PV Financing Guidelines

PV Financing Project

Deliverable 3.5

TURKEY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646554

Country PV Environment

Interest in solar energy has always been quite high throughout the contemporary history of Turkey. Especially in the southern and coastal parts of the country, water heating through solar energy has been widely used and spread easily. It is obvious that the fast and easy spread of water heating systems can be associated with lower legal liabilities, bureaucracy and property rights issues. Solar energy has been a center of attraction in Turkey. However, there are many factors that make the spread and use of PV installations slower compared to water heating solar energy systems. Especially legal and financial obstacles can be regarded as the overriding problems.

PV installations have quite high CAPEX initially. After the installation, costs are getting lower and cover the expenses necessary for the operation of the system (OPEX). So, it requires high initial investments which could easily be undertaken with the help of bank loans. Feed-in Tariffs (FiT) are paid for 10 years and the state does not tax PV generated electricity currently. Most of the investors find Feed-in Tariff and tax exemption very important in their investment decision. PV investment procedures should be well defined in terms of finance and taxing so that investors can foresee the future and invest in a trustful financial environment.

Although main financing instruments could be seen as loans, private equity is the alternative financial scheme. Private equity can be used as the sole financial instrument for the installation of the system and also banks require 20 to 25% private equity share in order to grant loans for the projects.

Financing Schemes

Financing Scheme 1: Loan

The European Bank of Reconstruction and Development (EBRD) has initiated different programs in order to enable the sustainable energy financing in Turkey for different interest groups such as residential and SMEs (Small Medium Sized Enterprises). Each program is accompanied by national banks in order to grant loans. Apart from the aforementioned programs, banks can grant loans by using ordinary loan procedures such as commercial loans or consumer loans. However, these loans may have shorter loan tenors and/or higher interest rates and are therefore less attractive for the investor. Hence, using other ordinary loans increases the financing costs of the projects and may deter the investors.

The Tureeff program (Turkish Residential Energy Efficiency Financing Facility) has been developed by the European Bank of Reconstruction and Development and is supported by the Clean Technology Fund (CTF). It aims to finance the projects of residential consumers who wish to invest in energy efficiency projects in their homes. The program grants loans to the investors with a loan tenor of 3 years and 20-25% private equity. Unlike other participatory bank, Şekerbank could increase this time interval up to 10 years as in a consumer loan by using its own funds. Furthermore, Şekerbank could regulate the payment schedule and amounts according to the investor's income generated by the PV system based on FiT. For instance, the customer pays more in the months of summer seasons compared to winters in line with solar electric generation.

The Turseff (Turkey Private Sector Sustainable Energy Finance Facility) program is another fund of the EBRD for SMEs in order to finance energy efficiency and renewable energy investments in Turkey. The program can provide loans thanks to participatory banks with a tenor of up to 10 years. The program also requires a share of 30% of private equity for loan granting and it allows a grace period of 6 to12 months.

The Midseff Program (Turkish Mid-size Sustainable Energy Financing Facility) is a fund provided by the EBRD with the contributions of the European Investment Bank and the European Commission in order to finance middle-sized sustainable energy investments in Turkey.

Within the light of the aforementioned programs and local participatory banks, it is necessary to explain the historical and prudential context of Turkey's banking system. To begin with, the

Turkish banking system has been tightly regulated since the economic crisis 2001 in the country. Necessary financial and collateral conditions for granting loans are under strict control of the Banking Regulation and Supervision Agency of Turkey (BRSA). It has become very important to allocate loans to creditworthy customers and each time (especially after the 2008 global crisis) the supervision agency tightens the requirements regarding collateral, private equity ratios for loans, etc. As a result of this, participatory banks of the aforementioned programs face some restrictions for loan granting processes. They cannot apply project financing tools for solar energy systems as they can for other energy (thermal power stations and hydroelectric power plants) investments, although it would be a quite proper solution when one considers the high initial investment costs of solar energy systems. Loan tenor is shorter compared to its European counterparts. Furthermore, due to the fact that banks cannot accept PV panels as collateral, they have to grant loans according to the investors' creditworthiness and other properties such as mortgages. All in all, the banking side has a quite prudential approach and a low level of risk appetite for solar energy system investments in Turkey.

