives of which every objective covers one exact segment of territorial cohesion. It has to be kept in mind that objectives are defined on same hierarchy and should not cross with each other. The list should be universal, so it can be used further on with different sector policies. We need the list to address the question: What is the overall appreciation of policy impacts in relation to Cohesion aims, in particular to territorial cohesion?

On the EU level, territorial policy is not legally bounding since it has been set up only to provide guidelines for commonly managed national territories. On one side, contrary to the environmental directives the member countries do not need to oblige the rules, on the other, they need to contribute their space for joint or major EU spatial projects, such as the construction of Nabucco pipeline. If they develop their own national territorial conceptions or spatial development plans, hence it is recommended they integrate common EU guidelines for territorial development.

The first major EU policy document for the territory was European Spatial Development Perspectives. Recently, two important documents have been accepted which both derive from the Lisbon strategy. Adopted in 2005, Lisbon strategy would try to put more emphasis on research and innovation, to provide a more dynamic business environment, to invest in people and to make economy greener. More importantly, it also involves the cohesion policy. To define more specific goals, Territorial Agenda and Leipzig charter have been prepared. The first one promotes a polycentric territorial development of the EU with a view to making better use of available resources in European regions. It gives an important input to a culturally, socially, environmentally and economically sustainable Europe. Additionally, the document implies the term Territorial Cohesion as a permanent and cooperative process involving the various actors and stakeholders of territorial development on political, administrative and technical levels. The second one presents an agreement of EU members on establishment of common principles and strategies for urban development policy.

We took that into consideration when we were deciding about the framework for the model. The description of the territorial cohesion, done on the first axis, consists of territorial objectives. The term territorial cohesion originally derives from French word “aménagement du territoire”, a broader term than spatial planning which was introduced to EU by Michel Barnier (Faludi, 2004). Due to the fact that Community policies have spatial impacts they were looking for a term to compound both, economy and territory orientated policies. So by definition the goal of territorial cohesion incorporates the sustainability agenda and promotes greater coherence and coordination between regional policy and sector policies with a substantial territorial impact (Faludi, 2004).

Taking the European policy and the Spatial Planning Act into account, in 2004 Slovenian Ministry of the Environment and Spatial Planning adopted the Spatial Development Strategy of Slovenia (SDSS). It defines 12 major objectives of spatial development which pay regard to broader European context and are further more divided up into more detailed targets. The decision to obey just the 12 fundamental objectives could be considered superficial but it was decided so for these following reasons:

- The strategy is for the moment the major national legal policy document of spatial development
- It integrates all of the most important contents of European territorial policies such as Agenda Habitat, European Spatial Development Perspective, CEMAT Recommendations
- The level of division is thus harmonized with the level of sector policy's division which is also described on the national level
- The framework is a joint decision of all involved within the projects

Table 1: Slovenian spatial planning objectives and correlated TEQUILA – territorial cohesion targets

Objectives of Slovenian spatial development	TEQUILA cohesion elements
1. Rational and effective spatial development	Te: Economic performance Ti: Social capital; Multiethnic solidarity and integration Tq: Integrated and balanced territorial system
2. Polycentric development of the network of cities, towns and other settlements	Te: Efficient and polycentric urban system; Quality of transport services Tq: Sustainable transport: share of public transport and deduction of congestion on network
3. Increased competitiveness of Slovenian towns in Europe	Te: Competitiveness and attractiveness of the local territory; Strengthening of gateway cities
4. High-quality development and attractiveness of cities, towns and other settlements	Tq: Quality of life and working conditions: access to services of general interest; Quality of service Te: Accessibility to infrastructure Ti: Accessibility to telecommunication, service and to knowledge
5. Harmonious development of areas with common spatial development characteristics	Tq: Comparable quality of life in different territorial units Te: Inter-regional integration Ti: Development of productive expertness and strengths of individual territorial units
6. Complementary rural and urban area functions	Ti: Co-operation between city and countryside
7. Integration of infrastructure corridors with the European infrastructure systems	Te: none of the elements of Territorial Efficiency is suitable
8. Prudent use of natural resources	Te: Resource efficiency, competitiveness, attractiveness; Compact city form; reduction of sprawl Tq: Conservation of natural and water resources
9. Spatial development harmonized with spatial limitations	Te: Reduction of environmental risks
10. Cultural diversity as the foundation of the national spatial identity	Ti: Conservation and creative management of cultural resources Tq: Conservation and creative management of natural landscape
11. Nature conservation	Tq: Conservation of natural and water resources; Conservation and creative management of natural landscape
12. Environmental protection	Tq: Conservation of natural and water resources

