



# ASSESSMENT OF A POSSIBLE INSTITUTIONAL SET-UP FOR A NATIONAL PROGRAMME ON DOMESTIC BIOGAS IN SENEGAL

## Report



R. Snelder - SNV WCA  
G. Dekelver - SNV Rwanda  
S. Sarr - Enda Energie  
J.-P. Correa - Enda Energie

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## **Acknowledgement**

The mission on the possible set-up of a national domestic biogas programme in Senegal had the benefit of excellent cooperation of all parties involved, starting with a lively and productive half-day seminar. The individual interviews that followed were equally constructive and allowed us to fully appreciate the solid support that the proposed programme can count on.

We would like to express our gratefulness to all participants and respondents who contributed so generously to the success of the mission and thereby hopefully to the overall objective of the initiative.

Special thanks to our colleagues and partners of Enda who were instrumental in the organization and implementation of the mission and who made themselves available beyond the call of duty.

## Executive summary

This report presents the findings of a mission conducted by a team composed of two advisors of the Netherlands Development Organisation SNV and two staff members of *Enda Energie* to assess the possible institutional set-up for the proposed national domestic biogas programme in Senegal. The mission was carried out from February 18<sup>th</sup> till March 1<sup>st</sup> 2008 and made use of the following methodology:

- A half-day workshop to present a summary of the findings of the Feasibility Study and to generate discussion with selected stakeholders about the institutional set-up and the required functions to be assigned to various actors.
- Interviews with potential stakeholders to explore more in depth the feasibility of the results of the discussions during the workshop.
- A field visit to the region where the pilot and first stage are scheduled to be implemented to reconnect with the realities of the local context.

The main conclusion of the mission is that there is a real interest in the potential of the domestic biogas programme that augurs well for the proposed approach. The available institutional framework offers sufficient potential to execute the required functions without any noticeable exception.

The Ministry of Energy is the most appropriate institution to assure the connection with the wider institutional context and its *Agence Sénégalaise d' Electrification Rurale* (ASER) is proposed as the appropriate implementing agency under whose responsibility the Office of a National Biogas Programme can be established.

The first main recommendation is therefore to designate ASER for the role of implementing organization.

The second main recommendation is for the Ministry of Energy/ASER to consider the Programme Outline included in the Feasibility Study in its Section 4 as the basis for the implementation programme.

The third main recommendation is for Ministry of Energy/ASER to determine within the framework of the national budget allocation procedures the potential Senegalese budgetary contribution on the basis of the Feasibility Study and its Programme Outline.

The fourth main recommendation is for Ministry of Energy/ASER to link with the ongoing process that is now establishing a programme for the dissemination of domestic biogas in Africa and to submit the Feasibility Study and the present Report on the Institutional Set-up to the participants in this process for funding – this can be done through SNV.

Two other recommendations are addressed to SNV WCA as action in these respects has become urgent indeed:

- Finalize SNV's conditions and mode of intervention in domestic biogas activities in Senegal within the framework of the regional activities as well as the developments for Africa as a whole in this sector.
- Decide on the possible collaboration with ENDA TM and, if that option is retained, work out the roles that each will play in the various functions to be fulfilled and define the framework within which this collaboration can best be formalized.
- Proceed with all the necessary steps in order to be able to assign staff to the Senegal domestic biogas programme as soon as the commitments of the various partners are formalized and taking into account the outcome of the actions above.

## Sommaire Exécutif

Le présent rapport propose les observations d'une mission conduite par une équipe composée de deux conseillers de l'Organisation néerlandaise de développement SNV et deux cadres de Enda Energie et qui cherchait à examiner les options de montage institutionnel pour le programme national de biogaz domestique proposé pour le Sénégal.

La mission s'est déroulée du 18 février au 1er mars 2008 et elle a employé la méthodologie suivante:

- Un atelier d'une demi-journée pour présenter sommairement les conclusions de l'Etude de Faisabilité et pour entamer une discussion avec une sélection de parties prenantes potentielles au sujet du montage institutionnel et des fonctions requises devant être confiées aux diverses acteurs;
- Interviews avec des parties prenantes potentielles afin d'explorer plus en profondeur la faisabilité des résultats des discussions menées durant l'atelier;
- Une visite de terrain dans la région où l'opération pilote et la première phase sont programmées afin de rétablir le contact avec les réalités du contexte.

La principale conclusion de la mission est qu'il existe un réel intérêt pour le potentiel du programme de biogaz domestique ce qui est de bonne augure pour l'approche proposée. Le cadre institutionnel existant disponible offre suffisamment de potentiel pour prendre en charge les fonctions requises sans exception particulière.

Le Ministère de l'Energie est la structure la plus indiquée pour assurer la liaison avec le contexte institutionnel général et son Agence Sénégalaise d'Electrification Rurale (ASER) est proposée comme étant l'entité appropriée de mise en œuvre sous la responsabilité de laquelle le Bureau du Programme National de Biogaz Domestique peut être établi.

La première recommandation majeure est donc de désigner l'ASER pour le rôle d'agence d'exécution.

La seconde recommandation majeure préconise au Ministère de l'Energie/ASER de considérer le Programme Préliminaire tel que proposé dans la section 4 de l'Etude de Faisabilité comme la base du programme d'exécution.

La troisième recommandation majeure propose au Ministère de l'Energie/ASER de déterminer suivant les procédures nationales d'allocation de fonds la contribution budgétaire sénégalaise sur la base de l'Etude de faisabilité et son Programme Préliminaire.

La quatrième recommandation majeure suggère au Ministère de l'Energie/ASER de se mettre en rapport avec le processus en cours qui cherche à établir un programme de dissémination du biogaz domestique en Afrique et de soumettre l'Etude de Faisabilité et le présent Rapport sur le Montage Institutionnel aux participants de ce processus pour financement – ce qui peut se faire par l'intermédiaire de la SNV.

Deux autres recommandations s'adressent plutôt à la SNV- Afrique de l'Ouest et Centrale puisqu'il devient éminemment urgent maintenant de passer à l'action sur les points en question :

- Mettre au point les conditions et les modalités d'intervention de la SNV dans le secteur du biogaz domestique dans le cadre de ses opérations régionales et des développements au niveau de l'Afrique subsaharienne dans ce secteur.
- Prendre une décision au sujet de la collaboration avec Enda TM et, le cas échéant, définir les rôles que chacun peut assumer eu égard aux fonctions requises et définir le cadre approprié dans lequel leur collaboration éventuelle peut être formalisée.
- Faire toutes les démarches nécessaires afin de pouvoir affecter des cadres au programme sénégalais de biogaz domestique dès que les engagements des différents partenaires arrivent à être formalisés et en tenant compte des résultats des actions ci-dessus.

