



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 12.03.1997
COM(97) 122 final

REPORT FROM THE COMMISSION

ON

THE RESULTS OF THE ALTENER PROGRAMME

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1. Introduction.

The Council on 13 September 1993 adopted the decision to set up the ALTENER Programme (93/500/EEC)¹. The approval of the programme was the culmination of several steps and decisions within the Community. In 1986 the Council adopted a resolution concerning new Community energy policy objectives for 1995 and stated that the contribution of new and renewable energy sources "should increase substantially" to replace traditional fuels. Another Council resolution a few months later confirmed the importance of developing new and renewable energy sources in the Community. In 1988, a review of the progress towards the 1995 objectives stated that "it attributed particular importance to renewable energy sources for future energy supplies."

On 29 June 1992 the Commission submitted a Communication (COM(92) 180 final) containing an action plan for 1993-1997 concerning renewable sources of energy and a proposal for a Council Decision. This led to the Council Decision of 13 September 1993. The programme formally started on 1 January 1993 with a limited budget.

The purpose of the ALTENER Programme is to promote renewable energy sources in the Community. The programme, which covers a five year period (1993 - 1997), was given an indicative budget of 40 MECU. By the end of the programme the budget will be likely to total 44 MECU, including the additional funding made available due to the enlargement of the Community on 1 January 1995 and due to the extension of the programme to the EEA.

The ALTENER programme is an integral part of the Community's strategy to reduce carbon dioxide emissions. This is further specified in the Annex to the ALTENER Decision which contains a series of specific indicative objectives for CO₂ emission reductions achieved through development of renewable energy sources.

According to the Council Decision, the Commission is responsible for the implementation of the programme, assisted by a committee (the ALTENER Committee). The Commission is furthermore, in accordance with Article 8 of the ALTENER programme, requested to submit a report on the results of the programme. The present Communication constitutes the report for the first three years of the programme. As the Council Decision was only made in September 1993, the report covers most of the activities undertaken in 1996.

¹ OJ L 235/41 of 18.9.1993

It should be emphasised that the present report does not constitute an evaluation of the programme. It is considered that a full evaluation of the programme can only be undertaken once the programme has expired and once the majority of projects which have been launched have been completed. However, as the report coincides with the launching of the proposal for a renewal of the programme some preliminary conclusions are drawn which can provide a useful input to the decision making process concerning ALTENER II. The report should therefore be considered in conjunction with the proposal for ALTENER II.

2. The ALTENER Programme

The Council Decision on ALTENER states in Article 1 that the Member States "shall endeavour to contribute in their energy policies to the limitation of carbon dioxide emissions by taking account of the Community's indicative objectives" for renewable energy. To this end, the ALTENER programme, as outlined in Article 2 of the Council Decision, is designed to support a series of actions to promote renewable energy sources.

There are four categories of actions outlined in the Council Decision (Art.3):

- a) Studies, market strategies and technical evaluations for defining technical standards or specifications (Article 3 (a))
- b) Measures to support Member States' initiatives to extend or create infrastructures. These include training and information activities as well as a variety of sectoral actions (Article 3(b));
- c) Measures to help create an information network to promote "better coordination between national, Community and international activities" and "at evaluating the impact the various actions" of Article 3 (Article 3(c));
- d) Studies, evaluations and other measures to assess the technical feasibility and advantages for both the economy and the environment of the industrial exploitation of biomass for energy purposes (Article 3(d)).

The Community provides different levels of funding for the different categories. It can range from 30 per cent for the biomass measures to 100 per cent for the studies and technical evaluations. By the end of 1996 more than 38 MECU out of the Indicative budgetary envelope of 40 MECU had been committed.

Before a detailed examination of the individual elements of the ALTENER programme, it is useful to have a general overview of activities. The budget (ALTENER share) by programme element is set out in table 1 below.

Table 1: Budget allocation for the various programme elements
(See annex)

The total amount of 38.221 MECU for the period 1993-96 represents the Community's share and excludes support provided within Member States. Adding in other contributions, the total expenditure for ALTENER activities amounts to about 74 MECU.

