

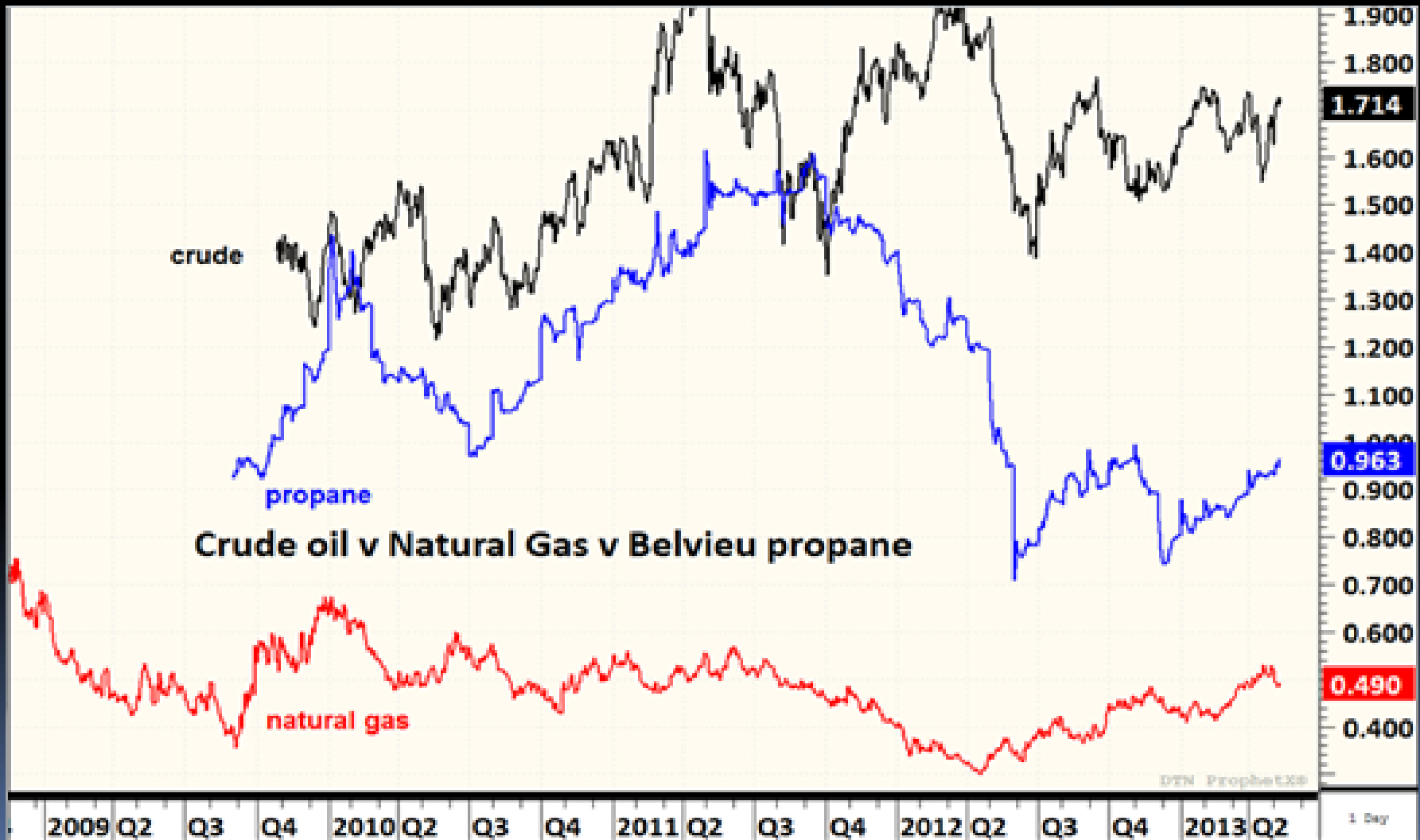


- Safe and versatile
- Used in 12 million US households
- Heating, agriculture, industrial, transportation
- Non Toxic – no aquifer or soil contamination
- Approved clean alternative fuel -1990 Clean air act

