A White Paper On
The Solution to Pollution From Heat Engines

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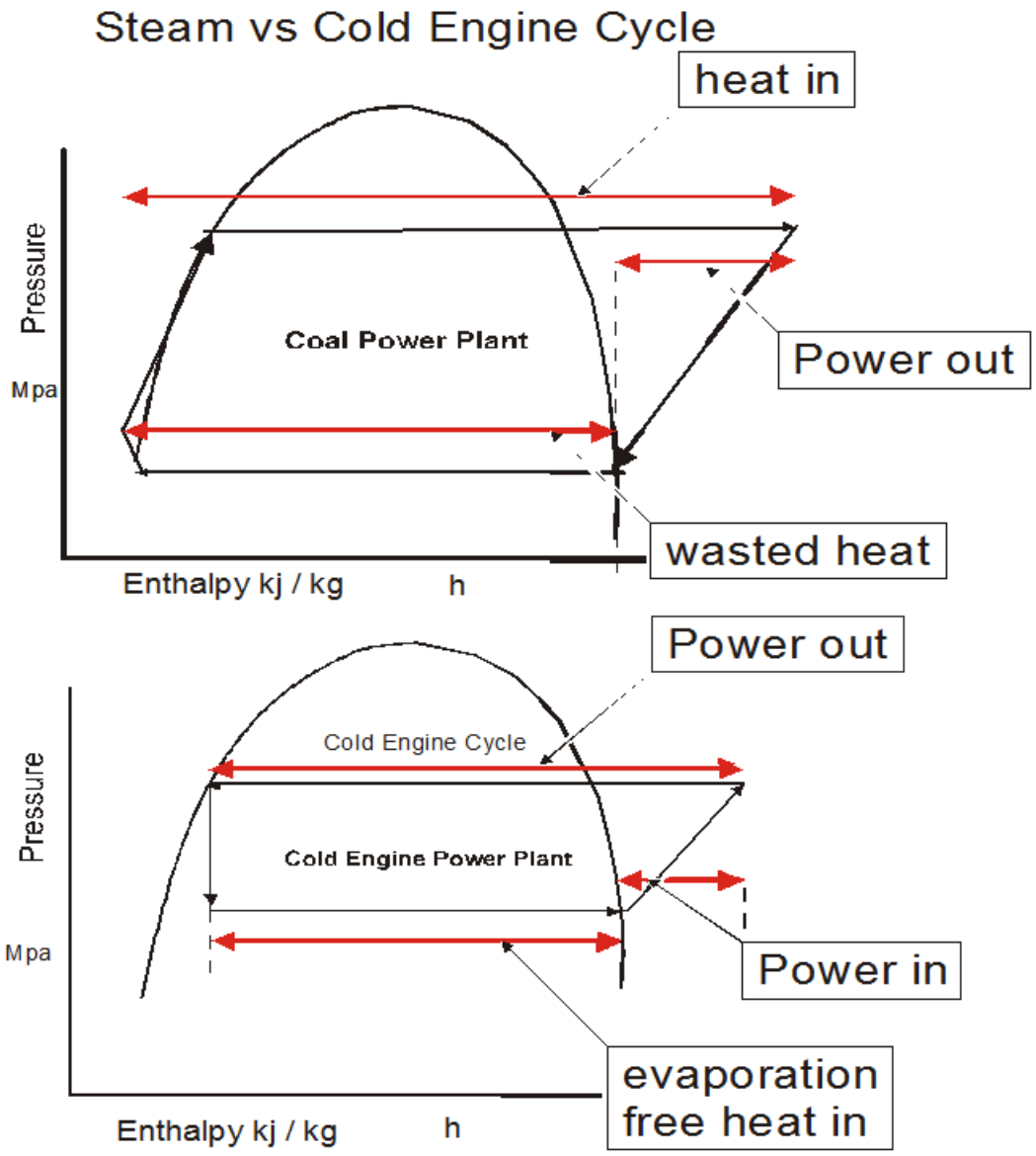
Basics: – The Difference between Hot and Cold

