



# Global Applications Program

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## *Senegal: An Annotated Bibliography*

1. Arieff, A. (2013) *Senegal: Background and U.S. Relations*. Congressional Research Service. Washington, D.C. June 20. Accessed at: <http://www.fas.org/sgp/crs/row/R41369.pdf>
  - a. Prepared by the African affairs analyst of the Congressional Research Service, this document details the political history of Senegal and the present day status of its foreign affairs, national security, human rights, and U.S. relations including aid. The report is meant to aid Congressional members in making appropriations decisions. In FY2012, Senegal was allocated \$109.6 million in aid, on top of a five year Millennium Challenge Compact for \$540 million signed in 2009.
  
2. Camblong, H. et al. (2009a) *Micro-grids project, Part 1: Analysis of rural electrification with high content of renewable energy sources in Senegal*. Renewable Energy. Vol. 34 pgs. 2141 – 2150. Accessed at: <http://www.sciencedirect.com/science/article/pii/S0960148109000548>
  - a. A summary of the Micro-grid project, undertaken by the Université Cheikh Anta Diop de Dakar (UCAD) in conjunction with Spanish and French development agencies, to promote the electrification of rural regions of Senegal through the installation of micro-grids with high content of renewable energies. For this study, surveys were carried out in three regions of Senegal to assess the needs of non-electrified rural villages' households, as well as the resource potential of the area. The results presented in this paper have been used to design a rural electrification kit which is described in another paper.
  
3. Camblong, H. et al. (2009b) *Micro-grids project, Part 2: Design of an electrification kit with high content of renewable energy sources in Senegal*. Renewable Energy. Vol 34 pgs. 2151 – 2159. Accessed at: <http://www.sciencedirect.com/science/article/pii/S0960148109000524>
  - a. This follow up report to the Micro-grids project presents the design of an electrification kit based on the information provided by that analysis. This methodology is applied to a typical village and results are extended to differently sized villages in the areas of Thies, Fatick and Kaolack. Economic considerations are also included to establish the relationship between electrification costs and paying capability of the communities.

4. Dafrallah, T. (2009) *Energy Security in West Africa the Case of Senegal*. ENDA Energy, Environment, and Development Program. Accessed at:  
[http://www.gnesd.org/upload/gnesd/pdfs/energy%20security/enda%20senegal\\_energy\\_security.pdf](http://www.gnesd.org/upload/gnesd/pdfs/energy%20security/enda%20senegal_energy_security.pdf)
  - a. This socio-economic report of Senegal analyzes the energy security situation, highlighting its vulnerability and the many challenges it has to face. These challenges have to do with the need to reach development and economic growth targets, respond to the need of a young and growing population and mitigate the impacts of negative externalities (foreign dependence for conventional energy, vulnerability to climate change of biomass and hydro energy resources, etc.) on the country energy supply.
  
5. de Gouvello, C. and Kumar, G. (2007) *OBA in Senegal – Designing Technology-Neutral Concessions for Rural Electrification*. Global Partnership on Output-Based Aid, March Note Number 14. Accessed at: <https://www.gpoba.org/node/110>
  - a. An introduction to recent Senegalese energy policy as well as an overview of its rural concessions. The rural concessions analysis covers topics such as the tariff regimes, the output-based aid subsidy design of the program, bidding process, and funding sources.
  
6. Diop, M. et al. (2012) *Implementation Completion and Results Report of the Senegal River Basin Multi-Purpose Water Resources Development Project*. World Bank. September 25. Accessed at: <http://documents.worldbank.org/curated/en/2013/09/18405843/africa-senegal-river-basin-multi-purpose-water-resources-development-project>
  - a. In 1972, Mauritania, Mali and Senegal established the Organization for the Development of the Senegal River Basin (OMVS) in order to promote regional coordination of water resources and energy development. Guinea joined OMVS in 2006, which created an opportunity to coordinate with the nation at the headwaters of the river. The OMVS has since been working with the World Bank to pursue hydro development with less of negative impacts of the Diama and Manatali projects.
  
