



FINAL REPORT

September 2005 through September 2008

IDER

Instituto de Desenvolvimento Sustentável e Energias Renováveis
and Partners:

Instituto ECO-ENGENHO de Tecnologia Aplicada ao Desenvolvimento
Sustentável

Sociedade Civil MAMIRAUÁ

RENOVE – Rede Nacional de Organizações da Sociedade Civil para as
Energias Renováveis

WINROCK International Institute for Agricultural Development

Cooperative Agreement # RFA 512-A-00-05-00025

Project Manager: Jorgdieter Anhalt

Tel. (00 XX 85) 3247.6506

The activities described in this quarterly report for the above mentioned period have been carried out with the support of USAID – the U. S. Agency for International Development, under the Renewable Energy & Development Program of which IDER is prime recipient and four partners are sub-grantees.

This report was produced with the support of the people of the United States of America through the United States Agency for International Development (USAID). The content of this publication is the sole responsibility of its authors and does not necessarily reflect the views or opinions of USAID or the Government of the United States.

ACRONYMS

ABDL	Associação Brasileira para o Desenvolvimento de Lideranças
	Brazilian Association for Leadership Development
ADELIS	Agência de Desenvolvimento Local, Integrado e Sustentável
	Locally Integrated and Sustainable Development Agency
ADENE	Agência de Desenvolvimento do Nordeste
	Agency for Northeast Development
AED	Agência de Educação para o Desenvolvimento
	Agency for the Education Development
AFAM	Agricultura Familiar Agroecologia e Mercado.
	Agro ecological Family Agriculture and Marketing
AMOPE	Associação de Moradores e Produtores de Energia de Cachoeira do Aruã
	Association of the population and energy producers of Cachoeira do Aruã
ANEEL	Agência Nacional de Energia Elétrica
	National Electric Energy Agency
BEMFAM	Sociedade Civil de Bem Estar Familiar
	Social and Health Development Organization
BID	Banco Interamericano de Desenvolvimento
	Inter-American Development Bank
BIOFACH	Feira Internacional de Negócios de Produtos Orgânicos
	International fair of organic produce business
CAWST	Center for Affordable Water and Sanitation Technology - Canada
	Centro de Tecnologias Sociais para Água e Saneamento - Canadá
CAR	Companhia de Desenvolvimento e ação regional
	Company for Development and regional accomplishment
CDL	Câmara de Dirigentes Lojistas
	Chamber of Commerce
CEAM	Companhia Energética do Amazonas
	Energy Company of Amazonas
CEFET	Centro Federal de Educação Tecnológica
	Federal Center for Technological Education
CELPA	Centrais Elétricas do Pará
	Electrical Plants of Pará
CENP Energia	Consórcio entre CGE, Cummins, TEP Potiguar, Parnamirim e Engebra
	Consortium CGE, Cummins, TEP Potiguar, Parnamirim and Engebra
CERPCH	Centro Nacional de Referência em Pequenas Centrais Hidrelétricas
	National Reference Center on Small Hydroelectric Centrals
CEPEL	Centro de Pesquisas de Energia Elétrica
	Research Center for Renewable Energies
CIEE	Centro de Integração Empresa Escola
	Placement Agency for beginners

COELBA	Companhia de Eletricidade do Estado da Bahia
	Bahia State Power Company
CODEVASE	Companhia de Desenvolvimento dos Vales do São Francisco e Parnaíba
	Company for the development of the São Francisco Valley and Parnaíba state
CONAB	Companhia Nacional de Abastecimento
	National company for supply
COOPANEI	Cooperativa de Produção, Assistência e Comercialização do Núcleo de Empreendedores em Irrigação
	Cooperative of production, assistance and commercialization of the Nucleus of entrepreneurs of irrigation
COOPASB	Cooperativa de Pequenos Produtores Agroecológicos do Sul da Bahia
	Cooperative of small agro-ecological producers of the South of Bahia
COPPE	Instituto Alberto Luiz Coimbra de Pós Graduação e Pesquisa de Engenharia
	Institute for Pos Graduate Studies in Engineering
COOPEAGRO	Cooperativa dos Pequenos Agricultores Organizados
	Cooperative of Organized Small Rural Workers
COOPERVIDA	Cooperativa da Agropecuária Orgânica do Semi-árido
	Cooperative of Recycling Agents Vida Nova
CRESESB	Centro de Referência para Energia Solar e Eólica Sérgio de Salvo Brito
	Reference Center for Solar and Wind Energy Sérgio de Slavo Brito
CTNERG	Fundo Setorial de Energia do Ministério da Ciência e Tecnologia
	Energy Sector Fund of the Ministry of Science and Technology
Dot-Org	Digital Opportunities Through Technologies & Communication Partnerships
	Oportunidades digitais através de tecnologias e parcerias em comunicação
DQA	Controle de Qualidade de Dados
	Data Quality Assessment
EBDA	Empresa Baiana de Desenvolvimento Agrícola
	Bahia State Company of Agricultural Development
E&D	Programa da USAID Energia Renovável e Desenvolvimento
	USAID's Renewable Energy and Development Program
ELETRONORTE	Centrais Elétricas do Norte do Brasil
	Electrical Centrals of North Brazil
EMBRAPA/ CNPAT	Empresa Brasileira de Pesquisa Agropecuária/Centro Nacional de Pesquisa de Agroindústria Tropical
	Brazilian Agricultural Research Corporation/National Research Center for Tropical Agrobusiness
ENTERJOVEM	Programa Jovens em Situação de Risco da USAID
	USAID's Program Youth at Risk
ESAGRI	Escola de Agricultura da Região de Irecê
	Agricultural school of the IRECÉ region
FENAGRI	Feira Nacional de Agricultura Irrigada
	National fair of irrigated agriculture
FNMA	Fundo Nacional do Meio Ambiente
	National Fund for the Environment
FTC	Faculdade de Tecnologia e Ciência
	Faculty of Technology and Science

FUNCREC	Fundo de Microcrédito do Governo do Estado de Alagoas
	Alagoas State Microcredit Fund
GEF	Global Environment Fund
	Fundo Global de Meio Ambiente
GVEP	Global Village Energy Partnership
	Parceria Global em Energia Comunitária
KAS	Konrad Adenauer Stiftung
	Konrad Adenauer Foundation
ICLEI	International Council for Local Environmental Initiatives
	Conselho Internacional para Iniciativas Ambientais Locais
IDEAAS	Instituto para o Desenvolvimento de Energias Alternativas e da autosustentabilidade
	Institute for the Development of Alternative Energy and Self Sustainability
IDT	Instituto de Desenvolvimento do Trabalho no Ceará
	Work Development Institute in Ceará
IEA	Iniciativa Energia da Amazônia
	Energy Initiative of the Amazon
IEE	Instituto de Eletrotécnica e Energia da USP
	Institute of Electrotechnic and Energy/University of São Paulo
INCRA	Instituto Nacional de Colonização e Reforma Agrária
	National Institute for Land Reform
INWENT	Internationale Weiterbildung und Entwicklung gGmbH
	Human Resources and Organizational Development in International Cooperation -- Germany
IRPAA	Instituto Regional da Pequena Agropecuária Apropriada
	Regional Institute for Appropriate Small Farming and Animal Husbandry
MCH	Mini Central Hidrelétrica
	Small Hydropower Plant
MDS/SESAN	Ministério do Desenvolvimento Social e Combate à Fome/Secretaria Nacional de Segurança Alimentar e Nutricional
	Ministry for Social Development Against Hunger/National Secretary of Food and Nutrition Security
MLO	Military Liaison Office (USA Government)
	Escritório Militar no País (Governo dos Estados Unidos)
MME	Ministério de Minas e Energia
	Ministry of Mines and Energy
MMT	Movimento Minha Terra
NEPPA	Núcleo de Estudos e Pesquisa em Produção Animal
	Center for Research and Studies of animal production
NIC	Núcleo de Iniciativas Comunitárias
	Nucleus of communitarian initiatives
PAA	Programa de Aquisição de Alimentos
	Brazilian Food Acquisition Program
PNPE	Programa Nacional de Estímulo ao Primeiro Emprego
	Federal Program for the Promotion of First Employment
PRODEEM	Programa de Desenvolvimento Energético de Estados e Municípios

