

# **IEA Bioenergy – An International Network for Worldwide Promotion of Sustainable Use of Biomass for Energy**

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international energy agency  
agence internationale de l'énergie

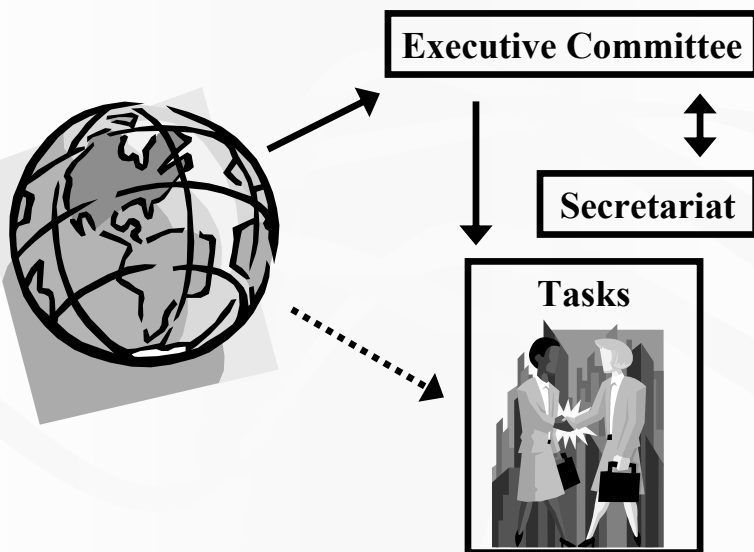
## **IEA Bioenergy**

- An international network offering opportunities to coordinate national RD&D programs and to exchange information,
- Set up in 1978 by the International Energy Agency (IEA) and currently has 20 countries or organizations as members,
- Carries out its work in a series of Tasks, each having a defined work program that offers benefits for researchers, industry and policy-makers.

## Current participation

- **21 participants:** Australia, Austria, Belgium, Brazil, Canada, Croatia, Denmark, European Commission, Finland, France, Italy, Ireland, Japan, the Netherlands, New Zealand, Norway, South Africa, Sweden, Switzerland, United Kingdom, United States
- **12 Tasks:** with a total annual budget of 1 million US\$ for Task management to utilize the results of the national R&D programs of the participating countries

## IEA Bioenergy Structure



## **Opportunities and Outputs**

- Information exchange on bioenergy RD&D in participating countries
- Platform for collaborative RD&D projects with industry
- Project reports, workshop proceedings, position papers, computer programs and handbooks

## **IEA Bioenergy Tasks**

- **Biomass resources:** Forestry and agricultural products, municipal solid waste,
- **Biomass conversion:** Combustion, thermochemical and biochemical processes,
- **Bioenergy utilization:** Heat and power production, transportation fuels,
- **Integrating research themes:** Techno- and socio-economic and environmental analyses, greenhouse gas balances.

## IEA Bioenergy Task 29:

Socio-economic Drivers in  
Implementing Bioenergy Projects  
(2003-2005)

Socio-economic Aspects of  
Bioenergy Systems (2000-2002)



## Task 29: What is this all about?

<b>Social</b>	Increased Standard of Living (Environment, Health, Education) Social Cohesion and Stability (Migration, Development, Diversification)
<b>Economic Macro level</b>	Security of Supply, Regional Growth, Reduced Regional Trade Balance, Export Potential
<b>Economic Supply Side</b>	Increased productivity, Enhanced Competitiveness, Labour and Population Mobility, Improved Infrastructure
<b>Economic Demand Side</b>	Employment, Income and Wealth Creation, Induced Investment, Support of Related Industries

## UK: Case Study - Walles

- Farmer co-operative with @100 members
- Current usage 1,079,802 litres of fuel oil per annum.



