

# POLK POWER STATION

Welcomes  
Gasification Technologies Council  
March 2, 2006



# SAFETY FIRST

Requirements for walking tour:

1. Long pants, closed toed shoes
2. Hard hats, safety glasses & hearing protection will be provided



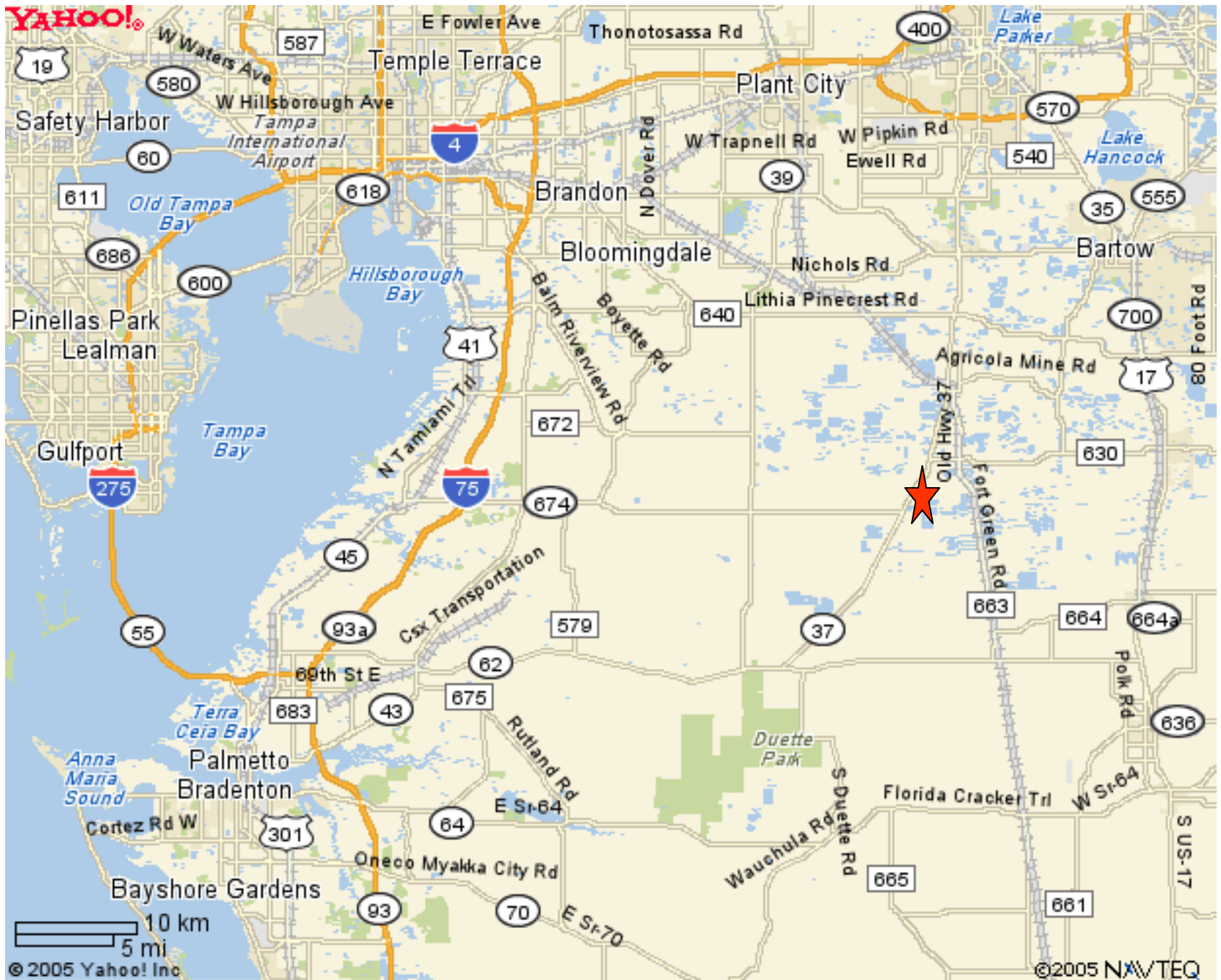
# TAMPA ELECTRIC GENERATION

• <b>BIG BEND STATION</b>	<b>1900 MW</b>
4 Coal fired steam units	
• <b>BAYSIDE POWER STATION</b>	<b>1800 MW</b>
Repowered NGCC	
One 3 on 1	
One 4 on 1	
• <b>POLK POWER STATION</b>	<b>650 MW</b>
One IGCC	
Two Peaking CT's	
• <b>PHILLIPS POWER STATION</b>	<b>36 MW</b>
Two slow speed diesels	
<b>TOTAL CAPACITY (approx)</b>	<b>4400 MW</b>

