Noca Clean Energy is a Canadian-based company positioned to be an industry leader by providing clean, cost-effective, efficient, and viable alternative energy technology to markets that have limited access while simultaneously creating a working sustainable environmentally friendly power generation for years to come.
ENVIRONMENT
Generating zero-emissions, No radiation, No sulphur, No heat, high-efficiency, and scalable energy solutions through advanced innovations in engineering

Maintenance
Routine maintenance ensures efficient power generation with no down-time. Upon purchase, a maintenance contract will be catered specific to your organizational needs. For additional information and pricing regarding our maintenance program,
Our customers seek maximum performance and minimum downtime. Therefore, Noca Clean Energy delivers the necessary support to power our customers forward.

**Troubleshooting and Remote Assistance:**
Although technical issues are rare, simple technical problems can be fixed by consulting our troubleshooting guide. Alternatively, our trained technicians can provide over the phone service to solve issues that may arise.

**Field Support and Training Programs:**
In some cases, especially in remote locations, it may be necessary to consult a local technician. We offer an extensive training program and educational seminars to a local team so that they can provide maintenance and repairs on our technologies when needed.
The Magnetic Transducer Generator

Noca Clean Energy has developed a technology that will redefine the electrical energy generation sector. The Magnetic Transducer Generator (MTG) provides access to an inexpensive, continuously available, and non-polluting method for generating electrical energy in a format that is applicable in both small and large-scale, fixed and portable, energy scenarios. The MTG is currently available in several models with generation capacities starting at 5MW respectively, and is easily customizable to larger scales.

Flexibility and functionality are two key elements of the MTG technology that make it ideal for many energy generation scenarios. The MTG can be affixed to existing energy grids as a method to improve energy efficiency in urban areas, or used to develop mini-grids in rural areas that lack access to energy. The MTG can also function as a standalone energy source for mining companies, medical facilities, research centres, construction firms, as well as other industrial and commercial enterprises operating in remote locations.

Potential Applications:

Utilities (grid and mini-grid): The MTG is the ideal technology to affix to existing energy grids as a method to improve energy efficiency, increase energy capacity, and to ensure reliable, clean, and continuous energy in urban areas. The MTG is also suitable for developing mini-grids in rural areas that lack access to reliable, clean, and efficient energy. Noca Clean Energy is building strategic partnerships with utility providers that are suitable for adopting MTG units into their energy mix or to have a complete MTG power plant.

Commercial and Industrial Ventures (off-grid): The MTG also provides a highly efficient and practical solution as a standalone energy source. Due to the low cost, versatility, and portability of the technology, Noca Clean Energy is targeting mining companies, research centres, medical facilities, construction firms, as well as other commercial and industrial enterprises operating in remote locations as ideal customers.
In 2014, the average annual electricity consumption for a U.S. residential utility customer was 10,932 kilowatt-hours (kWh), an average of 911 kWh per month. Louisiana had the highest annual consumption at 15,497 kWh per residential customer, and Hawaii had the lowest at 6,077 kWh per residential customer.
Installation

Noca Clean Energy personnel will be present for installation in order to ensure units are properly engaged and generating electricity. Service and maintenance operations will be catered to the specific needs of individual clients and will outlined in a maintenance contract.

Although technical issues are rare, simple technical problems can be fixed by consulting our troubleshooting guide. Alternatively, our trained technicians can provide over the phone service to solve issues that may arise. In some cases, especially in remote locations, it may be necessary to consult a local technician. We offer an extensive training program and educational seminars to a local team so that they can provide maintenance and repairs on MTG units when needed.
All shelters should meet the following specifications and standards:

(a) Uniform Building Code  
(b) BOCA National Building Code  
(c) Standard Building Code  
(e) Local Basic Building Codes  
(f) ANSI-A.58.1  
(g) UL 752 requirements for low, medium and high power rifle  
(h) National Electric Code latest addition  
(l) IEC - Illuminating Engineering Society

In the event that two specifications conflict, the more stringent shall apply.
2.0 SPECIFIC CONDITIONS
2.1 The shelter (s) shall be designed to meet the following conditions.
   (a) Seismic Zone 4
   (b) Ambient temperature of 70°C (158°F) to -55°C (-67°F)
   (c) Ambient humidity from (0 - 100) percent
   (d) Winds 145 mph (235 Km/Hr) while on specified foundation.