Sources: *Strategy of Spatial Development of Slovenia 2004, TEQUILA 2005*

To clearly show the relation to the EU policies and to lessen the weaknesses of chosen list, some alternations have been done. For each of the objectives the proper TEQUILA cohesion element was searched for. Upon these elements characteristics of the territory are applied. The objective “Nature conservation” refers to the Tq element “Nature conservation and creative management of the natural landscape”, for example. This also enables comparison on the international level.

One of the major questions regarding the territorial cohesion concept was whether to perform a qualitative or quantitative analysis. With a weak knowledge about indirect relations between input/output result and impact it is more likely to explore such a complex system (lacking experience and theory) by qualitative indicators (Schindegger, Tatzberger, 2004). As some similar assessments have shown, it is possible to collect and use imprecise information also by means of a qualitative systems approach (Nijkamp, van Pelt, 1989). Nevertheless, since the objectives are not distinctly defined or quantified and no indicators have been fixed to monitor the policy operative indicators replace the objectives in the evaluation. The list of approximately 20 indicators was prepared by the project group. Firstly, a broader enlistment was available which was later cut down. The chosen indicators more or less cover the criteria for measuring goal achievement which were set up by ESPON, these are GDP per capita, employment, income, population change, etc (Schindegger, Tatzberger, 2004). Common questions that project group struggled with were the proper number of indicators; the type of indicators, complexity of indicators, but the major problem raised is availability of the data. It is no use except theory-wise to find an ideal list of indicators if there is no available data to be put into the model. This is not just a Slovenian or an undeveloped country problem (Nijkamp, van Pelt, 1989) but also EU-15 member states struggle with the lack of available data to proceed, for example Finland in the case of R&D data in impact assessment of R&D policy (Inkinen, 2005). The chosen indicators can be simple and based only on one data, the population number, for example, or complex which sum up different data. Like in some other evaluations (Nijkamp, van Pelt, 1989) impacts are assessed over a 4 year period so the chosen period is not so irrelevant though it is a very short time for the assessment of such complex policy.

### **3.3 Energy as a chosen sector**

The chosen sector policy is presented on the second axis. Obeying the EU and its priorities we have chosen energy sector which is described with its measures. It is also one of the oldest common policies of the European Union with its foundation in 1952. Due to the numerous problems such as energy dependence, limited stock, increasing use and prices, environmental problems and nuclear waste there has been an agreement that difficulties and challenges of the sector should be tackled together with other sectors or even through their policies. Energy strategic targets should be included also in broader political goals, the functionality and stability of common energy market should be improved, the export of gas and oil decreased. Regarding the territory, also sustainable development will be encouraged. Six complex objectives have been set up together with the measures and programmes for their implementation. These are competitiveness and the internal energy market, diversification of the energy mix, solidarity, sustainable development, innovation and technology, and external policy. Furthermore, the goals were concretized, for example, gas emissions should be decreased by at least 20% by 2020.

Slovenian energy policy was adapted to EU policy in 1999 with the new Energy Act. On its basis the Resolution of National Energy Programme was prepared in 2004. It has three major aims: to provide a reliable supply, to create a competitive market and to preserve the environment. It serves as a foundation of measures' overview which is a part of the model. Speaking of sector problems, they also mention the troubles caused by intersections with the territorial policy sector. Due to the extreme rules for nature conservation (re)construction of production units is rendered more difficult, the market has not been liberalized enough so far, the national development priorities are neglected on the local level, the instrument of expropriation is mostly not used, and there is a possibility of construction of EU infrastructure corridors. Every field of policy has more detailed objectives and envisages exact measures for their implementation.

As shown above, we can see strong links between the energy sector and spatial planning. One of the articles claims that energy as a theme in spatial planning, especially on the regional scale is still in a premature phase. A few European areas where they performed the projects to gain the energy supply self-sufficiency, for example on the Danish island of

Samsø. (Kartkarel, van Loon, de Roo, 2007). To integrate energy policy into a planning concept would be sensible because we have to tackle the climate change, exploitation of fuels is based on permission granted through spatial planning process, and energy efficiency is poor, especially on the regional level we are interested in.

