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on

Energising Development – Phase 2

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Name of sector project:
Energising Development

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List of Abbreviations

Abbreviation	Meaning
Overall	
ACP	African, Caribbean and Pacific countries
ADB	Asian Development Bank
AEEP	Africa-EU Energy Partnership
AEI	African Energy Initiative
ARE	Alliance for Rural Electrification
ASTAE	Asia Sustainable and Alternative Energy Programme
BMZ	German Federal Ministry for Economic Cooperation and Development
CO^2	Carbon dioxide
CSO	Civil Society Organisation
DFID	The Department For International Development
DGIS	Directorate-General for International Cooperation of the Dutch Ministry of Foreign Affairs
EnDev	Energising Development Programme
ESMAP	Energy Sector Management Assistance Programme
EU	European Union
EUEF	EU-Energy Facility
EUR	Euro
GACC	Global Alliance for Clean Cook Stoves
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPOBA	Global Partnership on Output-Based Aid
GVEP	Global Village Energy Partnership
HH	Households
HLM	High-Level Meeting
IOB	Policy and Operations Evaluation Department of DGIS
KI	Key Intervention
LA	Lighting Africa
LPG	Liquefied petroleum gas
M&E	Monitoring and Evaluation
MDGs	Millenium Development Goals
MFIs	Micro finance institutes
MHP	Micro Hydro Power
MHPP	Mini Hydro Power Project
MoU	Memorandum of Understanding
NGO	Nongovernmental Organisation
NLA	Agentschap NL
NORAD	Norwegian Agency for Development Cooperation
PHP	Pico Hydro Power
Pico PV	Pico photovoltaic
PPP	Public Private Partnership
PRSs	Poverty Reduction Strategies
PV	Photovoltaic
RBF	Result Based Financing
RE	Renewable Energies/ Rural Electrification
RWI	Rheinisch-Westfälisches Institut für Wirtschaftsforschung
SHS	Solar Home Systems

TERI	The Energy and Resources Institute
ToR	Terms of Reference
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WBG	World Bank Group
WHO	World Health Organisation
Benin	
ABERME	Agence Béninoise d'Electrification Rurale et de Maîtrise d'Energie
AFD	Agence Française de Développement
FABEN	Foyers Améliorés Benin
GSM	Global System for Mobile Communications
ICS	Improved cooking stoves
PN	Project Number
ProCGRN	Programme of Conservation and Management of Natural resources (Benin)
PU	Productive Use
SBEE	Societe Beninoise d'Electricite et d'Eau
SIs	Social institutions
SMEs	Small- and medium-sized enterprises
STS	Prepaid Systems
Burkina Faso	
FAFASO	Foyer Amélioré in Burkina Faso
IRSAT	Institut de Recherche en Sciences Appliquées et Technologies
Burundi	
DGHER	Direction Generale de L'hydraulique et del'Electrification Rurales
IFDC	International Fertilizer Development Center
MEM	Ministry of Energy and Mines
SL	Street lights
Ethiopia	
BEST	Biomass Energy Strategy
CC	Community Centres
HC	Health Centre
MME	Ministry of Mines and Energy
SNV Biogas	Netherlands Development Organisation
WFP	World Food Programme
Ghana	
CEFE	Compétences entrepreneuriales dans la formation d'entrepreneurs
ECG	Electricity Company of Ghana
MoTi	Ministry of Trade and Industry
NED	Northern Electricity Department
PSED	Programme for Sustainable Economic Development
VRA	Volta River Authority
Kenya	
IAP	Indoor air pollution

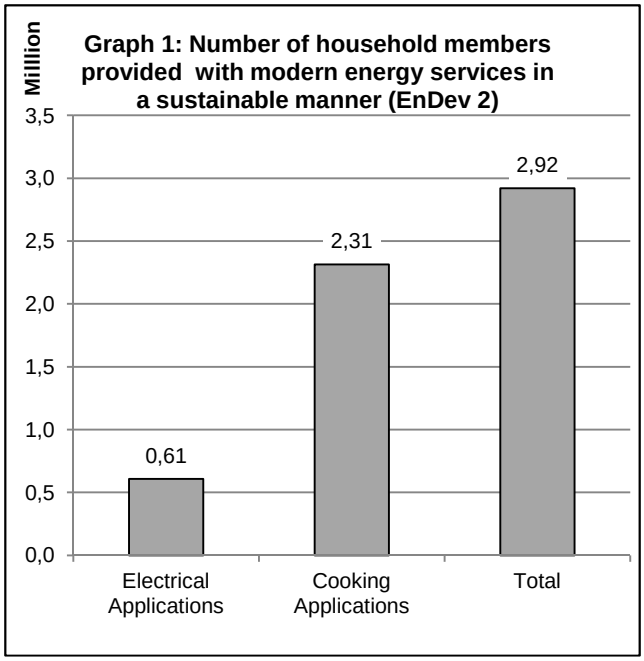
JK	Jiko Kisasa stove
PSDA	Promotion of Private Sector Development in Agriculture
RS	Rocket stove
Mali	
AMADER	Agence Malienne pour le Developpement de Energie Domestique et de
BCS	Battery Charging Station
DNCT	Direction Nationale de Collectivites Territoriales
ELCOM	Electrification Communale
MATCL	Ministere de l'Administration Territoriale et des Collectives Locales
O&M	Operations & Maintenance
PACT	Programme Promotion of Local Government
Mozambique	
AKSM	Associacao Kwaedza Simukai Manica
AMES-M	Access to modern Energy Services- Mozambique
DEG	Deutsche Investitions- und Entwicklungsgesellschaft
EdM	Electricidade de Mozambique
EIB	European Investment Bank
FUNAE	Fundo Nacional de Energia
Kulima	Organisation for Integrated Socio-Economic Development
MoE	Ministry of Energy
PEB	Programme on Educational Building
PPFD	Programme for Decentralisation
REF	Dutch Rural Energy Fund
SSHS	Small Solar Home Systems
Rwanda	
MHPP	Micro Hydro Power Plants
MININFRA	Ministry of Infrastructure
NDBP	National Domestic Biogas Programme
PSP	Private Sector Participation
SNV Biogas	Netherlands Development Organisation
Senegal	
ASER	Agence Sénégalaise de l'Electrification Rurale
ENDA	Environnement et développement du tiers monde
ERSEN	Projet Electrification rurale Sénégal
FASEN	Foyers Améliorés au Sénégal
ME	Ministères de l'Energie
PERACOD	Programme pour la promotion de l'électrification rurale et de 'l Approvisionnement
WFP	World Food Programme
Uganda	
PREEP	Promotion of Renewable Energy and Engery Efficiency Programme
Bangladesh	
SED	Sustainable Energy for Development
IDCOL	Infrastructure Development Company Limited
POs	Private Organisations

SL	Solar Lanterns
Indonesia	
DG	Directorate General
DGEEU	Directorate General for Electricity and Energy Utilisation
MHPP²	Micro Hydro Power Project
MHP-TSU	Micro Hydro Power- Technical Support Unit
PNPM	Programme Nasional Pemberdayaan Masyarakat
PSOs	Private Sector Organisations
Nepal	
AEPC	Alternative Energy Promotion Centre
CRED	Community Rural Electrification Department
CREE	Community Rural Electrification Entities
CREF	Community Rural Electrification Fund
DANIDA	Danish International Development Agency
ESAP	Energy Sector Assistance Programme
MoE	Ministry of Energy
NACEUN	National Association of Community Electricity Users – Nepal
NEA	Nepal Electricity Authority
REDP	Rural Energy Development Programme
SHPP	Small Hydro Promotion Project
Bolivia	
IAP	Indoor Air Pollution
KPT	Kitchen performance test
PADEP	Programa de Apoyo a la Gestión Pública Descentralizada y Lucha contra la Pobreza
PROAGRO	Programa de Desarrollo Agropecuario Sustentable
WBT	Water boiling test
Honduras	
AHDESA	Honduran Association for Development
AHPROCAFÉ	Asociación Hondureña de Productores de Café
FHIA	Honduran Foundation of Agricultural Investigation
IHCAFÉ	Honduran Coffee Institute
SIN	National Interconnected System
Nicaragua	
FODIEN	Fund for the Development of the National Electric Industry
MEM	Ministry of Electricity and Mines
Peru	
APCI	Agencia Peruana de Cooperacion International
PCM	Predidencia del Consejo de Ministros

A. Overview on current status of the EnDev 2 programme

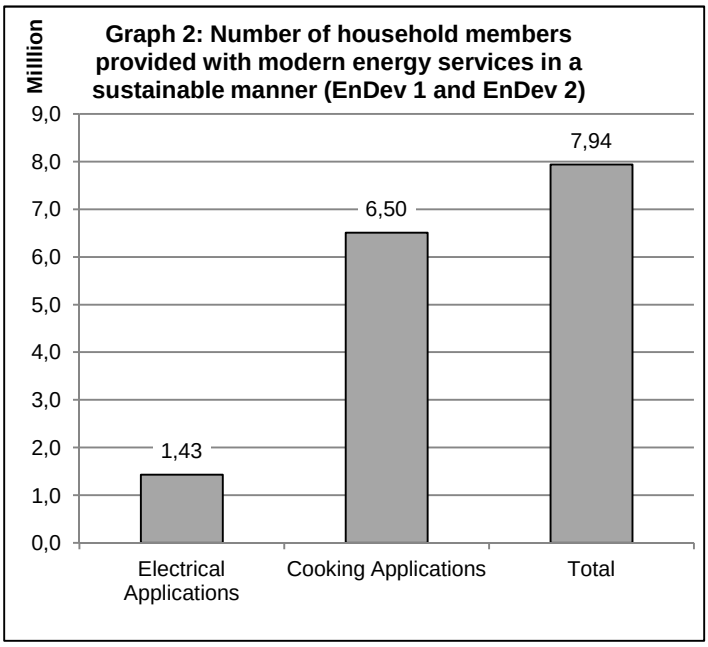
In 2011, the EnDev Partnership comprised 19 activities in 18 different countries. The focus is on partner countries of the Netherlands and Germany, and particularly on those in Africa. Around 58 per cent of the EnDev 2 funds are allocated for Africa.

Until June 2011, EnDev 2 provided about **3 million** people with sustainable access to modern energy services and technologies. This is either done with electricity by connecting households to the central grid, a mini grid powered by hydropower or through photovoltaic systems or with improved cooking technologies, such as improved firewood and charcoal stoves or biogas plants (Graph 1). In addition, 3,700 social institutions got access to improved cooking energy or electricity, or other modern energy carriers and 10,400 small and medium enterprises were provided with a modern form of energy for productive use.



These figures take into account:

- a “sustainability adjustment factor,” which takes into consideration that the access provided to modern energy technologies is not sustainable in all cases
- a “windfall gain factor” considering that some households supported by EnDev would have gained access to modern energy services anyway even without support
- a “double energy factor”, which accounts for households and social institutions, which received an improved stove or other modern cooking energy technologies but already had access to electricity.

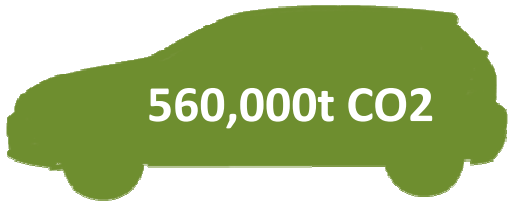


When looking at the overall EnDev programme, starting from phase one in 2005 up to June 2011 in phase two, the total number of people, which got sustainable access to modern energy services on household level amounts to almost **8 million** (Graph 2), the total number of social institutions and enterprises benefitting from EnDev was 11,200 and 22,300, respectively.

When it comes to CO2 monitoring EnDev reached about 8 million people with access to modern energy services in a sustainable manner (during EnDev 1 and EnDev 2). Renewable energy technologies used within the EnDev programme replace traditional energy technologies, thus reduce wood consumption and CO2 emissions.

The total savings for one year amount to approx. 560,000 t / CO2[1]. More than 880,000 tonnes of firewood were saved due to the introduction of energy efficient cook stoves.

Savings of 560,000 t / CO2 are as much as 300.000 medium-sized vehicles (150 g CO2/ km) driving 12,500 km a year.



All cars in Frankfurt (300,000) per year
(assuming 12,500 km driven distance)

[1] For the time being the CO2 savings per year are only calculated for Solar Home Systems, off grid hydropower, Pico PV and improved cook stoves of EnDev 1 and EnDev 2, which were present in June 2011. The calculation is according to UNFCCC based on default values and where necessary on own assumptions. For improved cook stove it is assumed that (only) half of the biomass is non-renewable.

- a household provided with electricity saves fuel of 2 kerosene lanterns (0.15 t / CO2 per year)
- a household with an improved cook stove saves 0.54 t / CO2 per year

Within EnDev the adjusted outcome figures are used to calculate the CO2 savings. However, only the Replacement Factor (sustainable used systems) and the Windfall Gain Factor (systems would have been sold even without EnDev) are applied. The Double Energy Factor will not be applied, as both “electrical systems” as well as improved stoves contribute to CO2 reduction.

B. Overview about planned country activities in 2012 under EnDev 2

The governing board of the programme approved up to now 19 country activities. The total budget of the second phase is currently 78 Mio. EUR. As part of the Energy Facility II the European Commission will provide an additional funding of 4,820,000 EUR for EnDev that is earmarked for electrification activities in Senegal (2,370,000 EUR) and for stove activities in Benin, Burkina Faso and Senegal (2,450,000 EUR). Also Ethiopia might expect funding as a partner organization of a consortium for two projects under the EU Energy Facility (in total up to 800,000 EUR). DFID and the Foreign Ministry of Norway are planning to join the EnDev partnership. A decision is expected till the end of this year. In addition, BMZ is currently considering additional financial contributions to EnDev. However, the present document is not taking into account these possible additional funds for EnDev. It is based on the assumptions that the total EnDev 2 budget will be 82.8 Mio EUR and that the programme will end in 2014.

Based on these assumptions it is planned that 10 country activities will end in 2012 as scheduled (see table 1). The country activity in Mongolia had already ended before. A handover strategy that is described in the final chapter of the respective country sheet has been developed for all country activities ending in 2012.

Table 1: Ongoing EnDev 2 activities without changes ending in 2012

Country	Activities	Project Duration		Funding	Planned outcomes on household level
		Start	End	in Euro	Persons
Bangladesh	Solar, Stoves	06/09	12/12	5,850,000	962,500[2]
Benin	Rural Electrification	01/10	12/12	1,600,000	15,399
Bolivia	Rural Electrification, stoves	10/09	12/12	5,400,000	277,000
Burundi	Rural electrification	09/10	08/12	900,000	11,000
Ethiopia	Rural Electrification, Stoves	10/09	06/12	6,830,000	526,000
Kenya	Improved Stoves	06/09	12/12	3,300,000	1,020,000
Mongolia	Rural Electrification	01/10	ended	580,000	EnDev 1
Mozambique	Rural Electrification	10/09	12/12	3,800,000	45,600
Nicaragua	Rural Electrification	10/09	12/12	2,640,000	29,000
Peru	Rural Electrification, Stoves	06/09	12/12	3,400,000	187,600
Uganda	Rural Electrification and Stoves	04/09	12/12	4,000,000	1,129,000
Total				**38,300,000**	**3,204,559**

Some projects that originally planned to finish their activities of the current phase in 2011 or 2012 reduced their expenditures to extend their activities till 2012 or 2013. Other country projects will receive additional co-funding through the EU-Energy Facility. The EU-activities are implemented till the end of 2014. EnDev funds are used as own contribution so that the total project duration would have to be extended till the end of 2014.

[2] The outcome figure on household level for Bangladesh has been reduced from 1,093,000 to now 962,500. Explanations are given on pages 31-32.

Table 2: Country projects which need an extension of the period

Country	Activities	Project Duration			Funding	Planned outcomes on household level
		Start	Old End	New End	in Euro	Persons
Benin	Stoves	10/09	12/12	12/13	2,000,000	400,000
Ghana	Rural Electrification	10/09	12/11	03/13	900,000	Not applicable, productive use only
Mali	Rural Electrification	04/09	12/11	06/13	2,000,000	19,800
Senegal	Rural Electrification and Stoves	04/09	12/12	12/14	7,200,000	459,700
Indonesia	Rural Electrification	05/09	09/12	12/13	8,000,000	90,000[3]
Honduras	Rural Electrification and Stoves	10/09	12/11	06/13	2,630,000	29,300
Nicaragua	Rural Electrification	10/09	12/12	06/13	2,640,000	29,000
Rwanda	Rural Electrification/Biogas	10/09	12/12	12/13	7,200,000	30,700
Total					**29,930,000**	**1,109,500**

Two country projects that are very successful will not have enough funds to finalise the initiated work and to use the evolved opportunities for additional access within the current project period. Therefore, a moderate increase of the project budget by 500,000 EURO and the extension of the project period in each case are requested.

Table 3: Country activities that are planned to be up-scaled and extended

Country	Activities	Project Duration			Funding in EURO		Planned outcomes on household level (persons)	
		Start	Old End	New End	Old Funding	New Funding	Old target	New target
Burkina Faso	Stoves	10/09	12/12	12/14	1,000,000	1,500,000	200,000	300,000
Nepal	a) grid-extension b) hydro-power	05/09	12/12	12/13	1,140,000	1,640,000	72,427	127,427
Total					**2,140,000**	**3,140,000**	**272,427**	**427,427**

[3] The outcome figure on household level for Indonesia has been reduced from 170,000 to now 90,000. Explanations are given on pages 35-37.

C. Overview about planned general EnDev activities

Cooperation with other Organisations and Initiatives

In recognition of the importance of energy access for sustainable economic development and supporting achievement of the Millennium Development Goals, the United Nations General Assembly has designated 2012 as the International Year of Sustainable Energy for All.

EnDev will play an active role in the events and campaigns that are linked to the UN initiative. In particular EnDev will prepare publications illustrating the results and lessons learnt of the partnership programme and participate in relevant conferences and workshops.

EnDev will continue to cooperate closely with the Africa-EU Energy Partnership (AEEP), the Lighting Africa initiative and the African Electrification Initiative (AEI) of the World Bank.

It will also actively contribute to the Global Alliance for Clean Cook Stoves. EnDev experts are participating in working groups of the alliance and provide other kind of support. In addition, EnDev will be part of the core group on Energy Access Indicators of the Energy Sector Management Assistance Programme (ESMAP) and continue to be a member of the task force on off grid lighting of the UNEP en.lighten initiative.

Energypedia

The Energypedia platform was recently opened to the public – now everyone can join and contribute, and Energypedia content can be found by anyone on the internet.

To assure the sustainability of Energypedia and to avoid that funding for Energypedia depends on the project life span of Energising Development it is planned to operate Energypedia by a non-profit organisation. Such an organisation was recently founded. The non-profit organisation will raise funds and offers services for fees, so that the management of Energypedia can be handed over to the new organisation in 2012.

The EnDev-Wiki is one of the restricted workspaces within Energypedia and is the common interaction platform for all EnDev stakeholders and aims to improve the workflow efficiency.

It has become the intranet of EnDev and is used for Monitoring, Cooperation Management and internal processes. In 2012 the monitoring section will further develop a web-based monitoring tool and will maintain an online publication database for impact studies.

Impact Monitoring and Evaluation

Main activities in the field of impact monitoring and evaluation will be:

- Impacts studies of about 2-3 individual country measures, related to a specific approach or technology.
- The further development of an Impact Monitoring plan for the EnDev programme (indicators, sampling, time frame, methods, etc).
- Updating the publication on impact of the EnDev programme as a whole.
- Supporting sustainability assessment in cooperation with the IS academy of the Netherlands. The framework developed in 2011 will be further detailed, and applied at least at two EnDev projects.
- Sharing M&E experiences by expanding and managing the tool-box (such as result chains, sample questionnaires, other tools) in Energypedia and in EnDev-Wiki.

- Supporting the exchange of results from Impact Monitoring within EnDev and other interested groups (via publications, workshops, etc). In 2012 a half day workshop in the Netherlands on sustainability is planned. The *objectives of the workshop are:*
  - To exchange knowledge and practical experience on the assessment of sustainability of energy access markets and project approaches between the various actors in the field.
  - To come to a general understanding of the key sustainability factors for different markets.
  - To explore possibilities for cooperation between implementing organisations in the field of monitoring and sustainability frameworks.

D. Status of Country Activities

Benin: Stoves

Promoted Technology	Stoves		
Project Budget	2,000,000 €	**Spent until reporting date**	513,879 €
Project Period	10.2009 – 12.2012	**Reporting Date**	06.2011
Lead Executing Agency	Ministry of Agriculture		
Implementing Partner	Ministry of Energy		
Involved Bilateral / Multilateral Programmes	ProAgri Promotion de l'Agriculture		

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	0	0	0	people
Cooking Energy for Households	400,000	38,097	65,817	people
Electricity and/or Cooking Energy for social infrastructure	0	14	29	institutions
Energy for productive use/ income generation	0	245	245	SMEs

Project strategy and key components

In the first phase, FABEN promoted a variety of efficient cook stoves in a rural area in the North-West of Benin. Commercial supply-demand systems without direct subsidies have been developed. However, at the end of the first phase there were still some weaknesses concerning the quality of the stoves and the sustainability of the market to be addressed.

