

## Working Period 2003-2005

### Task Proposal Summary Sheet

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Task Title: **Socio-economic Drivers in Implementing Bioenergy Projects**

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#### Task leader

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Endorsement by ExCo Member of participating country

- Country: Croatia
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#### Objective

To achieve a better understanding of the social and economic drivers and impacts of establishing bioenergy markets at the local, regional, national and international level, to synthesise and transfer to stakeholders critical knowledge and new information, to improve the assessment of the above mentioned impacts of biomass production and utilisation in order to increase the uptake of bioenergy and to provide guidance to policy makers.

#### Progress achieved in Task 29

- Completing an analysis of the existing tools for socio-economic modeling of different bioenergy systems;
- Overview of data needs for selected regions in each of the participating countries;
- Summary of the differences between models for 'top-down' assessments and management/ business type approaches;
- Report setting out the possibilities for using management/ business type approaches either alongside more conventional methods employed for case study areas, or using hybridised methods;
- Modelling work in communities (chosen case studies for each participating country);
- Model testing for 'user friendliness' with student participation;
- Catalysing and participating in local community actions and events in partner countries to promote the benefits of bioenergy;
- Facilitating the establishment of an environmental sociology hub at the University of Reading in the UK through TV Energy to support future project work with communities;
- Facilitating the improvement of understanding of socio-economic aspects of bioenergy in participating and other interested countries;
- Linkage with existing and future projects in bioenergy sector and support of international knowledge exchange within partnership;
- Achieving a recognition of the importance of this IEA based Task with the European Commission through individual project activities and strategic direction (with a view to future collaboration and possible funding for example by inclusion in a 'virtual centre of excellence')
- Successful linkage and joint activities with IEA Bioenergy Tasks 31 and 38 and FAO.
- Workshop proceedings, meeting minutes, posters, and a large selection of papers presented 2000-2002 at several international workshops, conferences and seminars;
- A recognized, extensive and efficient web site ([www.iea-bioenergy-task29.hr](http://www.iea-bioenergy-task29.hr)) as a successful and powerful tool for wide distribution of information;
- Brochure 'Bioenergy in your Community'

#### Work scope for the new Task

Much has been achieved in the first three years of activity addressing the complex topic of socio-economics as applied to bioenergy systems. The Task has been able to clearly set out the 'State-of-the-art' and begin to apply new methods and thinking to community centred initiatives, based on community interaction and feedback. However, existing models and approaches have been found lacking and not appropriate to community working when tested. Much is clearly still to be done if the Task is to be able to better understand the functioning of community, or 'bottom-up' approaches, to projects and to maximise the possibilities for successful implementation of bioenergy initiatives. In particular, increased emphasis will need to be given to specialist

sociological input to both modelling and practical implementation, balancing the strong economic inputs already achieved.

The proposed new Task will give this new direction to the programme undertaken in Task 29. It will encompass the results and the findings obtained previously in the Task and also through the international state of the art socio-economic evaluation of bioenergy programmes and projects. The scope will be world wide, but focussing primarily on regions, taking into account national and international frameworks. Efforts will be made to expand activities to include developing countries through the FAO and similar organisations. The work will include the sharing of research results, stimulation of new research directions in national, regional and local programmes of participating countries, technology transfer from science to resource managers, planners and industry. The emphasis will be on an integrated approach to economic, environmental and social components of bioenergy systems. Multi-disciplinary partnerships of key stakeholders in forest biomass production and utilization research, planning and operations will be fostered. The concept of ‘clustering’ a range of users calling upon an integrated fuel supply chain will be investigated at the regional level along with the institutional frameworks that need to be constructed to allow such activities to proceed with strong community ownership (e.g. co-operative ESCO’s or Energy Supply Companies). Likewise the socio-economic implications of such entities will be examined.