In Energy more than in any other sector, it is difficult to draw a line between the TIA of projects and TIA of policies since some major construction projects of energy infrastructure are also part of the national policy. Therefore it is very difficult to find a balance in between and choose the right measures for the final list. When we deliberate direct interventions onto a certain location, the strategy level of policy is exceeded and we start to think about location-based analysis which are closer to environmental impact assessment and some alternative locations. Mainly, this is not our concern since we focus on one policy/programme being executed. We try to find out how it (in)directly influences a whole spatial system by several interventions in the total area, for example subsidising. (Schindegger, Tatzberger, 2004).

Choosing the measures for evaluation is part of the first phase of TIA and is needed to create a causal relationship with territorial objectives. The major question is, "how a specific measure influences the implementation of specific territorial objective". In other words, what territorial impact does a singular measure cause? To illustrate that with a project example, biomass plantations can positively and negatively influence the territory. They contribute to the improvement of the soil and water quality, and can be used for recreation purposes; on the other hand, they might also increase the pressure on productive land and might cause a substantial increase of food prices (Ignaciuk, 2007). To be able to soundly judge an individual measure, every measure is properly described. Description of every measure consists of 13 elements: name, label, description, targets, target group, level of implementation, sources for implementation, schedule, territorial frame, impacts assessment, remarks, date of inscription and sources for it. Similarly to the territorial objectives, also the question of number and relevance of the measure to be included has been raised. Full descriptions of the measures are not part of the national programme so several other documents had to be checked through. Those were different action programmes, e.g. National programme for energy efficiency for the period 2008-2016, operative programmes, indicative development plans, regulative documents etc. Altogether, 69 measures were fully described. Since such a large number is difficult to control within the model, their number was cut down. After the second selection, 22 remained, majority of which contextually refers to environment protection. This artificially implies that the environment has the closest relation to the territory in comparison with most regulation rules for provision and market of the energy.

The measure was left out in the selection procedures if it clearly had no territorial impact, if it had no direct influence or had a mild indirect one. Since collateral impacts should not be left out, the measures with similar but miniature impact are jointed together within the group of measures. These five groups are added to the list of measures, so altogether 27 will be evaluated. In the model one group equals a measure but within the computer tool also individual measures are described so that evaluation can be done properly and evaluators can inform themselves. Doing the analysis, it has been found out that measures can be classified into different types. This was also done in one of the Norwegian researches (Johansen, 2007) where measures were classified as financial means (subsidies), rules and regulations, and localisation of public activities and public purchase from the private sector. In our case, firstly, there is a division regarding the territory, secondly the sector coverage, thirdly the time scope and finally the field of energy. Location measures are the ones which presume the construction of productive unit which needs its own parcel and actually covers the surface, the soft ones are not territory-related and more in concern with awareness, prices, education or energy market. The time scale is also very important. If we do an ex-post impact analysis, it is only possible to consider the measures that have already been implemented. If we choose ex-ante also the future ones are accepted. In this case, different policy options can be tested through the model.

A number of questions were raised during the preparation of the measures. Beside the impacts on the policy there are also ones caused on the micro level due to the construction of production buildings. These impacts are usually analysed in the preparation process of the document in the detailed environmental impact analysis and are not subject of TIA. We are also concerned about how much the territorial issues are included into external costs because this also represents a connection between the sectors.

### **3.4 Regions as territorial units**

As seen in many examples (Inkinen, 2005) the geographical facts affect the implementation of sector policies significantly. Therefore it is needed to put the relation between the spatial planning and the energy also into real time and space. Regarding this matter we ask ourselves:

- Will a policy have positive impacts on the access to particular regions? Will it have substantial effects on the use of land? Are other territorial phenomena affected by the policy, and how?
- What will the impact on the structure and organisation of the territory be? To which degree will it support more polycentric structures at different scales?

The choice of the territorial region should vary upon the extent of the measure and should be chosen separately for each pair of the measure and objective taken into account the characteristics of the measures, accessibility of the data and possibilities of modelling influences. Nevertheless, in our case we decided only for one level of the territorial units – statistical regions which suit EU NUTS3 level. This decision was made due to the fact that the national level in case of Slovenia would not show any significant differences and no comparison would be possible between the units, so regions are the next level. Also other European cases have shown that a more detailed regional approach is needed than the NUTS2 level used by ESPON. Even the NUTS3 can still be looked upon as generalizing (Inkinen, 2005). The only pro for the national level was availability of data, especially for the energy which is much better than for the regional level. Since the spatial objectives are replaced by numeric indicators it is expected that some of them simply will not be covered sufficiently.

