

Global Warming by Man

by David Graham P. Eng 780 450 2574 www.turbogenpower.com 2020

Global Crisis

In 2018 - 2019, fire storms devastate California while Scientist offer dire predictions and Trump fiddles. Category five typhoons and hurricanes ravage through Asia and America. Extreme heat waves, and devastating floods and unusual weather conditions strike randomly. **The climate is warming and mankind is contributing 9×10^{20} Joules each and every year.** All this while World leaders stick their head in the sand and pursue phoney solutions.

Are we Solving The Wrong Problem?

Environmentalists Dr. Debra Davidson article on Climate Change she stated that, " Global warming is caused by greenhouse gasses (GHGs)". Her article can be found on the City of Edmonton web site. This is the consensus reached by the UN and the Scientific community.

This premise is flawed.

Mankind's GREATEST FEAR, is pursuing the WRONG solution.

If world leaders pursue the WRONG problem and WRONG solution, mankind will suffer the consequences of FALSE HOPE, followed by natural disasters like; fire, floods, and famine. The only question then is how many humans will survive. This has been a reoccurring theme though out history. For example the bubonic plague wiped out 30% of Europe's population. This time we may be looking at a significant percentage of the worlds population being adversely affected.

Dr Davidson has absolutely no knowledge and no training in applied thermodynamics which is the study of heat flow. Neither does the world scientific community. This is an unfortunate situation where prominent scientist are commenting (lying) on a subject in which they have absolutely no knowledge, no education, no training and no experience. Applied thermodynamics is taught to engineers only. Why scientist do NOT take this course is beyond me. Maybe it is because they are "elitist" and "arrogant", and look down their noses at Engineers.

Professional Engineers with a background in applied thermodynamics and person licensed under the Boiler Act **are the only people allowed by law to design, build and operate large heat engines or large refrigeration system (cold engine). Scientists and environmentalist are excluded from these activities - with good reason.**

So what are these lies? Crying Wolf

In the past few years it has been observed that the arctic ice is melting at an alarming rate. Scientists blame the ice melt on man kinds heating the environment. They say this melt will cause the oceans to rise by three feet, flooding many ocean port cities. Twice in the last five years scientists have claimed that chunks of ice that broke off the antarctic ice cap would made the ocean level rise by three feet. Yet no city is being inundated by the ocean.

In all accredited professions like M D's and Eng's there is a legislated society that determines the education and competency of individual members and their area of expertise. Individuals who call themselves Scientists are not accredited in any field by any legal body. There is no court that the public can take members of this community to task for their lies and fraud. In science there is no such legislation and courts that the public can hold members accountable. Because of this inadequacy there is a very small group of Scientist who have no education in thermodynamics but claim themselves to be Global Warming experts. Every statement that comes from this group of scientists is a lie. Yet no scientist from other fields dare take them to task. Unfortunately this small group of scientist teach, more accurately preach, false science, and in doing so discredit and smear the reputation of ALL qualified scientist. Until the scientific community as a whole, organize, publicly discredit and decertify the lying scientists in their community, they will never become true professionals.

For the sake of this article I am choosing to call this small group of lying scientists simply “scientists” or “lying scientist”. I sincerely hope that competent scientist do not think this article is directed at them. Yet they are the ones who should be eliminating lying scientist from their ranks rather than myself an Engineer. This lack of professionals will way heavy on all scientists shoulders for many decades to come.

Proof the Scientists Lie - Melting Arctic Ice

The reader must be curious who to believe the Scientist or the Engineer. Let this engineer prove the premiss that scientist are lying beyond a shadow of a doubt. Take the Scientist biggest hype. Quote “ The ocean level will rise when the ice in the arctic melts causing many cities to flood.” This is a lie, nothing will happen.

Lets put this to a test. take a glass of water and a felt pen. Fill the glass half full then mark the water level with the pen. Add an ice cube and mark the NEW water level.