In thermodynamics there are two cycles the heat engine cycle and the cold engine cycle. Once you choose the cycles everything else falls into place as far as the numbers go. Heat engine cycle are found in boilers, car and jets etc. Cold engine cycles are found in refrigeration, air conditioning, chillers and cryogenics, etc. All heat engines are open systems and emit heat and pollutants into the air. All cold engines are closed systems and emit nothing but cold into the air, no pollutants. All heat engines have approximately a 5 to 1 heat to power ratio. All cold engines have a 1 to 1 heat to heat or power ratio. A cold engine moves heat from point A to point B. A heat engine produce 1 unit of power while releasing 5 units of heat into the air. The solution to pollution is very simple replace all heat engines with cold engines. No pollution and no heating of the environment. Why is this not so obvious? Because everyone in the world understands a car (heat engine) but only the few engineers who design cold engines understand them, less than 1,000 people world wide. For the educated and lay people to even grasp this simple but effective solution we have to go back to basics of hot and cold.



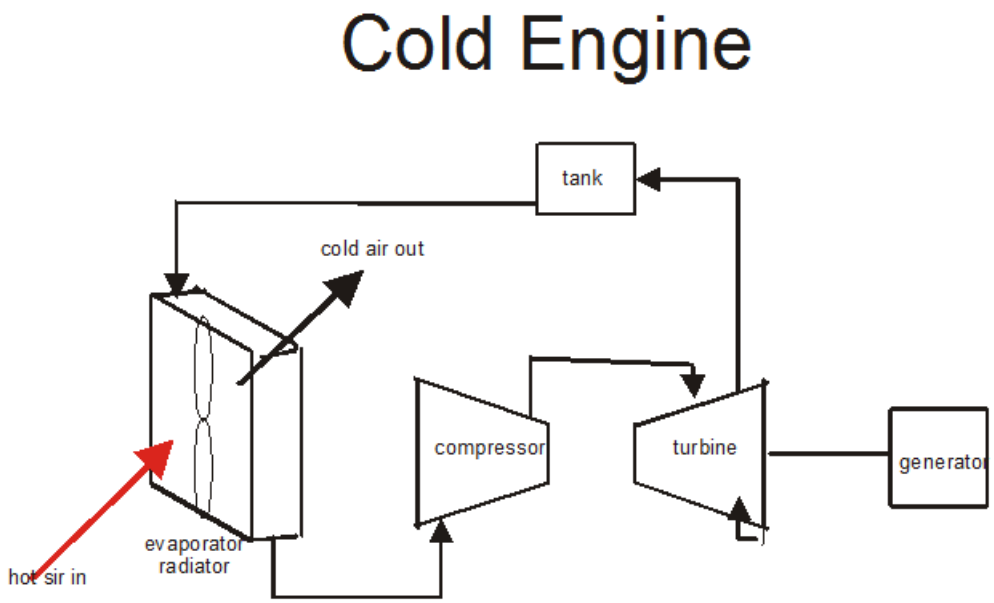
The above chart is the thermodynamics chart for a heat cycle and a cold cycle. The key difference between the two charts is that a heat engine goes clockwise around a thermodynamic chart and a cold engine goes counter clockwise around a thermodynamic chart. The second key difference is that the heat engine needs a heating element, combustion, and that portion of the system is an open system that emits heat and pollutants into the atmosphere. A cold engine has no heating unit and is contained in a totally closed system, emitting no pollutants into the atmosphere.

A New Clean and Inexpensive Energy Source

What is this source? It is air, the low grade heat contained in the air. Weather and wind bring it to every location on Earth. No well, no mine, no pipeline, no high voltage grid is needed to distribute it. Local winds replace it hourly. A new supply is always on the way. How do we take the heat out of the air? We use a heat pump, a refrigeration system and than a turbine to convert the heat into power. This I have invented and call a Cold Engine. A Cold Engine is a refrigeration system, (heat pump) with a turbine added.

How does a Cold Engine work?

The cold engine has an evaporator similar to a car radiator which sucks in air and blows out colder air. This is where the cold engine gets its heat from the temperature difference of the air, multiplied by volume of air across the evaporator. Later a turbine converts the heat into power.



