

EXPRESSION OF INTEREST FOR DJIBOUTI TO PARTICIPATE IN SREP

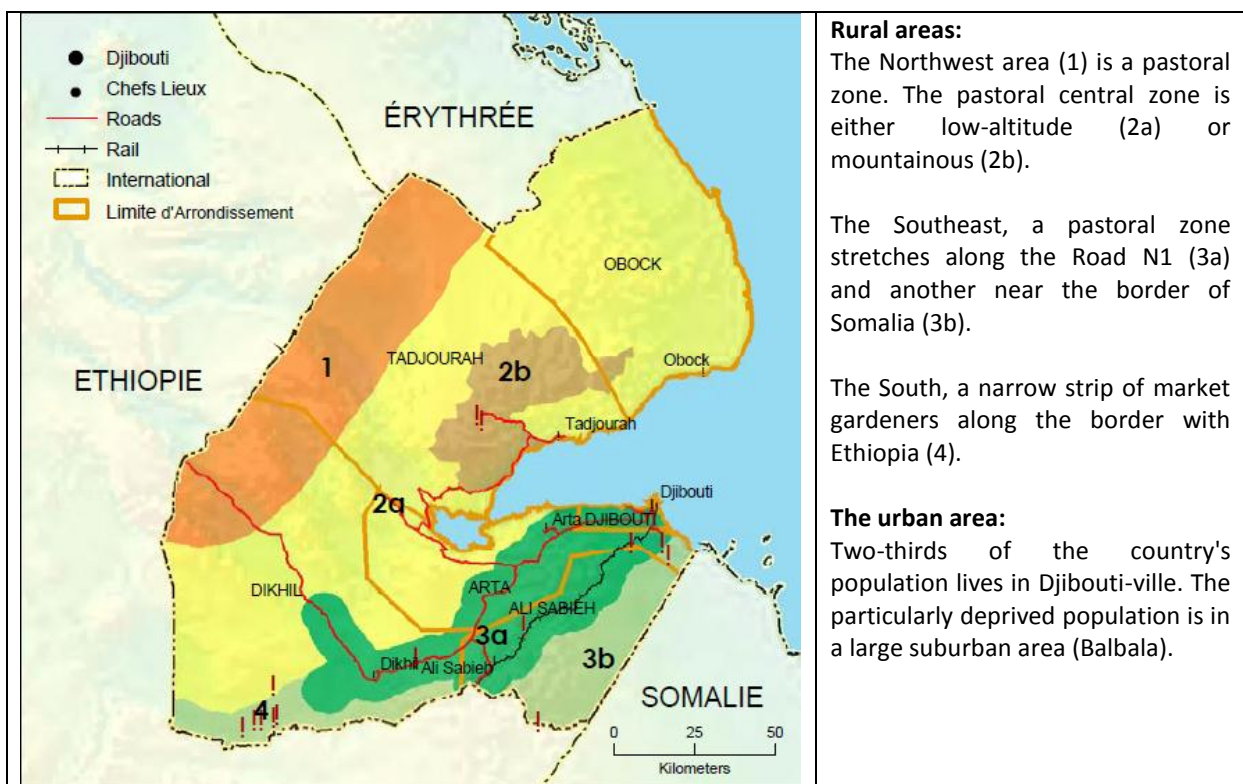
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I. COUNTRY AND GOVERNMENT AGENCY SUBMITTING EXPRESSION OF INTEREST.

1. This expression of interest by the Government of Djibouti to access the SREP was developed by the Ministry of Energy, responsible for Natural Resources of the Republic of Djibouti, with support from the Ministry of Economy and Finance, responsible Industry.

II. DESCRIPTION OF THE COUNTRY AND THE ENERGY SECTOR CONTEXT

2. THE COUNTRY. *Djibouti holds a key role in the Horn of Africa, controlling the access between Indian Ocean and the Red Sea.* The country is surrounded from the North by Eritrea, the West by Ethiopia and the South by Somalia. Djibouti is a small country (23,200 km², 150 km from North to South). Its population is 906,112 (2013). The urbanization rate is 77% (2012) and Djibouti-city gathers 526,000 (2013). 20% of the population is nomadic. A third of the population is less than 15 years old (2012). The urban unemployment rate is very high: 59% (2007), but considerably less than the rural population (83%).



