

Information kit 12

Biomass & biofuels

The European Union has reassessed its energy policies in recent years in the face of rising greenhouse gas emissions, high prices for traditional fuels and over-reliance on imports from volatile parts of the world. Growing concerns over climate change and the security of energy supplies have underlined the need for alternative energy sources.

Biomass and biofuels have a vital role to play in the energy mix of the future. Provided suitable checks are in place to ensure sustainability, they can help to replace fossil fuels and mitigate climate change.

Biofuels produced in Europe can deliver serious CO₂ reductions – between 35 and 50% compared to fossil fuels. Transport, which currently depends almost entirely on oil-based energy, is responsible for 26% of all greenhouse gas emissions. This key economic sector, amongst others, is suffering from high-energy prices and there is a demand for new sources of energy.

Small-scale energy generation systems based on local supplies of bioenergy can help strengthen local infrastructure and ensure secure supplies. Bioenergy also has the potential to revitalise the agricultural sector and help rural areas diversify their economies.

What is the EU doing?

Policies

- The climate action package, agreed upon in 2008, sets the following targets for 2020: 20% reduction in greenhouse gases; 20% increase in energy efficiency; and an increase in renewable energies to 20% of total energy consumption.
- The Commission has proposed a minimum target of 10% of vehicle fuel to come from biofuel by 2020, ensuring that they come from sustainable sources.
- The 2003 biofuels directive (2003/30/EC) aims to boost the production and consumption of biofuels in the EU.
- The Biofuels Progress Report analyses the progress made in the use of biofuels across the EU.
- In 2006, the Commission issued an EU strategy for biofuels, following on from an 2005 action plan. The aims are to increase the use of energy deriving from forestry, agriculture and waste material. It also includes a "biofuels obligation" for transport fuels to include a minimum proportion of biofuels.

Funding

- The **Intelligent Energy Europe Programme** (IEE 2007-2013) supports biofuels projects such as the "Establishment of regional biomass markets through plant partnerships" to support 'less advanced' biomass countries (http://ieea.erba.hu/ieea/page/Page.jsp?op=project_detail&prid=1460&side=projectbrief).

- The **Seventh Framework Programme** for Research and Technological Development (FP7 2007-2013).
- Energy and climate projects under the **LIFE+** programme can include biomass and biofuels.
- The **European Agricultural Fund for Rural Development** (2007-2013).
- Sustainable energy is a priority for **Structural Funds** for 2007-2013.

Other Initiatives

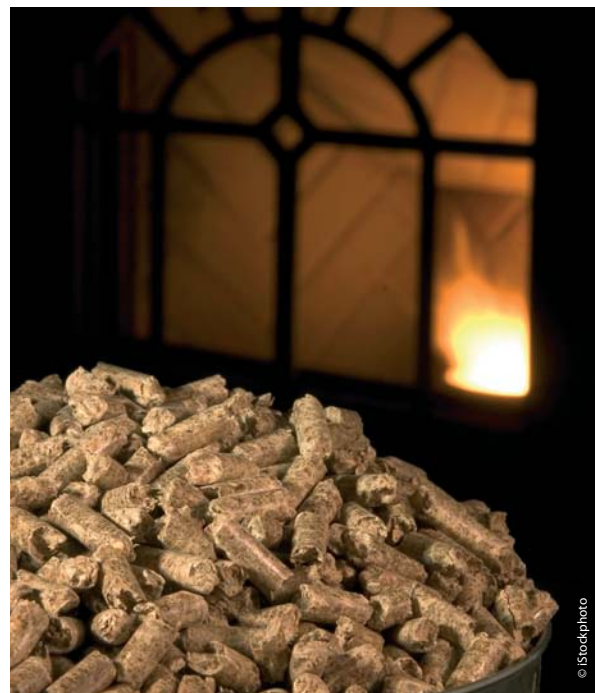
- **ManagEnergy** supports capacity building to strengthen local and regional energy actors and provides information on best practices and funding opportunities.
- 18 **Concerto** projects focus on demonstrating the environmental, economic and social benefits of integrating renewable energy sources (RES) and energy efficiency (EE) techniques at community level. <http://concertoplus.eu/>.
- **ELTIS** and **CIVITAS** promote sustainable urban transport and mobility. See www.eltis.org and www.civitas-initiative.org/.
- Through the **Covenant of Mayors**, cities and towns across Europe have committed to cutting CO2 and increasing renewable energy. http://ec.europa.eu/energy/sustainable/covenant_mayors_en.htm.

Biomass and biofuels at a glance

Biomass describes any material of organic origin that can be used to produce energy, including trees, crops, algae and plants, as well as household, agricultural or industrial waste.

