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Large Scale Solar Thermal in Canada

Figure 5: Ten-year history of domestic collector sales (m²)

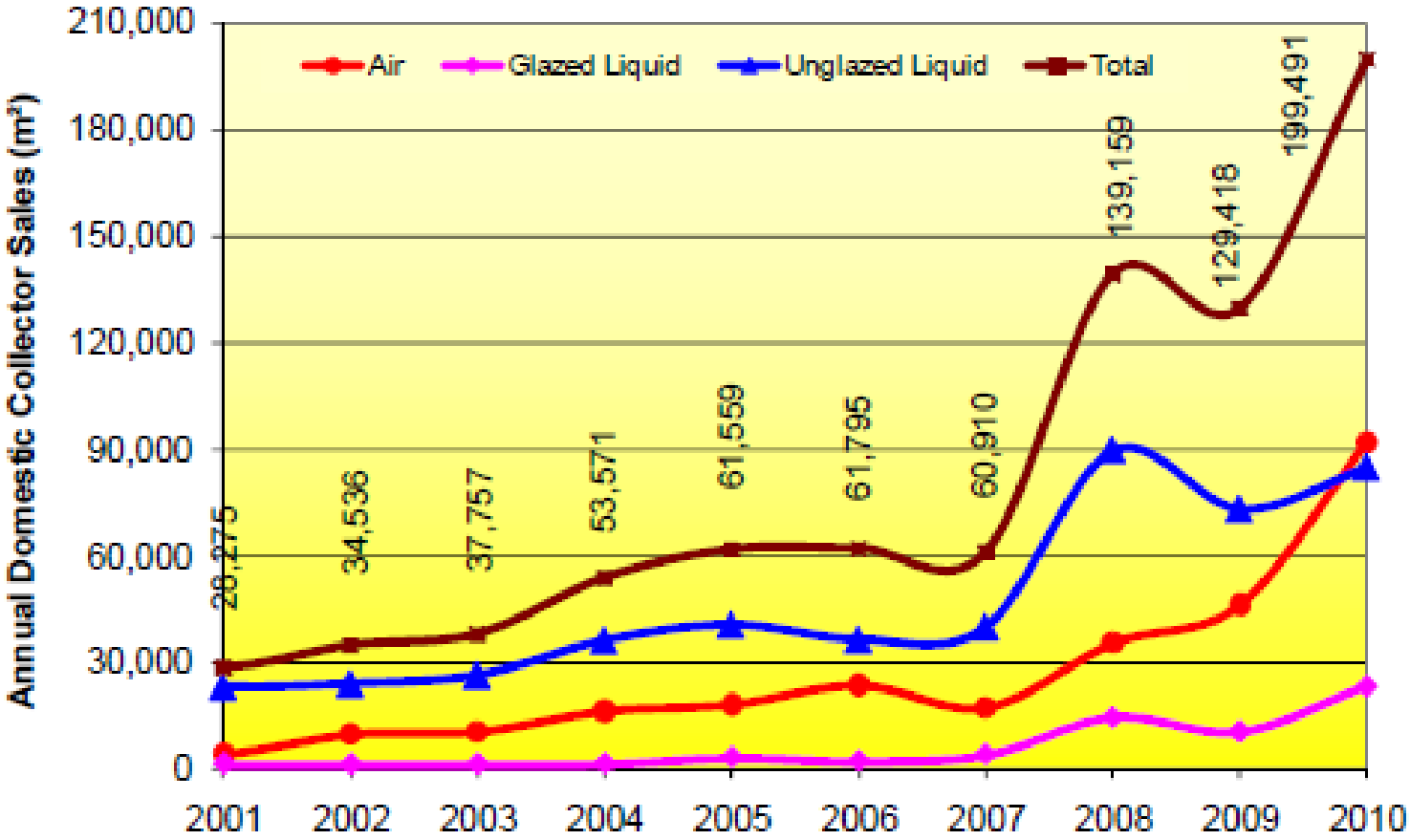
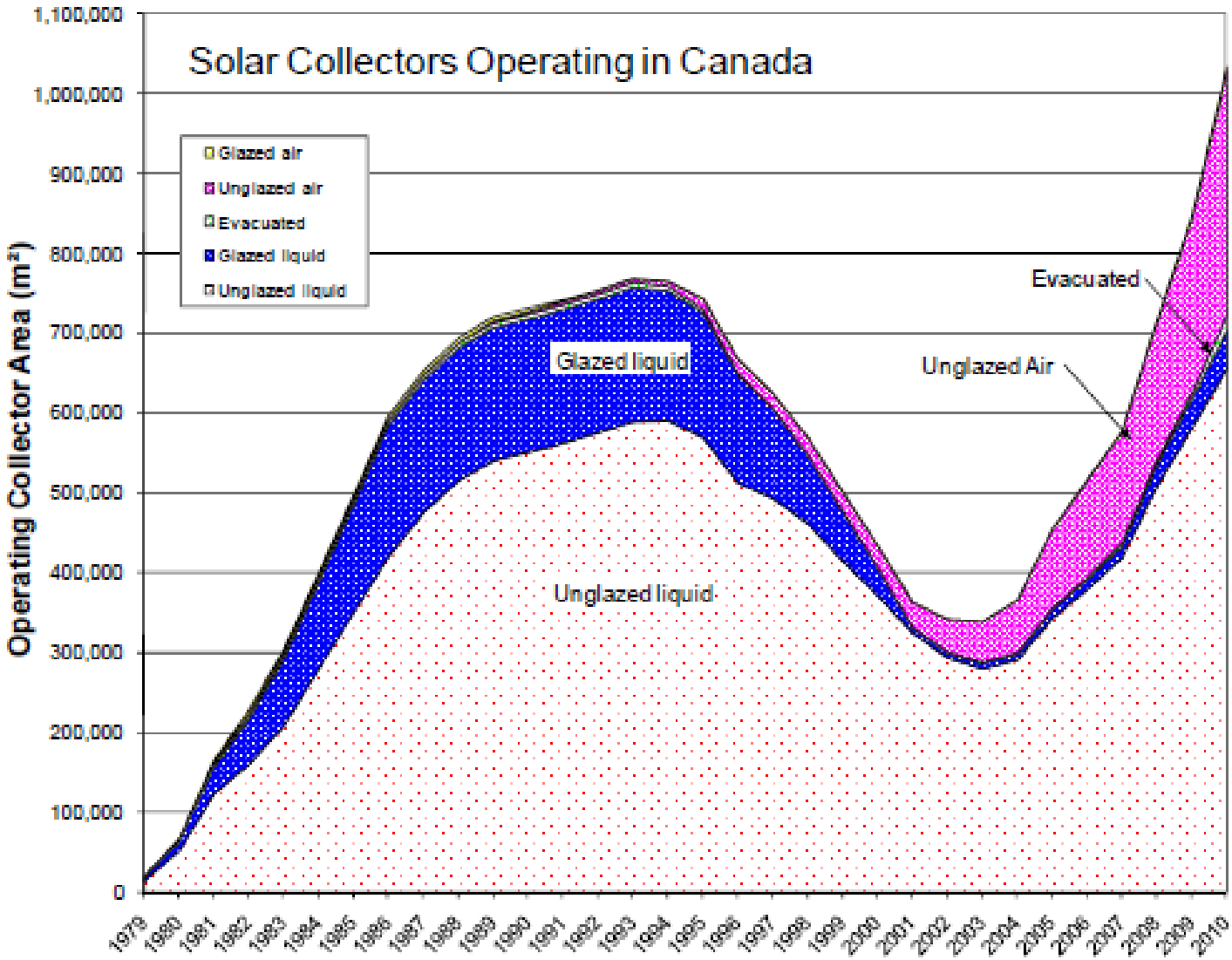