- Further 3,700 MWh of electricity per annum
- This releases 4,922 tonnes CO<sub>2</sub>
- 3MW system (simple combustion) to replace 3 oil boilers and 80% of current oil usage.
- Complex load profile

## UK: Results

Net Additional Labour Income (direct and indirect) after Deductions	£ 128,220
Net Additional Profit (direct and indirect) after Tax	£ 50,990
Share of Net Additional Incomes/Profit Spent in the Region	53%
Direct Jobs Generated	3,5
Indirect Jobs Generated	7,4
Induced Jobs Generated	4,9
Total Jobs Generated	15,7

## Croatia Case Study



- 'ITC Varaždin' – furniture manufacturing
- 35,000 m<sup>3</sup> of wood processed annually - 11,000 m<sup>3</sup> of wood waste



- in the past, waste used to fuel company heating plant, remains sold to local households
- new heating plant in 1998
- briquettes production in 1999
- pellets production in May 2002

## Economy and Environment

Heating plant, annually:

66 TJ = 1,545,000 l of heating oil =

819,000 € = 14.7 kt of CO<sub>2</sub>

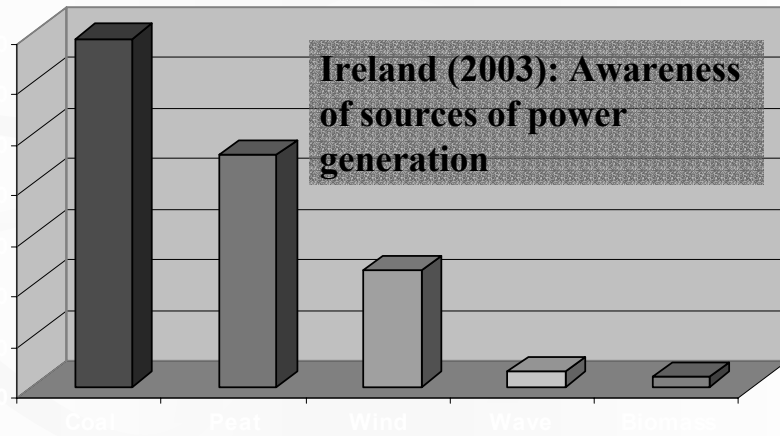


Briquettes production

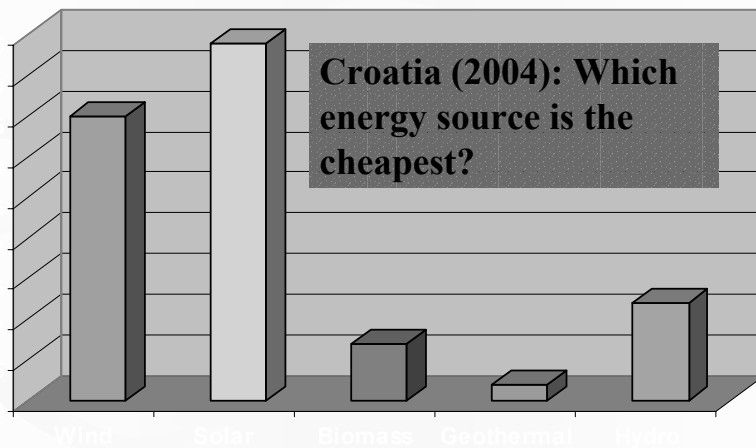
in 2000/2001: 5000 t (75,000 €)

in 2002: 8000 t (120,000 €)

## Public Perception



## Public Perception



# Education – example!

- IEA Bioenergy Task 29 Educational website about biomass and bioenergy
  - 3 years project within Bioenergy Agreement of the International Energy Agency
  - Austria, Canada, Croatia, Ireland, Japan, Norway, Sweden, United Kingdom

IEA Bioenergy

## Educational Web Site on Biomass and Bioenergy

Task 29: IEA Bioenergy Network on Socio-economics

definition | technologies | sustainability | environment | economy | benefits | implementation | expert login

**tools**  
Here you can select and use various interactive tools.

**how to learn more**  
Interested in learning more? We have a selection of scientific papers, reports and brochures, as well as a variety of useful links.

**ask the experts**  
Have a question? You can ask the world leading experts in the field of biomass and bioenergy!

**test**  
After reading the material, you can test your understanding and knowledge about biomass and bioenergy.

**did you know...**

**quick search**  
Can't find your answer and time is running late? You can always perform a quick search through our site!

# www.aboutbioenergy.info

## What is biomass?

## What is bioenergy?

This educational web site created by IEA Bioenergy Task 29 has the aim to inform you about the oldest source of energy used by men.

Inside you will learn about modern use of biomass in a wise, clean and sustainable manner.

Please select where you want to go from the menu above!

LET ME BE YOUR GUIDE THROUGH THE EXCITING WORLD OF BIOMASS AND BIOENERGY! CLICK ON ME FOR A GUIDED TOUR OR CHOOSE DIRECTLY FROM THE MENU ABOVE!