Application Segments

The loan option is likely to be used with single and multifamily residential, commercial sector and public and industrial sector application segments. It is necessary to explain why the loan option is highly preferred in Turkey. From a macro-economic point of view, Turkey is a developing country and it needs foreign financial resources in order to finance commercial investments.

For each business segment, investments are more likely to be undertaken with bank loans in the Turkish market. First of all, the repayment plan of the loan is based on the income that is generated by the PV system and this persuades both the investors and banks for the low level of riskiness and the solvency of the project. Secondly, a bank loan is an easy and accessible tool for residential investors. Because their investments are smaller compared to the commercial and industrial sector, banks could be more efficient in addressing their needs (in other words, banks can offer solutions that are compatible with the financial intellectual level of the investors, other financial tools could be quite complex for average residential investor to comprehend).

Banks require investors' assets as a collateral and in order to finance successful projects, they demand confirmation of an EPC firm listed in white lists of banks for preventing adverse selection problems. Hence, technical feasibility reports play an important role for banks to

grant loans to the investors. The main decision criteria for residential projects is the investor's electricity consumption quantity and the income generated from the excess electricity that is sold to the state. Within the context of the Tureeff program a typical loan tenor is three years in Şekerbank T.A.Ş.

The loan tenor can be longer (up to 10 years and 250000 EUR) when it comes to the commercial sector and to the public and industrial sector (up to 7 years and 5 million EUR). In these business sectors, typical investors have an institutional framework and have a cash flow mechanism that can be investigated by banks. Furthermore, energy consumption is a vital cost of businesses. Hence, the installation of the system can increase profitability of the firm or organization. In this respect, banks have a more positive attitude to grant loans for these business segments.

For all of the business segments mentioned above, it is an obligation to obtain the permission of the electricity distribution company to connect the system to the grid. Nearly all of the commercial sector and OIZ (Organized Industrial Zones) as well as the public sector work with banks and banks have their cash flow data and financial health information. As a result, the information asymmetry problem is likely to decrease for banks. They know their customers closer and could increase their financing capacity for the investors. The reciprocal trust will accelerate the credit line routines and procedures.

Related Business Models

Loans are applicable for all the business models. Namely, net metering and self-consumption. Bank loans are one of the oldest and most traditional financing schemes in Turkey as in rest of the world. It is suitable for both addressing small and large scale projects at the same time. It requires time for the banking sector to become accustomed to the PV system's financing structure. Both the banking sector and the solar energy sector will contribute and provide feedback to each other. As the sector develops and becomes known to more and more investors and parties, the banking industry will be able to allocate more financial funds and will develop its workflow for the solar energy sector in order to offer more comprehensive products.

However, these days the banking sector sets some conditions and restrictions in order to grant loans for both self-consumption and net metering. First of all the project itself must generate sufficient level of electricity to meet investors' consumption and payback the loan within the loan tenor. Secondly, apart from the project's profitability and loan repayment ability another important factor is the financial creditworthiness of the investor (risk report, net

monthly income, age, occupation, wealth, other loan repayments etc.). Hence, the investor's financial qualifications are assessed besides the financial data and the ability of the project to pay back the loan.

Implementation

In general, the process descriptions could reflect the following scheme:

An investor calculates the cost of the project and necessary private equity. After defining the capital needs, he/she starts to search for loan options either directly by visiting a bank's branch or searching on the internet. Apart from the aforementioned programs, more options can be found by searching loans such as energy efficiency loans or renewable energy loans. However, most of the banks grant loans within the concept of energy efficiency loans. The programs like Tureeff, Turseff, Midseff manifests the participating local banks and also it is possible to apply for loans on the websites' of the programs.