Pollution and Health

According to the Canadian Associations of Physicians for the Environment (letter Aug 9 , 2012) "Emissions from coal plants are linked to deadly asthma attacks, cancer, brain damage, acid rain and more. ... Coal is the most climate-destructive fuel on earth. When burned it releases arsenic (a carcinogen), mercury and lead (a brain poison)." ...."Asthma alone costs the Canadian Health System $7 billion yearly."

In "Science and Technology" (Dec 20, 2014) one study estimate "that two important constituents of air pollution kill more than 100,000 people a year in America."

The cold engine is a closed refrigerator system that emitters no pollution or anything else into the air. Everything is re-circulated, similar to your air conditioning system in your house. The simplest way to view the lack of pollution from a cold engine is an air conditioning system with a turbine added. A closed system produces absolutely no pollution. **No CO2, no pollutants and no heat into the environment.**

A standard 7.1 Mega watt cold engine power plant will save 52,500 metric tonnes of CO2 each and every year, for the life of the plant, as compared to coal and half of this amount as compared to gas. Over 40 years the saving will be over a 2 Million tonnes of CO2. Think about what 700 Mega watts of cold engine electricity will do over 40 years, a saving of over 200 Million tonnes of CO2. Although a cold engine can run 24 / 7 365 days a year this calculation assumes operating only 18 hours a day.

What would a cold engine power plant look like? An fan driven air evaporator unit raised 10 feet off the ground on steel pipes. The evaporator unit would be 4 feet wide by sixteen feet long and sixteen to twenty feet high. The compressor, turbine, generator and transformer would sit on a cement slab about the size of a double garage. This equipment would be inside a wood or steel building on the slab. The plant would produce 7.1 mega watts to grid.

Savings to Large Consumers of Electricity

You may think that you got a real bargain when you negotiated your electricity contract. You think you are only paying 4 cents a kilo watt hour, that is what your contract says. Think again look for two other add on costs, local distribution, and grid fees. Take your total electricity bill and divide by the total kilo watt hours. What a surprise you are actually paying 18 cents a kilo watt hour. Some bargain?

Here's the real deal, have a cold engine power plant installed in your facility and pay only 8 cents a kilo watt hour in total. This will cut your electricity bill by a factor of 2. Savings can even go higher if you are willing to fund the power plant yourself.

A Very Sloppy Analysis of the Pollution Problem

For the past 12 years I have been studying possible solution to the pollution created by heat engines. What I have found is unsubstantiated conclusions, assumptions and various numbers tossed around as if they are valid, with no supporting research or even a definition. Even the Environmentalists conclusion that the current heating of the earth is caused by man has no in depth research and analysis to support such a statement. After a crude thermodynamic source and sink analysis I personally concluded that there are much larger heat sources then heat engines and fossil fuels. These heat sources are totally unknown to the environmentalists. For some reason the Environmentalists did not bother to identify the major sources of heat affecting the Earth. They consider sunlight to be the major and only source of heat. It is not even the largest one, the heat emitted from the Earth's core is the major heat source for the Earth. A very sloppy analysis on their part.

Definitions

Worst of all everyone uses their own definition for the same word. The worst case of conflicting definitions comes from the Department of Energy in Ottawa in 2014. Energy has a web site that contains the cost of electricity, COE, for major cities in different provinces. In their 2014 web site Department of Energy in Ottawa has the cost of electricity for major cities; Montreal 7.5 cents a kilo watt hour, Toronto 8.5 cents a kilo watt hour and Edmonton 17 cents a kilo watt hour. None of these figures represent the real COE as defined by the US Department of Energy National Laboratories. So what are these figures? The Montreal and Toronto figures of 7.5 and 8.5 cents a kilo watt hour appear to be the average current market price for electricity. In the case of Edmonton the Department of Energy Ottawa has added up the market price of electricity plus the grid fees plus the local distribution fee. Which more than double the cost of electricity. **Without clear definitions we have no idea what any one is talking about. I am not just talking about comparing apples to oranges, I am talking about comparing apples to a basket of fruit and flowers. This is the classical Tower of Babble Syndrome.**

With definitions the place to start is with the only organization that has published its reports, calculations and definitions, the US Department of Energy - National Laboratories - studies of 24 coal fired and 4 gas fired power plants.

