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European Union / Instrument For Pre-Acession Asistance (IPA) Energy Sector Technical Asistance Project

MENR IPA12 / CS02

Survey Report

24 February 2017

T.C. ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI

Terna plus ENERGY VENTURE TERNA GROUP

MWH

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Summary

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Acronyms

EPC	Engineering Procurement Construction
FI	Financial Institutions
FIT	Feed in Tariff
NGO	Non-Governmental Organization
PC	Project Consultant
PV	Photovoltaic
SME	Small-Medium Enterprise
TOR	Terms of Reference

Executive Summary

The Instrument for the Pre-Accession Assistance (IPA) is similar to structural funds, and gives opportunity to beneficiary countries to comply with European Union (EU) cohesion policy before accession. In this scope, IPA is made up of five different components such as; assistance for transition and institution building, cross border cooperation, regional development, human resources, and rural development. The countries that could benefit from this instrument can be divided into two categories; EU candidate countries[1], and to some extent potential candidate countries in the Western Balkans[2] which are eligible for the first two components only.

The current EU/IPA 2012 Energy Sector Technical Assistance Program supports projects in various sectors including the energy sector. Within the framework of EU/IPA 2012, the European Commission (EC) and the ministry for EU Affairs have signed a financial agreement for an energy sector technical assistance project. The project is executed by the Ministry of Energy and Natural Resources (MENR) and administered by the World Bank (WB). Thus, WB signed an administrative agreement between the European Commission (EC) and a grant agreement between MENR in order to finance the implementation of the project.

Turkey is considered as one of the fastest growing energy economies in the world. In such a way that, both primary electricity and energy demand are following an increasing trend along with the growth of social wealth and economy. However, Turkey has limited options to meet this demand. Furthermore, only around a quarter of Turkey's total energy demand is met by domestic resources while the rest is supplied by imports. Therefore, the development of renewable energy technologies in Turkey's energy mix is essential in order to reduce the dependency on fossil fuels, improve the security of power supply, and mitigate GHG emissions.

Turkey's strategy and policy in renewable energy sector for 2023 are outlined in the National Renewable Energy Action Plan that was carried out by the Government of The Republic of Turkey, MENR and the General Directorate of Renewable Energy. According to the Plan, by 2023, 30% of Turkey's electricity need would be provided by the renewable energy technologies. To meet this highly ambitious goal, Turkey offers various opportunities for investors within the energy sector. SME renewable energy projects which are in general small scale projects also play an important role in order to achieve this objective.

Within the scope of the project, the purpose of the survey study is to originate small scale renewable energy projects from various project origination channels. PC has established project origination channels as FIs, NGOs, EPCs, and Suppliers. To increase the number of projects coming from these channels, PC has identified two project origination tools: marketing activities and SME database. After the origination of the projects, 186 project assessment reports will be prepared.

[1] Turkey, Albania, Montenegro, Serbia, and the former Yugoslav Republic of Macedonia.
[2] Bosnia-Herzegovina, and Kosovo under UN Security Council Resolution 1244/99.

1 Objective of the Survey Study

The primary objective of EU/IPA 2012 CS02 project is to promote the renewable energy sector in Turkey. In this scope, a comprehensive road map plan will be established in order to ensure larger integration of renewable electricity to the system, identify legislative and regulatory gaps and harmonize them with EU Acquis together with the elimination of identified barriers.

In order to achieve these targets, PC has carried out a survey study to determine potential small scale renewable energy investors and projects. According to TOR, the potential investors can be selected from industrial or building sector with the projects including different technologies such as roof top PV systems, biomass facilities, micro hydro and wind applications. Additionally, heating and cooling applications based on renewable energy sources can be also evaluated as renewable energy projects. The aim of the CS02 project is to prepare 186 project assessment reports for the viable renewable energy investments. In this scope, the project assessment reports will be only prepared for those meeting the determined project eligibility criteria to maximize the benefit of the project.

As it is defined in TOR, SME type renewable energy projects can be grouped based on their investment costs: projects with investment cost lower than $50,000, between $50,000 and $300,000, and higher than $300,000. Three types of project assessment reports (Mini, Normal, and Complex) will be written based on the investment cost of the project.

The results of the survey study showed that there is a large amount of renewable energy projects pending in portfolios of FIs. On the other hand, ability and resources of FIs are limited to assess these small scale renewable energy projects. Therefore, PC will provide technical assistance and prepare bankable assessment reports which will create mutual understanding between FIs and investors. The survey study has been focused more on local Turkish banks which own Private Sector Renewable Energy and/or SME renewable energy credit lines provided by institutions such as WB, AfD, EBRD, EIB, IFC, KfW etc. The utilization of international credit lines are useful for investors because of their low interest rates and long term maturities.