	State and Municipal Program for the Energy Development
PSA	Projeto Saúde e Alegria
	Health and Happiness Project
PSF	Programa de Saúde da Família
	Brazilian Family Health Program
REEEP	Renewable Energy and Energy Efficiency Partnership
	Parceria de Energia Renovável e Eficiência Energética
RENOVE	Rede Nacional DE ONG's de Energias Renováveis
	National Network of NGO's for Renewable Energy
RITTAER	Rede Ibero-americana de Transferência de Tecnologias Apropriadas com o uso de Energias Renováveis
	Ibero-american association of transfer of appropriate technologies using renewable energies
SCM	Sociedade Civil Mamirauá
	Civil Society Mamirauá
SEAGRI	Secretaria da Agricultura, Irrigação e Reforma Agrária, Bahia
	State Secretariat for Agriculture, Irrigation and Land Reform, Bahia State
SEBRAE	Serviço Brasileiro de Apoio às Micro e Pequenas Empresas
	Brazilian assistance service for small and micro enterprises
SECTAM	Secretaria Executiva de Ciência, Tecnologia e Meio Ambiente – Pará
	Executive Secretariat of Science, Technology and Environment – Pará
SECOMP	Secretaria de Combate a Pobreza e as Desigualdades Sociais
	Secretary to combat poverty and social imparity
SECTI	Secretary de Tecnologia e Infra-estrutura, Bahia
	State Secretary for technology and Infra-structure, Bahia State
SEINFRA	Secretaria da Infra-Estrutura
	Secretariat of Infrastructure
SEMARH	Secretaria de meio Ambiente e Recursos Hidricos, Bahia
	State secretary for environment and water resources, Bahia State
SESC	Serviço Social do Comércio
	Social Service for the Commerce
SETE	Secretaria do Trabalho e Empreendedorismo – CE
	Secretariat for Work and Entrepreneurship – CE
SHP	Small Hydropower Plant
	Mini Central Hidrelétrica
SINE	Sistema Nacional de Empregos
	Employment Placement Office
UFAL	Universidade Federal de Alagoas
	Alagoas State Federal University
UFPA	Universidade Federal do Pará
	Federal University of Pará
UNDP/PNUD	United Nations Development Program
UNEB	Universidade do Estado da Bahia
	Programa das Nações Unidas para o Desenvolvimento
UNESP	Universidade Estadual Paulista

	State University of São Paulo
USAID	United States Agency for International Development
	Agência dos Estados Unidos para o Desenvolvimento Internacional
USEPA	United States Environmental Protection Agency
	Agência dos Estados Unidos para a Proteção Ambiental
VSAT	Very Small Aperture Terminal (station used in satellite communications)
	Meio de comunicação por satélite
WADE	World Alliance for Decentralized Energy
	Aliança Mundial de Energia Descentralizada

INDICE

Basic E&D Program information	2
1. Program History and Objectives:	3
2. Coverage of the E&D Program	6
3. Summary of Macro-Activities Results	6
3.1 Macro-activity 1 - Market Development	7
3.2 Macro-activity 2 – Improving Public Policy	10
3.3 Macro-activity 3 – Increment of Technological Cooperation	11
3.4.1 Additionalities	12
3.5 Macro-Activity 4 – Capacity Building	13
3.6 Macro-activity 5 – Decentralized Generation	14
3.7 Macro Activities, Outcomes and Indicators	16
3.8 Fulfillment of pre-established goals	19
4. Monitoring and Evaluation	20
4.1 Data Quality Assessment – DQA	20
4.2 Accountancy	20
4.3 Cost share	23
4.4 Audit	23
5. Communication	24
6. Success Stories	26
7. Closing event of E&D program	28
8. Conclusion	29

Basic E&D Program information

Agreement Number :: RFA 512-A-00-05-00025

Project Title: Energia Renovável e Desenvolvimento – E&D

Implementing Agent: Ider – Instituto de Desenvolvimento Sustentável e Energias Renováveis.

Date of Program signature: 31, August 2005

Date of Program start: 1, September 2005

Date of Program termination: 30, September 2008

Extension : until 30, November 2008

Total funds received: R\$ 4,040,180.77 (U\$ 2,031,531.89)

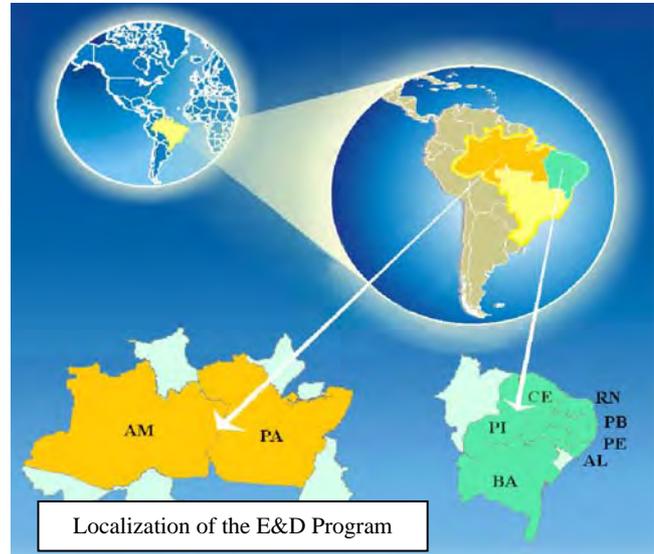
Total funds liquidated: R\$ 4,041,119.24 (U\$ 2,031,528.62)

Total revenues leveraged: R\$ 2,410,600 (U\$ 1,211,843)

Total cost share: R\$ 2,453,141.90 (U\$ 1,236,372.00)

1. Program History and Objectives:

The program Energia Renovável e Desenvolvimento – Cooperation Agreement USAID/RFA 512-A-00-05-00025 had as forerunner two other USAID-sponsored Programs: *BECEEP* and *Energia Produtiva*, both having prepared the soil for successful implementation and execution of this program. IDER, in contrary to the previsions prime contractors, is a genuine Brazilian NGO, which resulted in effective fund application with low administrative overhead. IDER was founded in



1995 as a result of a former international project, which began in 1990 in the state of Ceará, and has since accumulated 15 years experience in renewable energy, sustainable rural development, and national and international program management.

The E&D Program was designed to support activities that are multidisciplinary and that use renewable energy and energy efficiency projects as a means for promoting social and economic development while also addressing climate change. Thus supported activities should identify and remove energy related constraints that restrain increases in productivity, health status, educational levels, and improvements in environmental management.

The program was conducted by a consortium of four partners under the leadership of IDER:

- 1) IDER – Instituto de Desenvolvimento Sustentável e Energias Renováveis,
- 2) Instituto ECO-ENGENHO de Tecnologia Aplicada ao Desenvolvimento Sustentável,
- 3) WINROCK INTERNATIONAL Brasil,
- 4) Sociedade Civil Mamirauá and
- 5) RENOVE - Rede de Organizações da Sociedade Civil para Energias.

