



CHEM | E SHOW 23

november 28-30, 2023 | moody gardens, galveston, tx



Gulf Energy[®]



Enterprise-wide Energy Efficiency Fleet Monitoring Tool

Energy lives here™

Presented: 2023 ChemE Show
Energy Efficiency & Decarbonization – Projects & Programs
Date: November 28-30, 2023

Bill Hicks (EMTEC)

Contents of this presentation is based on "Enterprise-wide Energy efficiency fleet monitoring tool", Hydrocarbon Processing, Sept. 2021; [Enterprise-wide energy efficiency fleet monitoring tool \(hydrocarbonprocessing.com\)](https://www.hydrocarbonprocessing.com/enterprise-wide-energy-efficiency-fleet-monitoring-tool)

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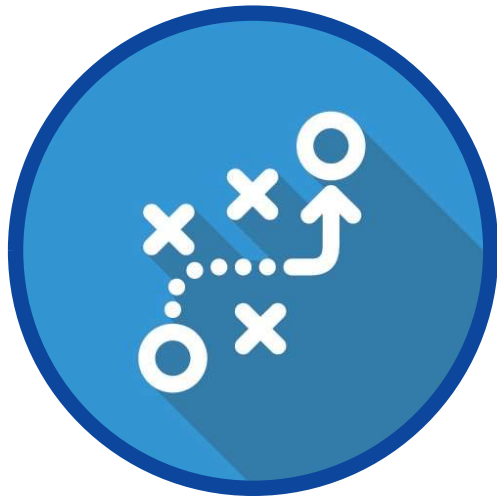


