

# ATMOSPHERE AMERICA 2016

---

# New Jersey Ammonia Requirements

1. License issued by State of New Jersey not RETA

2. Size measured by tonnage

300 tons & up	Gold Seal
---------------	-----------

65 – 300 tons	Red Seal
---------------	----------

Under 65 tons	Blue Seal
---------------	-----------

3. 24/7 Engineer required - \$700,000 cost/yr.

## IIAR and RETA Proposal

1. License by RETA
2. Size measured by lbs of ammonia 5,200 lbs or less – NJCPA
3. System consistent with IIAR 2, including completely automated monitoring and control system
  - a) with instant internet notification of all parties
  - b) automatic shut down procedure
  - c) sensing and evacuation system
4. Two year associates program in refrigeration at Essex Community College

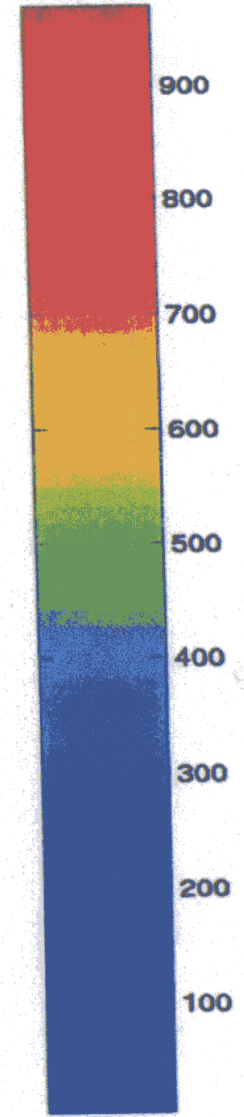
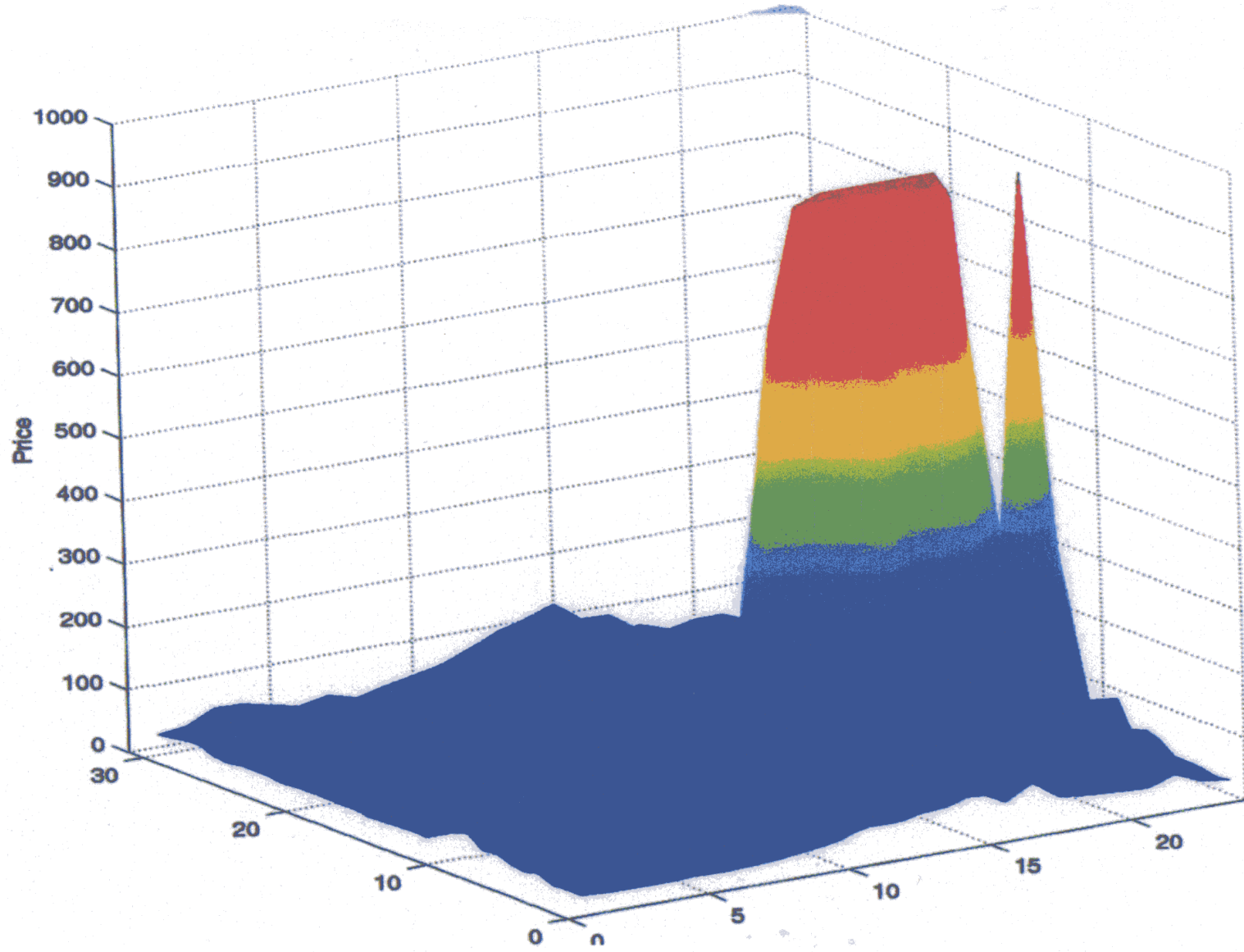
# OUR NEW SYSTEM

