Document of
The World Bank

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Report No: 46808-TR

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT LOAN

IN THE AMOUNT OF US$500 MILLION
(TSKB: US$210 MILLION AND EUR109.6 MILLION
TKB: US$130 MILLION AND EUR15.7 MILLION)

AND A

PROPOSED LOAN FROM CLEAN TECHNOLOGY FUND (CTF)

IN THE AMOUNT OF US$100 MILLION
(TSKB: US$70 MILLION
TKB: US$30 MILLION)

TO

TÜRKİYE SINAİ KALKINMA BANKASI A.Ş. AND

TÜRKİYE KALKINMA BANKASI A.Ş.

WITH THE GUARANTEE OF THE REPUBLIC OF TURKEY

FOR A

PRIVATE SECTOR RENEWABLE ENERGY AND ENERGY EFFICIENCY PROJECT

May 1, 2009

Sustainable Development Department
Turkey Country Unit
Europe and Central Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective February 28, 2009)

Currency Unit = New Turkish Lira (YTL)
1.6945 YTL = US$1
0.59 US$ = 1YTL

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	Agence Française de Développement
BRSA	Banking Regulatory and Supervisory Agency
CBRT	Central Bank of the Republic of Turkey
CPS	Country Partnership Strategy
CSP	Concentrated Solar Power
CTF	Clean Technology Fund
DSI	General Directorate of State Hydraulic Works, Turkey
EMBI	Emerging Markets Bond Index
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EIE	General Directorate of Electric Power Resources Survey and Development Administration
EML	Electricity Market Law
EMP	Environmental Management Plan
EMRA	Energy Market Regulatory Authority
ESCO	Energy Service Company
EU	European Union
EÜAŞ	Electricity Generation Corporation of Turkey
FI	Financial Intermediary
FMR	Financial Management Report
GHG	Greenhouse Gas
IFI	International Financial Institution
IRR	Internal Rate of Return
ISE	Istanbul Stock Exchange
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau, German Development Bank
LUCF	Land Use Change and Forestry
MENR	Ministry of Energy and Natural Resources
MoEF	Ministry of Environment and Forestry
$mtCO_2$	Million tons of carbon dioxide
MW	Mega Watt
NCCC	National Communication on Climate Change
PIF	Project Introduction File
PV	Photovoltaic
TEDAŞ	Electricity Distribution Corporation of Turkey
TEİAŞ	Electricity Transmission Corporation of Turkey
TETAŞ	Electricity Trading Corporation of Turkey
TKB	Development Bank of Turkey
TPES	Total primary energy supply
TSKB	Industrial Development Bank of Turkey
TWh	Terawatt hour
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change

Vice President:	Shigeo Katsu
Country Director:	Ulrich Zachau
Sector Manager:	Ranjit Lamech
Task Team Leader:	Sameer Shukla

TURKEY
Private Sector Renewable Energy and Energy Efficiency Project

CONTENTS

TURKEY

PRIVATE SECTOR RENEWABLE ENERGY AND ENERGY EFFICIENCY PROJECT

PROJECT APPRAISAL DOCUMENT

EUROPE AND CENTRAL ASIA

ECSSD

Date: May 1, 2009	Team Leader: Sameer Shukla
Country Director: Ulrich Zachau	Sectors: Renewable energy (100%)
Sector Manager/Director: Ranjit J. Lamech	Themes: Climate change (P);Other economic management (S)
Project ID: P112578	**Environmental screening category: Financial Intermediary Assessment**
Lending Instrument: Specific Investment Loan	

Project Financing Data

[X] Loan [ ] Credit [ ] Grant [ ] Guarantee [X] Other: Clean Technology Fund (CTF)

For Loans/Credits/Others:
Total Bank financing (US$m.): 500.00
Proposed terms: VSL

Financing Plan (US$m)

Source	Local	Foreign	Total
Borrower	276.75	273.25	550.00
International Bank for Reconstruction and Development	100.00	400.00	500.00
Clean Technology Fund	20.00	80.00	100.00
Total:	396.75	753.25	1,150.00

Borrower:
Turkiye Sinai Kalkinma Bankasi (TSKB)
Meclisi Mebusan Cad. No 81
Istanbul
Turkey
Tel: +90 (212) 334 5050 Fax: +90 (212) 334 5234
www.tskb.com.tr

Turkiye Kalkinma Bankasi (TKB)
Necatibey Caddesi No 98
Turkey
Tel: +90(312) 231 8400 **Fax:** +90 (312) 230 2394
www.tkb.com.tr

Responsible Agency:
TSKB
Meclisi Mebusan Cad. No 81
Istanbul
Turkey
Tel: +90 (212) 334 50 50 Fax: +90 (212) 334 5234
info@tskb.com.tr
www.tskb.com.tr

TKB
Necatibey Caddesi No 98
Ankara
Turkey
Tel: +90(312) 231 8400 Fax: +90(312) 230 2394
www.tkb.com.tr

Estimated disbursements (Bank FY/US$m)									
FY	2010	2011	2012	2013	2014				
Annual	50.00	125.00	150.00	125.00	50.00				
Cumulative	50.00	175.00	325.00	450.00	500.00				

j t ıplemenıa period: St t June 3 l),
xpected effectiveness ı June 5 2009
Expected closirg date: :m 1, 201

Does the project depart from the CAS in content or other significant respects? ***Ref. PAD A.3.***	[ ]Yes [X] No
Does the project require any exceptions from Bank policies? ***Ref. PAD D.7.***	[ ]Yes [X] No
Have these been approved by Bank management?	[ ]Yes [X] No
Is approval for any policy exception sought from the Board?	[ ]Yes [X] No
Does the project include any critical risks rated "substantial" or "high"? ***Ref. PAD C.4.***	[X]Yes [ ] No
Does the project meet the Regional criteria for readiness for implementation? ***Ref. PAD D.7.***	[X]Yes [ ] No

Project development objective ***Ref. PAD B.2., Technical Annex 3***
The project's development objective is to help increase privately owned and operated energy production from indigenous renewable sources within the market-based framework of the Turkish Electricity Market Law, enhance energy efficiency, and thereby help reduce greenhouse gas emissions.

Project description *[one-sentence summary of each component]* ***Ref. PAD B.3., Technical Annex 4***

The proposed Project will closely follow the project design of the existing Renewable Energy project. The proposed loan will help increase privately owned and operated energy production

from indigenous renewable sources within the market-based framework of the Turkish Electricity Market Law, enhance energy efficiency, and thereby help reduce greenhouse gas emissions. The proposed Project will consist of two IBRD credit lines, one each to TSKB and TKB, and two CTF credit lines to each FI. In aggregate, CTF financing will be limited to 20% of the total project costs of sub-projects. The FIs will allocate 10% of the IBRD loan towards energy efficiency, with the remaining focused on renewable. The Project will be complemented by a parallel technical assistance program financed by other donors (KfW and UNDP at this stage), through ongoing and planned activities. The TA will focus on capacity building for financial intermediaries and industries for energy efficiency investments. Other donors such as JICA and AfD also may consider providing additional TA as necessary.

Renewable Energy: all renewable energy sources are eligible for financing including hydro, wind, geothermal, biomass, and solar energy, including renewable resources (such as geothermal) for heating and cooling.

Energy efficiency: Energy efficiency investments will be eligible for financing under the proposed project. Such eligible energy efficiency investments will likely be in sectors such as iron and steel, cement, ceramics, chemicals and textiles.

Risks: The overall risk of the project is rated Moderate. In view of the ongoing global economic downturn and financial turmoil, the risk relating to fiscal and other macroeconomic policies is rated Substantial.

Which safeguard policies are triggered, if any? ***Ref. PAD D.6., Technical Annex 10***

Environmental Assessment - OP 4.01
Involuntary Resettlement - OP 4.12
Safety of Dams - OP 4.37

Significant, non-standard conditions, **if any**, for:
Ref. PAD C.5.
Board presentation:

Loan/credit effectiveness:

Covenants applicable to project implementation:

- The Borrower shall comply with the applicable prudential regulations of the Guarantor.

- The Borrower shall prepare and furnish to the Bank as part of the Project Report, not later than forty-five (45) days after the end of each calendar semester, interim un-audited financial reports for the Project covering the semester, in form and substance satisfactory to the Bank.

- The Borrower shall maintain, until the completion of the Project, the PIU, and ensure that the PIU functions at all times in a manner and with staffing and budgetary resources necessary and appropriate for Project implementation, and satisfactory to the Bank.

- The Borrower shall submit for the Bank's approval: (a) the first Energy Efficiency Sub-project; (b) the first Renewable Energy Sub-project using the proceeds of the CTF Loan; and (c) all Sub-projects which are classified as Category A Sub-projects in accordance with the provisions of the Operational Manual.

- The Borrower shall, not later than six months after the end of each calendar year during Project implementation, carry out a review of procurement practices used by Sub-project Sponsors for procuring goods, works and services for Sub-projects by an independent consulting firm in accordance with the terms of reference agreed with the Bank.

- The Borrower shall make Sub-loans or provide Financing Leases to Sub-project Sponsors on the terms and conditions set forth in the Operational Manual, including, without limitation, the terms and conditions set forth in the Loan Agreement.

- The Borrower shall ensure that Sub-loans and Financing Leases shall be made for projects which will have at least fifteen percent (15%) sponsor equity financing for Renewable Energy Sub-projects, and at least twenty five percent (25%) sponsor equity financing for the Energy Efficiency Sub-Projects; and generate a financial rate of return of at least eight percent (8%);

- The Borrower shall ensure that Sub-loans and Financing Leases shall be made for Sub-projects which will be in compliance with all requirements pertaining to environmental protection applicable under the laws and regulations of the Guarantor and with the Environmental Policy Framework, Land Acquisition and Resettlement Policy Framework and Dam Safety Framework. To that end, the Borrower shall require each Sub-project Sponsor applying for a Sub-loan to furnish evidence satisfactory to the Bank and the Borrower, showing that the Sub-project in respect of which the application has been made has been prepared in accordance with such procedures, such evidence to include, *inter alia,* an environmental management plan, land acquisition plan and/or resettlement action plan, as might be applicable for a Sub-project submitted for approval.

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

1. **The global economic downturn has worsened the outlook for emerging markets in general as well as Turkey.** The government forecasts Turkish economic growth to be -3.6 percent in 2009 and the outlook for 2010 is uncertain. World economic growth in 2009 was projected (as of March 2009) to be negative (-1.7 percent),[1] with the EU (-2.7 percent), Turkey's main export market, expected to experience a severe recession. In addition to slowing demand for exports, capital flows towards developing countries have fallen dramatically relative to the highs of 2007. (The International Institute for Finance forecasts 2009 flows to Emerging Markets around US$165 billion, down from US$929 billion in 2007.) The pricing of emerging market risk has altered correspondingly. The Emerging Markets Bond Index (EMBI+) has risen from 239 basis points at end-2007 to 639 basis points on March 30, 2009.

2. **Turkey's slowdown started in earnest in the fourth quarter of 2008, driven by declining exports and low domestic demand.** Fourth quarter GDP fell 6.2 percent from a year earlier, and capacity utilization, a leading indicator of production and income, was at an 18-year low of below 64 percent in February 2009. Exports in December 2008 were down 21 percent from a year earlier. Unemployment reached 15.5 percent in January 2009, higher now than during the 2001 economic crisis in Turkey. More than one in four young workers is unemployed. However, while these figures imply difficult times for Turkish workers and their families, they are by no means exceptional among emerging markets, among which those most integrated in the world economy have generally been hardest hit.

3. **The magnitude of the contraction will mainly depend on whether or not growth recovers in the second half of the year**, which in turn will depend mainly on the pick-up in domestic consumer demand, since external demand is not expected to pick up that soon.

4. **Having relied on substantial positive net capital inflows during the 2002-2007 period of high economic growth, Turkey's corporate sector faces a major challenge in continuing to attract external financing**, as its re-financing needs will be higher in 2009 than in 2008, in a global environment in which total external capital flows to emerging markets are expected to decline dramatically. Turkey's estimated short, medium- and long-term external amortizations in 2009 are about US$100 billion, of which about 58 percent come from the non-bank private sector. Rollover needs have been more than met in 2008, but the decline in rollover ratios in late 2008 underlines that uncertainty remains about external financing in 2009 and 2010. As of March 30, the Turkish lira had depreciated by 45 percent against the US dollar since end-2007 (and by 30 percent against the euro).

5. **The relatively strong financial sector is likely to be able to absorb the valuation effects and liquidity risk from downside economic scenarios without a systemic threat.** Direct spillovers from the global financial crisis, through bank ownership structure or exposure to sub-prime assets, have been and are likely to remain limited. FX liquidity will be supported by strong ownership and a domestic foreign currency (FX) deposit base. Majority-owned foreign banks operating in Turkey are small, making up 15 percent of total assets, while foreign

[1] World Bank, *Global Economic Prospects,* March 30, 2009.

banks hold no controlling interest in any large domestic banks,[2] and the fundamental business franchise of these Turkish banks with minority foreign stakes is sound. Moreover, Turkish banks do not have significant exposure to mortgage-backed securities. Finally, the household sector, which maintains significant holdings of foreign exchange, has in the past acted as a significant buffer against currency fluctuations by switching FX deposits to TL after local currency depreciations. Households' long FX position remains above US$85 billion.[3]

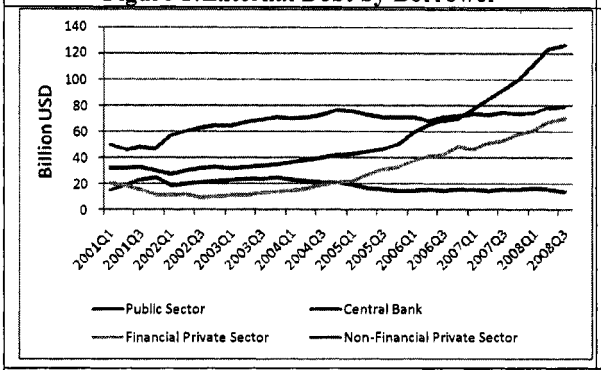
6. **In this environment Turkish macroeconomic policy has relied mainly on traditional monetary easing through inflation targeting to boost domestic demand.** Between end-October 2008 and end-February 2009, the Central Bank of the Republic of Turkey (CBRT) has cut interest rates five times for a total reduction of 625 basis points. The CBRT has focused measures on maintaining liquidity, particularly foreign exchange, and confidence in the banking sector. A long list of measures has included CBT intermediation in the interbank Foreign Exchange (FX)-deposit market and increasing maturity and lending limits therein; granting the Council of Ministers the legal power to increase deposit insurance if necessary; lower reserve requirements; raising CBRT lender-of-last-resort facility maturities and limits; amending regulation to facilitate loan restructuring for viable firms; and amending corporate debt securities regulation to facilitate rollover.

7. **Fiscal policy remains consistent overall with debt sustainability and macroeconomic stability.** The central government primary budget surplus was 1.9 percent of GDP in 2008 compared with the target under the medium-term fiscal framework (MTFF) of 2.7 percent. At the same time, the central government's overall deficit, at 1.8 percent of GDP (versus the target of 1.9 percent), will lead to only a slight rise in the public debt-to-GDP ratio in 2008 (to 42.2 percent from 41.6 percent in 2007). In April 2009 the government released new budget estimates forecasting an overall fiscal deficit of 4.6 percent of GDP for 2009, falling to 3.2 percent in 2010 and 2.8 percent in 2011.

8. **During 2002-2008, public debt was brought down to manageable levels, with limited vulnerability of gross debt to exchange rate risk.** Analysis carried out by Bank staff indicates that, even under severe stress testing, public debt remains on a stable or downward-sloping trajectory, and is sustainable in the long term, despite an expected moderate increase in 2009-10, largely due to the impact of the global economic crisis. In particular, the external debt fell rapidly after the 2001 crisis but has risen slightly since 2005 (driven by corporate-sector external borrowing). Assuming the continued availability of credit from external markets, Turkey's gross external debt ratio, including both public and private debt, would increase gradually in the near term, mainly reflecting continuing current account deficits, but on a declining trend given lower oil prices and shrinking domestic demand. Gross external financing needs in 2008-12 are projected to increase as private-sector non-bank amortizations increase, and corporate external borrowing are expected to continue to be the main driver of increasing external debt ratios (Figure 2). A sharp depreciation or a fall in non-debt creating inflows would place the external debt ratio on a steeper upward path. Still, the composition of external debt has improved, with the share of short-term debt outstanding in gross external debt declining to about 16 percent as of mid-2008.

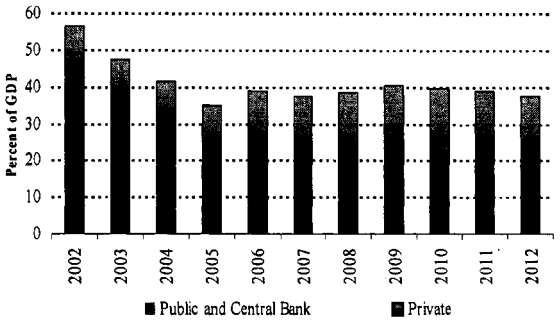
[2] Citigroup holds 20 percent of Akbank, GE Capital owns 21 percent of Garanti, and Unicredit owns 41 percent of Yapi Kredi.
[3] CBRT.

Figure 1:External Debt by Borrower



Source: Treasury

Figure 2: Total External Debt Projection



Source: Staff projections

9. **External debt sustainability will depend in the longer term on reducing the current account deficit.** In this respect, improved energy efficiency and the further diversification of energy sources will be important to help reduce the country's external energy dependence. The activities supported by the proposed Project therefore have a direct relation to Turkey's longer-term objective of macroeconomic sustainability.

10. **Although the global financial crisis poses macroeconomic challenges to Turkey, deep structural progress since 2001 and continuing strong economic policy should allow the country to navigate the current downturn.** The main risk is of further tightening of international liquidity for an extended period of time, leading to a more severe economic downturn. Were this to happen, strong balance sheets in the public and financial sectors should help Turkey manage the situation, but growth and employment in the private sector would suffer even more than they currently do.

11. **After the completion of its stand-by arrangement with the IMF in May 2008, the government is now in discussions with the IMF on a possible new arrangement.**

The Banking Sector

12. Turkey's banking sector is substantially more resilient than before the 2001 crisis and is in a better liquidity position than banking sectors in many other countries in the Region. The overall capital adequacy ratio for the sector, at 18 percent, is well above the Banking Regulation and Supervision Agency (BRSA) requirement of 12 percent. Return on equity and assets of about 18.6 percent and 2.5 percent as of end 2008, respectively, point to a still strong level of profitability for a sector with solid growth. The economic downturn resulting from the global financial crisis poses a significant risk, with projections showing lower profitability and higher delinquency in the sector's asset portfolio. However, up to this point, asset quality remains relatively good with somewhat low non-performing loans (NPL) and high provisioning levels. As of end 2008, Government securities account for less than a third of banks' total assets.

13. The supervisory framework for the banking sector has improved substantially since the 2001 crisis. The regulatory framework has been revised to be mainly in line with the international practices, as with most of the operational, governance and prudential regulations.

BRSA, the banking sector regulator in Turkey, has extensive reporting requirements and monitors the credit activities of the banks in detail. Additionally, there is more transparency now, as most banks disclose quarterly financial statements and statistics within weeks.

14. Foreign currency liquidity risk is mitigated by a strong domestic deposit base. Even though roughly forty percent of the banking sector's liabilities are in foreign currency, they mainly stem from domestically collected deposits rather than direct borrowing from abroad. Capital inflows to the economy have mostly come through the government securities market, investments in the Istanbul Stock Exchange (ISE), and more recently directly to the corporate sector. Thus, whereas the economy is exposed to a reversal of capital flow, the banking sector exposure is more indirect. The net open foreign currency position is well managed and amounts to 1.1 % capital as of January 2009.

15. Access to finance for the private sector has improved, but medium and long term financing remains scarce. The sector has expanded access of credit to the private sector, but the domestic credit remains at a modest 31.1 percent of GDP as of 2008 and is well below that of similar income level countries. Additionally, medium and long term lending to the private sector remains modest, due to the short maturity of the banks' funding base and banks' desire to limit maturity mismatches. Fifty percent of bank assets as of September 2008 have maturities with less than one year, so investment and project finance loans with longer maturities are still at an early stage of development. The average maturity of deposits in Turkey is between 1 and 2 months. Banks accept some degree of maturity mismatch risks, but they do so only for the highest credit quality borrowers and at high interest rates. Recessionary pressures on the economy from the financial crisis on the international level will make it even more difficult for the financial sector in Turkey to generate long-term financing.

16. Financing of suitable medium to long-term tenor is thus scarce in Turkey, particularly for small scale long-term investments for renewable energy and energy efficiency. This is one of the major constraints limiting the growth of renewable energy in Turkey – as shown later, there is a substantial level of viable renewable energy and energy efficiency projects in Turkey, but these have been slow in taking off due to, among other reasons, the lack of suitable financing at reasonable prices.

The Energy Sector

17. **Government strategy and focus:** The Government's updated energy strategy and Turkey's Ninth Development Plan (2007-13) both aim at ensuring security of energy supply, while keeping environmental effects at a minimum level (See Annex 1). The Government is particularly focused on developing renewable energy resources, in which Turkey is well-endowed, and scaling up energy efficiency investments in various parts of the economy – industry (which accounts for about 32 percent of total energy consumption in 2006[4]), municipal facilities, public and residential buildings, appliances and equipment, lighting, etc.

18. The focus on renewable and energy efficiency is driven by the imperative to address three key energy-related development issues:

- CO_2 emissions – Turkey's greenhouse gas (GHG) emissions are growing rapidly. Total GHG emissions rose from about 170 million tons of carbon dioxide (CO_2) equivalent in

[4] IEA Energy Statistics, 2006

1990 to about 300 $mtCO_2$ in 2005 (excluding land use change and forestry – LUCF). CO_2 emissions consistently account for a large majority of total emissions, at about 85.3 percent or 256 $mtCO_2$. Emissions from the energy sector have grown the fastest over this period, and the energy sector accounts for the majority (77 percent) of GHG emissions in the country. CO_2 emissions are projected to continue to increase from 256 $mtCO_2$ in 2005 and exceed 604 $mtCO_2$ by 2020 in the reference case scenario presented in the Government's 1st National Communication on Climate Change (NCCC), January 2007 to the United Nations Framework Convention for Climate Change (UNFCCC);

- Security of energy supply, especially electricity - Electricity demand in Turkey is increasing rapidly. Additional generating capacity and increased focus on energy efficiency are urgently required to improve the security of supply; and
- Energy import cost - The cost of energy imports in 2006, 2007 and 2008 amounted to US$ 29 billion, US$34 billion and US$48 billion, respectively (34 percent, 31 percent and 36 percent of the corresponding value of Turkey's total exports). A substantial part of these imports, especially natural gas, are used for electricity generation.

19. The Government is implementing the NCCC Reference Case which takes Turkey 11 percent below the emission level of the business-as-usual (BAU) case (see table below). Additional scenarios are shown below, which factor in additional investments and emissions reductions through interventions including renewable energy and energy efficiency.

Table 1: Emission Scenarios for 2020

	Million tons CO_2	% of BAU
Business-as-Usual (BAU) Case	682.7	-
NCCC Reference Case	604.6	-11
Accelerated Emission Reduction Case	468.6	-31
Emission Reduction Stretch Case	384.2	-44

20. **Investment needs in energy and role of private sector:** Significant investments will be needed to contain emissions and to mitigate supply security. A large portion of this investment will need to be financed by the private sector. The Government's encouragement of private sector participation will result in increased competition and improved efficiency in the supply of electricity.

21. **Limited long-term financing for renewable energy and energy efficiency:** At the same time, as discussed earlier, long-term financing is still quite limited in Turkey. Renewable energy needs tenors far in excess of the longest maturities available in Turkey today. Energy efficiency is still relatively untested in Turkey and is perceived to carry significant risks (detailed later). Some financing is now emerging for renewable energy projects, building on the success of the ongoing Renewable Energy Project, which has resulted in significant renewable capacity addition (more than 600 MW) and concomitant emission reductions (about 1.01 $mtCO_2$). IFC and other multilateral and bilateral sources such as EIB, KfW and AfD have also entered the market. To some extent, particularly for specific types of equipment, suppliers' credit is available. However, the need for renewable energy financing substantially exceeds availability. The Government has ambitious plans for renewable energy. In keeping with the plans, licenses for more than 3,300 MW have been issued so far for wind projects as of January 2009, although a tender by EMRA resulted in applications amounting to 78,000 MW. Similarly, licenses of about 11,000 MW have been issued in hydro (See Annex 4 for more information). Implementation is thus being constrained by the extent of financing available.

22. **Renewable energy:** The Government's target is to raise the share of electricity generated from renewable sources (hydro, wind, biomass, geothermal, solar, landfill gas), from 19 percent in 2007 to 25 percent by 2020. The Renewable Energy Law was passed in May 2005. This provides a number of incentives to encourage renewable energy, including a feed-in tariff and an off-take agreement with the host distribution company. There has been a significant upsurge in private sector interest in renewable energy, but financing constraints are slowing down development. The Government's target is to increase hydro capacity from the current level of 13,500 MW to 30,000 MW by 2020 (this includes large hydro capacity of about 11,500 MW right now, growing to about 16,000 MW). The target for wind energy growth is even more ambitious, from the current capacity of about 452 MW to 20,000 MW in 2020.

23. **Renewable energy potential:** Turkey is well-endowed with renewable energy resources. Total potential hydropower is estimated at around 126 TWh per year (with normal rainfall conditions) of which about 30 percent has been developed. Turkey is also rich in wind resources. A recent survey indicated that there is about 48,000 MW of economic potential. This is mostly close to the Sea of Marmara and the Aegean Sea (about 70 percent together) with smaller amounts close to the Mediterranean Sea and Black Sea. If this capacity were fully exploited, production could be close to 96 TWh. Currently, estimated geothermal capacity is about 600 MW of electricity generating capacity of which about 30 MW are currently being exploited and 71 MW under active development. In addition there is perhaps 30,000 MW of geothermal heating potential, little of which is being used. The heating potential is mostly in the ambit of municipalities, which often do not have adequate capacity to design and implement these projects. The initial costs of drilling and others also act as a disincentive to large-scale development of geothermal resources. Solar energy potential is also very good.

24. In addition to the above developed renewable energy technologies which are being exploited in Turkey to a greater (as in hydro) or lesser (for instance, wind, geothermal) extent, there are several other renewable technologies which are technically proven elsewhere in the world but have not been used a lot in Turkey because they are less attractive economically and/or not well-known. These technologies include biomass, biogas, landfill gas, and solar. The potential for biomass electricity generation is estimated at around 3.4 TWh per year under quite conservative assumptions (See Annex 4). These technologies are not likely to be as prevalent as wind or hydropower, but once developed, they can make a major contribution to Turkey's renewable energy production and to the reduction in greenhouse gas emissions.

25. **GHG reduction potential from renewable energy:** If Government targets for renewable energy materialize as discussed above, it would result in a reduction of 49 million tons of CO_2 emissions in 2020, a 7 percent reduction beyond the reference case (Refer to Annex 1 for further details). It is important to note that the reference case already includes significant renewable energy – hydro power capacity reaches 30,000 MW and non-hydro generation capacity (mostly wind) reaches 3,000 MW by 2020. Under the reference case, CO_2 emissions reach 604 mt in 2020. In the BAU case with more conservative assumptions about renewable development, CO_2 emissions would reach about 683 mt.

26. **Energy efficiency:** The Energy Efficiency Law (No: 5627) was adopted by the Turkish Grand National Assembly in April 2007, and regulations were issued in 2008 covering specific areas of focus. The objective of this Law is to use energy efficiently, to prevent energy losses, to moderate the burden of energy costs on the economy, to increase the yield in the use of energy resources and to protect the environment. This Law targets industrial facilities,

buildings, service and transport sectors, and also power plants; generation, transmission and distribution networks. The Law also provides for subsidies of up to 20 percent of the project cost for small energy efficiency projects in the industry sector, which are not the target for the proposed Project. The Law further provides for the establishment of the energy efficiency consultancy companies which, under an appropriate performance contracting regime, can be useful in promoting energy efficiency in some sectors such as small and medium enterprises (SMEs).

27. **Energy intensity of the economy:** The Turkish economy is considered to be energy intensive when compared with several comparable countries (Refer to Annex 1 for further details), and this will increase further with increased industrial growth and urbanization. Though total primary energy supply (TPES) per capita in Turkey is among the lowest – 1.2 toe/capita in 2005 compared to the OECD average of 4.7 toe/capita, the Turkish economy is comparatively more energy intensive – 0.35 toe/'000 GDP (in 2000 US$) in 2005 compared to an OECD average of 0.20 toe/'000 GDP (and a world average of 0.32 toe/'000 GDP). High energy intensity of a country's economy may not of course directly lead to a high potential for energy efficiency, and specific sectors have to be analyzed in terms of energy efficiency potential.