COE (cost of electricity) by the US DOE - National Laboratories is the current dollar value replacement cost which include capital costs and operating costs on a kilo watt hour basis. All these are hard numbers that accountants and engineers can agree to. Now recognize that for older plants like hydro and nuclear the determination of the current value replacement cost of a power plant is an expensive and horrendous exercise, as the National Laboratories extensive work indicates. A close approximation can be made by starting from the book value (including all subsidies) at the time of commission and adjusting this figure using the construction inflation index rate every year since commission.

Although this is a good basis to start the COE (cost of electricity) by the US DOE - National Laboratories, it is better titled the Replacement Cost of Electricity, or (RCE). The DOE - COE This number is also the full capacity cost of electricity. What other terms need to be defined? Here are the first two on my list.

Replacement Cost of Electricity, or (RCE) – COE (cost of electricity) as defined by the US DOE - National Laboratories is the current dollar value replacement cost which include capital costs and operating costs on a kilo watt hour basis. The capital cost include erection, pollution equipment, and overnight costs depreciated over the life of the plant, using acceptable accounting principles. The denominator is the kilowatt hours in a year (24 x 365) multiplied by the generating capacity. US DOE COE is also the full capacity cost of electricity.
Selling Price or market value of Electricity (MVE) The price electricity is sold in the free market. This definition does not include any grid or distribution fees.

When it comes to analyzing and comparing power plants there are two additional cost considerations, the first is the distance the plant is from market or grid fees and the second is the down time or the number of hours in a year that a plant is not operating at full capacity. Grid fees are as complex as power plant kilo watt hour calculations but for inclusion let us define two grid fees.
Grid current (GRID C) is the current fees a grid is charging customers to send electricity over its grid and **Grid replacement (GRID R)** is the current estimated costs to replace a grid. Eventually grids get so old they have to be replaced.

Down Time (DT) is the most important consideration in selecting or building a power plant, For example if the down time is 50% the capital costs and operating costs per kilo watt hour doubles. This is the one factor that the US Department of Energy - National Laboratories studies did not include in their costing. There are a number of reasons for this, the primary is that down time is not known until many years after commissioning a plant. Down Time is a soft number, at best a crude estimate. Down Time is a different function for different plants. For coal it is the shut down time for cleaning repair and maintenance generally between 8% and 12%. For solar and wind it is the time the plant does not run or runs at less than rated capacity. One article I read estimates solar down time at 90% wind down time at 75%. These figures may or may not be valid. For gas it is the time the plant is not run because the cost of the fuel is greater than the price they get for the electricity plus shut down for repair and maintenance. For gas this figure is considered corporate confidential for obvious reasons but can be crudely estimated at 50% to 75%. Down Time is further complicated by the daily cycle of electricity demand causing many plants to be shut down between midnight and 6 AM.

For purposes of this paper down time is not factored in for two reasons, first it is a soft number and will vary from site to site and second the figures compiled in the presentation were compiled 5 years ago when nothing was written on down time not even by the National Laboratories. If down time were to be factored into this report it would totally eliminate wind, solar and gas turbine as simply too expensive to even consider building. Best let the reader reach his own conclusion.
Down Time (DT) is defined as the percentage of time in a year that the power plant is shut down or running at less the rated output, no matter the reason.

Pollution Severity

In this paper Pollution is a list in descending order of severity or impact upon the health of a man. Pollution and heat are key factors when analyzing power plants. Pollution and heat are released into the atmosphere from every heat engine. There is no way around this equation unless the cycle is reversed and a refrigeration cycle is employed. A refrigeration cycle is a closed system and no pollutants are released into the air.

Heat from Heat Engines

The measure of heat employed in this paper is quite unique but self evident. The reference point for the presentations is a one mega watt power plant, which is referred to as the generating capacity. When referring to heat it is common to use Joules where a mega Watt of energy is equal to a mega Joule of heat per second (MJ/s). These two terms are interchangeable since a Watt = one Joule per second. For this paper the heat factor is referred to as the heat multiplier.

