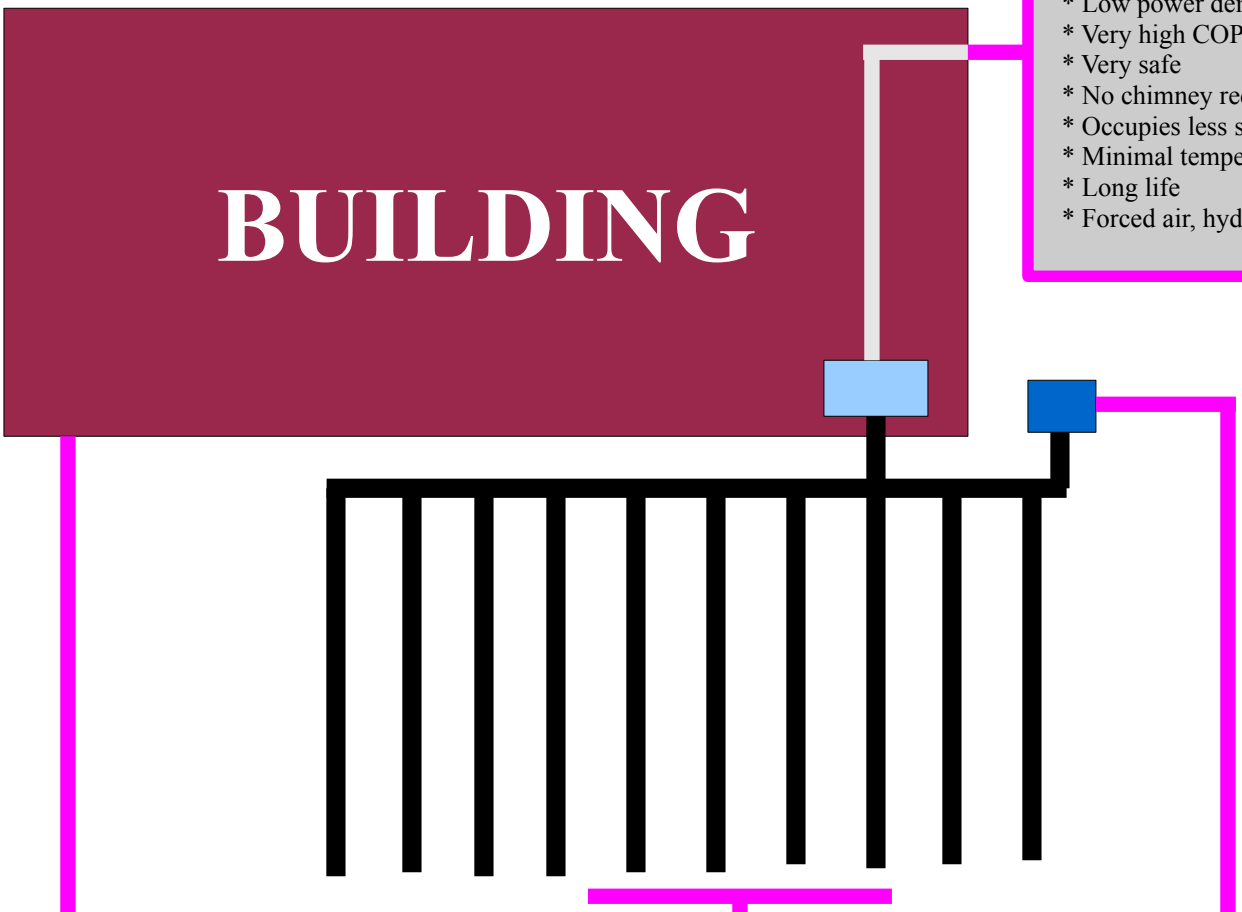
Atmospheric Energy System
for Kanata North Recreation Centre



HEAT PUMP

* Provides both heating and cooling
* No greenhouse gases
* Low power demand
* Very high COP for cooling
* Very safe
* No chimney required
* Occupies less space
* Minimal temperature cycling
* Long life
* Forced air, hydronic or underfloor

BUILDING PERFORMANCE

* **Produces no CO_2**
* **Life cycle costs lower than natural gas**
* **The AE source has unlimited capacity**
* Outdoor pools could be heated (no GHG)
* A future ice rink could operate in summer
* Permanent energy supply
* Permanently low operating cost
* Provides energy resilience
* Does not require expensive insulation
* More internal building space available
* No capacity or siting limitations
* Applicable to new buildings and retrofits
* Adaptable to community heating/cooling
* Can be used for buildings of any size
* Can match buildings w. different demands
* Takes advantage of our wide T swings
* Provides a means of power storage
* Potentially subject to government grants
* Ottawa can demonstrate energy leadership
* Could create many Ottawa jobs
* **Replaces fossil fuels for heating**
* **Reduces electricity consumption**

BOREHOLE HEAT EXCHANGERS

* Can be placed under building
* Shorter & less expensive than GSHP
* Can be packed closely together
* Very high heat exchange rate per metre
* Do not interfere with neighbouring units
* Do not lower surrounding ground temp.
* Extremely long lifetime
* Passive design with no moving parts
* Provisions for heat storage for peaks
* Minimal heat short circuiting

The fundamental AE objectives would be achieved if the heat exchangers simply replaced the amount of natural heat that is extracted during the first winter. However, the capacity and efficiency can be greatly increased by injecting extra heat. That requires that the storage fields must be designed to trap the extra heat and the heat exchangers must be designed to handle the increased capacity.

AIR HEAT INJECTOR

* Compact
* Silent
* Simple, inexpensive and reliable
* Creates vertical temperature gradient
* Operates only in the summer
* Uses antifreeze heat exchange fluid

This outline is a suggestion for the **Kanata North Recreation Centre** from Ron Tolmie, Editor of the **Sustainability Journal**. Details can be found in http://sustainability-journal.ca including data from an operating AE System.

If the suggestion is adopted the system would be built by a contractor selected by the City.