



# Complete Retrofit Solutions

POWERED BY  
**ENERGYLINK**



# A BOLD NEW WORLD

Our world is ever-changing. Being at the forefront means never standing still. That is why we have created NEXT, one of the most comprehensive, scalable and cost efficient, Retrofit services available in the market today. Specifically designed to answer the question: What's NEXT for your operation? EnergyLink provides a wide scope of small and large air emissions and noise control Retrofit solutions that ensures you are compliant for today and well into the future — helping take your operations to the NEXT level.

## A COMPREHENSIVE PROGRAM

NEXT is a customized program designed for your individual needs. Our results-driven solutions that includes an extensive line of products and services, has been specifically developed to address the following issues facing operations today:

- System troubleshooting and analysis of solutions to restore system integrity and extend equipment life
- Increase Overall Productivity
- Improve Plant Performance
- Enhance Operational Flexibility
- Drive Greater Efficiencies
- Reduce Operating Costs
- Add Longevity to Assets and Facility
- Lower Environmental Impact
- Foster Positive Community Relations

## SOLUTIONS FOR AIR AND NOISE EMISSIONS

Clients from a variety of industries have called upon our engineers to bring their equipment or facilities back into compliance or to a necessary performance level. For all our products, we can offer retrofit solutions encompassing:

- Site inspection and problem analysis
- Technical evaluation
- Developing solutions for as small as field liner repair kits to as big as turnkey demolition of sections and replacements
- Sourcing of materials or fabrication of components
- On-site supervision of the installation
- Demolition and/or installation
- Commissioning
- Performance guarantee
- Turnkey abilities



## A RESPECTED LEADER

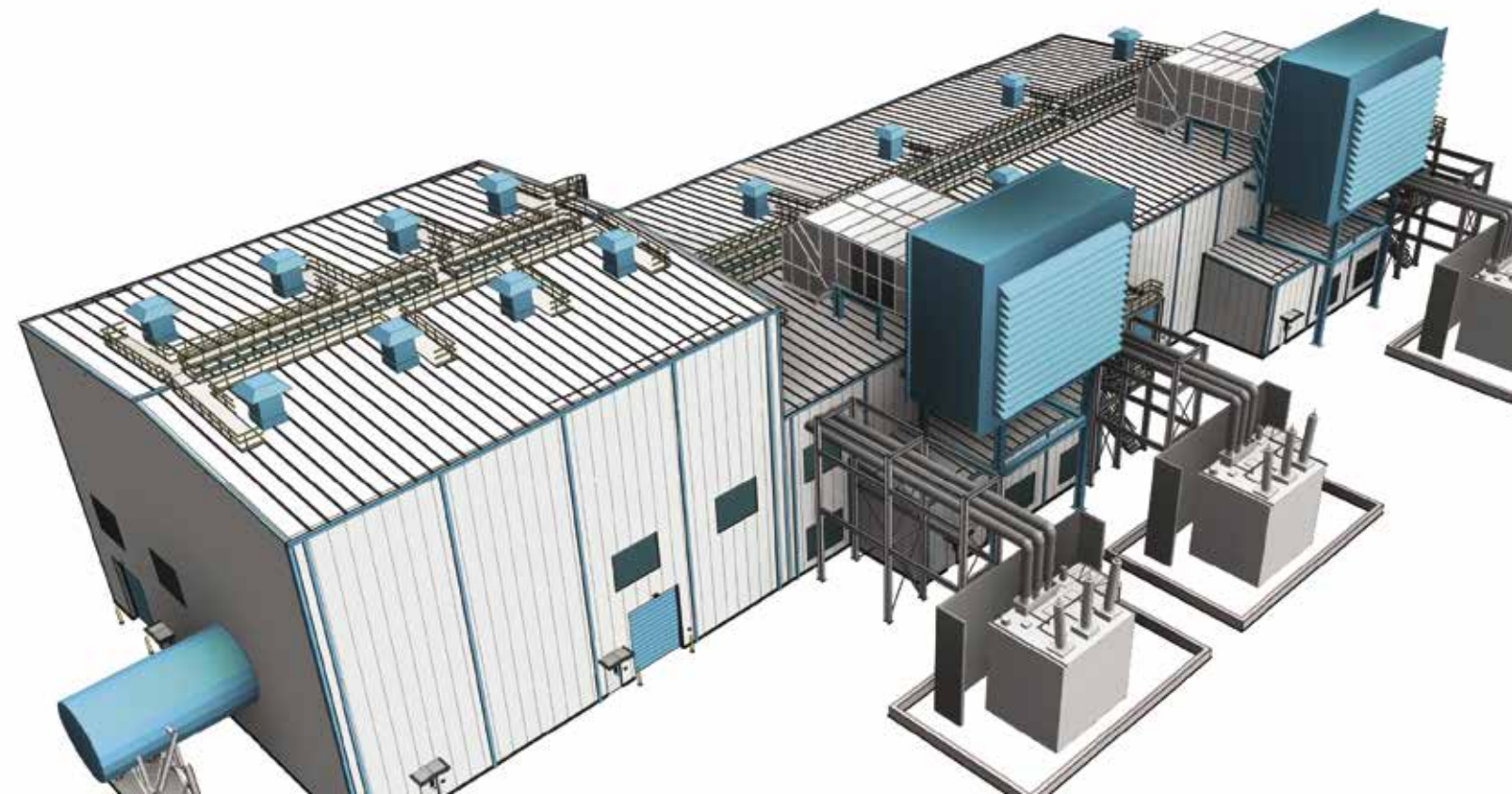
As a recognized leader in air emissions and noise control, EnergyLink International also specializes in the retrofit of industrial equipment and buildings to achieve regulatory compliance, improve efficiencies and prolong life. Whether you are contemplating an expansion to your site or requiring upgrades to your noise or air emissions control equipment or replacement of minimal parts for life extension, we can help. Through innovative technologies, leading edge-designs and intimate first-hand knowledge working with a variety of products, we can ensure your operation and equipment is performing to optimum levels. Our experience and background also enable us to look at the “big picture” as we understand how all the subsystems work together to enhance the performance of your gas turbine as well as comprehensive understanding of noise management to help you effectively identify and mitigate sound issues. Our equipment and product recommendations are based on an understanding of your overall plant ensuring complete world-class solutions for your complex challenges.

