

Finanzierung von Klimaschutzmaßnahmen in Entwicklungs- und Schwellenländern

Clean Development Mechanism in Egypt
Project Example Zafarana

Rainer Sünner,
Vice President, KfW Carbon Fund
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The presentation is about...

- ... **Facts about Zafarana Site and Wind Farms**
- ... **Achievements**
- ... **Experiences**
- ... **CDM success story – Project Economics**

Zafarana Wind Farms

- Project to finance a large wind park at the West coast of the Red Sea, 220 km south east of Cairo
- Average wind speeds 8 – 9 m/s, flat area
- Local costs (ca 20%) borne by the Egyptian “New and Renewable Energy Authority” (NREA)
- Total capacity in Zafarana: 545 MW
- International cooperation of NREA with Germany, and Denmark, Spain and Japan



KfW Project: Zafarana I - IV

- **German financial cooperation funds of 149 Mio € in 4 phases between 1995 - 2008:**
 - 17,9 Mio € grant,
 - 56,2 Mio € soft loan,
 - 74,9 Mio € composite loan
- **Phases 1 – 3 in operation:**
 - 137 wind turbines - together 80 MW
 - => “early projects” - no CDM Registration
- **Zafarana 4 in operation since 04/2008**
 - 94 wind turbines with another 80 MW
 - => CDM registered
- **Suppliers: Nordex, Vestas, Gamesa**



Zafarana I - IV: Achievements

- **Ecologically sustainable and economically efficient electricity production and feeding in into the national power grid**
- **Significant contribution to the protection of global climate and protection of Egypt's natural resources**
- **German financing sufficient to supply more than 250.000 households with energy**



- **Emission reduction of 360.000 tCO₂ yearly (Zafarana I-IV)**
- **Capacity factors among the best values worldwide**

Zafarana I - IV: Experiences

- **Initial very soft financing assured financial feasibility at a time when wind energy was still in early stage; nowadays more market oriented financing is possible.**
- **Aggressive expansion targets will need more private sector participation; to enable this, far-reaching sector reforms are necessary.**
- **Private sector participation in O&M-contracts.**
- **Adjustment of technical projects to environment necessary: Danger for migratory birds was studied, but not critical in Zafarana.**

