



ATMO
sphere

business case

natural refrigerants

June 16 & 17, 2016 – Chicago

ENGINEERING
TOMORROW

Danfoss

**AMERICA** **ATMO**
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North America Food Retail Segment Leader

NAM Overview

What is unique about NAM?

- **Large market:** > 3B USD identified potential for Cooling, Heating, & Drives
- **Stable market:** 1.5-2.5% growth for each of last five years, 2% forecast for next two years
- **Safe currency:** USD remains the world's reserve currency
- **Global reach:** major customers and competitors call US home, direct influence on Mexico business and more



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Angelo Caputo's Fresh Markets - Transcritical CO₂

- Carol Stream, Illinois
- Heat reclaim for space heating and hot water
- Case controllers
- Variable frequency drive capacity control



Midwest manufacturer of Energy Efficient Ice Makers - Hydrocarbon

- R290 combined with the high efficiency compressor
- 20 to 30% more energy than comparable ice makers

#3 Local Case Studies

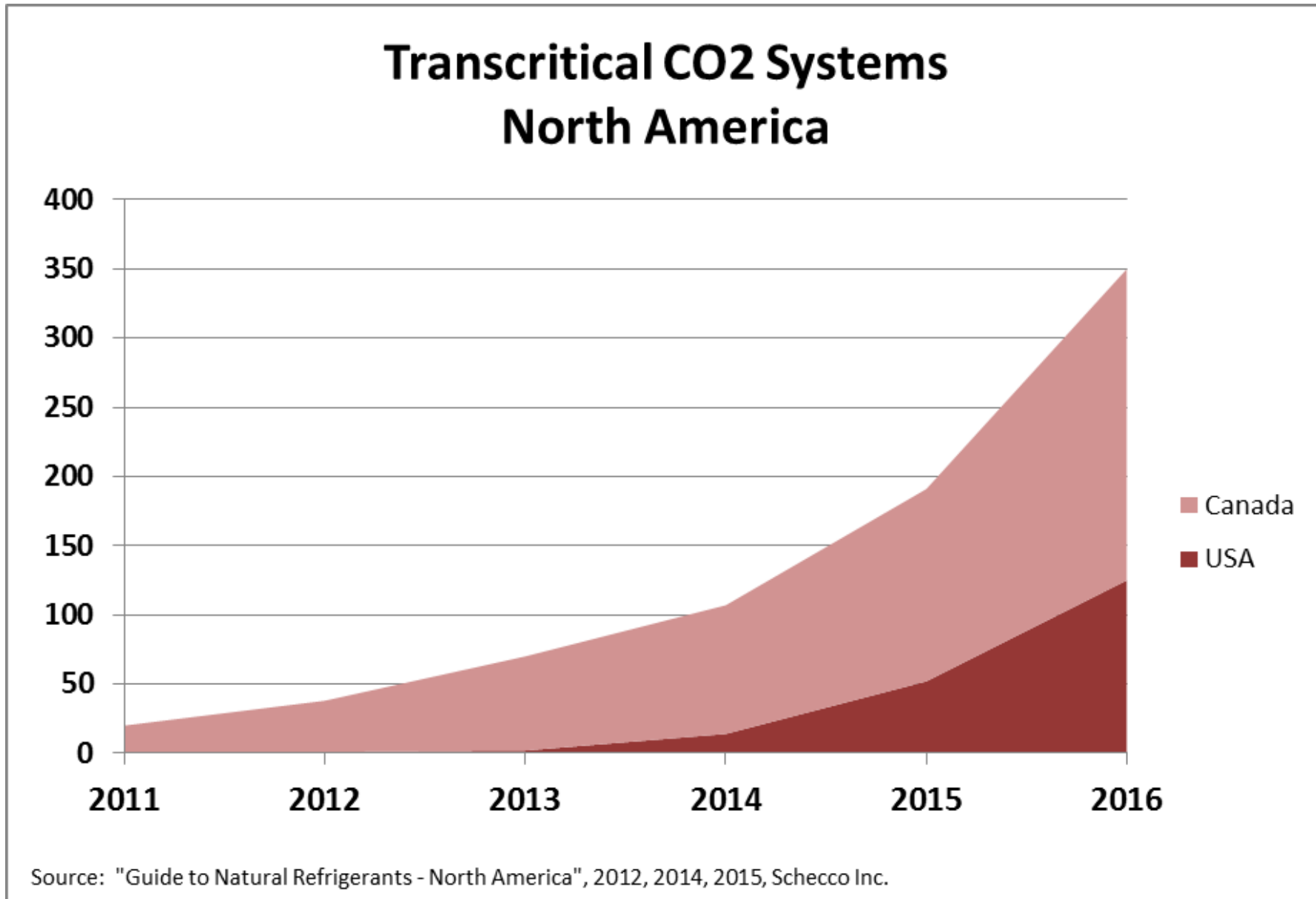


Supreme Lobster and Seafood Company, Joliet Cold Storage (JCS), cold storage warehouse and logistics facility

- Direct Expansion Low Temp Ammonia versus Pumped recirculated liquid
- Low(er) Charge Ammonia system, cut equivalent charge by 50% - Less than 10,000 lbs.
- 2 ½ % lower first cost, Plus reduced operating costs.