Each partner had to fulfill a detailed work plan shaped to his physical area of operation, but strictly embedded in the overall program aims.

In order to achieve a maximum productivity under the predefined Strategic Objectives of USAID (see below), five macro-activities were defined:

Macro-activity 1 - Market Development, aimed at RE applications for productive use, provide access to the market for small farmers, substitute fossil fuel, and interact with rural associations, cooperatives and organizations in general. These tasks should assist in opening market opportunities for RE equipment and place products from small farmers in the market.

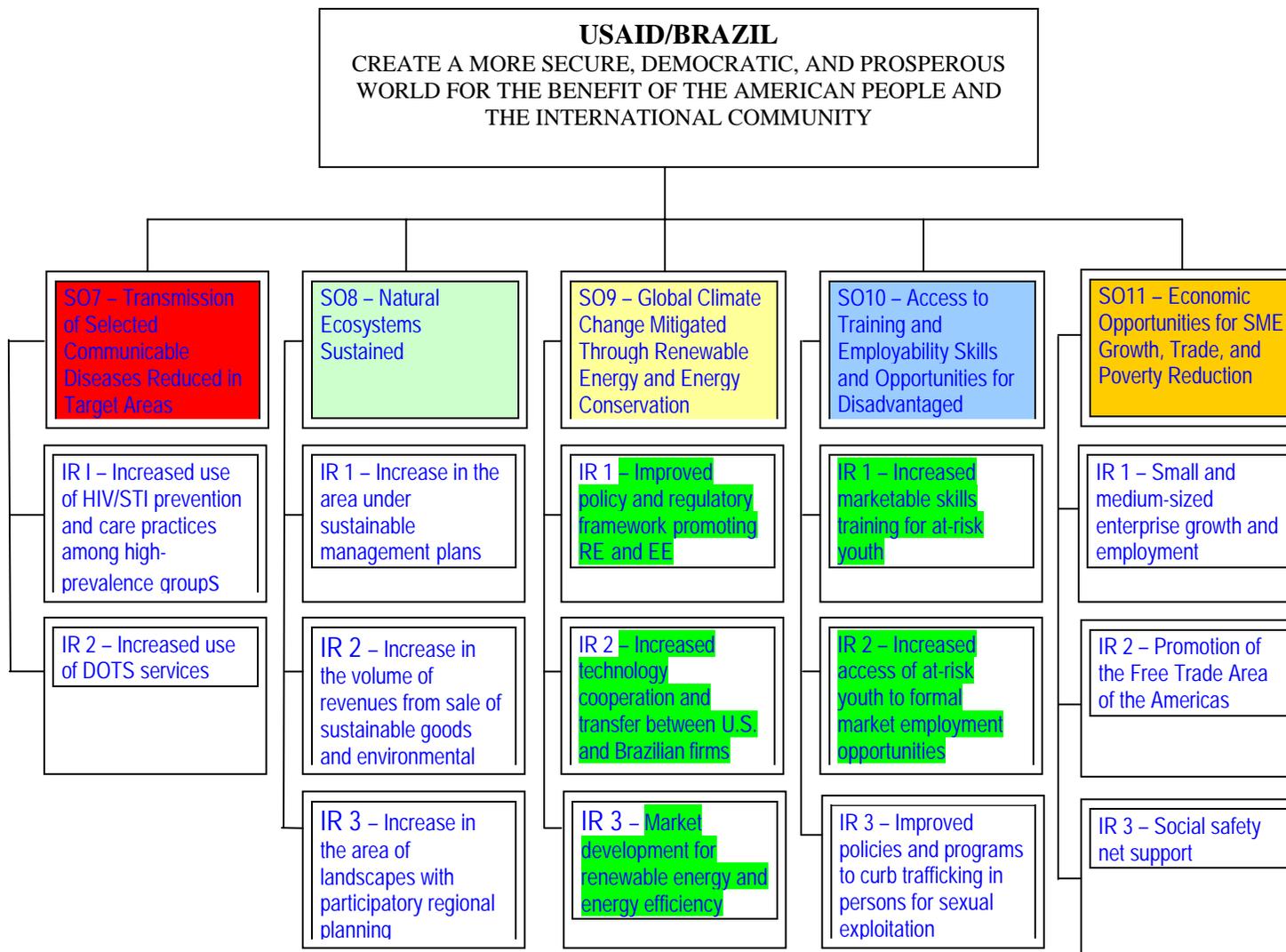
Macro-activity 2 – Improving Public Policy, aimed at the development and promotion of public policies, and formation of strategic alliances, thus creating a basis for RE dissemination and law enforcement for future large scale propagation.

Macro-activity 3 – Increment of Technological Cooperation, does mean the establishment of national and international partnerships; involvement of manufacturers and financing agents in order to enhance knowledge transfer, product improvement and additional financing.

Macro-Activity 4 – Capacity Building, is directed to vocational education in RE of youth living under risk conditions; assist in micro-credit development, capacity measures for technicians, ONG's and community leaders, as well as operation and maintenance assistance in RE applications at community level. The educational and capacitating methodologies developed under this topic are essential for future educational activities since they offer unique resources of interacting approaches.

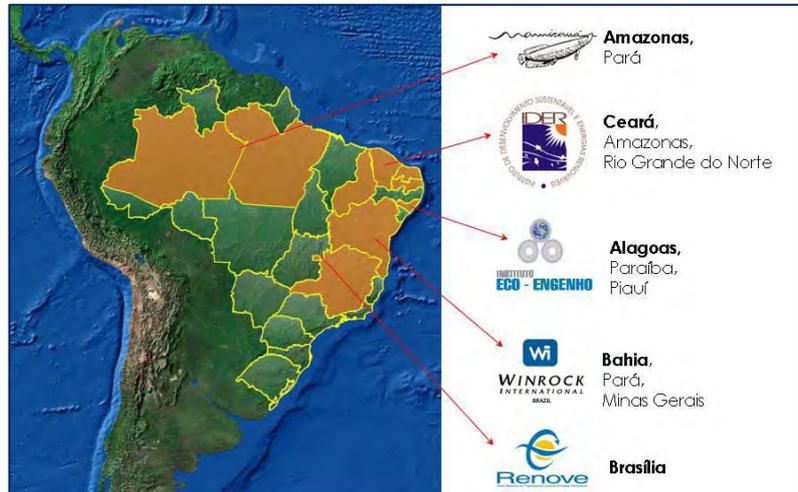
Macro-activity 5 – Decentralized Generation, aimed to diffuse the PRISMA model developed under the former *Energia e Productiva* program and application of solar home systems. The research on bio fuel production for electricity generation in decentralized grids was also part of this task. Here, the verification of economical, administrative and technical feasibility was the main objective.

Strategic Objectives of USAID (Green marked applicable for E&D Program)



2. Coverage of the E&D Program

In detail, these are areas of Amazonas and Pará state, the northeastern region of the states of Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí and Rio Grande do Norte, as well as a little part of Minas Gerais in the southeastern region. The political arm of E&D, RENOVE, was hosted in the capital of Brazil, Brasilia.



Brazil's poorest of the rural poor are to be found in these regions, and greatly benefited from applying cost-effective Renewables. The partners build upon the several successful renewable energy productive demonstration project developed under the forerunner programs *BCEEP* and *Energia Produtiva*, offering the prospect of more effective and rapid dissemination and replication, and helping to ensure that USAID's investment over the last four years achieved its full potential impact.

