



Natural Refrigerants at Delhaize America

Harrison Horning

Transcritical CO₂ Pilot: Turner, Maine



36,000 gsf Supermarket



Looks "normal" to a customer

Transcritical CO₂ Pilot: Turner, Maine



Good reliability, as hoped...



Good energy performance, as expected

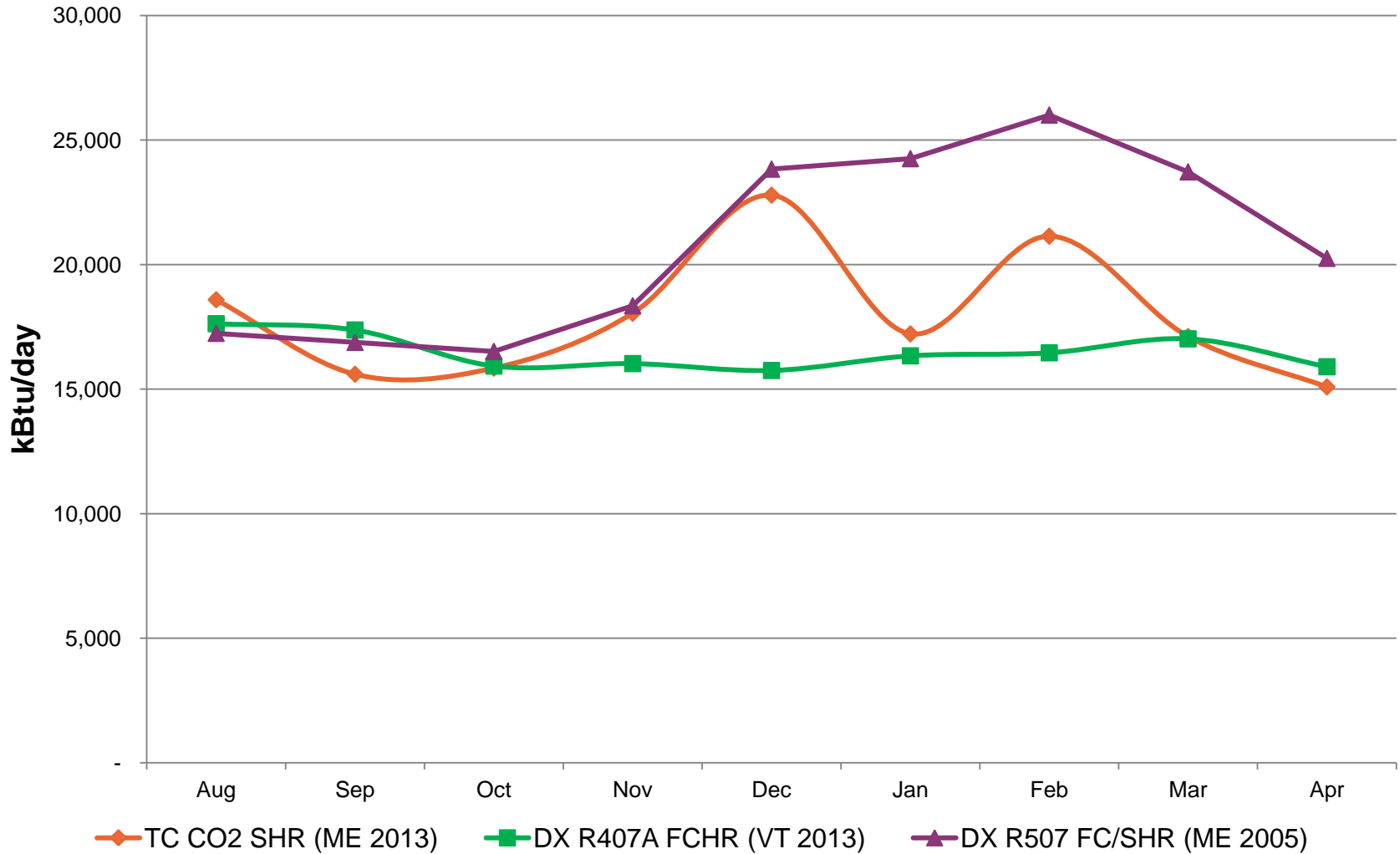
Energy Performance Data

Three 36,000 gsf Hannaford stores compared:

- Transcritical CO₂ rack with series heat reclaim; Turner, Maine; new in 2013
- DX R407A, three racks, full-condensing heat reclaim (glycol); Bradford, Vermont; new in 2013
- DX R507, three racks, combination of series and full-condensing heat reclaim (direct); Portland, Maine; new in 2005

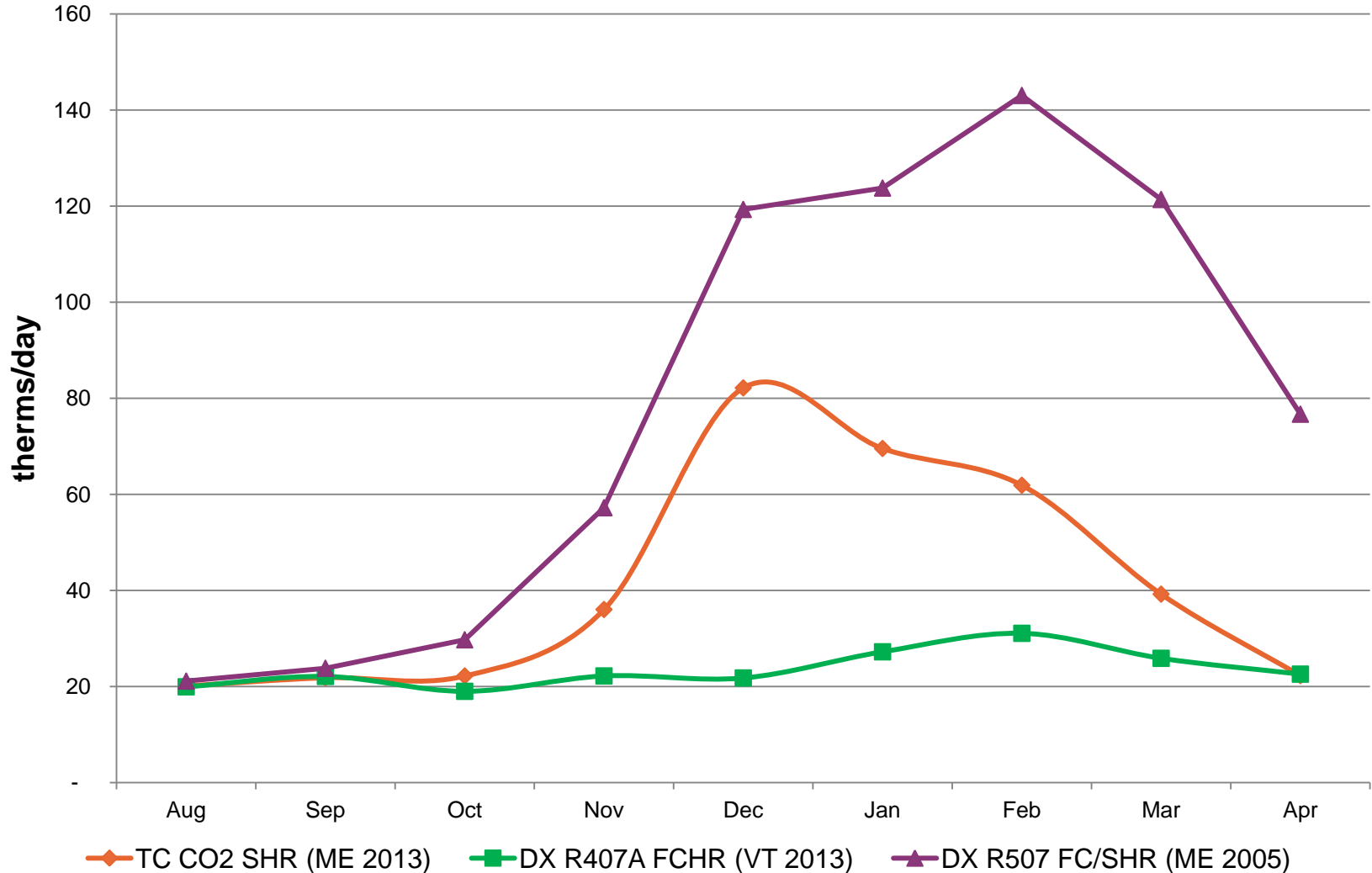
Store Total Energy Comparison - TC CO₂ vs. DX