The heat multiplier estimates the amount of heat released into the environment when multiplied by the current generating capacity. For example consider a wind turbine. At the wind site there is some heat (loss) from the friction within the turbine but this amount is insignificant. When the electricity reaches the city and is consumed the one mega watt of power is converted into one mega joule of heat per second. This is the reason our cities are visible from space. From this illustration this paper defines the heat multiplies of a wind turbine as being one. A modern cold fired power plant heat multiplier is about 5 while a very old coal fired power plant can be as high as 10.

A refrigeration system i.e heat pump, on the other hand has a totally different impact. At the plant site it extract one mega watt of heat out of the air. In the city the electricity is converted into heat. If we remove one mega watt of heat at the plant site and release one mega watt of heat in the city, the net effect is 1 - 1 = 0 mega watts of heat, for a heat multiplier of zero.

Costs - The Beginning of a Glimmer

Now the question the reader is asking is why consider costs, if this paper is about a solution to pollution? Well costs are very important. If the cost of the solution cannot be sustained by society then people would rather live with the pollution then live in poverty.

In the 1990's when Ontario Hydro became Hydro One, the company asked the Ontario government permission to white off half the capital cost of nuclear plants otherwise it would take 80 years for a nuclear plant to show a profit. This illustrated the first glimmer in understanding the high cost of subsidizing nuclear power in Canada.

The Dilemma Governments Face from Subsidizing Electricity

Historically Governments have built every conceivable type of power plant without any regard to costs. China has just begun this process with nuclear and Japan is about to repeat this mistake with nuclear. In the 1990's in North America the states, provinces and federal governments began to realize that the electricity industry is getting too expensive to subsidize. There was no obvious solution to this problem. Generally it is the federal government which subsidizes power plants, in Canada it is the provinces.

The crisis the world is facing is how to produce clean but economical power. Both Canada and the US foresaw this crisis and they jointly made the first move to resolve the situation by breaking up the electrical monopolies. Before 2008 it was almost impossible for any company in Alberta to sell electricity. In 2008 Alberta broke up the electrical monopolies into producers, consumers and distributers, they also created the power pool, which is an electronic stock market where electricity is bought and sold. To become a “trader” in electricity all a company has to do is join the power pool. This opened up the electricity market to free enterprise and it various solutions of wind and co-generation projects. This same process happened across North America. Yet no private plant has been built with out a government subsidy or price guarantee in Canada or the US since these changes have been made.

Government Subsidies
Since governments subsidize power plants and eventually a power plant has to be replaced how do we monitor this ever growing future financial obligation? Lets start with a simpler question, How to measure in current dollars past subsidies? Past subsidies lowered the corporate cost of goods sold i.e. electricity, so how will that show up in current dollars. This question can be answered. If we consider the difference between the US DOE national laboratories replacement cost of electricity, RCE, and the current market value (selling Price), MVE, multiplied by the total provincial capacity, we have a dollar value for past subsidies. This is also a clear indication of the provincial portion of replacement cost. More clearly this is a measure of the size of the elephant in the closet that will wreck the house when it comes out to play.

The Subsidy Formula
Subsidy = [Replacement Cost (RCE) - Selling Price (MVE)] x capacity

- Generating Capacity in Alberta= 14,000 mega watts capacity.
- In 2012 the Federal Department of Energy in Ottawa estimated that the COE in Alberta was about 17 cents a kilo watt hour.
- Electricity in Alberta was selling between 8 to 8.5 cents a kilo watt hour.
- Subsidy per (kw - hr) = 0.170 - 0.085 = 0.085 $ / kw hour
- Total Subsidy = $0.085 / kW-hr x 14,000,000 kW x 24 hrs / day x 365 days / year
- Total Subsidy in Alberta = $10.4 billion
- The subsidy was paid in the years when the plants were built, and the dollars were deflated.

