

**“Integrating and strengthening the European Research Area,
Specific Measures in support of International Cooperation (INCO)”**



**“Rural Sustainable Development through Integration of
Renewable Energy Technologies in Poor European Regions”**



RES INTEGRATION



**WP4 - COST BENEFIT ANALYSIS
OF THE PROPOSED PROJECTS**



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INTRODUCTION

Choice of an optimal IRES scheme, beside the other influencing factors, depends on the economic feasibility to complete the plants in question and profitability of their exploitation. Any planning, not taking into account these two influencing factors, shall be unsuccessful! Furthermore, when such different economy environment is in question, like it is the case with the target regions of the project RES integration, it is particularly important to understand why resulting economy of similar projects is different and which are the factors influencing to come to such results. In that way, encouraging development factors and constraints can be identified, enabling use of the first or activities to eliminate the seconds, i.e. to positively influence correction of the present economy environment.

Normally, evaluation of any investment goes through application of particular methodologies, developed by national or international finance institutions. Obviously, and in order to get comparable results and influencing factors, it was necessary to chose a common methodology to be applied for the elements of the RES Integration IRES schemes. The one of EBRD has been found as appropriate because being recognized in all the EC countries, but also all over the world. Necessary software has been on disposal at one of the collaborating institutions of MAGA, with possibility to use it free of charge for educational and non-profit research needs. It is a cost benefit analysis, enabling to identify profitability of the investment in a concrete project, based on the finance data for the composition of it, costs of exploitation, conditions of available market for product(s) and available finance conditions to cover the investment.

A template has been prepared by the WP leader and sent to all participants of the project to fill it with necessary set of data for each one of the projects of their IRES schemes. Completes of the cost benefit analysis are presented in the following written complete and some comments, foundlings and discussion on the common elements of results get, at the end.

**“Integrating and strengthening the European Research Area,
Specific Measures in support of International Cooperation (INCO)”**



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Renewable Energy Technologies in Poor European Regions”**



RES INTEGRATION



ALBANIA - EXAMPLE OF ECONOMIC ANALYSIS OF PLANNED INVESTMENT IN DIFFERENT RES PROJECTS



RES - INTEGRATION



**Work Package 4: FP6-509204
ECONOMIC IMPACT ASSESSMENT**

ALBANIA

**EVALUATION OF
ECONOMIC
JUSTIFIABLENESS
FOR INVESTING IN
TWO DIFFERENT
RES PROJECTS**

RES Integration Project

WP 4

Project Partner: ALBANIA

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of the energy production from Small Hydropower Plants recourses in Albania, we can comment the following:

1. PROJECT FOR Small Hydropower Plants ALBANIA (repayment period 7 years)

Considering the fact that the total costs (costs + annual credit instalment) are higher than the incomes, this project is not profitable for this period of analysing and this capacity of energy production (kWh). It means that the basic investment for realization of this project is too much expensive.

- **Financial rate of return**

The financial rate of return is negative (-22%) for the discount rate (15%), which means that the project will realize more costs than incomes, i.e. the investment **is non-profitable**.

Table 1. Total capital costs

Small Hydropower Plants ALBANIA (repayment period 7 years)

DEN/EUR		in denars 61,7	in EUR
Preparing activities		0.0	0.0
Building construction		67.870.000	1.100.000
- building and crafty activities		67.870.000	1.100.000
- machine instalations			0
- electroinstalations and telephony			0
- drain and drainage			0
- other activities			0
EQUIPMENT		33.935.000	550.000
equipment		33.935.000	550.000
		0	0
- tax		0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
VECHICLES		3.085.000	50.000
- invoice value with assemblage and transport		3.085.000	50.000
- custom		0	0
- tax	18%	0	0
OTHER		9.255.000	150.000
- licence rights and patent		9.255.000	150.000
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		0	0
TOTAL PLANNED COSTS FOR FIXED ASSETS		101.805.000	1.850.000
Funds planned for working capital			19.430
TOTAL REQUIRED FUNDS		101.805.000	1.869.430

Table 2. Total financial sources

		RESOURCES in denars	countervalue in EUR	Structure of funds resources
DEN/EUR	61,7			
BANKING CREDITS		69.208.890,0	1.121.700,0	60,00%
- Bank		69.208.890,0	1.121.700,0	60,00%
- Commercial Banks		0,0	0,0	0,00%
- World Bank		0,0	0,0	0,00%
- European Bank		0,0	0,0	0,00%
- Other resources		0,0	0,0	0,00%
OWN SOURCES		46.139.260,0	747.800,0	40,00%
- preparatory investments		46.139.260,0	747.800,0	40,00%
- additional investments		0,0	0,0	0,00%
- SEAF		0,0	0,0	0,00%
-from accumulation		0,0	0,0	0,00%
- from depreciation		0,0	0,0	0,00%
OTHER SOURCES		0,0	0,0	0,00%
		0,0	0,0	0,00%
		0,0	0,0	0,00%
TOTAL FINANCIAL SOURCES		115.348.150,0	1.869.500,0	100,00%

Table 3. Structure of utilisation

		in denars	in EUR	Structure of utilization
DEN/EUR	61,7			
MACHINES, EQUIPMENT AND TECHNOLOGY		55.367.112,00	897.360,0	80,00%
BUILDING CONSTRUCTION		0,0	0	0,00%
WORKING CAPITAL		13.841.778,00	224.340,0	20,00%
TOTAL BANK CREDIT		69.208.890,0	1.121.700,0	100,00%

Table 4. Sales in EUR after investment

Annual production	2007	2008	2009	2010	2011	2012	2013
Quantity (kWh)	0	0	2.000.000	4.000.000	4.000.000	4.000.000	4.000.000
Price per unit (Euro)	0,075	0,08	0,09	0,095	0,1	0,1	0,1
Value= Product unit * price per unit	0	0	180.000	380.000	400.000	400.000	400.000
Quantity							

Price per unit							
Value= Product unit * price per unit							
Quantity							
Quantity							
Price per unit							
Value= Product unit * price per unit							
Incomes from other activities							
TOTAL IN EUR	0	0	180.000	380.000	400.000	400.000	400.000
Domestic market (in % from total)	100%	100%	100%	100%	100%	100%	100%
Foreign market (in % from total)	0%	0%	0%	0%	0%	0%	0%

Table 5. Total costs after investment

TOTAL NUMBER OF EMPLOYEES								
Amounts in denars		2007	2008	2009	2010	2011	2012	2013
<u>Total raw materials</u>								
<u>Total raw materials - domestic</u>		-	-	-	-	-	-	-
<u>Total raw materials - foreign</u>		-	-	-	-	-	-	-
Salary costs								
<u>Salary costs for regular employees</u>								
<u>Compensation costs for part time jobs</u>								
<u>Costs for energy</u>								
<u>Maintanance costs</u>		1.000,00	50.000,00	100.000,00	105.000,00	107.000,00	107.000,00	107.000,00
<u>Indirect costs</u>								
<u>Other costs</u>								
<u>Total costs in EUR</u>		100.000	105.000	107.000	107.000	107.000	100.000	105.000

Table 6. Annual profit

FORESEEN ANNUAL PROFIT

for the new project as a difference between the new and current production

(before and after investment)

exchange for EUR	61,7	61,7	61,7	61,7	61,7
------------------	------	------	------	------	------

in EUR		2007	2008	2009	2010	2011	
AFTER INVESTMENT							
Incomes from domestic market	0	0	180.000	380.000	400.000	400.000	400.000
Incomes from export	-	-	-	-	-	-	-
Total incomes	0	0	180.000	380.000	400.000	400.000	400.000
Costs from domestic market	1.000	50.000	100.000	105.000	107.000	107.000	107.000
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	1.000	50.000	100.000	105.000	107.000	107.000	107.000
GROSS WORKING INCOMES	(1.000)	(50.000)	80.000	275.000	293.000	293.000	293.000
GROWTH AND FINANCIAL CALCULATIONS							
Incomes from domestic market	-	-	180.000	380.000	400.000	400.000	400.000
Incomes from export	-	-	-	-	-	-	-
Total incomes	-	180.000	380.000	400.000	400.000	400.000	400.000
Costs from domestic market	1.000	50.000	100.000	105.000	107.000	107.000	107.000
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	1.000	50.000	100.000	105.000	107.000	107.000	107.000
GROSS WORKING INCOMES	(1.000)	(50.000)	80.000	275.000	293.000	293.000	293.000

Table 7. Working capital

FORESEEN ADDITIONAL WORKING CAPITAL					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2007	2008	2009	2010	2011
Increased current assets:					
Cash needed	0	0	1.800	3.800	4.000
(as % of increased income)	1%	1%	1%	1%	1%
Receivables from buyers	0	0	14.795	31.233	32.877
(number of collecting days/ increased income)	30	30	30	30	30
Inventories					
Materials and spare parts (raw materials)	0	0	0	0	0
(number of collecting days/ increased costs and inventories)	30	30	30	30	30
Finished and semifinished products	0	0	0	0	0

(number of collection days/ increased income)	0	0	30	30	30
Final product	0,0	0,0	14.794,5	31.232,9	32.876,7
(number of collection days/ increased income)	30	30	30	30	30
Other	0	0	0	0	0
(% of increased income)	0%	0%	0%	0%	0%
Increased current assets	0,0	0,0	31.389,0	66.265,8	69.753,4
Increased short term liabilities					
Liabilities toward suppliers	83	4.110	8.219	8.630	8.795
(number of collection days/ increased costs)	30	30	30	30	30
Salary liabilities	-	-	-	-	-
(number of pay out days/increased salaries)	30	30	30	30	30
Depreciation	11.425	11.425	11.425	11.425	11.425
(number of calculation days/annual depreciation)	30	30	30	30	30
Other	0	0	7.849	16.570	17.442
(% of increased income)	4%	4%	4%	4%	4%
Increased short term liabilities	-11.507	15.534	27.493	36.625	37.662
ADDITIONAL WORKING CAPITAL	-11.507	-15.534	3.896	29.641	32.092
INCREASING OF ADDITIONAL WORKING CAPITAL	-11.507	-4.027	19.430	25.745	2.451

Table 8. Financial Rate of Return for investment of 5 years

FINANCIAL RATE OF PROFITABILITY

in EUR	2006	2007	2008	2009	2010	2011	2012	2013
Project costs:								
Total project costs:	-1.869.430,4	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Increased income:								
Domestic incomes	0,0	0,0	0,0	180.000,0	380.000,0	400.000,0	400.000,0	400.000,0
Foreign incomes	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total increase income	0,0	0,0	0,0	180.000,0	380.000,0	400.000,0	400.000,0	400.000,0
Increased operational costs								
Costs from domestic market	0,0	1.000,0	50.000,0	100.000,0	105.000,0	107.000,0	107.000,0	107.000,0
Costs from foregin market	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	1.000,0	50.000,0	100.000,0	105.000,0	107.000,0	107.000,0	107.000,0
Increased gross working profit	0,0	-1.000,0	-50.000,0	80.000,0	275.000,0	293.000,0	293.000,0	293.000,0
INCREASED NET PROFIT	1.869.430,4	1.000,0	50.000,0	80.000,0	275.000,0	293.000,0	293.000,0	293.000,0

**FINANCIAL RATE
OF RETURN**

-22%

**NET PRESENT
VALUE**-
1.350.08
7,7

(discount rate)

15%

Table 9. Review of credit liabilities

Amount in EUR				
Source of assets			BANK	
Credit amount			1.121.700	
Repayment period in years without grace period			4	
Grace period - years			1	
Amount of annual instalment			280.425	
Interest			8,00%	
Periods	Credit	Instalment	Interest	Annuity
1	1.121.700	-	89.736	89.736
2	1.121.700	280.425	89.736	370.161
3	841.275	280.425	67.302	347.727
4	560.850	280.425	44.868	325.293
5	280.425	280.425	22.434	302.859
Total		1.121.700	314.076	1.435.776

Table 10. Calculation of Depreciation

Nr.	Fixed assets	Value	%	Depreciation
1	Building - old	-	0%	-
2	Building - new	1.100.000	4,0%	44.000
3	Equipment - old		0%	-
4	Equipment - new	550.000,0	10%	55.000
5	Subsidiary equipment -old		0,00%	-
6	Subsidiary equipment -new	0,0		-
7	Vehicles - old		0%	-
8	Vehicles - new	50.000,0	20%	10.000
9	Other - old	-	0%	-
10	Other - new	150.000	20,0%	30.000,00
11	TOTAL - OLD			-
12	TOTAL - NEW			139.000,00
13	ALL TOTAL			139.000,00

Table 11. Sensibility of Rate of Profitability

ANALYZING THE SENSIBILITY OF THE FINANCIAL RATE OF PROFITABILITY

<div>TESTING THE SENSIBILITY</div> <div>Changes in % on 5 variables</div> <div>with the following presumptions:</div> <div>in EUR</div>	Domestic incomes		-10%
	Foreign incomes		0%
	Price of rawmaterials on domestic market		0%
	Proce of raw materials on foreign market		0%
	Investme nt costs		20%

	2006	2007	2008	2009	2010	2011
<u>Project costs (Investment):</u>						
Total project costs	-1.869.430,4	0,0	0,0	0,0	0,0	0,0
<u>Increased income</u>						
Domestic income	0,0	0,0	0,0	172.800,0	364.800,0	384.000,0
Foreign income	0,0	0,0	0,0	0,0	0,0	0,0
Total increased income	0,0	0,0	0,0	172.800,0	364.800,0	384.000,0
<u>Increased oeprational costs</u>						
Costs for domestic market	0,0	1.000,0	50.000,0	100.000,0	105.000,0	107.000,0
Costs from foreign market	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	1.000,0	50.000,0	100.000,0	105.000,0	107.000,0
Increased gross working profit	0,0	-1.000,0	-50.000,0	72.800,0	259.800,0	277.000,0
INCREASED NET PROFIT	-1.869.430,4	-1.000,0	-50.000,0	72.800,0	259.800,0	277.000,0

FINANCIAL RATE OF RETURN	-23%
	-
NET PRESENT VALUE	1.368.678,7
(discount rate)	15%