7. Fall, P. et al. (2010) *Senegal Country and Research Areas Report*. Université Cheikh Anta Diop de Dakar (UCAD) and Peace Research Institute Oslo. Dakar, Senegal October 1. Accessed at: <http://www.eumagine.org/outputs/PP2%20-%20Senegal%20Country%20and%20Research%20Areas%20Report%20-%20Final.pdf>

- a. An overview of country background including: geography, demography, politics, socio-economics, culture, and borders. Special attention is paid to the history of migration and current migration trends to Europe and other regions of the African continent.
8. Fall Sarr, O. et al. (2007) *Costing for National Electricity Interventions to Increase Access to Energy, Health Services, and Education: Senegal Final Report*. ASER and the Columbia Earth Institute. New York, NY April 17. Accessed at: [http://modi.mech.columbia.edu/wp-content/uploads/2013/04/Senegal\\_WorldBank\\_Report\\_8-07.pdf](http://modi.mech.columbia.edu/wp-content/uploads/2013/04/Senegal_WorldBank_Report_8-07.pdf)
  - a. Using the Earth Institute's electricity planning and investment costing model, this report inputs input financial and socio-economic data along with policy criteria to evaluate the feasibility and costs of electrification scenarios and quickly compare alternatives. The model is explained in detail, in addition the results of various scale up plans for Senegalese villages are compared.
9. Faye, J. (2008) *Land and Decentralization in Senegal*. The Rural Hub. Dakar, Senegal. May. Accessed at: <http://pubs.iied.org/pdfs/12550IIED.pdf>
  - a. History of land ownership in Senegal from pre-colonial times to decentralization efforts in the 1960s and 1990s. This paper examines the capacities of local and regional governments to make resource decisions and how the public is included in land management.
10. Izouma, S and Sokona, M. (2012) *Senegal Renewable Readiness Assessment* International Renewable Energy Authority. Abu Dhabi, U.A.E. Accessed at: <http://www.irena.org/DocumentDownloads/Publications/IRENA%20Senegal%20RRA.pdf>
  - a. Renewable Readiness Assessments, a pilot initiative of the International Renewable Energy Authority, are intended to be comprehensive tools for understanding the political, economic, regulatory, and resource suitability of renewable technology use in a country. This report, created in conjunction with the Senegalese Minister of Energy, lists recommended action items for the government, synthesizes data about in country energy use for the reference of outside developers, and identifies best practices for future cooperation.
11. Ly A. and Mboup, S. (2009) *National Ecovillage Agency (ANEV) Senegal: Justifications, strategies, models, and estimated costs*. ANEV. Accessed at [http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.worldwewant2015.org%2Fbitcache%2Fec6093c193525954a2473bf26084d20c4416590e%3Fvid%3D326292%26nid%3D300792%26parent\\_vid%3D297313&ei=YNePUqOA](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.worldwewant2015.org%2Fbitcache%2Fec6093c193525954a2473bf26084d20c4416590e%3Fvid%3D326292%26nid%3D300792%26parent_vid%3D297313&ei=YNePUqOA)

[CdHmoATR\\_oJA&usg=AFQjCNHaIRcjN7r4FuHZCOPURmRKdF8frg&sig2=qsZWt-TKqqCBTQs6IAyCQ&bvm=bv.56988011,d.cGU](http://www.peracod.sn/IMG/pdf/ENR-bases-technologies.pdf) on (11/9/13)

- a. This Power Point presentation explains the operations of the Senegalese Ecovillage Agency. The Ecovillage concept originated at the 1992 Rio Summit as an attempt to integrate sustainable practices at the village level in local governance, renewable energy, water control, agroforestry, basic social infrastructure, quality of life, promotion of the private sector, and sustainable financing. Ecovillage has previously been an effort of an NGO by the same name, but has been transformed into a government agency by Senegal. In addition to outlining process, the presentation provides cost estimates for achieving Ecovillage standards in 8 different eco-geographical zones.
12. Maristes, H. (2011) *Les energies renouvelables: Les bases, la technologie et la potential au Senegal*. PERACOD. Dakar, Senegal. April. Accessed at: <http://www.peracod.sn/IMG/pdf/ENR-bases-technologies.pdf>
    - a. This report was prepared by the Senegal Minister of Energy and Rural Electrification Agency (ASER) to provide a comprehensive update of the PERACOD program and the ERSEN initiative. A 130 page document written in French, it contains data about the current status of Senegal's energy use, as well as an assessment of how effective the program has been at achieving stated objectives.
  13. Mauritius Freeport Authority (2002) *Market Study: Focus on Senegal Business Prospects and Opportunities for Mauritius*. MFA Accessed at: [http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.efreeport.com%2FDisplayFile.aspx%3Fnm%3D%26DOCID%3D63&ei=OGPUuHPFo\\_ZoAT63YC4Cg&usg=AFQjCNFIPPCgmlqj9wvXCJM6uNeRbGfEAg&sig2=CrTN4IdCl-jVCLX-ZoeBEw&bvm=bv.56988011,d.cGU](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.efreeport.com%2FDisplayFile.aspx%3Fnm%3D%26DOCID%3D63&ei=OGPUuHPFo_ZoAT63YC4Cg&usg=AFQjCNFIPPCgmlqj9wvXCJM6uNeRbGfEAg&sig2=CrTN4IdCl-jVCLX-ZoeBEw&bvm=bv.56988011,d.cGU) on (9/9/13)
    - a. An review of the market potential in Senegal for a variety of products through the eyes of another African nation. Includes discussion of energy products such as solar rechargeable lanterns and cell phone stations.
  14. Modi, V. et al. (2011) *Infrastructure from the Bottom-Up: An overview and assessment of the Millennium Village Project energy and infrastructure sector after five years* Earth Institute, Columbia University New York, NY. Accessed at: <http://modi.mech.columbia.edu/wp-content/uploads/2013/06/Acknowledgements-and-Table-of-Contents.pdf>
    - a. A report summarizing the first five years of the Millennium Village Project (MVP), which is a joint effort between the Earth Institute at Columbia University, Millennium Promise,

