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GREEN BONDS



Daiwa
Impact Investment Forum

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<http://treasury.worldbank.org/greenbonds>



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Climate Change is a development issue



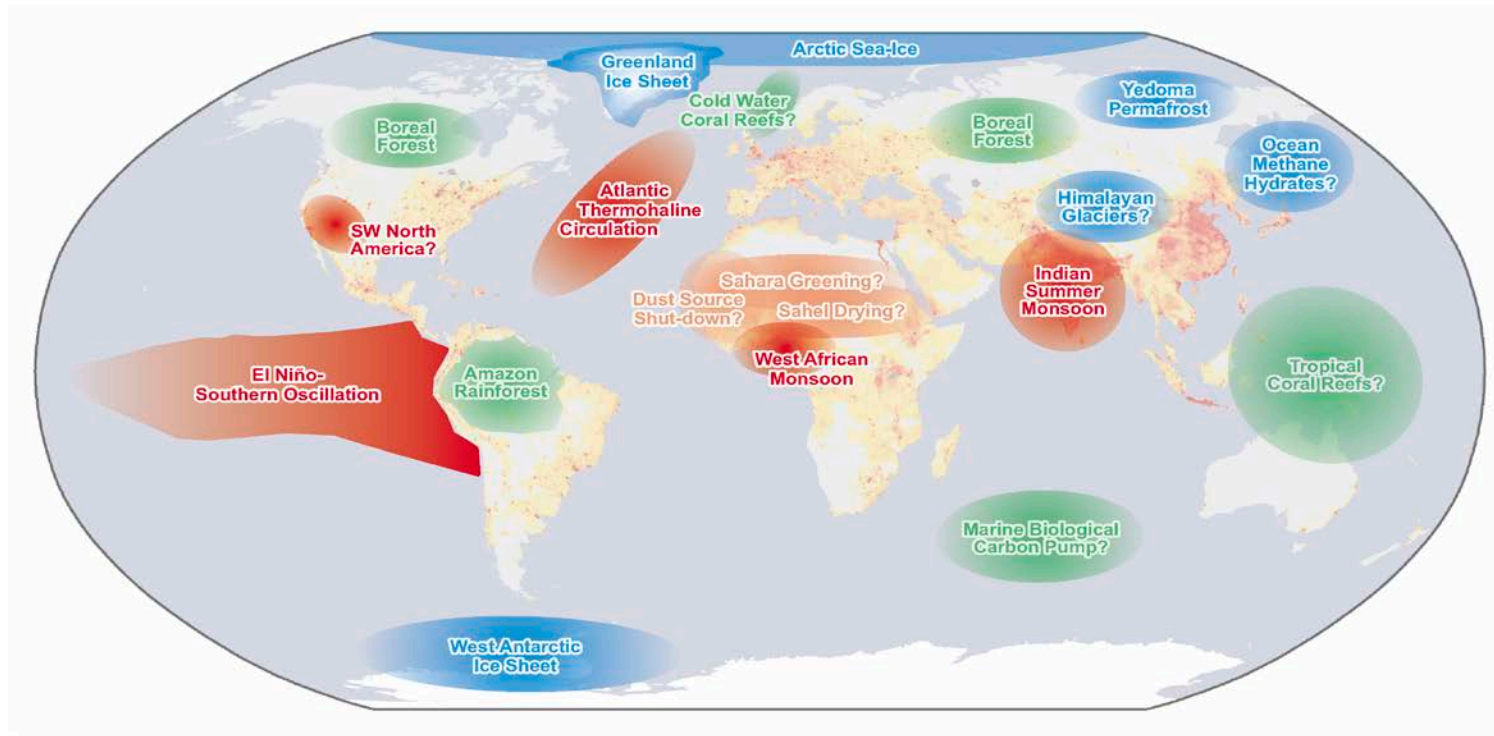
Climate Change

“Substantial scientific evidence shows that climate change is occurring - evidenced by increases in global average air and ocean temperatures, widespread melting of snow and ice, rising global average sea level and climate extremes. Most of the observed increases in global average temperatures since the mid-20th century is attributable to anthropogenic greenhouse gas emissions. Many human and natural systems are being affected and there is clear risk to development.”

