1. Objectives of SMILE[i]

SMILE project responds to the EU seventh framework programme, theme 8 "Socioeconomic Sciences and Humanities" (SSH). The SMILE project analyses the trade-offs and synergies that exist between the different objectives related to sustainable development by utilising the different indicators developed within the European Sustainable Development Indicator (SDI) Working Group as well as new types of indicators provided by the tools developed by the consortium partners in previous projects. The assessment takes place (i) between economic and environmental aspects, (ii) between economic and social aspect, (iii) between social and environmental aspects, and (iv) between all three objectives. The assessment takes place through several case studies, Romania being one of them.

2. The Romanian Case Study[ii]

Exploring the Romanian Economy and its energetic performance is a special case of concern, not only because it is a new EU member state, with different (mostly lower) metabolic profiles when compared to other European member states; but also because there are many hidden and underlying causes for this difference. The peculiar history of the country, with the quick transition of the social (i.e. mass emigration), political and mostly economic system needs to be explored and linked to a complex set of criteria of performance to be analyzed. To this respect, when discussing the application of the toolkit to the Romanian case study it was decided to go for a very "in depth" analysis of structural changes of its economy, based on the MuSIASEM methodology, for its ability to link the two issues of technical changes taking place in the Romanian informal economy and the consequences (difficult to study in quantitative terms) of massive migration.

2.1. Multi-Scale analysis of Energy Intensity (MuSIASEM)

This study provides a comparison of energy intensity across different economic compartments (a MuSIASEM analysis) for Romania, Bulgaria, Poland, and Hungary over a ten year period: 1995 - 2004. The advantage of such a study is that it presents an analysis of

a cluster of countries expressing a performance similar in relation to the values of the benchmarks typical of the MuSIASEM analysis (when compared with that of the EU-15). The study highlights how energy intensity calculated at the level of the whole economy is a misleading indicator when used to design policies aimed at increasing energy efficiency. In fact, it does not provide any useful information about the changes in the pattern of consumption taking place within the socioeconomic system. The analysis of historic series of energy data suggests that structural changes and reforms have generated a much larger impact (dramatic changes) in the final energy consumption in Romania and Poland than in Bulgaria (mild variations) and Hungary (a smooth and continuous transition). Hungary and Poland had similar energy intensities between 1995 and 1997, then, they diverged from one another. Romania and Bulgaria (even if at different levels) had a similar trend – an increase followed by a decrease in energy intensity. Specifically, the Romanian Industrial Energy consumption data has shown a drastic drop in energy consumption rate between the years of 1990 and 1992 (just after the revolution period).

2.2. Romanian Socioeconomic Metabolism in Industry and Transportation Sectors (MuSIASEM at level n - 4)

This study, investigates in more detail the structural changes in Romanian economy; it opens the black box to look into the performance of the sub-sectors that make up the former hierarchical category of Productive Sectors (that pertain to level n–2). In this way, the analysis considers the changes in the economic sub-sectors down to levels n-3 and n-4. The benefit of conducting such a study is that it gives an opportunity to perform a cross check of how/if the data fit when: (i) working from below (using national statistics, starting from individual subsectors); (ii) working from above (using EU/Eurostat) Statistics already aggregated. It gives the opportunity to cross check and validate the data congruence over the different hierarchical levels of analysis. This double check is extremely important in periods of fast transition, in which an informal economy and new phenomena escape the ability of statistical office to provide a reliable quantitative representation of changes. At the level n-3 – we find: (i) the sub sectors define within the Productive Sectors (PS) [level n-2], which are Mining and Energy (ME) and Building and Manufacturing (BM); and (ii) the sub-sectors defined within the Service and Government (SG) [level n-2], which includes Transport (TR), Public Administration (PA) and other sectors (OS).

Energy and Mining (passing from level n- 3 to level n- 4) has been disaggregated in six industries.