Table 12. Simplificated balance sheet

SIMPLIFICATED BALANCE SHEET							
EUR							
	2007	2008	2009	2010	2011	2009	2009
ASSETS:							
Current assets							
Surplus of cash	-973.687	148.013	148.013	148.013	148.013	148.013	148.013
Cash from working	0	0	1.800	3.800	4.000	4.000	4.000
Receivables for buyers	0	0	14.795	31.233	32.877	32.877	32.877
Inventories	0	0	14.795	31.233	32.877	32.877	32.877
Other	0	0	0	0	0	0	0
Total current assets	-973.687	162.808	195.840	215.923	217.766	217.766	184.890
Net fixed assets	1.850.000	1.838.575	1.827.151	1.815.726	1.804.301	1.792.877	1.781.452
Total fixed assets	1.850.000	3.708.006	3.696.581	3.685.156	3.673.732	3.662.307	3.650.882
TOTAL ASSETS	2.734.319	3.859.389	3.880.997	3.889.654	4.094.633	4.083.208	399.449
LIABILITIES AND SHAREHOLDING CAPITAL (NEW)							
Liabilities							
Deficit of cash	89.611	250.611	250.611	250.611	250.611	250.611	250.611
Short liabilities toward suppliers	2.137	82	4.110	8.219	8.630	8.795	8.795
Other	-82	-4.110	23.170	57.636	60.959	60.959	60.959
Debts	161.000	-306.375	-773.750	-1.241.125	-1.708.500	-1.708.500	-1.708.500
Other long term liabilities and reservations	0	0	0	0	0	0	0
TOTAL LIABILITIES	250.611	-55.764	-491.750	-924.248	-1.388.136	-1.388.136	-1.388.136
Shareholding capital							
Capital	747.800	747.800	747.800	747.800	747.800	747.800	747.800
Retained annual profit	-132.837	-142.818	-6.029	184.484	-184.022	229.885	229.885
Retained profits	0	-132.837	-275.655	-281.684	-97.200	-281.222	-51.337
TOTAL SHAREHOLDING CAPITAL	614.963	472.145	466.116	650.600	466.578	696.463	926.348
TOTAL LIABILITIES AND SHAREHOLDING CAPITAL	865.574	416.381	-25.634	-273.648	-921.558	-691.673	-461.788

Table 13. Income statement

INCOME STATEMENT

in EUR		2006	2007	2008	2009	2010	2011	2012	2013
Sales and other incomes:									
in country	-	-	-		180.000	380.000	400.000	400.000	400.000
abroad	-	-	-		-	-	-	-	-
Total sale	-	-	-		180.000	380.000	400.000	400.000	400.000
Costs and expenditures									
Raw materials									
in country	-	-	-	-	-	-	-	-	-
abroad	-	-	-	-	-	-	-	-	-
Gross salaries	-	-	-	-	-	-	-	-	-
Other costs	-	1.011	50.574	101.148	106.205	108.228	108.228	108.228	108.228
Total costs	-	1.011	50.574	101.148	106.205	108.228	108.228	108.228	108.228
Depreciation:									
Total depreciation	-	11.425	11.425	11.425	11.425	11.425	11.425	11.425	11.425
Interest costs									
Total interest costs			89.736	67.302	44.868	22.434	302.859		-
TOTAL OPERATIONAL INCOMES AND EXPENDITURES		-	102.172	129.300	157.440	140.064	422.512	108.228	108.228
Extra items:									
Total extra items	-	-	-	-	-	-	-	-	-
NET PROFIT BEFORE TAXATION		-	(102.172)	(129.300)	22.560	239.936	(22.512)	(108.228)	(108.228)
Income tax (% from the income before taxation)	-	18.391	23.274	(4.061)	(43.189)	4.052	19.481	19.481	
		18%	18%	18%	18%	18%	18%	18%	18%
NET PROFIT		(83.781)	(106.026)	18.499	196.748	(18.459)	(88.747)	(88.747)	

Table 14. Review of Cash Flow

REVIEW OF CASH FLOW

(SOURCES OF ASSETS AND NEED FOR INVESTMENT)

	61,7	61,7	61,7	61,7	61,7	61,7	61,7
In EUR	2007	2008	2009	2010	2011	2012	2013
SOURCES							
Own resources							
Retained profit	(83.781)	(106.026)	18.499	196.748	(18.459)	(88.747)	(88.747)
Depreciation	11.425	11.425	11.425	11.425	11.425	11.425	11.425
Cash inflow from regular working	(72.356)	(94.602)	29.924	208.173	(7.035)	(86.690)	(86.690)
							(94.602)
Credits	1.121.700	-	-	-	-	-	-
Total financial activities	1.121.700	-	-	-	-	-	161.000
From other sources							-
New capital from owners	747.800		-	-	-		-
New capital from joint ventures	-	-	-	-	-		-
TOTAL SOURCES	1.797.144	(94.602)	29.924	208.173	(7.035)	(86.690)	(86.690)
DEMAND							
Investments							
Total investments	1.869.430	-	-	-	-	-	-
Financial activities							
Instalments	-	280.425	280.425	280.425	280.425	22.434	302.859
Total financial activities	-	280.425	280.425	280.425	280.425	22.434	302.859
TOTAL DEMAND	1.869.430	280.425	280.425	280.425	280.425	22.434	302.859
ANNUAL SURPLUS/DEFICIT OF CASH	(72.287)	(375.027)	(250.501)	(72.252)	(287.460)	(109.124)	(389.549)
							1.351.294
CUMULATIVE SURPLUS/DEFICIT	(72.287)	(447.314)	(697.815)	(770.067)	(1.057.527)	(1.166.652)	(1.556.201)
							1.154.712

Table 15. Projection of net foreign market inflow

PROJECTION OF NET FOREIGN CURRENCY INFLOW

in EUR	2006	2007	2008	2009	2010	2011
<u>SOURCES</u>						
Total export	0	0	0	0	0	0
Credits	1.121.700	0	0	0	0	0
Total foreign currency sources	1.121.700	0	0	0	0	0
<u>EXPENDITURES</u>						
Investment costs (planned)	1.869.430	0	0	0	0	0
<i>Import</i>						
Total import	0	0	0	0	0	0
<i>Credit repayment</i>						
Instalment, net	0	0	280.425	280.425	280.425	280.425
Interest	0	89.736	67.302	44.868	22.434	302.859
<i>Total credit repayment</i>	0	89.736	347.727	325.293	302.859	583.284
Total foreign currency expenditures	1.121.700	89.736	347.727	325.293	302.859	583.284
TOTAL NET FOREIGN CURRENCY PROFIT	0	-89.736	-347.727	-325.293	-302.859	-583.284

Table 16. Financial Ratios

FINANCIAL RATIOS

in EUR	2007	2008	2009	2010	2011
<u>Liquidity</u>					
<i>Current ratio</i>					
Current assets (□)	0	14.795	47.827	67.910	36.877
Short term liabilities (B)	0	0	31.389	66.266	69.753
□/B	#DIV/0!	#DIV/0!	1,52	1,02	0,53
<u>Quick ratio</u>					
Current assets (□)	0	14.795	47.827	67.910	36.877
Inventories (B)	0	0	14.795	31.233	32.877
Short term liabilities (C)	0	0	31.389	66.266	69.753
(□-B)/C	#DIV/0!	#DIV/0!	0,53	0,53	0,53
<u>The share of debt in total capital</u>					
<i>Debts in total assets</i>					
Debt (□)	161.000	-119.425	-399.850	-680.275	-960.700
Total assets (B)	2.734.319	3.859.389	3.880.997	3.889.654	399.449
□/B	6%	-3%	-10%	-17%	-241%
<i>Debt/Shareholding capital</i>					
Debt (□)	161.000	-119.425	-399.850	-680.275	-960.700

Shareholding capital (B)	664.019	557.993	576.492	773.239	754.780
\square/B	24%	-21%	-69%	-88%	-127%
Debt spreading over					
Net income (\square)	-83.781	-106.026	18.499	196.748	-18.459
Depreciation (B)	11.425	11.425	11.425	11.425	11.425
Interest (C)		89.736	67.302	44.868	22.434
Mature instalment (D)	0	280.425	280.425	280.425	280.425
$(\square+B+C)/D$	0,2	-0,1	0,2	0,8	0,0
Profitability					
Net profit rate					
Net profit (\square)	-83.781	-106.026	18.499	196.748	-18.459
Income (B)	0	0	180.000	380.000	400.000
\square/B	#DIV/0!	#DIV/0!	10%	52%	-5%
Return of total assets					
Net profit (\square)	-83.781	-106.026	18.499	196.748	-18.459
Total assets (B)	2.734.319	3.859.389	3.880.997	3.889.654	399.449
\square/B	(0,03)	(0,03)	0,00	0,05	(0,05)
Return of capital					
Net profit (\square)	-83.781	-106.026	18.499	196.748	-18.459
Capital (\square)	664.019	557.993	576.492	773.239	754.780
\square/B	(0,13)	(0,19)	0,03	0,25	(0,02)
Working					
Inventories turn over					
Sales costs (\square)	1.011	50.574	101.148	106.205	108.228
Inventories (B)	0	0	14.795	31.233	32.877
\square/B	#DIV/0!	#DIV/0!	3,42	3,24	3,23
Average time for payment					
Receivables (\square)	0	0	14.795	31.233	32.877
Daily income (B)	0	0	493	1.041	1.096
\square/B	#DIV/0!	#DIV/0!	30	30	30
Turn over of fixed assets					
Income (\square)	0	0	180.000	380.000	400.000
Fixed assets (B)	1.850.000	3.708.006	3.696.581	3.685.156	3.673.732
\square/B	0,0	0,0	0,0	0,0	0,1
Turn over of all assets					
Income (\square)	0	0	180.000	380.000	400.000
Total assets (B)	2.734.319	3.859.389	3.880.997	3.889.654	399.449
\square/B	0,0	0,0	0,0	0,1	1,0

RES Integration Project

WP 4

Project Partner: ALBANIA

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of the energy production from Solar Thermal Completes recourses in Albania, we can comment the following:

2. PROJECT FOR Solar Thermal Completes ALBANIA (repayment period 7 years)

Considering the fact that the total costs (costs + annual credit instalment + depreciation) are higher than the incomes, this project is not profitable for this period of analysing and this capacity of energy production (kWh). It means that the basic investment for realization of this project is too much expensive.

- **Financial rate of return**

The financial rate of return is negative (out of range - #NUM%) for the discount rate (15%), which means that the project will realize more costs than incomes, i.e. the investment **is non-profitable**.

Table 1. Total capital costs

Solar Thermal Completes ALBANIA (repayment period 7 years)

DEN/EUR		in denars 61,7	in EUR
Preparing activities		0.0	0.0
Building construction		15.425.000	250.000
- building and crafty activities		15.425.000	250.000
- machine instalations			0
- electroinstalations and telephony			0
- drain and drainage			0
- other activities			0
EQUIPMENT		80.210.000	1.300.000
equipment		80.210.000	1.300.000
- tax		0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
VECHICLES		3.085.000	50.000
- invoice value with assemblage and transport		3.085.000	50.000
- custom		0	0
- tax	18%	0	0
OTHER		3.085.000	50.000
- licence rights and patent		3.085.000	50.000
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		0	0
TOTAL PLANNED COSTS FOR FIXED ASSETS		95.635.000	1.650.000
Funds planned for working capital			2.302
TOTAL REQUIRED FUNDS		95.635.000	1.652.302

Table 2. Total financial sources

	DEN/EUR	61,7	RESOURCES in denars	countervalue in EUR	Structure of funds resources
BANKING CREDITS			61.168.146,0	991.380,0	60,00%
- Bank			61.168.146,0	991.380,0	60,00%
- Commercial Banks			0,0	0,0	0,00%
- World Bank			0,0	0,0	0,00%
- European Bank			0,0	0,0	0,00%
- Other resources			0,0	0,0	0,00%
OWN SOURCES			40.778.764,0	660.920,0	40,00%
- preparatory investments			40.778.764,0	660.920,0	40,00%
- additional investments			0,0	0,0	0,00%
- SEAF			0,0	0,0	0,00%
-from accumulation			0,0	0,0	0,00%
- from depreciation			0,0	0,0	0,00%
OTHER SOURCES			0,0	0,0	0,00%
			0,0	0,0	0,00%
			0,0	0,0	0,00%
TOTAL FINANCIAL SOURCES			101.946.910,0	1.652.300,0	100,00%

Table 3. Structure of utilisation

	DEN/EUR	61,7	in denars	in EUR	Structure of utilization
MACHINES, EQUIPMENT AND TECHNOLOGY			48.934.516,80	793.104	80,00%
BUILDING CONSTRUCTION			0,0	0	0,00%
WORKING CAPITAL			12.233.629,20	198.276	20,00%
TOTAL BANK CREDIT			61.168.146,0	991.380,0	100,00%

Table 4. Sales in EUR after investment

Annual production	2007	2008	2009	2010	2011	2012	2013
Quantity (kWh)	29.000	550.000	1.100.000	1.122.000	1.122.000	1.122.000	1.122.000
Price per unit In Euro	0,075	0,08	0,09	0,095	0,1	0,1	0,1
Value= Product unit * price per unit	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Quantity							
Price per unit							

Value= Product unit * price per unit							
Quantity							
Quantity							
Price per unit							
Value= Product unit * price per unit							
Incomes from other activities							
TOTAL IN EUR	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Domestic market (in % from total)	100%	100%	100%	100%	100%	100%	100%
Foreign market (in % from total)	0%	0%	0%	0%	0%	0%	0%

Table 5. Total costs after investment

TOTAL NUMBER OF EMPLOYEES							
Amounts in denars	2007	2008	2009	2010	2011	2012	2013
<u>Total raw materials</u>							
<u>Total raw materials - domestic</u>	-	-	-	-	-	-	-
<u>Total raw materials - foreign</u>	-	-	-	-	-	-	-
Salary costs							
<u>Salary costs for regular employees</u>							
<u>Compensation costs for part time jobs</u>							
Costs for energy							
Maintanance costs	1.000,00	50.000,00	100.000,00	105.000,00	107.000,00	107.000,00	107.000,00
Indirect costs							
Other costs	100	500	10.000,00	10.000,00	11.000,00	11.000,00	11.000,00
-							
Total costs in EUR	1.100	50.500	110.000	115.000	118.000	118.000	118.000

Table 6. Annual profit

FORESEEN ANNUAL PROFIT							
for the new project as a difference between the new and current production							
(before and after investment)							
exchange for EUR	61,7	61,7	61,7	61,7	61,7		
in EUR							
	2007	2008	2009	2010	2011		
AFTER INVESTMENT						2012	2013
Incomes from domestic market	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Incomes from export	-	-	-	-	-	-	-
Total incomes	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Costs from domestic market	1.100	50.500	110.000	115.000	118.000	118.000	118.000
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	1.100	50.500	110.000	115.000	118.000	118.000	118.000
GROSS WORKING INCOMES	1.075	(6.500)	(11.000)	(8.410)	(5.800)	(5.800)	(5.800)
GROWTH AND FINANCIAL CALCULATIONS							
Incomes from domestic market	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Incomes from export	-	-	-	-	-	-	-
Total incomes	2.175	44.000	99.000	106.590	112.200	112.200	112.200
Costs from domestic market	1.100	50.500	110.000	115.000	118.000	118.000	118.000
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	1.100	50.500	110.000	115.000	118.000	118.000	118.000
GROSS WORKING INCOMES	1.075	(6.500)	(11.000)	(8.410)	(5.800)	(5.800)	(5.800)

