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PROJECT PERFORMANCE ASSESSMENT REPORT

NIGER

ENERGY PROJECT
(CREDIT 1880-NIR)

April 15, 2005

Sector, Thematic and Global Evaluation Group
Operations Evaluation Department

Currency Equivalents (annual averages)

Currency Unit =CFA franc

1988	US$1.00	CFA franc 267.2
1989	US$1.00	CFA franc 203.9
1990	US$1.00	CFA franc 289.5
1991	US$1.00	CFA franc 260.6
1992	US$1.00	CFA franc 259.2
1993	US$1.00	CFA franc 275.5
1994	US$1.00	CFA franc 291.8
1995	US$1.00	CFA franc 544.0
1996	US$1.00	CFA franc 491.1

Abbreviations and Acronyms

AfDB	African Development Bank
BOAD	West African Development Bank
CAS	Country Assistance Strategy
CFAF	Francs of the Communauté Financière Africaine
DANIDA	Danish Cooperation Agency
DCA	Development Credit Agreement
EIB	European Investment Bank
ESMAP	Energy Sector Management Assistance Program
GON	Government of Niger
ICR	Implementation Completion Report
IDA	International Development Agency
KfW	Kreditanstalt für Wiederaufbau, Germany
LPG	liquefied petroleum gas
MME	Ministère des Mines et de l'Energie
NIGELEC	Niger Electric Company
OED	Operations Evaluation Department
PAFN	Project for the Management of Natural Forests, funded by the ADB
PED	Domestic Energy Project, funded by DANIDA
PPAR	Project Performance Assessment Report
UNDP	United Nations Development Program

Fiscal Year

Government: January 1 – December 31

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OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: http://worldbank.org/oed/eta-mainpage.html).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development objectives and sustainability. Possible ratings: Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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This report was prepared by Rod Janssen (Consultant) who assessed the project in January 2004. The report was edited by William Hurlbut, and Rose Gachina provided administrative support.

Principal Ratings

	*ICR**	*ICR Review**	*PPAR*
Outcome	Satisfactory	Satisfactory	Moderately Satisfactory
Sustainability	Likely	No rating	Likely
Institutional Development Impact	Partial	No rating	Substantial
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The ICR Review is an intermediate OED product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

Project	*Task Manager/ Leader*	*Division Chief/ Sector Director*	*Country Director*
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Completion	Mark Segal	Max Pulgar-Vidal	Theodore Ahlers

* Country Operations Division Chief

Preface

This is a Project Performance Assessment Report (PPAR) on the Niger Energy Project for which a credit of US$65.9 million was approved on February 23, 1988. The project's original closing date of December 31, 1994, was extended to December 31, 1996. Only US$17.5 million equivalent (or 55 percent) of the US$31.5 million equivalent of the IDA credit was disbursed. US$14.0 million equivalent was cancelled at project closing.

Co-financing was provided by Kreditanstalt für Wiederaufbau (KFW) of Germany, the European Investment Bank (EIB) and DANIDA of Denmark.

The Energy Project was the first major project to develop a comprehensive approach to energy policy in Niger. It was brought about largely to address the problems of deforestation and its environmental effects given that the country is highly dependent on wood as its main energy source. A more balanced pattern of energy sources and uses was necessary, given the limited wood resource and the high population growth.

This project was selected for an OED assessment in order to look more carefully at the performance and sustainability of a lending operation for which there has been a substantial duration between project closing and the PPAR. Given the seven years that have elapsed since project closing (December 1996) and the assessment mission (January 2004), additional time was required during 2004 to conduct phone interviews and collect further data from evaluation informants who have since rotated through various positions and were difficult to track down.

This report is based on the Implementation Completion Report (Report No. 16734) prepared by the Africa Region, issued June 19, 1997; the Staff Appraisal Report (Report No. 6746-NIR) dated January 8, 1988; loan documents, project files, and discussions with Bank staff. An Operations Evaluation Department (OED) mission visited Niger in January 2004. The mission included discussions with government officials of the relevant ministries and the High Commission for Decentralization, donor representatives, staff of related wood energy projects, electric utility officials, appliance importers, non-government organizations, informants from two rural markets and other stakeholders. Their co-operation and assistance is gratefully acknowledged.

Following standard OED procedures, copies of the draft PPAR were sent to the Government officials and agencies for their review but no comments were received.

Summary

The overall objective of the Niger Energy Project was to develop a general strategy and specific policies to address interconnected energy problems together with financing investments necessary to implement the policies. This included specific objectives in three energy areas. For the household energy sub-sector, the objective on the demand side was to promote woodfuel conservation and fuel substitution, while on the supply side, the objectives were to promote more effective forest cover management and to develop renewable energy technologies. For the electricity sub-sector, the objectives were to promote the conservation of electricity and to help NIGELEC provide electricity at least cost. For the petroleum sub-sector, the objective was to upgrade Niger's capability to administer a petroleum exploration promotion program.

Overall, the project's outcome is rated *moderately satisfactory*. The project helped put the energy sector in Niger on a more modern, comprehensive foundation. However, in each of the individual components some targets or objectives were not achieved. The worst outcome was for the electricity sub-sector component, which completed the interconnection with Nigeria but did not complete the distribution network. In the petroleum component, there was good progress in creating the documentation and archive center and the petroleum testing laboratory, as well in establishing a legislative framework. For the household sub-sector, the best results were in the creation of the rural wood markets that have helped improve the forest resource base and helped in the orderly supply of wood to urban areas.

The project's institutional development impact is rated *substantial*. The project was able to create some important new structures that have facilitated energy market development. In particular, in the household energy sub-sector, the rural wood markets are extremely important and functioning well. Regional and national federations have supported and facilitated the development and maturation of these markets. The local forestry authorities, which were initially against these markets because they affected their own mandates, have accepted these rural markets and have evolved into a new role of monitoring and fraud control. The team of local experts that helped during the project have formed themselves into a non-profit organization supporting the creation and development of new rural wood markets.