3. Results achieved.

3.1. Studies and technical evaluations for defining technical standards and specifications

According to policy changes in Community standardisation activities the actions for defining technical standards or specifications under this Article were re-oriented. Instead of Community-wide directives, the strategy is to develop standards through organisations such as CEN² and CENELEC³. Because of that, the ALTENER actions under Article 3 (a) have concentrated on studies and technical evaluations of a more general nature. These actions can be considered as tools for market development because they are used to help increase the penetration of renewables in the marketplace. To support the better functioning of the internal market, the main purpose of ALTENER's studies are to identify barriers, develop European-wide standards and identify the potential for renewable energy resources.

Concerning funding, Article 4 of the Council Decision indicates that all the costs relating to the actions under Article 3 (a) can be borne by the Community. The standards being developed at present by CEN and CENELEC are being financed by the programme at a share of 95 per cent with the rest being provided by the countries of the EFTA. This is normal procedure for developing standards. The long process for standards development means that the standards will be ready in 1998 or 1999.

Studies

From 1993 to 1996, 18 major studies were funded under ALTENER Article 3 (a). Tables 2 and 3 below reflects the situation.

² Comité Européen de Normalisation

³ Comité Européen de Normalisation Electrotechnique

Table 2
ALTENER studies and funding

Year	1993	1994	1995	1996	Total ALTENER
Number	6	3	6	3	18
Total Cost (ECU)	891.8	611.4	1,832.9	1,005.6	4,341.7

Table 3
ALTENER studies by resource (number)
1996

	General	Hydro	Wind	Solar Thermal	PV	Biomass	Geoth.	Total
1996	1			1			1	3
1995	2	1	2				1	6
1994	1			1		1		3
1993	1	2			1	2		6
Total	5	3	2	2	1	3	2	18

By final energy, six studies relate to electricity (hydro, wind and photovoltaics), four to thermal (solar thermal and geothermal), and three to biomass. Five general studies are being elaborated on potential and development of renewable energy sources. The studies launched in 1995 and 1996 have not been completed, but interim reports are available. Studies undertaken between 1993 and 1996 include:

- European strategy for biomass, biofuels and mini-hydro (1993)
- Harmonisation and standards for wood heating equipment (1993)
- Phase 2 of the European Atlas (soft-ware) of small hydropower potential (1993)
- Photovoltaics: examination of the present situation of technology, the industry and the market (1993)
- General procedures for the authorisation of small-hydro installations in the Community (1993)
- The role of renewable energy in Europe (1994)

- The energy balance, ecological impact and economics of vegetable oil methylester production in Europe as a substitute for fossil fuel (1994)
- The solar thermal market. A strategic plan for action in Europe (1994)
- Guide to standards and procedures for planning of the wind energy in the EU (1995)
- Introduction of a European insurance scheme to cover the geological risk related to geothermal operations (1995)
- The European Renewable Energy Study, TERES II. The prospects for Renewable Energy in 30 European Countries from 1995-2020 (1995).
- Comparative assessment of system charges for renewable generation in Member Countries (1995)
- Promotion of wind energy by the production and dissemination of an updated and expanded EWEA (European Wind Energy Association) strategy document (1995)
- European Atlas (soft-ware) of small-scale hydropower resources – Phase III (1995).
- Blue Book on geothermal (1996).
- ENER-IURE (1996).
- Solar Thermal Strategy (1996).

Standards

With respect to the standards selected for development by ALTENER, it was decided to concentrate on equipment related to solar thermal and wind energy. In addition CEN/CENELEC was in 1996 asked to prepare standards for photovoltaics and for biodiesel. The mandate for thermal solar panels include six standards , i.e.:

- Collectors; general requirements.
- Collectors; test methods.
- Factory made solar systems, general requirements.
- Factory made solar systems; test methods.
- Custom built solar systems; general requirements.
- Custom built solar systems; component thermal performance characterisation and system performance prediction.

The mandate includes not only the standard formulation, but also an inquiry between members of EFTA, the formal adoption of the standard by CEN/CENELEC and the implementation.