Table 7. Working capital

FORESEEN ADDITIONAL WORKING CAPITAL					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2007	2008	2009	2010	2011
Increased current assets:					

Cash needed	0	0	1.800	3.800	4.000
(as % of increased income)	22	440	990	1.066	1.122
Receivables from buyers	1%	1%	1%	1%	1%
(number of collecting days/ increased income)	30	179	3.616	8.137	8.761
Inventories	30	30	30	30	30
Materials and spare parts (raw materials)	0				
(number of collecting days/ increased costs and inventories)	30	0	0	0	0
Finished and semifinished products	0	30	30	30	30
(number of collection days/ increased income)	0	0	0	0	0
Final product	0	30	30	30	30
(number of collection days/ increased income)	30	178,8	3.616,4	8.137,0	8.760,8
Other	30	30	30	30	30
(% of increased income)	0	0	0	0	0
Increased current assets	379,3	7.672,9	17.264,0	18.587,5	19.565,8
Increased short term liabilities					
Liabilities toward suppliers	90	4.151	9.041	9.452	9.699
(number of collection days/ increased costs)	30	30	30	30	30
Salary liabilities	-	-	-	-	-
(number of pay out days/increased salaries)	30	30	30	30	30
Depreciation	9.781	9.781	9.781	9.781	9.781
(number of calculation days/annual depreciation)	30	30	30	30	30
Other	95	1.919	4.317	4.648	4.893
(% of increased income)	4%	4%	4%	4%	4%
Increased short term liabilities	9.966	15.850	23.139	23.881	24.372
ADDITIONAL WORKING CAPITAL	-9.587	-8.177	-5.875	-5.293	-4.806
INCREASING OF ADDITIONAL WORKING CAPITAL	-9.587	1.409	2.302	582	487

Table 8. Financial Rate of Return for investment of 5 years

FINANCIAL RATE OF PROFITABILITY

in EUR	2006	2007	2008	2009	2010	2011	2012	2013
Project costs:								
Total project costs:	-1.652.302,4	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Increased income:								
Domestic incomes	0,0	2.175,0	44.000,0	99.000,0	106.590,0	112.200,0	112.200,0	
Foreign incomes	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Total increase income	0,0	2.175,0	44.000,0	99.000,0	106.590,0	112.200,0	112.200,0	

Increased operational costs

Costs from domestic

market 0,0 1.100,0 50.500,0 110.000,0 115.000,0 118.000,0 118.000,0

Costs from foregin

market 0,0 0,0 0,0 0,0 0,0 0,0 0,0

Total increased operational costs

0,0 0,0 1.100,0 50.500,0 110.000,0 115.000,0 118.000,0 118.000,0

Increased gross working profit

0,0 0,0 1.075,0 -6.500,0 -11.000,0 -8.410,0 -5.800,0 -5.800,0

INCREASED NET PROFIT

-1.869.430,4 1.075,0 -6.500,0 -11.000,0 -8.410,0 -5.800,0 -5.800,0 -5.800,0

FINANCIAL RATE OF RETURN

#NUM!

NET PRESENT VALUE

-
1.453.223,7

(discount rate)

15%

Table 9. Review of credit liabilities

Amount in EUR				
Source of assets			BANK	
Credit amount			991.380	
Repayment period in years without grace period			4	
Grace period - years			1	
Amount of annual instalment			247.845	
Interest			8,00%	
Periods	Credit	Instalment	Interest	Annuity
1	991.380	-	79.310	79.310
2	991.380	247.845	79.310	327.155
3	743.535	247.845	59.483	307.328
4	495.690	247.845	39.655	287.500
5	247.845	247.845	19.828	267.673
Total		991.380	277.586	1.268.966

Table 10. Calculation of Depreciation

Nr.	Fixed assets	Value	%	Depreciation
1	Building - old	-	0%	-
2	Building - new	1.100.000	4,0%	44.000
3	Equipment - old		0%	-
4	Equipment - new	550.000,0	10%	55.000
5	Subsidiary equipment -old		0,00%	-
6	Subsidiary equipment -new	0,0		-
7	Vechicles - old		0%	

				-
8	Vehicles - new	50.000,0	20%	10.000
9	Other - old	-	0%	-
10	Other - new	50.000	20,0%	10.000,00
11	TOTAL - OLD			-
12	TOTAL - NEW			119.000,00
13	ALL TOTAL			119.000,00

Table 11. Sensibility of Rate of Profitability

ANALYZING THE SENSIBILITY OF THE FINANCIAL RATE OF PROFITABILITY

TESTING THE SENSIBILITY Changes in % on 5 variables with the following presumptions: in EUR	Domestic incomes		-5%
	Foreign incomes		0%
	Price of rawmaterials on domestic market		0%
	Proce of raw materials on foreign market		0%
	Investment costs		10%

	2006	2007	2008	2009	2010	2011
Project costs (Investment):						
Total project costs	-1.652.302,4	0,0	0,0	0,0	0,0	0,0
Increased income						
Domestic income	0.0	1.957,5	39.600,0	89.100,0	95.931,0	100.980,0
Foreign income	0.0	0,0	0,0	0,0	0,0	0,0
Total increased income	0.0	1.957,5	39.600,0	89.100,0	95.931,0	100.980,0
Increased oeprational costs						
Costs for domestic market	0.0	1.100,0	50.500,0	110.000,0	115.000,0	118.000,0
Costs from foreign market	0.0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0.0	1.100,0	50.500,0	110.000,0	115.000,0	118.000,0
Increased gross working profit	0.0	857,5	-10.900,0	-20.900,0	-19.069,0	-17.020,0
INCREASED NET PROFIT	-1.652.302,4	857,5	-10.900,0	-20.900,0	-19.069,0	-17.020,0

FINANCIAL RATE OF RETURN	#NUM!
NET PRESENT VALUE	-
(discount rate)	1.472.091,7
	15%

Table 12. Simplificated balance sheet

SIMPLIFICATED BALANCE SHEET							
EUR							
	2007	2008	2009	2010	2011	2009	2009
ASSETS:							
Current assets							
Surplus of cash	-818.892	148.013	148.013	148.013	148.013	148.013	148.013
Cash from working	22	440	990	1.066	1.122	1.122	1.122
Receivables for buyers	179	3.616	8.137	8.761	9.222	9.222	9.222
Inventories	179	3.616	8.137	8.761	9.222	9.222	9.222
Other	0	0	0	0	0	0	0
Total current assets	-815.075	160.206	165.901	167.062	167.579	167.579	158.357
Net fixed assets	1.650.000	1.640.219	1.630.438	1.620.658	1.610.877	1.601.096	1.591.315
Total fixed assets	1.650.000	3.292.522	3.282.741	3.272.960	3.263.179	3.253.398	3.243.617
TOTAL ASSETS	2.477.446	3.442.947	3.438.861	3.430.241	3.635.536	3.625.755	372.916
LIABILITIES AND SHAREHOLDING CAPITAL (NEW)							
Liabilities							
Deficit of cash	89.611	250.611	250.611	250.611	250.611	250.611	250.611
Short liabilities toward suppliers	2.137	90	4.151	9.041	9.452	9.699	9.699
Other	289	3.522	8.223	9.135	9.867	9.867	9.867
Debts	161.000	-86.845	-334.690	-582.535	-830.380	-830.380	-830.380
Other long term liabilities and reservations	0	0	0	0	0	0	0
TOTAL LIABILITIES	250.990	171.439	-66.815	-313.336	-560.203	-560.203	-560.203
Shareholding capital							
Capital	747.800	747.800	747.800	747.800	747.800	747.800	747.800
Retained annual profit	-72.184	-62.601	-50.593	-32.257	-233.378	-13.887	-13.887
Retained profits	0	-72.184	-134.785	-185.378	-217.635	-451.013	-464.900
TOTAL SHAREHOLDING CAPITAL	675.616	613.015	562.422	530.165	296.787	282.900	269.014
TOTAL LIABILITIES AND SHAREHOLDING CAPITAL	926.607	784.454	495.607	216.829	-263.416	-277.303	-291.189

Table 13. Income statement

INCOME STATEMENT							
in EUR							
	2006	2007	2008	2009	2010	2011	2012
Sales and other incomes:							
in country	2.175	44.000	99.000	106.590	112.200	112.200	112.200

abroad	-	-	-	-	-	-	-	-
Total sale		2.175	44.000	99.000	106.590	112.200	112.200	112.200
Costs and expenditures								
Raw materials								
in country	-	-	-	-	-	-	-	-
abroad	-	-	-	-	-	-	-	-
Gross salaries	-	-	-	-	-	-	-	-
Other costs		1.113	51.080	111.262	116.320	119.354	119.354	119.354
Total costs		1.113	51.080	111.262	116.320	119.354	119.354	119.354
Depreciation:								
Total depreciation	-	9.781	9.781	9.781	9.781	9.781	9.781	9.781
Interest costs								
Total interest costs			79.310	59.483	39.655	19.828	267.673	-
TOTAL OPERATIONAL INCOMES AND EXPENDITURES	-	90.204	120.343	160.698	145.928	396.808	129.135	129.135
Extra items:								
Total extra items	-	-	-	-	-	-	-	-
NET PROFIT BEFORE TAXATION	-	(88.029)	(76.343)	(61.698)	(39.338)	(284.608)	(16.935)	(16.935)
Income tax		15.845	13.742	11.106	7.081	51.229	3.048	3.048
(% from the income before taxation)		18%	18%	18%	18%	18%	18%	18%
NET PROFIT		(72.184)	(62.601)	(50.593)	(32.257)	(233.378)	(13.887)	(13.887)

Table 14. Review of Cash Flow

REVIEW OF CASH FLOW							
(SOURCES OF ASSETS AND NEED FOR INVESTMENT)							
	61,7	61,7	61,7	61,7	61,7	61,7	61,7
In EUR							
	2007	2008	2009	2010	2011	2012	2013
SOURCES							
Own resources							
Retained							

profit	(72.184)	(62.601)	(50.593)	(32.257)	(233.378)	(13.887)	(13.887)	
Depreciation	9.781	9.781	9.781	9.781	9.781	9.781	9.781	
Cash inflow from regular working	(62.403)	(52.821)	(40.812)	(22.476)	(223.597)	(4.106)	(4.106)	(4.106)
Credits	1.121.700	-	-	-	-	-	-	-
Total financial activities	1.121.700	-	-	-	-	-	-	-
From other sources					-	-	-	-
New capital from owners	747.800		-	-	-	-	-	-
New capital from joint ventures	-	-	-	-	-	-	-	-
TOTAL SOURCES	1.807.097	(52.821)	(40.812)	(22.476)	(223.597)	(4.106)	(4.106)	
DEMAND								
Investments								
Total investments	1.652.302	-	-	-	-	-	-	-
Financial activities								
Instalments	-	247.845	247.845	247.845	247.845	-	-	-
Total financial activities	-	247.845	247.845	247.845	247.845	-	-	-
TOTAL DEMAND	1.652.302	247.845	247.845	247.845	247.845	-	-	-
ANNUAL SURPLUS/DEFICIT OF CASH CUMULATIVE SURPLUS/DEFICIT								
	154.795	(300.666)	(288.657)	(270.321)	(471.442)	(4.106)	(4.106)	(4.106)
	154.795	(145.871)	(434.528)	(704.849)	(1.176.291)	(1.180.397)	(1.184.503)	(1.188.603)

Table 15. Projection of net foreign market inflow

PROJECTION OF NET FOREIGN CURRENCY INFLOW

in EUR	2006	2007	2008	2009	2010	2011
SOURCES						
Total export	0	0	0	0	0	0
Credits	991.380	0	0	0	0	0
Total foreign currency sources	991.380	0	0	0	0	0
EXPENDITURES						
Investment costs (planned)	1.652.302	0	0	0	0	0
Import						

Total import	0	0	0	0	0	0
<i>Credit repayment</i>						
Instalment, net	0	0	247.845	247.845	247.845	247.845
Interest	0	79.310	59.483	39.655	19.828	267.673
<i>Total credit repayment</i>	0	79.310	307.328	287.500	267.673	515.518
Total foreign currency expenditures	991.380	79.310	307.328	287.500	267.673	515.518
TOTAL NET FOREIGN CURRENCY PROFIT	0	-79.310	-307.328	-287.500	-267.673	-515.518

Table 16. Financial Ratios

FINANCIAL RATIOS					
in EUR					
	2007	2008	2009	2010	2011
<u>Liquidity</u>					
<i>Current ratio</i>					
Current assets (□)	3.817	12.193	17.888	19.049	19.566
Short term liabilities (B)	379	7.673	17.264	18.588	19.566
□/B	10,06	1,59	1,04	1,02	1,00
<u>Quick ratio</u>					
Current assets (□)	3.817	12.193	17.888	19.049	19.566
Inventories (B)	179	3.616	8.137	8.761	9.222
Short term liabilities (C)	379	7.673	17.264	18.588	19.566
(□-B)/C	0,53	0,53	0,53	0,53	0,53
<u>The share of debt in total capital</u>					
<i>Debts in total assets</i>					
Debt (□)	161.000	-86.845	-334.690	-582.535	-830.380
Total assets (B)	2.477.446	3.442.947	3.438.861	3.430.241	3.635.536
□/B	6%	-3%	-10%	-17%	-23%
<i>Debt/Shareholding capital</i>					
Debt (□)	161.000	-86.845	-334.690	-582.535	-830.380
Shareholding capital (B)	675.616	613.015	562.422	530.165	296.787
□/B	24%	-14%	-60%	-110%	-280%
<i>Debt spreading over</i>					
Net income (□)	-72.184	-62.601	-50.593	-32.257	-233.378
Depreciation (B)	9.781	9.781	9.781	9.781	9.781
Interest (C)		79.310	59.483	39.655	19.828
Mature instalment (D)	0	247.845	247.845	247.845	247.845
(□+B+C)/ D	0,2	0,0	0,0	0,0	0,1
<u>Profitability</u>					
<i>Net profit rate</i>					
Net profit (□)	-72.184	-62.601	-50.593	-32.257	-233.378
Income (B)	2.175	44.000	99.000	106.590	112.200