During the application process, banks require some documents indicating the expected financial performance of the project and creditworthiness of the investor. For all application segments, the project cash flow mechanism provided by project developers or investors, electricity consumption data, financial creditworthiness of the individual investor, the reimbursement data of former loans and the indebtedness status play an important role for financial assessment of the application.

During the technical assessment of the application, the projects are reviewed for their efficiency standards under the supervision of the experts who are contracted by the banks. After the financial and technical assessment, projects can be found either bankable or not. As a result of this, income and expenditure balance can be analyzed in a more efficient way and further options can be provided by banks (like cheaper interest rates, longer maturity).

In order to approve the projects, banks demand some official documents for carrying on the loan's legal procedures. Usually they demand tax registration certificate, balance sheet, document which indicates the structure of partnership (shares, names of the partners) certificate of good standing, covenant which indicates that the funds will be used in the aforementioned solar energy system project and letter of consent which indicates that the investor agrees that the amount of loan will be given to the EPC firm in the forms of progress payments. After defining the loan tenor and the maximum amount for loan granting, a loan agreement is presented to the investor which defines the legal framework of the loan. A

reimbursement plan is also required to be signed by the investor which indicates the principal and interest payment structure

When it comes to borrowing money, it is necessary to document who is the responsible/legal representative of the entity and whether he/she is authorized to undertake debts on behalf of the company/entity. The tax registration certificate is important for documenting the existence of the entity and its commercial transactions level. Furthermore, banks investigate thoroughly and try to obtain intelligence about the commercial operations of the individual/entity. These procedures are quite important because of the high investment volumes and because the way this business is operated makes it quite suitable for money-laundering. Balance sheets indicating the transaction and business operations performed within the industry may explain the commercial life and transaction levels of the company.

After the disbursement of funds has been realized, the most important criteria for loan monitoring is the complete and on time repayment of the loan. As long as the loans are paid back on time, no specific monitoring for the performance of the system is conducted by banks. That is because, the main character of the funds are based on consumer/commercial loans.

External Conditions

Global economy has been interconnected so much that one's economic success or failure could change another party's success or failure. Multinational companies and increasing free international trade have made economic problems and crisis contagious all over the world. External conditions could affect the loan granting significantly. The banking industry is quite open to global macro-economic risks as in the case of the recent 2008 global crisis. The Banking Regulation and Supervision Agency of Turkey has tightened the criteria for loan granting under the name of macro prudential policies. Since the 2001 economic crisis (the main source of the crisis was the poor quality of banking regulations), state authorities and governments have aimed to keep banking industry strong in terms of capital adequacy ratio. Within the light of these developments, the risk appetite of the banking industry is quite low compared to the times before the 2001 crisis. Hence, even though the banking industry would like to undertake risks in the solar energy sector and fund the projects, many factors prevent it. As it is mentioned previously, regulations regarding banking law and global and domestic macro-economic conditions have affected banks' decision process in order to grant loans.

Apart from the aforementioned factors, insufficient and incompatible foreclosure legislations contribute to the negative attitude of the banks towards solar energy systems. The main reason of it is the fact that, banks cannot collateralize the PV systems in return of the project financing or loan options. The granted loans depend heavily on the funds provided by international development banks and organizations. In order to provide sustainable, commercial funding via the domestic banking industry, the banking industry should increase its knowledge and know-how about the solar energy industry and both the solar energy and banking industry should be supported and encouraged by legal regulations.

Example of key players and sources of information

Local participants of the Tureeff program are Türkiye İş Bankası A.Ş and Şekerbank T.A.Ş. Links can be found below:

- www.isbank.com.tr
- www.sekerbank.com.tr/

Local participants of the Turseff program are Denizbank A.Ş, Türkiye Vakıflar Bankası Türk Anonim Ortaklığı (Vakıfbank), Yapı ve Kredi Bankası A.Ş (Yapı Kredi) and Türkiye İş Bankası A.Ş (İş Bankası).