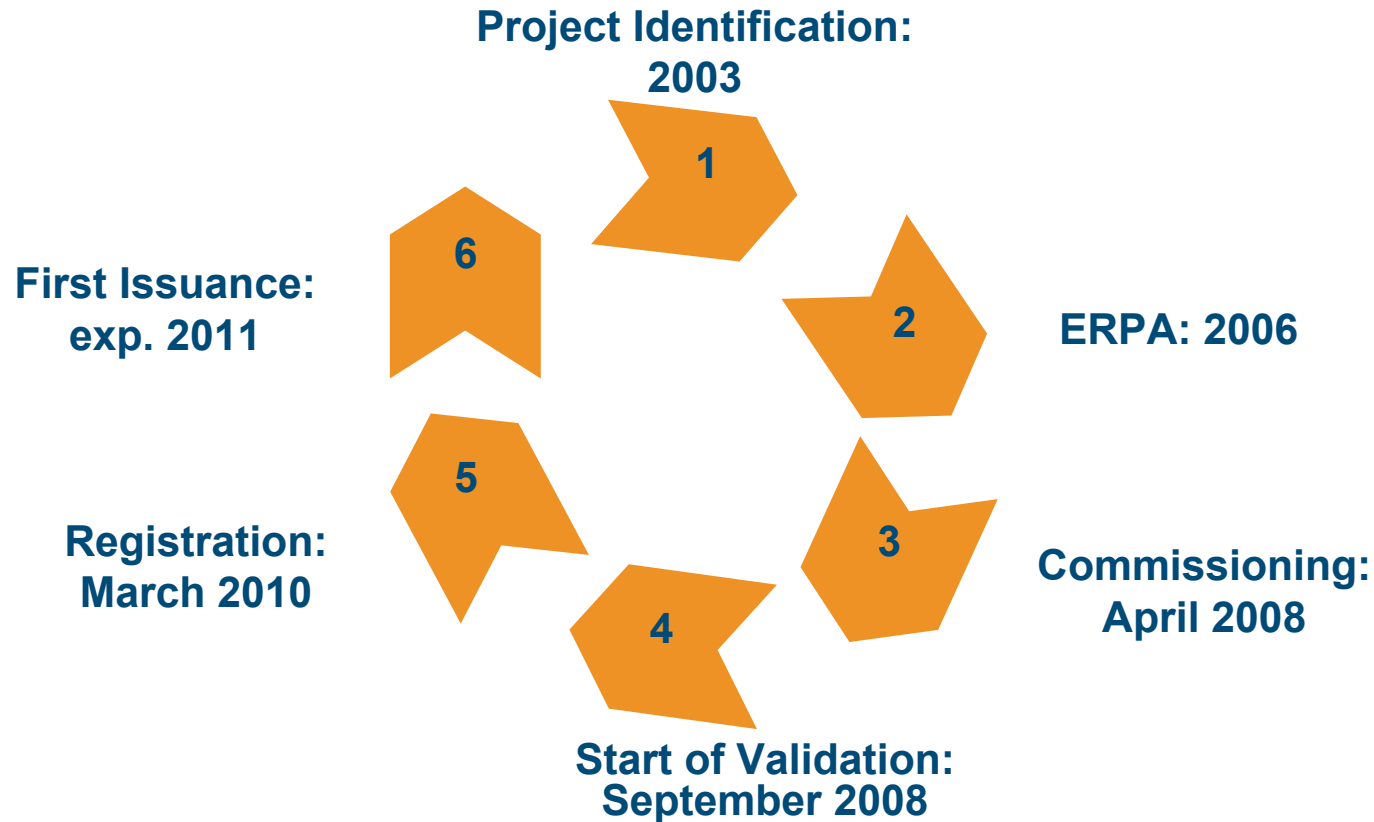


Zafarana IV: CDM Success

- **Project will generate 170.000 Certified Emission Reductions per annum (CERs/a); Registration with UNFCCC second quarter 2010**
- **Important: Proving “early consideration of CDM”**
- **KfW-Carbon Fund concluded first ERPA (Emission Reduction Purchase Agreement) in 2006. Purchase volume: 550.000 CERs over 5 years starting until 2012 at 10 EUR/CER**
- **New project: 200 MW wind farm in Gulf of el Zayt, commissioning 2012, approx. 400.000 CERs/a**
- **PDD in scope of Consultant contract**



