Technology Fact Sheet for Mitigation

Technology 6: **Wind turbines** [i]

Subsector	Energy supply
Sector GHG emission (tCO_2-eq)	6,399,000 tCO_2-eq from the energy supply subsector in 2006
Technology Name	**Wind turbines**
Background/Notes, Short description of the technology option sourced from ClimateTechWiki, Seminars, etc	Wind energy is actually a form of solar energy; the temperature differences caused by the sun shining on the earth act, along with other factors, to cause large bodies of air, winds, to move across the face of the planet. A large wind turbine primarily consists of a main supporting tower upon which sits a nacelle (the structure containing the mechanical to electrical conversion equipment). Extending from the nacelle is the large rotor (three blades attached to a central hub) that acts to turn a main shaft, which in turn drives a gearbox and subsequently an electrical generator
Implementation assumptions, How the technology will be implemented and diffused across the subsector?	There are going be 2 wind parks built, each with 50 MW capacity in the Gobi steppe region of Mongolia
Reduction in GHG emissions	GHG emissions are expected to be reduced by 243.000 tCO_2-eq
Impact Statements - How this option impacts the country development priorities	
Social development priorities	1.The electricity supply of Mongolia will improve. 2. It will demonstrate to the public that a wind park is a viable way to produce electricity.
Economic development priorities	Annual electricity production is 300,000 MWh. - Introduction of wind technologies has the potential to reduce coal consumption by 180,000t per year. - Price of electricity will be reduced (0.075 USD/kWh). (The number of hours of use of installed capacity - 2500) For modern turbines the levelised cost of electricity in 2009 (accounting for capital costs, lifetime O&M and typical financing costs) ranges between USD50 to USD100 per MWh at a good to excellent site.
Environmental development priorities	By acting to displace generation from thermal power plants, onshore wind energy can prevent the emission of roughly 2,200 tons of CO_2 per year per Megawatt (MW) of installed wind capacity (assuming it replaces coal and is located at a reasonable wind energy site). Reduced air pollution:the air will not be polluted with toxins such

	as NO_X, SO_2 and CO. CO_2 reduction: 243,000 tCO_2-eq /year
Other considerations and priorities such as market potential	
Costs	
Capital costs	Capital costs for wind park with capacity 100 MW will be 150 million USD. Based on the cost of around USD1500.0/MW. Assuming a life time of 30 years the annualized cost would be around 5.0 million USD.
Operational and Maintenance costs	Annual electricity production is 250 000 MWh and capital cost of 1 KW electricity is 0.018 USD. Running cost will be around USD0.007/kW.h. Assuming: 0.05-0.09 USD/kWh (IPCC, 2010). Total annual operational and maintenance costs will be 5.5 million USD.
Cost of GHG reduction	Mitigation achieved 243,000 tCO_2-eq GHG emission reduction cost will be 22.63 USD /tCO_2-eq.

[i] **This fact sheet has been extracted from TNA Report – Technology Needs Assessment For Climate Change Mitigation– Mongolia. You can access the complete report from the TNA project website http://tech-action.org/**