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ExxonMobil Fleet Management





Reduce CO₂ Emissions



Optimize Energy



Minimize Inefficiency

Fleet Management | Key to Efficiency Improvement

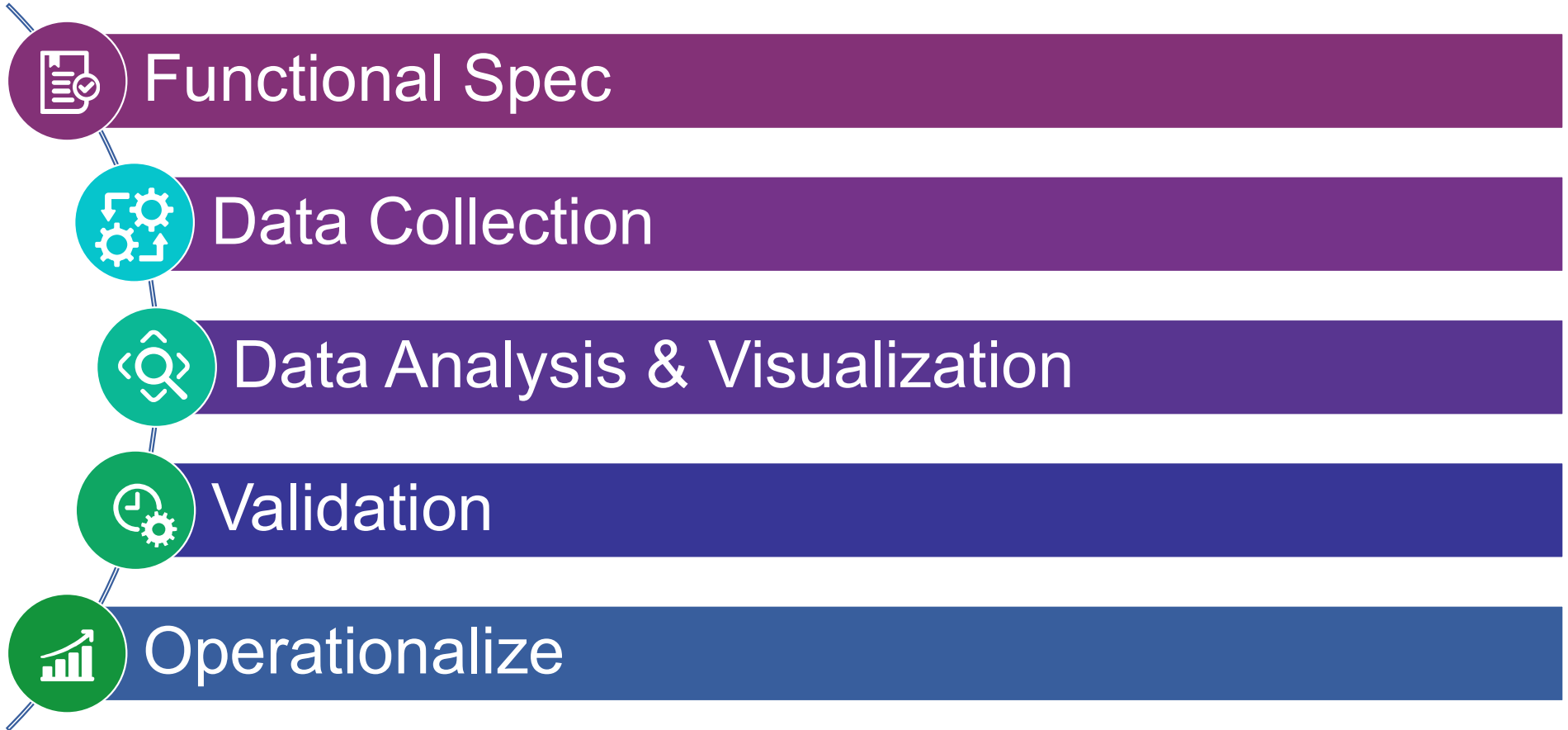
Case for Action

- Energy Efficiency
- Sustainability
- Green House Gas Emissions

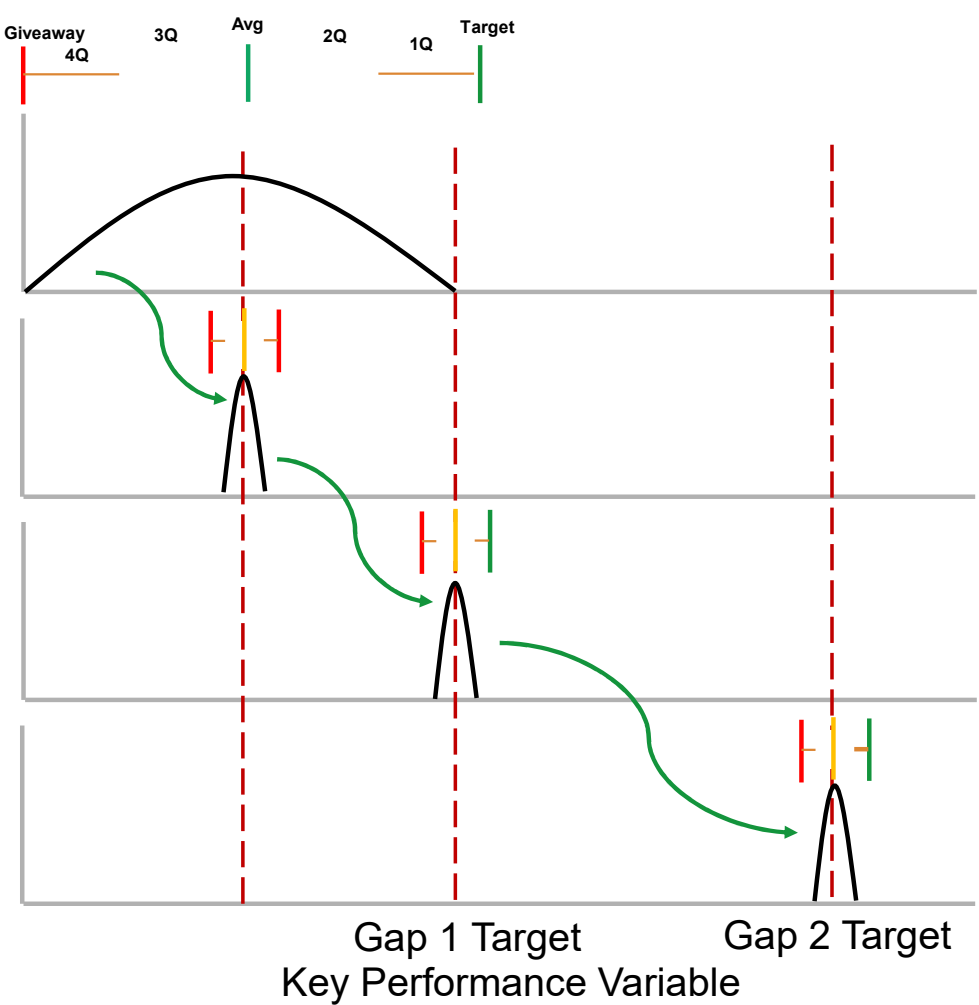
Objectives

- Identify/prioritize potential opportunities
- Gap estimate based on historical data and engineering benchmarks
- Identify long term trends
- Enterprise wide team for development and deployment