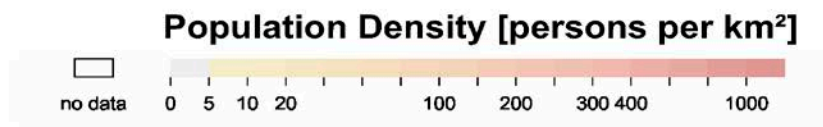
(IPCC 2007, 2012; America’s Climate Choices: Panel on Advancing the Science of Climate Change, National Academy of Sciences, 2010)



Tipping Elements of the Earth's Systems



- Melting
- Circulation Change
- Biome Loss





Climate Extremes

Heat

Heavy precipitation

Drought

Storm surge

**Projected: 10-fold increase
in frequency of extreme heat
events later this century**





Climate Change threatens development



- Disruption in agricultural productivity
- Worsened water quantity and quality
- Increased incidences of malaria, dengue and other vector borne diseases
- Damage to ecological systems and their biodiversity
- Displacement of populations
- Threats to the existence of small island states



Climate Change threatens development

***Economic losses
have increased***

Increasing exposure:
major cause

***Fatalities: higher in
developing countries***

Source: IPCC 2012





Rising CO₂ Concentrations and Global Temperature

Drastic cut in the trajectory of emissions is needed to stabilize temperature rise

Source: Meinshausen et al. 2011



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1.6 billion poor are without access to modern energy...



Earth at Night
More information available at:
<http://antwrp.gsfc.nasa.gov/apod/ap001127.html>

Astronomy Picture of the Day
2000 November 27
<http://antwrp.gsfc.nasa.gov/apod/astropix.html>

Focus

Financing Climate Change Mitigation and Adaptation



Climate Finance: Projected Costs

Total climate finance for developing countries over 2010-20: US\$ 180 bln to US\$ 250 bln p.a.* or 0.5 % of OECD GDP

Additional investment needs over 2010-20 (US\$ bln p.a.)

Mitigation

550 ppm 450 ppm

Global

~\$270 ~\$460

Developing countries

~\$150 ~\$220

Adaptation

Developing countries

~\$30 ~\$30



* UNFCCC, IEA, McKinsey



What is the World Bank Doing on Climate Change

Our strategic framework :

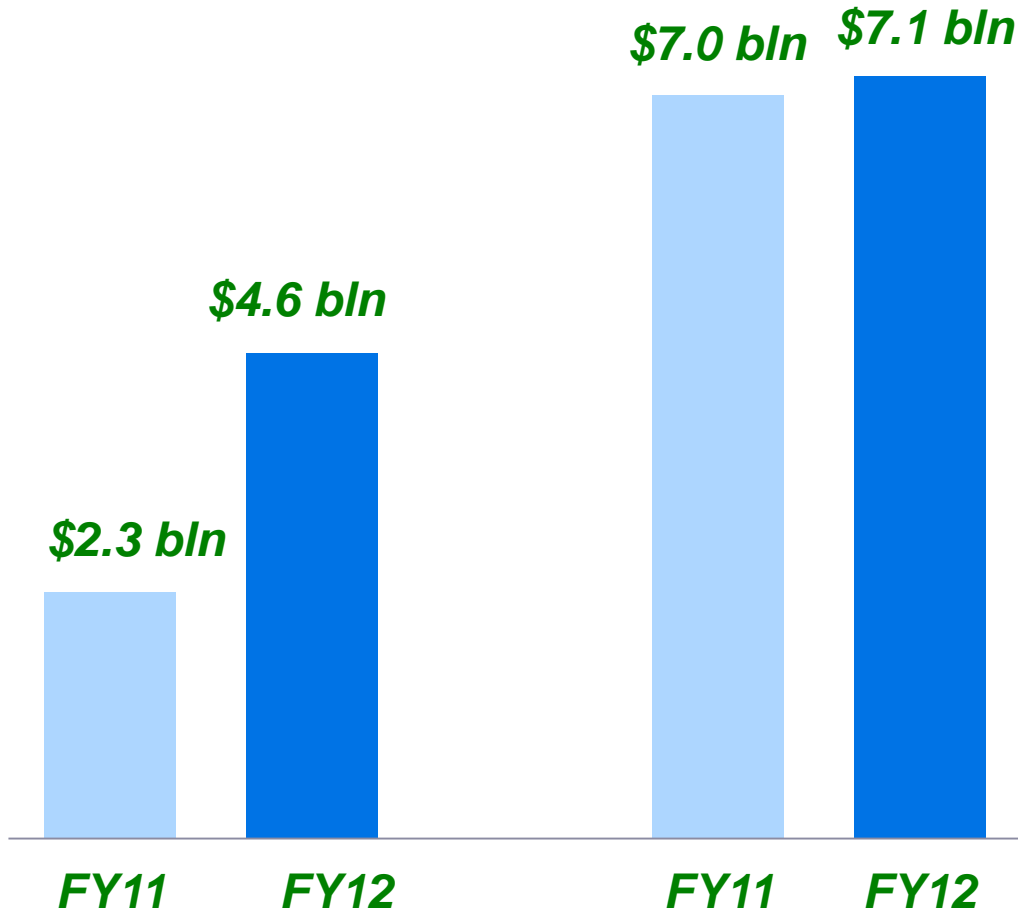
- 1. Supporting climate actions in country-led development processes**
- 2. Mobilizing additional concessional and innovative finance**
- 3. Facilitating development of market-based financing mechanisms**
- 4. Leveraging private sector resources**
- 5. Supporting accelerated development and deployment of new technologies**
- 6. Step-up policy research, knowledge and capacity building**