□/B	-3319%	-142%	-51%	-30%	-208%
Return of total assets					
Net profit (□)	-72.184	-62.601	-50.593	-32.257	-233.378
Total assets (B)	2.477.446	3.442.947	3.438.861	3.430.241	3.635.536
□/ B	(0,03)	(0,02)	(0,01)	(0,01)	(0,06)
Return of capital					
Net profit (□)	-72.184	-62.601	-50.593	-32.257	-233.378
Capital (□)	675.616	613.015	562.422	530.165	296.787
□/ B	(0,11)	(0,10)	(0,09)	(0,06)	(0,79)
Working					
Inventories turn over					
Sales costs (□)	1.113	51.080	111.262	116.320	119.354
Inventories (B)	179	3.616	8.137	8.761	9.222
□/ B	0,00	0,31	6,28	12,70	12,61
Average time for payment					
Receivables (□)	179	3.616	8.137	8.761	9.222
Daily income (B)	6	121	271	292	307
□/ B	30	30	30	30	30
Turn over of fixed assets					
Income (□)	2.175	44.000	99.000	106.590	112.200
Fixed assets (B)	1.650.000	3.292.522	3.282.741	3.272.960	3.263.179
□/ B	0,0	0,0	0,0	0,0	0,0
Turn over of all assets					
Income (□)	2.175	44.000	99.000	106.590	112.200
Total assets (B)	2.477.446	3.442.947	3.438.861	3.430.241	3.635.536
□/ B	0,0	0,0	0,0	0,0	0,0

**“Integrating and strengthening the European Research Area,
Specific Measures in support of International Cooperation (INCO)”**



**“Rural Sustainable Development through Integration of
Renewable Energy Technologies in Poor European Regions”**



RES INTEGRATION



GREECE - EXAMPLE OF ECONOMIC ANALYSIS OF PLANNED INVESTMENT IN DIFFERENT RES PROJECTS



RES - INTEGRATION



**Work Package 4: FP6-509204
ECONOMIC IMPACT ASSESSMENT**

GREECE

**EVALUATION OF
ECONOMIC
JUSTIFIABLENESS
FOR INVESTING IN
TWO DIFFERENT
RES PROJECTS**

RES Integration Project

WP 4

Project Partner: GREECE

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of the energy production from wind & desalination in island Milos, Greece, we can comment on the following:

3. PROJECT FOR

Wind & Desalination (repayment period 5 years)

- **Financial rate of return**

With planned capacity for production of electricity (kWh) and hot water with following explained production per year, recourse for production wind & desalination, the financial rate of return is about 55% (repayment period 5 years, Table 8.). It's good scenario whit a discount rate (15%) and sensibility rate of profitability for pessimistic conditions (about 30%), which means that the costs for project will be returned between 2nd and 3rd year of exploitation, i.e. the investment is profitable.

- **Net profit**

During the whole repayment period of 5 years, the project shows net profit with tendency of growth from year to year.

- **Cash flow**

The cash flow is positive during the whole repayment period of 5 years that could be positively estimated.

- **Liquidity ratio (current)**

The current liquidity ratio is ~1 (Table 15) that is in accordance with the optimal current liquidity ratio. This means that there are enough current assets to cover the short term liabilities.

- **Liquidity ratio (quick)**

The same situation applies for the quick liquidity ratio when this ratio is about 0,5.

- **Profitability ratio**

This ratio shows tendency of growth form year to year that could be positively estimated.

The financial analysis shows that the expected parameters are positive its mean its optimistic scenario.

Wind & Desalination GREECE (repayment period 5 years)

DEN/EUR		in denars 61,7	in EUR
Preparing activities		0,0	0,0
Building construction		0	0
- building and crafty activities		0	0
- machine installations		0	0
- electro-installations and telephony		0	0
- drain and drainage		0	0
- other activities		0	0
EQUIPMENT		197.440.000	3.200.000
wind turbine + infrastructure		74.040.000	1.200.000
desalination facility cost		123.400.000	2.000.000
- tax		0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
VECHICLES		0	0
- invoice value with assemblage and transport		0	0
- custom		0	0
- tax	18%	0	0
OTHER		0	0
- licence rights and patent		0	0
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		0	0
TOTAL PLANNED COSTS FOR FIXED ASSETS		197.440.000	3.200.000
Funds planned for working capital			266.924
TOTAL REQUIRED FUNDS		197.440.000	3.466.924

Table 1. Total capital costs

		RESOURCES in denars	countervalue in EUR	Structure of funds resources
DEN/EUR	61,7			
BANKING CREDITS		91.982.977,0	1.490.810,0	43,00%
- Bank		91.982.977,0	1.490.810,0	43,00%
- Commercial Banks		0,0	0,0	0,00%
- World Bank		0,0	0,0	0,00%
- European Bank		0,0	0,0	0,00%
- Other resources		0,0	0,0	0,00%
OWN SOURCES		60.965.461,5	988.095,0	28,50%
- preparatory investments		60.965.461,5	988.095,0	28,50%
- additional investments		0,0	0,0	0,00%
- SEAF		0,0	0,0	0,00%
-from accumulation		0,0	0,0	0,00%
- from depreciation		0,0	0,0	0,00%
OTHER SOURCES		60.965.461,5	988.095,0	28,50%
		60.965.461,5	988.095,0	28,50%
		0,0	0,0	0,00%
TOTAL FINANCIAL SOURCES		152.948.438,5	3.467.000,0	100,00%

Table 2. Total financial sources

Table 3. Structure of utilisation

		in denars	in EUR	Structure of utilization
DEN/EUR	61,7			
MACHINES, EQUIPMENT AND TECHNOLOGY		73.586.381,60	1.192.648,00	80,00%
BUILDING CONSTRUCTION		0,0	0,0	0,00%
WORKING CAPITAL		18.396.595,40	298.162,00	20,00%
TOTAL BANK CREDIT		91.982.977,00	1.490.810,00	100,00%

Table 4. Sales in EUR after investment

Annual production	2007	2008	2009	2010	2011
Quantity electricity in kWh	6.307.200	6.307.200	6.307.200	6.307.200	6.307.200
Price per unit 0,2 Euro	0,2	0,2	0,2	0,2	0,2
Value= Product unit * price per unit	1.261.440,00	1.261.440,00	1.261.440,00	1.261.440,00	1.261.440,00
Quantity water in m3	640.800	640.800	640.800	640.800	640.800
Price per unit 1,8 Euro	1,8	1,8	1,8	1,8	1,8
Value= Product unit * price per unit	1.153.440,00	1.153.440,00	1.153.440,00	1.153.440,00	1.153.440,00
Quantity					
Quantity					
Price per unit					
Value= Product unit * price per unit	0	0	0	0	0
Incomes from other activities	0	0	0	0	0
TOTAL IN EUR	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
Domestic market (in % from total)	100%	100%	100%	100%	100%
Foreign market (in % from total)	0%	0%	0%	0%	0%

Table 5. Total costs after investment

TOTAL NUMBER OF EMPLOYEES					
Amounts in denars	2007	2008	2009	2010	2011
Total raw materials	38.448	38.448	38.448	38.448	38.448
Total raw materials - domestic	-	-	-	-	-
Total raw materials - foreign	-	-	-	-	-

Salary costs	57.600,00	57.600,00	57.600,00	57.600,00	57.600,00
<u>Salary costs for regular employees</u>					
<u>Compensation costs for part time jobs</u>					

<u>Costs for energy</u>	102.528,00	102.528,00	102.528,00	102.528,00	102.528,00
<u>Maintanance costs</u>	35.534,00	35.534,00	35.534,00	35.534,00	35.534,00
<u>Indirect costs</u>	19.224,00	19.224,00	19.224,00	19.224,00	19.224,00
<u>Other costs</u>	2.755,00	2.755,00	2.755,00	2.755,00	2.755,00
<u>Total costs in EUR</u>	255.653	255.653	255.653	255.653	255.653

Table 6. Annual profit

FORESEEN ANNUAL PROFIT						
for the new project as a difference between the new and current production						
(before and after investment)						
exchange for EUR	61,7	61,7	61,7	61,7	61,7	
in EUR						
	2007	2008	2009	2010	2011	
AFTER INVESTMENT						
Incomes from domestic market	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880	
Incomes from export	-	-	-	-	-	-
Total incomes	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880	1.356.000
Costs from domestic market	255.653	255.653	255.653	255.653	255.653	255.653
Costs from foreign market	-	-	-	-	-	-
Total operational costs	255.653	255.653	255.653	255.653	255.653	40.000
GROSS WORKING INCOMES	2.159.227	2.159.227	2.159.227	2.159.227	2.159.227	2.159.227
GROWTH AND FINANCIAL CALCULATIONS						
Incomes from domestic market	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
Incomes from export	-	-	-	-	-	-
Total incomes	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
Costs from domestic market	255.653	255.653	255.653	255.653	255.653	255.653
Costs from foreign market	-	-	-	-	-	-
Total operational costs	255.653	255.653	255.653	255.653	255.653	255.653
GROSS WORKING INCOMES	2.159.227	2.159.227	2.159.227	2.159.227	2.159.227	2.159.227

Table 7. Working capital

FORESEEN ADDITIONAL WORKING CAPITAL					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2007	2008	2009	2010	2011
Increased current assets:					
Cash needed	24.149	24.149	24.149	24.149	24.149
(as % of increased income)	1%	1%	1%	1%	1%
Receivables from buyers	198.483	198.483	198.483	198.483	198.483
(number of collecting days/ increased income)	30	30	30	30	30
Inventories					
Materials and spare parts (raw materials)	0	3.160	3.160	3.160	3.160
(number of collecting days/ increased costs and inventories)	30	30	30	30	30
Finished and semifinished products	0	0	3.124	3.124	3.124
(number of collection days/ increased income)	0	0	30	30	30
Final product	198.483,3	198.483,3	198.483,3	198.483,3	198.483,3
(number of collection days/ increased income)	30	30	30	30	30
Other	0	0	0	0	0
(% of increased income)	0%	0%	0%	0%	0%
Increased current assets	424.275,5	427.399,7	427.399,7	427.399,7	427.399,7
Increased short term liabilities					
Liabilities toward suppliers	21.013	21.013	21.013	21.013	21.013
(number of collection days/ increased costs)	30	30	30	30	30
Salary liabilities	4.734	4.734	4.734	4.734	4.734
(number of pay out days/increased salaries)	30	30	30	30	30
Depreciation	26.301	26.301	26.301	26.301	26.301
(number of calculation days/annual depreciation)	30	30	30	30	30
Other	105.303	105.303	105.303	105.303	105.303
(% of increased income)	4%	4%	4%	4%	4%
Increased short term liabilities	157.351	157.351	157.351	157.351	157.351
ADDITIONAL WORKING CAPITAL	266.924	266.924	270.048	270.048	270.048
INCREASING OF ADDITIONAL WORKING CAPITAL	266.924	266.924	3.124	0	0

Table 8. Financial Rate of Return for investment of 5 years

FINANCIAL RATE OF PROFITABILITY

in EUR	2006	2007	2008	2009	2010	2011
<u>Project costs:</u>						
Total project costs:	-3.466.924,1	0,0	0,0	0,0	0,0	0,0
<u>Increased income:</u>						
Domestic incomes	0,0	2.414.880,0	2.414.880,0	2.414.880,0	2.414.880,0	2.414.880,0
Foreign incomes	0,0	0,0	0,0	0,0	0,0	0,0
Total increase income	0,0	2.414.880,0	2.414.880,0	2.414.880,0	2.414.880,0	2.414.880,0
<u>Increased operational costs</u>						
Costs from domestic market	0,0	255.652,8	255.652,8	255.652,8	255.652,8	255.652,8
Costs from foreign market	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	255.652,8	255.652,8	255.652,8	255.652,8	255.652,8
Increased gross working profit	0,0	2.159.227,2	2.159.227,2	2.159.227,2	2.159.227,2	2.159.227,2
INCREASED NET PROFIT	-3.466.924,1	2.159.227,2	2.159.227,2	2.159.227,2	2.159.227,2	2.159.227,2

FINANCIAL RATE OF RETURN	55%
NET PRESENT VALUE	3.279.252,5
(discount rate)	15%

Table 9. Review of credit liabilities

Amount in EUR				
Source of assets		BANK		
Credit amount		1,490,810		
Repayment period in years without grace period		4		
Grace period - years		1		
Amount of annual instalment		372,703		
Interest		8,00%		
Periods	Credit	Instalment	Interest	Annuity
1	1.490.810	-	119,265	119,265
2	1.490.810	372,703	119,265	491,967
3	1.118.108	372,703	89,449	462,151
4	745.405	372,703	59,632	432,335
5	372.703	372,703	29,816	402,519
Total	1.490.810		417,427	1,908,237

Table 10. Calculation of Depreciation

Nr.	Fixed assets	Value	%	Depreciation
1	Building - old	-	0%	-
2	Building - new	-	4,0%	-
3	Equipment - old		0%	-
4	Equipment - new	3.200.000,0	10%	320.000
5	Subsidiary equipment -old		0,00%	-
6	Subsidiary equipment -new	0,0		-
7	Vehicles - old		0%	-
8	Vehicles - new	0,0		-
9	Other - old	-	0%	-
10	Other - new	-	0%	-
11	TOTAL - OLD			-
12	TOTAL - NEW			320.000,00
13	ALL TOTAL			320.000,00

Table 11. Sensibility of Rate of Profitability

ANALYZING THE SENSIBILITY OF THE FINANCIAL RATE OF PROFITABILITY

TESTING THE SENSIBILITY Changes in % on 5 variables with the following presumptions: in EUR	Domestic incomes		-30%			
	Foreign incomes		0%			
	Price of rawmaterials on domestic market		0%			
	Proce of raw materials on foreign market		0%			
	Investment costs		20%			
	2006	2007	2008	2009	2010	2011
Project costs (Investment):						
Total project costs	-3.466.924,1	0,0	0,0	0,0	0,0	0,0
Increased income						
Domestic income	0,0	1.690.416,0	1.690.416,0	1.690.416,0	1.690.416,0	1.690.416,0
Foreign income	0,0	0,0	0,0	0,0	0,0	0,0
Total increased income	0,0	1.690.416,0	1.690.416,0	1.690.416,0	1.690.416,0	1.690.416,0
Increased operational costs						
Costs for domestic market	0,0	255.652,8	255.652,8	255.652,8	255.652,8	255.652,8
Costs from foreign market	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	255.652,8	255.652,8	255.652,8	255.652,8	255.652,8
Increased gross working profit	0,0	1.434.763,2	1.434.763,2	1.434.763,2	1.434.763,2	1.434.763,2