The sustainability of the project is rated *likely*, particularly in the case of the rural wood markets. By the end of 2002, 120 markets were in operation and more are being created through separate projects. This component began the trend toward decentralization, which the government has now embraced. The project's petroleum legislation will have an enduring, positive legacy, and the documentation center and petroleum testing laboratory are making lasting contributions, but the lack of sufficient operational funding is hampering their effectiveness. In the electricity sector, the project began the long process of reform that is only now starting to see results.

The Bank's performance is rated *satisfactory*. The initial analysis and project design provided a strong foundation for the project, although the project was probably too complex for the government to handle at that time. Supervision was inconsistent for much of the project, but on the household energy component the supervision was

exemplary and led to the strong results. Government representatives and other stakeholders mentioned, however, that continued Bank involvement or follow-up of the household energy component would have been useful, even after project closing. Both the electricity and petroleum components could have benefited from stronger supervision.

The borrower's performance is rated *satisfactory*. Overall, the relevant government ministries implemented their respective components. The borrower has developed a strong analytical and policy development capability that will prove important in its overall energy policy development. In particular, there was a good synergy between the Bank and the borrower on the household energy component. However, in the electricity component, the failure to meet some of the conditions of the covenants led to the termination of parts of the credit.

The main lessons from this assessment are as follows:

- Substantial effort is necessary to integrate economic restructuring reforms with social and poverty reduction objectives.
- The Bank needs to ensure that the rationale for reforms (i.e., better provision of energy services to the public) is clear to domestic stakeholders.
- "Ownership" of a project or an element of a project is key to its success and it is necessary to ensure that project partners are fully committed to the aims and the approach taken. This occurred for the successful household energy component but not for the electricity component.
- A dynamic, supportive, and committed approach by the Bank throughout the lifetime of the project is vital to success, as was the case in the household energy component of this project.
- Regular post-closing project follow-up by Bank operational staff (e.g., while supervising other ongoing projects) may be needed to ensure that projects are meeting their long-term objectives and to reinforce to project partners the commitment of the Bank to the reform processes in the recipient countries.

Ajay Chhibber
Acting Director-General
Operations Evaluation

Background

1. When the Niger Energy Project was formulated in the 1980s, Niger was one of the world's least developed countries and it remains so today. Niger is a country of 11.1 million inhabitants[1] that has some domestic energy resources that have not been exploited for the benefit of the country. Its uranium can only be exported. Some coal and lignite is starting to be used. Some of the hydro potential is being exploited and there are plans to develop more. There is hope for oil because it has a similar geological structure as some of its neighboring countries that have good proven reserves. There is also wind and solar potential. Yet, by far the most important energy resource is wood, which provides almost 94 percent of total energy consumption. Wood is used for cooking, heating, and lighting. Only 6 percent of the population has access to electricity (including only 25 percent in areas where there is electricity available) and 58 percent of electricity supply was imported.[2]

2. The concern in 1987, when the project was being appraised, was that the rapid growth in the urban population (estimated at 6 to 7 percent annually) would have a devastating environmental effect on the fragile forests. Some estimates at the time predicted that demand would outstrip supply in 10 to 20 years. The main options to avoid such devastating effects were to encourage the use of efficient kerosene and LPG stoves, improve the efficiency of wood use through improved wood stoves and to undertake measures to increase the supply of wood through better forestry management.

3. But more support to the energy sector was needed. If commercially exploitable oil were to be discovered, a better system and legal framework for oil exploration was needed to encourage private sector participation. The electricity supply system needed to be bolstered through the increased import of lower-cost electricity from Nigeria. Once that electricity was available, steps had to be taken to deliver it to a larger customer base. Only about 5 percent of the population had access to electricity and it remains approximately around 6 percent now, although new strategies are being designed to increase access.

Niger is one of the poorest countries in the world. Per capita GNP stood at approximately US$180 in 2000 (World Bank Atlas method), and Niger ranks 161st out of 162 countries listed in UNDP's 2001 Human Development Report (HDR). Available data point to a poverty headcount of 63 percent and to an extreme poverty incidence of 34 percent. Vulnerability to drought has worsened food insecurity and consequently malnutrition affects 40 percent of children under 5 years old. Combined with poor access to safe water, poor nutrition contributes to an infant mortality rate of 114 per 1000 and life expectancy at birth of about 46 years. Adult illiteracy remains high at 84 percent and gross primary enrollment rates low at 42 percent overall, with female enrolment at only 33 percent of school-age girls for the school year 2001/2002. The burden of poverty and low social development falls disproportionately on women, whose access to land, credit, technology, and social services remains very limited, despite some recent progress.

From the January 21, 2003 Country Assistance Strategy

1. UNDP, *Human Development Report*, 2003, page 253.

2. Ministère des Mines et de l'Energie, Déclaration de Politique Energétique, Novembre 2003.

4. On the policy front, some progress has been made since 1987. The policy development process is improving and a new declaration of energy policy was prepared by the Ministry of Mines and Energy in November 2003. The declaration provides the broad outline of a comprehensive energy policy, which has been lacking for a long time. There have been many attempts by the government to provide better, more modern energy services but it is a slow process in a country that is desperately short of sustainable energy and financial resources.

The Project

Project Objectives

5. The ***overall objective*** of the project was to develop a strategy in the energy sector to address interconnected problems facing Niger's economy, support financing for the related investments, and help improve the operational and financial performance of NIGELEC within the context of the state enterprise reform program.

6. The project focused on three sub-sectors: household energy, electricity, and petroleum. The household sector, highly dependent on rapidly depleting wood supplies to provide most of their energy services, urgently needed to introduce new fuels to substitute for wood, increase the efficiency of wood use, and find ways of improving the wood resource base in a sustainable manner. Firewood accounted for 87 percent of energy consumption in Niger and was used by 99 percent of households for cooking. The electricity sector had insufficient generation capacity, an inadequate distribution system to increase the access to electricity, and a national electricity company that was inefficient and in need of improving its capacity to provide better electricity services. The petroleum sector needed a better legal and technical infrastructure in order to encourage the exploitation of potential petroleum resources within the country.