According to the possible flexibility of the spatial units in relation to the measures the regions will not be described in detail nor will their state of art and development trends be presented. This will be left to every evaluator in a way that he or she esteems elements which are relevant and suitable for the chosen combination of measure-objective-unit. If we wanted to do it correctly, we should imagine ourselves the situation in the region with and without the intervention. However, Territorial Agenda complemented with Leipzig Charter recommends this basic list of relevant areas of the present situation and trends:

- Regional differences of impacts of climate changes
- Increase of energy prices, energy inefficiency and different territorial options for new possibilities of energy production
- Inclusion of the regions into global economy, increased interdependency of the regions
- Excessive exploitation of environmental and cultural resources and the loss of biodiversity, especially because of unplanned development in the centres on one hand and a decrease of the population of remote areas on the other
- Spatial consequences of demographic changes, especially because of elderly population, commuting to and from work which all together strongly impact the availability of public service, dynamics of property market, development of the settlements' structure and the way of life in the cities
- Dissimilarities in understanding of energy policy
- Contrasts in transport flows and modality in the case of the region cooperation, energy policy and the environmental pollution

What is also worth bringing forward in the regional context is the role that the energy sector has played in the recent development of some Slovenian regions. That is to say, the economic development of some regions strongly relies on one or more production units such as nuclear power plant or thermal power plant. In advance, we can predict that the measures of the energy sector will in such regions play a huge role in the implementation of the sustainability.

### **3.5 Analysis procedure and evaluation**

Analysis consists of three steps:

1. Identification of possible influences
2. Impact assessment in spatial units
3. Synthesis of evaluated values

The first step is the general estimation – identification of the potential impacts which is carried out in the two dimensional matrix with the values (yes/no). The purpose of this phase is to find the mechanism of connections in between the measures of sector policy and objectives of territorial cohesion. The important result is simplification of the matrix complexity because further on, only the impacts with certain territorial impacts are included. The basis of the evaluation is a firm model of causal relations.

The second phase brings the theoretical level down to the practical. Therefore general presumptions of the impacts are made, current situation and the trends are described for every unit, and procedure of measures' implementation is defined in every unit. In this step the third dimension also becomes valid – the parameters of spatial unit. Even though the evaluation of every measure is individual, it is important that the role of the measure is clear in the whole strategy together with the differences based on various intensities of the measure implementation. One way of having clear evidence about the measure's impact would be to produce a status quo situation – a state without any sector interference – what we think the world would look like without the policy measure in position (Johansen, 2007).

Impacts are described with the change of indicators or other relevant data. The final mark of the impact is taken from the qualitative/quantitative interval scale which will enable comparison. The values used are -2, -1, 0, +1, +2; for example, -2 means a relatively large negative impact. This is not a new scale since it has already been used, for example in case of impact assessment in developed countries, performed by Nijkamp and van Pelt, (1989). Because of the numerous data input, the computer tool has been prepared which will enable preparation and evaluation of the measures in territorial units. This is an online application so it is possible to insert the marks in time and also aggregate them according to certain rules. In such a way, the model becomes simpler and coordination easier. The analysis of the impacts in territorial units will be done mainly by the method of meta-analysis and expert knowledge. Later on, if there is a need it is also possible to enter and assess alternative strategies.

Thirdly, the synthesis of the results presents feedback for the policy creators and formation of recommendations. When the energy policy is designed, two major questions are considered: the first one in the case of one single measure - whether the measure is so important for the energy that even the larger territorial impact is allowed, and the second one on the level of the whole policy – whether the group effect of the policy will cause the situation to improve or worsen. To answer the first question, we need to take a look at the role of the measure in the whole structure of the chosen energy strategy and the alternatives. Practical cases for this are different projects for the use of renewable resources, for example wind power plants. From the structure of the measures we can define the share of a certain project in the objectives of energy policy and the possibility of its replacement with alternative projects, for example what would be the benefits and costs of replacing the planned wind power plants with thermo power plant. For the second one, we need the summary criterion. This question also implicates the possibility of lessening the effect of pressures in one area and enlarging it

in another one. For example, the construction of a new distribution network for electricity is allowed if in several other areas older ones are replaced by the terrestrial, placed underground.

