1. Brief introduction to low carbon investments

What are low carbon investments?

Low carbon investments are all the investments which contribute to improve the carbon footprint of an activity

Renewable energy investments

- To sell energy by connecting to the grid
- For your activities' own energy consumption
- For both own consumption and sell

Energy efficiency investments

- All investments which reduce the energy needs of your activities
- It can be improvements in energy systems: cogeneration, more efficient heat and cooling systems
- It can be improvements in processes: high efficiency motors, automation and control
- Buildings and facilities can also be more energy efficient: better thermal insulation, high efficiency lightening and heating

Carbon sequestration and adaptation to climate change projects

Why are low carbon investments important for Turkey?

Turkey is dependant at 73% from its primary energy imports and energy supply security is at risk due to rapid growth in demand

- It is therefore crucial for Turkey to increase energy supply and to decrease energy consumption per output through energy efficiency to ensure energy supply stability

Turkish economy is more energy intensive than other OECD countries

- 0.27 toe per each $1,000 of GDP in Turkey, OECD average: 0.18

The growth rate of CO2 emissions has been the highest among Annex 1 countries between 1990 – 2007: + 119%.

Turkish government recognized the importance of fighting climate change

- Ratification of Kyoto protocol in February 2009
- National Strategy on Climate Change in 2010
- A Climate Action Plan should be published in 2011
- Renewable energy Law in 2005 and Energy efficiency Law in 2007

Why are low carbon investments important for businesses?

To limit climate-change related risks and capture new opportunities

RISKS

- Increased energy expense
- Loss of customers looking for more energy-efficient suppliers (EU multinationals)
- Weakened competitive position
- Risks of energy cuts if expected supply-demand gap happens
- Non-compliance with official targets
- Negative corporate image (bad product's carbon footprint)

OPPORTUNITIES

- Improved process control, productivity and product quality
- Reduced operating costs
- Reduced operating risks
- New customers looking for energy-efficient suppliers
- Government subsidized program available
- Access to cheaper financing sources (IFI, institutionals)
- Better corporate image/reputation

Two reference studies on opportunities in low carbon investments in Turkey

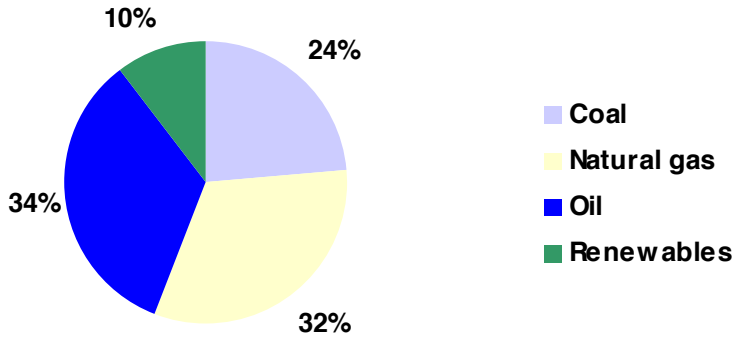
AFD study “Engaging Turkish banks in scaling up investment on Climate Change, 2008”

World Bank study “Tapping the Potential for Energy Savings in Turkey”, January 2011

2. Renewable energy opportunities in Turkey

Renewable energy opportunities in Turkey?

Energy consumption mix in Turkey was composed in 2008 of 10% renewable energy; government objective is of 30% by 2023



Renewable energy potential in Turkey

	Economic potential	Installed capacity
Hydroelectricity	35 000 MW	15 831 MW
Wind	47 849 MW	1 329 MW
Geothermy	500-1000 MW	94 MW
Solar PV	38 M toe	10 MW
Waste-to-energy	108 municipal dumps	?
Vegetal biomass	17 M toe	?