28. **Energy efficiency potential:** An assessment by the International Energy Agency (IEA) estimates that two-thirds of the reduction in carbon dioxide emissions expected from developing countries would come from increased energy efficiency. As further assessments of Turkish industry show, parts of it can indeed benefit from energy efficiency investments as significant parts of industrial sectors in Turkey also compare unfavorably with other countries in terms of energy efficiency (Annex 1). At the same time, other segments of the economy, particularly municipal facilities, and public and residential buildings also show a significant need for energy efficiency investments and efforts.

29. **GHG reduction potential from energy efficiency:** The NCCC presents a Demand Side Management (DSM) case analyzing the impacts of a 15 percent reduction in industrial electricity consumption and 10 percent reduction of electricity consumption in residential applications. In line with international experience, the results of the implementation of such measures would be highly beneficial – a win-win for the economy and the environment. Turkey's CO_2 emissions in 2020 would be 75 $mtCO_2$ (11 percent) below the business as usual (BAU) case, while total cumulative CO_2 emissions by 2020 would be reduced by about 7.1 percent as a result. Even further emission reductions from energy efficiency are feasible, and the Emission Reduction Stretch Case estimates an additional 75 $mtCO_2$ emission reduction.

30. **Barriers to renewable and energy efficiency investments:** Even though energy efficiency has significant benefits, and is normally financially viable, experience with energy efficiency investments in other countries shows that many energy efficiency projects remain unimplemented because of key barriers which have impeded the development of the lending market for medium and large-sized industrial energy conservation investments, despite its large potential. These investments face market barriers in Turkey because of a higher level of perceived technical and financial risk. Another key financial barrier is the high transaction costs faced by both industry as well as financial institutions in energy efficiency investments. Such costs can arise from energy audits, feasibility studies, sometimes the need to shut down processes in order to rehabilitate or replace parts. Energy efficiency investments require innovations for efficient loan origination, reliable and cost-effective technical appraisal skills,

development of specific loan products, and often, efficient means to package investments together to achieve scale economies in origination and appraisal. All these elements add to the transaction costs. These costs are further enhanced by the lack of adequate familiarity and experience with identifying and preparing such projects both within industry as well as in banks. As a result, financial institutions as well as industry do not see an incentive in developing these businesses.

31. Renewable energy investments also face significant barriers. Technical risk and higher capital requirements in technologies such as solar and geothermal often deter investments. Geothermal projects often entail upfront exploration and development risks. Solar technologies are still very new and capital costs tend to be high. Further, transaction costs involved in developing renewable energy projects are also high particularly in newer areas such as solar, geothermal and biomass but also in developing small hydro or wind, which are often located in remote areas.

2. Rationale for Bank involvement

32. **Consistency with CPS:** Continued Bank support for renewable energy and support for energy efficiency is consistent with the Country Partnership Strategy 2008-11 (Report No. 42026-TR) which highlights the importance of ensuring reliable and efficient energy supply both through supply side measures in increasing generation capacity as well as through demand side energy efficiency improvement. Sustained electricity imbalances will have serious adverse macroeconomic impacts. Therefore the Government is executing a substantial reform program to eliminate the imbalances and mitigate the adverse macroeconomic impacts. Further, the Project will enhance private investment in the sector, thereby supporting a key imperative of the Government's development strategy. The Bank has also been supporting the Government on various issues concerning the energy market, including the implementation of the electricity market, development of renewable energy, privatization and supply security. The Project will supplement these past efforts through support for alternative energy sources and energy efficiency.

33. **Rationale for the use of Clean Technology Fund (CTF):** Prioritization of CTF resources across countries and programs is driven by the following eligibility criteria: (a) significant potential in emissions reductions, (b) demonstration potential, (c) development impact and (d) implementation potential. Annexes 1 and 11 assess Turkey and the proposed interventions, respectively, against these criteria. Given the sizeable contribution of the energy sector to Turkey's emissions (77 percent of emissions in Turkey in 2005 were attributable to the energy sector) the Government's proposal to select energy as the key sector for interventions under the CTF with a focus on renewable electricity generation and energy efficiency is consistent with CTF criteria. As explained in Sections B.1 and B.3, CTF resources in the amount of US$100 million are proposed to be blended in the Project and are proposed for supporting (a) renewable energy sources through the acceleration of small hydro, wind energy and geothermal projects, and through support for the use of emerging renewable technologies such as solar, biomass, etc., and (b) supporting the development of energy efficiency investments (See Annex 11 for details). A comprehensive approach is being proposed because the achievement of the Government's targets for emissions and energy intensity by 2020 necessitates a multi-pronged approach. Further, a portfolio approach is a prudent risk management strategy for the financial intermediaries, and will also help them respond to the demand they foresee from their clients.

34. In the absence of CTF support, it is anticipated that renewable energy development will remain restricted to the few existing large hydro developers and perhaps the initial (lower cost) wind energy sites. Without CTF support, it is unlikely that smaller hydro and wind projects will materialize at the expected scale, or that investors would experiment with relatively newer technologies such as solar or biomass. Finally, without CTF support, it is not likely that financial institutions will consider energy efficiency investments, or that industry will be attracted towards such investments. In short, without CTF support, the Government's targets for greenhouse gas emission reductions and sustainable energy intensity levels may not be achieved at the scale and in the timeframe envisaged.

3. Higher level objectives to which the project contributes

35. The proposed Project is a key element of Turkey's strategy for climate change, and will have significant sustainable development impacts. With the help of CTF resources, it aims to make a major positive contribution to three critical development objectives in Turkey: (1) it helps Turkey improve energy efficiency as well as overall energy generation capacity, thereby helping enhance energy security – once replicated throughout the economy, the energy intensity of the Turkish economy could reduce by about 16 percent by 2020; (2) it does so "cleanly" with a focus on environmental sustainability by reducing greenhouse gas emissions – through its transformational impact, CTF would potentially help the Government reduce emissions by 44 percent in 2020 compared to the business as usual scenario; and (3) it provides financing for private sector investments in clean energy – with credit intermediated through Turkish banks, which helps increase private sector investments. It is expected that with CTF support, the proposed Project can demonstrate the viability of investments in underutilized renewable energy and energy conservation technologies, and can widen the investor base. Further, by helping the financial intermediaries gain experience and build capacity in such projects, the use of CTF will catalyze further investments. The use of CTF in this fashion is expected to result in a sustainable business model which can be replicated across the country.

36. The Project will assist in enhancing private investment in the energy sector significantly – as mentioned above, significant resources are required for the energy sector, and private investment is key to the Government's aim of maintaining supply security. At present, after including the ongoing Project, financing available for renewable energy is about US$70-75 million on average every year. With the proposed Project, the annual financing available will still be below the level necessary, but will increase significantly to US$180-185 million per year. The Government's Ninth Development Plan has also endorsed the importance of private sector development. The private sector is expected to be the primary source of the productivity gains and innovations required to sustain economic growth, generate employment opportunities and bring living standards closer to European levels. In helping implement this endeavor, the proposed Project will play a key role, focusing as it does on fostering private investment in renewable energy generation.

37. Finally, the Project will help in mitigating supply security risks in Turkey – on the supply side by supporting additional domestic energy generation capacity, and on the demand side, by assisting in improving energy efficiency. The Project will thereby assist in preventing significant macroeconomic impacts which would arise if the country were to face sustained imbalances in the supply and demand for energy.

B. PROJECT DESCRIPTION

1. Lending instrument

38. The proposed Bank Loan to TSKB and TKB will be a Specific Investment Loan with a Variable Spread (VSL) denominated in US dollars and Euros with level repayment of the principal. The Loan would be guaranteed by the Republic of Turkey. CTF resources are proposed to be made available to eligible sub-projects through the two banks at harder concessional terms[5] and with a guarantee by the Republic of Turkey.

39. **Loan amount:** The demand for financing for renewable and energy efficiency investments being witnessed by the two FIs is high (see Annex 4). A loan of US$500 million; equivalent is proposed, along with CTF resources of US$100 million. The IBRD loan and CTF allocation for TSKB is proposed at US$350 million equivalent (US$210 million and EUR109.6 million) and US$70 million respectively, while for TKB it is proposed at US$150 million equivalent (US$130 million and EUR15.7 million) and US$30 million respectively. The allocation is driven by *inter alia*, the relative sizes of the two FIs, their performance under the ongoing Project, and the size of their respective pipelines.

40. **The level of CTF financing** proposed, US$100 million, is driven by the scale of potential outcomes that could be considered sustainable in a country of the size of Turkey. Although actual projects to be financed are not known upfront, this being an intermediary operation, it is expected that, with US$100 million, about 1 million tons per annum of greenhouse gas emissions could be saved. Other factors that played a role included CTF programming envelopes and the allocation among different types of projects such as public sector energy efficiency, energy efficiency in small and medium enterprises, and public sector grid management. The Government and the two FIs seek higher amounts. Turkey is requesting US$400 million of CTF resources over two phases for renewable, energy efficiency and modern transmission grid management systems – refer to the CTF Investment Plan for further details. The CTF amount for the proposed Project is part of the first phase of US$250 million endorsed by the CTF Trust Fund Committee in January 2009, which also includes an IFC/EBRD loan and an electricity transmission project which would help Turkey improve grid management (smart grid).

2. Project development objective and key indicators

41. The Project's development objective is to help increase privately owned and operated energy production from indigenous renewable sources within the market-based framework of the Turkish Electricity Market Law, enhance energy efficiency, and thereby help reduce greenhouse gas emissions.

42. The indicators are proposed as follows (see Annex 3 for details):

- For renewable energy: Incremental capacity of renewable electricity or thermal heating plants created; Incremental production of electricity or heat; Increase in share of renewable generation in total generation; and Emission reduction potential

[5] The harder concessional terms are as follows: 0.75% service charge per annum, 20 years with 10 years grace (plus 0.1% MDB fee per annum on the undisbursed balance).

- For energy efficiency: Extent of savings in heat or electricity; and Emission reduction potential
- Cost-effectiveness of CTF
- Proportion of renewable energy and energy efficiency projects in the FIs' portfolios over the course of the Project

3. Project components

43. The Project will consist of two credit lines, one each for TSKB and TKB, for financing of renewable and energy efficiency investments. The Project, using IBRD and CTF resources, proposes to finance renewable energy and energy efficiency investments, and will be supported by a parallel technical assistance program financed by other donors focused on capacity building for energy efficiency. Ten percent of the IBRD loan is being allocated for energy efficiency. However, the extent of utilization of the loan for renewable energy and for energy efficiency investments will depend on the market and investor appetites, as well as the credit decision made by the FIs.

44. **Renewable Energy:** As in the existing Project, all renewable energy sources are eligible for financing including hydro, wind, geothermal, biomass, and solar energy. The proposed Project will also finance renewable resources (such as geothermal) for heating and cooling purposes. At the request of the FIs, the eligibility criteria for hydro projects have been altered to reflect the definition of renewable hydro projects in the Renewable Energy Law – those projects with a reservoir area limited to less than 15 km^2. CTF will finance small hydro, those less than or equal to 10 MW in capacity, in addition to other emerging renewable technologies.

45. **Energy efficiency:** The Project proposes to cover also energy efficiency investments. Some of the subsectors likely to be borrowers include iron and steel, cement, ceramics, chemicals and textiles. The eligibility criteria for energy efficiency defined by the FIs during appraisal are based on the extent of energy savings resulting from the investment.

46. In parallel with the Project, technical assistance is proposed through financing by other donors, aimed at building capacity among banks and industry – the objective of this assistance is to help reduce the barriers to energy efficiency investments discussed in Annex 1. The following three broad areas are proposed for support in capacity building (Refer to Annex 4 for details) drawing on lessons learned from recent successful energy efficiency projects in the region (Bulgaria for example):

- First, in order to enable a sustainable investment framework, a capacity building effort is necessary in creating sustainable financing mechanisms and in enhancing the ability of banks to identify and assess energy efficiency projects, loan origination, technical issues, financial appraisal techniques and loan product development;
- Second, the private sector needs assistance with capacity building to help it identify and exploit energy efficiency investments. This capacity building would include assisting with improving energy audits and helping with the training of Energy Service Providers; and
- Third, the new law and regulations place enhanced responsibility and authority on various government institutions in particular on EIE, which will have to play a critical role in research, market facilitation as well as monitoring of various initiatives.

47. Several sources of financing for technical assistance have been identified, and given the significant need for capacity building, one or more sources may indeed be necessary over time. KfW and UNDP have agreed to utilize ongoing and planned TA programs to support capacity building for energy efficiency investments in TSKB and TKB, and to consider further support as necessary. Financing and technical assistance for this aspect may also be considered by Agence Française de Developpement (AFD) and Japan International Cooperation Agency (JICA) as part of their ongoing and planned assistance to Turkey.

48. **Use of CTF resources:** CTF usage is proposed to be targeted towards the investments discussed below with CTF contribution being determined by the extent required to enable subprojects to achieve robust levels of equity returns (See Annex 11 for further details). The following interventions are proposed for CTF co-financing:

- Increase investor confidence in relatively new renewable technologies such as biomass and solar, which are not prevalent in Turkey principally because of lack of awareness about their financial and technical viability or because of high upfront capital costs;
- Broaden the investor base and diversify project locations for small-scale hydro (up to 10 MW);
- Accelerate the deployment of wind energy by moving up the marginal cost curve, in order to support Turkey to reach the highly ambitious 20,000 MW target for wind by 2020; and
- Stimulate the market for energy efficiency investments, as well as help develop sustainable financing mechanisms for such investments. Reducing risk perceptions and transaction costs require innovation in efficient loan origination, reliable and cost-effective technical appraisal skills, development of specific loan products, and often, efficient means to package investments together to achieve sufficient economies of scale in origination and appraisal.

49. The benefits of the CTF financing would be lower interest rates and significantly longer tenor, which are expected to be large enough to significantly increase the incentive to undertake these projects. The CTF funds will be disbursed through the two banks along with the IBRD funds as two separate loans, as terms and conditions of CTF and IBRD funds differ. The procedures and reporting requirements for the funds are outlined in the Operational Manuals.

4. Lessons learned and reflected in the project design

50. The ongoing Renewable Energy Project in Turkey started slowly due primarily to procurement problems. These constraints were largely overcome by amending the Operational Manual for the Project in 2006 and increasing procurement thresholds for use of international competitive bidding (ICB). This allowed the Project to proceed rapidly, with the loan amount now fully committed and about 90 percent disbursed. The Bank realized that in Turkey, particularly for long-gestation projects, private sector commercial practices are the norm, and that the comparatively low thresholds were restricting the use of loan funds. Once the procurement thresholds were raised, the Project started operating successfully. Based on feedback from the intermediaries as well as from existing and potential developers, the proposed Project will use acceptable private sector commercial practices (Refer to Annex 8).

51. Experience with energy efficiency investments in other countries shows that many energy efficiency projects which may be financially viable remain unimplemented because of significant barriers. Significant capacity building and extensive groundwork are therefore

needed in the initial years, before energy efficiency investments take root[6]. The proposed Project, therefore, plans to include, in parallel, a significant focus on technical assistance for these aspects.

52. Experience also suggests that financing mechanisms for energy efficiency need two aspects to be well-balanced: (a) marketing, project development and technical design to assist in preparing a pipeline of good projects, and (b) financing product development and loan origination skills. Recognizing that these aspects will take time to evolve, the Project proposes to provide the FIs with flexibility in developing their institutional capacity and expertise in building up a pipeline – as mentioned above; the Project, therefore, proposes a single component covering renewable energy and energy efficiency projects.

5. Alternatives considered and reasons for rejection

53. The main alternative considered was additional financing to the existing renewable energy loan. This would have saved time and effort. However, this alternative was rejected for two reasons. First, the new loan includes funds for energy efficiency investments. Second, the borrowers will change, which will entail significant changes to the legal agreements. Under the existing loan, the borrower is the Government of Turkey which on-lends the funds to TKB and TSKB, whereas under the new loan the proposed borrowers are TSKB and TKB, with the loans guaranteed by the Government. For these reasons, it was considered more efficient to prepare a proposed Project.

54. A second alternative considered was to expand the Project to cover other banks. This approach could help in spreading the Project's benefits wider, by *inter alia*, building the skills of a larger number of banks for lending to renewable and energy efficiency projects. On reflection, this approach was rejected because this would have increased the complexity of the project design, and would have led to delays in project approval and perhaps also in project implementation. It is proposed that the capacity building effort to be developed in parallel with the Project also be used to provide assistance to other banks.

55. Another alternative considered was to expand the scope of the project to include other types of energy efficiency projects such as for municipalities, public/residential buildings or small enterprises. This approach was also rejected as it also would have increased complexity and scope of the project design. Municipalities for instance, would have needed a separate type of financial intermediation, and so would have small industry. Subject to availability of IBRD lending under the CPS, it is proposed that a separate project be prepared aimed at municipalities, buildings and small industry.

C. IMPLEMENTATION

1. Institutional and implementation arrangements

56. The Borrowers (TSKB, TKB) will provide long-term debt to sub-project sponsors for eligible renewable energy and energy efficiency investments. The on-lending of funds will be in accordance with the Operational Manual prepared by each Borrower and agreed with the Bank,

[6] Financing Energy Efficiency- Lessons from Brazil, China, India and Beyond: Taylor, Govindarajalu, Levin, Meyer and Ward, The World Bank (2008)

for the ongoing Project, with suitable changes as necessary. The two FIs have well-equipped teams in-charge of marketing, project evaluation, appraisal, safeguards aspects and implementation, and these teams will continue to operate under the proposed Project. Their skills are proposed to be expanded to cover energy efficiency investments.

57. Subprojects will be approved by the FIs based on compliance with their respective Operational Manuals, which cover aspects such as eligibility, safeguards compliance, monitoring requirements, etc. The IBRD and CTF loans will be provided in parallel to eligible subprojects. The level of CTF to be provided to each subproject will be determined by the FI based on the criteria set up in the Operational Manual and discussed in Annex 6. The broad terms for the IBRD and CTF sub-loans are summarized here:

- For sub-loans or financing leases from IBRD resources, the interest rate will be equal to the costs of funds to the FI plus a risk-adjusted spread based on the risk classification of the sub-borrower and the subproject. Sub-loans from CTF resources will have the CTF terms passed onto the sub-borrower along with an appropriate spread to cover the FI's administrative costs.
- Sub-loans from IBRD will have a maturity of not less than 4 years, sub-loans from CTF funds will have maturity of at least 7 years, and financing leases will have a maturity of not less than 4 years.
- The allocation of CTF funds will be determined by the FIs based on their assessment. The level of CTF resources used for any particular subproject will be determined as the amount required to enable the project to reach the target IRRs on equity levels discussed in Annex 11.
- Overall CTF allocation will be up to 20% of total project cost.
- CTF funds will be used for diverse portfolio of RE and EE investments, and will not be restricted to any particular technology.
- The FIs will make best endeavors to gradually decrease the CTF contribution for specific technologies in the later years of the Project.

2. Monitoring and evaluation of outcomes/results

58. The Project will be monitored using the existing monitoring arrangements (described in Annex 6). Both FIs have gained significant experience in monitoring implementation and the outcomes. Results indicators have been enhanced from those under the ongoing Project (See Annex 3). Progress will be reviewed using the intermediate outcome indicators. As the Project advances, monitoring will shift to the outcome indicators.

3. Sustainability

59. Financial sustainability is likely owing to the regulatory certainty achieved through the licensing and tariff framework applicable to renewable energy projects, and the availability of a pipeline of projects. Hydropower assets in particular would be financially sustainable given their low operating cost once built and the additional non-energy benefits they have in the Turkish electricity market. Also, hydropower projects have a long life, generally substantially longer than thermal power plants. Environmental sustainability is assured based on the eligibility qualifications and project selection process for renewable projects. Institutional sustainability will be sustained by (a) the successful credit delivery and implementation

supervision mechanisms of TSKB and TKB - which have already served to attract other sources of financing for renewable energy projects; and (b) institutional capacity and processes within the Government to continue the identification of attractive renewable energy projects.

60. To ensure development and expansion of financing sources for clean energy investments, it is important not to distort the market by subsidized interest rates that may discourage new financiers from entering the market. CTF resources, which represent concessional terms, will be used in a specific targeted approach, focusing on buying down the global public goods component that is not financially viable. The use of CTF in this fashion is considered sustainable, on the basis that the CTF is designed as a bridging financial mechanism to be used until the post-Kyoto framework has been established. Furthermore, it will help create and expand the market for emerging renewable technologies and will also help build the market for energy efficiency investments by assisting in removing the major barriers.

61. As different technologies take hold in Turkey due to the support from CTF, it is likely that the costs of the technology will decline, both due to technological progress plus through scale effects and enhanced knowledge in the country. The IEA has developed outlooks for cost reductions, but it is difficult to estimate the quantum of cost reduction over time in Turkey at this time, given the different factors that are likely to impact such evolution – it is expected that the reduction in technology costs may be in the order of 5-7 percent over the next decade.

62. In order to avoid market distortion and to ensure that the Borrowers will gain appropriate returns from investments made under this loan, TKB and TSKB will follow their respective pricing policies according to the market rates, for projects not using CTF resources. Both banks price their loans comparable to the market price for each currency on average. The Borrowers have been implementing broadly the same approach in the ongoing project and the only significant market advantage that the TKB and TSKB derive from the Bank loan is the long-term funding that will allow them to provide long-term financing without taking on significant maturity mismatch. TKB and TSKB will, therefore, likely continue to be leading clean energy financiers, but will not have a monopolistic hold on the market.

63. Another aspect that is important in ensuring sustainability will be the continued availability of adequate resources and skilled staff in the two banks. The technical and operational risk associated with clean energy and energy efficiency investments require that the financial institutions need to have a strong technical capacity to appropriately identify, appraise and monitor the projects (for example, TSKB has seven engineers who are supporting fifteen marketing officers). This is true not only for renewable energy, but especially for energy efficiency which is a new area for Turkey. It will require intensive training and marketing to promote the effectiveness and viability of energy efficiency for the investments to be scaled up. The technical assistance effort as part of the Project will help address this issue by further developing capacities in these two banks, as well as the beneficiary companies and responsible government agency (EIE) to identify and promote investment in energy efficiency.

4. Critical risks and possible controversial aspects

64. The overall risks in this Project are considered moderate because of the good experience under the existing Project. The proposed use of CTF and the addition of energy efficiency add additional risks to the Project as discussed below.

Potential risks	Residual Rating after mitigation	Description
Turkey faces fiscal challenges as a result of the global financial crisis.	Moderate	(i) There is a long record of good public debt management and fiscal balance consistent with debt sustainability; (ii) government fiscal targets for the next three years were recently revised to reflect lower growth, with some loosening in 2009 and stabilization thereafter.
High external financing needs, mainly in the private sector, make Turkey vulnerable to persisting international illiquidity and capital outflows.	Substantial	(i) Strong capitalization and regulation, modest bank credit to the private sector, and a strong domestic deposit base fuel confidence in Turkey's financial sector; (ii) the CBRT has taken measures to protect FX liquidity and confidence in the banking system. There are limited further actions available to the government to mitigate external financing risk, beyond strong fiscal management and prudent monetary/regulatory policy to maintain confidence in the domestic financial system.
Inadequate demand from the private sector for new investment in emerging renewable technologies or energy efficiency.	Moderate	Feed-in tariffs for technologies such as solar, geothermal etc. are being raised. Further, the wholesale market price is relatively high. For energy efficiency, capacity building is planned as part of the Project for the FIs, for industry as well as for agencies involved in the subsector. These resources will assist in improving awareness, and in building a suitable pipeline, for energy efficiency.
Sustained decline in electricity demand.	Low	Demand growth is forecast to slow down in 2009, but is then expected to rise again. Additional (preferably renewable) capacity will still be needed since even with falling demand current tight reserve margins will only relax slightly.
Inadequate capacity to prepare and design energy efficiency projects with clear focus on energy savings.	Low	Capacity building is planned as part of the Project. Some TA is already ongoing - UNDP, bilateral donors. Experienced staff and external experts with experience of designing energy efficiency projects will be used, and with all these inputs, institutional capacity is expected to increase.
Unwillingness of project sponsors to follow safeguard policies – Other donors do not have additional requirements beyond Turkish law.	Low	The Bank safeguards team together with the FIs are working on generic EMPs for specific RE technologies, which the FIs will then provide to sponsors - this will reduce the workload on project sponsors. Further, Turkish environmental regulation has recently been made more stringent for hydro projects, thus bringing them further in line with Bank guidelines. Finally borrowers will apply the agreed requirements for safeguards (as specified in the Operational Manuals) and will insure that subprojects comply with these requirements.
Delays in Project due to delays in approval of CTF terms, and/or because of inadequate clarity on processing requirements.	Moderate	Turkey's CTF Investment Plan and the decision-stage PAD were submitted together to CTF in January 2009. It is expected that donors to CTF will put into effect their respective contribution agreements, and their contributions, in time.
The financial crisis may have an impact on the financial condition of the FIs.	Low	The risk of economic downturn and asset portfolio deterioration as a result is substantial. However, measures have been and are being implemented that make the banking sector in Turkey more resilient than its peers in other

Potential risks	Residual Rating after mitigation	Description
		countries, such as FX exposure limits, prudential requirements including higher target of capital adequacy ratio than BIS standards and detailed reporting requirements. Additionally, both of the FIs follow very conservative policies, such as provisioning policies and lower leverage ratios than their peers. Both FIs are adequately capitalized, and have prudential norms which are in part, more conservative than required by Turkish regulations (which in turn are consistent with BASEL 1 norms). TSKB and TKB in September 2008 had (a) low levels of non-performing loans on net basis – both at 0 percent, (b) high capital adequacy ratios – 21.1 percent and 83 percent, and (c) low levels of exposure to market risk since they do not collect deposits, instead relying on long term loans from multilateral and bilateral donors.
Overall Rating	**Moderate**	

5. Loan/credit conditions and covenants

65. Financial Covenants

- The Borrowers shall comply with the applicable prudential regulations of the Guarantor.
- The Borrower shall prepare and furnish to the Bank as part of the Project Report, not later than forty-five (45) days after the end of each calendar semester, interim un-audited financial reports for the Project covering the semester, in form and substance satisfactory to the Bank.

66. Other Covenants

- The Borrower shall maintain, until the completion of the Project, the PIU, and ensure that the PIU functions at all times in a manner and with staffing and budgetary resources necessary and appropriate for Project implementation, and satisfactory to the Bank.
- The Borrower shall submit for the Bank's approval: (a) the first Energy Efficiency Sub-project; (b) the first Renewable Energy Sub-project using the proceeds of the CTF Loan; and (c) all Sub-projects which are classified as Category A Sub-projects in accordance with the provisions of the Operational Manual.
- The Borrower shall, not later than six months after the end of each calendar year during Project implementation, carry out a review of procurement practices used by Sub-project Sponsors for procuring goods, works and services financed with the Loan proceeds for Sub-projects. The review shall be carried out by an independent consulting firm in accordance with terms of reference agreed with the Bank.
- The Borrower shall make Sub-loans or provide Financing Leases to Sub-project Sponsors on the terms and conditions set forth in the Operational Manual, including, without limitation, the terms and conditions set forth in the Loan Agreement.
- The Borrower shall ensure that Sub-loans and Financing Leases shall be made for projects which will have at least fifteen percent (15%) sponsor equity financing for Renewable Energy Sub-projects, and at least twenty five percent (25%) sponsor equity financing for the

Energy Efficiency Sub-Projects; and generate a financial rate of return of at least eight percent (8%).

- The Borrower shall ensure that each Sub-project shall be in compliance with all requirements pertaining to environmental protection applicable under the laws and regulations of the Guarantor and with the Environmental Policy Framework, Resettlement Policy Framework and Dam Safety Framework. To that end, the Borrower shall require each Sub-project Sponsor applying for a Sub-loan to furnish evidence satisfactory to the Bank and the Borrower, showing that the Sub-project in respect of which the application has been made has been prepared in accordance with such procedures, such evidence to include, *inter alia,* an environmental management plan, land acquisition plan and/or resettlement action plan, as might be applicable for a Sub-project submitted for approval.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

67. A financial assessment of the intermediary banks has been carried out (see below, and Annex 9 for details). The financial and economic analysis focused on a review of prototype projects that can potentially be financed by the Project. Since this is an FI operation, actual projects are not known upfront. An assessment of the economic and financial benefits of the use of CTF has also been carried out (Annex 11). Experience under the ongoing Project and market assessments carried out by the FIs shows that medium-scale hydro projects are expected to be economically and financially viable. As discussed above, however, for newer renewable technologies and energy efficiency investments, and for smaller-scale hydro plus wind, financial barriers exist, which reduce the attractiveness of such investments. CTF resources are proposed to be used, in order to attract financial intermediaries as well as investors. Annex 11 demonstrates the use of CTF resources, for a sample of prototype projects.