**INCREASED NET
PROFIT**

-3.466.924,1 1.434.763,2 1.434.763,2 1.434.763,2 1.434.763,2 1.434.763,2

**FINANCIAL RATE
OF RETURN
NET PRESENT
VALUE**

30%

1.167.499,8

(discount rate)

15%

Table 12. Simplificated balance sheet

SIMPLIFICATED BALANCE SHEET					
EUR	2007	2008	2009	2010	2011
ASSETS:					
Current assets					
Surplus of cash	-12.987	148.013	1.302.725	2.678.468	4.078.661
Cash from working	24.149	24.149	24.149	24.149	24.149
Receivables for buyers	198.483	198.483	198.483	198.483	198.483
Inventories	201.643	204.768	204.768	204.768	204.768
Other	0	0	0	0	0
Total current assets	414.413	575.413	1.730.125	3.105.868	4.301.293
Net fixed assets	3.200.000	3.173.699	3.147.397	3.121.096	3.094.795
Total fixed assets	3.200.000	6.640.623	6.614.321	6.588.020	6.561.719
TOTAL ASSETS	7.055.035	7.189.734	8.318.145	9.667.587	4.515.852
LIABILITIES AND SHAREHOLDING CAPITAL (NEW)					
Liabilities					
Deficit of cash	89.611	250.611	250.611	250.611	250.611
Short liabilities toward suppliers	2.137	21.013	21.013	21.013	21.013
Other	403.263	406.387	406.387	406.387	406.387
Debts	161.000	-211.703	-584.405	-957.108	-1.329.810
Other long term liabilities and reservations	0	0	0	0	0
TOTAL LIABILITIES	674.886	466.308	93.606	-279.097	-651.799
Shareholding capital					
Capital	107.400	107.400	107.400	107.400	107.400
Retained annual profit	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Retained profits	0	1.648.796	3.322.042	5.019.737	6.741.881
TOTAL SHAREHOLDING CAPITAL	1.159.111	1.756.196	3.429.442	5.127.137	6.849.281
TOTAL LIABILITIES AND SHAREHOLDING CAPITAL	1.646.186	2.431.083	3.895.750	5.220.743	6.570.185

Table 13. Income statement

INCOME STATEMENT						
in EUR	2006	2007	2008	2009	2010	2011
Sales and other incomes:						
in country	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
abroad	-	-	-	-	-	-
Total sale	258.587	258.587	258.587	258.587	258.587	258.587
Costs and expenditures						
Raw materials						
in country	26.301	26.301	26.301	26.301	26.301	26.301
abroad						
Gross salaries		119.265	89.449	59.632	29.816	
Other costs						
Total costs						
Depreciation:						
Total depreciation	26.301	26.301	26.301	26.301	26.301	26.301
Interest costs						
Total interest costs			119.265	89.449	59.632	29.816
TOTAL OPERATIONAL INCOMES AND EXPENDITURES	- 404.153	374.336	344.520	314.704	284.888	
Extra items:						
Total extra items	-	-	-	-	-	-
NET PROFIT BEFORE TAXATION	- 2.010.727	2.040.544	2.070.360	2.100.176	2.129.992	
Income tax	(361.931)	(367.298)	(372.665)	(378.032)	(383.399)	(236.206)
(% from the income before taxation)		18%	18%	18%	18%	18%
NET PROFIT	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594	

Table 14. Review of Cash Flow

REVIEW OF CASH FLOW					
(SOURCES OF ASSETS AND NEED FOR INVESTMENT)					
	61,7	61,7	61,7	61,7	61,7
in EUR	2007	2008	2009	2010	2011
<u>SOURCES</u>					
Own resources					
Retained profit	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Depreciation	26.301	26.301	26.301	26.301	26.301
Cash inflow from regular working	201.753	212.835	1.675.098	1.699.547	1.723.996
Credits	1.490.810	-	-	-	-
Total financial activities	1.490.810	-	-	-	-
From other sources					988.095
New capital from owners	988,095	-	-	-	-
New capital from joint ventures	-	-	-	-	-
<u>TOTAL SOURCES</u>	4.154.003	1.699.547	1.723.996	1.748.446	1.772.895
<u>DEMAND</u>					
Investments					
Total investments	3.466.924	-	-	-	-
Financial activities					
Instalments	-	372.703	372.703	372.703	372.703
Total financial activities		372.703	372.703	372.703	372.703
<u>TOTAL DEMAND</u>	3.466.924	372.703	372.703	372.703	372.703
ANNUAL SURPLUS/DEFICIT OF CASH	687,079	1,326,845	1,351,294	1,375,743	1,400,192
CUMULATIVE SURPLUS/DEFICIT	687,079	2,013,923	3,365,217	4,740,960	6,141,153

Table 15. Projection of net foreign market inflow

PROJECTION OF NET FOREIGN CURRENCY INFLOW						
in EUR						
	2006	2007	2008	2009	2010	2011
SOURCES						
Total export	0	0	0	0	0	0
Credits	1.490.810	0	0	0	0	0
Total foreign currency sources	1.490.810	0	0	0	0	0
EXPENDITURES						
Investment costs (planned)	3.466.924	0	0	0	0	0
<i>Import</i>						
Total import	0	0	0	0	0	0
<i>Credit repayment</i>						
Instalment, net	0	0	372.703	372.703	372.703	372.703
Interest	0	119.265	89.449	59.632	29.816	0
<i>Total credit repayment</i>	0	119.265	462.151	432.335	402.519	372.703
Total foreign currency expenditures	1.490.810	119.265	462.151	432.335	402.519	372.703
TOTAL NET FOREIGN CURRENCY PROFIT	0	-119.265	-462.151	-432.335	-402.519	-372.703

Table 16. Financial Ratios

FINANCIAL RATIOS					
in EUR					
	2007	2008	2009	2010	2011
Liquidity					
<i>Current ratio</i>					
Current assets (□)	427.400	427.400	427.400	427.400	222.632
Short term liabilities (B)	424.275	427.400	427.400	427.400	427.400
□/B	1,01	1,00	1,00	1,00	0,52
Quick ratio					
Current assets (□)	427.400	427.400	427.400	427.400	222.632
Inventories (B)	201.643	204.768	204.768	204.768	204.768
Short term liabilities (C)	424.275	427.400	427.400	427.400	427.400
(□-B)/C	0,52	0,52	0,52	0,52	0,52
The share of debt in total capital					
<i>Debts in total assets</i>					
Debt (□)	161.000	-211.703	-584.405	-957.108	-1.329.810

Total assets (B)	7.055.035	7.189.734	8.318.145	9.667.587	4.515.852
\square/B	2%	-3%	-7%	-10%	-29%
Debt/Shareholding capital					
Debt (\square)	161.000	-211.703	-584.405	-957.108	-1.329.810
Shareholding capital (B)	1.756.196	3.429.442	5.127.137	6.849.281	8.595.875
\square/B	9%	-6%	-11%	-14%	-15%
Debt spreading over					
Net income (\square)	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Depreciation (B)	26.301	26.301	26.301	26.301	26.301
Interest (C)		119.265	89.449	59.632	29.816
Mature instalment (D)	0	372.703	372.703	372.703	372.703
$(\square+B+C)/D$	15,0	3,9	4,1	4,4	4,8
Profitability					
Net profit rate					
Net profit (\square)	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Income (B)	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
\square/B	68%	69%	70%	71%	72%
Return of total assets					
Net profit (\square)	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Total assets (B)	7.055.035	7.189.734	8.318.145	9.667.587	4.515.852
\square/B	0,23	0,23	0,20	0,18	0,39
Return of capital					
Net profit (\square)	1.648.796	1.673.246	1.697.695	1.722.144	1.746.594
Capital (\square)	1.756.196	3.429.442	5.127.137	6.849.281	8.595.875
\square/B	0,94	0,49	0,33	0,25	0,20
Working					
Inventories turn over					
Sales costs (\square)	258.587	258.587	258.587	258.587	258.587
Inventories (B)	201.643	204.768	204.768	204.768	204.768
\square/B	0,00	1,26	1,26	1,26	1,26
Average time for payment					
Receivables (\square)	198.483	198.483	198.483	198.483	198.483
Daily income (B)	6.616	6.616	6.616	6.616	6.616
\square/B	30	30	30	30	30
Turn over of fixed assets					
Income (\square)	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
Fixed assets (B)	3.200.000	6.640.623	6.614.321	6.588.020	6.561.719
\square/B	0,0	0,4	0,4	0,4	0,4
Turn over of all assets					
Income (\square)	2.414.880	2.414.880	2.414.880	2.414.880	2.414.880
Total assets (B)	7.055.035	7.189.734	8.318.145	9.667.587	4.515.852
\square/B	0,3	0,3	0,3	0,2	0,5

RES Integration Project

WP 4

Project Partner: GREECE

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of the energy production from geothermal resources in island Milos, Greece, we can comment on the following:

4. PROJECT FOR

Geothermal project Thiafes (repayment period 7 years)

- **Financial rate of return**

With planned capacity for production of heat and coldness (kWh) with following explained production per year, with geothermal resource, the financial rate of return is about 22% (analysis for period of 7 years, Table 8.). For the discount rate (15%) it's a good scenario, where also, analysis is made for sensibility rate of profitability for pessimistic conditions (10% minus of incomes) and result is 17% financial rate of return for that sensibility analysis. General conclusion is that the costs for this project will be returned between 5th and 6th year of exploitation i.e. the investment is profitable.

- **Net profit**

During the whole repayment period of 7 years, the project shows net profit with tendency of growth from year to year.

- **Cash flow**

The cash flow is positive during the whole repayment period of 5 years that could be positively estimated.

- **Liquidity ratio (current)**

The current liquidity ratio is ~1 (Table 15) that is in accordance with the optimal current liquidity ratio. This means that there are enough current assets to cover the short term liabilities.

- **Liquidity ratio (quick)**

The same situation applies for the quick liquidity ratio when this ratio is about 0,5.

- **Profitability ratio**

This ratio shows tendency of growth from year to year that could be positively estimated.

Table 1. Total capital costs

Geothermal project Thiafes (repayment period 7 years)

DEN/EUR		in denars 61,7	in EUR
Preparing activities		0.0	0.0
Building construction + Equipment		30,850,000	500,000
- building and crafty activities		0	0
- machine instalations		0	0
- electroinstalations and telephony		0	0
- drain and drainage		0	0
- other activities		0	0
Connections to network		24,680,000	400,000
- invoice value with assemblage and transport		0	0
- custom		0	0
- tax		0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
Drilling		2,776,500	45,000
- invoice value		0	0
- custom		0	0
- tax	18%	0	0
NETWORK		10,797,500	175,000
- licence rights and patent		0	0
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		0	0
TOTAL PLANNED COSTS FOR FIXED ASSETS		55,530,000	1,120,000
Funds planned for working capital			33,432
TOTAL REQUIRED FUNDS		55,530,000	1,153,432

Table 2. Total financial sources

		RESOURCES in denars	countervalue in EUR	Structure of funds resources
DEN/EUR	61,7			
BANKING CREDITS		27,746,141.4	449,694.4	38.89%
- Bank		27,746,141.4	449,694.4	38.89%
- Commercial Banks		0.0	0.0	0.00%
- World Bank		0.0	0.0	0.00%
- European Bank		0.0	0.0	0.00%
- Other resources		0.0	0.0	0.00%
OWN SOURCES		21,404,166.2	346,907.1	30.00%
- preparatory investments		21,404,166.2	346,907.1	30.00%
- additional investments		0.0	0.0	0.00%
- SEAF		0.0	0.0	0.00%
-from accumulation		0.0	0.0	0.00%
- from depreciation		0.0	0.0	0.00%
OTHER SOURCES		22,196,913.1	359,755.5	31.11%
		22,196,913.1	359,755.5	31.11%
		0.0	0.0	0.00%
TOTAL FINANCIAL SOURCES		49,150,307.6	1,156,356.9	100.00%

Table 3. Structure of utilisation

		in denars	in EUR	Structure of utilization
DEN/EUR	61,7			
MACHINES, EQUIPMENT AND TECHNOLOGY		22.197.192,00	359.760,00	80,00%
BUILDING CONSTRUCTION		0,00	0,00	0,00%
WORKING CAPITAL		5,549,298.00	89.940,00	20,00%
TOTAL BANK CREDIT		27.746.490,00	449.700,00	100,00%

Table 4. Sales in EUR after investment

Annual production	2007	2008	2009	2010	2011	2012	2013
(For calories in kWh)							
Quantity	1,109,760	1,109,760	1,109,760	1,109,760	1,109,760	1,109,760	1,109,760
Price per unit 0,2 Euro	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Value= Product unit * price per unit	223.062,00	223.062,00	223.062,00	223.062,00	223.062,00	223.062,00	223.062,00

Quantity	(For frigories in kWh)	924,800	924,800	924,800	924,800	924,800	924,800	924,800
Price per unit	0,2 Euro	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Value= Product unit * price per unit		184.960,00	184.960,00	184.960,00	184.960,00	184.960,00	184.960,00	184.960,00
Quantity								
Quantity								
Price per unit								
Value= Product unit * price per unit		0	0	0	0	0	0	0
Incomes from other activities		0	0	0	0	0	0	0
TOTAL IN EUR		406.912,00	406.912,00	406.912,00	406.912,00	406.912,00	406.912,00	406.912,00
Domestic market (in % from total)		100%	100%	100%	100%	100%	100%	100%
Foreign market (in % from total)		0%	0%	0%	0%	0%	0%	0%

Table 5. Total costs after investment

TOTAL NUMBER OF EMPLOYEES								
Amounts in denars		2007	2008	2009	2010	2011	2012	2013
<u>Total raw materials</u>		1.000,00	1.000,00	1.000,00	1.000,00	1.000,00	1.000,00	1.000,00
<u>Total raw materials - domestic</u>		-	-	-	-	-	-	-
<u>Total raw materials - foreign</u>		-	-	-	-	-	-	-
Salary costs		57.600,00	57.600,00	57.600,00	57.600,00	57.600,00	57.600,00	57.600,00
<u>Salary costs for regular employees</u>								
<u>Compensation costs for part time jobs</u>								
<u>Costs for energy</u>								
<u>Maintanance costs</u>		13.500,00	13.500,00	13.500,00	13.500,00	13.500,00	13.500,00	13.500,00
<u>Indirect costs</u>								
<u>Other costs</u>								
<u>-</u>								
Total costs in EUR		72,089	72,089	72,089	72,089	72,089	72,089	72,089

