

WELCOME TO THE CHP SUMMIT: WESTERN MISSOURI

Presented by the Missouri Division of Energy
and Spire Energy



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Combined Heat & Power, A Natural Fit for Healthcare

CHP Summit, October 16, 2018



St. Vincent's Chilton Hospital



St. Vincent's Chilton Hospital

- Located on I-65 North halfway between Birmingham and the Montgomery
- 30 Bed Acute Care Facility
- Designed to be highly efficient for many years to come with advanced,
 - Building Automation Systems
 - Lighting
 - Exterior Insulation Finish Systems
 - Membrane roof
 - Low infiltration
 - Advanced Energy Systems



Missouri Connection

- Building owned by Chilton County and managed by the Chilton County Healthcare Authority.
- Hospital operated by St. Vincent's Health Systems of Birmingham which is owned by Ascension.

- **Ascension:**

- 101 South Hanley Rd.
St. Louis, MO 63105

- About Ascension,
 - 150,000 employees and 36,000 aligned providers
 - Operates 2,500 sites
 - 22 states





CHP Project Development

- **Identify need** - Reliability, resiliency, environment or economics.
- **Education, outreach and advocacy**
- **Qualification**- Determine technical potential and cost effectiveness.
 - Minimal site information and average utility costs.
- **Feasibility** - Level 1 and level 2 feasibility analysis with a qualified provider.
- **Procurement** – Procurement planning, contracting, financing, permitting and commissioning.
- **Operations and maintenance**

