



CONFIDENTIAL

CEGEN Green Energy Catalogue

2018-2019

Prepared By:

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Noise Solutions Inc. presents CEGEN Green Energy, an alternative green power source technology that is using proven “wind” power designs and applying them to controlled industrial HVAC/Air Exchanger environments.

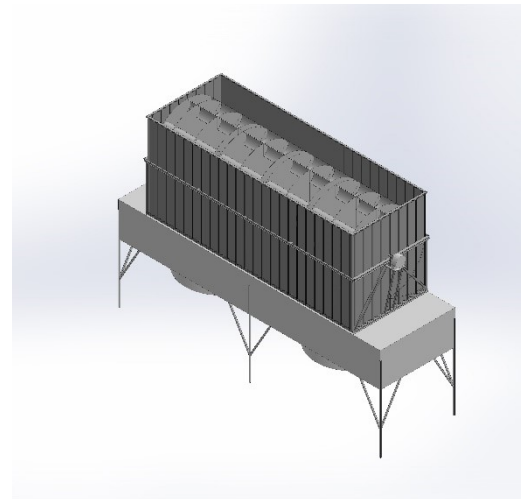
Depending on a facility’s energy consumption needs, CEGEN Green Energy can become the operation’s primary power source or at minimum, supplement the facility’s needs.

Features

- **No addition facility footprint.** CEGEN installs on top of the cooler, in the exhaust flow path, no additional piles or foundations needed.
- **Zero net increase in facility CO₂ footprint**
- In fact, for every kWh generated, 1.22 lbs of CO₂ is not exhausted into the atmosphere from NG fueled power generation.
- Quick installation time
- Structurally Engineered stamped.
- **Green and brown field applications** are both easily engineered and designed.

Operational Benefits

- **Low added back pressure** of <0.10 iwg (AXC recommendation limit of 0.20 iwg limit).
- **Low parasitic draw on driver.** Calculated using cooler manufacturing consultation of ¼ of one HP on a 1500 HP application with a 156” vertical fan cooler.
- **3 phase, 480volt power**
- **Power storage option**
- **Energy independence.** A typical 1500 HP compressor will consume 5-6 kW of power including, ventilation, lighting, PLC and gas detection. Other uses for the power include, heat trace, facility operations and lighting.
- **Low maintenance.** CEGEN’s life expectancy will exceed 10 years of operations with no scheduled rebuilds of generators or bearing replacements.
- **Not dependent** on weather conditions like so many other green energy technologies.



Costs Benefits

- **Competitive** with all power generation and supply when the full understanding of operational and maintenance costs and schedules are applied. CEGEN typically is a \$0.12/kWh on an 8 kW/h design at today’s very low gas rates, a typical micro turbine application with install, fuel and yearly and scheduled maintenance costs is slightly higher at \$0.13/kWh.
- **Carbon credits** will become more and more important in time, CEGEN can be part of a facility’s carbon credit plan.
- **Great story of fossil fuels and green energy** working together to better both operations and environmental impact.
- Not subject to change of natural gas or other fuel pricing.

Frequent questions....

Q. Where is your manufacturing taking place?

A. CEGEN Green Energy units are manufactured by Noise Solutions Inc (USA) in Sharon PA and Alberta, Canada.

Q. Certifications?

A. Class 1, Zone 2

- CSA C22.2 No. 145-11 => Electric motors and generators for use in hazardous locations. This standard is harmonized with the NEC and so it covers motors and generators in both Canada and the US.
- CSA C22.2 No. 14 => Industrial Control Equipment (for Canada); UL 508a => Industrial Control Panels (for the US).

Q. Current backlog?

A. Current backlog of manufacturing would mean that a PO today would be delivered in 14-16 weeks, including design and approval process.

Q. Delivery Schedule? (i.e. duration from PO to delivery on site)

A. 14-16 weeks for single unit. Multiple units would be manufactured in parallel with each, should have space for up to three units on the shop floor at any one time.