For wind turbines the mandate is to prepare a coherent set of European standards for wind turbines, to create a common technical environment for all enterprises and to improve industrial competitiveness.

The total cost for standards committed until now is a total of 756,619 ECU, of which 224,551 ECU has been paid as of June 1996. Table 4 summarises the data.

*Table 4
Cost for development of standards (1993-1995)*

CEN/CE-NELEC	Standard	Total Cost ECU	Paid (June 96)	Year Contract	Expected end by
M077	Thermal solar panels	434.433	176.224	1994	1999
M087	Wind Turbines	322.186	48.327	1996	1999
	TOTAL	756.619	224.551		

Standards development is a very relevant part of renewable energy promotion with guarantees for customers and associated fabrication cost reductions.

Also as guarantees for costumers the guarantees of results have been developed in the field of solar thermal and PV and a model contract will be ready by 1997.

3.2. Creation and extending infrastructure

Among the four main elements designing the ALTENER Programme, creating and extending an infrastructure in the Member States ("Pilot projects") is the dominant measure receiving the majority of the funding. For the first four years of the programme about 68 per cent of the total funding has been allocated to Article 3 (b) measures. A total of 278 projects have been funded Two main elements were included in Article 3 (b):

- * Training and information activities; and
- * Sectoral actions, listed in Annex II of the Council Decision of 13 September 1993.

A total of 10 sectoral actions were listed in the Annex II of the Decision The actions were "illustrative and non-restrictive". In fact some of these indicatives sectoral actions have been developed and funded under articles 3a, c and d, as the Commission considers this is a better way to fullfild the objectifs, i.e. the "geological risks in geothermal" which is a study instead of a pilot projet, etc.

More specifically, and in line with article 5.1, when establishing annual guidelines, sectoral actions to be supported by pilot projects have been grouped in four categories or themes :

- 1) Tools, i.e. pilot projects producing different products and software, including design manuals, feasibility studies, tools for local and regional energy planning.
- 2) Planning, i.e. pilot projects supporting the development of local and/or regional plans for renewables, including projects targeted towards specific systems such as district heating and single family houses.
- 3) Information/training, including development of training infrastructure for local authorities and project developers, training and information systems for energy operators, training courses for architects and engineers in technical schools or the university, information and promotion campaigns for renewables.
- 4) Financing, including Third Party Financing (TPF), guarantee of results.

The number of projects performed within each theme are set out in table 5.

Table 5
Sector Actions by theme

Theme	No. of Projects	Total Support (ECU)	Total Support (%)
Financial	46	5.287.288	20,37
Information/ training	80	7.557.472	29,11
Planning	78	6.369.436	24,54
Tools	74	6.744.677	25,98
TOTAL	278	25.958.873	100

The projects are proposed through Member States where often a preselection is made. This guarantees a high level of project quality. However, only 43% of the proposed projects submitted during the first four years could be supported because of shortage of budget. In total 278 projects had received support by the end of 1996, 61 projects of which have been completed at the end of 1996 (only a few 30 at the end of the third year). The break-down of projects per Member State is indicated in table 6.

Table 6
ALTENER Funding by Member State (ECU)
(see annex)

During 1996 five contractors meeting have been organized on each of the four main themes and one focussed on electricity by RES in order to evaluate the impact of the programme and to allow contractors to share experience. To conclude the process a major conference has been held on 25-27 November 1996 in Sitges, Barcelona, with a considerable success. About 800 participants, including a high level representation from Member States, local authorities, industry, utilities associations and almost all the ALTENER contractors attended the Conference. Conclusions and recommendations are being elaborated and will be taken into account for the final evaluation of the programme.

3.3. Information and dissemination activities

Article 3(c) of the Council Decision requires the ALTENER programme to establish an information network "aimed at promoting better coordination between national, Community and international activities through the establishment of appropriate means for exchanging information and at evaluating the impact of the various actions ..."