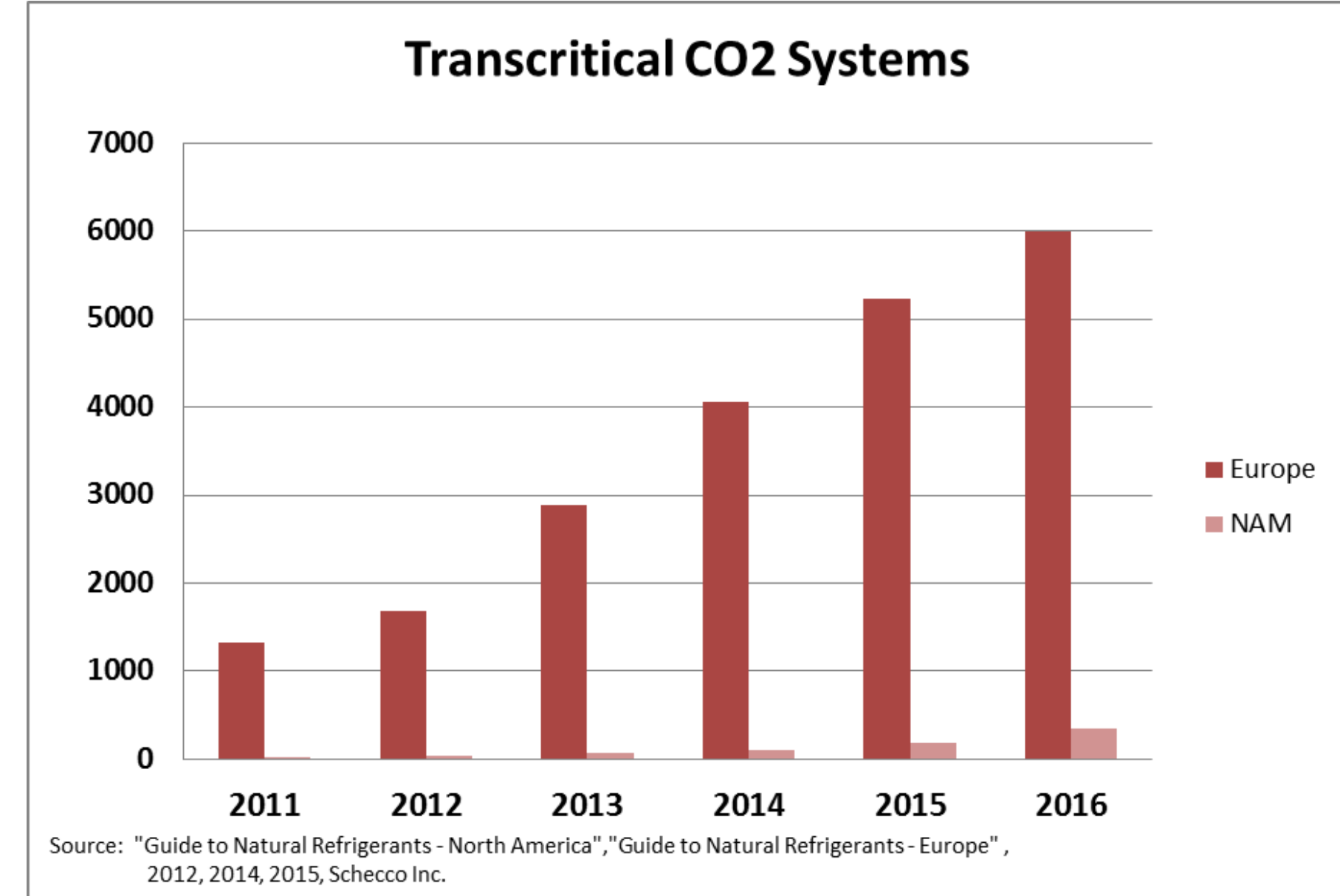
#4 Grow with CO2

No. of Xcritical Systems 2011 – 2016e



North America
~300 Installations
~60,000 Outlets
 ~ 0.5%

Europe
~6000 Installations
~70,000 Outlets
 ~8.5%



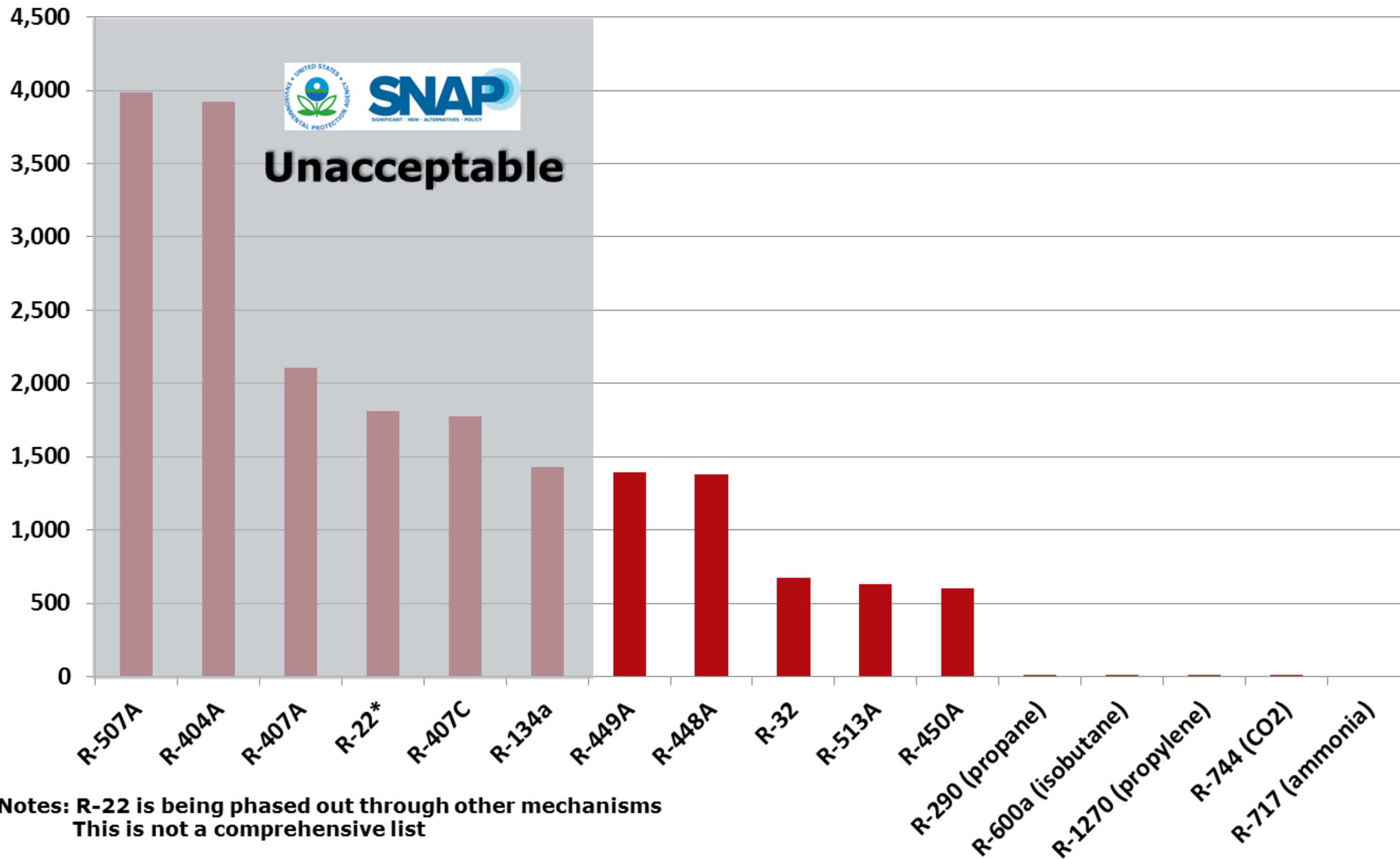
	2015 Units	Project 2016 Sales	2016 Units	% Growth
North America	190	160	350	84%
Europe	5225	775	6000	15%
NAM Compared to EUR	<4%	20.0%	6%	

Key Driver: Regulations

- **Very active regulatory environment**
 - EPA eliminating commonly used refrigerants, adding new options
 - DOE driving new efficiency standards in 10+ applications
 - President Obama's Climate Action Plan is driving aggressive changes
 - OEMs are adapting designs to meet new refrigerant and efficiency requirements



#6 GWP of Common Refrigerants



- EPA’s authority under the Clean Air Act of 1990
- “Requires EPA’s continuous review of alternatives to find those that pose less overall risk to human health and the environment.”
- EPA issues Notices of Acceptability and Rules



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Thank you very much!