

# REToolKit Case Study

## *Turkey Renewable Energy Project*

### 1. Overview

The project objective is to increase privately owned and operated distributed power generation from renewable sources, without the need for government guarantees, and within the market-based framework of the new Turkish Electricity Market Law. The project also ties into the three priorities of the World Bank in Europe and Central Asia region which are to: (a) support key global public goods including environmental commons; (b) help create the conditions for a vibrant private sector; and (c) develop a sound public sector by reducing government contingent liabilities and by leveraging Government investment with private funds.

The project objective is being achieved through the following two components:

- 1) The establishment of a commercial financing mechanism for renewable energy projects and
- 2) The implementation of various institutional development activities to ensure the development of economic and financially viable renewable energy projects within a competitive market framework.

The Special Purpose Debt Facility (SPDF) for renewable energy financing is a term lending facility which was established and is being operated by the two financial intermediaries (FIs): the Turkish Industrial Development Bank (private); and the Turkish Development Bank (Government). The World Bank loan for the SPDF was on-lent from the Treasury (the Borrower) to the FIs, who utilize the SPDF to provide long-term debt financing to private sponsors of renewable energy projects. The SPDF is intended to leverage equity investment from local private developers, export credit financing and other financing for the construction and operation of qualified renewable generation projects.

In order to support the implementation of the Project, Ministry of Energy and Natural Resources (MENR), General Directorate of State Hydraulic Works (DSI) and General Directorate of Electric Power Resources (EIE) will undertake various institutional development activities, which are being financed through internal sources and grants. The principal institutional development activities that are being pursued include:

- **Renewable Energy Development Capacity:** For the immediate to medium-term (next 2-3 years) there is a substantial potential pipeline of projects which are at an advanced stage of development by private sponsors.
- **Legislation for Renewable Energy Resource Development:** Apart from the Electricity Market Law and the MENR-DSI Regulation on Principles and Procedures for Obtaining a Water-Use Rights Agreement, Turkey does not have a specific and comprehensive law for renewable energy resource development.
- **Mechanisms for Public-Private Hydropower Development:** With the implementation of the new Electricity Market Law (Law No. 4628), the responsibilities for developing new hydropower generation will tend to shift towards the private sector.

## 2. Core Issues

With the move towards a competitive wholesale power market as envisaged in the Electricity Market Law and the ending of Treasury guarantees, private developers of power generation projects have found it more difficult to obtain financing since Treasury support will no longer be available. Moreover, private developers of environmentally clean renewable energy projects find it even more difficult since they tend to be smaller, are mainly Turkish and are less able to access both international capital markets and export credit agencies. This is the case even though many renewable projects are economically viable on the basis of life-cycle costs; Turkey is considered to have very large renewable energy resources in the form of small hydropower and wind power sites; and energy from renewable resources will reduce pollution and emissions of green house gases.

Local private sponsors of generation projects based on renewable energy resources face the following barriers:

- Higher pre-investment costs, relative to conventional power generation projects, due to the lack of technically reliable information on renewable energy resources and the costs of pre-feasibility, detailed feasibility engineering design, etc.
- Lack of medium-to-long term debt financing that is necessary to achieve financial viability for such small but capital intensive infrastructure projects, which tend to have longer payback periods and need debt with long maturity.
- Uncertainty about whether the soon-to be privatized distribution companies will enter into bilateral contracts to purchase electricity from small renewable power generators.

The local private sponsors interested in renewable power generation projects asked the Government for assistance to overcome these barriers, and the Government was willing to provide such assistance since it believes that there is considerable potential for utilizing renewable energy sources for distributed generation in Turkey to reduce pollution from fossil fuel plants and help to restrain emissions of carbon dioxide. Taking into account that the BOT model, which was previously used to overcome these barriers, has now been largely eliminated, the Government was anxious to develop a new approach. Therefore, this project was designed to assist the Government by providing a financing facility to help all types of renewable power generation projects to obtain long-term debt.

## 3. Project Design Strategy

A key strategic choice during project design was to define how to support renewable energy development within an electricity market. The easiest way to encourage development of renewable energy is to put in place a new set of rules and regulations that would force the newly privatized distribution companies to buy power from renewable power generators. Typically this is done by the so called *feed-in law* under which distribution companies are required to buy renewable power at a certain price set by the Government, or by the *portfolio approach* under which distribution companies are required to purchase a certain minimum percentage of their electricity requirements from renewable sources. Normally under either of these approaches the price paid for

renewable power by the distribution companies is above market levels and the companies comply to the extent that they are allowed to pass on the higher costs to their customers. However, the Government of Turkey preferred not to force the distribution companies to buy electricity from renewable sources at above market rates since this is an additional complication to the new reform program which is under way. Also, with the almost total lack of longer term domestic debt financing in Turkey, the above two approaches would have favored wind power (which can obtain most of its funds from export credits) as opposed to small hydropower plants which need domestic financing for civil works and electromechanical equipment. For these reasons the Government and the Bank agreed on the establishment of a financing facility to support private sector-led development of distributed renewable energy generation.