1. Three buildings – all secondary, no refrigerant in buildings
  - a) Old building ,evaporators, CO<sub>2</sub> Brine with Desiccant Dehumidifier
  - b) Two crane buildings, liquid desiccant with CACL brine
  
2.
  - a) Condensing with well water
  - b) Evaporating with Plate and Shell heat exchangers
  - c) Compressors – R32
  - d) State of the art automated monitoring, control and notification system
  - e) Extensive fire proofing of engine room
  - f) Compressors natural gas engine driven

# Refrigerant Comparison

	Flammability Class	P Cond (PSI)	Vol Capacity	COP
R22	1	250	100	100
R32	2L	406	160	97
R717 (NH <sub>3</sub> )	2L	258	116	106

R32 has 30% lower charge size than R22

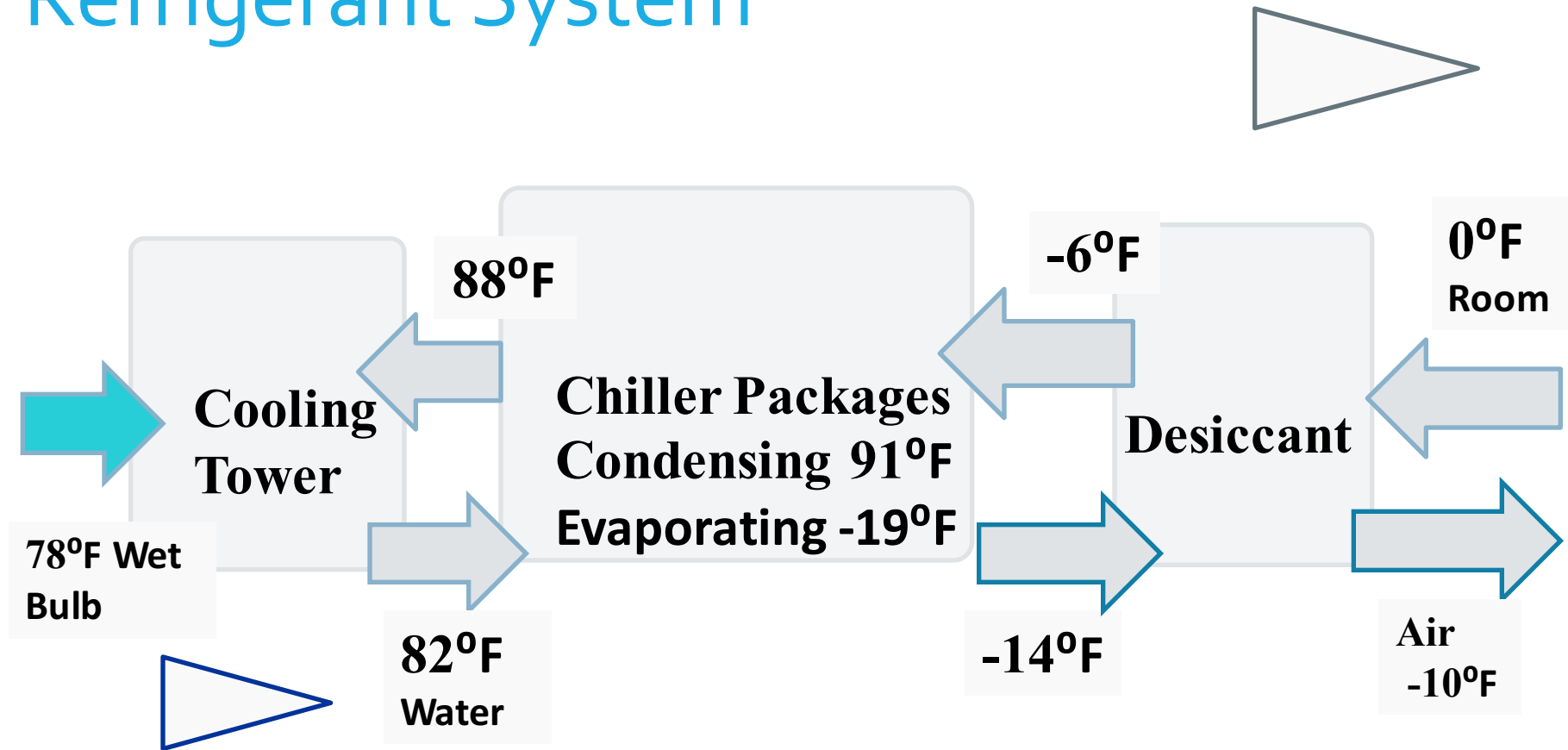


# HIGH RISE WITH GOOD TRUCK DOORS VS. CONVENTIONAL

## LOAD REDUCTIONS

	% Reduction	% of Total	% Reduction
Transmission (surface area)	56%		
Transmission (added insulation)	<u>30%</u>		
Total	70%	46%	25%
Infiltration			
Dock/Freezer	80%		
Dock/Outside	<u>60%</u>		
Weighted Average	63%	19%	12%
Lights			
Freezer	100%		
Dock	<u>0%</u>		
Weighted Average	80%	15%	13%
Activity			
Freezer	100%		
Docks	<u>0%</u>		
Weighted Average	75%	10%	8%
Motors (Evaporators)	0%	<u>10%</u>	<u>0%</u>
Total		100%	58%