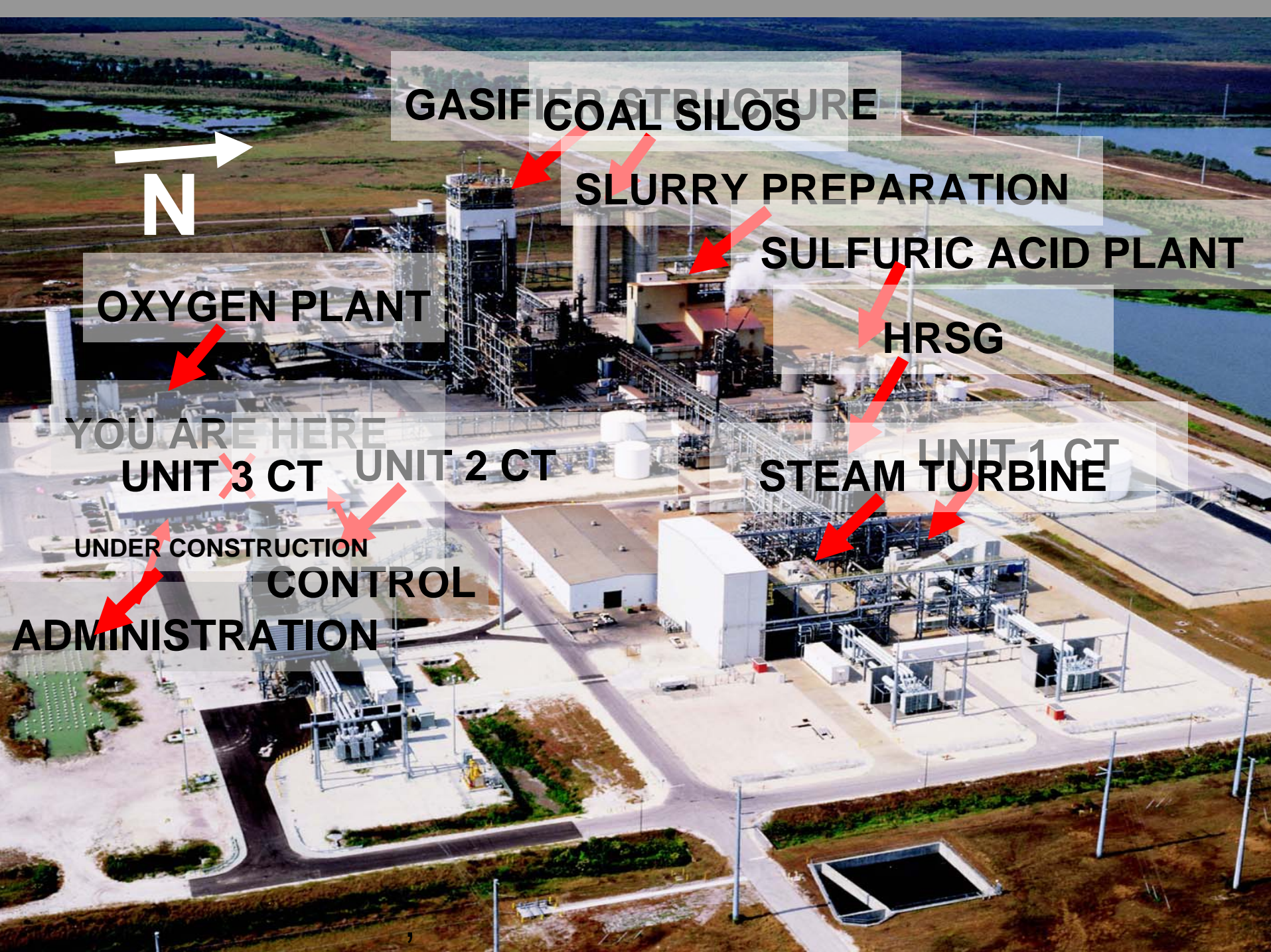
# POLK POWER STATION

- **UNIT 1 IGCC, Base load on syngas, intermediate on oil**  
**Combined cycle, GE 7F, 7221                      192MW**  
**GE D11, steam                      120MW**  
**Dual fuel, Syngas/Distillate Oil**  
**In service 1996**
- **UNIT 2 & 3 Simple Cycle CT, Peaking**  
**Simple cycle      GE 7FA+E, 7241                      165 MW each**  
**Dual fuel, Natural gas/Distillate Oil**  
**Unit 2 In service 2000**  
**Unit 3 in service 2002**
- **Employees**  
**78 Full-Time TECO Employees**  
**~22 Full Time Contractors (Maintenance, Security, etc.)**