## ADDING VALUE AT EVERY STAGE

For each retrofit project and as needed, we successfully bring together engineering, procurement, project management, fabrication and construction. The benefits we offer using our turnkey approach include:

- Minimizing solution costs
- Elimination of client risk to achieve emissions or efficiency targets
- Cost savings for our clients through streamlining of the design, procurement and construction processes
- Assurance of quality
- Assurance of site safety
- Performance Guarantee

And through our team of dedicated professionals, we can provide the highest standard of delivery throughout every stage of the project.





## > AIR EMISSION SOLUTIONS

- SCR Catalyst Systems
- CO Catalyst Systems
- Ammonia Injection Systems
- Waste Heat Recovery Systems

## > GAS TURBINE AUXILIARY SYSTEMS

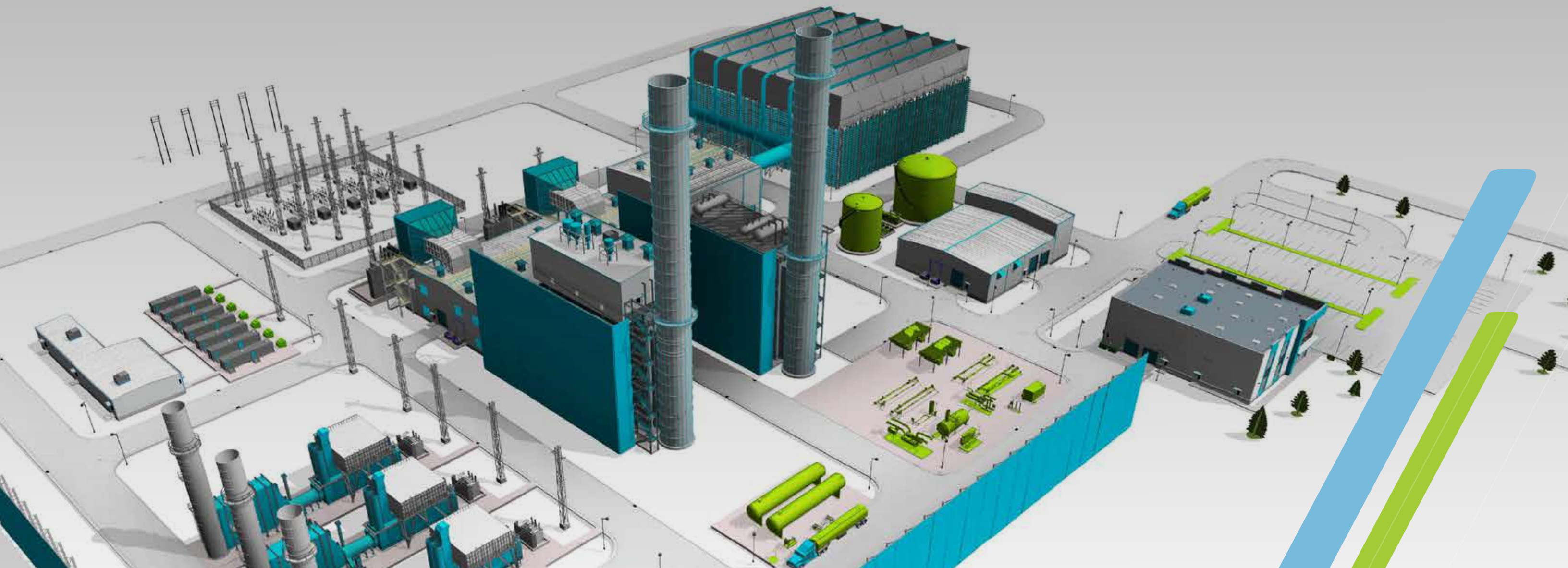
- Exhaust Silencing Systems
- Intake Silencing Systems
- Inlet Filter Houses
- Bypass Stack Systems
- Anti-Icing / Inlet Heating Systems
- Inlet Cooling Systems
- Auxiliary Skids
- Exhaust Diffusers

## > BUILDINGS AND ENCLOSURES

- Acoustic Buildings
- Non-Acoustic Buildings
- Turnkey Buildings
- Enclosures

## > NOISE CONTROL SOLUTIONS

- Barriers
- Acoustic Wall and Roof Assemblies
- Custom Silencers
- Exhaust Silencing Systems
- Site-Wide Noise Guarantee