## NEW JOBS CALCULATOR





http://www.aboutbioenergy.info - Calculator - Micros

### CALCULATOR

**TYPE OF BIOMASS:**


LOGS:  CHIPS:  PELLETS: 

**TYPE OF WOOD:**

oak  spruce  pine  birch 

**MOISTURE CONTENT**  % **VOLUME**

**MASS OF WET WOOD**  kg **ENERGY**  GJ

1000 kg  9.35 GJ

How many euros invested?  €

How many megawatts installed?  MW

Construction & installation period:  months

Operating hours per year:  hours

Average load:  %

Life time:  years


Year of installation:

What technology is used?

Construction & installation full time equivalent:

Operation & maintenance full time equivalent:

**TOTAL:**



Ask The Experts


Write your question here.


Subject:

Your Name:

Your e-mail address:

**SARAH NILSSON**  
**SWEDEN**






http://www.aboutbioenergy.info - Expert Profile - Microsoft Int...

### EXPERT PROFILE

**Keith Richards**  
United Kingdom



http://www.aboutbioenergy.info - Task 29: Ask the Experts - Microsoft Internet Explorer

### Ask The Experts

Questions and Answers

► What are the most significant elements of biomass price? Are they country or regionally specific? (by *Kresimir Stb*.)

**Answer:**

There are many elements that make up the cost of biomass. I would highly recommend that costs be looked at from a regional point of view. The larger the country and the more localised the decision making structures with respect to natural resources, the more important it is to use regional data. For example, Canada is a large country with varied geophysical characteristics and royalties collected by the provinces. Regional analysis is essential in that case.

What are the most significant elements of biomass price?

1. Logging cost including hauling. The longer the haul the greater the cost.
2. Taxes and stumpage costs. What needs to be paid to the government for the privilege of cutting on Crown land?
3. If on private land, what is the cost of the logs?
4. The nature and quality of the biomass. Points 1-3 above relate to whole tree processes. If the biomass is in the form of chips, sawdust, bark, or pellets, or branches for example, the cost will vary according to the markets for those goods. For example, if a sawmill has residues beyond which it can use itself and there are few other firms interested in the product, it could be

stitution: TV Energy Ltd.

ocation: Newbury, United Kingdom

ate of birth: 15th January 1954

o: Keith has more than 24 years experience of renewable energy and energy efficiency project management and consultancy. He has been central to the take up of energy from waste and biomass projects in the UK developing strategies for Government and then implementing them. He is championed the development of resource assessment tools (particularly GIS) to aid in regional and community initiatives in the UK, Europe and OECD counties (through the International Energy Agency). Over the last five years, Keith has been focusing on working with community groups in close collaboration with Local Authorities and Regional Government to introduce hybrid renewables solutions.

Homepage: <http://www.tvenergy.org>

x close window

IEA Bioenergy

## Why is biomass a renewable energy resource?

home
→ Task 29: IEA Bioenergy Network
Test Your Knowledge - Microsoft Internet Explorer

definition | technologies | sustainability | environment | economy | benefits
TEST

**tools**

**how to learn more**

Links and papers about sustainability

**ask the experts**


Bill White (Canada)  
 Julije Domac (Croatia)  
 Kevin Healion (Ireland)  
 Tatsuo Yagishita (Japan)  
 Anders Lunnan (Norway)  
 Sarah Nilsson (Sweden)  
 Keith Richards (United Kingdom)

**test**

Test your knowledge!

**did you know...**

...that a hectare of forest absorbs a similar amount of CO<sub>2</sub> as is released by burning 88,000 litres of fuel oil or 134,000 cubic meters of 'natural' gas? Also, using a tonne of sustainably produced wood fuel will save one tonne of CO<sub>2</sub> if replacing natural gas, nearly 1.5 tonnes compared to using heavy fuel oil or almost 1.8 tonnes if replacing bituminous coal.



### Sustainability

**Using biomass as a fuel means that carbon that the plant was growing, is released back to the atmosphere. Providing the balance use, the system is sustainable and helps reduce greenhouse gas emissions.**

Global climate change is the major environmental problem. Since the turn of the 20th century the amount of greenhouse gases has been increasing rapidly. Greenhouse gases are accumulating and there is a growing consensus that the earth's atmosphere – the so-called greenhouse effect – is trapping too much heat. CO<sub>2</sub> emissions are recognised as the most important problem. Since the turn of the 20th century the amount of greenhouse gases has been increasing rapidly. Greenhouse gases are accumulating and there is a growing consensus that the earth's atmosphere – the so-called greenhouse effect – is trapping too much heat.