3. *Lack of water and low level of economic activity in rural areas increase the concentration in urban areas.* The country is barren due the low level of rainfall and arable land represents 0.1% of the country (2009). Agricultural production is limited to irrigated fruits and vegetables; 90% of the

staple foods are imported. 42% of the population lives below the poverty line. 120,000 people, about half of the rural population, are affected by food insecurity in rural areas. Nomads and members of pastoralist communities are victims of the reduction of water reserves, shrinking of the herd and rising cost of imported foods.

4. *Isle of stability and peace in the heart of East Africa, Djibouti is a very indebted country.* The State budget is close to \$450 million (2011). The national economy is based mostly on services (80% of the GDP in 2011), the largest deriving from ports and railway works to Ethiopia and the military. 17% of GDP are represented by the industry (mostly the construction sector, supplemented to a small extent by the production of mineral water and salt), and only 3% by agriculture. The country depends heavily on foreign aid.

5. *The external debt of the country is \$800 million or 55% of GDP (2013 - IMF) and almost twice the budget of the State.* GDP per capita is US\$1,593 (2013), which is one of the highest in East Africa. It increases by 5% per year (2013). On the other hand the country ranks 164th (2013) in the UNDP's Human Development Indicator. A highly uneven distribution of wealth and the high rate of unemployment explain this situation.

6. *The Government of Djibouti is showing considerable efforts to improve the business environment and reduce the high cost of production.* The challenge is huge and can only be raised up satisfactorily with the technical and financial support of the international development agencies. The "Doing Business 2013" of the World Bank places Djibouti 171st out of 185 countries, and last on several criteria, which includes the protection of investors (181st overall), and also business creation (185th) or acquiring loan (180th). Entrepreneurs still face high production costs, in addition to the problem of access to energy, water, skilled workforce and telecommunications.

7. *Water shortage slows the economic development of the country.* Natural resources are scarce or barely used (fishing, agriculture). Djibouti is firstly a port of transit to the region (Ethiopia, which no longer has access to the sea since Eritrea's independence in 1993, uses 75% of the activity of the port of Djibouti for its importations) and a transshipment center for petroleum products. Djibouti hosts important military bases (France, USA) and is the headquarters of a multinational force fighting against maritime piracy.

8. *The Government wishes to take advantage of geopolitical situation of the country for its modernization by attracting the private investments required.* The current priorities of the Government are focused on the implementation of the investment program to develop the infrastructure of the country, the improvement of the competitiveness of the economy and the emergence of a private sector. Thus, to extenuate the shortage of water, two competing projects are envisaged: a water pipe for importing water from Ethiopia financed by the Chinese and the construction of a desalination plant financed by the European.

9. *The Djibouti Government has improved the regulatory framework to promote the private sector.* In 2010, the investment code was revised, as well as the legislation governing companies and bankruptcy procedures. The labor code was also revised. In addition, Djibouti has a free zone, offering administrative and logistics tax incentives to facilitate exchanges, through importation, storage, processing and re-exportation of goods.

10. THE ENERGY SECTOR.¹ *Djibouti imports all of its energy needs while the country has a strong potential in renewable energy, virtually unexploited to date.* The wind energy potential is immense compared to the need for the country and it has already been the subject of numerous wind measurements. Gali Ma'aba, Ghoubet and Bada-wein have annual average rates of 6.6 to 9.1 m/s. Several wind farm projects are being studied, one of a dozen MW. The solar potential is indisputable with solar radiation that varies between 6 and 7 kWh/m². The country also has a wide geothermal potential, which could provide base energy supply for the country. The development of the country's geothermal potential is supported by a project co-financed by 7 donors, including the World Bank and the ADB. The project is financing an exploration program to confirm resources in the region of Lake Assal. If the commercial viability of the resource for the production of electricity is confirmed, the Government of Djibouti would organize a competitive tender to independent power producers to allow the construction of a power plant for geothermal electricity generation.

