

Joint Review of  
Energy Sector Assistance Programme (ESAP II)  
NEPAL

Review Report

February 17, 2011

Prepared for Norad

## Preface

The second phase of the Energy Sector Assistance Programme (ESAP II) in Nepal is supported by Denmark (Danida), Norway (Norad) and Germany (KfW), and it is implemented by the Alternative Energy Promotion Centre (AEPC) under the Ministry of Environment. The programme began in March 2007 and will continue until March 2012. A Joint Financing Agreement (JFA) was signed by the Governments of Nepal, Denmark and Norway on 15th March 2007 and by KfW 11 June 2010. The JFA includes contributions from Denmark of DKK 150 Million, from Norway of NOK 147.4 Million, from KfW of € 8.5 million, and from Government of Nepal of an amount equal to NPR 554 Million. The total budget for ESAP II equals about NPR 4.9 Billion.

A joint review of the Energy Programme Assistance Programme (ESAPII) was carried out in Nepal from November 29 to December 10, 2010. In accordance with clause 40 of the Joint Financing Agreement (JFA), the review was a joint effort of the ESAP II executing agency AEPC and the above mentioned development partners.

The Review Team (RT) composed of the consultants Wolfgang Mostert (team leader), Ms. Kanta Singh and Michael Linddal was selected and contracted by Norad. Geir Hermansen (Norad, Oslo) and Mike Speirs (Ministry of Foreign Affairs of Denmark, Copenhagen) participated in the review as observers.

The review was carried out according to the Terms of Reference prepared by the Royal Embassy of Norway and the Embassy of Denmark in Kathmandu with input/comments from AEPC. The RT carried out the review in Kathmandu with interviews of key stakeholders in the government, private and NGO sectors and during a field visit to Chitwan, Kaski, Syangja, Baglung and Tanahun districts. A list of persons met and sites visited is included in Annex 9: List of Persons met.

The RT wishes to express its thanks and appreciation to all concerned for kind cooperation and contributions. Dr. Narayan Prasad Chaulagain (Executive director of AEPC) and Niels Juhl Thomsen (Chief Adviser of ESAP) together with AEPC and ESAP staff contributed extraordinarily to support the review team. Inge Harald Vognild (First Secretary, Royal Norwegian Embassy, Kathmandu) and Shiva Paudyal, (Senior Programme Officer, Embassy of Denmark, Kathmandu) provided excellent support, guidance and insights during the review.

The findings and recommendations included in the review report are those of the RT and cannot necessarily be attributed to AEPC or the ESAP II development partners. The review report does not include any commitments on behalf of the ESAP II development partners.

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## Abbreviations

ADB	:	Asian Development Bank
AEPC	:	Alternative Energy Promotion Centre
ADDCN		Association of District Development Committee of Nepal
CA	:	Chief Adviser (ESAP II)
CBO	:	Community Based Organisation
CEF		Community Energy Fund
CRED	:	Community Rural Electrification Department
CREF		Central Renewable Energy Fund
Danida	:	Danish International Development Assistance
DEF		District Energy Fund
DEES	:	District Energy and Environment Section
DEEU	:	District Energy and Environment Unit
DDC	:	District Development Committee
ED	:	Executive Director (of AEPC)
EE		Energy Efficient
EoD	:	Embassy of Denmark
ESAP	:	Energy Sector Assistance Programme
FI		Finance Institution
GESI	:	Gender Equality and Social Inclusion
GMSI		Gender Mainstreaming and Social Inclusion
GoDK	:	Government of Denmark
GoN	:	Government of Nepal
GoNO	:	Government of Norway
IAP	:	Indoor Air Pollution
ICS	:	Improved Cooking Stove
IICS	:	Institutional Improved Cooking Stove
ISRES	:	Institutional Strengthening of Rural Energy Sector
IWM	:	Improved Water Mill
JFA	:	Joint Finance Agreement
KfW	:	Kreditanstalt für Wiederaufbau
kW	:	kilo Watt
LFI		Local Finance Institution
LPO	:	Local Partner Organisation
M&E		Monitoring and Evaluation

MG	:	Mini Grid (Micro/mini-hydro power based rural electrification)
MH	:	Micro Hydro
MHP	:	Micro Hydro Project
MIS		Management Information System
MoEnv	:	Ministry of Environment
MoEST	:	Ministry of Environment, Science and Technology
MW	:	Mega Watt
NEA	:	Nepal Electricity Authority
NEPQA	:	Nepal Photo Voltaic Quality Assurance
NFY	:	Nepali Fiscal Year
NGO	:	Non Government Organisation
NOK	:	Norwegian Kroner
NORAD	:	Norwegian Agency for Development
NPC	:	National Planning Commission
NPD	:	National Program Director
NPR	:	Nepali Rupee
PIU	:	Programme Implementation Unit
PV	:	Photo Voltaic
REF	:	Rural Energy Fund
REI	:	Rural Energy Investment
RET		Renewable Energy Technology
RETS	:	Renewable Energy Test Station
RNE	:	Royal Norwegian Embassy
RRESC	:	Regional Renewable Energy Service Centre
RT	:	Review Team
SEMAN	:	Solar Electric Manufacturer's Association Nepal
SHS	:	Solar Home System
SNV	:	Netherland Development Organisation
SOD	:	Strategic and Organisation Development Plan
SSHS	:	Small Solar Home System
SWAp	:	Sector Wide Approach
UNDP	:	United Nations Development Programme
VDC	:	Village Development Committee
WB	:	World Bank
WECS	:	Water and Energy Commission Secretariat
Wp		Watt Peak
ToR	:	Terms of Reference

## **Executive Summary**

ESAP II has achieved impressive results in terms of providing rural households with access to renewable energy and energy efficient (RE&EE) technologies. By December 2010, ESAP II has assisted the instalment of 191,000 improved cooking stoves (ICS), 157,000 solar home systems (SHS), 9,000 SSHS, and provided 63,000 households with access to electricity from mini-grids (includes households from MHP-projects presently under construction). This presents a higher level of annual installations than during ESAP I. ESAP II contributed to the formulation of Government of Nepal (GoN) policies for rural and renewable energy, including the national subsidy policy for RE and to getting RE incorporated in the Government's three-year development plans. ESAP II's pilot activities to promote credit finance of SHS and of MHP-projects by commercial banks have resulted in commercial credit finance of 3,000 SHS and 5 MHP-projects; the rational approach, which was developed and applied in the pilots, will yield an important expansion of commercial credits to RE in a few years.

Despite its success in the field, some warning signals indicate a need for a revision of implementing modalities. Annual sales of SHS have gone down since 2007, inter alia, because insufficient REF funds for subsidies turned the REF-subsidy into a market stopper. The subsidy rates for SHS can be reduced in accessible areas, taking into account that market prices for SHS have dropped. Annual sales of SSHS – the so-called Tukis expected to be the main lighting technology for reaching the poorest households – have remained at low levels. Reaching the poorest household requires a program approach that keeps upfront cash payments to a minimum by adding a credit to the REF-grant. The installation of new MHP-capacity (including the effort of the World Bank financed REDP-project) has remained below 5 MW per year, and turbine manufacturers have neither increased their capacity, nor expanded into new turbine technologies. The DDCs are indispensable collaboration partners in MHP- projects and the REF grant disbursement modality needs to be adjusted to the reality of DDC-cofinance of MHP-projects. The AECP/REDP District Energy Fund modality can provide some inspiration for this. Rural Energy Policy 2006 proposed the establishment of District Energy Fund at the district level and Community Energy Fund at the community level, suggestions which could not be included into the ESAP II framework due to various reasons.

In its focus on achieving the 122 outputs defined in the ESAP II program document, ESAP II paid insufficient attention to the objective of strengthening AEPC's institutional capacity; the process consultant aspect of the work was neglected. AEPC, on the other hand, has made insufficient efforts to institutionalize information and experience sharing between the managers of the programs executed by AEPC. AEPC needs to further enhance its capacity to manage the envisaged scaling-up of RE-activity in the country and the targeted implementation of a SWAp for RE. The capacity can be developed within the next 3 to 4 years through a concerted GoN and donor effort. ESAP II is in its remaining period to undertake a determined effort to assist the ED in this.

No socio-economic baseline had been prepared prior to or at the beginning of ESAP II to verify achievement of the Development Objective and later quantification and verification of impacts, e.g. changes in socio-economic conditions. However, the outputs of ESAP II produce significant impacts. The support to the SHS- and micro-hydro supply chains increased the number of qualified actors (competition has driven the service providers to move deeper into more remote regions in order to

maintain sales) and improved the quality of service delivery, including the provision of after-sales services. The bio mass energy sub-component promotes time saving, pollution reducing and fuelwood saving household devices. ESAP II strengthens the democratic process in Nepal at two levels: at civil society level and at local community level. The intensive stakeholder consultation process of ESAP's public-private-partnership implementation modality gives the involved business associations and NGOs direct influence on program design and modality. Villages having benefited from the services rendered by AEPC do believe that they are living in a country where the government takes care.

AEPC's Strategic Organisation Development (SOD) plan provides a relevant framework for AEPC in the future, although the recommended large expansion of staff is not be implemented fully until practical work experience justifies it. The donor community can accelerate AEPC's development by agreeing on the joint financing of the topping-up staff salaries to levels that reflect the salary scales expected to be introduced by a future autonomous AEPC. This will enable AEPC to contract staff of the needed quality. The topping up will be temporary, as AEPC, after the passing of the AEPC Act, will be able to move away from the restrictions imposed by public salary scales and can generate some funding resources to provide its staff more facilities to reduce the turn over.

The REF is one of the success stories of ESAP; it is now time for ESAP II to actively assist AEPC in preparing its planned transformation into the Central Renewable Energy Fund (CREF). As part of this effort, a management consultant review is to take stock of the continued effectiveness of ESAP administrative procedures for the processing of subsidy payments to identify areas where efficiency gains could be made without impairing the quality of the control over disbursements.

The following table provides the recommendations of the RT grouped by 11 major themes. Additional 'recommendation-type' observations found in the report serve "food for thought" purposes.

## ESAP II Review Recommendations – Process Action Plan

Recommendation	Recommended Actions	Time line	Responsibility
1. Implement a targeted capacity-building program to enable AEPC within a 3-4 years period to be able to manage a SWAp for RE	<ul style="list-style-type: none"> <li>Functional analysis of AEPC to identify core functions, core competences and resource gaps.</li> <li>Report to define salary scales for an autonomous AEPC and, from this, required donor topping-up payments till AEPC Act is passed</li> <li>Donor-community to agree on joint topping-up finance.</li> <li>Recruitment of staff according to SOD</li> <li>Transfer all existing and forthcoming ESAP monitoring data to the AEPC's M&amp;E system &amp;</li> </ul>	<p>ToR by Feb. 2011; completed May 2011; approved by AEPC Board June 2011 and endorsed by MoEnv</p> <p>ToR by Feb. 2011; completed May 2011; approved by AEPC Board and SC June 2011</p> <p>Recruitment from July 2011 onwards</p> <p>Transfer of ESAP data</p> <p>Functional not later than from July 2012</p>	ED with technical and logistical assistance from CA in preparation of ToR and in contracting consultants



	framework that is being established with WB assistance		
2. AEPC to impose its corporate image	<ul style="list-style-type: none"> <li>Transfer of operating responsibility of AEPC website from ESAP II to AEPC</li> <li>AEPC to prepare Annual Report covering all AEPC executed programs</li> <li>Introduce AEPC format for program identification on program vehicles, business cards.</li> <li>ED to hold monthly coordination and information exchange meetings between managers of ESAPII, REDP, REP</li> </ul>	<p>Early 2011</p> <p>First report prepared for Nepal fiscal year ending June 2011</p> <p>Early 2011</p> <p>Immediate</p>	<p>ED with TA from ESAP</p> <p>ED with TA from ESAP</p> <p>ED with TA from ESAP</p> <p>ED</p>
3. Prepare for a conversion of REF into CREF and the transfer of financial management responsibility in the Joint Finance Agreement	<ul style="list-style-type: none"> <li>Detailed analysis of legal and organisational options for CREF and of steps to transform REF into CREF without loss of staff continuity to be prepared by AEPC in close consultation with donor community</li> <li>Assessment of the fiduciary risks of a gradual transfer of financial management of development grants to AEPC, a specification by development partners of their requirements and performance criteria for transfer of responsibilities.</li> </ul>	<p>ToR for REF study, March 2011</p> <p>Draft report, discussed by RREDPF and endorsed if found acceptable</p> <p>Proposal for CREF endorsed by MinFin and MoEnv</p> <p>Financial Management report before May 2012</p>	<p>Secretary of MinEnv to take lead as Chairman of RREDPF.</p> <p>Donors in collaboration with MinFinance</p>
4. Review ESAP's administrative and subsidy processing routines to verify the potential for cost savings and reduced transaction costs.	<ul style="list-style-type: none"> <li>Management consult report reviewing ESAP II's administrative processes and detailing findings and recommendations</li> <li>Adjust ESAP II administrative procedures and manpower in light of recommendations</li> </ul>	<p>ToR and tender for contract March 2011</p> <p>Report discussed by SC June 2011</p> <p>Post July 2011</p>	<p>CA in consultation with ED</p> <p>CA</p>
5. Prepare a Road Map / Process Action Plan for the introduction of a SWAp	<ul style="list-style-type: none"> <li>Preparation of Road Map / Process Action Plan, based on the recommendations of the SWAp report prepared by ESAP II for AEPC in 2010</li> </ul>	<p>Draft road map by April 2011</p> <p>Road map workshop under auspices of RREDPF by May 2011</p> <p>RREDPF meeting on decision for next steps by June 2011</p>	<p>Secretary of MinEnv to take lead as Chairman of RREDPF</p>

<p>6. Implement GESI policy and the recommendations in the Gender and Social Inclusion Addendum on the best use of the funds that is allocated to gender and social inclusion in ESAP II, starting with the activities identified in output 7</p>	<ul style="list-style-type: none"> <li>• AEPC to take positive action in its recruitment policy to change the present over-representation of high-level castes</li> <li>• AEPC to recruit a gender expert to look after gender issues also in RRESC and activate gender focal person in DDC to look after gender issue in DEEU/DEES.</li> <li>• In areas where there are no MFIs, credit facilities with focus on the poorest of the poor should be established through the creation of a saving and credit fund.</li> <li>• Where there are savings cooperatives, disadvantaged members should be encouraged to access loans by introducing affirmative action such as reduced interest rates and increase in the number of installments.</li> <li>• Carry out an assessment of progress on gender and social inclusion in order to establish a baseline for the next programme.</li> </ul>	<p>Definition of practical steps for affirmative action in recruitment by April 2011.</p> <p>By May 2011</p> <p>Paper on options and identifying potential collaboration partners that are active in this area by July 2011</p> <p>Paper outlining the practical feasibility of this approach by July 2011</p> <p>By May 2012</p>	<p>ED to take lead, ESAP II support</p> <p>ED</p> <p>ISRES credit officer</p> <p>ISRES credit officer</p> <p>AEPC gender officer assisted by ESAP</p>
<p>7. Support AEPC to further strengthen the collaboration with DDCs towards empowering DDCs to effectively carry out decentralized planning and management of rural energy sector</p>	<ul style="list-style-type: none"> <li>• AEPC to agree with REDP to turn all DEESs into DEEUs (with REDP continuing to separately financing its GSI experts at its DDCs and its community mobilisers) and with the DDCs to take over full responsibility for all by 2015.</li> <li>• Establish clear collaboration procedures for the interaction between the work done by the DEEUs and the RRESC.</li> </ul>	<p>Agreement to be reached as soon as possible early 2011</p> <p>Draft manual for discussion, May 2011</p> <p>Discussed by SC and adopted by ED, June 2011</p>	<p>ED</p> <p>ED with TA from ESAP</p>
<p>8. Improve the sustainability of MHP-power projects and streamline the regulatory procedures for pico-, micro- and mini-hydro</p>	<ul style="list-style-type: none"> <li>• Define REF modality for REF-grant &amp; DDC loan/equity co-finance of approved MHP-projects through District Energy Fund</li> <li>• Link monthly amortization payments by Community on DDC-finance to DEF commitment to finance major repairs during project lifetime</li> <li>• AEPC position paper on the</li> </ul>	<p>Joint REDP/ESAP workshop to discuss operational consequences to be drawn from two WB-studies, March 2011</p> <p>AEPC/REF modality paper May 2012</p>	<p>ED with REF and ISRES</p> <p>Secretary of MinEnv to take lead assisted by, TA from</p>

	required streamlining of regulatory procedures for pico-, micro- and mini-hydro, including the recommendation to lift the size of DDC approval authority of pico-HP from 5 to 15 Kw.	Position paper by May 2011	AEPC Counterpart & MHP component manager
9. Reduce SHS subsidy levels and adjust the REF subsidy delivery mechanism for SSHS	<ul style="list-style-type: none"> <li>Reduce REF subsidies to SHS by minimum 2,000 NPR to better equate demand for grants with available funds and to take drop in SHS market prices into account</li> <li>Prepare the introduction of a specific SSHS promotion program to satisfy very basic lighting needs of the poorest households</li> </ul>	<p>Paper for approval by MinEnv February 2011; decision by Government March 2011, in force July 2011,</p> <p>Program to be ready for implementation by mid-2012</p>	<p>ED with TA for justification by ESAP</p> <p>ED with TA for justification by ESAP</p>
10. ESAP to undertake reallocation of ESAPII budget lines for remaining work program and expand ESAP II to June 2012	<ul style="list-style-type: none"> <li>Preparation of a budget balance with actual expenditures and set-aside commitments for each output and proposal for a revised budget allocation.</li> <li>No-cost extension of ESAP II from March to June 2012 to align ESAP II with the GoN Financial Year from 2012.</li> </ul>	<p>Next SC meeting (before March 2011)</p> <p>Proposal by Embassies of Denmark and Norway and AEPC approved by SC before March 2011</p>	<p>ESAP II in collaboration with AEPC ED prepares a proposal.</p> <p>SC approves.</p>
11. Recommendations for next program	<ul style="list-style-type: none"> <li>A collaborative design process for a new program is to be launched as soon as possible in 2011. The program is to be based on the principles of joint assistance and aligned to government policies in the sector.</li> <li>Prepare a lessons learned study of ESAP II that can will be a status assessment and contribute to the programme completion report</li> <li>Prepare a baseline for the impact monitoring of the next programme phase.</li> <li>It is recommended to find a new name for the program to underline the break with the past. A potential name could be 'Energy for Rural Transformation'.</li> <li>Subject to confirmation by the program preparatory process, the program is to be structured differently from ESAP II. The CA could act as direct advisor to the ED (not as independent program administrator) along with a small team of temporary consultants whose responsibility it is to build the capacity of specific specialised staff in AEPC. The management of the MHP, solar and biomass programs could be outsourced by AEPC to three different NGOs/consultant firms. REF will gain semi-autonomous status as CREF (with present REF staff hopefully remaining as CREF staff); some temporary program advisors will be attached</li> </ul>		<p>Design phase coordinated by Rural and Renewable Energy Development Partnership Forum</p>

	<p>to build its multiple finance instruments capacity.</p> <ul style="list-style-type: none"><li>• Subject to confirmation by the CREF legal structure/organisation report and the fiduciary review report, CREF is to be ring-fenced from AEPC's executing functions (arms length relationship) and the high quality of REF's monitoring and control system for grant disbursements is to be maintained.</li><li>• Reviews of the post-2012 program are to include a review of the price and quality of completed consultant reports</li><li>• An option for the post-2012 program modality to explore is to abolish the Steering Committees and have the Board of AEPC perform the SC-function.</li><li>• One new activity that may be added is an innovation support program to strengthen the capacity of the national supply chains, in particular the micro-hydro turbine manufacturers.</li></ul>	
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## **1 Introduction**

### **1.1 Objectives of the Review**

The overall purpose of the review is:

- (i) To assess the programme performance against the target;
- (ii) To give the foundation for a decision based on possible corrective measures for the rest of the programme period; and
- (iii) To obtain information and advice with regard to the preparations of a possible new rural energy programme after the completion of ESAP II.

The review shall assess the progress of ESAP II, including assessment of the follow-up actions and the present relevance of the recommendations of the November 2008 mid-term review.

### **1.2 Methodology**

The review is based on:

- a thorough review of the key documents that have been produced by ESAP II (and of relevant documents produced by other donor-supported programs executed by AEPC);
- a self-assessment by ESAP II managers of the status quo with regard to achievement of outputs according to an evaluation matrix provided by the RT;
- stakeholder interviews comprising senior officials in Government, AEPC and ESAP staff, the managers of the other donor-supported programs executed by AEPC, staff from the regional renewable energy service centers and from the District Energy & Environment Units (DEEUs), representatives from the service providers and manufacturers, donor representatives and last, but not least, individual final beneficiaries – households having received improved cooking stoves, solar home systems and electricity from small village-community owned mini-grids attached to a micro-hydro power plant.

The interviews are top-level biased since the final user groups are underrepresented. Although not ideal, within the time constraints of a two weeks mission, the emphasis can be justified by the focus of the review on processes, instruments and donor harmonization and alignment.

### **1.3 Structure of the Report**

The structure of the report follows the lay-out defined in the TOR; except for a couple of marginal changes accepted by Norad.

Chapter 2: “Political Economy Context” provides a brief introduction to the political and economic environment under which ESAP II operated.

Chapter 3: “Description of ESAP II” gives a short overview of objectives, components, outputs and management.

Chapter 4: “Assessment of Performance and Achievements” assesses the status quo against the evaluation benchmarks of efficiency, effectiveness, impact, relevance, sustainability, risk management, financial management and audit, and anti-corruption measures.

Chapter 5: “Review Questions and Themes” offers a more in-depth look at the key challenges for ESAP II: (i) AEPC organisational development and institutional capacity; (ii) decentralisation and impacts on democratic process; (iii) coordination with grid electrification, (iv) harmonisation and alignment; (v) maximisation of socio-economic impacts: gender equality & social inclusion, promotion of productive uses; (vi) finance mechanisms – subsidy mechanisms and credits; (vii) climate change.

Chapter 6: “Findings and Recommendations” summarises the Review Team’s (RT) findings from chapters 4 and 5 structured by results and impacts; processes, management and implementation; instruments; and provides the RT’s recommendations for the remaining period of ESAP II and for its follow-up program.

The report content is structured to avoid repetition of text. The draw-back is some interruption in the logical flow of the arguments from observations to findings and to recommendations.

The start of an individual topic is indicated by an underlining serving as “header”. The careful reader will recognize some of these from the checklist of questions posed in the TOR.

## **2. Political Economy Context**

The implementation of ESAP II took place in a difficult political environment. After the peace accord in 2006, elections were held in April 2008 for a special assembly to draw up a new constitution and to form a government. 24 political parties ended up being represented in the Constitutional Assembly.

The sharing of power between the Prime Minister and the President as well as between the parties in the coalition Government proved to be unstable. The integration of earlier Maoist insurgence into the army and the shape of the Federation (some want ethnic states, others do not) were and are other issues of contention. There has been a mushrooming of political parties and of groups pressing ethnic and regional agendas. In turn, this has led to a gathering backlash against federalism and programs for political inclusion, such as quotas and reservations. Nepotism and party bias in appointments undermine state institutions. The Constitutional Assembly has set up 11 thematic committees to draft new legislation. Unfortunately, some of these committees have drafted parallel (and irreconcilable) laws, leaving key issues unresolved. An adoption of a Constitution by the next deadline of May 2011 is not yet in sight.

The political situation affected AEPC negatively in, above all, three ways.

Firstly, changing Government coalitions led to changes of the AEPC-ED undermining the stability of the position. The first AEPC ED served from 1996 to 2000, the second from 2000-2006, the third, Dr. Govinda Raj Pokharel, from 2006-2008; the present ED, Dr. Narayan Prasad Chaulagain, has been in office for only 2 years now.

Secondly, since 2002, there are no elected officials at the local bodies, and AEPC has to work with party representatives and government employees at district and village levels.

A further factor which influenced ESAP's operating modality is concern about Government corruption.<sup>1</sup> The concern - about corruption in general, not AEPC in particular - led Danida/ESAP to introduce complex bureaucratic application, monitoring and control procedures in the administration of its funds and to introduce dual ED-CA signature of expenditure. As a consequence, ESAP is managed more as a project rather than as a support programme.

Out of Nepal's total population of around 28 million, currently about 2 million Nepalese (youth) are working abroad. Due to the strong dependence of the national economy on remittances from abroad - Nepal receives more than 100 billion NPR per year in remittances, amounting to some 20 percent of GDP - the political situation did not have a major negative impact on the purchasing power of the population.

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<sup>1</sup> In its report Nepal's political rites of passage, Asia Report N°194 of 29 September 2010, the International Crisis Group provides the following characteristic of corruption in Nepal: "In the patron-client system there is no incentive to clamp down on corruption. The state is more flexible than fragile. It endures - and has survived the conflict surprisingly unscathed, and unreformed. This is partly because its own raison d'être is not serving citizens so much as servicing the needs of patronage networks and keeping budgets flowing and corruption going."

The remittances impact the financial system in the form of high credit growth, finance a high level of imports and boost foreign exchange reserves while having an indirect impact on tax revenue growth. There is statistically significant correlation between remittances and decline in poverty: a study done by Nepal Living Standard Survey on the contribution of remittances in reducing poverty between 1996 and 2003 showed that they led to a reduction in poverty by 11 percentage points between 1995-96 and 2003-04. The proportion of households receiving remittances increased from 24 per cent in 1995-96 to 32 per cent in 2003-04; and as remittances continued to grow at 10-30 percent per year in the following years, the share of households receiving remittances must have gone up since then.

Whereas the implementation of isolated mini-grid systems connected to micro-hydro power plants depend on collective decision taking by local communities, the penetration of most other AEPC-promoted technologies – biogas, solar home systems, improved cooking stoves – depend on decisions by individual households and thus, on household purchasing power. In the near-absence of credit facilities in rural areas, this means access to cash. The low average annual per capita income of USD260 – and lower in rural areas – would normally have posed an obstacle towards the expansion of annual sales, above all for solar home PV-systems (SHS). But, because emigrant workers come from all communities of Nepal, the cash-flow from remittances has penetrated into all areas.



## 3 Description of ESAP II

### 3.1 Objective and Components

The development objective of ESAP II is to *“Improve the living conditions of the rural population by enhancing their access and affordability to rural energy solutions that are efficient, environment-friendly and socially justifiable.”*

The immediate objectives of the ESAP II components are:

1. Coherency in policy and coordination for delivery of rural energy services with focus on decentralisation and private sector
2. Alignment of national and external development partners to the national rural energy sector policy and institutional framework
3. Relevant institutions are capable to coordinate, develop, implement, and monitor rural energy policy/programmes

ESAP II is designed with the following three components:

1. Institutional Strengthening of Rural Energy Sector, ISRES (only Denmark); to promote coherence and coordination of policies for rural energy supply
2. Rural Energy Investment: Rural Energy Fund (REF) (GoN, Norway, Denmark and Germany); to promote access to and affordability of renewable energy solutions in rural areas
3. Technical Support within Biomass Energy, Solar Energy and Mini Grid Electrification (Norway and Denmark) to provide technical support for the development and implementation of renewable energy solutions

### 3.2 Outputs and M&E

The three ESAP II components are divided in 32 outputs with 122 sub-outputs, see Annex 2, which shows the status of target achievement at the time of the review (December 2010).

The Gender and Social Inclusion Addendum of November 2010 adds the following outputs to the list of ESAP II outputs: (i) Gender and Social Inclusion (GESI) criteria mainstreamed in mini-grid implementation; (ii) Increased plant utilization and economic end-use of electricity; (iii) Professional management and efficient operational practice of implemented mini-grid schemes; (iv) Rural livelihoods improved through IWM.

Progress in ESAP II is measured according to systems installed of ICS, SHS and mini-grids (see Annex 1 for the status as of end-November 2010). There is no integrated M&E across technologies, programmes or to capture socio-economics impacts. Technology specific impacts studies have been prepared by consultants.