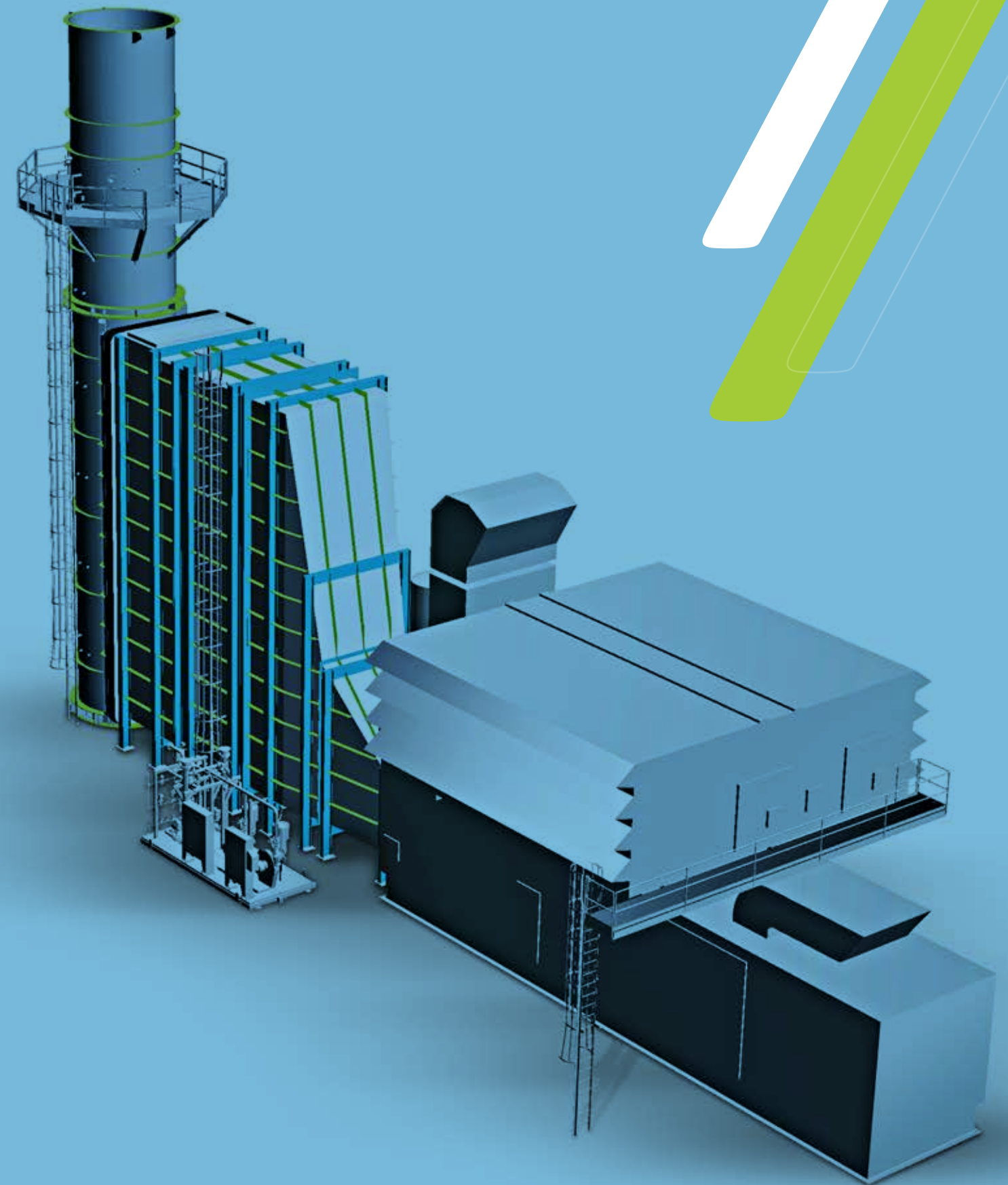
# AIR EMISSIONS SOLUTIONS

## SCR AND CO CATALYST SYSTEMS

- Unique Ammonia Injection Grid – Custom design achieves uniform  $\text{NH}_3$  to  $\text{NO}_x$  mixing providing higher system efficiency that not only meets current emission limits but purposefully exceeds them
- Superior Sealing from Frame to Casing – Ensures high performance by preventing  $\text{NO}_x$  and CO from bypassing around the catalysts
- Multi-Zone Tuning Adjustability – Units with one dimensional adjustability do not take into account duct gradients for velocity,  $\text{NO}_x$  and lance to lance ammonia flow which can cause over saturation
- Low Parasitic Loads for Higher Plant Output – Innovative designs utilize excess heat from the turbine for  $\text{NH}_3$  vaporization which saves on operating costs
- Optimized Reactor Size – Advanced solution provides streamlined flow distribution without exceeding pressure drop requirements
- Longer Life / Reduced Operating Costs – Ammonia Injection Grid's superior design minimizes ammonia slip into the atmosphere, extending catalyst life while reducing operating costs
- Flexibility (Built to Your Specifications) – Vertical and horizontal designs depending on plant configuration as well as modular designs for ease of transportation and installation
- Involvement with more than 206 SCR and CO Emissions Control Systems as well as over 1,200 Exhaust Systems
- Experience spans from small aeroderivative to large frame sized machines and virtually all gas turbine configurations
- Design confirmation through CFD and physical flow models
- Modular construction for easy shipment and site erection

## AMMONIA INJECTION SYSTEM

- Unique ammonia injection grid design for more efficient exhaust gas/ammonia mixing
- Improved system efficiencies, resulting in a more compact system footprint, reduced cost and lower pressure drop
- Fast-start ammonia injection system
- Aqueous and anhydrous ammonia systems



# DEMONSTRATED EXPERTISE

EnergyLink International’s team is a recognized leader with gas turbine technologies. The following is a comprehensive list of the extensive experience our members have with different types of gas turbines.