In aggregation we have to appreciate the fact that spatial planning policy is a good example of the complex governmental policies which try to connect and efficiently satisfy the incompatible economic, social, spatial and other needs of society. Since there is a content typology of energy sector measures, we cannot just sum up all evaluated impacts since we soon come across two aspects of incommensurability. One is the scale in which we differ macro level of common activity framework, mezzo level is a sphere of collective intermediation and micro level is the actual implementation. The second aspect is the goal of the policy, in territorial cohesion there are economic, social and physical goals. Regarding the TEQUILA model, we get the three elements of territorial cohesion as an overlap of economic system, socio-cultural system and physical system.

We also have to answer the question whether to summarize the partial values or not. If we abolish that idea we cannot offer any clear and sound results to the decision makers. On the contrary, if we stick with the idea of summed results we come across with Arrow's impossibility theorem which says it is impossible to optimally aggregate the micro level data to the macro level without the loss of reliability and soundness.

The basis for the final synthesis is a LEM (Leopold-Ekins-Medhurst) matrix developed by Ekins and Medhurst for the assessment of the EU structural funds impacts and further on used by Radej in evaluation of one Slovenian regional development programme for the 2001-2006 period. It is an input/output matrix which confronts four regional capitals – potentials for development; these are economic, human, social and natural capital. By evaluation and filling in the table we find out for example, how economic measures and projects in the region impact the society development objectives. The content principle is similar to TIA, so we decided to adapt the matrix and use it in our case. The indicators we have chosen for the quantification of the territorial objectives are distributed to three capitals and also to territorial cohesion elements: identity, efficiency and quality. The Leonty matrix of TEQUILA territorial elements will have in the columns and rows systems of TEQUILA (socio-cultural, economic and physical system). In the cells we put the measures of the energy sector with the relevance to individual element, for example the socio-cultural system. With combining the cells we get the evaluation of individual TEQUILA element. For example, territorial quality is a result of crossing energy measures with the physical impacts in the territory with the socio-cultural characteristics of the territory and the socio-cultural measures of the policy with the physical characteristics of the territory. The evaluation of the level of territorial cohesion reached with the help of energy policy is done descriptively (Radej, 2008), and the results are explained by expert knowledge method of the project group.

#### **4 Results and conclusion**

The project is still in progress and the model has not been performed so far. Therefore, in February 2008 there were no exact outputs of the model to be presented. Some questions, especially about the nature of the causal relations, which are another big challenge in assessing territorial impacts of any policy, and the aggregation of the final results, still need to be discussed though they have been briefly described in the paper.

For now the TIA method has been shown as a complex approach to connect two sectors that in the territory strongly correlate which is not the case in the policy preparation process. Sector policies are hindered by administrative frictions, single disciplinary approaches, and lack of information, political discrepancies, and a shortage of trained government employees (Nijkamp, van Pelt, 1989). To evaluate the actual relationship between two sectors, we want to answer the question: *Which and how certain territorial development objectives have been reached in individual regions through the implementation of energy sector measures?* The context is not just spatial but of regional development, therefore the term territorial cohesion

is used as a main policy goal. It upgrades spatial planning with economic policy since it is connected to public action concerning the disposition in space of people, activities and physical structures based on a balanced notion reflecting the geographical and human situation in the area under consideration (Dupuy 2000 in Faludi, 2004). In such a way it is easier to judge to what extent the national energy policy together influences regional development (Johansen, 2007) and also to see how much regional characteristics are relevant to implementation of a single measure.

As in other similar projects (Johansen, 2007), we discussed qualitative as well as quantitative methods for calculating impacts, as well as different indicators, and have come up with a mixture of both. The lack of needed and suitable data and tangled relations between the components of the territorial cohesion make development and the implementation of the model complicated.