Three Similar 36,000 gsf Supermarkets - Different Refrigeration Systems



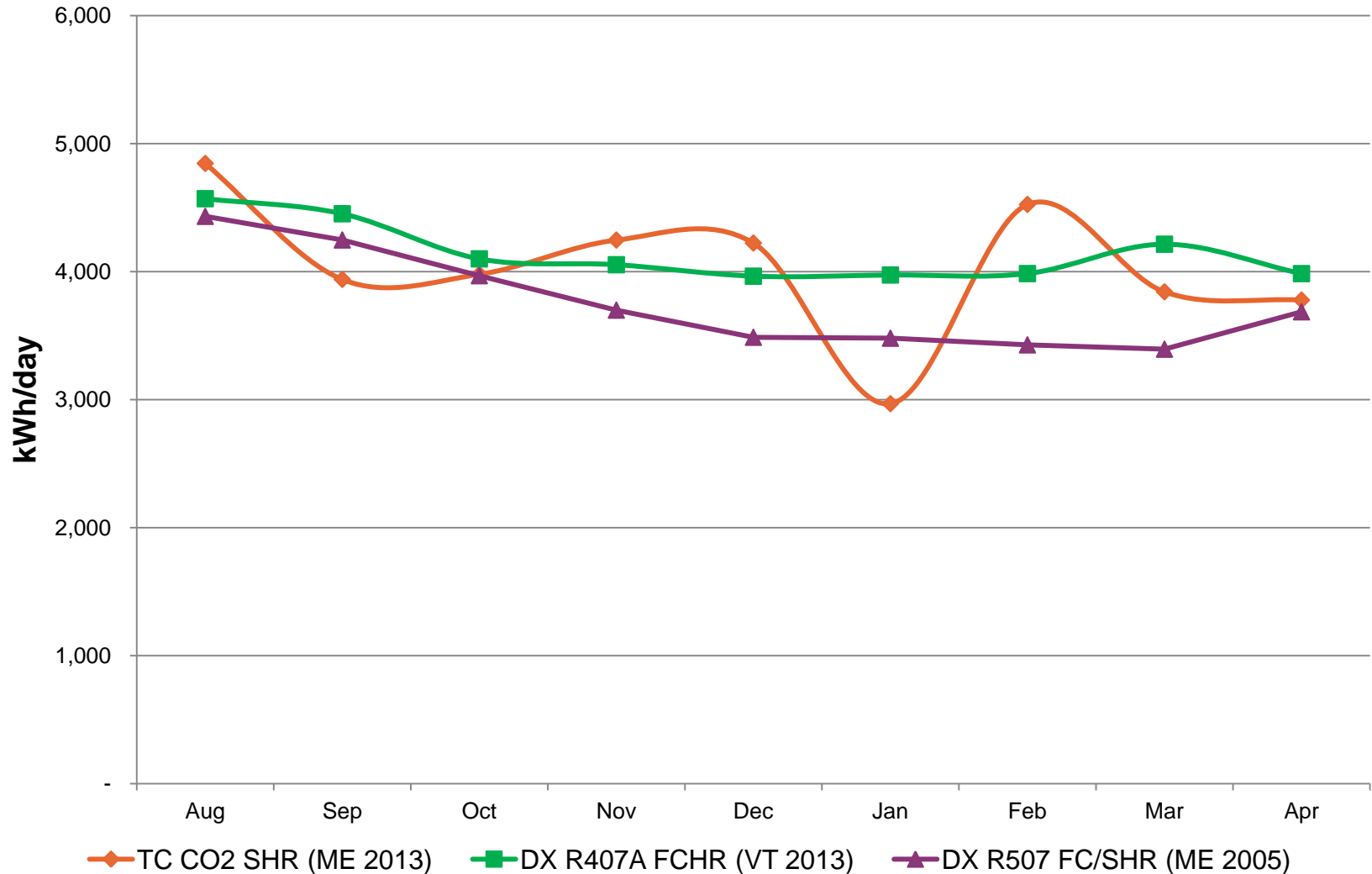
Store Gas Energy Comparison - TC CO₂ vs. DX