Figure 10: History of operating solar thermal systems in Canada



Funding Priority

- Focus on community heating using seasonal storage
- Continue to monitor and optimize Drake Landing. Funding approved to 2016
- Development of 1000+ home solar community. Demo application submitted by utility. Ranked top 1% of 250 applications ($94 million available. $1.4 billion requested)

Drake Landing Update

- System performance is very close to expectations; 86% solar fraction in year 4 suggests 90% is likely in year 5
- Design simulations generally accurate
- Demonstrated the technical feasibility of high solar fraction heating in a cold climate
- Ongoing monitoring and detailed simulations were instrumental in identifying and evaluating differences from expected operation
- Success of DLSC project to date has led to possibility of implementing a similar but much larger system for over 1000 living units

Drake Landing Improvements

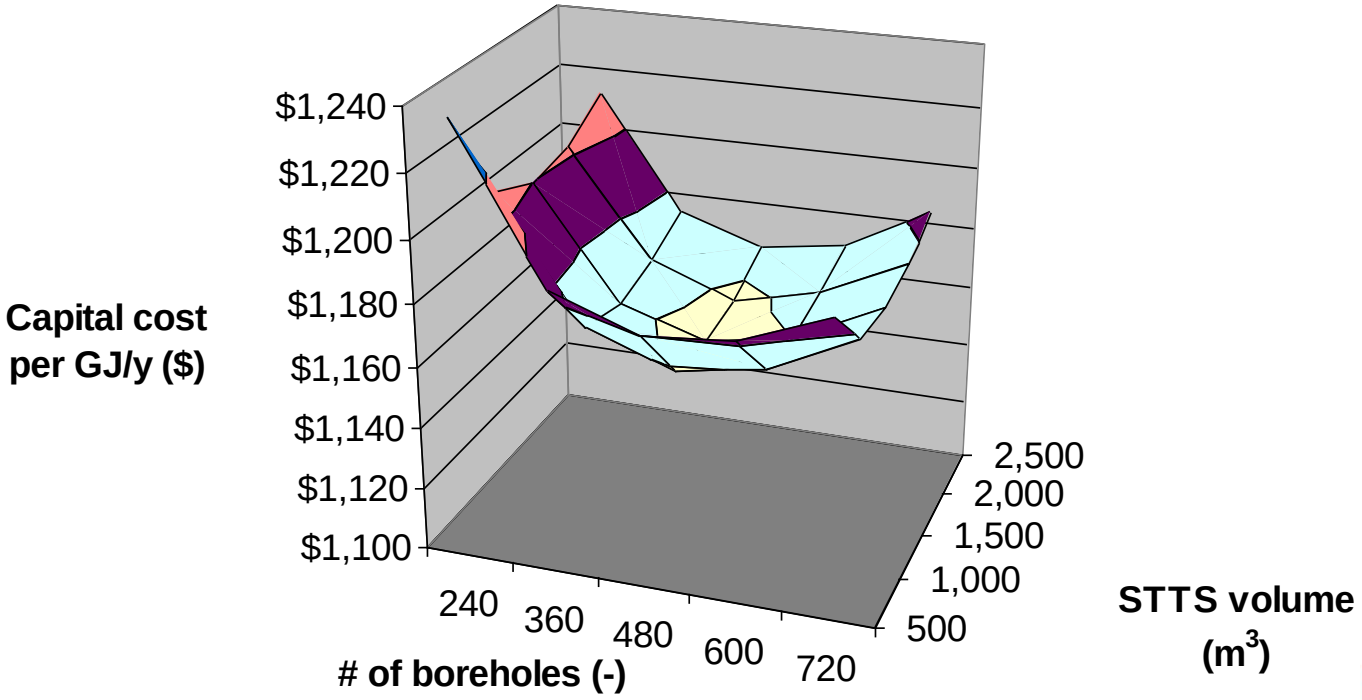
- Optimize control strategies to maximize temperature stratification in storage
- Implement BTES variable speed pump capability to maximize heat recovery during high heat load periods
- Reduce electricity consumption to enable close to net-zero electricity supply/demand