3.0 SHELTER SPECIFICATIONS
3.1 The manufacturer (Noca Clean Energy) shall provide, outside dimensions, height and overall size to be constructed by the client. A typical Shelter is shown in Figure 2. Figure 1 is recommended for frequently flooded areas. A program specific drawing will be provided when the order is placed.

Concrete Compressive strength shall be 4000 PSI at 28 days. Mix design of 114-118 lb/cu. ft. structural lightweight concrete expanded shale or expanded clay aggregate is preferred. Mix shall be homogenous. Seeding of aggregate for exposed aggregate finish is not allowed. Cement used in concrete shall be standard Portland cement conforming to the requirement of the “Standard Specifications for Portland Cement”, ASTM Designation C150. Concrete aggregates shall conform to one of the following specifications: 1. “Specifications for Concrete Aggregates”, ASTM Designation: C33. 2. “Specifications for Lightweight Aggregates for Structural Concrete”, ASTM Designation C30.

Structural Loading - The shelter shall meet the following loading requirements.
   (a) 200 psf floor loading while lifting or on foundation.
   (b) 3000 pounds concentrated floor load over 4 square feet area
   (c) 90 pounds per square foot roof live loading - 7 day duration
   (d) 1000 pounds concentrated roof load over 3 feet square area.
MTG Advantage

- More cost-effective per kWh than all other (conventional and alternative) sources of energy.
- Scalable according to the requirements of any demand load.
- Versatility, can be used in both indoor and outdoor applications and at high and low temperatures and altitudes.
- Offers unparalleled portability when compared to traditional oil and gas.
- Decentralized, requires no connection to existing infrastructure to operate.
- Emits zero harmful radiation or emissions.
- Low vibration with no noise disturbance
- The Magnetic Transducer Generator requires no fuel and emits no waste energy in the form of heat.
APPLICATIONS

On Grid: The MTG is the ideal technology to affix to existing energy grids as a method to improve energy efficiency, increase energy capacity, and to ensure reliable, clean, and continuous energy in urban areas. MTG units can be connected in series to act as a power plant with a generation capacity of up to 1000MW.

Micro-Grid: The MTG is also suitable for developing micro-grids or hybrid micro-grids. Noca Clean Energy is building strategic partnerships with utility providers that are suitable for adopting MTG units into their energy mix.

Standalone (off-grid): The MTG also provides a highly efficient and practical solution as a standalone energy source. Due to the low cost, versatility, and portability of the technology, it is ideal for mining companies, research centres, medical facilities, construction firms, as well as other commercial and industrial enterprises operating in remote locations.
The MTG is available in 5 MW and scalable to any capacities (see Figure 1). The MTG contains a number of rotors; each attached to a central spinning shaft. Each shaft is comprised of a series of discs with magnets attached to the perimeter of each disc (see Figure 2).

A small source battery provides the initial voltage that engages the rotors. As the rotors spin, each magnet on the disk passes a series of copper coil assemblies that are fixed at the same rotational height to the interior of the surrounding chassis. Each coil assembly is coupled with an electronic circuit unit that collects all output and directs a portion of the voltage back to the source battery to maintain rotational charge; excess voltage is usable output.
An acceptable method to compare energy generation technologies is to measure their Levelized Cost Of Electricity (LCOE). The LCOE is the average total cost to build and operate a power-generating technology over its lifetime divided by the total power output of the technology over that lifetime. The following graph (Figure 3) shows the LCOE for a number of electricity generation technologies. As the graph illustrates, the LCOE for the MTG is significantly lower than all other competing forms of electricity generation. There are two key attributes contributing to the low LCOE for the MTG. First, unlike conventional forms of energy (such as natural gas or diesel), the MTG does not require any fuel. Second, the Capacity Factor of the MTG is stable (97% capacity at 100% load), unlike energy sources such as wind or solar where output depends on fluctuating weather conditions. These attributes, together with competitive numbers for capital costs, installation, and maintenance, contribute to the low LCOE of the MTG.
MTG vs. Diesel: Significant Fuel Cost Savings

