



Oxidizer System Optimization

10 Strategies for Lowest Cost
of Equipment Ownership

ANGUIL

Anguil Environmental Systems, Inc
8855 N 55th St Milwaukee, WI 53223 USA
www.Anguil.com | info@Anguil.com



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ABOUT ANGUIL

Anguil Environmental Systems is a second generation family owned and operated environmental technology supplier headquartered in Milwaukee, WI USA with offices in Asia and Europe. With annual sales in excess of \$75 million, Anguil has been a trusted air and water solutions supplier for 40 years.



Capabilities:

- Engineering
- Equipment
- Aftermarket Services

Products/Services:

- Air Solutions
- Water Solutions
- Energy Recovery Solutions





Lowest Cost Of Ownership Strategies

1. Know your **estimated and actual oxidizer operating costs** for gas usage and electrical consumption.
2. Pay attention to **percentages**.
3. Monitor your **emission loading**. Determine what type of oxidizer System would be specified today.
4. Evaluate **modern technology**
5. State and federal **grant money**
6. Consider an **emission concentrator**
7. Focus on **combustion air**
8. Improve **primary heat recovery**
9. Consider **secondary heat recovery**
10. Properly **maintain** existing systems



#1

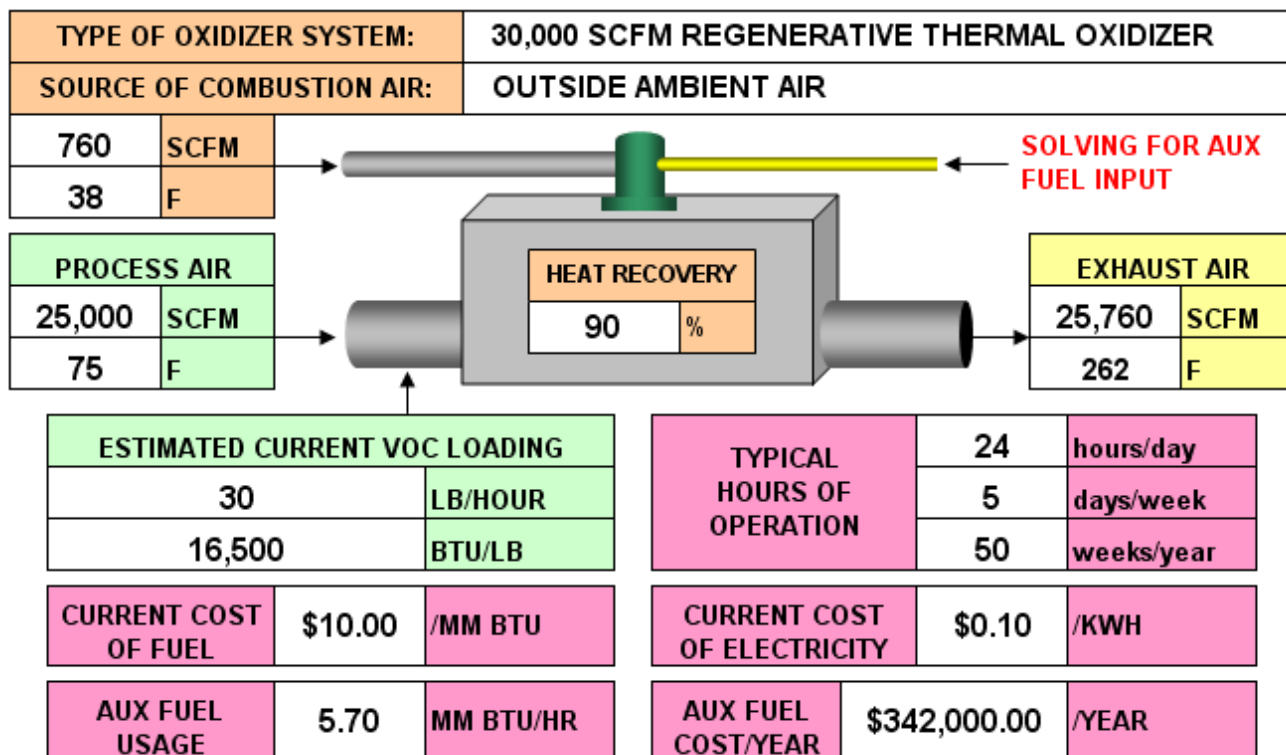
OPERATING COST
REDUCTION
STRATEGIES

Know Estimated and Actual Operating Costs

Make sure you can answer the following questions:

- What is the expected annual operating cost of our oxidizer?
- How close is our actual operating cost to that expected value?

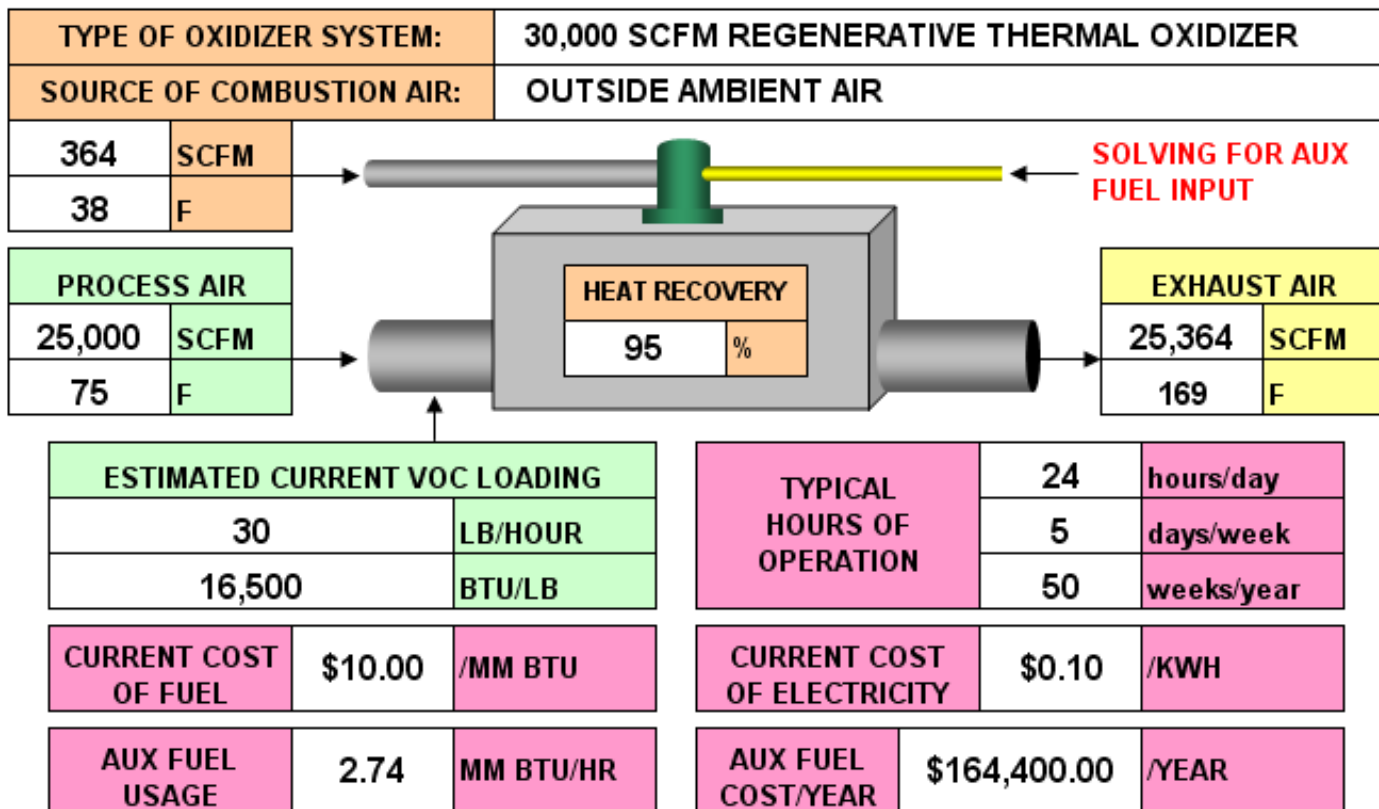
With relatively minimal inputs, oxidizer vendors can run a performance model and give you the expected operating cost range for your system. Anguil offers a complimentary [Operating Savings Analysis](#) and Consultation.