68. This assessment shows that a combination of higher feed-in tariffs and CTF usage is expected to enable such projects to be financed and developed. Technologies such as small hydro and wind would require a CTF financing of 20 percent of total project cost to reach the threshold IRRs. In the case of technologies such as biomass, high levels of CTF would be required – 50-75 percent – to enable threshold returns to be attained. Solar PV would require even higher CTF levels. For some energy efficiency investments, the expectation is that 20 percent of CTF would enable threshold returns to be achieved, although for other investments, higher CTF contribution may be needed. This is consistent with the experience in other countries – in other countries, it has been seen that energy efficiency investments have needed GEF contributions of as high as 15 percent of the investment pipeline in the first 5 years.

2. Technical

69. The various renewable energy project types already in use in Turkey, such as hydro and wind, are well-tested and follow the best available technologies available worldwide. For wind particularly, it is important that the technology used is advanced, in order for the variable power from such projects to be integrated into the grid efficiently. EMRA has recently announced a regulation in this regard, and it is expected that private investors will be able to comply with these requirements easily, given the wide exposure to these technologies elsewhere. For emerging renewables such as biomass or solar, Turkey is likely to progress up the learning curve followed elsewhere much faster, because of the advantage of not having to go through

each early stage of advancement. In broadening the use of technologies beyond hydro (where Turkey already has 13,500 MW of capacity, overwhelmingly consisting of large hydro), CTF resources will be critical, because with the concessional terms from CTF it is expected that the risk perception of investors will be reduced sufficiently to enable them to invest in these technologies. Technical aspects relating to energy efficiency are expected to be handled particularly through the use of technical assistance in capacity building, both for banks as well as for industry.

3. Fiduciary

70. **Financial intermediary assessment (Bank operational policy 8.30):** (Refer to Annex 9.1 and 9.2 for a detailed description of the two FIs' financial condition). Both banks are in good financial condition, and the future prognosis is healthy. TKB has low leverage and a capital adequacy ratio of 79.2 percent as of 2008. Profitability is satisfactory with a return on assets of 3.6 percent and a return on equity of 7.6 percent for 2008. Non-performing loans (NPLs) gross provisioning is 10.6 percent. The after provisioning NPL ratio is 0 percent. In addition to provisioning, the NPL portfolio is also secured by collateral with a nominal value at 10 times the outstanding NPL principal. TKB is government-owned, and most of its financing sources are long term in nature, as is most of its lending. TSKB also has a relatively low leverage and a capital adequacy ratio on a non-consolidated basis of 21.1 percent at the end of 2008. Profitability is at a return on assets of 2.1 percent and a return on equity of 16 percent for 2008. Gross NPLs at the end of 2008 were 0.7 percent of loans, and are fully provisioned so their net NPL ratio is 0 percent. Most borrowing remains long term as is most lending.

71. **The financial management systems** for the Project have been assessed by the task team under ongoing and newly-approved projects. The current financial management arrangements for the Project are satisfactory at both TKB and TSKB. All of the subcategories of financial management are rated satisfactory for both banks. Continued soundness of TSKB and TKB, their compliance with domestic prudential regulations will be monitored through (a) prudential regulation compliance certified annually by auditors and (b) annual audit reports.

72. **Procurement** will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004 and revised in October 2006 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004 and revised in October 2006 (Consultant Guidelines). Procurement capacity at TSKB and TKB has been assessed and rated low risk, based on the experience they have gained under the ongoing Project. Turkish private commercial practices are well-established, and have enabled efficient and economic procurement in the case of renewable energy projects. Under the ongoing Project, sponsors have had difficulty in obtaining a wide range of quotations from suppliers as they have been facing a very high level of demand globally. It was only after thresholds were raised under the ongoing Project that implementation began improving. As a result, acceptable local private sector commercial practices as defined in the Operational Manuals will be followed by sub-borrowers for procurement of goods, works and consultancy contracts which also allows participation of international suppliers. Under the ongoing Project for instance, a majority of goods have been supplied by foreign suppliers. The FIs will use independent procurement reviews annually to ensure that the procurement is carried out using these practices and that prices in the contracts are reflective of market prices. The procurement performance of each bank will be reviewed annually.

4. Social

73. The Project will have both widespread and more localized benefits. Citizens of Turkey will benefit from increased access to non-polluting energy as the proportion of energy production from renewable generation projects increases, replacing generation from fossil-fuel plants. Besides the general public, the principal stakeholders in the project are the FIs, contractors and suppliers of related machinery, and people employed during construction and operation of the facilities. These localized benefits will be significant, as Turkish companies will account for the major part of the construction and are also expected to be able to compete for equipment supplies, and hence are a significant source of employment. Moreover, renewable energy projects are often developed in the poorer mountainous and rugged areas of the country, where most new hydro facilities are located. These poor areas have historically been points of out-migration because agriculture is poor and employment is very limited. These out-migration trends continue today, but the project will help stem the outflow in different areas, by providing new employment in some of the poorer parts of the country.

74. OP 4.12, Involuntary Resettlement, will apply because some of the facilities require land acquisition, such as for generation plants and reservoirs, that may be subject to expropriation. The overall land requirements are minimal, however, because reservoirs are generally located in steep, narrow river valleys thus the surface area is small. Much of the land in these remote regions is publicly owned. Privately owned land, which constituted 10-20 percent of the total requirements in the ongoing project, is agriculturally marginal or used for tree crops, such as hazelnuts. Virtually all private land is acquired through negotiation (only one plot was expropriated in the ongoing project). Expropriation for public benefit is a final resort available to the investors, thus triggering OP 4.12.

75. During implementation of the ongoing Project, the Operational Manual was revised to include additional provisions based on the experience under the Project to assure compliance with OP 4.12. The OP 4.12 compliance requirement applies to every subproject to be financed by an FI with project funds for which either EMRA issued or will issue a Public Benefit Document for renewable energy facilities, which enables the investor to exercise eminent domain for land acquisition for the sub-project, and/or for which an investor requests an Expropriation Decision. The requirement also applies when third parties are affected when Government land is transferred to the sponsor or when third parties are affected by negotiated acquisition of private land. Both FIs have been following their Operational Manuals for the ongoing Project and are doing a satisfactory job in complying with OP 4.12. For the proposed Project, a Resettlement Policy Framework was prepared by the borrowers and reviewed and found acceptable to the Bank. It was disclosed prior to appraisal. The Policy Framework was updated during appraisal and accepted by the Regional Safeguards Unit and disclosed. Both borrowers have developed the capacity to handle safeguards aspects as part of the ongoing Project, and this will be of crucial importance in implementing the proposed Project.

5. Environment

76. World Bank supervision activities under the ongoing Project demonstrate that both TSKB and TKB have performed satisfactorily in implementing the procedures of the Environmental Safeguard Review document prepared for the ongoing Project. In accordance with World Bank Environmental Assessment (EA) policies and procedures (OP/BP/GP 4.01), the proposed Project has been classified as FI, since, as in the ongoing Project, the Borrowers

are banks who will on-lend funds to project developers (Sponsors). The Sponsors, in turn, undertake the actual subprojects. These subprojects will be identified after loan approval. Therefore, in accordance with the requirements of OP/BP/GP 4.01, the FIs have revised the existing Environment Policy Framework document acceptable to the Bank that describes EA procedures to be followed by the FIs in their environmental safeguard review of individual subprojects as part of their overall subproject appraisal. This framework document has been designed to satisfy EA requirements of both the Government of Turkey (Regulation on Environmental Impact Assessment (EIA) published in Official Gazette No: 26939 and dated July 17, 2008) and the World Bank. As required by the Bank, the framework document will be incorporated as a separate section in the Operational Manuals. Turkish and English language versions of the framework document were disclosed on the TSKB and TKB websites on January 28, 2009, and the English language version was disclosed in the World Bank Infoshop on February 3, 2009. Annex 10 contains a summary of the environment policy framework.

6. Safeguard Policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP 4.01)	[x]	[ ]
Natural Habitats (OP/BP 4.04)	[ ]	[x]
Pest Management (OP 4.09)	[ ]	[x]
Physical Cultural Resources (OP/BP 4.11)	[ ]	[x]
Involuntary Resettlement (OP/BP 4.12)	[x]	[ ]
Indigenous Peoples (OP/BP 4.10)	[ ]	[x]
Forests (OP/BP 4.36)	[ ]	[x]
Safety of Dams (OP/BP 4.37)	[x]	[ ]
Projects in Disputed Areas (OP/BP 7.60)	[ ]	[x]
Projects on International Waterways (OP/BP 7.50)	[ ]	[x]
Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects (OP/BP 4.00)	[ ]	[x]

77. **Dam Safety:** The Operational Manuals cover requirements with regard to dam safety, reflecting the Bank's policy in this regard. These are summarized in Annex 10. For dams which are covered by OP 4.37, a panel of experts will be set up, which will review the designs as well as construction progress periodically. Operations plans and emergency preparedness plans will be prepared for each such dam. The panel will continue to monitor the dam for safety considerations after its completion.

78. The Project does not trigger OP 7.50. As in the ongoing Project, it was agreed under this Project that hydro power projects would be financed on a specified list of domestic basins. This is reflected in the Loan Agreements with FIs in the form of a list of the river basins where hydro subprojects could be located.

7. Policy Exceptions and Readiness

79. No policy exceptions are required.

Annex 1: Country and Sector or Program Background

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

The banking sector

1. Turkey's banking sector is substantially more resilient than before the 2001 crisis and is in a better liquidity position than banking sectors in many other countries in the Region. Despite the recent credit expansion, the overall capital adequacy ratio for the sector, at 18 percent, is well above the Banking Regulatory and Supervisory Agency (BRSA) requirement of 12 percent (Table 1.1). Return on equity and assets of about 18.60 and 2.5 percent as of end 2008, respectively, point to a still strong level profitability for a sector with solid growth. The economic downturn resulting from the global financial crisis poses a significant risk, with projections showing lower profitability and higher delinquency in the sector's asset portfolio. However, up to this point (December 2008), asset quality remains relatively good with somewhat low non-performing loans (NPL) at 3.6 percent and high provisioning levels at 79.7 percent. Government securities still account for about a third of banks' total assets.

Table 1.1: Banking Sector Financial Strength Indicators

Percent	2004	2005	2006	2007	2008
Gross Non-performing loans/ Total loans	6.0	4.7	3.7	3.5	3.6
Provisions/NPL	88.7	88.7	89.7	86.8	79.7
ROA /1	2.5	2.7	3.3	3.4	2.5
ROE /1	13.4	12.1	21.0	24.8	18.6
Loans/deposits	51.0	65.7	74.3	83.2	84.1
CAR	27.6	23.7	21.9	18.9	18.0

Source: BRSA, Monthly Bulletin (No.46, Feb 2009).
/1 The elimination of inflation accounting at the end of 2005 makes the income data not comparable across time

2. **Banking Regulations:** Having experienced financial turmoil in 1994 and 2001, the regulatory framework of the banking sector in Turkey has evolved to increase the stability and resilience of the sector to such volatility. The framework has put the Turkish Banking Sector "at the level of comparator countries such as Poland or Greece"[7]. The joint IMF/World Bank Financial System Stability Assessment[8], completed in November 2007, outlines that though vulnerabilities remain, "Turkey's financial system has strengthened markedly over the last five years" since the 2001 financial crisis. The regulatory framework is mainly in line with international practices, as with most of the operational, governance and prudential regulations. Some of the regulations are more stringent than international standard; for example, the Capital Adequacy Ratio requirement of 12 percent set by the BRSA is higher than the Bank of International Settlements (BIS) requirement of 8 percent and recommended ratio of 10 percent. BRSA has extensive reporting requirements and monitors the credit activities of the banks in detail (see Table 1.2). Additionally, there is more transparency now, as most banks publicize quarterly financial statements and statistics on the internet within weeks.

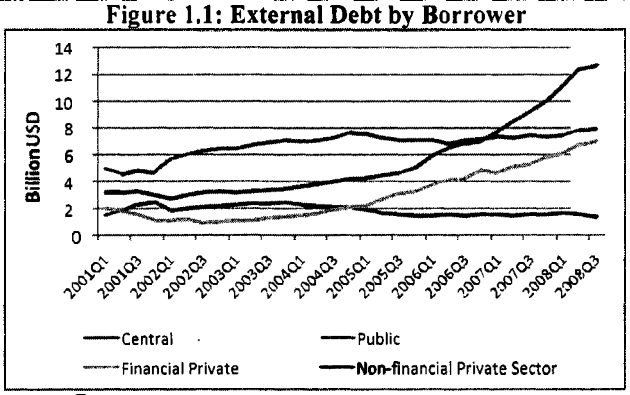
[7] Steinherr, Tukel and Ucer, "The Turkish Banking Sector: Challenges and Outlook in Transition to EU membership", Center for European Policy Studies, EU-Turkey Working Papers No.4, August 2004
[8] "Turkey: Financial System Stability Assessment", International Monetary Fund, IMF country report No. 07/361, November 2007

Tal . :p rti g Requirements for Turkish Banks

Main ratios	Limits
Capital Adequacy Ratio	12 percent
Foreign Currency Open Position/equity	+/-20 percent
FX Liquidity Ratio	80 percent
(FX+TRY) Liquidity Ratio	100 percent
Single Client/Group Exposure Ratio	not more than 25 percent of equity
Aggregate Large Exposures Ratio	not more than 8 percent of equity

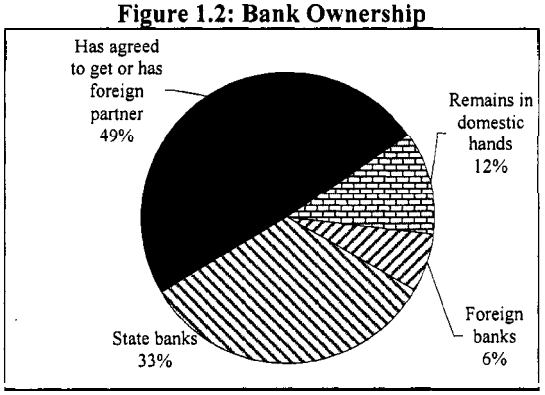
3. **Foreign Currency and Market Exposure:** The banking sector is less exposed to shifts in global sentiment today than several years ago, while exposure to foreign capital outflows in the non-banking sector is more pronounced. Capital inflows have mostly come through the government securities market, investments in the ISE, and more recently directly to the corporate sector (Figure 1.1). While forty percent of the banking sector's liabilities are in foreign currency, they mainly stem from domestically collected deposits rather than direct borrowing from abroad. This modest reliance on foreign borrowing provides a measure of resilience against a reversal of capital flows.

Figure 1.1: External Debt by Borrower



ource: Treasury.

Figure 1.2: Bank Ownership



Source: Bankers Association of Turkey and the World Bank.

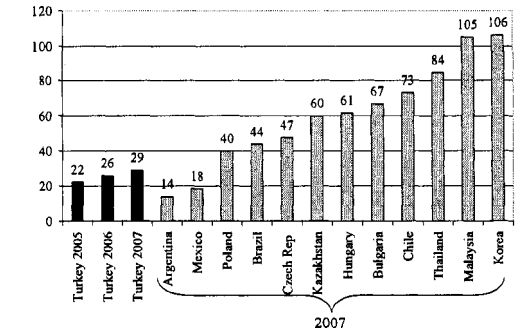
4. The banking system's net foreign currency position is now almost in balance. The net position including off-balance sheet hedges amounted to 1.1 percent of capital as of January 2009. The banking sector provides the market with more detailed information about on- and off-balance balance sheet currency positions. There is market recognition that, contrary to 2001, counterparties holding a share of the sector's exchange rate risk are more reputable and financially stronger. A possible shift in investor sentiment would affect the banking sector only indirectly through a possible deterioration in the banks' loan portfolio and, to a lesser degree, marked-to-market losses in their securities' holdings.

5. **Ownership by large international banks offers clear advantages but may also add potential vulnerabilities.** More than half the sector has ownership linkages with large international banks, and this has so far helped the banks to be able to raise or sustain financing from abroad (Figure 1.2). This aspect also has the benefit of contributing international experience and capacity. However, ongoing global developments are reducing the parent banks' ability to provide liquidity and capital, and if a parent bank were to fail it could have a detrimental impact on the Turkish subsidiary's liquidity. Capital inflows have mostly come

through the government securities market, investments in the ISE, and more recently directly to the corporate sector (Figure 1.2 above).

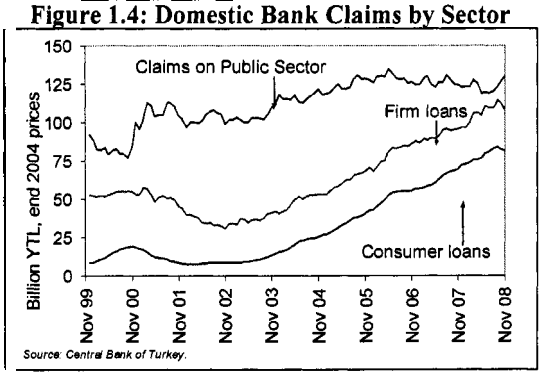
6. Credit risk has increased as the sector has expanded access to credit to the private sector, but the level of domestic credit remains at a modest 31.1 percent of GDP as of 2008 and is well below that of similar income level countries (Figure 1.3). Moreover, in volume terms about half of the credit expansion has been to consumers rather than to firms, and consumer credit has changed from being a marginal to a main line of banking business[9] (Figure 1.4).

Figure 1.3: Domestic Credit to Private Sector



Source: IMF, International Financial Statistics.

Figure 1.4: Domestic Bank Claims by Sector



Source: Central Bank of Turkey.

7. Medium and long term lending to the private sector remains modest due to the short maturity of the banks' funding base and the banks desire to limit maturity mismatches. Fifty percent of bank assets as of September 2008 have maturities with less than one year, so investment and project finance loans with longer maturities are still at an early stage of development. The average maturity of deposits in Turkey is between 1 and 2 months, and bank risk managers encourage banks to avoid the mismatches associated with lending for the medium or long term. Banks accept some degree of maturity mismatch risks as only 2.1 percent of bank liabilities had more than one year maturity in September 2008, while 19 percent of loans had more than one year maturity (Table 1.3), but they do so only for the highest credit quality borrowers and at high interest rates.

Table 1.3: Maturity of Liability and Assets of Turkish Banking Sector (as of Sept 2008)

(USD million)	Up to 3 months	3-12 months	1-5 years	5 years and over
Liabilities	90.8%	6.9%	2.1%	0.2%
Assets	50%	25%	19%	6%

8. The Government is undertaking reforms to resolve the underlying structural reasons for the lack of long term financing and these reforms are supported by the World Bank. Most importantly, better macroeconomic conditions, but also financial sector reforms will be needed to ensure that the financial sector can provide sustainable long term finance to the private sector. The World Bank is supporting both macroeconomic policies and the financial sector reform process through a series of Competitiveness and Employment Development Policy

[9] It is recognized that the distinction between small business and consumer credit is not so clear, because business owners will often use personal loans to finance their commercial activities. However, even with this possible bias, the point remains valid that much of the credit has gone to finance consumption.

Loans (CEDPL I-III). Supported financial sector reforms include efforts to enhance policy coordination among key agencies with responsibility for financial sector policies, credit information on firms, accounting standards, the legal framework for capital markets, and corporate governance.

9. Financing of suitable medium to long-term tenor is scarce in Turkey, particularly for small scale long-term investments for renewable energy and energy efficiency. This is one of the major constraints limiting the growth of renewable energy in Turkey – as shown later, there is a significant level of viable renewable projects in Turkey, but these have been slow in taking off due to, among other reasons, the lack of suitable financing at reasonable prices.

The energy sector

10. **Sector reform:** The Turkish electricity sector has been undergoing extensive reform and restructuring - with the goal of increased private sector participation in a competitive market leading to the efficient and cost-effective provision of electricity. The reforms being undertaken are overall in line with the EU Acquis Communitaire framework and broadly comprise: (a) unbundling of the sector into its different business activities (transmission, generation, distribution, wholesale trading and retail supply), (b) restructuring of the existing state-owned entities into independent corporate entities, diversifying the numbers of sellers and buyers; (c) creating an independent energy regulator (EMRA) and implementing a regulatory framework and a licensing regime; (d) privatizing the state-owned distribution and generation businesses; and (e) creating a competitive market in electricity both at the wholesale level as well as the retail level. Significant progress has been made in implementing these reforms and the sector has been restructured significantly but some of the reforms have been delayed, in particular the privatization of distribution and generation entities.

11. In October 2001, pursuant to the Electricity Market Law, TEAŞ, the former integrated generation and transmission corporation was restructured into a generating corporation EÜAŞ, a trading corporation TETAŞ and a transmission corporation TEİAŞ. TEDAŞ, the Government-owned distribution corporation had been earlier separated from TEAŞ' predecessor, TEK. In 2004, TEDAŞ was restructured into separate regional distribution companies (DISCOs) in preparation for their privatization. The generation sector is also being restructured into one holding company which will retain the major hydroelectric power plants, and six separate business units containing generation assets that will be later formed into companies to be privatized.

12. An independent regulatory authority, the Energy Market Regulatory Authority (EMRA) with jurisdiction over electricity, gas, petroleum and LPG, has been established. EMRA has powers over licensing, approval of market rules and codes, tariff setting and customer service issues. The electricity market sees competition at the wholesale level as well as for retail consumers. A bilateral contract market has been established, along with a wholesale energy market – about 18-20% of total consumption on average is transacted through this market, which is supported by a balancing and settlement system. TEİAŞ is the market as well as system operator. Cash-based market operations began in August 2006, based on monthly settlements. Facilities for hourly metering and hourly settlement are currently being implemented. At the same time, large retail consumers whose annual consumption exceeds 1.2 GWh are eligible (i.e., they can choose their own supplier) - this represents more than 41 percent of the total Turkish electricity market.

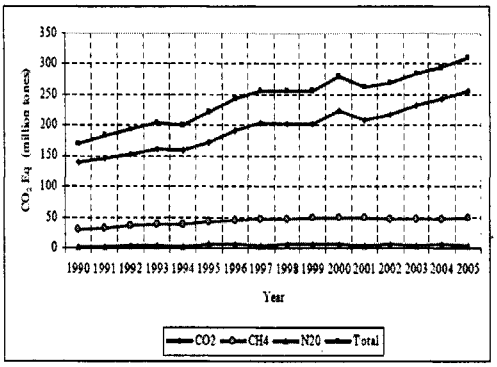
13. End-user tariffs were below cost-recovery levels during 2002-07, despite a significant increase in generation costs and high network losses. Beginning in July 2008, a new cost pass-through mechanism became effective which aims to reflect power purchase and fuel costs on a quarterly basis, into retail tariffs. Under this mechanism, prices have risen by about 40 percent. This is an important step in the reform program, since it ensures that the sector remain financially viable, and more immediately, it has enabled the privatization of distribution. Four regional distribution companies have been privatized, to Turkish and international investors.

14. **Government strategy and focus:** The Government's updated energy strategy and Turkey's Ninth Development Plan (2007-13) both aim at ensuring security of energy supply, while keeping environmental effects at a minimum level. The Government is particularly focused on developing renewable energy resources, in which Turkey is well-endowed, and scaling up energy efficiency investments in various parts of the economy – industry, municipal facilities, public and residential buildings, appliances and equipment, lighting, etc.

15. The focus on renewable and energy efficiency is driven by the imperative to address three key energy-related development issues:

CO_2 emissions – Turkey's greenhouse gas (GHG) emissions are growing rapidly. Total GHG emissions rose from about 170 million tons of carbon dioxide (CO_2) equivalent in 1990 to about 300 mtCO_2 in 2005 (excluding land use change and forestry – LUCF) – see Figure 1.5. CO_2 emissions consistently account for a large majority of total emissions, at about 85.3 percent or 256 mtCO_2 (See Figure 1.6). Emissions from the energy sector have grown the fastest over this period, and the energy sector accounts for the majority of GHG emissions in the country, at about 77 percent. CO_2 emissions are projected to continue to increase from 256 mtCO_2 in 2005 and exceed 604 mtCO_2 by 2020 in the reference case scenario presented in the Government's 1st National Communication on Climate Change (NCCC), January 2007 to the United Nations Framework Convention for Climate Change (UNFCCC).

Figure 1.5 – GHG Emissions



Source: NCCC

Figure 1.6 – Sectoral GHG Emissions

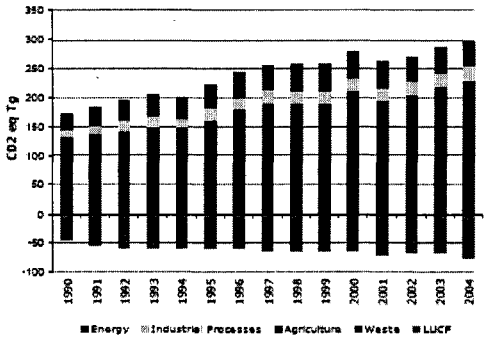


Fig.1.2 Sectoral Greenhouse Gas Emissions and Removals between 1990 and 2004

Security of energy supply, especially electricity - Electricity demand in Turkey is increasing rapidly and additional generating capacity, particularly renewable energy capacity, and increased focus on energy efficiency are urgently required to improve the security of supply.

Energy import cost - The cost of energy imports in 2006, 2007 and 2008 amounted to US$29 billion, US$34 billion and US$ 48 billion, respectively (34 percent, 31 percent and 36 percent

of the corresponding value of Turkey's total exports). A substantial part of these imports, especially natural gas, are used for electricity generation. Furthermore, gas supply is often unreliable particularly at peak winter times.

16. **Renewable energy:** The Government's target is to raise the share of electricity generated from renewable sources (hydro, wind, biomass, geothermal, solar), from 19 percent in 2007 to 25 percent by 2020. The Renewable Energy Law was passed in May 2005. This provides a number of incentives to encourage an enhanced role for renewable energy, including a feed-in tariff and an off-take agreement with the host distribution company. There has been a significant upsurge in private sector interest, although financing constraints are slowing down their development. The Government's target is to increase hydro capacity from the current level of 13,500 MW to 30,000 MW by 2020 (this includes large hydro capacity of about 11,500 MW right now, growing to about 16,000 MW). The target for wind energy growth is also ambitious, from the current capacity of 452 MW to 20,000 MW in 2020.

17. **Renewable energy potential:** Turkey is well-endowed with renewable energy resources, especially hydropower, in contrast to its general lack of fossil fuels. Preliminary studies conducted by the General Directorate of State Hydraulic Works (DSİ) and the General Directorate of Electric Power Resources Survey and Development Administration (EIE) for the 26 river basins in Turkey have led to the identification of 344 hydropower projects (less than 30 MW capacity) with a generating capacity of 3,400 MW. Topographical analysis of the basins indicates that there may be as much as an additional 5,000 MW of potential small hydropower capacity capable of producing around 19 TWh. Thus the total small and medium hydropower potential may be as much as 33 TWh which is equivalent to about 16 percent of current demand. These 344 hydropower sites are being auctioned to the private sector by DSI working with the EMRA. The private company that bids the highest payment to the Government per kWh generated receives permission to develop the site under DSI supervision. These sites are part of basin development plans developed by DSI taking into account irrigation requirements, social issues and power needs. They often have DSI dams up and down stream from them. In many cases the sites are developed as run of the river power plants while in other cases they may be small hydropower plants which are added to existing dams. They usually have very limited storage of their own and have little impact on irrigation.

18. Turkey is rich in **wind** resources. EIE has recently completed a survey of the country's wind resources and produced a wind atlas for Turkey. This survey indicates that there is about 48,000 MW of economic potential.[10] This is mostly close to the Sea of Marmara and the Aegean Sea (about 70 percent) with smaller amounts close to the Mediterranean Sea and Black Sea. It is estimated that if this capacity were fully exploited, production could be close to 96 TWh. Estimated **geothermal** capacity is about 600 MW of electricity generating capacity of which about 30 MW are currently being exploited and about 71 MW are under active development. Utilization of these plants is quite high at around 90 percent. In addition there is about 30,000 MW of geothermal heating potential, little of which is being used. The heating potential is mostly in the ambit of municipalities, which often do not have adequate capacity to design and implement these projects. The initial costs of drilling and others also act as a disincentive to large-scale development of geothermal resources.

[10] This is based on a wind speed of greater than 7 meters/second at 50 meters above the ground for 35% or more of the time. Excluded were elevations greater than 1500 meters and slopes greater than 30%. See Atlas of Turkish Wind Energy Potential (Turkey Ruzgar Enerjisi Potansiyeli Atlası).

19. There are several other renewable technologies which are technically proven but have not been used a lot in Turkey because they are less attractive economically and/or not well-known. These technologies include biomass, biogas, landfill gas, and solar. The potential for biomass electricity generation is estimated at around 3.4 TWh per year under conservative assumptions (See Annexes 4 and 9), and once developed, they can make a major contribution to Turkey's renewable energy production and to the reduction in greenhouse gas emissions.

