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Green Electricity for Sale



The Darling Wind Farm Demonstration Project



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Project Goals- Darling Wind Farm

The project is a National Demonstration Pilot Project designed to:
“explore the technical, commercial and environmental viability of converting wind energy into electricity in the Western Cape and other regions”

It is funded jointly by:

- The Central Energy Fund (CEF)
- The Development Bank of South Africa
- The Danish Government (Danida)
- A private developer: Darling Independent Power Producer

Background



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- 1997 – Oelsner Group involved leading German and Danish Wind Turbine Manufacturers for Technical Input
- Environmental Scoping Exercise conducted by UCT Environmental Evaluation Unit
- Generating License issued by NER for initial 5,2MW on 21/02/2002
- June 2002 – Minister of Minerals and Energy approves Darling Wind Farm as a National Demonstration Project.
- Negotiations with City of Cape Town Project Team on feasibility of 20 Year Bulk Power Purchase Agreement
- Joint Marketing Survey (Darlipp/Cape Town) to gauge Consumer Reaction to Green Electricity

Background cont'd



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- Reports served before Trading Services and Finance Portfolio Committees 06/06/2002 and 05-07/10/2002
- Letter of Intent from Cape Town to Dept of Minerals and Energy on 23.12.2002
- Exco approved project in principle on 2003/02/14 subject to acceptable PPA
- Power Purchase Agreement (PPA) subsequently negotiated
- EIA study concluded and final DEAT approval obtained 2005/07/07
- Darlipp and Eskom signed Wheeling Agreement 2005/08/05
- DBSA approves BEE warehoused loan funding mid December 2005
- RED1 OPS Committee supports Ceding of PPA



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Background cont'd

- In June 2006 the City of Cape Town signed a 20 year power purchase agreement with Darling Wind Power to purchase all green electricity to be produced by the farm at a price of 37c per kWh with escalation
- Cape Town then paying Eskom ±12c per kWh for conventional electricity i.e. green energy would be purchased at a 25c per kWh premium.
- Generator license conditions precluded this premium being spread across all consumers.
- Green power must therefore be sold into a voluntary green market
- The Green Electricity is to be “wheeled” through the national utility Eskom’s network to a City intake substation in Atlantis
- Production started on 1 May 2008
- Original estimated annual production of 13.2 GWh (about half of Civic Centre’s annual consumption) from 4 X 1.3MW turbines)

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Power Purchase Agreement



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- Dates
- Prices- over production, escalation
- Metering
- Guarantees
- Obligations of buyer and seller
- Wheeling
- Resolutive conditions
- Certification
- Marketing
- Rights of access
- General rules of contract- breach, arbitration, Force majeure, termination, transfer
- Confidentiality

Major Risks



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Risk

- City cannot sell all green electricity it is obliged to purchase (entire risk is only 0.2% of entire electricity purchases)
- DWP does not deliver green energy

Risk Mitigation

- Take up GEF production subsidy (limits exposure for 5 years)
- Conduct green energy marketing campaign
- Secure National and Provincial supply contracts
- TREC system (was) being developed by DME
- City only contracts to sell green energy actually generated
- Default clause in PPA

