

BioProm – BioEnergy Promotion



EIE/04/100/S07.38585

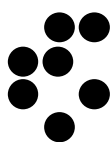
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Report on integrated socio-economic factors

Work Package 6

Executing Region: Slovenia



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Socio-economic factors

1 Introduction and description of socio-economic factors

The objective of the analysis is to evaluation of the characteristics of socio-economic factors including barriers, best practice solutions to overcome these barriers and remaining limitations for the use of all observed bio-energy applications (biogas- , wood chip-, and pellet facilities).

Socio-economic aspects of utilization of bioenergy is large and it is subject of different research and studies like IEA bioenergy project (IEA Bioenergy Task 29). The socio-economic impact analysis are used to evaluate the local, regional and/or national implications of implementing particular development decisions.

In the mentioned research (IEA Bioenergy), the socio-economic implication are measured in terms of economic indices, such as employment and monetary gains, but in effect the analysis related to number of aspects which include social, cultural, in environmental issue [1].

The socio-economic impacts on local level are diverse according to such factors: technologies, local economic structures, social profiles and production processes.

A summary of some of the benefits associated with local bioenergy production¹ is:

1. Social Aspects:

- Increased Standard of Living:
 - environment
 - health
 - education
- Social Cohesion and Stability
 - migration effects (mitigating rural depopulation)
 - regional development
 - rural diversification

2. Macro Level:

- Security of Supply /Risk Diversification
 - regional growth
 - reduced regional trade balance
 - export potential

3. Supply Side:

- Increased Productivity
 - enhanced competitiveness
 - labour and population mobility (induced effects)
 - improved infrastructure

4. Demand Side:

- Employment
 - income and wealth creation
 - induced investment
 - support of related industries

¹ R. Madlener, H. Myles: Modeling Socio-Economic Aspects of Bioenergy Systems: A survey prepared for IEA Bioenergy Task 29, Workshop in Brighton/UK, 2 July 2000

The focal point of the majority of socio-economic impact is the Demand side effects and they are primarily quoted in terms of employment and regional income. They can be categorised accordingly into:

- direct effects
- indirect effects
- induced effects
- displacement effects

Socio-economic variables (factors) are ranked (according to IEA 's Task 29 Experts) on a scale according to:1 –high;10 –low.

Table 1:..Importance of key socio-economic variables in Task 29 research

Socio-Economic Variables	Importance Factor (according to IEA 's Task 29 Experts)
Regional Employment created	1.6
Regional Activity Created	2.3
Regional Economic Gain	2.6
Increased Regional Incomes	3.1
Regional Return on Investment	3.1
Replication potential	3.9
Avoided Unemployment	2.0
Support of Related Industries	4.3
Education	4.6
Health	5.9
Poverty Alleviation	5.0
Conventional Energy Displaced	3.3
Stimulation of Local Farming Activity	2.9
Rural Diversification	4.4
Rural Depopualtion	3.9
Land Management	4.9
CO ₂ Saved	3.0
SO ₂ Saved	5.4
NO _x Saved	5.4
Noise / Visual Impact	6.1
Biodiversity	6.3

2 Socio-economic benefit of Bioenergy projects - Employment created

The utilisation of bioenergy fuels (wood, bio-fuels..) is a multidisciplinary system which is integrated into larger multi-purpose systems within forests and/or agricultural areas and with several economic, social, technological and environmental impacts for the people living in and around the areas involved [2].

Reports of various analysis and studies experiences have been made (curry out) worldwide by many experts. The economic and socio economic impact as is shown from the most of the the cases analysed, that the economic and socio economic impact of bio-energy systems are very site specific and situation-specific which makes it difficult to be properly generalized.

Socio-economic benefits of bioenergy utilization can clearly be identified as a significant driving force in increasing the share of bioenergy in the total energy supply as well regional employment created and economic gains.

Employment from the perspective of bioenergy projects is defined as direct, indirect and induced employment. Direct employment results from production of fuel, construction, operation and maintenance of conversion plant and for transporting bioenergy fuels (wood biomass, liquid bio-fuel..) ([2], [3], [5]). Indirect employment is employment results from all activities connected, but not directly related (supporting industries, services..). Induced employment is results of higher purchasing power, due to increased earnings from direct and indirect jobs. As example of employment (direct, indirect and induced employment) in different European bioenergy projects is shown in Table 2.