### **Work programme**

- Completing the ongoing work in formulating a methodology for determination of economic contribution and social impact resulting from the deployment of bioenergy systems.
- Annual workshops and field study tours, for sharing of scientific and technical information and furthering the Task programme, with published proceedings.
- Study of different regional and national achievements in recognition and evaluation of social and economic benefits of biomass utilisation.
- Establishing current best practice for maximising the social and economic gain for local communities including existing planning models for the implementation of bioenergy projects and programmes.
- Design and development of an ‘easy-to-apply and use’ socio-economic tool for local bioenergy projects based on the existing models and the recommendations derived from the abovementioned complementary review.
- Completing Task 29 synthesis book on bioenergy based socio-economics.
- Application of the abovementioned tool in selected regions chosen so that they are complementary in nature and having particularly socio-economic challenge or focus, in order to check its flexibility and user-friendliness.
- Assessment of the international state of the art on socio-economic evaluation of bioenergy programmes and projects along with benchmarking national, regional, IEA and EU programmes.
- Dissemination of findings and conclusions by means of publications and an Internet web site with downloadable publications, tools, overviews communications and links relative to the activities of the Task.
- Transfer to stakeholders new knowledge and technical information.
- Co-operation and information exchange with Tasks dealing with greenhouse gas balances, short-rotation and conventional forestry, and others.
- Produce and undertake educational programmes; Training and education.
- Make policy recommendations to the relevant bodies at various levels.
- Linkage with complementary FAO, IEA, EU and World Bank projects and programmes.
- Analyse different trading mechanisms and other promotion schemes (green trading, certificates, emissions...).

### **Deliverables**

- Annual workshops with subsequent published proceedings.
- Electronic information system based on existing Task 29 web site.
- Technology and knowledge transfer including technical seminars, conferences and participation in different events with educational goal.
- Book on bioenergy based socio-economics.
- ‘Easy-to-use model’

### **Management**

Task Leader: Julije Domac, Energy Institute ‘Hrvoje Pozar’, Croatia. Associate Task Leader Keith Richards, TV Energy Ltd., United Kingdom

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**Annual Budget** US\$ 12,000 per participant (level of work will be adjusted to fit that budget)

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# **A PROPOSAL TO THE EXECUTIVE COMMITTEE IEA BIOENERGY**

## **FOR AN INTERNATIONAL COLLABORATIVE TASK ON**

### **Socio-economic Drivers in Implementing Bioenergy Community Projects**

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#### **OBJECTIVE**

To achieve a better understanding of the social and economic impacts and opportunities of bioenergy systems to communities at the local, regional, national and international level, to synthesise and transfer to stakeholders important knowledge and new information, to improve the assessment of the above-mentioned impacts of biomass production and utilisation.

#### **WORK SCOPE**

Continuing and giving new direction to the programme undertaken in the IEA Bioenergy Task 29, this proposed Task will focus on social and economic impacts and opportunities of bioenergy systems, which in some instances will involve linking bioenergy projects with other renewable energy supply systems such as wind, solar and small hydro. The key priority will be the analysis of the economic and social aspects and the net overall benefits of bioenergy use, and the development and promotion of tools and guidelines for their determination. The new Task will also deal with connected environmental considerations and the contribution that biomass makes to rural and remote areas, in which biomass production for energy often takes place.

Geographically, the new Task will focus directly on the member countries of IEA Bioenergy that agree to participate in the Task. More generally, the new Task will emphasise conditions in rural and urban regions in various parts of the world (e.g. Europe, North America, New Zealand, others). However, efforts will also be made within budget limitations to involve, for example, South Africa, Central and South American countries, and countries in eastern Europe. Such countries may be able to contribute to the work of the Task, or to help implement its ideas through the development and expansion of bioenergy production systems in new regions. This work will be carried out in close collaboration with FAO.

The work of the new Task will draw on and build upon existing scientific and technical knowledge, information and expertise within the limits of budget, time and the voluntary nature of country participants. Results of completed and ongoing research in participating countries and elsewhere will be synthesised and stimulation will be given to new research directions. Applications to real projects and linkages with other complementary initiatives and programmes will be identified. Key experts from government, universities, high-level research institutions, local energy agencies, NGOs, and industry will be brought together and engaged in high-level discussions guided by scientific knowledge in order to address the issues. In doing this, an integrated approach will be maintained involving critical social, economic and environmental sustainability components of bioenergy systems. Multi-disciplinary partnerships of the most important stakeholders will be fostered. Local communities and industrial involvement will be particularly sought in relation to the transfer of technical information concerning environmentally and socially sustainable and economic biomass production. The new Task will endeavor to have a significant impact on research, development and demonstration (RD&D) and practice in participating countries in order to achieve the goals of IEA Bioenergy.



## WORK PROGRAMME

### *Background*

Within the international community there is considerable interest in the socio-economic implications of moving society towards the more widespread use of renewable energy resources. Such change is seen to be very necessary but is often poorly communicated to people and communities who need to accept such changes. There are pockets of activity across the world looking at various approaches to understanding this fundamental matter. In that framework, several models have been developed and tested in order to monitor the socio-economic aspects of bioenergy and other renewable energy projects. However, most of them are addressing the technical and economic aspects of schemes under study without undertaking or seeking to analyse the social implications of developments as well.