20. **Energy efficiency:** The Energy Efficiency Law (No: 5627) was adopted in April 2007, and regulations were issued in 2008 covering specific areas of focus. The objective of this Law is to use energy efficiently, to prevent energy losses, to moderate the burden of energy costs on the economy, to increase the yield in the use of energy resources and to protect the environment. This Law targets industrial facilities, building, service and transport sectors, and also power plants; generation, transmission and distribution networks. The Law also provides for subsidies of up to 20 percent of the Project cost for small energy efficiency projects in the industry sector, which are not the target for the proposed Project. The Law further provides for the establishment of the energy efficiency consultancy companies (ESCOs) which, under an appropriate performance contracting regime, can be useful in promoting energy efficiency in some sectors such as small and medium enterprises (SMEs).

21. **Energy intensity of the economy:** The Turkish economy is considered to be energy intensive when compared with several comparable countries, and this will increase further with increased industrial growth and urbanization. As Figures 1.7 and 1.8 below show, even though total primary energy supply (TPES) per capita in Turkey is among the lowest – 1.2 toe/capita in 2005 compared to the OECD average of 4.7 toe/capita, the Turkish economy is comparatively more energy intensive – 0.35 toe/'000 GDP (in 2000 US$) in 2005 compared to an OECD average of 0.20 toe/'000 GDP (and a world average of 0.32 toe/'000 GDP).

Figure 1.7: TPES per capita (toe/capita) – 2005

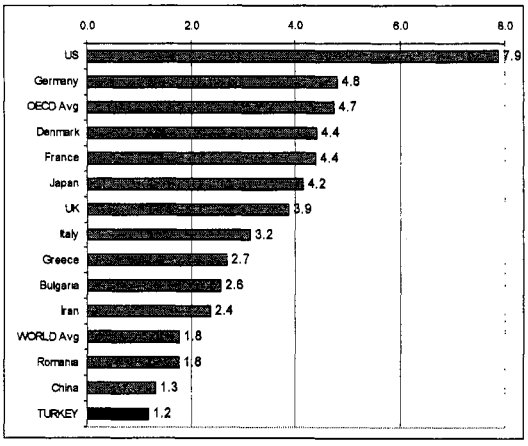
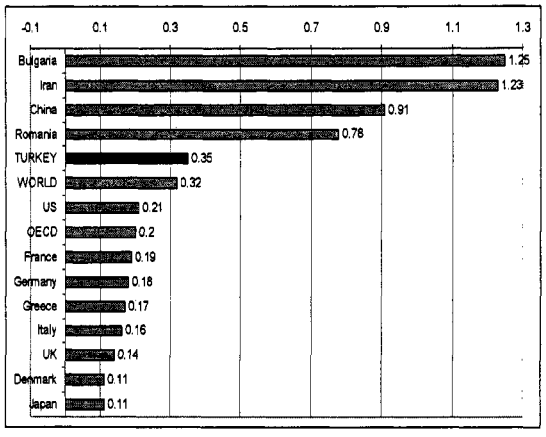


Figure 1.8: Energy intensity (toe/ '000 GDP in 2000US$)



IEA, Key World Energy Statistics, 2007

22. **Energy efficiency potential:** An assessment by IEA estimates that two-thirds of the reduction in carbon dioxide emissions expected from developing countries would come from increased energy efficiency. As the next paragraphs show, a further assessment of Turkish industry shows that parts of it can indeed benefit from energy efficiency investments. At the

same time, other segments of the economy, particularly municipal facilities, and public and residential buildings also show a significant need for energy efficiency investments and efforts.

23. **Industrial energy efficiency:** Turkish industry makes up about 32 percent of final energy consumption in the country, and is thus the priority area for energy efficiency efforts. Studies by various agencies such as EIE show that significant parts of industrial sectors in Turkey, particularly the more energy intensive, also compare unfavorably with other countries in terms of energy efficiency. Overall energy intensity in Turkey emanates primarily from the high share of energy intensive industry such as cement, iron and steel. At present, metal and non-metal and mineral products represent 47 percent of the total energy use in Turkish manufacturing industry. Substantial potential for energy efficiency investments exists across some of these sectors in Turkey such as iron and steel, cement, ceramics, textiles, paper etc. where a switch-over to new process technologies, as well as replacement of generic equipment (like electric motors, compressors, pumps) can produce substantial financially-viable energy savings. A World Bank report[11] (under finalization) assesses the potential for energy efficiency in various end-use sectors, and notes that energy consumption in Turkish steel and cement plants could be economically reduced by about 20 percent.

24. Although the textile sector is not as energy intensive, the Turkish textile sector consumed 19 percent of industrial electricity consumption in 2006. EIE estimates that considerable energy savings potential exists there as well, mainly from waste heat recovery and efficient motor drives. A study by TÜBİTAK Textile Research and Development Center shows that adoption of new technologies such as steam-combined radio frequency dryers, plus improvement in existing finishing, dyeing and drying processes could generate significant energy savings of about 15 percent with payback periods in the range of 2-4 years.

25. **Barriers to energy efficiency investments:** Energy efficiency has significant benefits, and is normally financially viable. However, experience with energy efficiency investments in other countries shows that many energy efficiency projects remain unfinanced and unimplemented because of key barriers which have impeded the development of the lending market for medium and large-sized industrial energy conservation investments, despite its large potential. These barriers include:

(a) **Inadequate awareness of the benefits of energy efficiency and perceived high technical and financial risks of such projects among industry:** Industry, particularly medium and large industry, may in cases perceive energy efficiency projects to be technically risky and not bringing about commensurate financial returns, particularly when compared to green field investments. In some cases, such investments also face the principal-agent dichotomy, particularly where industries franchise operations to others and responsibility for reducing costs is not clearly attributed.

(b) **Insufficient capacity for evaluating renewable energy and energy efficiency projects among banks, and their perception of high financial risks of such projects.** There is a lack of adequate debt financing for such projects, primarily because banks are not familiar with such projects in Turkey. The internal capacity for identification of such projects, their evaluation and further processing is also low as a result. In Turkey, this is further exacerbated by the absence of financing of suitable tenor and cost – financing available in the Turkish market is short-term and high-cost financing. For industries, banks prefer new

[11] Draft report on Assessment of Energy Efficiency Potential in Turkey.

investments, or investments that raise productivity or capacity, rather than investments aimed at reducing costs or improving efficiency.

(c) **Insufficient institutional capacity for managing the regulatory framework for energy efficiency.** The capability of the regulatory arrangements to effectively implement the Government's energy efficiency policies and programs needs to be scaled up to meet the new challenges posed by the EE Law and the secondary regulations. This is a significant challenge, as witnessed in other countries that have embarked on the path to scaling up energy efficiency, and needs significant capacity building support in initial years.

(d) **High transaction costs in developing renewable energy and energy efficiency investments.** The transaction cost of developing renewable energy (other than large hydro and wind) and energy efficiency investments faced by industry as well as by banks is usually high. Such costs can arise from energy audits, feasibility studies, sometimes the need to shut down processes in order to rehabilitate or replace parts. These costs are further enhanced by the lack of adequate familiarity and experience with identifying and preparing such projects both within industry as well as in banks.

(e) One of the key limitations for wider project implementation of renewable energy and EE financing is the **lack of financial resources and proper lending facilities**, particularly for small-scale projects and SMEs. Financial institutions view renewable energy and the EE sector as higher risks, 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. CTF will be instrumental in attracting the attention of the financial institutions to this new field, providing necessary know-how to help develop institutional capacity and developing a competitive market for these products.

Annex 2: Major Related Projects Financed by the Bank and/or Other Agencies

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. **Renewable Energy Project:** The main Project related to the proposed Project is the Renewable Energy Project. It is a US$202.3 million loan; approved in 2004 to Republic of Turkey and on-lent to TSKB (US$150 Million) and TKB (US$50 Million). This Project has been proceeding well and is therefore rated satisfactory both in terms of implementation and achieving its development objectives. All of the funds in this ongoing loan have been committed by TSKB and TKB, and about 90 percent of the funds was disbursed by January 2009. The Project has helped finance an additional generation capacity of 605 MW, involving 22 private projects (13 projects financed by TSKB and 9 by TKB) for a total investment of US$774 million. These projects include three geothermal projects (2 TSKB and 1 TKB), one wind project (TSKB), one land fill gas project (TSKB) and 17 hydropower projects. The addition to energy generation when all plants are completed and assuming normal hydro and wind conditions will be about 2377 GWh. The reduction in carbon dioxide emissions will be about 1.01 million tons compared to a target of 0.932 million tons in the PAD using the conversion factors in the PAD.

2. **Other Electricity Sector Projects:** There are four other electricity sector projects under implementation in Turkey. These are loans to state owned enterprises with a guarantee from the Republic of Turkey – two transmission projects (ECSEE APL2 and ECSEE APL3) which are loans to the transmission company TEİAŞ, a loan to the generation company EÜAŞ (the Electricity Generation Rehabilitation and Restructuring Project) and a loan to the distribution company TEDAŞ (Electricity Distribution Rehabilitation Project). ECSEE APL 2 is a loan for 50.6 Million Euro. ECSEE APL 3 is a loan for 125 Million Euro. The loan to EÜAŞ is for 280 Million Euro and was made in 2006. Finally the loan to TEDAŞ for 205 Million Euro became effective in 2008.

3. **Energy Sector Policy Dialog**: The Bank has been providing analytical support through its advisory support program. Completed and ongoing work includes: (a) Regular high-level advice by an independent expert panel of leading international specialists on critical sector issues including supply security, market implementation, regulation and privatization; (b) Provision of advisory services on sustainable wind energy development; (c) Analytical work on demand-side energy efficiency potential and opportunities in Turkey; (d) Preparation of a report in 2007 on the security of electricity supply; (e) Studies related to a gas sector strategy and to greenfield gas distribution; and (f) Preparation of a study on incentives that would be provided to private investors through a capacity mechanism in conjunction with a better functioning electricity market, with additional measures to add new generation capacity to be installed by private investors under long-term contracts with the Distribution Companies (Discos). Assistance has also been provided for the design and implementation of the power sector reform program through the Bank's investment operations, including: (i) Support for the design and implementation of the electricity market including the balancing and settlement system and the day-ahead market; (ii) Support to the System and Market operator through training and capacity building; and (iii) Financing of key market infrastructure, in terms of the market models, software and hardware, system dispatch and control tools, metering systems, and market management system.

Annex 3: Results Framework and Monitoring

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

Project Results Framework

PDO	Project Outcome Indicators[12]	Use of Project Outcome Information
The Project's development objective is to help increase privately owned and operated energy production from indigenous renewable sources within the market-based framework of the Turkish Electricity Market Law, enhance demand-side energy efficiency, and thereby help reduce greenhouse gas emissions.	For renewable energy: a. Total capacity of renewable electricity or thermal heating plants; b. Incremental production of electricity or heat; c. Share of renewable electricity generation in total generation; d. Emission reduction potential. For energy efficiency: a. Extent of savings in heat or electricity; b. Emission reduction potential. Cost-effectiveness of CTF in terms of CTF US$ per ton of CO_2 reduction.	The information will be used by the Government and the Bank to track the progress of the Project and measure its success. Also the information on the results of the energy efficiency projects will be used by the Government to promote further energy efficiency projects and programs.
Intermediate Outcomes	**Intermediate Outcome Indicators**	**Use of Intermediate Outcome Monitoring**
TSKB Loan	a) Commitment of funds b) Disbursement of Funds c) Proportion of renewable and energy efficiency projects in the portfolio	Monitored indicators will be used to assess implementation performance.
TKB Loan	a) Commitment of funds b) Disbursement of Funds c) Proportion of renewable and energy efficiency projects in the portfolio	Monitored indicators will be used to assess implementation performance.

[12] Given that this is an FI operation, it is not clear upfront the extent to which the project will finance renewable and energy efficiency. The outcome indicators in the results monitoring table below are calculated on the assumption that 10% of the total project (US$1.1 billion) goes towards energy efficiency – if the proportion between renewable and energy efficiency changes, the respective indicators will also change. For each US$100 million invested in renewable energy, renewable capacity would be increased by about 42 MW, generation by 175 GWh/yr and CO_2 reduced by 219,000 tons/yr. For each US$100 Million invested in energy efficiency 482 Tcal/year would be saved and CO_2 emissions would be reduced by 190,000 tons/yr.

Arrangements for results monitoring

Project Outcome Indicators	Baseline	Target Values					Data Collection and Reporting		
		YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Renewable energy									
Capacity of renewable electricity or thermal heating plants (MW)	1540	1583	1692	1778	1865	1973	Semi Annually	TSKB/TKB Reports	TSKB/TKB
Potential Incremental production of electricity (TWh)	0	181	635	998	1360	1814			
Incremental Emissions reduction potential: (000 tons CO_2)[13]	0	227	794	1249	1703	2270			
Renewable Electricity Generation as a percent of total generation	18%	18%	19%	19%	20%	20%			
Energy efficiency									
Extent of savings in heat or electricity (Tcal)	0	55	194	305	415	554	Semi Annually	TSKB/TKB Reports	TSKB/TKB
Emission reduction potential: (000s tons)	0	22	77	121	165	219			
Cost-effectiveness of CTF (US$ of CTF per ton CO_2)				10.0	10.0	10.0			
Intermediate Outcome Indicators									
TSKB Loan Commitments	0	20%	50%	75%	100%		Semi Annually	TSKB Reports	TSKB
TSKB Loan Disbursements	0	10%	35%	65%	90%	100%			
% of RE+EE in TSKB Portfolio	17%					21%			
TKB Loan Commitments	0	20%	50%	75%	100%		Semi Annually	TKB Reports	TKB
TKB Loan Disbursements	0	10%	35%	65%	90%	100%			
% of RE+EE in TKB Portfolio	13%					18%			

[13] Under different scenarios, depending on the extent of financing for renewable and energy efficiency, the emission reduction would vary. The key assumption is that these investments would offset the need for constructing incremental generation capacity which comprises a mix of lignite and natural gas plants, resulting in avoided emissions of 1,031 tCO_2/ GWh. This is a conservative assumption, since in all likelihood, the renewable generation or energy efficiency savings would offset a lignite-fired plant, thereby resulting in a higher level of emission reduction.

Annex 4: Detailed Project Description

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. Each FI will intermediate their loan (US$350 million equivalent for TSKB, US$150 million equivalent for TKB) and CTF resources (US$70 million and US$30 million respectively) for financing participating sub-project sponsors for constructing plants that use renewable energy such as (hydropower, geothermal, wind or biomass including landfill gas) to produce electricity or heat, or for energy efficiency projects defined as those projects where the major benefit comes from a reduction in energy usage. Separately, a technical assistance program financed by KfW and UNDP using ongoing facilities (and potentially other donors) will proceed in parallel. The Project will be composed of two IBRD credit lines, one each to TSKB and TKB, and two CTF credit lines, one each to each FI. Ten percent of the IBRD credit line will be allocated by each FI towards energy efficiency projects, with the remaining being allocated to renewable energy.

2. While specific projects are not yet known, the universe of potential projects is currently defined by the extent of licensed projects, as below:

Table 4.1: Licensed Renewable Energy Projects (2008)

Renewable Energy Source	Number of Projects	Capacity (MW)
Wind	93	3,300
Hydro	376	10,906
Geothermal	5	77
Landfill Gas	5	32
Biogas	8	14

3. In addition there are 193 projects with 4118 MW of capacity which have been approved by EMRA and are awaiting licenses. There are also 950 projects with 102,067 MW of capacity which are seeking licenses and are under evaluation. However, most of these applications are for the same sites and the total potential generation from these applications is only a small fraction of the 102,000 MW face values of the applications.

4. Both FIs have a sizeable pipeline for renewable projects, although primarily in hydro – this demand is contingent upon financing of the right tenor and terms being available. Because of the lack of significant long term resources in Turkey, if TSKB and TKB do not have sufficient long term resources, these projects are likely to get delayed or stopped. Both banks feel less certain about energy efficiency, for reasons explained earlier, but subject to availability of CTF, are forecasting some investments in this area. The table below shows the pipeline of projects for TSKB and TKB as of end-2008.

Table 4.2: Pipeline of Potential Projects

	TSKB		TKB	
	MW	US$ million	MW	US$ million
Hydro	1068	494	135	100
Wind	23	7	35	50
Geothermal	0	0	45	50
Total RE	1091	501	215	200
Energy Efficiency		200		150
Total potential		**701**		**350**

5. Besides the projects in the TSKB and TKB pipelines, the Project also aims to use CTF resources for renewable and energy efficiency investments. The types of projects which could use CTF are discussed below.

6. **Small hydro:** Under the proposed Project, CTF support is recommended for small-scale hydro (up to 10 MW), to help accelerate the development of this important renewable resource. In order to widen the investor base and to diversify project locations, so that a wider potential for hydro is utilized, incentives are needed - CTF usage is therefore recommended for smaller projects and smaller investors. Because many of these plants are run-of-river projects, they have a high capacity factor which leads to more reductions in CO_2 emissions. The financial and economic analysis in Annex 11 shows that such projects are likely to be marginally economic, but the use of CTF will help enhance their returns, thereby helping attract investors and accelerate capacity additions.

7. **Wind energy** is emerging in Turkey (about 452 MW now in operation) and as noted in Annex 1, there is significant potential in Turkey. The Government is requesting CTF support to ensure accelerated development of wind resources, in order to help Turkey scale-up its wind program to reach the highly ambitious 20,000 MW target for wind by 2020. The most attractive sites – those with the best wind regimes – are under development, leaving less attractive resources with higher marginal costs for the next round of development. Given that the uptake for wind power is well below the level needed to meet Turkey's ambitious target, incentives are needed to attract potential sponsors, such as through CTF. Separately through another Bank-financed project, CTF support is also proposed for the transmission system operator, TEIAS, for improved management of the variations and other impacts of wind generation on the power grid (the smart grid proposal).

8. **Geothermal:** Turkey has considerable geothermal resources of about 600 MW for electricity generation and about 30,000 MW thermal for heating applications. Turkey's current geothermal electricity generation capacity is about 30 MW. Three projects, with a total of 71 MW, are under way with financing under the ongoing Renewable Energy Project. Turkey's target is to develop the 600 MW by 2020. The sites for these plants are limited by the requirement that substantial amounts of very hot fluids (water, brine) be available. While Turkey is a seismically active area with lots of hot water most of it is of low temperature to support a geothermal project using the technology currently available. Geothermal projects are fairly expensive at US$2500- US$4000 per kW- considerably more expensive than combined cycle plants or most coal fired power plants. They also generally tend to be fairly small: those financed by the Bank range from 6 MW to 47 MW. Nevertheless if there is a major source of very hot geothermal water or brine, plants based on this water or brine are quite economic because the fuel is free. Their impact on the GHG emissions is positive since no fossil fuels are burnt. The potential for geothermal heating in Turkey is quite large but not well developed. Currently there are about 15 district heating systems using geothermal hot water. These systems serve around 60,000 customers. If funds were available many of these systems could be expanded and new systems built. CTF usage will enable a large number of projects to become financially attractive which otherwise would remain undeveloped – initial costs for such projects can be very high, thus deterring private investment. More generally, CTF usage is expected to help expand the development of geothermal resources in Turkey.

9. **Emerging renewable technologies:** In addition to these technologies which are in use in Turkey but need to be accelerated, there are relatively newer renewable technologies such as

biomass and solar, which are proposed for CTF financing, in order to attract private investment to these technologies. These technologies are new to Turkey and they may not be financially attractive at this stage. With the exception of landfill gas projects, these emerging technologies all have somewhat higher incremental investment costs and hence high cost of CO_2 abatement. CTF usage for these technologies will assist in the deployment of these resources in Turkey, and thereby over time, help reduce the costs of such technologies as they become more prevalent in the country. These are discussed below.

10. **Biomass:** Turkey's biomass potential is estimated at about 15 million tons of oil equivalent (mtoe) per annum. Biomass (wood, animal and plant waste) has traditionally been used as fuel for cooking and heating in rural areas of Turkey. About 6 mtoe is currently estimated as being used, accounting for about 23 percent of Turkey's indigenous primary energy production. Most of this is in the form of wood. If 20 percent of this biomass material can be used for generating electricity it would generate about 3.4 TWh per year which would reduce CO_2e emissions by 2.1 Million tons per year. This would also require the construction of about 430 MW of generation capacity at a cost of about US$1.1 billion. Most biomass projects are likely to be marginally economic in the absence of significant incentives – the use of CTF may enable some biomass (particularly steam) projects to become economic, thereby helping accelerate capacity addition.

11. **Solar:** Turkey's solar energy potential is estimated to be 78 mtoe p.a. Solar PV power is generally uneconomic at current tariffs except for a limited number of remote locations where it is expensive to connect to the grid. A 2006 Bank study showed that solar PV capacity costs about US$7,500 per kW, more than 10 times as much as a combined cycle plant. Concentrated Solar Power (CSP) is also expensive ($2,500/kW) but is closer to being economically attractive. The Government is proposing a higher feed-in tariff for solar plants. At higher tariffs, solar thermal plants appear to be close to economic. CTF financing would greatly assist solar thermal, both in increasing its credibility and raising the rate of return on equity above the high hurdle rate for a technology which is new to Turkey. Solar PV would, however, require higher tariffs than currently under review. At present there are no cases of private interest in such solar technology. The expectation is that, once the feed-in tariffs are raised and the FIs start marketing the CTF blending, there may be an increase in private sector interest at least in solar thermal.

12. **Energy efficiency:** The Turkish economy is considered to be energy intensive when compared with several comparable countries. Under energy efficiency legislation and recent and forthcoming regulations (see Annex 1) the Government is promoting the efficient use of energy in large industries, in small and medium-scale enterprises (SMEs), in households, in transport, and in the public sector. Residential interventions will focus on fluorescent bulbs (an ongoing program), appliance standards (in particular refrigerators) and insulation as well as the implementation of the energy performance regulations for buildings. Public sector interventions will focus on lighting and insulation.

13. The NCCC presents a Demand Side Management (DSM) case (a DSM wedge) analyzing the impacts of a 15 percent reduction in industrial electricity consumption and 10 percent reduction of electricity consumption in residential applications. In line with international experience, the results of the implementation of such measures would be highly beneficial – a win-win for the economy and the environment. Accelerating energy efficiency could reduce Turkey's CO_2 emissions in 2020 by 75 million tons p.a., 12 percent below their

reference case. In view of the net benefit and high absolute volume of CO_2 reduction, one of the two areas of focus of Turkey's CTF program is on energy efficiency.

Technical Assistance for Energy Efficiency Financing

14. Experience from across countries in developing energy efficiency projects suggests that the provision of technical assistance (TA) in identifying, evaluating and developing energy efficiency investments for participating banks as well as industries during the initial stages is very useful for sustainable implementation. Technical assistance is therefore necessary, and will be provided in parallel to the Project, by donors. KfW and UNDP have agreed to utilize ongoing and planned TA programs to support capacity building for energy efficiency investments. Furthermore, additional funds may be sought in future as may be necessary. In addition, other donors such as JICA and AfD have also expressed an interest in providing additional support going forward.

A. Capacity building for Financial Institutions: The aim here will be to (a) provide capacity building support to the two banks participating in the proposed Project, TSKB and TKB, and (b) provide a forum for outreach to the Turkish banking industry in general, with a view to broadening the impact of the technical assistance in energy efficiency across the banking sector.

15. **Assistance to TSKB and TKB** – The main areas of support to these FIs will be as follows:

i) Assistance in capacity building and training, including development of necessary internal mechanisms, procedures and knowledge base, through training with a view to facilitating:

   - Enhanced understanding of energy efficiency investments
   - Due diligence techniques for eligible energy efficiency projects, including financial, technical, social and environmental assessment – appraisal techniques, assessment of main benefits, cash flows, investment needs, etc., in different types of industrial sectors – both in energy intensive industries as well as in non-intensive sectors
   - Improved understanding of energy audit techniques, particularly with a view to assessing energy savings potential both in energy as well as in value terms

ii) Strengthening the capacity of the Marketing teams at these banks, with a view to developing and maintaining a sustainable energy efficiency pipeline. Assistance will support increased awareness of energy efficiency projects, ability to identify potential areas, dissemination and replication of successful activities.

iii) Development of suitably customized financial products and risk management tools for energy efficiency. Financial products could vary depending on industry sector, intensity levels, size of investment needs, etc. Such products would range from direct financial support through loans of suitable tenors, upfront contingent grants for initial transaction costs, guarantee products, shared savings/performance contracts such as through energy service companies (ESCOs), etc.

16. **Assistance to the banking sector in Turkey** – The TA program will also provide technical assistance to additional commercial banks, which will lend their own funds to eligible industrial energy efficiency projects, with a view to enhancing the development impact as well

as to demonstrating the viability of such projects. This will include a series of workshops to present successful case studies of energy efficiency projects financed by TSKB and TKB, and also in other countries, in order to enhance awareness of the sustainability and viability of such investments. The two FIs, TSKB and TKB, may also carry out outreach activities with a view to broadening the appreciation for the benefits of energy efficiency projects. The areas to be covered will include assistance in increasing awareness of energy efficiency investments, due diligence techniques, financing products, risk management instruments aimed at energy efficiency, strengthening the capacity of the marketing teams at these banks, etc.

B. Capacity building for industry: The aim here will be to provide capacity building support to industry in general, with a view to broadening the understanding of benefits of energy efficiency investments, enabling industry to identify and prepare such projects, and strengthening their ability to finance and implement these projects. This support could be provided to prioritized industry sectors, starting with those industrial sectors which may have a higher potential for energy savings, or by focusing on energy intensive industries, and/or by focusing on the existing client base of the two FIs, TSKB and TKB. Support in this area is aimed to be provided by a UNDP-GEF project, and the proposed TA would complement and expand on this Project.

i) Capacity building support will assist with increased awareness of energy efficiency projects, appraisal techniques for such projects, familiarization with regulations, guidelines and procedures; and risk management, financial instruments and hedging instruments.

ii) Support for institutional arrangements will include support for the organization, staffing, and initial business plan for energy-efficiency investments.

iii) Project preparation support will focus on helping industry assess their energy consumption and energy intensity, identifying energy savings potential and defining projects to tap the potential, preparing feasibility studies and energy audits for these projects, and then preparing for due diligence by the banks. Selected industry staff would be trained in these activities.

C. Assistance for Institutional Framework for energy efficiency (to EIE): The Energy Efficiency Law places a large responsibility on EIE – it is mandated to develop, implement and monitor national energy efficiency programs and strategies throughout the country, manage and develop financing programs under the Law for energy efficiency projects, monitor ongoing programs and determine their sustainability, etc. EIE will also have to play a critical role in market facilitation to enable effective implementation of the Law. This support will therefore provide organizational and strategic planning assistance to the further strengthening of EIE, as well as to help develop the initial programs to be undertaken by EIE.

Annex 5: Project Costs

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

Project Cost By Component and/or Activity	Local US$ million	Foreign US$ million	Total US$ million
IBRD Loan	100	400	500
CTF	20	80	100
Sponsor Equity	200	100	300
Other Borrowing (including bilateral donors)	25	75	100
Total Baseline Cost	345	655	1000
Physical Contingencies	17.25	32.75	50
Price Contingencies	34.5	65.5	100
Total Project Costs[1]	396.75	753.25	1150
Front-end Fee		1.25	1.25
Total Financing Required	396.75	754.5	1151.25

[1]Identifiable taxes and duties are US$138 million, and the total project cost, net of taxes, is US$1013 million. Therefore, the share of project cost net of taxes is 88 percent.

Annex 6: Implementation Arrangements

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. TSKB is one of the two borrowers for the proposed Project. It will borrow from the Bank and the Undersecretariat of Treasury will provide the loan guarantee to the Bank on behalf of the Republic of Turkey. TSKB will be one of the implementing agencies for the Project, and will use the existing Renewable Energy Project Implementation Unit (PIU) within TSKB headed by an Executive Vice President for the implementation of the proposed Project. A financial assessment of TSKB and its suitability for the proposed Project is described in Annex 9.1.

2. TKB is the second borrower for the proposed Project. It will borrow from the Bank and the Undersecretariat of Treasury will provide the guarantee to the Bank on behalf of the Republic of Turkey. TKB has identified a program manager and a PIU team to implement the Project. The program manager and several of the PIU team members are directly involved with the Renewable Energy Project and are thus experienced with World Bank Project implementation. The PIU team will maintain the financial management and reporting systems for the Project and will implement the credit line. A financial assessment of TKB and its suitability for the proposed Project is described in Annex 9.2.

3. Both these intermediaries have gathered sufficient knowledge and experience with managing complex projects such as renewable energy investments, under the ongoing Project. They have suitable levels of staff with requisite qualifications and experience, and these staff will continue to market the new facility, appraise and evaluate project proposals, and monitor implementation.