# Air Conditioning Style Refrigerant System





# ***New Warehouse***



*Liquid  
Desiccant  
Equipment*

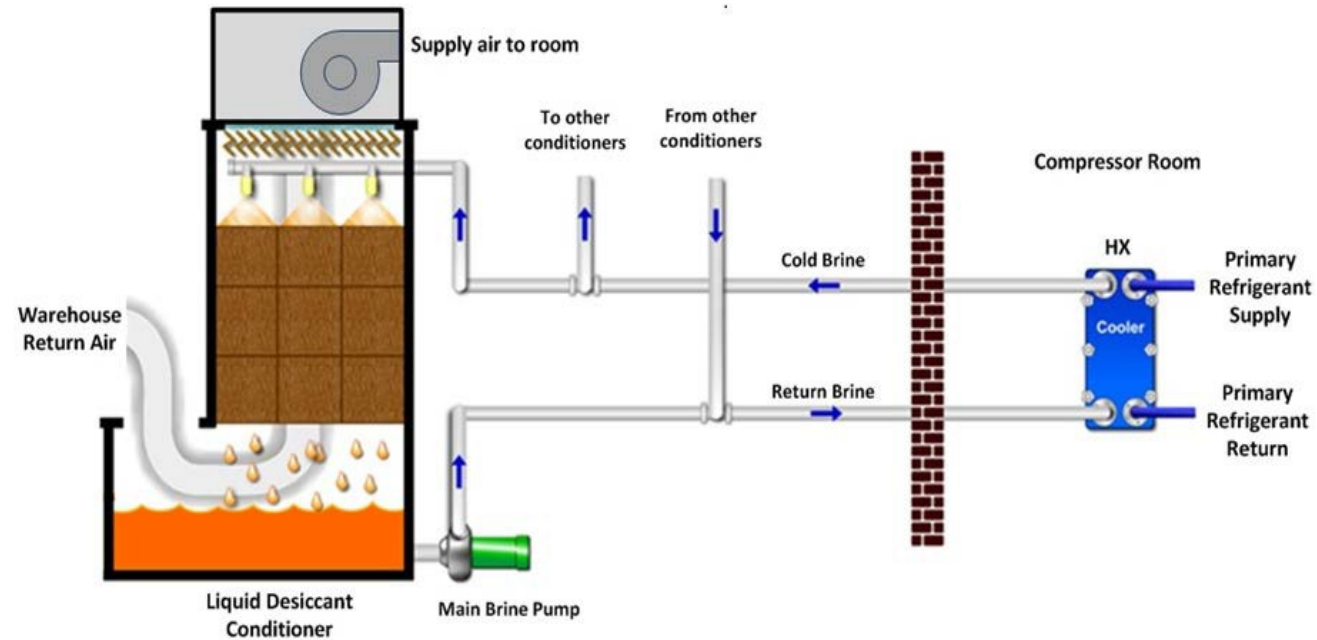


Desiccant Regenerator





