

# Texas Industrial Sector Market Analysis

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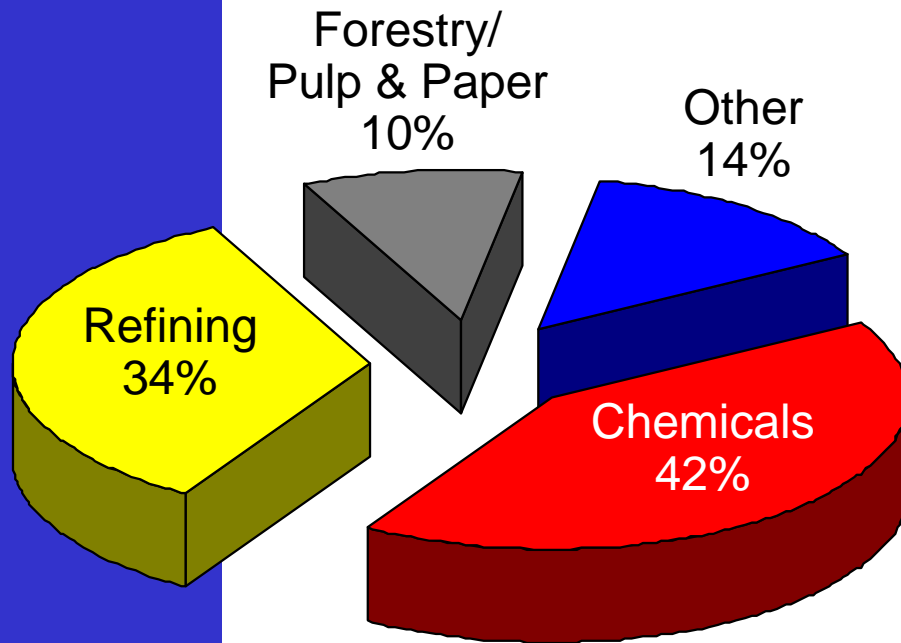
*Texas Industries of the Future*

# Introduction to Texas Industries of the Future

- Initiated in 2001 with Advisory Board representing Industry and Academia
- Located at the University of Texas, Center for Energy and Environmental Resources
- Funded by Department of Energy through SECO-extensive leveraging of federal resources
- Special focus on sectors with highest energy use: chemical, refining and forest products sectors although work with all manufacturers
- Active Chemical and Refining Sector Advisory Committee



# Texas Industrial Energy Usage



**Percentage of Total Energy Use by Type of Industry**

- Texas is the leading industrial energy user in the US
  - 53% of the energy used in Texas is consumed by the industrial sector
  - Texas consumes almost 20% of the energy used by industry in the U.S.
  - 8 % of the largest industrial energy users (sites) are in Texas.

Industrial energy usage in Texas region is dominated by 3 sectors.

# Study Background

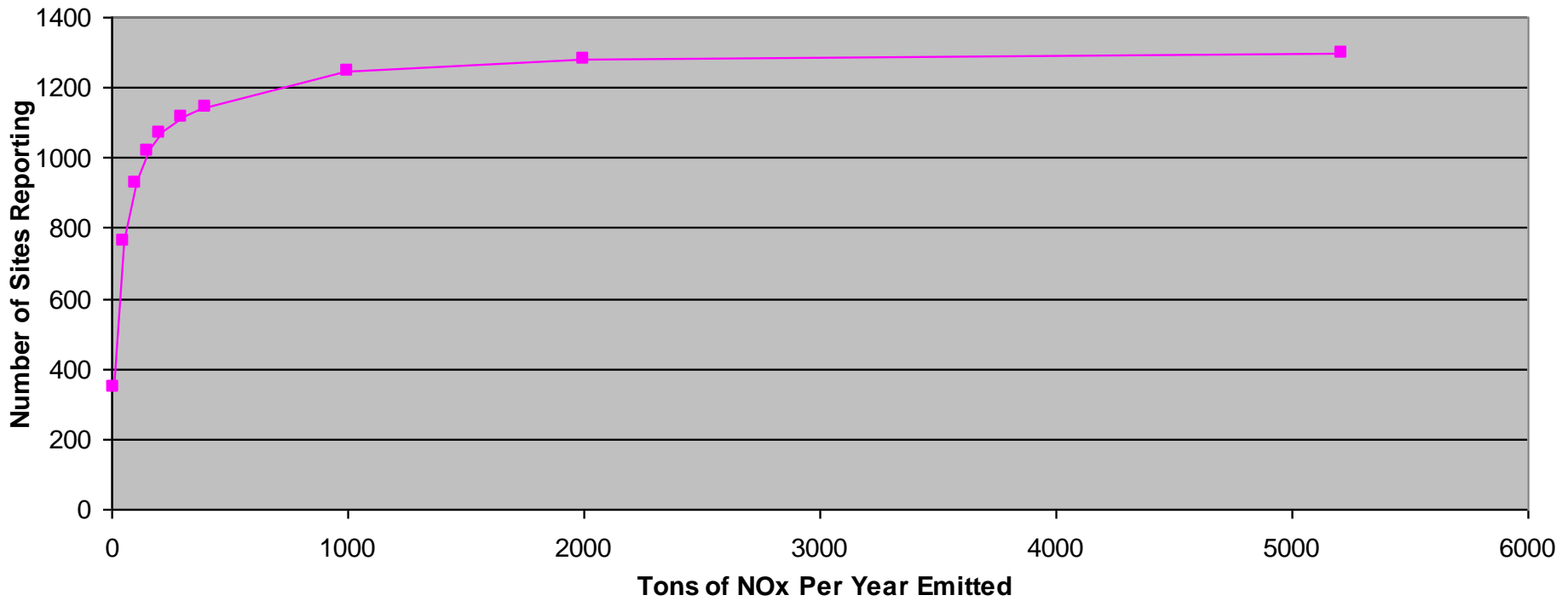
- Conducted for the HARC Clean Heat and Power Application (CHPA) Center in 2010
- Identify industrial sectors that have CHP potential in Texas
- Identify and characterize plants in those sectors
- Develop a sector-specific marketing strategy for HARC CHPA Center