World Bank Lending for Climate Change

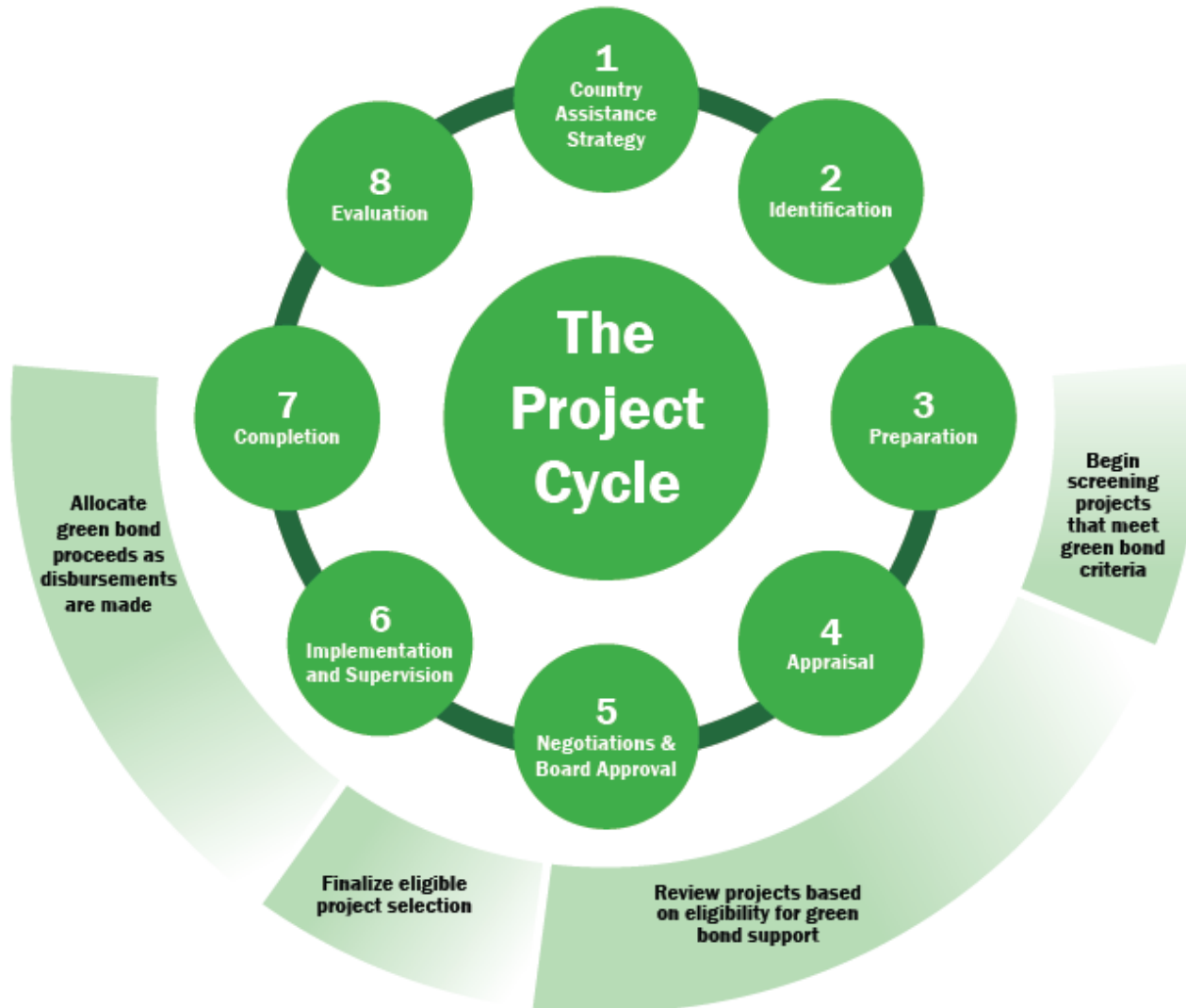
Adaptation

Mitigation





The Green Bond Project Cycle





Examples of the types of projects Green Bonds support

MITIGATION project examples:

- Solar and wind installations
- Funding for technologies that result in significant reductions in GHG emissions