**1** Major environmental issue of current times is:

- Global climate change
- Biodiversity in mountain areas
- Protection of birds
- NOx emission

**2** Which of the following energy production technologies can not be classified as sustainable?

- Biomass district heating
- Wind turbines
- Natural gas power plant
- Solar air-conditioning

**3** Net carbon emissions from generation of a unit of electricity from biomass, compared with fossil fuel-based electricity generation, is:

- 10-20 times higher
- roughly the same
- 10-20 times lower
- 20-50 times lower

**4** A CO<sub>2</sub> neutral system is characterized by...

- low CO<sub>2</sub> emissions

IEA Bioenergy

## In what ways can local communities benefit from bioenergy use?

home
→ Task 29: IEA Bioenergy Network on Socio-economics

definition | technologies | sustainability | environment | economy | benefits | implementation

**tools**

**New Jobs Calculator**  
 Estimates a number of new jobs which could be generated by a bioenergy project.

**how to learn more**

Links and papers about benefits

**ask the experts**

Bill White (Canada)  
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 Tatsuo Yagishita (Japan)  
 Anders Lunnan (Norway)  
 Sarah Nilsson (Sweden)  
 Keith Richards (United Kingdom)

**test**

Test your knowledge!

**did you know...**

...that 2.5 kg of wood has a similar energy value as a litre of extra light heating oil?

**quick search**

Can't find your answer and time is running late? You can always perform a quick search through our site!



### Benefits

**employment | health | social cohesion | security of energy supply | trade balance | education/traditional industries | local investment/infrastructure**

**Communities can become direct stakeholders in their own energy supply either by producing fuel or through involvement in local projects.**

Local communities can benefit from biomass for energy use in many different ways. The most obvious is new jobs created in local business, perhaps retraining people who would otherwise need to move away (a particular problem for young people in many rural communities). Bioenergy is by its very nature 'job sensitive' and those with skills in the forestry and agricultural sector will be most sought after. These jobs may either be created directly (plant operation, biomass for energy production and transportation) or indirectly (related industries, equipment manufacturers). Projects may also actually help forestry and agricultural businesses to survive in some countries, as it allows them to generate additional income and to make use of otherwise redundant set-aside land.

Social cohesion may be enhanced by organising and running a localised and renewables-based energy supply system, and quality of life may be substantially increased (e.g. through the co-benefits offered by new infrastructure installations). Joint ventures may allow for social schemes to

IEA Bioenergy
Biomass in action!

home
Task 29: IEA Bioenergy Network on Socio-economics

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**examples of implementation**

- ▶ Anaerobic digestion at Campmill Community Ballytobin, Ireland
- ▶ Briquettes and pellets production in Varazdin, Croatia
- ▶ CHP plant at Kahoku Town, Japan
- ▶ District heating at Oslo airport, Norway
- ▶ District heating in Charlottetown, Canada
- ▶ Low-emission biomass plant in Höör, Sweden
- ▶ Poultry-litter power station Fibrowal, Bedford, UK


**how to learn more**

Links and papers about implementation

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 Keith Richards (United Kingdom)

**test**




Implementation

targets | resource potential | barriers | energy markets | fuel supply  
 laws and regulations

Biomass is the largest renewable energy source in use today. For the future, bioenergy offers cost-effective and sustainable opportunities with the potential to meet up to 50% of world energy demands during the next century, while meeting the requirements of reducing carbon emissions from fossil fuels. Bioenergy projects come in all sizes and types. Biomass can provide heat, power, transport fuels and even alternative material feedstocks.

Communities with bioenergy systems (often rural) benefit from the economic activity associated with the biomass production. The increased levels of employment and social cohesion help to maintain community stability. Urban attitudes to biomass production are more related to broader concerns for the environment. The examples of bioenergy applications in many European cities also illustrate that bioenergy is not just about local, rural communities but it is important for cities too.



