Technology Fact Sheet for Mitigation

D. Windmill Generation[i]

Sector: Energy	
Subsector: Power	
Technology characteristics	
Introduction	Windmills are installed to capture mechanical power from the wind to generate electricity on small and medium scale basis.
Technology characteristics/highlights	• Makes use of wind, a renewable resource, available in some Lebanese regions. • Wind power drives ac/dc generators to generate power, which is either stored into batteries, or consumed by the owner, or fed to the network. • No combustion process is involved. • No GHG emissions. • Well established technology on global scale.
Institutional and organizational requirements	• It will require new policies and laws (feed in tariffs, or PPP) with some incentives. • Limited local expertise does exist since wind power is already used in some residents. • More capacity building will be required for wider penetration.
Operation and maintenance	Windmill generation can be regarded as independent systems that will require trained personnel for maintenance and trouble shooting.
Endorsement by experts	Stakeholders are in favor of this technology.
Adequacy for current climate	Quite adequate, with no impacts on the climate.
Scale/Size of beneficiaries group	Communities living in regions with sufficient wind speeds may benefit. There is also a benefit for the economy due to fuel savings, and GHG reduction.
Disadvantages	Noise source, redundant for almost half the year, and require large territories.
Capital costs	
Cost to implement mitigation technology	Capital cost: USD1,900/kW
Additional cost implement mitigation technology, compared to "business as usual"	USD900/kW
Development impacts, direct and indirect benefits	
Direct benefits	Distributed generation
Reduction of vulnerability to climate change,	Fuel saving, and combustion reduction

indirect	
Economic benefits, indirect	• Fuel diversification • Lower fuel bill • New jobs
Social benefits, indirect Income, Education	Training needed to establish experts and technicians for maintenance and trouble shooting.
Environmental benefits, indirect	Reduction of GHG emissions, slowing down resources exhaustion.
Local context	
Opportunities and Barriers	Lack of policies for PPP, and FIT.
Market potential	Very promising market potential for the private sector.
Status	Adopted on very small scale currently.
Timeframe	Short to medium term.
Acceptability to local stakeholders	• Wind power has been favorably used in many regions of the country. • Wind mill posts are not a favored view in populated zones.

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