This survey report reflects the current positioning and approach of Turkish FIs in general together with the barriers for financing small scale renewable energy investments. It is significant to stress that the survey study has been performed in detail. Moreover, further financing mechanisms are also analyzed as a part of the study.

2 Overview of the Current Status

To better understand the project scope, it is better to first assess the current situation of renewable energy technologies in Turkey. Figure 2-1 below visualizes the total installed capacities for each technology from 2013 to October 2016. It can be easily seen from the figure that total installed capacity of the renewable energy technologies are in the increasing trend, such that the share is 40% in 2013. This number reached up to 42.4% in October 2016. The main contributors of this increase are wind, solar and hydro power plants. For instance, the installed capacity of wind is increased from 4% to 6.7% between 2013 and October 2016. In case of electricity production, which could be seen in Figure 2-2, the share of the renewables in total electricity production has also been increasing. Likewise, it has increased from 20.4% in 2014 to 32.8% in October 2016.

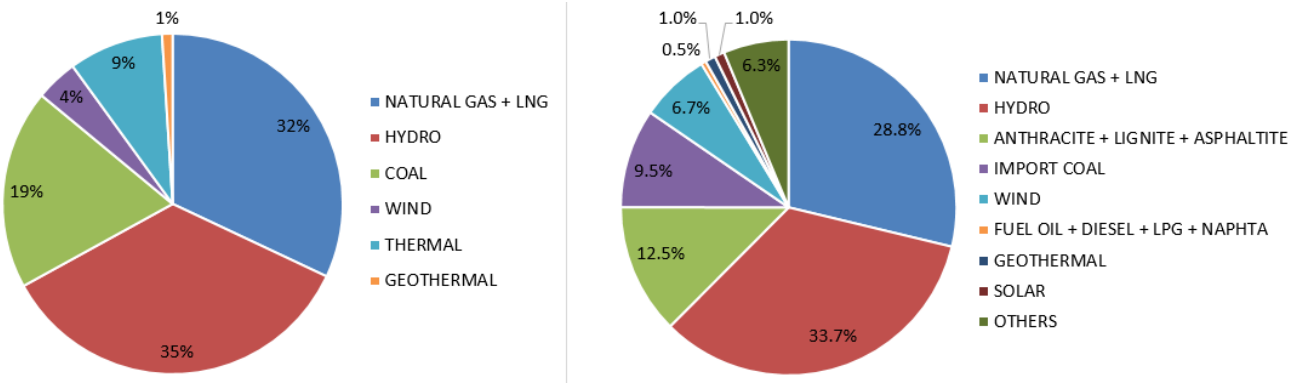

Figure 2-1: Turkey's total installed capacity from 2013 to October 2016[3]

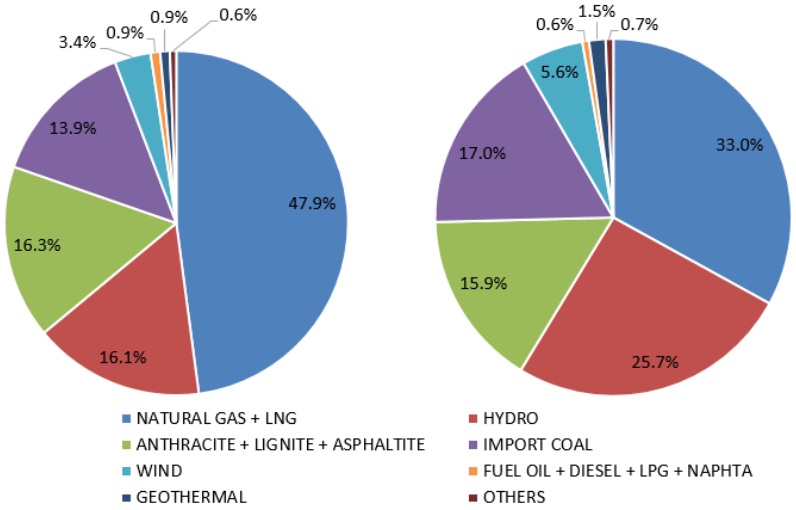

Figure 2-2: Turkey's electricity production from 2014 to October 2016[4]

[3] TEIAS
[4] TMMOB Elektrik Muhendisleri Odasi, Turkiye Elektrik Enerjisi Istatistikleri

According to the National Renewable Energy Action Plan, Turkey plans to have an electricity generation mix in which the share of renewable energy corresponds to 30% of the total need in 2023. Based on the same strategy plan, the expected generation capacity from renewable energy technologies will be 61,000 MW; mostly in the forms of wind, hydro, and solar generation. The target set for 2023 is highly ambitious, and as a result Turkey offers various opportunities for investors within the energy sector. The breakdown of the 2023 targets is shown in Table 2-1.