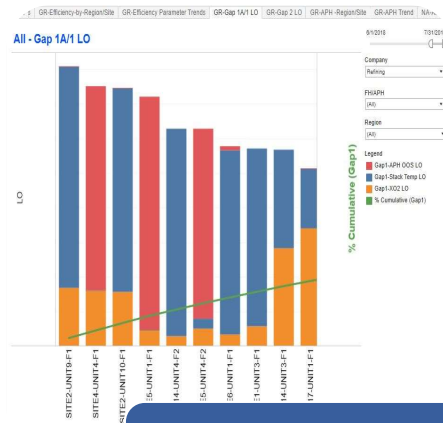
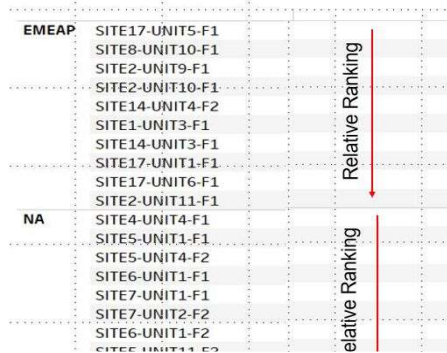
Development | Work Process



Journey To Performance Excellence

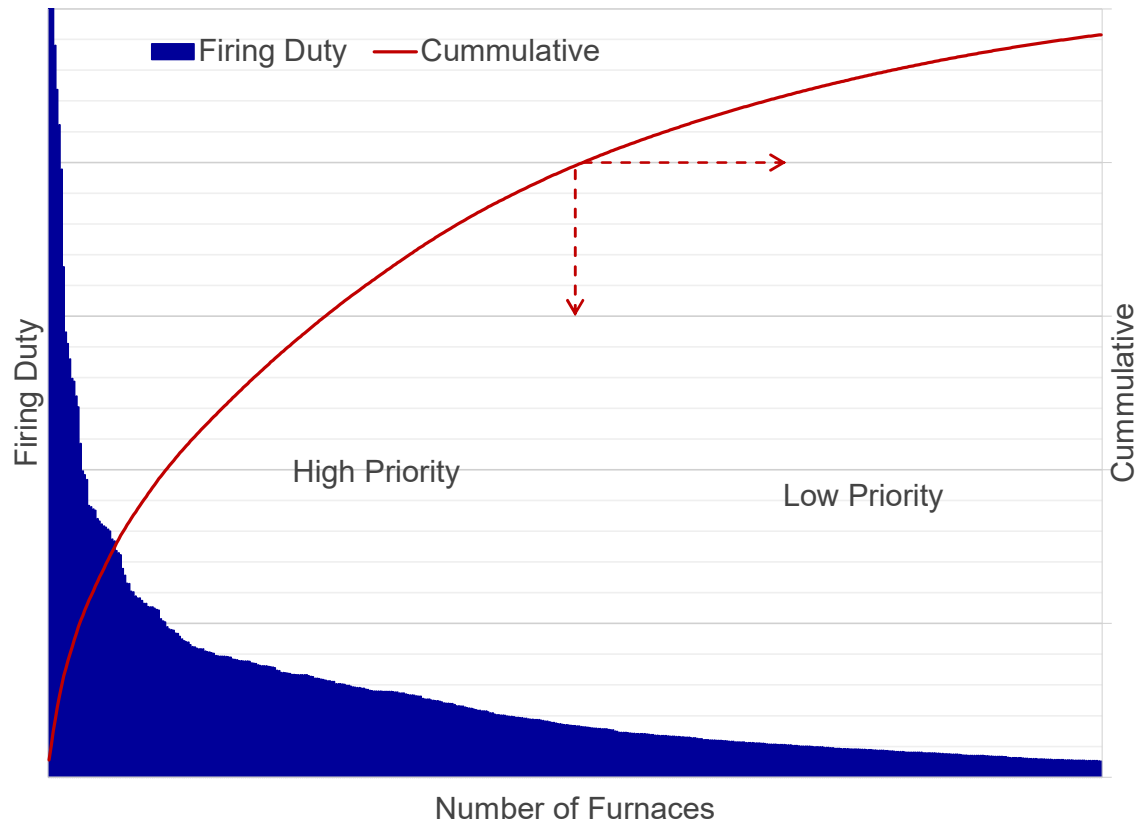


- Current**
 - High Variability
- Gap1A**
 - Reduce Variability
 - Move towards G1 target
- Gap 1**
 - Best Demonstrated
- Gap 2**
 - Best Achievable
 - Facility Changes