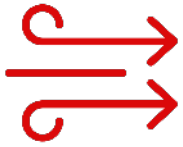
Pay Attention to Percentages

- A 1% drop in thermal efficiency for a standard RTO equates to a 20% increase in natural gas consumption.
- After 5 years of operation, an RTO originally designed for 95% Thermal Energy Recovery (TER) could slip to 93%. An average sized RTO (25,000 SCFM, 40,125 Nm³/hr) operating for a full year at 93% TER vs 95% TER could cost \$65,000+ a year!
- Percentage points accrue gradually. Get to know the critical parameters to watch as your system ages.



► **Added Heat Recovery Media to increase Primary HX Efficiency**

APPROX SAVINGS: > \$175,000.00/YEAR!



Know Your Emission Loading

Often it is peak VOC loads that determine your oxidizer design, but average VOC loads that determine your oxidizer operating cost. Operating an oxidizer designed to handle a theoretical peak loading may be costing you much more than necessary for your actual day-to-day production loading. After a couple years of operation, it may be time to re-evaluate.

- Determine your emission loadings, especially the amplitude and duration of peaks
- Have process conditions changed since your [oxidizer](#) was installed?

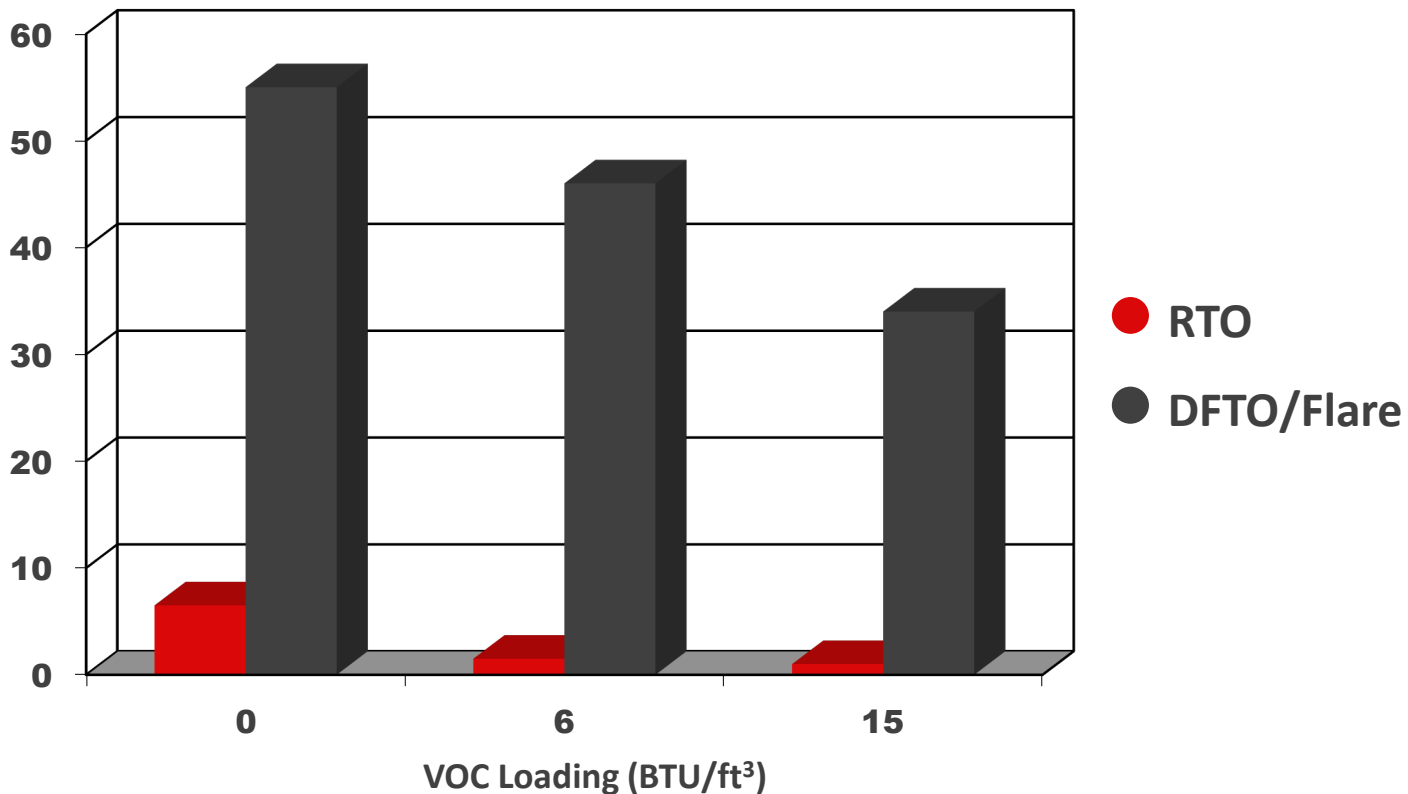




Evaluate Modern Technology

- Determine what system would be specified today - can illuminate cost effective upgrades to your existing equipment.
- Technologies and components have advanced - Knowing exactly what would be specified today can save you from sinking too much money into an outdated oxidizer system. If your system is due for repairs, a service provider like Anguil can also determine the cost effectiveness of upgrading to today's standards at the same time.
- Did you know [RTOs](#) can now reach 97% thermal efficiencies?

Operating Cost (\$/hr.)