# Propane – The Advantages

- **Versatility** – can be stored above or underground
- **Environmentally friendly “Green Fuel”** to store and burn
- **Plentiful in supply**
- **Fewer competitors**
- **Lower cost**
- **Santa owned infrastructure helps ensure longer relationships**
- **Increased per gallon margins**
- **Lower BTU fuel = more gallons**
- **Larger barrier to entry from competitors**

# Comparison to Oil and Natural Gas



# Typical Commercial Uses

- Building Heat – bi-fuel or primary source
- Hot Water (excellent year around use)
- Restaurants
- Fork Lifts (busy fork lift uses 8 Gal per 8 hour shift)
- Autogas – fleet fuel
- Pump Stations – Refill consumer tanks
- Temporary Heat
- Green Houses
- And More.....

# How Does Santa Energy Ensure Safety?

- Distribution of industry safety brochures
- In person discussion from technicians
- MSDS sheets to all commercial accounts
- CETP computer based training underway for
  - CSRs
  - Salespeople
  - Dispatchers
  - Technicians
  - Management



# Propane – Safety Precautions

- Protect tanks from vehicular traffic – same as oil
- Piping must be pressure tested in all applications – same as oil
- Odorant is added for warning
- Instruct customers to call 911 if any sight, sound or smell of gas
- Never sacrifice safety for increased volume
- Gas detectors are available
- All storage infrastructure is on site (not from street)

# Residential & Commercial Tanks



Fork Lift 33.5 LB Tanks



120 Gal AG Tank (often in multiples)

500 Gal AG Tank

500 Gal UG Tank



1000 Gal Underground Tank Installation



Autogas Tank (17 Gal)



18,000 Gal Bulk Storage Facility (transport delivery)