4. The IBRD and CTF loans will be provided in parallel to eligible subprojects. The level of CTF to be provided to each subproject will be determined by the FI based on the criteria set up in the Operational Manual and discussed in Annex 11. The broad eligibility criteria are summarized here:

- Sub-projects must be targeted towards the production of energy (both electricity and heat) based on renewable resources or improvement of energy efficiency of operations.
- The Sub-projects will be categorized in the following three groups:
  1. Traditional Renewable Energy (Not eligible for CTF) – Hydroelectric projects greater than 10 MW capacity, landfill projects;
  2. Emerging or less developed Renewable Energy (Eligible for CTF) – Power generation and heat utilization investments using renewable energy sources that are less developed and/or less economic such as wind, geothermal, Solar, Biomass, and Hydroelectric projects less than or equal to 10MW; and
  3. Energy Efficiency (Eligible for CTF) – Projects that show at least 50 percent of incremental benefits from the Project coming from a reduction in energy consumption or at least 20 percent energy savings in the specific investment.
- For sub-loans or financing leases from IBRD resources, the interest rate will be equal to the costs of funds to the FI plus a risk-adjusted spread based on the risk classification of the sub-borrower and the subproject. Sub-loans from CTF resources will have the CTF terms passed onto the sub-borrower along with an appropriate spread to cover the FI's administrative costs.

- Sub-loans from IBRD will have a maturity of not less than 4 years, sub-loans from CTF funds will have maturity of at least 7 years, financing leases will have a maturity of not less than 4 years.
- Subprojects will generate a financial rate of return of at least 8 percent, and will have at least 15 % sponsor equity financing for renewable energy projects, and 25% for energy efficiency projects unless otherwise agreed with the Bank.
- The allocation of CTF funds will be determined by the FIs based on their assessment. The level of CTF resources used for any particular subproject will be determined as the amount required to enable the project to reach the target IRRs on equity levels discussed in Annex 11.
- Overall CTF usage will be 20% of total project cost.
- CTF funds will be used for diverse portfolio of RE and EE investments, and will not be restricted to any particular technology.
- The FIs will make best endeavors to gradually decrease the CTF subsidy for specific technologies in the later years of the Project.

Annex 7: Financial Management and Disbursement Arrangements

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. The overall financial management risk for the Project is considered low. A summary of the risk assessment for the Project is shown in the table below:

Table 7.1 Summary of Risk Assessment

	FM Risk Rating	Risk Mitigating Measures	Residual Risk
Inherent Risk			
Country Level.	Moderate	There is a well functioning banking system regulated by the Banking Regulation Supervisory Agency.	Low
Entity Level - Both implementing entities are strong banks that are fully in compliance with BRSA regulations.	Low		Low
Overall Inherent Risk	Moderate		Low
Control Risk			
Budgeting - Both banks have their own budgeting procedures and the Project will be taken into consideration in budget formulations and revisions.	Low		Low
Accounting - Both banks have functioning accounting systems and the projects will be fully integrated into these systems.	Low		Low
Internal Controls - The projects will be subject to the internal control procedures existing in the banks.	Low		Low
Funds Flow - Traditional disbursement will be used.	Low		Low
Financial Reporting	Low		Low
Auditing - Both banks are being audited as part of BRSA requirements.	Low		Low
Overall Control Risk	Low		Low
Overall FM Risk	Low		Low

Country Issues

2. The proposed Loan will be disbursed through financial intermediaries, namely TSKB and TKB, directly to sub-project sponsors. TSKB and TKB are required to be in compliance with the Banking Regulation and Supervision Agency (BRSA) prudential ratios set forth in the banking law and regulations. The accounting and auditing requirements applicable to the Banks are also determined by BRSA.

3. Banks are required to prepare financial statements in compliance with the BRSA accounting requirements. The BRSA requires Banks to comply with Turkish Accounting Standards set by the Turkish Accounting Standards Board. For regulatory purposes banks have to consolidate only the financial statements of participations which are credit institutions and financial institutions. Additionally through corporate governance principles, BRSA requires banks and other financial companies to prepare financial statements that fully comply with Turkish Accounting Standards which are based on and correspond to IFRS, where all participations are subject to consolidation.

4. Banks submit quarterly financial reports to the BRSA and publish audited annual financial statements. Only auditors approved by the BRSA may carry out such audits. Any changes of auditor must also be approved, and a change can be imposed where there is dissatisfaction with the performance of the auditor. The external auditor is required to report to the BRSA on banks' and internal control and risk management systems, and also reports to the BRSA with respect to issues which may seriously impact the bank.

5. Both TSKB and TKB are in compliance with the BRSA regulations.

Strengths

6. The current Renewable Energy Loan has been disbursed satisfactorily and the financial management arrangements for the Project are satisfactory. TSKB and TKB will apply the same arrangements for the new Loan.

Weaknesses and Action Plan

There are no specified financial management weaknesses for the Project.

The Implementing Entities

7. TSKB and TKB will continue to be the implementing entities. TSKB was established in 1950 and is one of the leading investment and development banks in Turkey. The current Renewable Energy Project implementation arrangements in TSKB where a PIU team comprising of experienced and qualified staff oversees the implementation and coordination activities is satisfactory to the World Bank. TKB has also been able to implement the existing loan satisfactorily and is expected to continue to do so with the new loan.

The risk associated with implementing entities is low.

Accounting

8. Staffing: Both banks will use their own staff for the financial management of the Project. The staffs assigned to work on the Project both in TSKB and TKB are qualified and experienced. There is a clear segregation of duties between the staff with respect to evaluation of applications, accounting and reporting.

9. Accounting Policies and Procedures: The operational manuals (OM) for the proposed Project agreed with TSKB and TKB separately have details about the work flows in the Project.

10. TSKB: The financial management of the Project is integrated into the TSKB system which allows the follow-up of loans under the current Renewable Energy Loan from the initial application to the approval and monitoring stages. The system has adequate security levels and is fully integrated into the management information system of the bank. The same system will be used for the proposed Project.

11. TKB: The financial management of the Project is integrated into the TKB system which allows the follow-up of loans under the current Renewable Energy Loan. All project information is entered into the Central Database System. While the beneficiary companies are followed up under TKB's Loans System; an additional Source Area is created to follow up the IBRD funds (i.e. payments to the Treasury, disbursements from the IBRD loan, etc.). The system has adequate security levels and is fully integrated into the management information system of the bank. The same system will be used for the proposed Project.

The risk associated with accounting is low.

Internal Control and Internal Auditing

12. In TSKB, the marketing of the loan facilities is carried out by the Relationship Manager in the corporate marketing department. The appraisal of the project and loan applications is carried out by the Technical Services Division. Therefore marketing and appraisal are carried out by two different departments independent from each other headed by different Executive Vice Presidents. Project appraisal team consists of an economist, an engineer and a financial analyst. Each of them appraises the project from different perspectives. The project appraisal report is submitted to the Credit Committee and eventually to the Board of Directors.

13. TSKB has adequate internal control procedures and these controls are also documented in the information system. Beneficiary enterprises make their applications to the loan department of TSKB. The application and the feasibility of the project are reviewed by the project appraisal department who assesses the project from technical, financial and economical perspectives. The project appraisal team is composed of an economist, a financial analyst and an engineer, whose project reports are submitted to the Credit Committee and then to the Board of Directors (BOD). Upon approval of the BOD, a contract is signed with the beneficiary enterprise. The Operations Department receives the invoices only after the relevant departments/engineers complete the control procedures in terms of mathematical correctness as well as compliance with the project framework. These eligible invoices are recorded to the beneficiary's sub-account under the memorandum accounts. Approvals are made on-line, thus it is possible to track the process from TSKB's system. When all the approvals for payment are completed in the system, the

Operations Department releases the funds and the credits division within operations generates the accounting records automatically through the system.

14. TKB has adequate internal control procedures for the projects and these controls are documented in the information system. Beneficiary enterprises make their applications to the Credit Marketing department of TKB. The application and the feasibility of the Project are reviewed by the Loan Evaluation department that assesses the Project from technical, financial and economical perspectives. The project appraisal team is composed of an economist, a financial analyst and an engineer, whose project reports are submitted to the Credit Committee and then to the Board of Directors (BOD). Upon approval of the BOD, a contract is signed with the beneficiary enterprise. The contract entitles the firm to make disbursements from its allocated loan account. The invoices are received and entered into the system by the technical expert responsible for that project. While the technical expert is responsible for the verification of the receipt of the goods and services outlined in the invoice, the financial expert is responsible for the accuracy of the financial information on the invoice. The technical team prepares a report after visiting the project site and executing the controls explained in the paragraph below. The report is also verified and signed by one manager and two assistant managers from the Loan Evaluation Department.

15. Once the beneficiary enterprise/firm sends its declaration of expenditures, the bank's technical experts responsible for the Project of this firm visit and document the work in progress at the project site through photos and technical evaluation. The same team then goes to the firm's headquarters to verify the progress reports, related invoices and the payments made by the firm for these invoices. The original of each invoice that is verified is stamped by TKB's technical experts, to prevent any duplicated payment request from the firm. Following their visit, the technical team prepares a report and determines the amount that is going to be financed from the World Bank, supported with Excel tables showing the details of the invoices. Copies of the invoices are kept in the technical team's files. The Loan Evaluation Department sends the report and the payment order signed by the Loan Evaluation Manager, Deputy General Manager and General Manager to the Financial Affairs Department. The Financial Affairs Department makes the payment and sends the relevant statements to the Sources Department which is responsible for making the withdrawals from the World Bank. This procedure is repeated for every payment request made by the beneficiary enterprises.

16. Both banks have internal audit departments and the project related transactions will be subject to their regular reviews.

The risk associated with internal controls and internal audit is low.

Funds Flow

17. Both TSKB and TKB will open two designated accounts for the Project, one in USD and one in EUR. Funds from the loan will be made available to beneficiary enterprises/sponsors following submission of and verification of invoices and payment documents to TSKB and TKB.

18. The risk associated with funds flow is low.

Financial Reporting

19. Both banks will maintain records and will integrate the accounting for the funds provided for the Project into their systems. The interim unaudited financial reports (IUFR) will be prepared semi-annually and will be submitted to the Bank no later than 45 days after the end of the period. The content and format of IUFRs were agreed upon negotiations.

The risk associated with reporting and monitoring is low.

Auditing

20. TSKB's external auditors are Deloitte and Touche. They have audited the current Renewable Energy Loan Project financial statements and TSKB's financial statements prepared in accordance with the International Financial Reporting Standards for the year ended December 31, 2007 and submitted an unqualified audit opinion.

21. TKB's external auditors are Rehber YMM AS. They have audited the current Renewable Energy Loan Project financial statements and TKB's financial statements prepared in accordance with the International Financial Reporting Standards for the year ended December 31, 2007 and submitted an unqualified audit opinion on their financial statements.

22. The following table identifies the audit reports that will be required to be submitted by TSKB and TKB separately.

Table 7.2 Audit reports

Audit Report	Due Date
Entity financial statements	Within six months after the end of each calendar year
Project financial statements (PFS) including SOEs and designated account.	Within six months after the end of each calendar year and also at the closing of the Project.

The risk associated with audit is low.

Disbursement Arrangements

23. Each bank will have two designated accounts, in US Dollars and in EUR, and US Dollar account for CTF. The withdrawal applications that will be submitted by banks will have two signatures indicated in their list of authorized signatures.

24. Applications documenting funds utilized from the Designated Account will be submitted to the Bank on a quarterly basis, and will include a reconciled bank statement as well as other appropriate supporting documents.

25. Disbursements from the IBRD Loan Account will follow the transaction-based method, i.e., traditional Bank procedures: including Advances, Direct Payments, Special Commitments and Reimbursement, with full documentation for Direct Payments and Special Commitments and against Statements of Expenditures (SOEs). For payments above the Minimum Application Size, as specified in the Disbursement Letter, the Borrower will submit withdrawal applications to the Bank for payments to be made directly from the Loan Account or issuance of Special Commitment to cover goods being imported into the country through a Letter of Credit. TSKB and TKB will prepare and authorize their withdrawal applications.

26. Payments against sub-loans will be made according to certified Statement of Expenditure (SOEs). Full documentation in support of SOEs would be retained by the banks for at least two years after the Bank has received the audit report for the fiscal year in which the last withdrawal from the Loan Account was made. This information will be made available for review during supervision by Bank staff and for annual audits which will be required to specifically comment on the propriety of SOE disbursements and the quality of the associated record-keeping.

Supervision Plan

27. During project implementation, the Bank will supervise the Project`s financial management arrangements as follows; (i) during the Bank`s supervision missions financial management and disbursement arrangements will be reviewed to ensure compliance with the Bank`s minimum requirements, (ii) entity and project financial statements of each bank and related audit reports and management letters will be reviewed. As required, a Bank-accredited financial management specialist will assist in the supervision process.

Annex 8: Procurement Arrangements

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. **General:** Procurement for the proposed Private Sector Renewable Energy and Energy Efficiency Project will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004 as revised in October 2006 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004 as revised in October 2006 (Consultant Guidelines) and the provisions stipulated in the Loan Agreements (LAs). The various procurement actions under different expenditure categories are described in general below.

2. **Assessment of the Agency's capacity to implement procurement:** A Country Procurement Assessment Report (CPAR) was prepared in 2001. Turkey has moved decisively to upgrade its public procurement legislation and practices in line with international standards as recommended in CPAR. The current public procurement law was enacted in 2002 (effective since January 2003). The law is based on the United Nations Commission on International Trade Law (UNCITRAL) model and moves Turkey in the direction of compliance with EU standards. The independent Public Procurement Agency (PPA) established by law to oversee public procurement and ensure enforcement of the new procurement standards is fully operational.

3. In the CPAR, it was determined that there are well established commercial practices for the procurement of goods, works and services by the private sector enterprises, autonomous commercial enterprises and individuals. In the case of goods, the local practice is to prepare the technical specifications and solicit quotations from the local and/or international market. In the case of medium and large works, the technical specifications are usually prepared by consultant companies and bids are collected from qualified contractors. Minor works are generally tendered on a lump sum basis by collecting bids from a number of local contractors. When equipment and machinery are needed for expansion of existing facilities, the purchasers usually prefer proprietary goods from a single source for the sake of standardization and minimization of the operation and maintenance cost. Therefore, the local private sector or commercial practices can be considered to be consistent with the World Bank's criteria with respect to economy and efficiency. The general rule in the private sector is to procure the least cost goods, works and services consistent with minimum quality requirements.

4. Turkey has a competitive market for electricity (set up in August 2006, and handling about 18-20 percent of the total electricity on average). Renewable energy projects sell into this market at fully competitive prices. Generators submit hourly bids for the day ahead, and thereafter, in real time, the market operator dispatches the generators on a merit order starting with the lowest price. There is thus a significant incentive for renewable energy sponsors to ensure that they minimize their costs and that they complete projects in time. The experience under the existing Renewable Energy Loan (REL) shows that the use of commercial practice has resulted in good quality projects which have been completed in time and within budget.

5. Turkish private commercial practices are well-established, and have enabled efficient and economic procurement in the case of renewable energy projects. Under the ongoing Project, sponsors have had difficulty in obtaining a wide range of quotations from suppliers as they have been facing a very high level of demand globally. On this basis, the Bank has agreed to continue

the use of acceptable commercial practices as defined in the Operational Manual for procurement under the proposed Project. Foreign suppliers and manufacturers will be eligible to participate. In fact, it has been noted that in the ongoing Project, a majority of the equipment has been procured from foreign suppliers. In order to ensure that procurement is carried out in accordance with the Operational Manual, TSKB and TKB have agreed to carry out independent annual procurement reviews of contracts financed by the proposed Project.

6. An assessment of TSKB and TKB's capacity to implement Project procurement was conducted by the Bank and included in the project file. Both TSKB and TKB have so far successfully implemented the existing Project.

7. TSKB as an institution has a good knowledge about the Bank's operations and has already managed many World Bank financed projects including the existing REL. The staff of TSKB has a good understanding in terms of credit operations. The number and the qualifications of the staff that will be responsible in managing the sub-loans to enterprises are sufficient for the satisfactory implementation of the Project. TSKB's Engineering Department consists of engineers who are responsible for appraisal of the sub-loans and the review of the contracts for their compliance to the Loan provisions. Currently the Engineering Department is providing service for EFIL III, EFIL IV, SME Projects and projects financed by EIB, KfW, JBIC, IFC and AFD. The majority of staff speaks English and has a good understanding of the Bank's terminology. They are good at using electronic communication and documentation.

8. TKB has gained experience about the World Bank financed projects during the implementation of the existing Project. The staff of TKB also has a good understanding in terms of credit operations and majority of the staff speak English. The number and the qualifications of the staff that will be responsible for managing the sub-loans to enterprises are sufficient for the satisfactory implementation of the Project. They are good at using electronic communication and documentation. The engineers in the Credit Evaluation Department review the investment proposals and cost estimates in terms of market prices before the approval of a sub-loan. The Credit Evaluation Department consists of Engineers in various specialties.

9. **Procurement risk assessment:** The overall procurement risk is rated **low**. To mitigate any potential procurement risk, the following issues will be carefully monitored by TSKB and TKB during the implementation:

- TSKB and TKB will agree with each sub-borrower on the procurement packages and the procurement methods (procurement plan) exclusively during the sub-loan appraisal process.
- PIU Engineers in TSKB and TKB will review the relevant contracts before the first payment in terms of their compliance with the agreed procurement methods.
- The PIU Engineers in TSKB and TKB will be responsible to indicate the procurement type and method in their computer network system for each contract during the disbursement process and correct information will appear in the financial management reports produced by TSKB and TKB.
- The sub-loan application documents and contracts will be archived properly for future reference.

- TSKB and TKB will strengthen supervision efforts through independent procurement reviews.
- TSKB and TKB will carefully monitor the work load of the Engineers in the PIUs and if necessary the respective PIUs will be strengthened with additional Engineers.

10. **Procurement implementation and arrangements:** In case of procurement under sub-loans, TSKB and TKB will be responsible for ensuring that the procurement rules for sub-loans specified in the Loan agreement are followed by the sub-borrowers. Specialists assigned for the procurement arrangements within the TSKB and TKB's PIU teams will be responsible for all procurement oversight for the management of the Project. TSKB and TKB will maintain the existing Project Implementation Units which are headed by an Executive Vice President of TSKB and TKB respectively. The existing PIU teams are comprised of experienced staff from Credit Marketing, Credit Evaluation/Operations and Engineering Departments of TSKB and TKB. The PIU teams will keep the records and copies of the documents of the procurements handled through the sub-borrowers. The World Bank will conduct regular post reviews of the sub-projects. The PIU teams will be responsible for assembling the documentation related to specific procurement transactions from sub-borrowers in order to facilitate the Bank's reviews.

11. **Procurement of Goods, Works and Consultants' Services under Sub-Projects**: Procurement of goods, works and consultants' services under the sub-projects developed by the beneficiary enterprises will be conducted in accordance with the acceptable local commercial practice methods described in the Operational Manuals (OM).

12. **Hiring of Procurement Review Firms:** TSKB and TKB will employ independent procurement review firms with their own resources. The Bank will review the qualifications of the audit firms.

13. **Retroactive Financing:** From the IBRD loan, TSKB and TKB may finance eligible project expenditures incurred up to 12 months prior to the IBRD Loan signing date up to a maximum 20 percent of the IBRD Loan amount provided that the payments are for items that are procured in accordance with procedures acceptable to the Bank.

14. **Filing and records keeping:** TSKB and TKB will keep all the procurement documents (including advertisement, bidding documents, purchase order, evaluation reports, contracts, invoices etc.) in proper order and make them available to the Bank during prior and post reviews. The planned and completed procurement list will be furnished to the Bank together with interim unaudited financial reports (IUFR). Agreed reporting formats are included in the Operational Manuals.

15. **Procurement Plan and General Procurement Notice (GPN):** Because of the demand-driven nature of the Project and the fact it is being implemented by financial institutions, it is not possible to be certain which sponsors and their sub-projects will be financed or their procurement requirements of the Project at the appraisal stage or during the implementation. Therefore, it is not possible for the borrowers to develop an initial procurement plan. However, each of the financial intermediaries will review the procurement plan of the sub-borrower and approve it. Thus, it may not be practical for the procurement plan to be published during the implementation stage especially since commercial practices will be used. A General Procurement Notice for the

Project will be published as soon as the Project becomes effective - the GPN will provide general information about the Project as there will be no specific contract information at that stage.

16. **Frequency of Procurement Supervision:** The Bank will review the procurement arrangements proposed/performed by TSKB and TKB every year, including contract packaging, applicable procedures, and the scheduling of the procurement processes, for its conformity with World Bank Procurement and Consultant Guidelines, the proposed implementation program and disbursement schedule.

17. **Review Procedure for Procurement:** The procurement documents for all contracts under the Project shall be subject to the World Bank's post review in accordance with the procedures set forth in paragraph 5 of Appendix 1 to the World Bank Procurement Guidelines in addition to the procurement review conducted by an independent firm employed by TSKB and TKB. TSKB and TKB will furnish the annual procurement reports to the Bank latest by June 30th of each calendar year. The last procurement report will be furnished to the Bank within 6 months after completion of the disbursements. The Bank's Procurement Specialist will review the procurement reports prepared by the independent firm and, if necessary, will conduct further review of the contracts. The Bank's procurement specialist will also review the procurement documents during the World Bank supervision missions or as the Bank may request to review any particular contracts at any time. In such cases, TSKB and TKB shall provide the relevant documentation to the Bank for its review.

18. **Anti Corruption Measures:**

(a) Risks attributable to the procurement process in Renewable Energy and Energy Efficiency Components are:

- Inappropriateness of prices in the contracts relative to market prices;
- Inappropriate use of funds for intended eligible purposes;
- Unreasonableness of the profit margins of affiliate firms which have works or goods contracts with beneficiary enterprises;
- Low quality of the facility, low energy generation.

(b) Mitigation Measures

- TSKB and TKB will employ an independent procurement audit firm which will provide additional monitoring of the sub-loan utilization;
- The sub-loan agreements of TSKB and TKB will refer to the Bank's "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006" (Anti-Corruption Guidelines) as well as the Procurement and Consultant Guidelines;
- TSKB and TKB will check the contracts from sub-borrowers so that the contracted firms are not in the Bank debarment list.

Annex 9: Economic and Financial Analysis

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. **Financial intermediary assessment:** (Refer to Annex 9.1 and 9.2 for a detailed description of the two FIs' financial condition). Both banks are in good financial condition, and the prognosis for the future looks healthy as well. TKB has low leverage and a high capital adequacy ratio of 79.2 percent, both measured at the end of 2008. Profitability is satisfactory with a return on assets of 3.6 percent and a return on equity of 7.6 percent for 2008. Non-performing loans (NPLs) gross provisioning is 10.6 percent. The after provisioning NPL ratio is 0 percent. In addition to provisioning, the NPL portfolio is also secured by collateral with a nominal value at 10 times the outstanding NPL principal. TKB is government-owned, and most of its financing sources are long term in nature, as is most of its lending. TSKB also has a relatively low leverage and a capital adequacy ratio on a non-consolidated basis of 21.1 percent at the end of 2008. Profitability is at a return on assets of 2.1 percent and a return on equity of 16 percent for 2008. Gross NPLs at the end of 2008 were 0.7 percent of loans, and are fully provisioned so their net NPL ratio is 0 percent. Most borrowing remains long term as is most lending.

2. **Economic and financial analysis:** The Project aims to finance the following: (i) traditional renewable energy projects, mainly hydro, and landfills; (ii) emerging renewable energy projects that need subsidies to provide incentives that address global public goods, such as small hydro, wind, geothermal, biomass, solar; and (iii) energy efficiency projects that face barriers to entry which limit their effectiveness in addressing Greenhouse Gas emissions reduction. In parallel, bilateral donors such as KfW will finance a technical assistance program in support of building capacity among banks and industry for energy efficiency investments. The Project proposes to blend concessional resources from the Clean Technology Fund (CTF) along with IBRD and other financing, for supporting renewable energy (other than large-scale hydro), and energy efficiency investments.

3. Since this is an FI operation, actual projects to be financed are not known upfront. However, the experience under the Renewable Energy Project shows that medium-sized hydro projects are economically and financially viable. TSKB and TKB have a potential pipeline of projects that are seeking financing, as shown in Annex 4. The proposed Project will finance projects that demonstrate a financial return of at least 8 percent. A sample of hydro projects in this pipeline was reviewed for financial and economic viability, and they demonstrate healthy economic and financial returns ranging from 12-14 percent and 10-12 percent respectively. The real financial rates of return on these projects are slightly lower than the real economic rates of return primarily because of tax liabilities. For prototype projects that may be financed by the Project, the table below shows the economic rates of return under various tariff scenarios. The detailed financial assessment is shown in Annex 11.

Table 9.1: Economic analysis of prototype projects

	Current tariffs (8 cents/kWh)	Stress test (15% lower tariff)
Small hydro	11.2%	7.8%
Wind	12.1%	8.5%
Geothermal	11.3%	7.4%
Biomass Steam	7.0%	1.0%
Biomass Gasifier	3.3%	Negative

	Current tariffs (8 cents/kWh)	Stress test (15% lower tariff)
Concentrated Solar CSP	Neg.	Neg.
Solar PV	Neg.	Neg.
Small Land fill	7.9%	4.2%
Energy Efficiency	13.1%	10.8%

4. The table above shows that at current market prices of 8 US cents/kWh, except for biomass and solar, other technologies are considered economically viable. As mentioned earlier, the Government is currently preparing to raise feed-in tariffs for different technologies, to levels that can make them economically attractive. Annex 11 discusses the financial viability of these prototype projects further.

5. The key variable determining the economic rate of return is the price at which these plants sell the electricity they produce. The actual price at which they sell varies from day to day and over the course of a day depending on the spot market conditions. The economic and financial analysis assumes the current market price of about 8 US cents/kWh. This is close to the feed-in tariff for renewable energy at this time. There is a proposal to increase the feed-in tariffs depending on the different technologies, particularly for relatively newer technologies such as biomass and solar. Hydro tariffs are however expected to remain at current levels.

6. So far, hydro projects have not received carbon credits. Only wind projects and a landfill project have been able to earn carbon credits in the voluntary market[14], based on past trends although currently, due to the financial crisis there appear to be few if any sales of voluntary credits even from wind farms. The FIs stated that in their experience it is difficult to sell carbon credits from hydropower projects or geothermal projects. The former especially the larger hydropower projects are often viewed as fully economic and not requiring carbon credits for viability while the latter are more complex and their impact on greenhouse gases depends on the quality of the geothermal water or brine produced. In the past some wind projects in Turkey, including one financed under the ongoing Renewable Energy Project, did arrange to sell carbon offset credits into the voluntary carbon market at about EUR 5-6/ ton. It is not clear whether this market will return after the economic crisis. In order to be conservative and because of the numerous uncertainties, no carbon credits are included in the above financial analysis.

Use of CTF Resources

7. As Annexes 1 and 11 state, the Government is seeking CTF support to move from the NCCC Reference Case to the Accelerated Emission Reduction Case (31 percent below BAU), and in energy efficiency towards the Emission Reduction Stretch Case (44 percent below BAU). CTF usage will help attract financiers and investors and accelerate the deployment of renewable technologies such as wind, solar, biomass and geothermal, as well as small-scale hydro, to scale up their development. Similarly CTF will help attract financiers and investors to promote energy efficiency investments, given the significant barriers that are faced by such investments in Turkey (and elsewhere) in the absence of grants and/or subsidized financing. In several cases, as shown in Annex 11, candidate projects are financially viable, but CTF resources will help accelerate their deployment or as in the case of energy efficiency, help reduce upfront costs and barriers.

[14] Turkey has recently ratified the Kyoto Protocol, and in the interim, Turkey can access only the voluntary carbon markets.

8. The assessment in Annex 11 shows that a combination of higher feed-in tariffs and CTF usage is expected to enable such projects to be financed and developed. Technologies such as small hydro and wind would require a CTF financing of 20 percent of total project cost to reach the threshold IRRs. In the case of technologies such as biomass, very high levels of CTF would be required – 50-75 percent – to enable threshold returns to be attained. Solar PV would require even higher CTF support levels. For some energy efficiency investments, the expectation is that 20 percent of CTF would enable threshold returns to be achieved, although for other investments, higher CTF contribution may be needed. This is consistent with the experience in other countries where it has been seen that energy efficiency investments have needed GEF contributions of as high as 15 percent of the investment pipeline in the first 5 years.

Annex 9.1: Financial Intermediary Assessment of the Borrower – TSKB

1. **Overview of TSKB:** TSKB is the largest private investment and development bank in Turkey. TSKB, besides its core business lines which is long term corporate lending and project finance, also takes credit risk with banks and leasing companies through its APEX banking activities. It was one of the FIs in the EFIL I Project and currently is the borrower of the Renewable Energy, EFIL II, EFIL III, EFIL IV Loans and the SME Loan. As such, it is well known to the World Bank team through a regular exchange of views on the implementation of the above mentioned loans, and through reviews of TSKB's audited reports and other financial reporting as required under these projects. TSKB maintains an overall sound financial and operational structure, and is fit to undertake the financial liability and operational commitments under the proposed Project.