Table 6. Annual profit

FORESEEN ANNUAL PROFIT							
for the new project as a difference between the new and current production							
(before and after investment)							
exchange for EUR	61,7	61,7	61,7	61,7	61,7	61,7	
in EUR							
	2007	2008	2009	2010	2011		
AFTER INVESTMENT						2012	2013
Incomes from domestic market	406,912	406,912	406,912	406,912	406,912	406,912	406,912
Incomes from export	-	-	-	-	-	-	-
Total incomes	406,912	406,912	406,912	406,912	406,912	406,912	406,912
Costs from domestic market	72,089	72,089	72,089	72,089	72,089	72,089	72,089
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	72,089	72,089	72,089	72,089	72,089	72,089	72,089
GROSS WORKING INCOMES	334,823	334,823	334,823	334,823	334,823	334,823	334,823
GROWTH AND FINANCIAL CALCULATIONS							
Incomes from domestic market	406,912	406,912	406,912	406,912	406,912	406,912	406,912
Incomes from export	-	-	-	-	-	-	-
Total incomes	406,912	406,912	406,912	406,912	406,912	406,912	406,912
Costs from domestic market	72,089	72,089	72,089	72,089	72,089	72,089	72,089
Costs from foreign market	-	-	-	-	-	-	-
Total operational costs	72,089	72,089	72,089	72,089	72,089	72,089	72,089
GROSS WORKING INCOMES	334,823	334,823	334,823	334,823	334,823	334,823	334,823

Table 7. Working capital

FORESEEN ADDITIONAL WORKING CAPITAL					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2007	2008	2009	2010	2011
Increased current assets:					
Cash needed	4,069	4,069	4,069	4,069	4,069
(as % of increased income)	1%	1%	1%	1%	1%

Receivables from buyers	33,445	33,445	33,445	33,445	33,445
(number of collecting days/ increased income)	30	30	30	30	30
Inventories					
Materials and spare parts (raw materials)	0	82	82	82	82
(number of collecting days/ increased costs and inventories)	30	30	30	30	30
Finished and semifinished products	0	0	4,816	4,816	4,816
(number of collection days/ increased income)	0	0	30	30	30
Final product	33,444.8	33,444.8	33,444.8	33,444.8	33,444.8
(number of collection days/ increased income)	30	30	30	30	30
Other	0	0	0	0	0
(% of increased income)	0%	0%	0%	0%	0%
Increased current assets	71,041.0	75,856.5	75,856.5	75,856.5	75,856.5
Increased short term liabilities					
Liabilities toward suppliers	5,925	5,925	5,925	5,925	5,925
(number of collection days/ increased costs)	30	30	30	30	30
Salary liabilities	4,734	4,734	4,734	4,734	4,734
(number of pay out days/increased salaries)	30	30	30	30	30
Depreciation	9,205	9,205	9,205	9,205	9,205
(number of calculation days/annual depreciation)	30	30	30	30	30
Other	17,744	17,744	17,744	17,744	17,744
(% of increased income)	4%	4%	4%	4%	4%
Increased short term liabilities	157,351	37,609	37,609	37,609	37,609
ADDITIONAL WORKING CAPITAL	266.924	33,432	38,248	38,248	38,248
INCREASING OF ADDITIONAL WORKING CAPITAL	266.924	33,432	4,816	0	0

Table 8. Financial Rate of Return for investment of 5 years

FINANCIAL RATE OF PROFITABILITY

in EUR	2006	2007	2008	2009	2010	2011	2012	2013
Project costs:								
Total project costs:	-1,153,432.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Increased income:								
Domestic incomes	0.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0
Foreign incomes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total increase	0.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0	406,912.0

income									
Increased operational costs									
Costs from domestic market	0.0	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	
Costs from foregin market	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total increased operational costs	0,0	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7
Increased gross working profit	0,0	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3
INCREASED NET PROFIT	-1,153,432.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3	334,823.3

FINANCIAL RATE OF RETURN	22%
NET PRESENT VALUE	208,324.6
(discount rate)	15%

Table 9. Review of credit liabilities

Amount in EUR				
Source of assets			BANK	
Credit amount			449,700	
Repayment period in years without grace period			4	
Grace period - years			1	
Amount of annual instalment			112,425	
Interest			8,00%	
Periods	Credit	Instalment	Interest	Annuity
1	449,700	-	35,976	35,976
2	449,700	112,425	35,976	148,401
3	337,275	112,425	26,982	139,407
4	224,850	112,425	17,988	130,413
5	112,425	112,425	8,994	121,419
Total		1.490.810	125,916	575,616

Table 10. Calculation of Depreciation

Nr.	Fixed assets	Value	%	Depreciation
1	Building - old	-	0%	-
2	Building - new	-	4,0%	-
3	Equipment - old		0%	-
4	Equipment - new	1.120.000,00	10%	112.000,00
5	Subsidiary equipment -old		0,00%	-

6	Subsidiary equipment -new	0,0		-
7	Vehicles - old		0%	-
8	Vehicles - new	0,0		-
9	Other - old	-	0%	-
10	Other - new	-	0%	-
11	TOTAL - OLD			-
12	TOTAL - NEW			112,000.00
13	ALL TOTAL			112,000.00

Table 11. Sensibility of Rate of Profitability

ANALYZING THE SENSIBILITY OF THE FINANCIAL RATE OF PROFITABILITY

TESTING THE SENSIBILITY Changes in % on 5 variables with the following presumptions: in EUR	Domestic incomes		-10%			
	Foreign incomes		0%			
	Price of rawmaterials on domestic market		0%			
	Proce of raw materials on foreign market		0%			
	Investment costs		20%			
	2006	2007	2008	2009	2010	2011
Project costs (Investment):						
Total project costs	-1,153,432.3	0.0	0.0	0.0	0.0	0.0
Increased income						
Domestic income	0.0	366,220.8	366,220.8	366,220.8	366,220.8	366,220.8
Foreign income	0.0	0.0	0.0	0.0	0.0	0.0
Total increased income	0.0	366,220.8	366,220.8	366,220.8	366,220.8	366,220.8
Increased oeprational costs						
Costs for domestic market	0.0	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7
Costs from foreign market	0.0	0.0	0.0	0.0	0.0	0.0
Total increased operational costs	0.0	72,088.7	72,088.7	72,088.7	72,088.7	72,088.7
Increased gross working profit	0.0	294,132.1	294,132.1	294,132.1	294,132.1	294,132.1
INCREASED NET PROFIT	-1,153,432.3	294,132.1	294,132.1	294,132.1	294,132.1	294,132.1

FINANCIAL RATE OF RETURN	17%
NET PRESENT VALUE	61,113.8
(discount rate)	15%

Table 12. Simplificated balance sheet

SIMPLIFICATED BALANCE SHEET							
EUR							
	2007	2008	2009	2010	2011	2009	2009
ASSETS:							
Current assets							
Surplus of cash	-301,687	178,198	326,556	482,290	545,835	812,375	966,490
Cash from working	4,069	4,069	4,069	4,069	4,069	4,069	4,069
Receivables for buyers	33,445	33,445	33,445	33,445	33,445	33,445	33,445
Inventories	33,527	38,343	38,343	38,343	38,343	38,343	38,343
Other	0	0	0	0	0	0	0
Total current assets	-225,831	254,054	402,413	558,146	621,692	888,231	1,004,004
Net fixed assets	1,120,000	1,110,795	1,101,589	1,092,384	1,083,178	1,073,973	1,064,767
Total fixed assets	1,120,000	2,264,227	2,255,021	2,245,816	2,236,610	2,227,405	2,218,199
TOTAL ASSETS	2,038,396	2,509,076	2,648,229	2,794,757	2,849,097	3,106,431	1,004,004
LIABILITIES AND SHAREHOLDING CAPITAL (NEW)							
Liabilities							
Deficit of cash	89,611	250,611	250,611	250,611	250,611	250,611	250,611
Short liabilities toward suppliers	2,137	5,925	5,925	5,925	5,925	5,925	5,925
Other	65,116	69,931	69,931	69,931	69,931	69,931	69,931
Debts	161,000	48,575	-63,850	-176,275	-288,700	-297,694	-419,113
Other long term liabilities and reservations	0	0	0	0	0	0	0
TOTAL LIABILITIES	321,652	375,042	262,617	150,192	37,767	28,773	-92,646
Shareholding capital							
Capital	346,900	346,900	346,900	346,900	346,900	346,900	346,900
Retained annual profit	236,828	244,203	251,578	258,953	166,765	266,328	266,328
Retained profits	0	236,828	481,031	732,609	991,562	1,158,327	1,424,655
TOTAL SHAREHOLDING CAPITAL	1,159,111	583,728	827,931	1,079,509	1,338,462	1,505,227	1,771,555
TOTAL LIABILITIES AND SHAREHOLDING CAPITAL	1,646,186	905,380	1,202,974	1,342,127	1,488,655	1,542,995	1,800,329

Table 13. Income statement

INCOME STATEMENT							
in EUR							
	2006	2007	2008	2009	2010	2011	2012
Sales and other incomes:							
in country							

	406,912	406,912	406,912	406,912	406,912	406,912	406,912	406,912
abroad	-	-	-	-	-	-	-	-
Total sale	406,912	406,912	406,912	406,912	406,912	406,912	406,912	406,912
Costs and expenditures								
Raw materials								
in country	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
abroad	-	-	-	-	-	-	-	-
Gross salaries	58,261	58,261	58,261	58,261	58,261	58,261	58,261	58,261
Other costs	13,655	13,655	13,655	13,655	13,655	13,655	13,655	13,655
Total costs	72,916	72,916	72,916	72,916	72,916	72,916	72,916	72,916
Depreciation:								
Total depreciation	9,205	9,205	9,205	9,205	9,205	9,205	9,205	9,205
Interest costs								
Total interest costs		35,976	26,982	17,988	8,994	121,419	-	-
TOTAL OPERATIONAL INCOMES AND EXPENDITURES	-	118,097	109,103	100,109	91,115	203,540	82,121	82,121
Extra items:								
Total extra items		-	-	-	-	-	-	-
NET PROFIT BEFORE TAXATION	-	288,815	297,809	306,803	315,797	203,372	324,791	324,791
Income tax (% from the income before taxation)	(51,987)	(53,606)	(55,224)	(56,843)	(36,607)	(58,462)	(58,462)	(51,987)
	18%	18%	18%	18%	18%	18%	18%	18%
NET PROFIT	236,828	244,203	251,578	258,953	166,765	266,328	266,328	236,828

Table 14. Review of Cash Flow

REVIEW OF CASH FLOW							
(SOURCES OF ASSETS AND NEED FOR INVESTMENT)							
	61,7	61,7	61,7	61,7	61,7	61,7	61,7
In EUR							
	2007	2008	2009	2010	2011	2012	2013
SOURCES							
Own resources							
Retained profit	236,828	244,203	251,578	258,953	166,765	266,328	266,328
Depreciation							

	9,205	9,205	9,205	9,205	9,205	9,205	9,205	
Cash inflow from regular working	246,033	253,409	260,784	268,159	175,970	275,534	275,534	275,534
Credits	449.700,00	-	-	-	-	-	-	
Total financial activities	449.700,00	-	-	-	-			161.00
From other sources							359.760,00	
New capital from owners	346.900,00	-	-	-	-		-	-
New capital from joint ventures	-	-	-	-	-			
TOTAL SOURCES	1,042,633	253,409	260,784	268,159	175,970	275,534	275,534	
DEMAND								
Investments	1.153.432							
Total investments	,00	-	-	-	-	-	-	
Financial activities								
Instalments	-	112,425	112,425	112,425	112,425	8,994	121,419	
Total financial activities		112,425	112,425	112,425	112,425	8,994	121,419	
TOTAL DEMAND	1,153,432	112,425	112,425	112,425	112,425	8,994	121,419	
ANNUAL SURPLUS/DEFICIT OF CASH	(110,799)	140.984,0	148.359,0	155.734,0	63.545,0	266.540,0	154.115,0	1.351.294
CUMULATIVE SURPLUS/DEFICIT	(110,799)	30.185,0	178.543,0	334.277,0	397.822,0	664.362,0	818.477,0	1.154.712

Table 15. Projection of net foreign market inflow

PROJECTION OF NET FOREIGN CURRENCY INFLOW

in EUR	2006	2007	2008	2009	2010	2011
SOURCES						
Total export	449,700	0	0	0	0	0
Credits	449,700	0	0	0	0	0
Total foreign currency sources						
EXPENDITURES	<u>1,153,432</u>	<u>0</u>	0	0	0	0
Investment costs (planned)						
Import	0	0	0	0	0	0
Total import						
Credit repayment	0	0	112,425	112,425	112,425	112,425
Instalment, net	0	35,976	26,982	17,988	8,994	121,419
Interest	0	35,976	139,407	130,413	121,419	233,844
Total credit repayment	449,694	35,976	139,407	130,413	121,419	233,844
Total foreign currency expenditures	449,694	35,976	139,407	130,413	121,419	233,844
TOTAL NET FOREIGN	6	-35,976	-139,407	-130,413	-121,419	-233,844

CURRENCY PROFIT

Table 16. Financial Ratios

FINANCIAL RATIOS					
in EUR	2007	2008	2009	2010	2011
Liquidity					
Current ratio					
Current assets (□)	75,856	75,856	75,856	75,856	75,856
Short term liabilities (B)	71,041	75,856	75,856	75,856	75,856
□/B	1.07	1.00	1.00	1.00	1.00
Quick ratio					
Current assets (□)	75,856	75,856	75,856	75,856	75,856
Inventories (B)	33,527	38,343	38,343	38,343	38,343
Short term liabilities (C)	71,041	75,856	75,856	75,856	75,856
(□-B)/C	0.53	0.49	0.49	0.49	0.49
The share of debt in total capital					
Debts in total assets					
Debt (□)	161,000	48,575	-63,850	-176,275	-288,700
Total assets (B)	2,038,396	2,509,076	2,648,229	2,794,757	2,849,097
□/B	8%	2%	-2%	-6%	-10%
Debt/Shareholding capital					
Debt (□)	161,000	48,575	-63,850	-176,275	-288,700
Shareholding capital (B)	583,728	827,931	1,079,509	1,338,462	1,505,227
□/B	28%	6%	-6%	-13%	-19%
Debt spreading over					
Net income (□)	236,828	244,203	251,578	258,953	166,765
Depreciation (B)	9,205	9,205	9,205	9,205	9,205
Interest (C)		35,976	26,982	17,988	8,994
Mature instalment (D)	0	112,425	112,425	112,425	112,425
(□+B+C)/ D	7.8	2.0	2.1	2.3	1.3
Profitability					
Net profit rate					
Net profit (□)	236,828	244,203	251,578	258,953	166,765
Income (B)	406,912	406,912	406,912	406,912	406,912
□/B	58%	60%	62%	64%	41%
Return of total assets					
Net profit (□)	236,828	244,203	251,578	258,953	166,765
Total assets (B)	2,038,396	2,509,076	2,648,229	2,794,757	2,849,097
□/ B	0.12	0.10	0.09	0.09	0.06
Return of capital					
Net profit (□)	236,828	244,203	251,578	258,953	166,765
Capital (□)	583,728	827,931	1,079,509	1,338,462	1,505,227