Vertical 1,990 Gal Dispenser Station

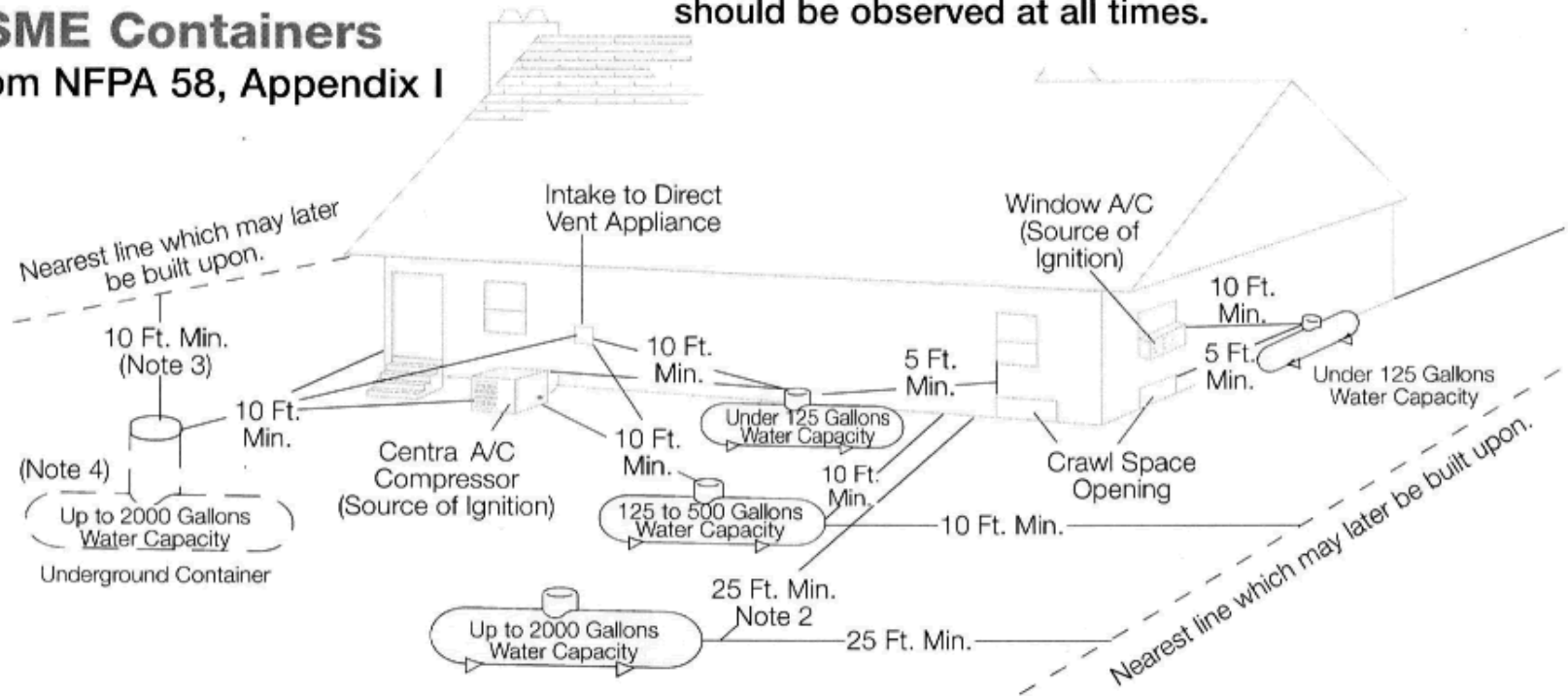


30,000 Gal Bulk Storage Facility (transport delivery)

# LP Storage Distance

## Location of ASME Containers From NFPA 58, Appendix I

Federal, state, and local ordinances and regulations should be observed at all times.



### Notes:

- 1) Regardless of its size, any ASME tank filled on-site must be located so that the filling connection and fixed liquid level gauge are at least 10 feet from external source of ignition (i.e. open flame, window A/C, compressor, etc.), intake to direct vented gas appliance, or intake to a mechanical ventilation system.
- 2) May be reduced to 10 feet minimum for a single container of 1200 gallons water capacity or less if it is located at least 25 feet from any other LP-Gas container of more than 125 gallons water capacity.
- 3) Minimum distances from underground containers shall be measured from the relief valve and filling or level gauge vent connection at the container, except that no part of an underground container shall be less than 10 feet from a building or line of adjoining property which may be built upon.
- 4) Where the container may be subject to abrasive action or physical damage due to vehicular traffic or other causes it must be either a) placed not less than 2 feet below grade or b) otherwise protected against such physical damage.



# Propane – The Green Fuel

- Unlike natural gas – propane is NOT a greenhouse gas
- Does NOT harm the environment when released into the atmosphere
- Will NOT contribute to pollution
- Similar emission rate to natural gas but not used for electricity production
- Both natural gas and propane have minimal toxin and emission profiles (environmentally friendly)



# Liquid Propane Vaporization

- Like water – propane vaporizes but at a lower point (water turns to steam at 212°F)
- Propane is “LP Gas Steam”
- Unlike water – influenced by size of tank
- Vaporization rate must be ample enough to deliver required amount to fuel an appliance



# Steam Engine



# Steam Engine Analogy

- Railroad steam locomotive runs by heating water in a boiler to 212– turning it to steam
- Too small a boiler can't produce enough steam to power the locomotive
- Not enough heat and surface area can't produce enough steam
- So remember~
  - **Container size** – The tank must be big enough
  - **Heated surface area** – must be big enough and hot enough

# Propane Properties

- $C_3H_8$  - The molecular makeup of propane consists of 3 Carbon molecules and 8 Hydrogen molecules
- Propane Boiling Point  $-44^{\circ}F$
- Weight of 1 Gallon Liquid Propane\* - 4.24 Lbs
- Specific Gravity of Propane Gas\* - 1.52
- Specific Gravity of Liquid Propane\* - .51
- BTU per Gallon of Propane Gas\* - 91,547
- BTU per Lb. of Propane Gas - 21,591
- BTU per Cu Ft of Propane Gas\* - 2,516

\*at  $60^{\circ}F$