Resource: www.energy.gov, EPA CHP Project Development Handbook, CHP TAPs

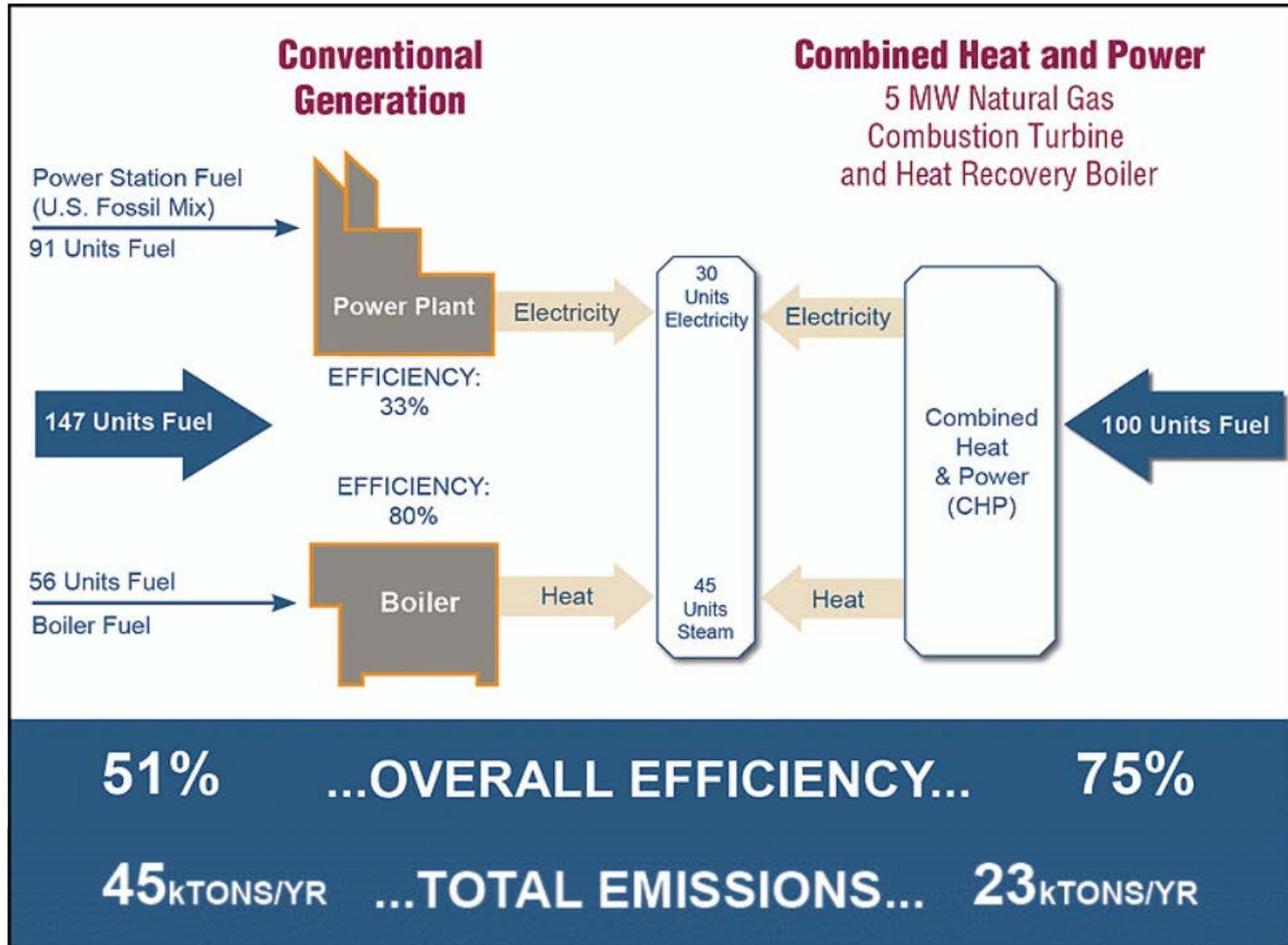


Why CHP at St. Vincent's Chilton?