Zafarana IV: CDM Success – time schedule

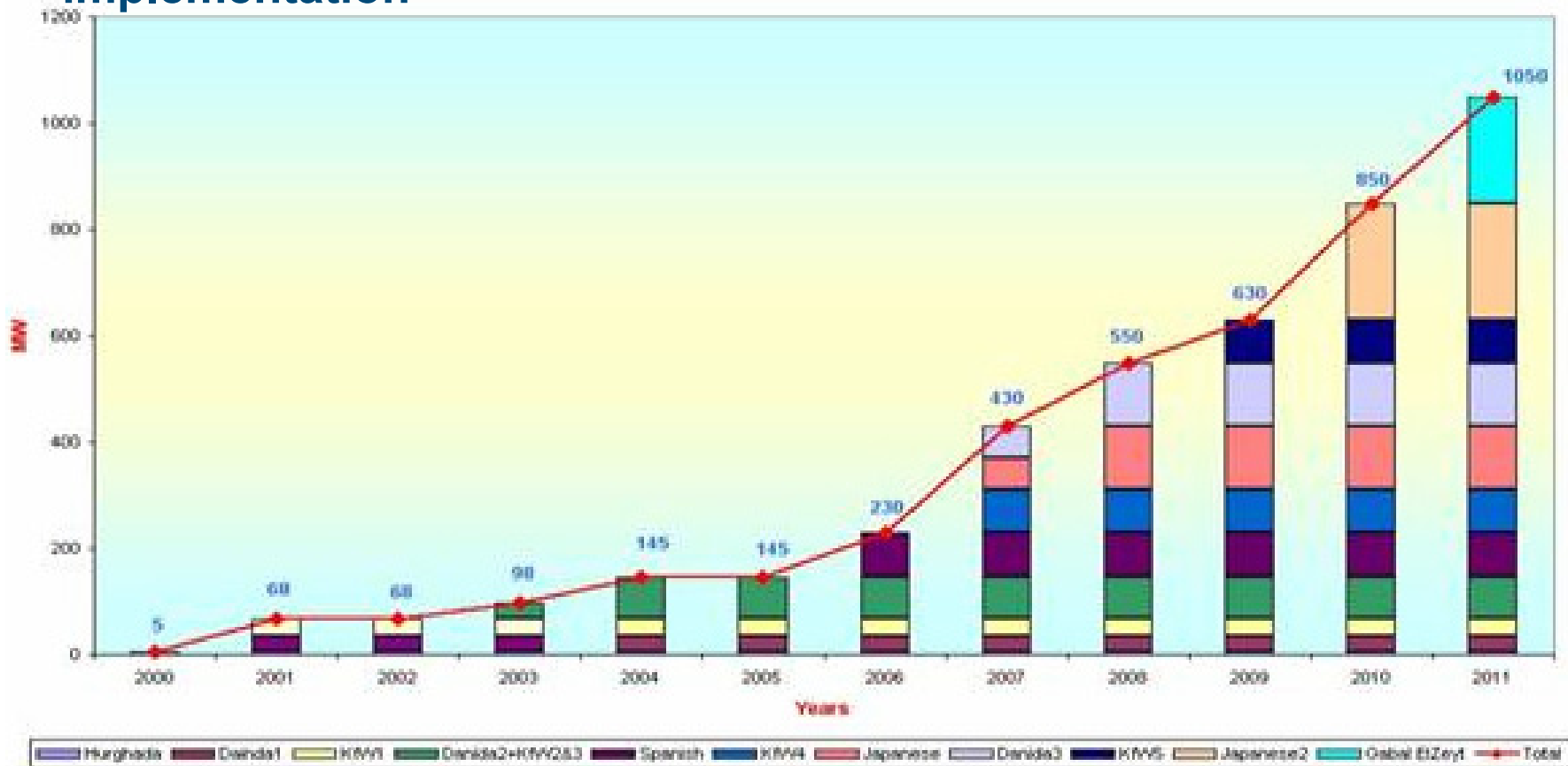


Zafarana IV: CDM Project Economics

- Annual generation: 300,000 MWh
- Electricity sales price: 20 EUR/MWh = 2 EURct/kWh
- Annual sales revenues: 6 Mio. EUR
- Grid Emission factor: 0.571 tCO₂/MWh
- Avoided CO₂ emissions: 171,300 tCO₂
- CER price: 10 EUR/CER
- CDM sales revenues: 1.7 Mio. EUR = 0.6 EURct/kWh
additional revenues +28%
- Project IRR improvement: appr. 2%
=> CERs can improve financial viability!

NREA's Expansion Plan for the Red Sea

- Zafarana site is completely developed
- Construction of a new wind farm near Gulf of el Zayt is under implementation



Thank you for your attention

Contact



Rainer Suennen
Vice President

KfW Bankengruppe
Palmengartenstraße 5–9
60325 Frankfurt am Main

Fon +49 69 7431 2431
Fax +49 69 7431 4775

rainer.suennen@kfw.de
carbonfund@kfw.de

www.kfw.de
www.kfw.de/carbonfund
www.kfw-entwicklungsbank.de
www.kfw-ipex-bank.de
www.deginvest.de