Three Similar 36,000 gsf Supermarkets - Different Refrigeration Systems



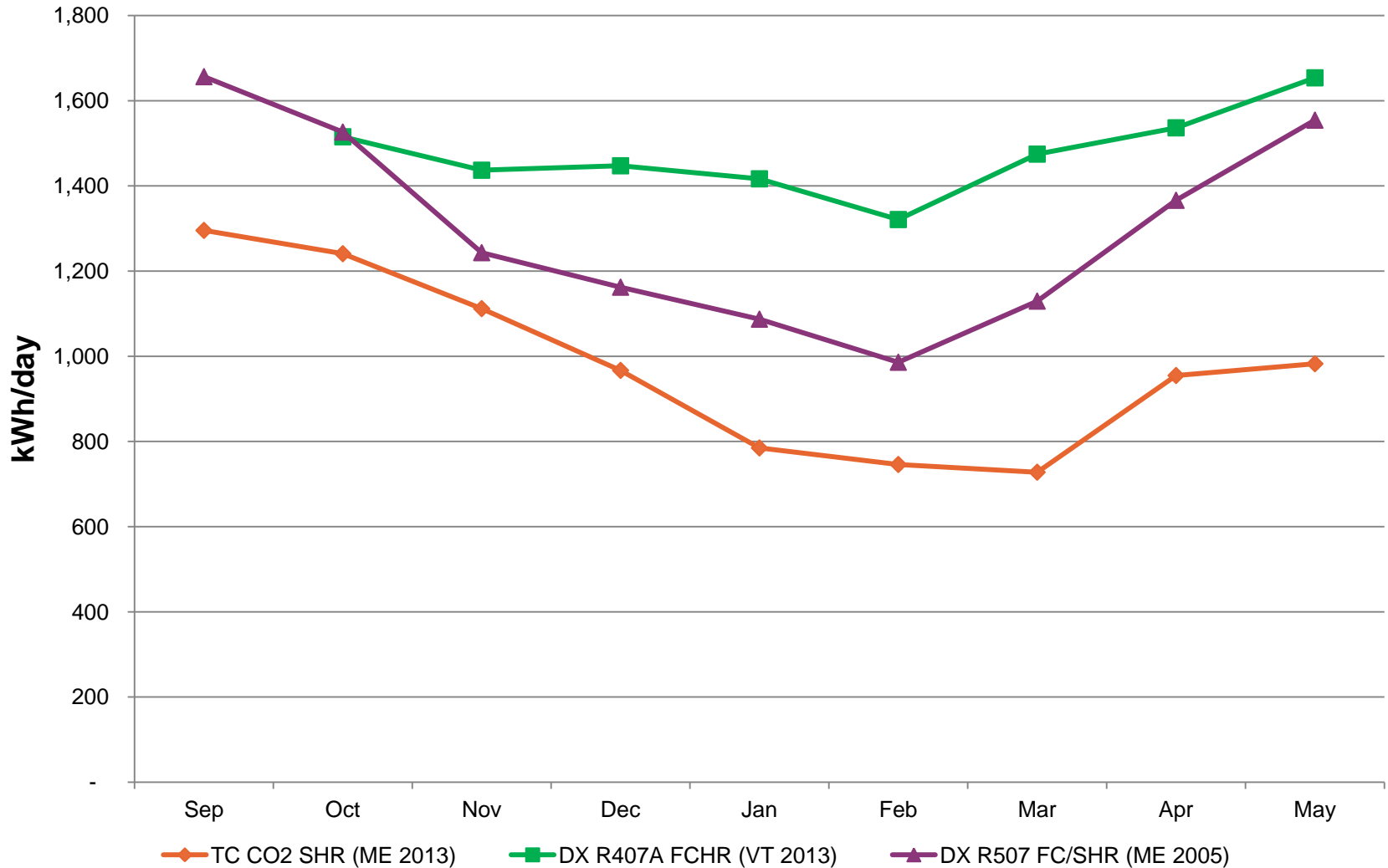
Store Electric Energy Comparison - TC CO₂ vs. DX

Three Similar 36,000 gsf Supermarkets - Different Refrigeration Systems



Rack Electric Energy Comparison - TC CO₂ vs. DX

Three Similar 36,000 gsf Supermarkets - Different Refrigeration Systems



What comes next?

- Planning more pilot projects in new Hannaford and Food Lion stores
- Considering remodels/retrofits at Hannaford if...
 - Systems and equipment at end-of-life,
 - Plenty of space for new equipment,
 - Good proposal(s) from supplier(s),
 - Etc...
- Contemplating a phaseout...
- Meanwhile, continuing with ODS phaseout, leak reductions, lower GWP HFCs, etc.



ATMO
sphere

business case

natural refrigerants

June 18-19, 2014 - San Francisco

Thank you very much!