Comparison of wind industries

TOP 10 CUMULATIVE CAPACITY DEC 2010

Turkey: 1329 MW

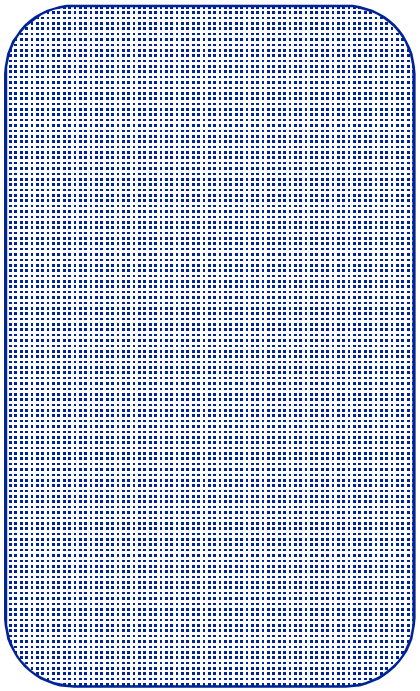
Country	MW	%
China	42,287	21.8
USA	40,180	20.7
Germany	27,214	14.0
Spain	20,676	10.6
India	13,065	6.7
Italy	5,797	3.0
France	5,660	2.9
UK	5,204	2.7
Canada	4,009	2.1
Denmark	3,752	1.9
Rest of the world	26,546	13.7
Total TOP 10	**167,844**	**86.3**
World Total	**194,390**	**100**

TOP 10 NEW INSTALLED CAPACITY JAN-DEC 2010

Turkey: 461 MW

Country	MW	%
China	16,500	46.1
USA	5,115	14.3
India	2,139	6.0
Spain	1,516	4.2
Germany	1,493	4.2
France	1,086	3.0
UK	962	2.7
Italy	948	2.6
Canada	690	1.9
Sweden	603	1.7
Rest of the world	4,750	13.3
Total TOP 10	**31,052**	**86.3**
World Total	**35,802**	**100**

Amendment of the Renewable Energy Law: New feeds-in tariffs since Dec. 2010



Tariff (dollar cents / kWh)	If local facilities production (dollar cents / kWh)
7,3	up to + 2,3
7,3	up to + 3,7
10,5	up to + 2,7
13,3	up to + 5,6
13,3	up to + 6,7

Example 1: Mamak landfill waste-to-energy

Context

Open fields create air pollution, strong odours, and cause major healh risks to those who live nearby. Landfills emit methane, which contributes 20x more than CO2 to greenhouse effect. Methane can be captured in landfills and converted into clean electric power.

Invest Trading & Consulting

Sector:

Energy production from biomass, solid waste management, utilisation of waste heat in greenhouses, packaging waste management

Year of the project : 2006

AFD's loan:

2 M € through TSKB

Project description

The project consists in the collection of landfill gas, installation of gas engines and construction of a bio-digester for treatment of organic waste on Mamak landfill located in Ankara
Sell of electricity to the grid
Cost of the project: 24 M €
Purchase of 1.3 M teq CO2 carbon credits by Rabobank

Impacts

Energy production installed capacity: 40 MW
Expected CO2 emissions reduction per year: 500 000 tons

Example 2: Industrial biomass plant

Context

Wood biomass is a renewable source of energy, that can be used for heating but also for electricity production. One of the most cost-effective wood sources are residues from manufacturing and wood wastes otherwise destined for landfills: less than 50% of the tree ends up in a final product, what gives a large underutilized resource.

Forestry company

Sector: Forestry products

Year of the project : 2011

AFD's loan: 4.9 M € through a partner bank

Project description

The project consists in the construction of a biomass central
The produced energy will cover own needs of the plant

Impacts

Energy production installed capacity: 64 MW
Energy savings: 53 838 km3 of natural gas
Expected CO2 emissions reduction per year: 100 000 tons

3. Energy efficiency opportunities in Turkey

Energy efficiency

Energy efficiency = either when energy inputs are reduced for a given level of service, or there are increased services for a given amount of energy inputs

Energy efficiency investments thanks to high energy savings enable high returns on investments and short payback period

- Average expected IRR for energy efficiency projects financed through AFD's credit lines: 44%

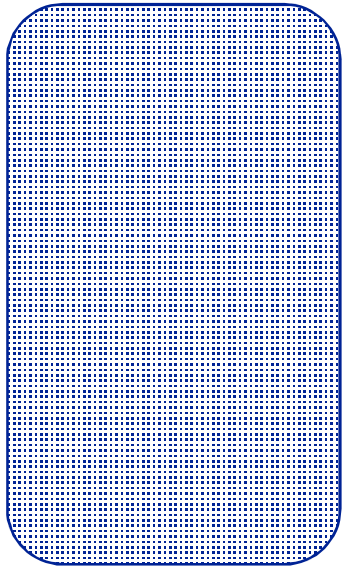
However several barriers explain the lack of investments in energy efficiency in Turkey:

- Consistent data collection across timeline and sectors needed to prioritize investments
- Low awareness of benefits of energy efficiency
- Lack of energy efficiency expertise
- Low access to financing for such projects until recent years: IFI's role

Energy consultants and EVDs can help you find energy efficiency opportunities in your business

Energy efficiency opportunities in Turkey

The potential for energy savings in Turkey's industry is up to $ 3 bn per year, which represents 25% of the total industrial energy consumption of 2007

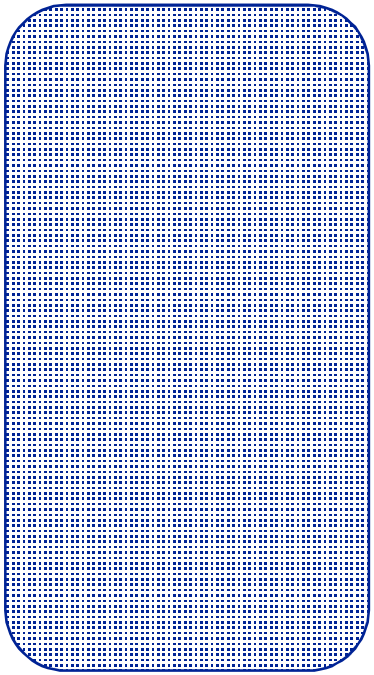


Electricity savings potential	Fuel savings potential	Total energy savings potential
21%	19%	1,4 M toe / an
25%	29%	1,1M toe / an
10%	34%	261 000 toe / an
57%	30%	1,1 M toe / an
22%	21%	206 000 toe / an
18%	32%	n.a.
18%	64%	n.a.

The potential for energy savings in commercial buildings simply through better insulation is estimated to be 20%, representing 1.8% of total energy consumption.

Energy efficiency opportunities in residential buildings are up to 32% of energy savings, which represents 7% of Turkey's total energy consumption.

Comparison of energy intensity in different countries (2004)



Turkey	EU-countries selection	UE-15	Unit
0,31	0,14-0,37	0,3	toe/tonne
0,09	0,07-0,12	n.a.	toe/tonne
0,3	n.a.	n.a.	toe/tonne
0,42	0,09-0,18	0,12	toe / 100€
0,31	0,44-0,60	0,37	toe/tonne
0,25	0,11-0,21	0,14	toe / 100€
0,88	0,11-0,84	0,27	toe / 100€

Turkish regulation fosters energy efficiency

National Strategy for Energy Efficiency published in 2004, new version in 2011

- Objective: 20% energy efficiency by 2023
- € 30 bn investments needed to reach this goal, according to the government

Law on Energy Efficiency published in 2007, followed by seevral regulations in 2008

- Creation of the EVD status
- Obligation of employing an energy manager for industrial units consuming more than 10,000 toe per year and creation of an energy management unit in each industrial zone

Energy Performance Regulation in Buildings, revised in 2008

- Limits energy consumption of new buildings

Example 3: Nuh Cimento

Context

Elimination of sludge from water treatment facilities is a worrying problem in Turkey. Other solutions than composting and spreading have to be found. One solution is to use waste steam from industrial processes to dry the sludge and use it as fuel.

Summary

Sector:
Cement factory

Year of the project : 2008

AFD's loan:
11 M € direct loan

Project description

The project consists in the construction of a sludge drying unit. Steam from the cement factory is used to dry sludge, which is then used as fuel in the cement furnaces. Sludge comes from municipal water treatment plants.

Impacts

Methane emission reduction: 23 500 tons per year
CO2 emission reduction: 21 500 tons per year
Reduction of soils pollution through elimination of 55 000 tons of sludge per year.