### **3.3 Inputs (budget)**

The total budget for ESAP II is NPR 4.9 Billion of which GoN provides 11 %, KfW 16 %, Norad 35 % and Denmark 37 %). An overview of the ESAP II budget, disbursement and expenditure is provided in Annex 4.

### **3.4 Management: Implementation and Programme Steering Committee.**

ESAP II is implemented by a Chief Adviser (CA) and 46 staff.<sup>2</sup> The implementation modality was designed as a project based approach due to the difficult circumstances of implementation in Nepal. This has led to insufficient management responsibilities – as executing agency - being transferred to AEPC.

The Programme Steering Committee is functional and meets quarterly as requested in the JFA.

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<sup>2</sup> The total number of positions, including the CA amounts to 47; currently, 44 are employed, including the CA. Out of the total employed, Male : 31 (Incl. CA) Female: 13

## 4 Assessment of Performance and Achievements

### 4.1 Efficiency

At the macro-level, efficiency can be defined as the ratio of the effective or useful output to the total input in ESAP II. The same yardstick can be used at disaggregated level per individual component or sub-component.

Output achievement. The target ratio between expected outputs and inputs is given by the program document for ESAP II which defines the outputs to be achieved and assigns the total inputs in the form of the budget envelope overall and by component. Annex 1 shows the status quo early December 2010 for the goal achievement at end-user level showing the original quantitative targets as well as the revised targets approved by the Steering Committee in 2010.<sup>3</sup>

The status, after 32 months (67 %) of the ESAP II implementation, shows the highest achievement of the adjusted end-of-programme target by the installation of 157,000 solar home PV-systems (SHS) (73 %) followed by the installations of 191,020 mud-brick improved cooking stoves (ICS) (63 %). The other outputs, including the commissioning of 2.5 MW of micro-hydro based mini-grids (MHP), 3,050 metallic stoves and 9,000 small solar home PV-systems (SSHS), are at less than 20% of their quantitative end-of-programme target.

ESAP II's performance has been strong in building on the well-functioning delivery modalities for SHS and ICS that were established during ESAP I. ESAP II has under-achieved so far in the introduction of new single-user technologies, institutional systems, and in organizing new community based MHP-schemes. The *lack of progress in metallic stoves* can be ascribed to the time lag in getting a new delivery modality in place; the programme took long time to finalise the modality. The *low consumer response to the SSHS* reflects the difficulty in designing an appropriate subsidy disbursement modality for an easily movable product (the subsidy to SHS is dependent on photo-documentation of its instalment on the house of the recipient household), lack of interest of solar companies in pushing a product yielding very low profits, as well as the difficulty low-income households face in providing the upfront cash payment of around 2,000 NPR.<sup>4</sup> The *slow progress in MHP-instalments* is due to several factors; including the increase in the prices of materials, equipment and the cost of transportation. The subsidy contributes around 50% of the total cost of MG-projects, the remaining amount has to be born by HHs/community, which face difficulties in this due to low income and the absence of bank credits. It takes long time to arrange the rest-finance and this leads to slow progress. But the figures for ongoing construction and for completed feasibility studies for new schemes point to an acceleration of MHP-implementation during the remaining phase.

<sup>3</sup> The revision of the quantitative targets was required to reflect the financing gap in the ESAP II, which was designed with a funding gap of NPR 15.559 Million from development partners. The recent additional grants from KfW and Norad will cover 69% of this 'planned' funding gap. More realistic information on the demand response to new technologies in the market – e.g. the SSHS - also called for adjustment.

<sup>4</sup> AEPC developed the strict procedure for subsidy disbursement including recommendation from VDC and DDC before coming to AEPC/REF for subsidy.

The question is how much catching-up can be expected during the remaining period? Annex 2 shows the self-assessment of the ESAP II of the result achievement for each of the 32 outputs and 122 sub-outputs that are defined in the programme document. The ESAP II component managers were asked to prepare a self assessment of the progress of the programme. For each of the 122 sub-outputs a score was assigned from 0 to 5 (equal to a scale from 0% to 100 % target achievement) for progress in December 2010 and expected progress achievement in March 2012 at the planned completion date of ESAP. The managers were asked to assign weights to each component, output and sub-output to reflect their relative importance within ESAP II. According to ESAP's estimate, the weighted rate of achievement of ESAP II until now (December 2010) with regard to the expected results is 62 % (score of 3.1). ESAP II expects that the programme will catch up, reaching an achievement rate of 92% (score of 4.6) by March 2012. The break-down by component shows the following scores:

- Component 1 "Institutional strengthening of the rural energy sector" = 3.4/4.5;
- Component 2 "Rural Energy Fund" = 3.0/4.8;
- Component 3.1 "Biomass energy" = 3.3/3.4;
- Component 3.2 "Solar energy" = 4.1/4.3;
- Component 3.3 "Mini-Grid Rural Electrification" = 3.9/4.0.

The first score is the achievement in December 2010. If the number was 5.0 the implementation would have been according to schedule. The second score is what the expected achievement at the end of ESAP II. It can be noted that while component 3 sub-components will more or less be at the same level of achievement as now, it is expected that there will be a leap for both component 1 and 2.

Results reporting. ESAP II has a good output monitoring of results for each of the technologies. A key element in the monitoring is the sampling of after-sales verifications of solar home systems (10%) and the verification of all MHP-projects. But there is no integrated monitoring system for the entire programme. Due to remoteness it is a costly affair to monitor on site and to do follow-up verification.

Program management and administrative efficiency. ESAP is well managed. The technical and administrative staff perform well. The dense programme of visits prepared for the RT is an eloquent illustration of ESAP's logistical capabilities. The impressive speed of response by ESAP staff to requests for information during the RT's visit proved the quality of ESAP's MIS. The quality of the REF's systems for reporting, monitoring and disbursement is recognized by stakeholders in Nepal and is undergoing ISO-certification. AEPC as executing agency, however, has expressed concern about what is seen as an excessive number of ESAP staff;<sup>5</sup> about the length of ESAP's processing time during the project cycles, in particular for micro-hydro projects, and about the amount of paper work involved in the processing of subsidy payments throughout the project cycle. It is not possible for the RT team to judge the extent of "fat" in ESAP's organisation; the short time for the review did not allow for an in-depth review of job descriptions and work routines. Compared with the number of staff in

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<sup>5</sup> As indicators, AEPC points to ESAP staff studying in universities and some managers doing consultancy work. However, allowing staff to take time off to do consultancy work (2-3 weeks consultancies) is a means to spread best practice; and was approved by the ED.

REP and REDP, the 44 staff employed in ESAP do not a priori appear to be excessive<sup>6</sup>; the complexity of ESAP's administrative processes can to a large extent be justified with the need to avoid deviation of funds in a country that suffers under high levels of corruption<sup>7</sup>. On the other hand, any successful organisation or long-term program risks becoming stuck in its routines. A critical stock-taking look from a well-qualified management consultant at the administrative and processing routines of an organisation is useful to test in-grown assumptions and bring to light alternative, more cost-effective approaches. ESAP would benefit from such a review as a means to identify adjustments that can increase productivity and to eliminate suspicions of inefficiencies that turn out to be unfounded.

Efficiency of programme modalities. Slow progress in micro-hydro based electrification indicates weaknesses in the approach to implementation.<sup>8</sup> According to ESAP II, the slow realisation of approved projects (from 6 months to 5 years) is due to low private sector capacity to deliver timely service delivery: projects take a long time to complete as some companies have more projects than they can support and face limits in the number of skilled staff for installation: trained installers go abroad in search of better paid jobs.<sup>9</sup> Representatives from the private manufacturers and installers point to ESAP's dual contract approach as one source for delays. ESAP supported MG-projects are not implemented through turn-key contracts. The single contract tendered by the community user committee concerns the electrical and mechanical works only (signed with a turbine manufacturer). The community attempts to carry out the civil works itself (the community provides labour and purchases the required cement) under the supervision of the installer from the micro-hydro manufacturer. The latter is paid the REF subsidy directly by REF. Due to the separation for the contractual responsibility for the civil and for the mechanical/electrical works, the micro-hydro manufacturer may find, that the civil works are not completed, when it delivers its contracted equipment to the site for installation. That may impact his ability to be released from the bank guarantee for the first subsidy payment.<sup>10</sup>

Comparative analysis of REDP and ESAP II modalities for micro-hydro. The Rural Energy Development Program (REDP) started in 1996. UNDP has since then provided USD10 million to the project; the World Bank has since 2003 provided a further USD21 million. REDP has supported the electrification of some 300 villages. REDP applies an intensive and extensive approach to the "social mobilization" of a community which has been selected for a MHP-project; ESAP II applies a lighter "social facilitation" approach. ESAP II considers that its approach is faster (some projects took only 9 months to complete) and that 60-70% of projects in recent years have been implemented by ESAP; the

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<sup>6</sup> REP had a staff of 50 staff in the beginning and is downscaling now to 20, as social mobilisation (by REP field staff) has been completed and the activities now focus on testing and commissioning. The REDP has 17 staff (13 men, 4 women) at the Kathmandu office and 119 staff (94 men, 25 women) at DDC/VDC level.

<sup>7</sup> Nepal is number 10 from the bottom on Transparency International's corruption index

<sup>8</sup> One should note that the implementing achievement of ESAP II has been higher than of ESAP I, which during 7 years completed 153 mini-grid projects totalling 1.9 MW whereby 20,000 households were electrified. Between 1996 and 2009, REDP installed 267 micro-hydropower grid systems, with a combined capacity of 4.5 MW.

<sup>9</sup> The loss of skilled staff is a concern for the Hydropower Association in Nepal.

<sup>10</sup> Subsidy Delivery Mechanism 2010: "30 to 60 percent of the estimated subsidy amount will be released to the project developer against an Advanced Payment Bank Guarantee (APBG) after final approval from REF upon submission of the agreement made between qualified project installer and operator and other necessary documentation with proof for subsidy. ... The bank guarantee for advance instalment will be returned after supply of material and equipment to the project site and upon hand-over of material to the developer as per the agreement."

REDP is equally convinced of the superiority of the REDP modality and points with pride to the fact that ESAP over time has taken over several aspects of the REDP-modality such as including the promotion of productive uses in the implementation package for a project.<sup>11</sup> Together ESAP II and REDP have managed to install less than 3 MW of new capacity per year.<sup>12</sup> Two consultancy studies presently under preparation by the World Bank/UNDP financed REDP may shed some light on the relative efficiency of AEPC's two approaches/modalities to micro-hydro development; one study looks at the comparative sustainability of MHPs in Nepal supported by REDP and ESAP-; the other at ways to have common modality for MHP in Nepal.

Ability to innovate. Innovations introduced by ESAP II concern the introduction of new technologies and the testing of new implementing modalities:

- Different types of improved cooking stoves (ICS) to suit the ecological condition have been designed and are promoted by AEPC through ESAP: mud stoves for household use, larger mud-stoves with metal chimneys for road-side restaurants and metal stoves and gasifiers for higher altitude use. The mud stove is the most popular and has been in great demand and in use without need for support by a per-system direct subsidy.
- In its quest to identify the most appropriate structures for decentralised service delivery, ESAP II has tested the use of the DEES in Darchula as service centre (to support ICS-promotion only) as an alternative to its conventional regional service centre approach.
- To accelerate the identification and implementation of micro-hydro schemes, ESAP II has tested a so-called 'carpet approach' for the identification and planning of micro-hydro development. GIS-analysis (population map, water resources map, etc) is used to identify potential sites in a region, then micro-hydro experts and mobilisers are sent out to promising communities.

Contracting of consultants for strategy studies. Contracting national consultants costs less per manday than contracting foreign consultants and strengthens local consultant know-how through the learning-by-doing process that results from any analytical assignment. However, ESAP-staff experienced lack of competent consulting firms to perform specialised tasks, studies, assessments and research according to ESAP standards. This increases the work volume vis-a-vis in-house human resources. A simple, cost-efficient solution is to insist on the inclusion of foreign specialists as (home office) peer reviewers and providers of inputs to methodology.

Status of 2008 Review. A mid-term review of ESAP II was carried in November 2008. The Review Aide Memoire included eleven recommendations. By not being sufficiently specific on required actions and by whom, they caused a certain uncertainty in ESAP about how to respond. The review's findings

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<sup>11</sup> Other differences relate to the emphasis on productive use enhancement (discussed under "impacts"), the involvement of DDC/VDCs in project preparation and implementation (discussed under "decentralization"). Also, for site approval, REDP requires that the stream can support 12 months of operation, ESAP requires 10 months only.

<sup>12</sup> The previous GoN had a 25 MW per year target announced in its '1000 micro-hydros for an installed capacity of 100 MW for 1000 villages electrification within four-years' goal statement. In its budget announcement of 2010/2011, The present GoN announced massive promotion of MHPs with involvement of the local bodies and maximum utilization of local investment and provided additional funding of NPR 550 million budget (around 5.5 Million Euro) for that.

about the staffing situation were used to justify an expansion of the ESAP staff.<sup>13</sup> One recommendation was for the AEPC Executive Director (ED) to take responsibility of program level management and that a gradual transfer of management responsibility should be made at component level “in accordance with a new organisational structure and with a programme and a timeline for its implementation to be presented to the ESAP SC for approval”. The SC approved a note on JRT 2008, which included the recommendation of immediate day to day management by ED and gradual transfer of components to AEPC senior staff. The recommendation is not clear: the “transfer of component” cannot concern the taking over by AEPC staff of the day-to-day work on implementation since AEPC is an executing, not an implementing agency. Another recommendation was that AEPC and ESAP should start a process to clarify the future implementation strategy with a focus on the end-of-programme situation. The Strategic and Organisation Development (SOD) report of 2010 can be seen as providing some of the answers to this. AEPC with input from ESAP II staff prepared a note with a status of the follow-up to the 2008 review recommendations, which is shown in Annex 3.

Joint Financing Agreement: The partners (Norad, Danida and KfW) together with the Government of Nepal have signed the Joint Finance Agreement (JFA), which provides an efficient and functional framework for collaboration on ESAP II. In the JFA, the “donors have committed themselves to the principles of harmonisation and to strive for the highest degree of alignment with the budgetary and accountability system and legislation of the Government of Nepal so as to enhance effective implementation, reduce the administrative burden of the Government of Nepal and minimise transaction costs” (clause 4). The JFA also notes (clause 12) that the “AEPC on behalf of the Ministry of Environment ... will be responsible for the day-to-day implementation of ESAP II and for the management of the financial contributions of the donors”. It is agreed that “the donor contributions will be channelled to a common interest bearing foreign exchange account indicated by the Ministry of Finance through the AEPC” (Clause 21).

The agreement to align with the GoN financial system for the transfer of funds to ESAP II has not been complied with completely except for KfW that uses the GoN system for transfer of funds to the REF. Norad and Danida provide a nominal transfer through REF from separate ESAP accounts. This is the only major deviation from the JFA for Denmark and Norway.

The agreement on four annual Steering Committee (SC) meetings is fulfilled. Twelve meetings were held between March 2007 and September 2010, which is an average interval of less than four months. The ESAP II PD requested a minimum of two annual SC meetings; the JFA changed the frequency to

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<sup>13</sup> At the time of the review, ESAP had 29 staff while AEPC was providing 34 staff on part time basis corresponding to what was anticipated in the Program Document. The 2008 review recommended an expansion of ESAP staff: “The number of regional centres increased from four in ESAP I to eight in ESAP II. Some of the newly contracted NGOs for the regional centres have had difficulties in following the guidelines of the ESAP program and had been demanding a lot of work of the ESAP staff to provide training and to give ad hoc advice. Supporting and guiding the NGOs on their new role which include interacting with both local authorities, private companies, and communities demands extra work and seen in relation to the ISRES component other activities, the JRT can support ESAP's demand for additional staff to support the Regional Centres. The capacity of ESAP organization to process Subsidy Application Forms and project proposals has been a bottleneck. The demand for staff to undertake these tasks has exceeded the estimates in the Program Document. This gap has been overcome by including consultants. The regular as well as the consultant staff is paid through ESAP funds. As it is not convenient to have staff doing the same work hired under different contracts the JRT can support ESAP's demand to adjust manning schedules for these activities.”

quarterly. The JFA notes that the “minutes will be drafted by the AEPC” (clause 26); currently the minutes are drafted by ESAP and sent by AEPC to SC members.

This review is carried out as a joint review in accordance with clause 40 of the JFA.

The JFA has proved to be an effective framework for agreeing among the development partners when to be part of ESAP. There are good lessons for an update of the JFA for the next phase of a Rural Renewable Energy programme.

GoN contributions. The *contribution in-cash* by GoN to the REF is according to the PD expected to be NPR 554 million in cash and NPR 42 million in kind. By November 30, 2010, GoN has disbursed NPR 217.9 Million to REF or 29% of the commitment. A reason the disbursement rate is not higher is that requests for transfers has not been made, since the REF had a large balance allocated due to advance payments by the donors. . AEPC/GoN transfer the matching fund based on actual expenditure in REF. *The GoN in-kind contributions* according to the Programme Document (PD) of ESAP II are “the professional staff; support staff, office space for the technical assistance team and local short-term consultants assigned to the component, salary of counterpart staff and other recurrent funds such as utility, which is estimated at EUR 0.18 million” (Programme Document, p.35). The office space of AEPC is on rent and AEPC is contributing expenses related to office, regular electricity, telephone etc.. The human resource contribution by AEPC to ESAP II is outlined in table 6.1 (p.62) of the PD. The expected AEPC input is about 300 person-month (pm) of professional support and about 500 pm of management and support staff. .

From the above it is clear, that ESAP II’s efficiency measured at the macro-level has been satisfactory: the programme delivers the targeted results on the ground. Chapter 5 takes a closer look at the efficiency of ESAP II’s performance in the critical strategic areas of “institutional development and capacity building of AEPC”, “sector wide approach in the renewable energy sector / donor coordination and alignment”, “decentralization (the efficiency and sustainability of the Regional Renewable Energy Service Centres and the integration of ESAP II activities in DDCs’/VDCs’ planning)”, “access to credit for the financing of renewable energy technologies”.

## 4.2 Effectiveness

Effectiveness concerns the degree to which objectives are achieved and the extent to which targeted problems are resolved.

To what extent will the overall objectives be reached?

The development objective of ESAP II is: “*Improve the living conditions of the rural population by enhancing their access and affordability to rural energy solutions that are efficient, environment-friendly and socially justifiable.*” The massive scale and reach of ESAP II has resulted in a wide range of beneficiaries getting access to renewable energy technologies - ICS, SHS and MPH - in rural areas. They improve the living conditions of the beneficiary populations.

The immediate objectives of the ESAP II components are: *Regulatory and institutional arrangements are in place, technological solutions are available with quality assurance according to income strata, and*



*credit facilities are available to promote investments.* The ICS, SHS and MPH dissemination results are commented above. Here a look is taken at the immediate objectives of ISRES. (i) *Coherency in policy and coordination for delivery of rural energy services with focus on decentralisation and private sector.* At the rural energy policy level, ESAP II has assisted AEPC in getting the promotion of renewable energy incorporated in GoN/NPC's three Year Plans and has provided key inputs to the preparation of a number of draft Acts, regulations and bylaws. . Due to the past and current political deadlock in Nepal, there has been limited progress on the coordination of rural energy delivery. . But progress is emerging with the establishment of the Rural and Renewable Energy Development Partnership Forum. (ii) *Alignment of national and external development partners to the national rural energy sector policy and institutional framework.* There has been good progress in developing the REF and use this as funding vehicle for subsidies to rural renewable energy technologies (RET). (iii) *Relevant institutions are capable to coordinate, develop, implement, and monitor rural energy policy/programmes.* There has been limited institutional development of AEPC or of other GoN institutions. For example, the capacity building at local level i.e. support to DEEU/S in 72 districts is done by AEPC/GoN and UNDP. Finally, credit facilities have been made available at pilot project level.

Baseline study. Brief feasibility assessments were carried out for the three technologies (biomass, solar and hydro) at the beginning of ESAP II. There is no base line carried out of the socio-economic data to verify achievement of the Development Objective for later verification of impacts, e.g. changes in socio-economic conditions. The ESAP II PD does not mention such baseline or how to access progress in the development objective. Monitoring is done to establish the number of systems delivered. The monitoring also includes after sales services that is part of the subsidy scheme. The activities under the Gender and Social Inclusion Addendum will mobilise the RRECs to obtain comprehensive disaggregated information on GESI. It would be relevant towards the end of ESAP II to carry out a baseline or an assessment of progress in order to establish a baseline for a next phase of a rural renewable energy programme.

To what extent have inputs, outputs and activities contributed to the overall objectives of the programme? The ESAP II contributes efficiently to the countrywide distribution of RETs. The availability of REF grants and technical support provided the required inputs for the delivery of the targeted outputs. There is a weak link between the delivery of renewable energy technology and documentation of the achievements of socio-economic impacts. The link between the good delivery of outputs and impacts on the achievements of the development objectives is incidental though likely. More emphasis on the impacts of the programme, for example, on gender and social inclusion, could add further guidance on future implementation modalities and subsidy mechanisms.

ESAP's project-based approach and management style are a result of years of difficult implementation conditions due to the influence of the conflict in Nepal on governance structures. ESAP II is a programme which is implemented as a project. The unfortunate outcome is that ESAP because of this approach delivers less than expected towards the institutional development of AEPC.

Achievements by technical components in reaching target groups taking into account gender and social exclusion issues? Reaching the poorest of the poor is difficult<sup>14</sup>, see section 4.5 "Gender and Social Inclusion" and 4.6 "Subsidy and Credit Finance". Although the mud-brick ICS achieves very high penetration rates in the communities, where it is promoted, the poorest of the poor may not afford the

<sup>14</sup> According to the ESAP II program document, the poorest of the poor are not the key target for the program.

small payment to the installer. Micro-hydro projects seem to achieve a 100% penetration rate in the beneficiary community. In solar energy much hope had been placed on the ability of the SSHS to penetrate into the poorer strata of the population; but so far results have not been encouraging.

### **4.3 Impact**

Impacts concern the tangible and intangible effects (consequences) of one entity's action or influence upon another.

Baseline study. Brief feasibility assessments were carried out for the three technologies (biomass, solar and hydro) at the beginning of ESAP II. There is no base line carried out of the socio-economic data to verify achievement of the Development Objective for later verification of impacts, e.g. changes in socio-economic conditions. The ESAP II PD does not mention such baseline or how to access progress in the development objective. Monitoring is done to establish the number of systems delivered. The monitoring also includes after sales services that is part of the subsidy scheme. The activities under the Gender and Social Inclusion Addendum will mobilise the RRECs to obtain comprehensive disaggregated information on GESI. It would be relevant towards the end of ESAP II to carry out a baseline or an assessment of progress in order to establish a baseline for a next phase of a rural renewable energy programme.

Main outputs and impacts of support provided for institutional development. A Rural Energy Policy (mainly supported by REDP for the study) was adopted by the Government in 2006; ESAP assisted in the preparation of follow-up laws and regulations. A national policy for RE-subsidies was supported by ESAP in 2000 and finalised by AEPC and approved by the Government; it has been updated since then with the help of AEPC other programmes including ESAP II. ESAP II has assisted the GoN in getting the promotion of renewable energy incorporated in GoN/NPC's three Year Plans and drafted ToR for the preparation of a 20 Years Perspective Plan for Renewable Energy. Three reports completed in 2010 are likely to have a strong positive impact in moving the SWAp preparation process forward. (i) The draft "Act for Establishment and Operation of Alternative Energy Promotion Board", prepared in 2010, defines the direction of AEPC and provides AEPC with autonomous agency status. (ii) The "AEPC Strategic Organization Development Plan 2010" (SOD), prepared through an intensive stakeholder consultation process, provides an excellent foundation for decision taking on how to enable AEPC in performing its central role in a future SWAp. (iii) The "Feasibility Study on the Possibility of the Sector Wide Approach (SWAp) in Rural and Renewable Energy Sector and Identification of Its Indicators" is a high-quality document that provides a practical step-by-step roadmap for how to move towards a coherent SWAp within a few years. It can be used as a guide by AEPC and the donor community.

Main outputs and impacts of support provided for infrastructure investments. The main outputs are the supply chains that have been created for the promotion of ICS, SHS and micro-hydro projects. The modality for the promotion of SHS and for micro-hydro projects integrates promotion, capacity building, quality control and subsidy disbursements as one coherent package. The strong support has had two impacts: it has increased the number of qualified actors (competition has driven the service providers to move deeper into more remote regions in order to maintain sales) and improved the

quality of service delivery, including the provision of after-sales services. 52 private sector installation companies and 45 consulting companies to provide survey and design services are involved in the mini grid sector. 37 solar companies have been pre-qualified by AEPC for SHS dissemination and 36 companies for SSHS dissemination. 15 private companies pre-qualified by AEPC for manufacturing and installation of metallic ICS.

Impact of rural electrification: Rural electrification has improved access to technology and information. Television, radio, computers, phone and mobile phone, have informed women on recent happenings in the country and are informed on issues such as health (maternal and child health, reproductive health and HIV/AIDS) and violence against women (VAW) and gender based violence (GBV). Women have information on dealing with agriculture and livestock related problems such as particular crop/livestock related diseases and treatment.

Impact of Biomass Energy Component: The bio mass energy sub-component promotes time saving, pollution reducing and fuelwood saving household devices: improved cooking stoves (ICS) and gasifiers. The ICS program activities target women and socially excluded groups. Women are mainly responsible for kitchen work that includes cooking household meal. Main impacts are:

- Due to the introduction of ICS (30% decrease in fuel wood use of ICS compared to traditional stoves) and gasifier technology, women and girl child work load of collecting fuel wood is reduced saving their time to undertake other activities. Women invested their saved time in improving health and hygiene where as girl children had more time to peruse education.
- ICS has helped in reducing deforestation and risk of violence against women and girl child while collecting fuel wood from forest: there are high incidents of women and girl children being sexually assaulted and raped in the forest.
- ICS and gasifiers are smokeless which improves the health of women and children as they do not have to inhale smoke from the open fire. It has also helped in improving kitchen leading towards improved family hygiene.
- During the field visit to Dhading and Kaski districts respectively, the review team found that two types of ICS were in use. In Dhading district institutional stoves were installed along the main highway in tea stall (restaurant). Women who are mainly responsible of managing the restaurants reported with the installation of the stove they have been able to save half the expenditure that was invested in buying fuel wood for cooking. Prior to the installation of ICS stoves, women had to purchase fuel wood approximately of NPR 60,000 per month. The installation of stove reduced the consumption of fuel wood requirement by half, now they spend only NPR 30,000 thousand per month. The higher cost of investment was reduced by the subsidy. Within a short period of installation demand of such stoves was created as more people from the hotel business are seeking for support to install the institutional stoves.

Contribution of MG and SHS components to rural livelihood. Whereas ESAP I did not pay much attention to the promotion of productive uses neither from the application of SHS nor from the electricity made available in micro-hydro grids; the ESAP II program document includes “campaign for the promotion of end uses” as specific outputs for the SHS and for the micro-hydro components. Due to their low power, SHS do not offer many prospects for productive uses. They are used in poultry production to keep lights on in the stables at night, thereby accelerating the growth process of chicken (they keep eating when lights are on); other uses are in roadside stalls. It is not surprising, that the

self-evaluation of the ESAP II on results achieved through the promotion of productive uses of SHS gives a score of 2 to this output. The productive use potential is much better in micro-hydro projects where it serves a double purpose. One is to increase local household and business income. The other is to increase the financial viability of the MHP-plant by increasing the load factor of the plant through day-time demand for power from productive uses: typical plant factors in ESAP-projects are a low 20-30%. A productive use promotion program can increase the factor by 10 percentage points in good cases; but much depends on the drive of local entrepreneurs. With the adoption of the 2009 Subsidy Policy a grant was included for establishing businesses using electricity (known as SEED money) in ESAP-supported MHP-projects.<sup>15</sup> However, according to AEPC, ESAP has not yet supported AEPC to draft the productive end uses guidelines for MHPs as per subsidy policy 2009.