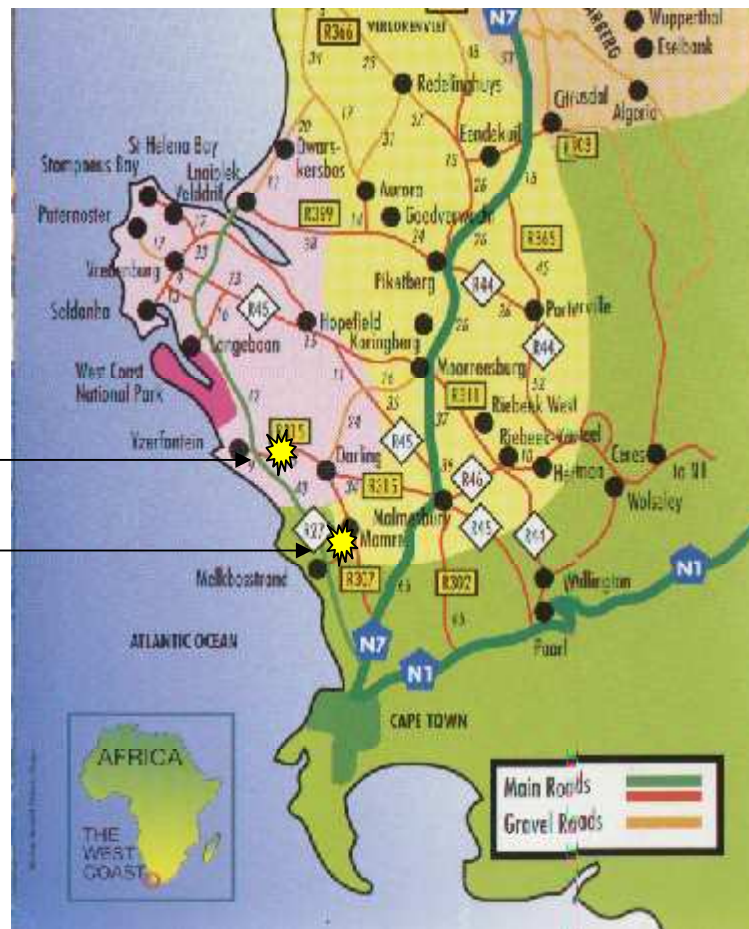
Project Location



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Darling Wind Farm
Intake Point, Atlantis



