

## Appendix B: Renewable Energy Technology Guide

### A Feasibility Overview for School Boards

#### Solar Systems

- The higher insolation (or intensity of incoming solar radiation), the more potential output from the system. An interactive map of insolation can be found at:
  - o [https://qlfc.cfsnet.nfis.org/mapserver/pv/index\\_e.php](https://qlfc.cfsnet.nfis.org/mapserver/pv/index_e.php)
- **South-facing Mounting Area:** True south (100%) facing wall or roof exposure is best for photovoltaic (PV) and heating. A PV system's efficiency decreases as it is shifted away from south facing exposure (see table below):

|          | System Efficiency |
|----------|-------------------|
| South    | 1.00              |
| SSE, SSW | 0.99              |
| SE, SW   | 0.96              |
| ESE, WSE | 0.91              |
| E, W     | 0.84              |

- **Shade and Obstructions:** The system must be free of shading and any obstructions, such as snow, trees, buildings, and chimneys or roof vents, particularly during peak sunlight hours. For PV, this also includes dust and dirt.
- **Structural Condition:** The roof must be capable of supporting the system (including snow load).
- **Location of boiler or storage tanks for solar water heating:** Some existing buildings will require external piping if their design makes it difficult to incorporate the solar hot water system.

#### Wind Systems

- **Turbines work best with a steady wind source:** Industry standards place wind turbines in areas where the average annual wind-speed is at least approximately 5.5 – 6 m/s. An interactive map of wind information can be found at:
  - o [http://www.lio.ontario.ca/imf-ows/imf.jsp?site=windpower\\_en](http://www.lio.ontario.ca/imf-ows/imf.jsp?site=windpower_en)

#### Geothermal Systems

- **Year-Round Heating and Air Conditioning:** Geothermal is most economical in buildings that use both heating and air conditioning throughout the year.
- **Adequate Ground Space:** It is ideal to have sufficient space for a horizontal loop system; if there is not sufficient space, vertical loop systems can often be installed, although they are more expensive. Dense urban areas could present a problem for bringing in installation equipment.
- **Soil Conditions:** Soil should be suitable for boring holes deep into the ground, so the presence of substantial rock formations can increase complexity and cost.