- Rehabilitation of power plants and transmission facilities to reduce GHG emissions
- Greater efficiency in transportation, including fuel switching and mass transport
- Waste management (methane emission)
- Energy efficient building construction
- Reforestation and avoided deforestation

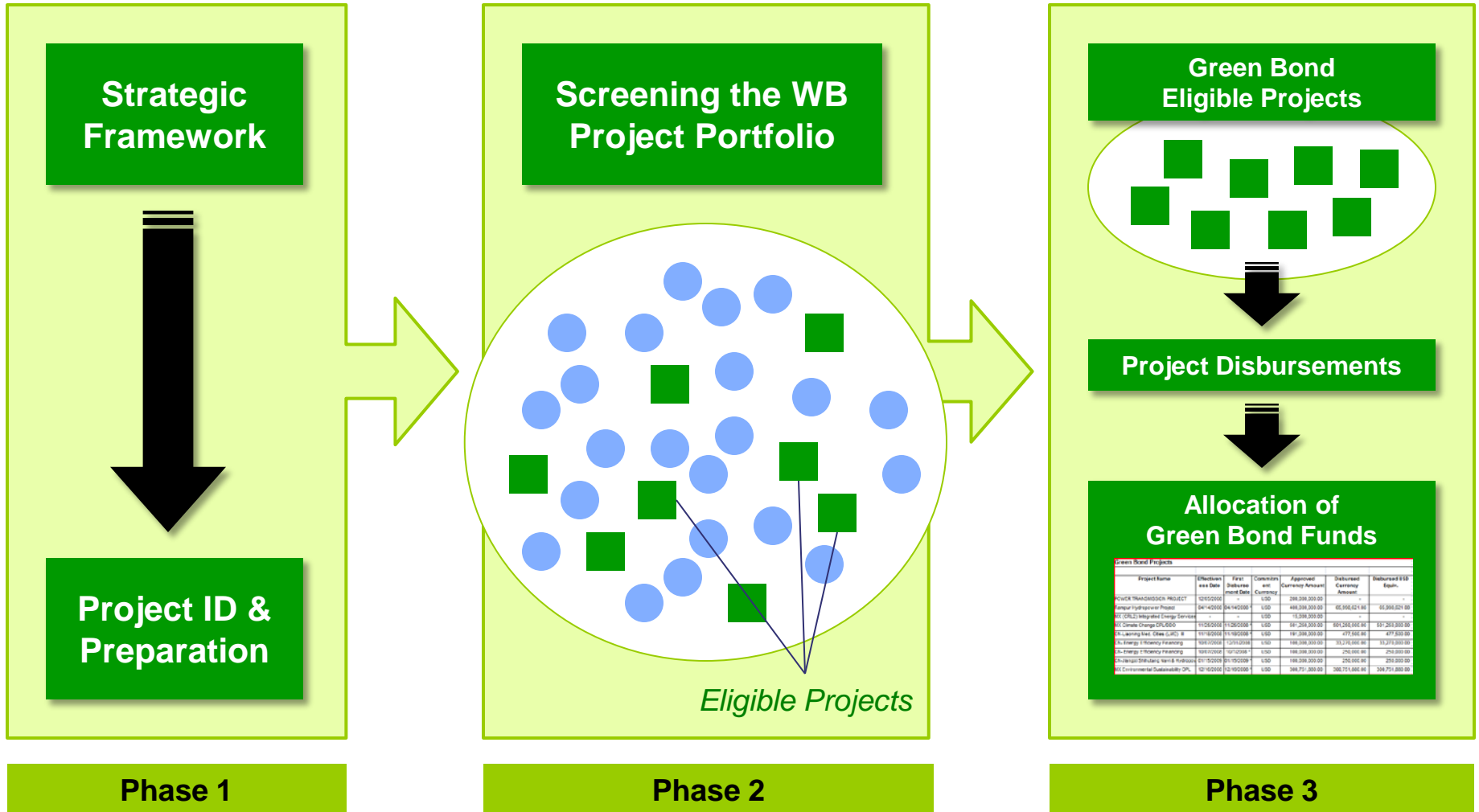
ADAPTATION project examples:

- Protection against extreme events, such as floods and droughts (including reforestation and watershed management)
- Food security improvement and stress-resilient crops (to slow down deforestation)
- Sustainable forest management and avoided deforestation





The Green Bond Decision Process





Locations of Eligible Projects



Focus

Green Bond Project Stories



Project Example in Mexico

Project summary:

Purpose: To reduce carbon emissions and increase public transportation efficiency

Project Term: 2010 - 2015

IBRD Financing: US\$150 million



© Associated Press

Urban Transport Transformation Program

Mexico's transport sector is high carbon-intensive

Accounts for 18% of Mexico's total GHG emissions

The rise in traffic, crowded roads, small/polluting buses contributed to overcrowding and high GHG emissions in Mexico's many cities.

Project increases urban transportation efficiency in Mexican cities by building exclusive bus lanes, dedicated passenger stations and other infrastructure

Old buses are scrapped and replaced with larger cleaner buses transporting passengers faster and more safely

These measures help reduce CO2 emissions and improve overall quality of service

More Information:

<http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P107159>



Morocco: Ouarzazate Concentrated Solar Panel

Project Summary:

Purpose: To build a 160 MW solar power plant

IBRD Financing: US\$200 million

Project Term: 2012 - 2018



More Information:

<http://operationsportal2.worldbank.org/wb/opsportal/ttw/about?projId=P122028>

Ouarzazate Concentrated Solar Panel

Concentrated Solar Power (CSP): demonstrated technology in need to be scaled-up to bring costs down

This project accelerates deployment of CSP in a suitable location.

Morocco Southern region of Ouarzazate has exceptional solar potential and eventual access to European Union electricity markets favoring carbon-free electricity.

Together with other multilateral, bilateral agencies, and the Clean Technology Fund, the \$200 million World Bank loan helps finance the first phase (160 MW) of a 500 MW CSP system in Morocco.

Activities include:

- Setting a public-private partnership to build the 160 MW plant and facilities;
- To support the higher operational costs associated with the initial years of CSP

The Project is expected to reduce 240,000 tons of CO₂ per year



Project Example in Montenegro

Project Summary:

Purpose: Improve energy efficiency in buildings used for health and education services

Project Term: 2008 - 2012

IBRD Financing: US\$9.4 million



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Energy Efficiency in Public Buildings

Montenegro imports about one-third of its power to feed its growing electricity demands and to make-up for diminishing electricity production from the run-down plants and assets of the state-owned electricity company. A legacy of highly inefficient buildings and other facilities contribute to the drain on energy supplies in Montenegro.

The World Bank funded Energy Efficiency Project mainly finances energy efficiency investments, reducing energy consumption and improving environmental quality in public schools and health centers—and promoting new energy efficiency and supply technologies in targeted public buildings across the country.