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## Abréviations

<b>(F/E/M) IRR</b>	<b>(Financial / Economic / Modified) Internal Rate of Return</b>
<b>(SNV) BPT</b>	<b>(SNV) Biogas Practice Team</b>
<b>(Solar) pV</b>	<b>(Solar) photo Voltaic</b>
<b>€</b>	<b>Euro</b>
<b>AfDB</b>	<b>African Development Bank</b>
<b>AFME</b>	<b>Agence Française pour la Maîtrise de l'Energie</b> <i>French Agency for Energy Management</i>
<b>AFSTech/ Sénégal</b>	<b>Association des Femmes pour la Promotion des Sciences et de la Technologie au Sénégal</b> <i>Women's Association for the Promotion of Science and Technology in Senegal</i>
<b>ANCAR</b>	<b>Agence Nationale de Conseil Agricole et Rural</b> <i>National Agency for Agricultural and Rural Advise</i>
<b>ANCR</b>	<b>Association Nationale des Conseils Ruraux</b> <i>National Association of Rural Councils</i>
<b>AREED</b>	<b>African Rural Energy Enterprise Development</b>
<b>ASER</b>	<b>Agence Sénégalaise d'Electrification Rurale</b> <i>Senegalese Rural Electrification Agency</i>
<b>ASN</b>	<b>Association Nationale de Normalisation</b> <i>National Normalisation Association</i>
<b>BAB</b>	<b>Biogas Advisory Board</b>
<b>BAD</b>	<b>Banque Africaine de Développement</b> <i>African Development Bank</i>
<b>BCC</b>	<b>Biogas Construction Company</b>
<b>BFI</b>	<b>Biogas Feasibility Index</b>
<b>BPO</b>	<b>Biogas Programme Office</b>
<b>CDM</b>	<b>Clean Development Mechanism</b>
<b>CEDEAO</b>	<b>Communauté Economique des Etats de l'Afrique de l'Ouest</b> (English : ECOWAS)
<b>CER</b>	<b>Certified Emission Reduction</b>
<b>CERER</b>	<b>Centre d'Etudes et de Recherches sur les Energies Renouvelables</b> <i>Study and Research Centre for Renewable Energies</i>
<b>CEREEQ</b>	<b>Centre Expérimental de Recherche et d'Etudes pour l'Equipement</b> <i>Experimental Research and Study Centre for Infrastructure</i>
<b>CIMES</b>	<b>Comité Interministériel pour la Mise en Oeuvre des Synergies entre l'Energie et les autres Secteurs</b> <i>Inter-Ministry Committee for the Implementation of Synergies between Energy and other Sectors</i>
<b>CIRAD</b>	<b>Centre de Coopération Internationale de Recherche Agronomique</b> <i>Centre for International Cooperation in Agronomic Research</i>
<b>CMS</b>	<b>Crédit Mutuel du Sénégal</b> <i>Credit Union of Senegal</i>
<b>CNQP</b>	<b>Centre National de Qualification Professionnelle</b> <i>National Centre for Occupational Qualification</i>
<b>CNRA</b>	<b>Centre National de Recherches Agronomiques</b> de Bambey <i>National Centre for Agronomic Research</i>
<b>CRAT</b>	<b>Centre Régional Africain de Technologie</b> <i>African Regional Centre of Technology</i>
<b>DEEC</b>	<b>Direction de l'Environnement et des Etablissements Classés</b> <i>Direction of the Environment and Protected Areas</i>
<b>DIREL</b>	<b>Direction de l'Elevage</b> <i>Direction of Livestock</i>
<b>DPC</b>	<b>Direction de la Protection Civile</b> <i>Direction of Public Safety</i>
<b>ECOWAS</b>	<b>Economic Community of West African States</b> (français: CEDEAO)
<b>EKN</b>	<b>Embassy of the Kingdom of the Netherlands</b>
<b>ENDA</b>	<b>Environmental Development Action</b>
<b>ENSUT</b>	<b>Ecole Supérieure Universitaire de Technologie</b> <i>University of Technology</i>

<b>EPIC</b>	<b>Etablissement Public à Caractère Industriel et Commercial</b> <i>Public Establishment with Industrial and Commercial Statute</i>
<b>ESP</b>	<b>Ecole Supérieure Polytechnique</b> <i>Polytechnic University</i>
<b>FNPEF</b>	<b>Fonds National de Promotion de l'Entrepreneuriat Féminin</b> <i>National Fund for the Promotion of Women's Entrepreneuriat</i>
<b>FONDS STAB</b>	<b>Fonds d'appui à la Stabulation</b> <i>Support Fund for Stabling</i>
<b>Franc CFA</b>	<b>Franc de la Communauté Financière Africaine</b> <i>Franc of the African Financial Community</i>
<b>GDI</b>	<b>Gender-related Development Index</b>
<b>GDP</b>	<b>Gross Domestic Product</b>
<b>GHG</b>	<b>Greenhouse Gas</b>
<b>GTZ</b>	<b>Organization for Technical Cooperation, Germany</b>
<b>HDI</b>	<b>Human Development Index</b>
<b>hh</b>	<b>household</b>
<b>HPI</b>	<b>Human Poverty Index</b>
<b>ICS</b>	<b>Improved Cooking Stove</b>
<b>IMF</b>	<b>Institution de Micro Finance</b> <i>Micro Finance Institution</i>
<b>IPCC</b>	<b>Inter-governmental Panel on Climate Change</b>
<b>ISRA</b>	<b>Institut Sénégalais de Recherches Agricoles</b> <i>Senegalese Institute of Agricultural Research</i>
<b>LVIA</b>	<b>Associazione di cooperazione e Volontariato Internazionale</b> <i>Association of Cooperation and International Volunteers</i>
<b>M&amp;E</b>	<b>Monitoring &amp; Evaluation</b>
<b>MDG</b>	<b>Millennium Development Goals</b>
<b>MFI</b>	<b>Micro Finance Institute</b>
<b>MJ, GJ, TJ</b>	<b>Mega (10<sup>6</sup>)-, Giga(10<sup>9</sup>)-, Tera(10<sup>12</sup>) Joule</b>
<b>NGO</b>	<b>Non-Governmental Organisation</b>
<b>NPV</b>	<b>Net Present Value</b>
<b>NTFP</b>	<b>Non-Timber Forest Products</b>
<b>ODA</b>	<b>Official Development Aid</b>
<b>OECD</b>	<b>Organization for Economic Cooperation and Development</b>
<b>PAPEL</b>	<b>Programme d'Appui à l'Elevage</b> <i>Livestock Support Programme</i>
<b>PAPIL</b>	<b>Projet d'Appui à la Petite Irrigation Locale</b> <i>Small-scale Local Irrigation Support Project</i>
<b>PERACOD</b>	<b>Programme de Promotion de l'Electrification Rurale et de l'Approvisionnement Durable en Combustibles Domestiques</b> <i>Promotion Programme for Rural Electrification and for Sustainable Supply of Domestic Fuel</i>
<b>PRSP</b>	<b>Poverty Reduction Strategy Paper</b>
<b>PMIA</b>	<b>Programme de Modernisation et d'Intensification Agricole</b>
<b>PNBD</b>	<b>Programme National de Biogaz Domestique</b> <i>National Domestic Biogas Programme</i>
<b>PROGEDE</b>	<b>Programme de Gestion Durable et participative des Energies Traditionnelles et de Substitution</b> <i>Program for Sustainable and Participative Management of Traditional and Substitute Energies</i>
<b>PROMER</b>	<b>Programme de Promotion de la Micro-Entreprise Rurale</b> <i>Rural Micro-Enterprise Promotion Programme</i>
<b>R &amp; D</b>	<b>Research and Development</b>
<b>RNE</b>	<b>Royal Netherlands Embassy</b>
<b>SADER</b>	<b>Société Africaine de développement des Energies Renouvelables</b> <i>African Company for the Development of Renewable Energies</i>
<b>SHS</b>	<b>Solar Home Systems</b>
<b>SNV</b>	<b>SNV / Netherlands Development Organization</b>
<b>SWOT</b>	<b>Strong – Weak – Opportunity – Threat</b>
<b>TLU</b>	<b>Tropical Livestock Unit</b>



