Energy Systems – Renewable

Actual and Potential Environmental Impacts on Alternative Energy Systems

Energy System	Air Pollution	Water Pollution	Land Disruption	Possible Large Scale Disasters
Conservation	Decreased	Decreased	Decreased	None
Water power (hydroelectricity)	Negligible	Disruption of aquatic ecosystems	Flooding in areas to form lake(s), ecosystem disruption, loss of wildlife and human habitat, disruption of estuary into which river flows.	Dam breaks
Tidal Energy	Negligible	Estuary disruption	Very little	None
Ocean Thermal Gradients	Local climate change	Ocean ecosystem disruption, marine life disruption	Estuary disruption	None
Solar Energy				
• Low Temperature heating (homes & water)	Negligible	Negligible	Negligible	None
• High temperature heating & production of electricity	Negligible except for moderate amount from materials (cement, steel, glass) needed to make collectors	Negligible	Requires land for large farms of solar collectors, disruption of desert ecosystems	Depletion of water resources in arid regions
Wind Energy				
• Home & neighbourhood turbines	Negligible except for some noise and aesthetic degradation	Negligible	Negligible	None
• Large scale power plants	possible local or regional climate changes	Negligible	Negligible	None
Geothermal Energy	Hydrogen sulphide and ammonia, global climate change from carbon dioxide, radioactive materials, noise, local climate change, odour	Dissolved solids (salinity), runoff, excess heat	Subsidence	Depletion and contamination of water resources in arid regions
Biomass				
• Burning of wood, crop, food and animal wastes	Particulates and hydrocarbons, global climate change from carbon dioxide	Runoff of fertisers and pesticides, sediment from erosion	Large use of land, soil erosion, loss of habitat for wildlife	None

Energy Systems – Renewable Cont.

Derived Fuels

Biofuels				
• Alcohols and Natural gas from plants and organic wastes	Global climate change from carbon dioxide	Runoff of fertilisers and pesticides, sediment from soil erosion	Large use of land, soil erosion, soil salinity and waterlogging from irrigation, ecosystem simplification, loss of wildlife habitats	None
Hydrogen Gas				
• from coal or water	Depends on source of electricity or heat in the process	None	None	Pipeline or cylinder explosions
Synthetic				
• Natural Gas - SNG from Coal	Similar to coal but less pollutant	Same as coal plus increased pollution from heavy metals, phenols, hydrocarbons	Same as coal	Same as coal, earthquakes from blasts for underground coal gasification, pipeline explosions
• Oil and alcohols from coal and organic waste	Similar to coal but less pollutant	Same as coal except increased pollution from heavy metals, phenols, hydrocarbons	Same as coal	Same as coal, pipeline spills
Urban Wastes				
• for incineration	Sulphur oxides, particulates (heavy metals), nitrogen oxides, hydrogen chloride, hydrocarbons, hydrogen sulphide, global climate change from carbon dioxide, odour	Leaching of dissolved solids and heavy metals from ash	Decreases solid waste disposal	Fire or explosion in incinerator