Why did the water level rise? Because the water level automatically adjusted as soon as the ice enters the glass, NOT after the ice melted. The oceans have already adjusted to all the ice in them. Just another lie by scientists to goad government into wasting money to support THEIR phoney science.

Calling the Scientists to Task

This is the third time scientists in the last five years have cried WOLF and made the claim of rising sea levels. Yet no city has been flooded by the ocean. The oceans have not and will not rise because of melting ice. The world and politicians need to call the lying scientists to task for what they are - **Swindlers and con men seeking influence and power.** Scientists and environmentalists need to be remove from the equation and from their university and government posts.

Melting Arctic Ice

The arctic ice is melting at an alarming rate. So what is causing the arctic ice to melt. Scientist blame man for melting the arctic ice. If this was so the ice would melt from the top down. Meteorologists have removed chunks of the remaining arctic ice and observed that the ice is melting from the bottom up not the top down as the scientist believed. From this observation a good engineer will conclude that the heat is coming from the ocean floor. What would be the heat source for such an event? The only mechanism which produces heat on the ocean floor is the ring of fire. For this to happen a new ring of fire through the arctic ocean must have opened up

The answer is the earths core is heating up and expanding. As the core expands the crust is being ripped apart causing the earth to form a new ring of fire from the Aleutians through the arctic to Greenland. The melting of the arctic ice cannot be stopped. This is explained in more detail in the paper entitled “*GLOBAL Warming by Nature*”. Strangely enough this was predicted by the sleeping profit Edger Cayce over 100 years ago. Cayce predicted that Greenland would erupt in volcanic activity and the people would be driven into the sea and saved by small boat from Canada.

Scientists Lies and Crying Wolf

In the past few years it has been observed that the arctic ice is melting at an alarming rate. Scientists blame the ice melt on man kinds heating the environment, meaning heat from the air. They say this melt will cause the oceans to rise by three feet and flood many ocean port cities. Twice in the last five years scientists have claimed that chunks of ice that broke off the antarctic ice cap would made the ocean level rise by three feet once melted. Yet no city is being inundated by the ocean.

Scientists are lying to induce fear and panic to take power away from governments and empower themselves. This scare tactic although succeeding with the public and politicians, is warring thin among thermodynamic engineers.

This power play is nothing more than crying wolf for the tenth time. Just because the ice is melting doesn't mean the atmosphere, air is causing it. Also it does not mean the oceans are rising by three feet and will flood all major ocean cities. Scientists and environmentalists need to be removed from all government posts that relate to global warming.

Calling the Scientists to Task

This is the third time scientists have cried WOLF in the last five years and made the claim of rising sea levels. Yet no city has been flooded by the ocean. The oceans have not and will not rise because of melting ice. The world and politicians need to call the lying scientists to task for what they are - **Swindlers and con men seeking influence and power**. Yet it is the Swindlers, (scientists and environmentalists), who advise world governments on climate change.

The Swindlers are praying upon the ignorance of politicians and the public. **To succeed in the GREATEST SWINDLE IN HISTORY the Swindlers need to convert politicians into true believers.**

"Lies, Smoke and Mirrors of the GREAT SWINDLE"

In a paper entitled *"Lies, Smoke and Mirrors of the GREAT SWINDLE"* I have identified the fifteen lies scientists and environmentalists have sold the world on this subject. This article can be found on the web at www.turbogenpower.com As long as scientists and environmentalists continue these lies the world will never solve this problem. The intense politicking of scientists and environmentalists have caused the world to waste billions of dollars on meaningless and useless *"false solutions"*. Nothing more than taxpayer money pits. No wonder a backlash from the public is developing towards the *false scientist* who are spending taxpayer money on *scientific* money pits. No wonder the debate never ends. The public is not as ignorant or as stupid as the scientific community assumes they are.