These issues are taken-up in the first component of the second phase. Activities to improve stove quality as well as production capacities particularly for charcoal stoves are in the centre of component 1.

The extension of the programme interventions beyond the North-West are the focus of the second component. Particularly the urban centres in the South have been selected as an additional interesting market for improved cook stoves. However, there were some investigations still to be done concerning the target markets and the possible ICS products.

Additionally, another area in the North-East has been selected for an extension of the work in rural areas based on the implementation concept developed in the North-West.

In addition to capacity development activities on the municipality level in the North-West of Benin, EnDev has one grant contract ongoing with the “Association des Communes de l´Atacora et de la Donga” (ACAD). This grant aims to secure and to upgrade achievements reached in this intervention area as well as to support the appropriation and continuation of promotion of improved stoves for households in thirteen communities.

Project progress (overall progress towards outcome target EnDev 2)

Unlike during EnDev 1 productive use for SMEs is not a key-activity anymore. EnDev 2 focuses more on households. Thus activities with regard to supplying energy for productive use to SMEs have been reduced. However, with regard to household- and social infrastructure figures, results of EnDev 2 have almost doubled as compared to the last reporting period. Compared to the overall target this represents only 16%. However, based on a requested cost-neutral prolongation until end of 2013, and the start of the new interventions (in the South and the North-East), there will still be enough time to reach the target.

Progress in the North-West has been achieved through the introduction of standardised and mechanised production systems for the clay liner of charcoal stoves. Sales of this type of stoves have since more than doubled. However, this increase was realised partially to the disadvantage of the manual stove producers. It is anticipated that the current level of production and sales is representing a saturation level which is now almost achieved and shall be consolidated for a phasing out of programme activities.

The activities in the South have been delayed by extensive preparation work (market studies, identification of partners, products, etc). The main problem is the high prevalence of a cheap intermediary charcoal stove “cloporte” which the current ICS cannot replace with a 40% saving of fuel. Test results of a new prototype confirm that it is now (under lab conditions) reaching the required saving levels and reducing the CO emissions by app. 70%. This prototype will be field-tested in Benin and the design adjusted for market conditions. The sale of improved firewood stoves will start within the next reporting period.

A new intervention area will be established in the North-East. It is a similar area as the one in the North-west. Best practices will be applied for a fast commence of production within the next reporting period.

Sustainability and handover strategy

In the North-West, the results are approaching a saturation level. There appears to be a stable market which will continue after the end of EnDev 2. Current interventions are now focussing to improve the standardisation of the production to increase the quality of the products. By reducing the danger of design-drift, the long term availability of quality-products will be enhanced. A step by step phasing out concept for the North will be developed early 2012.

Activities in the South and the North-east are just starting. Until the end of 2012 it will be clear how the results in these two areas will be made sustainable until the anticipated end of the current phase in December 2013 (after approval of the extension).

Benin: Rural Electrification

Promoted Technology	Grid			
Project Budget	1,600,000 €	**Spent until reporting date**	1,350,000 €	
Project Period	10/2009 – 12/2012	**Reporting Date**	06.2011	
Lead Executing Agency	GIZ			
Implementing Partner	Societe Beninoise d'Electricite et d'Eau (SBEE), local communities			
Involved Bilateral / Multilateral Programmes	BMZ-GIZ Decentralization Programme & BMZ GIZ Water Programme			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	15,399	8,519	8,519	people
Cooking Energy for Households				people
Electricity and/or Cooking Energy for social infrastructure	79	68	68	institutions
Energy for productive use/ income generation	37	53	53	SMEs

Project strategy and key components

EnDev R.E. Benin targets grid extension and densification through cooperation with the national utility Societe Beninoise d'Electricite et d'Eau (SBEE). The project introduced adequate structures for tariff collection (pre-paid meters, group connections) and downsizing of technical standards to fit rural electricity use circumstances, and contributes to investment financing. It is supporting SBEE in the tendering process for the concessions of grid extensions to local electricity supply companies.

Next to that the project aims to develop non-grid power supply options through the rural energy agency Agence Béninoise d'Electrification Rurale et de Maîtrise d'Energie (ABERME). Under EnDev 1, twelve villages were electrified, fully financed by EnDev. Under EnDev 2, a basket financing project under the lead of EnDev, together with the EU Energy Facility, ADF and GoB, aims to electrify an additional number of 105 villages (redesigned within the budget from 59), and also includes a renewable energy off-grid component.

EnDev Benin had a financial contract with the Benin Electric Energy Society (SBEE). This contract has now come to an end.

Project progress (overall progress towards outcome target EnDev 2)

No new connections have been counted since the last reporting date. For the (completed) EnDev 1 component, SBEE does indicate that new customers have been connected to the "EnDev 1– villages", but this still has to be supported by their formal records. In EnDev 2, the EU Energy Facility component is currently lagging somewhat behind.

Nevertheless 105 villages have meanwhile been selected for electrification under the programme, mechanical and electrical design studies have been implemented, and construction started in August 2011. Current planning is to finish construction before the end of 2011 and subsequently start connecting households.

A study into the possibilities for small renewable energy projects for off-grid rural electrification indicated possible viability for small biomass cogeneration systems (agro-waste). Because of capacity constraints with the partner organisation ABERME as well as in the timely procurement of suitable consulting capacity however this component was put on hold for now.

EnDev Benin is currently searching for a new project manager.

Sustainability and handover strategy

Preparatory measures by NGO's well before electrification proved the value in getting higher connection densities and customer understanding, thereby improving the chances of sustainability, already in phase 1. The fact that SBEE reported negatively on possible disconnections since then carefully also indicates that connections are sustainable. For phase 2 the same approach is chosen. NGOs start their work, unfortunately a little delayed because of contracting procedures.

Burkina Faso

Promoted Technology	Stoves		
Project Budget	1,000,000 €	**Spent until reporting date**	669,204 €
Project Period	10.2009 – 12.2012	**Reporting Period**	06.2011
Lead Executing Agency	Ministry of Environment		
Implementing Partner	Government institutions, business associations, NGOs, IRSAT		
Involved Bilateral / Multilateral Programmes	Foyer Amélioré in Burkina Faso (FAFASO)		

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	0	0	0	people
Cooking Energy for Households	200,000	117,800	217,170	people
Electricity and/or Cooking Energy for social infrastructure	200	61	249	institutions
Energy for productive use/ income generation	2000	774	1939	SMEs

Project strategy and key components

FAFASO has pioneered in establishing commercially viable supply-demand systems for improved cook stoves in Burkina Faso. Starting in the capital Ouagadougou, it has expanded its activities first to Bobo Dioulasso. Under EnDev 2, the focus has shifted to small towns and rural areas. Next to household stoves, other key components are large scale stoves for schools and restaurants as well as special cooking devices for beer brewing and Shea butter processing.
Key elements of the intervention strategy are the training of producers, the support of producers' associations (for quality control, lobby work and marketing activities), awareness campaigns (e.g. on TV), product development, mobilisation of government initiatives (e.g. for ICS in school canteens).

Project progress (overall progress towards outcome target EnDev 2)

The overall targets of FAFASO have already mostly been achieved, thanks to a huge increase since the last reporting period. Only concerning the number of small and medium-sized enterprises (SMEs) there is still some improvement required, though the results have nearly doubled since December last year. The main growth has been realised in rural areas. The investments into capacity development and public awareness are now paying off. The promotion of ceramic stoves has just started after problems with the kiln technology have been overcome. It is realistic that more ceramic stoves will be sold in the next reporting period, though the rainy season may restrict this growth a bit.
While the overall sales of large stoves have increased a lot, it has been found difficult to find out how many have been sold to schools and how many to SMEs, as they are the same stoves from the same producers. The beer brewing stoves have also been sold about twice as much as in the same period one year ago because of extension of the project's activities into two big urban centres. However, in the upcoming rainy season there is the usual seasonal drop of sales to be expected. The stoves for the processing of Shea butter did not yet pick up as tests results are not yet fully satisfactory.
Until the end of 2011, FAFASO will prematurely have achieved all its targets which were set for December 2012. However, it will also have exhausted all its financial resources. As there is good prospect for further increases particularly in the small towns and the rural areas, it is recommended to provide more funding to the programme for additional targets to be achieved.

Sustainability and handover strategy

In Ouagadougou, sales are slightly decreasing over the past 2 years and should eventually stabilize. This is a process of consolidation as project support to the producers has been step by step withdrawn, in fact demonstrating the effect that is generally factored in by the sustainability factor. The producers' association has assumed responsibility for the implementation of marketing campaigns.
Similarly, a handover process for Bobo and the other new areas will be initiated. The promotion of ceramic stoves as well as the beer brewing stoves still requires a lot of follow-up activities to ensure that all technical difficulties have been overcome. The proposed additional funding for FAFASO should also be used to develop and implement additional measures to improve the sustainability of the established supply-demand systems.

Burundi

Promoted Technology	Solar/Stoves			
Project Budget	900,000 €	**Spent until reporting date**	201,000 €	
Project Period	09.2010 – 08.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Energy and Mines (MEM)			
Implementing Partner	DGHER - General Directorate of Water and Rural Energies IFDC - International Fertilization and Development Committee via Catalyst SEW Project			
Involved Bilateral / Multilateral Programmes	GIZ Decentralization and Poverty Alleviation project (Appui à la Décentralisation et à la Lutte contre la Pauvreté)			

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	11,000	0	38	people
Cooking Energy for Households	0	0	0	people
Electricity and/or Cooking Energy for social infrastructure	12	0	0	institutions
Energy for productive use/ income generation	150	0	0	SMEs

Project strategy and key components

EnDev Burundi works on increasing access to modern energy services for households, SMEs and social institutions. Hereby the focus is on the promotion of PV systems of various scales, from Pico PV lanterns up to systems for offices. EnDev Burundi supports capacity development on communal basis and in the private sector. Communal staff and management committees are trained on their respective tasks as owner and supervisory body. Service providers and private solar technicians are trained on operation and maintenance of PV systems and on business tools.

The installation of PV-systems for key communal services (schools, health centres, town halls and solar street lights) will be partly financed. In addition the setting up of solar powered battery charging stations (BCSs) will be supported and partly financed.

EnDev Burundi works on setting up sales and maintenance shops with attached BCSs that sell Pico PV, SHS, batteries and related equipment. The promotion is done through sales exhibitions (“road shows”) near the most frequented markets and churches. The project plans at least one exposition every week, followed by a second visit some weeks later, allowing potential customers to collect the money for a PV device meanwhile.

As a side activity to promotion of PV, there is cooperation through knowledge exchange and joint activities with biomass stove NGOs (IFDC) in Burundi as well as knowledge management and -exchange with the Partner (DGHER) and other players in East Africa about micro hydro power (MHP).

Project progress (overall progress towards outcome target EnDev 2)

In training sessions 35 electricians (2 of them female) were trained as solar technicians. Part of the training was done at health centres and schools with existing malfunctioning PV systems to have real technical conditions and to get direct user feedback. As a side effect the technicians arranged maintenance contracts with the institutions. Until the reporting date additionally 2 PV systems on infrastructure were repaired by the newly trained technicians. Considering that there was no commercial PV maintenance structure in Burundi before this is a positive spin off for the sector. After the training sessions the new solar technicians founded the “Gitega association for promotion of solar energy". The sales exhibitions

throughout the rural municipalities had a good start and have received high interest by the visitors. Sales needed some time to start up as people didn't bring enough money at that specific market day.

Three solar companies were participating during these exhibitions, exposing their Pico PV lanterns and Solar Home Systems (SHS). Some people bought lamps directly from those solar companies some days after the exhibitions. So far 26 Pico PV lanterns and 3 SHS have been recorded to be sold at or related to the sales exhibition. Some more unrecorded sales were reported. The road shows also entailed a mobile battery charging station, a mobile "darkness-room" to demonstrate solar lantern light output vs. light output of kerosene lamps or candles and some pin boards with further information.

Monitoring of these sales is in progress. 4 Municipalities have approved the financial contribution of 20 % for the electrification of 4 social infrastructures. The installations will be done until end 2011.

Existing Burundian stoves have been tested on their efficiency at CREEC laboratory at Makerere University in Kampala (Uganda). The report will be published soon. 2 students were sent along for training on stove testing.

EnDev invited the partnering NGO IFDC to two international GIZ workshops on improved cooking stoves. IFDC made new contacts and plans to introduce technologies and tools from Senegal and plans to cooperate with an established Kenyan stove producer group.

Sustainability and handover strategy

EnDev Burundi works towards achieving sustainability through capacity development, awareness raising and provision of high quality services and products in the market. The project conducts training of technicians and organisations in maintenance systems in order to keep installations operational over the lifespan.

The Department of Rural Energy in the DGHER and the grid maintenance team of the utility are eager to cooperate on training and maintenance of solar systems, especially those mounted on social infrastructure to strengthen their capacity. The technicians of DGHER as well as private operators will be integrated in the maintenance structure.

Network building is done between actors such as solar companies in Burundi, shop keepers and a pool of technicians, suppliers of quality solar products, municipalities, provincial health and education departments.

To ensure that BCSs are viable they will be integrated in existing shops. The shop keepers do not only depend on the income generated by charging batteries since they also offer other goods but they will furthermore diversify their income sources. Also smaller BCSs will be promoted that can be taken inside the shop after sunset.

Pico PV systems will be promoted without subsidies to avoid distorting this virgin market.

Ethiopia

Promoted Technology	Solar/Stoves/Hydro			
Project Budget	6,830,000 €[4]	**Spent until reporting date**	5,539,600 €	
Project Period	01.2010 – 06.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Water and Energy (MWE)[5]			
Implementing Partner	Governmental institutions at all levels, local and international NGOs, business and development associations, etc			
Involved Bilateral / Multilateral Programmes	Sustainable Land Management, Urban Governance & Decentralisation Programme, Engineering Capacity Building Programme; SNV Biogas (NL)			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	25,000	96	273	people
Cooking Energy for Households	500,000	219,438	256,698	people
Electricity and/or Cooking Energy for social infrastructure	361[6]	40	58	institutions
Energy for productive use/ income generation	60[7]	8	16	SMEs

Project strategy and key components

Stove component:

The project is supporting the private stove producers to play a major role in the promotion and dissemination of the improved stoves. The project is working on the following key (k) interventions: K-1 Raising awareness by employing various promotion and marketing activities, K-2 Establishing a network of stove and clay liner production micro enterprises for sustainable supply of improved stoves, K-3 Enhancement of biomass fuels supply through support for firewood planting, K-4 M&E; and K-5: working on supporting interventions (studies, product development, performance testing of stoves and assisting the Ministry of Water and Energy in policy and strategy issues).

Solar and Hydro Units:

Main strategies are energising institutions and households through community base MH development and capacitating institutions through PV System installation.

Major changes for the up-scaling of MHP development intervention is planned to up-grade traditional watermills to electricity generating systems with cost efficient and community managed approach.

Project progress (overall progress towards outcome target EnDev 2)

Stove component:

102.679 improved stoves have been sold to households until June 2010 that can be attributed to EnDev 2, serving 256,698 persons. 58% of the stoves were acquired by urban households and the remaining 42% by rural/semi-urban households. Sales figures for

[4] The total budget indicated in the last progress report amounted to 6,000,000 €. Due to additional funding of 830,000 € based on EnDev 1 commitments for Ethiopia the total budget increased.
[5] After the 2010 elections a change was made in the ministerial organisation. The previous partner ministry, the Ministry of Mines and Energy (MME) was split. The energy part joined the ministry of Water Resources to become MWE. The former partner minister moved along, making it a relatively smooth transition for EnDev.
[6] According to Planning: 300 schools with stoves, 11 community centres with PV, 50 HC with PV.
[7] According to Planning: 50 battery charging stations, 10 PV kiosks.

Institutional Rocket Stove and Mirt stoves that are used for productive and institutional use remain low and need to be looked into. So far only the EnDev 1 stoves and a few more can be counted.

Solar and Hydro Units:

Under EnDev 2 a total of 54 institutions and 2 community centres are equipped with solar PV systems.

Twenty nine battery based systems for lighting are distributed for 29 families, benefiting 129 persons.

The MHP Gobecho project has connected 2 social institutions, 12 SMEs and households, benefitting 144 persons.

Sustainability and handover strategy

Stove component**:**

Different bilateral consultation meetings with responsible government bodies at all levels have been conducted and strengthened harmonisation and joint implementation of the planned activities of both parties to retain the infrastructure and capacity at the hands of the project owner.

To ensure the sustainable supply of the stoves in the market, ECO is jointly working with the Ministry of Water and Energy on scaling up and enhancing the production capacity of the Tikikil and IRS producers.

Solar and Hydro Units**:**

The Health Centres PV systems are fully handed over to the respective Woreda health office. In order to insure sustainability, one company provides maintenance service for a set of health centres. Different trainings and lobbying campaigns are currently carried out influencing the government to allocate a budget for the service maintenance cost.

In securing the sustainable functioning of the MHP sites, the cooperatives that will run the pilot plants are provided with a set of trainings on productive use of energy, operation and maintenance and MHP administration and management. In addition, different awareness creation campaigns were carried out.

Ghana

Promoted Technology	Grid			
Project Budget	900,000 €	**Spent until reporting date**	629,789 €	
Project Period	10.2009 - 12.2011	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Industry and Trade (MoTI)			
Implementing Partner	Ministry of Energy, District, Municipal and Metropolitan Assemblies, Local Business Associations, Regional Coordinating Councils, Environmental Protection Agency			
Involved Bilateral / Multilateral Programmes	Programme for Sustainable Economic Development (PSED)			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	300	117	127	People
Cooking Energy for Households				People
Electricity and/or Cooking Energy for social infrastructure	Social infrastructure at 6 zones	3 zones using street lighting (55 street lanterns)	3 zones using street lighting (55 street lanterns)	institutions
Energy for productive use/ income generation	300	84	111	SMEs

Project strategy and key components

EnDev Ghana works in close cooperation with the Programme for Sustainable Economic Development in Ghana (PSED). Together they support the creation of light industrial zones with adequate energy for productive use and other appropriate infrastructure services, in selected district capitals. EnDev Ghana also offers capacity building in Local Economic Development (LED), Profitable Environmental Management (PREMA) and business entrepreneurship to the targeted Micro- Small- and Medium-Sized Enterprises (MSME) in order to help them establish their businesses at the light industrial zones and manage the area sustainably. During EnDev 1 (2006-2009), eight district capitals benefitted from the "Energy for Productive Use" component of PSED, co-financed by "Energising Development". In the current phase from 2010-2011, six more zones will be supported. District Assemblies and local Business Associations contribute by designating, acquiring, and developing suitable land for the light industrial zones. The districts also provide additional infrastructure like roads, water and sanitation. In return, the GIZ facilitates the planning process and contributes to the installation of an electricity distribution network for the zones by co-financing hardware like transformers, and high and low tension lines. Under EnDev 2, demonstration of ownership for sustainability is being increasingly emphasized. This means for example the districts do not receive other financial and technical support for the infrastructural development, and the district assemblies and artisan associations have more responsibility for liaising with the electricity and other utility companies. Also, PSED plays a stronger role in supporting the EnDev interventions by focusing local and regional economic development activities around the supported zones.

Project progress (overall progress towards outcome target EnDev 2)

Disappointingly, transformers delivered at 3 zones started under EnDev 1, have not been connected to the electricity grid. The reasons vary, but highlight the weak financial and organisational capacities of the district assemblies and business associations. With the exception of one zone, where EnDev carried out other infrastructure work on the existing light

industrial area, there are no new companies that can be counted until the transformer is connected. In a fourth EnDev 1 zone, companies have finally been able to move to the new site, but the utility was not able to supply meters to connect the artisans. The numbers of connected households has increased only slightly by five new connections, as other households moving to the zone did have electricity access before moving to the zone[8].

On a brighter note, the light industrial zones chosen under EnDev 2 are developing at a good pace. Electrical Installation is nearly complete at two zones (Sefwi Wiawso and Enchi) and will start soon in one zone (Kumasi). Procurement is under way for four zones (Nsuaem, Dorma Ahenkro, Suhum and Axim). The light industrial area at Bechem is also filling rapidly. The more rapid development of the light industrial areas chosen under EnDev 2 can be attributed to the selection process, which laid more emphasis on the demonstration of commitment and readiness for implementation from the district assembly and members of the private sector associations.

The use of district economic development forums continues its roll-out, and an institutional partnership with the Institute for Local Government Studies is being pursued. The Profitable Environmental Management programme is accelerating, with coaching for new trainers and intensified follow-up activities being carried out. Further, the costs for the CEFE (Compétences entrepreneuriales dans la formation d'entrepreneurs) business entrepreneurship trainings may be offset by fees from the participants soon. In 2011 the CEFE programme will focus on offering experience to the new CEFE trainers from the 2010 ToT, and improving monitoring of CEFE trainees. A monitoring framework for all activities is being revised. An impact study for the first zones is scheduled for September 2011.

