



Advances in CO₂ Supermarket Refrigeration in North America

*Scott Martin – Director Sustainable Technologies
Hill PHOENIX*

Why all the interest in CO₂?

“Just give me a natural refrigerant...
I am tired of all the retrofits.”

R-22

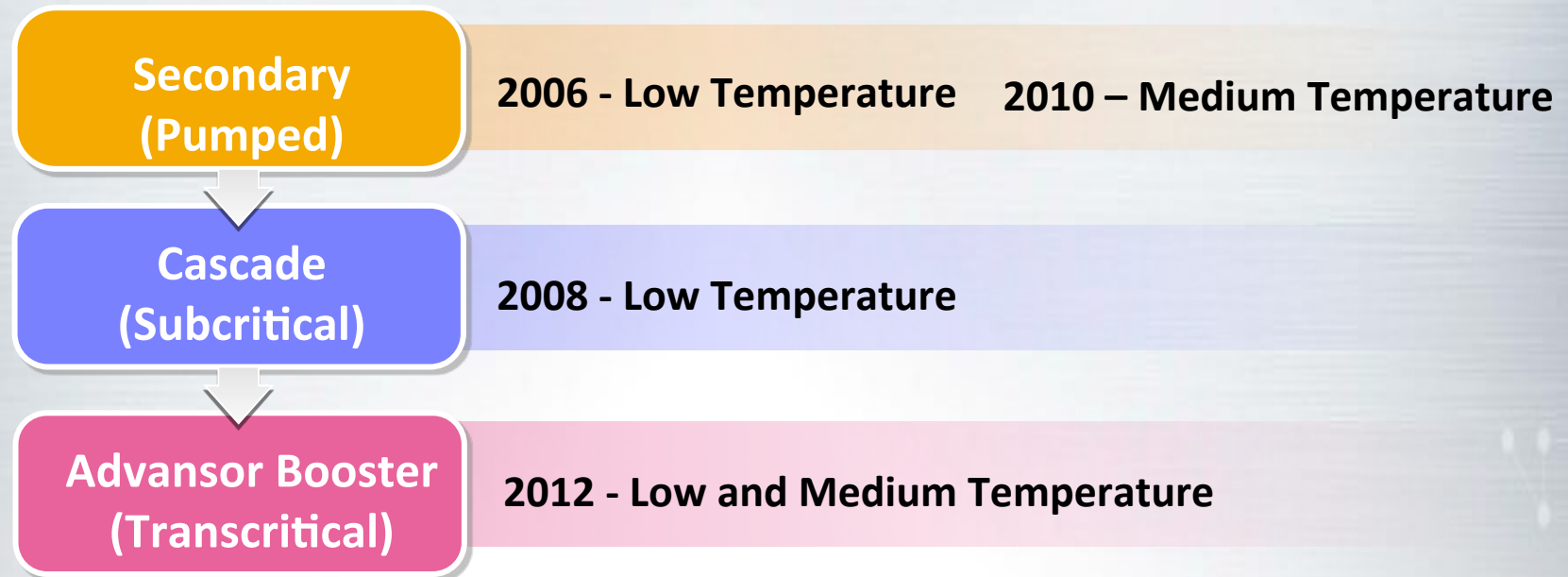
Hi GWP HFC - R404A