3. Summary of Macro-Activities Results

In this chapter are outlined very briefly the main results of each macro-activity. Details can be found in the 12 quarterly reports and in specific reports about each technology collected in the DVD produced for the final event of the program (enclosed). The table at the end of this chapter summarizes the tasks and their outcomes over the three-year program period. A graph summarizes the measurable, obligatory tasks. All, except one, achieved or exceeded the pre-established goals.

3.1 Macro-activity 1 - Market Development

The development of an adequate market for both the renewable energy systems and products benefitted by renewable energy equipment is the essential part of a long term, sustainable achievement.

The consortium started out to identify opportunities of pilot implementations. After realization and putting in operation, parallel monitoring of efficiency, maintenance and operational costs, the feasibility of each venture was calculated. These pilot installations were part of the partners cost share, either covered by themselves or through cooperation with other national and international bodies. Depending on the target group, the demonstration plants were installed at private farms, agriculture cooperatives or at communities. All of these groups entered the undertaking with good and valuable consideration in order to avoid troubles with “donations”.

From the multitude of projects investigated, the following examples were the most promising and illustrated excellent results in terms of economic feasibility and replicability.



Irrigation of organic vegetable cultivation by solar powered pumping system.

Hydroponics cultivation of pepper powered by solar pumping systems.





Small scale portable solar dryer for fruits.

Large scale solar tunnel dryer and water pumping for sea weed processing.



Solar dessalinator for potable water supply, suitable for rural families and remote schools.

Biodigesters of different sizes and applications for bio gas and bio fertilizer production.





In terms of energy efficiency, the preoccupation with the environment was the main concern. An efficient cook stove with reduced fire wood consumption and another stove operating with ethanol had great success. Considerable improvement of health conditions went along by eliminating indoor air pollution.

The cook stove was recognized mainly in the state of Ceará and a 22,000 unit project, financed by the local state government, is in progress. Great efforts were undertaken also in the Amazon region by Mamiraua Institute to make this technology available to the population living at the riversides.



The detailed analyses of these projects included not only the investment in the renewable energy equipment, but also the development of marketing channels, appropriate administration, and business planning and so forth. In order to make these technologies available for futures implementation, operation manuals, construction guidelines and computerized market analyses tools were developed.

3.2 Macro-activity 2 – Improving Public Policy

In order to work efficient in this area, the precedent programs of E&D founded RENOVE with its main office in Brasilia. The proximity to politicians and decision makers on federal level was essential for continuous participation in law processes regarding renewable energy, and even more, placement of new ideas in the house of



parliament. RENOVE could successfully influence the progression of the laws 3566/4, 3680704 and 7692/06. Amplify the rights of small energy producers (less than 1 MW) and make the installation of solar hot water systems obligatory at public financed homes were the main issues. Moreover, RENOVE promoted several national conferences and exhibitions in order to bring together politicians, energy distributors, consumers, investors, and energy system and component manufacturers. These events offered favorable conditions for discussions and presentations about renewable energy legislation and application and opened markets for RE equipment.

Each of the partners performed similar efforts in his home state, making sure that all E&D activities were known by local politicians. In addition, some state bodies cooperated actively with the program, thus ensuring sustainable progress and future commitment.

3.3 Macro-activity 3 – Increment of Technological Cooperation

The E&D program was designed to capture additional resources and establish cooperation with national and international partners. This goal aims to the continuance of activities also after the program termination with financing from other sources.

All consortium partners entered cooperation with national and international foundations, financial agencies and companies, either to boost tasks of the E&D program or develop a number of RE equipment.

Two cooperation, which involved large amounts of financial support should be mentioned here explicitly:

- 1.) Implementation of the hydro power station in Aruã/Pará under the PRISMA administration model, and
- 2.) Implementation of a complete production plant for bio fuel in Quixeramobim/Ceará.



The total monetary value of these cooperation was about R\$ 2,410,600, practically half of the amount provided by USAID for the E&D program. This shows clearly the great efforts undertaken by the consortium to conquer supplementary partnerships.

Besides this, three projects are also worth to refer to:

- 1.) Development of a climate resistant plastic foil for solar desalinization,
- 2.) Provision of a monthly staple food basket for all youth participating in the RE course in Ceará, and
- 3.) Research on solar dehydration techniques and appropriate preparation of the raw material.



3.4.1 Additionalities

Not very specific “Technical cooperation”, but tasks developed under the E&D program, which assisted greatly the accomplishment of several activities were the following:

- 1.) Implementation of five hydroponic pepper cultivation plants with solar pumping systems in Baixas/Alagoas. Beginning of 2009, Alagoas state government asked a proposal to replicate this venture in 40 other communities.
- 2.) Implementation of a 4,000 efficient cook stove program in Ceará state. Nearly at the end of the E&D program, the government signed an additional contract to implement 18,000 stoves in 2009.



Initiated by E&D, both projects linked rightly social needs with RE or EE technology. They provided income, protect the environment, curb diseases and are inherently sustainable.

Furthermore, three tasks financed from other foundations were perfectly integrated in the E&D with the following results:

- 1.) Development of the PIN –Project Idea Note for the efficient cook stoves in order to initiate the carbon credit process;
- 2.) Development of a cook stove dissemination strategy, and
- 3.) Capacity building in productive use of RE applications and market studies.



3.5 Macro-Activity 4 – Capacity Building

The introduction of renewable energies and rational use of natural resources at productive processes require extended capacity building measures of the multiple stakeholders. Consequently, the consortium partners build up capacitating know-how at several levels in order to attend the demand. Communities needed assistance in RE equipment operation and maintenance, business planning, marketing and administration, and ONG's, bank staff and governmental bodies were introduced in RE applications. Active participation in



numerous workshops, seminars and conferences on national



and international level allowed a wide spread dissemination of successful RE technologies.



For youth living under risk conditions, an ambitious vocational training course in RE was established in Fortaleza and Natal. The course did not only cover the technical education but attended also the particular social needs of the adolescences. During three years, 225 students terminated the 8-month courses. 60 % got employed soon afterwards, while other 30% preferred to continue studying at technical high schools or universities.



species. Pupils from local schools were encouraged to plant trees. Theatre plays made this tough matter a delighted happening for all community members.

Environmental education at communities, which had received the efficient cook stoves, was an important issue to guarantee the fuel wood supply in future, thus closing the carbon cycle by replanting fuel wood with native



3.6 Macro-activity 5 – Decentralized Generation



energy supply systems require specific regulations for its operation and administration. Distribution utilities do not have the adequate access to remote districts.

The PRISMA model was developed precisely for these circumstances. A small hydropower system was successfully implemented in the community Aruã/Pará. The impact on the local economy and life conditions was impressive. Discussions with the MME where highly promising, but up to now further implementations cold be materialized.

The federal government program *Luz para Todos* (Light for All) has the goal to provide electric energy to all Brazilian households until 2015. Even though the normal grid may reach 95% of all families, there is still a great demand of decentralized generation, specifically in very remote areas, e.g. the Amazon region. Autonomic





Since bio fuel production was and still is a main concern of secure fuel supply, a demonstration production facility, including oil plants cultivation, oil extraction, bio-diesel fabrication and utilization in a modified diesel engine to generate electricity for a small village was implemented.



However, in economical terms, the results were not such encouraging. Only large scale production of bio fuel seems to be economical feasible. The keenly desired

social aspect of bio fuel production by small farmers could not be confirmed to be a solution for thousands of poor.



