

RENEWABLE ENERGY, THE ENVIRONMENT AND AGRICULTURE **SHORT ROTATION COPPICE (SRC)**

Background

1. The potential for renewable energy sources to substantially contribute to world energy consumption has long been recognised. In 1987, the World Commission on Environment and Development called for “every effort to be made to develop the potential for renewable energy, which should form the foundation of the global energy structure during the 21st century” (WCED, 1987: 195).
2. The EU has taken these concerns on board. In 1986 already, the Council had listed the promotion of renewable energy sources among its energy objectives. In a Green Paper published in 1996, the European Commission’s Energy Directorate (DGXVII) reaffirmed its commitment to increasing the use of renewables. The development of renewable energy sources was beneficial for both environmental and economic reasons. Not only could it contribute to protecting the environment, and help the EU to meet its CO₂ emissions targets, it could actively contribute to employment creation and to regional development, with the objective of achieving greater social and economic cohesion between the regions of the Community.
3. The Commission has now approved a White Paper (December 1997) entitled “Community Strategy and Action Plan for Renewable Energy Sources”, which sets an overall EU target of doubling the contribution of renewables by 2010, from its current level of less than 6% of the EU’s energy consumption. As part of this is a target for 10 million hectares of land in the EU to be planted with renewable energy crops for heat and electricity production by 2010 (this compares with 7.4 mn ha set aside in the 1995/96 marketing year).
4. Short Rotation Coppice (SRC) is well developed in Austria, Finland and Sweden, where it is acknowledged to provide substantial environmental benefits. SRC, for instance, acts as a carbon sink: growing biomass increases the stock of carbon immobilised in vegetation, and the use of new generation boilers not only increases the energy-efficiency of SRC use, but also releases half to a quarter less greenhouse gases as natural gas or diesel-heating units. SRC can also act as a vegetation filter for the removal of polluting materials from the environment. In some areas, it can contribute effectively to the fight against soil erosion, or against flooding. Last, but not least, SRC also contributes to preserving biodiversity. Researchers at Munich University have found for instance that biodiversity in short rotation coppice is closer to that of conventional woodland than that of intensively farmed land, as measured by the presence of indicator species (e.g. earthworms).
5. The production of fuel from the establishment of SRC remains generally uncompetitive both as a land use against CAP supported crops, and against fuel produced from waste products including forest residue. Where it is established in the EU it has been created under national aids and market measures.

The latest Commission proposals

6. In the White Paper, the Commission proposes to develop the renewables market by, among other measures, supporting the provision of 10,000 MW of biomass installations, ranging in scale from a few hundred kW to multi-MW plants.
7. Under existing and proposed Directives described in the White Paper, Member States are to provide for:
 - fair access to the electricity and gas markets;
 - tax and finance measures;
 - the new bioenergy initiative for transport, heat & electricity;
 - amendments to building regulations and town & country planning procedure .
(See Annex 3 for more details)
8. The Commission also calls for agricultural and forestry policy to include consideration of the following goals:
 - energy crop production on more than 10,000 ha of land by 2010;
 - association of the CEEC countries in a proactive energy crop policy;
 - support for bio-based renewable energies in the CAP's rural development and other ongoing programmes;
 - financial support for wind & biomass cogeneration in farming communities in order to provide additional income;
 - extension of the regulation on processing and marketing of agricultural products wherever feasible to all types of biomass;
 - specific inclusion of biomass promotion in rural areas within the structural fund regulations.
9. As is set out in Annex 3, the White Paper also calls for "rapid agreement on a guaranteed minimum land area and secure set-aside conditions under the CAP". These conditions are not really met by the *Agenda 2000* proposals, which call for the reference rate for compulsory set-aside to be fixed at 0%, though they allow voluntary set-aside to continue. Because of the time-frame involved with the establishment of SRC, and the longer pay-back period than with conventional crops / set-aside, it may be desirable for the Commission to provide additional guarantees to landowners that payments on set-aside land used for SRC will be made for a given minimum number of years.
10. It must be added, moreover, that experience to date suggests that set-aside payments do not provide sufficient incentives for the planting of SRC. When the national aids for establishing SRC in Sweden were replaced with set-aside payments, new planting declined substantially. Notwithstanding the well developed market for SRC products and the lower costs of establishment in Sweden, SRC is not competitive at current low levels of support. This is a predictable result given the crop cycle costing analysis set out in Annex 1, which shows that with an annual grant payment of ECU 810/ha (far more than the estimated ECU 310/ha which will be paid for set-aside under *Agenda 2000*), the payback period for SRC is of at least 5 years.
11. Accordingly, set-aside policies as outlined under *Agenda 2000* will not put in place a sufficient incentive to landowners in order to achieve the desired planting target.