<b>ToT</b>	<b>Training of Trainers</b>
<b>UCAD</b>	<b>Université Cheikh Anta Diop</b> <i>Cheikh Anta Diop University</i>
<b>UEMOA</b>	<b>Union Economique et Monétaire Ouest Africaine</b> <i>West African Economic and Monetary Union</i>
<b>UN-FAO</b>	<b>United Nations Food and Agriculture Organization</b>
<b>US-DoE</b>	<b>United States Department of Environment</b>
<b>VER</b>	<b>Verified Emission Reduction</b>
<b>VEV</b>	<b>Vent et Eau pour la Vie</b> <i>Wind and Water for Life</i>

## CHAPTER 1 : Introduction and background

In 2004 the *Agence Sénégalaise d'Electrification Rurale* (ASER) expressed interest in studying the opportunities for a national domestic biogas programme in Senegal. To investigate this, SNV – Netherlands Development Organization and ASER commissioned a pre-feasibility study<sup>1</sup>. Following the promising indications of this desk study, ASER and SNV decided for a more comprehensive feasibility study<sup>2</sup> that was carried out in October 2006 and completed with a separate mission to collect additional field information<sup>3</sup> in the region proposed for the pilot stage in July 2007.

The potential that was identified is partly today's already existing potential in terms of availability of inputs and expressed needs for alternative energy sources, and partly the potential that is being built up before our eyes, so to speak, as the way cattle husbandry is practised is rapidly evolving under the influence of modernization, the pressure of land-use restrictions and the need for environmental protection, while energy cost is constantly going up in real terms as well as in terms of proportion of imports and of export earnings. In the early stages demand is likely to come primarily from the peri-urban areas but the rural areas can be expected to follow promptly. In terms of project implementation logistics and from a point of view of dissemination effort this seems to be the most logical way.

The approach adopted by SNV and successfully implemented in Asia is based on the establishment, over time, of a market mechanism for domestic biogas installations and accessories, in which a well-informed demand side - i.e. in which clients who know what they want, who recognize quality and value for money - addresses an equally capable supply side that provides the market with quality products at competitive prices and with adequate after-sales services. Such a market should be able to reach a volume that allows a significant number of operators to maintain an economically sound and profitable level of turnover.

In the process towards a market situation the government, organisations of civil society, and other players in the public and private sectors have a role to play in addition to the main actors in the market.

In order to start the long process towards a self-sustaining and dynamic market mechanism the efforts of the various stakeholders must be bundled, embedded in some kind of structural framework and coordinated.

To assess the way this framework can best be put together, what partners to choose and what roles to assign was the subject of the mission that was carried out from February 18<sup>th</sup> until March 1<sup>st</sup> 2008. The mission was composed of Sécou Sarr and Jean Pascal Correa of Enda Energie, Guy Dekelver of SNV Rwanda and Raoul Snelder of SNV Bénin/West and Central Africa. This report presents the findings of this mission.

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<sup>1</sup> J. Lam, September 2004; Draft biogas pre-feasibility desk study.

<sup>2</sup> F. ter Heegde, Ukkerman R. & Diop, L. September 2007; Report on the feasibility study on a national programme for domestic biogas in Senegal.

<sup>3</sup> R. Snelder, August 2007; Report of a mission to collect additional information for the feasibility study on a national programme for domestic biogas in Senegal.

## CHAPTER 2 : Objective, methodology and limitations

### 2.1 Objective

The objective of the mission is to assess the possible institutional set-up for the biogas programme in Senegal as proposed in the Feasibility Study.

### 2.2 Methodology and limitations

The following methodologies were employed to achieve the objective of the mission:

- Elaboration of the Terms of Reference by the SNV Biogas Practice Team.
- Preparation of the mission in consultation with our colleagues of SNV Biogas practice Team in ASIA, ESA and WCA and with our partners from *Enda Energie*. This was done through documents and by email and finally in meetings on February 18<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup>. The programme of the mission can be found in Annex 2;
- A half-day Consultative Workshop on February 21<sup>st</sup> 2008 to present a synopsis of the findings and recommendations of the Feasibility Study to potential stakeholders that had accepted the invitation to attend.
- Interviews with potential stakeholders for the proposed programme on domestic biogas. To structure the interviews the main questions to be discussed and especially those relating to the diagrams representing the various functions required had been introduced during the workshop. See Figure 1.  
The contact details of the respondents and summaries of the main findings of the interviews are included in Annex 3.
- Field visit to the area where the pilot phase is proposed to be located, the *Région de Kaolack* and the *Région de Fatick* to get an impression of the local situation and the presence of various actors at the local level.
- Writing of the present draft report that will be circulated and then finalized after reception of comments from SNV, Enda and ASER.

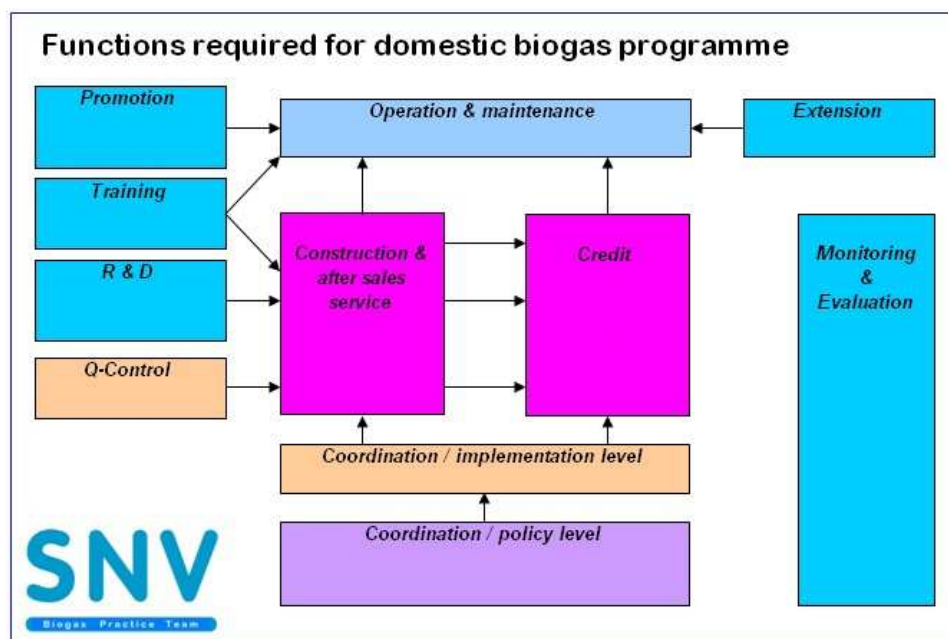


Figure 1. Functions required to be executed in the biogas programme

## CHAPTER 3 : Overview of (potential) stakeholders

### 3.1 GOVERNMENT DEPARTMENTS

#### 3.1.1 Présidence de la République *President's Cabinet*

The President's cabinet comprises a number of senior Technical Advisors who provide policy advice to the cabinet in every sector of the nation's life. The Technical Advisor in charge of renewable energy and related subjects, Mr. Lamine Diop, happens to be the Senegalese member of the team that carried out the feasibility study for the domestic biogas programme, formerly a staff member of the CERER.