3.7 Macro Activities, Outcomes and Indicators

Balance of Results and Targets		Year 1			Year 2			Year 3			Summary all years		
		Target	Result	left over or additionally	Target	Result	left over or additionally	Target (%) remade	Result	left over or additionally	Target	Result	left over or additionally
Indicators : Targets are obligatory, others are optional, blue only Year 1, green new for Year 2, pink new for year 3													
1. Market development for ER	Number of biodigestors installed	6	7	1	8	8		2	1	1	16	16	
	Number of solar desalinators installed	5	2	3	7		7	2	4	2	14	6	8
	Number of efficient stoves installed	45	119	74	50	131	81	4000	4,000		4095	8,000	3,905
	Number of solar dryers installed	8	22	14	10	18	8	1	1		19	41	22
	Number of water pumping systems with RE installed		3	3		7	7					10	10
	Amount of biogas produced (m³)												
	Amount of biofertilizer product (m³)												
	Amount of dehydrated products produced (Kg)		3,650	3,650		1,150	1,150					4,800	4,800
	Amount of organic products produced (ton)		8	8		38	38					46	46
	Commercialization of dehydrated products (R\$)		18,250	18,250		1,050	1,050					19,300	19,300
	Commercialization of biofertilizer (R\$)												
	Commercialization of organic products (R\$)		18,886	18,886		6,016	6,016					24,902	24,902
	Number of manufacturers producing and supplying RE equipment	1	1		1	3	2				2	4	2
	Number of commercialization centers created/identified	2	8	6	3	3		11	5	6	16	16	
	Number of workshops for technology dissemination carried out	6	10	4	5	5		4	4		15	19	4
	Number of training courses for communities, public entities	9	20	11	6	15	9	3	3		18	38	20
	Reports, publications, studies related to RE technologies							3	3				
	Number of people trained in the use/construction of efficient stoves		145	145					45	45		190	190
	Number of vegetable oils extraction units	1	1								1	1	
	Number of people trained/capacitated		576	576								576	576
	Number/description of didactic material prepared and available		2,770	2,770								2,770	2,770
	Number of new members for the organic farming network		40	40								40	40
	Number of communities		61	61		49	49					110	110
	" of community associations		25	25								25	25
	" of public-sector agents		18	18					9	9		27	27
	" of private agents		20	20					3	3		23	23
	" of other stakeholders involved, strengthened or capacitated		14	14								14	14
	Number of ha recuperated under sustainable management models		10	10								10	10
	Number of families that adopted environmental friendly practices		292	292		401	401					693	693
	Number of studies/reports/dignosis prepared		7	7								7	7
Number of stakeholders involved (national and international)		16	16								16	16	
Number of women capacitated		266	266		153	153					419	419	
Number of community women participating in project		13	13		25	25					38	38	
Number of people directly or indirectly benefitted by the project		2,510	2,510		10,000	10,000		12,000	12,000		24,510	24,510	

Balance of Results and Targets													
Indicators	Targets are obligatory, others are optional, blue only Year 1, green new for Year 2, red new for year 3	Year 1			Year 2			Year 3			Summary all years		
		Target	Result	left over or additionally	Target	Result	left over or additionally	Target (X) remade	Result	left over or additionally	Target	Result	left over or additionally
	Number of policies or regulatory improvement measures effectively promoted	1	1		1	3	2				2	4	2
	Number of internal, external seminars and assemblies carried out		1	1		2	2					3	3
	Number of RENOVE's members involved in initiatives of universalization and public policies		7	7								7	7
	Number of contributions from the third sector submitted to key political actors		3	3								3	3
	Number of MOUs signed with governmental entities	4	7	3	6	8	2		1	1	10	16	6
	Additional funds raised												
	New partners					2	2					2	2
	Number of stakeholders involved (national and international)		13	13				2	1	1	2	14	12
Report about results when promoting public policies							1		1				
3. Improving Technology cooperation	Number of manufacturers producing and supplying RE equipment	1	4	3							1	4	3
	Number of credit lines made available	1	1		1	1					2	2	
	Number of cooperation accords with national and international institutions		19	19		9	9					28	28
	Number of communities stakeholders involved, strengthened or capacitated		1	1								1	1
	Number of communities stakeholders involved, strengthened or capacitated		3	3								3	3
4. Capacity building	Number of people capacitated/trained in RE operations, maintenance and management.	50	75	25	50	429	379				100	504	404
	Number of people involved in educational activities, training courses or workshops.		92	92		943	943					1,035	1,035
	Number of people/mobilization actors capacitated and able to implement feasible solutions in RE		36	36		444	444					480	480
	Number of NGOs trained in projects of RE		6	6								6	6
	Number of youth participating in vocational education	50	94	44	20	20					70	114	44
	Number of young people entering labor market		17	17		12	12					29	29
	Number of courses/methods replicated in other states	1	1			2	2				1	3	2
	Number of women capacitated		67	67		170	170		4	4		241	241
	Number of communities		11	11		43	43					54	54
	Number of workshops/courses held					48	48	5	5		5	53	48
	Number of brochures developed					3	3	3	3		3	6	3
	Number of pamphlets printed					2	2					2	2
	Number of demonstration projects installed					11	11	4	4		4	15	11
	" of community associations		1	1								1	1
	" of public-sector agents												
	" of private agents												
	" of other stakeholders involved, strengthened or capacitated (list by type)		3	3								3	3
	Number of stakeholders involved (national and international)		5	5								5	5
Number of community women participating in project management		19	19								19	19	
Number of people directly or indirectly benefitted by the project		1,118	1,118								1,118	1,118	

Balance of Results and Targets				Year 1			Year 2			Year 3			Summary all years		
Indicators : Targets are obligatory, others are optional, blue only Year 1, green new for Year 2, red new for year 3				Target	Result	left over or additionally	Target	Result	left over or additionally	Target (X) remade	Result	left over or additionally	Target	Result	left over or additionally
5. Decentralized generation	Number of off-grid systems (biofuel vegetable oil) installed	1	1									1	1		
	Number of electrified households		47	47									47	47	
	Electrical energy parameters of the pilot project (installed kw)		130	130									130	130	
	Number of key stakeholders interested in replicating the model	1	2	1	1	5	4						2	7	5
	Funds obtained from other resources to develop Prisma and other biofuel projects (R\$)		2,410,600	2,410,600										2,410,600	2,410,600
	Number of steps taken to the promotion of favorable policies for the model replication	1	1							1	1		1	2	1
	Study on technical and socio-economical issues related to decentralized power generation and Prisma and engines				1	1			3	3			4	4	
	Workshops and didactical material held / developed								1	1					
	Number of communities		2	2										2	2
	" of community associations		2	2										2	2
	" of public-sector agents		2	2										2	2
	" of private agents		2	2										2	2
	Number of families that adopted environmental friendly practices and biofertilization		98	98										98	98
Number of people directly or indirectly benefitted by the project		250	250										250	250	
6. Communication and Marketing	Program's electronic newsletters		5	5		29	29			12	12		46	46	
	Number of events participated in					36	36			6	6		42	42	
	Number of people receiving the newsletter (online)					3,362	3,362			7,200	7,200		10,562	10,562	
	Number of media appearances		45	45						34	34		79	79	
	" of seminars		14	14						2	2		16	16	
	" of folders		5,000	5,000		11,500	11,500						16,500	16,500	
	" of banners		9	9		18	18						27	27	
	" of site visitors					123,293	123,293			26,000	26,000		149,293	149,293	
	" of flyers (printed)														
	" of CDs, DVDs		1	1						2	2		3	3	

Comments on the Outcomes and Results :