**GASIFIED COAL SILOS**

**SLURRY PREPARATION**

**SULFURIC ACID PLANT**

**HRSG**

**STEAM TURBINE**

**UNIT 1 CT**

**UNIT 2 CT**

**UNIT 3 CT**

**CONTROL ADMINISTRATION**

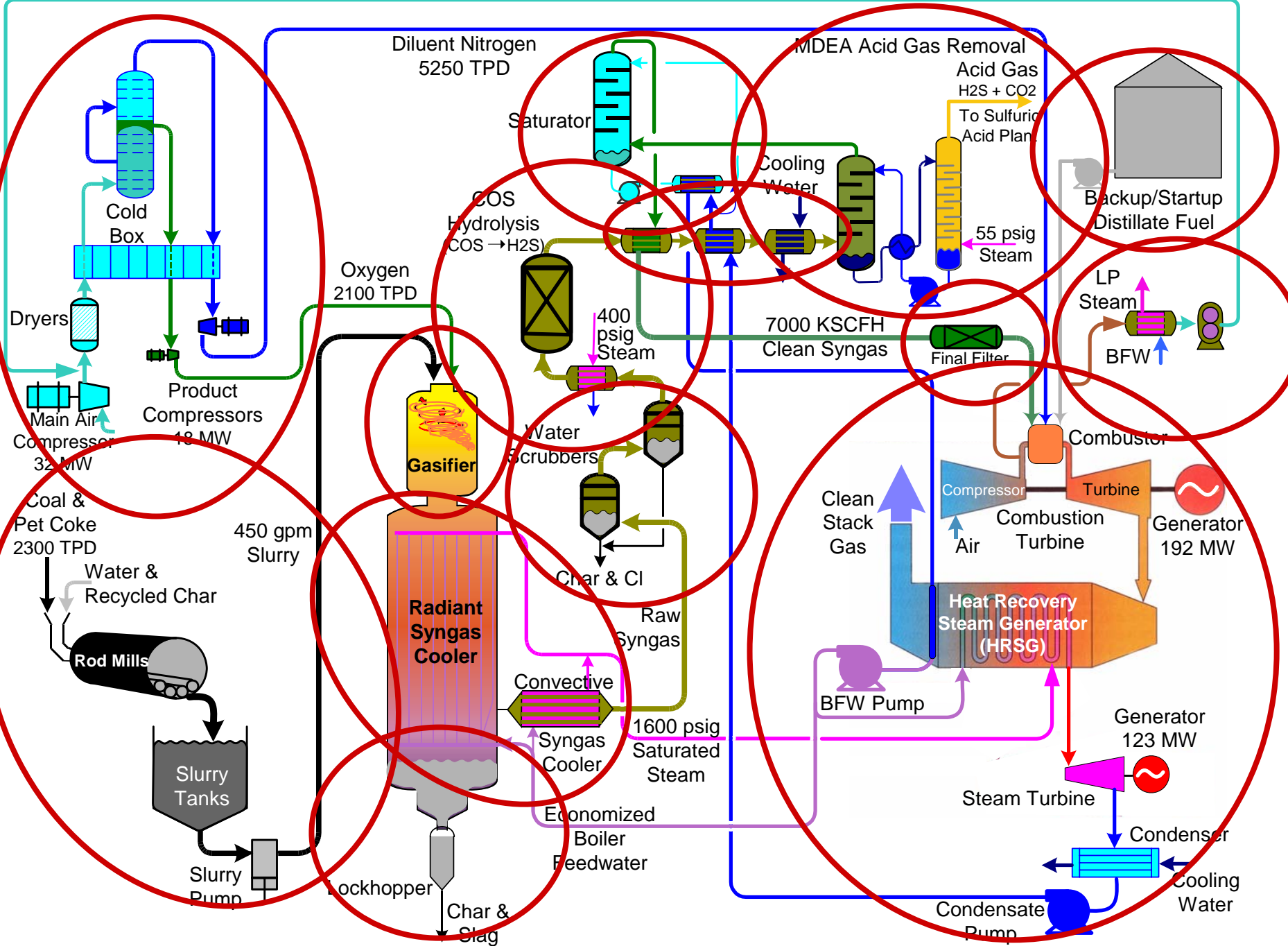
**UNDER CONSTRUCTION**

**OXYGEN PLANT**

**YOU ARE HERE**

**N**





# POLK 1 PERFORMANCE ENVIRONMENTAL

- Polk recently rated the “Cleanest Coal Fired Power Plant in North America” by the Energy Probe Research Foundation

(total emissions from 2002 TRI data)



# LOW EMISSIONS

## Typical Emissions (Lb/MMBTU)

	<u>Polk</u> (Permit)	<u>Polk</u> (Steady State)	<u>New IGCC</u>
SO <sub>2</sub>	0.14	0.12	0.013 (0.006 w/SCR)
NO <sub>x</sub>	0.055	0.04	0.064 (0.015 w/SCR)
Particulate	0.007	<0.004	0.005
Mercury	NA	NA	90% removal

(New IGCC values are basis 8,500 hhv btu/kwh net)

# OTHER ENVIRONMENTAL ADVANTAGES

- **Beneficial Reuse of Sulfur –  $H_2SO_4$  at Polk**
- **Beneficial Reuse of Slag**
- **Low Water Use (2/3 that of PC unit)**
- **Minimal solid waste (no gypsum from FGD)**
- **Zero Process Water Discharge**

# FUEL FLEXIBILITY



- Polk has proven fuel flexibility by operating on over 20 different fuels including:

Coals

Coal Blends

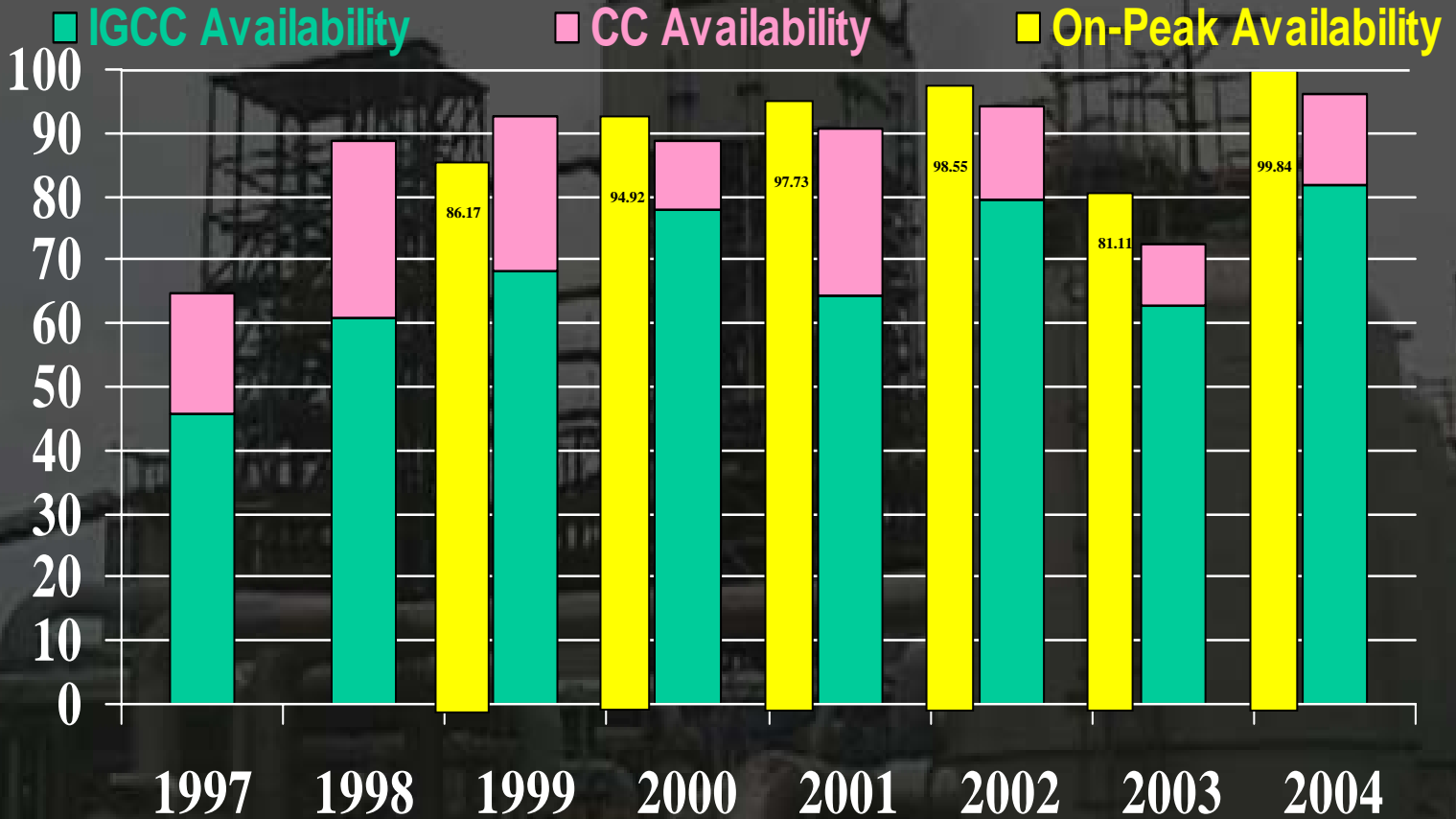
Coal/Pet Coke Blends

Coal/Coke/Biomass Blends

- Low rank fuels can be used, but hurt efficiency



# KEY AVAILABILITY STATISTICS



Calendar Year

# POLK - TEAM STRUCTURE

- NON-UNION, TEAM BASED ENVIRONMENT
- NO FRONT LINE SUPERVISORS
- RIGOROUS SELECTION PROCESS
- JOURNEYMAN LEVEL CORE SKILL (M, E, I&C)
- PAY FOR MULTI-SKILLS (no barriers)
- 5 X 10 PERSON TEAMS – 4 OPS & 1 MAINT  
(currently 7 week rotation)
- NO PREVIOUS GASIFICATION EXPERIENCE
- SIMULATOR USED FOR OPS TRAINING

# TEC's ADVANCEMENTS of IGCC

- Refractory life extension to 3 years
- Successful integration of 100% fines recycle
- NO<sub>x</sub> below 15ppm with diluent N<sub>2</sub> and saturation
- Successful zero process water discharge system
- Air extraction/integration with GE 7F turbine
- IGCC use with sulfuric acid plant
- World's leader in clean coal power production
- IGCC ambassadors, 4000+ visitors