\square / B	0.41	0.29	0.23	0.19	0.11
Working					
Inventories turn over					
Sales costs (\square)	72,916	72,916	72,916	72,916	72,916
Inventories (B)	33,527	38,343	38,343	38,343	38,343
\square / B	0.00	1.90	1.90	1.90	1.90
Average time for payment					
Receivables (\square)	33,445	33,445	33,445	33,445	33,445
Daily income (B)	1,115	1,115	1,115	1,115	1,115
\square / B	30	30	30	30	30
Turn over of fixed assets					
Income (\square)	406,912	406,912	406,912	406,912	406,912
Fixed assets (B)	1,120,000	2,264,227	2,255,021	2,245,816	2,236,610
\square / B	0.0	0.2	0.2	0.2	0.2
Turn over of all assets					
Income (\square)	406,912	406,912	406,912	406,912	406,912
Total assets (B)	2,038,396	2,509,076	2,648,229	2,794,757	2,849,097
\square / B	0.2	0.2	0.2	0.1	0.1

**“Integrating and strengthening the European Research Area,
Specific Measures in support of International Cooperation (INCO)”**



**“Rural Sustainable Development through Integration of
Renewable Energy Technologies in Poor European Regions”**



RES INTEGRATION



**ITALY - EXAMPLE OF ECONOMIC
ANALYSIS OF PLANNED INVEST-
MENT IN DIFFERENT RES
PROJECTS**



RES - INTEGRATION



**Work Package 4: FP6-509204
ECONOMIC IMPACT ASSESSMENT**

ITALY

**EVALUATION OF
ECONOMIC
JUSTIFIABLENESS
FOR INVESTING IN
THREE
DIFFERENT
RES PROJECTS**

**RES Integration Project
WP 4**

Project Partner: ITALY

TITLE OF THE PROJECT (Business investment):

Solar Thermal System Uptake

LOCATION: Mountain Community of Limina

HEAD OF CONCRETE PROJECT: TBD

SHORT DESCRIPTION OF THE PROJECT (Summary of the idea):

The proposal is to install a wide array of Solar Hot Water (SHW) Systems across the Limina community. It is estimated that 1000 roof-top systems could be possible in the near-term future, which could provide the hot water usage for up to half of the inhabitants. In the lower-altitude regions, hot water usage makes up a very large portion of thermal energy demand, as heating is used very sparingly.

1. PREPARATION ACTIVITIES:

INVESTIGATIONS (Short description of necessary investigations):

Typical hot water consumption in the region is estimated at approximately 50L/day/person, and thus for a residential building containing 3 families, with 9 people in total would result in a system roof-top solar system requiring a daily storage of 450L, with approximately 7 m² of solar collectors required. A single-dwelling residential building for a family of four (200L tank) would require about 3 m².

The question then becomes to survey the community to find who has the required space on the roofs for such systems, as well as who would have the economic situation to participate in such a scheme.

ADMINISTRATIVE PROCEDURE (Short description of necessary activities):

For a solar thermal installation on a residential dwelling, no extraordinary permits are required.

INITIAL ORGANIZATION ACTIVITIES

- 1) Establishment within the communes of a working group to promote the uptake of SHW systems
- 2) Promotion of SHW systems benefits and survey of homeowners for willingness to install systems
- 3) Establishing SHW system supply agreements

ORGANIZATION OF COVERING THE INVESTMENT FINANCE CONSTRUCTION

(Planned composition of own resources, national and international funds, banks, etc.):

No financing would be expected, that is, own-resources would be required for the systems. Small loans by local banks for certain individuals could be possible. A tax-deduction of 1/3 the cost of the system can be used, which decreases system cost.

DEFINITION OF TERMS OF REFERENCE:

To be achieved:

To install Solar Hot Water Heaters on a significant portion of households to replace hot-water demand from electrical and fossil-fuel heaters.

Stakeholders:

- 1) The communes of Limina (Canolo, Gerace, Gioiosa Ionica, Grotteria, Mammola, Martone, San Giovanni di Gerace), with a potential financial/administrative role.
- 2) Families and homeowners

Financial Resources:

- 2) Own resources

Work Breakdown:

- 1) Establishment of Limina community "Solar Hot Water Heater Promotion Group".
- 2) Promotion of SHW, installation of first promotional systems (12 months).
- 3) Community surveying/organizing (6 months, concurrent with phase 2).
- 4) Establishment of supply contracts (6 months, concurrent).
- 5) Realization of systems across the community (1 to 1.5 years).
- 6) Operation and Maintenance (continuing thereafter).
- 7) Continuing work of "promotion group" for homeowners willing to install in the future (continuing thereafter).

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of project for installation of a wide array of Solar Hot Water (SHW) Systems for multi-families across the Limina community, in ITALY, we can comment on the following:

5. PROJECT FOR SOLAR THERMAL SYSTEM

LUMINIA– ITALY (repayment period 5 years)

- **Financial rate of return**

in according with the planned production capacity per year, the financial rate of return is 11% (repayment period 5 years, Table 7.) whit the discount rate (15%) and sensibility rate of profitability with little increasing of production is 13% (Table. 9), that means that the project will realize more incomes than costs, i.e. the investment is profitable for relatively long period (payback period is about 8 years).

- **Net profit**

During the whole repayment period of 5 years, the project shows fix net profit which shows the tendency of stabile investment whit out of growing.

- **Cash flow**

The cash flow is positive during the whole repayment period of 5 years that could be positively estimated (Tables 11 and 12).

- **Liquidity ratio (current)**

The current liquidity ratio is ~1 (Table 15) that is in accordance with the optimal current liquidity ratio. This means that there are enough current assets to cover the short term liabilities.

- **Liquidity ratio (quick)**

The same situation applies for the quick liquidity ratio.

- **Profitability ratio**

This ratio shows the constant tendency from year to year that could be positively estimated.

Table 1. Total capital costs

Multi-Family Building Solar Hot Water Heater Thermosyphon System

DEN/EUR		in denars 61,7	in EUR
Preparing activities		12.340	200
Building construction		12.340	200
- building and crafty activities			0
- machine installations			0
- electro-installations and telephony			0
- drain and drainage			0
- other activities		353.541	5.730
EQUIPMENT - Wood briquette production plant		353.541	5.730
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	0%	0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
VECHICLES			0
- invoice value with assemblage and transport		0	0
- custom		0	0
- tax	18%	3.659	59
OTHER		3.659	59
- licence rights and patent		0	0
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		365.881	5.989
TOTAL PLANNED COSTS FOR FIXED ASSETS			170
Funds planned for working capital		365.881	6.160
TOTAL REQUIRED FUNDS		12.340	200

Table 2. Total financial sources

	DEN/EUR	61,7	RESOURCES in denars	countervalue in EUR	Structure of funds resources
BANKING CREDITS			0,0	0,0	0,00%
- Bank			0,0	0,0	0,00%
- Commercial Banks			0,0	0,0	0,00%
- World Bank			0,0	0,0	0,00%
- European Bank			0,0	0,0	0,00%
- Other resources			0,0	0,0	0,00%
OWN SOURCES			256.918,8	4.164,0	67,60%
- preparatory investments			256.918,8	4.164,0	67,60%
- additional investments			0,0	0,0	0,00%
- SEAF			0,0	0,0	0,00%
-from accumulation			0,0	0,0	0,00%
- from depreciation			0,0	0,0	0,00%
OTHER SOURCES			123.153,2	1.996,0	32,40%
			123.153,2	1.996,0	32,40%
			0,0	0,0	0,00%
TOTAL FINANCIAL SOURCES			256.918,8	6.160,0	100,00%

Table 3. Sales in EUR after investment

Annual production	2006	2007	2008	2009	2010
Quantity [kWh/year]					
Electricity Saved [kWh/year]	6.742	6.742	6.742	6.742	6.742
Price per unit (t) (in Euro)	10	10	10	10	10
Value= Product unit * price per unit	66.557	66.557	66.557	66.557	66.557
Quantity [m3]					
Natural Gas saved [m3]	919	919	919	919	919
Price per unit	41	41	41	41	41
Value= Product unit * price per unit	37.991	37.991	37.991	37.991	37.991
TOTAL IN DEN	104.548	104.548	104.548	104.548	104.548
TOTAL IN EUR	1.694	1.694	1.694	1.694	1.694
Domestic market (in % from total)	100%	100%	100%	100%	100%
Foreign market (in % from total)	0%	0%	0%	0%	0%
Domestic market	1.694	1.694	1.694	1.694	1.694
Foreign market					

Table 4. Total costs after investment

TOTAL NUMBER OF EMPLOYEES						
Amounts in denars		2006	2007	2008	2009	2010
<u>Total raw materials</u>		-	-	-	-	-
<u>Total raw materials - domestic</u>		-	-	-	-	-
<u>Total raw materials - foreign</u>		-	-	-	-	-
Salary costs						
<u>Salary costs for regular employees</u>						
<u>Compensation costs for part time jobs</u>						
Other costs						
<u>Costs for energy</u>		-	-	-	-	-
<u>Maintenance costs</u>		1.851	1.851	1.851	1.851	1.851
<u>Marketing costs</u>						
<u>Other costs</u>						
<u>Total costs in DEN</u>		1.851	1.851	1.851	1.851	1.851
<u>Total costs in EUR</u>		30	30	30	30	30

Table 5. Annual profit

FORESEEN ANNUAL PROFIT					
for the new project as a difference between the new and current production					
(before and after investment)					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2006	2007	2008	2009	2010
AFTER INVESTMENT					
Incomes from domestic market	1.694	1.694	1.694	1.694	1.694
Incomes from export	-	-	-	-	-
Total incomes	1.694	1.694	1.694	1.694	1.694
Costs from domestic market	30	30	30	30	30
Costs from foreign market	-	-	-	-	-
Total operational costs	30	30	30	30	30
GROSS WORKING INCOMES	1.664	1.664	1.664	1.664	1.664
GROWTH AND FINANCIAL CALCULATIONS					
Incomes from domestic market	1.694	1.694	1.694	1.694	1.694
Incomes from export	-	-	-	-	-
Total incomes	1.694	1.694	1.694	1.694	1.694
Costs from domestic market	30	30	30	30	30
Costs from foreign market	-	-	-	-	-
Total operational costs	30	30	30	30	30
GROSS WORKING INCOMES	1.664	1.664	1.664	1.664	1.664

Table 6. Working capital

FORESEEN ADDITIONAL WORKING CAPITAL					
exchange for EUR	61,7	61,7	61,7	61,7	61,7
in EUR					
	2006	2007	2008	2009	2010
Increased current assets:					
Cash needed	17	17	17	17	17
(as % of increased income)	1%	1%	1%	1%	1%
Receivables from buyers	139	139	139	139	139
(number of collecting days/ increased income)	30	30	30	30	30
Inventories					
Materials and spare parts (raw materials)	0	0	0	0	0
(number of collecting days/ increased costs and inventories)	30	30	30	30	30
Finished and semifinished products	0	0	0	0	0
(number of collection days/ increased income)	0	0	30	30	30
Final product	139,3	139,3	139,3	139,3	139,3
(number of collection days/ increased income)	30	30	30	30	30
Other	0	0	0	0	0
(% of increased income)	0%	0%	0%	0%	0%
Increased current assets	295,5	295,5	295,5	295,5	295,5
Increased short term liabilities					
Liabilities toward suppliers	2	2	2	2	2
(number of collection days/ increased costs)	30	30	30	30	30
Salary liabilities	-	-	-	-	-
(number of pay out days/increased salaries)	30	30	30	30	30
Depreciation	49	49	49	49	49
(number of calculation days/annual depreciation)	30	30	30	30	30
Other	74	74	74	74	74
(% of increased income)	4%	4%	4%	4%	4%
Increased short term liabilities	125	125	125	125	125
ADDITIONAL WORKING CAPITAL	170	170	170	170	170
INCREASING OF ADDITIONAL WORKING CAPITAL	170	0	0	0	0

Table 7. Financial Rate of Return for investment of 5 years

FINANCIAL RATE OF PROFITABILITY

in EUR	2005	2006	2007	2008	2009	2010
<u>Project costs:</u>						
Total project costs:	-6.159,7	0,0	0,0	0,0	0,0	0,0
<u>Increased income:</u>						
Domestic incomes	0,0	1.694,5	1.694,5	1.694,5	1.694,5	1.694,5
Foreign incomes	0,0	0,0	0,0	0,0	0,0	0,0
Total increase income	0,0	1.694,5	1.694,5	1.694,5	1.694,5	1.694,5
<u>Increased operational costs</u>						
Costs from domestic market	0,0	30,0	30,0	30,0	30,0	30,0
Costs from foregin market	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	0,0	30,0	30,0	30,0	30,0
Increased gross working profit	0,0	0,0	1.664,5	1.664,5	1.664,5	1.664,5
INCREASED NET PROFIT	-6.159,7	1.664,5	1.664,5	1.664,5	1.664,5	1.664,5

FINANCIAL RATE OF RETURN	11%
NET PRESENT VALUE	-504,5
(discount rate)	15%

Table 8. Calculation of Depreciation

Nr.	Fixed assets	Value	%	Depreciation
1	Building - old	-	0%	-
2	Building - new	200	4,0%	8,00
3	Equipment - old		0%	-
4	Equipment - new	5.730,0	10%	573,00
5	Subsidiary equipment -old		0,00%	-
6	Subsidiary equipment -new	0,0		-
7	Vehicles - old		0%	-
8	Vehicles - new	0,0		-
9	Other - old	-	0%	-
10	Other - new	59	20,0%	11,86
11	TOTAL - OLD			-
12	TOTAL - NEW			592,86
13	ALL TOTAL			592,86