- Efficiency
- Environmental benefits
- Economics
- Resiliency

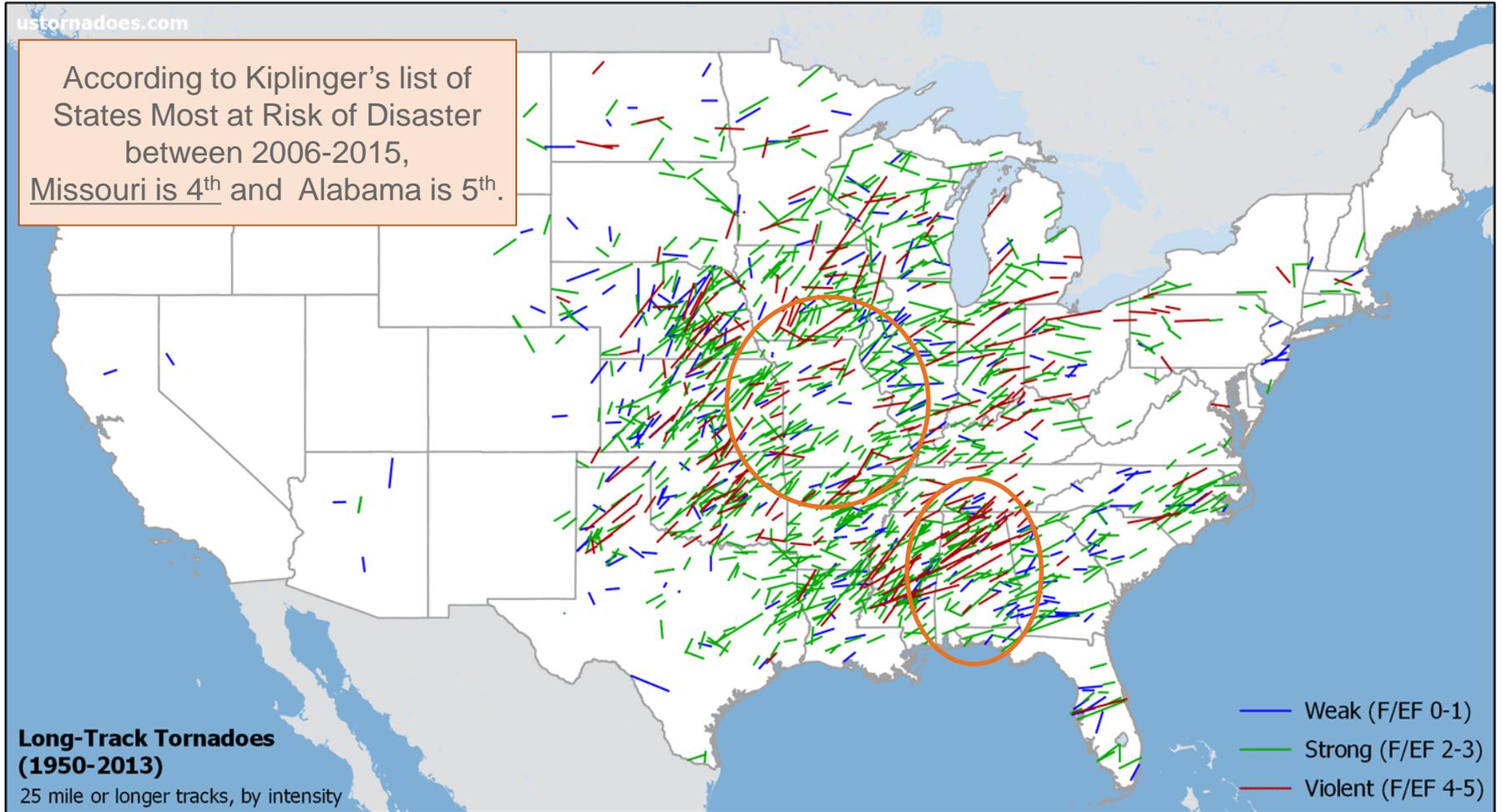


Efficiency and Environmental Benefits



Resiliency

Hospital is located near the Alabama Emergency Management Agency.



Natural Gas Equipment

- Kitchen
- Water Heating
- Condensing Domestic Water Heaters
- Condensing Hot Water Boilers
- Steam Humidifiers
- Micro-Turbines
- Waste Heat Absorption Trigen Chiller



Domestic Hot Water Heater

- Kitchen Hot Water
- 2 at 150 MBH
- Up to 96% Thermal Efficiency
- 5:1 Modulation
- Vent up to 100 equivalent feet
- Smart Controls



Hot Water Boilers

- Heating and domestic hot water boilers
- 2 at 4,000 MBH
- Ultra low emissions
- Up to 98% efficient
- 5:1 turn down
- Metal fiber premix burner



EX SPIRAL FIRETUBE



- ▶ 85% more heat transfer than a straight tube design
- ▶ Keeps hot flue gas in turbulent flow throughout profile

ALUFER FIRETUBE



- ▶ Thermal conductivity is 10 times greater than stainless alone
- ▶ Provides the maximum effective heating surface where it is needed the most
- ▶ Heating surface up to five times larger than other condensing boilers



Micro-turbines

- 2-Capstone Turbines
- 65 kw / Turbine
- Power Used Within Facility
- Turbine Exhaust Powers Absorption Chiller



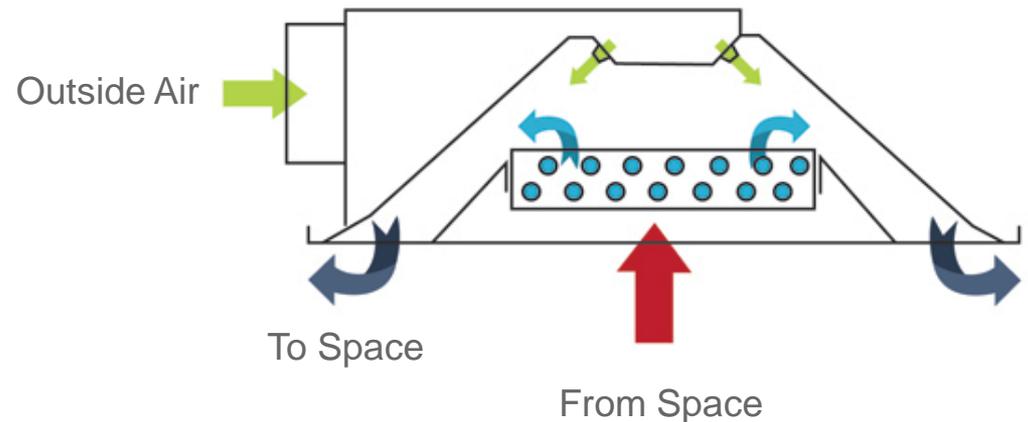
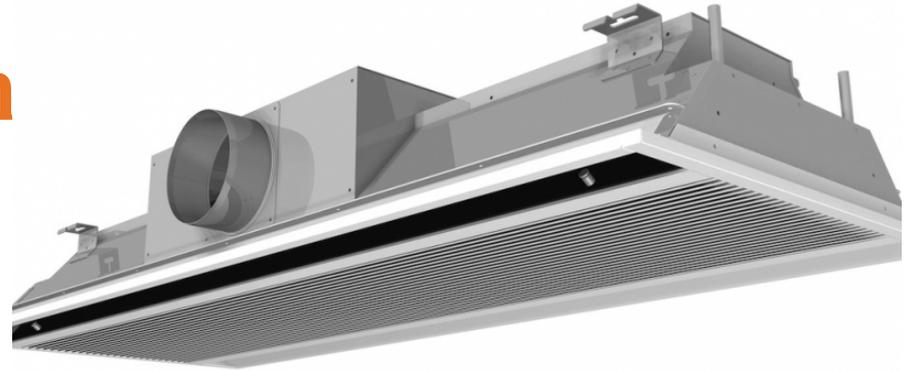
Waste Heat Chiller

