

### Hypothetical wind power case study Naristan

The utility German Power (GP) wants to use its competence in the field of renewable energy in the country Naristan whose electricity market is to be liberalised. Naristan's mountain regions have an excellent wind power potential. At an energy fair in the capital Nurudin GP representatives talk to Naristan's monopoly utility Naristan National Electricity Ltd. (NNE). NNE suffers from a rapid increase in electricity demand fuelled through an ambitious rural electrification programme. As all fossil fuels have to be imported, NNE has a positive stance towards renewable energy.

Therefore, GP and NNE decide on a Joint Venture to build a wind power plant of 100 MW. Investment costs are 100 million € and annual expected electricity generation is estimated at 300 GWh. Electricity generation costs that achieve an acceptable rate of return thus are 3.5 Cent/kWh. GP wants to use emission credits in Germany and thus is strongly interested to register the project under the CDM. A rough calculation of the average emissions intensity of Naristan's electricity grid yields 700 g CO<sub>2</sub>/kWh. Annual emission credits would thus amount to 210,000 t. At current world market prices of 5 €/t CO<sub>2</sub> additional cash flow would reach about 1 million €. The technical lifespan of the wind turbines reaches 25 years. NNE pays 3.5 Cent/kWh for generated electricity.

*The CDM project has to conform to the **normal business criteria** and to take **economic and political risks** into account. An in-depth analysis of the framework in the host country is necessary.*

In September 2002 GP contacts the German CDM office at the Ministry of Environment. Wind power is among the accepted project types and GP is told that its emission credits can principally be used in Germany. However, final approval will only be given when the official project documentation has been submitted to an independent validator.

*The investor has to find an **industrialised country** that accepts the emission credits.*

Building on GTZ's technical assistance, Naristan has defined a national set of criteria for CDM projects. Renewable energy is a priority sector. NNE is told by the national CDM Secretariat that an environmental impact assessment (EIA) is necessary. Furthermore, job creation has to be proved. Moreover, the Kyoto Protocol has not yet been ratified. The EIA costs 10,000 € and takes one month. The national CDM Secretariat can be convinced that additional jobs will be created. In December 2002 all documents are available and Naristan's interministerial CDM Commission approves the project. However, the parliamentary timetable for Kyoto Protocol ratification has slipped to spring 2003.

***National CDM criteria** can lead to **delays** and **additional costs** but are necessary from a development policy perspective.*

Already in October 2002 GP has asked the certifier CDMZert to validate the project. CDMZert is officially accredited with the CDM Executive Board. An initial discussion shows that the rough baseline calculation is insufficient. CDMZert refers to the three baseline options listed in the Marrakech Accords:

1. historical emissions
2. emissions of an economically attractive alternative
3. emissions of the best 20% of similar projects

As the project is a new zero-emissions plant only the second alternative can be applied. GP selects a seven-year crediting period which can be prolonged twice.

For 5000 € GP asks a consultant to analyse the electricity generation sector of Naristan. He concludes that electricity import from neighbouring Ripalia is the currently cheapest option at costs of 2.8 Cent/kWh. As the contracts have to be renegotiated every three months, the consultant thinks that by 2007 electricity generation costs of a new gas-fired power station have to be used; they amount to 4 Cent/kWh. As the wind power project would then be cheaper, it would become the economically most attractive alternative and cease to generate emissions credits. GP asks CDMZert whether it shares this opinion. CDMZert concurs but states that a small cost advantage would not change the baseline if the existence of barriers could be proven. The applicable baseline would be the weighted average of baseload power stations that would be forecast for seven years using the expansion plans of Naristan's electricity generation sector.

*The **baseline** is the basis for determination of emission credits and thus has to be calculated extremely **carefully**. The necessary data are not always available. Generally, investors will opt for the seven-year crediting period that can be extended to 21 years. It is unclear whether projects are eligible for*

*the CDM that are **business-as-usual** and generate **profits** for the investor already without emissions credits. Eligibility could be restricted to projects that are less attractive and thus "additional" investment.*

The monitoring plan elaborated by another consultant envisages continuous collection of data from electricity meters supplemented with bills for electricity sold to NNE. Moreover, price data of electricity imports from Ripalia are collected. NNE provides evidence on barriers to GP such as lack of engineering capacity and of infrastructure such as sufficiently large cranes). GP asks for a seven-year crediting period and submits the full Project Design Document to CDMZert including the baseline, monitoring plan and government approval for validation in December 2002. After ratification of the Kyoto Protocol by Naristan has finally been done in January 2003 CDMZert submits the document to the CDM Executive Board at the UNFCCC Secretariat which then publishes it on the CDM website. Within 30 days, stakeholders and UN-accredited observers can submit comments to the Executive Board. Greenpeace submits a complaint with the following arguments:

- The project endangers migratory birds; the EIA has not addressed this issue sufficiently
- As the project is the least-cost option for expansion of electricity generation it is not additional

Greenpeace succeeds in convincing two members of the Executive Board to start a review of validation. The Uralian member anyway supports all activities that make the CDM less attractive than the surplus Uralian emission rights. The Executive Board meeting in February thus decides with the necessary minimum of three votes to formally review the application. The review needs the statutory 8 weeks and results in the decision that the EIA was correct but that the baseline is zero from 2008 onwards. The Executive Board registers the project in April 2003 under this condition.

*The CDM Executive Board is a **political body** with strong influence.*

Due to quick progress the wind plant is operative in December 2003. Monitoring is done without incidents. GP wants to receive emissions credits as soon as possible and contracts the accredited certifier ClimateApproved (CA) to verify the project. CA checks the archived data from monitoring. Between December 2003 und December 2004 the wind plant delivered 227.53 GWh to NNE. The emissions factor of baseload power stations is 722 g/kWh. Thus 164,255 t emissions credits would accrue. CA asks the CDM Executive Board for certification which is done in the session of January 2005. The Executive Board retains 3285 t as tax to finance adaptation projects and allocates the remaining 160,977 t to GP.

*The **emissions credits** are created only after a decision of the Executive Board on the basis of a certification report.*

GP submits 150,000 t to the Ministry of Environment to fulfil its commitments under the EU emissions trading system. It sells another 10,977 t at 4.57 €/t via the US broker Green Markets.

*Holger Liptow (GTZ), Axel Michaelowa (HWWA), 2002*