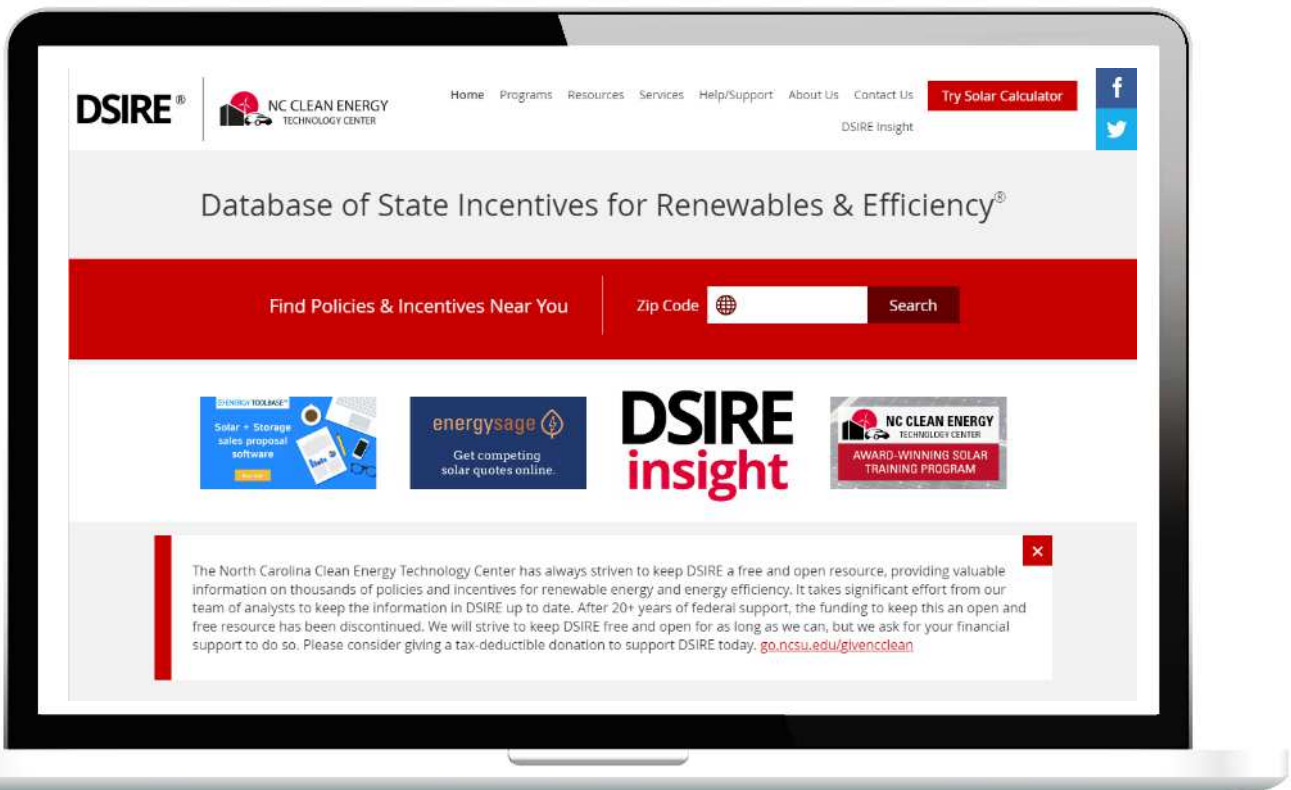




State & Federal Grant Money

Energy reduction upgrades to existing equipment will have an associated initial capital cost. This can be significantly reduced with grant money from local utility companies. Across the country, money has been earmarked for the specific purpose of funding energy reduction projects.

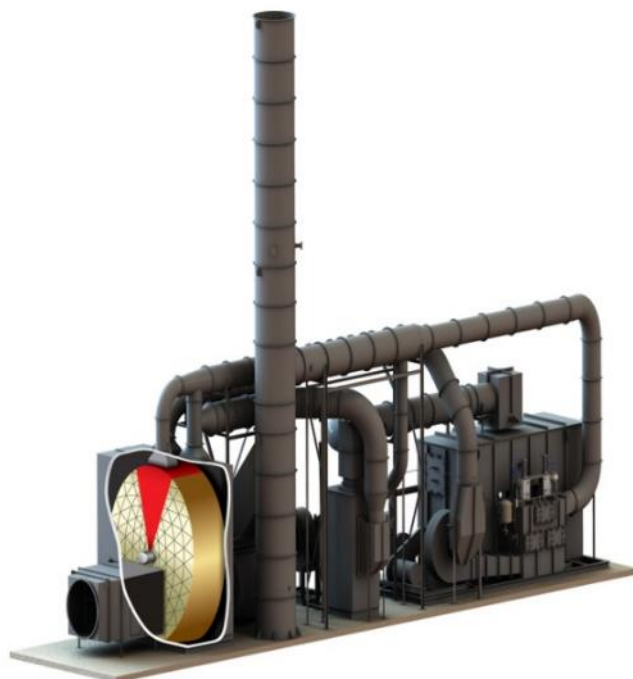
- Know what state and federal grant money is available to you.
- Database of State Incentives for Renewables & Efficiency: www.dsireusa.org





Consider an Emission Concentrator

Consider an [emission concentrator](#) for high volume, low concentration process streams. A concentrator can take exhaust air at or near ambient temperatures and concentrate it so the flow sent to the oxidizer system is reduced by a factor of eight to 15 times. This greatly reduced airflow is typically fuel-rich with VOCs and much less of an operating cost burden on the oxidizer system.