Scientists have sold themselves on their *false science* and have become a *cult of True Believers*. Unfortunately once a subject because a *belief system* the *true believers* no longer listens to reason and is no longer capable of putting their premise to scientific scrutiny. No wonder Trump calls their dire pronouncements *false news* and dismisses them out of hand. These *Lies* by implication taints and discredit the good data that meteorologists collect on the subject. Unfortunately meteorologists have not bothered to study applied thermodynamics either.

Proof the Scientists Lie - Melting Arctic Ice

The reader must be curious who to believe the Scientist or the Engineer. Let me prove this premise to you beyond a shadow of a doubt. Let's take the Scientist's biggest hype. Quote **"The ocean level will rise by three feet when the ice in the arctic melts"**.

This is a lie, nothing will happen. Let's put this to a test - take a glass of water and a felt pen. Fill the glass half full then mark the water level with the pen. Add an ice cube and mark the NEW water level.

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The question is why would scientists and environmentalists be so BOLD as to perpetuate such an obvious lie and expect the public to believe it? Surely they know Archimedes' principle. It is taught in grade 5 science. They have obviously taken a bath and observed the level of water in the tub rise and fall as they get in and out. It is not a few scientists. It is the collective body of world scientists and environmentalists who are perpetuating this and many other lies. See www.turbogenpower.com for over 15 other lies. The only reason they would risk the sculling of their reputation is for power and money - greed.

The worst part is the false scientists who are lying to politicians and the public are indoctrinating impressionable university students with their venom and turning their students into a “cult of true believers”, at the tax payers expense. This is a MAJOR problem for politicians who provide grants to the universities. This poisoning of university students minds is a threat to our society. Something needs to be done.

People need to call their politicians to task to find out if they have been brainwashed and joined the cult of true believer in the new false science. If so, they need to remove them from office as quickly as possible.

Melting Arctic Ice

Before dealing with the real climate warming by man lets finish the issue of what is causing the arctic ice to melt. Meteorologists have removed chunks of the remaining arctic ice and observed that the ice is melting from the bottom up not the top down as the scientist believed. From this observation a good engineer will conclude that the heat is coming from the ocean floor. What would be the heat source for such an event?

The answer is the earths crust is ripping apart and forming a new ring of fire from the Aleutians through the arctic to Greenland. The melting of the arctic ice cannot be stopped. This is explained in more detail in the paper entitled “GLOBAL Warming by Nature”. Strangely enough this was predicted by the sleeping profit Edger Cayce over 100 years ago. He predicted that Greenland would erupt in volcanic activity and the people would be driven into the sea and saved by small boat from Canada.

The Real Heat Problem

To address the real heat problem, one must start with measuring the heat mankind is spewing into the environment in a year. This simple concept and calculation appears to be beyond the ability of modern scientists. Let a thermodynamic engineer provide you with this information.

In the following table the “Quantity” data came from the US DOE web page in 2017. “Heat” for oil and gas is the Quantity multiplied by the “specific heat” per unit as found in a good Applied Thermodynamic text. Electricity Heat is the “quantity” multiplied by the “Heat Multiplier”. The Heat Multiplier used is the weighted average for the different heating sources. The “Heat Multiplier” is defined as the ratio of heat released into the environment for one unit of electricity produced. A detailed report on power sources and the heat multiplier can be found on the web at: <http://www.turbogenerator.com/pollution.html>

2016 World --- Man Made Heat —

Energy Source	- Quantity -- US DOE	Specific Heat / Heat Multiplier	Heat Released
Oil	81 million bbl per day	6.16 MKj / bbl	1.8 x 10²⁰ Joules per year
Gas	3,552 Billion cm	38.5 MJ / cm	1.4 x 10²⁰ Joules per year
Electricity	24 Tera watt-hours	6.73 heat multiplier	1.62 x 10¹⁷ Joules per year

Coal is not included because its primary use is in electricity production. If coal had been included we would be double counting.