Table 9.1.1: TSKB Key Indicators

(million USD)	2008	2007	2006	2005	2004
Total Assets	4,095	4,195	2,881	2,470	1,707
Loan Portfolio	2,562	2,393	1,757	1,136	901
Shareholders' Equity	495	634	418	413	286
Net Profit/(Loss)	78	127	75	75	35

2. TSKB's main business is to extend medium and long term loans. Ninety-nine percent of its loans are in foreign currency (including FX indexed local currency loans). Trade credit and financial leases are also important products for the bank. Finally, TSKB provides a wide range of investment banking services including public offerings, private equity fund management, mutual fund management and investment advisory services.

3. **Bank Ownership and Corporate Governance:** TSKB is 50.1 percent owned by Turkey's largest private bank, Türkiye İş Bankası group. Additional 8.4 percent of a minority stake is owned by the state owned Vakıflar Bankası, and 41.5 percent of its stock is held by non-strategic investors and are traded on Istanbul Stock Exchange. Reflecting the shareholding proportions, the Chairman, Vice Chairman and majority of seats are appointed by Türkiye İş Bankası. Türkiye Vakıflar Bankası, Central Bank of the Republic of Turkey and Undersecretariat of Treasury each gets one seat. Inclusion of the Central Bank and Treasury reflects TSKB's mandate and status as a development bank. The fact that Türkiye İş Bankası, the largest private sector bank in Turkey in asset size, is the majority shareholder of TSKB is generally seen as positive and is expected to provide comfort and stability in volatile market conditions.

4. In addition to the reporting requirements imposed by the BRSA, TSKB also monitors a number of ratios as part of its credit portfolio management as indicated in Table 1.2 in Annex 1 (see Table 9.1.2 below). The ratios are to monitor compliance with internal prudential requirements, and indicate a proactive effort by TSKB to manage its portfolio and ensure compliance.

Table 9.1.2: Additional internal monitoring ratios and its limits

Ratios	Limits
Single Client/Group Exposure Ratio-excluding APEX Lendings	not more than 25 percent of equity
Related Party Exposure Ratio -excluding APEX Lendings	not more than 20 percent of equity
Aggregate Large Exposures Ratio	not more than 8 times of equity
Letter of Guarantee taken from a single bank and APEX Lending	not more than 1.5 times equity
Industry Exposure Ratio -excluding APEX Lendings	not more than 25 percent of total loan portfolio
Single Financial Institution Exposure Ratio	not more than 35 percent of equity
D and F Ratings Exposure Ratio / Total Loan Portfolio	not more than 5 percent of total loan portfolio

Source: TSKB

5. **Suitability of TSKB as Counterpart for the Project:** TSKB is one of the two proposed borrowers and maintains a Project Implementation Unit (PIU) for the Project. With 75 percent of its credit portfolio reflecting credit risk in corporate credits, TSKB has good experience in assessing corporate risk. Furthermore, TSKB has extensive experience with intermediation of funds from international organizations, including the European Investment Bank (EIB), Japan Bank for International Cooperation (JBIC), Kreditanstalt für Wiederaufbau (KfW), Council of European Development Bank (CEB), IFC and Agence Française de Developpement (AFD). TSKB enjoys a special status as a development bank, which allows the bank to receive Government guarantees on its borrowings and thus makes it eligible for World Bank loans.

6. For a bank of this size, TSKB has substantial capacity in technical, economic and financial appraisal. The seven engineers in the Engineering Department are all qualified and experienced in their capacity to provide support for the marketing of the transactions. A technical assistance program is envisioned in the Project to further develop the capacity of this function, in the area of energy efficiency.

7. **Financial Soundness and Risk Exposures:** TSKB is a profitable and solvent bank with a sound liquidity position and moderate market risk exposures. It has a large credit portfolio of which 99 percent is in foreign currency, exposing the bank to indirect exchange rate risk and shocks to the real sector. The risks are mitigated by extensive use of bank guarantees, collateral taking, and lending to firms with foreign currency earnings. On balance, TSKB is viewed as a very sound bank.

8. TSKB is rated by both Fitch Ratings and Moody's and receives ratings in line with the largest and best rated banks in the country. Strong capitalization, improved asset quality and profitability, stable funding, and the bank's niche position are the key positives cited in the ratings. Under these global market conditions Fitch Ratings upgraded the Long-term Foreign Currency Rating of TSKB to 'BB' from 'BB- as of September 2008.

Table 9.1.3: Rating by Fitch Ratings

	TSKB	Akbank	İşbank	Garanti Bank
Foreign Currency Long Term Issuer Default Rating	BB	BB	BB	BB
Foreign Currency Short Term Issuer Default Rating	B	B	B	B
Local Currency Long Term Issuer Default Rating	BB+	BBB-	BBB-	BBB-
Local Currency Short Term Issuer Default Rating	B	F3	F3	F3
Rating Date	Sept. 17, 2008	Oct.10, 2008	July 31, 2008	June 26, 2008

Table 9.1.4: Ratings by Moody Ratings

	TSKB	Akbank	İşbank	Garanti Bank
Financial Strength	D+	C-	D+	C-
Long-Term Bank Deposits	**B1**	B1	B1	B1

Source: Moody's Investors Service (as of Dec. 11, 2008)

9. **Solvency:** TSKB's equity amounts to US$495 million or 12.1 percent of assets for 2008. The capital adequacy ratio of 21.1 is above the sector average, reflecting the conservative credit policy, moderate risk profile and a strong loan portfolio. The ratios indicate that TSKB is well capitalized and has capacity for further borrowing. Even after the IBRD/CTF loan of the Project, Capital Adequacy Ratio of TSKB is projected to remain significantly above the BRSA target of 12 percent and above banking sector average.

Table 9.1.5: Solvency

	Banking Sector (2008)	2008	2007	2006	2005	2004
Capital Adequacy Ratio	17.8	21.1	27.6	32.9	36.8	42.8
Shareholders Equity/Total Assets	12.2	12.1	15.1	14.5	16.7	16.7

Source: Banks Association of Turkey and Staff Calculations

10. **Credit Risk and Loan Portfolio Performance:** TSKB's loan portfolio is large and amounts to US$2.4 billion, or 59 percent of its assets plus another US$ 142 million in lease receivables. It has a low risk profile, as illustrated by the low risk weights applied under the regulatory rules with 64 percent of loans receiving a 100 percent risk weight. The 16 percent of its loans are to banks or with a bank guarantee, which allows the 20 percent risk weight. An additional 20 percent of its loans are risk weighted at 50 percent, reflecting the use of mortgage collateral.

11. The bank's gross NPLs, at 0.7 percent at end of 2008, is much lower than the Turkish banking system average and has been reduced to less than one sixth since 2003. The reduction in NPLs reflects mostly collections on existing NPLs. Gross additions to NPLs in 2007 and 2008 were just US$8 million, and NPL ratio stayed at 0.7 percent at end of 2008. Thus, the performance of TSKB's loan portfolio is highly satisfactory and is an indication of their well established portfolio management. TSKB provisions its NPLs 100 percent, which is a conservative provisioning policy.

Table 9.1.6: Non Performing Loans

	Banking Sector (2008)	2008	2007	2006	2005	2004
Gross NPLs/ Total loans	3.6	0.7	0.7	1.3	2.4	2.5
Net NPLs/ Total loans	0.7	0.0	0.0	0.0	0.0	0.0
Loan Provisions/NPL	79.7	100.0	100.0	100.0	100.0	100.0

Source: TSKB, Banks Association of Turkey and Staff Calculations

12. In addition, TSKB generally asks high levels of collateral from its clients on the loans that it makes. TSKB has only 2 percent of uncollateralized lending (net of apex operations such as EFIL). The strategy of TSKB to build itself up as market leader in such niche market as small scale renewable energy, as well as the general scarcity of long-term financing, has enabled it to command a healthy margin as well as collateral.

13. **Profitability:** TSKB's profitability is in line with the Turkish banking system as well as with international standards, with ROA of 2.1 percent and ROE of 16 percent in 2008. TSKB has low operating expenses, which reflect the efficiency of the bank and that they do not engage in costly retail operations.

Table 9.1.7: Profitability

	Banking Sector (2008)	2008	2007	2006	2005	2004
Return on Assets	2.5	2.1	2.8	2.6	3.0	2.1
Return on Equity	18.6	16.0	22.2	18.1	18.1	12.4

14. **Liquidity:** TSKB's funding is very stable because it to a large degree is based on long term lending from IFIs. Liabilities are almost entirely borrowings, while what interbank money market liabilities they have are mostly for funding their liquid assets. In contrast to the Turkish Banking sector in general, TSKB has very long term liabilities because the majority of its funding is from IFIs with long maturities.

Table 9.1.8: Liquidity ratios

	Banking Sector (2008)	2008	2007	2006	2005	2004
Liquid Assets/ Total Assets	25.7	31.2	36.5	32.9	38.1	31.1
Liquid Assets/ Short-term Liabilities	31.7	180.8	202.6	217.2	193.8	217.1

Source: Banks Association of Turkey and Staff Calculations

15. **Market Risk Exposures:** TSKB's direct market risk exposures are moderate because it does not collect deposits and has a long term funding base and therefore is able to extend loans with maturities more or less matching the funding it receives. Seventy-seven percent of TSKB's loan portfolio is long-term lending at maturity of more than 1 year, and matches the long maturity by funding 126 percent of the asset amount with borrowings with more than 1 year maturity.

16. Moreover, TSKB's exposure to fluctuations in foreign exchange or local currency interest rates is very limited. Ninety-nine percent of the TSKB's outstanding loans are in foreign currency (including FX indexed local currency loans). The matched characteristic of the loans in terms of currency and maturity allows TSKB to be naturally hedged against volatility in the

currency and interest rates. TSKB has short net foreign position amounting to 7.9 percent of its capital as of 2008 on its balance sheet, and in total, has a long position amounting to 3.9 percent of its equity. There are significant off-balance sheet positions, but since a majority of them are pledges and custodies held by TSKB, these do not represent a significant risk exposure.

17. **Projections:** The management at TSKB expects that with the market downturn that is expected for 2009, there will be limited growth. They expect a marginal increase in the gross NPL rates. The management is now conducting further stress testing and closely monitoring their loan portfolio. TSKB will continue its 100 percent provisioning policy, which will not pose any significant issues considering the small amount of expected delinquencies. Although the risks from the global economic downturn on their asset portfolio are clearly present, the management is closely monitoring the situation.

Annex 9.2: Financial Intermediary Assessment of the Borrower – TKB

1. **Overview of TKB:** TKB is a state-owned development and investment bank in Turkey. It was established in 1975 in order to utilize the savings of expatriate workers to invest in industry. In 1988 the Bank's mandate was widened to include providing finance to corporations in all sectors. The Undersecretariat of Treasury (Treasury) is the main shareholder of the Bank, with 99 percent shareholding of registered capital. TKB's main business is to provide medium and long term finance to medium and small sized corporations. It acts as an intermediary for funds received from the Treasury and from the other financial institutions and lends these funds in all regions in Turkey. TKB is one of the FIs in the existing Renewable Energy Project in Turkey. As such it is well known to the World Bank which receives TKB's audited reports and other financial reports required under the Project. TKB maintains an overall sound financial and operational structure, and is fit to undertake the financial liability and operational commitments of the proposed Project.

Table 9.2.1: TKB Key Indicators

(million USD)	2008	2007	2006	2005	2004
Total Assets	670	705	629	514	387
Loan Portfolio	385	343	237	210	160
Shareholders' Equity	317	395	382	344	293
Net Profit/(Loss)	24	37	111	20	13

Source: Banks Association of Turkey, TKB and Staff Calculations

2. TKB's main business is to provide medium and long term finance to corporations and act as an intermediary for funds received from the Treasury and international financial institutions. TKB lends these credit funds to small and medium sized companies in all regions in Turkey especially underdeveloped regions. 57 percent of its loans are in foreign currency and 43 percent of its loans are in local currency as of end 2008.

3. **Bank Ownership and Corporate Governance:** TKB is subject to the registered capital system, and 99.08 percent of its capital is owned by the Treasury and the remaining shares are quoted on the Istanbul Stock Exchange. Reflecting this share ownership structure, the members of the Board of Directors are elected by the Bank's General Assembly upon suggestion of the Treasury. The General Manager of the Bank is appointed by a joint decree that is signed by the relevant State Minister, Prime Minister and the President. Six members of the board represent the Treasury, while the CEO represents the management and also chairs the Board. The Bank not only is subject to the regulations of BRSA (see the Banking Regulation section in Annex 1), but is also subject to supervision by the audit committee of the Parliament as a state-owned enterprise.

4. **Suitability of TKB as a Counterpart for the proposed new Project:** TKB is one of the two borrowers for the Project. It has experience from the ongoing Renewable Energy Project working with the World Bank safeguards, procurement, and accounting and financial management systems. The Project financial management system is satisfactorily integrated into TKB's credit system which tracks the Renewable Energy Project and loans from other international institutions starting with the initial application clear through the approval and monitoring stages. TKB has experience in assessing corporate credit risk, as it is their main business line. Furthermore, TKB has extensive experience in intermediation of funds from international organizations, including the European Investment Bank (EIB), Kreditanstalt für Wiederaufbau (KfW), Council of Europe Development Bank (CEB), Agence Francaise de

Developpement (AFD), the Islamic Development Bank (IDB), AKA Bank and UBS from Switzerland. Being a development bank, TKB has a special status given by regulations, which allows it to receive Government guarantees on its borrowings and thus makes it eligible for World Bank loans.

5. The Loan Evaluation Department has considerable experience and expertise in assessment and evaluation of small scale infrastructure projects. The engineers there are well qualified and have supported activities under the ongoing Project. The internal capacity allows TKB to establish itself in renewable energy and small scale infrastructure investment financing. One of the objectives for the technical assistance component of the Projects will be to further develop this capacity, as well as to expand it to the new area of energy efficiency.

6. **Financial Soundness and Risk Exposures:** TKB has a comfortable liquidity position and a negligible interest rate risk owing to matched maturity and loan periods. It has a relatively small portfolio of government securities and equities, which comprises 13.2 percent of total assets at end of 2008. Fifty-seven percent of the credit portfolio amounting to US$ 225 million is in foreign currency, nevertheless exposure exchange rate risks are mitigated by matched foreign exchange funding (US$239 million), extensive use of bank guarantees, collateral, and lending to firms with foreign currency earnings.

7. TKB is rated by Fitch Ratings. TKB's individual rating takes into account its low core profitability that is counterbalanced by the banks strong capitalization, matched funding, high liquidity and competitive advantage from being funded or guaranteed by the Treasury.

Table 9.2.2: Rating by Fitch Ratings

	TKB
Foreign Currency Long Term Issuer Default Rating	BB-
Foreign Currency Short Term Issuer Default Rating	B
Local Currency Long Term Issuer Default Rating	BB
Local Currency Short Term Issuer Default Rating	B
National Long Term Rating	AA+ (TUR)
Support Rating Floor	BB-

Source: Fitch Rating dated by 14 December 2007

8. **Solvency:** TKB operates with high levels of equity, and capitalization is solid. The equity amount is US$323 million and 47.3 percent of assets, and capital adequacy ratio is high at 79.2 percent as of 2008.

Table 9.2.3: Solvency

	Banking Sector (2008)	2008	2007	2006	2005	2004
Capital Adequacy Ratio	17.8	79.2	91.2	208.2	81.4	77.5
Shareholders Equity/Total Assets	12.2	47.3	56.0	60.8	66.9	75.7

Source: Banks Association of Turkey and Staff Calculations

9. **Credit Risk and Loan Portfolio Performance:** The TKB's loan portfolio grew by 49 percent in 2008, reaching 58 percent of total assets. Lending is primarily medium and long term. The loan portfolio is heavily concentrated in the tourism sector, with loans in this sector contributing 42 percent of total gross loans as of end 2008. The tourism portfolio was inherited

when TKB absorbed another state owned bank, Tourism Bank in 1989. Half of the tourism portfolio is an on-lending operation from Treasury to tourism sector in the Turkish Republic of Northern Cyprus for tourism. Tourism is a cyclical sector, which imposes uncertainties, but it also bounces back after relative downturns fairly quickly.

10. As of end 2008, TKB has a conservative loan portfolio with 36.9 percent of its assets being classified as 20 percent or less in the regulatory risk weight categories. This indicates the bank's conservative credit policy to secure guarantees or assets as collaterals in almost all their lending, and 53.4 percent of their loans are classified at 50 percent risk weight and only 9.7 percent is classified in the 100 percent risk weight category.

11. TKB's gross NPL ratio is above that of the Banking sector average. This is reflective of the bank's policy and mandate to support the restructuring of its delinquent clients as a publicly owned development bank. This leads to an increase in the NPL ratio for TKB as the loan does not get written-off until the borrower is liquidated or legal settlement has been made. TKB continues to work and collect their loans through their Loan Follow-up and Collection Department, a department dedicated to this task. Gross NPLs ratio has been declining as a result of these continued efforts. The NPLs are all provisioned accordingly to the BRSA banking regulations. Therefore, although the bank's Gross NPL ratio may seem high; the credit risk, net of provisions that the bank is exposed to is generally in line with the Turkish Banking sector average. Additionally, the NPL portfolio is also secured by collateral with a nominal value at 10 times the outstanding NPL principal.

Table 9.2.4: Credit Risk

	Banking Sector (2008)	2008	2007	2006	2005	2004
Gross NPLs/ Total loans	3.6	10.64	12.9	16.1	12.0	18.7
Net NPLs/ Total loans	0.7	0.0	0.7	0.0	0.0	6.5
Loan Provisions/NPL	79.7	100.0	95.5	100.0	100.0	71.6

Source: Banks Association of Turkey, TKB and Staff Calculations

12. **Profitability:** TKB's profitability is moderate, as its balance sheet is small relative to their operational costs, which is indicated in its lower than average ROE. This is reflective of the low leverage of the bank. Higher profitability in 2006 is due to the sale of a stock that was held by TKB of state-owned steel manufacturer stocks that was privatized that year, valued at about US$149 million. But loan yields (before provision expenses) were slightly lower, in line with the overall decline in market rates.

Table 9.2.5: Profitability

	Banking Sector (2008)	2008	2007	2006	2005	2004
Return on Assets	2.5	3.6	5.3	17.7	3.8	3.5
Return on Equity	18.6	7.6	9.4	29.0	5.7	4.6

additional comfort. Short-term liabilities are low, while funding is mainly medium and long term and is matched with the maturities of liabilities. Although there is a decreasing trend, liquidity is also expected to be substantially above the sector average owing to the large proportion of loans funded by equity.

Table 9.2.6: Liquidity

	Banking Sector (2008)	2008	2007	2006	2005	2004
Liquid Assets/ Total Assets	25.7	35.0	41.9	49.0	48.3	43.7
Liquid Assets/ Short-term Liabilities	31.7	36.8	29.6	72.0	69.9	56.2

Source: Banks Association of Turkey, TKB and Staff Calculations

14. **Market Risk Exposures:** TKB's direct market risk exposures are very moderate as it is not allowed to fund itself through deposits but through mainly IFIs; which allows it to avoid the currency and maturity mismatch between assets and liability. Government securities continued to grow and are now at about 15 percent of assets as of September 2008. TKB has very little gap between its assets and liabilities with regard to both maturity and repricing periods. This provides a very strong cushion against potential interest rate shocks. However, although very unlikely, if interest rates were to decline very fast in a very short period, the impact on TKB would be lower interest income through compressed margins.

15. Fifty-seven percent of the TKB's outstanding loans are in foreign currency. In case of a depreciation of the New Turkish Lira (YTL), this may create a risk for sub-borrowers in YTL as the value of the loan in YTL terms increases. This risk is mitigated for borrowers that are naturally price takers in export markets and tourism sector. Through other securities assets and off-balance operations, TKB almost completely covers its foreign currency position to a balanced position. Based on above analysis, TKB has a moderate market exposure profile.

16. **Projections:** The management of TKB expects that the market downturn will push down their profitability and increase the risk of a deterioration of a portion of their asset portfolio, especially in their tourism sector assets which are sensitive to economic downturns. But with continued activities to collect and renegotiate loans under difficulty and the NPL portfolio, the gross NPL ratio is expected to continue its declining trend. Even after additional funding (including the IBRD/ CTF loan) and from other sources, the CAR is expected to remain at a high level for the foreseeable future.

Annex 10: Safeguard Policy Issues

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. All sub-projects to be financed under the proposed Project will be subject to an environmental review process by the FIs incorporating procedures described in this section. These procedures incorporate the Republic of Turkey's recent revision of their regulatory requirements for Environmental Review (Regulation on Environmental Impact Assessment, Official Gazette, dated 17 July 2008, Number 26939) from the Ministry of Environment and Forestry and World Bank safeguard policies on Environmental Assessment (OP/BP/GP 4.01).

2. It is the responsibility of the FIs to ensure that: (a) all Turkish approvals are in place before a final financing decision is made, (b) any discrepancies or inconsistencies are corrected, (c) complete supporting files are available, and (d) any additional safeguard requirements of the World Bank are met.

3. Turkish environmental impact regulations classify projects by relative environmental risk in a very similar manner to that of the World Bank, though there are some cases where the outcomes differ. Therefore it may be necessary in some cases for the FIs to request additional information from, or request additional measures to be taken by the Sponsors as a condition of funding.

4. Both FIs are considered sufficiently experienced in safeguards procedures, because of their significant exposure to these policies under the ongoing Project, where progress has been satisfactory. TSKB has a professional environmental engineer with prime responsibility for implementation of environmental safeguards. The experience of this individual gained both with the ongoing project and several previous World Bank projects is more than sufficient to meet the needs of the current loan. Engineers from different branches are responsible for all technical issues including environment. There are about twenty engineers dealing with energy projects. TKB's implementation of World Bank environmental safeguards has been satisfactory to date in the ongoing project. Under the new EA regulations, TKB will likely see many more projects in the Annex II category and may likely see some Annex I projects. Thus they will be obligated to play a greater role in environmental review. The Task Team recommended and TKB agreed that they would hire an environmental engineer or engage an environmental consulting firm in a long-term arrangement to provide support in implementing procedures defined in the Environmental Safeguard Review document.

5. **Subproject Environment Assessment (EA) Procedures:** The seven elements of subproject EA procedures are summarized below.

6. Screening: Under Turkish Environmental Regulations, the Ministry of Environment and Forestry (MoEF) is responsible for initial sub-project screening. FIs will review the documentation and screening decision to identify those cases where World Bank safeguards require additional due diligence.

7. Under the Turkish EA system, projects are classified as either Annex I or Annex II, and by default, "No Annex". If a subproject is identified under Annex I of the Turkish Regulation, an EIA Report is automatically required. Sub-projects identified under Annex II require the Sponsor to prepare and submit a "Project Introduction File" (or PIF) to the MoEF

for review and a further determination of whether an Environmental Impact Assessment Report (EIA Report) is required.

8. For renewable energy projects to be financed under the proposed Project a summary of Annex I and Annex II projects according to current Turkish EA regulation and for comparison under earlier Turkish EA regulation utilized for the earlier renewable energy loan are presented below:

Table 10.1 Revised categorization under Turkish environment regulati s

Technology	Project Categorization	Limits	
		Former	Revised
Hydro	Annex I	Capacity - More than 50 MW Reservoir size - More than 100 million m^3 Reservoir area - More than 15 km^2	more than 25 MW more than 10 million m^3
	Annex II	10 – 50 MW	more than 0.5 MW
Wind	Annex II	N/A	more than 10 MW
Geothermal	Annex II	More than 5 $MW_{thermal}$	more than 5 $MW_{thermal}$
Biomass	Annex I	N/A	more than 300 $MW_{thermal}$
	Annex II	N/A	more than 10 MW

9. As can be seen, under the proposed Project, a greater number of subprojects are likely to require EIA documentation with the new legislation.

10. Environmental assessment procedures for *energy efficiency* projects will also follow procedures described in this Environment Policy Framework document. Under the Turkish EA regulation, energy efficiency projects are likely to be Annex II or "No Annex" and under the World Bank screening system (see paragraph 14 below) they are likely to be Category B or Category C, since energy efficiency projects usually involve replacement of process equipment with higher efficiency equipment, rearrangement of process flows for greater heat recovery, or simply improving insulation.

11. Under the World Bank EA system projects are classified as "Category A", "Category B" or "Category C" depending upon estimated potential environmental risk. In general terms, Annex I projects are comparable with Category A, and Annex II projects are comparable with Category B. Furthermore, "No Annex" projects are comparable to "Category C". Nonetheless, it is conceivable that differences in the two systems may arise, and it may be possible for some Annex I projects to be considered Category B, or conversely, some Annex II projects to be considered Category A.

12. "Category B" projects can involve different projects with a very broad range of potential environmental issues: from projects with little or minor potential environmental issues to projects with potentially important environmental issues that need special consideration to manage properly. Therefore, for the proposed Project, for Category B projects that have minimal environmental issues, akin to a Category C, the Project Introduction File (PIF) may suffice as the EMP. The PIF would be disclosed after suitable consultations.

13. The FI will review the subproject documentation and Turkish screening decision and further classify projects as Category A, Category B or Category C. Table 10.2 below summarizes the likely outcomes of the Turkish and World Bank screening systems:

Table 10.2 Matrix of screening results

Turkish EA Screening Decision	World Bank Screening EA Decision		
	Category A	Category B	Category C
Annex I	X	X	
Annex II-Positive EA Decision	X	X	
Annex II-Negative EA Decision	X	X	
No Annex			X

14. **Documentation:** The Sponsor will be responsible for preparing EA documents.

Category A

- Annex I and Annex II-Positive EA Decision
  Requires preparation of an EIA in accordance with Turkish regulations.
  The subproject sponsor will be required to submit to the FI a copy of the official MoEF "Environmental Impact Assessment Positive Decision".

  Supplementary documentation would be needed to meet World Bank EA requirements for Category A projects including: (a) an Executive Summary, (b) detailed Environmental Management Plan (EMP), (c) Project Description, and (e) a short summary of the Minutes of the Public Consultations.

- Annex II-Negative EA Decision
  Turkish EIA is not required. The Sponsor will be required to prepare an EIA in accordance with the World Bank requirements. *It is anticipated that this situation would be very rare.*

Category B

- Annex I, Annex II-Positive EA Decision, or Annex II-Negative EA Decision: The only additional requirement would be the preparation of an EMP in accordance with World Bank requirements.

  The PIF would determine the additional documentation necessary. There are a large number of possibilities which are explained in the Operational Manuals. In many/most cases an EMP would be necessary.

Category C

- No Annex No Annex/Category C projects have no EA requirements and will not be discussed any further.

- Generic EMPs: To simplify sponsor efforts in the preparation of EMPs, a series of generic EMPs that have been used in other World Bank renewable energy projects has been included as Annexes to the Environmental Safeguard review document.

15. **Consultation:**

Category A:

- Annex I and Annex II-Positive EA Decision: The new Turkish EA regulation requires one public consultation conducted by the MoEF for Annex I projects and Annex II-Positive EA Decision. The regulations however do require several public consultations at various stages of EIA preparation. The World Bank EA policy requires *two* public consultations for a Category A project: the first at an early stage (i.e., "scoping" or on Terms of Reference for EIA) and the second on the draft EIA at a point where comments made can still be taken into consideration for finalizing the document. The regulation requires the MoEF to establish a commission consisting of representatives of "related agencies and institutions". The commission utilizes the outcome of the public consultation to define the scope and format of the EIA (scoping) and reviews and evaluates the draft EIA. However, the draft EIA is also made available to the public for comment and the commission must take into account the public comments in their evaluation. The commission then finalizes the EIA including the public comments and submits the EIA to the MoEF for a final decision whether or not to approve the project. The Positive EIA Decision is shown on the MoEF's website. In addition the EIA Reports and the public meeting date are available for public view at the MoEF website. English language versions of the consultation minutes, public comments, and commission deliberations should be included in the Supplementary EA documentation provided to the World Bank.
- Making the draft EIA available for public review and comment will in most cases satisfy the World Bank second consultation requirement for Category A projects. The FI will however assess the efficacy of the public consultations organized with regard to a proposed subproject, and if it considers necessary, may require the sponsor to carry out a second consultation meeting.

Category B:

- Annex I and Annex II-Positive EA Decision/ Negative EA Decision: One public consultation is required. This requirement is satisfied under Turkish EA procedures. However, details of the public notification, who was present and issues raised should be documented. Turkish language versions of this documentation (consultation minutes, public comments, and commission deliberations etc.) should be included in the PIF project file.

- Annex II-Negative EA Decision or No Annex: One public consultation is required. These discussions should include the village Headman along with other relevant people. Details of how, when and where the site visit was announced, who was met, and issues raised should be carefully documented. Turkish language versions of this documentation should be included in the PFI project file.

16. **Disclosure:** For Category A projects, the World Bank will deposit the English language EIA and World Bank Addendum at the World Bank Infoshop. The FI is not permitted to provide a sub-project loan using Project funds until the Turkish language EIA

Report is disclosed in Turkey and the English language version is disclosed at the World Bank Infoshop.

17. For category B projects, disclosure is being made by the MoEF for Annex II Projects. A copy of the PIF for each project is available for public view at the MoEF. If no PIF was required under Turkish regulation, the PIF prepared to meet World Bank requirements (Category B) will be disclosed by the Sponsor.