11. *The development of geothermal energy is a crucial element of the policy promoting renewable energies in Djibouti.* Wind and solar resources are intermittent, which suggests important means of storage systems in particular for the solar system, because the peak demand is in the evening after sunset. The current power network is almost linear and not meshed, which makes it very sensitive to the integration of intermittent renewable energy sources. Geothermal energy could stabilize the electrical system and enable a more aggressive integration of intermittent energy sources, by becoming the main source for base generation.

12. *Energy access is very limited and not affordable to a large part of the population.* Access to electricity in Djibouti is limited to Djibouti city, where the electrification rate is about 57%. In the rural area, only 1% of the population has access to electricity. In this context, only 70,000 households, essentially located in urban areas have access to electricity. The cost of electricity is high. Despite significant recent tariff reductions, Djibouti remains among the one-third of African countries who endure the highest prices. In addition, quality of electricity generation remains low with frequent interruptions, and supply curtailments.

13. *The electrical distribution network covers only certain urban areas where people can pay for the service.* Deprived urban and rural areas usually do not have access to electricity, which translates to insecurity (no lighting), a handicap for the school kids to do their homework in the evening and a constraint on the economic development of small businesses. The absence of a guarantee of supply 24 hours a day and the price of electricity also has a serious handicap for the development of the private sector in Djibouti. Supply interruptions are so frequent (failures, supply curtailments) that many businesses and shops have had to purchase a private generator.

14. *Today local electricity generation is oil burned.* Total generation capacity is approximately 100 megawatts. It is supplied by heavy fuel oil gensets for the base consumption and diesel generators for peak demand. The inefficiency of certain gensets, combined with transmission & distribution losses, contribute to an offer / demands balance barely reached in 2014.

¹ Emphasis here is mainly to analyze the power sector. Indeed, the country has no oil resources or refining capacity. The oil sector is, therefore, limited to importation, storage and necessary distribution for domestic consumption.

15. *Commissioning, by May 2011, of the interconnection line between Ethiopia and Djibouti has drastically changed the situation.* Importation of hydropower from Ethiopia, limited to 300 GWh per year depending on the availability, are charged from 6 to 7 cents USD per kWh depending on the hours of the day and seasons. These importations have recently allowed a reduction in the price of electricity for the Djiboutians. Since March 2014, the price per kilowatt hour is around USD 15 cents for the social rate (less than 200 kWh / month) and around 35 cents for industries. Unfortunately, these importations are not firm supply: during dry season in Ethiopia, the supply is interrupted every day during peak hours. During rainy season, failures of the Ethiopian transport network can lead to unplanned interruptions. It is then necessary to restart the thermal oil gensets to provide electricity to the country.

16. *The President of the Republic has established a production goal of 100% renewable energy by 2020.* Djibouti would be the first African country to succeed this wager. Solar, wind and geothermal energies seem abundant in the country. However, they have not been exploited to date. A project to develop a capacity of 50 MW geothermal production project was launched mid-2013, with support from the World Bank and the African Development bank and five other donors. Another project for the construction of a wind farm is being developed with support from Qatar. However, to cope with the growth in demand (+ 5% / year for last 10 years), a tender has been launched to achieve 75 MW of classic thermal energy (project PK12) as a back-up generation plant.

17. Finally, a study on rural electrification by renewable energy (solar and wind), funded by the Public Private Infrastructure Advisory Facility (PPIAF), allowed the development of an off-grid/ decentralized generation program, which would involve a dozen of mini-grid for villages with populations ranging from 500 to 2000 inhabitants. Several scenarios of public private partnerships are contemplated for the implementation, provided grants and highly concessional funding become available.