The cabinet is ready to play a role in the national domestic biogas programme but emphasizes the need to avoid institutional cumbersome: the steering committee must be a 'light' structure. In practice this most likely means that it will appoint a representative to a compact steering committee and that it can be counted upon to intervene when progress is jeopardized by undue administrative obstacles.

In Mr. Diop's view the Ministry of Energy is the most appropriate entity to lodge the Programme Office.

#### 3.1.2 Direction de l'Energie *Direction of Energy*

While highly interested and firmly supportive of the proposed domestic biogas program on the department's behalf, its representative did not feel that a BPO should necessarily be attached to it or come under its wings. It was pointed out that an argument could be expected to be made for attachment to the Department of Biomass and Biofuels of the Ministry of Biofuels, Renewable Energy and Scientific Research), and more specifically to its *Division Biomasse*.

Although the spokesman is in particular responsible for the demand side of PROGEDE (*Programme de Gestion Durable et Participative des Energies Traditionnelles et de Substitution*, Program Sustainable and Participative Management of Traditional and Substitute Energies) and from this viewpoint the introduction of domestic biogas is a welcome innovation that can be included in the alternatives to be promoted.

It was suggested that a member of the *Comité Interministériel* (CIMES) be assigned to the Pilot Committee – possibly someone from Aser which functions as the secretariat for the CIMES. In this view a representation by Enda could be an alternative.

#### 3.1.3 Direction de l'Environnement *Direction of the Environment*

The director and staff expressed great interest and welcomed the initiative as an important step in reducing environmental impact of domestic energy consumption but didn't feel the department needed a claim on ownership of the biogas programme. Given the nature of the department's mandate it will be intimately involved at all stages and it is ready to play to the full the role that can be expected of it. It does expect to be a member of the steering committee.

#### 3.1.4 Direction de la Biomasse et des Biocarburants *Direction of Biomass and Biofuels*

The Department expressed great interest in the proposed programme and, as a newly created institution, it welcomes every programme that falls within the sphere of its mandate. Although the Minister would have to confirm, the Department head and staff were of the opinion that the national biogas programme, as an experimental endeavour in the field of renewable energy and use of biomass, should logically be attached to its Biomass Division.

The Ministry is very much involved in the statutory and legal aspects of the sector and has a role to play in formulating the legal framework and the regulations for the sector.

**3.1.5 Direction de l'Élevage**  
*Direction of Livestock*

The Livestock Department considers itself a main stakeholder as the biogas programme potentially constitutes an important valorisation of the sector as a whole and a powerful instrument in the policy towards modernization and rationalization of cattle husbandry. The operational partner for a biogas programme would naturally be the *Programme d'Appui à l'Élevage* (PAPEL) which operates in every department<sup>4</sup> in close collaboration with the decentralized representations at the level of the *Régions* and the *Départements*.

The Department is ready to cooperate with a national domestic biogas programme whatever the institutional set-up may be: it has no particular requirements but would expect to be represented at the level of the steering committee.

**3.1.6 Direction de la Santé Animale**  
*Direction of Animal Health*

This direction expressed interest for a technology that in its view comes at the right moment and it was suggested that the PAPEL is one of the natural partners for the office of a National Domestic Biogas Programme. A second partner that should be involved is the *Agence Nationale de Conseil Agricole et Rural* (ANCAR), if only for the promotion of the efficient use of the effluent. It is expected that this direction can be helpful with the identification and dissemination of basic rules for healthy practices of intensive cattle raising - which may still be a novel experience for many farmers.

**3.1.7 Direction de la Micro-Finance**  
*Direction of Micro-Finance*

As the importance of the proposed domestic biogas programme was well recognized, support from this department would be forthcoming but - in the pilot phase – not directly. The modus operandi and the accomplishments in the initial stages will be followed with great interest but a more active role would be possible only when the programme has reached the operational stage. However, sufficient opportunities exist to ensure availability of micro-credit formulas even in the initial stages.

**3.1.8 Direction de l'Artisanat**  
*Direction of Arts and Crafts*

The Department of Arts and Crafts expressed great interest in the programme as it means employment and training for local craftsmen. It can play a role in informing local institutions such as the '*chambres de métiers*' (artisans organization at local level), and by coordinating at the central and local levels.

The department wants to be involved in the process of technical and managerial training of the craftsmen.

## **3.2 GOVERNMENT AGENCIES AND ASSOCIATED ORGANISATIONS**

**3.2.1 Programme d'Appui à l'Élevage PAPEL**  
*Livestock Support Programme*

An important programme in the Senegalese livestock policy the PAPEL views a national biogas programme based on the use of cattle dung as a natural and vital addition to the range of services that tend to improve productivity of the livestock sector in general and cattle husbandry in particular. Their presence in the pilot area and in the sylvopastoral zone is strong and dynamic which makes for a very promising partnership perspective. The needs of a biogas programme (availability of dung, disposal of effluent) and some of the policies already promoted by the PAPEL (zero-grazing, cultivation of fodder crops, improved use of manure) are already very much part of the same logic.

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<sup>4</sup> The word 'department' is used for the sectoral entities at ministerial level called '*direction*' as well as for the territorial administration entity '*département*'.

**3.2.2 Centre de Qualification Professionnelle CNQP**  
*National Centre for Occupational Qualification*

The CNQP is an education institute providing (i) technical training to school-leavers and (ii) refreshment/upgrading courses to practising technical staff.

The director and staff expressed great interest in working with a national domestic biogas programme and developing a comprehensive training component for all relevant skills and levels.

On the basis of our discussions with director and staff, which were followed by an extensive visit of the premises, it appeared to us that the Centre would indeed be a very interesting partner who would be capable of covering the whole range of training needs of teachers, supervisors and craftsmen. A specially tailored 'ad hoc' programme is a possibility but an additional regular curriculum can also be envisaged.

The financial and administrative autonomy that the institution enjoys makes it an 'easy' partner in that respect.

**3.2.3 Crédit Mutuel du Sénégal CMS**  
*Mutual Credit of Senegal*

Senegal's oldest micro-finance institution with the most densely knitted network of field representations expressed great interest in playing a role in the proposed programme. While standard procedures and requirements might exclude biogas as an object for standard credit allocation special arrangements and parallel funding mechanisms could well be a possibility. The potential for a role as client interface in the field is a very powerful asset as is the willingness to cooperate in combining financial solutions.