In addition, it was believed that there was a large pool of economically viable renewable power generation projects which could be commercially developed to produce electricity at or below prices that were expected in the Turkish Electricity Market if the projects could obtain long-term debt.

Total investment in renewable energy generation under the project is expected to be around \$500 million, which would include equity financing from the private sponsors, debt financing from export credit agencies, the World Bank Special Purpose Debt Facility (SPDF) as well as commercial banks.

The renewable energy technologies eligible for financing under this project are:

- **Small-Hydro Projects:** Over 70% of the small-hydro project potential in Turkey is based on existing irrigation canals and water conveyance facilities. Most of the remaining potential projects use existing irrigation dams. Therefore, the principal technical risk – the geological risk -- is largely absent. For the few potential “green field” projects, where new dams are required, the dams are likely to be relatively small and any underground works very limited. Again, therefore, geological risks could be considered to be minor. The electro-mechanical technologies associated with these small-hydro projects, such as hydraulic turbines, valves, gates, electrical generators, are all mature technologies.
- **Wind Projects:** The technologies associated with wind projects are also well established and may be considered mature. Although innovations continue, there are no technical risks inherent to wind projects.
- **Geothermal Projects:** The technologies and project configurations used to produce electricity from geothermal projects depend on the nature of the resource (temperature, water/steam purity) and site conditions (geology).

#### **4. Institutional Arrangements**

##### **Special Purpose Debt Facility**

The SPDF is a term lending facility which is operated by the two financial intermediaries: the Turkish Industrial Development Bank (TSKB) and the Turkish Development Bank (TKB). The two FIs were selected based on their financial strength, and their capacity to appraise and supervise project implementation. In addition, their status as development banks allows the Turkish Treasury to on-lend public funds to these organizations.

TSKB and TKB process loans to private sponsors for eligible renewable energy generation projects and monitor the implementation of these projects. Both TSKB and TKB are experienced development banks and have undertaken investment lending in the

energy sector. TSKB, a privately owned development bank, has substantial experience in implementing World Bank-funded projects. TSKB, a public development bank experienced in project financing especially for medium-sized investments, is working with the Bank for the first time.

Both TSKB and TKB have engineering departments whose staff ensure that the projects financed are technically feasible and in compliance with environmental regulations and other applicable licensing and permitting requirements. These staff members hire specialist consultants/firms to assist with issues requiring such attention according to the specific safeguard implemented under the Renewable Energy Project.

Operation Manuals were specifically prepared for this project by each bank to guide the management of the project loans and provide implementation standards for the banks.

### **Institutional Development Activities**

MENR and their related agencies DSI and EIE are responsible for the execution of the institutional development activities that support the project implementation. MENR is responsible for the development of the Renewable Energy Law, as well as revisions to related legislation. MENR has in the recent past successfully drafted legislation, conducted stakeholder consultations, and has implemented the Electricity Market Law. MENR is clearly capable of doing the same for the next phase of legislation in the energy sector.

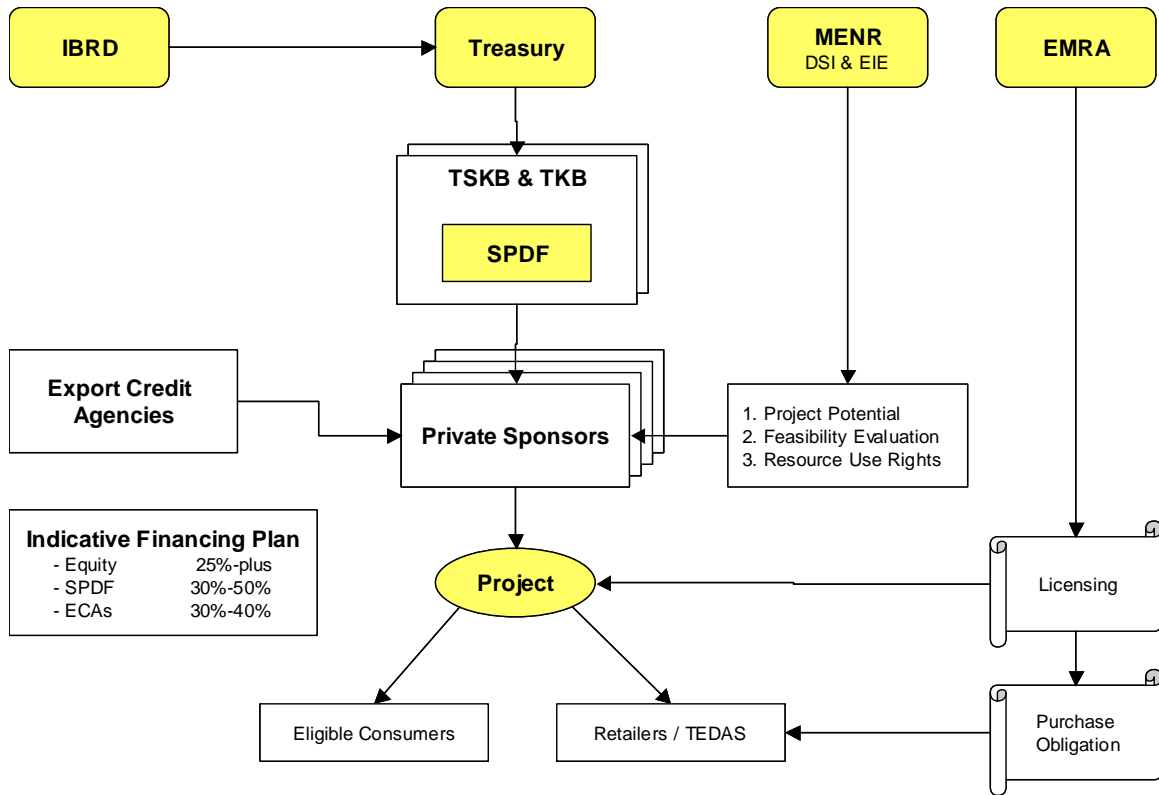
DSI and EIE are responsible for much of the implementation support work on project pipeline development, and the tasks associated with review and evaluation of project applications from private sponsors, issuance of water rights, and technical monitoring of implementation. DSI and EIE are very capable institutions with decades of experience and an extensive regional network of offices/branches that: undertake resource measurements over long periods; conduct detailed assessment of project potential; prepare investigation and feasibility studies; etc. DSI is a world-class organization in its ability to plan and execute complex hydraulic resource utilization and irrigation schemes.