<b>Siemens</b> <ul style="list-style-type: none"><li>• SGT5-9000HL</li><li>• SGT5-8000HL</li><li>• SGT5-8000H</li><li>• SGT6-9000HL</li><li>• SGT6-6000G (W501G)</li><li>• SGT5-4000F (V94.3A)</li><li>• SGT6-4000F (V84.3A)</li><li>• SGT6-8000H</li><li>• SGT6-5000F (W501F)</li><li>• SGT6-3000E (501D5A)</li><li>• SGT5-2000E (V94.2)</li><li>• SGT6-2000E (V84.2)</li><li>• SGT-900 (W251)</li><li>• SGT-800</li><li>• SGT-750</li><li>• SGT-700</li><li>• SGT-500 (ABB GT-35)</li><li>• SGT-600 (Alstom GT-10)</li><li>• SGT-400 (Cyclone)</li><li>• SGT-300 (Tempest)</li><li>• SGT-200 (Tornado)</li><li>• SGT-100 (Typhoon)</li><li>• KG2</li><li>• SGT-A65 (Industrial Trent 60)</li><li>• SGT-A45</li><li>• SGT-A35 (Industrial RB211)</li><li>• SGT-A05 (Industrial 501-K)</li><li>• DR50G</li><li>• DR61</li><li>• DR990</li><li>• RLM1600</li><li>• Avon (Coberra)</li><li>• SGT 1000 F</li><li>• SGT 3000 F</li><li>• V64.3A</li><li>• V84.2</li><li>• V84.3</li><li>• V84.3A</li><li>• V94.2</li><li>• V94.3A</li></ul>	<b>General Electric</b> <ul style="list-style-type: none"><li>• Frame 9HA.01/9HA.02</li><li>• Frame 7HA.01/7HA.02/7HA.03</li><li>• Frame 9F.05</li><li>• Frame 9F.03/9F.04</li><li>• Frame 7F.05</li><li>• Frame 7F.04</li><li>• Frame 9E.03/9E.04</li><li>• Frame 7E.03</li><li>• GT13E2</li><li>• Frame 6F.03</li><li>• Frame 6F.01</li><li>• Frame 6B.03</li><li>• Frame 5</li><li>• GT 11N1</li><li>• GT 11 N2</li><li>• GT 13E2</li><li>• GT 24</li><li>• GT 26</li><li>• GT 40</li><li>• LMS 100</li><li>• LM 1500</li><li>• LM 1600</li><li>• LM 2500</li><li>• LM 6000</li><li>• 11 N2</li><li>• 13 E2</li><li>• ABB 11 N</li><li>• ABB 11D2</li><li>• ABB 11 N2</li><li>• ABB 13 D</li><li>• ABB 13 E1</li><li>• ABB 13 E2</li><li>• ABB GT 24</li><li>• Alstrom GT 11N2</li><li>• Alstrom GT 13E2</li><li>• Alstrom GT26</li><li>• Alstrom GT 8</li><li>• Alstrom GT13E2</li><li>• Alstrom