



ATMO
sphere

Ammonia Charge...

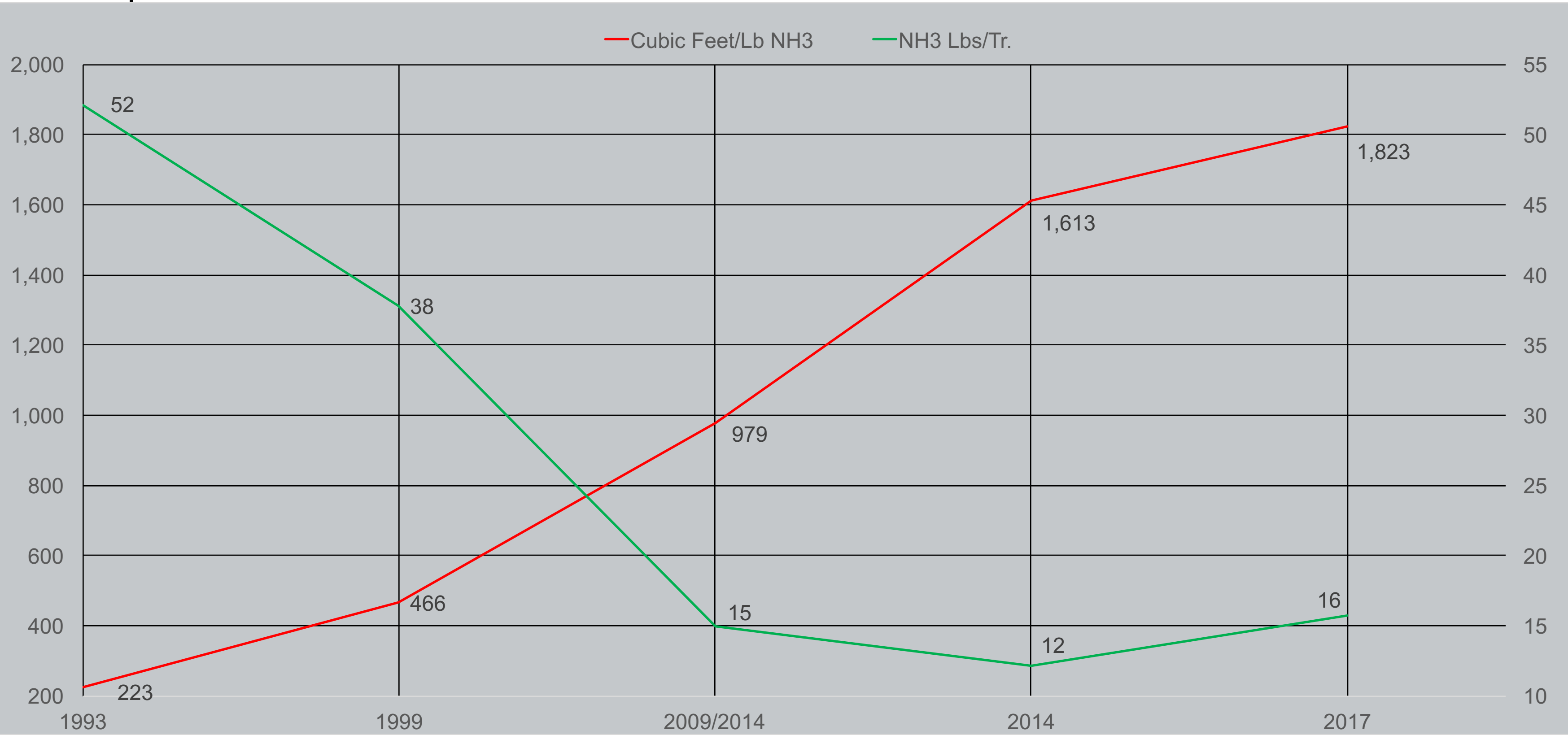
When Less > More

Pete Lepschat
Henningsen Cold Storage Co.

Background

- **Henningesen is family owned, in business since 1923**
- **13 Facilities, majority in the Pacific Northwest**
- **Very hands on with design/engineering of new facilities**
- **Focus on energy efficiency strategies since the mid '90's**
- **One of the most energy efficient companies in the industry**
- **Focus on reduced charge ammonia since around 2009**

HCS Charge Evolution



Ask Yourself (or someone else who might actually know the answer)

- 1. Do we need this component?**
- 2. Does it need to be that big?**
- 3. Do we really need to use NH₃ for this part of our process?**

Y, Y, Y, Y, Y?

**“We have met the enemy, and he is ~~Us~~
Liquid”** (“Pogo” comic strip, 1953)

- **Vessels**
- **Piping**
- **Evaporators**
- **Thermosyphon Oil Cooling**
- **Heat Exchangers**

(Not) All Of The Answers

- **Use “the book” (IIAR Piping Handbook, Vilter Piping manual, manufacturers data, etc.) to right size your components**
- **Don’t “stack your factors”**
- **Don’t be afraid to try new things (with a little help from your friends)**
- **16 Oz. = 1 Lb., 2000Lbs = 1 Ton**

Salem West

- **8,307,583 cuft.**
- **31,500 pallets**
- **5,150 lbs NH3**
- **-10°f warehouse**
- **38°f dock**
- **425 Evap. tons**
- **High Throughput**
- **.357 kwh/cuft/yr**



Simpler & Efficient

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- **6,017,423 cuft.**
- **25,000 pallets**
- **3,300 lbs. NH3**
- **0°f warehouse**
- **38°f dock (100')**
- **210 Evap. tons**
- **Brand New!**
- **Energy Use - TBD**



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The Most important things

**Efficiency and low charge are not at odds with
each other.**

**An efficient facility will function fine with a
smaller charge.**



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Thank You!

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