



Earth Rangers Centre

For Sustainable Technology



**Ground Source Heat
Exchange System**

Overview

- About Earth Rangers
- System Detail
- Performance to date
- Questions

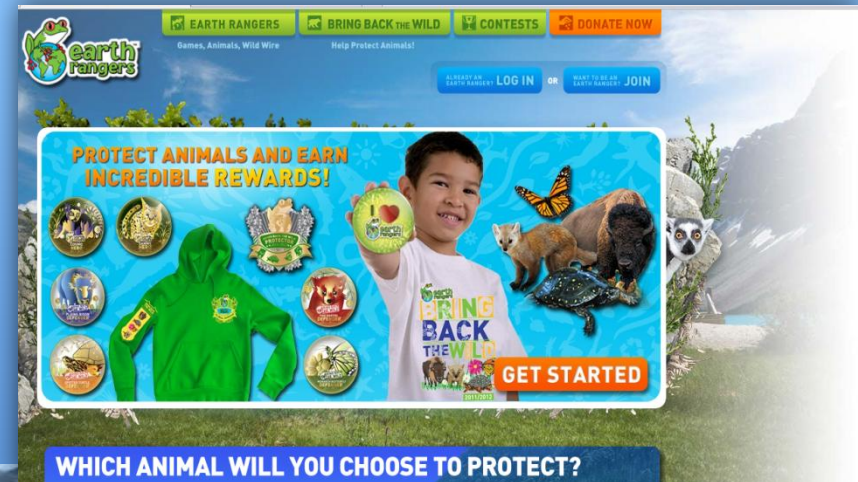


About Earth Rangers

Earth Rangers' award winning live shows and interactive programs motivate hundreds of thousands of children each year to take action to help protect the planet.

Our mission: *Bring Back the Wild*

- Educate children about the importance of biodiversity and the threats facing animals and their habitats
- Inspire children to adopt more sustainable behaviours
- Engage children and their families to take action to protect animals



Why a Green Building?

Earth Rangers values

+

40% of energy consumed is in buildings
75% of a building's life cycle cost is in operations
Lower operating costs and impacts

+

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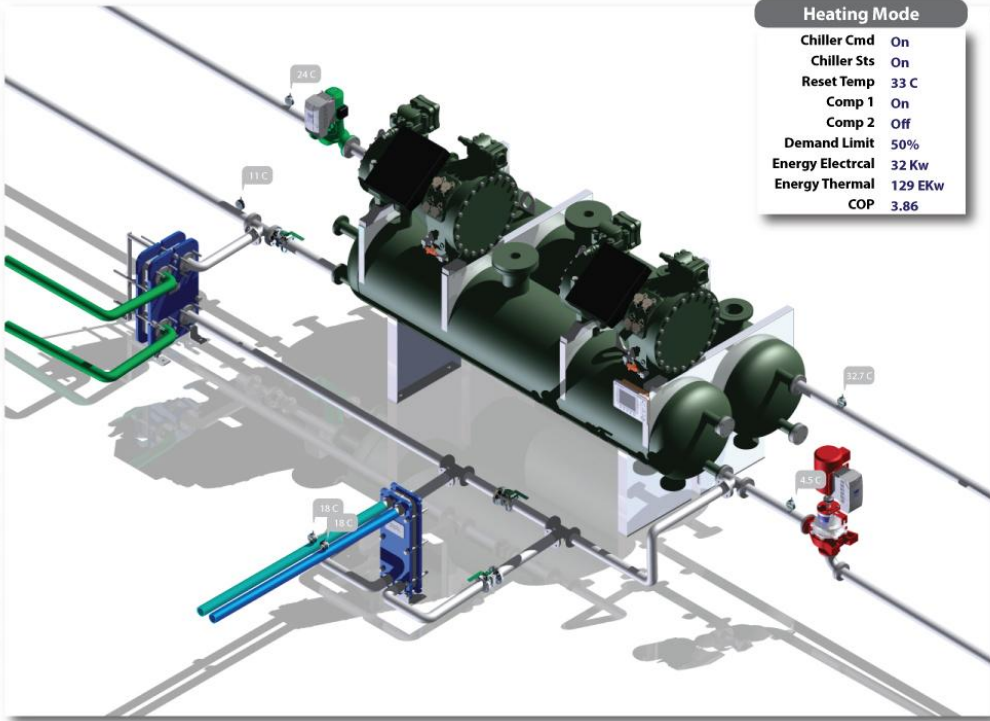
Repurposed Chiller