Task 29 of IEA Bioenergy included exchange of results and information among the normally discrete research areas of social, economic, techno-engineering/engineering-economic and environmental issues. The Task provided a platform for integration of research among those areas (table 1). As a result, a wider, system-oriented and multi-criteria-based view of the issues connected to production and utilisation of biomass for energy activities has evolved from this successful collaborative effort. Some concrete outcomes are a number of reports and studies as well as a book of proceedings from Task workshops.

Table 1. Issues associated with local bioenergy production

Dimension	Benefit
Social	Increased Standard of Living Environment Health Education Social Cohesion and Stability Migration effects (mitigating rural population) Regional development Rural diversification
Macro Level	Security of Supply/ Risk Diversification Regional Growth Reduced Regional Trade Balance Export Potential
Supply Side	Increased Productivity Enhanced Competitiveness Labour and Population Mobility (induced effects) Improved infrastructure
Demand Side	Employment Income and Wealth Creation Induced Investment Support of Related Industries
Institutional Aspects	Democratic decision processes Participatory problem solving Local problem solving.

Task 29 collaborated with several other Tasks, e.g. by organizing joint workshops that were documented by joint proceedings. These activities also contributed to the development of a more integrated knowledge base. As well as the positive experience of synergistic effects of

the multidisciplinary collaboration within Task 29, it is believed that this concept should be developed further. Important effects would include increased opportunities to share and exchange model components, technical information and linkages with other IEA Bioenergy Tasks.

The current proposal for a new Task builds on the achievements of Task 29. It is designed to capitalise on the present body of knowledge, and to continue to add to it and develop it further drawing in new expertise sometimes generated by the action itself. The aim is an enhanced transfer of holistic, integrated knowledge and technical information which is believed to be of substantial value to local communities, scientists and decision makers in the field of biomass production and utilisation and energy planning.

### *Technical focus*

The Task will deal with: stakeholder involvement, local income, public acceptance, local NGO involvement, long-term support (e.g., rental of credits), technology transfer, technology diffusion, distribution of benefits, fuel substitution aspects, policy aspects, education and capacity building, definition of collateral effects, market development in relation to timber and non-timber products markets (e.g. shift of income or changing in financial sources for sustainable development), institutional development, the nature and role of local and co-operative ESCOs (Energy Services Companies) in propagating community actions, and other means relevant to secure long-term success and to minimize leakage and maximize additionality of projects. An integrated approach will be taken to investigation and sharing of knowledge on these separate aspects. Typically, socio-economic implications are measured in terms of economic indices, such as employment and monetary gains, but in effect the analysis relates to a number of aspects which include social, cultural, institutional, and environmental issues. The problem lies in the fact that these latter elements are not always tractable to quantitative analysis and, therefore, have been precluded from the majority of impact assessments in the past, even though at the local level they may be very significant.

### *The Social Dimension*

In many ways the social implications arising from local bioenergy investment represents the ‘woolly’ end of impact studies, nevertheless they can be broken down into two categories: those relating to an increased standard of living and those that contribute to increased social cohesion and stability.

In economic terms the ‘standard of living’ refers to a household’s consumption level, or its level of monetary income. However, other factors contribute to a person’s standard of living but which have no immediate economic value. These include such factors as education, employment opportunities, the surrounding environment and healthcare, and, accordingly, they should be given equal consideration.

Moreover, the introduction of a net employment and income-generating source, such as bioenergy production, could help to stem adverse social and cohesion trends (e.g., high levels of unemployment, rural depopulation, etc.). It is evident that rural areas in some countries are suffering from significant levels of outward migration, which mitigates against population stability. Consequently, given bioenergy’s propensity for rural locations, the deployment of bioenergy plants may have positive effects upon rural labour markets by, firstly, introducing direct employment and, secondly, by supporting related industries and the employment therein (e.g., the farming community and local/regional renewable energy technology providers, installers and service providers).

Finally, it is often possible to achieve significant and sustained development of local initiatives given genuine local involvement of key stakeholders. The emergence and cultivation of local champions is an essential area for study.

### *Macro-economic and Supply Security/ Diversity Effects*

The increased use of bioenergy, which exhibits both a broad geographical distribution and diversity of feedstock, could secure long-run access to energy supplies at relatively constant costs for the foreseeable future. Moreover, the use of indigenous resources implies that much of the expenditure on energy provision is retained locally and is re-circulated within the local/regional economy.

Similarly, by securing a heat-and-power supply system based on indigenous and renewable resources, exposure to international fuel price fluctuations and input fuel requirements are minimised, thus reducing the risk of rising costs of production, transport, etc., further enhancing the goal of sustainable development by increased energy efficiency.