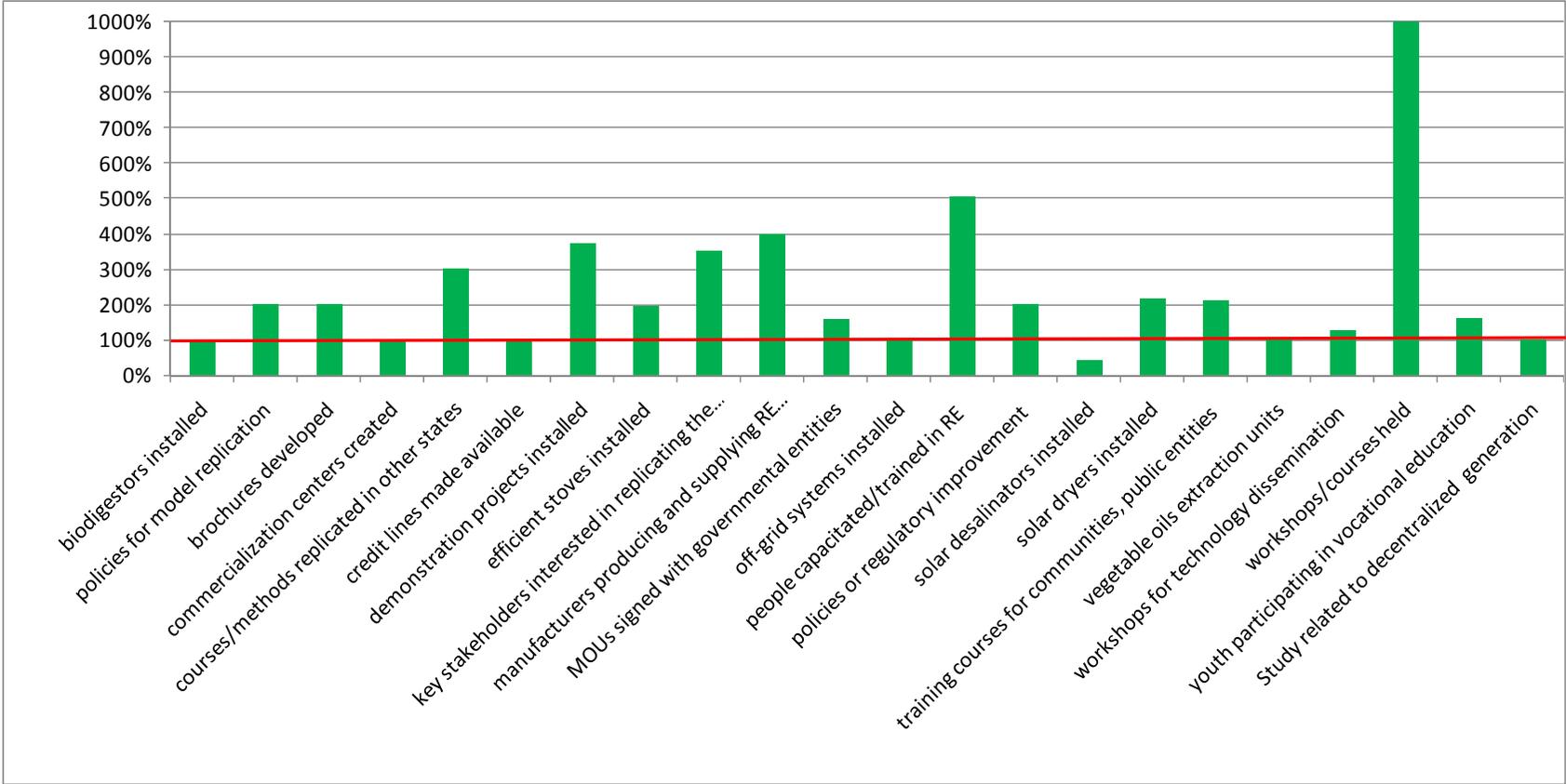
The list covers all deliverables over the three-year program period. In order to keep the obtained results transparent, the targets discontinued or newly placed (blue for year one and green for year two and pink for year 3) are shown.

The program is terminated and practically all deliverables have been meet. The only left-over are some solar desalinators (8), which is due to extreme delays of the manufacturer during material development and wrongly understood design. However, after official close out, Eco-Engenho could successfully implement additional four units and IDER is waiting two desalinators to be installed in March 2009.

The set targets have all been reached, while optional deliverables show very good results in terms of persons trained, women involved in project management, workshops and seminars held, and specifically additional funds obtained. Publication and marketing of the program reached an enormous number of people and the number of media appearance is astonishing high.

All in all, the programs goals have been achieved with some exceptional highlights in one or the other task.

3.8 Fulfillment of pre-established goals



4. Monitoring and Evaluation

In conformity with the USAID rulings, IDER had established a comprehensive monitoring and evaluation scheme. This includes also quantitative and qualitative data collection, ethical rules and financial control.

For all topics, IDER developed adequate methodologies, manuals, guidelines and computer software, approved by the USAID responsible personnel.

4.1 Data Quality Assessment – DQA

The Data Quality Assessment (DQA) report was one of the key documents prepared to analyze in detail the effectiveness of the monitoring and evaluation methodology and results obtained during the E&D program execution. IDER was the first entity in Brazil requested to submit a DQA-report under USAID rulings. The report presented an accurate outline of the entire institute, its management and conduction of the E&D program, focusing on the control of program deliverables, indicators and partner comportment. The report was delivered in April 2007 and considered commendable for other projects.



4.2 Accountancy

USAID exigencies require differential handling of accountancy figures due to the complexity of categories, cost share appliance and exchange of in-country to US currency.

IDER developed singular software on EXCEL basis which fulfilled by far all necessities imposed by the financial control personnel of USAID and auditors.

In the following list are summarized the advanced and liquidated values during the three fiscal years, including the extension until 30, November 2009. The turn over was as expected.

The next list shows that all funds were spent in all categories according the agreement (categories reduced to only two in the last year) in-between the predefined limits (10%).