18. **Review and approval:** For Category A projects, World Bank involvement in the process should be maintained. For sub-projects requiring a Turkish EIA Report, the MoEF is responsible for providing approval of the EIA. The English language Executive Summary of the EIA, the EIA, EMP, and minutes of the public consultations will be transmitted to the World Bank who will provide an independent review and approval. The FI is not permitted to provide a sub-project loan from Project funds until an official approval letter is received from the World Bank. The World Bank may selectively review applications on an ex-post basis thereafter as part of routine supervision.

19. For Category B projects, The FI will review the EMP to verify that all environmental issues are properly reflected in the EMP. For the first few B projects (one each for hydro, wind, biomass, and geothermal), the FI would then send the EMP to the World Bank for approval in order to determine if the generic EMP approach is working successfully. Subsequently, the FI will be responsible for approving all EMPs as part of the overall loan approval process. The World Bank may selectively review applications on an ex-post basis thereafter as part of routine supervision.

20. For minimal environment impact projects under Category B, the FI will review the PIF to verify that all environmental issues are properly reflected. The FI will be responsible for approving all PIFs as part of the overall loan approval process. The World Bank may selectively review applications on an ex-post basis thereafter as part of routine supervision.

21. **Conditionality:** For subprojects the FIs will assure that the subproject loan agreements include a commitment of the subproject sponsor to follow the requirements set forth by the Turkish environmental regulations as well as the social and environmental safeguard measures set forth in the Environmental Policy Framework (and elaborated in the relevant EA document for the particular subproject), Resettlement Policy Framework and the Operational Manual.

22. **Monitoring and Reporting:** As part of normal supervision activities the FI will perform desk and field-based supervision functions to assure compliance by the Sponsor with environmental obligations specified in the loan agreement. All FI sub-project performance reports will include an environment section. In this section the FI will verify whether or not environmental requirements as detailed in the sub-project loan agreement have been met. If requirements have not been met, the FI will provide recommendations for further action to insure compliance.

23. **Projects Initiated Before the Change in Turkish EA Regulations:** Section 6, Provisional Articles 1, 2, 3 and 4 addresses the issue of subprojects that have started their EA process prior to the passage of the new regulation. In essence, they would be subject to the specific EA regulation in effect at the time their EA process commenced.

Involuntary Resettlement

24. As in the Ongoing Renewable Energy Project, the Proposed Project is expected to involve land acquisition, primarily for the placement of facilities and, in the case of hydropower investments, land surrounding reservoirs. The energy efficiency component is not expected to involve land acquisition. Energy investments are automatically eligible for expropriation under the rubric of "public benefit," for which the investor obtains a "Public Benefit Document" or an Expropriation Decision from the court. In practice, although the investors routinely obtain the Public Benefit Document, virtually all land transactions are negotiated, rather than subject to expropriation.

25. Under the ongoing Project, the project Operational Manual was revised in February, 2006, to include procedures for dealing with land acquisition and resettlement acceptable to the Bank. Subsequently, the Bank worked closely with TSKB as they applied the procedures in assessing the Akkoy Hydro Project to ensure compliance.

26. The application for a Public Benefit Document requires full details regarding the size of affected plots and the portion required, ownership, use of the land, and estimated value based on professional appraisal. This applies to State land (Treasury, Forestry, Roads, etc) as well as private land. Officially, EMRA sanctions expropriation, as needed. In practice, the investor communicates with the owners, negotiates and prepares documentation through which the land is purchased for the Treasury and then leased back to the investor. Land is generally purchased or obtained as needed during construction, thus land acquisition is an ongoing process. Most of the purchases are concluded through negotiation and the investor asks the court to exercise expropriation for specific properties only if negotiations fail or if there are multiple absentee owners who are hard to trace and contact. The court decision sets a purchase price, which the investor must pay into an account in the name of the owner before the title is transferred and the property can be entered. The former owner has three years in which to appeal the compensation level decided by the court. In this process, ownership of the property is transferred to the Turkish Treasury (because expropriation has been used) and immediately leased back to the investor, usually for 49 years. The procedure is the same for both TKB and TSKB. According to the Operational Manuals, as part of their due diligence, TKB or TSKB obtain information regarding the need for land acquisitions. If the investor has been issued a Public Benefit Document or an Expropriation Decision, or if third parties are affected by the transfer of State or private land for the project, the FI assesses the situation and prepares a brief report on the magnitude and status of land acquisition, with plot-level details. The FI continues to monitor the issue and reports semi-annually to the Bank on implementation.

27. Under the ongoing project, TKB had only one investment that involved new land acquisition after TKB got involved but before the Operational Manual was revised—the Trabzon Hidrokontrol Project. The bulk of the land involved belonged to the Forestry Department, which issued use rights. Private land was obtained through negotiation, not expropriation.

28. The TSKB portfolio for the Renewable Energy Project had a higher incidence of projects that involve land acquisition. TSKB closely follows the issue by gathering and assessing land acquisition details and copies of purchase agreements, as well as through field

visits. Out of 13 TSKB loans for 14 projects, seven involved land acquisition (ranging from 2 ha to almost 6 ha of private land). Two others involved very small amounts of private land and three had no land acquisition. TSKB's clients reported no legal problems with land acquisition, although the process can be slow if there are multiple owners (due to inheritance fragmentation) or if the owners are absent or cannot be located. The Akkoy project, for example, obtained part or all of 29 parcels, one of which was ultimately subject to expropriation. Despite the magnitude of the investments, tight construction schedules, and the cost and time required for litigation, TSKB's clients invoke their expropriation rights only as a last resort.

29. To comply with OP 4.12, a Resettlement Policy Framework has been prepared and agreed by the Bank and disclosed prior to Appraisal. The framework was drawn from the Operational Manual, which both FIs followed satisfactorily, and incorporated lessons learned during implementation. Given prior experience, the policy framework primarily reiterated existing principles and practices, offering minor refinements in formats and procedures to clarify requirements and formats to ease compliance and increase transparency and early notification.

30. As part of its due diligence, the FI is responsible to ensure that any land expropriation or involuntary resettlement associated with a sub-project complies with the World Bank's Operational Policy 4.12 (OP 4.12), *Involuntary Resettlement.* The purpose of the policy is to avoid or mitigate harm caused to third parties by development investments. The compliance requirement applies to every project to be financed by an FI with project funds for which either EMRA issued or will issue a Public Benefit Document for renewable energy facilities, which enables the investor to exercise eminent domain for land acquisition for the sub-project, and/or for which an investor requests an Expropriation Decision. The requirement also applies when third parties are affected either when Government land is transferred to the sponsor or when third parties are affected by negotiated acquisition of private land under a "willing-buyer-willing-seller" approach.

Dam Safety

31. The Operational Manual covers requirements with regard to dam safety, reflecting the Bank's policy in this regard. This project has seen two subprojects where the dam safety policy was triggered, and the project sponsor followed the requirements of the policy satisfactorily, under the oversight of the FI. A panel of experts was set up, which reviewed construction progress periodically. The panel will continue to monitor the dam for safety considerations after its completion.

32. The Project does not trigger the OP7.50. It was agreed under this Project that hydro power projects would be financed on a specified list of domestic basins. This is reflected in the Loan Agreements with FIs in the form of a list of the river basins where hydro subprojects could be located.

Annex 11: Clean Technology Fund

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

The proposed Project is the cornerstone of Turkey's strategy for climate change and will have significant sustainable development impacts. With the help of CTF resources, it aims to make a major contribution to three critical development objectives in Turkey: (1) **Enhancing energy security** – by improving energy efficiency as well as meeting overall energy generation capacity needs; (2) **Supporting a clean energy transition** – by focusing on meeting energy needs in an environmentally sustainable manner and thereby reducing greenhouse gas emissions; and (3) **Increasing private sector involvement** – in the development and financing of clean energy and energy efficiency investments – with credit intermediated through Turkish banks targeted at private sector investments.

The Government has identified the energy sector as the focus for reducing greenhouse gas emissions and for reducing the energy intensity of the economy over the long run, and has requested CTF support for (a) the development of the energy efficiency market in Turkey and (b) scaling up deployment of renewable energy. Thus far, Turkey has developed its large hydro resources significantly, and now the challenge is to help develop underutilized resources such as solar, geothermal, biomass and wind, along with small-scale hydro. Also, while significant potential for energy efficiency exists, such investments have not taken place primarily due to lack of adequate know-how in industry and the banking sector and due to the lack of access to finance.

CTF co-financing of US$ 100 million is thus proposed to be targeted at (a) supporting the development of renewable technologies that are high on the marginal cost curve, such as solar, biomass and geothermal, by demonstrating their viability and economic benefits, (b) accelerating the development of resources such as wind and small hydro by helping widen the investor base and by helping the country move up the marginal cost curve for such technologies, and, (c) unlocking the potential for energy efficiency by helping demonstrate the benefits of energy efficiency and the efficacy of financing mechanisms and models aimed at energy efficiency. CTF co-financing along with IBRD will be targeted through financial intermediaries, so that the experience gained and the institutional capacity created can be scaled up and applied to these and other banks and financial institutions, catalyzing further investments. The use of CTF in this fashion is therefore expected to result in a sustainable business model for the financial sector and project developers which can be replicated across the country.

The proposed CTF loan size of US$100 million is based on the scale of potential outcomes that could catalyze sustained change in the banking sector in a country of the size of Turkey. Although actual projects to be financed are not known upfront, this being an intermediary operation, it is expected that CTF co-financing blended with IBRD, sponsor equity, bilateral donors and other borrowings will result in about 1 million tons per annum of greenhouse gas emissions saved.

In the absence of CTF support, it is anticipated that renewable energy development will remain restricted to the few existing large hydro developers and perhaps the initial (lower cost) wind energy sites. Current market conditions and lending practices in Turkey suggest that, without CTF co-financing at the proposed level, smaller hydro and wind projects are unlikely to materialize at scale, and that investors would not enter the market for technologies such as solar or biomass. Experience to date in Turkey has demonstrated that without positive incentives to address risk perception and transaction costs, it is not likely that financial institutions will consider energy efficiency as a viable long-term business-line nor would industry make such investments. In summary, CTF resources will support measures that are necessary for Turkey to achieve its ambitious goal of accelerated emissions reductions through increased renewable energy generation and reduced energy intensity by 2020.

Introduction

1. Turkey's greenhouse gas (GHG) emissions are growing rapidly. Total GHG emissions rose from about 170 million tons of carbon dioxide (CO_2) equivalent in 1990 to about 300 $mtCO_2$ in 2005 (excluding land use change and forestry – LUCF) and in Business-as-Usual (BAU) scenario emissions would reach 683 $mtCO_2$ by 2020. Turkey's first National Communication on Climate Change (NCCC) submitted to UNFCCC in January 2007

estimates CO_2 emissions of 605 mt in 2020 under its Reference scenario. The Government is seeking IBRD and CTF support to move beyond the NCCC Reference Case to an Accelerated Emissions Reduction Case (31 percent below the BAU case), and towards the Emissions Reduction Stretch Case (44 percent below BAU) – see Table 11.1 below. This will require increasing non-hydro renewable energy from 3,000 MW to 20,000 MW by 2020, as well as a 30 percent reduction in industrial electricity consumption and 20 percent reduction in residential electricity consumption, in addition to other measures.

Table 11.1: Emission Scenarios for 2020

	Million tons CO_2	Emission reductions (% of BAU)
Business-as-Usual (BAU) Case	682.7	
NCCC Reference Case	604.6	-11
Accelerated Emission Reduction Case	468.6	-31
Emission Reduction Stretch Case	384.2	-44

2. The NCCC defines Turkey's fundamental strategy to achieve its energy policy objectives as "encouraging private/foreign investments". Accordingly, the Turkish government is implementing a private sector oriented energy strategy and is taking necessary steps to create an enabling environment for clean energy investments. As one of the leading fast-growing emerging economies, Turkey needs significant levels of financing to realize its potential to implement environmentally responsible investments. However, investments in low carbon technologies – while impressive in areas such as large and medium-scale hydro – have not been at a scale to have the impact necessary to achieve national objectives. The principal reason for this relatively slow rate and scale of clean technology adoption are the inherent economic and financial barriers for the deployment of such technologies – particularly by the private sector. In addition, the recent deterioration of global financial conditions may increase the cost of financing and limit the availability of both internal and external resources for clean energy investments in Turkey as well as other countries. Within this context, CTF co-financing may provide the necessary incentive for triggering and accelerating investments and thereby help Turkey to move faster towards the goal of achieving the Accelerated Emission Reduction Case.

3. The proposed Project – by extending a large credit line to financial institutions in Turkey – seeks to achieve a scale increase and sustained renewable and energy efficiency business lines in the Turkish financial sector. At the proposed scale and scope the project will:

- Attract financial institutions to develop the necessary expertise and loan products;
- Extend the range of renewable investments to encompass new renewable energy technologies that investors and banks currently perceive to have much higher technical and financial risks;
- Encourage renewable and energy efficiency suppliers and businesses to enter the Turkish market – with the expectation that a critical mass of skills and capabilities will be developed domestically to speed up the rate of adoption of the clean energy technologies and energy efficiency investments; and
- Develop and demonstrate efficient and effective financing mechanisms for energy efficiency projects, by developing new financing business models designed specifically to overcome risky aspects of energy efficiency projects and to reduce transaction costs.

4. CTF co-financing will support implementation of two transformative initiatives of the Government of Turkey to improve the investment climate in the energy sector. The Renewable Energy Law, which was passed in May 2005, provides a number of incentives to encourage an enhanced role for renewable energy, including a feed-in tariff and an off-take agreement with the host distribution company. The Energy Efficiency Law was adopted in April 2007, with regulations on energy efficiency requirements for industrial facilities, building, service and transport sectors, and also power plants; generation, transmission and distribution networks. The Law also provides for subsidies of up to 20 percent of the Project cost for small energy efficiency projects (not target for this project) and provides for establishment of energy efficiency consultancy companies. The government is also in the process of developing a technology-based feed-in tariff regime, which would provide different feed-in tariffs for different renewable electricity generation technologies. The aim of this regime is to increase investor interest in low carbon technologies with higher tariffs.

5. Central to the government's strategy to catalyze scaled-up investments for renewable energy and energy efficiency is the need to stimulate larger volumes of debt financing by banks. The project will supplement capacity building of the banks for evaluating clean energy projects and awareness-raising to reduce their risk perception with a credit line to overcome the capital and transaction costs, as well as perceived financial risk, of such projects.

Assessment of Proposed Project with CTF Investment Criteria

A. Potential for GHG Emissions Savings

6. **Emissions Reduction Potential of Investment**: Since the Project is structured as an intermediary operation, the precise composition of the banks' loan portfolio cannot be predetermined. Therefore, it is necessary to provide a broad range estimate of the emission reductions that are likely from the project. Several scenarios for CTF usage have been developed however, presented later in Table 11.6 – based on these scenarios, the CTF-blended Project could be expected to yield direct annual emission reductions of about 0.6-1.0 $mtCO_2$ per year from renewable energy and from energy efficiency investments[15]. Over the 20-year life time of the project, emissions savings could thus range from 12-20 $mtCO_2$.

7. **Technology Development Status**: Table 11.2 below shows the various technologies analyzed for CTF financing split into four groups. The group of technologies in the first column, Technically Viable Technologies, represents technologies which have been developed, implemented and proven viable elsewhere, but have not penetrated the Turkish market because they face financial and other barriers. The group of technologies in the second column, Commercially Available Technologies, represents technologies that are well understood and implemented in Turkey, but which may require support for scaling up or accelerating their utilization. Both of these categories are then split by the extent to which the

[15] This is calculated based on the scenarios of potential investments that the CTF resources may be used for. Under different scenarios, depending on the extent of financing for renewable and energy efficiency, the emission reduction would vary. The key assumption is that these investments would offset the need for constructing incremental generation capacity which comprises a mix of lignite and natural gas plants, resulting in avoided emissions of 1,031 tCO_2/ GWh. This is a conservative assumption, since in all likelihood, the renewable generation or energy efficiency savings would offset a lignite-fired plant, thereby resulting in a higher level of emission reduction.

technology would mitigate greenhouse gas emissions if adopted. Technologies which have low mitigation potential are excluded.

8. CTF support is proposed for the following interventions:

(a) Increase investor confidence in relatively new renewable technologies such as biomass and solar, which are not prevalent in Turkey principally because of lack of awareness about their financial and technical viability or because of high upfront capital costs.
(b) Broaden the investor base and diversify project locations for small-scale hydro (up to 10 MW).
(c) Accelerate the deployment of wind energy by moving up the marginal cost curve, in order to support Turkey to reach the highly ambitious 20,000 MW target for wind by 2020.
(d) Finally, stimulate the market for energy efficiency investments, as well as help develop sustainable financing mechanisms for such investments.

9. CTF is proposed to be utilized for the above range of technologies and investments for a number of reasons:

(a) The achievement of the Government's targets for emissions and energy intensity by 2020 necessitates a multi-pronged approach.
(b) A demand-driven approach provides the optimum level of flexibility to financial institutions to develop their client base.
(c) A portfolio approach is a prudent risk management strategy for the financial intermediaries.

Table 11.2: Technologies proposed for CTF funding

Technically Viable Technologies – High mitigation	**Commercially Available Technologies – High mitigation**
Biomass steam, biomass gasifier, Concentrated Solar Power (CSP)	Wind, Geothermal, Small Hydro, Energy efficiency
Technically Viable Technologies – Low mitigation[16]	**Commercially Viable Technologies – Low mitigation**
Solar Photovoltaic	None

B. Cost-effectiveness

10. **CTF investment per ton of CO_2-equivalent reduced:** The direct emission reductions potential of about 0.6-1.0 $mtCO_2$ per year of the proposed Project translates into 12-20 $mtCO_2$ over the expected 20-year investment life for the proposed CTF funding of US$ 100 million. This results in a cost-effectiveness of CTF resources of about US$5-8.2/ tCO_2 saved. Further analyses of the cost-effectiveness of CTF funding based on typical projects for each technology are given at Table 11.5 later. The cost-effectiveness of CTF for various prototype renewable and energy efficiency projects ranges from a highly economic US$5 per tCO_2 for

[16] Solar Photovoltaic has a low mitigation potential for grid connection relative to its cost. See Annex 9.

energy efficiency, US$5.2 for geothermal, US$5.5-5.9 for wind and small hydro, and a very expensive US$171/ tCO_2 for solar PV.

11. **Expected cost reduction of technologies:** Table 11.3 shows projected global capital costs based on past trends and assumptions taken from a 2006 report[17] issued by the World Bank. The projections on cost reductions of technologies depend on many variables; (i) technical advancements, (ii) economies of scale, (iii) raw material costs, (iv) production facility capacity, (v) demand and supply balance. Some of these variables are also dependent on fossil fuel prices, which have been highly volatile in the past year, thus making projections even more uncertain. The cost reduction may be accelerated if investments to these technologies are scaled-up, conditional on economies of scale being reached and indigenization of the technologies occurring.

Table 11.3: Renewable Energy Technology Capital Costs Projections

Capacity (MW)	Technology	Probable Capital Cost Projection (US$2005/kW)		
		2005	2010	2015
6	Small Hydro	2,370	2,280	2,250
22.5	Wind	1,440	1,260	1,120
20	Geothermal	4,100	3,830	3,730
50	Biomass Steam	1,700	1,550	1,520
20	Biomass Gas	2,030	1,810	1,710
30	Solar Thermal	4,850	4,300	3,820
5	Solar PV	7,060	6,190	5,500

12. These are global estimates. The reduction in costs in Turkey may be faster than shown above, adjusting for cyclical effects. As increased numbers of small hydro, wind and geothermal plants are built in the country, a larger proportion of the equipment is expected be manufactured in Turkey at lower costs. Indigenization is also likely to occur over time, thus further reducing technology development costs.

C. Demonstration Potential at Scale

13. **Scope for avoided GHG emissions through replication:** The CTF co-financed Project will have a very significant potential for replication throughout the country in view of the fact that energy demand in Turkey is expected to continue to grow at between 5-6 percent per annum over the future, more than doubling to about 400 TWh by 2020. Moreover, there are a large number of commercial banks and financial institutions in Turkey that have the institutional capacity to add renewable energy and energy efficiency loans to their portfolios. Once replicated, the Project will enable the achievement of the Government's renewable energy and energy efficiency targets for the Accelerated Emissions Reduction Case and the Emission Reduction Stretch Case. Under the former case, emissions reductions of 49 $mtCO_2$ per year in 2020 are estimated from renewable energy and 75 $mtCO_2$ from energy efficiency investments. Under the latter, an additional 75 $mtCO_2$ of emission reductions are forecast from energy efficiency. Thus, **the replication of the Project over the economy is likely to enable emission reductions of about 199 $mtCO_2$ per year in 2020**, or over 90 percent of emission

[17] Source: Technical and Economic Assessment of Off-Grid, Mini-Grid and Grid Electrification Technologies, World Bank, 2006.

reductions required for Turkey to achieve the Emission Reduction Stretch Case. Such scaling-up would result in annual emissions 44 percent lower than the BAU in 2020.

14. **Transformation Potential:** The proposed Project is estimated to directly reduce emissions by 0.6-1.0 $mtCO_2$ per year. Under a business-as-usual scenario, Turkey's emissions are forecast at 683 $mtCO_2$ in 2020. On a scaled up basis, as discussed above, the CTF co-financed project is expected to result in emission reductions of 199 $mtCO_2$. This represents a **transformational ratio of about 199-330**[18].

D. Development Impact

15. The proposed Project is a key element of Turkey's strategy for climate change, and will have significant sustainable development impacts. With the help of CTF resources, it aims to make a major contribution to three critical development objectives in Turkey: (1) Enhancing energy security – by improving energy efficiency as well as meeting overall energy generation capacity needs; (2) Supporting a clean energy transition – by focusing on meeting energy needs in an environmentally sustainable manner and thereby reducing greenhouse gas emissions; and (3) Increasing private sector involvement – in the development and financing of clean energy and energy efficiency investments – with credit intermediated through Turkish banks targeted at private sector investments.

16. Through its transformative impact, the use of CTF is expected to significantly reduce the energy intensity of the economy by 2020 by about 16 percent from present levels, under the Emission Reduction Stretch Case. Further, and perhaps more importantly, by supporting renewable and energy efficiency, the use of CTF will help ensure energy security – energy shortages usually have serious adverse macroeconomic impacts, and often also lead to usage of suboptimal sources of energy, which in turn has detrimental impacts on the environment.

17. The use of CTF will have very positive local as well as global environmental benefits. By enabling industry to use energy efficiently, and by promoting environmentally sustainable renewable energy resources, CTF would help reduce pollution and associated adverse impacts. Better air quality means better health. Labor-intensive renewable and energy efficiency projects provide employment.

E. Implementation Potential

18. **Public policies and institutions:** The Government's updated energy strategy and Turkey's Ninth Development Plan (2007-13) both aim at ensuring security of energy supply, while keeping environmental effects at a minimum level. The Government is particularly focused on three key energy-related development issues, (i) CO_2 emissions, (ii) security of energy supply, especially electricity, and (iii) energy import cost. To address these issues, the government has been actively implementing enabling policies and legislation to encourage investments in renewable energy and energy efficiency. The Government's target is to increase hydro capacity from the current level of 13,500 MW to 30,000 MW by 2020. The target for wind energy growth is even more ambitious, from the current capacity of an about 350 MW to 20,000 MW in 2020. These are built into the Reference and Accelerated Emission Reduction cases.

[18] The Transformational ratio is calculated assuming that the project will be replicated throughout the economy.

19. The Electricity Market Law was passed in 2001 and substantially amended in 2008. It is complemented by the recently updated energy strategy. The strategy includes a range of measures to improve both efficiency in the supply and consumption of electricity and the supply-demand balance, such as:

- Revising electricity tariffs to cover supply costs and introducing a cost-based automatic mechanism for future tariff adjustments to reflect changes in supply costs, thereby encouraging more efficient consumption patterns and improving the incentives for private investment;
- Reducing electricity theft and improving collections (particularly from municipalities) - thereby reducing demand, improving consumption efficiency and improving the incentives for private investment;
- Ensuring adequate investments in the transmission and distribution networks to enhance capacity and reliability, and reduce technical losses - thereby improving the efficiency of electricity supply;
- Rehabilitating existing generation plants to increase reliability and efficiency - thereby reducing the need for investments in new generation capacity; and
- Privatizing the distribution network and selected generation plants, improving the functioning of the wholesale market, introducing a capacity mechanism and undertaking other measures to add additional generation capacity - thereby enhancing the role of the private sector and creating the structure for attracting enhanced private sector investments for new generation capacity.

20. The Ministry of Energy and Natural Resources (MENR) is responsible for sector strategy and policy formulation. The Ministry is supported by the main regulatory institution for the energy sector - the Energy Market Regulatory Agency (EMRA) – and the General Directorate of Electrical Power Resources Survey and Development Administration (EIE). They work closely with the Treasury, State Planning Organization, and the Ministry of Environment and Forestry, the lead agency for climate policy.

21. **Sustainability of the transformation:** Turkey's market-based energy pricing policies, the availability of a reliable nation-wide transmission system, and the development of a functional electricity market into which renewable energy generators can sell their output provide the basis for improving the investment climate for renewable energy and energy efficiency investments in Turkey. Additional sectoral and project-level measures for sustainability of renewable energy and energy efficiency are detailed below.

- Legislative basis for Renewable Energy – A Renewable Energy Law enacted in 2005 is designed to help reduce risk perceptions of potential investors in generation and enhance the attractiveness of the Turkish electricity market. A road map for receiving and evaluating applications for wind power plants and issuing the related licenses has been issued by EMRA and TEIAS has prepared an investment plan to accommodate 15,000 MW wind power. Additional support measures are currently being proposed to further promote renewable electricity generation, such as through an amendment to raise feed-in tariffs for renewable energy (see below).
- Feed-in tariffs for renewable energy – The Law provides for a feed-in tariff for renewable energy set at eurocents 5/ kWh. This can be raised to eurocents 5.5/ kWh with a Cabinet

decision. Currently, the Government is reviewing a draft Law to provide for different (higher) tariffs for different technologies, particularly biomass and solar; this draft is currently under review by relevant Parliamentary Committees. This draft law is based on the experience thus far with the relatively newer technologies, where investors have expressed concerns with the existing level of the feed-in tariff.

- Legislative basis for energy efficiency – The Energy Efficiency Law enacted in 2007 promotes efficient energy use, loss prevention, lessening the burden of energy costs on the economy, increased yield in the use of energy resources and environmental protection. The Law targets industrial facilities, building, services and transport sectors, as well as the power sector (generation, transmission and distribution networks). The Law has four pillars: establish an administrative structure and tasks for delivering energy efficiency services across sectors; promote training and awareness; implement penalties for misconduct; and provide incentives to increase energy efficiency and renewable energy use. Energy efficiency regulations issued in 2008 cover:
  - Supply side management including measures to improve efficiency in electricity generation, transmission and distribution;
  - Increased energy efficiency in the public and transport sectors;
  - Support to businesses to augment ongoing energy efficiency efforts including implementation of voluntary measures;
  - Training, research and development; and
  - Energy performance in buildings.

22. **The use of financial intermediaries:** The Project will contribute to a sustainable transformation by working through financial institutions to: (i) provide needed long-term financing, (ii) develop further the financial intermediaries' capacities to finance renewable and energy efficiency projects, and (iii) demonstrate the viability of these investments. The use of financial intermediaries particularly for renewable and energy efficiency is a well-established approach with a successful track-record across the world. In Turkey the development of financial intermediaries to scale-up the financing of medium to small-scale hydro has been remarkably successful. The proposed Project will build on this success and on the institutional capabilities of the financial intermediaries to extend the scope of coverage to newer renewable technologies and energy efficiency. This approach is eminently scalable and replicable given the potential in Turkey, and it is expected that other financial institutions and banks will develop these business lines to scale-up the potential impact of the Project.

23. Further, CTF usage will help develop and demonstrate efficient and effective financing mechanisms for energy efficiency projects, through new business models designed specifically to overcome aspects of energy efficiency projects considered risky and to reduce transaction costs. Reducing risk perceptions and transaction costs requires innovations for efficient loan origination, reliable and cost-effective technical appraisal skills, development of specific loan products, and often, efficient means to package investments together to achieve scale economies in origination and appraisal.

24. **Leverage:** The CTF co-financing of US$100 million for the proposed Project is expected to leverage about US$400 million (i.e. a leverage ratio of 5) from domestic financial institutions, bilateral donors and project sponsors. It is expected that the Project will attract co-financing from bilateral donors such as KfW and AfD, which have, or are preparing, lines of credit with the proposed financial intermediaries. The overall IBRD project is larger, at

about US 1.1 billion, as shown in Table 11.4, and the remaining project covers medium and large hydro, which is not co-financed by CTF.