The project is designed to be a model for positive energy efficiency activities in rest of the country's public sector and private companies, reducing national greenhouse gas emissions.

More information:

<http://web.worldbank.org/external/projects/main?Projectid=P107992&theSitePK=40941&piPK=64290415&pagePK=64283627&>



Project Example in Tunisia

Project Summary:

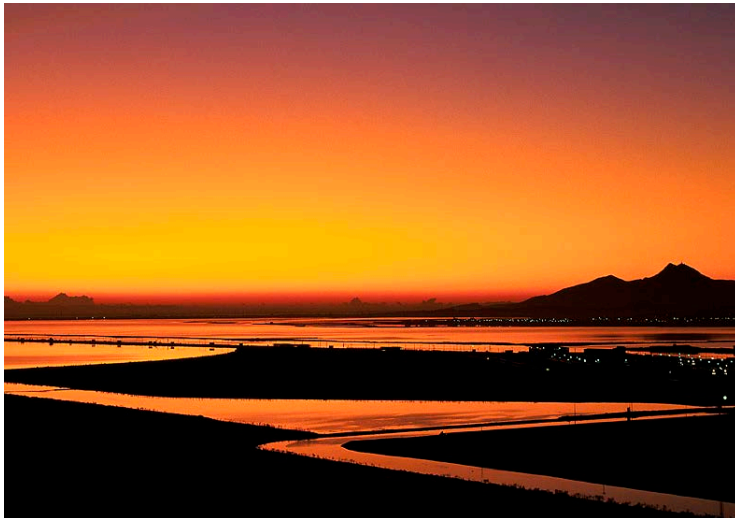
Purpose: To promote better water management

Project Term: 2009-2015

IBRD Financing: US\$30.6 million

Project ID: P095847

Adaptation: Improved efficiency in water use in irrigation and increased capacity for climate adaptation



© Curt Carnemark/World Bank

More Information:

<http://web.worldbank.org/external/projects/main?Projectid=P095847&theSitePK=40941&piPK=64290415&pagePK=64283627&menuPK=64282134&Type=Overview>

Second Water Sector Investment

The project promotes efficiency improvements in irrigation schemes, more reliable water supply in rural areas and increased capacity to plan for the current and future water management challenges, including climate change.

Compared to countries in North Africa and the Middle East and in spite of severe scarcity and stress in its aquifers, Tunisia has been able to capture and use more than 80% of the usable water thanks to infrastructure investments and good management policies.

Climate change will exacerbate scarcity and reliance on already-stressed groundwater. The project promotes more efficient use of irrigation water and increases capacity to plan and manage water in the future.



Project Example in India

Project Summary:

Purpose: To strengthen India's transmission infrastructure resulting in decreased greenhouse gas emissions through efficiency gains

Project Term: 2008 - 2014

IBRD Financing: US\$600 million

Project ID: P101653

Mitigation: Access to renewable energy (hydropower) in underserved areas through better interregional power exchange. Also increased efficiency of transmission



© Curt Carnemark/World Bank

More Information:

<http://web.worldbank.org/external/projects/main?Projectid=P101653&theSitePK=40941&piPK=64290415&pagePK=64283627&menuPK=64282134&Type=Overview>

Power System Development Project IV

India's weak power infrastructure constrains India's full growth potential and leaves many households without electricity services. The inefficiency of the power system contributes to environmental problems by forcing 60% of Indian firms and 40% of households to use diesel generators as back-up power sources. In addition, the poor connectivity between regions restricts India's ability to transfer surplus hydropower resulting in growing pressure to build additional coal-based power generation.

The project is will have a positive development impact by helping expand the transmission system and capacity and reduce transmission losses. It supports India's clean energy initiative by strengthening India's ability to transfer surplus hydro energy to power deficit regions in India, increase transmission efficiency, and avoid building additional coal-based generation.

Next Steps and Challenges

- Continue to raise awareness of the need for and support from private sector financing to tackle the climate challenge to improve incentives
- Continue to work with investors and intermediaries to create financial products that support climate change programs and meet investor demand, and encourage complimentary products (e.g. green indices, funds)
- Continue to work with World Bank colleagues to further develop the internal infrastructure/capacity to create and deliver new investment products





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