7. The specific objectives of the three energy areas covered were:

- ***Household energy sub-sector.*** On the demand side the objective was to promote woodfuel conservation and substitution of other fuels for woodfuel. On the supply side, the objectives were to promote more effective forest cover management and to develop renewable energy technologies.
- ***Electricity sub-sector.*** The objective was to promote the conservation of electricity and to help NIGELEC provide electricity at least cost.
- ***Petroleum sub-sector.*** The objective was to upgrade Niger's capability to administer a petroleum exploration promotion program.

All of the sub-sectors included several components, as described in the following table.

Objectives of the Three Project Components

Subsector	*Sub-Objectives*	*Components and Activities*
Household Energy	• Promote fuelwood conservation • Provide for substitute energy sources • Improve management of natural forest cover • Promote the development of renewable energy sources	• Regulation of trade in and transport of fuel wood • Control the supply and distribution of fuel wood to towns • Preparation of master supply plans • Creation of rural markets and production zones • Promotion of local production and marketing of improved wood stoves • Local production, import, and marketing of kerosene and butane gas stoves
Electricity	• Protect the conservation of electric power • Supply electricity at least cost	• Construction of the Nigerian portion of a 300-km, single–circuit, 132-kV transmission line • Rehabilitation of a 132-kV transmission line in the north • Rehabilitation and extension of distribution facilities in Niamey and the east • Studies, including provision for engineering of a hydroelectric project • Provision of technical assistance, training, office space, equipment, and vehicles to NIGELEC
Petroleum	• Improve management of oil exploration	• Retrieval, reprocessing, and archiving of geological and geophysical data • Organization of laboratory, storage, and information retrieval facilities for petroleum samples and data • Review of legislation and fiscal regimes • Preparation of a synthesis of the petroleum geology of Niger and a strategy to accelerate exploration, possibly in co-operation with neighboring Chad and Nigeria • Promotion of areas that are presently free or will be relinquished • Provision of equipment, training, and technical assistance

8. The actual costs were less than half of the estimate as a result of the cancellation of the electricity component after the interconnection with Nigeria was completed but the distribution component was not, due to non-compliance with financial covenants and the Bank's procurement procedures (see paragraph 15). IDA disbursed 55 percent of its credit amount. DANIDA disbursed 90 percent of its estimates, used for the household energy component. The ICR did not have data for the disbursements by the other donors, KfW and the EIB.

Project Costs and Financing

Component	*Appraisal ($million)*	*Actual ($million)*	*Percentage Share (based on Actual Costs)*
Household Energy	9.4	16.2	53
Electricity	53.5	9.4	31
Petroleum	3.0	4.8	16
Total	**65.9**	**30.4**	**100**

Implementation Arrangements

9. A number of government organizations were involved in the implementation of the project. The Ministry of Mines and Energy took the lead on energy sector reforms, the petroleum sub-sector component and on the demand component of the household energy component. The Ministry of Water and Environment led the supply-related activities of the household energy component. NIGELEC took the lead together with the electricity directorate of the Ministry of Mines and Energy for the interconnection of the electricity grid to Nigeria and related grid expansion.

Implementation Record

10. The credit was approved on February 23, 1988, and closed on December 31, 1996, two years after it had originally been planned to end. This extension was to allow additional time to complete important household energy and petroleum sub-sector components.

11. The project was affected negatively by the political and social instability resulting from the transition to democracy during 1990-92, a weakened fiscal administration leading to GON arrears in the payment of its electricity bills, and the devaluation of the CFA franc, which increased the local currency cost of imported substitutes for woodfuels, namely kerosene and LPG.

12. The Development Credit Agreement (DCA) was modified twice during the implementation period. First, in 1989 IDA changed a condition of disbursement that Niger and Nigeria reach a satisfactory agreement on the operation and management of the power transmission line that was to be constructed as part of the project. Second, the DCA was modified in 1994 to transfer funds from the unallocated component to the remaining project components. While the transmission line to Nigeria was constructed, the sub-transmission and distribution components were not completed. NIGELEC did not complete other studies for the sector and the extension of company office space did not happen because the extension plan involved purchasing a building that was too large for its needs. The electricity component was suspended after the interconnector to Nigeria was completed. It was eventually cancelled due to non-compliance with financial covenants in the project's legal agreements and non-compliance with Bank procurement procedures in the distribution component.

Ratings

13. The ratings are assessed almost eight years after the credit closed. This period of time creates certain challenges because many of the project files are hard to obtain and many of the people involved are no longer working in the field. For example, this makes it hard, but not impossible, to assess both the Bank's and the borrower's performance. Thus, the approach taken was to interview officials (and two ministers) in Niger and the World Bank who were either involved in the project at the time or were involved with the continuation of various components after the completion of the project.

Outcome

14. **The project's overall outcome is rated as moderately satisfactory.** The project was designed to help put the energy sector in Niger on a more modern, comprehensive foundation. In this it has succeeded, even though some individual components were not achieved.

15. The outcome of the electricity component is unsatisfactory. The 40 MW interconnection with Nigeria was completed. Only a small share of its capacity is used, in part because the distribution component was not completed. The development of the distribution network stopped due to non-compliance with financial covenants in the project's legal agreements and non-compliance with Bank procurement procedures in the distribution component. NIGELEC states that the financial covenants were the responsibility of the GON and that it did not have the managerial latitude to go beyond the government's wishes. Government representatives state that these requirements on NIGELEC were but one aspect of the restructuring required by the World Bank and IMF and that NIGELEC could not be blamed. There is a widespread belief in the GON and NIGELEC that the covenants demanded by the Bank were too strict for the country at that point in the economic reform process. Part of the problem was that NIGELEC was a fairly young company with relatively poor capacity and that, in many ways, it sees itself more as a government agency than an energy company separate from government. Now, almost 10 years later, the transmission network and other investments will be carried out through funding primarily from the BOAD.[3] The investment will be for 7,050 million CFA francs (US$14.24 million equivalent).