Network Arrangements



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DWF Green Electricity



Eskom's Networks

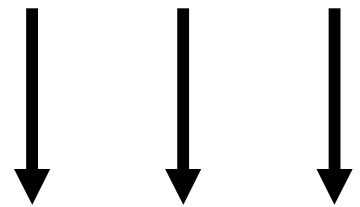


Eskom Coal Based Electricity



Atlantis Intake Substation

Cape Town's Atlantis Distribution Network

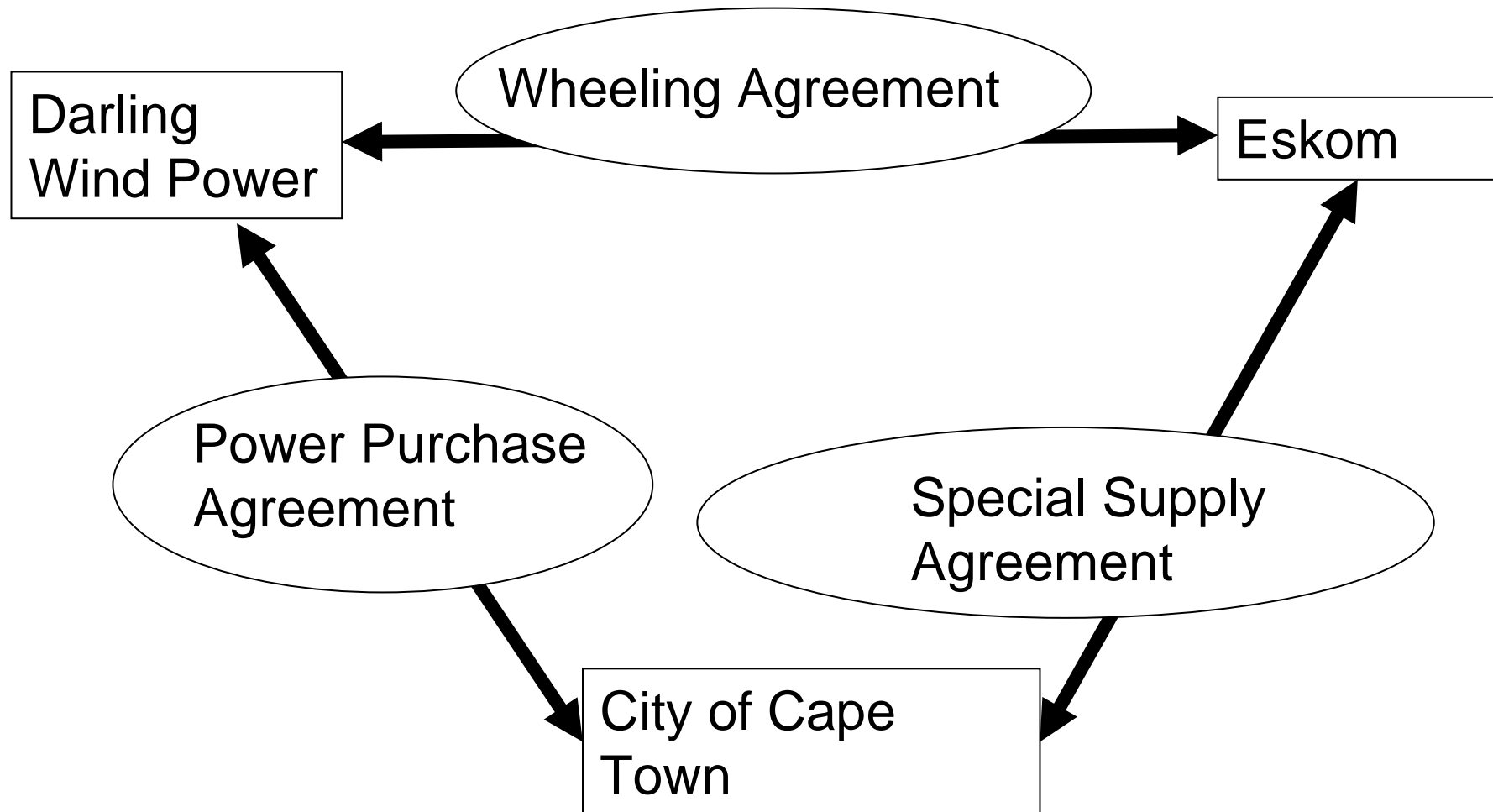


Agreements



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Income Streams

3 Streams of potential income from green electricity:

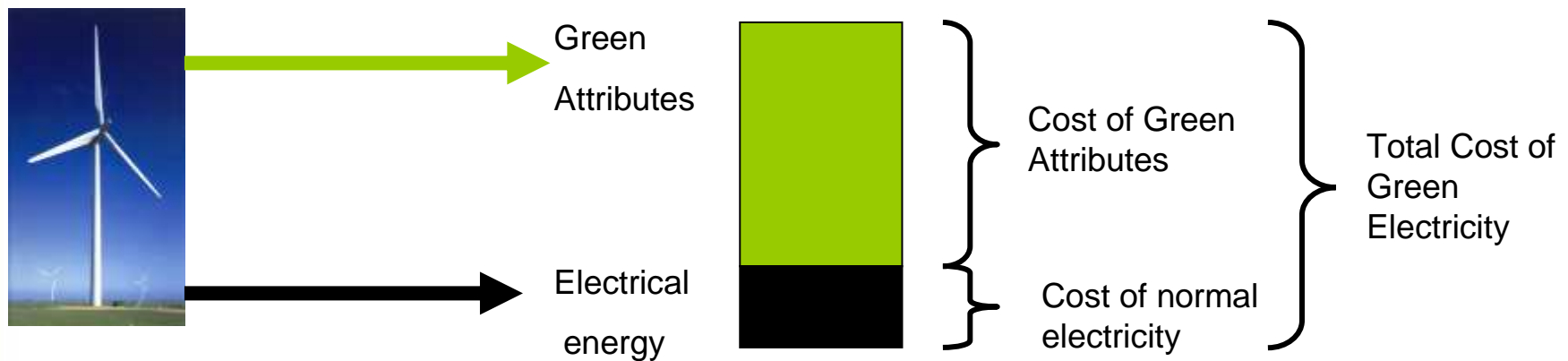
- Sale of electricity itself
- Sale of carbon emission reduction e.g. through CDM mechanism (Darling Wind Farm excluded because of donor funding)
- Sale of renewable energy certificates (Rec's, Trec's, green certificates)



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Components of Green Electricity



Green characteristics and electric energy are separated



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Green Attributes

Green attributes include:

- Reduction in CO₂, SO_X, NO_X, particles
- Generation from renewable source
- Local health benefits
- Job creation etc. etc.