Below is a simple example comparing the annual cost of running a diesel generator to that of an MTG unit with the same capacity (1.3 MW). The cost of diesel was based on the 2015 average in Ontario (Ontario Ministry of Energy, 2015): 109.6 cents/litre equals $4.98/gallon. The calculations reveal a significant cost savings associated with substituting a diesel generator with an MTG unit of the same capacity (see Figure 4). The fuel cost alone for running a diesel generator at full capacity for 2 years is more than the overall cost of purchasing and operating a 1.3 MW MTG for the same time period. Over a 20-year lifespan of generating energy using a 1.3 MW MTG, more than $29 million dollars (CAD) is saved in fuel costs. In other words, when used instead of a diesel generator, a 1.3 MW MTG has a Return of Investment (ROI) of less than 2 years. For a detailed breakdown of this, and other cost comparisons, please see our technology white paper available at: www.nocainc.com

### Table: Fuel Cost Savings by Year (CAD) (Assuming 100% Load)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of Diesel Fuel</th>
<th>Fuel Cost Savings Including MTG Purchasing Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$1,655,687</td>
<td>-$1,594,313</td>
</tr>
<tr>
<td>Year 2</td>
<td>$3,311,373</td>
<td>$61,373</td>
</tr>
<tr>
<td>Year 3</td>
<td>$4,967,060</td>
<td>$1,717,060</td>
</tr>
<tr>
<td>Year 4</td>
<td>$6,622,747</td>
<td>$3,372,747</td>
</tr>
<tr>
<td>Year 5</td>
<td>$8,278,434</td>
<td>$5,028,434</td>
</tr>
<tr>
<td>Year 20</td>
<td>$33,113,740</td>
<td>$29,863,740</td>
</tr>
</tbody>
</table>

Figure 4
The average American home consumes approximately 900 kWh of electricity per month depending on location. A 1.5MW wind turbine can technically produce enough energy to power at least 300 and require 100 acres to produce 1MW to households in one year. Wind power is intermittent and variable, not to mention very expensive. As a result, industry estimates suggest a 30-40% output while real world experience exhibits output in the 15-30% range*. A 1.3MW MTG has the capacity to provide uninterrupted, clean energy 100% of the time. So, how many homes can be powered by a 1.3MW MTG unit in a rural setting where load demand is significantly less than the average American home.
According to the International Renewable Energy Agency (IRENA), Africa is undergoing unprecedented and sustained population growth. By 2050 Africa's population is projected to double to over 2 billion people (IRENA, 2013). This population growth is currently coupled with an extreme deficiency of energy supply. In 2010, about 590 million African people (57% of the population) did not have access to electricity. If these current energy access trends continue, in 2030 there will be 655 million people in Africa without access to power (ibid.).

Economies in Africa are currently growing at an average rate of 4% per year, with six out of ten of the world's fastest growing economies in the past decade located in sub-Saharan Africa (IRENA, 2012). To sustain this growth a much larger, and better performing energy sector is required. Renewable energy is now poised to play a key role in providing this:
Physical Specifications

- Maximum Height 91 inches
- Diameter 79 inches Aluminum structure Light grey (NCS 2703-G84Y)

Conformance Regulatory Approvals CUL Listed, FCC Part 15 Class A, ISO 14001, ISO 9001, UL 1778, UL. Continuous Use - CE Approved

Energy Efficiency

<table>
<thead>
<tr>
<th>Load</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>94.1%</td>
</tr>
<tr>
<td>50%</td>
<td>96.3%</td>
</tr>
<tr>
<td>75%</td>
<td>96.9%</td>
</tr>
<tr>
<td>100%</td>
<td>97.0%</td>
</tr>
</tbody>
</table>
Technical SPECIFICATIONS

- Output Power Capacity, 5 MW / 4.9 MVA
- Max Configurable Power, 5 MW / 4.9 MVA
- Nominal Output Voltage, 480V 3PH Output
- Voltage Distortion, Less than 5% at full load
- Output Frequency (sync to mains), 60 Hz - programmable +/- 0.5 / 1 / 2 / 4 / 6 / 8%
- Crest Factor, Unlimited Topology, Delta
- Conversion On-Line Waveform Type, Sine wave
- Output Connections, (1) Hard Wire 4-wire (3PH + G)
- Bypass, External Static Bypass
- Safety
3.6 Billion People Have No or Only Partial Access to Electricity

- Millions of People Who Lack Adequate Electricity
- Millions of People Who Have No Electricity

- 449 (31) in South America
- 136 (2) in Africa
- 70 (21) in Asia
- 1,054 (493) in Asia
- 378 (184) in other regions
CLEAN ENERGY

Are You READY?