Biomass exists in many forms and can make solid, liquid or gas fuels. Solid biomass, such as wood and straw, can be put through processes including combustion, pyrolysis, hydrolysis or gasification to produce bioenergy.

Meanwhile, 'biofuel' is the term normally used for liquid fuels made from agricultural crops or plants. There are usually two types: biodiesel and bioethanol. Biodiesel is produced from plants such as sunflower or rapeseed, while bioethanol derives from the fermentation of sugar, cereals, fruits or even wine distillation.



Applications of biomass and biofuels

At present biofuels offer the only viable way to reduce significantly the transport sector's almost complete dependence on oil.

Biomass can replace traditional high CO₂ emitting energy sources and can create more sustainable buildings through heating and cooling applications.

The use of animal waste, used oils and other organic wastes as a source of energy also helps to reduce waste, and so contributes to solving associated environmental problems.



Good practice

Fossil fuel, Kristianstad (Sweden)

Kristianstad, a Swedish town of 75,000 inhabitants, aims to wean itself off oil and power everything in the city with renewable energy.

In 1999, the city set itself the ambitious goal of becoming completely fossil fuel-free and it created a broad climate strategy, including initiatives on both energy and transport.

Biofuels are promoted for heating, electricity generation and transportation. The city has developed a biomass-fuelled combined electricity and heating plant, which produces around 285,000 MWh of electricity per year, and has converted boilers in 43 public buildings to use biofuel pellets. The municipal waste company produces some 40,000 megawatts per year of biogas and the wastewater treatment plant produces a further 6,800 MWh.

The municipality is also encouraging motorists to use biogas by covering 50% of the cost of purchasing a biogas vehicle.

Overall, the city's efforts have reduced CO₂ emissions by a tenth over the past decade.

For details, see:

<http://www.managenergy.net/products/R1911.htm>

Bioenergy and sustainable local development

Bioenergy can be an important source of diversification for rural economies, helping to balance the distribution of agricultural activities across the EU and create jobs in areas of high unemployment.

Major EU initiatives, such as the Covenant of Mayors, can help drive increasing use of renewable sources of energy and the production and use of bioenergy, particularly in rural municipalities or rural areas surrounding cities.

Local partnerships can help local authorities, energy agencies, technology suppliers, energy experts and business associations work together to increase the use of renewables.

However, there are some important sustainability considerations. Biomass and biofuels are not totally carbon free as there are always some emissions from processes such as cultivation and

fuel production. And biofuels and biomass can have negative environmental impacts, especially on biodiversity. Therefore the production of biomass and biofuels must respect criteria of environmental sustainability.

If managed correctly, energy crops can bring benefits for the land, flora and fauna. Crops such as short rotation coppice can be grown in low-fertility land, helping to increase habitats for birds and animals, retain soil, prevent erosion and regulate water flows. They bring areas of woodland with no other commercial use into productive use. Better forest management and the clearing out of dead material for bioenergy can also help to prevent forest fires.

Good practice

Cultivation of energy crops - A chance for development in the rural areas of Podlaskie Voivodship

This project, which took place during 2004 and 2005, aimed to highlight the value of energy crops as an alternative source of income to farmers and entrepreneurs.

A series of nine seminars took place in various places in northeast Poland. Subjects covered included: technical aspects of growing biomass crops; the legal and logistical framework of bioenergy in Poland and the EU; sources of financing; energy saving and awareness raising; and energy market issues.

Results include:

- Over 125 participants took part;
- The area of energy crops planted in the region increased;
- The number of buildings and farms powered by bioenergy increased;
- A regional market for biomass has developed;
- The amount of money spent on traditional fuels has decreased.

For details, see:

<http://www.managenergy.net/download/gp2005.pdf>

Local and regional energy actors and bioenergies

Energy agencies can help make local and regional actors more aware of the potential of biomass and biofuels, and underline the economic, social and environmental benefits.

The involvement of civil society is important and can be helped by information and educational activities, for instance when biomass plants are opened up. Necessary information should be available for potential users, for example on household heating systems.

The Covenant of Mayors can lead to an increase of the use of renewable energies and at the same time strengthen the role of local and regional energy agencies in providing information and advice in this field, particularly for smaller municipalities with fewer resources.

What is ManagEnergy?

ManagEnergy is an initiative of the European Commission Directorate-General for Energy and Transport. It aims to support local and regional actions on energy efficiency and renewable energies through training workshops and on-line events. In addition, information is provided on case studies, good practice, European legislation and programmes.

ManagEnergy is also a European network of local and regional energy agencies (LEAs). These agencies promote the introduction of good energy management practices, support sustainability, provide information and guidance, and offer other services depending on local needs.

www.managenergy.net

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