Q. QA practices

A. A full QA/QC manual has been included in this document.

Q. OEM warranties?

A. One-year Warranty (details provided).

Q. Can the installation be performed by our General Contractor, or do we have to use yours?

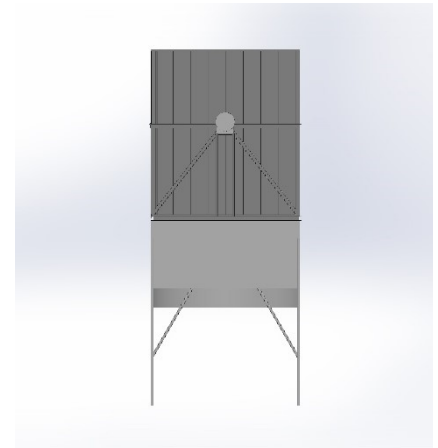
A. Your general contractors could be used, we would recommend we provide supervision for the first units.

Q. Control/switchgear specs?

A. This will be site design specific

Q. How can we minimize the impact on cost to support the CEGEN unit?

A. Depending on application, most installs do not need additional support. Larger cooler applications will be assessed by CEGEN's engineering based on structure, wind and snow loads and if needed, seismic requirements, installation designs will be



The Catalogue

The MicroCEGEN 1 kW Unit

The MicroCEGEN one kilowatt units can be the answer to remote sites without grid power and have low energy needs. Typically, a natural gas compressor has only one operational need, 200 watts of power to for the PLC.

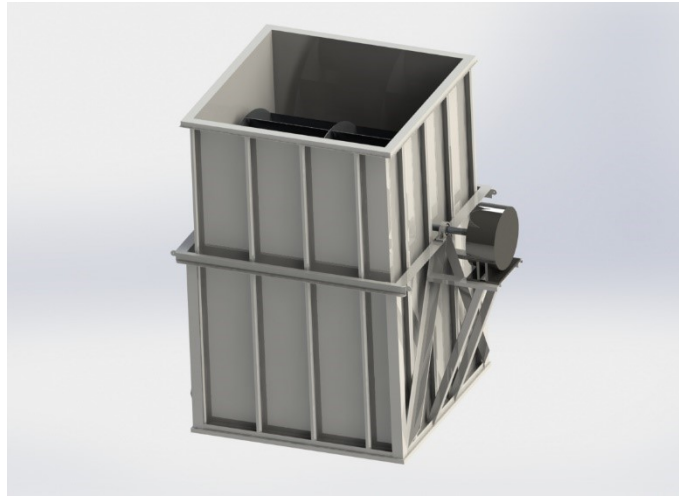
The MicroCEGEN is not dependent on the weather, short days of sunshine in the winter or rainy seasons with low cloud cover, if the cooler fan is spinning, the power is readily available.

One of the big issues with remote facilities is restarting the compressor engine. A typical 1800 hp driver requires 150 hp or 112 kW's of power for a "Black Start"

A MicroCEGEN one kW unit can trickle charge a battery bank, even at only 75% efficiency, there would be enough extra power to charge the batteries to 112 kW in about 200 hours.