Table 2: Employment in selected European projects[2]

	Direct jobs	Indirect jobs	Inducted jobs	Total jobs per PJ	Country
SRC ² , gasifier	51	11	36	98	UK
Miscantus, heat	321	0	214	534	Belgium
27Forest residues, CHP	52	33	30	115	France
Triticale, proc.heat	134	60	28	222	Germany
Artichoke, heat	269	19	93	380	Greece
SRC, gasifier	36	21	23	80	Ireland
Ind.residues, CHP	41	11	13	65	Italy
Waste, CHP	13	2	27	42	NL
Logg.residues, heat	52	2	21	76	Sweden

Some studies about the employment generated by different energy option show that wood and other biomass resources generate at least between 100 and 170 person days (of local employment) per TJ energy [2].

3 Socio-Economic Factors - Analysis and Evaluation

The analysis of socio-economic impacts on the bioenergy projects in urban area is focused (limited) on the real impact factors due to this projects and will not include all (large scale of) socio-economic aspects (factors) regarding to the utilization of bioenergy.

The impacts of socio-economic on the implementation of bioenergy project in urban area are in general mainly depended of the used technologies, location of the plant, energy prices, and the financial structure of the investment. The acceptance of the project and environmental impacts have negative influence on the decision-making in case of location is nearly housing area (less impact in case the location is in industrial area).

² SRC: Short rotation crop.

The evaluation of the questionnaire (WP 2) and comments done by partners is a base for the following summary of socio-economic aspects influencing the performance of bioenergy projects in urban area:

- social demand, economical tradition of the region (forestry, textile industry), tradition use of fuel oil for heating,
- cost of biomass, operating and investment and un-activity of biomass market,
- skepticism on sustainability,
- link between city and rural areas. Biomass often comes from close distance, until now there's no awareness of use of biogas in cities,
- the role of local politics, objectivity is essential for the acceptance, public acceptance through adequate politics of communication,
- energy strategy of the city and country,
- public information, lack of information of distorted information from persons or organisms which have economical interests, forming of opinion of the population,
- information deficit on the emission of particulate matters,
- at present don't exist a fuel market,
- lack of knowledge about bioenergy technologies and their impacts,
- sensibility to environmental problems, proximity of forestall /industrial areas,
- average environmental awareness of the municipal population,
- unanimously decides from the municipal council, modern technique, availability of resources,
- serious project operators.

The main brake remains the bad communication between the technicians and the neighboring inhabitants (web site with information about the bioenergy technologies, bioenergy sectors).

Some conclusion of the socio-economic impacts/aspects due to the used of bioenergy in urban area are:

- direct employment in the conversion plants is not big, but other (direct and indirect) employment is more important (bio-fuel preparation, transporting of bioenergy fuels, construction and operation of plants,...),
- reduction of CO₂ emissions and increasing of energy security on local level,
- increasing of investment,
- increasing awareness of local authorities and people,
- lack of information of distorted information from persons or organisms which have economical interests,
- public acceptance through adequate politics of communication,
- public money is the most important specific influence on financing concepts of urban biomass projects,
- specific barriers are: the location of the plant and the emissions (pollutants and noise) which are mentioned in all regions.

4 REFERENCE

- [1] R. Madlener, H. Myles: Modelling Socio-Economic Aspects of Bioenergy Systems: A survey prepared for IEA Bioenergy Task 29, Workshop in Brighton/UK, 2 July 2000
- [2] Miguel Angel Trossero: Socio-economic Aspects of Wood Energy Systems in Developing Countries: A Focus on Employment, FAO –Rome
- [3] J. Domac, V. Segon: Socio-economic drivers in implementing bioenergy projects (IEA Bioenergy-Task 29)- Technology report, ExCo56, 12-13 October 2005, Dublin, Ireland
- [4] J. Domac, K. Richards, S. Risovic: Socio-economic drivers in implementing bioenergy projects, Biomass&Bioenergy 28 (2005), p. 97-106
- [5] A. Lunnan: Contribution from bioenergy to local economic development- a Norwegian case study, Norwegian Forest Research Institute