16. The outcome of the petroleum component is satisfactory. One of the main achievements is the establishment of the new petroleum code (Order No. 92-45, dated December 16, 1992) which regulates oil operations in the country. Under the project, there was also training for the staff of the Hydrocarbon Group in the Ministry of Mines and Energy and a study of the oil potential in the country. To support the promotion of oil exploration a documentation center was created, bringing together all the exploration archives that can be used by potential companies wanting to explore in Niger. The documentation center is staffed and available to possible users. Unfortunately, there is not a lot of interest on the part of the petroleum exploration industry in Niger at the moment and the center has not been used a lot. There are concerns that some of the equipment is either inappropriate for local weather conditions and that some of the archives must be read in Paris or other documentation centers because of the lack of appropriate readers. The center does lack sufficient operating funds to safeguard the archives and equipment. Also created was the petroleum laboratory, which is designed for controlling the quality standards of petroleum products entering the country. It is fully functioning with good equipment and well-trained staff. However, due to the lack of adequate operating funds, tests on imported oil products cannot be undertaken systematically because there are no means to obtain samples from incoming trucks. There is no vehicle that can transport staff to get the samples.

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3. West African Development Bank

17. The outcome of the household energy component is satisfactory. The component is divided into two segments: supply and demand. On the supply side, under the Ministry of Water and Environment, the 1992 changes to the forestry and tenure laws allowed villages to sign agreements giving them exclusive rights over their own forest areas. This has transformed the wood supply industry and been key to the future of wood sustainability. By the closing of the credit, 92 wood markets were established in villages throughout the country. This is a complex set of measures including giving the villages the right to manage forests near them, dividing the forests into parcels for woodcutting rotation, establishing permits for woodcutters, setting up a management unit to interface with wood transporters (who buy the wood) and collect taxes, etc. There was also a separate sub-element of setting up a distribution system for substitutes: kerosene and LPG. While there was one distributor before, now there are two. Since the demand is relatively low and the potential market is small, there is no apparent interest in other distributors entering the market.

18. On the demand side, there was the need to promote the use of improved stoves for cooking with wood, kerosene, and LPG, and to develop "Energie-Shops" to facilitate the distribution of kerosene and stoves. TCHIP Import was set up as a company to help import and manufacture equipment to support the substitution of fuels for cooking. Results are mixed and generally fell short of the initial project estimates for the penetration of improved stoves. The ICR states that over 13,000 petroleum stoves, 12,000 basic gas stoves, 10,000 improved metal-wood stoves per year, and 4,000 wood stoves were disseminated commercially during the project but there was no complete data on actual sales.[4] The initial plan was to have stoves save about 180,000 tons of woodfuel between 1988 and 1997. Until the end of the project, many improved stoves were imported. The penetration of improved stoves did not help stabilize wood consumption for several reasons. First, the devaluation of the CFA franc meant that after 1994 imported stoves became too expensive for most of the target population. Second, the domestically-built stoves only became available at the end of the credit period and thus could not benefit from project support because they were brought onto the market too late. Until 1996, probably less than 100,000 tons were saved according to the ICR due to the factors stated above. As shown below under "Sustainability" the market remained fairly low but is now showing strong signs of growth.

Relevance of Objectives

19. Prior to this project, the Bank had been involved in Niger in attempting to improve the forestry sector, in analyzing the economic feasibility of petroleum development in the Agadem basin and in developing a reform program of the parastatal sector, which included the electric utility, NIGELEC. The depletion of the forestry resource base was acute, particularly in the regions near major cities and alternatives were needed urgently, either through improved efficiency, through improving the resource base, or through fuel substitution. The electricity sector needed to modernize in order to provide more electricity more cheaply to more of the population. With respect to the petroleum sector, according to the SAR, Niger offers possibilities for the discovery of

4. The SAR had an indicator of saving 180,000 tons of woodfuel between 1988 and 1997.

oil reserves, the Agadem Basin being the most attractive. Some private interest was evident early on. Petroleum exploration started in the early 1960s and by the 70s, nearly 3,000 km of seismic were shot and 10 wells were drilled (by a consortium including Texaco and Esso), three of which gave oil flows. Tests and studies, however, gave insufficient data to stimulate further appraisal or development in such a remote area. The Government's strategy was to continue to rely on private companies, but petroleum development was held back by (a) the lack of comprehensive petroleum data acquisition, analysis and storage from past exploration[5] and (b) inadequate legal, regulatory and administrative framework, which the project addressed.

20. As stated in the SAR, IDA had taken a leading role in the development of the household energy strategy and in the preparation of studies related to power system planning, power organization, and petroleum development. This new project was needed to ensure that energy sector investments are directed to economic projects of high priority; to help resolve the institutional and organizational issues; to ensure that energy prices reflect both economic costs and fiscal considerations; and to mobilize financing from other donors.

21. **The project's overall rating for relevance of objectives is substantial.** The project's objectives are consistent with both national and Bank priorities, both at the time of the project and now. According to the most recent Country Assistance Strategy,[6] the GON's strategy for economic growth and poverty reduction is based on four pillars, of which three are particularly relevant to this project:

- A macroeconomic framework ensuring economic and financial viability while promoting sustainable and robust growth: the project was designed to support economic and financial viability in a sustainable manner
- The development of productive sectors, especially in rural areas, to mitigate vulnerability and stimulate income generation: the creation of the rural wood markets provided an entirely new source of income for some of the poorest villages in Niger, allowing these villages to be economically independent and sustainable
- The strengthening of institutional and individual capacity inside and outside government, at the central and local level: this project provided support for the petroleum development and monitoring systems of the government and it helped capacity at the local level through the wood market system.

5. Inspecting petroleum products is one of the many capabilities of the laboratory facilities that the project financed. What the project financed was similar to a geological office that included modern facilities for seismic reprocessing; storage of raw data and their reproduction in both paper and film; storage of drill cuttings and cores; archiving of magnetic tapes, and the like. Analysis of petroleum samples was a necessary but small component in these facilities.

6. Report No. 25203-NIR, January 21, 2003

22. The Niger energy project is fully consistent with supporting economic growth and poverty reduction, the twin objectives of the CAS.[7] Unfortunately, the current CAS does not pursue further the positive results from the project under review.