Lower GWP HFC - R407A/F

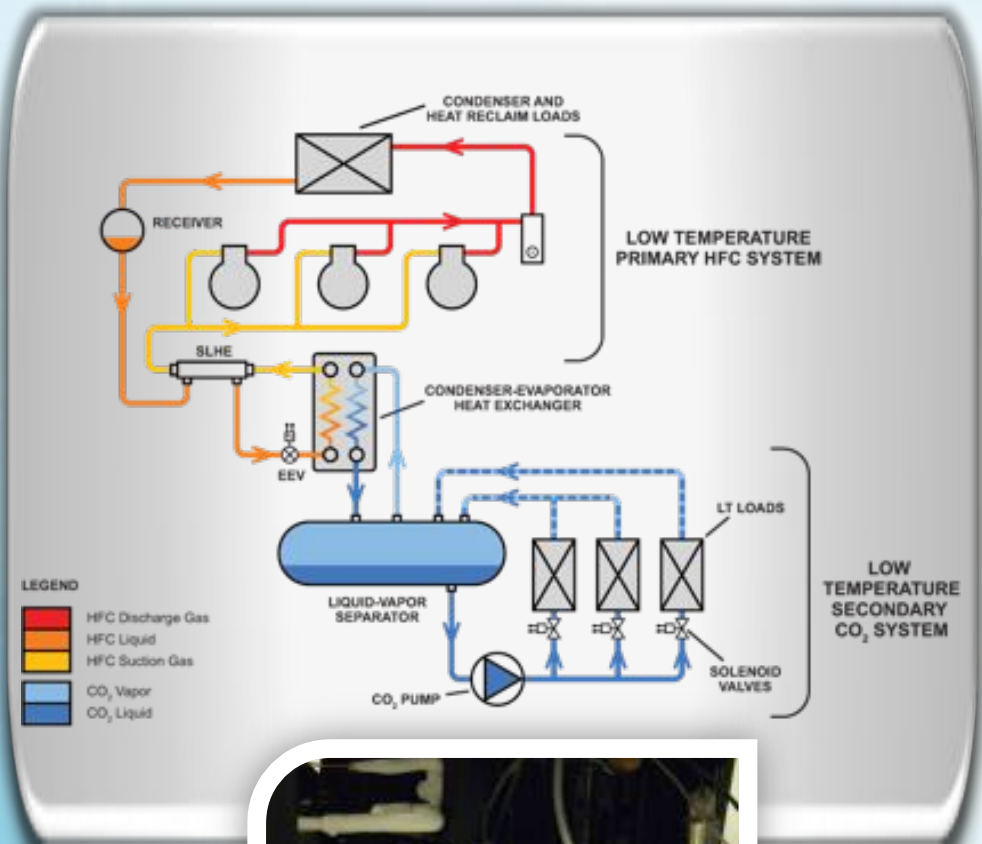
Lowest GWP - HFO's or Blends

Most of us
began our
careers with
R-12 and R-502
as the standard

CO₂ System Evolution for the North American Market



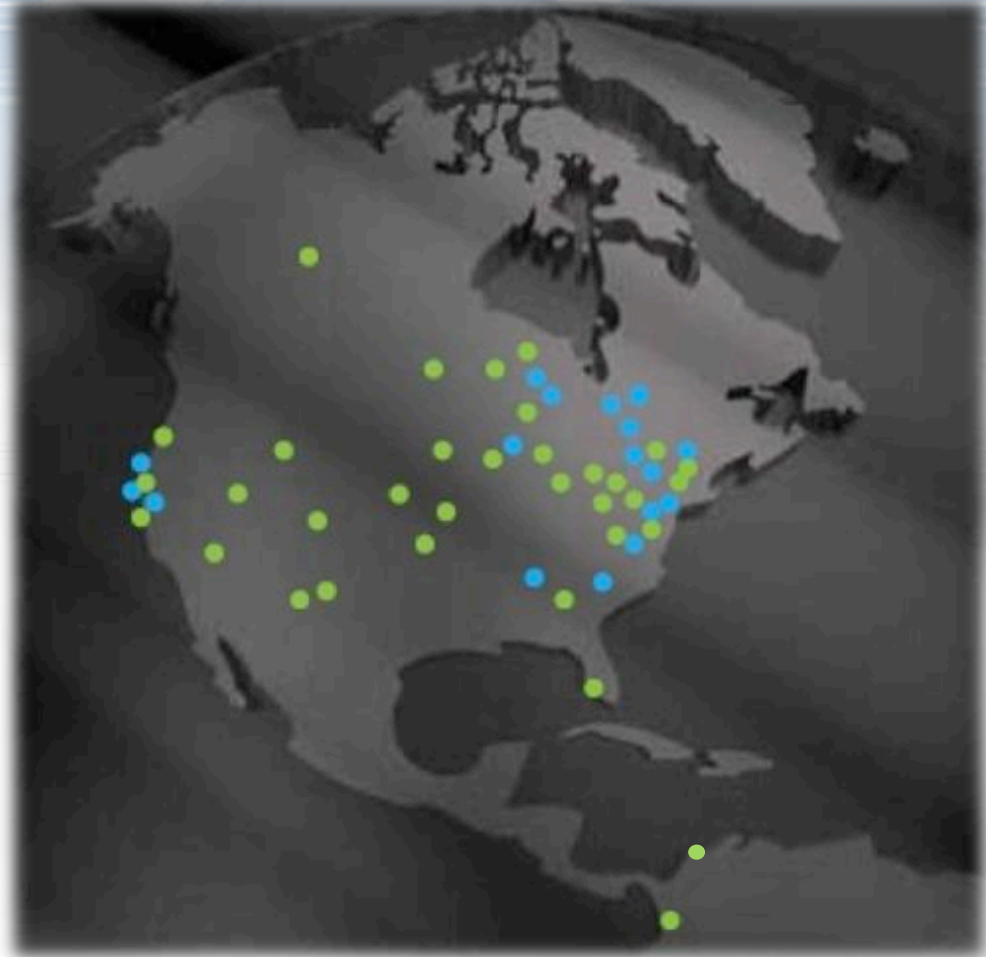
LT2 – CO₂ Secondary (pumped)