Following the model of the SAVE programme, ALTENER contracted with the EnR Network⁴ in March 1994 to formulate a programme covering two broad activity areas: events and news/publications. The Danish Energy Agency is the programme operating agent, ADEME of France is the operating agent for events and ETSU of the United Kingdom for news/publications.

The main objectives, as outlined in the most recent (1996-97) work programme for the information activities are:

- to provide general information on the ALTENER programme;
- to provide specific and targeted information to defined groups relevant to the objectives of the ALTENER programme as a continuation of the efforts of the 1995/96 activities;

⁴ EnR Members are EVA (Austria), DEA (Denmark), VTT Energy (Finland), ADEME (France), KFA-BEO (Germany), CRES (Greece), FORBAIRT (Ireland), ENEA (Italy), AEL (Luxembourg), NOVEM (Netherlands), IFE (Norway), CCE (Portugal), IDAE (Spain), NUTEK (Sweden), and ETSU (United Kingdom)

- to collect and disseminate information on the results of the first phase of the ALTENER programme.

The 1995/96 work programme also included the objective of providing information links between Member States and between the European Union and countries outside the EU.

There was a separate contract under EnR for CRES in Greece for the development of the database activities. This activity is now carried out directly by the Community database on Research and Technology CORDIS.

EnR has an advisory group within its members to support the information programme that meets three times a year on average. However, activities are co-ordinated in terms of timing and content by the team of Operating Agents.

The ALTENER programme covers 60 per cent of the costs. Member States and other parties are required to provide the rest. The overall budgets for the programme were:

1994/95 - 833,000 ECU of which ALTENER provides 500,000 ECU
 1995/96 - 1,000,000 ECU of which ALTENER provides 600,000 ECU
 1996/97 - 1,100,000 ECU of which ALTENER provides 660,000 ECU

The total breakdown of funds by programme area is as follows.

	1994/95	1995/96	1996/97
Events	403.000 ECU	662.500 ECU*	656.000 ECU*
News/Publications	350.000 ECU	377.500 ECU*	440.000 ECU*
Database	200.000 ECU	200.000 ECU	
Overall management	80.000 ECU		

* includes management costs

As stipulated under the contract between EnR and the Commission, events include the organisation of conferences, seminars and workshops for the purpose of:

- disseminating information on the ALTENER programme;
- gathering information concerning initiatives relevant to the ALTENER programme;

- collecting data and information relating to proposed legislative and administrative action within the ALTENER programme; and
- gathering and disseminating information on renewable energy sources and technologies.

In 1994, the first year of activity, the budget was 403,000 ECU. In the first year, ALTENER supported 33 events. In April 1995 - March 1996, the indicative budget was 662,500 ECU. ALTENER supported 42 events. Most of these events had a Europe-wide scope. The major European-wide event in 1995 was a seminar on mini-hydro held in Spain which brought together 300 participants.

With respect to news and publications, EnR in the first year concentrated on raising awareness and improving the understanding of the ALTENER programme and to disseminate project information and results where available. This included the preparation of an information pack, several brochures, newsletters, posters, fact sheets and a renewables 'road map'. For the most recent year, activities are aimed more towards providing project information to target groups.

The database was 100 per cent funded by ALTENER. The database includes information on ALTENER activities (projects, events and publications); national activities on renewables (including programmes, projects; events and publications); and national measures on renewable energy.

EnR members assisted in the collection of information for the first phase of the project which terminated in mid-1995. CRES updated the database with the latest information on ALTENER and on national activities. By 1997 the information will be available on the CORDIS database on Internet and CD-ROM. From now on, contractors are required to provide information directly to CORDIS.

3.4. Biomass measures

Article 3(d) of the Council Decision on ALTENER calls for "studies, evaluations and other appropriate measures aimed at assessing the technical feasibility and the advantages for the economy and the environment of the industrial exploitation of biomass for energy purposes, in particular heat and electricity production". The Commission in cooperation with Member States experts decided that a market driven approach with a high degree of industry input, was appropriate to implement this programme element. It was thus decided to set up three separate networks involving existing national biomass centres. The networks were set up in three main areas. These areas are:

- Agricultural and forestry Biomass
- Liquid Biofuels
- Energy from Waste

The general objectives for all of the networks were identified as exchange and sharing of knowledge, promotion of co-operation and coordination of national biomass centre activities, identification and promotion of business opportunities e.g. joint ventures, and setting up strategies, where appropriate. This concept of networking for the purposes of information exchange and the creation of a greater awareness of what can be achieved within the various technological areas is appropriate for the Community biomass situation, because there is largely heterogeneous distribution of activity and expertise.