23. The project is fully consistent with the objectives of the Bank's Energy Business Renewal Strategy, whose main priorities for the program include helping the poor directly, improving macroeconomic and fiscal balances including protecting budgets for social programs that help the poor, promoting good governance and private sector development, and protecting the environment. The Niger energy project is consistent with all of those priorities. These priorities are somewhat mirrored in the Bank's sector strategy, "A Brighter Future? Energy in Africa's Development, which discusses the relevance of energy infrastructure and services to the major challenges of development, particularly human resource development; the fight against poverty; and care for the natural environment.

Efficacy

24. **The project efficacy is rated as modest.** The project made headway in achieving the overall objectives but they were not fully satisfied and that has affected the overall project. One of the difficulties is in establishing good indicators to determine the impact.

25. The primary objective is to develop a strategy to address interconnected energy problems facing Niger's economy. Policies and strategies were put in place and these are important for developing a long-term policy framework. Important institutional strengthening occurred, especially at the local level but also within the government. The wood energy system is much more robust but more effort is needed in reducing wood demand through improved efficiency and fuel substitution. This affects the development of a fully integrated household energy strategy.

26. The interconnection with Nigeria was an important component of the project in order to provide more reliable electricity at lower cost than domestically generated electricity. Greater access to electricity to a wider segment of the population did not make much headway during the project because the investment in the distribution system did not take place, as described above.

27. The policy of promoting petroleum exploration exists through the creation of the documentation center and archives but they are not being used to their full potential due to poor equipment and under-funding for daily operation. But, importantly, the petroleum legislation is now in place and that will have long-term benefits in promoting exploration and modernizing the petroleum sector.

28. Some progress has been made with respect to the objective of supporting the financing of related investments. Investments in the rural wood markets have helped the villages become completely independent and no further support for their continuing operations is needed. This component has transformed livelihoods in these villages and

7. The CAS makes little reference to energy other than promoting privatization of utilities and energy distribution companies.

has made an important contribution to providing a more sustainable wood supply to urban areas. Investments in more efficient wood stoves or kerosene or gas stoves have been inadequate. Purchase of the appliances was not sufficient because of the level of poverty. There was also a need to subsidize the price of the fuel inputs and this was not possible under the credit conditions.

29. The creation of the rural wood markets has had many incidental benefits. Jobs have been created for woodcutters and other management positions. Tax is collected and most of this is retained at the local level. This tax is used for many local projects. In some cases, the villages buy their own vaccines, repair communal buildings including the medical facility, provide a specific share for the women in the village, and so on. The revenue from the wood together with the local taxes give the villages a sense of empowerment that they did not have in the past.

30. The IDA credit supported the creation of the petroleum laboratory and the documentation center. These were to ensure compliance with petroleum product standards and to provide a one-stop location for all data on petroleum exploration respectively. Both are seriously hampered by ongoing operational expenses. The costs are not high but the GON is not providing enough of the ongoing running costs to make both organizations fully functional and effective. This effectively provides some indication of their priority for the government. While there have been difficulties, this does not mean that the IDA support was wrong. The problem is that there has been no Bank follow-up to ensure that those facilities were used effectively.

31. As regards the objective of improving the operational and financial performance of NIGELEC, this component unfortunately came to an end after NIGELEC failed to comply with financial covenants. NIGELEC continued to have serious financing problems for years after the closing of this credit and the company only recently agreed on a new financing package with the BOAD. Since the closing of the credit, little expansion of the distribution network has taken place and much of the new financing from BOAD will be used for closing existing inefficient power plants (through increased imports from Nigeria) rather than expanding access to the grid. There is some logic to this since expanding access to the grid is made difficult by the level of poverty and the reduced costs will potentially make NIGELEC more financially viable.

Efficiency

32. **The overall economic and financial rates of return are rated modest.** Analysis of the benefits are difficult to assess given the dearth of data almost a decade after the project's closing, and the non-completion of NIGELEC's distribution network. Consequently, the economic internal rate of return was not re-calculated. The project's benefits are discussed below.

33. For the electricity sector, few benefits were derived due to the suspension of the component after only the high-voltage interconnection with Nigeria was completed. The interconnection has a capacity of 40 MW and now after about a decade, only 5 MW of the capacity is being used. Although no data was provided from NIGELEC, the interconnection did help to reduce costs since electricity costs were lower from Nigeria

than from local generation. So, even though it was used below capacity, because of the favorable terms, there are financial benefits to NIGELEC.

34. For the petroleum component, an economic analysis is not relevant because it only relates to the archives and documentation center, testing laboratory, and legislative framework.

35. For the household component, the ICR assessed an economic rate of return of 8.5 percent, compared with 30 percent estimated at the appraisal. The 8.5 percent was calculated based on the benefits of the woodfuel substitution component relative to its costs from the 1989 to 1996 period. In 1996, savings in firewood consumption were estimated at 15,300 tons and between 1992 and 1996 they ranged between 15,000 and 23,000 tons. While the data is poor, this would mean that the savings would be about 100,000 tons, less than the 180,000 tons estimated at the time of the SAR. According to recent analysis, commercial wood consumption in urban areas has grown from 181,392 tons in 1988 to 249,666 tons in 1997. This increased to 309,462 tons in 2003 and it is estimated to reach 357,354 tons in 2007.[8] This increase to date has grown in direct correlation with population growth since, according to recent analysis, wood consumption per capita was 0.17 tons/person in 1988 and has remained at that level throughout.

Institutional Development Impact

36. **The institutional development impact is rated as substantial.** The project was able to create some important new structures that have facilitated energy market development. The project started the process of decentralization that the GON has now embraced. It is widely accepted that this project had a fundamental impact on government policies, showing that the villages were capable of a greater role in their economic and social management.

37. In the household energy sector, there have been some important developments. The rural wood markets that were created by the project are important and functioning well overall. Effectively, the villages were given control over adjoining forests. Forest management plans were put into place and a certain number of woodcutters were allowed within the area. The wood is then sold in the local wood market to transporters who take the wood to the cities. At the market, taxes are collected and sent to the local Ministry of Environment office. A portion of the tax revenue is kept within the village to support local needs and each village developed a plan for disbursement of revenue.