However, during the formation of the model and collection of the data we have realised that even the procedure of the preparation is partly an evaluation process since you need to think at the same time about possible relations, energy measures and the regions in real time and space. Even by that, some dependent links are explored which further on helps with the assessment. We can connect that Radaelli and Dente (1996 in Dabinett, Richardson, 1999) thought that evaluation can be described as a process of transformation of ideas and knowledge and the transmission of knowledge into the policy process. Not just spatial planners but also the energy sector presenters find out how the sector can be more efficient by not only reaching its goals but also obeying the targets of the territorial policy. For the moment we cannot directly answer the introductory question about the exact benefits of the territorial development from the energy sector but more or less every measure, even if it is just fiscal, finally influences the way in which our territory is shaped. For example, increasing energy prices and the emergence of a new energy paradigm have significant territorial impacts, some regions being more affected than others. Besides, some of the regions have a huge potential for production of energy which can present an important development speed-up factor. In such a case, the energy can significantly add to a better territorial coherency. Of course, the impacts can also be negative and non-desirable (Johansen, 2007).

Unfortunately, TIA is not all about the good. Planning and analysis are technical and disciplined by objective methods but they also learn and come to gear that planning and analysis are political and subject to outrageous manipulations (Throgmorton, 1993 in Dabinett, Richardson, 1999). The results of impact assessments are usually used strategically, for justification or in favour of different opinions, or symbolically as replacement of the decision-making procedure. It can happen that major contents of the policy have already been decided before parliament procedure and (public) consultations which makes the method useless and a complete waste of resources. Also in energy sector strong interest groups usually choose other ways of pressure rather than formal assessments. If the assessment is made by the same people who also prepare the legal document, the purpose of tool normally deteriorates. It is used as a tool of persuasion and only the arguments pro are presented. Limited efficiency of the method is also the result of late inclusion into process. Indeed we can claim this happens, especially in the environmental impact assessment or in some cost benefit analysis tailored in advance by initiators and clients. Nevertheless, since no territorial impact assessment has ever been performed on the national policy level we still believe such an assessment is needed and wanted. Also some informal evaluations and alternative probations have shown some positive effects.

Finally, we cannot fail to notice that TIA puts a huge effort into joint development planning and especially the policy preparation procedures. In recent years numerous recommendations on the EU level have suggested that a huge saving in the terms of financial and human resources can be achieved if the sectors obey the targets that interact with the policies. Not to mention that the goals of territorial cohesion can be faster and easily achieved without the territory being improperly developed. By that, the main purpose of the Spatial Planning Act for which it was adopted is reached. That is *“to provide the sustainable spatial development with the harmonisation of development needs with security requirements*

*in space by achieving the rational use of space for individual activities, taking into account the existing quality of the natural, constructed and other constituents of space and identity of the landscape”.*

## 5 References

*Action Plan for Energy Efficiency: Realising the potential – Saving 20 % by 2020* (2006) URL: [http://ec.europa.eu/energy/action\\_plan\\_energy\\_efficiency/index\\_en.htm](http://ec.europa.eu/energy/action_plan_energy_efficiency/index_en.htm) (citirano: October 2007)

*An energy policy for Europe: Commission steps up to the energy challenges of the 21st century. MEMO/07/7* (2007) URL: [http://ec.europa.eu/energy/energy\\_policy/documents\\_en.htm](http://ec.europa.eu/energy/energy_policy/documents_en.htm) (citirano: October 2007)

*A new partnership for Cohesion; Third report on economic and social cohesion, European Commission* (2004) URL: [ec.europa.eu/regional\\_policy/sources/docoffic/official/reports/cohesion3/cohesion3\\_en.htm](http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/cohesion3/cohesion3_en.htm) (citation: October 2008)

*Annexes to impact assessment guidelines* (2005) European Commission

*A practical guide to program and policy evaluation* (1999) Paris: French council for evaluation Scientific and national councils for evaluation.

*Better Regulation: Making Good Use of Regulatory Impact Assessments* (2002), London: National Audit Office.

CAMAGNI, R. (2005) *TEQUILA SIP, Interactive Simulation Package for Territorial Impact Assessment*, Espoo: General ESPON meeting.