The Gender Equality and Social Inclusion Addendum to ESAP II of November 2010, financed by the GoNO, emphasizes assistance to local economic development. Consultants are to identify potential business opportunities, assist entrepreneurs in the preparation business plans, and facilitate credit/loans.<sup>16</sup> The interventions are to support economic uses in about half of the 143 mini-grid schemes (excluding the pico-hydro plants which have no economic end-use potential) with a generating capacity of around 3 MW that are in operation and add economic use promotion to the preparation and implementation activities for new projects. The Addendum adds the following outputs to the list of ESAP II outputs: (i) Gender and Social Inclusion (GESI) criteria mainstreamed in mini-grid implementation, (ii) Increased plant utilization and economic end-use of electricity, (iii) Professional management and efficient operational practice of implemented mini-grid schemes, (iv) Rural livelihoods improved through IWM.

Impact on democratic process. ESAP II strengthens the democratic process in Nepal at two levels: at civil society level and at local community level. The intensive stakeholder consultation process of ESAP's public-private-partnership implementation modality gives the involved business associations and NGOs direct influence on program design and modality. Villages having benefited from the services rendered by AEPC do believe that they are living in a country where the government takes care. At the end of the day it is the creation of this feeling which brings peace back to Nepal, it will not be the kWh supplied, nor the profit on the balance sheet. These are important, non-tangible factors. To quote the consultant for the World Bank-financed study on the sustainability of micro-hydro schemes: "Any major intervention in a village to improve the infrastructure (and these micro-hydro schemes are major interventions in relation to normal economic activities in these villages) require an intensified dialogue. It does not allow the different casts and ethnic groups in a village to continue to go their own way, they have no other way than to talk to each other. REDP has facilitated this extremely complex process with an unprecedented competence."<sup>17</sup>

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<sup>15</sup> REDP had from its beginning included promotion of productive end-uses of energy. For this up to NRs. 250,000 at the rate of NRs. 10,000 per kW are made available for the MHFG (micro-hydro functional group) of supported projects. The productive end-use promotion must be done within 6 months from the date of micro-hydropower scheme installation and MHFG must have the business plan approved from DEF (District Energy Fund). The amount is given as a grant to the CEF (Community Energy Fund) and made available to entrepreneurs in the form of soft loan. The loan amount is not to exceed 50 percent of the total investment made by the enterprise.

<sup>16</sup> The subsidy policy on seed money for economic end-use development is not applicable for the plants approved before the promulgation of the existing policy.

<sup>17</sup> Preliminary paper of December 14, emailed for Delphi-style peer reviewing.

## **4.4 Relevance**

An intervention is relevant if it serves as a means to achieve a given purpose.

The ESAP I-CA and AEPC-ED were deeply involved in the program preparation process for ESAP II. The thoroughness of the preparation process is reflected in the impressive number of 32 outputs with 122 individual sub-outputs. It is thus no surprise that the RT found the outputs to be relevant as means to improve the energy and livelihood situation of the rural population in Nepal.

ESAP II implements its decentralized activities through 13 Regional Renewable Energy Service Centers (RRESC). The relevance of using these regional centres (NGOs) instead of District Development Committees (DDCs) is assessed in section 5.3 “Decentralisation”.

The relevance of ESAP’s subsidy policy is discussed in section 5.4 “Subsidy and Credit Finance”.

## **4.5 Sustainability**

Sustainability of capacity building in the technical supply chains. ESAP II continues to implement training courses for level 1 (installers) and level 2 (after sales service) staff in the SHS-chain and of installers and plant operators in the MHP- chain. In solar PV, more than 600 SE L1 and around 100 SE L2 technicians were trained and certified from Centre for Technical Education and Vocational Training (CTEVT). Due to high levels of emigration, these training courses are a never ending exercise. The SHS and MHP- sub-components report a shortage of skilled human resources among suppliers and contractors as well as among local consultants. But as long as training courses are undertaken with support from ESAP, the quality of the supply chains can be maintained. And whereas loss of qualified staff to emigration is a loss to the program, it is not a loss to Nepalese society, which benefits from the remittances. A more critical issue is replacement of trained operators in micro-hydro projects who emigrate. Generally, for each plant, one part time manager and one or two full time operators are recruited and trained to physically operate the system. Women operators are less likely to emigrate than male operators, but security of staying in an isolated power-house (particularly at night) is an issue of concern.

Absence of capacity expansion in the manufacturing of MHP-turbines. A cause for concern is the stagnation in the manufacturing of turbines for MHP and in terms of annual manufacturing capacity and in terms of new technology development. The manufacturers can handle the manufacturing of Pelton turbines up to 300 kW. But they have no experience with the Francis turbine technology, which is used for sites with low head but high flow.

Sustainability of operating MHP-plants. Most of the mini-grid schemes are owned by communities and are registered to community organisations. These organisations form committees that make all the major decisions pertaining to mobilisation of resources, plant constructions, plant management and operations. The Community Committees determine the tariff rates for their plants and establish their

own unique systems for tariff collection. The tariff rates tend to cover only the costs incurred in the daily operations (i.e. salary to operators and managers and normal maintenance of plants), but not financial provisions for major repairs and refurbishments. Most communities will not be able to raise finance for refurbishment themselves, making the sustainability of long-term plant operation dependent on the willingness of DDCs/VDCs or GoN to provide additional financial support for refurbishments when problems occur. Operators selected by the management committees are trained by the local partner organizations in O&M. Operators are given 3 weeks long training with extensive practical classes. But operators complain about lack of follow-up support. The ongoing World Bank review of the sustainability of MHP-plants has observed that three factors determine sustainability, listed by order of importance: (i) the entrepreneurial drive of a strong person on the consumer committee, (ii) the level of cost-covering provided by the charged tariffs, (iii) the quality and intensity of community mobilization in ethnically and caste-divided communities.

The GoNO agreed to provide financial resources to a specific Gender Equality and Social Inclusion Addendum to ESAP II (November 2010) to rectify the lack of rural livelihood support given by ESAP II. To quote the document: “The technical support received from the Energy Sector Assistance Programme (ESAP) to date includes, among others, training on the organisation, management, operation, and maintenance mini-grid systems but only up to the point of commissioning. Experience has shown that it is necessary to re-visit the operational schemes for further training and guidance. However, the Programme Document for ESAP does not include resources for re-visiting and supporting operational mini-grid schemes and only very limited resources for activities targeting GESI.” Provision of insurance to MHP-schemes is one of the measures that will improve the sustainability of the community scheme. (The addendum also takes over the funding of IWM-activities beyond 2010.)

Mechanism for monitoring and mitigating environmental impacts. The ESAP II program has no mechanism for monitoring and mitigating direct environmental impacts. Assessment has been made in a study on the benefits on ICS on indoor air quality in order to document potential health benefits from. AEPC has a simple environmental assessment of renewable energy systems, but in practice it has limited impact.

Support to the strengthening of the capacity of AEPC is discussed in section 5.1 “AEPC Organisational Development and Institutional Capacity”.

The social-cultural/gender sustainability of ESAP’s interventions is discussed in section 5.5 “Gender and Social Inclusion”.

## **4.6 Risk management**

Major risks experienced during ESAP II. The ESAP II PD identifies some risks and assumption. There is not a specific risk mitigation plan development. Risks are not specifically addressed in the Annual Progress Report. Some of the main risks during ESAP II implementation are:

- Political vacuum reducing the progress on national policy and strategy for rural renewable energy.

- Lack of elected local governments for planning and prioritisation. The regional resource centers have delivered on social mobilisation and other local facilitation.
- Impact of AEPC institutional development reducing transfer to AEPC management and sustainability.
- Unknown plan for grid expansion becomes an uncertain factor in the optional distribution of SHS and MHP and design of an efficient subsidy scheme.
- Funding gap for SHS. This will be partly addressed with KfW joining ESAP.

#### **4.7 Financial Management and Audit**

ESAP II financial status. The total budget for ESAP II is NPR 4.908 Billion of which NPR 3.097 Billion (63 %) has been distributed by the development partners. According to the budget status the balance for each of the components is high for component 1 (ISRES) (47 %) and component 2 (REF) (41 %). The balance is low for component 3 with biomass energy (15 %), solar (- 1%) and mini-grid (12 %). The balance for the disbursement from the development partners according to the programme document gives not an entirely true picture as some of the disbursement is held on the ESAP bank accounts for each component.

The bank balance of ESAP is NPR 1.409 Billion (29 %) of which some is already committed to future disbursement, e.g. to MHP. The actual expenditure is NPR 1.688 Billion (34 %). So after about two-third of the programme implementation period roughly two-third of the budget have been disbursed by development partners, of which roughly one-third has been used for expenditures and one-third is held in the fourteen ESAP bank account. End of December 2009 the ESAP bank balance was NPR 1.344 Billion (2009 Audit Report).

The ESAP audit is by calendar year. AEPC audit is GoN fiscal year. The Nepal Auditor General audits the financial flow of AEPC including the REF. There have been only minor remarks by the Nepal Auditor General to the AEPC financial management. The selection of auditor for the separate auditing of ESAP II program accounts was done by the ESAP-CA. When he arrived, the ESAP-CA selected a new auditor from a short-list provided by Danida and kept the same auditor during the last three years. A transparent auditor selection system (e.g. endorsement by ESAP steering committee) should be in place for selection of the auditor for the annual audit of ESAP's accounts.

#### **4.8 Anti-Corruption Measures**

No system can reduce the possibilities for corruption to zero. But the ESAP operating modality has a number of design features that limits the scope for deviation of funds.

- One is “ring-fencing”: the funding of investment support – the bulk of ESAP II finance – is channeled through the REF and from there directly to the targeted recipients. In REF, the three persons executive board is headed by AEPC ED, the other two members are the AEPC Account Chief and the ESAP CA.

- The applicant for a subsidy payment must provide strict documentation for having achieved the milestone that triggers the asked for subsidy payment.
- ESAP performs ex-post monitoring of de facto installation and of quality through 100% monitoring of MHP-projects and a 10% random sampling of installed SHS-systems and a system of stiff fines.
- Subsidy rates are fixed by the GoN as per system, per household, per kW, and not as a percentage of costs that can be artificially inflated.
- Contracts and payment orders for expenses require dual signature by the AEPC-ED and the ESAP-CA.<sup>18</sup>

The system provides reasonable protection against misuse of funds, but at a cost. One drawback is massive paperwork; meaning costs of transactions for the provider of the subsidy (ESAP) and the recipient of the subsidy. The other is friction between AEPC staff in their performance of the executing agency function and ESAP staff is their performance of the implementing agency function. As per the CA's ToR specified in the program document, CA should report to and be responsible to ED. Yet, according to the opinion of AEPC staff, whenever ED or any senior AEPC staff raise question of efficiency in resources or innovation in ESAP, they face the argument that AEPC is trying to have too much control over ESAP. The SC is the right forum to discuss the existence of these kind of frictions.

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<sup>18</sup> The RT has not looked into how consultant contracts are awarded – the process from tendering through bid-evaluation.



## 5. Review Questions and Themes

### 5.1 AEPC Organisational Development and Institutional Capacity.

In order to perform its responsibilities as core Government institution within a SWAp, AEPC must:

- (i) Have a clear concept for the performance of its responsibilities as executing agency, be able to recruit and keep qualified staff, and implement a capacity building program enabling its staff to carry out AEPC's core functions efficiently and effectively.
- (ii) Have a clear policy for how to interface with donor-supported programs. (see section 5.2)
- (iii) Have a well-organised structure for the coordination of activities by the manifold actors that operate at decentralized level in renewable energy (see section 5.3).
- (iv) Be able to coordinate its activities with NEA's rural electrification efforts (see section 5.4)

AEPC has advanced in all four areas.

- During 2010, a strategy process detailed AEPC's future legal status and organizational development:
- A draft "Act for Establishment and Operation of Alternative Energy Promotion Board" was approved by the Board of AEPC. The draft defines the direction of AEPC and provides AEPC with autonomous agency status, releasing it from the constraints of Government salary scales when recruiting staff. The draft Act enshrines the creation of a Central Renewable Energy Fund (CREF) as the legal successor to the REF. As an act (the present institutional existence of AEPC is based on a Cabinet order) it requires adoption by Parliament.
- The "AEPC Strategic Organization Development Plan 2010" (SOD) is the outcome of a very intensive stakeholder consultation process. It formulates AEPC's Mandate Statements as: (i) Formulate policies and regulatory frameworks to enable promotion of sustainable clean energy solutions, (ii) Develop and coordinate plans and programmes, (iii) Mobilize resources, (iv) Facilitate promotion and provide technical support to stakeholders; (v) Design and oversee monitoring and evaluation systems, (vi) Facilitate networking and collaboration in the sector, (vii) Support R&D and innovative services.<sup>19</sup>
- ESAP supported AEPC in the drafting of regulations for CREF and for the Rural Energy Central Coordination Committee (RECCC).

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<sup>19</sup> Expressed in the words of the ED: "In my personal view, the most appropriate model for AEPC might be:- (i) The overall responsibility with AEPC including planning, budgeting, reporting to donors/ GoN, stakeholders' coordination, monitoring and evaluation, publication and information dissemination, new program formulation. (ii) The day-to-day implementation responsibility rests with program staff including interacting with local communities, capacity building of implementing partners, supervision of the program, field level monitoring, progress report preparation, supporting AEPC in policy, plan, information dissemination, institutional strengthening of AEPC.

Despite its recent achievements, AEPC is not yet able to effectively manage the envisaged scaling-up of RE-activity in the country and facilitate the introduction of a SWAp. After ten years of capacity building by ESAP this status is a disappointment. The two main factors for the underperformance are the unstable staffing situation at AEPC and the ISRES component document.

Staffing situation. The SOD's organization plan foresees an AEPC staff of 85. In 2010, AEPC staff regulation, approved by Ministry of Finance, authorizes AEPC to increase its number of permanent staff from the present 39 to 55. In addition to its permanent staff, AEPC employs a contract staff of 16, bringing its present staff to 55 persons. To establish the new units proposed in the SOD and build the capacity of new staff takes time. As AEPC is executing agency for the implementation of public-private-partnership (PPP) programs, it needs staff with skills that easily find work in the private sector. Yet, since AEPC does not yet have status of semi-autonomous institution, as planned for in the draft AEPC Act, it can offer its staff only public sector salaries. Whereas the base salary of AEPC program officers is around NPR 16,000 per month, the monthly salary of the highest paid national staff in ESAP II is NPR 140,000. The Government adds modest allowances and fringe benefits on top of the base salary. The large differences in pay are a source of jealousy and reduced job motivation of AEPC staff who are paid less for what they regard as similar work. This, as well as uncertainty about the respective roles and responsibilities ESAP and AEPC staff (ESAP staff refusing to be told what to do by AEPC staff) has led to a "them and us" rather than an "us" cooperation climate on both sides. Staff turn-over at AEPC is high, making capacity building a short-lived exercise. This affects the ability of AEPC to effectively lead the development in RE.

Topping-up of salaries. To reduce the turn-over of the professional and best AEPC staff, ESAP has been funding performance-based incentive payments to top up AEPC salaries. Presumably other donors provide incentives to AEPC staff also; but there is no sharing of information on this between donors. Topping up of government salaries is not popular with donors because of the distortions they introduce in the Government system through their selectivity. Yet, since AEPC is destined to become an autonomous agency, topping up in the present situation is an interim, bridging, measure to help AEPC have qualified staff in place by the time it achieves autonomous status. It is now time for donors to move beyond their ad-hoc and isolated approach to topping up and in consultation with the Board of AEPC define a joint AEPC remuneration policy. The level of the topping up should equal the difference between what AEPC can pay under the Government pay scales and what is required to attract staff with the needed competences for the future autonomous AEPC. Presumably, salaries similar to NEA salaries (including fringe benefits) plus 10 percent will be reasonable.

The ISRES component document guides the capacity building effort of ESAP II. According to the document: "This component has a broader scope compared to ESAP I "Support to AEPC", and is therefore renamed "Institutional Strengthening of Rural Energy Sector". The broad scope, however, proved problematic during implementation: it detracted the attention of ESAP II away from the objective of enabling AEPC to manage a SWAp. The low quality of the component document contributed to this: it is too weak to provide proper guidance for implementation. The listed objectives and associated indicators are too unclear about the desired outcomes - what change ISRES is to achieve and what the resulting institutional framework is to be capable of doing.<sup>20</sup>

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<sup>20</sup> The indicator for "Relevant institutions are capable to coordinate, develop, implement, and monitor rural energy policy/programmes" is "Transparent & efficient organisational management & financial system in place"

Capacity building. The ISRES component document places the responsibility for implementation into the hands of AEPC-ED: “The overall management responsibility of the component lies with the Executive Director of AEPC in the matters related with this component. The ESAP Chief Adviser and other ESAP Component Managers will assist AEPC as required. ... The Executive Director of AEPC will be responsible for working out contracts and procurements directly related to the Component, including implementation and monitoring of tasks assigned to consultants”. Entrusting the ED with the responsibility for institutional development makes sense and promotes learning-by-doing at the level of involved AEPC staff. Yet, ESAP II was not organised in a way that strategically targeted capacity building of AEPC staff. Support to the formulation of RE policies and the drafting of RE-regulations is a core activity of AEPC. But instead of physically placing ISRES staff as advisers next to AEPC’s policy staff, they sit within the ESAP II office section producing outputs for AEPC. The management and operation of AEPC’s website – a core AEPC activity - is done by ESAP staff not by AEPC staff. In addition, up to end-2010, ESAP II provided capacity building to AEPC without reference to a defined human resource policy for AEPC, which articulated the ED’s vision of AEPC’s core functions and of the core competencies that AEPC staff must possess to execute these functions. Capacity building was ad-hoc. ESAP II financed the participation of staff in courses and workshops on RE and technical disciplines abroad, and in computer skills courses in Nepal, see Annex 5.<sup>21</sup>

M&E of rural renewable energy and socio-economic impacts is a core activity for AEPC, which received insufficient capacity building support from ESAP II. AEPC provides aggregated data to MoEnv and NPC on outputs. But monitoring is technology specific and confined within each of the externally funded programs with no harmonised approach to data sharing and comparability. In 2010 a state-of-the art M&E framework for AEPC was developed with World Bank technical assistance. The framework is not yet functional but can be a useful platform for AEPC monitoring that combines information across programmes and technologies. The system can be developed to encompass socio-economic impacts, financial analysis, and geo-referenced information with options for internal data management and analysis in AEPC and external web access.

Alignment of ESAP II and AEPC reporting systems. ESAP has its own financial management system and, therefore, limited experience with AEPC’s financial management system. The JFA foresees that the financial flows pass through the Government system beginning with transfers from development partners to the Ministry of Finance. This has not happened except for the recent transfers by KfW to the REF. The aim is a gradual transfer of responsibility as capacity is developed in AEPC, but limited progress has been achieved by ESAP II. The perception is that AEPC’s financial management officers are not yet sufficiently capacitated to take over the financial management of ESAP. But the fiduciary risks of the transfer have not been properly assessed; and the specific ‘donor requirements’ are not known in detail by AEPC.<sup>22</sup> The Embassy of Denmark has prepared an assessment of the ‘ten budget support principles’ that will appear in the concept paper for the support by Denmark to the next program phase.

The capacity of AEPC to manage a SWAp effectively can be developed within the next 3 to 4 years through a concerted GoN and donor efforts. But it requires ISRES to focus on this.

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<sup>21</sup> ESAP II also financed ESAP staff’s training and exposure visits including personal development costs.

<sup>22</sup> One should take note though that the World Bank funding to REDP activities and KfW fund for biogas have been channelized and managed by AEPC, who demonstrated a good records and capability.

## 5.2 Harmonisation and Alignment – AEPC Interface with Donors

“ESAP-II has been conceptualised as preparing the rural energy sector for a Sector Wide Approach (SWAp)” (ESAP II Programme Document). A SWAp, in its essence, is a coordinated strategy in which donors and host governments agree on a single sector wide policy and expenditure program. At the national policy level good progress has been achieved during the implementation of ESAP II:

- AEPC-executed programs. AEPC’s position as the focal point for the promotion of RE in Nepal, provides excellent potential for donor harmonization and alignment as donors operate under AEPC’s umbrella. Norad, Danida and KfW<sup>23</sup> work together under ESAP II; DfID, which assists AEPC with the creation of a Carbon and Climate Unit, is expected to join soon. In addition, AEPC is executing agency for the World Bank and KfW financed Biogas Support Program and REDP (funded under the Power Development Program with US\$15. million from FY2010 to FY2013); the EU financed Renewable Energy Project (REP) ending 2012; ADB’s USD 1.1 million assistance to the Improved Water Mill project and (some assistance to wind power); and GTZ’s Euro 0.5 million Micro Hydro Debt Fund. AEPC is also the main contact partner for the preparation of the USD 40 million SREP assistance to Nepal.
- The contours of a coherent national RE-policy framework are in place. A Rural Energy Policy (mainly supported by REDP) and finalized by AEPC was approved by the Government in 2006; ESAP assisted in the preparation of follow-up laws and regulations. A national policy for RE-subsidies was supported by ESAP in 2000 and approved by the Government; it has been updated several times since then. ESAP supported to draft ToR for the preparation of a 20 years Perspective Plan for Renewable Energy. The preparation of the plan is now underway under the coordination of the Secretary of the MoEnv through an inter-institutional effort involving WECS, Ministry of Energy ( MoE), Ministry of Local Development, Ministry of Finance, NPC the Center for Energy Studies, two RE experts and AEPC is the Member Secretary of this plan. A weak point is the absence of a Rural Electrification Master Plan; the last one, prepared in 1999, is outdated.
- Rural and Renewable Energy Development Partnership Forum (RREDPF). To serve as the institutional vehicle for donor coordination, the MoEnv is in the process of setting up the Rural and Renewable Energy Development Partnership Forum. The Forum will be chaired by the Secretary of Environment or someone designated by him and will comprise representatives from NPC, Ministry of Finance, local Government, and the present and potential collaborating development partners in RE.
- Feasibility study on the possibility of a SWAp. ESAP supported in 2010 the preparation of a “Feasibility Study on the Possibility of the Sector Wide Approach (SWAp) in Rural and Renewable Energy Sector and Identification of Its Indicators”. The document, which is of high quality, provides a practical step-by-step roadmap for how to move towards a coherent SWAp

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<sup>23</sup> KfW joined ESAP II in October 2009 for supporting 100,000 SHS, 50,000 SSHS and 100 solar PV pumping systems

within a few years. It can be used as a guide by AEPC and the donor community. The study outlined two options (apart from a third – doing nothing) (i) rapid and sustained move towards full SWAp implementation with 3 years plan and (ii) gradual and partial move towards SWAp with pilot options. The differences between the roadmaps for two options are marginal. The point is that a SWAp is feasible in principle and that donors and GoN can take a number of practical steps to make the implementation of a SWAp feasible within a few years.

At the level of AEPC's operating modality as executing agency further work needs to be done to define AEPC's interface with the implementing programs, to strengthen AEPC's corporate image and to detail how the REF can be transformed into the CREF.

Organisation of the interface between AEPC and donor-financed programs. The four major donor financed programs executed by AEPC are ESAP II, BSP-IV, REDP, and REP. Whereas the implementation of the biogas program is managed by BSP-N, an NGO, located outside of the AECF building, REDP, ESAP II and REP are present within AEPC's office building; each program has its separate office space for its team. Each program has its separate Steering Committee. The interface between AEPC and the programmes is organized as follows:

- An AEPC-staff is fulltime National Program Director (NPD) of REP; fully authorized for both financial and managerial functions with approval of ED and the Project Steering Committee.
- AEPC has assigned counterpart staff to each ESAP component. The participation of the counterpart staff is limited to the execution of the program; they provide comments on relevant documents and counter signature for recommendation to ED and CA. Most of the documentation is done by ESAP management. Theoretically, the counterpart role was to provide full ownership of the program, in practice, the counterpart function as seen by the ED serves as a purely formal arrangement with the AEPC counterpart staff performing as witnesses/observers.
- The REDP seems to work very independently from AEPC. However the ED of AEPC is the NPD of the program and a program focal person from AEPC is involved in day to day affairs and reports to ED.
- There is no direct communication between BSP-N staff and AEPC except in the Biogas Coordination Committee (the Committee is chaired by AEPC ED; AEPC's senior officer is one of the members and BSP-N-ED is the member secretary of the Committee). ). AEPC has assigned one officer to look after BSP related activities. All communication and reporting has been made through the AEPC assigned staff.

The differences in the organization of the interface between AEPC as executing agency and the programs as implementing agencies is not due to a strategic choice by AEPC. It is a legacy of past ad-hoc, isolated negotiations with donors wishing to cooperate with GoN in rural and renewable energy.

The ED had experimented with the creation of a formal coordination forum for ESAP II, REDP and REP composed of the ED and the three program managers. That experiment was not regularized. Instead, the ED intended to hold informal weekly meetings between the ED and the three program managers. But so far only one such meeting has been held. Monthly information meetings should be held. The

participation of AEPC counterpart staff in joint ESAP-managers/counterpart information meetings called by the ED has been irregular. In AEPC work plans care should be taken to avoid preventing staff from participating in these meetings due to other AEPC-work assignments during meeting hours.

AEPC has failed to impose its corporate image as executing agency on programs. The lack of a standard interface is visually apparent in the formats that the programs use for their identification: the business cards, pencils, notepads, and the program identification on program vehicles give little if any reference to the name of AEPC.<sup>24</sup> The picture of fluidity is reinforced by the absence on AEPC's website of an AEPC Annual Report in English which summarizes the results achieved by the AEPC-executed programs. It is now time for AEPC to define a common AEPC-presentation format for the programs to follow and to prepare an AEPC Annual Report for the 2010/2011 fiscal year. . AEPC in the past had prepared and published a consolidated Annual Progress Report and has planned to publish such report in this fiscal year. ESAP II can assist in this.

Transforming REF into CREF. The development of REF as the integrator for joint donor- and government financed investment support is the most important institution-building effort provided by ESAP I and II. The REF has become the most important recipient of donor and Government funds that are not tied to the financing of technical assistance and other support services. The draft AEPC Act includes the establishment of a CREF. The short text foresees a range of public finance instruments to be administered by it: donor and government finance for TA-program activities, credit enhancement instruments, investment grants and R&D-support. At present, REF channels investment grants only. The expanded scope of the REF required by its transformation into the CREF can take place by setting up specific finance windows for individual instruments. A REF window can act as a passive bank account facility (e.g. for "TA support for biogas"), as active angel capital investor (e.g. for "seed capital support to the creation of innovative RE-enterprises" or) or as an active monitorer and controller of the right to grant funding (the present subsidy funding modality, where performs independent checks on the de facto use of disbursed funds). The MIS of REF can handle the financial reporting requirement of any type of window and its checks and balances functions are essential for keeping the fiduciary risk of the large amounts of grant funding at a low level. Whenever specialist know-how is required, this can be provided through attached Advisory Committees or be contracted ad-hoc. For example, if CREF is to include a seed-capital facility, CREF would need to contract specialist outside know-how for the evaluation of candidate firms and for assessing their specific funding and incubation needs. If CREF includes a R&D challenge fund, researchers specialized in the specific technical disciplines must be contracted for the evaluation of received R&D project proposals.<sup>25</sup> A study is needed to outline the potential operating modalities for the CREF tasks envisaged in the draft AEPC Act. The analysis must include a review of the options for the legal person form of CREF and its primary institutional anchorage – MinFin or MinEnv?<sup>26</sup> It is essential that the legal-institutional

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<sup>24</sup> ESAP material includes the AEPC name and/or logo. That is not the case for other program.

<sup>25</sup> Donors have shown a tendency to exaggerate the qualification requirements for the management of business support programs, e.g. for managing innovation funds, including challenge funds for the award of R&D grants. There has been a tendency to equate the management qualifications for such funds with the management of equity funds and contract the management of such funds to professional fund managers charging the 20% fund management fee typical for equity fund managers. It is much more cost-efficient to contract specialist know-how for the evaluation of investment proposals on an ad-hoc basis. Equity fund managers have no comparative advantage in financial MIS or in M&E, where the bulk of the work is.

<sup>26</sup> In the SOD, the legal status of CREF is not defined; and in its organization chart the CREF floats somewhere under or parallel to the ED.

structure establishes an arms' length relationship vis-a-vis AEPC for disbursements of payments and for the ex-post control for the justification of these payments. One option is to establish CREF as a Trust Fund with an independent Board and a small staff.