**3.2.4 Centre d'Etudes et de Recherche sur les Energies Renouvelables CERER**  
*Study and Research Centre for Renewable Energies*

While the CERER has experience with biogas installations – there is a floating drum digester on the premises (not operational) its main field of activity is solar energy.

The centre is in obvious need of vigorous re-vitalization and that is what seems to be scheduled for the near future. At this point in time however, it does not yet seem to be equipped to play a major role. However, if the upgrading plans materialize it could be a candidate for research work on technical aspects and on norms and standards.

**3.2.5 Centre Expérimental et d'Etudes pour l'Équipement CEREEQ**  
*Experimental Study and Research Centre for Infrastructure*

This public company is an important player in the national market for technical studies and engineering services. It is well equipped with human and material resources and has reputedly a well furnished portfolio and is financially sound. The premises are well kept and the laboratories are equipped with fairly dated but for the most part functional equipment.

The impression was that the quality of leadership and the strong personality of the director were crucial elements for the continued success of the company.

Interest in some form of collaboration was expressed and the intervention areas indicated are: research on building materials and manufactured accessories and appliances. Obviously work can be contracted to the company but forms of partnership in research and development of appropriate solutions is also possible. Cereeq already plays an important role in building materials and construction quality control and therefore this domain and normalization would likely offer opportunities for cooperation.

**3.2.6. Fonds National de Promotion de l'Entrepreneuriat Féminin FNPEF**  
*National Fund for the Promotion of Women's Entrepreneurship*

The Fund provides access to financial resources for women entrepreneurs and it is ready to explore opportunities linked to the proposed national domestic biogas programme. The obvious formula is to assist in setting up small cattle raising units (beef fattening and milk production) but this needs further study.

The Fund works in close collaboration with various institutions of microfinance in the whole country.

**3.2.7 Agence Sénégalaise d'Electrification Rurale ASER**  
*Senegalese Agency for Rural Electrification*

Aser is willing to be the anchor point for a *Programme National de Biogaz Domestique*, in fact the general feeling at the agency is that this is where the PNBD belongs for various reasons. It is the initiator of the attempts to bring the programme to Senegal, it has the field presence and experience, the search of alternatives contributions to the solution of the energy problems of the rural areas are part of its mandate and, last but not least, it has the administrative and financial autonomy required for the implementation of such a programme.

The exact formula is open to discussion and the institutional details can be determined at the next stage. The CIMES - of which the Energy Department holds the presidency while Aser functions as its secretariat - could play a major role.

**3.2.8 Agence Nationale de Conseil Agricole et Rural ANCAR**  
*National Agency for Agricultural and Rural Extension Services*

ANCAR manifested great enthusiasm for the proposed domestic biogas programme as a whole and identified several areas of shared interest. Complementarities seem obvious and several functions and roles could involve the Agency: promotion, extension (including the vital area of slurry use in agricultural production), quality control and research. Their presence at the grass roots level makes them a natural partner. They have excellent links with the *Organisations de Producteurs* (Organisations of Producers), government agencies, Ngo's and other civil society organisations. The modus operandi of the Agency would appear to be a very good match for the way the biogas programme would operate.

### **3.3 CIVIL SECTOR ORGANISATIONS**

**3.3.1 ENDA Energy-Environment-Development**

ENDA TM – Environment and Development Action in the Third World is an international non-profit organization based in Dakar, Senegal. The organization consists of a group of teams and Programmes working in synergy. ENDA collaborates with grassroots groups in search of alternative development models based on the experience, expectations and objectives of marginalized peoples. ENDA Energy-Environment-Development Programme, one of the largest teams comprising the ENDA family, is extensively engaged in issues such as energy production and consumption, climate change, desertification and other environmental and developmental issues.

Its main objectives and lines of the mission: to contribute towards a greater understanding of energy and development issues in Africa; to help identify the conditions for widening access to energy services for deprived populations.

In the ENDA Energy programme, emphasis is constantly placed on the interaction between certain key elements including research, policy, action and training. Programmes and work are generally undertaken in collaboration with national and international organizations as well as with African organizations and institutions, local communities and operators.

**3.3.2 SNV - Netherlands Development Organisation**

The Netherlands Development Organisation SNV is a Netherlands-based international development organisation providing advice to local organisations in more than 25 developing countries in Africa, Latin America, Asia and Eastern Europe to harness their own solutions for development.

SNV has been in West and Central Africa for 40 years. It is well known in the region as a key partner for local authorities and other actors involved in decentralisation processes. This makes us an interesting partner in the basic services education, water & sanitation and health. We also help poor people to improve their income in the fields of livestock and pastoralism, cotton, timber and non-timber forest products, oilseeds and fruits & vegetables. In selected countries SNV is entering the sector of renewable energies through the promotion of national programmes for domestic biogas. This technology has been successfully

promoted by SNV and partners in Asia for over twenty years. To that end SNV/Asia has established a Biogas Practice team of about 10 advisors who are engaged in setting-up and implementing large-scale programmes for domestic biogas in Nepal, Vietnam, Cambodia and Bangladesh. Recently we have extended activities to Africa - SNV is a founding partner of the Biogas for Better Life initiative - where Rwanda is the first country to have started a national programme with SNV in an advisory capacity. Ethiopia is slated to follow soon.

While SNV does not have a representation and resident team in Senegal it is envisaged that appropriate ways and formulas can be found to make the expertise available to a national domestic biogas programme if and when such a programme is set-up.

### **3.4 INTERNATIONAL ORGANISATIONS**

#### **3.4.1 African Development Bank**

The Bank is interested especially in the potential for synergy with other activities it undertakes or is involved in. However, financial involvement is only possible through the Ministry of Finance as this would come under public finance. However, opportunities may well be found in existing financial instruments which the Bank has put in place such as the PMIA, Fonds Stab and others. Such funds are accredited to the budgets of the *Communautés Rurales* and allocated on the basis of well established tendering procedures.

Information and exchange about the evolution of the programme is welcomed and once beyond the demonstration stage a request for financial support could be introduced. If results of the initial stages are conclusive good opportunities can surely be identified.

### **3.5 PRIVATE SECTOR**

#### **3.5.1 Transtech**

Transtech Industries is a private company that produces various types of containers for water storage and waste water treatment and various other moulded items such as garden furniture using a significant amount of recycled plastic. The technology used is called "rotomoulage" which refers to the use of a two-way rotating mould that is heated to melt plastic pellets whereby the produce is formed as a kind of lining to the inside of the mould. The size of the rotating framework determines the maximum size of the forms that can be produced. At present the maximum is about 180 to 190 cm in diameter.

TTI is constantly looking for opportunities to enlarge its range of articles and they are ready to work with a National Domestic Biogas Programme in research and development as a partner or on a contract basis. Conditions will depend on the perspectives of return on investment but shared risk taking is not excluded a priori. The dome of the digester is an obvious target for prefabrication research and on certain conditions such research could be a joint enterprise.