38. A support system of regional and national federations has facilitated the development and maturation of these markets. The forestry brigade, which was initially against these markets because it affected its mandates, has accepted these markets and has evolved into a new role of monitoring and fraud control. The team of experts that helped during the project has formed themselves into a non-profit organization supporting the creation and development of new rural wood markets. This non-profit organization has even been asked outside Niger for assistance.

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8. Michel Matly, Groupement Cirad-fôret--Louis Berger, *L'Indicateur du bois-énergie au Niger*, PAFN, Ministère de l'Hydraulique, de l'Environment et de la Lutte contra la Désertification, octobre 2003.

39. Also important is the Association Nationale des Exploitants de Bois (ANEB), which brings together all involved in the wood energy industry (women, woodcutters, and transporters). The ANEB has offices in eight regions. This is an important organization to ensure the interests of the wood energy industry are protected. The ANEB is affiliated to the "Plate-forme Paysanne," an umbrella organization that co-ordinates the various peasant organizations throughout the country and lobbies for the interests of the general population. The Plate-forme Paysanne is part of the region-wide Représantants du Réseau des Organisations Paysannes de l'Afrique de l'Ouest (ROPPA). These are important institutions for local market development.

40. The project has also helped capacity building at the local level. It has helped to develop a market mentality and has helped develop local skills. There are now organizations that help new rural markets understand the different aspects of the rural market development. Villages have also started working together through regional and national federations to discuss and solve their own problems and concerns related to market development.

41. The role of NIGELEC as the state's national electricity company has still not fully evolved into a more effective, restructured model promoted by the World Bank and others. There is still an ongoing debate about public service and the role of NIGELEC. There are concerns about reconciling goals of poverty reduction and economic restructuring. The draft declaration on energy is forthright in promoting the economic restructuring, however. While electricity consumption and access to electricity are both very low, there is still little effort in promoting its cost-effective efficient use.

42. The team within the Ministry of Water and Environment that supported the follow-up wood supply component, funded by DANIDA, has now been formed into a cell within the Ministry of Water and Environment.

43. The electricity and hydrocarbon groups within the Ministry of Mines and Energy are well trained and motivated. They have good analytical capacity but the effectiveness of the staff is hampered by inadequate office equipment.

44. While existing, the petroleum laboratory and the petroleum documentation center have run into difficulties because of ongoing operating costs. The staff are well trained and most of the equipment is good. The problems would be easily solved if the GON provided sufficient ongoing resources for them to carry out their tasks. The funds required would be quite modest.

45. The recommended actions from this project to further the reform process for NIGELEC have been slow to non-existent. During the project, the utility did not comply with the financial covenants in the project's legal agreements and it also did not comply with the Bank's procurement procedures. Essentially, the company has not sufficiently improved its management style.

Sustainability

46. **The project's overall sustainability is rated as likely.** Since eight years have passed many of the elements have proven to be highly sustainable. This is particularly the case for the rural markets. By the end of 2003 there were 180 rural wood markets, up from the 92 created by the end of the IDA credit. The additional markets were created through a DANIDA-sponsored project.[9] The major aims of the DANIDA project were to increase the number of markets from about 75 in 2000 to 172 by 2004; to simplify forest management procedures and to increase the efficiency of the tax system. The total budget for the five-year project was about US$3.6 million.

47. The existing markets are continuing without any ongoing support. There were concerns at the beginning because of the venture into decentralization and whether it would work. It has and no one from the local level through to the High Commission of Decentralization for the GON would want to reverse the process. Today the methodology is being used for two subsequent household energy projects to expand the number of rural markets (one funded by DANIDA and the other by the African Development Bank). The forms and the process developed by the project are still in use today.

48. Only 16 percent of the wood potential is covered by these rural wood markets and the remaining area still remains under the old system. It is difficult to have two systems within one country but there is no ongoing international support to expand to the rest of the country.

49. On the demand side, during the project the deployment of new stoves and the increased use of kerosene and LPG were less than projected, in part because of the devaluation of the CFA franc and the resulting increase in the price of LPG and kerosene.[10] Since the end of the credit, the main emphasis has been on wood supply through the expansion of the rural wood markets, not demand reduction. There are starting to be changes, however. Domestic coal is being promoted through a new government initiative. TCHIP Import (see paragraph 18) estimates that in 2004, it will produce 10,000 kerosene, 5,000 LPG, and 6,000 coal stoves and some of these are exported to Mali. This production is up from 3,000 kerosene, 2,000 LPG, and 300 coal stoves in 2003. Because of this significant increase, further investigation is needed in order to have a better understanding of market dynamics. Coal stoves have increased because of new government promotional activities, since there is domestic coal that can be used, but the reason for the rapid expansion in production of the other types of stoves needs to be better understood. These figures are still modest in comparison to the entire market, but they are signs of improvement.

50. Even though NIGELEC failed to follow procurement procedures and did not comply with reducing receivables sufficiently, the obligations under the project were

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9. A further 40 are planned for 2004 in an ADB-funded project.

10. For example, LPG went from 308 CFA francs per kilogram in 1988 to 240 CFA francs between 1990-1993 and then increased to 571 CFA francs per kilogram after 1994, because of the devaluation. The same trend was true for kerosene.

important in starting to change the mentality toward the importance of restructuring the electricity sector.

51. The petroleum component has the incentive framework to be sustainable. The legislative framework is fundamental to the future development of petroleum exploration and development and now minor changes need to be made to reflect changes in oil markets, including the use of pipelines (according to the ministry's argument). Concerning the other elements of the petroleum component, lack of funding hampers the sustainability of the petroleum product testing laboratory and the documentation center. If sufficient funding is not found soon, the buildings and equipment will seriously deteriorate. Some equipment installed during the project was inappropriate, but that does not affect the overall sustainability of the documentation center. And without adequate resources to allow for the effective functioning of the laboratory and documentation center, the well-trained and highly motivated staff will undoubtedly leave.