Example 4: energy efficiency in the steel sector

Context

The iron and steel industry is one of the most energy intensive industry, and Turkish steel industry is more energy intensive than European ones. Many investments can therefore be made in order to reduce companies' energy bills and GHG emissions

Summary

Sector:
Iron and steel

Year of the project : 2010

AFD's loan:
5 M € loan through TSKB

Project description

The project has two components:
Re-use of oven gas for energy production
Modernization of equipments, coke batteries

Cost of the project : 123 M€

Impacts

Total energy savings: 26.4 M € per year, leading to a reduction by 5.03 € per ton of the unit cost
CO2 emission reduction: 246 K tons per year

4. AFD at a glance

AFD at a glance

AFD: main French instrument for international development aid

AFD (AAA rated, not for profit bank & development agency)

PROPARCO: private sector subsidiary (funding at market rates)

FFEM (the French GEF)

Strategy focusing on sustainable development

Sharing global challenges in emerging countries (clean energy, energy efficiency, environmental protection, global warming, biodiversity)

Supporting economic growth (developing private and financial sectors, infrastructure)

Reducing poverty in developing countries (water, health, education, rural and productive sector)

Total commitments in 2010: €6.8 billion; 40% on Climate Change

Wide range of clients & products

AFD Group provides funding/support to:

- Governments
- Publics enterprises & entities
- Local governments
- Commercial or state owned banks
- Private enterprises & projects

Wide range of financing tools

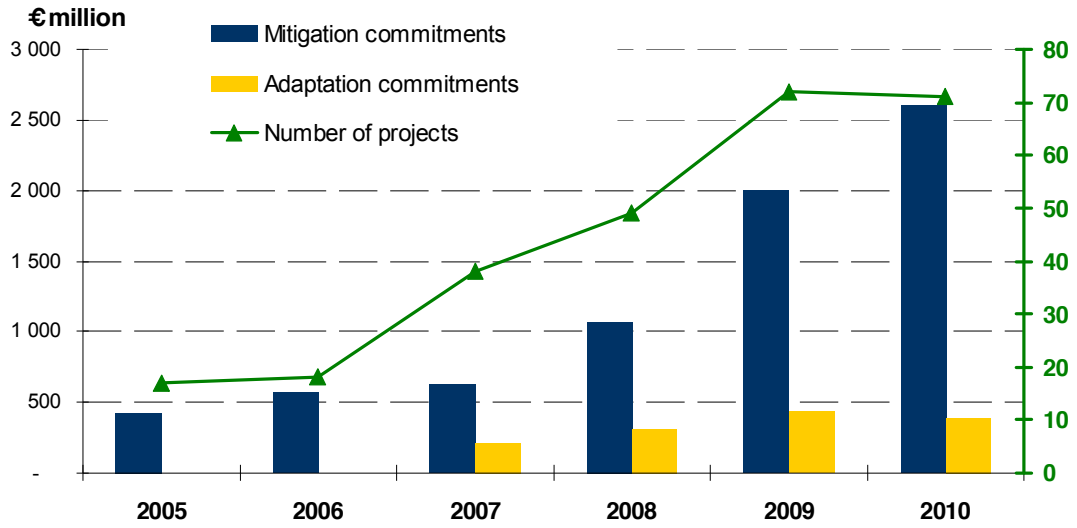
- Non-sovereign loans (concessional or market conditions)
- Sovereign loans (from very concessional to market conditions)
- Guarantees on loans in foreign or local currency
- Credit enhancement of bond issues
- Equity investment & quasi equity instruments
- Grants (projects, study, FFEM)

Environmental / Climate Change (CC) commitments on the rise

Integration of environmental & climate change challenges into AFD's strategy: supporting **low carbon investments**

Main sectors: **renewable energies & energy efficiency; low carbon urban transportation;** carbon sequestration projects in sustainable forest management and agroecology represent a high potential (~30% of mitigation global potential)