In Alberta this subsidy is estimated at $10.4 billion, In Ontario I am guessing it is it is over $30 billion. If this trend of ever increasing cost is not reversed the replacement costs of existing power plants is far beyond the ability of any Province budget. Alberta and Saskatchewan need to replace 2 coal fired power plants in the near future for a total of 600 mega watts of generating capacity. Ontario is facing this problem today, it is looking to replace 12,000 mega watts of nuclear generating capacity. This is the elephant in the closet that is about to comes out to play, and will wreck finances havoc in Ontario.

Ontario has recognized this problem some years ago. First they tried wind. Then in 2013 Ontario undertook a study of wind power and found the kilo watt hour cost (COE) was between 17 to 18 cents. I do not have this study but seriously doubt that down time was factored in. Then Ontario began building gas turbine power plants and after a short period of preparation cancelled the project for various reasons including a dangerous supply chain and cost overruns. This fiasco cost the Ontario government almost $ one billion in damages to New York financiers who would not provide monies to proceed without guarantees from the Ontario government. Ontario then went to France to investigate nuclear and upon returning reported that nuclear was just too expensive.

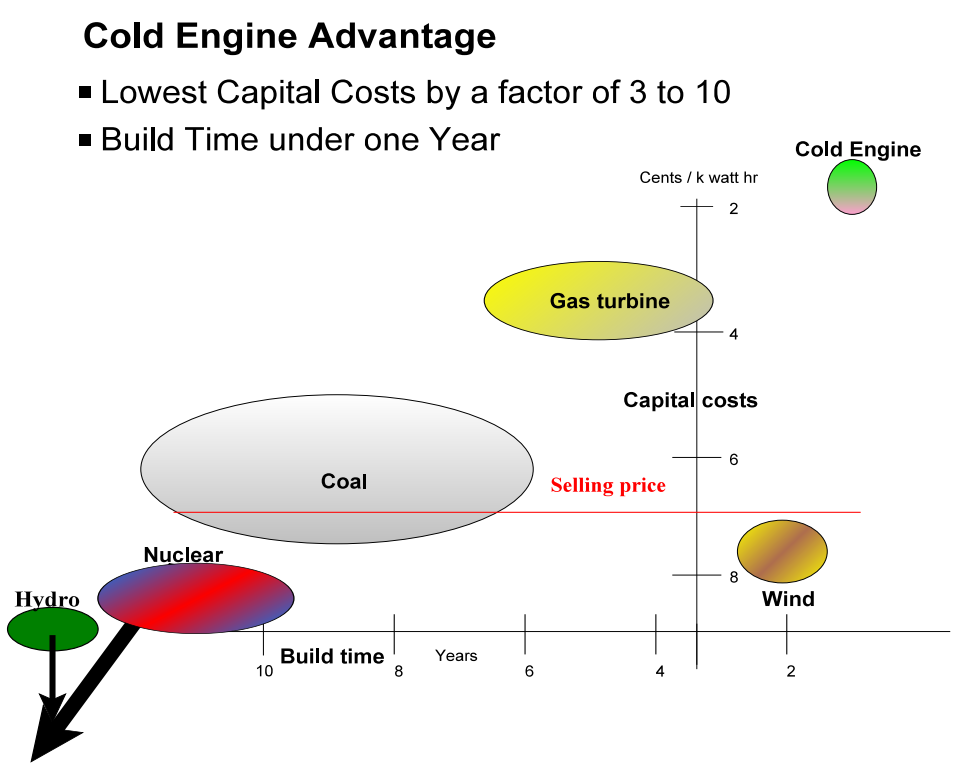
So that leaves coal or a new energy source?? In Ontario the people consider coal such a dirty source of energy that the electorate will not allow coal power plants. A new clean and inexpensive energy source is dearly needed.

The Cold Engine Advantage
The Cold Engine has three important characteristics. First the heat multiplier is zero The Cold Engine is the only net neutral means of producing power with zero heat impact on the environment.

Second the Cold Engine is a closed system unlike heat engines which are open systems. Open systems release hot gasses and pollutants into the atmosphere. A closed system releases nothing but cold into the air, no pollutants. Also a refrigeration system using the right refrigerant produced no harmful pollutants even when it leaks. The Cold Engine has a zero pollution impact on the environment. Unlike every other means of producing power.