Bank Performance

52. **The Bank Performance is rated as satisfactory.** The Bank staff that prepared the project did an excellent job of analyzing the issues in the Niger energy sector, described in the SAR. The project was probably too complex for the government to handle. It is hard to reconcile the need to reform NIGELEC and the need to provide modern energy services to the population and, for this reason, the project was probably too ambitious without a major effort on the part of the Bank to explain what it takes to undertake structural reform and why such reform is necessary. The household component, however, was very complex but managed to succeed through good support from the Bank.

53. Supervision was inconsistent for much of the project. For the household energy component, however, the same Bank staff remained throughout the project. The Bank expert worked persistently with local experts to design and implement the component. This was much appreciated by all stakeholders, even today.

54. The electricity component could have used a more hands-on approach by Bank staff. This is not only to work directly with NIGELEC but also to help explain on a regular basis why the reforms were needed for the long-term benefits of the country. There is still some confusion more than a decade later. It appears the government was not sufficiently prepared for the demands of the Bank on restructuring and the financial covenants.

55. The petroleum component needed better supervision at the point of installation of the documentation center. Some of the equipment was not appropriate for the local conditions, but there is no evidence that this was told to Bank staff. Now the equipment is neglected and less than fully effective. Some of the equipment cannot be used. The staff of the center blame the contractor for the equipment that was not appropriate for Niger conditions. This reflects a breakdown in communications between the Bank staff and Niger officials because the specific, inappropriate equipment (only a small part of the total equipment installed) should never have been accepted in the first place.

56. There are also concerns about regular monitoring after the completion of the project. There are widespread concerns in Niger about the lack of monitoring of progress

of the credit components. Such regular monitoring is needed to have both the Bank, the GON and the local organizations and individuals focus on the necessary future direction.

Borrower Performance

57. **The borrower's performance is rated as satisfactory overall, despite the mixed performance for the electricity component**. In the woodfuel and petroleum components of the project, the GON ministries participated fully supportive, with strong motivation. For the household energy component, the borrower's performance was highly satisfactory and the synergy between the Bank and borrower was exemplary. The borrower to this day takes a strong role in this field. This was particularly true for the wood supply element, creating the rural wood markets and setting up the taxation system. This also included convincing forestry officials to play a different role in wood management, ceding more of the authority to the villages. While not as many new stoves were sold as had been expected, this was due to circumstances beyond the borrower's control, including changes in the exchange rates that severely affected costs and the lack of domestically produced stoves until late in the project cycle.

58. In the petroleum component, the implementation went well and credit must be given to the motivation of GON officials. Since the project, however, the borrower has not provided the necessary resources to fully operate the testing laboratory and the documentation center.

59. For the electricity component, the performance of the borrower is mixed. The component had to be suspended in 1993 due to the borrower's unwillingness to meet the conditions of the covenants. NIGELEC states that it was not the utility's fault that the covenants were not met but it was bound by government rules of the day that did not allow it the freedom to raise tariffs or gain more management independence. Since the project, progress has been slow and, after 10 years, a new major investment program is only now beginning, funded by BOAD.

60. In recent years, the GON has begun to promote reforms in the energy sector through new policy documents in overall energy, renewable energy, and on how energy can help the strategy to reduce poverty. It has also been promoting the increased use of domestic coal as a means of reducing wood consumption. The objectives include restructuring and liberalizing the electricity and petroleum sectors as well as to reduce dependence on wood consumption through increased substitution.

Findings, Lessons Learned, And Outlook

Major Findings

61. The project is complex covering many aspects of national energy policy and including two GON ministries and the national electricity company. The project was undertaken in a period when democratic structures were just starting to take shape and when economic conditions were deteriorating. Yet, for all the difficulties and unbalanced

results, there is much to be optimistic about. The project proved to the authorities that some of the components could work and be sustainable. The project proved to the GON that local authorities could take control over their own wood resources and make them work to their advantage and to the advantage of the country. And by doing this, it proved to the GON that local authorities could be given more responsibilities in non-energy matters, starting a trend toward further decentralization that continues today. The project gave confidence to the local population that they had the capacity to undertake such responsibilities.

62. Concern remains about the role of state energy companies and the drive to alleviate poverty. There is a link between modern energy services and poverty. Yet, as seen in this project, NIGELEC was effectively paralyzed, caught between economic and structural reforms required by the project and the lack of effort to implement reforms on the part of the GON. The losers effectively are those without adequate energy services.

63. There is optimism in the country and that has been reinforced by the success of many of the components of this project. The people are fully aware that the country does not have the natural resources that some of their neighboring countries have but they are doing what they can with what they have.

64. The project has provided important results in terms of demonstrating that the fragile wood resource base can be managed effectively, although with the full realization that there needs to be greater use of commercial fuels. Forestry management and the rural wood markets are providing important benefits that will endure and now there is a need to expand rural forestry management to the rest of the country if donors can be found. The project has shown how difficult it is to promote commercial fuels to the greater proportion of the population that is so poor and that such promotion takes a long-term strategy.

Lessons Learned

65. The main lessons from this evaluation are as follows:

- Substantial effort is necessary to integrate economic restructuring reforms with social and poverty reduction objectives.
- The Bank needs to ensure that the rationale for reforms (i.e., better provision of energy services to the public) is clear to domestic stakeholders.
- "Ownership" of a project or an element of a project is key to its success and it is necessary to ensure that project partners are fully committed to the aims and the approach taken. This occurred for the successful household energy component but not for the electricity component.
- A dynamic, supportive, and committed approach by the Bank throughout the lifetime of the project is vital to success, as was the case in the household energy component of this project.
- Regular post-project follow-up by Bank operational staff (e.g., while supervising other ongoing projects) may be needed to ensure that projects are meeting their long-term objectives and to reinforce to project partners the commitment of the Bank to the reform processes in the recipient countries.

Outlook

66. The outlook for Niger's energy sector and for the continuing sustainability of the credit are guardedly positive. Undoubtedly, the electricity sector has to evolve. Only 6 percent of the population currently have access to electricity, whether through grid-based or off-grid electricity and this needs to increase significantly to have a positive effect on poverty alleviation. There are some inconsistencies that have to be addressed. For example, NIGELEC, in its new credit from the West African Development Bank, intends to import more electricity from Nigeria, while at the same time the draft energy declaration presented to the government seeks to reduce imports. NIGELEC should be part of the solution but it acts as a traditional utility with little consideration of modern management approaches to public service. It would help if there were a more comprehensive, structured approach to senior management training to help managers understand how public service and industry/economic reforms can be brought together. Some of its thinking is affected by comparable issues in Europe, where some of the same debates are going on. Yet, European countries, unlike Niger, have mature electricity systems. Niger needs to see some examples throughout the world, particularly in Africa, of how reforms can be a positive force.