The ELO's position

12. The ELO welcomes the Commission's policy on renewables, particularly its recognition of the likely benefits to the rural economy and environment and supports its full introduction by Member States throughout the EU.

13. The ELO calls on DGVI to recognise that the development of a substantial planted area of biomass within the time-scale set out in the Commission's White Paper will require, in addition to any market development measures taken under the EU's energy policies, that support for biomass matches the support which 'conventional' agricultural productions will receive under *Agenda 2000*.
14. This additional support can only be justified on the basis of providing a level playing field between CAP-supported crops and energy production from biomass in order to remedy distortions which would otherwise limit the area planted. In this light, the ELO recommends that additional funding for energy crop production under the *Agenda 2000* reforms be based on the following:
 - a one-off establishment contract to reflect the current high costs of establishment of SRC crops. This grant could reduce in time, to reflect the potential cost savings that will be achieved through improved techniques and economies of scale (see Annex 2);
 - an annual contract payment designed to reflect the difference between returns achievable for SRC as against other CAP-supported cropping;
 - this annual contract payment might be directly linked to a basket of other CAP support payments. It should be guaranteed and index linked for a minimum period to give confidence to prospective producers. The example in Annex 1 uses the figure of ECU 815/ha, roughly equivalent to the amount payable for flax under Council Regulation 1415/97.
15. Support for SRC would be directed at a non-food product, and would thereby constitute a shift, for a given area of land, from agricultural production-related support to decoupled non-food contract payment. As such, this should be acceptable under the terms of the WTO.
16. The ELO would also recommend that SRC establishment and maintenance payments should be attached to processing contracts in much the same way as other CAP supported industrial crops. This would ensure that supply and demand develop jointly, and would act as a control to the planting on environmentally sensitive land. SRC grown for use on the farm to replace other fossil fuel energy supplies should also qualify for these payments.
17. In the same context, the ELO recommends that the implementation of the Commission's proposals for the development of the market for the produce be given priority to ensure that planting matches processing capacity.
18. The ELO recommends that such arrangements support be provided from EAGGF-Guarantee funds on an EU wide basis but as part of the new Regional Development initiatives and not as an extension of crop production policies. As was discussed above, such funding will be necessary for the whole crop cycle for early plantings. We would hope however that, as the biological potential of the crop is improved and establishment costs fall with improved techniques and economies of scale, future plantings would require considerably less support (see Annex 2).

Conclusions

19. The potential clearly exists for developing a sustainable SRC energy policy. The current European and international context is one in which there is clear pressure for reducing direct price support on 'conventional' agricultural output. At the same time, there is growing demand from society for land managers to manage the land in more environment-friendly ways. SRC provides land managers with an opportunity to diversify their range of activities, while growing an environment-rich crop.
20. As profit-margins on conventional agricultural output tighten, the production of SRC can also contribute to local rural and economic development, by anchoring local jobs and creating a new industry. This rural and economic dimension of SRC is one

which the ELO strongly supports. In this context, the ELO would encourage the Commission to explicitly include biomass projects in the objectives of the new Structural Funds, and in particular in the new rural development Community Initiative.