an international NGO, and the UN Development Program to help achieve the Millennium Development Goals in sub-Saharan Africa. MVP develops energy and infrastructure projects with an emphasis on community empowerment and local engagement. Chapter 7 details the activities in the Potou Millennium Cluster, a group of 31,000 residents in 106 villages in the Northwest portion of Senegal.

15. Muller, S. et al. (2011) *Renewable Energy: Markets and Prospects by Region*. International Energy Authority. Paris, France. November. Accessed at:  
[http://www.iea.org/publications/freepublications/publication/Renew\\_Regions.pdf](http://www.iea.org/publications/freepublications/publication/Renew_Regions.pdf)
  - a. One report in a three part series that complement the IEA publication *Deploying Renewables 2011: Best and Future Policy Practice*. This paper offers a broader perspective of the markets for rural electrification within sub-Saharan Africa as a whole. It contains projections and mid-term potential for renewables in heat, electric, and transportation.
16. Oxford Business Group (2013) *Diversifying Energy Sources in Senegal*. SpyGhana. 7/10/13  
Accessed at: <http://www.spyghana.com/diversifying-energy-sources-in-senegal/> on (9/9/13)
  - a. This article discusses Senegal's plans to import LNG from the U.S. to power a planned 150MW natural gas facility. This combined with a 250MW coal plant in the works by South Korean company KEPCO will increase Senegal's power production capacity by 60%.
17. Programme for the Promotion of Rural Development, Rural Electrification and Sustainable Supply of Household Fuels (PERACOD) (2011) *Rural Electrification Senegal (ERSEN) Project Fact Sheet*. Dakar, Senegal. Accessed at:  
[https://energypedia.info/images/6/61/Rural\\_Electrification\\_Senegal\\_ERSEN\\_Project\\_Factsheet.pdf](https://energypedia.info/images/6/61/Rural_Electrification_Senegal_ERSEN_Project_Factsheet.pdf) on (11/11/13)
  - a. The Senegalese Rural Electrification Agency (ASER) undertook the PERACOD initiative to work in tandem it's with rural concessions at increasing rural electrification. This face-sheet provides an executive summary of the initiatives history, directives, and accomplishments thus far. Co-financing for PERACOD is supported by Deutsche Gessellschaft fur Internationale Zusammenarbeit (GIZ)
18. Programme for the Promotion of Rural Development, Rural Electrification and Sustainable Supply of Household Fuels (PERACOD) (2011) *Rural Electrification: A public private partnership for innovative projects in Senegal*. Dakar, Senegal. Accessed at:  
[https://energypedia.info/images/2/2d/Rural\\_Electrification\\_wind\\_Solar\\_Senegal\\_INENSUS-PERACOD\\_Project\\_Factsheet.pdf](https://energypedia.info/images/2/2d/Rural_Electrification_wind_Solar_Senegal_INENSUS-PERACOD_Project_Factsheet.pdf) on (11/11/13)