FINANCIAL ANALYSIS FOR E & D CONSORTIUM: C.A. # 512-A-00-05-00025-00						
Key implementing partner : IDER				CTO: Alexandre Mancuso; Alternate CTO: Fernanda Arraes		
Agreement Authorization Date: August 31, 2005				Agreement Completion Date: September 30, 2008		
FY 05	Advance (R\$)	ROE	US\$ equivalent	Liquidation (R\$)	ROE	US\$ equivalent
October 2005	110,720 00	2 254	49,121 56	110,720 00	2 254	49,121 56
November 2005	122,388 00	2 254	54,298 14	122,388 00	2 254	54,298 14
December 2005	119,356 00	2 254	52,952 97	118,570 00	2 254	52,604 26
Total 1st quarter	352,464.00		156,372.67	351,678.00		156,023.96
			Carry over 1st qtr	786.00	2,254	348.71
January 2006	126,500 00	2 336	54,152 40	126,500 00	2 336	54,152 40
February 2006	122,002 00	2 336	52,226 88	122,002 00	2 336	52,226 88
March 2006	126,500 00	2 336	54,152 40	120,815 00	2 336	51,718 75
Total 2nd qtr	375,002.00		160,531.68	370,103.00		158,446.74
			carry over 2nd qtr	5,685.00	2,336	2,433.65
April 2006	140,110 84	2 154	65,046 82	140,110 84	2 154	65,046 82
May 2006	133,581 00	2 154	62,015 32	133,581 00	2 154	62,015 32
June 2006	133,581 00	2 154	62,015 32	116,751 16	2 154	54,202 02
Total 3rd qtr	407,272.84		189,077.46	396,128.00		183,697.81
			carry over 3rd qtr	16,829.84	2,154	7,813.30
July 2006	109,168 67	2 238	48,779 57	109,168 67	2 238	48,779 57
August 2006	102,634 03	2 238	49,378 91	110,510 00	2 238	49,378 91
September 2006	110,510 00	2 238	45,859 71	101,424 49	2 238	45,319 25
Total 4th qtr	322,312.70		144,018.19	337,933.00		151,291.03
Total 1st Year	1,457,051.54		649,999.99	1,455,842.00		649,459.53
FY 06	Advance (R\$)	ROE	US\$ equivalent	Liquidation (R\$)	ROE	US\$ equivalent
			carry over 4th qtr	1,209.54	2,238	540.46
October 2006	123,007 84	2 170	56,685 64	123,007 84	2 170	56,685 64
November 2006	124,036 00	2 137	58,042 12	124,036 00	2 137	58,042 12
December 2006	123,272 29	2 142	57,550 09	122,049 74	2 142	56,979 34
Total 5th qtr	370,316.13		172,277.84	370,303.12		172,247.55
			carry over 5th qtr	1,222.55	2,142	570.75
January 2007	116,600 00	2 152	54,182 16	116,600 00	2 152	54,182 16
February 2007	117,200 00	2 140	54,766 36	117,200 00	2 140	54,766 36
March 2007	117,164 00	2 082	56,274 74	92,598 99	2 082	44,475 98
Total 6th qtr	350,964.00		165,223.25	327,621.54		153,995.24
			carry over 6th qtr	24,565.01	2,082	11,798.76
April 2007	105,937 85	2 043	51,854 06	105,937 85	2 043	51,854 06
May 2007	123,440 00	2 024	60,988 14	123,440 00	2 024	60,988 14
June 2007	130,440 00	1 960	66,551 02	111,454 31	1 960	56,864 44
Total 7th qtr	359,817.85		179,393.23	365,397.17		181,505.40
			carry over 7th qtr	18,985.69	1,960	9,686.58
July 2007	117,440 00	1 903	61,713 08	117,440 00	1 903	61,713 08
August 2007	98,454 31	1 865	52,790 51	98,454 31	1 865	52,790 51
September 2007	30,475 90	2 012	15,147 07	30,475 90	2 012	15,147 07
Sept add 2007	6,524 10	2 012	3,242 59	6,524 10	2 012	3,242 59
Total 8th qtr	252,894.31		132,893.26	271,880.00		142,579.84
Total 2nd Year	1,333,992.29		649,787.58	1,335,201.83		650,328.03
FY 07	Advance (R\$)	ROE	US\$ equivalent	Liquidation (R\$)	ROE	US\$ equivalent
			carry over 8th qtr	0.00	2,012	0.00
October 2007	108,750 00	1 801	60,383 12	108,750 00	1 801	60,383 12
November 2007	108,368 49	1 796	60,338 80	108,368 49	1 796	60,338 80
Nov 2007 add FY 06 funds	381 51	1 796	212 42	381 51	1 796	212 42
December 2007	108,750 00	1 763	61,684 63	106,728 43	1 763	60,537 96
Total 9th qtr	326,250.00		182,618.97	324,228.43		181,472.31
			carry over 9th qtr	2,021 57	1 763	1,146 66
January 2008	111,155 00	1 720	64,625 00	111,155 00	1 720	64,625 00
February 2008	96,787 43	1 791	54,041 00	96,787 43	1 791	54,041 00
March 2008	98,814 00	1 744	56,659 40	96,553 32	1 744	55,363 14
Total 10h qtr	306,756.43		175,325.40	306,517.32		175,175.81
April 2008	99,011 00	1 684	58,795 13	100,585 40	1 684	59,730 05
May 2008	87,950 32	1 666	52,791 31	89,018 62	1 666	53,152 66
June 2008	107,811 00	1 696	63,567 81	107,401 17	1 696	63,551 41
Total 11th qtr	294,772.32		175,154.25	297,005.19		176,434.11
July 2008	105,498 00	1 633	64,603 80	82,283 54	1 633	50,387 96
August 2008	113,670 19	1 583	71,806 82	91,755 92	1 583	57,963 31
September 2008	102,190 00	1 642	62,235 08	82,408 58	1 642	50,187 93
Total 12th qtr	321,358.19		198,645.69	256,448.04		158,539.20
October 2008	-	-	-	3,200 00	1 642	1,948 84
November 2008	-	-	-	62,676 43	1 642	38,170 79
Total Oct-Nov	0.00		0.00	65,876.43		40,119.63
Total 3rd Year	1,249,136.94		731,744.31	1,250,075.41		731,741.05
Total 1+2+3 yrs	4,040,180.77		2,031,531.89	4,041,119.24		2,031,528.62
Total authorized amount (US\$)			2,050,000.00	Total obligated amount (US\$)		2,032,484.00
Mortgage (US\$)			17,516.00	Obligated amount FY 06 (US\$)		650,000.00
Obligated amount FY 05 (US\$)			650,000.00	Obligated amount FY 07 (US\$)		732,484.00
Advances to date (US\$)			2,031,531.89	To be obligated (US\$)		952.11
Unexpended obligated funds (US\$)			3.27	Total actual expenditures (US\$)		2,031,528.62
Total Accrued Expenditures (US\$)			2,090,323.75	% Life of agreement time elapsed		100.00%
% Life of agreement funds expended			99.95%	Monthly burn rate FY 05 (US\$)		54,166.67
Monthly burn rate FY 06 (US\$)			54,148.96	Monthly burn rate FY 07 (US\$)		81,304.92

Final Financial Report

LINE ITEMS	NEW COST CATEGORIES	TOTAL APPROVED BUDGET FOR THE LIFE OF PROJECT (a)	TOTAL APPROVED BUDGET FOR FISCAL YEAR (b)	TOTAL ADVANCES RECEIVED TO DATE (c)	TOTAL ADVANCES RECEIVED THIS FISCAL YEAR (d)	TOTAL DISBURSEMENT THIS PERIOD (e)	TOTAL DISBURSEMENT THIS YEAR (f)	TOTAL DISBURSEMENT AS OF THIS DATE SINCE THE START OF PROJECT (g)	REMAINING BALANCE AS OF THIS DATE SINCE THE START OF PROJECT (h) (c-g)
I - SPECIAL ACCOUNT									
(Managed by Grantee)									
a Personnel									
b Third party fees and expenses	1.) Program activities	1,506,410		1,478,432	507,182	124,224	507,076	1,479,480	(1,048)
c Travel, meetings and workshops									
d Other Direct costs									
e Sub-grantees (small grants)	2.) Other direct costs	526,073		553,100	224,562	74,435	224,665	552,049	1,051
f Indirect costs									
SUB TOTAL - I		2,032,484	732,484	2,031,532	731,744	198,658.83	731,741	2,031,529	3

4.3 Cost share

The agreement between USAD and IDER stipulated a cost share not less than of 30% of the overall program costs to be provided from the consortium. This cost share could be sort of in-kind or monetary and should cover the categories personnel costs and other direct costs as follows:

TOTAL BUDGET FOR ENTIRE AWARD PERIOD: October 1, 2005 to September 30, 2008			
Line Item	USAID	IDER Cost Share	Total Program
1. Program Activities	\$1,519,392	\$843,119	\$2,362,511.00
5. Other Direct Costs	\$530,607	\$239,172	\$769,779.00
TOTAL	\$2,050,000.00	\$1,082,291.00	\$3,132,290.00

The consortium partners were able to surpass the stipulated value by far (see table below), not taking in account the leveraged resources by the technical cooperation.