18. **To summarize**, the country survived until May 2011 on electricity generated from imported petroleum products. Hence, very high cost of productions and a barrier to energy access for the most deprived population. The political will to implement renewable energy (geothermal, solar and wind), especially abundant in Djibouti, is now at the highest level of the State. The Government of Djibouti has indeed succeeded in a project of Interconnection with Ethiopia. Nowadays, the importation of hydroelectricity gives Djibouti the time required to implement a policy on all renewable energy. However, if the maximum use of the interconnection with Ethiopia is allowing Djibouti to reduce its dependence on fossil, it creates a new dependence towards the irregularity of hydraulic resources. It is therefore necessary for Djibouti to diversify its sources of supply.

19. The needs for the most deprived of the population are enormous. Water pumping and lighting are the first two priorities. This challenge affects half of the population of Djibouti: in urban areas where distribution networks are insufficient and in rural areas where there is no local generation, nor connection to the domestic electricity grid.

20. SREP's support would be instrumental in turning the renewable energy potential of the country into actual capacity. Moreover, SREP financing would radically enhance electricity access, especially in rural areas, thereby transforming the country and the life of its people.

III Rationale for Selected Sectors for SREP Financing

21. THE MAIN OBSTACLES TO THE DEVELOPMENT OF RENEWABLE ENERGY. The transmission and distribution network has been designed for centralized production. The existing network was built around power plants Boulaos and Marabout for Djibouti-ville. This network radiates medium voltage to provide for different neighborhoods. In the districts, Tadjoura and Obock, on one hand, and Dikhil and Ali Sabieh, on the other, are small centralized units. Certainly the interconnection line with Ethiopia has achieved a first mesh around Djibouti-ville, but generally, there is no network connecting the major cities of the country. Integration of renewable energies, often distributed (or fragmented), has to be where these energies are present. Therefore, transportation to consumption areas has to be foreseen. Eventually, the mesh of the national network, as with all new development project, should be located at a reasonable distance from the national network (remember that the country's dimensions are very modest). It's the same for consumption centers which should not be too far from the network. This is particularly the case for rural electrification. The early development of transport infrastructures and distribution is therefore a key factor for successful integration of renewable energy generation.

22. *The electricity network of Djibouti was designed on the EDF model of France, which makes it very costly for the deprived population.* Many consumers are satisfied with a subscription of 1 kVA. Quality standards and performances of existing low voltage networks are oversized for this type of consumer. The result is a major constraint on access to electricity, even for people living close to the MV network or Interconnection with Ethiopia. The implementation of low-cost electrification techniques would connect the low income customers. For example, the techniques of "Single Wire Earth Return" allow the cost to be divided by 2 or 3.

23. *The stability of the power grid may be jeopardized by intermittent energy sources.* Usually, it is recommended that these energies should not exceed 30% of the national production to ensure operation of the network under any circumstances (e.g. climatic hazards). Djibouti should here be regarded as an island and provided with dispatching performance system to optimize the use of renewable energy. Also known as "smart grid". Energy generation being centralized today, such a steering system does not exist, which prevents a large deployment of decentralized generation.

24. *Consumer data and demands are not current, while half of the population has no access to electricity.* In order not to oversize energy generation equipment, which lessen profitability, it is essential for consumers to moderate their consumption when the electrical system encounters difficulties to satisfy peak consumptions. Smart meters contribute both to inform customers, and to limit their consumption for short periods. The EDD has launched a pilot project for 3500 smart meters with a grant from the World Bank. It would be important to provide these meters to all consumers, as the basis for an effective energy efficiency program.

25. *Generation units based on renewable energies are often very small, making it very critical to maintain.* A wind farm in a district or, a fortiori, a photovoltaic field in a rural village requires planning and specific local skills to ensure maintenance of the equipment. Many solar projects delivered have proven the risks: at the first breakdown, the project is abandoned due to lack of spare parts and trained technicians. These decentralized generation projects must be accompanied by a structure for

maintenance activities at several levels: monitoring and reporting of anomalies locally, simple troubleshooting and replacement of spare parts at a regional level, repairs and restoration by a centralized level of expertise.