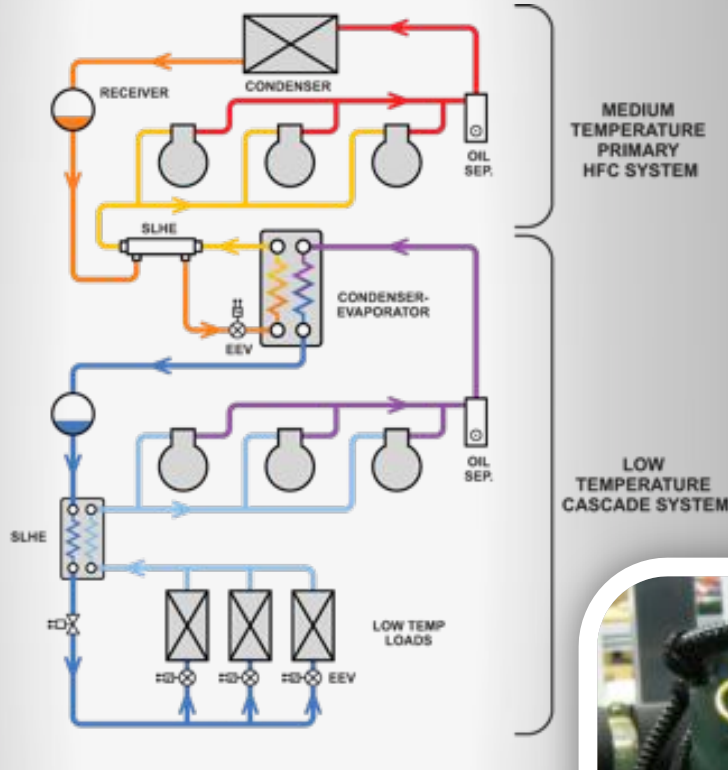
- Liquid CO₂ is circulated to provide refrigeration
- Significantly reduces carbon emissions over traditional DX technology.
- Simple system design. On/Off solenoid operation for temperature control



