



DEPARTMENT OF AGRICULTURAL ECONOMICS AND ENGINEERING  
UNIVERSITY OF BOLOGNA

**"STUDY ON IMPLEMENTING THE ENERGY CROPS CAP MEASURES  
AND BIO-ENERGY MARKET"**

**Final Report**

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*November 2006*

*This study has been financed by the Commission of the European Communities and produced by the Department of Agricultural Economics and Engineering of the University of Bologna.*

*The conclusions, recommendations and opinions presented in the report reflect the opinion of the consultant and not necessarily the opinion of the Commission*

*Bologna, November 2006*

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**GLOSSARY***Agricultural biomass*

Solid biomass from agriculture. It includes dedicated energy crops as well as residues from agricultural activities (forestry and non-forestry).

*Bio-fuels*

Fuels produced from renewable resources. Liquid bio-fuels cover bio-ethanol (ethanol produced from biomass), bio-diesel (diesel produced from biomass or used fried oil), biomethanol, biodimethylether and bio-oil (a pyrolysis oil fuel produced from biomass).

*Bio-gas*

Bio-gas is a gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass. It comprises landfill gas, sewage sludge gas and other bio-gases such as bio-gas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and agro-food industries.

*Break even price*

Given the crop  $i$  and the alternative land use  $j$ , the break even price of the crop  $i$  is the minimum price such that the gross margin of the crop  $i$  becomes higher than the gross margin associated to the alternative land use  $j$ .

*Energy available for final consumption*

Energy available for final consumption covers the energy put at the final users' disposal.

*Final energy consumption*

Final energy consumption covers energy supplied to the final consumer's door for all energy uses.

*Gross inland consumption*

Gross inland consumption represents the quantity of energy necessary to satisfy inland consumption of the geographical entity under consideration. It represents a measure of the energy inputs to the economy and it is calculated by adding total domestic energy production plus energy imports minus energy exports, plus net withdrawals from existing stocks.

*Gross margin*

The gross margin is the output (market) value from growing a particular arable crop plus any relevant crop specific, area-based support payments, less the variable costs associated with the production of the crop.

*Input to autoproducers thermal power stations*

Input to autoproducers thermal power stations consists of fuels transformed into electricity as well as the part of fuels used for the heat sold to third parties (Combined heat and power plants) by autoproducer thermal power stations. Autoproducer thermal power stations are defined as undertakings which generate electricity wholly or partly for their own use as an activity which supports their primary activity.

*Input to conventional thermal power stations*

Input to conventional thermal power stations covers fuel or geothermal heat transformed in conventional public utility power stations for the production of electricity and heat, as well as in autoproducer power stations for the generation of electricity and heat sold to third parties only. Public supply thermal power stations are defined as undertakings which generate electricity (and heat) for sale to third parties as their primary activity. They may be privately or publicly owned. Autoproducer thermal power stations are defined as undertakings which generate electricity wholly or partly for their own use as an activity which supports their primary activity.

*Input to district heating plants*

Input to district heating plants consists of fuels used in district heating plants. Delivered heat may be used for process or space heating purposes in any sector of economic activity including the residential sector.

*Input to public thermal power stations*

Input to public thermal power stations consists of fuels transformed into electricity and heat (if any) in public thermal power stations. Public supply thermal power stations are defined as undertakings which generate electricity (and heat) for sale to third parties as their primary activity. They may be privately or publicly owned.

*Inter-crop choice*

Choice among different crops.

*Intra-crop choice*

Choice between conventional and energy use of the same crop.

*Primary production*

Any kind of extraction of energy products from natural sources to a usable form is called primary production. Primary production takes place when the natural sources are exploited, for example in coal mines, crude oil fields, hydro power plants or fabrication of bio-fuels. Transformation of energy from one form to another, such as electricity or heat generation in thermal power plants, or coke production in coke ovens, is not primary production.

*Solid biomass*

Solid biomass is generally referred to as the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste (Directive 2001/77/EC).

However, the scope of this work concerns energy crops and agricultural residues only.

Reference is regularly made in the text regarding the use of either definition.

*Transformation input*

Transformation input covers all inputs into the transformation plants destined to be converted into derived products such as electricity and heat. For example wood is a transformation input when it is burnt in a combustor in order to generate electricity.

*Variable costs*

Seed, fertiliser, crop protection, machinery/contracting, other variable costs.

**LIST OF ABBREVIATIONS**

AEC	aid for energy crops
AP	area payment
bbl	barrel (oil)
BEP	break even price
BFBC	bubbling fluidised bed combustor
CAP	Common Agricultural Policy
CCGT	combined cycle gas turbine
CHP	combined heat and power
DAM	direct aid measure
EBB	European bio-diesel board
eBIO	European bio-ethanol fuel association
EC	European Commission
EQ	Evaluation Question
ETBE	ethyl tertiary butyl ether
EU	European Union
EU-ETS	EU Emissions trading scheme
FAME	fatty acid methyl ester
FC	full cost
FI	feed-in tariff (scheme)
GHG	greenhouse gas/es
GM	gross margin
MS	Member State/s
NAP	national allocation plan (under the EU-ETS)
NExBTL	next generation biomass-to-liquid
NFSA	Non Food on Set Aside
NMS	New Member States
O&M	operation and maintenance
RDM	rural development measure
RE	renewable energy/ies
RES	renewable energy source/s
RES-E	electricity from renewable energy sources
RES-H	heating from renewable energy sources
RES-T	renewable energy sources for transport
RME	rapeseed methyl ester
SAPS	Single Area Payment Scheme
SRC	short rotation coppice
TGC	tradable green certificate
toe	tons of oil equivalent
VAT	value added tax