- Site, Subject Matter Experts, Business Team

Fleet Population & Development Scope



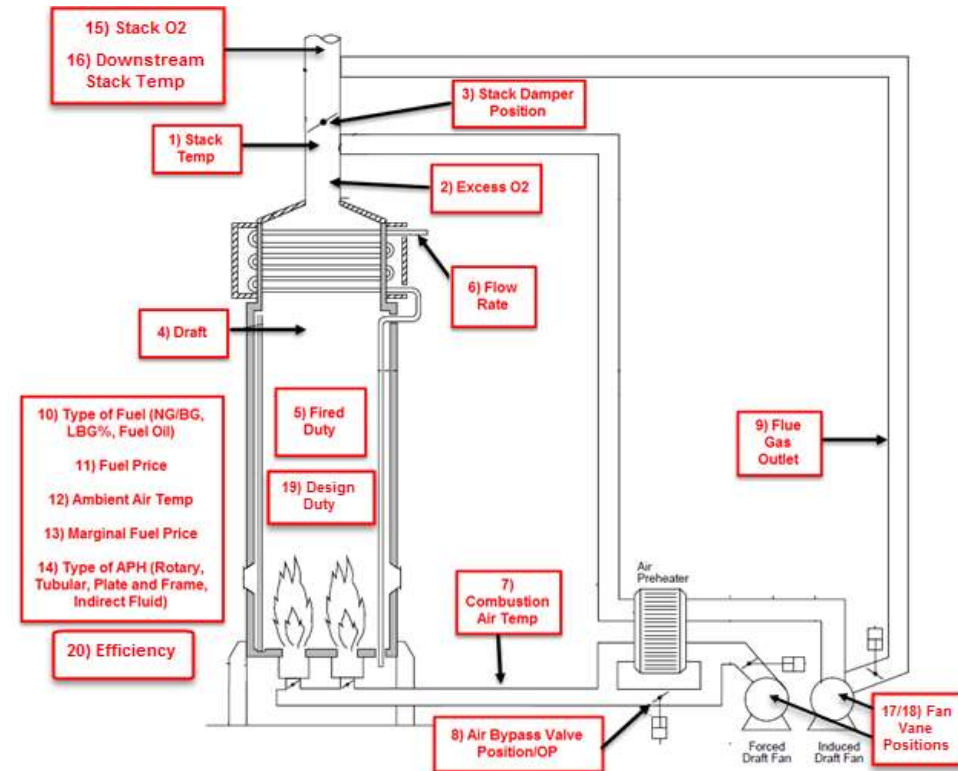
- Fleet population is prioritized based on firing duty
- All types of FH and all FH having APH



Source: Getty Images

Requirements | Process Data

- Equipment Information / tag collection
- Historical process information through data historian system
- Complete dataset uploaded into Tableau
- Validation exercise with sites and subject matter experts



Benchmarks | Target Definition



Gap 1

- Historical Performance
- 10 or 90 percentile of daily data

Gap 2

- Engineering benchmarks
- 300 - 350°F for stack temperature
- 1.5 - 2 % excess O₂

Tool Features | Big Data Handling

The background of the slide is a complex financial chart. The top half features a candlestick chart with red and green bars, overlaid with several blue and yellow trend lines. The bottom half features a bar chart with red and green bars, with a time axis labeled with months (Aug, Sep, Oct, Nov, Dec) and years (2014, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec 2015).