### 5.3 Decentralisation

GoN's decentralization policy aims to involve local communities in developing and implementing their own need based programs to ensure community accountability and the inclusion of socially excluded groups. The Local Self Governance Act (LSGA, 1999) provides the framework for decentralization; at the district level the responsible authority is the District Development Committee (DDC); at the village level the Village Development Committee (VDC). The last local elections took place in 1999 and since 2002 no elected local Government has been in place. The DDCs and VDCs have since 2002 been led by bureaucrats, not by locally elected bodies; DDCs by the Local Development Officer, VDCs by the VDC Secretary. The Rural Energy Policy 2006, defined with strong inputs from REDP, includes support to the establishment of energy units and energy funds in DDCs/VDCs.

Achievements of AEPC in working with decentralized structures. AEPC manages its programs and monitoring functions through active and effective engagement with the private sector bodies, currently more than 600 in number, and serving in wide ranging areas of manufacturing, service provision, quality control and financial intermediation.<sup>27</sup> Institutional linkages of the RE sector is increasingly with AEPC assuming lead role. AEPC's/ESAP's structure for the integration of actions at local level has three main pillars: (i) MoUs with organizations carrying out own-financed support programs in isolated regions of Nepal; (ii) support to DDCs in establishing energy and environment units within their organization structures; (iii) local NGOs contracted as regional services centers to provide technical backstopping and social mobilization services to communities setting up micro-hydro projects and to ICS promoters.

Use of MoUs. Two of the potentially most important MoUs signed by AEPC are the ones with the National Poverty Alleviation Fund (PAF) and with the *Rural Village Water Resources Management Project Phase II (RVWRMP II)*.<sup>28</sup> The MoU with RVWRMP (with a separate MoU with ESAP II in the Annex) concerns collaboration in the implementation of IWM, micro-hydro power and productive end use promotion projects in 10 remote districts. ESAP can assist AEPC officers in following up on the MoUs in order that good intentions can be transformed into effective collaboration. August 2007 AEPC entered into agreement with PAF to implement rural energy systems/project (mini and micro-hydro, solar energy and biomass) in common working areas of AEPC and PAF. PAF through the MoU supports rural energy projects/systems as follows:

- Promote micro and mini-hydro, solar, biomass energy projects/systems in target communities;
- Provide fund (credit/equity) to their community organizations (COs) specifically to the poor and disadvantaged community members to invest on energy related projects;

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<sup>27</sup> ESAP provides capacity building of district-based local partner organizations (LPOs). ESAP II works with more than 142 LPOs, in each DDC there are at least 3 LPOs, each LPO covers at least 7 villages.

<sup>28</sup> The RVWRMP is a joint program supported by GoN and the Government of Finland implemented in 10 districts located in the Far Western Region and the Mid Western Region of Nepal.

- Support poor beneficiaries in energy projects to carry out income generating activities;
- Support government's renewal/ rural energy subsidy policy;
- Support the poor and disadvantaged members by involving them in planning and implementing energy related projects and income generating activities;
- Support target communities for resource mobilization to access rural energy technology and income generating activities.

PAF through the agreement provides financial assistance to micro-hydro projects/systems. So far PAF has supported 74 projects out of which 27 of such projects were supported by AEPC. (Interaction program Feb. 2010). PAF supports ranges up to 3.5 million rupees for a project.

AEPC collaboration with DDCs. AEPC/REDP has set up *District Energy and Environment Sections (DEES)* in 40 DDCs; AEPC has with Government funds set up *District Energy and Environment Units (DEEUs)* in an additional 32 DDCs. Through these AEPC has countrywide (except the 3 Kathmandu valley districts) nominal presence of a unit within each DDC dedicated to rural energy and environment needs. The umbrella organizations, the Association of District Development Committee Nepal (ADDCN) and NAAVIN ( National Association of VDCs , Nepal) are also active in RE-promotion.<sup>29</sup> AEPC/REDP has supported ADDCN and NAVIN to create Energy and Environment Units under their organizations.

	AEPC with Core GoN budget	REDP
Staff	<u>DEEU</u> : Energy and Environment Officer (if engineer with full Bachelor-Degree) or Assistant EEO (if lower formal education) + Office Assistant.	<u>DEES</u> : Energy development officer , (engineer) + livelihood promotion officer (agriculture / forestry background) + Office assistant and messenger
Integration in DDC	AEPC staff, but transfer to DDC staff status foreseen by 2015	Located in DDC office but reporting directly to REDP's Regional Energy Advisor in Kathmandu and then to AEPC
Coverage in terms of VDCs	Services all VDCs in the DDC	Services only VDCs where REDP implements MHP-project. But covers all VDCs through annual planning process and awareness creation
Finance for MHP	From REF directly to manufacturer/installer	From AEPC to District Energy Fund and from there to Community Energy Fund with DDC and VDC co-finance
Social mobilization	Through RRESC social mobilization experts paying ad-hoc visits	REDP through local NGO as Support Organization (SO) from SO's fulltime social mobilizer placed in community till the MHP is commissioned and operated at least for six months

<sup>29</sup> They signed in 2009 a MoU with the Federation of Nepalese Chamber of Commerce and Industries (FNCCI) together for developing hydropower projects up to 3 MW in public-private-partnership model.



In many aspects the DEEU and DEESs are similar. Both:

- Assist DDC in local energy and environment planning and management in line with the Local Self Governance Act 1999;
- Coordinate with line agencies, I/NGOs, VDCs, and other key stakeholders for promotional activities and dissemination of the rural energy systems at the district level;
- Assist the DDC and VDCs in local resource mobilization;
- Monitor the activities of rural energy and environment programme in the district;
- Provide technical backstopping to DDC, VDC, communities and other stakeholders related to rural energy and environment;
- Form a District Energy Committee and District Energy Fund and work as a secretariat of the committee;
- Prepare and submit progress reports;
- Prepare district energy profile
- Carry out pre-feasibility study and detailed feasibility study of MH up to 10 kW (DEES)
- Undertake RET data collection and update at the district level.

In other aspects, a DEEU performs very different from a DEES.

- The two staff of a DEEU are contracted by AEPC and refer to AEPC-staff in Kathmandu; but with the intention that the DEEU by 2015 is taken over fully by the DDC. AEPC selects the staff and recommends to DDC for appointment. A DEEU relies on the local RRESC to undertake social mobilization, which is undertaken through ad-hoc visits to a community. The DEEU provides the RRESC with basic data about potential demand for MHP and ICS in the DDC. A DEEU is not engaged in AEPC's subsidy payment process except recommendation for SSHS and Biomass Metal Stoves: payment is done by REF directly to manufacturers.
- The three staff of a DEES are contracted by DDC and refer to the REDP Rural Energy Advisors in Kathmandu. A DEES sub-contracts a local NGO (Support Organization) to carry out community mobilization package with six basic principles in its section and places one Community Mobilizer per MH community (site) for a 1½ years period a permanent social mobiliser in the community where a MHP-project is implemented. In the REDP approach, co-funding of MHP-investments by the DDC and the by the VDC in the form of share participation is mandatory. The DEES sets up a District Energy Fund (DEF) for joint REDP/DDC/VDC co-finance of supported MHP-projects. The subsidy for the use of a specific MHP-scheme is channeled to the DEF from AEPC based on the district annual plan endorsement by AEPC's Program Management Committee; the DEF then channels it to the Community Energy Fund (CEF). The CEF bank account is operated with joint signatures of the Chairman of the Micro-Hydro Functional Group and the Energy Development Officer of the DEES.

The DEEU concept has proven its worth. Conventional DDC staff, such as engineer, sub engineer, social mobilizer and administrative officer, are responsible for infrastructure development programs in the DDC. Yet, prior to the establishment of the DEEU/DEES units, DDCs and VDCs did not include RE projects in their regular planning process and did not allocate a budget for RE projects in their districts. Local people were little aware of RE and of government subsidy policy. The establishment of DEEU/DEES has improved coordination in the energy sector: the DDC and its VDCs incorporate energy activities in their regular planning and allocate resources to RE-activities. Awareness has increased within community with regard to RE and the possibilities to obtain government subsidies.

Regional Renewable Energy Service Centers (RRESC). Neither ESAP I nor the ISRES component document paid attention to collaboration with DDCs/VDCs. *ESAP I's original approach* to the development of micro-hydro projects placed faith in the ability of local entrepreneurs to develop projects; in this perspective, the DDCs and VDCs did not have much of a role to play. In the ESAP concept, the RRESC is the contact point linking together AEPC/ESAP, private sectors and the recipient communities for RE-projects; working together with number of local partner organisations. Probably influenced by the political situation since 2002, the *ISRES component document hardly mentions DDCs/VDCs*. The document includes as indicator: "Local government bodies include energy activities in their plans and participate in resource mobilisation ", but includes no defined outputs for this except "An institutional basis with clearly defined roles established with focus on decentralisation and the private sector". ESAP II implements its decentralized activities through 13 RRESCs. *Seven of these support MG - and biomass projects* (listed in Annex 5a); *six only ICS-promotion* (listed in Annex 5b).<sup>30</sup> Each RRESC covers 3-5 districts; together, they cover 52 program districts. A RRESC is a local NGO, which in addition to its RRESC function; has contracts with other programs to provide services that may not be related to RE.<sup>31</sup> The core function of a RRESC is to facilitate the implementation of AEPC/ESAP activities. They implement and facilitate AEPC/ESAP annual work plan at local level, monitor and evaluate local ESAP activities, undertake feasibility studies for MHP-plants and mobilize communities. They report to AEPC/ESAP on their activities and on their progress quarterly and annually. The social mobilization process of the RRESC follows a number of steps.

- Community mass mobilization meeting to inform on the program and discuss subsidy;
- District meeting for coordination and to mobilize resources;
- Demand collection from the community;
- Feasibility study - identification of company for feasibility study and undertake detail feasibility study;
- Approval and agreement to undertake the project;
- Community on their own chooses the company for installation and completion of the plant;
- Training for operators and managers;
- Public hearing; and
- End use training

The REF provides capacity building to RRESCs on subsidy delivery and book keeping systems. The MIS and data processing unit at AEPC/ESAP enables REF to effectively monitor all regional centers. The contract with one previous RRESC was discontinued due to under-performance and manipulated output documentation. An audit made by the ESAP auditor revealed poor maintenance of systems and some irregularities. The NGO was asked for a plan of action to increase performance, but failed to do so. The remaining 13 seem to perform efficiently: Annex 5a, shows good correspondence between the size of the annual budgets and the outputs of the 7 RRESCs proper. The sustainability of RRESC

<sup>30</sup> The latter are in ESAP terminology referred to as 'service centers' not as RRESC. This review report uses the name RRESC for these centers as well.

<sup>31</sup> An example is the REESC located in Baglung, the Dhaulagiri Community Resource Development Centre (DCRDC), an NGO affiliated with Social Welfare Council, Kathmandu. It has a staff of 48 (14 technical, 31 social, 3 administrative) of which 17 are RRESC: one team leader and regional coordinator who is an engineer with expertise in MHP, one biomass energy engineer, sub- engineers, district field technical coordinators, account and administrative officer, social mobilisers and others).

facilitated support services to MHP-communities is currently looked into by the comparative study on the ESAP and REDP modalities for MHP-projects.

Changes in ESAP II approach. The private sector perspective of AEPC/ESAP has changed over time: only 10% of installed MG-schemes supported by ESAP I+II are registered as private companies. ESAP II has, therefore, increasingly recognized the importance of involving local Government in RE-promotion.<sup>32</sup> In MHP, the DDC has a number of roles: (i) it has the authority to approve pico-hydro projects up to 5 kW without involvement of other government bodies, (ii) it is important in solving issues, in particular water rights, (iii) authenticates the capability of a User Committee and (iv) the right to the transportation subsidy, (v) provides logistical support to user committees and (vi) do the household certification for establishing the subsidy to be paid to the installer, and (vii) when the REF-subsidy is insufficient to secure full finance for the construction of a MHP-plant; the DDC and VDC are providing some fund to fill the gap in MHPs and SHS in number of districts. The DDCs and VDCs also sign the SSSH application forms before they are sent to REF.

Collaboration with VDCs: Decentralised Energy Management Initiative (DEMI). ESAP's ISRES completed in 2009 its DEMI in 7 VCs in 4 districts in coordination with all seven Regional Renewable Energy Service Centres (RRESCs), and is in 2010 undertaking the DEMI in 14 new VDCs.

Harmonization of ESAP II and REDP approaches. AEPC seeks a greater harmonization of the two implementing modalities. One can expect the trend of ESAP II to work with and through the DDCs and VDCs to be further strengthened. As argued in section 5.5, this may also involve providing REF-subsidies through a local District Energy Fund; alternatively, one might envision a procedure with continued parallel direct payments to contract holders but with DDC co-confirming the achievement of a payment triggering milestone. AEPC's intention that the DEEUs by 2015 are taken over fully by the DDCs, needs to be extended to the energy and environment staff of the DEESs. As a supplement, REDP can continue to fund its social mobilisers to work in the community on REDP-projects and having them report to its Kathmandu office. There is no reason to replace ESAP II's RRESC modality with REDP's Support Organization (SO) modality for local resource mobilization, or vice versa. Both have their strengths and weaknesses. The SO-modality is very resource intensive.<sup>33</sup> The effort may be cost-effective and needed in very ethnically divided communities; but that it remains to be proven that it provides value-for-money in an average MG-project compared with the alternative RRESC-approach.

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<sup>32</sup> The umbrella organization for the DDCs, the Association of District Development Committee Nepal (ADDCN) and NAAVIN (National Association of VDCs, Nepal) are also active in RE-promotion. ADDCN signed in 2009 an MoU with the Federation of Nepalese Chamber of Commerce and Industries (FNCCI) for developing hydropower projects up to 3 MW together in public-private-partnership model. REDP has supported ADDCN and NAVIN to create Energy and Environment Units under their organizations.

<sup>33</sup> REDP's community mobilization process is based on six principles: organization development, skill enhancement, capital formation, technology promotion, environment management, and vulnerable community empowerment.

## 5.4 Coordination with Grid Electrification and Regulation of pico-micro- mini-Hydro

NEA had 1.7 million consumers in 2010 and was adding 150,000 new consumers per year. AEPC sits in the Technical Committee for Rural Electrification together with NEA. AEPC's coordination with NEA concerns two subjects. One is to get information on NEA's electrification plans to avoid that MHP-projects are initiated in communities likely to receive grid connection within the first five years after commissioning. The other is to keep installed micro-hydro plants operational when the isolated community grid they were built to serve becomes connected to the grid.

The last *rural electrification master plan* by NEA is from 1999 and no longer operational. NEA is in no position to do rational grid expansion planning. The grid is subject to load shedding every day due to a growing power shortage. Rural electrification lines may be constructed, but some of these are not supplied with power. And because NEA's average tariff is far from full cost coverage (no tariff revision has been approved since 2001), NEA's investment program depends on allocations from the state budget with NEA adding some of its own fund. NEA's planning is, therefore, simple. Some rural electrification programs are done by donor-financed programs in specific regions based on prior feasibility studies for the program. For its independent rural electrification effort through cooperatives (80% financed by GoN and 20% from community for distribution of the electricity), NEA waits for the annual budget it gets from the Government for this purpose. NEA then looks at applications for rural electrification it receives from DDCs, defines where most demand exists and informs the DDCs where rural electrification is to be done. The DDCs then send proposals to procure material together with NEA.

Because of the low level of NEA's rural grid electrification effort, *grid connection of AEPC/ESAP/REDP supported MHP-projects* has not been a major issue so far. ESAP has encountered some cases – two in Ilam – where the projects before starting the construction were cancelled because grid extension was planned with Japanese assistance; it was a surprise to the community and also to the DDC. A few communities – less than 3% - after completion of detailed feasibility study opted for grid connection based on 20/80 payment scheme of the government. No MG-schemes completed by ESAP have so far been connected to the national grid. However, the expert preparing the WB/REDP-study of ESAP/REDP supported MG-projects, noted that every site visited (around 20) except two were going to be reached by the grid within the next 12 month. AEPC/REDP has two schemes for connecting MHP-plants with the grid at an advanced stage – one to link the mini-grid of seven MHPs in Baglung district and a 30 kW MHP in Lalitpur district to the national grid. AEPC is intent on signing a MoU with NEA for securing NEA's agreement to let micro-hydro power plants sell power to the grid after an isolated grid has been connected by NEA to the national grid.<sup>34</sup>

The *regulatory approval system for pico-, micro-, and mini-hydro* needs to be rationalized. The turbine manufacturers recommend that the approval authority of DDCs for pico-hydro be increased from 5 kW to 15 kW. AEPC's mandate includes support to mini-hydro plants up to 1 MW; the draft AEPC Act has

<sup>34</sup> NEA sells power en bloc to the community's electricity consumer cooperative. The PPA-agreement for the output of the micro-hydro power plant, can, therefore, be based either on reverse metering, or on sales of the power to NEA.

proposed to expand it from 3 -5 MW. AEPC currently provides financial incentives (i.e. subsidy) up to 500 kW, plants above 1 MW size need approval from the Ministry of Energy.

## 5.5 Gender Equality and Social Inclusion

Gender Equality and Social Inclusion Strategy: AEPC's Strategy on Gender Equality and Social Inclusion (GESI) formulated in July 2008 states the need for incorporating social and gender aspects in the energy sector program. The strategy recommends developing gender monitoring and social inclusion strategy (GMSI) to address gender issues at organizational as well as at program/project level.

ESAP and AEPC staff. The review of AEPC's organizations structure and ESAP program indicates that ESAP is 'gender blind' in its approaches and needs to incorporate gender and social inclusion to address the given situation in all of its components. AEPC as an organization is dominated by high caste male consisting of brahmin/chhetries (59%) followed by janajati (29%), Newars (19%) and dalits (2%) respectively. The higher caste (brahmin/chhetries) holds the higher position in the organization thus making all decision of the organization. There are 13 women staff out of which only 5 are in officer level position. In principle, AEPC applies no gender biasness in its recruitment; it is now mandatory that at least 33% of the total position should be allocated to women. But since very few women are educated in technical fields (e.g. engineering or RE background), AEPC, being a RE agency has not so many female staff. ESAP currently (December 2010) employs 13 women and 31 male staffs and only 2 women in management level position; the ethnic caste bias is similar to AEPC's.

AEPC-Programme	Male	Female	%
AEPC	39	12	24%
ESAP	31	13	30%
REDP	12	5	29%
REP	32	5	14%
BSP	16	8	33%

The staffs of AEPC and ESAP have largely ignored gender due to their lack of gender concept and orientation. AEPC has no gender expert to look after gender issues in its organization and program/project level. A socio-economist is hired to look after gender as a cross cutting themes. However, the job description is silent on gender issues and due to this gender is overlooked at the organizational and at the program/project level.

Gender and social inclusions impacts at program level. ESAP II is a program that has the potential to reducing work drudgery of women and girl children leading towards their empowerment. The project documents implicitly states that the program needs to include gender and social inclusion in its components. Yet, gender was not addressed in its objectives nor in its strategy and in its 3 year plan (not approved yet). The program was developed with the broader concept of reaching the rural population with the thinking that it would encompass women in general. It did not take into account

the needs and role of women as energy issues are assumed to be gender neutral. Women have taken participation and representation in the program components except in the ICS component; the solar energy and mini grid electrification components were considered to be technical. This undermined and ignored the management, need and utility of energy by women who are the main users and managers of energy in their home. Furthermore, due to male migration in pursuit for economic employment, women are left behind to look after the home and farm land. Due to this women are the main actors who are involved in cleaning solar panel and bulbs and changing distilled water in solar battery and contributors of labor in construction of micro hydro plant. It is therefore, essential that women needs and concerns must be addressed in solar energy and rural electrification.

Biomass energy component. Promoters and technical persons at local level are trained in promotion and technological support activities. This has helped in developing local human resources as well as generating local employment. Women are given priority as promoters of ICS mud stoves to enhance their skill and participation. However, due to the existing cultural practices of women's restricted mobility and heavy work load back home have drop out from the position. The biomass program aimed to include 50% women as promoters in ICS. As of now it has been able to retain only 40% of recruited women as promoters. The regional center informed that it is difficult to retain women promoters as the job requires women to travel longer distance away from their home. It is essential to retain the existing women promoters and increase the number of women promoters by considering their issues in providing their services. The review mission during the field visit to Kaski district found that the poorest of the poor had not been target by the component. One example was found that a dalit woman was not reached by the ICS support although she was interested and willing to pay the cost of the promoter.

IWM save time for grinding purposes and provide employment to socially excluded groups like dalit in operating and managing the improved water mill. Studies reveal that most of the IWM owners are from the poorest strata of society and socially excluded groups.

The solar energy and mini grid components have not considered seeing if women have specific requirement or need. The strategic interests and practical needs of women are different from men. Women requirement may consist of having electricity in the kitchen, cowshed and toilet; mens' need for lightning may differ. Furthermore, women may want to have electricity during different hours than men and are often interested specifically in productive applications of electricity.

ESAPs micro-hydro projects have close to 100% connection rates in their villages. Poor and disadvantaged people are benefited through Poverty Alleviation Fund (PAF) support. In some community poor households unable to pay the amount required as local contribution are supported by affirmative action programs by the user committee, which also help the poor households to install a few bulbs for lightning. In other communities, the user committee may not have such approach; in these, the poorest of the poor are left out of the intervention because cannot invest in their household electrification due to lack of resources. It is essential to learn from such experiences and adopt measures to include the poorest of the poor to have access to such schemes. In areas where there are MFIs, subsidized loans for the poorest of the poor would be a beneficial instrument.

Rural electrification has helped women in participating along with men in user committees. Women are provided 30% reservation in executive committee that has provided opportunity for women's representation and participation in decision making body. However, women's participation in the

decision making position is low which shows gender insensitivity of the program. In Tanahu district during the team field visit to the regional center, only 10 women have occupied decision making position in the executive committee where as 79 men has occupied decision making position. For detail refer to the table below.

Designation	Female	Male	Total
Chair	1	19	20
Vice-chair	1	19	20
Secretary	-	20	20
Vice-secretary	2	07	09
Treasurer	6	14	20
Member	38	94	132
Total	48	173	221

Source field review, December 2010

GESI Addendum: Norad provided in 2010 funding for an addendum to address GESI issue in ESAP II and link activities of ESAP II and its future follow-up program. The immediate objective of the addendum is to address gender and social inclusion in the implementation and operation of mini-grid and improved water mills. In order to meet the objective the GESI output has been added to the sub-component 3.1 (mini-grid) as an output 7: Gender and social inclusion (GESI) criteria mainstreamed in mini-grid implementation. This output has 5 activities that are recommended: (i) Gender and social audit. AEPC/ESAP with technical support from SNV will initiate gender audits to identify gender and social inclusion gap mainly for the mini-grid component and develop checklist and guidelines for GESI action planning. The action plan will identify training need of the staff of regional centers, special provision of seats in management boards, and focus on GESI during development of business plan and other intervention as identified during the audit. Gender audit will be piloted in the mini grid component and will be undertaken gradually in another components after the ESAP staffs capacity are enhanced to conduct gender audit on their own. This will enhance the capacity of AEPC in integrating GESI. (ii) Establish GESI database. Regional centers will be trained and mobilized to collect and store disaggregated information on GESI. This will provide valuable input in future policy recommendations, preparation of guidelines and planning future capacity building activities. (iii) Address GESI concerns in subsidy policies. The present subsidy policy has not made provision to address GESI elements. AEPC with support and linkages with Poverty Alleviation Fund (PAF) will address gender and social concerns. AEPC has signed a MoU with PAF. (iv) Develop guidelines to address GESI concerns. Existing guidelines will be revisited and GESI concerns will be incorporated in the guidelines. (v) Design and implement capacity building activities. Specific provision will be made to women and socially disadvantaged groups in specific training such as community mobilization, operation, maintenance and end use development.

Does the programme's activities target gender equality and social inclusion issues in the latest work plan? A Norad gender review in May 2010 assessed the integration of Women Rights and Gender

Equality issues in ESAP II. Based on the recommendations of the gender and social inclusion strategy and suggestions proposed by the gender review, the ESAP II Annual Work Plan (2009/10) has included a Gender and Social Inclusion (GESI) Action Plan in all four of the ESAP components, to create new potentials for increased participation of persons from disadvantaged and discriminated groups. This is the first step towards incorporating gender mainstreaming and social inclusion (GMSI) in the organization and program/project level.

## 5.6 Finance Modalities: Subsidy Mechanisms and Credits

National subsidy policy. The establishment of a rational national RE-subsidy and its efficient implementation through the REF is one of the success stories of AEPC and an outcome of ESAP activity. GoN subsidy modality has a number of positive features. One is *transparency*. Subsidies to individual household technologies (SHS and improved metal stoves) are given as a fixed payment per system irrespective of the size – except that in solar PV, different subsidy rates are given for SSHS less than 5 Wp, for 5-10 Wp and above 18 Wp - and the cost of the product; subsidies to micro-hydro grid electrification are given as a fixed payment per household and also per kW. Another is the *link between subsidy disbursement and quality control*: apart from stimulating demand, the subsidy scheme's system of pre-approved components, pre-qualified manufacturers/vendors has served as an incentive to maintain quality. One may doubt whether it would have been possible to build a reasonably well-functioning after-sales service for SHS without the staged payment of subsidies where the last rate is paid when the after-one-year service visit has taken place. The monitoring system is not without cost – it is estimated that the *transaction costs* for the administration of the subsidy scheme amount to about 1200-1500 NPR both for the REF and for the SHS companies; meaning that the transaction costs amount to 25-30 percent of the paid-out subsidy rate of 10,000 NPR. The RT has evaluated whether the transaction costs are justified and reached a positive conclusion. The system builds quality in the supply chains and trust at donor level.

Policy target: reaching the largest number of households. Subsidies are a limited good and emphasis in ESAP's approach is on reaching the largest number of households with the available funds:

- For individual household goods like SHS this means giving subsidies to those systems that have the highest price elasticity of demand. The fixed per system subsidy results in the percentage-wise highest subsidy being to the smallest systems that are purchased by the less well-off households. Their demand must be assumed to be more price-sensitive than the demand of household who purchase larger SHS-systems for being able to watch TV.
- MHP projects have an almost 100% connection rate within the service area of the mini-grid. The fixed per household subsidy makes only lower cost MHP-projects financially viable. This enables the largest feasible number of projects be financed through the available funds and, thus, the largest feasible number of households be reached in the short to medium term.



Evolution of subsidy rates over time. It is a worldwide phenomenon of political economy that the willingness of politicians to charge prices is lower than the population's willingness to pay.<sup>35</sup> The *nominal prices of the SHS and of the per system subsidy for SHS* are more or less unchanged since 2001; meaning that the inflation adjusted purchase price for households has decreased over time. For *MG-projects the evolution in the cost of investment* has moved in the opposite direction. The nominal cost of investment has increased more than the rate of inflation since 2001 leading the Government to increase the subsidy per kW/per household. Yet, the inflation adjusted cost of a new MG-investment to be paid by a user committee is probably higher in 2010 than in 2001.

Is subsidy policy cost-effective? That depends mainly on two issues. (i) Whether the subsidy rates are adequate or too high; meaning: "do they effectively expand demand and keep free-rider-effects down"? (ii) Whether ESAP II has done enough to promote the expansion of credits for rural RE-investments? Where rural credit is near-absent, subsidies compensate not only for low purchasing power, but also for the lack of access to credits!

The reasonableness of the subsidy rates can be checked by a look at a couple of indicators.