● **50+**
Secondary
Installations
since 2006



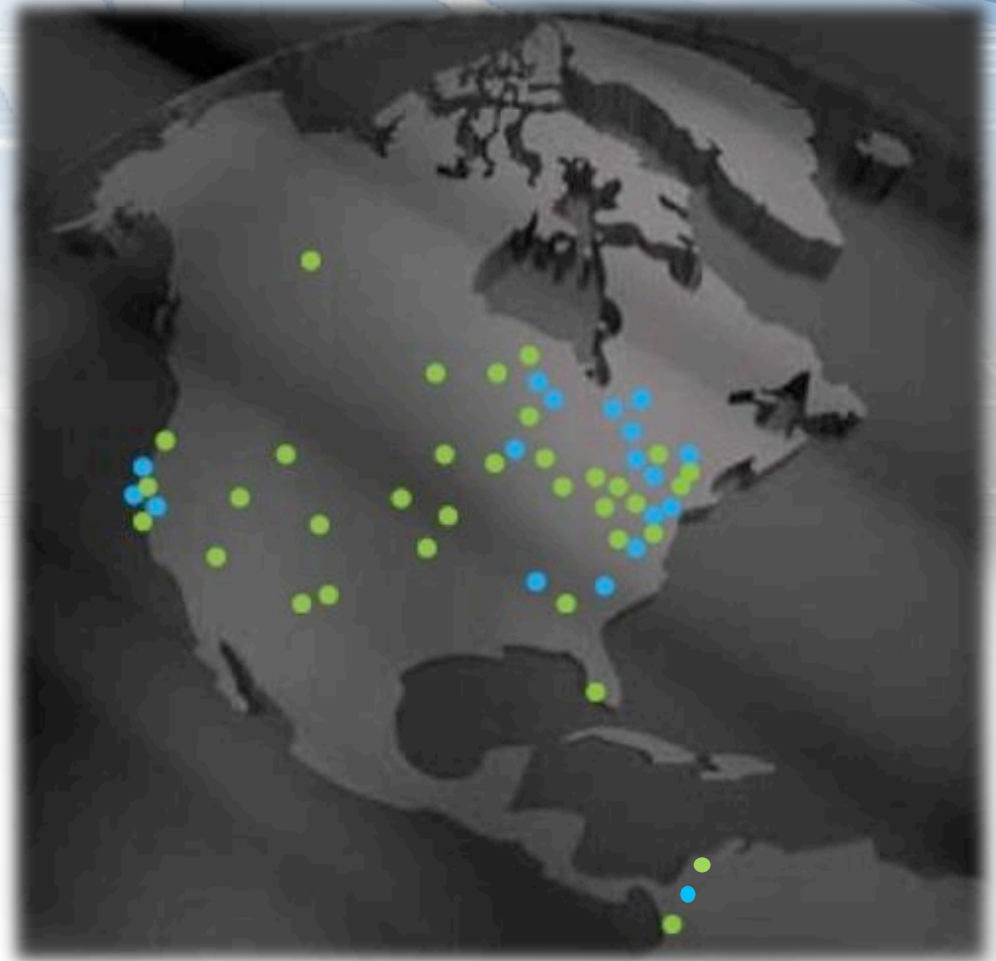
LTX2 – CO₂ Cascade



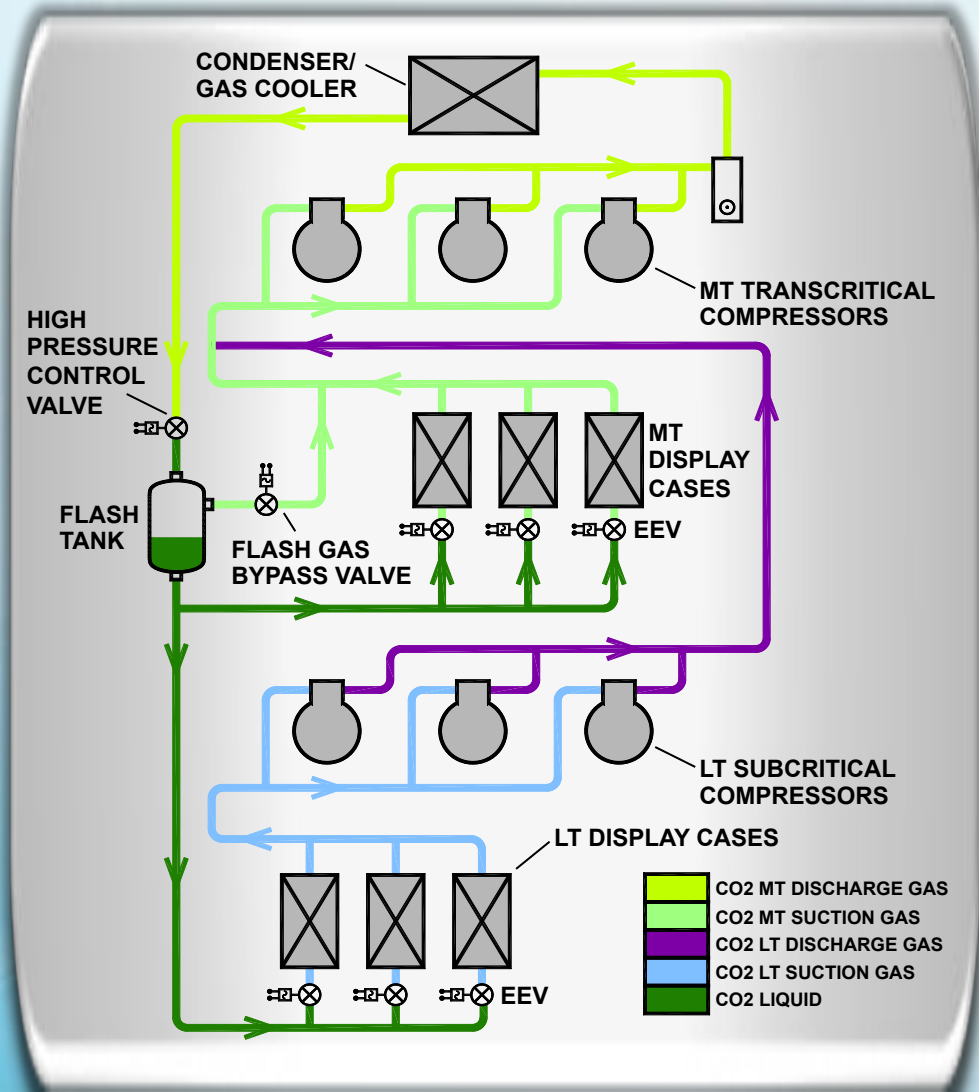
- Utilizes DX CO₂ on the lower cascade and an HFC-based DX system on the upper cascade.
- Eliminates all LT HFC's. Significantly reduces carbon emissions over traditional DX technology.