GT26B</li><li>• F9FA</li><li>• Nuovo Pignone PGT 25</li><li>• Nuovo Pignone PGT 16</li></ul>	<ul style="list-style-type: none"><li>• Nuovo Pignone PGT 10</li><li>• TCPL LM 500</li><li>• Trent 60</li></ul> <b>GM – Allison Gas Turbine Operations</b> <ul style="list-style-type: none"><li>• Allison 501</li></ul> <b>Orenda</b> <ul style="list-style-type: none"><li>• OT 3</li><li>• OT F 390</li></ul> <b>Centrax</b> <ul style="list-style-type: none"><li>• 4 MW</li></ul> <b>Dresser Rand</b> <ul style="list-style-type: none"><li>• DR 61</li><li>• DR 990</li></ul> <b>Hitachi</b> <ul style="list-style-type: none"><li>• 6541</li><li>• H25</li></ul> <b>Mitsubishi Hitachi Power Systems</b> <ul style="list-style-type: none"><li>• M 501 F</li><li>• M 701F4</li><li>• M 701 F5</li><li>• M 701 F</li><li>• M501 GAC</li></ul> <b>Pratt and Whitney</b> <ul style="list-style-type: none"><li>• FT 4C– 1 DLF</li><li>• FT 8</li></ul> <b>Rolls Royce</b> <ul style="list-style-type: none"><li>• 501K</li><li>• 501 KB5</li><li>• 501 KB7</li><li>• 501 KC5</li><li>• 501 KC7</li><li>• Avon</li><li>• Coberra 2000</li><li>• RB211</li><li>• Trent</li></ul>	<b>Solar Turbines</b> <ul style="list-style-type: none"><li>• Titan 250</li><li>• Titan 130</li><li>• Mars 100</li><li>• Mars 90</li><li>• Taurus 70</li><li>• Taurus 60</li><li>• Centaur 50</li><li>• Centaur 40</li><li>• Saturn 20</li><li>• Mars 100 S</li><li>• Mars T14000</li></ul> <b>Westinghouse</b> <ul style="list-style-type: none"><li>• 251</li><li>• 251 B</li><li>• 251 B12</li><li>• 252B</li><li>• 501 A</li><li>• 501 D</li><li>• 501 D5</li><li>• 501 D5A</li><li>• 501 DA</li><li>• 501 F</li><li>• 501 FD</li><li>• 501FD2</li><li>• 501FD3</li><li>• 501G</li><li>• 701D</li><li>• 701F</li><li>• W25</li></ul>
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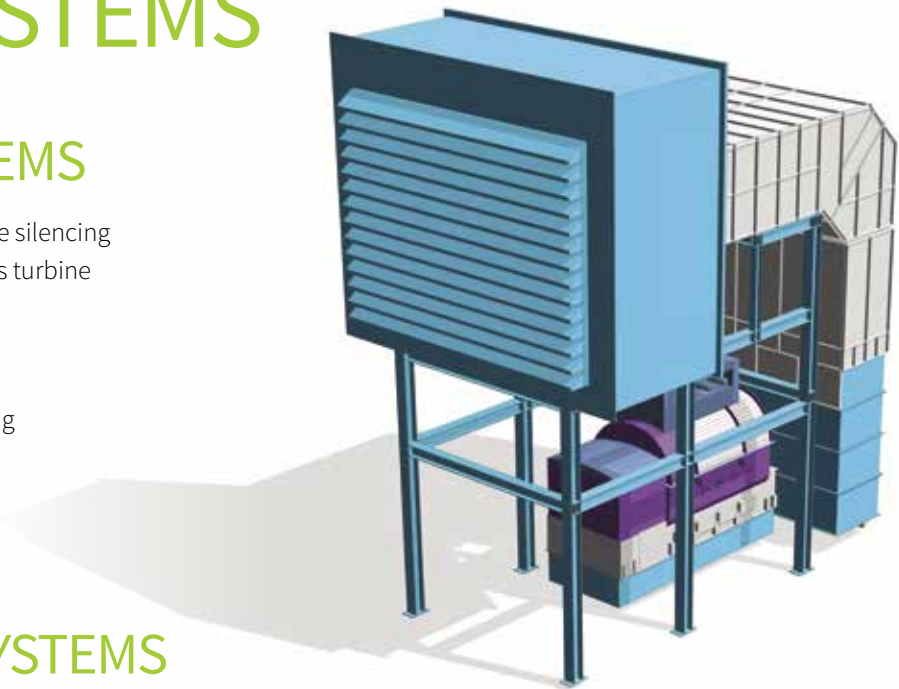
# GAS TURBINE AUXILIARY SYSTEMS