The focus solely on counting firms who never used electricity in their business before remains an obstacle for reaching the component goals. Only 32% of the 622 companies at the light industrial zones can be said to have "new" electricity access for their companies, either because they are a start-up, or they did not have an electricity connection at their old location. Overall, only 51% of the 622 have a connection (either new or transferred), while the rest either do not need their own connection, or cannot yet afford it. However those without their own connection located at the industrial zones access electricity services from their neighbours if needed. SMEs start moving to the zones only after completion of the infrastructure works. An extension of the project phase until March 2013 is recommended to ensure the initiated impact can be observed and reported.

Sustainability and handover strategy

The development of light industrial clusters and the use of local economic development planning has become part of national strategies for economic development.

Materials and services are procured on the local market as much as possible, which ensures that the development contributes to the local economy and can be continued after the project end. The electricity hardware is installed either by the local government or the local business associations. Once installed, the hardware becomes the property of the utility (VRA-NED or ECG) that has the responsibility to maintain and repair or replace. This demonstration of responsibility and financial commitment increases local ownership and thus the sustainability.

The majority of costs for developing the industrial zone are met by the local government and private sector. As the intervention subsidies can be seen mainly as catalyst funding and advisory services, it can be reasonably expected that the approach (development of light industry zones with adequate electricity and other infrastructure) will be replicated after the end of the EnDev intervention. Several factors will lead to this development: awareness of the benefits of the clustered environment, improved infrastructure and adequate electricity supply, improvements in the budgeting and planning capacity of the local assemblies, and growing awareness in MSME groups of their ability to influence the assembly and also better manage their own businesses, due in part to interventions such as the media programmes.

[8] According to the EnDev rules these households could thus not be counted as connected in the context of the project.

Kenya

Promoted Technology	Stoves/			
Project Budget	3,300,000 €[9]	**Spent until reporting date**	2,028,000 €	
Project Period	06.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Agriculture			
Implementing Partner	Ministry of Energy, Ministry of Education, NGOs, Private sector players			
Involved Bilateral / Multilateral Programmes	Promotion of Private Sector Development in Agriculture (PSDA)			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households				people
Cooking Energy for Households	1,020,000[10]	2,202,147	2,800,000	people
Electricity and/or Cooking Energy for social infrastructure	350	1	97	institutions
Energy for productive use/ income generation	140	242	242	SMEs

Project strategy and key components

The project promotes a fully commercial approach towards stove dissemination. EnDev's interventions are geared towards scaling up production of quality stoves, marketing and popularising the stove as well as towards sensitising the communities about the stove to increase uptake and utilisation. Project interventions focus on capacity building for stove builders and dealers to ensure they engage in stove work as a business. Opening up the stove market through awareness creation and user education is done by EnDev to ensure proper utilisation of the stove for maximum benefits on the user side. The EnDev intervention focuses mainly on up-scaling of stoves for households. Additional to that stoves for productive uses in SMEs and for social infrastructure are promoted.

The EnDev activities are in close cooperation with various implementing partners to increase the outreach and to prepare a sustainable knowledge base within Kenya about stoves.

The last six months were focused on taking audit of the progress made. This was necessary to enable the project assess what would happen in terms of stove uptake if no new areas were to be included. Indications are that stove uptake at HH level would go up and more people join in stove work.

Project progress (overall progress towards outcome target EnDev 2)

The current phase (June 2009 – Dec 2012) has the target to supply 1,020,000 million people at household level with access to modern stoves. As of June 2011, 2.8 Mio people have been reached already. This can be attributed to the fact that the project has increased awareness of the stove benefits amongst the potential users and more stove dealers got involved in the stove business and became more successful in selling the stoves.

The preference for Rocket Stoves (RS) compared to Jiko Kisasa stoves (JK) continues to dominate the sales figures. Positive feedback from early users, increased user awareness

[9] The total budget indicated in the last progress report amounted to 2,500,000 €. Since Kenya has been scaled up by 500,000 € in the course of the annual planning process for 2011 and due to additional funding of 300,000 € based on EnDev 1 commitments for Kenya the total budget increased.

[10] In the last progress report the outcome figure indicated as target for people to be reached with cooking energy in households was 850,000. However, in the course of the financial scaling-up, also the outcome number of beneficiaries increased.

about the various stove benefits and the increased prices for firewood have contributed significantly to the trend of high sales figures for both stoves.

Food shortage and increase in price commodities in some parts of the country have slowed down stove uptake. This can also be observed in the fluctuating number of people involved in stove work on monthly basis. However at the moment there are a total of 2,399 people (53% women) employed in the stove sector alone. This does not include the people who are doing stove work outside the project focal areas, supplying materials and offering transportation.

Currently the biggest challenge is the promotion of stove commercialisation while Carbon funded projects come in with a free stove. There is a serious contradiction in approaches and this is very confusing to the communities. This issue needs to be addressed at a higher level. At country level efforts are being made to establish an Inter – Ministerial forum where such issues can be addressed and the players be advised how best to make use of the carbon funds without distorting the market. It is clear the companies are attracted by money but the sustainability of these interventions is very questionable.

Social Institutions continue to be rather slow in stove uptake especially the governmental schools. Most schools are citing finances as a major hindrance. However the project continues to raise awareness in various forums, also highlighting the costs savings that can be achieved with the stoves.

The number of enterprises using ICS for productive uses is still low. The sales figures during the last reporting period reduced even more as compared to the earlier period. This can partially be explained by the fact that most enterprises within the project focal areas have been addressed and the project may need to move into other areas to get more enterprises on board. The long lifespan of the stove reduces the need for replacement within short intervals.

Sustainability and handover strategy

The increasing number of households purchasing ICS and the increasing number of stove businesses are an indication of a growing sector. The availability of a good product supply within reach and maintenance and replacement systems through technician and government staff available at division level ensure that skills, information and support are easy to access for the users. Income generation remains a major motivation for continuity in stove businesses and hence the commercial promotion of quality stoves.

Supporting the development of the Stove Association is another opportunity to ensure continuity. Partnering with financial institutions gives access for loan facility for stove work. Collaboration with other players helps to spread the technology and the appropriate dissemination strategy to reach more people on ground.

Exit strategy includes formation/launching/development of the Stove Association as a lobby forum for private sector participation, capacity building for public institutions to acquire technical skills for regulation and supervision, collaboration and partnerships with other players to develop stoves linkages that will widen and deepen the scope of activities towards building thriving stove enterprises.

Mali

Promoted Technology	Solar PV for Battery Charging Stations a Social Infrastructure		
Project Budget	2,000,000 €	**Spent until reporting date**	1,164,645 €
Project Period	04.2009 – 12.2011	**Reporting Date**	06.2011
Lead Executing Agency	Ministere de l'Administration Territoriale et des Collectives Locales (MATCL)		
Implementing Partner	Direction Nationale de Collectivites Territoriales (DNCT) Agence Malienne pour le Developpement de l'Energie Domestique et de l´Electrification Rurale (AMADER)		
Involved Bilateral / Multilateral Programmes	Programme Promotion of Local Government (PACT)		

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	19,800	0	0*	people
Cooking Energy for Households	0	0	0	people
Electricity and/or Cooking Energy for social infrastructure	180	1	1	institutions
Energy for productive use/ income generation	0	0	0	SMEs

***** New households connected for 2 months only.

Project strategy and key components

ELCOM 2 strategy is to guarantee sustainable provision of electricity to rural private households by PV-driven communal battery charging stations (BCS) and to rural social infrastructure (SI) by Solar Home Systems (SHS).

The BCSs remain property of the commune, are operated on fee-for-service basis and contracted to private service providers that are also responsible for Operation and Maintenance (O&M) of the Solar Home Systems in social infrastructure.

A percentage of BCS income and part of the fees charged for communal services are deposited into a fund to cover costs for maintenance and replacement.

Key interventions

- Identification of rural communes that comply with EnDev criteria and good governance criteria and that have the capacity to contribute financially;
- Set-up institutional framework by agreement on (1) management committee selection; (2) assignment of duties/rights for operator, committee (3) stakeholder supervision;
- Training for (1) communal staff and management committee on tasks as owner and supervisory body; (2) service providers on O&M of PV-systems and business tools;
- Financing of installation of solar PV-systems for electrification of schools, health centres, town halls, solar street lights and BCSs (community contribution 10 – 20%).
- Technical and managerial coaching/backstopping for institutions and operators; integration of public energy services concept in communal development plans;

In comparison to ELCOM 1, under ELCOM 2 economic viability/purchasing power in the commune is a more important selection criterion.

Project progress (overall progress towards outcome target EnDev 2)

Installation of solar equipment in new communes was delayed by procurement process. Preparatory work has progressed; installations are completed/will be completed very soon. **Since April BCSs are operational in 2 communes**. However, it would be premature to report already now reliable access data based on a two month observation period.

ELCOM 2 also entails follow up activities for ELCOM 1 communes where BCSs are used at strongly varying intensity, ranging from 5-80% of their maximum capacity at BCS level and averaging 15-50% at community level. Suggested underreporting is under investigation (data loggers), however despite that in most communes usage is still insufficient to guarantee longer term sustainability. On the other hand in one commune this level is practically achieved (proof of principle). A consultancy in September shall reveal contributing factors, based on which actions will be defined to increase BCS use.

To translate gross results (all people served through BCSs) into net results (people served (1) due to EnDev, (2) newly and (3) sustainably), three correction factors are applied. Two of these, the windfall gain (1) - and the double energy factor (2) can realistically be set at nil. The replacement rate factor (3) comprises the ability to maintain the PV infrastructure as well as the population's capacity to replace worn out batteries, and is set at 50%.

ELCOM 2 output targets can realistically be achieved during project period. However set up of minigrids as part-alternative is contemplated.

No specific impact has been measured yet.

Sustainability and handover strategy

BCSs are operated independently from the project. Hence operation in the ELCOM 1 villages can continue without project interventions. In line with the above, sustainability of outcomes is still unsure because of the presently low use that is made of (ELCOM 1) BCSs; analysis as to contributing factors is being set up, based on which appropriate actions will be identified and taken.

ELCOM 2 installations (BCS, SI) are very recent and not finalised. Handover to the communities still requires a lot of follow-up to secure proper utilisation, operation and management.

Options for autonomous up-scaling beyond the project boundary are limited; initial investment costs are high and largely subsidised; as setting up the fund for maintenance and repair already proves to be difficult, excess funds for up-scaling in this set up are unlikely. Due to the above mentioned delays in the procurement, there is need for an extension of the project phase until June 2013 to allow for a completion of the installation works and a sufficient follow-up of the installed systems.

Mozambique

Promoted Technology	Solar/Hydro/Grid			
Project Budget	3,800,000 €[11]	**Spent until reporting date**	2,086,000 €	
Project Period	10.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Energy (MoE)			
Implementing Partner	EdM, FUNAE, Provincial departments DIPREME, MFI's, NGOs and private enterprises			
Involved Bilateral / Multilateral Programmes	Decentralisation Programme (PPFD) and Education Programme (PEB), Economic Development Programme			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	45,600	38,000	38,282	people
Cooking Energy for Households	0	0	0	people
Electricity and/or Cooking Energy for social infrastructure	-	0	4	institutions
Energy for productive use/ income generation	-	0	43	SMEs

Project strategy and key components

EnDev is supporting grid extension, the construction of pico and mini hydro power plants on community level and the training of local SMEs doing business with PV systems in cooperation with several international private companies. In addition to capacity development activities in the different areas EnDev has made or is going to make grant agreements with the utility Electricidad de Mozambique (EDM), the Instituto Industrial de Maputo (IIM) (Solar training centre) and the Associacao Kwaedza Simukai Manica (AKSM) (micro hydro component).

The project is also evaluating a possible involvement in dissemination of improved cook stoves, in the installation of battery charging stations and the introduction of modern energy technologies for productive use. As complementary activities the project is mapping energy activities in Manica province and supporting the government in establishing a database on existing energy studies.

Project progress (overall progress towards outcome target EnDev 2)

EDM finished successfully the agreed grid extension activities providing around 38,000 people with access to electricity under EnDev 2. EnDev has currently no plans to renew the contract with EDM due to budget reasons at reporting time.

As result of EnDev 1 activities in the hydro component, 12 new households, 35 SMEs and 3 social institutions obtained access to electricity, and 20 public lighting units were installed. New hydro activities provided access to electricity to 38 households in 2 villages (Magunga and Mudododo I) as well as to 8 SMEs. Commissioning of additional 6 hydro plants is expected in the next reporting period. The progress in the hydropower programme with the NGO AKSM is seriously delayed. The inclusion of a bank (Banco Terra) caused problems mainly in getting the appropriate finance propositions tabled and accepted by this bank. Despite an MoU with the bank and despite a carefully worked out calculation model for the economic consequences of the (micro) hydro investment, the bank still hesitates on the apparent collateral (the plant) and looks for almost unacceptable payback security and a no risk involvement. Measures are in place to speed up the processes at the time of reporting.

[11] The total budget indicated in the last progress report amounted to 3,000,000 €. Due to additional funding of 800,000 € based on EnDev 1 commitments for Mozambique the total budget increased.

In the field of solar energy the project has started to monitor the number of trained people, their development and the sales figures of PV systems on a monthly basis. The project has established a database of currently some 140 trained individuals.

An impact study about grid-densification started in June in the Maputo suburbs and Matola. Parallel to this a study on the applicability of the sustainability framework developed by IS Academy of the Free University of Amsterdam has been carried out in the rural areas of the hydro interventions. The provisional findings of the study show high ownership, but also some weaker elements (lack of formal licenses to produce electricity) in the strict sense of sustainability criteria. Interestingly both studies show very positive responses of households to the availability of electricity. A third study was undertaken on the approach applied under EnDev 1 to disseminate Small Solar Homes Systems (SSHS) in Sofala province. It was found that apart from some administrative problems, the approach as such was satisfactory. However the monitoring and assurance of the quality of the solar products was insufficient. The market is spoiled by cheap low quality products being imported through informal channels.

The results of field tests of 3 systems (SSHS) carried out during 2009 and 2010 produced interesting background information on the energy situation of households. However, the development and introduction of new products on the international market made some of the results only partially relevant. It was decided to apply an approach developed by the former company SolarNow. This approach focuses on guidance and training of the (commercial) retail chain with a quality focus on products and close monitoring of outlets and buyers. Cooperation with the PPP, earlier mentioned, has started in this context and the previous SolarNow employees have signed a consultancy contract, operating under an activity titled SolarMoz (SolarNow SA has stopped its activities earlier this year in Mozambique. Its original financer, Dutch Rural Energy Fund (REF) Netherlands, has agreed to project plans and makes use of developed training materials. Efforts to obtain additional financing from EEP South Africa did not materialise yet).

Sustainability and handover strategy

In the case of the grid-densification the EnDev outcomes will be sustainable because the majority of the households is capable of maintaining the connection provided for. With a view to available budget and changing timelines for EnDev, the project (AMES-M) has re-focused the emphasis on capacity development and counting the achievements of the people capacitated, consistent with EnDev output counting protocols. The focus is on private sector involvement, NGO's, up to sub-government levels such as Fundo Nacional de Energia (FUNAE). For this purpose cooperation has also been established with the public and private educational infrastructure and universities such as Eduardo Mondlane (solar product testing), the UP (Energy sector database) and colleges such as Instituto Industrial de Maputo (Solar training centre). In Manica province, cooperation was established with the Catholic and Zambezi Universities as well as the UP local branch and the polytechnic Institute. Involvement there is foreseen and being developed in the fields of Productive Use of energy and the hydro sector. The institutes are selected on the basis of their active responses to the plans presented by AMES-M. Operational agreements are being worked out.

This cooperation will guarantee sustained access to lessons learned of EnDev interventions. Two new proposals are currently in the draft phase for continued GIZ involvement in the energy sector up to 2015 provisionally. Efforts are being undertaken to find new 3rd party financing or perhaps continued support from the existing partners, The Netherlands and German governments. The outputs of this potential 3rd phase will be discretely distinguished from the achievements in the first two phases. The new emphasis on capacity development will basically aim at market development for the renewable energy technologies available. Subsidies will not be abandoned but by high preference only be used to make the relatively small investments feasible in financial and economic terms. Other "grant" money will be used for investments with a clear public interest such as in a solar and hydro training centre.

Rwanda

Promoted Technology	Biogas/Hydro			
Project Budget	7,200,000€[12]	**Spent until reporting date**	2,770,000€	
Project Period	10.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Infrastructure (MININFRA): Energy Sector			
Implementing Partner	MININFRA, Private sector (MHP), SNV (Biogas)			
Involved Bilateral / Multilateral Programmes	GIZ Health Programme Rwanda			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	19,700	1,813	1,813	people
Cooking Energy for Households	20,544	5,279	7,329	people
Electricity and/or Cooking Energy for social infrastructure	5 SI with biogas system			institutions
Energy for productive use/ income generation	30			SMEs

Project strategy and key components

PSP Hydro: The EnDev Private Sector Participation Hydro Project (PSP) aims at developing a private hydropower sector in Rwanda. Therefore EnDev focuses on two key interventions, the development of micro hydro power Plants (MHPP) and the consolidation of the participation of private MHP developers in the energy sector.
The activities to achieve the 1st key intervention include the development of capacity in Rwandan small and medium-sized enterprises (SMEs) through technical and business assistance as well as co-financing. For the achievement of the 2nd key intervention the following activities have been undertaken: Political support and institutional guidance; Assistance and tutorage for sector consolidation.
PSP Hydro currently supports six private utilities / MHPPs. Support of MININFRA / EWSA in the privatisation of publicly funded MHPP is under analysis and design. Other donor organizations are becoming active in the hydro sector while following PSP Hydro's approach of private sector promotion negotiations are ongoing to ensure close cooperation.

Biogas: EnDev supports the National Domestic Biogas Programme to roll out household biogas digesters throughout the country. The support is through technical assistance (TA) and a grant contract. The grant is channelled through the Ministry of Finance and Economic Planning to the National Domestic Biogas Programme (NDBP). Subsidies are partly taken over by the grant to reduce the end user price. The TA support is done through a SNV biogas expert under a GIZ's contract who works directly with the NDBP Team.

Project progress (overall progress towards outcome target EnDev 2)

The grid connected micro hydro power Plant (MHPP) of Murunda (96 kW) was started on 12.03.10. This is the first power plant ever developed and operated by a private company in Rwanda. Two more MHPPs, Mazimeru (500 kW) and Musarara (438 kW) are under construction and are expected to be completed by the end of 2011.

Three more projects are under study: Gasumo (83 kW), Kavumu (280 kW) and Mashyiga (140 kW), which will be developed by three new implementing partners: Calimax, REGREPOWER and Atlas Express, respectively. The current production of electricity at the

[12] The total budget indicated in the last progress report amounted to 5,000,000 €. Due to additional funding of 2,200,000 € based on EnDev 1 commitments for Rwanda the total budget increased.

Murunda MHP is fed into the national grid. These kWh produced can be translated into 1813 people that are served through the plant.

EnDev Rwanda proposes to extend the project period for PSP Hydro until December 2013. Through this extension the benefits of the sector development will bear fruits and result in further operational MHPs that can be attributed to EnDev. Also the cooperation with other MHP donors can be strengthened which will result in further spin off results.

Until end of June 2011 a total of 1,383 biogas household digesters have been constructed through the EnDev 2 support to NDBP supplying 7,329 people with access to clean biogas. With an average construction number of approx. 80 new digesters per month the programme is clearly lagging behind its targets. However, the new NDBP team, being active since December 2010 has managed to tackle some of the main challenges. A smaller and cheaper size of digesters has been introduced in 2011 and has reached a market share of more than 20%, enabling poorer households to get access to biogas, too. Nevertheless the performance of the programme is, for valid reasons, much lower than originally anticipated, which increases the outcome cost ratio above an acceptable EnDev level. EnDev therefore decided to uphold its commitment to the biogas-programme until end of 2011, but to not prolong its involvement beyond that.

Sustainability and handover strategy

The case of the 1st successful MHPP developer (REPRO) shows that the grant provided is enough to reach feasibility for the company. Therefore, individual projects developed by PSP Hydro will survive even after the termination of the intervention in Rwanda. In fact, spin off is already occurring. Under the Dutch Daey Ouwens Fund 2 of the “EnDev-project developers” successfully submitted a proposal for a subsidy to construct a second plant, using the know-how and experience they obtained from the PSP Hydro project. In addition, private implementing partners of the PSP Hydro project pushed the GoR to develop a clear and stable framework for MHP activities (including: Power Purchase Agreement (PPA) with the Utility and environmental regulation). The most recent and significant impact is that MININFRA has adopted the PSP Hydro private sector approach as its own. An indication for this is that GoR is planning to privatise all publicly funded MHPPs in the country. A positive signal has been sent by GoR indicating the continued support of private companies in the micro hydro power sector after the exit of the EnDev programme.