Total World Heat by Mzn

Total heat is 3.2 x 10²⁰. How big a number is 3.2 x 10²⁰. Will it is 3.2 multiplies by 10 with 20 zeros after it. Here is the full number. 320,000,000,000,000,000 Joules per year. As you can see man is heating the environment at an astonishing rate. Man made heat is small when compared to natures heating the environment.

The Answer to man made HEAT Is the Cold Engine

Conventional solutions like hydro, wind or solar will not even drop a zero off the heat released. Herein lies the dilemma all heat engines heat the environment. Since all conventional electricity sources heat the environment, what can we do to solve this problem? Lets start with basics. A thermodynamic process travels clockwise (heat engine) or counterclockwise (refrigeration) around the thermodynamic chart. All heat engines travel clockwise so why not reverse the cycle and create a cold engine? By reversing the cycle we have a cold engine, for example a refrigerator. Any good applied thermodynamic text like "*Applies Thermodynamics for Engineers* " by Eastop & McConkey - Chapter 16 - Refrigeration, and web page www.turbogenerator.com will explain refrigeration in detail. The best reference for a cold engine theory is the White Paper on the web page www.turbogenerator.com. The direct web address for this paper is; <http://www.turbogenerator.com/A%20White%20Paper%202.pdf> .

What is a Cold Engine?

A cold engine is a refrigeration system with a turbine added to drive a generator. The advantage of the cold engine are numerous; runs 24 - 7 - 365 days a year. low cost electricity, no pollution, no heat to the environment, no CO2 produced. The major advantage of a cold engine is that its heat multiplier is ZERO. How is this possible if all heat engine release heat? A cold engine like a refrigerator extracts heat from one location (ice box) and deposits it in another location (the kitchen).

The cold engine intellectual property is owned by Turbogenerator and David Graham

A cold engine extracts heat from the air at the plant site to generate electricity and releases the same amount of heat back into the air when the electricity is consumed in the city. SIMPLE but it takes knowledgeable Engineers to understand and build one.

A Second Proof that Scientists Lie

Unfortunately the modern scientific mind is incapable of understanding this simple concept . The question is why? In a refrigerator engineers make heat flow uphill. This according to scientists is theoretically impossible. Why would scientists say such an obvious lie and expect people to believe them? Scientists reached this conclusion because of their superficial understanding of applied thermodynamics which states that "*heat flows from the hot source to the cold source*". Yet engineers make heat flow up hill in refrigerators every day, by using their more thorough knowledge and understanding of thermodynamics.

Check out your refrigerator with a thermometer and watch heat flow uphill, from the ice box at 0 C to the kitchen at 20 C - uphill. Another lie by scientists.

Any study of climate change requires a thorough knowledge and understanding of thermodynamics. Scientists totally LACK this knowledge and have NO experience of applied thermodynamics to comment relevantly on climate change.

For their total ignorance of thermodynamics and many other reasons Scientists should not be involved in discussing climate change. Their EGO'S and gross ignorance forces them and their followers to become *True Believers*. *True believer's believe in False Science*. *True Believers* solve nothing!

The Green House Effect

Now let a Professional Engineer who also holds a Boiler Ticket explain to you in lay man terms how the green house effect works and give you the solution to man made heating of the environment. The solution is quite simple - **replace all heat engines with cold engines**. To understand how this works you need an entry level

course in applied thermodynamics which can be taken at any accredited engineering school in the world. For those of you with an engineering background I would recommend two references. First the text "*Applies Thermodynamics for Engineers*" by Eastop & McConkey - Chapter 16 - Refrigeration, and web page www.turbogenerator.com which explains the cold engine.