>250 Furnaces

>100 M Data points

Daily Data from 2011 for 20 - 30 tags + calculated values/furnace

Dashboards

Fired Heater



Fleet Population

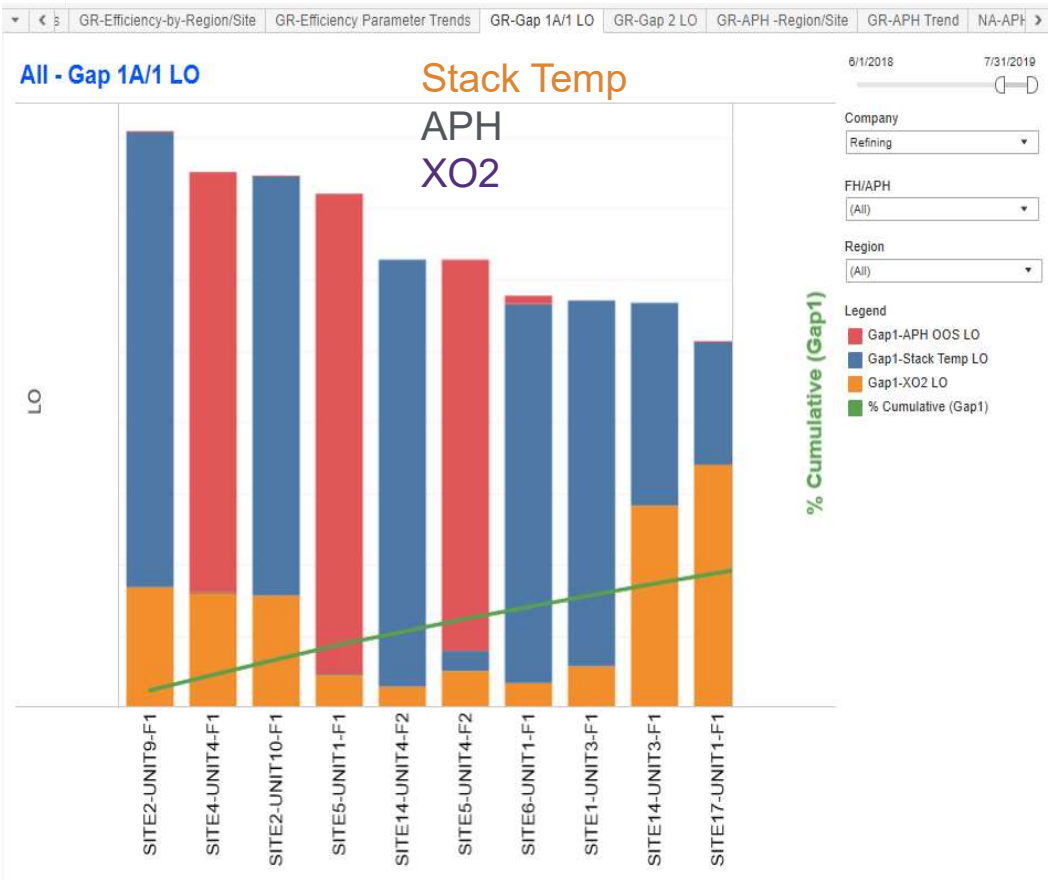
Global / Regional

Site

Equipment

Opportunities

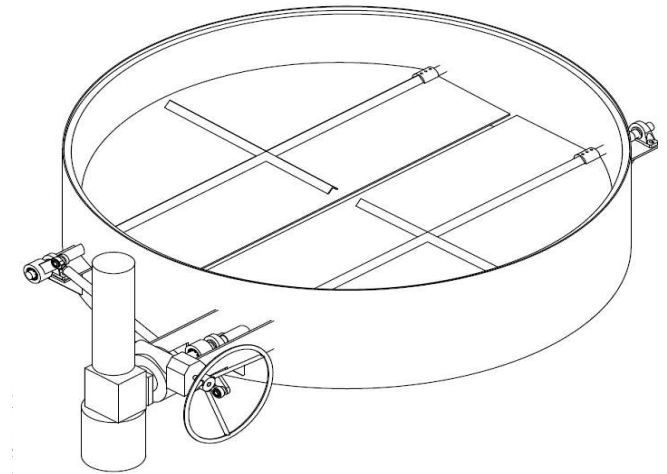
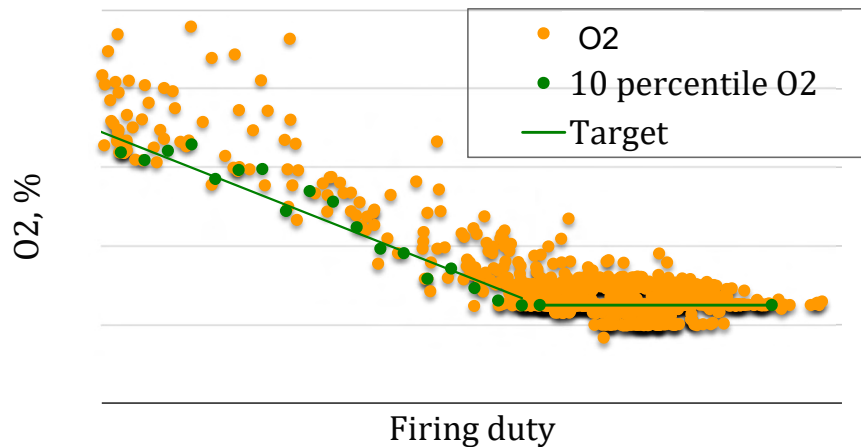
Areas for Improvement