26. *Involvement of the private sector is made difficult by the current limitations of the Djiboutian market and business practices.* To ensure a return on investments within a reasonable time, the project has to be big enough to absorb the fixed costs (e.g. qualified staff presence). If it is possible for a 10 MW wind park, it is more realistic to establish a solar mini grid of 50 kW in a village. However, payments from consumers are not guaranteed. At the national level, ESD must cut electricity for some customers to pay their Bill. Also, some organizations do not pay their bills or they are behind on several months. In those circumstances, the private sector is not inclined to accept the risk.

27. *For regulatory planning, it is therefore essential to put in place an institutional framework suitable for renewable energy.* For example, subsidy system should be provided for very low-income households, and for other clients, incentives to pay their bills. Similarly, for generation companies, the regulatory body should describe purchase prices so investors can have the guarantee to profit from their projects over the agreed period.

28. **SUPPORT OF SREP TO LIFT THESE OBSTACLES.** *The implementation of a project of 12 mini-grids would radically change the life and the future of rural populations in Djibouti.* The lack of access to electricity is a real bottleneck to shared growth, and is partly responsible for overcrowding in the city of Djibouti. The financing of a project of 12 mini-networks (wind and solar) would unleash the growth potential in rural areas and allow them to be genuine alternatives to Djibouti-ville. By including Djibouti in its program, SREP could change radically the configuration of the country and the economic prospects of its population. In particular, the electrification of villages can provide security to the population by creating services nearby and generating employment instead of a gradual exodus to the capital. It is, therefore, an essential element in the country's fight against poverty and its economic development. The decentralized electrification program, developed with funding from PPIAF, is a very detailed study. With the financial support from SREP, this study could be transformed into an in-depth investment plan within a few months and implemented shortly after. While the size of the country and its pollution make its impact on global population low, it is also an opportunity for SREP to demonstrate it can radically transform the destiny of a country and welfare of its population in a few years.

29. *SREP would also support more broadly:*

- (i) Development of a decentralized renewable electricity system, with transport infrastructures and distribution to major consumptions centers. Such an investment would be developed on the basis of low-cost electrification techniques to connect low-income customers.
- (ii) Deployment of a pilot system (dispatching) to optimize the use of intermittent energy, which would be produced in decentralized ways.
- (iii) A program of generalization of smart meters, as an essential base for the success of an efficient energy policy.
- (iv) Further investments that could prove transformational when developing the SREP investment plan with support from the World Bank Group and African Development

Bank Group, who are already actively co-operating and supporting our development strategy.

IV. ENABLING POLICY AND REGULATORY ENVIRONMENT

30. *The Government of Djibouti is committed to develop a policy, legal and regulatory framework that would foster private investment and enable shared-growth.* A thorough analysis was conducted with financial support from PPIAF to review the current legal and regulatory framework and identify the set of reforms would have the greatest impact on private sector involvement. While the results of this preliminary work are summarized below, further efforts are being developed by the Authorities, with support from PPIAF, SEFA, AFFI as well as the African Legal Support Facility to make the current legal and regulatory framework radically more attractive to private investors.

31. **CURRENT LEGAL AND REGULATORY SYSTEM.** The legal system of Djibouti is based on laws and regulations of the French codification in force at the time of independence, the Muslim law (*Charī'ia*) and nomadic customs. The legal system does not provide any legal framework for businesses in Djibouti but there are, however, specific laws referred to as "concession laws", that allow to conclude bilateral agreements between individuals. In addition, the review of the legal and regulatory framework of Djibouti, financed by PPIAF, stresses that no impediment to the concept of PPP exist in the existing legal framework. Presently the notion of PPP is, however, not clear in the current legal framework and the support of the Government to PPP arrangement is not clear enough. The Government of Djibouti is therefore working with the support of donors to reform the Legal and regulatory framework in the near future. Developed options are all designed to trigger private investment while respecting the public interest.