For the lay man I am writing this article to give you a somewhat clearer understanding of the REAL problem and solution. Let me assure you there is a REAL problem, Man is heating the environment to excess. **Man is heating the atmosphere at over 3.2×10^{20} Joules per Year. This is horrendous.**

The green house effect is named after a man made green house. A green house is a glass building with plants inside and a heating source. The glass shields the inside from the extreme weather of the outside while allowing sun light in. The heating source provides additional heat when sunlight is insufficient. Simple. Now the green house effect of Mother Earth starts with the electromagnetic shield combined with the ozone layer to shield and protect the earth from the harsh solar winds similar to the glass in a green house. Within Mother Earth there are both heating sources (10) and sinks (6). A list of these sources and sinks can be found on web page <http://www.turbogenerator.com/polution11.html>

Now the gasses inside the green house are the same as in the environment; nitrogen, oxygen, carbon dioxide and water vapor with other trace gasses. The purpose of a green house is to make plants grow. This is done when the plants use sunlight (a power source) and photosynthesis to convert carbon dioxide into fiber (carbon) and oxygen.

Plants and trees need carbon dioxide to flourish This is another concept not understood or mentioned by scientists.. **This is also where the first major man made environmental problem raises its ugly head. Heat engines heat the environment.** Plants and trees need carbon dioxide at ground level and at ambient (low) temperatures. Cars and other vehicles do not produce carbon dioxide that plants can consume. Power plant exhaust high temperature gasses; carbon dioxide 10% nitrogen 85% and water vapor 5% at the end of a tall chimney which is too hot for plants to consume. These hot gasses rise into the atmosphere and cool (by transferring their heat to cooler gasses thereby heating the environment) eventually mixing with water vapor and when cooled precipitate down as acid rain. **Another Major man made problem - acid rain.**

Plants and trees convert carbon dioxide into fiber and oxygen for man and animals to consume. Man and animals convert oxygen and protein into carbon dioxide and fertilizers for plants to consume. Destroy the carbon dioxide you also destroys mankind. It is a symbiotic cycle. Low temperature CO_2 near the ground is good CO_2 .

The green house gasses are not and have never been the problem. It is the heat that the gasses carry high into the atmosphere that is heating the environment. Getting rid of the gasses solve nothing, it is false science. This is where the scientist changes into false science. Heat flow cannot be stopped. It simply flows from the hot source to to a cooler element. This simple concept appear to be incomprehensible to the scientist. They should have taken a basic course in engineering thermodynamics. Unfortunately the scientists have macho political clout to shout down his nay sayers and continue to lie to the world. As Trump would say "The Lying Scientist" and their "False News".

How Does Carbon Relate to Heating the Environment

Carbon is related to heating the environment because carbon dioxide is a byproduct (exhaust) from heat engines. Although carbon dioxide is related to a combustion source. Carbon dioxide is not the problem, it is the heat that is the problem. There are three sources of electricity that do not produce carbon dioxide but heat the environment. These three sources are hydro, solar and wind. Consider hydro, solar and wind, there is very little heat released at the plant site but when the electricity is consumed the electricity is converted into heat. Each has

a heat multiplier of ONE. This is the first law of thermodynamics *Energy cannot be created or destroyed*. Energy can only flow elsewhere or be converted into another form of energy.

Key Observations

- **If we focus on carbon only we totally miss the ballpark.** We should be focusing on heat released as well as CO₂ produced. Refer to the attached report on Electrical generating heating the environment in Canada.
- **The Heat multiplier is the KEY to clean energy.** Only a prime mover with a heat multiplier of Zero will reduce the World's production of heat to the environment.

Home Heating

So How do you tell the good CO₂ from the bad CO₂? The answer is in the temperature of the CO₂. If the temperature of the CO₂ is relatively low, it will stay near the ground and can be consumed by plants and trees. If the temperature of the CO₂ is very high it cannot be consumed by plants. As hot CO₂ rises in the air it collides with other air molecules and in the collision transfer some of its heat, until it is the same temperature as the air. The CO₂ will eventually combine with water vapor forming carbonic acid and eventually precipitating down to the earth as a mild acid rain.