#### **3.5.2 Société Africaine pour le Développement des Energies renouvelables SADER African Company for the Development of Renewable Energies**

Private company recently established by Senegalese engineers and business people (including several "returning residents") to develop activities in the field of renewable energies. Main area was solar energy but recently biogas has been embraced. The company bought material (about 100 sets) from Puxin and it is preparing to sell and install digesters within the next few months. While this makes us competitors it should not cause undue concern as target groups are likely to be different. Theirs is probably the more affluent and/or the commercial and institutional segments of the market. Nevertheless both have a vested interest in each others success: the value of the biogas technology should be demonstrated by both if it is to reach its full potential and neither has the right to fail and turn people away from the technology. Close contact and exchange is the way to go and that was agreed to by both parties.



### **3.5.3 Ultraplast**

Ultraplast is another private company that produces cisterns, containers and tanks for water storage and waste water treatment. It uses the same technology (“rotomoulage”) at the same scale and produces more or less the same range of products. There are slight differences in details and finishing but these seem minor - to the casual observer. The same position was taken with regard to research and development: options include contract work and forms of partnership or joint venture, depending on the conditions and the perspective of returns on investment.

### **3.5.4 M. Aliou Niang**

As the ex-Director of the agency that was at the basis of the domestic biogas initiative in Senegal, Mr. Niang maintains high interest in the sector as a private consultant. In his view the programme should be attached to the Ministry of Biofuels, of Renewable Energies and Scientific Research. He emphasized that great care must be taken to ensure financial and administrative autonomy so as to avoid the pitfalls of bureaucratic management.

## CHAPTER 4 : Required functions and suitable actors

During the workshop and the interviews selected stakeholders proposed suitable actors for the various functions required for the proposed domestic biogas programme, see Annex 3 and 4. In this chapter a provisional match between required functions and suitable actors is presented. Some of the functions are supposed to be conducted by one actor only, others by multiple actors only with a third category of functions that could be executed by both single or multiple actors, see Figure 3.

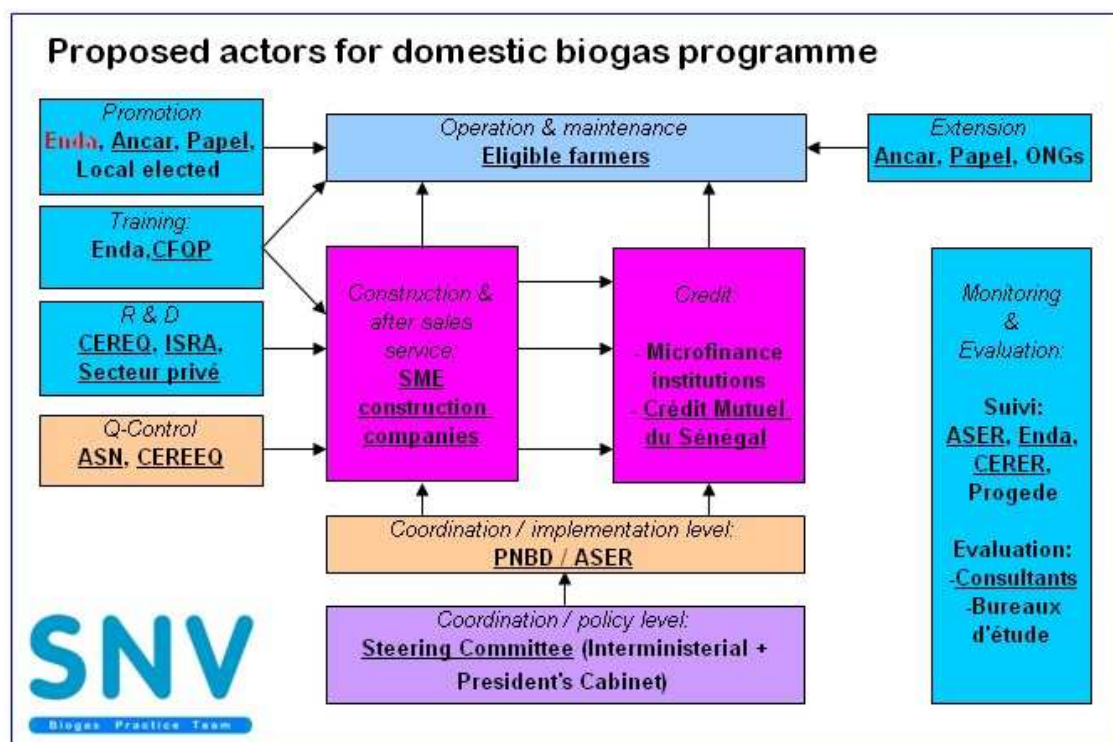


Figure 2. Suitable actors for required functions in the proposed biogas programme

Eligible farmers will operate and maintain biogas plants constructed and serviced by private sector companies. Appropriate organisations for managing micro-credit funds are present and, once the programme has proven its feasibility and economic performance, those organisations may be willing to incorporate these loans in their regular product line.

Promotion, training, R&D, extension services and M&E are functions that will be conducted by various institutes on the basis of ToR. ASER - and through it the Ministry of Energy - has been identified as the most appropriate partner for the Programme Office to be linked to in order to effectively coordinate the programme on the implementation level, to administer public funds and also to arrange for strict quality control. Details need to be worked out under the Implementation Plan. A separate Biogas Programme Steering Committee is to be established to be in charge of coordination at policy level and to provide a meeting platform for all actors to be involved in the programme. It was suggested that the “Présidence” (President’s Cabinet) should take the lead in this body.

More explanation is provided in Table 1.

Table 1. *Suitable actors to execute functions in a national biogas programme*

<b>Function</b>	<b>Suitable Actors</b>
Operation & maintenance (multiple actor)	Eligible farmers having sufficient cattle dung and water at their disposal on a permanent basis will operate and maintain the biogas plants.
Promotion (multiple actor)	Various actors from the government and civil society sector at central and local level will be able to promote the use of biogas plants including the dissemination of reliable information on the costs and benefits of biogas plants towards eligible farmers. During the stakeholder meeting there was a reminder and then a general consensus that it is important the "élus locaux" (local elected officials) be associated and play an active role in the promotional process.
Construction & after sales services (multiple actor)	Small and medium size construction companies will build the biogas digesters. In the given context this could vary from "tacherons" (jobbers or individual masons accompanied by one or two "apprentis" or as yet unskilled workers) to regular small construction companies. Based on a level playing field enabling fair competition different actors could very well construct and service biogas plants in the longer term. For the time being it is recommended to try and use the locally available actors as much as possible without compromising on quality aspects. It is not recommended to involve government organisations in conducting this function.
Provision of credit (multiple actor)	There is a general consensus that there are sufficient options as micro-finance institutions are well represented all over the country and people have become accustomed to micro-credit. One omnipresent and experienced organisation is CMS. Various actors expressed interest but a clear distinction may have to be made between the initial pilot stage and the later stages: in the first instance funding would have to come from the programme and/or other donors.
Training (single/multiple actor)	Various actors could be involved in different ways. A comprehensive set of training curricula could be offered by CNQP but others could offer decentralised formative support, for example the "Chambres des metiers" with the assistance of the Ministry of Arts and Crafts.
Applied R&D (single/multiple actor)	With applied R&D various actors could be involved, either on a ToR and contract basis or in some form of partnership. CERER and CEREEQ are obvious candidates but the private sector is also interested (Transtech and Ultrplast), while consultants are another option. To some extent R&D can be seen as an activity that transcends the region and with this in mind discussions have already taken place with colleagues from ESA.
Quality control (single/multiple actor)	Quality control is an important aspect that needs to be officially addressed by the appropriate actors such as the ASN and the Ministry responsible for public safety. The Ministry of Urban Planning and/or the Ministry of Public Health will also have their role through building permits and the like. The technical aspects can be handled on a contract basis by such actors as CERER, CEREEQ and even CNQP and institutes of learning can also play a role: ESP, ISRA. We were informed that the UEMOA is working on a policy of normalisation and labeling of equipment.
Extension on bio-slurry use (single/multiple actor)	Proper use of slurry needs to be promoted through extension programmes to the local level. Extension agents from ANCAR are in a very good position to play a vital role and the organisation is very willing to cooperate.

<p>Coordination at implementation level (single actor)</p>	<p>Only one single actor can be responsible for the day-to-day coordination or management of the biogas programme. There was general agreement that a programme office could be established at the Ministry of Energy and be linked to ASER or to CIMES even though other candidates were mentioned as possible alternatives: the Direction of the l'Environnement etc. and the Direction of Biomasse.</p>
<p>Coordination at policy level (single actor)</p>	<p>For the coordination at policy level the establishment of a Steering Committee (Comité de Pilotage) with a broad representation of various stakeholders was proposed by general agreement. The "Présidence" was seen as an important actor but it was also underlined that it should not be made any bigger than strictly necessary. It was also mentioned that the CIMES should be represented and this could be done either through ASER or through Enda.</p>

## CHAPTER 5 : Main conclusion and recommendations

### 5.1 MAIN CONCLUSION

The main conclusion of the mission is that the available institutional context in Senegal has the necessary potential and that stakeholders display the favourable disposition to execute the required functions of the proposed national domestic biogas programme. There is a real impression of positive attitudes and willingness to work together in the configuration that will be chosen and worked out as a result from the present mission's recommendation in the implementation plan. While some stakeholders are eager to play a particular role this does not lead to a situation where the distribution of roles is conditional on their frank cooperation.

ASER, attached to the Ministry of Energy and initiator of the process that led to the inception of the proposed programme, is the most suitable institutional anchorage for the Biogas Programme Office. While electricity is the main energy solution that ASER is bringing to the rural areas it is also looking at the energy situation in a more comprehensive way and alternative sources are very much part of the comprehensive solution. It has a solid experience of working in rural Senegal and while it operates on a project basis and does not necessarily have permanent representation in its intervention zones this may actually be an advantage in the sense that it may serve to emphasize the private sector approach and avoid the pitfalls of projects that are forever seen as externally owned.

In addition to the diagram of Figure 2 the chart in Figure 3 gives an idea of the recommended institutional set-up.

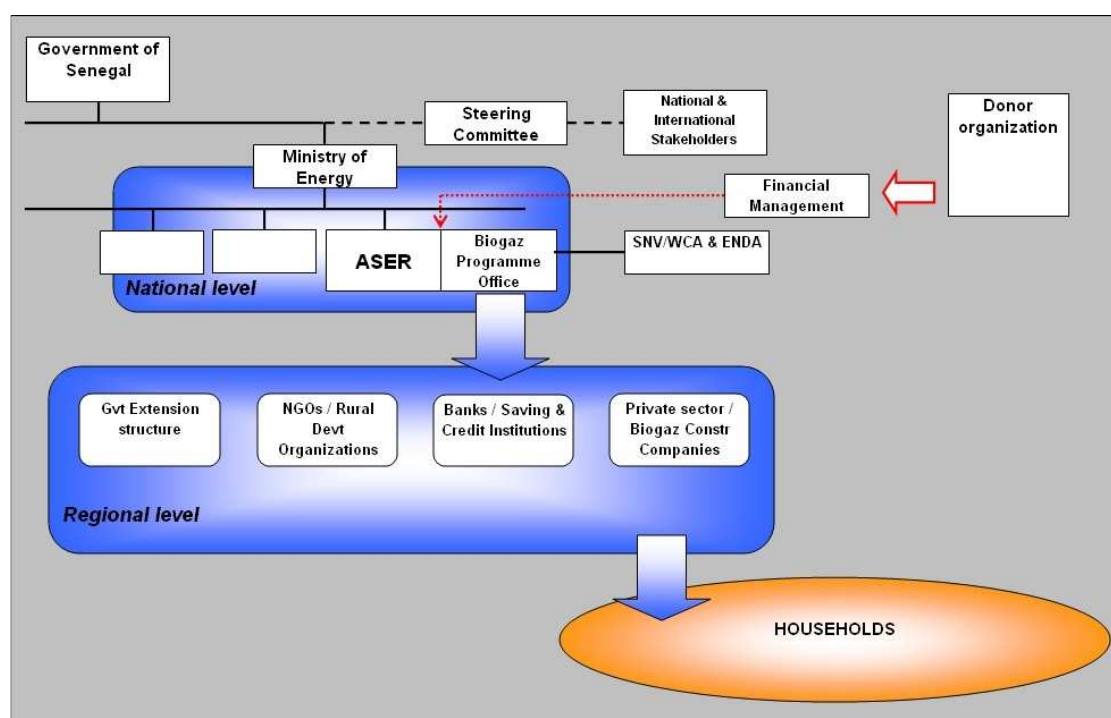


Figure 3. Senegal Biogas Programme Institutional Chart

ASER was set up in 1998 by law 98-29 dated April 14<sup>th</sup> 1998 as part of a reform process in the electricity sector in order to address the problem of access to electricity for the rural areas. Administratively it is located as a "structure rattachée" at the Ministry of Energy. It has reputedly sufficient managerial, administrative and financial autonomy to allow for efficient procedures in these respects.

Below is a mission statement for ASER as published by the Ministry of Energy on its website<sup>5</sup>.