Table 2-1: Electricity generation and Installed capacity: 2013 data, 2023 forecast and Increases[5]

Renewable Energy Technology	Installed Capacity (MW)			Electricity Generation (GWh)		
	2013	2023	Δ	2013	2023	Δ
Hydro	22,289	34,000	53%	59,420	91,800	54%
Wind	2,759	20,000	625%	7,558	50,000	562%
Geothermal	310	1,000	223%	1,364	5,100	274%
Solar	0	5,000	-	0	8,000	-
Biomass	224	1,000	346%	1,171	4,553	287%

Reaching these targets will not be an easy task for some renewable technologies. For instance while the capacity of hydropower must be increased by only 53%, the installed capacity of wind power must be increased by 625%. In the case of solar, the installed capacity was almost zero in 2013 and the projected capacity for 2023 is 5,000 MW. Same challenges are also valid for reaching electricity generation targets. Thus, Turkey offers various opportunities such as numerous government funds and incentives for the investors within the energy sector.

[5] National Renewable Energy Action Plan for Turkey

3 Technology Overview under the Project

Based on the investment cost, three types of project assessment reports will be written. These are classified as Mini, Normal and Complex assessment reports. In the previous version of this report, it was stated that the number of each type of assessment report would not exceed 59, 39, and 88 respectively, as it is shown in the Table 3-1 below. The target was small-scale renewable energy projects such as rooftop PV, small biomass/biogas plants, micro wind and micro hydro for electric power generation. In addition, some renewable heating and cooling technologies were also found to be in line with the project objective. PC stresses the fact that the assessment of some applicable renewable energy technologies are limited. Therefore, it was also explained in the previous version of this report that geothermal and hydropower renewable energy applications might not be suitable under the project since they often have high investment costs. Thus, the tentative table below was prepared according the expectations of PC.

Table 3-1: Number of project assessment reports within each category

Renewable Energy Technology	Nº Mini Project Assessment Report	Nº Normal Project Assessment Report	Nº Complex Project Assessment Report
PV/ Solar Water Heaters / Thermal Solar	59	36	51
Biomass/ Biogas	0	2	16
Wind	0	1	13
Hydro	0	0	7
Geothermal	0	0	1
Total	59	39	88

During the last couple of months, observations and experiences obtained through this project compelled PC to reconsider the values stated in this tentative table. Hence, PC remarks that the actual amount of assessment report may differ at the end of the CS02 project. For instance, the generation of biomass, biogas, and landfill gas projects turned out to be in a frequency close to that of hydropower and geothermal applications. Thus, the number of these types of project applications received so far have been limited. This was also due to the fact that the investments in Turkish renewable energy sector have been dominated by ground type unlicensed solar PV applications. Investors would rather invest in this type of projects compared to self consumption rooftop projects due to the convenience in permits, construction, and operation. Therefore, PC envisages that roof-top PV projects aiming self consumption that fall into Mini category will be lower than expected.

The working principle of Solar PV technology is based on conversion of sunlight into electricity through photovoltaic cells. Power generation from solar PV is a sustainable process because it uses the limitless energy of the sun. The most popular PV applications are technologies that use thin film and crystalline silicon. The crystalline silicon technology dominates the market compare to thin film technology. However, thin film cells are also favorable in aspects such as, flexibility, cost, lighter weight, and easiness in integration. Another benefit of thin film PV technology is the amount of reduced material required in producing a solar cell. The rapid installation of the equipment due to the modular structure, and safe electricity generation are among the main advantages of PV technology. They are especially useful on roofs of industrial and commercial facilities and as land applications in remote areas which lack grid connection.

PV technologies are not the only solar energy applications. The technologies that utilize thermal energy of the sun are also very popular in the market. They can be used of heating and cooling purposes, solar refrigeration water pumping and desalination.

Another specified technology within the project is micro wind power plants. The working principle of wind turbines is to convert the kinetic energy of wind into electricity. Micro wind turbines are used for micro electricity generation, which can be used by individual plants and buildings.

Main advantages offered by the micro wind turbines are independent power supply, mitigation of greenhouse gas emissions, no fuel cost, and occupying smaller space compared to an average power station. Most importantly, this technology can increase the security of power supply in remote areas because it can be used as a stand-alone energy generation system. Micro wind turbines can be used in countryside farmsteads and settlements with autonomous energy supply, pastures, mansions, beacons, buoys etc.

Micro hydro applications are generally used in rivers or irrigation channels to supply low cost electricity to nearby areas. Remote areas are especially dependent on such applications. They have less environmental impacts compare to large hydro power plants due to their low construction requirements.

Biomass power is another renewable energy technology that is evaluated under this project. The primary sources are organic matter and wastes such as agricultural, animal and municipal solid waste. Biomass resources are flexible renewable energy resources that can be used as solid, liquid and gaseous fuels to produce electric power, heat, chemicals and other types of fuels. They reduce net greenhouse gas emissions compared to fossil fuel based generation technologies. Their environmental impacts are much less compared to conventional power plants. Since most organic waste is produced as agricultural and animal husbandry activities, biomass power facilities can provide benefits to rural economies by creating revenues and job opportunities, and reducing pollution.

4 METHODOLOGY OF THE PROJECT ORIGINATION

Within the scope of the project, numerous project origination channels were established. These channels are mainly Financial Institutions (FIs), Non-Governmental Organizations (NGOs), EPCs, and Suppliers. Marketing activities and SME database are used as tools to accelerate the number of applications from the relevant channels which are being showed in Figure 4-1. These channels represent different steps of the project implementation procedure. To reduce the complications of the methodology, a level system is introduced. The procedure is then broken down into different levels, and all the project origination channels are associated with a certain level. The importance and role of each project channel are explained briefly in the next paragraph, followed by the explanation of the level system.

FIs are the last step before the project implementation phase if the investor does not have enough capital to carry out the project. Non-Governmental Organizations (NGOs) have extensive number of members from different backgrounds with various types of projects. Thus, potential investors can benefit from their knowledge and experience. The role of EPC is to design the project and provide turn-key project proposals to the investors. The suppliers provide relevant equipment to the EPC firm or directly to the investor. Moreover, additional marketing activities in municipalities, irrigation unions, cooperatives such as fishing and agriculture etc. will be used to accelerate the project origination. PC expects to receive direct project applications as a result of these activities. In addition, the utilization of SME database which is based on PC's previous experience from different projects will be an important source for project origination. Further SME databases can also be received from FIs which have widespread client portfolios.

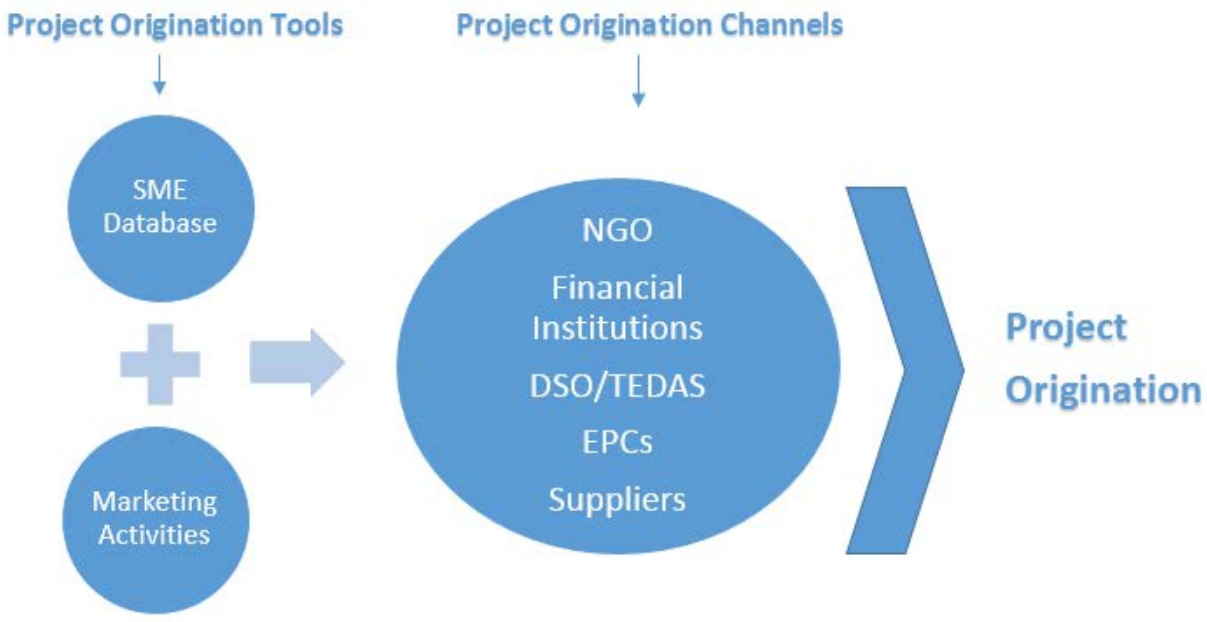

Figure 4-1: The project origination channels and tools

From project start up to implementation, the investor can follow different pathways. The methodology have been set considering the different steps of the project implementation and each step is associated with different levels. The levels have been set not only according to the knowledge of the investor but also on the closeness to project implementation. As a result, PC has concentrated project origination to FIs, which is the closest level to project implementation.

The methodology can be seen in Figure 4-2 below. The most detailed pathway that can be followed by the investor is to start with a project idea which corresponds to level 0. Then the investor can go to NGOs, EPCs/Suppliers, DSO/TEDAS and FIs which correspond to level 1, level 2, level 3 and level 4 respectively. The final step is the project implementation level 5. It is still possible for the investor to skip some levels within the pathway. For instance, if the investor is an EPC firm and a member of a relevant NGO with enough equity to complete the project, the project process can start in level 0 and skips directly to level 5. All possible pathways are shown with the arrows in the figure below. In the following section each level of the methodology is further explained.

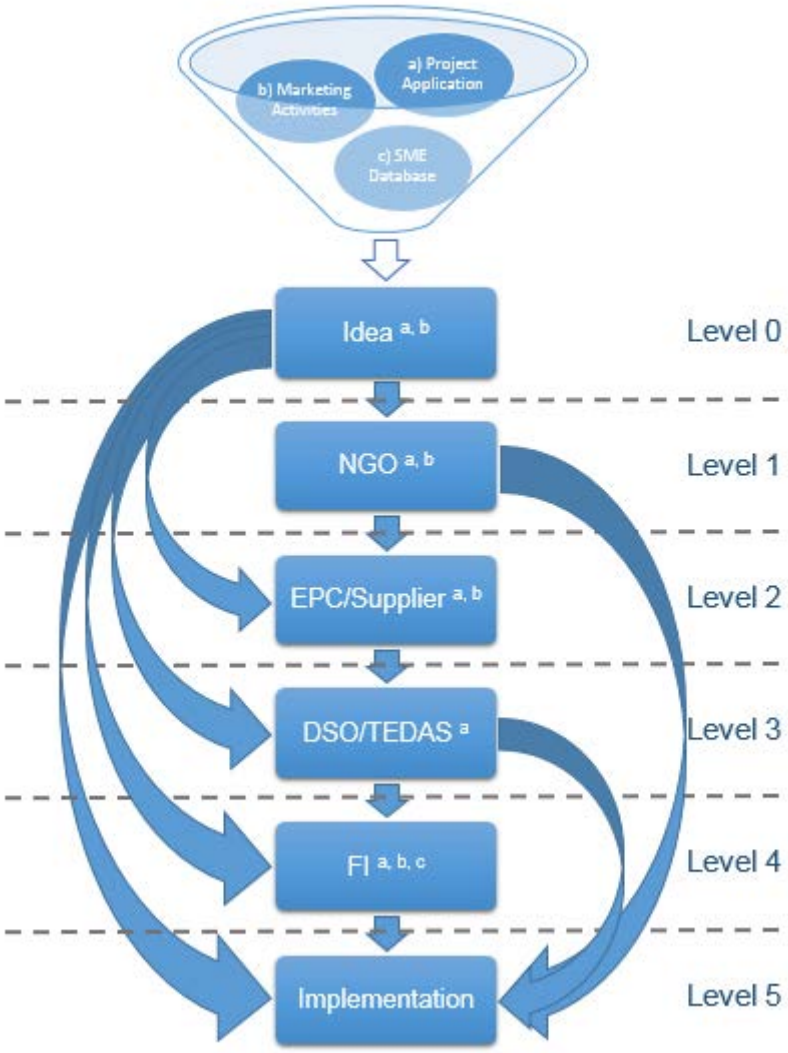

Figure 4-2: The project origination methodology

Level 0: The investor in this level has a project idea, but does not know how to proceed with the project implementation and the investment potential of different renewable energy technologies. The investor may lack technical knowledge such as the type of technology or may not be aware of EPC firms that can design the projects. To proceed with the project, the investor first needs an investment plan. This plan is based on the budget of the investor, type of technology and the equipment. Finally, the investor needs to gather information about the regulations on renewable energy projects such as permits that needs to be taken, and relevant incentives. Marketing activities and SME database of PC will be used to originate additional projects in level 0.

Level 1: The investor who has contacted with the NGO is considered to be at level 1. According to PC experience, the investor is more familiar with the steps that needs to be followed in this level compared to those in level 0. For instance, the investor is now at least aware of which permits needs to be taken or which technology will be implemented. In order to proceed, the investor needs to get in contact with EPC firms to design the project. The investor knows the difference between the licensed and unlicensed generation, thus the FIT system that will be benefited from. Most importantly; the investor will have a chance to get in contact with sector professionals and get a sight of their similar and successful projects. Subsequently, the investor will learn the details of project implementation process and understand the risks and opportunities. By using marketing activities through NGOs, PC will be able to increase the number of direct project applications.

Level 2: In this level, the investor is getting closer to the implementation phase and most probably made an agreement with an EPC firm to design the project. In this way, the investor will have much more solid understanding of the project and application. However, before making an agreement, the investor could take proposals from different EPC firms about equipment selection or other aspects of the project such as O&M agreement and performance guarantee. The feasibility study prepared by the EPC firm covers all the technical details of the project and provides an insight to the investor to choose the most suitable EPC firm to work with. If the investor has enough capital, there would be no need to go to FIs for financing, therefore the level 4 may be skipped. In this level, PC will use marketing activities to promote the projects coming from this channel. However, these projects are not particularly useful for PC since the project assessments will be carried out based on technical data provided by the EPC firms.

Level 3: Another project origination channel could be DSOs which periodically publish the list of investors who were able to acquire positive connection views. In this case the investors have already proceeded with their projects to a great extent. After this step, one of the most important actions that need to be taken by the investor is getting the connection agreement. Thus, the investors in this step are generally considered to be in the process of seeking financing for their projects. PC thinks of this level as an important means of attracting investors and generating successful projects.

Level 4: The investor has a complete understanding of the desired project in this step. PC named this step as level 4 since the investor have completed all the steps, required permits are taken and the project is designed. If the investor does not have enough or limited capital to implement the project, then the investor will seek financing through financing institutions such as banks and leasing firms. Then, FIs will evaluate the project and decide on financing it. However, due to the possible lack of mutual understanding between the financer and the investor, constraints that hinder the financing mechanisms of SME scale renewable energy projects sometimes occur. The project assessment reports that will be prepared by PC will improve this situation. Since FIs are important channels to originate projects, marketing activities and their SME database can be used to increase the number of incoming projects.

Level 5: The last step of the process is the project implementation. The project will reach the implementation phase if all the processes have been successful. Even if the methodology have been

set based on a simplified approach, the investor needs to fulfil many criteria between each level. PC will follow up with the investors after the submission of the assessment reports in order to assure the implementation status of the projects is well understood. For some of the projects, PC will prepare case studies/success stories and lessons learned to increase prospective capacities from these projects. In addition, these case studies will be used by PC for marketing activities; in this way awareness towards these projects will be increased. The ministry will also support these actions by sharing these studies on the project website.

After the methodology have been set by PC field studies were conducted. The purpose of the visits was to identify relevant projects from the project origination channels. Additionally, PC assessed the existing barriers both from investors' and financers' point of views which was important to understand how these projects could be promoted more. As mentioned, the visits were mostly concentrated on the FIs and NGOs since the projects coming through these channels are closer to the project implementation level. Since PC will only prepare a limited number of project assessment reports, it is better to find the projects which are more likely to be implemented in order to utilize the full potential of this consultancy service. PC will also support and provide resource based assessment reports for the idea level projects (level 0) because these projects have many requirements and steps in order to reach the implementation phase.

Even if the objective of the survey study is to originate small scale projects from various project origination channels, PC has concentrated the project origination mainly to FIs and NGOs. Since the FIs have already have a huge client portfolio for SME type projects, PC is not planning to discuss possible project origination strategies with them. As a result, PC has worked on identifying the barriers that affect the implementation of these projects. In addition, PC has also investigated the anticipated positive effects of the project assessment reports that will help to overcome the project barriers.

5 Survey Study

As part of the survey study, PC organized meetings and exchanged ideas with main stakeholders including FIs, NGOs, EPCs and investors. At the end of survey study, two possible financial mechanisms with different advantages and disadvantages have been identified: leasing companies and banks. The objective of the survey study is to originate small scale renewable energy projects through project origination channels and identify the possible barriers related to renewable energy project financing from the perspective of FIs and investors. PC have conducted the field visits with two key financial experts with the aim of improving the financial environment for the small scale projects and assess further renewable energy financing options.

5.1 Financial Institutions (FIs)

SMEs experience financing constraints due to their low credibility. Nevertheless, the awareness of banks and leasing companies towards renewable energy projects have been increasing in recent years. The number of project applications to some commercial banks is tripled in a year whereas it was relatively stable in other banks due to the lack of international credit lines. Overall, it is possible to claim that there is an increasing trend in the number of renewable energy project applications.

The availability of international credit lines which can provide long term maturity, low interest rate and advantageous pricing in the market is another important aspect to consider in financing of the renewable energy projects. Strong willingness of the banks towards renewable energy is also highlighted as the banks devote significant amount of money for renewable energy project financing. This willingness is also fueled by the increased demand in the market for renewable energy applications.

Leasing mechanism appears to be a significant alternative for projects which have low upfront costs such as solar PV plants. In these cases the equipment is leased to the investor by leasing companies. In contrast, the leasing mechanism is not feasible for projects with high upfront costs such as hydropower and geothermal plants because more than half of the total investment cost is spent on the construction. Leasing firms assess the projects based on the feasibility reports that they receive from EPC firms. Equity contribution is still required in leasing mechanism. Obviously the percentage of the equity changes based on the creditworthiness of the client and the feasibility of the project. Leasing firms finance projects both through their own sources and funds from international FIs. So far leasing firms have been influential among SMEs.

It is important to highlight the SME definition in Turkey. The financial balance sheet items or annual sales of SMEs cannot exceed TRY 40 million. Furthermore, the number of employees must be fewer than 250 in medium size enterprises; on the other hand the upper limit is 50 in case of small size enterprises. SMEs play a crucial role in Turkish economy due to their large share in the total number of enterprises and employment. According to the latest studies done by Turkish Statistical Institution, SMEs form 99.8% of all enterprises and 74.2% of the total workforce in Turkey[6].

[6] TUIK Haber Bülteni, KOBI girişim istatistikleri, Sayı:21864, Kasım, 2015

SMEs, which are the driving force of growth and employment in Turkey, can also supply their financing needs through APEX (wholesale banking) which is used as another product by state banks. The idea behind APEX banking is that loans are provided through on lending intermediate FIs with extensive branch networks. The criteria for the loan disbursement, which is based on the investor and the project feasibility, is determined by the bank that will benefit from the APEX mechanism.

Barriers

The main barriers for the investors are high collateral, uncertain regulatory environment, and high equity ratio requirement because of their low assets and inexperience in the energy sector. On the other hand, for the financers main barriers are morality of the customer, high provisioning requirements, and accurate project assessment.

The FIs request high collaterals from their clients to be in the safe side since renewable energy market in Turkey has not matured yet. High collateral requirement definitely possesses additional burden to the investor. However, the collateral rate changes based on the creditworthiness of the client and the feasibility of the project. To improve the situation, FIs have developed customer identification programs to compile the specific data related to renewable energy projects. In this way they can pull out useful data from the system to keep track the clients and the actual potential behind these investments.

Another reason behind the high collateral requirement is unstable payment behaviors of the investors. Even though high collateral is posing a burden for the renewable energy project investors, FIs have to take collaterals from the investors by law. FIs require items such as pledge on cash, pledge on land, letter of guarantee, mortgage, or credit guarantee fund as collateral. One of the most common way is the utilization of mortgage as collateral. In this case, FIs work with financial experts to determine the second hand value of the property. Banks reduce the interest rate of the offered loans if the collateral rate is high and vice versa.

Investors have a wrong impression that for renewable energy projects banks could finance 100% of the investments. However, the minimum equity required from the investors is around 25%. It is important to note that this percentage is not a fixed value and it depends on the project feasibility and creditworthiness of the client. Even though banks require equity contribution, there is still increasing appetite for the renewable energy projects among investors.

Another barrier for the investor is that the banks require the connection agreement before final loan decision. Before the latest revision of unlicensed regulation which was published in 23 March 2016, banks only required the connection view before the loan disbursement. However, there are many speculative actors and movements in the market, hence, to be in the safer position, before the loan disbursement banks/leasing companies now require the connection agreement which takes a longer time to acquire the connection view. The regulation change in the sector has brought new advantages and disadvantages to the market. For instance, many transformers in Turkey do not have enough capacity because speculative investors have already reserved capacities in the transformers in order to sell the connection views to real investors. New regulation prevents the transfer of call letters or connection permits before TEDAS provisional acceptance to eliminate the speculators in the market. In the contrary case, call letters will be cancelled. This implementation will be beneficial to reduce the financial risks for FIs. However, from the investors' point of view, this is one of the biggest challenges since it brings an additional financial burden to the investor due to financing requirement in the early stages of development phase.

Uncertainties in Turkish investment environment also presents barriers for the investors. These uncertainties include the pricing of the electricity under the FIT scheme or the regulations related to renewable energy investments. There can always be unexpected changes and amendments in the regulations that affect the investment environment. Small scale renewable energy projects need support in the form of advantageous pricing by FIs and additional premiums.

On the other hand, from financers' point of view, one of the important barriers is the morality of the customers which influences their loan instalment payment behavior. FIs reject significant percentages of the project applications due to several reasons. FIs assure that the rejections are not because of prejudices against renewable energy and if the project is feasible and the client is creditworthy, there is no reason for not to finance the project.

High provisioning requirements can be also considered as another significant barrier for financers. Banks are obliged to classify and monitor their loans and other receivables according to their collectability and the credibility of the debtors according to regulations. However, if the provisioning requirements are reduced then the cost of funding will also be reduced, consequently providing benefits for the investors. The low maturity of the sector poses risks for all the stakeholders in the market. That is why provisioning percentage is not currently low.

The final barrier that was mentioned by FIs during the field visits is the lack of accurate project assessment. Large scale projects with high investment costs are assessed by the project finance department of FIs. On the other hand, for small scale projects, investors are assessed by the scoring system developed by FI itself at the branch level or regional offices department which often do not have a specialized team for project assessment. Therefore, accurate assessment of projects is generally difficult. Thus, FIs work with external consultants, who specialize in project evaluation, to mitigate the potential risks. As a result, these project assessment reports that will be provided by PC will be beneficial for all parties.

5.2 NGOs

The contribution of the Non-Governmental Organizations like GÜNDER, GENSED, TÜREB, BiyogazDer is essential since these organizations have a widespread network all around Turkey. Thus, PC contacted and informed them about the content of the project. NGOs were eager to collaborate since they have extensive number of members from different backgrounds with various types of projects. In this way, PC will be able to originate and review the viable renewable energy projects from this channel.

GÜNDER: According to GÜNDER, one possible collaboration strategy is sharing the small scale investor portfolio with PC and building a database. Additionally, marketing activities will be useful to direct the investors to PC. This will be done through an advertisement in the website of GÜNDER and relevant magazines. One approach proposed by GÜNDER is the origination of the projects through energy efficiency consultancy firms. This will be effective because GÜNDER frequently recommends energy efficiency audits to its members through these consultancy firms. With the help of these audits, a variety of energy efficiency projects can be proposed including rooftop PV and solar water heaters. The inclusion of these projects to Consultant's pipeline will be valuable for the success of the project.

GENSED: According to GENSED, although most of the investors within the organization are knowledgeable in renewable energy applications, the number of investors who are willing to invest on small scale projects are limited. PC and GENSED are agreed on arranging a meeting with these investors to explain the project scope and benefits together with discussing possible collaboration mechanisms, in detail. Within the project scope, the target technology is rooftop PV projects, but the recent trend in Turkey is towards on land PV installations which possess an additional barrier for the project origination. Therefore focusing on marketing activities in order to promote these kind of projects and raise awareness among investors are imperative according to GENSED.

BiyogazDER: According to BiyogazDER, launching marketing activities through the website of the organization will be influential. Since BiyogazDER has fewer number of members compared to other NGOs, organizing a meeting is not considered to be an effective approach for project origination. According to PC experience, many idea level projects can be originated through this channel since there are many facilities that can adapt biogas technology to produce their own electricity. Therefore PC aims to reach out these potential investors to promote biogas projects.

TUREB: PC has communicated with TUREB to explore future collaboration opportunities with regard to wind energy technologies. The most effective one being marketing activities to promote small scale wind turbine installations and raise awareness among potential investors. The website of TUREB can be used as a beneficial tool to carry out these activities.

5.3 EPCs & Suppliers

EPC companies and suppliers are evaluated as essential project origination channels within project. Therefore, PC intends to benefit from their experience. PC have already prepared a list of EPC companies that have a track record on small scale renewable energy projects. However, since the assessment of the projects will be based on information from feasibility studies provided by the EPC companies, they might not prefer that their projects are assessed by PC. Any negative outcomes during this assessment will discourage EPC firms from collaborating with PC. Therefore, PC does not expect a serious contribution from EPCs in terms of project origination.

6 Conclusion

Within the scope of the task, PC has visited FIs, NGOs, EPCs and suppliers to analyze possible project origination channels and possible collaboration mechanisms to originate relevant renewable energy projects. These visits are specifically concentrated on NGOs and FIs because the projects which will originate from them are more likely to be implemented. During the survey study, barriers behind financing renewable energy projects for both investors and financers were identified. The key experts who are working on this project will assess the identified barriers and provide recommendation on how to overcome these barriers.

The role of the project assessment reports have also been studied extensively by PC from investor and financer aspects to increase awareness and installed capacity in the sector. Today, even though many international FIs operate in Turkey, investors still experience problems in financing their renewable energy projects which are particularly important for Turkey to reach its renewable energy targets for 2023. This project will help achieve Turkey’s goals and provide a positive environment for renewable energy project development.

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