### *Supply Side Effects*

Supply side effects are rather subjective in regional impact studies, as they are commonly deemed to be those impacts, which are the result of improvements in the competitive position of the region, including its attractiveness to inward investment. These effects are likely to differ in kind and will depend upon the development, but generally such 'economies of speculation' relate to changes and improvements in regional productivity, enhanced competitiveness, as well as any investment in resources to accommodate any inward migration that may result from the development.

Taken together, these effects may result in the establishment of complementary economic activity, where related (and often local) industries mushroom in response to increases in local demand. Accordingly, supply side effects have a much broader scope, and as such quantitative assessments are much more speculative. Despite this caveat, some projects have been justified purely on the grounds that they may have significant long-term supply side effects, even if they are difficult to quantify with any confidence prior to the development.

### *Demand Side Effects*

Demand side effects constitute the focal point of the majority of socio-economic impact studies, and are concentrated upon for several reasons. Most notably, they are relatively easy to define and the scale of the investment's impact can be quantified with reasonable accuracy. Moreover, it is the economic impact that is most important to regional developers and decision makers.

Demand side effects are primarily quoted in terms of employment and regional income. They can be categorised accordingly into:

- Direct Effects
- Indirect Effects
- Induced Effects
- Displacement Effects.

The derivation of the above should form the basis of socio-economic analyses. However, the extent to which these effects can be totally captured at a local level will depend crucially on the quality of the information available.

Considerable effort should be made to determine the extent and direction of capital flows both within the region under analysis and, more importantly, out of the specified region. If this 'leakage' element is ignored, then it gives rise to misleading spurious predictions about future employment and income gains. Furthermore, consideration should be given to the duration of the impacts, and only then can a tentative evaluation of the wider effects pertaining to some, or all, of the other factors be attempted.

## **Linkages with other Tasks**

The work programme proposed for this Task has been developed in cooperation with Tasks focussed on greenhouse gas balances, conventional forestry, and liquid biofuels. This Task will provide technical information such as:

- Society agreement and acceptance of greenhouse gas reductions and carbon trading concepts;
- Complementary review and comparison of:
  - NIMBY-ism and protest/ support,
  - effects on society of energy market liberalisation,
  - RES integration,
  - the nature and role of local, co-operative ESCOs (Energy Services Companies) in propagating community actions
  - environmental champions and
  - maximising local benefit for people accrued from bioenergy adoption.
- Socio-economic benefits of integrating the harvesting of forest residues into conventional forestry practices; Development of tools and guidelines for determining social and economic impacts of bioenergy systems.

## **DELIVERABLES**

### ***Annual workshops***

The Task will organize at least three annual workshops in different regions of the world. The first workshop will take place in Japan, the second in United Kingdom in co-operation with one or more other Tasks, and the third in one of participating countries. Each workshop will provide a technical and scientific programme involving input from Task programme areas and will incorporate local/regional content (if possible linking with a community action). Successive workshops will be designed to build on each other, and so maintain collaborator interest and continuity in the programme. Workshops will aim for a high quality of scientific and technical information and good interaction among participants.

The proceedings of each annual workshop will be published following scientific peer-review. These proceedings will record substantive and progressive scientific and technical information, discussion and analysis.

## **SCHEDULE AND MILESTONES**

- 2003
- detailed Task work programme planning
  - analyse the implication of Kyoto protocol in socio-economic context
  - establishing mechanisms for co-operation with related Tasks and FAO
  - selection and commissioning of scientific experts
  - concept and content planning for an easy-to-use model
  - student programme of researching community needs for tools
  - selection of methodology, data collation
  - continuation of work on Task 29 synthesis book
  - web site development
  - workshop in Japan (Theme: the role of bioenergy in promoting and retaining diversity in communities)

- 2004
- publication of 1<sup>st</sup> workshop proceedings
  - maintain and improve web-based technical information system
  - development of an easy-to-apply tool
  - student programme of beta testing of tool with communities
  - application to regions and generation of first results
  - mid-Task assessment and, if necessary, re-orientation
  - final work on Task 29 synthesis book
  - workshop in UK (Theme: Developing community wood fuel clusters and the role of ESCOs)
- 2005
- publication of 2<sup>nd</sup> workshop proceedings
  - maintain and improve web-based technical information system
  - critical evaluation of the tool
  - student programme of tool impact on community projects
  - final work by scientific experts on issues
  - presentation of tools and guidelines developed
  - presentation of book and participation in the major linked event with promotion effort
  - workshop (location to be determined; Theme: The implications of a proactive socially aware bioenergy strategy to urban communities using large scale bioenergy facilities)
  - publication of 3<sup>rd</sup> workshop proceedings
  - summary document, final Task report