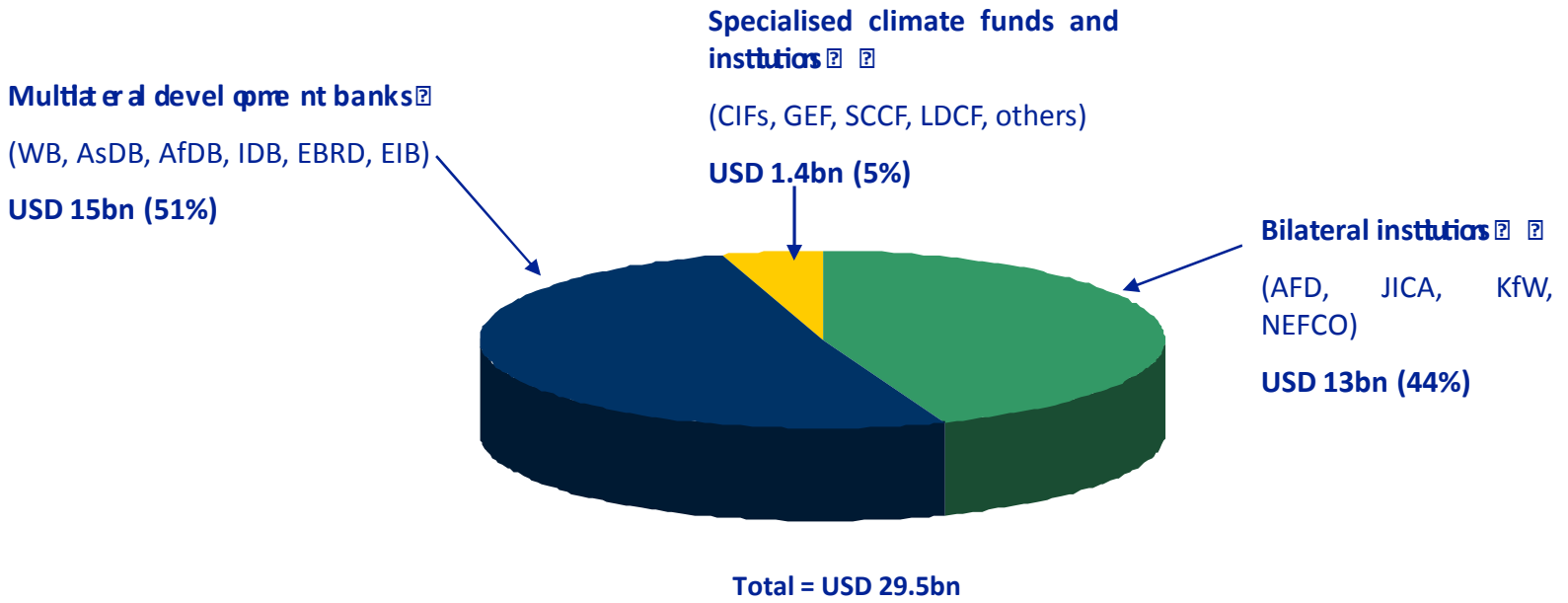
Impacts: projects supported are contributing to save **20 million tons of CO2eq**



Evolution of the AFD Group's « climate » commitments from 2005 to 2010

Distribution of international public funding sources for CC

AFD is a major global IFI on the climate issue with nearly 12% of international public funding identified



Distribution of the main international public funding sources for climate (2009 figures)

5. AFD in Turkey

AFD in Turkey

AFD supports the priority targets set by Turkey in order to promote sustainable growth:

promoting environmentally respectful development with low greenhouse gas emissions

fostering socially and environmentally responsible practices

contributing to a well balanced regional development

Total commitments over the 5 past years > € 1 billion (incl. **€600 million on the Climate Change agenda**: renewable energies, energy efficiency, public transport, etc.); banking sector representing 75% of total commitments

Partnerships with financial institutions

Reduction of green house gas emissions and pollution abatement projects (RE&EE)

TSKB HALKBANK TEB Garanti TÜRKİYE İŞ BANKASI

Several lines of credit with different focus: RE, EE in industry, EE in SMEs, etc; including or not TA program

"Climate-Turkey" program: €300 million committed over the past 2 years

Municipal investments in infrastructures & local public services DenizBank

Support to SMEs: Corporate social responsability, down-scaling & mesofinance

HALKBANK Şekerbank TÜRKİYE KALKINMA BANKASI TEB

6. Financing low carbon investments in Turkey

Financing opportunities for industrial companies

If you have a project of energy efficiency, renewable energy, waste treatment…

Contact one of our partner banks

For large industrial investments

Possibility to mobilize directly AFD/PROPARCO (minimum loan amount of € 10 million) alongside banks

Financial intermediation

Context

The “Climate Turkey” program aims at supporting investments for carbon emissions reduction in order to develop renewable energies and improve energy efficiency of industry and SMEs. It gathers projects carried out by AFD and Proparco through several partner banks for a total engagement of € 300M in 2 years.