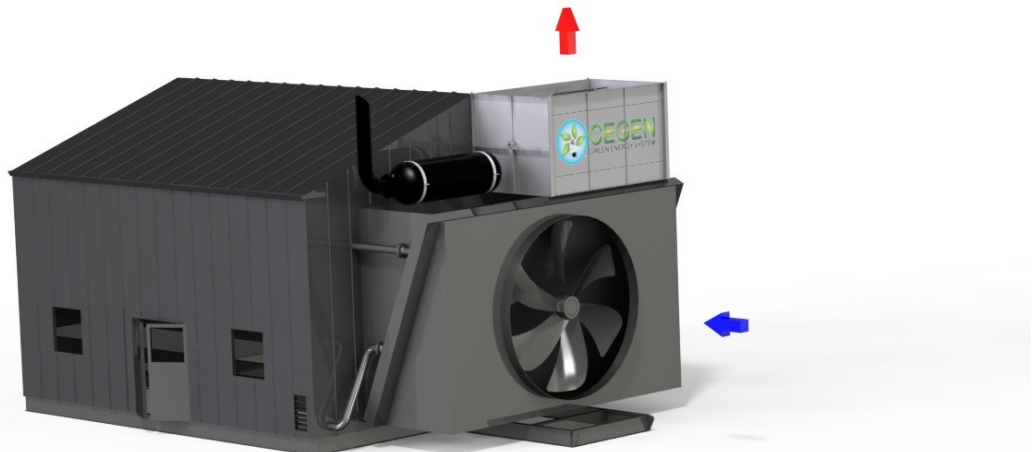
Features:

- Very low maintenance
- Fast installs
- No added physical footprint
- Clean power source
- No increase in your environmental footprint



Operational Benefits

- Meets remote facility operational power needs such as PLC and Lighting
- Trickle charger to store needed power for "black starts"
- Reliable power source
- Extremely low back pressure and parasitic draw



The Vertical Fan Cooler

The Vertical fan coolers are mostly used for compressor applications up to 1500 HP. Power consumption needs vary depending on applications, HVAC systems, auxiliary operations etc. Depending on air flow volumes and the exhaust wind speeds, the CEGEN Green Energy Technology can generate from 2-4 kW on smaller coolers and some of the larger can generate into the double digits, 12-18 kW/h or more!

In shaft driven cooler fan designs, CEGEN can become the primary energy provider, replacing on site fossil fueled power generation.

Easy installs in most cases only two days, no additional foundations or physical footprint, the CEGEN design can be an easy fit for your vertical coolers, green field or brown, new compression or retrofits to meet added electrical draws.



For example:

□ Vertical 156" Fan Coolers

- QuantityTwo (2)
- Data sheet reference Spec Sheet – Proposal 057223
- Air Flow Volume.....291,318 cfm
- Exhaust wind speed30.5 mph
- Style Vertical
- No. of bays One
- No. of fans per bay One

15-18 kW (3 Phase 480 volts)



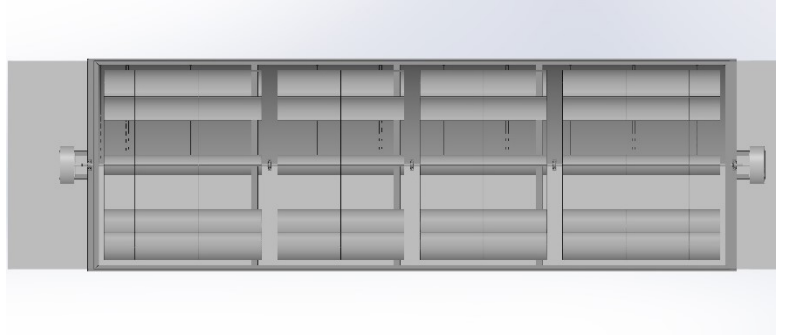
The Horizontal and F-Style (Vertical Series) Coolers

Noise Solutions (USA) Inc proposes the installation of CEGEN Green Energy as EQT's primary operational power source for future facility designs.

Air-X-Hemphill 180 2ZF" Process and Utility Cooler Fan (Reference Only)

The power generation equipment for the AXH **Air-X-Hemphill 180 2ZF** cooling unit includes:

- CEGEN 80 kW unit (double horizontal fan application).
- Inverters and Associated Equipment.
- Shipping Estimate.
- Installation Estimate.