The *Agricultural and Forestry Biomass Network (ABF-NETT)* started in January 1995 and an overall work programme was established. The network, which involves 14 National Biomass Centres, is coordinated by ETSU (UK) and has brought together more than 240 individuals from a wide range of professions. The work initially concentrated on the analysis of the non-technical barriers to different industry sectors in each country and on the compilation of information on the current status of biomass in each country.

An analysis of the above information was carried out by ETSU and the results presented in a final report to the Commission. Following this, work is now focusing on the development of strategies to overcome the barriers to the industry and on identification of business opportunities. Two Project Workshops have been held for all the National Co-ordinators and an Industry Workshop was held at the Bio-Energy Conference in Copenhagen (June 1996).

The *"Non-technical Barriers Liquid Biofuels European Network"* (NTB-NETT) commenced work in January 1995. The Project Co-ordinator is ADEME (France) and the network involves 8 national partners. In all the network has brought together over 120 professionals from different market sectors. In addition to identifying the non-technical barriers in the promotion of liquid biofuels, the network's objective is to establish recommendations and solutions for the promotion of liquid biofuels.

A final report for the first Phase of this network was presented in December 1995, including a series of National Reports for the Member States involved and a series of sectoral reports.

The third network is the *"Energy from Waste Network"* - EfW-NETT - started on 1 March 1995 with a budget for two years. There are nine main participants in the network. In January 1996, a Final Report was submitted for the initial phase of the operation of the network including an inventory of national waste programmes and analysis of overlaps and gaps, an inventory of waste streams, an inventory of public acceptance of waste treatments and energy production, an inventory of landfill regulations and landfill gas use, and a programme a proposal for the subsequent phase of the network.

In total 1,989,575 ECU have been spent on the biomass network activity in 1994 and 1995. Table 7 gives a more detailed breakdown of the expenditure to date for each network for the two years, 1994 and 1995.

*Table 7
Funding for the biomass networks*

Network	1994	1995
AFB-NETT	409.300 ECU	517.300 ECU
NTB-NETT	232.400 ECU	270.000 ECU
Waste for Energy	262.200 ECU	298.375 ECU

4. Conclusions

This reports presents the results of the ALTENER programme as required in Article 8.1 of the ALTENER Decision. The report is not an evaluation of the programme. An assessment of the programme will be undertaken on expiry of the programme as required in Article 8.2.

The report details the actions generated by the ALTENER programme covering all of the four elements covered by the programme. However, as only a small part of the projects have been completed it is not possible at this stage to assess in any detail neither in quantitative nor in qualitative terms, the specific results of the programme. This will done in final assessment report.

On the other hand a number of preliminary conclusions can be drawn and serve as the basis for the development of the ALTENER II programme which should be in place when the existing programme expires.

Firstly ALTENER has played an important role in raising awareness about the role of the renewable sources of energy in the Community. In particular the information activities carried out under the programme have made a significant contribution to this development, as has the network approach, which is an underlying feature of many of the activities, and in particular the biomass measures.

The reports and studies undertaken within the programme provide an important information base for the development of an overall renewable energy strategy for the EU. This task has now been initiated with the publication of the Commission's recent Green Paper "Energy for the Future: Renewable Sources of Energy; Towards a Community Strategy"⁵. ALTENER has in this way contributed to filling

⁵ COM(96)576 final of 20.11.1996.

the gap between research and commercial application of renewable sources of energy.

