Technology Fact Sheet for Mitigation

A. Combined Heat and Power (CHP) [i]

Sector: Energy	
Subsector: Power	
Technology characteristics	
Introduction	CHP is an efficient, clean, and reliable approach for generating power and thermal energy using one energy resource. CHP could be used for the new power plants, on large scale basis.
Technology characteristics/highlights	• Heat engineer a station used to generate both electricity and useful heat in the form of steam or hot water. • CHP can greatly increase the facility's operational efficiency and decrease energy costs. • CHP reduces the emission of greenhouse gases, which contribute to global climate change.
Institutional and organizational requirements	Training of personnel is needed to design and operate CHP systems. Also, having networks for steam or hot water distribution is not a common practice in the country.
Operation and maintenance	Training and developing expertise for maintaining CHP systems, including the hot water network, are needed.
Endorsement by experts	Experts are convinced that CHP is an established technology for improving the energy conversion efficiency.
Adequacy for current climate	Technology is quite adequate for the moderate climate of Lebanon where temperature along the coastal region does not fall to freezing level.
Scale/Size of beneficiaries group	• Local industrial and residential population may benefit from the hot water networking. • The economy, in general, will also benefit from this additional source of income/savings.
Disadvantages	CHP is limited to locations where water is abundant, and networking is feasible.
Capital costs	
Cost to implement mitigation technology	USD1,200/kW, as an average value.
Additional cost implement mitigation technology, compared to "business as usual"	USD 200/kW (assuming the BAU scenario involves building thermal plants at a cost of USD 1million/MW)
Development impacts, direct and indirect benefits	
Direct benefits	Cheaper source for steam and hot water generation.
Reduction of vulnerability to climate change, indirect	Reduction in quantities of fuel needed to provide steam and hot water for industries and residential sector.
Economic benefits, indirect	Additional jobs will be established for running and operating the CHP, and for maintaining the network.

Social benefits, indirect	Communities will benefit from the steam/hot water supply, and this will reduce to a certain extent their relevant expenses.
Environmental benefits, indirect	Avoiding the need to use electricity or fuel for water heating will reduce GHG, and other emissions at local level.
Local context	
Opportunities and Barriers	• Need to promote the hot water networking for locals and for industries. • Policies with incentives are non-existing. • Residential blocks are usually self- supplied with hot water and heating systems. • Also, it could be problematic to install pipes in highly populated regions.
Market potential	Very limited market potential since it will be acquired and used by thermal units of EDL.
Status	Not implemented yet in the power sector.
Timeframe	Short to medium
Acceptability to local stakeholders	The technology is quite acceptable. Its implementation, however, may be faced with some opposition due to the above listed barriers.

[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/**