Engineering Data (Reference Only - TBD)

□ **Air-X-Hemphill 180 2ZF Process and Utility Cooler**

- Quantity1
- Data sheet reference140627-R2
- Air volume587,949 scfm
- Exhaust wind speed at CEGEN Intake.....25.7 mph at fan face
- Style Horizontal
- No. of bays Two
- No. of fans per bay One

Scope of Supply

180 2ZF Horizontal Fan on Triple Fan Cooler

□ **CEGEN 10 kW Unit**

- Model No. CSCVEXL125238000 (CEGEN 180 2ZF)
- Dimensions..... Approximate OD 514" x 90" x 252"
- Weight..... Approximately 14,000 lbs
- Generator (2) Generator 40 kW (100 rpm) 3 phase
- Power generation forecast36-38 kW (double fan) 3 Phase 480 volts
- Added Back Pressure < 0.10 iwg.
- CO₂ Footprint reduction (Natural Gas Combustion)384,739 lbs. per annum
- Design scopeSavonius turbine enclosed in a venturi extension with hail guard, 2' x 3' access panels. (PER FAN)
- Exterior finishPre-painted sheet metal (color to be determined)
- Design airflow (per CEGEN turbine).....587,949 scfm per CEGEN unit
 - CSA C22.2 No. 145-11 => Electric motors and generators for use in hazardous locations. This standard is harmonized with the NEC and so it covers motors and generators in both Canada and the US.
 - CSA C22.2 No. 14 => Industrial Control Equipment (for Canada); UL 508a => Industrial Control Panels (for the US).
 - Class 1, Zone 2
- 1 x Isolation Transformer Inverter/Wind Controller Package
 - GCI - wind inverter
 - GCB - wind controller
 - GLL – dump load

Appendix

Warranty

WARRANTY

LIMITED 1 YEAR PARTS & LABOR

The following listed products used by CEGEN Green Energy Inc., will be warranted to the original purchaser against all defects in workmanship and materials for a period of one (1) year from date of purchase by the original manufacturer as listed below:

GENERATOR

ISOLATION TRANSFORMER INVERTER / WIND CONTROLLER PACKAGE:

GCI – WIND INVERTER, GCB – WIND CONTROLLER, GLL – DUMP LOAD.

NTN BEARING CORPORATION: NTN UCP-2.15/16 - PILLOW BLOCK BALL BEARING UNIT- TWO-BOLT BASE, 2.9375 IN ID, ROUND BORE, CAST IRON, NORMAL DUTY, NON-EXPANSION BEARING (FIXED).

NOISE SOLUTIONS INC., HORIZONTAL SAVONIUS WIND TURBINE, AIRFOILS AND ALL COMPONENTS INCLUDING STEEL FRAME, SELF-FRAMING PANELS, AND THE SUPPORT STRUCTURE.

LIMITATIONS AND EXCLUSIONS

The applicable warranty **ONLY COVERS** failures due to defects in materials or workmanship and **DOES NOT COVER** normal wear and tear or cosmetic damage. The warranty **ALSO DOES NOT COVER** damage which occurred in shipment, or failures which result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, set-up adjustments, improper maintenance, modification, lightning damage, or damage that is attributable to acts of God.

Warranty also excludes damages for lost time, or travel to and from the agreed upon installation site.

In certain instances, some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, or the exclusion of implied warranties, so the above limitations and exclusions may not be applicable. This warranty gives you specific legal rights and you may have other rights which vary depending on your state or territory

MANUFACTURER LIMITATIONS

Supplier warrants that all goods supplied in this Proposal will be free from defects in workmanship and material and be fit and sufficient for the purpose intended for a period of twelve (12) months from the completion of installation. If the agreement is supply only, the warranty period is twelve months (12) from the date of manufacture.

This warranty is voided for goods that have been subjected to misuse, neglect, accidental damage, or which have been caused to fail through alteration not approved by CEGEN Green Energy or result and effect of other equipment failure or misuse on site.

Supplier assumes no liability for any incidental or consequential damage or costs arising directly or indirectly from a defect in goods or services supplied. Supplier liability is limited to the original owner and original sale price of each item.

Supplier reserves the right to effect warranty repairs in any manner of their choosing but such that the goods will operate to the originally intended standard.