With respect to the pilot projects it is, given the few completed projects, difficult to draw any firm preliminary conclusions. However, as some Member States do not have similar programmes, it is evident that ALTENER fills an important gap as was clearly indicated by Member States representatives and the main actors during the recent ALTENER Conference "Renewable Energy entering the 21st Century". It can also be concluded that this part of the programme is seriously underfunded as less than half of the proposed projects, in spite of the fact that a preselection is carried out at national level, could be funded under the current budgetary provisions. It can furthermore be noted that there is a growing and important interaction amongst Member States due to the fact that many projects involve two or more countries.

In spite of the fact that renewable energy technologies are undergoing remarkable technological progress and are rapidly becoming economically viable in many areas and in spite of the largely successful implementation of the ALTENER programme, market penetration of renewable energy technologies is still slow and insufficient. This is clearly demonstrated in the Commission's Green Paper "Energy for the Future: Renewable Energy; Towards a Community Strategy", which also identifies a number of obstacles for a more widespread uptake of these energy sources. The present ALTENER programme, due to the limitations in the scope of actions laid down in the Council Decision, can only to a certain degree address these problems, which are often closely linked to market imperfections. It would therefore seem, that a future ALTENER II programme would have to more clearly address the particular problems related to market penetration.

TABLE 1

ALTENER I Allocation of funds (commitments)

in million Ecus

	Pre-programme		ALTENER Programme					Total ALTENER		
	1991	1992	1993	1994	1995	1996	TOT 93-96	1997*	MECU	%
3a Studies	1,052	0,617	0,892	0,611	1,916	1,320	4,739	0,380	5,119	11,8
3a Standards				0,405		0,454	0,859	0,400	1,259	2,9
3b Pilot Projects			3,913	7,190	8,977	6,005	26,085*	2,700	28,785	66,3
3c Informat./Disseminat.	0,080	0,111	0,194	1,004	1,003	1,245	3,446	1,000	4,446	10,2
3d Biomass Networks				0,785	1,221	1,031	3,037	0,800	3,387	8,8
TOTAL	1,132	0,728	4,999	9,995	13,172	10,055	38,221	5,280	43,446	100,0
Budget Allocation	1,137	0,880	5,000	10,000	13,300	10,158	38,458	5,282	43,740	

* indicative

TABLE 6

ALTENER Funding by Member State (ECU)

	1993		1994		1995		1996			
	Projects	Support	Projects	Support	Projects	Support	Projects	Support	Total Projects	Total Support
Austria	-	-	-	-	8	667 907	4	290 300	12	958 207
Belgium	2	152 002	4	384 387	5	412 565	2	152 321	13	1 101 275
Denmark	2	225 335	5	601 000	5	418 000	4	278 864	16	1 523 199
Finland	-	-	-	-	4	296 000	4	241 000	8	537 000
France	6	661 387	9	842 703	10	1 081 053	6	520 537	31	3 105 680
Germany	5	507 100	7	1 121 069	9	874 152	6	635 350	27	3 137 671
Greece	4	317 000	9	820 281	7	953 800	4	544 100	24	2 635 181
Ireland	2	95 568	5	399 900	8	771 594	4	354 790	19	1 621 852
Italy	3	480 863	5	622 047	6	456 460	6	597 421	20	2 156 791
Luxembourg	1	73 470	0	0	0	0	0	0	1	73 470
Netherlands	2	164 000	7	445 500	4	422 800	3	380 344	16	1 412 644
Portugal	4	419 659	8	420 771	6	519 993	4	312 889	22	1 673 312
Spain	5	545 374	5	666 712	9	784 379	7	548 442	26	2 544 907
Sweden	-	-	-	-	5	308 000	4	285 250	9	593 250
United Kingdom	4	271 050	10	865 415	13	1 010 369	4	446 600	31	2 593 434
Norway	-	-	-	-	-	-	3	291 000	3	291 000
Total	40	3 912 808	74	7 189 785	99	8 977 072	65	5 879 208	278	25 958 873

ISSN 0254-1475

COM(97) 122 final

DOCUMENTS

EN

12 15 14

Catalogue number : CB-CO-97-116-EN-C

ISBN 92-78-17256-1

Office for Official Publications of the European Communities

L-2985 Luxembourg