Cost share of USAID and the Consortium %

	TOTAL	USAID	Consortium
YEAR 1	100,00%	58,40%	41,60%
YEAR 2	100,00%	74,05%	32,44%
YEAR 3	100,00%	60,07%	40,10%

Total spend costs

Amount	USAID	Consortium
US\$	US\$	US\$
1.112.010	649.359	462.651
879.297	651.121	285.254
1.218.178	731.741	488.467

Totals	3.209.485	2.032.222	1.236.372
Total cost share	100,00%	63,32%	38,52%

4.4 Audit

Given that the amount of funds received from IDER exceeded US 300,000 per fiscal year, two financial audits, the first covering FY 05 and the second one FY 06 and FY 07.

The first audit detected some minor flaws which were immediately remedied. The second audit discovered no mistake. Nevertheless, both audit reports have not been approved by RIG at reporting date.

5. Communication

The E&D program offered several different communication channels to disseminate the obtained results. Quarterly reports and bi-monthly bulletins covered the official reporting to USAID. A web page (www.energiarenovavel.org.br) provided up date of program activities, event schedules and news regarding RE. Via Internet, some 2000 subscribers received the bi-monthly bulletins and a specific internet address channeled requests to IDER.

The high interest of the media in RE issues resulted in about 80 publications in local and national newspapers, journals and periodicals. Several TV appearances, also on national level, ensured a broad scale dissemination of the Program and its results. The cooperative agreements with international organizations gave ample room to present successful program tasks worldwide.

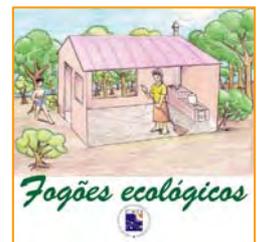
This efficient communication system will be kept active also after the E&D termination with input from the partners, which are continuing the majority of the tasks.

The following list contains the most significant publications in terms of manuals, instructions, research papers, proceedings, movies etc. of the E&D program. Not listed are the quarterly reports and bi-monthly bulletin, power point presentations and other documentation of minor importance.

In terms of significance on the achievement of carbon credits, the PIN-Project Idea Note- for efficient cook stoves is considered an imposing highlight of the E&D program.



- 1) Video: Efficient cook stove and furnaces in the Amazon
- 2) Leaflet: Garbage and citizenship: recycling of solid waste
- 3) Leaflet : Utilization of Efficient cook stoves
- 4) Leaflet: Construction of Efficient cook stove and furnaces in the Amazon
- 5) Leaflet : How to use biodigesters
- 6) Leaflet. Cultivation of pepper.
- 7) Manual : H2Sol – Micro hydroponics by solar energy: case study of pepper cultivation
- 8) Manual :Construction of an efficient cook stove
- 9) Manual: Construction of a simple Solar dryer
- 10) Manual: How to operate a biodigester
- 11) Research paper: Impact of indoor pollution on the nasal mucosa
- 12) Market research: Cost of photovoltaic solar energy
- 13) Didactical Manual : introduction in renewable Energy
- 14) Theatre script: The fight of Ze do Brejo against deforestation
- 15) Final Report : Public Policies and regulations of distributed energy
- 16) Final Report: PRISMA :Micro hydroelectric power plant Aruã/PA.
- 17) Final Report: Best practices in dehydration of fruits (EMBRAPA)
- 18) Final report: Community Unit of dehydration of banana
- 19) Project Idea Note (PIN): Efficient cook stoves
- 20) Booklet and DVD :Renewable Energies – a Brazilian Experiment –
Productive applications, entrepreneurship and social inclusion (Publication for the final event of the end of the E&D program)



6. Success Stories

The Consortium provided for international publications the following success stories (brief description only; full text is available on the DVD enclosed):

A) Renewable Adolescents, (Fortaleza-Ceará)

Five youth from the renewable energy course developed under supervision of one of the most respected staff of IDER, Mr. Antinous Carvalho, a solar furnace to bake cookies. It took a while to construct the apparatus, find the appropriate materials and last but not least, the right cookie recipe. After some attempts and first successful baking practices, the youth



entered a competition as “juvenile entrepreneurs” and received a prize worth U\$5,000 to open their own solar bakery. Today, they sell their cookies all over the place and can make their living just by the help of solar energy.

B) Technology serving Development (Baixas-Alagoas)

Some 30 kilometers from Sao Francisco River, the major water source of northeastern Brazil, the population of the village Baixas lived under very poor conditions and survived by sub-existence cultivation and some animal breeding. The first approximation with renewable energy was electric lighting by photovoltaic systems and the sun was not longer



considered as enemy. Twelve families participated in a venture of hydroponics irrigation of



pepper cultivation, with post processing in solar dryers, all of it powered by solar energy. An ample assessment opened marketing channels of the dehydrated pepper at restaurants and natural product shops in the towns near by. The families have now a decent income with their living conditions profoundly improved.

C) Capture Expectation - (Fortaleza-CE)



“We are not longer scavengers, we are environmental agents” These are the words of Huga and Lúcia, two women proud of their profession. A capacitating course involving 64 participants introduced new waste recycling techniques and social measures to create a scavengers association in Fortaleza. Thousands of scavengers all over Brazil suffer from non-acceptance of their rights and negligence of their important function in environmental protection. The municipal forum “Waste and Citizenship” recognized for the first time the

necessity of integration of this profession in the labor laws. Better working conditions, registration and social recognition are the first steps for these people in order to attain self-esteem. The E&D program assisted on this difficult path.

D) Energy for Life (Barra de Corrego-Ceará)



"It is not easy at all what I have been going through", Mariana says. As a 44 year old mother of eight children living together in a remote rural village and having access to light only through candles and kerosene lamps. The semiarid soil only allowed the cultivation of parsley and green onions. In 2003 was implemented a pioneer solar power project. The severe light of the sun is now being captured by solar panels feeding a water pumping system.



Together with beneficial eco-farming practices, the solar power irrigation system provided Mariana and other families the possibility to produce a substantial amount of food that they could have never imagined

before. The direct outcome has been an increase in income for all families and much healthier alimentation.

7. Closing Event of E&D Program



The greatly designed seminar and fair *Microgerar* marked the closing event of the E&D program. On 27, November 2008, all consortium partners and USAID officials as well as authorities of the Brazilian electric energy sector, representatives of RE equipment manufacturers, scientist of the area and NGO's met in São Paulo.

Beside the ample presentation of the E&D results and some video clips telling stories about several activities, the main attention was directed to Prof Dr. José Goldemberg, one of the most competent persons of Brazil when it comes to renewable energy and environmental questions. Once being Brazilian minister of science and technology and environment, he received the title “Hero of the environment”, side by side of Angela Merkel, Al Gore and Mikhail Gorbachev (The Times 2007). His excellent presentation demonstrated the fundamental advantages of renewable energy utilization under macro and micro economic considerations.



The event was closed with the launch of the publication "Energias Renováveis – Experiência Brasileira: aplicações produtivas, empreendedorismo e inclusão social” (Renewable Energies – a Brazilian Experiment: productive applications, entrepreneurship and social inclusion), a booklet covering all activities conducted under the E&D program.

8. Conclusion

The E&D program was one of the most challenging tasks IDER and its partners faced during three years. Even though, all consortium members had had much experience in most of the areas to embark upon, the grade stake was set at a very level. The first time, a genuine Brazilian team of NGO's conducted a program in Brazil, thus creating great expectations on one side and enormous responsibility on the other side.

The results obtained demonstrated the fulfillment of all, except one, predetermined objectives and a surprisingly high completion or even surpass of optional goals.

Financial and in-kind cost share also exceeded the 30% minimum level by far, while technical cooperation generated additional revenues of practically half of the amount provided by USAID for the entire E&D program.



We like to say thank you to be part of the global effort from USAID to construct descend live conditions for the poor by bringing in renewable energy, thus creating a sustainable world.