EnDev prepares to phase out its support to the National Domestic Biogas Programme (NDBP) by the end of 2011 in line with the end of the 1st phase of NDBP. Since the start of 2011 the TA support was commissioned to a SNV biogas expert. NDBP and SNV cooperated well during the 1st six month of the year. Together they develop a proposal for a 2nd NDBP phase starting from 2012 onwards. In 2011 GoR has taken over more financial responsibility in NDBP, covering parts of the programme costs that were not any longer covered through the contract with GIZ EnDev. From 2012 GoR will take over the major share of the programme costs. New donors will be sought.

Senegal

Promoted Technology	Solar/Stoves/Grid		
Project Budget	7,200,000	**Spent until reporting date**	4,501,554
Project Period	04.2009 – 12.2012	**Reporting Date**	06.2011
Lead Executing Agency	Ministeres de l'Energie (ME)		
Implementing Partner	Direction de l'Energie (DE), Agence Senegalaise de l'Electrification Rurale (ASER)		
Involved Bilateral / Multilateral Programmes	Promotion of Renewable Energies, Rural Electrification and Sustainable Supply of Household fuels (PERACOD)		

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	59,700	0	0	people
Cooking Energy for Households	400,000	41,618	100,077	people
Electricity and/or Cooking Energy for social infrastructure	549	0	0	institutions
Energy for productive use/ income generation	145	0	0	SMEs

Project strategy and key components

FASEN: Establishment of commercial supply-demand systems for ICS. EnDev 1 started in urban centres. EnDev 2 is focussing on consolidating the achievements in the large cities and the expansion in smaller towns and rural areas. The increase of professionalism of producers of stoves and inserts (use of machines) will increase both quantity of stoves produced as well as the quality of stoves through standardisation. Distribution networks will be expanded and strengthened.

FASEN plans to sign a financing agreement with Microfinance Institutions such as Mutual Savings and Credit: Women's Movement for Development, CMS, Mutual Dramé Escale . Moreover FASEN plans to set up a financing contract with NGOs such as TOSTAN.

ERSEN: Electrification of rural villages in concessions given out by ASER, on demand of the village, through either SHS (small villages) or minigrids (larger villages). In addition to household electrification some social infrastructure is generally electrified. Systems are operated and maintained on fee for service basis. ERSEN 2 essentially is an extension of ERSEN 1, i.e. electrification of more villages according to the same strategy.

Project progress (overall progress towards outcome target EnDev 2)

FASEN: The current result is more than twice as high compared to last reporting period. Results in Dakar have confirmed those good results of the last half year, consolidating on a level of approximately 19,000 stoves per half year. Increases in Kaolack and rural areas are steeper, but on a much lower level of stove sales. Increases particularly in small towns and rural areas still need to be raised to achieve the overall goal. There is a concentration of demand for the charcoal stoves of the Jambar stove family. These stoves require a ceramic liner. The increase in demand can so far not yet be matched by an adequate increase in supply despite numerous interventions of the programme. While these attempts will be further pursued, alternative options to produce a Jambar without ceramic inserts will be tested.

ERSEN: Due to delays in tendering, purchasing and some social unrest in Senegal, no new villages are electrified yet; though installation of systems at large scale is in progress. At present completion of installation is expected by the end of 2011, implying that beneficiaries of ERSEN 2 will firstly be reported in mid 2012. ERSEN 2 in addition entails some follow up

activities of ERSEN 1, where correction of some minor errors as well as installation of a few new systems and taking down of some SHSs has resulted in slightly lower numbers of beneficiaries than in December 2010.

An extension of the project phase till December 2014 is proposed with the intension to compensate the delays.

In line with the above, results for ERSEN 2 at present are reported as nil.

Sustainability and handover strategy

FASEN: Due to the reinforcement of the production system with the introduction of machines, the programme is still actively involved even in Dakar and Kaolack. The producers are organised in associations which will play a major role in the promotional activities in the next year. A handover strategy still has to be developed even for the rural areas where production has just started.

ERSEN 1 villages in principle are self sustainable; the service fee should enable operators to properly maintain systems. Handover however still entails some follow up and monitoring. With ERSEN 2 installations not yet operational, handover issues are not relevant yet.

Uganda

Promoted Technology	Solar/Stoves/Hydro/Grid			
Project Budget	4,000,000	**Spent until reporting date**	2,653,000	
Project Period	04.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Energy and Mineral Development			
Implementing Partner	Rural Electrification Agency, NGOs, Private Project Developers			
Involved Bilateral / Multilateral Programmes	Promotion of Renewable Energy and Energy Efficiency Programme (PREEEP)			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	29,000	1,302	1,888	people
Cooking Energy for Households	1,100,000	565,375	676,385	people
Electricity and/or Cooking Energy for social infrastructure	194[13]	16	34	institutions
Energy for productive use/ income generation	240[14]	31	72	SMEs

Project strategy and key components

EnDev Uganda is working on the dissemination of improved biomass technologies and on rural electrification. The programme has a three-fold approach to serve the various different stove user target groups in Uganda. In urban settings, EnDev Uganda is supporting commercial stove producers, e.g. in the establishment of a stove producers association and hence improvement of market structures. In rural settings, the programme is training trainers of local stove artisans with the aim to reduce costs for stove production and hence making them affordable for the rural poor. The stoves in those settings are made of locally available material. The third approach is aiming at supporting institutional and entrepreneurial users of improved biomass stoves (e.g. schools, prisons, bakeries, restaurants, etc). EnDev Uganda offers technical support to professional producers of institutional stoves and baking ovens and offers a subsidy scheme for institutional stoves, esp. for schools.

EnDev Uganda is aiming at increasing access to electricity supply in rural areas by Solar PV, micro hydro power and grid densification. The programme is supporting rural solar dealers and micro financing institutions in the establishment of their business and creation of a rural market for solar PV products (both solar home and business systems and Pico PV lamps). This support comprises business and technical trainings, marketing and creation of a dealer network. For the dissemination of institutional PV systems EnDev Uganda is offering a subsidy for health centres and boarding schools, whereby the programme finances 80% of the overall costs and the benefitting institution is contributing 20%. The installation is always done by a local Ugandan solar company.
In the field of micro hydro power EnDev Uganda started with a community-approach, i.e. the benefitting community is operating the micro hydro scheme. Later the programme has started supporting private project developers for micro and mini hydro power projects (Private Sector Participation Hydro Power).

Lastly, EnDev Uganda is connecting social institutions and trading centres to the national electricity grid in cooperation with the utility on a subsidy-based system, whereby the beneficiaries have to contribute 20% of the project costs.

[13] In the Interim Report 2010 the data indicated for “target till project end” based on *number of people*. In the new version of reporting, the *number of social institutions (SI)* was introduced as new unit of reporting. ‘194’ is the target number of social institutions (SI), while 80 SI will be supplied with stoves and 114 with access to electricity.
[14] See footnote No 13: ‘240’ is the target number of SMEs, while 160 SI will be supplied with stoves and 80 with access to electricity.

Project progress (overall progress towards outcome target EnDev 2)

By June 2011 more than 676,000 people gained access to improved household cooking stoves through the programme. The first pico hydro power plant has been installed in Eastern Uganda and supplies 30 people as well as one shop with electricity. Two micro hydro power plants are still under construction, commissioning is still expected in 2011. The solar market development activities are implemented in cooperation with a consortium of Ugandan and Kenyan consultants. So far 1,423 persons and 28 institutions got access to solar power through EnDev. In the field of grid extension, six schools were connected to the national grid. In addition, suitable areas for grid extension of entire trading centres have been identified. Procurement of works for these activities has started, others are under construction.

Stove dissemination activities in new districts will be intensified in the future and follow up in old districts will continue. The support for solar market development will continue in South Western Uganda in close cooperation with the Rural Electrification Agency. Electrification of secondary schools with solar PV systems in Central and Southern Uganda will as well continue.

It has been observed that households using improved stoves save time and/or money (depending on whether they buy firewood or not). Monetary saving can also be reported for institutions and SMEs using improved stoves or ovens, too.

Further observations are that some electrified health centres open at night and improve their services. They save money on paraffin for light. If they close at night, impacts are limited. Households and SMEs using Solar Home Systems also reported reduced expenditures on paraffin and phone charging.

The hydro power initiative to support private project developers has been started. In general it can be observed that hydro projects have long lead times. It is expected that most of the connections will be done towards the end of the implementation period. Availability of stock/finance turns out to be one of the biggest constraints for increased sales of solar systems.

Sustainability and handover strategy

All social institutions that have been electrified under EnDev 1 are re-visited for follow-up purposes. If needed minor errors are corrected and users are re-trained.

Social institutions that get access to Solar PV or stoves have to contribute 20% of the overall project costs. That increases ownership among beneficiaries and hence sustainability of the activity.
Follow up visits to private/SME users of SHS are under planning. Solar dealers are linked to micro finance institutions (MFIs). MFI representatives and solar dealers attend business trainings together. As a result solar dealers offer a one-year warranty on their systems. The stove dissemination rate in former intervention areas could be kept at a high market penetration through follow up activities of the project.

Bangladesh

Promoted Technology	Solar, Stoves				
Project Budget	5,850,000[15]	**Spent until reporting date**	3,849,775		
Project Period	06.2009 – 12.2012	**Reporting Date**	06.2011		
Lead Executing Agency	Ministry of Power, Energy and Mineral Resources				
Implementing Partner	Infrastructure Development Company Limited (IDCOL), 28 Private Organisations (SHS), and 37 Private Organisations (Stoves)				
Involved Bilateral / Multilateral Programmes	Renewable Energy and Energy Efficiency/ Sustainable Energy for Development (SED)				
Target (Number of beneficiaries)	**Target till project end**	**Revised target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	653,000	687,500[16]	337,981	447,623	people
Cooking Energy for Households	440,000	275,000[17]	-	110,000	people
Electricity and/or Cooking Energy for social infrastructure					institutions
Energy for productive use/ income generation					SMEs

Project strategy and key components

The EnDev component within SED focuses on the promotion and dissemination of Solar Home Systems (SHS) and Solar Lamps. In addition the project is supporting market development for improved cook stoves (ICS).

The project has introduced minimum technical requirements for solar systems, which have to be met in order to receive a subsidy. Besides technical specifications, also quality standards of service parameters have been introduced for providing private organisations (POs). Besides GIZ, KfW, World Bank, IDB, ADB and GEF have contributed to the dissemination of a total of 1,000,000 SHS in the last couple of years.

As for the SHS and Small Solar Home Systems (SSHS), a subsidy for Solar Lamps will be provided on the basis of a result based funding approach, after proof has been delivered, that the system has been sold (grant agreement with IDCOL).

In addition to capacity development activities in the area of improved cook stoves, EnDev has made grant agreements with several Pos to cover institutional set up costs and monitoring procedures. Since 2007 a total of 211 grant agreements were made. 130 grant agreements were signed with 115 POs within the last year (see p. 36).

Project progress (overall progress towards outcome target EnDev 2)

Within the current phase EnDev has already disseminated a total of 53,700 SHS and 27,727 SSHS. Since the beginning of SED/EnDev support of the sector a total of 187,000 SHS customers have received financial support to buy a SHS of different sizes.

[15] The total budget indicated in the last progress report amounted to 5,500,000 €. Due to additional funding of 350,000 € based on EnDev 1 commitments for Bangladesh the total budget increased.

[16] In the previous Annual Planning 2010 the outcome target for SSHS and SL were mistakenly swapped (60,000 SSHS und 25,000 SL) and a conservative calculation method was applied (5 persons per household). The correct target for SSHS is 25,000 Systems (137,500 persons) and for Solar Lanterns 60,000 (330,000 persons) with 5.5 persons calculated per household.

[17] The target of 440,000 persons provided with stoves (indicated in the Annual Planning document for 2010) has been reduced to 275,000 persons (50,000 stoves) as JPMorgan plans to take over the funding (see sustainability and handover strategy).

The overall picture of the sector in Bangladesh shows that a sustainable and vital market for solar appliances is close at hand. Up to now a total of 1,000,000 SHS has been sold and the market has shown an average of 39,000 systems sold each month over the last 7 months (increased from 30,000 one year ago) with an average system size of 50Wp. SED/EnDev considers this part of the project as successfully accomplished and further subsidies in this area are not planned. Still SED will keep a close eye on the sector to make sure, that the market survives on its own.

The next step is now to introduce Solar Lamps on the market. A field test with 4000 lamps will be conducted by the end of the year to check the market response and supplier structure. A baseline study for this intervention has been conducted and is currently under revision.

The Solar Lamp distribution is expected to take up quickly, since the project can benefit from the already established SHS supplier structure with more than 2,000 shops in the country, that are well known for selling solar supplies. With Pico PV appliances it is intended to supply households with an efficient (LED) lighting source, which provides a minimum electricity supply for lighting and mobile phone charging. In the initial phase it is intended that customers receive a buy down grant for purchasing high quality Solar Lamps.

SED has been supporting stove dissemination since EnDev Phase 1. While at the beginning stoves were made out of mud, the material chosen for the construction of improved cook stoves under EnDev 2 is concrete. Concrete ensures longer lifespan of these stoves and consistent quality through mass production of stove parts. Since June 2010 around 20,000 stoves reducing the indoor air pollution, have been built by 37 NGOs in a result based financing scheme. Payment is made only after a sample verified the existence and quality of stoves. Stove efficiency and durability tests were recently carried out for the concrete stoves. However testing procedures were not sufficient for EnDev standard, thus outcome figures are from now on reported but only 19.800 people are counted in a sustainable manner.

Sustainability and handover strategy

Affordability of the SHS systems has been improved through micro finance schemes and the possibility to pay the systems off in rates. At the same time the providers have to ensure that the systems are maintained during the full loan period. This is usually done along with money collection on a monthly basis. IDCOL staff checks the technically sound installation of the systems and ensures that all maintenance tasks are met appropriately. The service agreement with the providers can be extended by the households for a fee. It seems though, that only few households are willing to pay for this service.

The scheme under IDCOL has an inbuilt annual reduction of subsidies for SHS. According to this scheme, subsidies will be entirely phased out by end of 2012 at the latest.

The Solar Lamp initiative though will not only benefit the people who purchase such a lamp. Through making solar equipment even more affordable and advertising it to an even poorer target group, awareness for solar appliances will rise. Thus, the intervention might as well contribute to the solar sector in general.

In September 2011 the stove project was approved under the Clean Development Mechanism (CDM). Funding for new stoves will be provided by JPMorgan, instead of directly funding stoves, SED will thus focus on capacity building.

Grant Agreements – Improved Cook Stoves

	PO Name
1	AID Bangladesh
2	ANTAR society for development
3	Ashar Alo Sangstha
4	Asrayan Sheba Sangstha
5	Assistance for Social Organization and Development (ASOD)
6	Association for Bangladesh Social Advancement (ABSA)
7	Association for Integrated Development (AID)
8	Association for People Advancement (APA)
9	Association for Women Empowerment and Child Rights (AWAC)
10	Bandhan Samaj Unnayan Sangstha
11	Bangladesh Association for Social Advancement
12	Bangladesh Mohila Unnayan Sangstha
13	Bangladesh Nature Conservation Society
14	Bangladesh Red Crescent Society
15	Bangladesh Renaissance Association for Needy Development (BRAND)
16	Barabelgharia Agrani Seba Sangstha
17	Baragangina Sampad Bebosthapona Sangstha (BSBS)
18	Barendra Development Organization
19	Barna Samajkallyan Sangstha
20	Bhelabazar Samaj Unnayan Sangstha
21	Bongo Kalyan Sangstha
22	Bright Green Energy Foundation
23	Campaign for Sustainable Development (CSD)
24	Centre for Natural Resource Studies (CNRS)
25	Chandradip Development Society
26	Change
27	Dev-Com BPEATRCWH
28	Development Assistance for Farmers & Farm Labours
	(DAFF)- Bangladesh
29	Development of Poor Society
30	Dishari Unnayan Sangstha
31	Dream of Nation (DON)
32	Dumuria Unnayan Sangathan (DUS)
33	Durbar Mohila Sangstha
34	Environment and Social Development Organisation (ESDO)
35	FH Association
36	Gana Unnayan Kendra (GUK)
37	Gono Kallyan Trust
38	Gonoshasthaya Kendra
39	GOTI
40	Gram Kalyan Foundation (GKF)
41	Gram Unnayan Kendra (GUK)
42	Grameen Prodip
43	GreenHope
44	Haider Akhter Banu Memorial Kallyan Foundation
45	Hosain Biogas and Compost Fertilizer Company
46	Human Welfare Organization (HWO)
47	Infrastructure Development Company Limited
48	Integrated Dev. Foundation (IDF)
49	Integrated Social and Agriculture Development Organization (ISADO)
50	Integrated Village Development Society (IVDS)
51	Ishwaripur Development Foundation
52	Jana Unnayan Karmashuchi
53	Janasheba Sesshashebi Pally Unnayan Sangstha
54	Jano Shastha Unnayan Sangstha
55	Jarda Samaj Kalyan Foundation
56	Kheya Samaj Kalyan Sangstha
57	Lalu Panchayet Artha-Samajik Unnayan Prokolpo
58	Manab Unnayan Sangstha (MANUS)
59	Maya Samajik Unnayan Sangstha
60	Mohishbathan Samaj Kallyan

	Samiti
61	Mokhosh Beel Sampad Babosthapona Kallan Songstha (MBSBKS)
62	Monga Health Education Foundation
63	Navel Bangladesh Foundation
64	Notundik Shikkha Samaj Unnayan Sangstha
65	Onnessa
66	Padma Samaj Kalyan Sangstha
67	Palle Traders
68	Palli Shakti
69	Pally Unnayan Sahayak Samity (PUSS)
70	PAORS
71	Paradise
72	Paribesh Unnayan Enterprise (PUE)
73	Parizat Mohila Unnoyon Sangstha
74	People's Development Foundation
75	Population Unnayan Society (PUS)
76	Pragati Shessashebi Unnayan Sangstha
77	Pratidan Mohila Unnayan Sangstha
78	Prattaya
79	Ramedia Sampad Bebesthapona Sangatha (RSBS)
80	Real Education Advancement Society (Relation)
81	Rema Kalenga Nishorgo Sangstha (RKNS)
82	Resource Development Foundation
83	Rupantar
84	Rural Community Development Society (RCDS)
85	Rural Development Service
86	RUSTIC
87	Samaj Unnayan Karjocram
88	Sangkalpa Trust
89	Satchari Nishorgo Sangstha (SNS)
90	SEED Bangla Foundation
91	Shetu Rural Development Society
92	Singharkura Social Development Organization
93	Social Development Efforts (SDE)
94	Social Development Organization (SDO)
95	Social Upliftment Foundation
96	Social Women Organization for Village Advancement (SWOVA)
97	Society for Development Initiative (SDI)
98	Society for Social Development of Aboriginals (SSDA)
99	Socio Economic Resource Centre (SERC)
100	Sudipti Samaj Unnayan Sangstha
101	Sundarban Foundation
102	Supti Mohila Unnayan Sangstha
103	Surzomukhi Satkhira
104	Su-shanta Shechchashebi Sangstha
105	Swanirbhar World
106	Taifund Trust
107	Thengamara Mohila Sabuj Sangha
108	Tripte Foundation
109	Turag Beel Sampad Babosthapona Kallan Songstha (TBSBKS)
110	Uttara Development Programme Society (UDPS)
111	Venture Foundation
112	Village Association for Social Development (VASD)
113	Vishawagram
114	Voluntary Organization for Integration and Community Empowerment (Voice)
115	Wave Foundation

Indonesia

Promoted Technology	Hydro				
Project Budget	8,000,000 €	**Spent until reporting date**		3,380,000 €	
Project Period	05.2009 – 09.2012	**Reporting Date**		06.2011	
Lead Executing Agency	MHP-TSU: Ministry of Home Affairs (MOHA) MHPP²: Ministry of Energy and Mineral Resources (MEMR)				
Implementing Partner	Programme Nasional Pemberdayaan Masyarakat (PNPM), Operation Wallacea Trust				
Involved Bilateral / Multilateral Programmes	MHP-TSU: World bank Multi-Donor Trust Fund MHPP²: Indonesian-Dutch Energy Working Group/RE Programme				
Target (Number of beneficiaries)	**Target till project end**	**Revised target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	170,000	90,000[18]	1,920	3,956	people
Cooking Energy for Households					people
Electricity and/or Cooking Energy for social infrastructure	310		11	31	institutions
Energy for productive use/ income generation	550		0	0	SMEs

Project strategy and key components

The Project strategy is to warrant the sustainability of off-grid MHP schemes in rural Indonesia through a) demonstrating the success of adequate technical and institutional support for rural MHP projects, b) consolidating this and previous experience and expertise into the activities of relevant actors on both the project and government level.

MHP-TSU: directly supporting the technical and institutional implementation of rural electrification within the Green PNPM Programme through supporting the construction of off-grid MHP schemes. The MHP-TSU focuses on technical quality assurance and institutional capacity building of villagers owning these schemes, and capacity building for local MHP hardware and service providers.