## Some details...

- Started in 2003, planned to be completed by the end of 2004
- Widely recognised – links!
- Good visit – more than 8,000 visitors from 82 countries in period 1 July – 30 September
- Base for further educational activities
- Educational web site – both product and tool

Address [http://www.eere.energy.gov/biomass/for\\_students.html](http://www.eere.energy.gov/biomass/for_students.html)

U.S. Department of Energy  
**Energy Efficiency and Renewable Energy** *Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable*

**Biomass**

**Biomass Program**

About the Program | Program Areas | Information Resources | Financial Opportunities | Technologies | Deployment | Home

## Information Resources

**For Industry**

**For Researchers**

**For Policymakers**

**For Consumers**

**For Students**

ABC's of Biofuels  
 ABC's of Biopower  
 ABC's of Bioproducts  
 Student Glossary

**State & Regional Resources**

**Publications**

**Photographs**

**Related Links**

**Resources for Students**

Hey Students! We designed these pages specially to make it easier for you to learn about biomass. Whether you need to write a research paper or are just curious, this information may help you get started - it covers the basics, but also connects you to more advanced information.

- [ABC's of Biofuels](#)
- [ABC's of Biopower](#)
- [ABC's of Bioproducts](#)
- [Student Glossary](#): Biomass technology has its own vocabulary, so this glossary may help you better understand the information. The glossary for researchers is also available if you need more technical definitions.
- [Bioenergy Conversion Factors](#): A handy set of energy unit conversions and energy content values for biomass.

If you are in elementary or middle school, the following links may be helpful:

- [International Energy Agency Educational Web Site on Biomass and Bioenergy](#)
- [The Energy Information Administration's Kid's Page](#)
- [CANMET Energy Technology Center's Kid's Fun](#)
- [Energy Quest website by the California Energy Commission](#)

Information about biomass and bioenergy for the general public.

Organisations

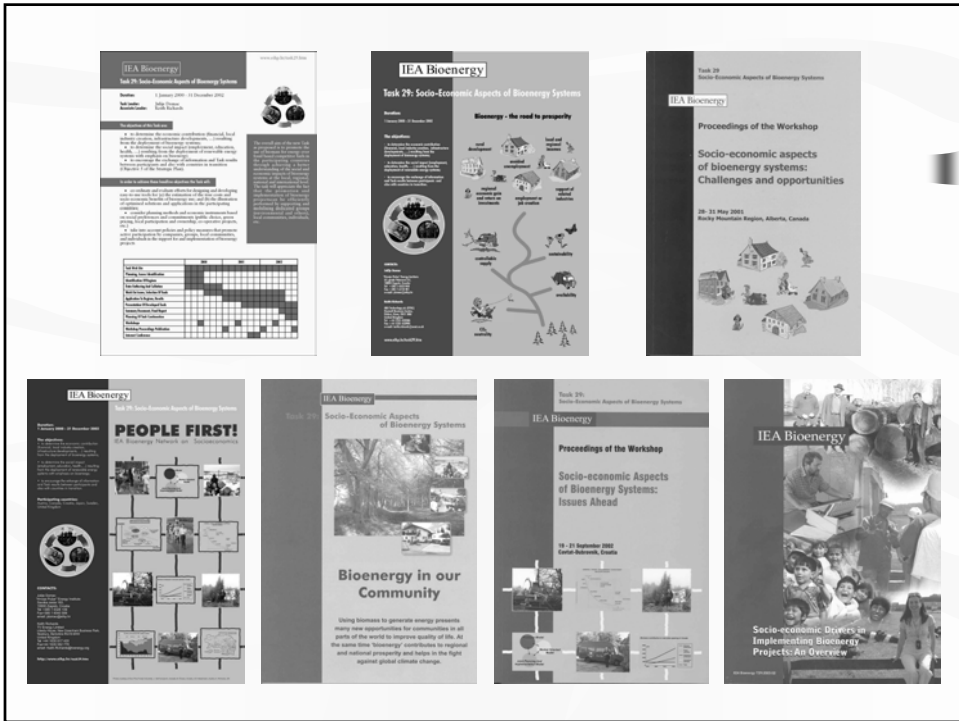

Complete the [Questionnaire](#) to add your organisation to this website

FRANCE

**IEA Bioenergy**

**Socio-economic Drivers in Implementing Bioenergy Projects: An Overview**

IEA Bioenergy T29-2003-02

Also:  
[www.iea.org](http://www.iea.org)  
[www.ieabioenergy.com](http://www.ieabioenergy.com)  
[www.iea-bioenergy-task29.hr](http://www.iea-bioenergy-task29.hr)

More information at:  
[www.aboutbioenergy.info](http://www.aboutbioenergy.info)  
 or  
[jdomac@eihp.hr](mailto:jdomac@eihp.hr)