- a. A case study of one of PERACOD's development projects in cooperation with INENSUS and MATFORCE. In the community of Sine Moussa Abdou, a micro-grid was established with one 5kW wind turbine, a 5 kWp photovoltaic plant, and an 11 kVA diesel generator. The system has been operating using the micro-power economy, a concept that won INENSUS the 2010 SEED Award for entrepreneurship in sustainable development.
19. Peterschmidt, N. (2013a) *MICRO POWER ECONOMY IN THE PHILIPPINES RISK MANAGEMENT IN MINI-GRID POWER SUPPLY*. Inensus. Germany Accessed at: <http://www.giz.de/fachexpertise/downloads/2013-en-peterschmidt-pep-informationsworkshop-pv-hybrid-philippinen.pdf> on (9/23/13)
- a. This power point presentation illustrates INENSUS micro-power economy model. This demand based model for electrification has been used in Senegal as well as the Philippines.
20. Pigaht, M. and van der Plas, R. (2013) *Mini-grids: A public private balancing act: Political, economic, and organizational lessons from Namibia, Senegal, and Rwanda*. Marge Accessed at: <http://www.giz.de/fachexpertise/downloads/2013-en-pigaht-pep-informationsworshop.pdf> on (11/11/13)
- a. This power point presentation is from a small French consultancy firm named Marge. Their team is focused on natural resource management and rural electrification. This presentation is an overview of rural electrification work they have done in conjunction with Deutsche Gessellschaft fur Internationale Zusammenarbeit (GIZ), in Namibia, Senegal, and Rwanda. It discusses some of the strengths and weaknesses of these operations, as well as best practices for public-private micro-gird development in Africa.
21. Public Private Infrastructure Advisory Facility (2012) *PPIAF Supports Rural Electrification in Senegal by Helping to Reform the Enabling Environment for Public-Private Partnerships* Newsletter August 2012. Accessed at: <http://www.ppiaf.org/sites/ppiaf.org/files/publication/PPIAF-Impact-Stories-Senegal-Rural-Electrification.pdf> on (9/9/13)
- a. This newsletter summarizes the work of PPIAF to provide technical support to the government of Senegal. Their focus is on removing institutional barriers to the involvement of the outside actors in the development of energy infrastructure. Since the creation of the PPIAF *Country Framework Report*, Senegal has made significant reforms, which are outlined in this document.

22. Seck, P. (2007) *The Rural Energy Challenge in Senegal: A Mission Report*. United Nations Development Programme. New York, NY. Accessed at:  
[http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/seck\\_papa\\_senegal.pdf](http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/seck_papa_senegal.pdf)
- a. An examination of rural electrification within the context of greater poverty indicators, such as the gender gap, health services, and overall economic vitality. It paints a detailed picture of how the current lack of energy services is actually a symptom of these issues in other development areas. It also promotes integrated approaches to solving electrification within the greater context of poverty management planning.
23. U.S. Commercial Services (2012) *Doing Business in Senegal: A Country Commercial Guide for U.S. Companies*. U.S. Department of Commerce Washington D.C. Accessed at:  
[http://photos.state.gov/libraries/senegal/323264/pdf/2012ccg\\_sn.pdf](http://photos.state.gov/libraries/senegal/323264/pdf/2012ccg_sn.pdf)
- a. In this document, a complete overview is provided of the Senegalese market, including challenges, opportunities, and entry pathways for U.S. companies. Chapters discuss: the political and economic environment, selling U.S. products and services, leading sectors for U.S. products and services, trade regulations, customs, and standards, investment climate, trade and project financing, business travel, contacts market research and trade events, and a guide to the services of the U.S. Commercial Service.
24. Youm, I. et al. (2005) *Analysis of wind data and wind energy potential along the northern coast of Senegal*. Renewable Energy. Vol.8 pgs. 95 – 108. Accessed at:  
[http://www.cder.dz/download/Art8-2\\_3.pdf](http://www.cder.dz/download/Art8-2_3.pdf)
- a. The paper presents the findings of an investigation on the wind energy potential of the northern coast of Senegal along the Atlantic Ocean. To inform this study, wind data was collected over a period of two years at five different locations in order to figure out the wind energy potential along the northern coast of Senegal. Research was conducted by members of the Center for the Study of Renewable Energy Research (CERER) in the UCAD.