# Methodology for Identifying Potential Sites

- Used Texas state environmental data on
  - point source emissions of NO<sub>x</sub> in 2007,
  - characterization of combustion units at sites, and
  - SIC code (NAICs code not available).
- Overlaid the CHP data base onto the TCEQ point source emissions data in order to identify existing CHP capacity. Did not include facilities with operating CHP from consideration.
- Did not include facilities with less than 1 ton of NO<sub>x</sub> emissions or the electric utility sector.
- Identified 1,298 sites that met these criteria.

# Potential CHP Sites by NOx Emissions

Number of Sites Emitting Less than or Equal to the X Axis Value



# Methodology to Identify Sectors

- Classified remaining sites by SIC
- Criteria for inclusion:
  - Obvious sectors due to thermal load: chemicals, refining, and pulp & paper (see US DOE *Energy Use, Loss and Opportunities Analysis*, 2004)
  - Average NO<sub>x</sub> emissions per site in sector >100 TPY
  - Many sites with one owner and > 100 TPY emissions per site
  - Total NO<sub>x</sub> emissions by sector
- 882 sites remaining

SIC Description	SIC Code	NOX Emissions (TPY)	Number of Sites	Avg NOx Emissions Per Site (TPY)	Reason for Inclusion
<b>Oil &amp; Gas Extraction</b>	13	74,503	442	169	Total emissions by sector; > 100 TPY NOX emissions per site; many sites with one owner.
<b>Chemicals &amp; Allied Products</b>	28	34,168	169	202	Potential based on emissions data, number of facilities and proven applicability of CHP technology.
<b>Stone, Clay, Glass and Concrete Products</b>	32	32,519	57	570	Potential based on emissions data, number of facilities and proven applicability of CHP technology.
<b>Natural Gas Transmission</b>	4922	26,853	181	148	> 100 TPY NOX emissions per site. Total emissions by sector.
<b>Petroleum Refining</b>	2911	22,535	23	980	Potential due to processes and need for steam. Note small number of sites.
<b>Products of Petroleum and Coal, NEC (Coke and Calcining)</b>	2999	988	3	329	> 100 TPY NOX emissions per site Note small number of sites.
<b>Paper &amp; Allied Products</b>	26	3,173	7	453	Potential due to processes and need for steam.

## Data Available for Each Unit at a Facility Reporting Emissions

- Type of Unit (ex: heater, boiler, flare, IC engine)
- Operating Hours Per Year (hrs per year; and distribution throughout year by season)
- Design Capacity (MMBT/hr)

# Educational Strategies for Reaching These Sectors/Sites

## Non-traditional CHP Sectors

- Trade Association (many smaller sites, a few owners)
- Contact with Corporate Officers (one owner with many sites)
- Identify how CHP can fill a need and the CHP technology appropriate to that sector

## Traditional CHP Sectors

- One on One (large sites, few of them)
- Find out specific obstacles for chemicals, refining, and forest products. Is there a niche that GC RAC can fill here?

# Caveats to Methodology

- Will not identify CHP opportunity at sites that only use electricity. However, this approach will identify those:
  - that have a need for steam, process heating or other thermal processes based on combustion,
  - that run these combustion processes most or all of the year, and
  - which have a large enough thermal load to warrant spending their time/resources evaluating CHP.

# For more information

Study Results or Detail:

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For State of Texas Annual Reporting System:

<http://www.tceq.state.tx.us/implementation/air/industei/psei/psei.html>