MHPP²: supporting the development and strengthening of institutional capacity and know-how of appropriate stakeholders, particularly the MEMR. A thorough stakeholder mapping, analysis and capacity assessment of the MHP sector in Indonesia was carried out, followed by the development of a strategy and work plan for support to MEMR. The focal point for the strategy, in the framework of rural electrification, will be to support identification, analysis, documentation and dissemination of lessons learned. 5 areas of intervention are defined (1) policy advice; (2) M&E; (3) capacity building; (4) pilot projects; and (5) information dissemination.

EnDev Indonesia will systematically explore synergies between the MHPP² and the MHP-TSU projects. With the help of MHPP² the learning experience from the MHP-TSU project shall be systematically extracted and made available in an appropriate form to the Directorate General for New and Renewable Energy, and Energy Conservation (NREEC), but also beyond to the wider MHP community in Indonesia. The implementation of MHP village electrification is seen as a pilot project for large scale dissemination of renewable energies to rural Indonesia. This pilot project will provide valuable lessons for the implementation of other schemes, like a Special Allocation Fund (DAK), which are implemented or going to be implemented via Indonesian ministries.

[18] For reasons on revision of target see page 37.

Project progress (overall progress towards outcome target EnDev 2)

The two projects have experienced a slow start and significant delays due to a number of reasons. Many of the impediments to implementation have since been overcome and the projects are currently progressing well.

MHP-TSU**:** The 70 MHP schemes planned, under construction or completed during 2009 and 2010 budget cycles will produce a total output of some 1,285 kW and will reach some 35,000 people. Once the MHP plants projected for 2011 and 2012 are included, the number of individuals provided with access to electricity could reach some 90,000 villagers. This falls short of the EnDev 2 Indonesia targets of 170,000 rural people provided with access to electricity for reasons explained below.

MHPP²: has been supporting MEMR in developing guidelines and regulations for the successful implementation of sustainable off-grid MHP schemes. Further the project is installing kWh meters in supported MHP sites, as well as more detailed energy meters in selected sites, to monitor energy utilisation. Results will feed back to identify technical difficulties and potential for additional usage of electricity. An overall concept for M&E of MHP is gradually being built which also considers the monitoring needs when rolling out the DAK programme by MEMR. MHPP² contracted a local NGO that already provides support to the Green PNPM, to carry out a study of Productive Use of Electricity (PUE) possibilities in two districts in Sulawesi. The goal is to convince villagers to start PUE activities with the available electricity during off peak hours (to be identified with intensive metering). The MHPP² also experienced some delays due to the change in counterpart institution during 2010 from Directorate General of Renewable Energy and Energy Utilisation to NREEC and the consequent changes in MHPP² counterpart staff which influenced component implementation over a 6-8 month period during 2010/11. The project is now progressing well and good working relations have been established with the NREEC.

Sustainability and handover strategy

95% of the EnDev 1 sites are in at least fair to overall good condition. Some concerns are however on tariff setting and collection within some of the villages, and the changing of operators, which could compromise sustainability over the longer term. Actively promoting productive use and the organisation of follow-up trainings will be prioritised in the remaining project time, next to increasing the numbers of beneficiaries to the maximum extend. The EnDev 2 Indonesia sustainability and hand-over strategy will gradually phase out the technical assistance and support provided through MHP-TSU to the Green PNPM, while ensuring that sufficient capacity remains in place to successfully complete the Green PNPM MHP pilot. On the other hand it aims at intensifying the support in institutional strengthening and capacity building through the MHPP².

The main focus of MHPP² throughout the MHP-TSU component will be to strengthen the capacity of the NREEC for it to assume and carry out/supervise the tasks and responsibilities linked to the development and/or rehabilitation of sustainable off-grid MHP schemes (and possibly also PV schemes) for rural electrification, of a good quality and with a clear ownership and commitment by the recipient villages. An extension of the MHPP² up to December 2013 would be required to ensure that the required institutional and organisational capacity could be developed within NREEC.

Reasons for adjusting the indicators for Indonesia

A new realistic target for the EnDev intervention in Indonesia is set to be 90,000 people. This obviously falls far short of the original EnDev 2 Indonesia target: it was estimated that a total target of 250-300 MHP schemes were to be implemented, corresponding to 170,000 people in rural areas provided with access to electricity.

This target is now viewed as too ambitious for a number of reasons:

- The original project design assumed a total of 5 persons per connected household. This figure has subsequently been revised to 4.3 persons/household for Indonesia based on the Indonesia 2010 Population Census and UN statistics, and supported by the findings of the RWI baseline report. In terms of the target indicator this means that the same number of households connected to an MHP scheme will now result in 14% less individuals connected.
- The assumed budget allocation of approximately 26 Mio USD earmarked for micro hydro power within the Green PNPM fund (the Dutch government through its embassy provided 20 Mio USD to the programme) via the World Bank Multi Donor Trust Fund to Ministry of Home Affairs have not been allocated as planned. It remains to be seen if the government of Indonesia will allocate funding as originally designed in 2012 for MHP with Green PNPM. This under-budgeting seriously affects the number of schemes that can be supported through the EnDev TSU[19].
- Within Community Driven Development (CDD) programmes such as the Green PNPM, communities demand, prioritise, decide, implement, monitor, and report. As the process is entirely demand-driven, the actual results and outcome are difficult to predict. EnDev has therefore no or only little influence on the selection of villages. The experience in the last years shows that under PNPM a preference for less remote villages occurred with a higher pre-electrification rate. Additionally remote villages chosen under PNPM have a smaller population than predicted.
- The Green PNPM was only formally approved in April 2009 and roles, responsibilities, and collaboration modalities for different stakeholders took time to clarify and be agreed. This led to delays in budgets and release of funds.
- Foreseen support and collaboration from PNPM Rural in the field did not immediately materialize; budget processing and release were significantly delayed and cut (the 2009 budget only provided funds for 26 MHP sites and the 2010 budget was significantly reduced for Sulawesi, only allowing for construction of 10 MHP schemes).

[19] The set-up of the EnDev Indonesia hydro component (designed in cooperation with the Netherlands Embassy in Jakarta) is that investment budgets, project selection, community buy-in, etc are channelled and organized by the Ministry of Home Affairs under a national community empowerment programme, supported via a WB MTDF. EnDev provides technical support by means of a technical support unit (TSU), which is however to a fairly large extend dependent upon the MoHA PNPM system (as well as budget cycle and decisions).

Nepal

Promoted Technology	Hydro/Grid			
Project Budget	1,140,000€[20]	**Spent until reporting date**	704,942 €	
Project Period	05.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministry of Energy (MoE)			
Implementing Partner	Grid-extension: Nepalese Energy Authority (NEA) Hydro: Alternative Energy Promotion Centre (AEPC)			
Involved Bilateral / Multilateral Programmes	Grid-extension: Nepalese Energy Authority (NEA) Hydro: Alternative Energy Promotion Centre (AEPC)			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	Grid: 60,602[21] Hydro: 11,825	Grid: 46,903 Hydro: 0	Grid: 69,667 Hydro: 0	people
Cooking Energy for Households				people
Electricity and/or Cooking Energy for social infrastructure	Grid: 0 Hydro: 30	Grid: 0 Hydro: 0	Grid: 126 Hydro: 0	institutions
Energy for productive use/ income generation	Grid: 0 Hydro: 40	Grid: 0 Hydro: 0	Grid: 196 Hydro: 0	SMEs

Project strategy and key components

EnDev Nepal consists of two components which provide electricity to rural communities. The first component supports a national programme implemented by the national utility (NEA) for **grid extension** to communities. The second component supports the efforts of remote communities to be electrified by **micro hydro power** plants via a credit fund enabling them to pay the high upfront costs over a long period of time and encouraging commercial banks to finance projects in the rural energy sector.

EnDev Nepal had a grant agreement with the utility NEA to financially support the Community Rural Electrification Fund. The grant agreement is formally closed by now. Regarding the micro hydro power Component EnDev has a grant agreement with the Alternative Energy Promotion Centre (AEPC) to set-up of the micro hydro power debt fund.

Project progress (overall progress towards outcome target EnDev 2)

Grid Extension: The grid extension component has made substantial progress in connecting households in the past monitoring period. The project was focusing on speeding up the electrification process, detailed monitoring and survey activities in the communities and facilitation between communities, contractors and NEA in case of problems which were delaying the electrification process. Therefore, workshops were held with all 49 communities, action plans with milestones developed for each of them and a monitoring committee founded which meets on a monthly basis. It is consisting on NEA representatives, the community umbrella organisation (NACEUN), GIZ and contractors on demand,. As a result to current date 89,605 (EnDev 1 and 2) persons were provided with electricity which exceeds the original project target of 80,000 persons substantially (with 29 communities out of 49 still to connect and 20 full or partly connected). While electrifying households is the main target

[20] The project budget of 1,140,000 € resulted from an adjustment in the course of the Annual Planning 2010.
[21] Until December 2009, 3,625 households representing 19,938 persons were connected to the national grid. The project continued working under EnDev 2 to achieve the originally planned figure of 80,000 beneficiaries. Thus, the target outcome figures for the grid extension component under EnDev 2 is the overall set target (80,000) minus the already connected persons (19,938).

for the programme, the communities also decided that it is in their interest to electrify social infrastructure institutions and many small businesses took up the opportunity to use the newly provided electricity. Due to considerable efforts in surveying the communities, figures for SI and SME could be reported for the first time. Beside households, 126 institutions were connected, consisting of mainly schools followed by health posts, temples and local administration. In addition, 196 SMEs are currently supplied whereby the vast majority consists of rice or maize mills followed by poultry farms and carpentry.

In addition, the very last tender for equipment and installation has been awarded which means that construction is underway in all 49 GIZ-supported communities. NEA is going through a restructuring process whereby the community electrification department was dissolved and a clear responsibility on the partner side is not available currently. Although not finally decided there is a tendency to found a separate Rural Electrification Board and delegate more responsibility to either local agency or government level.

A common problem is the unwillingness of local NEA offices to cooperate or even meet with community members. It was interesting to notice that as a side effect of the survey activities which included NACEUN members improved the willingness of local NEA officials to cooperate. Community representatives were received by their local NEA offices for the first time to listen to their concerns.

Hydro Power: During the last monitoring period the tendering process for banks which will act as fund managers has been completed. From the original 9 banks which handed in a letter of interest, 7 were asked to prepare a detailed proposal, 5 made it to the presentation and interview and finally two banks were selected. The winners were the Himalayan Bank and the Clean Energy Development Bank which will receive half of the EUR 0.5 million debt fund each. The negotiation on the agreement with the banks is already ongoing and signing can be expected shortly.

Due to its recent good performance it is planned to upscale the project and extend it until December 2013.

Sustainability and handover strategy

The current lack of a successor of the old community electrification department at NEA is a challenge. GIZ and NACEUN lobby for a rural electrification board directly under the Ministry of Energy which should be independent from NEA to be effective. If implemented, it can be a considerable improvement of the community electrification programme and alongside the existing revolving fund within NEA for communities a real push for sustainability. Meanwhile and in the future the role of NACEUN is crucial and EnDev has continued to support them. Despite its small resources it has been accepted by NEA central office as a partner for community electrification and can continue to lobby and monitor on behalf of the communities even when the project will phase out. As the communities have also invested quite considerable own funding, they will follow up closely that the electrification is carried out as agreed.

Bolivia

Promoted Technology	Biogas/Stoves/Hydro/Grid		
Project Budget	5,400,000 €[22]	**Spent until reporting date**	3,285,000 €
Project Period	10.2009 – 12.2012	**Reporting Date**	06.2011
Lead Executing Agency	Ministry for Hydrocarbons and Energy, Vice Ministry for Electricity and Renewable Energy		
Implementing Partner	Vice Ministry for Electricity and Renewable Energy, business association, NGOs, municipalities, communities, cooperatives, electricity utilities		
Involved Bilateral / Multilateral Programmes	Programa de Desarrollo Agropecuario Sustentable (PROAGRO), Programa de Apoyo a la Gestión Pública Descentralizada y Lucha contra la Pobreza (PADEP)		

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	200,000	62,715	86,325	people
Cooking Energy for Households	77,000	96,549	138,035	people
Electricity and/or Cooking Energy for social infrastructure	1,700	1,449	1,501	institutions
Energy for productive use/ income generation	8,200	5,489	5,727	SMEs

Project strategy and key components

The project´s strategy is to work on demand driven interventions, while minimising subsidies and incentives per household. The strategy is to mobilise local economic resources with a strong participation of direct beneficiaries and/or implementing partners. Besides co-financing, the project´s main contribution is the provision of technical assistance. In order to achieve sustainability, the EnDev project in Bolivia aims at “local ownership” through transferring capacity and strategy to national programmes and/or projects (implemented by the National, Regional or Municipal Government or NGOs) in the context of energy access in rural areas or to private sector activities. The EnDev Bolivia project has a monitoring and evaluation system under the GIZ central office framework with custom-made follow-up tools for each level of M&E (Activities, Outputs and Outcomes).

The project concentrates on the following key components:

- Design policies and co-finance mechanisms to grant better access to energy
- Train, advice producers/retailers/providers in the provision of innovative modern energy products and services and in opening up markets (Stoves, Pico PV, and Biogas).
- Support local stove and biogas plant installers as complementary job creation opportunities.
- Support awareness and public relations campaigns about Indoor Air Pollution (IAP), productive energy use, proper use of natural gas and safe indoor electric installations
- Advise and financially support financing institutions that offer loans to producers/retailers and households
- Facilitate and support networking between stakeholders in the energy sector, e.g. through workshops, working groups.

[22] The total budget indicated in the last progress report amounted to 5,000,000 €. Due to additional funding of 400,000 € based on EnDev 1 commitments for Bolivia the total budget increased.

Project progress (overall progress towards outcome target EnDev 2)

The intervention concept is similar to former years but with more participation of national programmes and other actors in line with the handover strategy.

Major results were achieved in the stoves component, where a strong alliance was built with a national programme called: “Infrastructura Rural para la Transformacion Productiva” (IDTR), under the Vice Ministry of Electricity that works with a loan from the World Bank. More than 7,000 stoves were built under this alliance, and the number of 30,000 new stoves is defined as objective for the second period 2012-2014 of this programme (beyond the EnDev end).

The grid densification activities within the Energy for Lighting component had continued as expected. The outputs continue to be part of the Supreme Decree 29635 that makes the EnDev strategy part of a National Policy. EnDev is also involved in the discussion of the new legal framework regarding universal access to electricity. It is planned to increase the dissemination of photovoltaic lamps during the next semester since the third study will finish with presumably positive results regarding impact. The strategy includes cooperation with private enterprises.

All other components are proceeding according to the planning. Ongoing activities connected to the promotion of dryers, roasters, electric pumps will further strengthen the provision of energy for productive uses in 2011 and beyond.

An impact study will be published during the following months, regarding the impacts found during 2005-2010 with regard to key findings under the three pillars of sustainable development (economic, social and environment).

Sustainability and handover strategy

Some handover activities were implemented in terms of strengthening local alliances, such as with the national and WB funded IDTR programme as well as with the Stoves Testing Centre, which has been recognised as a testing, research and certification centre. This centre has gained further support from University authorities, financing two professionals in the centre.

The project had also started to develop “hand over strategies” for the Energy for Lighting component. Two people hired by EnDev have started working within the Vice Ministry Office to support the project implementation and to coach their technical team in order to consolidate the EnDev strategy within the National Policy.

Regarding the future biogas strategy, it is expected to support private partners to continue with the scaling-up of the technology and service provision.

The interventions of energy for Productive Use shall be transferred to other GIZ projects involved in agricultural support and water management.

In the case of the natural gas support, the project had already transferred all “know-how” and gained the strong involvement of the National Oil and Gas Company (YPFB). It is expected that by the end of 2011, the National Government will have published a Supreme Decree that will incorporate the company´s full support to all future activities in the benefit of social infrastructures that require natural gas access.

Honduras

Promoted Technology	Solar/Stoves/Hydro/Grid/Solar Dryers			
Project Budget	2,630,000 €[23]	**Spent until reporting date**	1,265,596 €	
Project Period	10.2009 – 12.2011	**Reporting Date**	06.2011	
Lead Executing Agency	Secretaria Tecnica de Planificación y Cooperation Internacional			
Implementing Partner	Communities, NGOs			
Involved Bilateral / Multilateral Programmes	Natural Resources and Economic Development Programme			

Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	14,000	1,696	2,527	people
Cooking Energy for Households	15,300	3,755	3,755	people
Electricity and/or Cooking Energy for social infrastructure	150[24]	-	-	institutions
Energy for productive use/ income generation	50[25]	4	9	SMEs

Project strategy and key components

EnDev-Honduras is working with local NGOs, local governments and community development programmes under co-financing arrangements between EnDev, partner organisations and beneficiaries. The energy issue is integrated into rural development and agricultural and forestry production processes. Partners are encouraging the formation of local management entities, trained on technologies, organisation and management to support the beneficiaries in maintenance and repair of the energy systems.

The key components of EnDev-Honduras are:

- Energy for household lighting: grid extension, micro hydro power and Solar Home Systems.
- Energy for social infrastructure: schools, health-centres and community-centres.
- Energy for cooking: the “Justa” stove model is validated and improved.
- Productive use of energy: solar coffee and cocoa dryers, stoves for indigenous pottery and bread baking, sugar cane processing.

EnDev Honduras is going to make a grant agreement (a) with Hermandad de Honduras for the installation of Solar Home Systems, (b) with Asociación Hondureña para el Desarrollo (AHDESA) for Energy Saving Cooking Stoves and (c) with Fundación Hondureña de Investigación Agrícola (FHIA) for Three Micro Hydro Stations.

Project progress (overall progress towards outcome target EnDev 2)

Until end of June 2011 a total of 6,282 persons have been benefited during EnDev 2:

- Five grid extension projects connected 477 households (2,527 persons)

[23] The total budget indicated in the last progress report amounted to 2,000,000 €. Due to additional funding of 630,000 € based on EnDev 1 commitments for Honduras the total budget increased.
[24] In the last progress report the figure indicated as “target till project end” was 28,500 people for SI and 11,000 people for productive use. Meanwhile the reporting unit has been transformed from “people” into “institutions”. The conversion factor is the average of 119 beneficiaries per SI and 220 per PU, leading to a new outcome figure of 150 institutions and 50 small businesses for EnDev 2, while the outcome itself didn’t change.
[25] See footnote no.24.

- The number of stoves and benefiting people has not changed since the last reporting period. However new stoves have been constructed, but have not undergone quality control and verification yet. As soon as these steps are completed new figures will be reported.
- Solar coffee dryers were installed for 9 cooperatives with a total of 347 organised producers.

The installation of 1,700 Solar Home Systems of 30 Wp capacity is well under way coordinated by a partner organisation. An additional 220 households and one school will be electrified with Solar Home Systems of 50 Wp by another local partner. A diagnostic study of the hydro power sites developed during EnDev 1 is under way in order to define the site specific improvement measures to be taken. Within the “Integrated Capacity Development Plan for micro hydro power Technology”, several technology transfer workshops were implemented for 30 participants of the private hydro power sector. As result of the technology transfers implemented in Nicaragua, an axial turbine was locally fabricated, the sites for the installation of two axial turbines were identified and the design and installation of two electronic load controllers is under way. Cooking boards and chimneys for the construction of 1,659 improved "Justa" stoves were tendered and the construction of the stoves has started.

Since some interventions are under way and require final installation, follow up as well as quality control a cost-neutral extension of the project until June 2013 is recommended.

Sustainability and handover strategy

The sustainability strategy of EnDev-Honduras is based on three pillars:

- Active participation of community organisations in the development of the activities.
- Co-financing mechanisms, involving beneficiaries own contributions of up to 50%, participatory promotion by local NGOs and local implementation alliances.
- Capacity development of the partners for the management of technologies, administrative controlling and technical project backstopping and supervision.

EnDev-Honduras will continue concentrating on technical assistance and capacity development of its strategic partner organisations and local beneficiary organisations. These activities will be coordinated by training institutions. It is envisaged to intensify capacity development through training of trainer courses and the production of technical manuals for micro hydro project developers, installation, operation and maintenance of photovoltaic systems, construction of improved cooking stoves and solar coffee dryers.

EnDev-Honduras has demonstrated that rural communities are able to mobilise co-financing agreements and share project costs evenly between the communities and local governments. A national financing strategy shall be developed for replicating the successful financing scheme. It was also demonstrated that renewable energy technology can reach the most remote rural communities by ensuring demand oriented prices with after sale services, turn-key delivery and commercial relationships between providers and customers through local actors in rural development. The installation of an electronic library containing technical and other information materials compiled and generated by EnDev-Honduras is in progress for facilitating access to knowledge and experiences for interested partners and other organisations.