### Websites of Relevant Agencies and Initiatives

25. Agence Sénégalaise d'Electrification Rurale: [www.aser.sn/](http://www.aser.sn/)
- a. Website of Senegal's agency in charge of rural electrification (ASER). They are responsible for managing rural concessions and the Rural Electrification Fund

26. *Peracod* | Programme pour la promotion de l'électrification rurale: [www.peracod.sn/](http://www.peracod.sn/)
- a. Program managed by ASER and operated in cooperation with German financing to promote rural electrification. The focus is on renewable energy, particularly solar systems and sustainable use of non-fossil fuels. This initiative is the one that INENESUS has been able to partner with for their micro-power economy model.
27. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ):  
<http://www.giz.de/en/workingwithgiz/8373.html>
- a. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), GIZ assists the Senegalese Government and local businesses in efforts to provide energy access for 265 remote villages with a total population of 90,000 by 2016. GIZ is heavily involved in micro-grid work throughout the world.
28. Global Partnership for Sustainable Tourism: <http://www.globalsustainabletourism.com/>
- a. A global initiative launched in 2011 to inject sustainability principles into the mainstream of tourism policies, development, and operations. The integration of renewable technologies and energy efficiency are part of their priorities.
29. Global Environment Facility: <http://www.thegef.org/>
- a. Established in 1991, the GEF is today the largest public funder of projects to improve the global environment. The GEF has allocated \$9.2 billion, supplemented by more than \$40 billion in co-financing, for over 2,700 projects in 165 developing countries and countries with economies in transition. Through its Small Grants Programme (SGP), the GEF has also made more than 12,000 small grants directly to nongovernmental and community organizations, totaling \$495 million.
30. Global EcoVillage Network: <http://gen-africa.org/about-ecovillages>
- a. GEN-Africa is the African ecovillage association, promoting social resilience, environmental protection and restoration of nature through the concept of ecovillages as models for sustainable human settlements. Senegal is the first nation to create a national agency based on this NGO.
31. The Senegal Ecovillage Micro-Finance Fund: <http://www.sem-fund.org/index.php/en/what-we-do-2/environment>

- a. The SEM Fund is a nonprofit organization registered in both the US and in Senegal dedicated to combating poverty and environmental degradation. SEM works throughout Senegal with international and local partners to promote sustainable development opportunities. Since 2009, SEM's Environment program has been developing targeted programs and innovative financing solutions to address climate change, focusing on the provision of locally appropriate, renewable energy technologies at the household level.
32. The Millennium Village Project: <http://millenniumvillages.org/about/overview/>
- a. The Millennium Villages Project focuses on the attainment of the MDGs. From the simple task of charging a cell phone to powering clinics, computer labs and small townships, improving the quality and quantity of energy is vital to boosting incomes, agricultural production, health, environment and education in the most remote areas of the world. Partnering with USAID, UNDP, and the Earth Institute.
33. Foundation Aidara Cherif: <http://fac.sn/eng/>
- a. Foundation working for peace in the southern part of Senegal. They believe the Casamance is a development opportunity for Senegal, and is trying to encourage others to participate in their efforts. "Our Foundation has already received positive opinions for a project to build eco-villages to enable people to feed, shelter, health care, train and educate their children."
34. ISOFOTON: <http://www.isofoton.com/us/node/551>
- a. The Senegalese Rural Electrification Agency (ASER) has awarded ISOFOTON one of its rural concessions, which entails an investment of Euro 16 million and financing from the European Union. The project will be developed in the regions of Kaolack and Fatick beginning in 2013 – involving 10,000 800 KW systems – and the Kolda region – with 20,000 1.5 MW systems. The project envisions expanding the conventional grid by means of solar photovoltaic systems and diesel gensets. ISOFOTON, who already has projects under way in 19 African countries including Egypt, South Africa or Morocco and in 60 other countries globally.
35. Ocean Data and Information Network of Africa: <http://www.odinafrica.org/senegal>
- a. Repository and data base for information about Africa's marine environments including; geomorphology, coastal currents and tides, ports/ harbors, fisheries and socio-economic data.

36. EnDev: <http://endev.info/content/Senegal>
- a. EnDev Senegal fosters access to electricity in rural areas and decreases the reliance on the already overburdened national grid. In Senegal EnDev disseminates PV-diesel hybrid mini-grids for the electrification of villages with up to 500 inhabitants or 40 households. The households pay on a fee-for-service basis. 70% of the hardware is paid by EnDev 20% has to be covered by the private company operating the systems. They incorporate these costs in the service fee, the final 10% are expected as contribution by the village or customer depending on the system type.
37. Central Intelligence Agency World Fact Book: <https://www.cia.gov/library/publications/the-world-factbook/geos/sg.html>
- a. Comprehensive data on all countries covering geography, people and society, government, economy, energy, communications, transportation, and military.
38. International Renewable Energy Agency:  
<http://www.irena.org/home/index.aspx?PriMenuID=12&mnu=PriPriMenuID=12&mnu=Pri>
- a. Formally established in 2011, IRENA is the first global intergovernmental organization to be headquartered in the Middle East. IRENA supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a center of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity.