

CTF PRIVATE SECTOR PROPOSAL

<i>Name of Project or Program</i>	IFC Financial Innovation for Renewable Energy (FIRE) Program
<i>CTF amount requested</i>	Investment – US\$17.75 million Implementation and supervision budget – US\$0.55 million <u>Total amount – US\$18.3 million</u>
<i>Country targeted</i>	Turkey
<i>Indicate if proposal is a Project or Program</i>	Program

1 DETAILED DESCRIPTION OF THE PROGRAM

1.1 Proposal Context

The proposed Financial Innovation for Renewable Energy (FIRE) Program will support first-of-its-kind non-recourse financing for renewable energy (RE) projects in Turkey. This objective is consistent with the CTF Turkey Country Investment Plan (CIP) that indicates that “*One of the key limitations for wider project implementation of renewable energy [...] is the lack of financial resources and proper lending facilities*”. The CIP further specifies that “*Financial institutions view the RE sector as higher risk, due to lack of technical capacity on the part of lenders to evaluate such projects and potential borrowers being unable to establish bankability of their projects.*” The FIRE Program will aim at changing this perception of non-recourse financing by Turkish financial institutions (FIs).

The original CIP was endorsed by the CTF Trust Fund Committee (TFC) in January 2009 and envisioned a US\$50 million allocation to two IFC programs:

- US\$28.3 million for direct private sector investments into renewable energy (RE) projects; and
- US\$21.7 million for facilitating investment in RE and energy efficiency (EE) through commercial banks (Commercializing Sustainable Energy Financing program, CSEF).

Later, the updated CIP (endorsed by the TFC in November 2012) expanded the overall CTF work in Turkey by including Phase II and allocating an additional US\$20 million to IFC for Phase II of the CSEF work, establishing a total IFC allocation of US\$70 million. Further, in 2014, to increase the overall impact of the IFC CTF component of the CIP, IFC proposed to shift US\$10 million from the direct RE program into CSEF II. The current breakdown of IFC allocation, therefore, stands at:

- ✓¹ US\$21.7 million for facilitating investment in RE and EE through commercial banks (Commercializing Sustainable Energy Financing program, CSEF);
- ✓ US\$30.0 million for facilitating investment in green buildings/green mortgages through commercial banks (CSEF II); and
- US\$18.3 million for direct private sector investments into RE projects.

This proposal seeks an approval for the IFC CTF Program in Turkey that will facilitate direct investments into RE. IFC has developed a strong pipeline of sub-projects that, when realized, will help ramp up RE investments in Turkey by expanding the range of available long-term financing structures to include project finance and, thereby, drawing more RE project developers to Turkey. To move ahead with this

¹ The ✓ mark indicates programs already approved by the TFC.

pipeline, IFC is seeking approval of US\$18.3 million of CTF funds for IFC's direct private sector RE investment program (FIRE Program).

1.2 Country Context

According to the United Nations Framework Convention on Climate Change (UNFCCC), Turkey's growth in total greenhouse gas (GHG) emissions has been among the highest of all Annex I parties, having grown from 188 to 422 million metric ton of CO₂ equivalent (tCO₂e) between 1990 and 2011.² Turkey's GHG emissions are now the 12th highest among Annex I countries and 23rd highest in the world, representing 0.8% of global GHG emissions.

The largest contributor to Turkey's GHG emissions, the energy sector, is responsible for 79% of total emissions. Turkey's strong economic growth and rising living standards have led to continual increases in energy demand (with 3% cumulative average growth rate (CAGR) between 1995 and 2012) and electricity demand (6.5% CAGR over the same period), which in turn, have increased emissions of GHGs. Further, according to the World Bank³, low domestic fossil fuel resources resulted in over 70% of energy demand being supplied by imported energy. The share of imported energy is expected to continue to climb if no significant steps are undertaken. This heavy reliance on energy imports adversely impacts the country's economic competitiveness and further, worsens an already large current account deficit, exposing Turkey to significant energy price volatility. Realizing this, the Government of Turkey (GoT) is taking a series of actions in order to increase the share of domestic resources in the energy mix, including renewables, and decrease the share of imported natural gas and coal, thereby improving energy security in the country.

In 2012, about 228 TWh of electricity was supplied to the domestic market with the largest share generated by thermal plants.⁴ By June 2014, installed capacity was as follows: natural gas (37%), hydro (34%), and coal (22%), with small contributions from fuel oil (1%), and wind, geothermal, and other renewables (6%). Conditions for the growth of RE installed capacity continue to improve: a recent overhaul of the legislation system has enhanced the regulatory environment, a liberalized electricity market has attracted private sector players and financial flows, and, overall, the investment environment for RE investment remains strong. Moreover, the GoT has increased feed-in-tariff (FiT) values and extended the date through which RE investments can benefit from FiT support to 2020.

1.3 RE Sector Context

Turkey has plentiful reserves of renewable energy, such as geothermal, hydro, solar, wind, and biomass. The country has potential for 433 TWh/year of hydropower (of which some 140 TWh/year is thought economically viable),⁵ 166 TWh/year of wind power,⁶ a significant resource of solar energy, 31,500 MW of geothermal energy⁷ and 16.92 Mtoe/year of bio-energy.

² UNFCCC, *National greenhouse gas inventory data for the period 1990–2011*, UN, 2013. Retrieved from <http://unfccc.int/resource/docs/2013/sbi/eng/19.pdf>

³ The World Bank, 2011, *Tapping the Potential for Energy Savings in Turkey*.

⁴ US EIA, *Country reports: Turkey*, US EIA, 2014. Retrieved from <http://www.eia.gov/countries/cab.cfm?fips=tu>

⁵ D. Appleyard, B. Duarte, *Reaching for Turkey's Hydropower Summit*, Hydroworld, 2014. Retrieved from <http://www.hydroworld.com/articles/print/volume-22/issue-5/features/reaching-for-turkey-s-hydropower-summit.html>

⁶ R. Ata, *The Current Situation of Wind Energy in Turkey*, Journal of Energy, 2013. Retrieved from <http://www.hindawi.com/journals/jen/2013/794095/>. 2012 wind data provided by the Turkish Wind Energy Assoc.

⁷ M. Parlaktuna1, *Geothermal Country Update Report of Turkey (2010-2013)*, European Geothermal Congress, 2013. Retrieved from http://www.geothermal-energy.org/pdf/IGAstandard/EGC/2013/EGC2013_CUR-32.pdf

In recognition of the goal to enhance energy security and the need to rebalance domestic energy demand and supply, the GoT has set ambitious targets towards strengthening its energy base by promoting domestic energy generation, with a focus on supplying 30% of its electricity needs with RE by 2023, a remarkable increase from current 6%. Specifically, the GoT aims to reach 20,000 MW of installed wind capacity, 3,000 MW of installed solar PV capacity and the full utilization of its hydro potential by 2023⁸. To achieve this target, the GoT has given priority to the private sector to develop and finance RE projects and has already implemented a number of regulatory reforms and measures to facilitate private sector investments, including:

- Adoption of a new RE law in 2005 and amendments in 2010/2011;
- Adoption of National Climate Change Strategy in 2010 and issuance of National Climate Change Action Plan in 2011;
- Establishment of General Directorate of Renewable Energy and Energy Efficiency in 2011;
- Establishment of 10-year FiT (by the Decree of Council of Ministers in 2013) with potential to benefit from locally produced equipment incentives; and other measures.⁹

These and other measures have helped generate growth in RE installed capacity. In 2012, energy production from these RE facilities reached 58 TWh from hydropower, 8.8 TWh from wind energy, 0.9 TWh from geothermal energy, and small amounts from bio-energy and solar PV.¹⁰ Yet, the growth in RE capacity remains constrained, in large part because the Turkish banking sector has so far not undertaken a systematic effort in developing products and solutions for facilitating RE investments at scale.

Banks in Turkey follow opportunities identified by their corporate clients and, as a result, financing structures for RE projects have been largely limited to corporate financing. In other words, current investments in Turkish RE projects are conducted exclusively on the balance sheet of project sponsors. "Financing is a challenge," says Dorotea Delbruck, head of sales at Nordex.¹¹ "Non-recourse project finance has not developed in Turkey. Companies have to do balance sheet financing, which also means their balance sheets are loaded with debt and they can't take on new debt as quickly. Smaller firms may have trouble receiving financing at all." Only few project developers can get access to appropriate, long-term financing structures for RE projects—those who have available and disposable resources, and are willing to accept high risk and low leverage, and can accommodate for moderate returns. In short, despite the large potential for RE generation, the lack of non-recourse financing for renewable energy projects continues to constrain the growth of this sector.

1.4 Barriers to Private Sector Investment

In Turkey, non-recourse project finance is a relatively new financial structure and remains largely untested, even for the thermal generation.¹² Yet, the role of non-recourse project finance is critical to

⁸ *Renewable Energy & Environmental Technologies*, Republic of Turkey, Prime Ministry, Investment Support and Promotion Agency, 2013. Retrieved from <http://www.invest.gov.tr/it-it/infocenter/publications/Documents/ENVIRONMENTAL.TECH.RENEWABLE.INDUSTRY.pdf>

⁹ Government of Turkey, *Law on Utilization of RES for the Purpose of Generating Electrical Energy*, Republic of Turkey, Energy Market Regulatory Authority, 2014. Retrieved from www.epdk.gov.tr/index.php/elektrik-piyasasi/mevzuat?id=143

¹⁰ IEA, *Turkey: Renewable Energy and Waste for 2012*, IEA, 2013. Retrieved from <http://www.iea.org/statistics/statisticssearch/report/?country=TURKEY=&product=renewablesandwaste&year=Select>

¹¹ H. O'Brian, *Turkey starts to remove obstacles to growth*, Windpower monthly, 2014. Retrieved from <http://www.windpowermonthly.com/article/1318512/turkey-starts-remove-obstacles-growth>

¹² In 2014 IFC, together with other financial institutions (FIs), committed financing for a US\$1 billion combined-cycle gas turbine (CCGT) power plant sponsored by a Turkish subsidiary of ACWA Power. The financing of the 950 MW plant is one of the first times in Turkey when an independent power producer is financed on a limited-

enable Turkey to reach its 2023 target for RE production. To date, lenders have been willing to provide corporate loans or project finance loans with ongoing recourse to the sponsor and, as a result, RE projects have been constructed by large, diversified energy conglomerates. While this approach has demonstrated the viability of some RE technologies in Turkey and generated some growth of installed capacity (there has been over 100 wind projects of various sizes with aggregate installed capacity of over 3 GW), the growth remains limited. By 2013, installed wind capacity only reached about 15% of the government's 2023 target.

In many countries where RE installed capacity has grown significantly, non-recourse project financing has played a decisive role in accelerating RE development. Unlike other financing options (such as corporate finance), with non-recourse financing, lenders assess the cash flows expected to be generated from project activities, rather than the strength of the existing balance sheet of a project sponsor. Non-recourse project finance is a common, proven investment structure in developed markets and an instrument of choice for financing large infrastructure projects. The same is increasingly true for project development in emerging markets.

There are several advantages to non-resource project finance, particularly for small and medium sized developers. Specifically, it does not have a substantial impact on a company's balance sheet or creditworthiness, allows for higher leverage of capital, and enables companies to pursue several projects simultaneously. These factors allow for significant acceleration of the development of a particular market where project financing structures are available.

The lack of knowledge/familiarity with RE technologies and associated project risks makes Turkish financiers uncomfortable with undertaking non-recourse project finance structures. This dearth in long-term financing leaves many technically-qualified project sponsors out of the Turkish RE market.¹³ In order to further enable investment in the sector, a wider range of long-term financing structures need to be made available in Turkey so that project developers can invest in the Turkish RE market, in turn allowing the market to mature and meet its potential.

In summary, the key barriers to private investment in the RE sector in Turkey are:

- Lack of non-recourse project finance options, which limits the number of experienced RE project developers that are able to invest in Turkey; and
- Lack of project finance experience among commercial lenders and, therefore, lack of track record of RE project finance in Turkey.

1.5 Investment Services Component

The proposed Program will aim to address the barriers mentioned earlier and catalyze further scale-up of RE projects. It will support the first project finance RE projects in Turkey in order to: (a) generate a demonstration effect and help create a track record of the successful financing of RE projects under a non-recourse project finance structure; (b) expand the availability of financing options from commercial lenders to include project finance in the RE sector; and (c) enable more RE project developers to invest in Turkey. CTF support will help address the risks and uncertainties associated with developing and financing the first non-recourse RE projects in Turkey.

recourse basis. IFC, *Summary of proposed investment*, 2014. Retrieved from <https://ifcndd.ifc.org/ifcext/spiwebsite1.nsf/DocsByUNIDForPrint/2FFB935891F455F885257A4B0061A7D0?openDocument>

¹³ The World Bank, *Turkey: Building a Market for Renewable Energy and Energy Efficiency: Boosting the Power Supply and Moderating Demand*, the World Bank, 2013. Retrieved from <http://www.worldbank.org/en/results/2013/04/08/turkey-building-market-for-renewable-energy-and-energy-efficiency>

As non-recourse type of financial structures have not yet been extensively tried in Turkey context, CTF resources will target covering additional costs (including transaction costs) and perceived risks (including higher requirements for debt service coverage ratios, financial leverage, etc.). CTF funds will be structured alongside IFC own financing and will serve to help other lenders gain comfort and facilitate their participation in project-financed RE investments.

The Program will seek to retain flexibility in terms of structuring CTF funds. The financial instruments, pricing and terms of the CTF funds will be tailored on a project-by-project basis to address the specific needs of each sub-project. IFC will ensure that sub-projects receive only the minimum level of concessionality necessary to proceed. Final agreement to provide CTF funding to any individual sub-project would be subject to a full due diligence process and approval by an internal IFC approval body, as well as IFC Board. All sub-projects financed under the Program will be required to meet IFC environmental, social, governance and other compliance requirements, as well as all Turkish regulatory requirements. IFC's participation in the sub-projects will ensure implementation of IFC Performance Standards, including environmental and social guidelines.

1.6 Program's strategy to achieve market transformation

The proposed Program will play a transformational role in the Turkish RE sector by supporting the first project financed RE sub-projects in the country and catalyzing further market uptake. Recent experiences in promoting RE technologies in Turkey as well as continued advancement of project finance approaches in non-RE sectors have raised expectations of greater involvement by local banks in non-recourse financing and opening up of Turkish RE market to more commercial bank led-deals. To further support the momentum developed by the Turkish RE market it is important to facilitate an establishment of project finance structures and build a critical mass of knowledge.

Piloting several transactions that would involve domestic FIs will help build knowledge and institutional capacity to accelerate and increase financing to RE projects. IFC will seek opportunities to support engagement of domestic FIs in these transactions by directly providing needed financing to projects on a stand-alone, non-recourse basis. Sub-projects funded under the Program will establish a track record for this type of financing and demonstrate its viability to commercial lenders and project developers in an evolving and maturing market environment.

Market transformation can be further amplified because of the consistencies exhibited by the Program and the policies of the GoT, both of which directly support the goals of increasing RE generation capacity and "greening" the mix.

2 FIT WITH INVESTMENT CRITERIA

2.1 Potential GHG Emissions Savings

As the Program is technology agnostic and a breakdown between investments in various RE technologies is not defined at the moment, specific targets for RE capacity and related capacity factors are indicative and subject to adjustments once the sub-project pipeline is finalized.

The calculations of the potential GHG emissions savings are based on the following assumptions:

- The Sub-Program is expected to result in 75 MW installed capacity;
- An estimated weighted average capacity factor of 20%, based on initial assessment of sub-projects (which can potentially include wind, solar PV and possibly other RE technologies);

- A combined margin emission factor¹⁴ of 0.471506 tCO₂e/MWh; and
- An anticipated asset life of 20 years.¹⁵

Sub-projects under this Program are expected to directly generate GHG emission reductions of about 62,000 tCO₂e (0.472 tCO₂e/MWh x 75 MW x 8,760 hours x 20%) over the first full year of operation, and over 1,240,000 tCO₂e over the life of the sub-projects (estimated at 20 years).

Given that the Program may result in scaling up RE generation in Turkey, triggering a series of follow-up projects, IFC anticipates a significant replication effect. Assuming a multiple of at least 4x, the Program could indirectly lead to around 5,000,000 tCO₂e of GHG reduction.

2.2 Cost-Effectiveness

Based on the above calculations and the expected Program cost of US\$18.3 million, the implied direct GHG emission reductions per CTF US\$ will be US\$15/tCO₂e (or 0.07 tCO₂e/\$) over the life of the sub-projects and indirect GHG emission reductions per CTF US\$ will be US\$3.7/tCO₂e (or 0.27 tCO₂e/\$).

With the total investment cost of around US\$120 million, the total investment per direct life-time GHG emission reductions is expected to be around US\$97/tCO₂e.

2.3 Demonstration Potential at Scale

The Program seeks to support the growth and market maturation of RE projects in Turkey. Rapid expansion of these projects has been limited to date by a number of financial barriers, including the absence of non-recourse financial structures – those that have been found the most effective in context of many other countries. CTF support is expected to be critical to enable the first project finance lending structures to private sector developers of RE sub-projects, which could provide the impetus for a significant ramp up in project finance investments, leading to up to four-times larger combined installed capacity within the next few years.

If successful, the Program will be able to establish a foundation for an uptake in project-financed RE investments across various RE technologies. This growth can provide a significant contribution to achieving the GoT's 2023 RE targets (e.g. 20,000 MW of wind; 3,000 MW of solar PV).

2.4 Development Impact / Co-benefits

The expected co-benefits to be achieved by the Program include:

- Playing significant and catalytic role in scaling up private sector RE investments in Turkey;
- Contributing to GoT's strategic objective of diversifying Turkey's energy mix and reaching the 2023 RE installed capacity target;
- Improving access to finance; broadening and deepening financial markets;

¹⁴ For grid-connected renewable energy IFC follows the International Finance Institution (IFI) Approach to GHG Assessment in Renewable Energy. GHG emissions are estimated based on the combined margin emission factor.

¹⁵ The IFC GHG accounting methodology provides guidance on calculation of the GHG emission reduction on the basis of one representative year. To assess the amount of the lifetime GHG savings, a life of the asset is conservatively assumed to be around 20 years.

- Strengthening domestic demand for RE components, stimulating domestic manufacturing and creating domestic jobs (about 8 permanent jobs, up to 150 temporary construction jobs, and 120 jobs in components manufacturing, etc.);¹⁶
- Alleviating the energy imports burden, improving the current account deficit;
- Improving energy security for Turkey by reducing dependency on imported energy;
- Contributing to overall improvement of Turkish infrastructure, through building auxiliary infrastructure, such as roads, transmission lines, etc.; and
- Reducing local pollution.

2.5 Implementation Potential

IFC is assessing the market conditions and possibilities of structuring project-finance investments in various RE technologies. The range of potential investments can cover non-recourse structures in wind, solar PV, and possibly other technologies.

2.6 Additional Costs & Risk Premium

None

2.7 Financial Sustainability

The Program is intended to facilitate the emergence of new (for RE in Turkey) financial structures that are considered key for effective promotion of RE projects in an emerging market. The FIRE Program will help project sponsors and FIs establish this new financial structure, by demonstrating viability and commercial attractiveness of project financed deals. Successful piloting of this Program will lead to increased awareness of this type of financial structure and growing experience and capacity of Turkey domestic financial sector. Once a lending track record is established and the viability of project finance is proven, the FIs' comfort level with providing targeted, non-recourse financing to RE projects will significantly increase.

The financial community in Turkey is competitive, fairly closely knit and continues monitoring innovative activities of every sizeable participant. In its discussions with potential clients, IFC has sensed that some FIs are exploring possibilities of entering project finance in RE technologies but remain hesitant to pursue particular deals. It is expected that with a few successful first-movers, the market will pick up and commercial non-recourse financing will follow.

2.8 Mitigation of Market Distortions

The FIRE Program is specifically targeted to address the lack of experience of project finance structures in the RE sector in Turkey. So far, there has not been any non-recourse project financing of RE projects, making project sponsors and financiers uncertain and hesitant about pursuing such deals. Perceived risk and lack of track record impact the cost of RE technologies, making it unfeasible for project sponsors to proceed. IFC will focus the use CTF funds to remove the barriers that are preventing first movers from entering the market in the first several project finance deals. IFC will limit the amount of CTF support to minimal levels necessary to stimulate uptake in the market. Over time, as the market becomes proven,

¹⁶ For example, according to the Natural Resources Defense Council study, a 250-megawatt wind project generates 522 construction jobs, 432 positions in manufacturing, 80 for planning and development, 18 sales slots and 27 for operations. Bloomberg, 2012. Retrieved from <http://www.bloomberg.com/news/articles/2012-09-11/average-wind-farm-creates-1-079-jobs-nrdc-report-finds>

it is expected that additional project financing will become more readily available to RE developers, without the need for concessional finance.

2.9 Effective Utilization of Concessional Finance

Concessional funding will:

- Set a precedent for a series of successful projects under a new type of financial structure (project finance);
- Enable sub-projects to obtain financing with terms not currently available on the market, but necessary for sub-projects to move forward;
- Allow IFC and other investors to provide financing to sub-projects, reaching financial closure;
- Directly enable the construction of a series of RE projects and accelerate growth of RE in Turkey;
- Encourage private sector participation, especially among RE project developers not currently active in Turkey and local banks who lack experience in project finance.

2.10 Risks

Potential risks associated with the Program include:

- Lack of uptake from RE project developers
Mitigant: IFC has been closely monitoring market conditions in Turkey and has seen an initial interest in related market segments in various RE technologies.
- Lack of experience and capacity in the financial sector
Mitigant: By participating in the deals, IFC will be able to share its significant experience accumulated in project financing of a number of projects across the globe.
- Traditional RE risks: These include tariff and market considerations, completion risks and technology concerns.
Mitigant: These risks will be considered by IFC when selecting sub-projects to benefit from the Program. Residual risks stemming from the inherent uncertainty of the RE resource, possible cost overruns, and other factors may be addressed through financial structuring measures such as the establishment of minimum financial ratios and reserve accounts. In general, RE technologies and associated risks are fairly well known and IFC has accumulated significant experience in structuring RE projects adequately.

3 PERFORMANCE INDICATORS

The performance indicators outlined below are derived from the CTF Results Measurement Framework. These indicators will be tracked at least annually. Suggested performance indicators include:

Indicator	Current Baseline	Anticipated Impact
DIRECT IMPACTS:		
Increased supply of RE	No project-financed RE deals	75 MW
GHG emissions avoided	0 tCO _{2e} per annum	62,000 tCO _{2e} over a representative year; 1,240,000 tCO _{2e} over the life

Incremental financing leveraged (of all non-CTF parties)	US\$0	US\$102.25 million for the entire Program, including at least US\$30 million on IFC's own account
Jobs created	N/A	About 8 permanent jobs, up to 150 temporary construction jobs, and 120 jobs in components manufacturing