### **Private Project Sponsors**

There are an adequate number of private project sponsors in Turkey who have implemented both small hydro and wind projects. These firms have the potential to develop and operate the proposed renewable energy projects.

## **5. Financing Mechanism**

The figure below outlines the institutional and implementation arrangements for the Special Purpose Debt Facility SPDF.



The Borrower is the Republic of Turkey, represented by the Undersecretariat of Treasury, which on-lends the IBRD loan to the two financial intermediaries, TSKB and TKB. The two financial intermediaries operate the Special Purpose Debt Facility (SPDF) and provide long-term debt for eligible renewable energy project investments. The operation of the SPDF is in accordance with the "Operations Manual" prepared by each FI and agreed with the Bank. The Operations Manual details the:

- The procedures for the operating the SPDF between FI, Treasury and World Bank
- On-lending terms and conditions between Treasury and the FI
- Sub-project eligibility criteria for financing by the SPDF
- Lending terms and conditions for sub-projects -- agreements between the FI and the private renewable energy sponsors
- Project evaluation guidelines
- Environmental and resettlement review procedures including dam safety and riparian issues
- Procurement processes and applicable limits for commercial practice
- Disbursement procedures

In each bank, marketing and project appraisal functions are carried out by departments which operate independently of each other. Each project proposal submitted to a bank is evaluated by a team of specialists comprised of an engineer(s), a financial analyst(s), and a project economist, who then prepare a project evaluation report. These project evaluation reports are then submitted to the credit committee of the bank.

Upon approval by the credit committee, these reports are submitted to the boards of directors of each bank for approval. After the approval by the boards and signing of the (sub)-loans agreement, the (sub)-loans will be ready for disbursement. The first two

projects of each bank will be sent to the World Bank for prior review. For subsequent projects, approval by the FI's Board will be sufficient.

The FIs are responsible for assessing the commercial risk of the renewable energy projects, and bear the credit-risk on the SPDF funds that they provide for eligible private sector renewable energy projects. The lending spreads on these loans are based on the creditworthiness of the borrowers. The FIs only provide long-term debt financing to private developers who submit proposals which have fulfilled all necessary licensing requirements of the Electricity Market Regulatory Authority (EMRA).

### **Project Processing -- MENR, DSI, EIE and EMRA**

DSI and EIE maintain a database of identified renewable energy project opportunities -- ranging from reconnaissance study reports to feasibility study reports. There are about 400 MW of hydro electric projects, an additional 161 MW of wind energy projects and one geothermal project (25 MW) which are fairly far advanced and supported by individual private sector sponsors.

Developers must have the resource rights and an approved feasibility study before they can obtain a license from EMRA. To obtain a license from EMRA all projects must also conform to the requirements of the relevant legislation, specifically including the Licensing Regulation defined in accordance with the Electricity Market Law.

The Regulation issued by MENR and implemented by DSI that relates to renewable energy development from hydro-resources covers the following steps:

- Procedures for the preparation, public announcement, and updating of the list of potential hydro-electric projects.
- Procedures for private sponsors to register their project application, and then advance through the stages of feasibility report preparation, submission, and evaluation. Multiple applications for a specific project are possible, and DSI shall review them based on technical feasibility and optimal resource utilization.
- Provision of conditional water-use-rights to sponsors whose feasibility studies are found to be acceptable by DSI. The sponsor(s) for the project can then apply to EMRA for a license -- once again there can be multiple license applications for a single project. EMRA will select between competing license applications for a single project based on criteria that include: increasing competition; level of sponsor preparedness and experience; local participation; preference to those who sell directly to eligible consumers; as well as DSI comments on the feasibility report.
- Issuance of final water-use rights.

For the case of wind energy projects the sponsor proceeds directly to EMRA to obtain a license.

## **6. Project Results**

[Need input.]

## **7. Key Lessons Learned**

[Need input.]