- The development in the structure of SHS sales over time provides clues about the *price elasticity of demand* for the SHS, and thus, about *the extent of free rider effects*. The development of sales towards an increasing share of smaller SHS and the decrease in the annual sales of larger SHS indicate a high price elasticity of demand. This is reassuring except for one caveat: because REF rules do not prevent households to purchase more than one SHS per house, at least some households purchase two small SHS rather than one larger SHS in order to get the per system subsidy twice!
- The evolution in the number of annual SHS sales can indicate *when the "commercial market" reaches its saturation point caused by declining ability to pay*. After growing each year, the number of annual sales for SHS peaked in 2008: total annual sales averaged around 15,000 SHS from 2002 to 2005, jumped to 26,000 in 2007, to 49,000 in 2008, dropping to 30,000 in 2009 and even lower in 2010 as scarcity of subsidy funds blocked for an expansion of sales. Some of the loss of impetus may be due to energy providers having skimmed the very best market and have to conquer poorer and remoter customers. Yet, if the RT is informed correctly, the decline in sales is caused not by a drop in effective consumer demand, but by the fact that the REF ran out of money for SHS-subsidies. When subsidy finance puts a lid on annual sales, then the subsidy scheme turns into a market stopper, not a market promoter. If funds for an open-ended subsidy scheme like the REF run out, the subsidy rates have been set too high: a lower rate would have allowed more systems to be sold!

Conditions for credit enhancement. Access to credit is vital in order to reach households that are able to afford the purchase of a SHS only with credit and to enable community owned MHP-projects to reach financial close. It is more cost-effective and more sustainable to replace subsidies by credit enhancement instruments whenever this is feasible. Yet, to be effective, credit enhancing instruments require two conditions to be fulfilled. One is a presence in rural areas of local finance institutions

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<sup>35</sup> That politicians have kept the tariffs of NEA unchanged since 2001, despite the impact of growing load shedding on household comfort and on the economy is a good illustration of that tendency. The other is the proposal by a leading politician in 2010 to introduce a NPR 10,000 subsidy to SHS purchased by urban dwellers to provide electricity during load shedding.

(LFIs): grassroot level financing institutions like saving cooperatives, agriculture cooperatives and multipurpose cooperatives. The other is a certain level of financial sophistication in commercial FIs; otherwise, a guarantee facility for wholesale loans from commercial FIs to LFIs, for example, is ineffective. In Nepal, these conditions are far from being fulfilled. Very few commercial banks have any presence outside of the major towns; and access to LFIs is underdeveloped. Due to the near absence of credit institutions in rural Nepal, rural development programs include initiatives to improve credit conditions for rural target groups as a standard component. Yet, all face an uphill struggle. KfW, for example, made in 2007 a 2.5 million euro biogas credit line available for participating FIs; 2.5 years later in 2010, only 20% of the funds have been used. Lack of progress in improving rural credit finance is not caused by lack of imagination; several innovative schemes and substitutes for commercial financial intermediation have been tested. ADB, for example, allocated USD1.1 million for IWM-projects of which USD0.5 million are for the administrator of the Rural Microfinance Development Center (RMDC); the RMDC on-lends the funds to the Gatta Owner Association (GOA) for wholesale lending or for lending to individual projects. The expansion of commercial FI-finance into rural areas is supported by a Nepal Rastra Bank directive, which includes investments in MHPs up to 500 kW, solar cookers, solar dryers, solar pumps, IWM, ICS, SHS and wind energy under the Deprived Sector lending requirement (FIs must allocate a certain percentage of lending to deprived sectors or pay fines). Nepal Rastra Bank also approved the establishment of an electricity development fund to support small and medium hydropower project in association with FIs.

ESAP II approach to credit enhancement. ESAP II has focused its credit enhancing activities on the doable: *emphasizing confidence building* and working with existing finance institutions rather than *introducing new finance instruments* of its own. The introduction of a guarantee facility, foreseen in the ESAP II program document, was dropped; ESAP II prefers to collaborate with existing guarantee facilities.

*ESAP II launched a pilot project to secure FI credit finance for rural household purchases of 3,000 SHS.* The project idea is (i) that LFIs are constrained by limited financial and technical capacity to finance SHSs, and are unable to access commercial sources of funds; (ii) that commercial banks have high liquidity, but are not confident about creditworthiness of LFIs. The pilot activity therefore facilitates confidence building linkages between commercial/development banks, LFIs and solar companies. ESAP II's efforts to build confidence between FIs and LFIs included the identification and careful screening of participating LFIs according to criteria agreed to by the participating FIs. The project gave capacity building assistance to the 21 selected LFIs in six districts in assessing and providing loans for SHS installations and courses in business planning and book keeping. Since scale is essential – a commercial FI is interested in developing a new lending activity only if it can see sufficient business volume – ESAP II assisted the commercial efforts by cooperating solar companies through piloting the so-called carpet approach for credit financing (demand collection to identify promising clusters of potential demand for SHS).<sup>36</sup> The FIs give loans to LFIs; the LFIs use these to give their members individual loans of 5000 NRPs and upwards for SHS purchases. The participating solar companies

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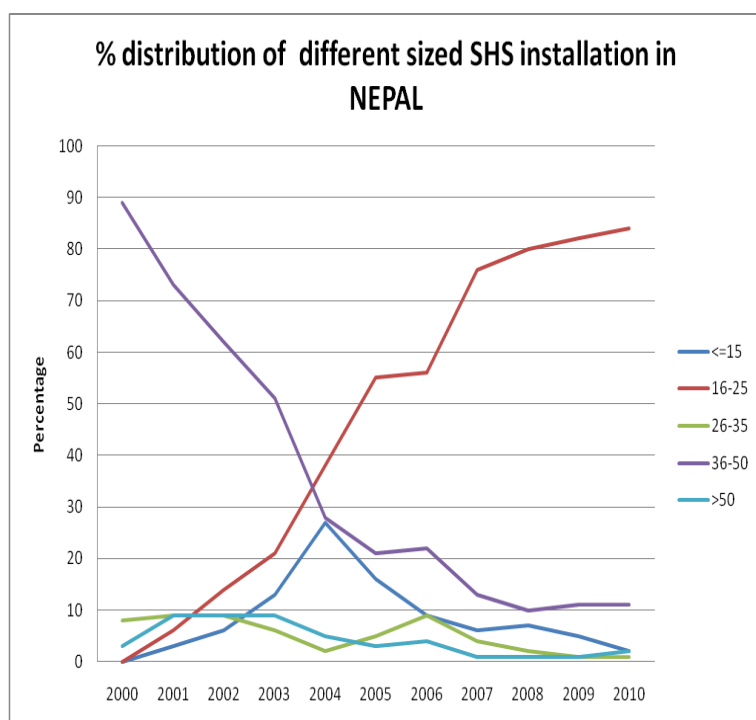
<sup>36</sup> The documents for the activity make claim to a fourth component: “piloting vendor financing mechanisms”; but that phrase covers the active promotion by MFIs of SHS from specific vendors. Cooperative members can get loans from the bank to SHS for which the banks receive a commission from the solar vendor.

commit themselves to providing proper after sales service. The project is now expanded into a further 8 districts.

*Access to credit is becoming increasingly critical for MHP-projects* as the increase in investment costs has increased the cash requirements for the user communities. The average cost of investment per kW is now 400,000 NPR per kW (USD5,800). In a typical project the subsidy covers 40 to 55 percent of the total cost of investment, 20-25% is raised by the local communities mainly in the form of in kind contributions. This leaves a funding gap of 20 to 40 percent to be raised from other sources, including grants or loans from local DDCs and VDCs. Rural MFIs cannot help in the financing of MHP-projects; they are restricted by law to give individual loans up to a maximum of 30,000 NPRs per loan. ESAP II has worked to get commercial banks to *provide credits covering up to 25 percent of the cost of investment* to MHP-projects. The credits have a tenure of 5 years and an interest rate of around 19 percent. ESAP II has fixed itself the target to secure bank-loan-finance for 15 MW. For the total investment of 6 billion, this goal amounts to 1.2 to 1.5 billion NPR in bank loan finance. GTZ is assisting this effort through the establishment of its 0.5 million euro Micro-Hydro Debt Fund (MHDF) at AEPC, the funds of which will be placed in at least two commercial banks for on-lending to MHP-projects. The banks will be found after competitive bidding. Simultaneously, ESAP II has engaged with other FIs to provide *insurance of equipment/civil works* and *partial debt guarantees* to safeguard the MHP investment from calamities of all kinds and loan default. So far, ESAP II has succeeded in securing loans from FIs to 5 MHP-projects, 12 more loans are in the pipeline. Yet, one of the challenges to get commercial FIs involved in MHP-lending is that the tariffs charged by user committees do not cover the total cost of O&M including the cost of major rehabilitations.

Do the subsidies make the RE-systems accessible to the poor? The answer is: “to a certain extent”. Whereas the policy manages to serve the largest number of households, it does not reach the *poorest income groups*. The solar program does not reach the poorest with its SSHS; the MG-program cannot without co-finance implement MG-projects in the high-cost remote areas.

One can identify *four categories of SHS* according to the household needs they serve: (i) Less than 15 Wp satisfy very basic lighting needs., (ii) Up to 35 Wp satisfy basic lighting needs, power a small radio and charge a mobile phone. (iii) The 36 Wp to 50 Wp provide black-&white TV service. (iv) Larger than 50 Wp colour TV service. The chart (and charts 1 and 2 in Annex 7) show the composition of annual sales over time. The chart shows that the SHS mass market is based on the sales of ‘*basic lighting SHS*’. They outcompeted the ‘*very basic lighting SHS*’ (the SSHS, the ‘*Tukis*’) that had gained an almost 30% market share in 2004. This development was not expected when the subsidy policy was adjusted in 2005 and 2006 and the program document for ESAP II was written. At that time it was expected



that the entry into the market of the 4 Wp white LED-systems with a selling price of around 4,000 NPR – the so-called Tukis -would allow the solar program to penetrate deeper into the lower income household groups and allow a continued expansion of annual sales. The purchase price of a Tuki after deduction of the 2,000 NPRs REF subsidy is 2,000 NPRs, the purchase of a 16 WP SHS after the deduction of the 8,000 NPR REF subsidy is 8,000 NPRs. The evolution in sales since 2004 indicates that households who have cash prefer the greater lighting quality and convenience of the 16 Wp system; while low-income households have problems raising the required 2,000 NPR in cash for the Tukis.

It is clear from the *limited market penetration of the SSHS* that the poorer population will not be reached by the general vendor sales model used to disseminate the SHS.<sup>37</sup> A large scale penetration of SSHS into the cash-strapped low income households requires a program approach supported by credits, not an individual sales approach. The Tukis make it affordable for the Nepalese Government to cover the “very basic lighting” needs of “all” low-income rural households with a modern technology. A potential “basic lighting program” could be organized by AEPC in collaboration with the Association of District Development Committee of Nepal. ESAP II could provide assistance to the formulation of the program. The DDCs in collaboration with the RRESCs would identify the poorest households in the villages to whom the Tukis would be marketed with a financing scheme reducing the upfront cash-contribution to a minimum, say 200 NPRs. A Tuki costs about 4,000 NPRs, the REF could pay a grant of 1,000-2,000 NPRs, a loan from the DEF would provide the rest-finance after deduction of the down-payment from the household. The tenure of the loan would be fixed so that the monthly amortization payment would equal the value of the average savings on monthly kerosene consumption.<sup>38</sup> The source of finance for the DEF loans that could come partly from the PAF, partly from commercial FIs.

*MG-projects in remote areas.* Although the per household subsidy modality used by ESAP II for MG-projects includes a transport cost add-on, it prevents the implementation of high-cost projects. Remoteness has a strong impact on the cost of MHP – even cement prices are highly affected. If average household income in a community is negatively correlated with the remoteness of the community, one will find that electrification of the poorest communities is postponed for many years until the pool of lower cost projects has been exhausted and the per household subsidy is raised to allow further electrification to proceed. The DDCs hosting such communities will provide topping-up financial support to enable some such projects to proceed. But a national electrification policy for remote communities is required.

Do REF subsidies promote productive uses? Productive use promotion was not included as support in the ESAP II program documents and has been a weak point in ESAP supported MHP-projects. Until recently, no provision was made to include a loan facility to entrepreneurial investments as part of the financial package for supported MHP-projects. Nor is the capacity limit of 120 Wp per household, which is encouraged by the subsidy rate calculation of the Subsidy Policy and the Subsidy Delivery Mechanism, conducive for productive uses, for the optimal utilization of hydropower potentials and for meeting demand growth.

<sup>37</sup> The incentive of (S)SHS-vendors is to focus their sales efforts on the larger systems: under the present GoN subsidy modality they need to put as much effort into the selling of an SSHS as for a SHS.

<sup>38</sup> The calculation of that must be realistic. International experience shows that SHS cut household kerosene consumption by 50-60% only.

Are SHS systems still used by those who received the subsidy? The subsidy modality for SHS provides two economic incentives for cheating: (i) The REF provides subsidies only to SHS that are installed in rural areas; because of frequent load shedding in Nepal, there is a demand for SHS also in urban areas. City dwellers, therefore, have an incentive to get a system temporarily installed at a rural house (subsidy payment depends on photo-documentation of the installed SHS at the defined rural premise and of the owner) and then move to their urban house. (ii) Within the rural areas, the standard per system subsidy is supplemented by a distance-related subsidy; if the subsidy is higher than the true cost of incremental transport, then there is an economic incentive to install a SHS at a remote rural house and then move it to a less remote rural house. Anecdotal evidence suggests that both types of misuse take place; yet, it is unlikely to be a widespread problem.

Can subsidy administration become more flexible? ESAP II has introduced improvements to its subsidy disbursement scheme. Payment in stages reduces the need of SHS vendors and turbine manufacturers for working capital (typical interest rates are 15%). The REF now disburses 90% of the subsidy after submission by the SHS vendor of the subsidy application form. Yet, there is room for more flexibility; e.g. increasing the disbursement to 100% for vendors that have build a track-record of minimum three years of good performance.

## **5.7 Environment and Climate change**

Environmental assessment or screening is not very developed in ESAP or AEPC. The environmental consequences are not likely to be large for the individual system and in many examples even beneficial. However, the aggregated number of systems could have combined environmental impacts.

A long standing issue has been the collection and refurbishing of SHS batteries. The incentives to collect batteries from remote areas are low due to high costs of transportation. There is not yet an established facility for battery recycling, and exports to India are technically possible but not legal under the Basel Convention. As part of its agreement to join ESAP II, KfW secured a commitment from the GoN to establish a battery refurbishing facility for used batteries: SHS batteries and other batteries (car, motorbike, trucks, inverters, etc.). A voucher based system has been developed to provide an economic incentive for battery collection from remote areas; but is not yet operational.

A potential environmental risk emerges from potential reductions in the flow of water for MHP. The water supply is depending on the land use in the watershed and in particular the maintenance of the forest and other vegetation cover to ensure a more even flow throughout the year and to prevent damages from floods and land slides on the MHP infra structure and mini-grid. ESAP and AEPC have a focus on the specific technologies but less on the external environmental conditions such as watershed management.

A particular concern emerges with the potential impacts of extreme climate events and erratic weather patterns due to climate variability and change. The planning of future use of rural renewable energy technologies should take into account the impacts on changes in temperature and precipitation on the efficiency of these technologies.

There are options for climate finance for mitigation and low carbon development from renewable energy technologies. A successful CDM project is already developed for biogas in Nepal. AEPC is at the signing stage for a CDM-project for MHP, the ERPA has already been signed; UNDP provided through REDP support to this initiative. Studies on the feasibility of CDM project of solar and ICS are going on with AEPC support. The options are mainly for non-grid technologies and biomass since the energy mix in the grid supply is mainly hydro-power. Options are also emerging with climate specific grants such as the SREF (Scaling Up Renewable Energy Fund) where ADB and World Bank is expected to allocated USD 40 Million for Nepal.

## **6. Findings and Recommendations**

### **6.1 Findings regarding results and impacts**

Overall, ESAP II has achieved impressive results in terms of providing rural households with access to RE&EE technologies: so far ESAP II has supported the installment of 191,000 ICS, 157,000 SHS, 9,000 SSHS, and provided 63,000 households with access to electricity from mini-grids (number includes 38,000 households from MHP-projects presently under construction). The annual level of installations is higher than during ESAP I. ESAP II has made valuable contributions to the formulation of Government policies for rural and renewable energy. But in focusing on achieving the 122 outputs defined in the ESAP II program document, insufficient attention was paid to the objective of strengthening AEPC's institutional capacity: the process consultant aspect of the work was neglected. The key strategic challenge for ESAP II during its remaining lifetime until 2012, is to assist AEPC in building its core competencies in the execution of its functions as RE-policy think tank proposing RE-policies and regulations to the Government, and as executing agency for the formulation and implementation of Government and donor financed RE-programs. The goal for this (and for follow-up capacity building in a post ESAP II program) is to provide AEPC within 3-4 years with the capacity to manage a SWAp for RE in Nepal.

Capacity of AEPC staff. End-of-2010, AEPC had 39 staff (plus 16 contract staff) and Government approval to increase the number of permanent staff to 55; the SOD's organization plan recommends a staff of 85. If AEPC within a 3-4 years period is to be capable of managing a SWAp for RE in rural Nepal, a more targeted capacity building effort is required than the ad-hoc workshop participation approval procedure which has been the norm for ESAP II's capacity building assistance in the past. The balance between ESAP II resources used on formal training of AEPC staff and on learning-by-doing through joint ESAP/AEPC staff work has also not been optimal. ESAP should focus on more capacity building of AEPC staff which includes also short and long term training and academic course and the transfer of more responsibilities to AEPC counterparts.

Gender and social inclusion: Until 2010, GESI issues received inadequate attention both at AEPC & ESAP II organizational level and at ESAP II program level. AEPC as an organization is dominated numerically by high caste male consisting of brahmin/chhetries that also hold the higher position in the organization, thus making all decisions. There is now special provision in the AEPC staff regulation that a certain percentage of the new recruitment should be reserved for the ethnic and janajati candidates. Out of the total staff 32% consists of women and only five of them are in the officer level position. The composition of ESAP II staff is similar. At ESAP II program level only the biomass energy component had a satisfactory performance in addressing GESI issues. In MHP-projects, female representation on decision taking committees was merely ornamental; decision making was captured by male members from the upper economic and caste strata. The GESI situation, however, is now being addressed by the Norad financed addendum to ESAP II from 2010. The ESAP II Annual Work Plan (2009/10) has included a GESI Action Plan in all four of the ESAP components.

Biomass energy component. The success of the mud-ICS can be described above all to its good design, which gives the recipient household not only energy efficiency, but also a better kitchen with a more elegant look and large smoke and particle reduction. However, proper maintenance is known to be an issue!

Solar energy component. The SSHS, the solar Tuki, was expected to be the instrument for providing the poorest population groups with a basic need source of lighting. Yet, it is clear from the limited market penetration of 9,000 SHS versus 157,000 SHS that ESAP II has failed in this goal.

MG-component. Whereas the SHS-industry boomed during ESAP II, the MHP-industry showed signs of stagnation. The combined efforts of ESAP II and REDP never succeeded in getting more than 5 MW of new micro-hydro capacity installed per year. The manufacturers did not invest in any expansion of capacity, and did not advance technically: they can manufacture Pelton turbines up to 300 kW; but have no experience with Francis turbine technology used for sites with low head but high flow. The MHP-schemes are not financially viable in the long run as the tariffs charged by the user committees cover the costs incurred of daily operation only (i.e. salary to operators and managers and normal maintenance of plants). The productive uses of power are modest. In part because of limited local economic opportunities for productive uses of power; partly due to insufficient productive use promotion; partly because the limitation of the power capacity of supported MHP-plants to 120 W per connected household leaves little scope for any growth in demand.

Structure for implementation at decentralized level. ESAP II has now 13 regional RE service centers operating, 7 support MG and ICS activities, 6 support ICS-activities only. AEPC's 32 DEEUs and 40 DEES provide AEPC with countrywide (except 3 districts) presence within each DDC, dedicated to rural energy and environment needs. The effort has resulted in DDCs incorporating RE-projects and a budget for these into their annual development plans.

Credit enhancement AEPC and ESAP successfully lobbied for the announcing by Nepal Rastra Bank that lending to RE is considered as a deprived sector lending scheme. ESAP succeeded in getting insurance of SHS panels and of MHP-plants initiated and to establish coordination between banks providing loans to SHS and to micro-hydros and the leading national debt guarantee institution. ESAP got 4 commercial FIs involved in wholesale lending to 21 LFIs for retail lending to SHS purchases. Some 3000 SHS received credits under the pilot scheme in six districts which is now expanded to 8 more districts. 5 MHP-projects received loans from commercial FIs, 12 more loans are in the pipeline. The approach promises to yield an important expansion of commercial credits in the medium term.

## **6.2 Findings on processes, management and implementation**

Program management. ESAP is well managed and the technical and administrative staff perform well as professionals. The dense program of visits prepared for the RT is an eloquent illustration of ESAP's logistical capabilities. The impressive speed of response by ESAP staff to requests for information during the RT's visit proved the quality of ESAP's MIS. The three components of ESAP II perform three qualitatively different functions: (i) the outsourced program function: the technical support for the development and implementation of biomass energy, solar energy and mini grid electrification projects; (ii) the technical support to AEPC function: the activities performed by the Institutional



Strengthening of Rural Energy Sector (ISRES) component; (iii) the institution creation function: the management and operation of the REF. Yet, the organization of the three components is not structured to take into account the qualitative differences between the three functions and their post-ESAP II length-of-life. ESAP II is managed as a single project. Business-as-usual is not in the cards for the successor program for ESAP II; yet, the present program staff seems to believe that there will be an ESAP III and acts accordingly. In particular the ISRES needs to shift into a process consultant mode of operation. For that to work, AEPC must make adequate staff available and impose a system of skill transfer to its staff.

Rural Energy Fund (REF). The quality of REF's systems for reporting, monitoring and disbursement is recognized by stakeholders in Nepal and is undergoing ISO-certification. But Subsidy Policy and the Subsidy Delivery Mechanism's modality for the disbursement of REF payments may need to be adjusted in order to take into account the increasing co-financing role of the DDCs in MHP-finance. The merits of replacing the present modality of direct REF payments to turbine-manufacturers with the channeling of an awarded REF-grant through a District Energy Fund (DEF) deserve to be looked into. The DEF would place the agreed DDC-REF co-finance into a bank account for the project from which all civil, mechanical and electrical works would be paid. This would facilitate a more 'turn-key type approach' (community will still supply labor inputs) to construction. The DDC would place its co-finance into the community project as investment, requiring the community to amortize the DDC equity over a period of five years after which the community would continue to pay the same amount into the DEF against the commitment by the DEF to pay for required major repairs and rehabilitation when the need for this occurs. This will also solve one of the obstacles to getting commercial FIs involved in MHP-lending: that the tariffs charged by user committees do not cover the total cost of O&M including the cost of major rehabilitations.

### **6.3 Findings on instruments**

Subsidy policy. The establishment of a rational national RE-subsidy and its efficient implementation through the REF is one of the success stories of AEPC and an outcome of ESAP activity. Yet, adjustments are called for in the subsidy schemes for SHS and for MG in order to further reduce the costs of transactions and to reach the poorer sections of the population in the poorer regions. A reduction in the subsidy rates for SHS in more accessible areas can be justified by the drop in market prices of the SHS and is a necessity due to the shortage of funds in the REF for solar subsidies. The RT has evaluated whether the transaction costs of the REF's disbursement modalities for SHS are justified and reached a positive conclusion. The system builds quality in the supply chains and trust at donor level.

Reaching the poor. The Tukis make it affordable for the Nepalese Government to cover the "very basic lighting" needs of "all" low-income rural households with a modern technology. The solar Tuki was expected to be an instrument for providing the poorest population groups with a basic need source of lighting. Yet, it is clear from the limited market penetration until now that the population will not be reached by the general vendor sales model used to promote solar home systems (SHS). A large scale penetration of SSHS into the cash-strapped low income households requires a program approach

supported by credits, not an individual sales approach. A potential “basic lighting program” could be organized by AEPC in collaboration with the Association of District Development Committee of Nepal/VDC Association of Nepal and with potential co-finance from the PAF. ESAP II could provide assistance to the formulation of the program. The DDCs in collaboration with the PAF/RRESCs would identify the poorest households in the villages to whom the Tukis would be marketed with a financing scheme reducing the upfront cash-contribution to a minimum, say 200 NPRs, by supplementing the REF grant by household credits from the local DEF. The source of finance for the DEF loans that could come partly from the PAF, partly from commercial FIs.

Credit enhancement. ESAP II has very intelligently stayed away from introducing specific new public finance instruments of its own – e.g. an ESAP II financed guarantee facility. ESAP II’s effort focuses on building mutual trust and practical collaboration agreements between commercial FIs, LFIs, and the actors in the SHS- and MHP supply chains; whilst simultaneously motivating insurance companies and credit guarantee providers to become active in the RE-sector. The quality of the work is very high.

## **6.4 Recommendations for rest of ESAP II**

The RT makes the following 12 recommendations, the contents of which are detailed in the matrix at the end of the Executive Summary:

1. Implement a targeted capacity-building program to enable AEPC within a 3-4 years period to be able to manage a SWAp for RE
2. AEPC to impose its corporate image
3. Take steps to transform REF into CREF without loss of staff continuity and specify the transfer requirements for financial management to be specified in the next version of the Joint Finance Agreement
4. Prepare a Road Map/Process Action Plan for the introduction of a SWAp
5. Implement GESI policy, including a gender and social inclusion balanced staff at AEPC and in the future new program and follow the recommendations in the Gender and Social Inclusion Addendum on the best use of the funds that is allocated to gender and social inclusion in ESAP II, starting with the activities identified in output 7.
6. Support AEPC to further strengthen the collaboration with DDCs towards empowering DDCs to effectively carry out decentralized planning and management of rural energy sector
7. Improve the sustainability of MG-projects and streamline the regulatory procedures for pico-, micro- and mini-hydro
8. Reduce SHS subsidy levels and replace the present vendor based SSHS dissemination modality by a program targeting the poorest households through combined use of REF grants and credits in collaboration with DDCs.

9. Review ESAP's administrative and processing routines to verify the potential for alternative, more cost-effective approaches
10. Expand ESAP II to June 2012 and undertake reallocation of ESAPII budget lines for remaining work program.

## **6.5 Recommendations for next phase**

As ESAP II ends in early 2012, the preparation of a new program is on the agenda for the Danish and Norwegian embassies and the KfW. Steps to be taken were discussed at the most recent ESAP Steering Committee meeting (September 2010); it was proposed that the terms of reference for hiring an international (process) consultant responsible for the preparation be drawn up.

The year 2011 is an opportune time to prepare new initiatives for supporting rural and renewable energy, notably as the new SREP investment strategy will be designed, the EU funded REP and the REDP are coming to an end (preparations are underway to design a new phase of the latter program). On the basis of the results and accumulated lessons of ESAP II, there appear to be many good reasons for continuing to advance towards a sector wide approach (SWAp) or sector budget support (SBS) in the 'rural and renewable energy sector.' The conclusions and recommendations of the SWAp feasibility study, dated August 2010, summarise the various policy, institutional, financial and technical issues faced in transforming the RE sector, including legal and institutional capacity difficulties, possibilities for convergence of donor funded programmes, challenges associated with decentralized institution building and the capacities of the private sector in RRE, etc.

The AEPC has a major role to play in developing the RRE sector and will be the primus motor for the preparation of the new program. Given that there are currently various modalities for providing funding to the RRE sector and a diverse range of donor agencies and partners, advancing towards joint agreement will require a concerted and government led effort.

A first step would be an indication of commitment to (or intention to) provide funds for a joint new rural and renewable energy program to start in 2012. The Rural and Renewable Energy Development Partnership Forum would be the relevant forum for the discussions leading to the preparation of a program document. A joint appraisal of the new program would be undertaken by donors. It is envisaged that a sufficiently well organized preparation process could lead to the finalization of agreements between the donor agencies and the GoN at the end of 2011 or the beginning of 2012.

