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Case study – Wind Energy

PROJECT: RES-CHAINS
PROGRAM: SOUTH BALTIC PROGRAM
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LANDKREIS NORDWESTMECKLENBURG
FOR: SOUTH BALTIC PROGRAM USERS
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Solar centre Mecklenburg-Vorpommern (art wind farm Lübow)



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Summary

THE SOLAR CENTRE MECKLENBURG-WEST POMERANIA is solar information, demonstration, congress and research centre, solar technology and industrial centre. They pursue the aim of long-term support of climate protection and the creation of innovative workplaces thanks to the use of regenerative energies. The ecologically restored manor house, a listed building, is used for conferences, congresses, exhibitions, training courses, information and advice and is also open to external event organisers.

The art wind farm is a part of exhibition and research at this place.

Site details

Start of operation (year): 1996

Location : Lübow

Coordinates (for the map): 53.842931,11.526804

Manufacturing and installation (~Upstream)

What type of wind turbines has been installed?	Enercon EN46
What type of towers is used, how high?	64 m
How has the turbines and the towers been transported from the manufacturer to the installation site?	Specify type and length
What type of foundations has been used?	Bankcredits, private capital
How long are the access roads being built or reinforced?	500m, 2 month
How has the grid connection been established?	800 m, 15 kV
What the yearly production the wind turbine(s)? (MWh)	3200 MWh
How far is the transport on average, km?	250 km
Which way of drying is used?	E.g. Open air, Mechanical de-watering, condenser

How is the storage organized?	without
What's the duration of the storage?	without
How many tons of fuel are delivered to the plant annually?	zero

Core process

What's the total installed power? (MW)	2 MW
What the yearly production the wind turbine(s)? (MWh)	3200 MWh
What has been the technical availability? (%)	99%
What is the annual average wind speed at hub height? (m/s)	5,4 m/s

Decommission (~Downstream)

Who is responsible for decommissioning?	Operating company
How will decommission be financed?	Operating company
Will the site be completely restored?	Now, repowering
How will not recyclable material be handled?	after technical verification further use

Environmental aspects

Environmental load from manufacturing, site preparation and installation.

What are the yearly emissions to air and water?

CO to air	zero
CO ₂ to air	Zero
SO ₂ to air.....	Zero
NO _x to air	Zero
Other to ...	
Other to ...	
Other to ...	

Financial aspects

The costs need be roughly estimated so as to reflect the total annual cost of the plant. The fundamental assumption is that the total annual cost comprises capital costs + O&M costs + fuel costs but if there is anything more important, please add that under the heading “Other costs” so as to make up 100 %.

What are the overall investment costs and interest rate?	2.5 Mio. €
What are the operational and maintenance costs?	50000 €/year
What is the total annual fuel cost?	zero
Other costs?	Electricity for starting, 2000 €/year
What's the estimated sales price of the electricity? (€/MWh)	140 €/MWh
Other revenues? (€/MWh)	Sale of Electricity to greenpeace organisation.
What is the life time of the wind turbines?	25 years

Summary



on building site – setting up rotor blades



4 artists from region designed stands of turbines