32. **REFORMS OF THE LEGAL AND REGULATORY SYSTEM THAT ARE UNDER DISCUSSION.** A policy will be created to set the targets and basic principles of the PPP, including the distribution of risks. This policy would be flexible and not overly rigid. In addition to this policy, the authorities plan to create a unit responsible for the PPP, which would develop policies, help Ministries with the implementation of PPPs, and disseminate any helpful information. This unit would be separate or integrated into a Ministry. Finally, the necessary tools for evaluation of procedures will be developed to ensure good implementation of the policy and programs of PPP.

33. There are two options to set up a PPP policy: keep existing legislation and improve it, or to develop new PPP-specific law. The first option could be implemented faster than the second and at a lower cost. Based on a study done with PPIAF support, this would require fewer resources in terms of staff and buildings and would also avoid inconsistencies between the old law and those resulting from new legislation. However, Djibouti could lose the opportunity to send friendly signal to potential investors and thus demonstrate its willingness to allow the private sector to finance projects. The second option (new law) would enable Djibouti to have a clear legal base for the implementation of PPPs, which would have a coherent legal framework to ensure transparency and fairness in procedures for winning project bids. It would also treat unsolicited offers clearly and plainly. A new framework would also adopt a wide scope beyond the simple construction and exploitation of infrastructures. It could provide maintenance, renovation, upgrading existing facilities etc., thus leading to better protect the interests of consumers and citizens of Djibouti, and also

provide the country an opportunity to position itself internationally in PPPs to attract investors who would be reassured by the presence of a legal framework. However, its implementation could take much longer than the authorities would like to see fundamental improvement of private investments.

34. The authorities continue to work closely with donors and trust funds to identify and implement a program of reforms in the business framework, which would likely have the greatest and fastest impact on the developments of favorable private investments, including shared growth.

V. INSTITUTIONAL AND TECHNICAL CAPACITY

35. OVERVIEW. The institutional and technical capacities of agencies implementing energy projects have been weak for several years, but they have remarkably improved through the strengthening of the capacity of the Ministry of Energy and establishment of monitoring tools and support for the implementation of projects. Thus the execution rate of the Energy Access and Diversification project described below has increased from 20 to almost 80 percent in less than a year. Encouraged by this successful experience, the Ministry is also speeding up the geothermal drilling project, co-financed by 7 donors. In addition, an in-depth training for procurement trainers will be provided this year to a dozen of Djiboutian experts with World Bank funds. These experts belong to the implementation agencies described below:

- (i) EDD (Electricité de Djibouti), which is the official body responsible for the implementation of the government electricity policy and strategy.
- (ii) CERD (Centre for Study and Research of Djibouti), which is the main research center in the country and an institution with database and extensive studies conducted on the geothermal, wind and solar potential of Djibouti.
- (iii) The National Energy Commission, which was created in 2009, by Presidential Decree, to help frame discussions on energy in Djibouti.
- (iv) ADME (Djiboutian Agency for Energy Efficiency), which was created in August 2013 to develop and implement the country's energy efficiency policy.
- (v) ODDEG (Djiboutian Development Office of Geothermal Energy), which is in charge of identifying, promoting and developing geothermal resources in the country.

VI. PROGRAMS OF MULTILATERAL DEVELOPMENT BANKS AND DEVELOPMENT PARTNERS

36. The World Bank Group, the African Development Group, the French Development Agency, the OPEC Fund for International Development and the European Union are the key development partners that are supporting the development of the energy sector in Djibouti. The first four have co-financed or are co-financing several key projects in Djibouti, and the experience that the country as gained in coordinating their intervention will be critical for the successful design and timely execution a SREP investment plan. We are highlighting hereinafter some of the main projects that are under implementation.