- www.denizbank.com/
- www.vakifbank.com.tr/
- www.yapikredi.com.tr/
- www.isbank.com.tr

Local participants of Midseff program are Türkiye Vakıflar Bankası Türk Anonim Ortaklığı (Vakıfbank), Yapı ve Kredi Bankası A.Ş(Yapı Kredi), Türkiye İş Bankası A.Ş (İş Bankası) and Denizbank A.Ş, Akbank T.A.Ş, Finansbank A.Ş, Türkiye Garanti Bankası A.Ş.

- www.vakifbank.com.tr/
- www.yapikredi.com.tr/
- www.isbank.com.tr
- www.denizbank.com/
- www.akbank.com/
- www.finansbank.com.tr/
- www.garanti.com.tr/

Financing Scheme 2: Green Cooperatives

Cooperatives have been a well-known and widely applied financing scheme within the Turkish society. First of all, initial cooperatives started in the agricultural sector and some of the oldest financial institutions like T.C Ziraat Bankası A.Ş and Şekerbank T.A.Ş have agricultural cooperative origins. Likewise, one of the main subsidizing tools of the state for farmers and agricultural sector Türkiye Tarım Kredi Kooperatifleri (The Central Union of Turkish Agricultural Credit Cooperatives) has been providing financing opportunities for farmers according to their income and needs. Furthermore, housing cooperatives are a well-known financing tool among the citizens. Throughout the history low capital accumulation, high interest and inflation rates forced people to unite their financing power in order to achieve their commercial and consuming goals. When energy is taken into consideration the same obstacles are likely to be faced. Hence, within the light of this historical and cultural context, it can be claimed that the economic and financing culture of Turkish people are quite compatible with cooperatives and the successful future of PV systems are strongly related to Green Cooperatives in Turkey.

Green Cooperatives may offer a proper method for collecting large amounts of funds from a group of investors in the future. Cooperative mechanisms in Turkey are supported by the state on tax and legal issues. In this sense, Green Cooperatives can be regarded as an innovative and promising way for the financing of photovoltaic systems. Nowadays, in Turkey, Green Cooperatives have been formed only legally (only articles of association, which is the constitution for cooperatives issued by the state, exists). There is no living cooperative body serving for its partners currently.

Financing via Green Cooperatives may be a very successful method for residential, commercial and public as well as industrial investors to overcome the problems regarding technical details and legal procedures and again they can benefit from economies of scale advantages and finance their projects at a lower cost. Furthermore, information asymmetry is less likely to occur as a result of a more professional and participatory governance and learning by doing approach. Hence, it is easier to overcome the adverse selection problem which noncommercial investors are more likely to face.

Furthermore, Green Cooperatives enable their partners to be prosumers (producer and consumer of the electricity). Hence, the regions where electricity is generated receive more income compared to conventional generation methods because investors are local residents. However, in the conventional methods the owners of the hydraulic and thermal power plant

investments are the corporations from metropolitan cities. They harm the local environment and shift the profits to the big cities. On the other hand, in the case of Green Cooperatives, local investors, labors and landowners receive more income. For instance, investors receive income from the electricity generated, landowners receive rent income, operation and management processes increase the employment. As a result of this, regional development differences will likely to be eliminated and income equality will tend to improve within the country and a step towards sustainable development will launch.

In Turkey, Green Cooperatives' PV system applications are assessed under the regulation of unlicensed electricity production. The maximum capacity for system power can increase up to 5 MWp depending on the number and consumption needs of the partners. This is a great opportunity because ordinary unlicensed projects can only reach up to 1 MWp. On the other hand, PPAs and crowdfunding are not allowed in Turkey. Hence, cooperatives can only install systems for self-consumption and net metering. Cooperatives cannot finance themselves with crowdfunding, they can use bank loans instead. As a result of this, legal and financial regulations are necessary to implement to accelerate the investments.