HEAT PUMP

-5 C
52 %
436 ppm


Weather Alert - Snow Storm for GTA
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- Floor Plan
- Geo Thermal
- Solar DHW
- Heat Pump
- Cooling Tower
- AHU
- Boiler
- Closed Loop
- Manifolds
- Backup Power
- UPS
- Fire System
- Waste Water
- Potable Water
- Security
- Schedules
- Personnel




Heating Mode

Chiller Cmd	On
Chiller Sts	On
Reset Temp	33 C
Comp 1	On
Comp 2	Off
Demand Limit	50%
Energy Electrical	32 Kw
Energy Thermal	129 EKw
COP	3.86



Pump Cmd On
Pump Sts On
Mod 41 %
Power 0.86 Kw
Off Delay 3 min



Pump Cmd On
Pump Sts On
Mod 46 %
Power 0.67 Kw
Off Delay 3 min

Preventative Maintenance

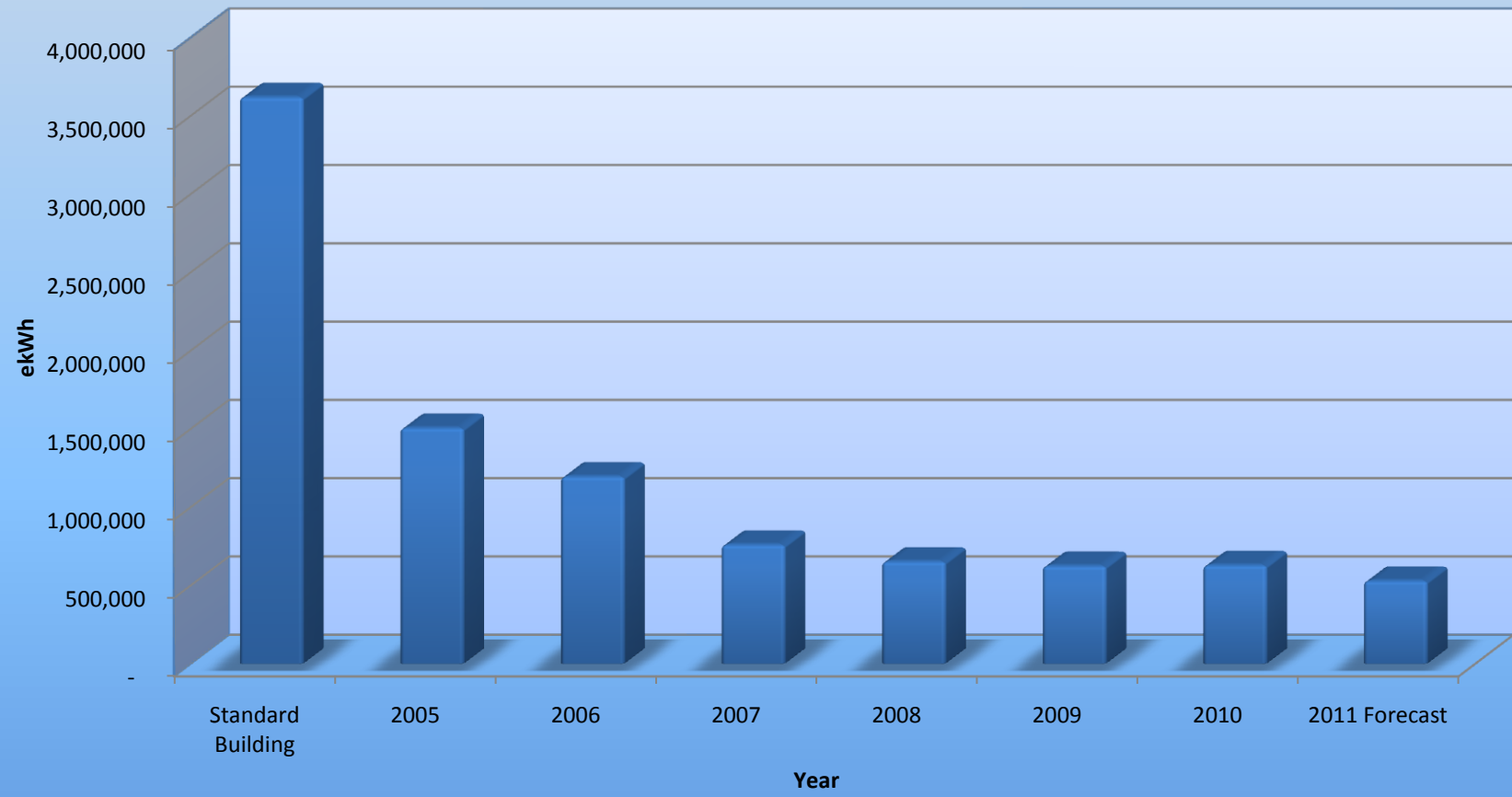
Service Reports
Trends

Service Manuals
PM Checklist



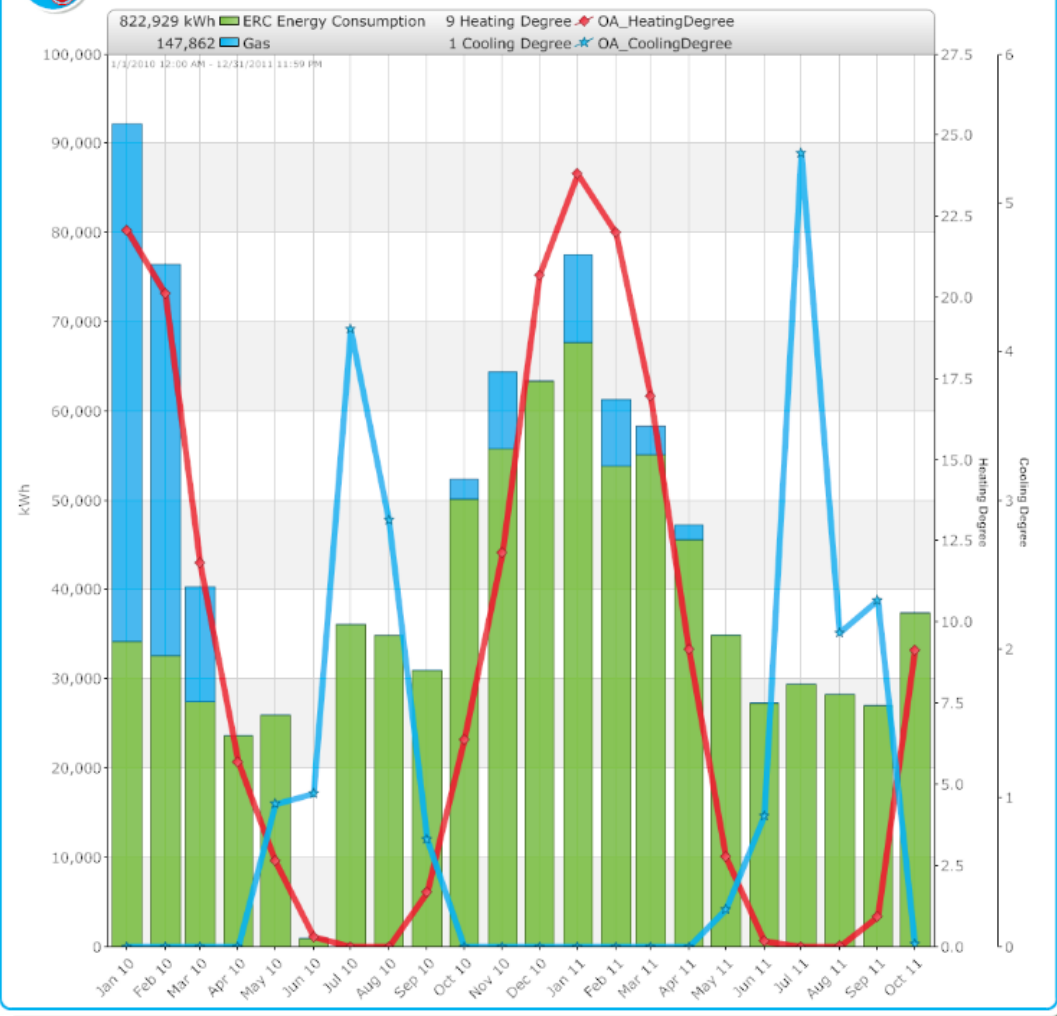
Performance

Total ERC Energy Consumption

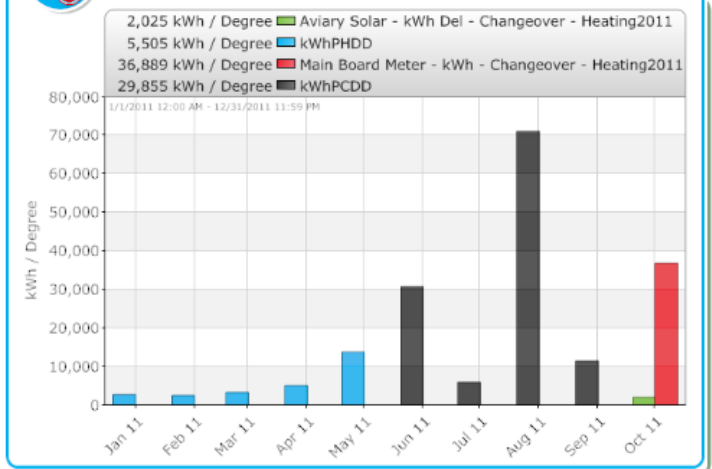




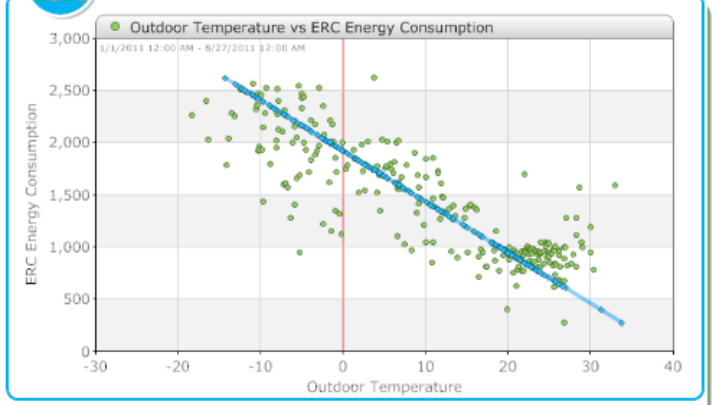
ERC Consumption vs HDD and CDD



ERC Consumption vs HDD and CDD



Daily Electricity Consumption vs Temperature





Facts

- COP
 - Heating 3.6-3.8
 - Cooling 4.5-100+!
 - Cooling Tower redundant
 - ~125,000 ekWh saved
- Future Plans
 - Cool data centre with ground source
 - Integrate solar thermal



Questions?



Thank you!

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www.ercshowcase.com

www.earthrangers.org