- Trane Thermax Chiller
- 1-150 Ton Chiller
- Turbine Waste Heat or Auxiliary burner
- Trigen Machine provides,
 - Cooling
 - Heating Hot Water
 - Domestic Hot Water

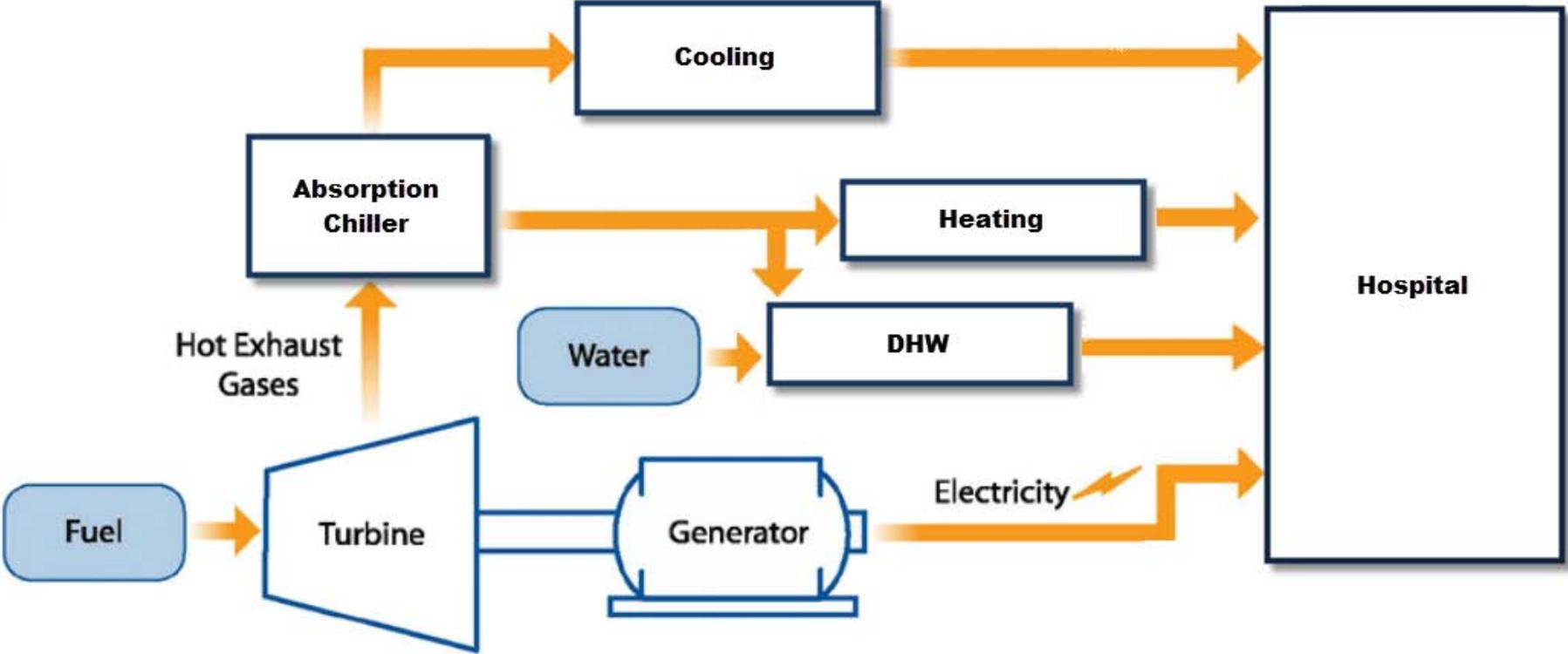


Chilled Beam System

- Saves
 - Space
 - Energy, Low Fan Energy
 - Maintenance
- Active Chilled Beams
- Passive Chilled Beams
- Hydronic Based 4-pipe Central System



Combustion Turbine with Heat Recovery Generator



Coming Soon!-Engine Driven Natural Gas Chiller

- Tecochill Natural Gas Chiller
- Supplies,
 - 150 tons of cooling
 - Waste heat for DHW and heating HW
- Resilient emergency cooling
- Reduces emergency electric generator load
- Variable speed and load following



MOB Expansion