1000+ home solar community

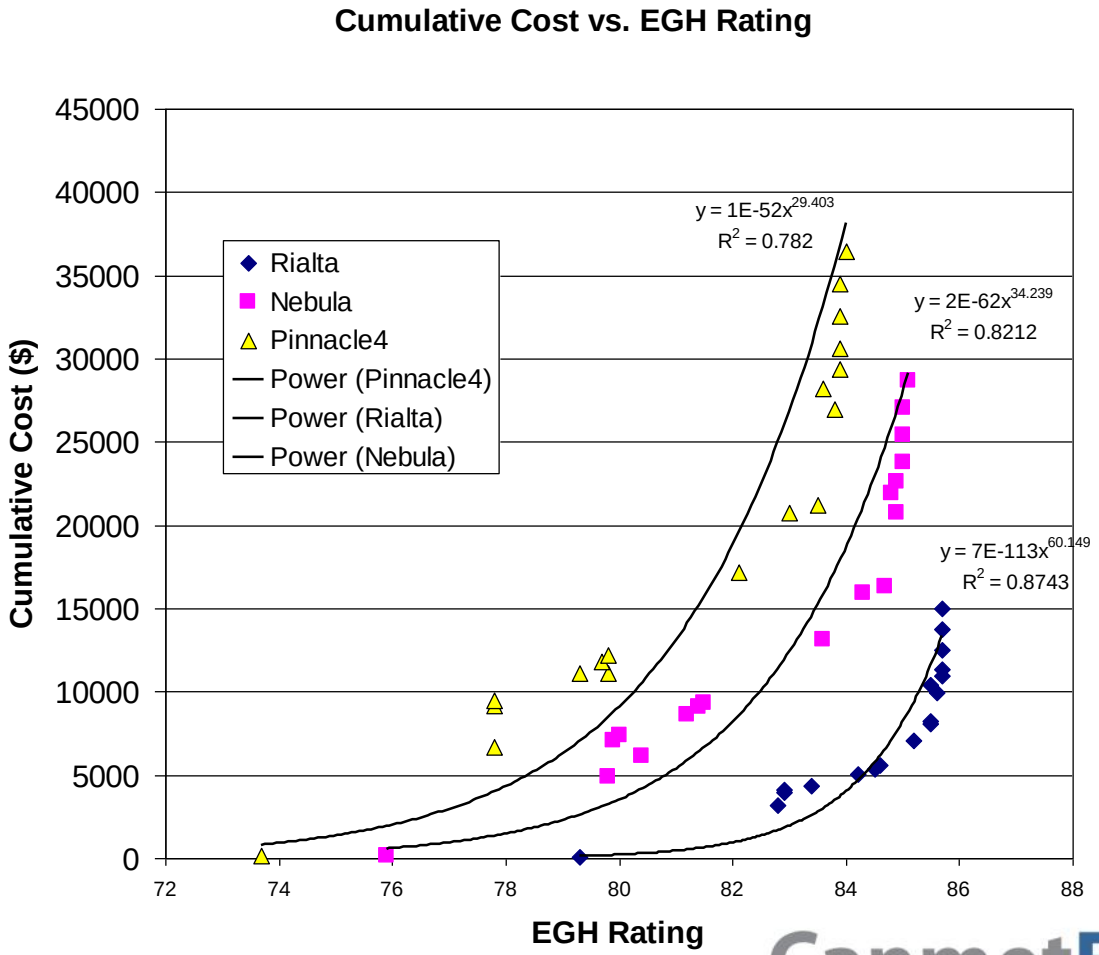
- Major focus in Canada for next 5 years
- Goal of 40% overall solar cost reduction compared to Drake Landing
- Development of detailed cost model for use in parameter optimization
- Evaluation of the optimum energy efficiency level for the homes
- Evaluation of combining space & dhw

Detailed Cost model – results

- Capital cost per GJ/y solar heat supplied to homes (in year 10, no roof integration):



Energy Efficiency Study - Results



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Latest TRNSYS Results for 1000+ Community Space Heat & DHW

- 5019 + 1552 (6571) collectors, district loop temp varies 37 to 55 C, 91% SF space heat & 48% SF dhw, BTES efficiency 76%
- District loop at constant 55 C, 68% SF space heat & 76% SF dhw, BTES efficiency 69%