*Commission staff working paper: Impact Assessment: Next steps, SEC(2004)1377* (2004)

*Communication from the commission. An energy policy for Europe, COM (2007)1* (2007) URL: [http://ec.europa.eu/energy/energy\\_policy/documents\\_en.htm](http://ec.europa.eu/energy/energy_policy/documents_en.htm) (citation: October 2007)

*Communication from the commission on impact assessment, COM (2002) 276 final* (2002) URL: [trade.ec.europa.eu/doclib/docs/2005/february/tradoc\\_121479.pdf](http://trade.ec.europa.eu/doclib/docs/2005/february/tradoc_121479.pdf) (citation: October 2007)

*Communication from the commission to the council and the European parliament: Better regulation for growth and jobs in the European union, COM (2005) 97 final* (2005)

DABINET, G., RICHARDSON, T. (1999) The European Spatial Approach: The Role of Power and Knowledge in Strategic Planning and Policy Evaluation, *Evaluation*, 5:2, p. 220-236

DALAL-CLAYTON B., SADLER B. (2004) *Sustainability appraisal: A Review of International Experience and Practice (draft)*, London: International Institute for Environment and Development.

DALAL-CLAYTON B., SADLER B. (2004) *Strategic environmental assessment: A sourcebook and reference guide to international experience*, London: International Institute for Environment and Development.

*Direktiva o presojah vplivov na okolje Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, Directive 85/337/EEC* (1985) URL: <http://ec.europa.eu/environment/eia/full-legal-text/85337.htm> (citation: January 2008)

*Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, Directive 2001/42/EC (2001) URL:*

[www.environ.ie/en/Publications/Environment/Miscellaneous/FileDownload,1805,en.pdf](http://www.environ.ie/en/Publications/Environment/Miscellaneous/FileDownload,1805,en.pdf)  
(citation: January 2008)

*Energy Act (1999) Ur. I. RS št. 79/99 in 8/00. URL:*

[zakonodaja.gov.si/rpsi/r00/predpis\\_ZAKO1550.html](http://zakonodaja.gov.si/rpsi/r00/predpis_ZAKO1550.html) (citation: October 2007)

*Environmental Protection Act (2005) URL:*

[zakonodaja.gov.si/rpsi/r05/predpis\\_ZAKO1545.html](http://zakonodaja.gov.si/rpsi/r05/predpis_ZAKO1545.html) (citation: October 2007)

*ESPON 2005, In search of territorial potentials, Mid-term results by spring 2005 (2005)*

*ESPON project 2.1.1: Territorial Impact of EU Transport and TEN Policies (2004)*

*ESPON project 2.1.4: Territorial trends of energy services and networks and territorial impact of EU energy policy, CEETA – Research Centre for Energy, Transport and Environment Economics (2005)*

*ESPON project 2.1.5: Territorial Impact of European Fisheries Policy (2006)*

*ESPON project 2.3.1: Application and effects of the ESDP in the Member states (2006)*

*ESPON project 3.1: Integrated tools for European spatial development, Final report (2004)*  
*Bonn: Bundesamt für Bauwesen und Raumordnung.*

*ESPON project 3.2: Spatial Scenarios and Orientations in relation to the ESDP and Cohesion Policy, ESPON (2006)*

*European Spatial Development Perspective – Towards Balanced and Sustainable Development of the Territory of the EU, European Commission (1999)*

FALUDI, A. (2004) Territorial Cohesion: Old (French) Wine in New Bottles? *Urban Studies*, 41:7, p. 1349-1365.

GOLOBIČ M., ZAKRAJŠEK F. (2007) *Challenges of regulating integrated impact assessment: the case of Slovenia*, in: George C., Kirkpatrick C. (ed.): *Impact assessment and sustainable development: European practice and experience*, Cheltenham: Edward Elgar Publishing.

*Good Practice: Regulatory Impact Assessments – Introduction to RIAs (2007)*

[http://www.nao.org.uk/ria/ria\\_introduction.htm](http://www.nao.org.uk/ria/ria_introduction.htm)

*Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy, SEC(2006) 317 (2006) URL: [http://ec.europa.eu/energy/green-paper-energy/index\\_en.htm](http://ec.europa.eu/energy/green-paper-energy/index_en.htm)*  
(citation: October 2007)

*Handbook on SEA for Cohesion Policy 2007-2013, Greening Regional Development Programmes Network, Interreg IIIC (2006)*

HERTIN ET AL. (2007) *The practice of policy assessment in Europe, MATISSE Working papers 6*, URL: <http://www.matisse-project.net> (citation: October 2007)

*Impact assessment guidelines, European commission SEC(2005) 791 (2005)*

IGNACIUK, A. M. (2007) *Positive Spillovers of Energy Policies on Natural Areas in Poland: an AGE Analysis*, in: Heijman, W. (ed.): *Regional Externalities*, Berlin Heidelberg: Springer