21. SRC is not yet currently profitable. As this paper has shown, this is due to the combined effect of the competition in land-use terms by CAP-supported crops, and to the comparatively embryonic level of technological development of renewable energy technologies (compared to fossil fuel technology). This double bind justifies the use of a proactive policy by the EU, to remedy these competitive distortions by jump-starting the industry.

ELO POLICY GROUP
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**Any comments or queries on this submission should be addressed to the
Secretary-General of the ELO at the address below**

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ANNEX 1

Crop cycle analysis of SRC production (current prices in ECU/hectare)

year	1	2	3	4	5	6	7	8	9	10	11
COSTS											
prepare land(1)	90										
planting(1)	410										
willow setts(1)	1270										
fencing(1)	560										
first cut(1)	40										
weed(1)	390	35	35	35	35	35	35	35	35	35	35
harvest(5)				1080			1450			1450	
grub up											
rent(4)	260	260	260	260	260	260	260	260	260	260	260
mgt overheads (5)	300	300	300	300	300	300	300	300	300	300	300
Total cost	3320	595	595	1675	595	595	2045	595	595	2045	595
INCOME											
ECU 60/t price assumed(7)				1620 (27t)			2160 (36t)			2160 (36t)	
profit	-3320	-595	-595	-55	-595	-595	115	-595	-595	115	-595
establishment grant(2)	1340										
annual grant(3)	815	815	815	815	815	815	815	815	815	815	815
return	-1165	220	220	680	220	220	930	220	220	930	220
running balance	-1165	-945	-725	-45	175	395	1325	1545	1765	2695	2915

Explanatory notes to the costings

1. Initial costings drawn from industry sources including the Brook Hall Estate demonstration project recently completed in Northern Ireland.
Costs reported in Sweden are lower, owing to better availability of willow setts from a larger planted area.
2. Grant requirement based on discussions with British Biogen.
3. Subsidy rates are equivalent to flax payments under current CAP.
4. Rent based on current UK better quality land rates. It is important that the regime is not limited only to areas that currently qualify for Arable Area Payments, as it Willow is equally well suited to growth in wetter pasture and livestock areas, where it may also be able to perform useful pollution control functions.
5. Management overheads exclude labour costs as these are included in the direct costs detailed.
6. The harvest cost includes chipping, carting to barn, drying and a small allowance for transport to the end user. Long distance transport of the material is not economic.
7. The assumed price is based on dry Tonnes, compared on a like for like basis with the calorific value of Coal at current UK prices, taking a midway point between large industrial supplies and domestic prices for delivered coal.
8. The harvest yield is based on industry estimates following field trials. It is expected that the crop has a much greater yield potential which plant breeding will exploit in subsequent plantings.
9. Prices are expressed at constant rates in ECU at the current rate of 0.671 ECU/t and on a per hectare basis. No assumptions have been made as to inflation or relative price changes, but it should be noted that oversupply and price competition from forest products in Sweden have led to constant prices in nominal terms over a period of some years, equivalent to real price falls. Price maintenance will depend on markets developing at the same rate as supply.

POTENTIAL COST SAVINGS IN ESTABLISHMENT OF SRC

Current costs

Current costs are high owing to a number of factors, including:

- limited availability of willow setts for planting stock;
- lack of mechanisation of the production of setts;
- limited experience with planting out by mechanical means;
- lack of competition;
- limited availability of specialist machinery.

This has led to UK audited establishment costs of ECU 2,760 (£ 1,850) per hectare for demonstration plots.

The future

It is forecast that as the area planted increases, the price of willow setts and the cost of planting will fall steeply. Further increases in planted area will stimulate competition, particularly among suppliers of setts and specialist machinery and contract services, leading to a further cost saving.

Furthermore, the crop is at a very early stage in its commercial development. Both improved husbandry and plant breeding may reasonably be expected to deliver very much higher yields per hectare in plantings made in a few years' time.

It is difficult to predict at what stage such effects might become apparent. In an EU context, it is assumed that significant establishment cost reductions will occur by the time 25% of the targeted total of 10 million hectares has been planted, given reasonably widespread development across the EU.