- (i). The project Energy Access and Diversification (US\$ 18.2 million, funded by IDA) aims to increase access to electricity and diversify the energy mix and consists of three financings. The first project's objectives were to increase the population's access to electricity and diversify the sources of energy production. The project also funded the rehabilitation and extension of the electricity distribution network in the District of Balbala, which allowed 2,000 households to win or regain access to electricity. After a restructuring of its development objectives, the project has financed the purchase of emergency heavy fuel oil for ESD, when the company was close to imminent bankruptcy. The project has also financed a technical assistance program to improve the effectiveness of ESD. It is important to note that the extension of the electricity network was also co-financed by ESD and AFD, which have provided electricity to an additional 1,100 households. This project received an additional financing in 2010 (a grant of US\$ 6 million). The objectives of this additional financing were to continue the extension of the energy network and enhance its effectiveness. The project has two main components: (i) the pilot project for smart meters, and (ii) the extension and rehabilitation of electricity network to Balbala and Arta. This funding has allowed the connection of 2000 new households to the network. In addition, the co-financing from EDD has allowed 1500 more connections. Thus, the project have enabled (directly or indirectly) 6,600 households (39,600 persons) to regain or have access to electricity (more than 10 percent of people have access to electricity). The smart metering system financed by the Bank will significantly improve the quality and cost of the service to consumers. The project Energy Access and Diversification received second additional financing (a grant of US\$ 5.2 million) in 2012. This second additional financing was through a grant called Responses to Crisis (CRW) of the International Development Association (IDA). The objectives of this financing are to help reduce the impact of drought in Djibouti and increase the resilience of the country to natural disasters through implementation of stocks of security of petroleum products, comprising of two components: (i) purchase and storage of security stocks of heavy fuel oil and diesel safety stock, and (ii) create the regulations governing these stocks. Today, the regulation of security stocks is being finalized. It provides for the monopoly granted to ESD and the DOSC in the energy sector to be constitutionalized and security stocks managed. It has established a mechanism for the sustainability of security stocks in diesel, needed for pumping and drilling of water in rural areas.
- (ii). *The Geothermal Electricity Generation Project (co-financed by IDA US\$6 million, GEF US\$6.04 million and the ESMAP US\$1 million - 2013-2018)*. IDA co-finances with 6 other donors a geothermal exploration within the caldera of Fiala project, located in Lake Assal. The Bank also administers the ESMAP grant (Energy Sector Management Assistance Program) and the Trust Fund of the GEF (Global Environment Facility). The objective of the project is to evaluate the possibility of the commercial geothermal resources of Fiala for large-scale energy generation. Achieving this objective could lead to unlocking the geothermal potential of Djibouti and help reduce internal costs of electricity generation, increasing security in energy supply in the country and encouraging the participation of the private sector in the energy sector. The project supports a well-drilling exploration program and will follow a pre-approved test protocol for certified results. The total cost of the project amounts to US\$31.23 million, funded as follows among the donors: International Development Agency, US\$6 million, Global Environment Fund US\$6.04 million, OPEC (OFID) International

Development Fund US\$7 million, the African Development Bank (AfDB) US\$5 million from the African Development Fund and US\$2.34 million of its trust funds, the French Development Agency (AFD) US\$3.25 million, the Energy Sector Management Assistance Program (ESMAP) US\$ 1.1 million, and the Government of Djibouti US\$0.5 million.

- (iii). *PPIAF is financing three studies in Djibouti:* (i) A study to upgrade the thermal energy generation (PPIAF US\$ 459,000). The study identifies the activities for the restoration of existing power plants and the cost of various options possible (restoration for simple maintenance of conditions of power plants safety; and expansion capacity of the energy generation in place). The study is a practical tool to help the Government's decision, the cost associated with the various options for the restoration of power plants for investment and for new power plants. (ii) The study on the solar energy in rural areas (PPIAF US\$400,600) aims to identify the best options for solar energy electrification for 25 villages pre-selected by the authorities. Three main options are considered: mini-grid, micro-grid and distributed solar energy. The study develops the technical specifications required for the implementation of pilot projects (network, microarray and solar distributed). It also recommends institutional and financial measures for their effective implementation. (iii) The study on the legal and regulatory framework for Djibouti, which deliberates on existing regulations and formulates proposals to stimulate PPP investments.