25. **Donor coordination:** The need for renewable and energy efficiency investments in Turkey is far greater than available financing. The Ministry of Energy estimates that about US$3 billion is needed just for industrial energy efficiency over the next three years. The Turkish Treasury organized two coordination meetings to present the Government's priorities for the use of CTF to support Turkey's climate change mitigation objectives and to seek increased financial and technical assistance from the doors. The Investment Plan's focus on private sector's renewable energy and energy efficiency investments was uniformly endorsed by the participants. They endorsed Turkey's Investment Plan and the proposed REEE project, recognized Turkey's high investment needs and welcomed Treasury's coordinating role for clean energy investments. It is expected that with the use of CTF and complementary donor financing (and through capacity building, supported by AFD, JICA, KfW and UNDP) barriers will be surmounted, thus helping create a sustainable market for energy efficiency.

Table 11.4: Financing Table

	US$ million
IBRD Loan	500
CTF	**100**
Sponsor Equity	300
Other Borrowing (including bilateral donors etc.)	250
Total Project Financing	1150

F. Additional Costs/Risk Premium

26. **Barriers faced by renewable and energy efficiency investments:** Existing lines of credit, particularly for energy efficiency are not disbursing so far, primarily because of barriers such as lack of awareness, perceptions of high technical and financial risks, lack of suitable financing for such projects etc. Recent ongoing capacity building work, focused primarily on energy efficiency, is expected over time to enable industry participants as well as financial institutions to better understand energy efficiency projects. The capacity building effort however does not address financial barriers faced by energy efficiency investments. These investments face market barriers in Turkey because of higher level of perceived technical and financial risks. Another key financial barrier is the high transaction costs faced by both industry as well as financial institutions in energy efficiency investments. Such costs can arise from energy audits, feasibility studies, sometimes the need to shut down processes in order to rehabilitate or replace parts. All these elements add to the transaction costs. These costs are further enhanced by the lack of adequate familiarity and experience with identifying and preparing such projects both within industry as well as in banks. As a result, financial institutions as well as industry do not see an incentive in developing these businesses. The proposed Project will develop the necessary infrastructure to address barriers faced by energy efficiency investments the industrial sector. Turkey's CTF Investment Plan includes additional World Bank and EBRD/IFC projects to complement these efforts in other areas (SMEs, privatized electricity distribution companies, the public sector).

27. Renewable energy investments also face significant barriers. Technical risk and higher capital requirements in technologies such as solar and geothermal often deter investments. Geothermal projects often entail upfront exploration and development risks. Solar technologies are still very new and capital costs tend to be high. Further, transaction costs involved in developing renewable energy projects are also high particularly in newer areas such as solar, geothermal and biomass but also in developing small hydro or wind, which are often located in remote areas.

28. **Assessment of Additional Cost/Risk Premium in typical CTF projects:** The assessment below is based on prototype projects representing different technologies. In view of the fact that the operation is structured as a financial intermediary operation, actual projects that will be financed are not known upfront. The assessment below shows the equity returns possible, given anticipated higher feed-in tariffs, capital costs and transaction costs (See Table 11.5).

29. The threshold returns are based on comparable investments, adjusted for risk and transaction costs that are more difficult to quantify. In Turkey, a typical developer of small hydro expects equity IRRs of 15 percent. It is proposed that the threshold for wind and geothermal investment be set at 15 percent too, recognizing that there are already investors familiar with such technologies. Technologies that are newer in the Turkish market, such as biomass and solar, are expected to require higher risk-adjusted returns. Therefore, the threshold IRR on equity for biomass is proposed at 20 percent and for solar at 25 percent. A higher risk premium is being proposed for solar technology due to the following considerations: (a) there is some, albeit limited, experience with biomass in Turkey whereas solar is still new and untested in the conditions in Turkey – Turkey has about 13 MW of biomass under operation but no solar project in operation or under consideration, (b) solar typically faces higher operational risks compared with biomass which has less operating constraints (in both biogas and combustion systems) because of the availability of alternative fuel sources, and (c) the experience in other countries which have experience in these technologies, in Europe and Asia for instance, suggests similar levels of equity IRRs as being required for deployment at scale – in parts of Europe, 25-30% equity IRRs for solar thermal and solar PV are considered reasonable.

30. Private industry in Turkey does not systematically and actively seek and invest in potential energy saving opportunities even when the specific investments may be financially viable. In initial market exploration with private industry by the FIs and the World Bank team, the following findings emerged: (a) since energy efficiency projects provide a stream of savings on energy bills rather than a clear accounting revenue stream, financial officers in industry do not readily approve such investments unless they offer rapid pay-backs. In some cases the required rates of return were quoted as high as 50 percent, because of their high upfront transaction costs and perceptions of high technical and financial risk; (b) private industry is not willing to approach financial institutions for small energy efficiency investments (below US$2-3 million) – which form the bulk of the energy efficiency project opportunities – because of high transaction cost of preparing loan documentation with the necessary energy audits; (c) financial institutions have on their part not actively pursued energy efficiency as a business-line as it requires a large commitment in terms of acquiring technical and financial skills to devise appropriate financing schemes, review project proposals as well as in establishing credit review standards. Given this context, it is necessary

to approach the energy efficiency investment potential in Turkey from several fronts – to create adequate incentives at the private industry and financial institution level respectively, to actively pursue these investments opportunities and develop a business-line for energy efficiency. As a proxy for these barriers and based on the findings of the market exploration the expected required return on energy efficiency projects has been set at 40 percent.

31. The additional cost of making a project financially viable, or the risk premium, is defined as the amount required to move from current return levels (at the increased feed-in tariffs) to threshold returns. The assessment below shows the CTF loan amount required in order to enable the grant element (of 45 percent) to cover the additional cost. It should be noted that the additional cost is significantly mitigated by the increase in feed-in tariffs, particularly for solar technologies.

Table 11.5: Prototype projects for CTF financing

	Typical Capacity	Typical Project Cost	Assumed Increased Feed-in Tariff[1]	Equity IRR w/o CTF	Threshold IRR on Equity	Additional cost covered by CTF grant element[2]	CTF Loan Amount	CTF required to cover additional cost	Cost effectiveness of CTF
	(MW)	($ million)	(US ¢/kWh)	(%)	(%)	($ million)	($ million)	(%)	($/TCO$_2$)
Small Hydro	6	14.2	8	12%	15%	1.3	2.8	20%	5.87
Wind	22.5	43.6	8	12%	15%	3.9	8.7	20%	5.46
Geothermal	20	80.0	9	12%	15%	7.2	16.0	15%	5.24
Biomass Steam	50	85.0	9	8%	20%	19.1	42.5	50%	10.37
Biomass Gas	20	40.6	9	3%	20%	13.7	30.5	75%	18.57
Solar Thermal	30	96.7	30	20%	25%	8.7	19.3	15%	15.73
Solar PV	5	35.3	30	3%	25%	15.9	35.3	87%	170.90
EE Project	-	10.0	12	34%	40%	0.9	2.0	20%	4.98

1. Tariff increase for RE based on current discussions of technology-based tariff; Energy Efficiency based on current retail tariffs.
2. Estimated grant element of CTF is about 45%. Additional Cost is the additional support needed to reach threshold levels of Equity IRRs.

32. This assessment shows that at the assumed increased feed-in tariffs, technologies such as small hydro and wind would require a CTF financing of 20 percent of total project cost to reach the threshold IRRs. In the case of technologies such as biomass, very high levels of CTF would be required – 50-75 percent – to enable threshold returns to be attained. Solar PV would require even higher levels of CTF. For some energy efficiency investments, the expectation is that 20 percent of CTF would enable threshold returns to be achieved, although for other investments, higher CTF contribution may be needed. This is consistent with the experience in other countries where it has been seen that energy efficiency investments have needed GEF grant contributions as high as 15 percent in the first five years.

33. The above assessment assumes that the terms of the CTF loan would be passed on by intermediaries to project developers (after factoring in a spread to cover their costs). Blending with current IBRD terms, this will result in an effective interest rate of about 2-2.2 percent if 15-20 percent of CTF is blended, and about 1.46 percent if 50 percent CTF is blended. Overall, the CTF resources will be expected to leverage additional resources at 1:5, at least. Therefore, even if for specific projects CTF contribution may be higher or lower, for the CTF-blended project as a whole, CTF resources will be limited to 20 percent of total project costs.

34. **Potential Investment Scenarios:** In order to assess the full impact of the usage of CTF resources (of US$100 million), a few illustrative portfolio scenarios have been

developed, using the sample projects in Table 11.5. Table 11.6 below shows four possible scenarios. Scenario 2 or a variant thereof is expected to be the most likely based on an assessment of market demand by the financial institutions and a minimum mix of the various renewable energy technologies and energy efficiency interventions. The scenarios vary in terms of the generation capacity financed, the additional cost (or the risk premium), the emission reduction potential, and cost-effectiveness of CTF.

35. In Scenario 1, the entire CTF co-financing is targeted to Energy Efficiency investments, which are the most cost-effective GHG emissions mitigation investments. The investments are expected to yield 950 GWh of energy savings in its project life, implying 20.1 $mtCO_2$ of GHG reduction in the same period. This is roughly equal to annual emission reductions of 1.0 $mtCO_2$. In Scenario 2, the most likely of the scenarios, the CTF loan of US$ 100 million is expected to yield about 167 MW of renewable capacity plus 190 GWh of energy savings. This will yield CO_2 emission reductions over the project life of about 20 $mtCO_2$, implying a cost effectiveness of about US$ 5/ tCO_2. The annual reduction of GHG emissions will be about 1 $mtCO_2$.

36. In Scenario 3, where CTF is used entirely for small hydro, while a larger capacity is enabled with a lower additional cost (because small hydro is considered relatively less risky), the emission reduction potential is lower than in Scenario 1. The cost-effectiveness is also a little lower than in Scenario 2, but will bring more RE capacity to Turkey than other investment scenarios. Scenario 4 represents the least cost-effective of the investment scenarios. The investments will yield less capacity than other scenarios, and the cost-effectiveness is significantly lower than other scenarios, because of the focus on technologies such as geothermal, biomass and solar.

Table 11.6: Investment Scenarios and Impact of CTF usage

Investment Scenarios	Capacity (MW)	Energy Saved (MWh)	Required CTF loan amount (US$ million)	GHG reduction over project life (million ton)	Cost effectiveness of CTF (US/TCO_2)
Scenario 1: 100% of CTF financing to Energy Efficiency	-	950,000	100	20.1	4.98
Scenario 2: Portfolio of Small Hydro (60 MW), Wind (67.5MW), Geothermal (40MW), Energy Efficiency (10 projects)	167.5	190,000	100	19.7	5.40
Scenario 3: 100 % of CTF financing to Small Hydro	210.0	-	100	17.0	5.87
Scenario 4: Portfolio of Wind (45MW), Geothermal (40MW), Biomass Gas (20MW), Solar Thermal (30MW)	135.0	-	99	12.2	8.16

Annex 12: Project Preparation and Supervision

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

	Planned	Actual
PCN review		October 28, 2008
Initial PID to PIC		November 17, 2008
Initial ISDS to PIC		December 8, 2008
Appraisal	January 2009	February 13, 2009
Negotiations	March 2009	March 31, 2009
Board/RVP approval	May 2009	
Planned date of effectiveness	June 2009	
Planned date of mid-term review	September 2012	
Planned closing date	December 31, 2014	

Key institutions responsible for preparation of the project: TSKB, TKB

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Sameer Shukla	Task Team Leader	ECSSD
Kari Nyman	Program Team Leader	ECSSD
Shinya Nishimura	Financial Analyst	ECSSD
Gürhan Özdora	Senior Operations Officer	ECSSD
James Moose	Economist	Consultant
Salih Kalyoncu	Procurement Specialist	ECSPS
Bernard Baratz	Environmental Specialist	Consultant
Stan Peabody	Social Safeguards Specialist	Consultant
Zeynep Lalik	Financial Management Specialist	ECSPS
Irina Kichigina	Senior Counsel	LEGEM
Hannah Koilpillai	Sr. Finance Officer	LOAFC
Furuzan Bilir	Operations Officer	ECCU6
Selma Karaman	Program Assistant	ECCU6
Yukari Tsuchiya	Program Assistant	ECSSD

Bank funds expended to date on project preparation:

1. Bank resources: US$353,265.24
2. Trust funds: US$60,000.00
3. Total: US$413,2665.24

Estimated Approval and Supervision costs:

1. Remaining costs to approval: -
2. Estimated annual supervision cost: US$100,000.00

Annex 13: Documents in the Project File

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

1. Operational Manual TSKB
2. Operational Manual TKB
3. TSKB Annual Report
4. TKB Annual Report
5. Wind Atlas
6. Renewable Energy Law
7. Energy Efficiency Law
8. Regulations for energy efficiency

Annex 14: Statement of Loans and Credits

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

			Original Amount in US$ Millions						Difference between expected and actual disbursements	
Project ID	FY	Purpose	IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P106284	2008	Land Regis & Cadastre Modernization Proj	203.00	0.00	0.00	0.00	0.00	203.00	6.50	0.00
P096858	2008	EFIL IV	600.00	0.00	0.00	0.00	0.00	504.23	-15.00	0.00
P100383	2007	ISTANBUL MUNICIPAL INFRASTRUCTURE PROJ.	322.15	0.00	0.00	0.00	0.00	321.34	105.75	0.00
P096801	2007	ELECT DISTRIB REHAB	269.40	0.00	0.00	0.00	0.00	258.67	48.52	0.00
P096400	2006	ECSEE APL #3 (TURKEY)	150.00	0.00	0.00	0.00	0.00	63.16	-29.22	0.00
P096262	2006	AVIAN FLU - TR	34.40	0.00	0.00	0.00	0.00	24.82	19.04	6.69
P093765	2006	GAS SECT DEVT	325.00	0.00	0.00	0.00	0.00	321.19	188.19	0.50
P085561	2006	ELECTRICITY GENERATION REHAB & RESTRUCTU	336.00	0.00	0.00	0.00	0.00	376.99	251.11	0.00
P082822	2006	ACC TO FIN FOR SMEs	446.91	0.00	0.00	0.00	0.00	259.42	31.64	0.00
P081880	2005	MUNICIPAL SERVICES	275.00	0.00	0.00	0.00	0.00	202.81	161.16	0.00
P078359	2005	SEISMIC RISK MITIGATION	400.00	0.00	0.00	0.00	0.00	221.31	110.04	-0.95
P077328	2005	RAIL RESTRUCT	184.70	0.00	0.00	0.00	0.00	152.91	135.63	13.78
P093568	2005	EFIL 3	305.00	0.00	0.00	0.00	0.00	0.06	-55.46	0.00
P066149	2005	SEC EDUC	104.00	0.00	0.00	0.00	0.00	93.59	68.84	19.04
P094167	2005	PSSP 2	465.40	0.00	0.00	0.00	0.00	97.96	61.26	0.00
P094176	2005	ECSEE APL #2 (TURKEY) (CRL)	66.00	0.00	0.00	0.00	0.00	33.80	16.46	0.00
P070950	2004	ANATOLIA WATERSHED REHAB	20.00	0.00	0.00	0.00	4.30	4.29	-1.66	0.00
P072480	2004	RENEW ENERGY	202.03	0.00	0.00	0.00	1.02	15.69	16.70	0.00
P074053	2004	HEALTH TRANSIT (APL #1)	60.61	0.00	0.00	0.00	7.59	17.03	18.74	18.74
		Total:	4,769.60	0.00	0.00	0.00	12.91	3,172.27	1,138.24	57.80

TURKEY
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2005	Acibadem	20.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
2006	Acibadem	40.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
1996	Arcelik	3.50	0.00	0.00	0.00	3.50	0.00	0.00	0.00
2005	Arcelik	101.99	0.00	0.00	101.99	101.99	0.00	0.00	101.99
2000	Arcelik LG Klima	2.82	0.00	0.00	0.00	2.82	0.00	0.00	0.00
2002	Assan	15.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2005	Assan	20.00	0.00	10.00	30.00	0.00	0.00	0.00	0.00
2002	Atilim	4.39	0.00	0.00	0.00	4.39	0.00	0.00	0.00
2005	Avea	120.00	0.00	0.00	0.00	120.00	0.00	0.00	0.00
2000	Banvit	6.67	5.00	0.00	0.00	6.67	5.00	0.00	0.00
2002	Beko	27.79	0.00	0.00	13.85	27.79	0.00	0.00	13.85
2001	Bilgi	6.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
2006	Bilgi	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	Borcelik	6.36	0.00	0.00	0.00	6.36	0.00	0.00	0.00
1994	CBS Holding	3.50	0.00	0.00	0.00	3.50	0.00	0.00	0.00
1990	Conrad	2.69	0.00	0.47	0.00	2.69	0.00	0.47	0.00
2002	Conrad	2.10	0.00	0.00	0.00	2.10	0.00	0.00	0.00
2002	EKS	8.11	0.00	0.00	0.00	8.11	0.00	0.00	0.00
1995	Entek	16.00	0.00	0.00	4.97	16.00	0.00	0.00	4.97
2006	Finans Leasing	25.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	Gunkol	4.47	0.00	0.00	0.00	4.47	0.00	0.00	0.00
1998	Indorama Iplik	3.75	0.00	0.00	0.00	3.75	0.00	0.00	0.00
2005	Intercity	15.00	5.00	0.00	27.75	15.00	5.00	0.00	27.75
2006	Intercity	44.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	Ipek Paper	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00
1988	Kiris	16.24	0.00	0.00	0.00	16.24	0.00	0.00	0.00
1990	Kiris	10.96	0.00	0.00	0.00	10.96	0.00	0.00	0.00
2004	Koclease	30.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
1991	Kula	5.17	0.00	0.00	0.00	5.17	0.00	0.00	0.00
2004	Meteksan Sistem	0.00	0.00	7.56	0.00	0.00	0.00	7.56	0.00
2002	Milli Re	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	Milli Re	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	Modern Karton	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
2005	Modern Karton	40.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00
2004	OPET	25.00	0.00	0.00	40.00	25.00	0.00	0.00	40.00
2004	Oyak Bank	38.89	0.00	0.00	0.00	38.89	0.00	0.00	0.00
2005	PALEN	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
2005	PALGAZ	10.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
1998	Pinar ET	1.57	0.00	0.00	0.00	1.57	0.00	0.00	0.00
2000	Pinar SUT	8.52	0.00	0.00	0.00	4.89	0.00	0.00	0.00
1999	SAKoSa	3.91	0.00	6.52	0.00	3.91	0.00	6.52	0.00
2006	Sanko Group	75.00	0.00	0.00	100.00	20.14	0.00	0.00	26.86
1990	Silkar Turizm	0.67	0.00	0.00	0.76	0.67	0.00	0.00	0.76
2003	Sise ve Cam	34.68	0.00	14.54	24.14	34.68	0.00	14.54	24.14
2006	Standard Profil	19.12	3.82	0.00	0.00	0.00	0.00	0.00	0.00
2006	TDD	31.87	0.00	0.00	0.00	31.87	0.00	0.00	0.00
2005	TSKB	0.00	0.00	50.00	0.00	0.00	0.00	50.00	0.00
1989	Trakya Cam	0.00	0.00	0.03	0.00	0.00	0.00	0.03	0.00
1996	Trakya Cam	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00

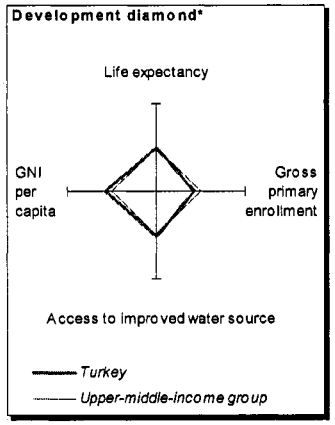
		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
1999	Trakya Cam	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00
2002	Turk Ekon Bank	6.67	0.00	15.00	0.00	6.67	0.00	15.00	0.00
2005	Turk Ekon Bank	0.00	0.00	50.00	0.00	0.00	0.00	50.00	0.00
2001	Turkish PEF	0.00	9.59	0.00	0.00	0.00	6.40	0.00	0.00
1999	Uzel	6.11	0.00	0.00	3.30	6.11	0.00	0.00	3.30
1998	Viking	4.32	0.00	0.00	0.00	4.32	0.00	0.00	0.00
2005	YUCE	4.10	0.00	0.00	0.00	4.02	0.00	0.00	0.00
	Total portfolio:	995.06	23.44	159.12	366.76	657.25	16.43	149.12	243.62

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2005	Avea	0.00	0.00	0.00	0.30
2001	Akbank	0.03	0.00	0.00	0.00
2002	TEB III	0.00	0.00	0.00	0.05
2006	Intercity II	0.00	0.00	0.00	0.01
2002	Milli Reasurans	0.00	0.01	0.00	0.00
2004	Akbank BLoan Inc	0.00	0.00	0.00	0.02
	Total pending commitment:	0.03	0.01	0.00	0.38

Annex 15: Country at a Glance

TURKEY: Private Sector Renewable Energy and Energy Efficiency Project

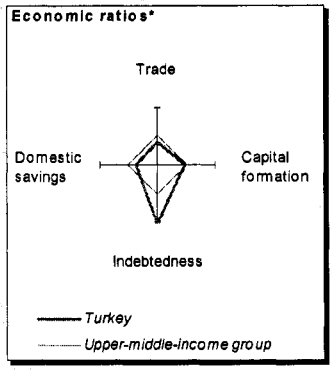
POVERTY and SOCIAL	Turkey	Europe & Central Asia	Upper-middle-income
2007			
Population, mid-year *(millions)*	73.9	445	823
GNI per capita *(Atlas method, US$)*	8,020	6,052	6,987
GNI *(Atlas method, US$ billions)*	592.9	2,694	5,750
Average annual growth, 2001-07			
Population *(%)*	1.3	0.0	0.7
Labor force *(%)*	2.5	0.5	1.3
Most recent estimate (latest year available, 2001-07)			
Poverty *(% of population below national poverty line)*	27	..	..
Urban population *(% of total population)*	68	64	75
Life expectancy at birth *(years)*	71	69	71
Infant mortality *(per 1000 live births)*	24	23	22
Child malnutrition *(% of children under 5)*	4	..	..
Access to an improved water source *(% of population)*	97	95	95
Literacy *(% of population age 15+)*	87	97	93
Gross primary enrollment *(% of school-age population)*	94	97	111
Male	96	98	112
Female	92	96	109



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

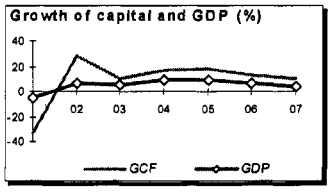
	1987	1997	2006	2007
GDP *(US$ billions)*	122.3	267.0	529.9	657.1
Gross capital formation/GDP	..	..	22.1	22.2
Exports of goods and services/GDP	..	..	22.7	21.9
Gross domestic savings/GDP	..	..	17.1	17.1
Gross national savings/GDP	..	..	16.2	16.3
Current account balance/GDP	-0.7	-1.0	-6.2	-4.9
Interest payments/GDP	1.6	1.4	1.4	..
Total debt/GDP	33.5	31.8	39.2	..
Total debt service/exports	41.2	22.4	33.5	..
Present value of debt/GDP	..	..	40.8	..
Present value of debt/exports	..	..	178.6	..

	1987-97	1997-07	2006	2007	2007-11
(average annual growth)					
GDP	4.1	4.2	6.9	4.5	..
GDP per capita	2.1	2.7	5.6	3.2	..
Exports of goods and services	..	7.0	6.6	6.7	..

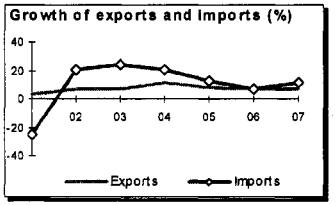


STRUCTURE of the ECONOMY

	1987	1997	2006	2007
(% of GDP)				
Agriculture	..	..	9.5	8.9
Industry	..	..	28.7	28.3
Manufacturing	..	..	19.8	19.0
Services	..	..	61.8	62.8
Household final consumption expenditure	..	..	70.5	70.7
General gov't final consumption expenditure	..	..	12.3	12.2
Imports of goods and services	..	..	27.6	27.0



	1987-97	1997-07	2006	2007
(average annual growth)				
Agriculture	..	1.3	1.4	-6.8
Industry	..	4.9	10.2	5.4
Manufacturing	..	4.8	8.4	5.4
Services	..	5.2	6.0	5.9
Household final consumption expenditure	..	5.1	4.6	4.6
General gov't final consumption expenditure	..	3.2	8.4	2.8
Gross capital formation	..	7.3	13.3	10.1
Imports of goods and services	..	9.9	6.9	11.1



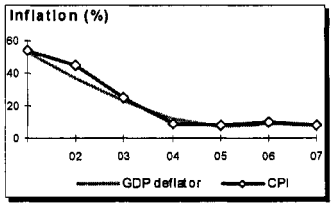
Note: 2007 data are preliminary estimates.

This table was produced from the Development Economics LDB database.

*The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

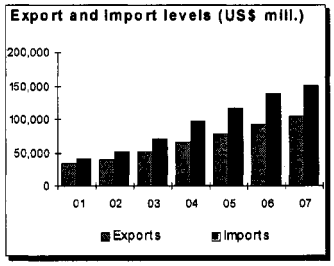
PRICES and GOVERNMENT FINANCE

	1987	1997	2006	2007
Domestic prices				
(%change)				
Consumer prices	..	85.0	9.6	8.1
Implicit GDP deflator	88.1	86.1	9.3	8.1
Government finance				
(%of GDP, includes current grants)				
Current revenue	16.3	16.9	21.2	21.1
Current budget balance	4.3	0.2	-7.7	-7.3
Overall surplus/deficit	-4.1	-5.5	0.2	-0.8



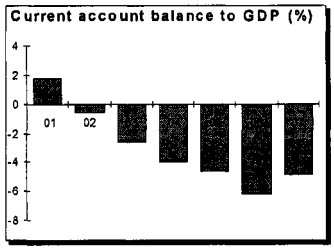
TRADE

	1987	1997	2006	2007
(US$ millions)				
Total exports (fob)	10,190	32,110	91,937	104,235
Agriculture and livestock	3,316	9,969	19,438	..
Mining and quarry products	1,826	4,365	4,521	..
Manufactures	9,050	30,648	87,179	99,023
Total imports (cif)	14,158	50,954	138,973	152,421
Food	830	2,425	2,537	..
Fuel and energy	3,275	6,258	29,664	..
Capital goods	3,956	11,353	23,316	..
Export price index *(2000=100)*	107	117	138	143
Import price index *(2000=100)*	114	106	149	154
Terms of trade *(2000=100)*	94	111	92	93



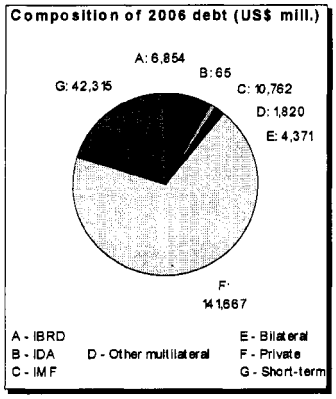
BALANCE of PAYMENTS

	1987	1997	2006	2007
(US$ millions)				
Exports of goods and services	14,135	51,358	116,427	130,625
Imports of goods and services	15,179	55,494	144,304	156,810
Resource balance	-1,044	-4,136	-27,877	-26,185
Net income	-2,085	-3,013	-6,584	-6,940
Net current transfers	2,323	4,511	1,687	1,820
Current account balance	-806	-2,638	-32,774	-32,228
Financing items (net)	1,775	5,954	36,494	37,526
Changes in net reserves	-969	-3,316	-3,720	-5,298
Memo:				
Reserves including gold *(US$ millions)*	2,740	19,993	60,705	69,438
Conversion rate *(DEC, local/US$)*	8.60E-4	0.2	1.4	1.3



EXTERNAL DEBT and RESOURCE FLOWS

	1987	1997	2006	2007
(US$ millions)				
Total debt outstanding and disbursed	40,944	84,785	207,854	..
IBRD	6,290	3,587	6,854	7,541
IDA	170	118	65	59
Total debt service	5,981	11,914	40,511	..
IBRD	776	999	1,135	1,055
IDA	5	7	6	6
Composition of net resource flows				
Official grants	42	58	415	..
Official creditors	480	-134	720	..
Private creditors	1,285	3,755	33,400	..
Foreign direct investment (net inflows)	115	805	20,070	..
Portfolio equity (net inflows)	0	8	1,939	..
World Bank program				
Commitments	957	35	1,909	867
Disbursements	787	266	1,796	1,223
Principal repayments	320	732	813	672
Net flows	467	-466	983	551
Interest payments	461	273	329	389
Net transfers	7	-740	654	162



Note: This table was produced from the Development Economics LDB database. 9/24/08

TURKEY

PROVINCE CAPITALS*
NATIONAL CAPITAL
RIVERS
MAIN ROADS
RAILROADS
PROVINCE BOUNDARIES*
INTERNATIONAL BOUNDARIES

*Province names are the same as their capitals.

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