Further Information

So far the technical manuals “Microturbinas Hidroeléctricas Axiales“, “Manual de Uso y Mantenimiento de la Eco Estufa Justa” and “Manual Práctico: Construyendo la Ecoestufa Justa 16”x24”, as well as two videos about the experiences and a series of information leaflets about the results of the project are available as electronic files from EnDev-Honduras.

Nicaragua

Promoted Technology	Solar/Hydro/Grid			
Project Budget	2,640,000 €[26]	**Spent until reporting date**	1,279,104 €	
Project Period	10.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Ministerio de Energía y Minas (MEM)			
Implementing Partner	MEM, NGOs, communities, private enterprises			
Involved Bilateral / Multilateral Programmes	Sustainable Management of Natural Resources and Strengthening of Entrepreneurial Competencies			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	29,000	7,285	10,989	people
Cooking Energy for Households				people
Electricity and/or Cooking Energy for social infrastructure	110[27]	22	54	institutions
Energy for productive use/ income generation	115[28]	-	85	SMEs

Project strategy and key components

The Ministry of Energy and Mines (MEM) is coordinating the activities within the national energy sector and is the major partner in planning and technical supervision of hydro power and national grid connected activities. Individual project implementation throughout Nicaragua is accomplished by linking actors as NGOs, local governments and private enterprises with local communities or cooperatives under cost sharing agreements. Partner organisations are trained in technical and organisational aspects for awareness building and capacity development. The key components of the rural electrification activities are the installation and maintenance of renewable energy systems as Solar Home Systems and micro or small hydro power plants. Grid densification and extension is pursued in cooperation with MEM as well as with the Nicaraguan Electricity Company (ENEL) and two distribution utilities (DISNORTE/SUR). EnDev has made or is going to make grant agreements with MEM / National Fund for the Development of the Electric Industry (FODIEN) for the Mini Hydro Plant Wapí (finalised) and another one with MEM/FODIEN for the Grid Densification Plan.

Project progress (overall progress towards outcome target EnDev 2)

A total of 10,989 persons, 54 social institutions and 85 small and medium enterprises have benefited during EnDev 2 until end of June 2011.

PV for households: 181 households (1,050 persons) have been provided with Solar Home Systems of 85 Wp for household lighting and basic domestic energy applications as radio, TV/DVD and cell phone charging. 3 schools and 2 cooperatives with 37 organised members were also electrified with photovoltaic systems. The subsidy rate for the families investing their own resources into Solar Home Systems was gradually reduced to 35% (18,50 EUR) by

[26] The total budget indicated in the last progress report amounted to 2,200,000 €. Due to additional funding of 440,000 € based on EnDev 1 commitments for Nicaragua the total budget increased.

[27] In the last progress report the figure indicated as "target till project end" was 25,000 people for SI and 8,000 people for productive use. Meanwhile the reporting unit has been transformed from "people" into "institutions". The conversion factor is the average of 227 beneficiaries per SI and 70 per PU, leading to a new outcome figure of 110 institutions and 115 small businesses for EnDev 2, while the outcome itself didn't change.

[28] See footnote no.27.

working with partner organisations with access to micro finance facilities, as coffee producer cooperatives or coffee marketing enterprises.

Micro and mini hydro power plants: 711 households (4,124 persons) were connected by installing the small hydro power plant Salto Mollejones with a capacity of 700 kW in the community of Wapí in the Autonomous South Atlantic Region (RAAS). 6 schools, 1 health centre and 6 churches have also been connected to the grid. 27 small enterprises with 67 employees and 2 cooperatives with 239 members are enabled to utilise the energy for productive use and income generation.

Within the “Integrated Capacity Development Plan for Micro Hydro Power Technology”, the following technology transfer workshops were implemented for about 30 participants of the private and public hydro power sector of Nicaragua:

- Fabrication of axial turbines for low heads and high flow site characteristics.
- Use of induction motors as generators and pumps as turbines.
- Fabrication of electronic load regulators for micro hydro power plants.
- Local management, operation and maintenance of micro hydro power plants.

As preliminary results of the capacity development two electronic load controllers have been installed and the site for the installation of an axial turbine has been identified.
A study evaluated the impact of rural electrification on migration patterns and the economic and social impacts by the small hydro power plants “El Naranjo” (220 kW) and “Ocote Tuma” (30 kW). More than 400 households were surveyed. It was found that both villages received significant numbers of migrants. About a quarter of all households were established within three years after electrification. However there is a difference in qualifications of migrants. The villages with electricity supply attracted more skilled labour, whereas those without access to power observed mostly unskilled labourers. Particularly small villages profit from migration due to electrification as people from small towns are coming with their skills and capital resources to establish shops, communication and other services for the local farmers.

Grid extension and densification: The installation work of the village grid for the micro hydro power plant “El Bejuco” (70 kW) was finished and 81 households (470 persons), 2 schools and 1 health centre were connected to the village grid.

The implementation of the “Grid Densification Plan for 15 Departments and the Autonomous North and South Atlantic Regions (RAAN/RAAS)” is in process. Since some interventions are under way and require final installation, follow up as well as quality control, the cost-neutral extension of the project until June 2013 is recommended.

Sustainability and handover strategy

PV for households: Sustainability of achieved success and project outcomes is based on a high own contribution of the beneficiaries for the purchase of the Solar Home Systems, training of the families in handling the systems and a growing market penetration of solar technology and services throughout the country. The exit strategy is based on gradual reduction of the EnDev-subsidy according to the market development of solar technology.

Micro and mini hydro power plants: Sustainability of the hydro power activities is based on the strong ownership and involvement of MEM with its long term technical and management capacity development obligations with the operators, a strong commitment of communities and users, and financially viable operation models. As projects are handed over to operators and communities, the exit strategy focuses on training on operation and maintenance.

Grid extension and densification: The grid activities are embedded in strong and sustainable national ownership and electricity service structures with a cross subsidised tariff structure favouring rural areas and customers.

Further Information

A Construction Manual for Axial Turbines by Mauricio Gnecco and the Impact Study on Migration and Electrification by Hauke Diederich will be available soon by EnDev-Nicaragua.

Peru

Promoted Technology	Solar/Biogas/Stoves/Hydro/Grid/Other			
Project Budget	3,400,000 €[29]	**Spent until reporting date**	2,564,957 €	
Project Period	06.2009 – 12.2012	**Reporting Date**	06.2011	
Lead Executing Agency	Agencia Peruana de cooperacion internacional APCI, Presidencia del consejo de Ministros PCM			
Implementing Partner	Ministry of Energy and Mines, Ministry of Agriculture, Ministry of health, support programme for the poorest JUNTOS, regional governments, governments of provinces, private companies especially mining.			
Involved Bilateral / Multilateral Programmes	None			
Target (Number of beneficiaries)	**Target till project end**	**Achieved till 12/2010**	**Achieved till reporting date**	
Energy for lighting / electrical appliances in Households	100,000	58,770	71,960	people
Cooking Energy for Households	60,000[30]	172,895	282,150	people
Electricity and/or Cooking Energy for social infrastructure	3,200 SI[31]	1,018 SI	1,620	institutions
Energy for productive use/ income generation	500 SME[32]	321 SME	2,024 SME	SMEs

Project strategy and key components

EnDev Peru is running a multiple energy access approach:

In the framework of the rural electrification campaign developed by the Peruvian government, EnDev is implementing an intervention strategy which facilitates safe and sustainable access to energy for lighting and domestic use through the installation of safe basic indoor electrical connections. This strategy allows for immediate access to electrical services and at the same time serves as a model for electrification companies and local governments.

After an introductory laboratory test of several Pico PV systems, three technologies were chosen for field tests which are running in three different villages in the department of San Martín. In the framework of the study, 120 systems have been installed in cooperation with the regional energy authority as part of its regional plan of rural electrification with renewables.

The project line of energy for cooking is implemented in the framework of the National Campaign of Half a Million Improved Stoves for a Peru without Smoke and is using two strategies: 1) Sustainable scaling-up (mass distribution) of improved stoves, financed through the investment of public resources. 2) Development of commercial structures, promoting the linkage between the existing supply (developed for the strategy described above) and potential demand to fully purchase improved stoves in the market.

[29] The total budget indicated in the last progress report amounted to 2,900,000 €. Since EnDev Peru has been scaled up by 500,000 € in the course of the annual planning process for 2011 the total budget increased.
[30] In the last progress report the outcome figure indicated as target for people to be reached with cooking energy in households was 60,000. However, in the course of the financial scaling-up, also the outcome number of beneficiaries increased.
[31] In the last progress report the figure indicated as “target till project end” for “SI” was 335,000 people. Meanwhile the reporting unit has been transformed from “people” into “institutions”, leading to a new outcome figure of 3,200 institutions, while the outcome itself didn’t change.
[32] In the last progress report the figure indicated for “target till project end” for “energy for productive use” was 5,000 people. Meanwhile the reporting unit has been transformed from “people” into “institutions”, leading to a new outcome figure of 500 small businesses. The outcome itself didn’t change.

EnDev supports appropriate technologies, like solar water heaters and improved cook stoves for schools, health centres and overall social institutions. EnDev cooperates with farmers' associations, by giving them access to higher-capacity technologies for their overall production, to achieve a greater impact on their total productivity and hence on their individual income. EnDev is going to make a grant agreement with the Instituto Trabajo y Familia to import standardised metal combustion chambers.

Project progress (overall progress towards outcome target EnDev 2)

Advancement towards sustainability was made in the grid extension component. 450 electricians were trained in indoor electrical installations; 15 local electricity suppliers are involved in indoor electrical installations; one regional government has reflected safe installations in its policy.

After the lab test, three lamp types were installed in three villages in San Martin – Sundaya, Fosera, and Phocos – where they are field tested. Due to some delivery delays, the report will be due early 2012.

The regional and national elections in 2010/2011 were a challenge for the National Cookstove Campaign. Following the elections the majority of authorities and government employees have changed. Nevertheless since the beginning of EnDev 2, around 1,500 people have been trained all over the country to build improved cook stoves; a strong alliance with SENCICO (National Training, Testing and Industry Services) has been established; 17 companies have been trained to produce components of the stoves.

Sustainability and handover strategy

EnDev ensures sustainability at two levels.

(a) Community level: It aims at strengthening a rural market with qualified providers in which the service offered maintains a certain level of quality as well as provides user information. (b) Institutional level: It aims at involving governments, institutions and companies of the electrical, extraction, production, commercial and financial sectors.

In the short run, achievements regarding the access to lighting for people using Pico PV systems depend mainly on the functionality of the systems themselves. Field tests will provide feedback regarding design, robustness and acceptance. In the course of the national campaign, the project has demonstrated that improved stoves are a crucial social factor which contributing to overcoming poverty and child malnutrition in the country. In this context, different financing mechanisms of public investment have been identified and developed so that public organisations can use public resources for stoves in private households.

Access to installed solar water heaters in social infrastructure can only be sustainable, if the technology remains operative after the cold season in high altitudes (below 4000m). The market for solar water heaters in Arequipa with over 30 supply companies seems promising, as well as in Junín where few suppliers show interest and big potential.

The strategy followed to improve productivity through better access to energy can be sustainable if members of the associations are aware of the impacts of their investments. Associations with experience in this area should become a reference for other associations and isolated farmers to follow their successful way of investing and trading.

E. Up-scaling proposals

Burkina Faso

1. Situation Analysis

1.1 Energy situation

In Burkina Faso more than 80% of the energy supply derives from biomass (wood and charcoal). National average is a daily consumption of 0.69 kg firewood by person, but this can rise in some areas up to more than 1 kg, where low firewood prices and higher humidity can cause higher consumption. In addition, urban households prefer charcoal to wood – this is considered to be more proper and "modern". Charcoal production causes thus high wood consumption in rural areas, even if it has been re-organised and concentrated in five production areas in 2005. As the population is growing, pressure on forest resources is growing as well. Nevertheless, scarcity of fuel is not really apparent in many parts of the country: wood collection is still a by-product of agricultural activity and firewood can still be found at least near the remote bush fields of each family, where people often are not sensible enough to avoid cutting fresh, green trees. The situation is different in the north, where scarcity even in rural areas is growing, and in the towns, where wood and charcoal are commercial products and scarcity is reflected by rising fuel prices thus affecting the poverty situation of most households.

The most used alternative energy for household cooking is gas. Nearly 35% of households in big towns and still some 10 - 25% in smaller towns own gas equipment. However, gas only counts for 0.4% of the urban consumption due to the lack of reliability of gas provisions. An increase of gas consumption, although officially promoted by the government, is not very likely to take place due to the high investment costs for the households (and the inability of the government to support the subsidies necessary to keep gas affordable).

The baseline stoves for firewood (3-stone-fire) and charcoal (simple metal stove called "le Malgache") cost nothing or are very cheap. Hence any "new" technology has to compete with the expectation of low technology prices. In addition, stoves have to be low and very stable, because the traditional daily food is a millet porridge that has to be "beaten" during preparation - a work that is very demanding for the cook as well as for the stove equipment.

The improved stoves developed in Burkina Faso at the end of the 1970s / early 1980s take these aspects into account. They cost around 3 - 4 €. In addition, they can also be constructed in bigger sizes to cover the needs of extended families and small businesses. For the moment, other improved wood or charcoal stoves on the international market that could eventually be imported (e.g. the Approvecho stove) do not seem to be adapted to the cooking habits: they are not stable enough to support the impact during porridge preparation and the standard sizes cannot cover the needs of extended families.

For the same reasons, the existing solar and plant oil cooker models cannot be promoted in Burkina Faso in large numbers. They are also too expensive and - regarding the plant oil cooker - fuel supply is not guaranteed.

For the promotion of improved cook stoves, the main problems are thus to raise the awareness for the necessity of fuel efficiency even outside the big cities and to make stable, durable and cheap stoves available even for poorer and remote-living parts of the population.

1.2 Policy framework, laws and regulations

Burkina Faso's Poverty Reduction Strategy Paper (PRSP) does not have a particular accent on energy or environment issues. The current version (2009 - 2011) has chapters on "reduction of pollution" and "sustainable management of natural resources". However, the solutions proposed are only dealing with the enlargement of urban street capacities and the maintenance of natural resources for pastoralists respectively. From 2010 onwards, the PRSP format has been replaced by a "Strategy of accelerated growth" that exclusively

stresses economic growth relying on the development of some urban economic pools and counting on a “trickle down effect” for the urban poor and the rural areas and that lays no particular stress on environment or energy (apart from electrification) issues.

More indicative for further DGIS interventions are the regional development plans and strategies, that are mostly considering environmental and energy issues in the sense that they are aiming at a sustainable management to assure provision even for future generations. In its 2008 version, the development plan of the capital’s region views access to modern energy as a measure to reduce poverty. According to this, FAFASO has, from 2009 onwards, undertaken joint activities with the Regional Council of the Central (the capital’s) region to enlarge access to improved stoves to wider population groups, in first line in the semi-rural parts around the capital. Nevertheless, FAFASO has, by now, not been able to transfer this type of cooperation to the elected councils in other regions.

Regarding access to biomass, the environmental services have the mandate to regulate access to wood supply (and to tax any fresh wood cut anyway) even for individual cutting in the villages, but they are too poorly equipped to assume this role. Nevertheless and quasi as an “heritage” of the 1980s revolutionary period, the control of big scale wood transport is still functional (in large parts): only specially accredited (painted in green and white) transporters are allowed to transport fire-wood and they are still controlled automatically on the overland streets. For the charcoal sector, the government decreed, in 2005, a nationwide stop of artisanal production for several months and gave afterwards licenses to some defined production areas. This system seems to work more or less.

1.3 Institutional set up in the energy sector, activities of other donors

Since the 1970s, Burkina Faso has been one of the leading countries in the sub region with regard to the development and the dissemination of improved stoves. As a result, the country has today a huge experience in terms of technology. A considerable choice of adapted stove types is available. On the other hand, most of the projects of the past have been donor or state driven – they cracked down in the moment, when the donor retired or state politics changed (as it was the case after the “revolution” in the 1980s).

In consequence, a kind of institutional setup is existing, but for the most part this concerns institutions believing that the dissemination of improved stoves should forcedly pass by them, without really having the (personal and financial) capacities to assume their roles. On the research and technology side, the “Institute of Research in Applied Sciences and Technologies” (IRSAT), a department of the Ministry of Research, has kept its standards and is still the only institution capable of accreditation for improved stoves and defining standards. But IRSAT has no capacities (and no ambitions) in dissemination. On the other side, the Ministry of Environment is seeing itself as the agency to be implied in stoves’ dissemination, eventual assisted by the Ministry of Women’s Rights. In this, the Ministry of Environment is not only contested by other governmental departments (e.g. the Ministry of Energy, not only in charge with a World Bank programme for the dissemination of improved stoves at the moment, but also responsible for the implementation of the national strategy for domestic energies, developed by CILSS-PREDAS), but its real capacities to lead a sustainable stoves’ programme have never shown up even in the past: all strategies relying on the Ministry for the dissemination of stoves broke down at latest when the donor retired (and notwithstanding the efforts the donors made in the strengthening of the Ministry’s capacities).

Most of the dissemination strategies in the past relied on subsidies (with the argument that Burkina’s poor population could not afford the real prices) and passed by the Ministry of Environment or others and several NGOs to spread the stoves and the technology. Being used to ever new upcoming projects, none of these actors was, at the beginning of FAFASO’s activities in 2005, really willing to adhere to a sustainable strategy that directs the use of the project funds rather to the producers and other actors of the private sector than to state or civil society institutions.

To establish a sustainable system, FAFASO has since the beginning of its activities in 2006 fully relied on structures in the private sector and followed a commercial approach, counting on the producers interests in disseminating the stoves (to earn money for themselves) and on the users acceptance of the stoves' advantages. With the extension of activities in rural areas, FAFASO started in 2008 to integrate provincial divisions of the Ministry of Environment in the training and dissemination process. However, the Ministry's agents failed to deliver at all – even if they have been promised to get paid for this. With its overall experience (by the middle of 2011 150,000 stoves sold without subsidies and without government structures as intermediates, proofed inactivity of stately agents), FAFASO is now in a position, where the project can negotiate partnership with the state actors in favour of a real sustainable approach. As, since the beginning of 2010, the Ministry of Environment has become FAFASO's official, political partner, the collaboration between the two institutions has to be newly defined. Negotiations concerning the execution contract and the role that the Ministry could and should play into the context of the project (e.g. concerning a steering-committee) are going on ever since and are not showing a great involvement on behalf of the Ministry.

Apart from some small NGOs, the biggest other actor in the sector is a World Bank programme (PASE), officially started in February 2008, launched in October of the same year and having as objective the dissemination of 250,000 stoves within five years. Even if PASE always pointed that they will not pay direct subsidies on the sales prices, there exists the danger that they will change the strategy in face of a situation, where by now, after nearly 4 years of official existence, hardly any stove has been disseminated by them - pressure to achieve the goal could thus bring PASE to change strategy. So far, the only activities that PASE has developed are a handful of sales-shows in some quarters of Ouagadougou since 2010, executed by producers that had been trained by FAFASO (the around 1,500 stoves sold at these events have been eliminated from the DGIS-statistics). For the end of October 2011, PASE is planning a national exposition aiming at bringing together all stakeholders in the modern energy sector on the national trade-fair-area.

In addition, SNV is currently planning a stove programme in Burkina Faso. The focus and concept of the programme are still not clear (Household stoves? Role of productive use? Subsidies? Imports? Local production?). SNV is in discussion with FAFASO since November 2010 and has also visited some of the project's realisations; a feasibility study is currently on track.

1.4 Other major activities in the country financed by BMZ or DGIS

In Burkina Faso there are in total five projects supported by DGIS: apart from FAFASO, these are the SNV-driven biogas-programme, a programme for the diffusion of solar-lanterns (in cooperation with World Bank) and the support of a NGO disseminating solar lamps as well as a programme aiming at production of Pure Vegetable Oil from Jatropha for electrification purposes (through the Daey Ouwens Fund). To none of these projects functional work relations exist.

On BMZ side, several partners can be identified:

- Having been, during its 2nd phase (mid-2007 to end 2009), part of GIZ "Decentralisation Programme", FAFASO has acquired some kinds of experience in the communal sectors and a huge knowledge of communal actors and procedures.
- Concerning the stoves' segment, the KfW component FICOD has agreed to disseminate stoves for institutions, e.g. for school canteens.
- The GIZ "Health and Human Rights Programme" is a potential partner also with respect to school canteens, but also for the realisation of awareness campaigns on health issues related to stoves.

- The GIZ “Agricultural Programme” is working on the transformation and commercialization of agricultural products. They already manifested their interest in integrating improved stoves for professional use in their production chain.

2. Planned Outcome

Energy Service Segment	Total Number of People Served
Energy for lighting and el. HH Appl.	n.a.
Cooking Energy for Households	100,000
Electricity for social infrastructure	n.a.
Cooking/ Heating Energy for social infrastructure	250 social institutions
Energy for prod. use/income generation	2,500 small businesses

3. Project Approach

3.1 Energy technologies promoted by the EnDev project

Selected technologies/services and approaches: The technologies promoted by the EnDev project can be distinguished by…

a) The fuel they are using;

b) The category of user they are produced for.