Examples of good CO₂ is the exhaust of animals and human, small camp fires, and home heating exhaust from a high efficiency furnace. **Gas for home heating is not a problem for the environment because of their low temperature and the purity of the gas.**

The Elephant in the Room

Governments have to fund all power plants. No enterprise can do it on its own. It is the governments responsibility to provide reasonably priced electricity to its citizens. **When it comes to governments funding power plants there is an elephant in the room.** The elephant is not corruption, pork barrel, or incompetence, although these all play a major factor. It is the hidden cost of replication and expansion. This is the Elephant in the room. Also known as the Government Dilemma (Electric).

Eventually all aging power plants have to be replaced and growing demand requires additional plants. This is the Elephant in the Room, an ever growing but hidden financial obligation. There is ONE and only ONE way to eliminate the Elephant and that is to invest in power plants that can replicate themselves. Only the cold engine power plant can do this. If governments invest in the cold engine the Elephant will slowly but surely shrink, eventually disappearing. If governments invest in conventional power plants the Elephant will grow and consume ever larger and larger parts of future budget. This dilemma Ontario is currently facing.

Retarded Government Decisions

Governments have a choice to spend Billions in kicking the ever growing ball down the road for future generations. Or to shrink the ball and eventually resolve this problem. In 2017 I sent an extensive package to P M Trudeau on this subject and solution. Unfortunately he and his advisors are not interested in REAL solutions. The government responded by rewriting the grant criteria for clean energy and in the rewrite eliminated the cold engine and all viable business ventures. Turning the clean energy program into another government fiasco, more accurately a money pit. Trudeau and his advisors may be socially astute but industry inept as we have seen with the west coast pipe line fiasco and their concerted attempt to destroy the oil and gas industries in the prairies. Trudeau's government has produced nothing more than billion dollar money pits which delays by 15 years real progress on clean energy solutions.

It would appear that Trudeau and his advisors are incapable of grasping or understanding the concept of the Elephant in the room.

Premiers and Prime Ministers

In the past 30 years. the record of our Premiers and Prime Ministers in their attempt to address environmental heating from electricity production is a dismal FAILURE. Wasting \$ billions of tax payers dollars on hair brained ideas. None of which address the basic problem. The basic problem is that all current means of generating electricity heat the environment. The solution is a prime mover which does not heat or pollute the environment. There is only one the cold engine. To solve this problem we have to seperate the Premiers and Prime Ministers from the engineering equation.

If history repeats itself, for the fourth time, the solution will not come from governments. These governments have no idea what they are doing and listen only to snake oil salesman selling *false science* and lame brain popular ideas which are nothing more then Billion dollar money pits.

Savings for City and Companies

Cities and companies who desire to save the planet can begin by building cold engine power plants. This will reduce the cost of electricity and eliminate grid fees (25% savings). If the returns from the investment are used to build more cold engines, slowly but surly the city will convert over to the only truly clean energy source - cold engines.

Companies can save distribution fees and grid fees if the power plant is built on or near their premiss, for a total saving of about 50% in their electricity bill. Companies currently use gas to heat their processes examples; refineries, cement, steel etc, can convert to cold engine electric heating and eliminate their heat and carbon footprint all together.

Environmental Benefits		What will cold engine electricity do?		
Company or City Proposal		4 Mega watts	8 Mega watts	
	plant size			
	electricity	35,040	70,080	M watt - hrs
	Costs	6 million	9 million	
	carbon reduction	35,040	70,080	tonnes / year
	heat reduction	1.26 x 10¹⁴	2.52 x 10¹⁴	Joules / year
cost	to save 1 ton of co2		\$121	\$ per ton co2
Cost	to save 1 tera joule of heat		\$282	\$ per Tera joule

Recommendation

- The first recommendation is to remove Scientists and Environmentalist from all government posts that relate to global warming.
- The second recommendation is to remove politicians and all political influences from the equation by selecting a committee of thermodynamic engineers to analyze and recommend a solution. And to have their report published in all major papers.
- The third recommendation is to remove all bureaucrats and like minded people who feel there is such a thing a “creativity Process” and box it in with meaningless rules, conditions, structure that limits the creativity to fit their preconceived ideas.
- **Kelly Johnson head of Skunk Works wrote “To do something spectacular requires unconventional methods”.** This is such a project.