Application Segments

Green Cooperatives may likely offer a bright future for the residential sector, commercial sector, public as well as the industrial sector. First of all, it requires a management body which is already existing in agricultural and housing sector (in the forms of cooperatives), for the commercial sector and organized industrial zones (as in the form of associations). Furthermore, cooperatives could benefit from state supports and tax incentives and could achieve the solutions of the problems stemming from the state or the market (since the installation, operation and sales of electricity generated requires professional and technical experience). The LCOE of electricity is more likely to be lower under cooperative mechanism than independent installations and operations because of economies of scale and competitive advantage provided by the cooperative body.

As a future forecast of energy markets, if electricity markets are liberalized, cooperatives can protect the prosumer partners from competitive market conditions. In other words, Green Cooperatives may act as intermediary between the experienced commercial purchasers (which hold the market power such as factories and corporations) and their partners and ensure the sufficient supply level and fair price that prevents its partners to suffer losses.

Currently there is no detailed legal framework for the cooperatives. However, additional taxes/incentives may be implemented by the state authority depending on the different segments in the future. Currently there is no tax for solar energy, but this could change in the future. It will be important to know the sector which the partner candidates operate in (because the cooperative will probably restrict the profile of the partner in terms of occupation, commercial sector etc.) in order to form a group of investors with similar financial features. Furthermore, another segmentation for cooperatives could require the investor to be resident in a specific location. The generated electricity and income can be benefited among the partners and can be directed to further PV system investments.

Related Business Models

Green Cooperatives financial scheme could be used best with net metering and self-consumption model. The FiT payments can provide sustainable and assured income for Green Cooperatives.

Implementation

A legal person/natural person has the right to apply for partnership of the cooperative. In order to be a partner, a fee is charged according to the share of partnership. The electricity generation with cooperative structure is assessed under the regulation regarding Unlicensed Electricity Production in Electricity Market.

At least 7 initiator partners are necessary to establish a cooperative. They sign an article of association (the constitution of cooperative) and establish the cooperative. Each member deposits some money in exchange for the cooperative's share. Each candidate has to apply to the board of directors in order to be a partner of the cooperative. In Turkey, currently only the articles of association for Electricity Production and Consumption Cooperatives (constitution of cooperative) has been issued, hence there is no actual cooperative body yet.

Some of the financial advantages of the Green Cooperatives that are derived from the articles of association can be aligned as (with the article number):

Article no: 2: The excess electricity can be used by the cooperative according to the related legislations.

Article no 5: In order to meet the loan needs, the cooperative can apply to the domestic and international financial institutions, can undertake debt, and take the measures necessary in order to utilize the loan in compatible with its purposes.

External Conditions

In Turkey, Green Cooperatives face some restrictions to enable the financing of the PV systems. First of all, the regulations in capital markets regarding crowdfunding have not been issued yet. So, cooperatives could not use crowdfunding mechanism to finance the projects. Secondly, the energy market in Turkey is not liberalized and signing PPAs is not allowed. As a result of this, it is not financially easy for cooperatives to spread the PV systems.

Macro-economic parameters such as high and volatile exchange rates, inflation rate and interest rate may deter cooperative partners/managements for installing and operating the PV systems.

Example of key players and sources of information

Currently there is no actual and operating Green Cooperative in Turkey. The articles of association (which is the constitution for Green Cooperatives) is issued by Ministry of Customs and Trade. The ministry is also in charge of the audit of the Green Cooperatives.

Related Regulations and Legal Agreements

- Amendment regarding Unlicensed Electricity Production: www.resmigazete.gov.tr/main.aspx?home=http://www.resmigazete.gov.tr/eskiler/2016/03/20160323.htm&main=http://www.resmigazete.gov.tr/eskiler/2016/03/20160323.htm
- Electricity Energy Production and Consumption Cooperatives Articles of Association: koop.gtb.gov.tr/data/52b18e46487c8ec1a8fccebd/yenilenebilir%20enerji%20kooperatifleri%20anas%C3%B6zle%C5%9Fmesi.pdf