- 50+ Secondary Installations – Since 2006
- 25+ Cascade Installations - Since 2008
 - Combined with MT pumped system - 2010



CO₂ Booster System



- HFC-Free System, CO₂-Only
- Design proven in 600+ installations
- High quality Heat Reclaim opportunities
- Familiar design to HFC DX systems



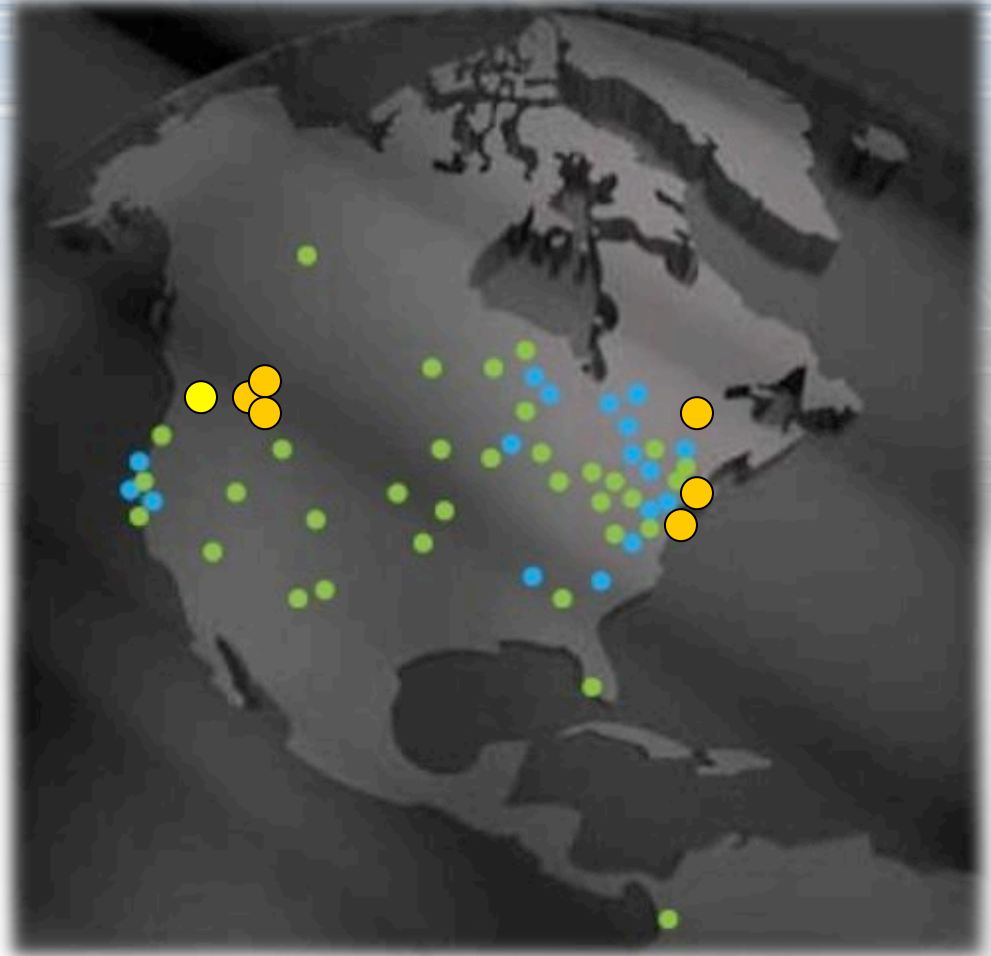
● Secondary Installations

● Cascade Installations

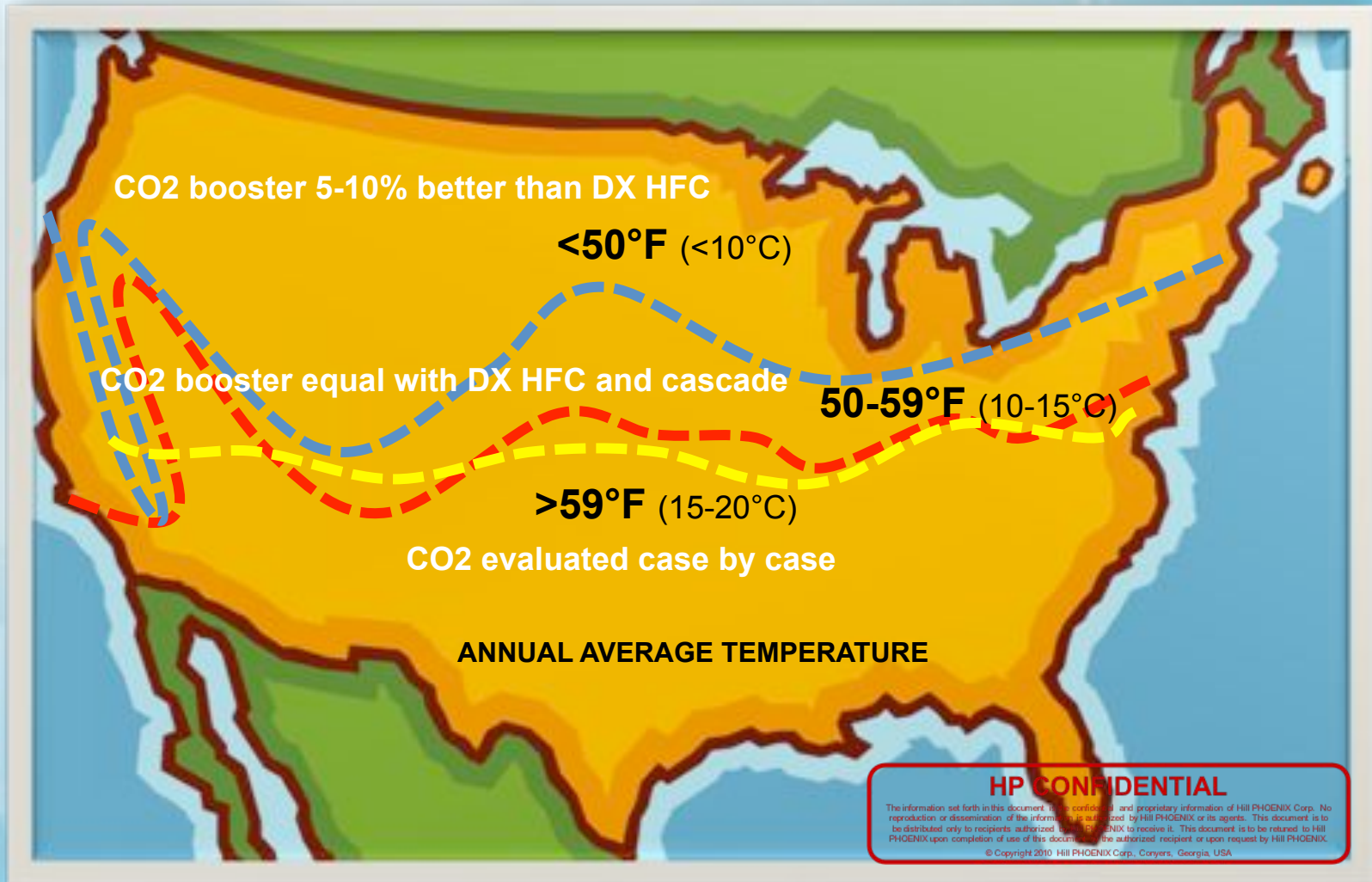
ADVANSOR
by Hill PHOENIX

● 1st System Installation

● More planned projects



CO2 Booster System "Sweet Spots"





ATMO
sphere
the Business Case

natural refrigerants

Thank you very much!