	Category of user		
fuel	**households**	**Social institutions**	**Productive use**
firewood	Mud stove Ceramic stove Ouaga métallique (metal stove) Burkina Mixte (metal stove) Multimarmite (metal stove)	Mud stove Ouaga métallique and Multimarmite (metal stoves)	Mud stove Ouaga métallique and Multimarmite (metal stoves)
charcoal	Ceramic stove Burkina Mixte (metal stove) Multimarmite (metal stove)	n.a.	n.a.
agrowaste	n.a.	n.a.	Cashew-nut “Shea butter nut”

Rationale of the approaches: As biomass remains the main fuel for urban and rural households for a foreseeable future, the EnDev project is focussing on the promotion of a variety of products for different target groups. This includes urban and rural households, productive use and social institutions.

Under EnDev 1, the activities were mainly focused on urban households. These efforts are now further promoted and consolidated under EnDev 2 with the target of a step by step phasing out of support for the EnDev 1 producers by the end of the second phase.

Rural household stoves and large scale stoves for productive use (beer brewing, restaurants) and social institutions (schools) were piloted under EnDev 1. These pilots are now scaled up under EnDev 2.

New technology development including testing and limited scaling-up shall be taken on board under EnDev 2 for the use of agrowaste as fuel for the processing of Shea butter nuts.

3.2 EnDev approach

The approaches for the EnDev 2 project phase are structured by the main type of products/uses:

- Households stoves
- Productive use
- Social institutions

Household stoves: Under EnDev 1 (since 2006) the project has concentrated on the promotion of portable household stoves. As a result, around 65.000 stoves were sold. At the beginning, urban households were the main target group. A portable metal stove was the main product under promotion. With the extension of the project into periurban and rural areas, ceramic and fixed mud stoves have also been integrated into the activities (since the middle of 2008 and beginning of 2009 respectively). All these stoves types have been developed and are produced in the country and had already been promoted by former projects.

But in contrast to the former projects' approaches – which were largely based on product-subsidies and the promotion of the stoves by associations – FAFASO developed a commercial strategy based for large parts on the engagement (and the interests) of the producers. For the metal stoves, which now make up more than 90% of the improved stoves sold, 250 small scale producers have been trained in technical and marketing skills and, at least in the two big cities, organized in producers associations. FAFASO further supported them by launching publicity campaigns and by strengthening the commercial chain.

Under EnDev 2, the focus was more on consolidation and less on extension of production. In this sense, only few additional metal stove producers have been trained (only to fill up some geographical gaps and to replace producers that stepped out). Emphasis has been laid on additional capacity development of the producers (more responsibility in marketing and quality control, development of business plans, knowledge on saving models and microfinance) and on organisational development.

By the end of 2011, FAFASO will retire itself from active accompaniment of the producers in the big cities. Project staff members will even leave the big cities and only, during 2012, observe from far how they continue. In parallel, efforts in rural areas will be intensified – and by additional money from the EU-Energy facility for the West-African projects the northern regions of the country, so far neglected in project's interventions, will be integrated in an intensive manor.

Household stoves in big cities: The situation in the country's two big cities, Ouagadougou and Bobo Dioulasso, is special with respect to two factors:

1. Interventions started here (in 2006) and the producers have thus profited from the longest supervision.
2. The concentration of producers is highest here and the possibilities of organisational building (creation of associations) are thus more promising.

Starting from these conditions, the two metal-Stove-producers' organisations in Ouagadougou and Bobo Dioulasso benefitted during the last years of special measures for

capacity development that prepared them for the time “after the project”. Part of this exit strategy has been:

- Organisation of the producers’ organizations in specialised “commissions”: quality control, material acquisition, credit, management of orders, PR and special activities.
- Attribution of special tasks and responsibilities to these commissions, i.e. with respect to quality control (that went over from IRSAT to the associations) and the organization of sale’s events (that was handed over from the project to the producers with the project only supporting the related costs).
- Trainings in organisational life and roles within the associations
- Trainings in questions of savings, microfinance etc.
- Attribution of promotion and transport material to enable the producers to organize themselves sale’s events without high costs.

These preparations now having come to an end, FAFASO intends to stop direct interventions in direction to the two producer groups in the big cities by the end of 2011. This end will be underlined by the respective “animateurs” physically leaving the cities to concentrate on minor towns. The project will stay available for requests of the producers and will still supervise the good usage of the material given to them (the promotion material has finally been handed over in July 2011; the transport material (“Rikcha” motorcycles) will hopefully be available before the end of the year).

Household stoves in small cities and rural areas:

Metal stoves: The two “animateurs” formerly having worked in the big cities will, in 2012, concentrate their activities on the small and middle towns in the Centre and the West of the country.

In the same logic, FAFASO will also by the end of 2011 retire from the small towns in the Southwest and the East where a direct support by an “animateur” has been given since 2009. The respective agents will now concentrate on other towns within their regions.

The main focus in all these areas, where work has begun since 2008/09, will be laid on the organizational and capacity development amongst the producers in the middle and small towns. Regional producers’ associations and networks will be created to rise up a system of quality control and resource management comparable to those in the big cities.

The objective is to enable the project to withdraw from accompanying the producers in the “old regions” by the end of 2012 in order to have free capacities to support regions neglected in the past, but by following at the same time from the distance how the producers will behave without direct support.

The northern regions of Burkina Faso are up till now amongst the most neglected ones. This can be partly explained by the project genesis – with the initial stress on the two big cities (in the Centre and the West) and the priority regions of the German cooperation (the Southwest and the East). On the other hand it has always been felt as an omission, because it is precisely the desert-like North that is most in need of improved stoves. This will be balanced out, since the planned 2nd EU-Energy Facility offers the opportunity to carry out training and awareness raising activities in these northern regions and especially its rural zones.

The planned two components of FAFASO (the EnDev 1 and the EU 1) will thus together concentrate for three years on rural areas by being separate in their respective geographical focuses. But the two components together can complement each other in the development and use of awareness-raising-tools as well as in the effort to join all improved stoves’ producers into a nationwide organization.

Ceramic stoves: Ceramic stoves have the same performance as metal stoves, but they are much cheaper. Transport often is problematic because of breakages due to bad road conditions. Since the beginning of 2009, some 180 potters have been trained in the production of improved ceramic stoves in three regions: in the Centre (in 6 rural communes around the capital), in the South-West, in the East and in the city of Bobo Dioulasso.

Challenges have been the construction of the kilns necessary to produce the stoves: during the current phase, only 9 of 17 kilns have been finished. Up to the end of 2012, the remaining kilns have thus to be built, production initiated and the commercial chain established.

Whereas the ceramic sector still needs consolidation in the regions touched since 2008, the ceramic stove production will be of special importance in the new rural areas covered from 2012 onwards by EnDev, as well as in the northern regions to be integrated under the EU-facility funds. We expect the development of production and commercialisation structures to be easier in these "new" regions as lessons can be learned from the previous experiences. In addition, ceramic stoves are now more widely known to the public (and to former potential producers) as they have been integrated into the FAFASO publicity campaign and especially the TV spot since august 2011.

Mud stoves: Former projects much relied on fix mud stoves ("improved three stones") for the dissemination overall in rural areas. An evaluation of results in the eastern region, made by end of 2009, showed, that success was limited because of the following reasons

1) People trained do not hand over their knowledge to others. Stoves actually build after the trainings are thus very few, and the cost-outcome ratio for the project is extremely unfortunate.
2) Stoves built do not have a really good quality, particularly in cases where the construction was done by a person not directly trained by the project but being "2nd generation".
3) Quality is also poor, because the preparation of material is not as easy as presumed.

Under these circumstances, FAFASO is actually only supporting trainings for mud stoves if an overwhelming interest of the demanding community can be seen: in these cases, the community has to support all costs for transport and nourishing the participants as well as for the material needed; FAFASO is only sending and paying the trainer. Under these conditions, in 2010 only one training has been organised, the expectations for 2012 are not very much above this.

Approach Aspect	Household stoves
Market Situation	Even though several types of improved wood and charcoal stoves have been known in Burkina Faso since the 1970s, production had totally broken down until the start of FAFASO's activities in 2006. The project has established today a network of app. 700 stoves producers and a recognized label. Gas stoves are promoted by several multinational (TOTAL) and national firms and there is no need of the project's support in commercialization their products.
Target areas	FAFASO has been concentrating its activities during the 1st phase in the two biggest towns of the country (Ouagadougou and Bobo Dioulasso); during the 2nd phase activities have been extended to smaller towns and rural areas with a special accent on the main intervention areas of the German Cooperation, but also touching other regions of the country. For EnDev 2, interventions outside the main intervention areas have been targeted (as the main intervention areas of German Cooperation are not the areas most in need for improved stoves) and to the suburbs of the big towns, accommodations of the poorest of the poor.
Target groups	While the metal stoves are designed for the average urban population, the ceramic and mud stoves are designed for the poorer target groups.
Implementing	The most important partners are the producers (private sector).

partner	Government structures are integrated in the lobbying work. For stove testing, technological development and training the “Institute of research on Applied Sciences and Technologies” (IRSAT), a branch of the Ministry of Research, is the most important partner.
Capacity development	Production and marketing capacities are for the moment concentrated in the two big cities, where for instance 100 of the 250 metal stove producers are concentrated. Based on these capacities, FAFASO will retire from active support to these producers by the end of 2011. During 2012 the focus will lay on capacity development in the small cities and rural areas: the producers should be organized in associations and be enabled to do efficient work in them (by trainings on organizational issues, savings, business calculations, microfinance).
Subsidy/credit	No direct subsidies (= subsidies on sales prices) have been or will be paid by the project. The subsidies consist in the indirect services of the project, e.g. the expenses for training, publicity and the installation of the commercialization chain. Some common activities with Microfinance institutions (French NGO Entrepreneurs du Monde) have been executed during 2010/11 and producers trained in using these structures. A consequent approach to get (professional) users in using micro financing to obtain stoves has still to be developed.
Quality management	While quality control was initially assured by the partner IRSAT, it has been taken over – at least in the case of the producers’ groups in the big cities – by the producers’ associations. All producers are, in general, trained in quality issues. In the peri-urban and rural areas, quality is, for the moment, assured by FAFASO personnel. For these areas, capacities and auto-control have still to be increased (to be done in the context of organizational support).
Sales strategy	Even the metal stoves are affordable to the biggest part of the population. Through savings in the purchase of fuel, a stove’s price can be recovered during one month of use. For the poorest of the poor, microfinance systems will be developed. For the rural populations, the cheaper ceramic and mud stoves are available. Prices (and thus profit margins) are fixed by the producers themselves. The project task consists in making the stoves known and accessible.
Marketing and awareness raising	In September 2010, a new TV-spot has been launched also presenting the “new” Roumdé stoves as well as the ceramic stove, the stoves for productive and institutional use and the beer stove. Permanently, the project runs a wide range of activities in awareness raising, using a whole lot of tools depending on social contexts: gadgets (T-Shirts, cloth etc), participation at fares and cultural events, cooking demonstrations, special animations to target groups (leading persons), sponsoring of public events (football competitions, fashion shows etc), theatre sketches, lobbying work to decision makers etc. In the big cities, the normal formats of marketing activities have been taken over by the producers’ associations. All over the country, cooks have been trained in the good use of improved stoves to be able to assist the producers and project staff in the execution of cooking demonstrations.

Productive use: Supporting productive use through cooking is an important pillar of the EnDev intervention. A particular interesting target group is represented by traditional beer brewers: referring to a census done by FAFASO, IRSAT and the Regional Council by the end of 2010, in the single city of Ouagadougou, around 2500 of these beer brewers are working and they consume (according to official figure of the Ministry of Environment) 52 % of the wood coming into town. Since mid 2008, trainings for masons to construct beer-stoves have been organized in four regions and up to mid 2011 app. 2000 stoves have been built.

Other high fuel consuming professional activities are for example the production of Shea butter (with rising importance due to rising export opportunities) and Soumbala (a tasty paste extracted from the fruit of the "Nere"-tree). FAFASO has assigned IRSAT to conduct tests for improved stoves for Shea butter and cashew nut production (by eventually even replacing wood by Shea and cashew nut shells). Following this, 2 prototypes of Shea butter stoves have been developed and first installed and tested in the field. These prototypes have now also been built within the IRSAT lab to be tested under lab conditions. A new stove for Soumbala production is currently under conception.

Based on this, FAFASO aims at supporting productive use in three areas:

a) Beer brewing

b) Restaurants

c) Processing of Shea butter and other agricultural products

Beer brewery stoves: IRSAT has developed special mud stoves for beer breweries that at the actual stage of development economise 80 % in comparison to traditional three stone fire and still 50 % in comparison to former improved stove models. Normally beer brewers cook twice a week and each time they prepare around 120 l. After successes in the south-western and the eastern regions of Burkina Faso, where, under EnDev 1 and in several communes, 100 % of the beer brewers were equipped with improved stoves, FAFASO has trained, in the middle of 2010, some 60 masons in the city of Ouagadougou and the 6 rural communes around in the construction of these stoves. If, on this basis, FAFASO would be able, until the end of 2012, to equip a major part of these women with improved stoves, overall wood consumption in the town could easily be reduced by at least a quarter. In Bobo Dioulasso, masons have been trained by the end of 2010 and have by mid-2011 already constructed 325 stoves.

The mud stoves are produced by professional masons, whereas the beer brewer herself has to deliver some basic materials (argil, sand, water). Prices are depending of the number and sizes of pots to be integrated into the stoves, but they turn in general around 8 – 20 €. By the economy of firewood, the beer brewer is normally able to compensate this expenditure within one or two preparations.

FAFASO's work consists in training a sufficient number of masons, integrating the beer brewer's stoves in public presentations (TV-reportage, etc) and to do lobbying work towards the communal authorities in order to impose and control the use of improved stoves by the beer brewers.

A prolongation of the project would offer the opportunity not only to consolidate the achievements in the four regions covered so far, but also to integrate some new regions into the dissemination of the beer mud stoves, especially regions that have the highest density in beer production (Centre-west, Boucle de Mouhoun and Centre-south).

Restaurant stoves: Already in its first two phases, FAFASO disseminated around 6000 big metal stoves that can either be used by extended families, by restaurants or by school canteens. Even if the number used in school canteens is constantly rising, it can still be considered as negligible (see next paragraph), and also the families buying a big metal stove only for household use can't be too considerable (most of them buy them for professional purposes and then take them to their families in case of need: big festivities, etc), we count the majority (75 %) of these big stoves sold as stoves for professional use.

A study executed in 2010 amongst restaurant owners in Ouagadougou and Bobo Dioulasso showed that most of them know the improved “Roumdé” stoves, but that they were not aware of the existence of big stoves adapted for their professional requirements. To boost the sales figures for this kind of stoves, publicity has thus been intensified, e.g. by producing 10 special editions of a nation-wide-known TV-cooking-show consecrated on the usage of improved “Roumdé” stoves in restaurants.

As the big metal stoves are a bit expensive (around 40 € depending on size), the conception of mud stoves adapted to restaurant runners’ needs overall in periurban and rural areas has to be pushed.

Concerning the producers, the exit strategy corresponds to that described for the household-metal-Stove producers: direct accompanying of the producers in the big towns will end by the end of 2011 whereas, from 2012 onwards, the producers in the middle and small towns should be prepared for the time after the end of the project by special measures of capacity development. In general, an intensified introduction of restaurant stoves in smaller towns and rural areas will still need lots of energy from the side of the project.

Production of Shea butter and transformation of other agricultural products: Shea butter becomes an ever more important item in Burkina Faso especially for export (for cosmetics and chocolate industry in Europe and the US). In the most producing Shea butter regions, Shea butter trees are planted and protected. But as the Shea butter production consumes lots of wood, it destroys at the same time the natural resources in the regions concerned, leaving a monoculture of Shea nut trees only. Tests have shown that the shells of the Shea nuts are a good fuel and there exist semi-industrial production units in Bobo Dioulasso that use the shells. To this respect, tests have to be intensified to deliver provable data. At the same time special kinds of stoves have to be conceived (using less firewood or working with Shea nut shells).

In 2010, two different stove types for Shea butter have been developed by the IRSAT technicians (one of them working with Shea nut shells, the other with wood). In cooperation with a big cooperative in the south of Burkina Faso and their French partners (TechDev = Technology pour le Developpement) three prototypes of the wood stoves have been constructed in the field (while IRSAT had another financing of the construction of the Shea-nut-shell-Stove in Bobo Dioulasso), the practical experiences of the users have been evaluated and the stoves tested in the field by may 2011. At present, the two stoves have also been constructed in the IRSAT lab to be tested there. After the availability of the test results the stoves will be presented to national and international stakeholders to promote their diffusion in the Shea butter production units.

Approach aspect	Situation for the promotion at productive use
Market Situation	The market situation for large scale stoves refer to both the commercial sector (productive use in restaurants, beer brewing) and in social institutions. FAFASO has, by its relation to IRSAT, a monopole situation on the dissemination of big stoves, designed for productive use and for institutions. There are both large scale cook stoves in metal as well as mud (cheaper) available. They can save up to 80% of the firewood as compared to the baseline stoves. However, the mud stove can still be improved and afterwards integrated into the dissemination system. For some other productive uses (e.g. processing Shea butter nuts), technological development has been pushed forward, but the actual market introduction has still to be achieved.
Target areas	All over the country with changing focuses depending on the respective sector (beer brewing, Shea butter production etc)

Target groups	Traditional beer brewers are the most important target group, as they consume app. 50% of the overall wood consumption. Restaurant owners, processors of Shea butter nuts, Soumbala etc
Implementing partner	professional stove producers; IRSAT to develop new stove models; communal and regional authorities (beer brewing);
Capacity development	Training of professional stove producers on technical and marketing skills
Subsidy/credit	Like with the other stoves, no direct subsidies are paid. The indirect subsidies to be calculated consist in the project's activities in training, marketing and bringing producers together with the users (especially in the beer brewing sector). Producers are taught to calculate prices; promotion prices are used to open up new markets. In cooperation with a microfinance-organization (the French NGO "Entrepreneurs du Monde") credit models for beer brewers have been developed and promoted.
Quality management	Metal stoves (for restaurants) are integrated into the general quality control system. The beer stoves' producers are also organized into associations and will be taught to execute their own quality control.
Sales structure	making producers known (more essential for the fix stoves), showing the stoves at fares, constructing prototypes etc
Marketing and awareness raising	integration of the big stoves in television/radio spots, special emissions addressed to the different target groups, sketches for the target groups, cooking demonstrations, lobbying in direction of deciders (to create pressure to introduce improved stoves).

Social Institutions: Many Social Institutions prepare meals for their clients. The food is prepared in large pots using a three stone fire as stove technology. The school canteens merit a special attention due to…

- The possible reduction of required firewood (around 50 %);
- The improvement of meals' quality in favour of the pupils;
- The possible reduction of the work load of the cooks;
- The alleviation for the children (who bring the firewood to school);

Under EnDev 1, the promotion of improved large scale cook stoves to schools has been piloted. Since then, a multitude of approaches has been applied to interest the schools and their supporting organizations (the communes, WFP, PLAN, KfW/FICOD and others) to bring them to introduce improved stoves. In this sense, in 2010 the Ministry of National Education has made an appointment to not only establish a school canteen in each and every primary school all over the country, but also to have them equipped with improved "Roumdé" stoves. However, sustainability is not yet assured as the purchase of the stoves is on charge of the pupils' parents and the stoves are rather expensive especially for parents in rural areas.

In this respect, FAFASO plans to:

- Establish, together with the Schools' Ministry, a system to adopt and follow-up of the programme "one school – one canteen – one Roumdé-stove" (existing since 2010);
- Integrate institutional stoves in the publicity activities (TV reportages on the subject etc);

- Looking for other partners to equip schools with improved stoves (WFP and PLAN already touched);
- Look for other institutions that can be equipped (military camps: contacts with Ministry of Defence already taken, health centres etc).

The health centres can serve as model places for a clean kitchen and can thus hopefully inspire users (patients are accompanied by parents who do the cooking themselves in the kitchens). These persons often come from remote villages that can hardly be reached by other ways of awareness raising.

Approach aspect	Situation for the promotion at social institutions
Market Situation	The market situation for large scale stoves refer to both the commercial sector (productive use in restaurants, beer brewing) and in social institutions. FAFASO has, by its relation to IRSAT, a monopole situation on the dissemination of big stoves, designed for productive use and for institutions. There are both large scale cook stoves in metal as well as mud available. However, the mud stove can still be improved and afterwards integrated into the dissemination system.
Target areas	All over the country
Implementing partner	Professional stove producers; IRSAT to develop new stove models.
Capacity development	Training of professional stove producers on technical and marketing skills
Subsidy/credit	As for the other stoves, no direct subsidies are paid. The indirect subsidies to be calculated consist in the project's activities in training, marketing and bringing producers together with the users. In addition, producers are taught to calculate prices. For the social institutions, Microfinance models do not seem to be suitable. However, the schools and their supporting organizations are accompanied by FAFASO to look for other funding for the stoves.
Quality management	Metal stoves are integrated in the general quality control system
Sales structure	making producers known, presenting the stoves to local and regional decision makers and to schools
Marketing and awareness raising	integration of the big stoves in television/radio spots, special emissions addressed to the different target groups, sketches for the target groups, cooking demonstrations, lobbying in direction of deciders (to create pressure to introduce improved stoves).

