Technology Fact Sheet for Mitigation

Technology 7: **Very large scale PV system** [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	**Very large scale PV system 100 MW**
Background/Notes, Short description of the technology option sourced from ClimateTechWiki, Seminars, etc	Very large scale PV is very likely to play a significant role in climate change mitigation in the future. VLS PV systems could be designed in 2 types: fixed flat plate or with a sun-tracking system. The some studies show that the VLS sun tracking PV power generation system is very promising for energy resource savings and addressing environmental issues[1].
Implementation assumptions, How the technology will be implemented and diffused across the subsector?	Solar electricity PV system (Very Large Scale Photovoltaic Power Generation VLS-PG) with capacity of 100 MW is needed to be builtin the Gobi region of Mongolia. Annual electricity production of a solar electricity PV system with capacity 100 MW is about 190 million kWh (Source: An analysis of very large-scale tracking PV (VLS-PV) systems in the govi desert)
Reduction in GHG emissions	Emission factors for coal fired plants are more than 900gCO_2 /kWh and for gas fired power stations more than 400 gCO_2 /kWh (Sovacool, 2008) showing the large potential for solar PV to contribute to reductions in carbon emissions from the electricity sector. The emission factor for Mongolian grid is 1.103 tCO_2/1000 kWh. GHG emissions are expected to be reduced by 210,000.0 tCO_2eq/year.
Impact Statements - How this option impacts the country development priorities	
Social development priorities	There will be a new electricity source for mining and chemical plants. New advanced technology will be introduced.
Economic development priorities	Introduction of above technology has a potential to reduce coal consumption by 95,000t per year.
Environmental development priorities	a. Reduced air pollution:the air will not be polluted with toxins such as NO_X, SO_2 and CO; b. A contribution to the goal of GHG emission reduction will be made.

[1] An analysis of very large-scale tracking PV (VLS-PV) systems in the govi desert.

Other considerations and priorities such as market potential	-
Costs	
Capital costs	There has been a large decrease in the cost of solar PV systems in recent decades. Investment cost for installation solar electricity PV system with capacity 100 MW is 400.0 million USD (4,000.0 USD/kW) The average global PV module price dropped from about 22 USD/W in 1980 to less than 4 USD/W in 2009, while for larger grid connected applications prices have dropped to roughly 2 USD/W in 2009 (IPCC, 2010). The annualized capital cost will be 16m USD/year (life time is 25 year).
Operational and Maintenance costs	The total annual cost including O&M, construction, transmission, PV module costs will be 23 million USD per year. (Source: An analysis of very large-scale tracking PV (VLS-PV) systems in the Govi desert) PV system's cost of electricity production is 14.5 cent/kWh
Cost of GHG reduction	GHG emission reduction cost will be 110 .0 USD/tCO_2.

[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/**