## INLET SILENCING SYSTEMS

- Sound absorption (baffles) effortlessly provide silencing of high-low frequency noise caused by the gas turbine
- Retrofit for optimum noise reduction
- High level of noise attenuation
- Tough-built baffle system
- Materials proven to provide optimum silencing
- Guaranteed performance
- Minimal pressure loss
- In-house CFD & FEA tested

## EXHAUST SILENCING SYSTEMS

- Exhaust systems for simple cycle and combined cycle
- Our team has over 100 years’ combined experience and have equipped auxiliary systems for +1200 gas turbines
- We can develop retrofit designs for existing exhaust systems with proven short-term payback periods for operators
- Better and more durable baffle with insulated hot gas path to mitigate casing radiated noise
- Low fabrication cost
- Designs for any turbine model
- OEM approved designs
- Octave band guarantees
- Satisfy the most stringent acoustic requirements including low frequency noise
- Design, build and install lined or unlined stacks or ducts
- Highly engineered and tested
- In-duct flow and noise measurements
- Exhaust system integrity analysis
- Low frequency and vibration analysis
- Scale model for flow simulation





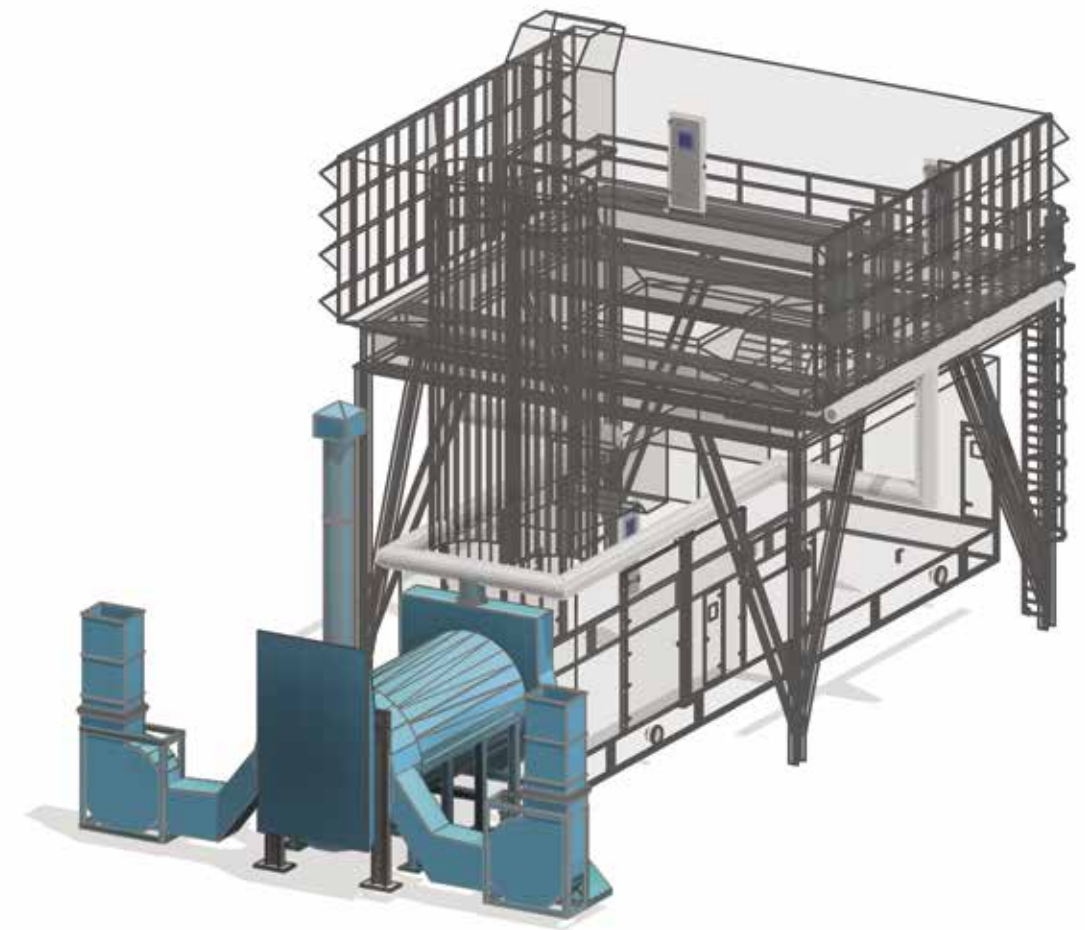


## ANTI-ICING/INLET HEATING/ WASTE HEAT RECOVERY SYSTEMS

- Our Anti-icing protection systems prevent ice formation or accretion on the turbine inlet filters and ducting
- Our Inlet Heating system promotes uniform mixing because of the large number of nozzles and low velocity of mixing
- Negligible pressure drop
- No noticeable reduction in engine efficiency
- Low cost operation & maintenance
- No glycol spills and environmental damage / concerns
- Activation at any time during operation
- No additional silencing required
- Can be used for inlet heating applications

### Example:

- » 1" wg pressure drop reduction = 0.355% power output gain
- » A 50 MW GT will yield an additional 177KW of power
- » Over 4 months of use at \$0.10/KWh, revenue will increase \$50,000.00




## INLET COOLING SYSTEMS

- Evaporation cooling systems on filter houses is the most cost-effective way to improve gas turbine performance during peak demand and hotter weather conditions
- Lowered firing temperature when compressing fuel, reduces wear and tear during ignition
- Enhances compression performance and enables more fuel to be ignited without increasing the firing temperature

## AUXILIARY SKIDS

- Efficient installation time with less field assembly since components are already incorporated on the structural base
- Cost effective – EnergyLink can design a prefabricated fully integrated skid with our single-source design and manufacturing capabilities
- Our team's extensive portfolio of designing sophisticated auxiliary skids include:
  - » Ammonia Vaporization Skids
  - » Tempering Air Skids

## EXHAUST DIFFUSERS

- Increases pressure recovery for a wide range of operating conditions
  - High-quality construction for reliable long-life
  - Our Diffusers are specifically designed to cope with strong gas turbine exhaust gas swirl characteristics, high gas velocities, and high temperatures.
  - Negligible pressure drop
  - No reduction in engine efficiency
  - Low cost operation & maintenance
- 

# BUILDINGS AND ENCLOSURES

## ACOUSTIC BUILDINGS

- Extensive acoustic transmission loss data provides us with key insights (sound transmission loss for wall and roof assemblies)
- Provide acoustic assemblies from STC 30 – STC 70
- Select different acoustic assemblies for different parts of building to further optimize cost reduction, delivering greater value
- Mix and match solutions to optimize costs and guarantee performance.
- Design and supply of powered ventilation systems working together with acoustic assemblies to optimize balance design
- Structural decoupling of the building envelope systems for reduced flanking noise transmission (reduce structure born noise transmission)
- Designed, supplied and/or installed more than 846 buildings
- Guaranteed performance

## NON-ACOUSTIC BUILDINGS

- Structural, mechanical, electrical engineering for complete building design
- Pre-engineered, conventional steel or hybrid systems
- In-Situ or Panelized options for building envelope
- Flexible to client scope requirements with structures or envelopes only
- Solutions are customizable to clients needs
- Technical field assistance and quality assurance available on-site throughout the construction process
- Experienced with different roofing types from sloped to membrane, etc.
- Designed for any seismic, wind load
- Industrial process-type applications from small to large and simple to complex buildings
- Excelling at complex industrial buildings – process and energy related buildings