The RT recommends:

1. That a collaborative design process for a new program be launched as soon as possible in 2011. The program is to be based on the principles of joint assistance, be aligned to government policies in the sector. And be GESI-sensitive from the design process.
2. Prepare a lessons learned study of ESAP II that can will be a status assessment and contribute to the programme completion report

3. Prepare a baseline for the impact monitoring of the next programme phase.
4. It is recommended to find a new name for the program to underline the break with the past. A potential name could be 'Energy for Rural Transformation'.
5. Subject to confirmation by the program preparatory process, the program is to be structured differently from ESAP II. The CA could act as direct advisor to the ED (not as independent program administrator) along with a small team of temporary consultants whose responsibility is to build the capacity of specific specialised staff in AEPC. The management of the MHP, solar and biomass programs could be outsourced by AEPC to three different NGOs/consultant firms. REF will gain semi-autonomous status as CREF (with its present staff hopefully remaining as CREF staff); some temporary program advisors will be attached to build its multiple finance instruments capacity.
6. Subject to confirmation by the CREF legal structure/organisation report and the fiduciary review report, CREF is to be kept ring-fenced from AEPC's executing functions (arms length relationship) and the high quality of REF's monitoring and control system for grant disbursements is to be maintained.
7. Reviews of the post-2012 program are to include peer-reviewing of the quality of completed consultant reports to verify value-for-money.
8. An option for the post-2012 program modality to explore is to abolish the Steering Committees for individual programs and have the Board of AEPC perform the SC-function. It can be done by holding separate donor-Board sessions at the end of normal board meetings.
9. One new activity that may be added is an innovation support program to strengthen the capacity of the national supply chains, in particular the micro-hydro turbine manufacturers.

## **Annexes**

## Annex 1: ESAP II Summary of Results

	ESAP II Document Target	ESAP II Revised Target	ESAP II Status	ESAP II Status (%)	ESAP I and II	Comments (from ESAP Team)
	Mar 2007	Jun 2010	Nov 2010	Nov 2010	Nov 2010	
<b>Improved biomass technology (ICS) (units)</b>						
• Improved mud bricks ICS	434,000	305,000	191,020	63 %	404,121	<ul style="list-style-type: none"> <li>Late start of implementation in terai districts due to delay in HR recruitment</li> <li>Initiated (year 2008/09) implementation through DEES as pilot in far western 4 districts (resulted into slow progress in all support structures) later continued with regular model since July 2010</li> </ul>
• Institutional ICS	5,000	2,800	354	13 %	1,287	<ul style="list-style-type: none"> <li>Road side hotels are of temporary settlement nature and more reluctant to adopt fixed IICS which costs more than NPR 2,000.</li> </ul>
• Metallic ICS	50,000	17,000	3,050	18 %	3,050	<ul style="list-style-type: none"> <li>The modality preparation took time.</li> </ul>
• Household gasifier (pilot)	10,000	500	27	5 %	27	<ul style="list-style-type: none"> <li>The modality and bench mark setting took time due to lack of HR</li> </ul>
• Institutional gasifier (pilot)	1,000	55	1	2 %	1	<ul style="list-style-type: none"> <li>The modality and bench mark setting took time due to lack of HR</li> </ul>
<b>Solar home systems</b>						
• Solar Home System (units)	150,000	215,000	157,000	73 %	225,000	

	ESAP II Document Target	ESAP II Revised Target	ESAP II Status	ESAP II Status (%)	ESAP I and II	Comments (from ESAP Team)
• Small SHS (Tuki) (units)	250,000	100,000	9,000	9 %	• 9,000	<ul style="list-style-type: none"> <li>The modality preparation took time.</li> <li>The product demand for the given level subsidy and size is low.</li> </ul>
• Solar water pumping	-	100	0	0 %	0	<ul style="list-style-type: none"> <li>This is introduced with KfW funding from March 2009 so modality preparation is ongoing.</li> </ul>
<b>Mini-grid (hydro) electricity</b>						
Commissioned (HH) / (kW)	150,000 (15,000)	122,000 (13,700)	24,910 (2,468)	20 % (18 %)	45,000 (4,400)	<ul style="list-style-type: none"> <li>Resource mobilisation from community took a long time.</li> <li>Low capacity of installation company</li> </ul>
Under construction or final (HH) / (kW)	-	35,000 (5,000)	38,423 (4,100)	-	-	
Preparation completed (HH)	-	122,000	218,000	-	-	

ESAP II target revision for solar and biomass approved by SC No. 34 (June 2010)

## Annex 2: ESAP II Progress Indicators

<b>ESAP II: Performance Score Card</b>		<b>Score:</b>	<b>Score:</b>	<b>Weights</b>
<b>Self-Assessment by ESAP II PIU</b>		<b>December</b>	<b>March</b>	<b>*)</b>
<b>SCORE: Green &gt;= 4.0; Yellow: 2.5 - 3.9; Red &lt; 2.5</b>		<b>2010</b>	<b>2012</b>	
	<b>ESAP II Programme: TOTAL</b>	<b>3,1</b>	<b>4,6</b>	
<b>COMPONENT 1</b>	<b>Institutional Strengthening of Rural Energy Sector</b>	<b>3,3</b>	<b>4,5</b>	<b>7%</b>
<b>Output 1</b>	<b>Coherent Rural Energy Policy addressing both on- and off-grid electrification issues, among others</b>	<b>3,4</b>	<b>4,5</b>	<b>15%</b>
Output 1.1	Support to prepare a National Rural Energy Development Strategic plan	<b>1</b>	<b>3</b>	25%
Output 1.2	Review the present policies governing RE	<b>4</b>	<b>5</b>	10%
Output 1.3	Assist the revision of subsidy policy and integrated credit mechanism	<b>4</b>	<b>5</b>	25%
Output 1.4	Periodic policy reviews and recommendations for amendments	<b>4</b>	<b>5</b>	10%
Output 1.5	Monitor the implementation of policies and strategies	<b>4</b>	<b>5</b>	10%
Output 1.6	Prepare inputs to the five years development plan	<b>5</b>	<b>5</b>	15%
Output 1.7	Cooperate with MoE in the preparation of CEAs & SEAs	<b>4</b>	<b>5</b>	5%
<b>Output 2</b>	<b>An institutional basis with clearly defined roles established with focus on decentralization and the private sector</b>	<b>4,2</b>	<b>5,0</b>	<b>15%</b>
Output 2.1	Mapping of institutional roles	<b>5</b>	<b>5</b>	15%
Output 2.2	Conduct a sector wide conference and agree on the sector diagram	<b>5</b>	<b>5</b>	15%
Output 2.3	Strengthen the coordination by institutionalising a network of institutions	<b>3</b>	<b>5</b>	25%
Output 2.4	Assist local partners to ensure efficient resource utilization through planning exercise	<b>3</b>	<b>5</b>	15%
Output 2.5	Participate in the Task Forces	<b>5</b>	<b>5</b>	30%
<b>Output 3</b>	<b>Sector Wide Approach (SWAp) for rural energy development in place.</b>	<b>3,0</b>	<b>3,6</b>	<b>15%</b>
Output 3.1	Ensure transparency in REF administration (ISO Certification)	<b>4</b>	<b>5</b>	20%
Output 3.2	Promote SWAp for participation by multiple EDPs	<b>3</b>	<b>3</b>	20%



Output 3.3	Encourage EDPs to sign on to joint financing agreements for rural energy	2	3	20%
Output 3.4	Strengthen the EDPs' coordination by institutionalising the current thematic group on rural electrification co-chaired by ADB	1	2	20%
Output 3.5	Follow up on decisions made in the EDPs coordination meetings	5	5	20%
<b>Output 4</b>	<b>An accountable and effective institutional leadership, especially in AEPC with transparent decision-making process for rural energy policy, planning and management</b>	<b>3,0</b>	<b>4,6</b>	<b>15%</b>
Output 4.1	Improve the Management practices of AEPC and partner institutions	3	3	20%
Output 4.2	Organise leadership and management training courses for management in AEPC and partner institutions	3	5	10%
Output 4.3	Establish a transparent system for dissemination of Management decisions	3	5	20%
Output 4.4	Financial management practices and systems	3	5	20%
Output 4.5	Improve the AEPC Management Information System (MIS) as required	3	5	20%
Output 4.6	Improved working environment in AEPC through infrastructure improvement and incentive support	3	5	10%
<b>Output 5</b>	<b>Conducive working environment in AEPC and partner organizations, including human resource development policy, planning &amp; management</b>	<b>2,6</b>	<b>4,2</b>	<b>15%</b>
Output 5.1	Update AEPC SOD plan	4	5	20%
Output 5.2	Conduct capacity building activities of AEPC and partner institutions	3	5	20%
Output 5.3	Implement the human resource development strategy in AEPC	0	2	20%
Output 5.4	Analyse institutional gender issues and implement gender mainstreaming in AEPC and other partner institutions	3	4	20%
Output 5.5	Conduct capacity building activities of other partner institutions	3	5	20%
<b>Output 6</b>	<b>Integrated documentations of the sector development and of major changes in the programme (ESAP II) in place</b>	<b>3,0</b>	<b>5,0</b>	<b>10%</b>
Output 6.1	Establishment of a network for knowledge sharing and coordination	3	5	30%
Output 6.2	Establishment of information services (web-site and resources centre)	3	5	40%
Output 6.3	Conduct an annual integrated stocktaking exercise of sector developments and for major changes and conduct impact studies	3	5	30%
<b>Output 7</b>	<b>Coherency among Rural Grid and Off-grid Electrification (Support for Kailali Kanchanpur Rural Electrification Project, KKREP, Umbrella cooperative)</b>	<b>4,0</b>	<b>5,0</b>	<b>15%</b>
Output 7.1	Social Mobilisation-Cooperative (Support for KKREP Umbrella cooperative)	4	5	35%
Output 7.2	Conduct capacity building activities with cooperatives	4	5	35%

Output 7.3	Prepare and disseminate IEC materials	4	5	15%
Output 7.4	Elaborate and publish guidelines, manuals and planning tools	4	5	15%
<b>COMPONENT 2</b>	<b>Rural Energy Fund</b>	<b>3,0</b>	<b>4,8</b>	<b>78%</b>
<b>Output 1</b>	<b>Fund raised for support to rural energy investment from national and EDPs</b>	<b>2,7</b>	<b>4,7</b>	<b>25%</b>
Output 1.1	Network and coordinate with Government institutions, donors, financial sector and private energy service sector.	3	5	40%
Output 1.2	Promote REF through dissemination of information on REF achievements and modalities.	3	5	30%
Output 1.3	Raise Fund with donors (grants and credits), financial sector and Government matching contributions	2	4	30%
<b>Output 2</b>	<b>Financial sector credits available for rural energy investment.</b>	<b>3,2</b>	<b>4,8</b>	<b>25%</b>
Output 2.1	Study on Development of modalities for promotion of solar PV technology	3	5	20%
Output 2.2	Piloting of modalities developed for promotion of micro credit with MFIs, NGOs/CBOs, etc.	4	5	20%
Output 2.3	Promote and lobby for a financial sector managed long-term credit facility for rural energy investments (Awareness Activity)	3	4	20%
Output 2.4	Conduct capacity building activities in the financial sector for RE investments.	3	5	15%
Output 2.5	Promote rural energy solutions through orientation program	3	5	10%
Output 2.6	Facilitate credit line availability with financial institutions	3	5	15%
<b>Output 3</b>	<b>Fund managed in a transparent and efficient manner</b>	<b>3,0</b>	<b>4,7</b>	<b>25%</b>
Output 3.1	Review of Delivery Mechanism	3	5	30%
Output 3.2	Institutional credit facilitating	3	4	35%
Output 3.3	Monitoring	3	5	35%
<b>Output 4</b>	<b>Fund optimally channelled by REF for the investment in different rural energy solutions</b>	<b>3,0</b>	<b>5,1</b>	<b>25%</b>
Output 4.1	Sound financial appraisal of projects for subsidy approval and for investment by financial institutions.	3	5	10%
Output 4.2	Approve applications for grant from the REF support for off-grid electrification	3	5	10%
Output 4.3.1	SHS-150,000HH	5	5	10%
Output 4.3.2	Solar Tuki -250,000HH	1	5	10%
Output 4.3.3	MH-150,000HH	4	5	20%
Output 4.3.4	BE-100,000HH	2	5	10%

Output 4.3.5	PV Pumping System	2	5	15%
Output 4.4	Facilitate the REF Institutional Credit Network and coordinate with Government institutions, donors, financial sector and private energy service sector	2	4	15%
<b>COMPONENT 3.1</b>	<b>Biomass Energy</b>	<b>3,3</b>	<b>3,4</b>	<b>6%</b>
<b>Output 1</b>	<b>Capacity development of district based LPOs', specifically in scaling up of ICS</b>	<b>3,75</b>	<b>3,75</b>	<b>15%</b>
Output 1.1	Provide technical inputs to LPOs for biomass technologies including ICS in the mid hill districts	4	4	25%
Output 1.2	Provide ToT and other trainings to LPOs for their capacity building	4	4	25%
Output 1.3	Monitor and supervise LPOs activities and back stop them on time	4	4	25%
Output 1.4	Establish ICS/biomass network	3	3	25%
<b>Output 2</b>	<b>ICS dissemination scaled up and integrated in other rural development programme</b>	<b>3,2</b>	<b>3,2</b>	<b>10%</b>
Output 2.1	Ensure integration of inclusion of ICS / Biomass energy programme in DDC periodic plan	3	3	20%
Output 2.2	Awareness for media, key local players, health related organization and medical doctors through orientation demonstration	3	3	20%
Output 2.3	Identify, compile and produce a complete range of appropriate information materials for massive dissemination to the stakeholders	4	4	20%
Output 2.4	Workshop for Donor, INGO, GOs	3	3	20%
Output 2.5	Consultative meeting and initiated dialogue with non-formal education	3	3	20%
<b>Output 3</b>	<b>All development organization have adopted uniform approach in dissemination of biomass technologies</b>	<b>3,0</b>	<b>3,0</b>	<b>10%</b>
Output 3.1	Advocacy, Lobbying and Networking for Integration of ICS	2	2	50%
Output 3.2	Improve and update best practices manual, including standard of testing in order to get quality technologies	4	4	50%
<b>Output 4</b>	<b>Identification of other biomass energy solutions</b>	<b>3,3</b>	<b>3,6</b>	<b>10%</b>
Output 4.1	Conduct adaptive research and development works and design stove options for high altitudes and tropical areas	4	4	20%
Output 4.2	Conduct feasibility studies for other biomass technologies	3	3	20%
Output 4.3	Testing of Biomass Technologies	3	4	20%
Output 4.4	IEC Materials-Orient & Demo	4	5	10%
Output 4.5	Publicity through Media	3	3	10%
Output 4.6	Technology Promotion - Dev Org	3	3	20%

<b>Output 5</b>	<b>Policy in place for identified biomass energy solutions i.e. especially gasifiers, briquettes, bio fuels and cogeneration</b>	<b>2,5</b>	<b>3</b>	<b>15%</b>
Output 5.1	Preparatory phase	3	3	50%
Output 5.2	Sector Development	2	3	50%
<b>Output 6</b>	<b>Awareness among rural people on efficient biomass energy solutions created</b>	<b>3,5</b>	<b>3,5</b>	<b>15%</b>
Output 6.1	Development of information materials for biomass technologies	3	3	25%
Output 6.2	Awareness campaign on a range of biomass technologies and training	4	4	25%
Output 6.3	Conduct IEC Impact study	3	3	30%
Output 6.4	Improvise IEC materials	4	4	20%
<b>Output 7</b>	<b>Commercialize other biomass energy technologies with private sector involvement</b>	<b>3,0</b>	<b>3,0</b>	<b>15%</b>
Output 7.1	Identify private companies /organization for involvement in other Biomass energy technologies	3	3	100%
<b>Output 8</b>	<b>Documentation of Biomass stoves installed in the next five years in all ecological zones</b>	<b>4,2</b>	<b>4,2</b>	<b>10%</b>
Output 8.1	Conduct impact studies	3	3	50%
Output 8.2	Support MIS	5	5	50%
<b>COMPONENT 3.2</b>	<b>Solar Energy</b>	<b>4,1</b>	<b>4,3</b>	<b>4%</b>
<b>Output 1</b>	<b>Efficient &amp; Effective Service Providers</b>	<b>4,3</b>	<b>4,3</b>	<b>15%</b>
Output 1.1	Disseminate information and build awareness	4	4	20%
Output 1.2	Prepare and distribute training Manuals	4	4	20%
Output 1.3	Conduct capacity building activities for service providers and support organization (orientation, training, exposure visit etc) in the sub sector	4,5	4,5	30%
Output 1.4	Conduct reviews, surveys and other impact studies	4,5	4,5	30%
<b>Output 2</b>	<b>Improved Quality Assurance Systems</b>	<b>4,4</b>	<b>4,4</b>	<b>15%</b>
Output 2.1	Update or revise criteria, mechanisms and standards	4	4	15%
Output 2.2	Conduct company qualification, performance evaluation, grading, penalty etc	4,5	4,5	20%
Output 2.3	Follow up action on RETS test Reports	4,5	4,5	15%
Output 2.4	Field monitoring of SHS and SSHS	4,5	4,5	20%
Output 2.5	Provide backstopping to RETS and CTEVT	4,5	4,5	15%
Output 2.6	Conduct reviews, surveys and other impact studies	4,5	4,5	15%
<b>Output 3</b>	<b>Inputs to Policy Formulation &amp; Review</b>	<b>4,5</b>	<b>4,5</b>	<b>15%</b>

Output 3.1	Provide policy as required	4,5	4,5	100%
<b>Output 4</b>	<b>Credit Delivery Modalities for Easy Access &amp; Wider Availability</b>	<b>3,0</b>	<b>3,5</b>	<b>15%</b>
Output 4.1	Support development of promotion of credit modality and institutional arrangement with commercial banks, local FI & MFIs	3	3,5	60%
Output 4.2	Concept awareness and capacity building MFIs in consultation with ISRES and REF Components	3	3,5	40%
<b>Output 5</b>	<b>Increased Use of SHS and SSHS</b>	<b>4,7</b>	<b>4,7</b>	<b>15%</b>
Output 5.1	Administer, appraise and recommend SHS applications to REF	4,5	4,5	30%
Output 5.2	Developing new modalities and support through POs for SSHS promotion	5	5	30%
Output 5.3	Conduct reviews, surveys and other impact studies	4,5	4,5	40%
<b>Output 6</b>	<b>Used Battery Management Initiated</b>	<b>4</b>	<b>4,5</b>	<b>15%</b>
Output 6.1	Conduct feasibility study for establishing battery collection and recycling within the private sector	4	4,5	20%
Output 6.2	Conduct awareness and capacity building activities of solar companies and relevant stakeholders for collection of battery	4	4,5	30%
Output 6.3	Support for developing battery collection mechanism	4	4,5	30%
Output 6.4	Conduct reviews, surveys and other impact studies	4	4,5	20%
<b>Output 7</b>	<b>Increased Cooperation for Complementarities and Synergies</b>	<b>3,5</b>	<b>3,8</b>	<b>10%</b>
Output 7.1	Interact with GOs/NGOs, programmes and projects for increased use of SHS and SSHS	4,5	4,5	30%
Output 7.2	Support for promotion of productive end-use and linkages	2	2,5	40%
Output 7.3	Conduct reviews, surveys and other impact studies	4	4	30%
<b>COMPONENT 3.3</b>	<b>Mini-Grid Rural Electrification</b>	<b>3,9</b>	<b>4,0</b>	<b>5%</b>
<b>Output 1</b>	<b>Inputs to various rural energy related policies and their updates.</b>	<b>4,2</b>	<b>4,5</b>	<b>20%</b>
Output 1.1	Provide inputs for the updating of various rural energy policies	4	4,5	30%
Output 1.2	Formulate policy for Mini Grid & Grid Connection	4	4,5	30%
Output 1.3	Advocate for Mini grid and grid connection strategy	4,5	4,5	40%
<b>Output 2</b>	<b>Rural electrification activities are integrated into local planning activities.</b>	<b>4</b>	<b>4,25</b>	<b>15%</b>
Output 2.1	Assist integration of electrification plan on VDC/DDC planning	4	4,5	50%
Output 2.2	Assist DDC on information dissemination and facilitations for local users	4	4	50%

<b>Output 3</b>	<b>Efficient and competitive service delivery mechanisms.</b>	<b>4</b>	<b>4</b>	<b>15%</b>
Output 3.1	Monitoring project cycle duration annually	4	4	40%
Output 3.2	Conduct capacity building activities	4	4	30%
Output 3.3	Ensure quality assurance of mini-grid implementation	4	4	30%
<b>Output 4</b>	<b>Institutionalized local ownership and use of electricity in rural areas not covered by national grid</b>	<b>4</b>	<b>4</b>	<b>20%</b>
Output 4.1	Conduct social facilitation activities with rural communities	4	4	30%
Output 4.2	Assist in formation of mini grid cooperatives/users group	4	4	40%
Output 4.3	Coordinate and interact with other programmes at local and national level	4	4	30%
<b>Output 5</b>	<b>Schemes identified, appraised, and forwarded to REF for subsidy approval.</b>	<b>4,4</b>	<b>4,4</b>	<b>15%</b>
Output 5.1	Identification of potential schemes	4	4	30%
Output 5.2	Prepare project information documents for identified schemes	4,5	4,5	20%
Output 5.3	Assist detailed feasibility studies of the schemes	4,5	4,5	30%
Output 5.4	Forward proposals for schemes to REF	4,5	4,5	20%
<b>Output 6</b>	<b>Increased information about rural mini-grid schemes and electricity end-use possibilities</b>	<b>3,0</b>	<b>3,0</b>	<b>15%</b>
Output 6.1	Conduct information awareness campaign	3	3	30%
Output 6.2	Conduct campaign for the promotion of end uses	3	3	30%
Output 6.3	Carry out technical reviews and impact studies addressing the target issues	3	3	40%

\*) Weights: The percentage weight for sub-outputs sum to 100% for each output. For outputs in each component the weights sum to 100%

### Annex 3: Status of 2008 Mid-Term Review Recommendations

Recommendation	Status <sup>39</sup>	Further Action Required
<p>1. JRT recommends that the ED {Executive Director} of AEPC with immediate effect assumes full responsibility for overall programme management and that the responsibility for daily management at component level gradually is transferred to senior AEPC staff in accordance with a new organizational structure with a programme and a timeline for its implementation to be presented to the ESAP SC {Steering Committee} for approval.</p>	<p>The follow up has only dealt with the preparation of the AEPC SOD.</p> <p>There has been no action on the immediate transfer of 'full responsibility for overall programme management'.</p> <p>The SOD includes a new AEPC structure. There has been no plan for a gradual transfer specifically of ESAP components to senior AEPC staff.</p>	<p>ESAP SC meeting approved the note on the JRT recommendation, but there is reluctance from ESAP staff to transfer the current ESAP II management set up and responsibilities to AEPC. It requires a separation of "executing tasks"(to transfer) and "implementing tasks" (to stay with ESAO II staff).</p> <p>It is mentioned in the program documents, bilateral and JFA agreements that AEPC has the overall responsible including financial management of ESAP. But there is no such action towards it due to reluctance of ESAP staff who consider ESAP as an institution parallel to AEPC and do not accept ESAP being an AEPC program. A move towards a program based approach will make it clearer what will be AEPC responsibilities and what is delegated to projects. This should be the aim from the next phase in 2012.</p>
<p>2. The JRT recommends the Steering</p>	<p>ToRs for the following by-laws/laws have been</p>	<p>There is limited scope for progress on laws and</p>

<sup>39</sup> The status is mainly based on the note prepared by ESAP PIU on the follow-up on the 2008 review (last version April 7, 2010).

<p>Committee to address the urgent need for the Cabinet to adopt laws, acts and by-laws in line with the Rural Energy Policy.</p>	<p>prepared and proposals have been received and evaluation is going on for:</p> <ul style="list-style-type: none"> <li>• Renewable (Rural) Energy Act, 2010.</li> <li>• By-laws for Formation of the Central Rural Energy Fund, 2010.</li> <li>• By-laws for Formation of the Rural Energy Central Coordination Committee, 2010</li> </ul>	<p>by-laws in the current political dread lock.</p> <p>The support from ESAP to AEPC to prepare a draft legal framework should be support with the aim of having draft Bills and By-laws ready before the end of ESAP II.</p> <p>Support may be required for updates once the political system is functional again.</p>
<p>3. JRT recommends the Steering Committee to address the urgent need for a revision of the present subsidy policy within framework of the Rural Energy Policy.</p>	<p>In August 2009, Subsidy Policy for Renewable (Rural) Energy has been revised and approved by cabinet.</p>	<p>The recommendation has been implemented.</p>
<p>4. The JRT recommends the Steering Committee to take steps to clarify the statutes for the CREF to function as a basket fund hosted by AEPC open for donor support. The statutes for the CREF should broaden the scope of the REF to address all renewable sources and technologies in rural areas including wind, biogas and bio fuels.</p>	<p>The CREF modality is included in the draft AEPC Act. There is no specific reference to REF.</p> <p>According to ESAP PIU this is part of Action Plan for Recommendation 2: Rural Energy Policy: Adopting of Laws, Acts and By-laws.</p>	<p>The political deadlock halts further development.</p> <p>AEPC could with support from ESAP II begin a development towards using the REF as the default CREF until the CREF is formally approved.</p> <p>This will require that donors providing subsidy funding and credit enhancement grants at least nominally use the REF.</p> <p>ESAP and AEPC may begin to update the REF to become the future CREF, e.g. by developing modalities for credit enhancement.</p>



<p>5. JRT recommends that AEPC and ESAP soon start a process of discussions to clarify the Future implementation strategy focusing on the programme-end situation.</p>	<p>According to the 2008 review follow up note “a draft concept paper on ‘Programme For Renewable and Rural Energy Sector (PR<sub>2</sub>ES)’ has been prepared. The ToRs for the next phase of ESAP has been drafted with formation of Task Force. The framework of the PR<sub>2</sub>ES will be based on the lessons learned from ESAP and other projects under AEPC, with the aim to attract External Development Partners (EDPs) to join the Programme and REF”.</p> <p>According to the CA the approach with the ‘Programme For Renewable and Rural Energy Sector (PR<sub>2</sub>ES)’ was abandoned again (information provided in December 2010). There was further progress on this initiative for a joint programme.</p>	<p>There is no concrete agreement on the future implementation strategy.</p> <p>A pattern is emerging with KfW already joining ESAP and DfID potentially joining. This provides a good basis for a joint next phase programme. A joint design phase is recommended. This shall also include other EDPs such as UNDP, ABD, World Bank.</p> <p>What is missing is a GoN framework to which a joint donor programme can be aligned.</p> <p>A revision of the ESAP II budget is recommended by the review in order to reallocate the available budget internally.</p> <p>It is also suggested to extend ESAP II until June 2012 in order to get in line with the GoN Financial Year.</p>
<p>6. The JRT recommends that social mobilization has to be intensive and rigorous for ensuring the financial and institutional sustainability of target groups by strengthening their capabilities/skills in leadership, good governance, resource mobilization for the sustained O&amp;M and financial management (including book-keeping) and preparation of the business plans for the end-uses for their increased income by raising their awareness.</p>	<p>Social Mobilization approach and guidelines prepared. There are 29 Local Social Mobilisers (LSM) working through Regional Centres covering 42 districts.</p>	<p>Good progress has been achieved.</p> <p>For social mobilisation it may be relevant to look at the LGCDP approach - transformative approach to mobilization so as to align with LGCDP mobilization process. Some of RCs are familiar with LGCDP as they are implementing (Tanahu). Those who are not familiar should get clarity on LGCDP mobilization process as well.</p>
<p>7. The JRT recommends to improve the co-</p>	<p>ESAP (Mini Grid) has developed a concept</p>	<p>The activities made possible by the GESI</p>

operation with relevant rural development institutions centrally and on district level to strengthen the co-ordination of village development efforts and creation of income generating activities, utilizing the surplus capacity of the plants.	paper (which was also discussed with JRT) and prepared guideline for supporting enhanced economic use of electricity. Activities are included in the ESAP Annual Work Plan for 2009/2010 and the Regional Centres are to support this activity.	addendum will accelerate progress
8. The JRT recommends establishing applicable technical standards and template terms and conditions for sale of power - Power Purchase Agreement (PPA) for connection of the mini-grid plants to the national grid.	<p>Meeting between Joint Review Team and NEA was held to discuss the issues on grid connection and establishing PPA and technical standards for grid connection, including the transmission and distribution services.</p> <p>GTZ has been supporting AEPC for preparation of the technical standards for grid connection</p> <p>The 1<sup>st</sup> national workshop on grid connection of MHPs was held on March 2010 with GTZ support with participation of all major stakeholders</p> <p>The Task Force by the ministerial decision has been formed for developing guidelines and implementation of this activity</p>	
9. The JRT recommends improving the quality assurance of professional management training including financial management and operation and maintenance routines during the guarantee period (after sale services).	<p>ESAP has prepared various guidelines and manuals for specific training programmes and orientations. Training programmes have been planned for:</p> <ul style="list-style-type: none"> <li>• Mini Grid project level (Mini Grid operator and manager, and end use entrepreneur)</li> <li>• Regional Centre staff level</li> <li>• Private sector, survey design consultant</li> </ul>	<p>The planned training programmes should be implemented without further delay and before ESAP II completion.</p> <p>Financial training programmes should also be developed.</p>

	<ul style="list-style-type: none"> <li>• Private sector, manufacturing/installation</li> </ul>	
10. The JRT recommends that MoEST {now Ministry of Environment} <sup>40</sup> intensify the activities to find solutions regarding the batteries.	<p>On July 10<sup>th</sup>, 2009 a Minutes of Meeting was signed between Ministry of Environment and KfW Mission for German financial cooperation to promote SHS.</p> <p>According to the Minutes, this funding can only be provided, if a sound and reliable battery collection and disposal system is ensured for those batteries that will be financed by KfW.</p>	<p>The laudable move by KfW to make the solution of the battery problem a condition for support may be effective.</p> <p>All partners in ESAP shall support AEPC and efforts by KfW finally to begin to address this problem seriously.</p>
11. The JRT recommends AEPC/ESAP to prepare an action plan to implement the recommendations made in the Strategy on Gender and Social Inclusion finalized in July, 2008.	<p>AEPC/ESAP has so far conducted series of the activities related to gender and equity. A preliminary exercise to analyse the gender issues and ways to implement gender mainstreaming in AEPC/ESAP are completed.</p> <p>This was followed by the consultant study titled: "Strategy on Gender and Social inclusion for AEPC/ESAP. Likewise, two workshops on Action Plan for Strategy on Gender and Social Inclusion in ESAP II were also conducted. However, all these activities facilitated by external consultant were found to be unsatisfactory and further activities on these issues are necessary.</p> <p>Based on the outputs of two workshops the</p>	<p>AEPC with support from ESAP II has developed the action plan. Norad has supported an ESAP addendum that targets Gender Equality and Social Inclusion.</p> <p>The recommendation has been achieved.</p>

<sup>40</sup> From July 6, 2009 the AEPC is under the Ministry of Environment (MoE).