Table 9. Sensibility of Rate of Profitability

ANALYZING THE SENSIBILITY OF THE FINANCIAL RATE OF PROFITABILITY

<div>TESTING THE SENSIBILITY</div> <div>Changes in % on 5 variables</div> <div>with the following presumptions:</div> <div>in EUR</div>	Domestic incomes		5%
	Foreign incomes		0%
	Price of rawmaterials on domestic market		0%
	Proce of raw materials on foreign market		0%
	Investm ent costs		20%

	2005	2006	2007	2008	2009	2010
<div>Project costs (Investment):</div>						
Total project costs	-6.159,7	0,0	0,0	0,0	0,0	0,0
<div>Increased income</div>						
Domestic income	0,0	1.779,2	1.779,2	1.779,2	1.779,2	1.779,2
Foreign income	0,0	0,0	0,0	0,0	0,0	0,0
Total increased income	0,0	1.779,2	1.779,2	1.779,2	1.779,2	1.779,2
<div>Increased oeprational costs</div>						
Costs for domestic market	0,0	30,0	30,0	30,0	30,0	30,0
Costs from foreign market	0,0	0,0	0,0	0,0	0,0	0,0
Total increased operational costs	0,0	30,0	30,0	30,0	30,0	30,0
Increased gross working profit	0,0	1.749,2	1.749,2	1.749,2	1.749,2	1.749,2
INCREASED NET PROFIT	-6.159,7	1.749,2	1.749,2	1.749,2	1.749,2	1.749,2

FINANCIAL RATE OF RETURN	13%
NET PRESENT VALUE	-257,6
(discount rate)	15%

Table 10. Simplificated balance sheet

SIMPLIFICATED BALANCE SHEET					
EUR	2006	2007	2008	2009	2010
ASSETS:					
Current assets					
Surplus of cash	0	751	2.124	3.498	4.871
Cash from working	17	17	17	17	17
Receivables for buyers	139	139	139	139	139
Inventories	139	139	139	139	139
Other	0	0	0	0	0
Total current assets	295	1.046	2.420	3.793	5.027
Net fixed assets	5.989	5.941	5.892	5.843	5.794
Total fixed assets	5.989	12.100	12.052	12.003	11.954
TOTAL ASSETS	12.396	13.098	14.423	15.747	5.027
LIABILITIES AND SHAREHOLDING CAPITAL (NEW)					
Liabilities					
Deficit of cash	0	0	0	0	0
Short liabilities toward suppliers	2	2	2	2	2
Other	293	293	293	293	293
Debts	0	0	0	0	0
Other long term liabilities and reservations	0	0	0	0	0
TOTAL LIABILITIES	295	295	295	295	295
Shareholding capital					
Capital	4.164	4.164	4.164	4.164	4.164
Retained annual profit	1.325	1.325	1.325	1.325	1.325
Retained profits	0	1.325	2.649	3.974	5.298
TOTAL SHAREHOLDING CAPITAL	5.489	6.813	8.138	9.462	10.787
TOTAL LIABILITIES AND SHAREHOLDING CAPITAL	5.784	7.109	8.433	9.758	11.083

Table 11. Income statement

INCOME STATEMENT

in EUR		2006	2007	2008	2009	2010
Sales and other incomes:						
in country	-	1.694	1.694	1.694	1.694	1.694
abroad	-	-	-	-	-	-
Total sale	-	1.694	1.694	1.694	1.694	1.694
Costs and expenditures						
Raw materials						
in country	-	-	-	-	-	-
abroad	-	-	-	-	-	-
Gross salaries	-	-	-	-	-	-
Other costs	-	30	30	30	30	30
Total costs	-	30	30	30	30	30
Depreciation:						
Total depreciation	-	49	49	49	49	49
Interest costs						
Total interest costs	-	-	-	-	-	-
TOTAL OPERATIONAL INCOMES AND EXPENDITURES	-	79	79	79	79	79
Extra items:						
Total extra items	-	-	-	-	-	-
NET PROFIT BEFORE TAXATION	-	1.615	1.615	1.615	1.615	1.615
Income tax		(291)	(291)	(291)	(291)	(291)
(% from the income before taxation)		18%	18%	18%	18%	18%
NET PROFIT		1.325	1.325	1.325	1.325	1.325

Table 12. Review of Cash Flow

REVIEW OF CASH FLOW

(SOURCES OF ASSETS AND NEED FOR INVESTMENT)

	61,7	61,7	61,7	61,7	61,7
in EUR					
	2006	2007	2008	2009	2010
SOURCES					
Own resources					
Retained profit	1.325	1.325	1.325	1.325	1.325
Depreciation	49	49	49	49	49
Cash inflow from regular working	1.373	1.373	1.373	1.373	1.373
□□□□□□□□					
Credits		-	-	-	-
Total financial activities	-			-	-
From other sources					1996
New capital from owners	4.164		-	-	-
New capital from joint ventures	-	-	-	-	-
TOTAL SOURCES	5.537	1.373	1.373	1.373	1.373
DEMAND					
Investments					
Total investments	6.160	-	-	-	-
Financial activities					
Instalments					
Total financial activities					
TOTAL DEMAND	6.160	-	-	-	-
ANNUAL SURPLUS/DEFICIT OF CASH	(622)	1.373	1.373	1.373	1.373
CUMULATIVE SURPLUS/DEFICIT	(622)	751	2.124	3.498	4.871

Table 13. Financial Ratios

FINANCIAL RATIOS

in EUR	2006	2007	2008	2009	2010
Liquidity					
Current ratio					
Current assets (□)	295	295	295	295	156
Short term liabilities (B)	295	295	295	295	295
□/B	1,00	1,00	1,00	1,00	0,53
Quick ratio					
Current assets (□)	295	295	295	295	156
Inventories (B)	139	139	139	139	139
Short term liabilities (C)	295	295	295	295	295
(□-B)/C	0,53	0,53	0,53	0,53	0,53
The share of debt in total capital					
Debts in total assets					
Debt (□)	0	0	0	0	0
Total assets (B)	12.396	13.098	14.423	15.747	5.027
□/B	0%	0%	0%	0%	0%
Debt/Shareholding capital					
Debt (□)	0	0	0	0	0
Shareholding capital (B)	5.489	6.813	8.138	9.462	10.787
□/B	0%	0%	0%	0%	0%
Debt spreading over					
Net income (□)	1.325	1.325	1.325	1.325	1.325
Depreciation (B)	49	49	49	49	49
Interest (C)		0	0	0	0
Mature instalment (D)	0	0	0	0	0
(□+B+C)/ D	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Profitability					
Net profit rate					
Net profit (□)	1.325	1.325	1.325	1.325	1.325
Income (B)	1.694	1.694	1.694	1.694	1.694
□/B	78%	78%	78%	78%	78%
Return of total assets					
Net profit (□)	1.325	1.325	1.325	1.325	1.325
Total assets (B)	12.396	13.098	14.423	15.747	5.027
□/ B	0,11	0,10	0,09	0,08	0,26
Return of capital					
Net profit (□)	1.325	1.325	1.325	1.325	1.325
Capital (□)	5.489	6.813	8.138	9.462	10.787
□/ B	0,24	0,19	0,16	0,14	0,12
Working					

Inventories turn over

Sales costs (□)	30	30	30	30	30
Inventories (B)	139	139	139	139	139
□/ B	0,00	0,22	0,22	0,22	0,22

Average time for payment

Receivables (□)	139	139	139	139	139
Daily income (B)	5	5	5	5	5
□/ B	30	30	30	30	30

Turn over of fixed assets

Income (□)	1.694	1.694	1.694	1.694	1.694
Fixed assets (B)	5.989	12.100	12.052	12.003	11.954
□/ B	0,0	0,1	0,1	0,1	0,1

Turn over of all assets

Income (□)	1.694	1.694	1.694	1.694	1.694
Total assets (B)	12.396	13.098	14.423	15.747	5.027
□/ B	0,1	0,1	0,1	0,1	0,3

RES Integration Project

WP 4

Project Partner: ITALY

TITLE OF THE PROJECT (Business investment):

Centralized PV Projects

LOCATION: Mountain Community of LUMINA

HEAD OF CONCRETE PROJECT: TBD

SHORT DESCRIPTION OF THE PROJECT (Summary of the idea):

To create three 1MW centralized PV power plant in three empty fields, to take advantage of the Italian PV feed-in tariff.

The projects could be wholly private, partly owned by the communes, or entirely owned by the communes.

PREPARATION ACTIVITIES:

INVESTIGATIONS (Short description of necessary investigations):

Proper sites must be chosen. Land-owners have expressed an interest in renting unused land. In fact, much land is unused, and finding a site suitable for a 1MW plant (approximately 1.6 ha) would not be difficult for three of such plants, but would require a more detailed surveying. Afterwards, the land-owners could be contacted.

Furthermore, state-owned land could also be considered by the communes.

Exact insolation measurements would be required to begin.

ADMINISTRATIVE PROCEDURE (Short description of necessary activities):

According to the Italian PV feed-in law, the following permits are required to begin the work:

- 1) Request to the GSE (Gestore della Rete di Trasmissione Nazionale – “National Transmission Grid Operator), or the local grid operator, to connect the plant to the grid.
- 2) Installation permit from the commune
- 3) Environmental permit – ONLY if the plant is in a region with environmental constraints (e.g. historical site or protected view point).
- 4) Request the PV feed-in tariff to the GSE

INITIAL ORGANIZATION ACTIVITIES

- 1) Detailed survey of available fields across the community.
- 2) Meetings with local landowners association to assess local participation.
- 3) Establishing PV and equipment supply.

ORGANIZATION OF COVERING THE INVESTMENT FINANCE CONSTRUCTION

(Planned composition of own resources, national and international funds, banks, etc.):

Financing available from banking institutions, in addition funding provided by a private-public consortium if the communes were also own the plants.

DEFINITION OF TERMS OF REFERENCES:

To be achieved:

To create three independent 1 MW PV plants in the Mountain Community of Limina.

Stakeholders:

- 1) The plant owner
- 2) The communes of Limina (Canolo, Gerace, Gioiosa Ionica, Grotteria, Mammola, Martone, San Giovanni di Gerace), with a potential financial/administrative role.
- 3) The land owners.
- 4) Financing institutions
- 5) Electrical maintenance teams

Financial Resources:

- 1) Private investment
- 2) Banking Loans
- 3) Commune participation

Work Breakdown:

- 1) Funding acquisition and supply contracts (6 months).
- 2) Site profiling, land-owner engagement (6 months to 1 year, concurrent with phase 1).
- 4) Equipment acquisition (6 months, concurrent).
- 5) Realization of system (6 months).
- 6) Operation and Maintenance (continuing thereafter).

COST BENEFIT ANALYSIS

According to the financial model that shows the projections of the project for create three 1MW centralized PV power plant in three empty fields, to take advantage of the Italian PV feed-in tariff across the Limina community (on roofs), production in Italy, we can comment on the following:

6. PROJECT FOR Centralized PV PLANT

1 MW Centralized PV Plant –Liminia, ITALY
(repayment period 10 years)

- **Financial rate of return**

in according with the planned investment resources and production capacity per year, the financial rate of return is about 4% (repayment period 10 years, Table 8.), its very low whit the discount rate (15%). Also, sensibility rate of profitability is low (about 3% with little random influences factors), showed on Table 11.. Those economic factors show that the project will realize more costs than incomes for short period, i.e. the investment is profitable only for long period, its means more than 20 years.

- **Net profit**

During the whole repayment period of 10 years, the project shows net profit with tendency of growth from year to year but with little and insufficient amount in according with investment (Table 13).

- **Cash flow**

The cash flow shows the positive tendency but with little growing factor in according with investment, during the whole repayment period of 10 years (Table 14). This could be positively estimated but only for long period of repayment of investment.

- **Profitability ratio**

This ratio shows tendency of growth form year to year that could be positively estimated.

PROJECT FOR Centralized PV PLANT
1 MW Centralized PV Plant –Liminia, ITALY
(repayment period 5 years)

DEN/EUR		in denars 61,7	in EUR
Preparing activities		0,0	0,0
Building construction		18.510.000	300.000
- building and crafty activities		18.510.000	300.000
- machine installations			0
- electro-installations and telephony			0
- drain and drainage			0
- other activities			0
EQUIPMENT - Wood briquette production plant		268.395.000	4.350.000
- invoice value with assemblage and transport		268.395.000	4.350.000
- custom	0%	0	0
- tax	0%	0	0
ADDITIONAL EQUIPMENT		0	0
- invoice value with assemblage and transport		0	0
- custom	0%	0	0
- tax	18%	0	0
VECHICLES		0	0
- invoice value with assemblage and transport			0
- custom		0	0
- tax	18%	0	0
OTHER		17.501.205	283.650
- licence rights and patent		17.501.205	283.650
- engineering and managing the project		0	0
- training		0	0
- shape of projects		0	0
- interest		0	0
- other costs		0	0
Other capital costs		0	0
TOTAL PLANNED COSTS FOR FIXED ASSETS		286.905.000	4.933.650
Funds planned for working capital			7.941
TOTAL REQUIRED FUNDS		286.905.000	4.941.591
		0,0	0,0

Table 1. Total capital costs

Table 2. Total financial sources

		RESOURCES in denars	countervalue in EUR	Structure of funds resources
DEN/EUR	61,7			
BANKING CREDITS		152.448.051,5	2.470.795,0	50,00%
- Bank		152.448.051,5	2.470.795,0	50,00%
- Commercial Banks		0,0	0,0	0,00%
- World Bank		0,0	0,0	0,00%
- European Bank		0,0	0,0	0,00%
- Other resources		0,0	0,0	0,00%
OWN SOURCES		152.448.051,5	2.470.795,0	50,00%
- preparatory investments		152.448.051,5	2.470.795,0	50,00%
- additional investments		0,0	0,0	0,00%
- SEAF		0,0	0,0	0,00%
-from accumulation		0,0	0,0	0,00%
- from depreciation		0,0	0,0	0,00%
OTHER SOURCES		0,0	0,0	0,00%
		0,0	0,0	0,00%
		0,0	0,0	0,00%
TOTAL FINANCIAL SOURCES		304.896.103,0	4.941.590,0	100,00%

Table 3. Structure of utilisation

		in denars	in EUR	Structure of utilization
DEN/EUR	61,7			
MACHINES, EQUIPMENT AND TECHNOLOGY		91.468.830,90	1.482.477	60,00%
BUILDING CONSTRUCTION		30.489.610,3	494.159	20,00%
WORKING CAPITAL		30.489.610,30	494.159	20,00%
TOTAL BANK CREDIT		152.448.051,5	2.470.795,0	100,00%