## TURNKEY BUILDINGS

- Structural, mechanical, instrumentation and controls, electrical engineering for building design
- Interior fixtures and finishes
- Metal clad, pre-cast, masonry or panel design
- Electrical, plumbing and HVAC
- Building foundations
- Cranes
- Mezzanine
- Fire protection
- Fire-rated walls (demising walls fire-rated acoustic rated demising and envelope walls or both)

## ENCLOSURES

- Free standing or on-skid – design, supply and/or install
- Removable and relocatable options
- Removable panels for equipment access and installation
- Explosion panels
- Protecting equipment to further extend equipment life span
- Advanced acoustic enclosure sealing significantly reduces noise leakage
- Have designed for STC 30 – STC 70
- Applications include turbines, compressors, generators, HRSG penthouse, pump buildings, utility enclosures, blowers, feed water pumps, ID and FD fans and many more





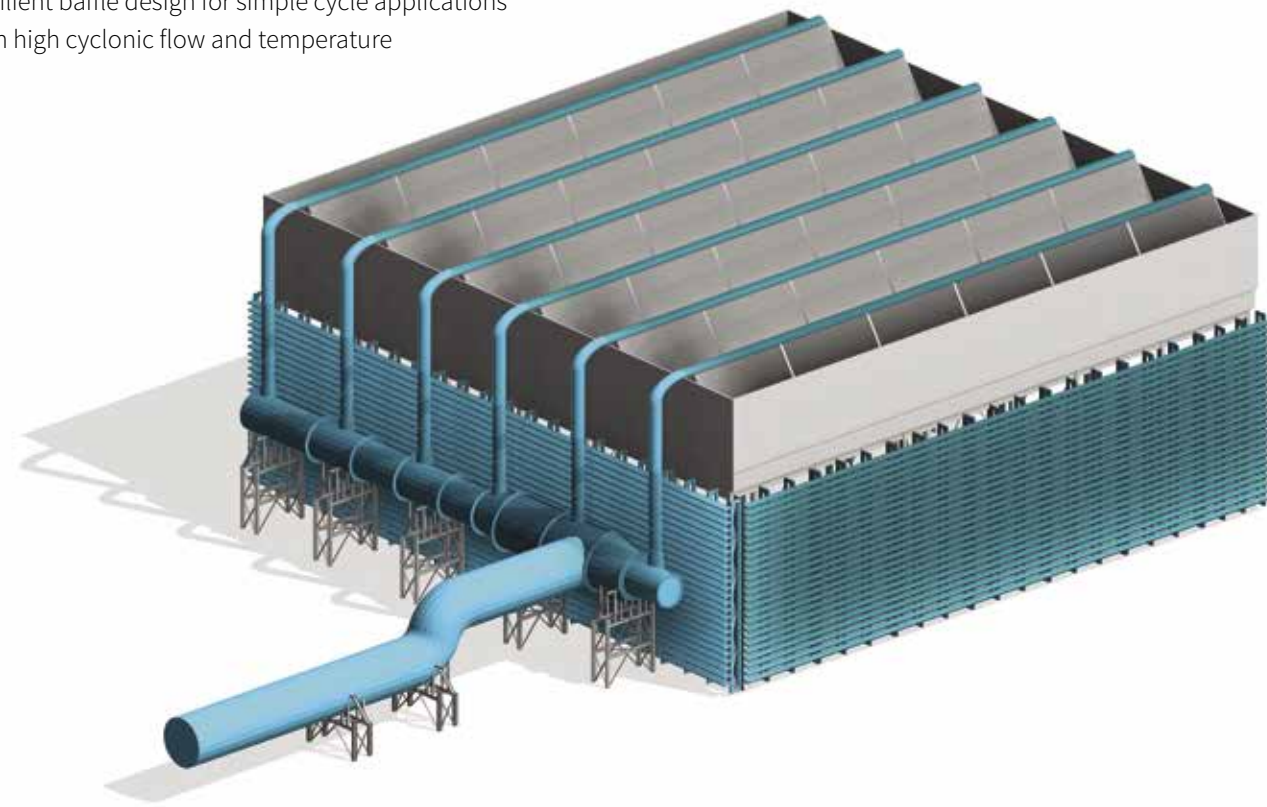
# NOISE CONTROL SOLUTIONS

## CUSTOM VENT SILENCERS

- Air handling, dust collection, blowers, steam vents, blowdown vents, exhaust flues, cooling towers, ID and FD fans, and more...
- Manufactured to SME and ISO standards

## EXHAUST SILENCING SYSTEMS

- Acoustically isolated interior liners to restrict casing radiated noise break-out
- Special applied vibration isolation to reduce structure born noise
- Designed for high life cycle
- Flexible structural design – vertical, horizontal, round or rectangular stacks or combinations
- Multi-stage high performance silencers
- Octave band guarantees
- OEM approved designs
- Highly engineered and tested
- Resilient baffle design for simple cycle applications with high cyclonic flow and temperature