## ANNUAL BUDGET

Staff costs	38 %	US\$
Workshops, seminars, meetings etc	10 %	US\$
Travel	21 %	US\$
Materials, supplies, publications etc	15 %	US\$
Contribution to annual report and newsletters	1 %	US\$
Consultants and contracts	15 %	US\$
Overhead	0 %	US\$
<b>TOTAL</b>	<b>100 %</b>	<b>US\$</b>

84,000\*

\* based on (an estimated) seven participating countries with a contribution of US\$ 12,000 each.

### Notes on budget items

*Staff costs* - includes cost of remuneration of Task Leader and Associate Leader(s), who will each devote approximately 25% of their time to the Task, as well as others directly involved in the work of the Task.

*Travel* - for participation of Task Leader, Associate Leader(s) and scientific experts in workshops and meetings.

*Consultants* - cost of specific contracts to achieve elements of the Task goals. Efforts will be made to obtain the participation of appropriate scientific expertise through remuneration of travel costs to international meetings rather than through more costly contracts.

*Overhead* - no overhead charge is made by any of institutions involved in the Task.

## MANAGEMENT

The Task will be led by Julije Domac of Energy Institute 'Hrvoje Požar, Zagreb/Croatia, assisted by Keith Richards of TV Energy, Newbury/UK. Accountability and an institutional guarantee of performance and delivery of the Task will be provided by the Energy Institute 'Hrvoje Požar through Branka Jelavic, the Croatian representative on the Executive Committee of IEA Bioenergy. Each participating country will provide a representative to the scientific management team, the primary vehicle for active country involvement in the Task. The expenses of these representatives will be borne by the individual countries, according to IEA Bioenergy policy.

Julije Domac, M. Sc., is the co-ordinator of BIOEN National Energy Programme in Croatia and leader of IEA Bioenergy Task 29: 'Socio-economic aspects of bioenergy systems'. He is responsible for international co-operation in field of biomass utilization in Croatia and currently finalizing his Ph.D. thesis 'Socio-economic aspects of bioenergy use – assessment methodology for transition countries'. He has been involved in many bioenergy implementation projects and renewable energy promotion and education campaigns in Croatia. In 2000, his paper was recognised as 'The Best Paper in Biomass Conversion Section' at World Renewable Energy Congress 2000, Brighton, UK. From 2001, he has been a member of the Scientific Council for Energy of the Croatian Academy of Science and Arts.

He is serving as a paper reviewer of Topic 5: Combined application of biomass for energy, products and climate change at 12<sup>th</sup> European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection, 17-21 June 2002, Amsterdam and member of Biomass Technical Committee at Conference on "Renewable Energy for Local Communities of Europe", organized by the International Solar Energy Society in Bologna, 23-26 June 2001. Julije is also a member of WREN (World Renewable Energy Network) and member of International Steering Committee at World Renewable Energy Congress VII, Cologne, 29 June-5 July 2002.

### Energy Institute 'Hrvoje Pozar'

The "Hrvoje Požar" Energy Institute is a non-profit organisation owned by the Republic of Croatia (Ministry of Economy and Ministry of Science and Technology), HEP – Croatian National Electricity and INA – Croatian Oil and Gas Company and the central scientific and professional institution for global planning in the energy system and its subsystems. Amongst the activities of the "Hrvoje Požar" Energy Institute is the co-ordination of the Biomass and Waste Use Programme (BIOEN), launched in order to initiate and enhance bioenergy application in Croatia and the leadership of the IEA Bioenergy Task 29 "Socio-economic aspects of bioenergy schemes". It has also been the Croatian signatory to the IEA Bioenergy Agreement since its inception.

Dr Keith Richards is the Managing Director of TV Energy Limited and has been at the centre of bringing this SAVE II Regional Energy Agency to life Keith brings more than 20 years experience of renewables and energy efficiency (at ETSU) to the Agency, having managed projects and programmes for the Department of Energy, DTI, DoE, MAFF, IEA and the European Commission. He set up the Interdepartmental Group on Energy Crops and Renewable Energy (IGEC RE) and also the Environmental Liaison Group (ELG) bringing NGOs, Government and Industry together on this topic for the first time. He is a recognised EC expert and evaluator, most recently evaluating both short term/ demonstration projects and medium to long term/research proposals for the EC in January 2002 (5<sup>th</sup> Framework).