## **Agence Sénégalaise d'Electrification Rurale (ASER)**

### **MISSION**

Assurer la promotion et de développement de l'électrification rurale, en accordant une assistance technique et financière aux entreprises et aux particuliers intervenant dans le secteur de l'électricité. Cette mission se décline comme suit :

#### **INFORMATION**

- o Campagne d'information générale sur le cadre de l'électrification rurale (ER)
- o Valorisation de l'expérience acquise au Sénégal et ailleurs

#### **DEVELOPPEMENT DE L'OFFRE DE SERVICES**

- o Renforcement de l'expertise nationale
- o Renforcement de l'offre des services techniques
- o Développement de l'offre des services financiers adaptés
- o Développement de solutions novatrices à moindre coût

#### **MAITRISE D'OUVRAGE DELEGUEE POUR L'EXECUTION DES PPER**

- o Définition des programmes prioritaires d'ER
- o Attribution de concessions dans le cadre du Programme prioritaire d'électrification rurale (PPER) par appels d'offres
- o Assistance technique aux attributaires des concessions
- o Suivi-contrôle de l'exécution des PPER
- o Appui au montage des projets ERILs (Electrification Rurale d'Initiative Locale)

#### **APPUI AU MONTAGE DES PROJETS ERILS**

- o Assistance technique et financière

#### **GESTION DES FINANCEMENTS POUR L'ER**

- o Mobilisation des financements auprès des bailleurs de fonds
- o Choix de la politique de financement de l'ER
- o Mise en œuvre de la politique de financement

#### **SUIVI ET CONTROLE DES ACTIVITES DE L'ER**

- o Contrôle de qualité des composants utilisés en ER
- o Suivi de la réalisation des projets ER
- o Suivi et évaluation du Plan d'action sénégalais d'électrification rurale (PASER)
- o Assistance au règlement des conflits entre usagers et opérateurs

#### **OBJECTIF**

Les objectifs de l'ASER sont :

- o 15% au moins de la population rurale ait effectivement accès à l'électricité en 2005 (en 1998 le taux était de 5%).
- o 52% au moins de la population rurale ait effectivement accès à l'électricité en 2012
- o 62% au moins de la population rurale ait effectivement accès à l'électricité en 2022

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<sup>5</sup> [http://www.energie.gouv.sn/pages.php?idarticle=19&id=1&smnu=22&file3=Le%20Minist%C3%A8re&file=Agence%20S%C3%A9n%C3%A9galaise%20d'Electrification%20Rurale%20\(ASER\)](http://www.energie.gouv.sn/pages.php?idarticle=19&id=1&smnu=22&file3=Le%20Minist%C3%A8re&file=Agence%20S%C3%A9n%C3%A9galaise%20d'Electrification%20Rurale%20(ASER))

ASER's qualification for the role as a host organisation for the Office of the National Domestic Biogas Programme has been assessed in relation to the criteria of the Terms of Reference and the results are summarized in the table below.

1	<i>Experience with developing and execution of M &amp; E schedules at programme level in general and formulation and endorsement of nation-wide quality assurance activities in particular.</i>
	ASER has a solid experience of developing and implementing M & E schedules as a necessary corollary of the donor funded rural energy projects, including aspects of quality control and consumer satisfaction. It operates on the national level.
2	<i>Active network with rural extension organisations.</i>
	Aser does not maintain a permanent presence in the field beyond the needs of its ongoing projects. This is not seen as a negative as Aser is not the implementing agency but the institutional anchor – a role which requires different qualities and assets, namely good connections on the central, regional and local institutional levels. It has excellent relations with rural extension services based on its
3	<i>Experience in arranging institutional support to government organizations, rural (N)GOs and training institutions and the private sector.</i>
	As part of its mission ASER was very much involved in mobilizing support and collaboration from various actors in the categories mentioned. It is vital to the accomplishment of its mission.
4	<i>Experience in guiding project/programme activities.</i>
	This is one of the very reasons for its existence.
5	<i>Affinity with rural development and domestic energy.</i>
	ASER target group is the population of the rural areas. And, as said earlier, in addition to the ER component ASER also sees the development of alternative sources of energy for its target population as an integral part of its mission.
6	<i>Own network in rural areas.</i>
	ASER does not have its own permanent network in the field but links with and mobilizes local networks as the need arises. Such networks are then assisted in acquiring and maintaining their own momentum.
7	<i>Affinity with (rural) private sector development.</i>
	One of the <i>modi operandi</i> of the ASER is to foster and enable private sector initiative in the sector of rural energy production and distribution.
8	<i>Experience with design and administration of subsidy flows to private sector, households and other programme partners.</i>
	Another element of the organizations core business.
9	<i>Experience with the initiation of credit schemes for rural technology programmes.</i>
	The conception and implementation of financial schemes to facilitate access to energy for the rural population is part of ASER's assignment and experience.
10	<i>Experience with financial administration of fund management.</i>
	Another part of the organization's daily operations and one of the reasons for selecting it as an anchor. Several stakeholders underlined the crucial importance for the Office to be able to access the available funding without having to go through the cumbersome administrative procedures that are apparently omnipresent in West Africa.

## 5.2 RECOMMENDATIONS

### 5.2.1 Main recommendations

The **first main recommendation** resulting from the present mission concerns the proposal of the entity to which the implementing responsibility should be entrusted and under whose administration and responsibility the Office of the National Domestic Biogas Programme should be established. In line with opinions expressed by most stakeholders and the agency itself the mission recommends that ASER be chosen for this role. As argued above, it fulfils the criteria in most every aspect.

There were competing suggestions (rather than real claims) and while these were duly considered, they were not seen as a better proposition. The one suggestion that was expressed in the form of a reserved claim was from the Direction of Biomass and Biofuels. However, the Ministry of Biofuels, Renewable Energy and Scientific Research is – as the name suggests – much more concerned with the investigation of available policy options in a very dynamic sector subject to rapidly changing technological as well as geopolitical conditions and with the formulation of recommendations to the Government in this respect. With the proven basic and mature technology of small-scale biogas production that the programme is proposing to disseminate a more executive implementing organisation is preferred.

Details of the establishment and operation of the unit that will actually be responsible for the daily execution of the programme will be worked out as part of the agreement with all partners.

The **second main recommendation** is for the Ministry of Energy and ASER to consider the programme outline which is included as Section 4 in the Feasibility Study as the basis for an implementation plan for the first stage of the programme.

The **third main recommendation** is for the Ministry of Energy and ASER to determine within the framework of the national budget formulation procedures the potential Senegalese budgetary contribution on the basis of the Feasibility Study and its Programme Outline.

The **fourth main recommendation** is for the Ministry of Energy and ASER to link with the ongoing process that is now establishing a programme for the dissemination of domestic biogas in Africa and to submit the Feasibility Study and the present Report on the Institutional Set-up to the participants in this process for funding - this can be done through SNV.

### 5.2.2. Other recommendations

It seems to be opportune to include some recommendations that address SNV WCA and that spell out the immediate actions that were deemed necessary in the feasibility study and that have become quite urgent at this stage:

- Finalize SNV's conditions and mode of intervention in domestic biogas activities in Senegal within the framework of the regional activities as well as the developments for Africa as a whole in this sector.
- Decide on the possible collaboration with ENDA and, if that option is retained, work out the roles that each will play in the various functions to be fulfilled and define the framework within which this collaboration can best be formalized.
- Proceed with all the necessary steps in order to be able to assign staff for the Senegal biogas programme as soon as the commitments of the various partners are formalized and taking into account the outcome of the actions above.



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[Agence%20S%C3%A9n%C3%A9galaise%20d'Electrification%20Rurale%20\(ASER\)](http://www.energie.gouv.sn/pages.php?idarticle=19&id=1&smnu=22&file3=Le%20Minist%C3%A8re&file=Agence%20S%C3%A9n%C3%A9galaise%20d'Electrification%20Rurale%20(ASER))