# Liquid Desiccant Refrigeration System Basic Schematic



## TD Detail

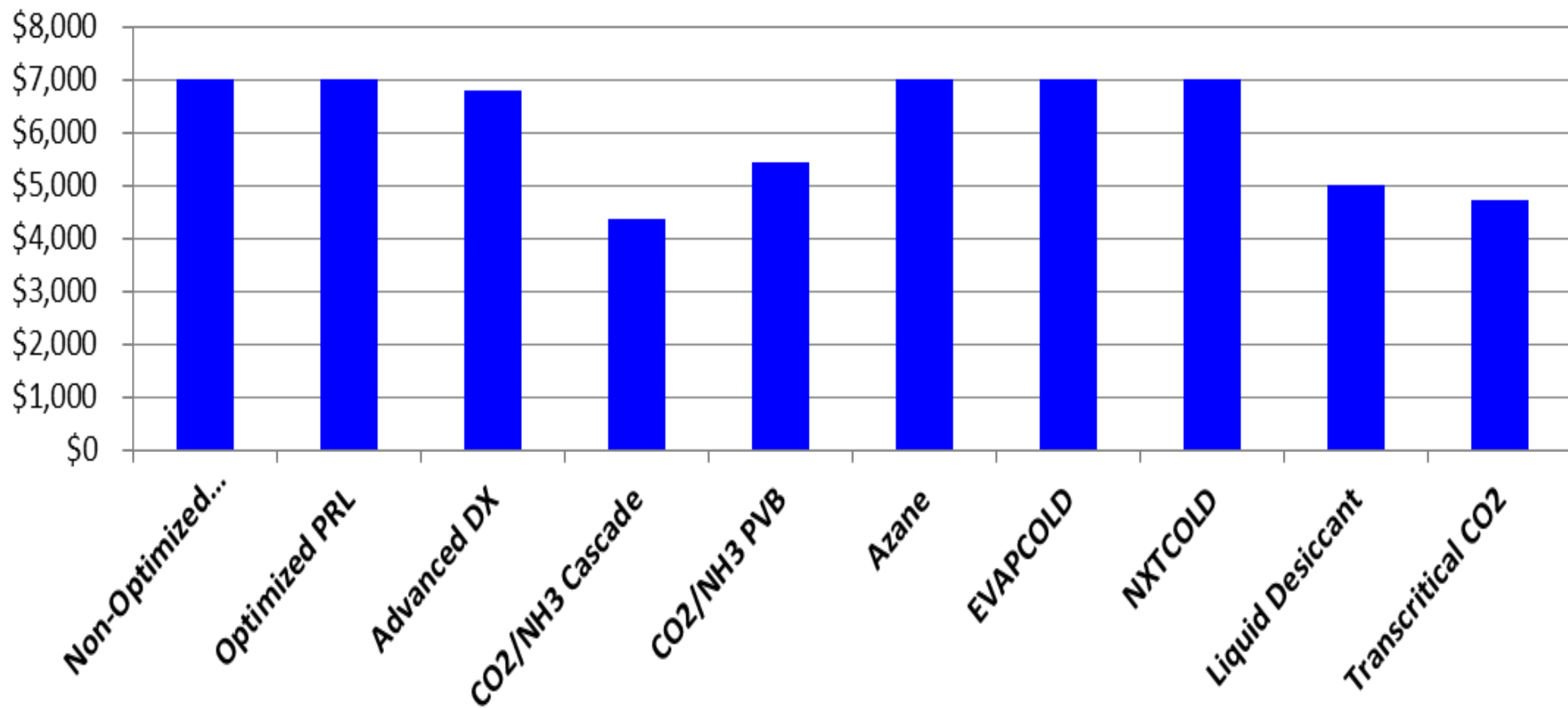
Saturated suction temperature to cold brine: 8.5°F