The expected yield improvements may take 5 to 10 years to show significant results, but better crop husbandry will help improve viability over a shorter time-scale.

The model

Annex 1 suggests an initial planting grant of the order of ECU 1,340 (£ 900) per hectare will be required. This figure may need adjustment depending on how far the market responds.

The annual compensation payment, whilst clearly necessary for the whole crop cycle of early plantings, will become progressively less important to the viability of the crop as yields increase. This can be assessed on a year by year basis for new entrants to the scheme.

COMMISSION OF THE EUROPEAN COMMUNITIES (1997)
COMMUNITY STRATEGY AND ACTION PLAN FOR RENEWABLE ENERGY
SOURCES

Summary of the measures outlined under the Commission's Action Plan aimed at developing the EU's renewable energies potential

1. Fair access for renewables to the electricity and gas markets

- Access for renewables to the electricity networks at fair prices, through the implementation of existing directives (on new generation capacity construction; on market liberalisation). Rationalisation of the electricity procurement process through Integrated Resource Planning which requires renewables to be included in assessment of conventional electricity generating proposals.
- A further Council directive requiring:
 - equal treatment between electricity generated by different means;
 - network operators to accept renewable electricity when offered to them, subject to provisions on transport in accordance with the liberalisation directive;
 - prices for renewable electricity to at least equal to the avoided costs on a low voltage grid plus a premium to reflect social benefits (including carbon tax exemption);
 - sharing of connection costs to grid networks between renewable generators and grid operators.
- Suitable provisions at Member State level, including:
 - equal treatment for renewable energy power plants in construction and planning procedures;
 - individual member state targets for renewable energy, within the framework of the overall Community targets.

2. Tax and Finance measures

- Measures so far available under Community Instruments:
 - tax exemption or reduction for renewables under art 13 to 16 of the proposed directive on energy products taxation;
 - income tax or corporate tax rebate or exemption for renewable energy investments or purchases;
 - accelerated depreciation of renewable energies investments;
 - favourable tax treatment for third party financing of renewable energies;
 - application of lowest VAT rates to renewable energy products and services;
 - start up subsidies for new production plants, SMEs and new job creation.
- Additional measures not yet included in Community instruments; to be promoted:
 - "Green" funds as part of tax incentive policies. The lower interest rates paid on these accounts attract a lower tax rate on the yield, but also enable the bank to provide soft loans to renewables projects;
 - public renewable energy funds, financed by government levy or taxes on all conventional energy, for investment and credit guarantees for renewables.

3. The new bioenergy initiative for transport, heat & electricity

- Liquids
 - introduction of liquid biofuels in the transport sector;
 - adoption of a Council directive on excise duties on biofuels
- Gas and Wood
 - incentives for biogas usage produced by anaerobic digestion of farm and other wastes;
 - new district heating systems run on biomass
 - incentives for upgraded biofuels (chips & pellets) and for exploitation of forest, wood and paper industry residue;
 - plans for biomass production on more than 10 mn ha of agricultural and forestry land by 2010. This policy must be carefully integrated with the conditions set under the proposed new CAP. The crops under consideration are those offering minimum pest control, fertiliser and water needs and which can be extensively farmed. A degree of preference has to be given to multi-purpose crops, such as those combining useful yields of cellulose, sugars and grains.
 - need to anticipate the extension as appropriate of the relevant provisions regarding biomass to any new biomass policy.

4. Building regulations and town & country planning

- a mandatory approval step to be added to current planning measures as regards the use of solar energy for heating and cooling;
- promotion of high energy efficiency buildings;
- promotion of active solar energy systems for buildings;
- building regulations to include a mandatory minimum surface of photovoltaic panels amounting to 50W per single dwelling equivalent except where impractical;
- photovoltaic electricity sales to utilities to be remunerated at 100% of the consumer price;
- measures to encourage use of building materials with a low energy content.