Improve Time For Action



Excess Air | Offer Technical solution for Gap Closure



Source: Getty Images

Establish best demonstrated performance under turndown conditions

Triggers root cause investigation to minimize gap

- Damper repairs
- Seal – Leaking furnaces
- CO breakthrough testing – for turndown operations



Source: Getty Images

Stack Temperature Offer Technical solution for Gap Closure



Gap Closure Solutions

- Convection/Radiant section fouling
 - Online cleaning – Chemical clean
 - Offline cleaning – Sand blast, hydroblast etc



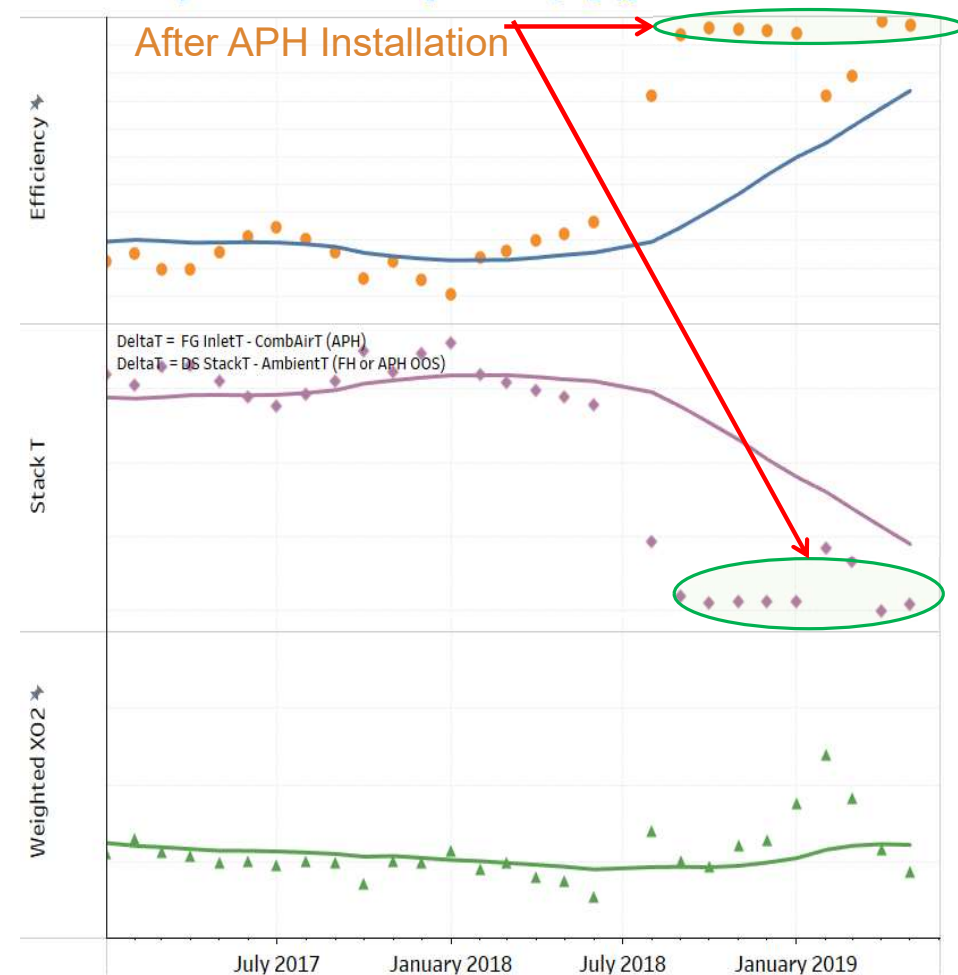
Source: Getty Images

Structural Improvements

- Provides justification for potential structural improvements
 - APH reliability improvements
 - Revamp for improved metallurgy/technology
 - Preventive regular maintenance
- APH Installation
- Tool helps to convey actual monetary loss incurred vs typical project justification
- 10-15% improvement identified at few sites and included in site execution plans

Project justification

All - Efficiency Parameter Trends [DeltaT in (degF)]



Site Empowerment | Drives Energy Excellence





Thank
you!
:D