Cold brine to supply air temperature: 2.0°F

Heat from fan to air: 3.0°F

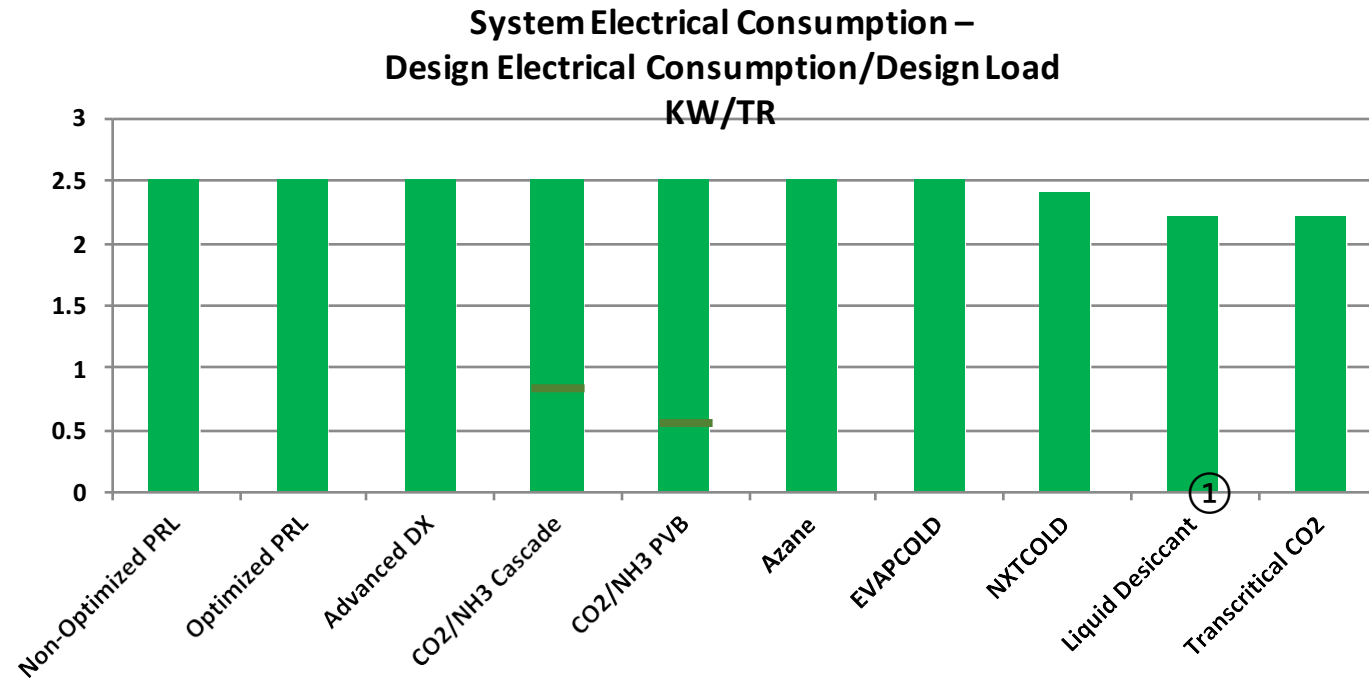
Saturated suction temperature to room air temperature: 12.0°F

## Installed Cost Comparison \$/TR



# Power Consumption By System Type

(updated June 2016)



① Cost of hot gas defrost - .74 KWH/TON

① Desiccant defrost - .06 KWH/TON