INKINEN, T. (2005) *European coherence and regional policy? A Finnish perspective on the observed and reported territorial impacts of EU research and development policies*, *European Planning Studies*, 13:7, p. 1113-1121

- JOHANSEN, S. (2007) *Macro policies and Regional Impacts in Norway*, in: Heijman, W. (ed.): *Regional Externalities*, Berlin Heidelberg: Springer
- KARSTKAREL, N., VAN LOON, J. P., DE ROO, G. (2007) *Towards a future energy system related to regional planning in The Netherlands: Analysing energy projects in Europe*, conference paper, Naples: AESOP 2007 Annual Congress, 8 p.
- KONTIĆ B. ET AL. (2000) *Trajnostno regionalno razvojno načrtovanje*, in: Zbornik rezultatov projekta Preliminarna strateška presoja vplivov na okolje za Predhodni državni razvojni program 2000-2002, Metodološka priporočila za izdelavo SPVO razvojnih programov, planov, politik, Normativne in metodološke podlage za izvedbo strateških okoljskih presoj v Sloveniji, Ljubljana: REC.
- KONTIĆ, B., MARUŠIČ, J., OGRIN, D., GOLOBIČ, M., URŠEJ, Š., JANKOVIČ, L., HUDOKLIN, J., SIMIČ, S., KONTIĆ, D., RAKOVEC, J., POLIČ, M., KOS, D. / (2005) *Celovito presojanje vplivov na okolje : rezultati CRP Konkurenčnost Slovenije 2001-2006 : študija ranljivosti prostora in celovita presoja vplivov na okolje za hitro železnico v Sloveniji in Regionalni razvojni program statistične regije Goriška 2002-2006*. Ljubljana: Institut Jožef Stefan
- Leipzig Charter on Sustainable Cities* (2007) URL: [www.eu2007.de/en/News/download\\_docs/Mai/0524-AN/075DokumentLeipzigCharta.pdf](http://www.eu2007.de/en/News/download_docs/Mai/0524-AN/075DokumentLeipzigCharta.pdf) (citation: January 2008)
- Lisbon strategy* (2005) URL: [http://ec.europa.eu/growthandjobs/index\\_en.htm](http://ec.europa.eu/growthandjobs/index_en.htm) (citation: Januar 2008)
- Managing the territorial dimension of EU policies after enlargement; Expert document, EU working group on Spatial and Urban Development – SUD* (2003)
- MIKLAVČIČ, T., WEAVER, A. (2005) *About IA, SEA and TIA, Draft*, Luxembourg: ESPON CU.
- NIJKAMP, P., VAN PELT, M. (1989) *Spatial Impact Analysis in Developing Countries: Method and Application*, *International Regional Science Review*, 12:2, p. 211-228
- Prostorski vplivi sektorskih politik: Pričakovane spremembe prostora in napoved posledične preobrazbe mestnega in podeželskega prostora z modelom za podporo odločanju, Končno poročilo, Ciljni raziskovalni program »Konkurenčnost Slovenije 2001-2006«*, (2005) Ljubljana: Urbanistični inštitut RS
- RADEJ, B. (2008) *Vaje v seštevanju. Sinteza vplivov nacionalnega programa energetike na teritorialno kohezijo Slovenije : not published*, Ljubljana: [B. Radej]
- Resolution of National Energy Programme* (2004) Ur.l. RS, št. 57/2004. URL: [http://zakonodaja.gov.si/rpsi/r05/predpis\\_NACP45.html](http://zakonodaja.gov.si/rpsi/r05/predpis_NACP45.html) (citation: October 2007)
- SCHINDEGGER, F., TATZBERGER, G. (2004) *Territorial impact assessment (TIA) A certain tool or a whole kind of tools (contribution for first Interim Report of ESPON 3.1)*, Vienna, Austrian Institute for Regional Studies and Spatial Planning (ÖIR)
- Spatial Development Strategy of Slovenia* (2004) URL: [http://www.mop.gov.si/en/legislation/spatial\\_planning/](http://www.mop.gov.si/en/legislation/spatial_planning/) (citation: January 2008)
- Territorial Agenda of the EU* (2007) URL: <http://www.bmvbs.de/en/Spatial-development/-,2950/Territorial-Agenda-of-the-EU.htm> (citation: January 2008)
- White paper on European governance, COM(2001) 428 final* (2001)