Concentrator Applicability

- Airflows > 5,000 SCFM. Lower flow rates generally make this technology uneconomical.
- Inlet Temperature < 100°F (40°C)
- VOC Concentrations < 500 ppm. Higher concentrations reduce concentration factor making this technology uneconomical.
- DREs < 99%
- Relative Humidity < 90%



Focus on Combustion Air

The smaller combustion fans are often supplying fresh air at outdoor temperatures directly into the oxidation chamber where it must be heated to full oxidation chamber temperature. At a temperature difference usually over 1400 F, this is significant operating cost dollars.

- Making sure burners are tuned properly and only firing when necessary can make a big difference.
- With [RTOs](#), a flameless supplemental fuel injection (SFI) system can eliminate the need for combustion air entirely.
- Combustion air can be preheated using a heat exchanger or a blend with stack air.

Consider [retrofits](#) that feed combustion blowers with tempered air from a secondary heat exchanger.

**Also ideal
for pre-
heating
coater
hood air!**





Improve Primary Heat Recovery

Projects improving the primary heat recovery of an oxidizer system offer the quickest payback because they always provide additional heat recovery when the oxidizer is in service.

- [Recuperative Thermal](#) and [Catalytic](#): Add additional passes to the internal air-to-air heat exchanger.
- [RTOs and RCOs](#): Increase or change the ceramic heat recovery media type or the control scheme that dictates how often beds are switched from inlet to outlet. Increasing the primary heat recovery in an [RTO](#) can result in a self-sustaining system, meaning no supplemental fuel is required during most operating conditions.



Catalytic & Recuperative

Metal Heat Exchangers
60-80% Efficient



Regenerative Thermal

Ceramic Heat Recovery Media
95-97% Efficient



#9

OPERATING COST
REDUCTION
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Consider Secondary Heat Recovery

Using ambient air for oxidizer burners is like burning money. [Heat exchangers](#) can be added to the exhaust stack of an existing oxidizer to capture excess stack heat in air, water, or even steam. Payback for these projects is greatly improved if the captured heat can be used back in the exhaust generating process itself, because again, it is assumed that the process is operating when the oxidizer is operating.

Ideal for pre-heating washer water!





Properly Maintain Existing Systems

No matter how well an overall system is designed, it cannot continue to operate at a high efficiency level without proper maintenance. A handful of small inefficiencies in system operation can lead to large operating cost bills over the course of a year.

A robust maintenance program with a trusted oxidizer service provider can ensure permit compliance, prevent operational inefficiencies, and give you the lowest total cost of ownership over the system's life. At a minimum, make sure your equipment undergoes an annual [Preventive Maintenance Evaluation \(PME\)](#).



CAPABILITIES:

AFTERMARKET SERVICES

Maintenance, Service, Repair, Upgrades, Retrofits and Spare Parts for Anguil Environmental Technologies as well as systems manufactured by others.

Preventive Maintenance

Annual Evaluations

3-Year Contracts

Predicative Maintenance

Monitoring

General Service

24-hour Emergency Service

Equipment Repair & Rebuild

Operator Training

Spare & Replacement Parts

Individual spare parts

Recommended Spare Parts

Packages

Catalyst & Media

Retrofits and Upgrades

Media Replacement

Controls Upgrades

Emission Concentrator

Integration



Additional Resources

Anguil.com

- [Introduction to Air Pollution Control](#)
- [Overview of Emission Control Technologies](#)
- [Industry & Regulatory Links](#)
- [Oxidizer Service Series](#)
- [Register My Environmental System](#)
- [24/7 Service Request](#)

Connect with Us



Anguil Environmental Systems, Inc

MAILING ADDRESS

8855 N 55th St Milwaukee, WI 53223

EMAIL ADDRESS

info@Anguil.com

PHONE

(414) 365-6400

WEB SITE

www.Anguil.com

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Committed
to Cleaner
Air and
Water

We Don't Walk Away.