	<p>following is initiated within ESAP:</p> <ul style="list-style-type: none"><li>• Action Plans for all ESAP components on Gender and Social Inclusion has been drafted.</li><li>• Activities focusing on promoting gender participation including indicators are included in the ESAP Annual Work Plan (AWP) for 2009/2010 and will be included in next AWP.</li></ul>	
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## Annex 4a: Budget status (November 2010)

### Energy Sector Assistance Programme (ESAP II) Programme Budget and Disbursement Overview (status November 30, 2010)

Components	Denmark (1,000 DKK)			Norway (1,000 NOK)			KfW (1,000 Euro)			Government of Nepal (1,000 NPR)			Total for ESAPII (1,000 NPR)			%
	Budget	Disbursed	Balance	Budget**	Disbursed	Balance	Budget	Disbursed	Balance	Budget	Disbursed	Balance	Budget	Disbursed	Balance***	
1. ISRES Component	28,300	14,871	13,429										342,430	179,939	162,491	53%
2. REF/REI Component	86,700	63,974	22,726	114,943	92,543	22,400	8,500	1,289	7,211	554,000	217,855	336,145	3,761,154	2,201,751	1,559,403	59%
3. Technical Supports																
3.1 Biomass Energy	12,270	8,407	3,862	13,057	13,057	0							301,882	255,147	46,735	85%
3.2 Solar Energy	8,129	8,270	-141	8,651	8,648	2							200,005	201,689	-1,684	101%
3.3 Mini Grid	10,101	7,715	2,386	10,749	10,751	-2							248,529	219,682	28,847	88%
Chief Adviser *	4,500	3,239	1,261	0	0	0							54,450	39,192	15,258	72%
<b>Total</b>	<b>150,000</b>	<b>106,477</b>	<b>43,523</b>	<b>147,400</b>	<b>125,000</b>	<b>22,400</b>	<b>8,500</b>	<b>1,289</b>	<b>7,211</b>	<b>554,000</b>	<b>217,855</b>	<b>336,145</b>	<b>4,908,450</b>	<b>3,097,400</b>	<b>1,811,050</b>	<b>63%</b>
<b>Percentage of Own ***</b>	<b>100%</b>	<b>71%</b>	<b>29%</b>	<b>100%</b>	<b>85%</b>	<b>15%</b>	<b>100%</b>	<b>15%</b>	<b>85%</b>	<b>100%</b>	<b>39%</b>	<b>61%</b>	<b>100%</b>	<b>63%</b>	<b>37%</b>	
<b>Percentage of Total</b>	<b>37%</b>	<b>42%</b>	<b>29%</b>	<b>35%</b>	<b>47%</b>	<b>15%</b>	<b>16%</b>	<b>4%</b>	<b>38%</b>	<b>11%</b>	<b>7%</b>	<b>19%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	

Based on data provided by Rohit B. Shrestha (ESAP Admin and Finance Manager). Exchange rates: DKK = 12.1 NPR; NOK = 11.8 NPR; € = 95 NPR

#### Notes:

Disbursement is the figures of budgets released by GoN and donors to the ESAP Program.

\* This figure is based on Led2 circulated by EoD on 02 Nov 2010

\*\* Additional Budget of 22.4 Million NoK provided by Norway for Gender and Social Inclusion has been included in this budget overview.

\*\*\* Disbursement rate and Balance for each donors' grants and GoN contribution. For example, Denmark has disbursed 71% of the allocated budget.

\*\*\*\* Percentage of total budget. For example, Denmark has a share of 42% of all disbursement to ESAP by donors and GoN

## Annex 4b: ESAP II Budget Disbursement, Commitment and Expenditure overview

### Energy Sector Assistance Programme (ESAP II) Programme Budget and Disbursement Overview in 1,000 NPR (status November 30, 2010)

Component	Budget	Disbursement	Disburs. (%)	Bank Balance	Commitments *	Expenditure **	Expend. (%)
Component 1	342,430	179,939	53%	29,507	19,507	150,432	44%
Component 2	3,761,154	2,201,751	59%	794,554	794,554	1,407,198	37%
Component 3	750,416	676,518	90%	324,256	324,256	352,262	47%
Chief Advisor	54,450	39,192	72%	0	0	39,192	72%
Unallocated to components				260,821		-260,821	
Total	4,908,450	3,097,400	63%	1,409,137	1,138,317	1,688,263	34% ***

**Notes:**

The budget is the revised programme document budget. Disbursement is transfer from donor to ESAP.

The bank balance is the balance on the fourteen ESAP bank accounts from Denmark and Norway (but not GoN and KfW)

\* Commitment are funds in the bank that are allocated. The data are provided ESAP programme implementation unit

\*\* Actual expenditures: funds transferred to recipients. Potential expenditures are Actual Expenditures plus Commitments.

\*\*\* The total expenditure rate by ESAP is 34% [ (disbursement - bank balance) / budget ]

## Annex 5a: In-country training provided for AEPC staff

S. No	Type of Training	Training Date	Training Venue	Description of Training	Participants	Position	Purpose	Costs (NPR)
1	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Bharat Raj Paudel	Monitoring Officer	Update of Computer Packag	3,600.00
2	Motivation	01-jul-10	Radission Hotel	7 Habits of Highly Effective People for Managers	Mr. Bharat Raj Paudel	Monitoring Officer	Capacity Development	26,000.00
3	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Binod Acharya	Admin Officer	Update of Computer Packag	3,600.00
4	Computer Training	jan-00	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Binod Acharya	Admin Officer		2,500.00
5	Office Mgmt	maj-08	Nepal Admin Staff College, Jawalakhel	Office Procedures & Management	Mr. Binod Acharya	Admin Officer	Capacity Development	13,500.00
6	GIS/Engineering	29-jul-09	Seagate, Kupondole, Lalitpur	Auto CAD	Mr. Bipin Karki	Engineer	Skill Development	14,500.00
7	IELTS	13-jun-08	British Council, Lazimpat	IELTS	Mr. Bipin Karki	Engineer	Capacity Development	12,000.00
8	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Bisnu P Kharel	Account Officer	Capacity Development	2,500.00
9	Report Writing	Aug 200	British Council	Report writing, Public Speaking & Grammer	Mr. Bisnu P Kharel	Account Officer	Capacity Development	20,000.00
10	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Chandra K Chaudhary	Accountant	Capacity Development	2,500.00
11	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Chandra Kishor Chaudhary	Account Officer	Update of Computer Packag	3,600.00
12	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Dharma Bhakta Dulal	Credit Assistant	Update of Computer Packag	2,500.00
13	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Dibya Rajbhandary	Engineer	Update of Computer Packag	3,600.00
14	English	01-jun-10	British Council	ILTS	Mr. Dibya Rajbhandary	Engineer	Capacity Building	23,000.00
15	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Mr. Dinesh Jun Dangol	Driver	Capacity Development	7,684.00
16	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Ishwar C Khanal		Update of Computer Packag	2,500.00
17	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Mr. Krishna P Bhujal	Driver	Capacity Development	7,684.00
18	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Laxman Khanal	Account Officer	Update of Computer Packag	3,600.00
19	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Mr. Lil Bdr Moktan	Peon	Capacity Development	7,684.00
20	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Narayan Adhikari	Engineer	Update of Computer Packag	3,600.00
21	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Nawaraj Dhakal	Sr. Training Officer	Update of Computer Packag	2,500.00
22	Project Mgmt	sep-08	ELD	Project Managers' Tool Kit	Mr. Nawaraj Dhakal	Sr. Training Officer	Capacity Building	18,000.00
23	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Prabesh Kumar Dhakal	Accountant	Update of Computer Packag	3,600.00
24	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Raju Laudari	Sr. Socio Economist	Update of Computer Packag	2,500.00
25	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Raju Pd Ghimire	Credit Assistant	Update of Computer Packag	2,500.00
26	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Ramesh Pd Danai	Store Keepre	Update of Computer Packag	2,500.00
27	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Rudra P Khanal	Sr. Admin Officer	Update of Computer Packag	2,500.00
28	Mgmt	15 Sept- 7 Oct 2010	Edify International Nepal		Mr. Samir Thapa	Senior Energy Officer	Skill Development for Data Analysis	16,400.00
29	Academic Course	Aug 2007 -2 Years	Himalayan Institute of Science and Tech	Bachelor in Electronics & Communication Engineering	Mr. Santosh Rai	Engineer	Academic Development	269,800.00

# Annex 5a: In-country training for AEPC Staff (continued)

S. No	Type of Training	Training Date	Training Venue	Description of Training	Participants	Position	Purpose	Costs (NPR)
30	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Santosh Rai	Engineer	Update of Computer Packag	2,500.00
31	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Mr. Sarmila Shrestha	Computer officer	Update of Computer Packag	3,600.00
32	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Mr. Shisir Thapa	Peon	Capacity Development	7,684.00
33	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Mr. Surya Syanden	Driver	Capacity Development	7,684.00
34	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Sushil Acharya	Credit Office	Update of Computer Packag	2,500.00
35	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Mr. Sushil Sharma	Monitoring Officer	Update of Computer Packag	2,500.00
36	General English Course	24-mar-09	British Council	English Language Training	Ms. Aruna Awale	Wind Officer	English Language update	7,500.00
37	Data Analysis	26 Jan to 1 Feb 2009	Kathmandu University	Data Analysis and Statistical Interpretation	Ms. Aruna Awale	Wind Officer	To develop effective Institu	17,950.00
38	Workshop	10-12 Nov 2008	Kathmandu University, Dhulikhel	International Workshop on Natural and Low Cost Materials in Wind Energy Technologies	Ms. Aruna Awale	Wind Officer	Capacity Development	7,000.00
39	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Aruna Awale	Wind Officer	Capacity Development	2,500.00
40	Motivation	aug-10	Radisson Hotel	7 Habits of Highly Effective People	Ms. Aruna Awale	Wind Officer	Capacity Development	18,000.00
41	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Ms. Bimala Khatriwada	Peon	Capacity Development	7,684.00
42	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Maya Nepali	SAF Processor	Update of Computer Packag	2,500.00
43	Computer Training	8-12 Nov 2009	AEPC Hall	Office 2007	Ms. Padma Paudel	Account Assistant	Update of Computer Packag	3,600.00
44	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Padma paudel	Account Assistant	Update of Computer Packag	2,500.00
45	English Language	01-jan-09	Universal Language & Computer Institute	Intensive English language- Level II	Ms. Ramankala Dhungel	Office Assistant	Capacity Development	4,500.00
46	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Ramankala Dhungel	Office Assistant	Update of Computer Packag	2,500.00
47	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Ms. Ratna K Timelsena	Peon	Capacity Development	7,684.00
48	Academic	2 Yrs from Sept 2008	Padma Kanya Campus, Ktm	Masters in Rural Development	Ms. Sabita Aryal	Admin Officer	Academic Development	32,000.00
49	English Language	01-apr-08	British Council	Business Communication	Ms. Sabita Aryal	Admin Officer	Capacity Development	25,000.00
50	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Sabita Aryal	Admin Officer	Update of Computer Packag	2,500.00
51	Motivation	feb-08	Organization Dev Centre, Pulchowk	Enhancement of Skills of Support Staff	Ms. Samjhana Dangol	Peon	Capacity Development	7,684.00
52	Academic Course	2 Yrs from Sept 2008	Padma Kanya Campus, Ktm	Masters in Rural Development	Ms. Sarmila Shrestha	Computer Officer	Academic Development	32,000.00
53	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Sharmila Shrestha	Computer Officer	Update of Computer Packag	2,500.00
54	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Shushila Giri	Receptionist	Update of Computer Packag	2,500.00
55	Computer Training	sep-08	New Horizon Computer - Jawalakhel	Office 2007 & Windows Vista	Ms. Srijana Pande		Update of Computer Packag	2,500.00
56	English Language	01-jan-09	Universal Language & Computer Institute	Intensive English language- Level II	Ms. Sushila Shrestha	Receptionist	Capacity Development	4,500.00
	TOTAL COST							708,022.00

Correction: The SN 48 and 52: Ms. Sabita Aryal got Rs. 15,000 and Sarmila Shrestha got Rs. 15,000 for Master's in Rural Development



# Annex 5b: International training for AEPC staff <sup>41</sup>

S. No.	Type of Training	Training Date	Training Venue	Description of Training	Participants	Position	Purpose	Costs (NPR)
1	Danida Fellowship	14 June 2nd July 2010	Denmark	Public Sector Leadership	Mr. Bharat Raj Paudel	Monitoring Officer	Capacity Development	151,626
2	Danida Fellowship	23 Aug- 3 Sept 2010	Denmark	Public Sector Leadership (continue	Mr. Bharat Raj Paudel	Monitoring Officer	Capacity Development	
3		06-10 Dec 2010	IIT, New Delhi, India	Economics and Financing on RET	Mr. Binod Acharya	Admin Officer	Capacity Development	32,000
4	Electro Mechanic	24 Aug-12 Sep 2009	IIT, Roorkee, India	Electro Mechanical Design Engineers- Micro/Mini Hydro Powers	Mr. Bipin Karki	Engineer	Capacity Development	47,135
5	Danida Fellowship	13 Aug 12 Oct 2007	Denmark	Training Management & Development	Mr. Nawaraj Dhakal	Training Officer	Capacity Development	522,000
6	Solar Design Engineer	23 Nov- 6 Dec 2008	IIT, New Delhi, India	Training for Solar Design Engineers	Mr. Rajeev Munankarmi	Energy Officer	Capacity Development	43,888
7	Workshop	19-25 July 2008	Scotland	World Renewal Energy Congress-10	Mr. Rajeev Munankarmi	Energy Officer	Capacity Development	201,720
8	Forum	3-5 June 2008	Manila	Asia Clean Energy Forum- 2008	Mr. Rajeev Munankarmi	Energy Officer	Capacity Development	68,366
9	Observation Visit	apr-09	Dhaka, Bangladesh	Battery Management	Mr. Rajeev Munankarmi	Energy Officer	Capacity Development	37,655
10	Danida Fellowship	sep-08	Denmark	Change Management	Mr. Rudra Pd khanel	Sr. Admin Officer	Capacity Development	376,142
11	Danida Fellowship	2nd Half of 2007	Denmark	Financial Management & Good Governance	Mr. Surya K Sapkota	Sr. Planning Officer	Capacity Development	-
12	Workshop	14-15 Oct 2010	Seol, South Korea	Asia Pacific Renewable Energy Policy	Mr. Surya K Sapkota	Sr. Planning Officer	Capacity Development	20,000
13	Academic	2008-2009	University of Flensbe	MSC on Sustainable Energy Systems & Mgmt	Mr. Surya K Sapkota	Sr. Planning Officer	Capacity Development	1,031,920
14	Workshop	13-14 May 2008	Bangkok	Bimstec/S Regional Workshop	Mr. Sushil Sharma	Energy Officer	Capacity Development	40,405
15	Conference	1-4 June 2008	Texas, USA	Wind Power 2008- Conference & Exhibition	Ms. Aruna Awale	Wind Officer	Capacity Development	61,380
16	Conference	December-08	China	Solar Tech Conference	Dr. Govind Raj Pokharel	Executive Director	Exposure Visit	68,000
17	Conference	December-08	Switzerland	Climate Change	Mr. Jagadish Chandra Pokharel	Ministry	Exposure Visit	28,338
18	Conference	December-07	Poland	Climate Change Conference	Mr. Purusottam Ghimire	Ministry	Exposure Visit	75,810
19	Conference	July-07	Germany	Air Ticket Support	Mr. Raju Laudari	Socio Economist	Exposure Visit	39,826
20	Conference	December-08	Poland	UN Climate Change conference	Mr. Taranath Pandey	Ministry	Exposure Visit	166,885
	TOTAL COST							3,013,096

<sup>41</sup> Data as provided by ESAP PIU (December 8, 2010).

**Correction: SN 11, there is no training I (Financial Management and Good Governance) in Denmark by Surya K. Sapkota, Sr. PO, AEPC in 2007**

## Annex 6a: Regional Centres

S.N	Name of RC	Year of establishment	Districts serviced	Annual budget (2009/2010)	Outputs				
							ESAP I	ESAP II	Total
1	Sundar Nepal Sanstha (BNA), Surkhet	1997	Surkhet, Dailekh, Jajarkot, Kalikot, Jumla, Humla, Mugu, Salyan	11,263,492	ICS:	hh	21,267	16,255	37,522
					MHP:	kW	33.9	66	99.9
2	Namsaling Community Development Center, (NCDC), Illam	1984	Ilam, Panchthar, Taplejung, Bhojpur, Terhathum, Dhankutta, Sankhuwashava, Jhapa, Morang, Dolakha and Siraha	32,796,664	ICS:	hh	16,558	26,983	43,541
					MHP:	kW	267.75	423.5	691.25
3	Dhaulagiri Community Resources Development Association (DCRDC), Baglung	1996	Baglung, Parbat, Myagdi, Kaski, Rukum, Mustang	32,884,737	ICS:	hh	11,933	19,010	30,943
					MHP:	kW	546.5	518.5	1065
4	Rural Economic Development Association (REDA), Palpa	1991	Palpa, Gulmi, Arghakhanchi, Syangja, Rolpa, Pyuthan and Dolpa	25,558,515	ICS:	hh	53,365	20,305	73,670
					MHP:	kW	158.7	275.6	434.3
5	Resource management and Rural Empowerment Center, (REMREC), Kavre	1998	Kavrepalanchowk, Dolakha, Ramechhap, Sindhupalchowk, Sindhuli, Okhaldhunga, Khotang, Udyapur, Solukhumbu	20,216,964	ICS:	hh	40,207	37,609	77,816
					MHP:	kW		491.43	491.43
6	Rural Empowerment Society (RESDTN), Tanahu	1996	Tanahun, Lamjung, Gorkha, Dhading, Nawalparasi, Makwanpur, Manang, Rasuwa & Nuwakot	12,585,365	ICS:	hh	5,569	7,759	13,328
					MHP:	kW		581	581
7	Rural Development Service Center (RDSC), Doti	1992	Doti, Achham, Bajura, Bajhang, Dadeldhura, Baitadi, Darchula and Kailali	10,772,693	ICS:	hh	11,519	7,817	19,336
					MHP:	kW		117.5	117.5
8	MGREC (Centre)	?	Lalitpur & Mustang	?	MHP:	kW	893.55	27	920.55
	Total				ICS:	hh	160,418	135,738	296,156
					MHP:	kW	1,900	2,501	4,401

## Annex 6a: Regional Service Centres (promoting biomass technology only)

S.N	Name of RREC	Year of establishment	Districts serviced	Total Districts
1	Center for Renewable Technology Nepal (CRT-N), Lalitpur	1989	Kathmandu, Bhaktapur, Laitpur, Dhading, Makwanpur, Rasuwa & Nuwakot	7
2	Center for Health and Environment Conservation Nepal (CHEC), Parsa	2001	Bara, Parsa	2
3	Renewable Energy, Water Supply, and Sanitation Promotion Center (REWSSPC), Rautahat	2009	Siraha, Rautahat	2
4	Kailali Kanchanpur Rural Electrification Umbrella Organization (KKREUO), Kailali	2008	Kailali, Kanachanpur	2
5	Development Concern Society (DECOS)	2004	Dang, Rukum, Rolpa, Salyan, Pyuthan	5
6	District Development Committee, DEES, Darchula as a pilot model working through DDC		Dharchula	1

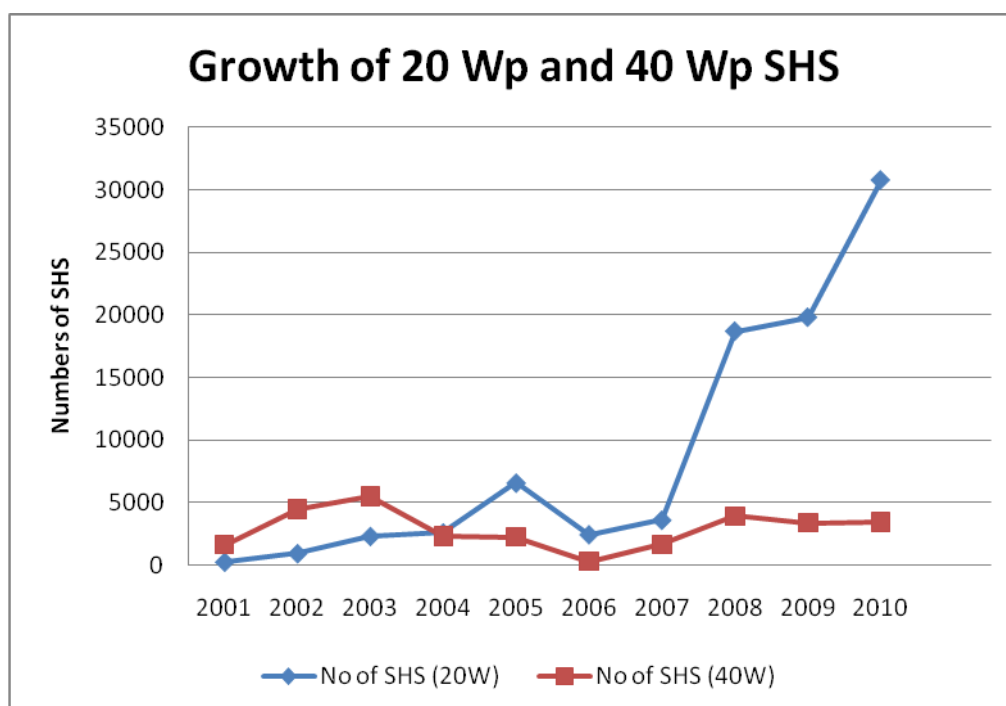
## Annex 7: Comparison of Growth of 20 Wp and 40 Wp SHS Systems

### 1. Growth of SHS of 20Wp and 40 Wp

Table I

Year	No of SHS (20W)	No of SHS (40W)
2001	283	1646
2002	957	4445
2003	2328	5527
2004	2608	2324
2005	6581	2248
2006	2469	301
2007	3624	1672
2008	18693	3919
2009	19806	3394
2010	30739	3450

Figure I



### 2. Average price movement of 20Wp and 40Wp SHS

Table II

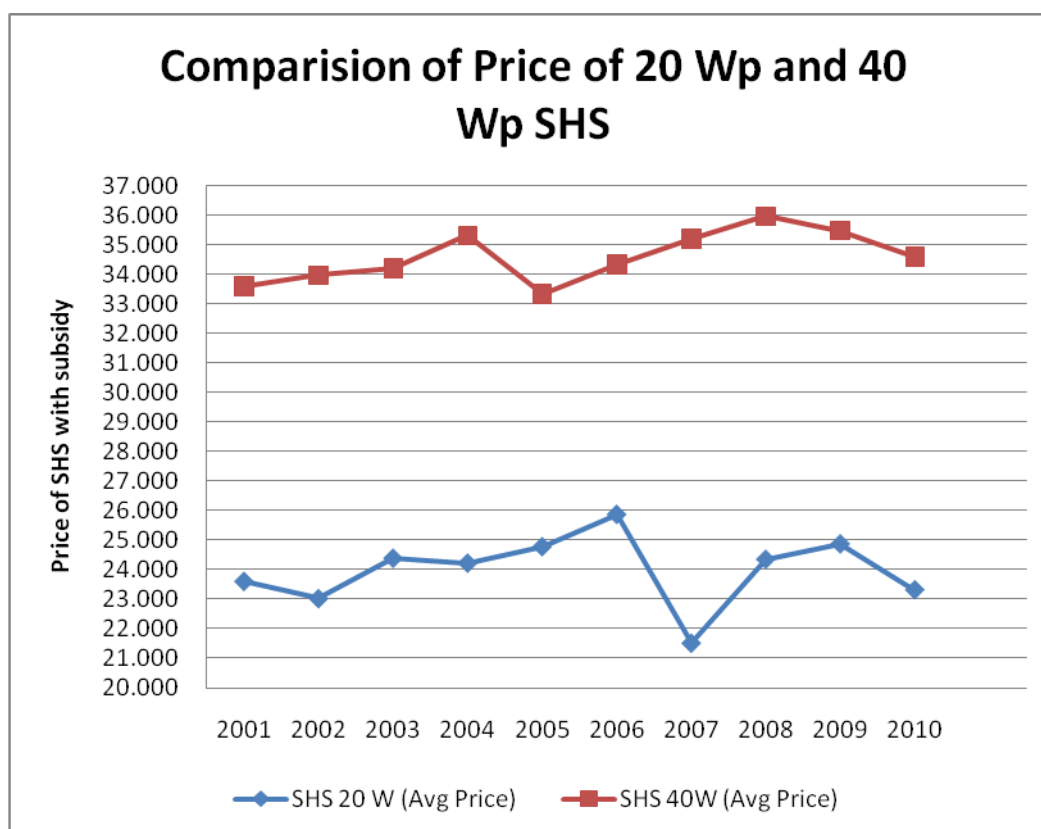


Figure II

Year	SHS 20 W (Avg Price)	SHS 40W (Avg Price)
2001	23,604	33,581
2002	23,019	33,965
2003	24,392	34,185
2004	24,224	35,313
2005	24,783	33,341
2006	25,879	34,340
2007	21,507	35,208
2008	24,353	35,964
2009	24,877	35,471
2010	23,321	34,589

Installed SHS per Year, Capacity group in Watt Peak						Total SHS Installation
Year	<=15	16-25	26-35	36-50	>50	
2000	0	0	18	187	6	211
2001	286	585	860	7021	874	9626
2002	830	1956	1152	8619	1252	13809
2003	2200	3364	903	8395	1445	16307
2004	4493	6339	344	4683	705	16564
2005	2570	8496	714	3245	463	15488
2006	867	5504	879	2168	391	9809
2007	1496	20114	1030	3381	475	26496
2008	3572	39488	739	4674	676	49149
2009	1417	24896	268	3256	492	30329
2010	136	4838	60	644	89	5767

## **Annex 8: ESAP II Review List of References**

### **Government of Nepal – renewable energy**

Rural Energy Policy (2006)

Subsidy delivery mechanism (2010) (translated)

Final subsidy mechanism (2009) (unofficial translation)

### **AEPC - institution**

AEPC Act (draft)

AEPC SoD Plan.