The Build - Like Skunk Works there is only one company that can successfully build and operate a cold engine and that company is Turbogenerator with the help of CIMCO Refrigeration. They have the creativity and relevant engineering experience. And like Skunk Works no promises from engineering groups or money can duplicate what

these two together can do.

Definition of Clean Electricity

Now Lets start by defining clean electricity. Clean electricity is defined as and comprises three components, economy, clean and reliability.

The prime mover to generate clean electricity must meet the following conditions.

- The cost of producing electricity (COE) with no subsidies must be less then 7 cents K W hr. COE as defines by US DOE National Laboratories which includes the total build cost as well as the operating costs.
- No Pollution and no heat to the environment i.e. a heat multiplier of ZERO. The heat multiplier is defined as the amount of heat released into the environment to produce one unit of electricity. In order to have a heat multiplier of zero the prime mover must remove one unit of heat from the air for every unit of electricity produced.
- Reliable run 27 / 7 365 days a year.

Choosing the right prime mover is an engineering discussion by thermodynamic engineers with relevant experience. Although the answer to this question may be obvious, the Premiers and Prime Minister would be wise to select a few qualified engineers to confirm and select the best clean energy prime mover. This approach has advantages in that the Politicians can isolate and insulate himself from attack and criticism.

A Suggested Clean Energy Committee

I would suggest that the Clean Energy Committee comprise the following thermodynamic engineers. All are highly qualified.

- David Graham P. Eng. Turbogenerator (Edmonton) as chairman,
- Wayne Dilt P. Eng. VP CIMCO Refrigeration (Edmonton),
- Wayne Borrowman P. Eng. CIMCO Refrigeration (Vancouver),
- U of A, Department of Engineering thermodynamic instructor (Edmonton),
- SAIT Power Engineering thermodynamic instructor (Calgary).
- Waterloo, Department of Engineering thermodynamic instructor (Waterloo)
- Queens University, Department of Engineering thermodynamic instructor (Kingston)
- Laval University, Department of Engineering thermodynamic instructor (Quebec City)

The committee will address one question. What if any, is the right prime mover to generate clean electricity. This committee can review the information on the six prime movers and reach a decision in a few days. The Politicians can discuss and publish the committees report in the papers for comments and review by stakeholders who generate and sell electricity. In Canada there are about 30 to 40 stakeholders.

The next decision is a political one, "How to fund clean energy?"

Governments can do this for as little as \$6 per person per year for 12 years in Canada. I believe the tax payers would gladly embrace these payments provided the money went to a non profit corporation that the politicians and scientists could not play with. Such a non profit corporation is available at McLeod Law in Calgary, the lawyers who have drafted the joint venture agreement for the cold engine. A detailed report on funding sources is entitled – **Cost of Total Conversion to Cold Engine Electricity.**

Why is this Cost so Low?

The cost is so low because the cold engine can replicate itself every 4 years. Only the cold engine can do this, but like a pump replication needs priming with say 2.6 billion dollars over 12 years, half to expand the supply chain. Replication is defined as the ability of a power plant to recoup its total build and operation costs since build in gross profits sufficient to replace itself. Consider the attached replication table. Government investment has a

replication multiplier of 64 over 24 years. Private investor replication has a replication multiplier of 40 over 24 years. Replication is dependent upon the supply chain keeping pace with the build.

David Graham P. Eng. And his company Turbogenpower can be reached in Edmonton at 780 450 2574. David Graham has two engineering degrees one from U of A in Edmonton and Power Engineering from SAIT in Calgary. David is also the inventor of the cold engine. Turbogenpower and David Graham own the intellectual property of the cold engine.