67. Wood consumption continues to grow and needs to be reduced, but the alternatives are not affordable for the majority of the urban population. New funding approaches are needed to break the vicious circle: people are too poor for a greater share of the population to afford modern energy services and yet poverty will not be sufficiently reduced until a greater share of the population has the necessary energy services. Yet, wood supply is not sustainable in the long-term, given population growth and current consumption patterns.

68. Niger is very proud that its wood energy project was the first in the region and that others (e.g., Mali and Chad) have built upon the experience gained since the beginning of the Niger Energy Project.[11] The IDA credit was important in providing Niger with tools for the development of its overall energy policy and it has provided a foundation for the other energy strategies and action plans that are being developed and implemented. This effort has to be sustained as the country develops other affordable alternatives and as new ways are found to expand and make the use of LPG and kerosene more affordable.

69. Niger is seriously hampered by a lack of government funding, even for small amounts of money for documentation centers and testing laboratories. The GON has to focus on its priorities: if the government believes there is sufficient oil potential to lure in international companies, then it has to provide more resources to encourage international companies to explore in the country in large part by better supporting the documentation center. In terms of ensuring petroleum product standards are maintained, again the GON has to decide whether it believes it is important for a country to do so or whether it will simply accept what traders sell.

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11. See Gerald Foley, Paul Kerkhof and Djibrilla Madougou, A Review of the Rural Firewood Market Strategy in West Africa, Africa Regioin Working Paper Series, Number 35, The World Bank, August 2002.

70. Funding is also necessary for helping the population switch to appliances that use commercial fuels. Yet, even that may not be sufficient as the greater share of the urban population cannot afford the fuel. The project did not provide subsidies for fuel consumption, rather building an infrastructure and supporting the promotion of more efficient stoves. The issue of subsidies has to be addressed to determine whether they are feasible or appropriate, given the sector priorities.

71. Policy development is improving. A better vision of where it wants to go is evolving. A wider audience is involved in energy policy and that is healthy. Decentralization has gained momentum although it has to be ensured that this is not an easy way out for the GON to shirk responsibilities. The Energy Declaration is before the government. The National Strategy and Action Plan on Renewable Energy was published in May 2003. The Domestic Energy Strategy (SED) is moving forward. These are positive steps that build upon this Bank project.

72. With the good analytical skills that are there, there is now a need to better formulate proposals to potential donors the way forward. There are a lot of positive signs but Niger needs continuing support from the Bank. The dissemination of the Bank's knowledge and experiences from other countries (developing and developed) are needed to build on the energy policy foundation that this project has helped provide. Yet, since the completion of this project, the Bank has not had any involvement in Niger, in any of the individual components. At a minimum, there should be an ESMAP study to assess where the energy sector is today and what new initiatives and investments are needed to create a more effective and robust sector that is achieving the economic, environmental, and social goals of the country.

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Annex A. Basic Data Sheet

NIGER ENERGY PROJECT (CREDIT 1880-NIR)

Key Project Data

Component	*Appraisal ($million)*	*Actual ($million)*	*Actual Percentage Share*
Household Energy	9.4	16.2	53
Electricity	53.5	9.4	31
Petroleum	3.0	4.8	16
Total	**65.9**	**30.4**	**100**

Source	*Appraisal Estimate*	*Actual*
IDA	31.5	17.5
KFW	10.0	N/A
EIB	6.3	N/A
DANIDA	11.5	10.3
Government/NIGELEC	6.6	2.6
Total	**65.9**	**30.4**

Cumulative Estimated and Actual Disbursements

	FY88	*FY89*	*FY90*	*FY91*	*FY92*	*FY93*	*FY94*	*FY95*	*FY96*	*FY97*
Appraisal Estimate	0.7	5.0	11.3	18.3	23.9	28.0	30.6	31.5	31.5	31.5
Actual	0.0	2.4	5.5	7.3	9.2	11.3	12.0	13.5	15.3	17.5
Actual as % of estimate	0.0	48.0	48.7	39.9	38.5	40.4	41.2	42.9	49.0	55.0

Project Dates

	Original	*Actual*
Negotiations	October 1987	October 1987
Board Approval	February 1988	February 23, 1988
Effectiveness	July 1988	July 1, 1988
Closing Date	December 31, 1994	December 31, 1996

Staff Inputs (staff weeks)

	Actual No. Staff Weeks	*Actual US$ (000s)*
Pre-appraisal	13.9	36.3
Appraisal	57.9	165.1
Negotiations	71.7	56.2
Supervision	214.5	294.1
Completion	6.5	17.7

Mission Data

	Date (month/ year)	No. of persons	Staff days in field	Specializations represented	Performance rating
Supervision 1	03/98	2	4	FA, EE	
Supervision 2	05/89	2	12	FA, EE, PE	1
Supervision 3	01/91	1	10	FA, EE	2
Supervision 4	10/91	2	9	FA, 2EE, EP	2
Supervision 5	02/92	4	18	EP, FA	2/3
Supervision 6	05-06/93	1		EE, ES	3
Supervision 7	06/93	2	12	EP	3
Supervision 8	06/94	2		EP, ES	
Supervision 9	03/95	2	13	EC, EE	S
Completion	12/96	2	17	EC, PA	S

Specialization: EC=Energy Economist; EE=Electrical Engineer; EP=Energy Planner; ES=Energy Specialist; FA=Financial Analyst; PA=Project Assistant; PE=Petroleum Engineer

Project Rating Codes: 1=no significant problems; 2=moderate problems; 3=major problems; S=Satisfactory

Source: Project files and Bank staff estimates

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

Operation	Credit no.	Amount (US$ million)	Board date
None.			