GoN Three Years Development Plan (2010-2013): Input to three plan (2010-13 on alternative energy) from AEPC.

### **ESAP II – Management and Implementation**

ESAP Audit Report (2007, 2008 and 2009)

ESAP Joint Finance Agreement

Bilateral Agreement between Nepal and Denmark on ESAP II (March 5, 2007)

ESAP II desk appraisal report (July 2006)

ESAPII programme document and component documents (September 2006)

Completion Report for ESAPI

Note on Implementation of recommendations in the Aide Memoire prepared by the Joint Danida/Norad Review mission

Addendum to ESAP (Gender equality and social inclusion)

TOR for Steering Committee

Annual Work Plans (2007-2008; 2008-2009; 2009-2010; and 2010-2011)

Minutes from SC meetings (No. 22 to 35)

Progress Reports (2007-2008; 2008-2009; and 2009-2010 (draft)



Biomass energy component – background feasibility document

Solar energy component - background feasibility document

Mini-grid electrification component - background feasibility document

### **ESAP II – studies, strategies, outputs**

Socio-economic impact study of the users of Solar Home System, June 2010

Assessment of Effectiveness of ICS in Reducing IAP and Improving Health (April 2008)

Strategy on Gender and Social Inclusion from July 2008

Independent verification of ESAP Programme Achievements: Micro-hydro plants, Solar Home System and Improved cooking Stoves (January 2008)

Reports on subsidy policy, subsidy delivery mechanism including background documents, Rural Energy Policy

SWAp Report for R and RE Sector – prepared by Consultant hired by AEPC/ESAP

### **REDP**

Winrock (2009): "Report on the renewable energy development programme' (REDP) – impacts and its contribution in achieving MGDs".

AEPC (2010): "An analysis of Development Benefits of Micro Hydropower in Rural Nepal"

AEPC (2010): "Capacity for scaling up renewable energy in Nepal"

ESMAP (2010): "Power and people – measuring the benefits of renewable energy in Nepal." (Prepared as part of REDP)

### **KfW**

Wald, A. & R. Lemor (2009): Report on Lead Acid SHS Battery Recovery in Nepal. KfW

### **Embassy of Denmark - Danida**

Climate Change Screening of Denmark's development cooperation with Nepal (June 2008).

'Assessment of Nepal's renewable and rural energy sector and its institutional framework', Final report, 13 October 2010 (Scoping for ESAP III)

Danida: draft concept paper for ESAP III

### **Norad**

Evaluation of Norwegian Power-related Assistance, Norad Evaluation Report 2/2007, Scanteam (Case: Nepal and Mocambique)

<http://www.norad.no/en/attachment/137813/binary/72024?download=true>

Norwegian Development Assistance to Rural Electrification. Best Practice Guide for Planning, Norad Report 18/2009 Discussion.

<http://www.norad.no/en/Tools+and+publications/Publications/Publication+Page?key=109731>

'Greening the portfolio' – Review of the Embassy's portfolio regarding increased focus on environmental aspects, Norad report 10/2007 Discussion

Gender review: Royal Norwegian Embassy of Nepal (August 2010)

<http://www.norad.no/en/Tools+and+publications/Publications/Publication+Page?key=201507>

## Annex 9: List of Persons met

Name	Position
Government of Nepal: Ministry of Environment	
Ganesh Raj Joshi	: Secretary, Ministry of Environment
Meena Khanal	: Acting Secretary, Ministry of Environment
Arjun Kumar Thapa	: Under Secretary, Ministry of Environment
Purna B. Tandukar	: Under Secretary, Ministry of Environment
Vinod Gautam	: Section Officer, Ministry of Environment
Government of Nepal: Ministry of Finance	
Bhuvan Karki	: Under Secretary, Ministry of Finance
Government of Nepal: National Planning Commission	
Manahari Khadka	: Under Secretary and Program Director (looking after Energy, Environment and Infrastructure Division), NPC
Dinesh C. Devkota	: Member, National Planning Commission
Government of Nepal: Renewable Energy Testing Station	
Prem Bahadur Basnet	: General Manager, Renewable Energy Test Station (RETS)
Rudra Mani Pokharel	: Technical manager, Renewable Energy Test Station (RETS)
Government of Nepal: Nepal Electricity Authority (NEA)	
Ganesh Prasad Raj	: Director, Technical Services, Commercial Department, NEA
Shanti Laxmi Shakya	: Joint Director, Distribution and Consumer services, NEA
Yugal Kishor Shah	: General Manager, Distribution and Consumer services, NEA
Rameshwar Yadav	: General Manager, Rural Electrification, NEA
Gopal Babu Bhattarai	: Manager, Transmission line/Substation Const. Dept., NEA
Tirtha Man Shakya	: Project Coordinator, NEA
AEPC	
Narayan Prasad Chaulagain	: Executive Director, AEPC
Mangal Das Maharjan	: National Project Director, Renewable Energy Project (REP)
Narayan Pd. Adhikari	: Engineer, BEC, Counterpart, AEPC
Bharat Raj Poudel	: Monitoring Officer and MGREC Counterpart, AEPC

Name	Position
Raju Laudari	: Sr. Socio-economist and Manager, Climate and Carbon Unit, AEPC
Non-state organisations and partners (NGO and Private sector)	
Hem Raj Lamichhame	: Executive Secretary General, Association of District Development Committees of Nepal
Krishna Prasad Jaishi	: Spokesperson, Association of District Development Committees of Nepal
Anil Kaphle	: Energy and Environment Officer, Association of District Development Committees of Nepal
Bir Bahadur Ghale	: Chairman, Nepal Micro-hydro Entrepreneur Federation
Surendra Bhakta Mathema	: President, Nepal Micro Hydropower Development Association
Hem Bahadur Nachhiring	: Member (Everest District), Nepal Micro-hydro Entrepreneur Federation
Krishna Prasad Devkota	: Chairman, Motherland Energy Group P. Ltd. and Member Secretary, Nepal Micro Hydropower Development Association
Sher Bahadur Budha	: Executive Director, Nepal Micro Hydropower Development Association
Janok Das Koirala	: Treasurer, Nepal Micro Hydropower Development Association
Prem Bahadur Shakya	: Nepal Micro Hydropower Development Association
Pradip Pandey	: Lamjung Electricity Development Company, Executive Committee Member,
Hari Gopal Gorkhali	: Director, Centre for Rural Technology/Nepal
Lumin Kumar Shrestha	: Director, Centre for Rural Technology/Nepal
Subarna Prasad Kapali	: Deputy Director, Centre for Rural Technology
Ramesh Kumar Maskey	: Professor of civil engineering at Kathmandu University , Chairperson, WECAN
Dhan Bahadur Gurung	: Vice-Chairperson, WECAN
Guna Raj Dhakal	: Secretary, WECAN
Kalidas Neupane	: Managing Director, Pioneer, Executive Committee Member, WECAN
Kiran Gautam	: Executive Director, Dhaulagiri Solar. Solar Electric Manufacturers Association, Nepal
Nabin Bhujel	: President, Solar Electric Manufacturers Association, Nepal
Uttam Sitaula	: General Secretary, Solar Electric Manufacturers Association,

Name	Position
	Nepal
Yug R. Tamrakar	: Managing Director, Solar Electricity Company and Member of Solar Electric Manufacturers Association Nepal
Bilateral and Multilateral Development Partners and Programmes	
Jorn Sorensen	Deputy Country Director, UNDP
Vijaya Pd. Singh	: Assistant Country Director, Environment, Energy and Disaster Risk Reduction Unit, UNDP
Anupa Rimal Lamichhane	: Programme Officer, Environment, Energy and Disaster Risk Reduction Unit, UNDP
Kiran Man Singh	: National Programme Manager, REDP (UNDP/World Bank)
Susan Goldmark	Country Director, World Bank
Pravin Karki	: Senior Hydropower Specialist, World Bank
Tomoyuki Yamashita	: Senior Energy Specialist, World Bank
Mikul Bhatia	Senior Energy Specialist, World Bank
Chudamani Joshi	: Programme coordinator, Embassy of Finland
Inge Harald Vognild	: First Secretary, Royal Norwegian Embassy
Morten Jespersen	: Ambassador, Embassy of Denmark
Peter Eilschow Olesen	: Deputy, Embassy of Denmark
Shiva Sharma Paudyal	: Senior Programme Officer, Embassy of Denmark
Otmar Werner	: KfW
Shanker Raj Pandey	: Sr Local Expert,, KfW
Upendra Man Shakya	: Programme Manager Energy, KfW
Simon Lucas	: Climate change & inclusive growth adviser, DfID
Ranjan Shrestha	: European Union
Rolf Posorski	: GtZ
Roman Grüner	: GtZ
Tom Thorsch Krader	: Senior Advisor Renewable Energy, SNV
Araceli Lloret	: Portfolio Coordinator, SNV
Anuj Dho Joshi	: Adviser, institutional development RE Sector, SNV
Keshav C. Das	: Carbon Finance Advisor, SNV
Tobias Zeller	Technical Advisor, German Development Service, ded

Name	Position
Alex Arter	REDP/World Bank consultant
Kiran Man Singh	REDP Program Director
ESAP II – Programme Implementation Unit	
Niels Juhl Thomsen	: Chief Adviser, ESAP II
Anand Raj Maskey	: REF Component Manager, ESAP II
Devendra P. Adhikari	: Component Manager, MGREC, ESAP II
Karuna Bajracharya	: Component Manager, BEC, ESAP II
Karuna Sharma	: Component Manager, ISRE
Madhusudhan Adhikari	: Component Manager, Solar Energy, ESAP II
Manu Binod Aryal	: Credit Officer, ISRES, ESAP II
Rana Bahadur Thapa	: Programme Officer, MGREC, ESAP II
Rohit B. Shrestha	: Administration and Finance Manager, ESAP II
Tilak Kandangwa Limbu	: Program Officer, Mini-Grid component, ESAP II

### Field trip: Organisations and Locations visited

Date	District	Municipality/ Village Development Committee	Activities
2/12/2010	Dhading	Malaykhu	• Observation of institutional stoves
	Chitwan	Gardi VDC / Bhairabpur	• Visit to 'solar city' • Discussion with Farmers' savings & Credit Cooperative
3/12/2010	Tanahu	Vyas Municipality / Damauli	• Rural Empowerment Society (Regional Centre: RRESC) • District Development Committee
	Baglung	Baglung Bazar	• Dhaulagiri Community Resource Development Centre (Regional Centre)
4/12/2010	Kaski	Bharatpokhari VDC	• Anapurna Women's Group on ICS and biogas
	Shangya	Chisapani VDC	• Putpute Khola Micro Hydro Power project. Meeting with user group and visit to MHP site.
5/12/2010	Kaski	Pokhara	• Shanti Engineering metal stove manufacturer. • Kaski, District Development Office



## Annex 10: ToR for Review

### Terms of Reference

for

### Review of the Energy Sector Assistance Programme (2007-2012)

19 July 2010

#### 1 Background

The present Energy Sector Assistance Programme (referred to as ESAP II) began on 15<sup>th</sup> March 2007 when the Government of Denmark (GoD) and the Government of Norway (GoN) signed a Joint Financing Agreement (JFA) with the Government of Nepal (GoNe) regarding support to the renewable energy sector in Nepal. The Alternative Energy Promotion Centre (AEPC) on behalf of the Ministry of Environment/Government of Nepal is overall responsible for the implementation of the ESAP II. The Government of Denmark (GoD) has been the lead donor so far in the ESAP II. The ESAP II programme is a continuation of the ESAP I Programme, which started in 1999, initially funded by the Government of Denmark and Government of Nepal. In 2003, the Government of Norway also joined the programme. Recently, in the first quarter of 2010, the German Government through Kreditanstalt für Wiederaufbau (KfW) also joined in the ESAP II to support solar home systems and will be signing the JFA. The Netherlands Development Organisation (SNV) has agreed to join ESAP with integration of improved water mill and will be signing the Joint Financing Agreement for ESAP II. The JFA expires in 2012. A new phase of ESAP is under consideration.

The development objective of ESAP II is:

- *“Improve the living conditions of the rural population by enhancing their access and affordability to rural energy solutions that are efficient, environment-friendly and socially justifiable.”*

ESAP II is designed with the following three components:



Component	Objective
Institutional Strengthening of Rural Energy Sector, ISRES (GoD only)	To promote coherence and coordination of policies for rural energy supply
Rural Energy Investment: Rural Energy Fund	To promote access to and affordability of renewable energy solutions in rural areas
Technical Support within Biomass Energy, Solar Energy and Mini Grid Electrification	To provide technical support for the development and implementation of renewable energy solutions

## 2 Purpose of the review

The overall purpose of the review is to **i)** assess the programme performance against the target **ii)** give the foundation for a decision based on possible corrective measures for the rest of the programme period and to **iii)** obtain information and advice with regard to the preparations of a possible new rural energy programme after the completion of ESAP II.

In particular, the review shall assess the progress of ESAP II, including assessment of the follow-up actions and the present relevance of the recommendations of the November 2008 early mid-term review.

## 3 Expected outputs

The following are the expected outputs of the review:

1. A mission preparation note prior to the arrival to Nepal
2. A wrap-up report prior to the departure from Nepal
3. A final review report including the observations, analysis and conclusions of the team as well as a set of specific recommendations.

## 4 Scope of Work

In general the review team shall address all issues found to be pertinent to meet the stated objectives and purposes. Hereunder, but not necessarily limited to, the following issues for each of the three components as shown in the table on page 1 shall be reviewed:

### Efficiency

- Verification of progress with regard to
  - Sector wide approach in the renewable energy sector
  - Donor coordination and alignment
  - Implementation of 2008 review recommendations
  - Access to credits for financing of renewable energy technologies
- Efficiency of activities carried out
  - Compare the efficiency and sustainability of the Regional Energy Centres
  - Integration of programme in local bodies' (DDCs, VDCs) planning
- Compliance with agreements/reviews
  - To what extent have the partners Denmark/Norway and – Government of Nepal (including AEPC) complied with obligations as stated in the Joint Financing Agreement?
  - Assess the degree of Government of Nepal/AEPC's actual contribution (staff, financial means and possible in-kind contribution) compared to the Programme Document.

### Effectiveness

- Achievement of objectives:
  - To what extent will the overall objectives be reached?
  - To what extent have inputs, outputs and activities contributed to the overall objectives of the programme?
  - What achievements have been made by technical components in reaching target groups taking into account gender and social exclusion issues?
- Deviations:
  - What deviations of plans have occurred and what are the causing factors
  - How compatible are AEPC roles, being responsible for both i) formulating renewable energy policy, preparing policy papers, preparing regulations and ii) also being responsible for implementing renewable energy programmes
  - The roles and responsibilities among and between AEPC and ESAP. Also the counterpart responsibility of AEPC should be assessed
  - Is AEPC set-up conducive to programme rollout and implementation? Will the AEPC Strategic Organisational Development (re-design) exercise affect its institutional effectiveness?
- Donor coordination:
  - Does the present organisation of donor programmes within AEPC facilitate effectiveness?

### **Impact**

- What are the main outputs and possible impacts of support provided for the institutional development and infrastructure investments respectively?
- To what extent do the MHP and SHS components contribute to the stated Development Objective?
- Has any baseline study been done to make it possible to verify the Development Objective of ESAP?
- To what extent do the intended target groups, including women and socially excluded, benefit from the programme?
- Does the programme's activities target gender equality and social inclusion issues in the latest work plan?

### **Relevance**

- Relevance of the present subsidy policy. Does it reach the intended target groups? Is the subsidy policy benefiting women and men and social excluded equally?
- The relevance of using regional centres (NGOs) instead of District Development Committees (DDCs) should be assessed. Do the regional centres contribute to institutionalisation of implementation of the renewable energy policy on a local level?

### **Sustainability**

- To what extent have the activities undertaken by ESAP, especially the ISRES component, contributed to strengthening the institutional capacity of AEPC and to make the institution more sustainable?
- Social-cultural/gender sustainability? The involvement of women in planning and decision-making, as well as the representation of women in electricity cooperatives should be assessed.
  - To what extent have women received repair and maintenance training for Solar Home Systems (SHS) and Minigrids?
  - To what extent have women received management and financial training?
- Environmental sustainability: Have adequate mechanisms for monitoring and mitigating environmental impact (for SHS, Minigrids and Improved Cooking Stoves (ICS) been integrated as planned? Is it possible to follow up and monitor the results?
- Technical issues: The need for training of Solar Home Systems (SHS) and Micro Hydro Plant (MHP) (operation and maintenance) should be identified.

### **Risk management**

- Assess the major risks experienced during ESAP II and to what extent the programme has addressed and mitigated these risks

## **Particular concerns**

### a) The subsidy mechanism

- To what extent does the present subsidy mechanism provide cost-efficient solutions?
- Transparency of the formulation of the subsidy policy
- Are there emerging links between subsidy administration and RETs developed in targeted, energy-poor communities?
- Financial transparency of the disbursement of subsidies (project level and household level) – Rural Energy Fund disbursement mechanism

### b) ESAP handover of responsibilities to AEPC

In particular the team shall review:

- Absorptive capacity of ESAP/AEPC for increased donor funding
- Status in harmonisation of donor programmes within AEPC
- Institutional set-up and performance of AEPC
  - Include analysis of SOD impact on AEPC going forward
- Interaction between AEPC and ESAP (communication, responsibility mapping, etc)
- To what extent are AEPC's financial management systems, quality of audit reports, cost control, disbursement aligned with donor requirement? Is it appropriate for AEPC to take over ESAP's systems? If yes, to what extent is AEPC prepared and which preparations need to be undertaken?
- Make a comparison of ESAP's and AEPCs' staff salaries, staff performances, staff turnover, incentive schemes etc.

### c) Gender and Social Inclusion

A strategy on gender and social inclusion has been prepared:

- Are the recommendations of the strategy still relevant?
- To what extent have the suggested recommendations been implemented?
- What are the critical issues at organisational as well as programme level?

### d) Results reporting

- Assess the quality of the results reporting, e.g., is measurement clearly defined, are baselines provided, context given, etc?
- To what extent is the detailed reporting used to present aggregate results, especially on a qualitative level
- To what extent can reported results be verified?
- To what extent are women/social inclusion issues and gender and social exclusion disaggregated data included in the reporting?

## **Audit**

- Are new kind of audit-reviews (compliance and performance audits, including verification of assets) appropriate?

- Are audits performed by a viable source?
- To what extent can it be verified that SHS systems are still used by those who received the subsidy? Can other incentive-mechanisms make control issues less necessary?
- Assess the need for a Gender Audit to be performed as part of the planning of ESAP phase III.

#### Anti-corruption measures

- To what extent is ESAP designed with ex-ante measures to fight corruption
- Assess the appropriateness of more systematic benchmarking of efficiency between ESAP and other donor programmes within AEPC, and also between ESAP's regional centres

## **5 Implementation and reporting**

#### Sources of information and methodology to be employed

**Documents:** The members of the review team shall make themselves familiar with all relevant and available background information, such as project documents, appraisals, the agreements, addendums, the decision documents, work plans, progress reports, minutes from the Steering Committee meetings etc.

**Interviews:** In addition, the review will be done through interviews with key informants. The team is expected to have extensive meetings with stakeholders, women as well as men, and counterparts, other donors and other partners providing relevant input for purpose of the review.

**Field trips:** One or two field visits to nearby areas at the end of the first week of mission will be organized for a maximum period of 3 days to familiarize and assess the field activities e.g. the Mini-grid, Solar Home System and Improved Cooking Stoves. Detailed field visit plan will be prepared prior to the arrival of the review mission. The review team shall meet with beneficiaries of the programme, and preferably with women/ men's groups separately.

#### Division of responsibility between the consultant/team, the donors and the Partners

The costs of the review mission will be borne by Norway. The Norwegian Agency for Development Cooperation (Norad) will assist the Royal Norwegian Embassy in Kathmandu to hire a team of consultants.

The Embassy of Denmark in collaboration with the Norwegian Embassy and ESAP/AEPC will prepare a meeting schedule for the Review Team prior to its arrival. Additional meetings will be prepared during the mission as needed. ESAP will provide the necessary logistics for the review team and organize the field trips.

#### Timetable for preparation, field work and reporting

**Preparations:** Upon signing of the contract, the Consultant will study relevant documents, and work out a mission preparation note.

**Field work:** The team shall undertake a 2-week fact-finding mission to Nepal, tentatively in week 48 and 49 2010 (29 November – 10 December), to conduct interviews, review additional documents and visit field sites. We would like to stress that the Consultant must be available to carry out the field work in week 48 and 49, but the involved Embassies and Norad may find it necessary to postpone the field work.

**Reporting:** The final review report shall be written in English and shall preferably not exceed 30 effective pages, plus an executive summary and attachments. The report shall be submitted on paper and electronically. The report format is shown in appendix 1. The preparation of the final review report shall be based on the following process:

- a) A mission preparation note shall be submitted to GoNe, AEPC and the ESAP donors (the parties) prior to the arrival to Nepal. The note should include the key issues identified, building upon a preliminary assessment of the Programme, referring to the outlined Scope of Work, and based on the available references.
- b) The team will submit a report with the major findings in wrap-up meetings with the parties prior to the departure from Nepal.
- c) The review team is expected to present a draft report to the parties, including summary of main findings, conclusions and recommendations, within 10 working days after the field work in Nepal. The draft shall also be submitted to Norad.
- d) The final report is to be submitted within 2 weeks after the parties have delivered their comments to the draft report.

#### Indicative volume of the assignment

The following assumptions indicate the volume of the assignment. The final budget is however to be proposed by the Consultant.

- 2 international experts and 1 national expert
- Preparations: two to three weeks á five working days (for the whole team in total)
- Nepal mission: five to six weeks á five working days (for the whole team in total)

- Reporting: two to three weeks á five working days (for the whole team in total)

Approximately 9 – 12 weeks in total for the team as such.

## **6 Qualifications of the Consultant**

It is the decision of the tenderer, but it is envisaged that it is necessary to have a team of several persons to be able to successfully carry out the assignment. The tenderer is expected to put forward the best team composition, and this will be given special attention in the evaluation of the tender. A gender-balanced team of qualified team members will in particular be assessed positively.

It should be noted that the field visits may include several hours walk in steep terrain, and it is a pre-condition that the members of the team are physically fit.

The team shall consist of a team leader who has the overall responsibility for the assignment. It is envisaged that the team leader will be assisted by one international expert and/or one local expert. The team should altogether cover the following disciplines and qualifications:

- Knowledge of and experience from Nepal's energy sector/renewable energy subsector (policy, institutional, technical, subsidy policy).
- Experience from similar assignments.
- Knowledge of and experience from work with gender and social inclusion issues.
- Knowledge of and experience from financial management and auditing.
- Organisational development
- Experience of working with national energy programmes
- Strong critical analysis skills
- At least one of the team members must command Nepali fluently in reading, writing and speaking, as some of the documents may only be available in Nepali.

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Each donor including GoN may in addition nominate one representative each to take part in the review as observers.

## **7 Presentation of tenders**

The technical part of the tender shall include, but not necessarily be limited to:

- Company brochure, maximum 5 pages
- Comments to the ToR, maximum 1 page
- A work plan with a proposed work methodology and time schedule, maximum 2 pages.
- List of proposed personnel with input (work-time), proposed role in the assignment, and professional profile, maximum 5 pages.
- CVs of all presented personnel for the assignment, signed by the person of the CV or person responsible for the proposal. Maximum 5 pages per person.
- Reference assignments in which the presented personnel for this assignment have participated, maximum 1 page for each reference assignment. Each reference assignment listed shall include role and duration in man-months for the proposed personnel.
- Reference assignments on Company/Consultancy level – the tenderer's references (similar assignments to the assignment described in this ToR) – maximum 7 references. Information shall include type and scope of work, value and duration.

The financial part of the tender shall include the elements below, and please note that this is a fixed price assignment.

- Fee rates of all personnel
- Specified budget with input of all personnel and other expenses such as travels, per diems, equipment etc. The budget shall include an amount of 5% for unforeseen expenses, physical contingency, and shall serve as a ceiling for the services to be rendered.
- All rates and other expenses shall be given in NOK, and it shall be specified if VAT is included or not.

The final budget is to be proposed by the Consultant in the tender according to the matrix below, and specified information must be submitted on each budget post for all proposed personnel.

Budget post	No.	Rate, NOK	Total, NOK
Tickets international and national			
Travel allowance, compensation			
Hotel			
Professional fee travel			



Professional fee home office			
Miscellaneous/unforeseen expenses			
<b>TOTAL</b>			

## 8 Weighting of Criteria

The evaluation of the proposals will apply the following weighting (the tender which gives the best value for money will be preferred):

Qualifications of the presented team/personnel	50%
Comments to the ToR, with a proposed work plan and methodology	10%
Reference assignments on company level	10%
Financial part/price	30%
	<b>100%</b>

## 9 Documentation

(To be submitted by ESAP unless differently explicitly stated)

- Background Documents
- Programme Documents
- Joint Financing Agreement
- Bilateral agreements
- TOR for Steering Committee
- Completion Report for ESAP Phase 1
- Appraisal and desk appraisal report for ESAP II
- Mid Term Review from 2008
- Strategy on Gender and Social Inclusion from July 2008
- Annual Work Plans
- Minutes from SC meetings
- Progress Reports
- Independent verification of ESAP Programme Achievements: Micro-hydro plants, Solar Home System and Improved cooking Stoves- January 2008
- Aid Memoire from the 2008 review
- Note on Implementation of recommendations in the Aide Memoire prepared by the Joint Danida/Norad Review mission

- Rural Electrification in Nepal and Possibilities for a Sector Wide Approach (Norad/Scanteam report from October 2003) (Norwegian Embassy)
- Reports on subsidy policy, subsidy delivery mechanism including background documents, Rural Energy Policy
- GoN Three Years Development Plan (2010-2013)
- AEPC SoD Plan.
- SWAp Report for R and RE Sector – prepared by Consultant hired by AEPC/ESAP
- Evaluation of Norwegian Power-related Assistance, Norad Evaluation Report 2/2007, Scanteam (Case: Nepal and Mocambique)
- Norwegian Development Assistance to Rural Electrification. Best Practice Guide for Planning, Norad Report 18/2009 Discussion

## **APPENDIX 1**

Required report format (proposed changes needs to be approved by the Client)

### **1            Executive Summary**

1.1           Review Findings

1.3           Conclusion

1.4           Recommendations

### **2            Introduction**

2.1           Objectives of the Review

2.2           Methodology

2.3           Structure of Report

2.4           Acknowledgements and Disclaimer

### **3            Review and analysis**

3.1           Description of the Project

3.1.1        Goal

3.1.2        Purpose

3.1.3        Outputs and Activities

3.2           Assessment of Performance and Achievements

3.2.1        Formal Criteria

3.2.2        Efficiency

3.2.3        Effectiveness

3.2.4        Impact

3.2.5        Relevance

- 3.2.6 Sustainability
- 3.2.7 Risk management
- 3.2.8 Particular concerns to be investigated
- 3.2.9 Audit
- 3.2.10 Anti-corruption measures

#### **4. Conclusions and recommendations**

#### **Annexes**

Annex A: Terms of Reference

Annex B: Document List

Annex C: Persons contacted

#### **APPENDIX 2 - stakeholders and counterparts**

Danish Embassy: Peter Elischov Olesen, Shiva Paudal

Norwegian Embassy: Thor Gislesen, Inge Harald Vognild

Norad: Geir Yngve Hermansen

Alternative Energy Promotion Centre: Dr. Narayan P. Chaulagain,

Alternative Energy Promotion Centre/ESAP: Niels Juhl Thomsen

KfW: Otmar Werner, Shanker Raj Pandey

SNV: Tom Thorsch Krader