Building and Manufacturing (passing from level n-3 to level n-4)

A first significant difference between the Manufacturing subsector and Building industry is related to their large difference in the pace of energy metabolism. The manufacturing subsector is 4 -5 times more intensive in energy throughput than the building sector. Further splitting these two subsectors, following the standard disaggregation of the statistics, we obtain that the manufacturing sector has twenty one industries, which can be aggregated into three groups. By adopting this approach the resulting information can be compared not only with the other sectors of Romania (to study how structural changes affect the overall energy intensity of the economy), but also with the homologous sectors (metallurgy and pulp and paper industry) operating in other EU countries. By doing a comparison in this way (by comparing "apples" with "apples" and "oranges" with "oranges"), it becomes possible to better investigate the reasons of the differences between Romania and the other countries.

Transport sector (passing from level n- 3 to level n- 4): Opening up the black box of the transportation sector, it is seen that it is highly dominated by the air transport sub category, that reveals an energy throughput of 1000 MJ/hr (4x that of terrestrial transportation). The air navigation sees a high increase in its energy throughput after the year 2004, which

corresponds to the first profitable year over the last decade of the operation of the national TAROM Company.

2.3. *Estimating Hidden Economy and Hidden Migration: The Case of Romania*

Quantifying the size of the informal economy in Romania (that has long been running in parallel to the formal/official economy) represents a clear challenge. Furthermore, with the extending migration phenomenon, there is an increasing preoccupation to estimate its invisible part to be added to the domestic hidden economy. The correlation between the official registered average income per capita in households and the income obtained by their participation in informal activities has been used to estimate the size of the informal economy in the last years (empirically demonstrated by previous works of Albu, 2004[iii]). One of the most significant determinants of the participation in informal activities is the average income per person in household obtained in formal sector. An underlying reason for participation in the informal economy could be linked to the attempt to avoid in a certain proportion the taxes associated with the participation in the formal economy. In this analysis the share of hidden (informal) income in the total average income per person in household is then extrapolated to the entire set of households to study the period between 2000–2007. Even more difficult is the assessment of emigration. From official statistics, we can see a strange situation during the 1997-2007 period: despite of a significant decrease (12.7%) of the total adult population [included in the age class 15-64 years], the number of inactive persons in the same group of population registered an impressive growth (+24.3%).

3. Sustainable development from a societal and policy perspective[iv]

In this project, the interface between scientific achievements in sustainability analysis and the various stakeholders, is represented by the Pentagon Model (PM). This model has demonstrated its operational validity in various European policy studies (e.g., transportation, energy, environment, land use etc.). Detailed interviews administered in each case-study area provided the data. Even if on a small scale, the Pentagon Model applied to Romania, a country experiencing a transition process, indicates that there is no precise 'the most important' factor, all three ecologic, social and physical systems are considered important.

4. The expected results and their potential impact and use[v]

The assessment of the inter-linkages of the different dimensions would be considered for policy recommendations on improvement of sustainability conditions at various geographical scales. The approach of the project is future oriented, including construction of different scenarios of future development paths relating to the synergies and trade-offs. The future aspect will provide knowledge relevant for economic, social and environmental policies and their combination in the longer term. In addition, SMILE enables interfacing the scientific results with societal/policy processes (stakeholder participation, sustainable consumption and production patterns). Assessment of these will enable policy recommendations for further development.

References

[i] http://www.smile-fp7.eu/?id=objectives

[ii] Deliverable 20, WP3, 'Final Report of the Case Studies' Project no.217213, SMILE, Socioeconomic Sciences and Humanities (SSH) Collaborative Project FP7-SSH-2007-1

[iii] Albu, L.L. (2004): Estimating the Size of Underground Economy in Romania, Tax Evasion, Underground Economy and Fiscal Policies in Candidate Countries (Case of Romania), GDN Project, Prague, June.

[iv] Deliverable 19, WP5, 'Stakeholder-based PENTAGON models' Project no.217213, SMILE, Socioeconomic Sciences and Humanities (SSH) Collaborative Project FP7-SSH-2007-1