Past projects

In 2004: € 50 M credit line for energy, health and education projects

In 2006: € 50 M credit line for renewable energy and depollution projects

Project description

€ 50 M credit line granted in 2009
Targets: industrials: energy efficiency and renewable energy projects
Technical assistance program:
- Training of staff on energy efficiency issues and marketing
- Awareness raising of customers on innovative renewable energies and energy efficiency
- Carbon footprint tool
- Studies

Impacts

At the moment: 17 projects, 52% to energy efficiency projects (refinery, iron and steel, plastic, car industry, energy production)
Total expected energy savings: € 58 M per year
Total expected greenhouse gases emissions reduction: 742 534 tons per year

Direct support to renewable energy investments

Recently financed projects:	Total Installed capacity:
Hydro – 3 dams in China (78MW), Bujagali dam in Uganda (250 MW), Larajb in Pakistan (84MW), Theun Hinboun in Laos (500MW)	1812 MW
Wind energy – 4 wind farms in Mexico, Morocco, in the French West Indies, in India and in Turkey	341 MW
Solar – Yingli in China (200 MW)	200 MW
Other – **Geothermal** – Olkaria plant in Kenya (48, 100 MW) – **Biogaz** – Al Dahrana in Jordan (6,5 MW) – **Fuel** – Kounoune power plant in Senegal (67 MW)	134 MW

Long term financing

Amount and conditions depending of project structure

Non or limited recourse structure possible

Proparco
GROUPE AGENCE FRANÇAISE DE DÉVELOPPEMENT

développeur d'avenirs durables

Belen Elektrik (Turkey)

Belen Elektrik (Turkey)

Type : Renewable Energies/ Wind Power

Country : Turkey

Year : 2010

Installed capacity: 30 MW

Main sponsor:

- Güris

Context

A growing demand (10% p.a) against a lack of supply
Objective of doubling capacity by 2017
Promotion of renewable energies in Turkey
- Electricity market liberalized
- Law for renewable energies

AFD launched a specific program for climate in Turkey

Financing

Financing the building of a wind power plant (30MW)
Co-financing :
- Commercial banks, Proparco

PROPARCO Financing: EUR 11.5 M Senior Loan – 12 years, with cash sweep

PROPARCO's role

Contribution to the diversification of power generation using local resources
Providing credit in a context of scarcity
CO_2 emissions avoided: 60,000 teq per year
Job creation: 24 direct and 120 indirect jobs during project construction

EnerjiSA (Turkey)

Context

Turkish government committed into the liberalization of the electricity market so as to improve its electric park through private investments and to face the steadily increasing demand (average 7.1% growth between 1992 and 2008)
EnerjiSA set up a construction program of wind farms, hydro and thermal power plants in two phases in 2008.
The second phase consists in the construction of 4 new power plants (one wind farm, 2 hydro and one gas power plant) with a total installed capacity of 1095 MW (total cost of EUR 1Bn).

EnerjiSA Enerji Uretim A.S.

Type : Energy

Country : Turkey

Year : 2011

Overall investment:

Senior loan EUR 40 M

Main sponsors:

- Sabanci Holding
- Verbund

Financing

Participation of PROPARCO in the financing of the phase 2 of EnerjiSA's investment program (EUR 795 M).
- PROPARCO is taking part in a EUR 240 M parallel loan alongside TSKB, FMO and Finansbank
- Senior loan of EUR 40 M

PROPARCO's role

PROPARCO's intervention will contribute to:
- Significant emissions reduction
- Limit climate change through the development of renewable energies
- Satisfy the increasing energy demand in Turkey that requires new investments in production capacity
- Support the economic recovery in Turkey

Thank you for your attention!

www.afd.fr

www.proparco.fr

Documentation available online:

"AFD and Climate Change"

Market study: « Engaging Turkish banks in Scaling-up investment on Climate Change in Turkey », 2008

"AFD Group and CSR in the banking sector"

Background paper "Banks for sustainable Development: Promoting the Competitiveness of SMEs through CSR", 2009

Working paper: "Corporate Social Responsibility in Turkey: Overview & perspectives", 2007

développeur d'avenirs durables