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Environmental Benefits - DWF

Over 20 years the Darling Wind Farm is set to:

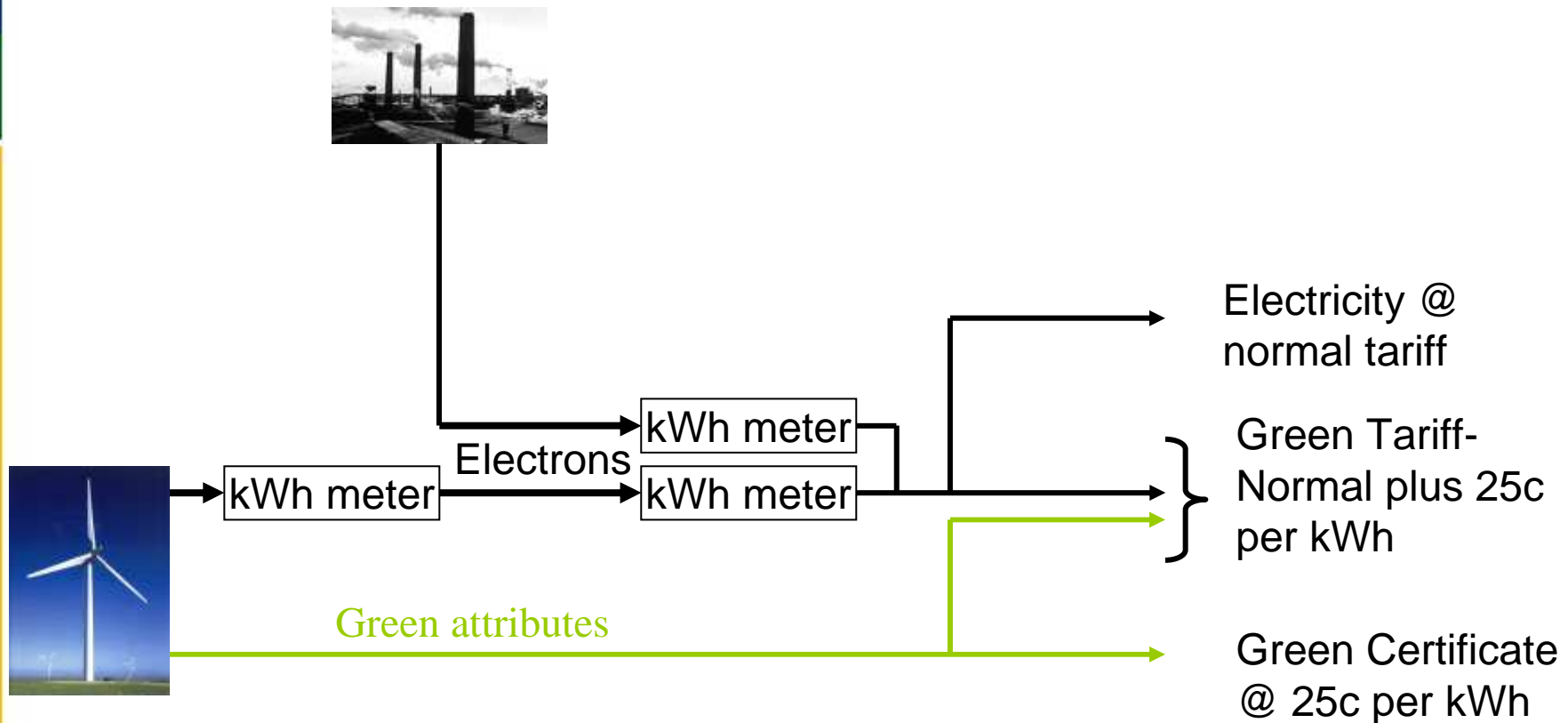
- **Save Resources**
 - 142 500 tons of coal
 - 370 million litres of water
- **Reduce pollutants**
 - 258 100 tons of carbon dioxide
 - 2 200 tons of sulphur dioxide
 - 1 100 tons of nitric oxide
 - 58 tons of particulates
 - 42 200 tons of ash

Energy and Green “flows”



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Green characteristics and electric energy are separated



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Credibility

Strict certification and audit process required to authenticate that:

- Source of electricity is renewable
 - Seller does not sell more green electricity/certificates than has been generated
 - Green benefits are not sold twice
- No formal certificate system yet in RSA
-Cape Town following international principles. (AIB)



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Systems and process considerations

- Books of account for green certificates- splitting energy and green components
- Stock control – MMI?
- Stock valuation, interest, depreciation?
- Additional fields for certificates
- Integrated purchasing, warehousing, sales and billing processes
- Audit requirements for certification purposes
- Certificate redemption, debtor management



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