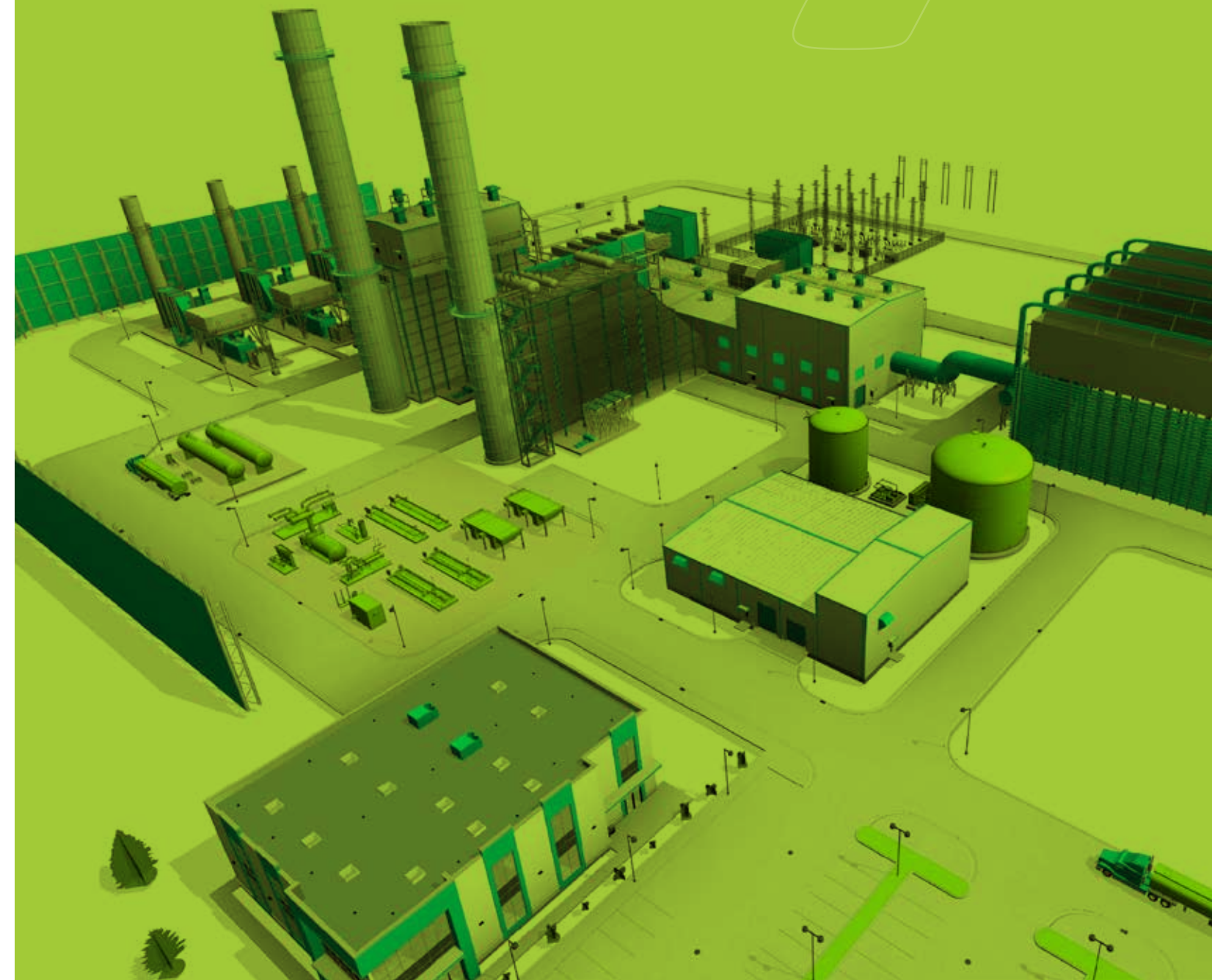


## NOISE BARRIERS

- Different applications – very standard 6 ft tall to over 100 ft design and install
- Permanent and temporary
- Foundations – significant experience with all types of foundation requirements and soil conditions
- Designed for fast and efficient installation
- Strategic design for barriers to optimize acoustic performance, overall costs and constraints
- In-house noise control engineering expertise that can be applied to design and guaranteed performance
- Coupled with structural engineering and construction expertise – total solution package
- Guaranteed performance
- Finishes for architectural aesthetics and different environments
  - » powder coating, marine paint
  - » brand and background integration
- Elevated on equipment – integrated into process equipment and structures or rooftops

## SITE-WIDE NOISE GUARANTEE

- Complete responsibility for acoustic design and guarantee
- Supply of equipment specifications and testing procedures
- Evaluation of proposed equipment vendor's noise data
- Troubleshooting equipment vendor non-compliances
- On-site testing during start-up and commissioning to ensure all guarantees are met
- Make-good guarantee on all EnergyLink supplied or designed equipment
- Cost of all engineering man-hours and expenses are included with material supply
- Specialize in octave band specific criteria and low frequency noise (compliance guarantee to 16 Hz)





# CONNECTING YOU TO A BETTER WAY

EnergyLink International is a leading supplier of specialized and balanced solutions for air and noise emissions control, building design and construction, acoustic control engineering services, mitigation and gas turbine auxiliary systems. Backed by more than 25 years of ingenuity and a strong commitment to customer excellence we have an unwavering focus for developing leading-edge technologies, environmental advancements, superior construction and quality manufacturing through our team of dedicated professionals who ensure our customers are well positioned for both today and the future.



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