4. Budget

		EUR
1	**Human Resources and travelling**	150,000
2	**Equipment and Supplies**	75,000
3	**Funding Financing Agreements/Local subsidies**	75,000
4	**Other direct costs**	150,000
5	**Total direct costs**	**450,000**
6	**Mark up costs/administrative overheads/imputed profit/**	50,000
7	**Cost price**	**500,000**

Nepal

1. Situation Analysis

1.1 Energy situation

More than 86% of Nepal's population live in rural areas. Despite this high number, only about 8% of the rural population have been electrified by either grid-based or decentralised energy supply. Nepal is ideal for the development of hydropower due to its vast water resources and steep topography. Nevertheless, about 87% of the energy supply in Nepal is provided by biomass including fuel wood (78%), agricultural residues (3.5%) and animal dung (5.5%). Fossil fuels account for 10% which consist of mainly Diesel as well as LPG and coal. Electricity accounts for about 3%. The only significant source in Nepal which is used for electricity generation is large-scale hydropower. The present technically and economically feasible potential (given the state of infrastructure and price of fossil fuel) in the country is estimated to be around 43,000 MW. Until today less than 1.7 % of the feasible hydropower capacity has been developed. Only a small part of the population has access to grid electricity in Nepal which is mainly limited to urban areas. In addition, rural electrification in Nepal is very expensive due to the topographical conditions and at the same time the purchasing power of consumers is very low. Nepal's economic and social development is hampered by its inadequate energy supply.

The Nepal Electricity Authority (NEA) as the major state utility has a monopoly on producing, selling and distributing electricity. However, it faces an immense increase in electricity demand (approximately 9% p.a.), whereas at the same time production and transmission capacities are limited. Though ambitious development targets are announced by politics, the development of plants and transmission lines cannot keep up with economic development and its induced demand increases. Between 2001 and 2011 peak demand has more than doubled from 391 to 946 MW. Likewise, the national annual energy demand has levelled at 4883 GWh with an annual electricity production of 3858 GWh out of which 694 GWh (18.42%) have been imported from India. The resulting gap has to be bridged by frequent load-shedding in particular in urban areas. Currently, 652 out of 706 MW installed capacity is hydropower. Around 478 MW (68%) of hydropower capacity is NEA-owned, while 175 MW (25%) is privately owned and operated by so-called Independent Power Producers. Due to rising fuel prices two diesel power plants with a total installed capacity of 53.4 MW were almost abandoned within the last years.

In 2008/09 consumption of electricity was almost balanced between industrial sector (37.37%) and households (41.4%), while the commercial sector (firms that are not engaged in manufacturing, transport or agriculture) consumed only 7.2%. However, the industrialized and urban areas account for the majority of electricity demand. Disparity in access is stark with the rural population being mainly dependent on fossil and biomass-based fuels.

1.2 Policy framework, laws and regulations

The energy sector is considered a key sector with regard to future economic growth and the realization of Nepal's development goals, as formulated in the Poverty Reduction Strategy Paper of the Nepalese Government: "Key objectives in the power sector include: expanding electricity coverage in a sustainable and environmental friendly manner by generating low-cost power; accelerating rural electrification to promote economic growth and improve living standards in the rural areas and to develop hydropower as an important export item".

Poverty Reduction Strategy: Up to now the development policy of the Nepalese government has been outlined in five-year plans. The tenth plan 2002/03 - 2006/07, which also served as a Poverty Reduction Strategy Paper (PRSP), mentioned the following main objectives:

- poverty alleviation as the overarching goal
- economic growth
- improvement of social indicators
- market-based regulatory policy
- good governance as a basic orientation

The realization of those development plans suffered from implementation weaknesses, financial constraints and too ambitious goals in detail. A major constraint for the implementation of the development strategy is the still fragile political and security situation.

Energy Policy – 3-Year Interim Plan: Up to now, the energy policy objectives have been set up as a part of the general 5-Year Plans by the National Planning Commission. Targets for the sustainable use of energy or the efficient use of commercial energy sources have been little discussed. After the national five-year plan ended in 2007, the government opted for three-year interim development plans instead of an eleventh five-year-plan. The energy policy of the latest 3-Year Interim Plan (2010/11 – 2012/13) has the following objectives:

- Increase public, private, community/cooperative investment in electricity generation and transmission for domestic use.
- Extend electricity transmission line with high priority.
- Increase electricity generation capacity to minimize load shedding.
- Make hydropower projects sustainable and cost effective by making them environment friendly and climate change adaptation.
- Develop electricity access as an inseparable part of poverty alleviation.
- Prepare investment friendly environment for construction and development of hydropower projects.

With regard to renewable energies, the strategy is as follows:

- Emphasize the development and expansion of renewable energy under decentralized energy system.
- Give priority on integrated programmes for improving the socioeconomic standard of rural people and environmental sustainability through alternative energy.
- Promote partnership and coordination with related stakeholders like local bodies, private sector etc for the development and expansion of alternative energy.
- Develop the rural energy in consideration with sustainability and appropriateness.
- Give emphasis on research and technology transfer of alternative energy.

The tariffs and prices for electricity and petroleum products, however, are politically determined. They are geared to the lower limit of acquisition costs or not cost-covering at all. Tariff increase has been denied to the National Electricity Authority (NEA) since 2001. Therefore, NEA's budget is in deficit and has to be balanced by the state. Discussions over the last months hint at a future increase in electricity prices which could give NEA a better standing and could also help to develop new potential sites for hydropower plants.

The EnDev project is in line with the sector strategy as envisaged by the Nepalese government. Moreover, it enables the Nepalese government to implement its ambitious rural electrification targets as without the proposed intervention the allocated subsidies would not be used by the target group. EnDev supports the Government of Nepal in the implementation of programmes regarding grid-connection as well as off-grid solutions as to be elaborated below.

1.3 Institutional set up in the energy sector, activities of other donors

The energy sector in Nepal is strongly fragmented on the governmental side. Responsibilities are shared between different ministries and the grid-connected sector is fairly separated from the off-grid sector which makes a common and organised planning between the two sectors difficult.

Public Institutions: Several ministries have mandates affecting energy policy issues and the use of energy. Most importantly the Ministry of Energy (MoE) has been created in 2009 after splitting the Ministry of Water Resources and separating the irrigation specific functions from hydropower development. It is mainly working on the grid-connected energy sector. On the other side, there is the Ministry of Environment (MoEnv) which is responsible for decentralized solutions (i.e. Micro Hydropower) in the sector. The Ministry of Forest and Soil Conservation (MoFSC) plays a role in the biomass sector and the Ministry of Housing (MoH) in the building sector. The Ministry of Commerce and Supplies is responsible for questions regarding the use of fossil fuels.

Nepal Electricity Authority (NEA): The state-owned utility NEA was founded in 1985 and is affiliated with the Ministry of Energy. Its exclusive field of operation is the generation, transmission and distribution of electricity and the development and operation of the electricity grid. Furthermore, the NEA is co-responsible for the preparation of energy planning and for education and training of professionals in the field of power generation, transmission and distribution. NEA is the main partner for implementing the Community Rural Electrification Programme (CREP) of EnDev and works also together with National Association of Community Electricity Users in Nepal (NACEUN) which is the umbrella organization of all Community Rural Electrification Entities (CREE).

The NEA cannot decide on electricity tariffs, but depends on the decisions of the “Electricity Tariff Fixation Commission” (EFTC). The revenues from electricity tariffs are not cost covering. The last tariff adjustment was approved in 2001. According to its own data, the long-term liabilities of the NEA amounted to 62 billion NRs (about 590 million EUR) at the end of the financial year 2007/2008. Due to the daily power cuts, the NEA is publically criticized. It tries to bridge the gap between electricity demand and supply by importing electricity from India. Therefore, a contract for the provision of 150 MW was stipulated. However, due to technical problems during transmission this capacity currently cannot be retrieved.

Alternative Energy Promotion Centre (AEPC): The Alternative Energy Promotion Centre was founded in 1996 to promote the development and deployment of renewable energies and alternative energy technologies in Nepal. It is a semi-autonomous institution formally attached to the Ministry of Environment. AEPC acts as an intermediary institution between the operational level NGOs / private promoters of renewable energy and the policy decision levels in relevant ministries. Its activities include renewable energy policy formulation, planning and facilitating the implementation of the policies/plans. It is also the main actor for the delivery of subsidies and financial assistance for off-grid Rural Electrification and monitoring, evaluation and quality control during the process of electrification projects. The technologies AEPC is working with comprise Bio fuel, Improved Cooking Stoves, Mini-/Micro hydropower, Improved Water Mill, Solar Energy (Solar Home Systems), Wind Energy and Geothermal Energy.

Activities of other donors: Most donors are active in the area of off-grid electricity whereby AEPC is the main actor. It receives basic funding from the Nepalese government but is financed to a large extend by international cooperation projects. Firstly, there is the Energy Sector Assistance Programme (ESAP), mainly financed by *DANIDA* and *NORAD*. This programme aims at improving the rural energy supply (Solar Home Systems, small hydropower plants, biogas plants and efficient stoves). ESAP manages the Rural Energy Fund, which facilitates the partial financing of investments in rural electrification measures.

The German *KfW Entwicklungsbank* participates in the promotion of SHS with a financial contribution to ESAP. Another important programme is the Rural Energy for Rural Livelihood Programme (RERL) by *UNDP* and *World Bank* which is supporting the government in implementing the Rural Energy Policy in all districts. The Renewable Energy Project (REP), a joint effort by the *European Union* and the government of Nepal focuses on the provision of solar energy systems in rural areas for social institutions (hospitals, schools, etc). Furthermore, there are additional smaller projects focusing on improved watermills, biogas and climate change adaption strategies. *The Asian Development Bank* has also several projects in the energy sector for developing the countries' hydropower resources, providing financial assistance for large-scale hydropower development and upgrading the transmission grid in the west of the country.

1.4 Other major activities in the country financed by BMZ or DGIS

The focal areas of BMZ in Nepal are Renewable Energies and Energy Efficiency, Local Governance and Health and Family Planning. Apart from those and due to the tense situation after the conflict that ended in 2006 and still dominates current politics, there are three GIZ programmes working on support of the national peace process. In addition, there is a programme on business promotion and economic development.

Nepal Energy Efficiency Programme (NEEP): The programme assists the Nepalese Government in preparing a national energy strategy with a particular focus on energy efficiency and the sustainable use of biomass. Furthermore it helps the national institutions to introduce energy consumption labels and develop energy efficiency standards for domestic appliances. In collaboration with non-governmental organisations and the private sector the range of uses for energy-efficient stoves is to be increased and their dissemination considerably accelerated. The programme also assists the private sector in establishing an energy efficiency centre.

Sub-National Governance Programme (SUNAG): The programme supports and advises the municipal authorities in the areas of good urban governance, social inclusion, poverty reduction, urban development planning and strengthening the Urban Development Fund financed by *KfW Entwicklungsbank*.

Health Sector Support Programme (HSSP): The programme supports regional, district and local administrations in establishing a quality management system for health institutions. In addition, HSSP is working on family planning and the reduction of infant and maternal mortality.

There is currently no direct involvement of DGIS in Nepal. In the past, however, there was DGIS participation in Nepal via supra-regional SAARC programmes which focused on environmental protection (including biodiversity and renewable energy) and good governance (mainly supporting decentralization and local governance). There is also a strong and long-term involvement of SNV in Nepal:

One of SNV's major programmes (*Next Generation Biogas)* was developing Nepal's domestic biogas schemes into a viable and vital part of the economy - a model that has been repeated throughout Asia and Africa. Up till now, 200,000 families in Nepal have gained access to domestic biogas plants. In order to accommodate the demand for *Improved Water Mills*, SNV supports the Centre for Rural Technology to upscale its programme to 40 districts (from current 16). With the programme *Inclusive Bio fuels* SNV is exploring possibilities to promote Jatropha sourced bio fuel. It will demonstrate the full value chain of Jatropha, from planting, cultivation to processing a final user-product that will include biodiesel. Furthermore, SNV is working to pilot *Innovative Microfinance* mechanisms by (1) building the capacity of promising microfinance institutions and (2) explore possibilities for Carbon Bundling and Microfinance whereby income from Nepal's emergent carbon trading market will be used as collateral for new Renewable Energy lending.

2. Planned Outcomes

Energy Service Segment	Total Number of People Served
Energy for lighting and el. HH Appl.	55,000
Cooking Energy for Households	n.a.
Electricity for social infrastructure	n.a.
Cooking/ Heating Energy for social infrastructure	n.a.
Energy for productive use/income generation	n.a.

3. Project Approach

3.1 Energy technologies or services promoted by the EnDev project

The project aims to provide additional 55,000 persons (10,000 HH) with access to electricity by grid extension to rural communities throughout Nepal. This proposal for scaling up will exclusively focus on the grid extension component of EnDev which supports the ongoing activities of the community based electrification model in Nepal. The project cooperates for achieving this goal with the Ministry of Energy and the national utility NEA on an implementation level as well as with NACEUN the umbrella organisation of all communities benefitting from CREP.

3.2 EnDev approach for the technologies/services being upscaled

EnDev will continue to support CREP which was initiated by the Government of Nepal and is implemented by the national utility NEA aiming to connect rural communities to the national grid. Costs for grid extension are predominantly covered by the government through the NEA (80%), whereas the communities have to cover the remaining share by own contributions. Once connected to the grid, the NEA sells bulk power to so-called CREE. Those organisations found and operated by the communities are responsible for the operation and management of the distribution network, collection of revenues from villagers and payment for bulk power purchased from NEA.

Despite this existing programme many communities still struggle to become electrified and to operate the CREEs in a sustainable manner. Firstly, communities often lack understanding of each stakeholder's role, responsibilities and rights. Despite a defined electrification process communities are therefore unable to implement electrification timely. Secondly, communication with NEA and monitoring of the contractors' work is in most cases poor, so that electrification progresses slowly and quality of the installations is not assured. Thirdly, CREEs have very limited organisational capacities to operate the local utilities. Besides technical knowledge on maintenance and repair, communities must be able to fulfil the administrative work (e.g. billing and bookkeeping). Fourthly, communities have no access to financial institutions which could provide loans in order to raise parts of the 20% own contribution. Therefore, electrification is either still not achievable or delayed for many years. EnDev has supported 49 CREE as part of the CREP of which 21 are electrified currently. The project will until December 2012 focus its efforts on non-electrified communities but also look after the others in order to make their operations more sustainable.

Support to CREEs: Selected communities will be strengthened by offering training activities in order to assure the sustainable operation of the community based utilities. Since the CREEs operate the distribution network independently, technicians are trained on the

operation and maintenance of distribution lines as well as electrical safety. House-wiring is predominantly done by local technicians, who are trained prior to electrification. Besides the necessary technical aspects, billing and accounting for maintaining the administrative necessities of the community-based utilities are important and CREE members will be trained on finance and accounting. The training should focus on mainly on-the-job training on site in order to support the participants while performing daily operations. In order to make communities aware of their rights and responsibilities in the electrification process, social mobilisation will be carried out. Adequate teaching material which will include advice on laws, regulations, the construction process and planning of rural electrification will be developed.

Capacity Building of NACEUN: The organisation plays an important role in rural electrification activities in Nepal. As the national umbrella organisation of over 200 CREEs, it is advocating the communities' interests and supporting its members with advisory services and information. EnDev cooperates closely with NACEUN and will strengthen its capacities. NACEUN will be involved in the project's progress monitoring and advised on improving its monitoring system allowing to follow up on its member communities which can be in remote locations and hard to reach. In addition, NACEUN will be supported in increasing its expertise in particular in tariff setting, management of CREE and income generating activities from electricity in order to pass it on to its members.

Dialogue Forum and Monitoring: The recently established monitoring committee will be strengthened and continue its work to speed up current activities and follow up on progress in additional communities as well as serving as a forum to discuss experiences and tackle the problems that delay electrification processes. It consists of both NEA and NACEUN representatives as well as contractors, CREE members and district representatives on request and is practically supported by a focal person. If urgent action is required the focal person can intervene by approaching contractors, make a personal visit to assist in NEAs regional offices or to support a CREE in contract administration.

Financial Support to CREEs: Since many communities struggle to raise the 20% own contribution, EnDev in cooperation with NEA set up a community rural electricity fund. The fund is administrated by NEA. In the past CREEs applied for a loan, which covered usually between 5 and 10% of the total investment. From the initial financial resources of the fund, NEA has allocated financial assistance to 49 communities. As only 21 are electrified at current date, the project will follow up on its disbursement and advise NEA on implementation.

Productive Use of Electricity: Although the project has not a specific productive use component it will build up on previous trainings and raise awareness for the usage of power for business opportunities in CREEs. It will provide information on best practices and help to identify promising business options for the use of electricity. Existing projects on rural business promotion from other developing partners which work in the same districts will be approached in order to maximise impacts and keep implementation costs low.

Current status of project: EnDev Nepal started its support of the Community Rural Electrification Programme in 2008. By the end of June 2011 approximately 88,000 persons (16,000 households) were provided with electricity via grid extension in 21 communities which were the main focus of the intervention. In addition, EnDev has supported the electrification of 126 social infrastructure institutions as schools, health posts and local administration buildings. In the field of power for productive use, 196 small businesses were provided with electricity out of which a majority consisted of rice and maize mills, as well as poultry farms and carpentry. In the various training activities which EnDev has conducted over 450 persons have participated in courses on operation and maintenance, accounting and billing as well as productive use of electricity. Hence, they gained valuable skills which contributed substantially to the sustainability of the CREE operation.

3.3 Risks for implementation

An overarching risk in Nepal remains the political stability of the country and the finalisation of the ongoing peace process after a decade of conflict which ended in 2006. Therefore, the country is still in a state of post-conflict instability until a new constitution will have passed. However, increasing the electrification efforts will remain a priority for any government ruling the country. Furthermore, ethnic and social tensions in various parts of the country could adversely affect the implementation of the project and restrict movement to certain areas. As the grid extension will benefit communities located in different parts of the country, overall implementation of the project should not be affected to a large extent. The frequent restructuring of the national utility NEA poses a risk for timely implementation. As the rural energy sector will, due to its size, always be less attractive than the urban one, the priorities of NEA might shift and result in poor management of their rural electrification activities. The sustainability of each CREE will depend on the ability to attract more customers and to increase productive end use. The project will intervene in this area but it also requires that the overall economic situation of the country does not deteriorate dramatically.

4. Impact Monitoring & Evaluation

Expected Impacts of project intervention: Low electrification in rural areas is a major impediment for development in Nepal. Lack of electricity means little business opportunities for rural households, bad pre-conditions for education for the youth, and less-than-optimal usage of community facilities such as health posts, schools and public administration. The electrification of rural areas in Nepal will improve living conditions through better lighting, less smoke and less risk of houses burning down or persons getting hurt through the use of petroleum or kerosene lamps. It will increase studying and reading hours of school children which can use light in the evenings. It also contributes to providing new access to information and communication means by charging mobile phones and increased use of radio and TV. In comparison to the amount a household spent on kerosene, the new electrification by the grid will also save energy costs as the tariff is comparably low and the transport of kerosene to remote locations difficult and expensive. It will also improve the quality of service from local health posts which can for example provide treatment at night or use refrigerators for vaccines. The promotion of new businesses which can be established with the availability of power will increase income to the community through stimulation of the local economy.

Planned Impact Monitoring & Evaluation Methodology: Intensive and regular monitoring during the electrification process is a major activity of EnDev Nepal. Furthermore, a majority of CREEs will be covered by verification visits in the field. Through household surveys, information on consumption patterns, quality of installations and customer satisfaction is collected. Furthermore, an extended interview with the CREE representatives is conducted, intending to gather information including the financial performance, qualification of employees, tariff setting and other future challenges of the CREE. A detailed baseline study on impacts in 5 representative communities and 3 control group communities has already been carried out. By doing regular monitoring and obtaining data from the field through verification visits quantitative and qualitative data will give an insight into the changes in the community after electrification has been completed. A detailed impact survey will be carried out towards the project finalisation by the end of 2012. The project is also interested in cooperating with the combined EnDev Impact Monitoring Working group of NL Agency and GIZ.

5. Budget

		EUR
1	**Human Resources and travelling**	333,000
2	**Equipment and Supplies**	10,000
3	**Funding Financing Agreements/Local subsidies**	55,000
4	**Other direct costs**	37,000
5	**Total direct costs**	**435,000**
6	**Mark up costs/administrative overheads/imputed profit/**	65,000
7	**Cost price**	**500,000**