The third characteristic of a refrigeration system with a turbine is that they are relatively inexpensive to build

and operate. The build time for a cold engine is relatively short, less than one year. The biggest advantage of a Cold Engine Power Plant is the capital cost recovery period which too is less than one year. This means that a cold engine power plant can replace itself every 2 to 4 years. This feat has never been accomplished by any power plant to date. Even over 40 years no power plant has earned enough to replace itself. The Cold Engine power plant with it low Capital Cost Recovery Period will get the elephant off the governments back.



Comparing the Alternatives

Lets compare the alternatives power generating systems against select key variables.

Power Source	key variables
Coal	Total Cost (RCE) or COE
Gas Turbine	Capital Costs
Wind	Operating Costs
Nuclear	Build Time
Cold Engine	Pollutants
Hydro	

Build Time and Capital Costs

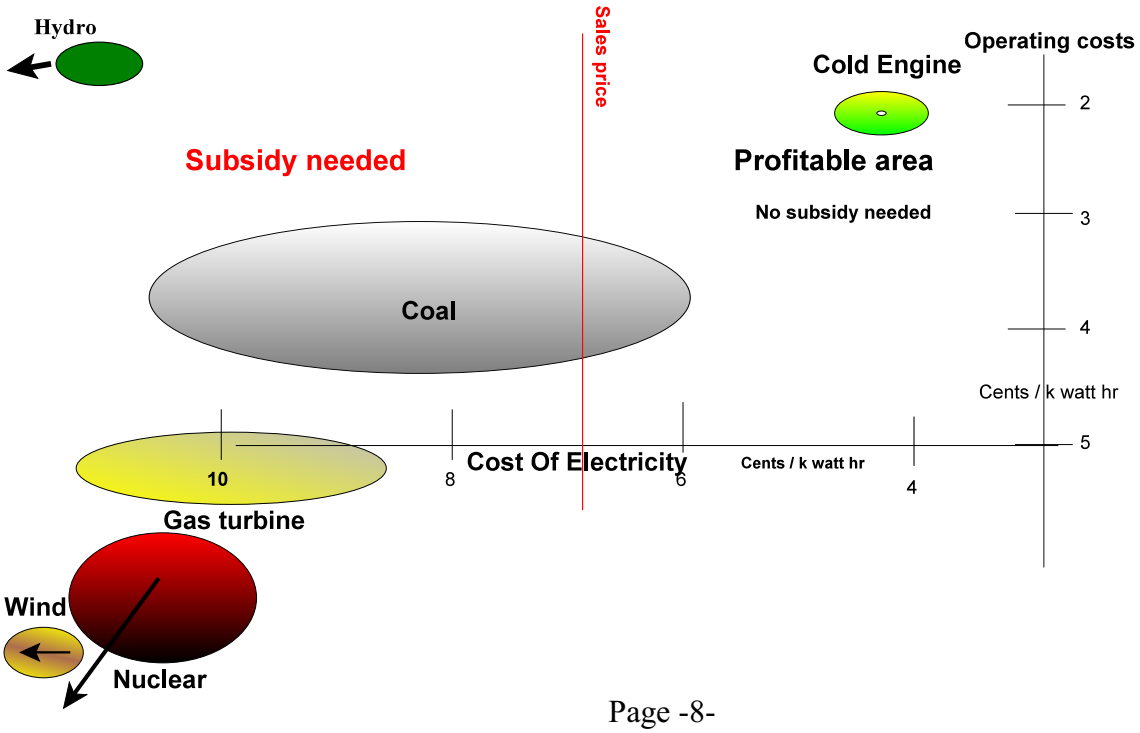
Note that the zero - zero reference point is at the top far right corner.

The First Chart is comparing **Build Time (x axis) and Capital costs (y axis)**.
Here is build time (years) and capital costs (in cents per kilo watt hour). As this image attests to the cold engine is the least expensive power plant to build by a factor of 3 to 10 And can be built in less than one year.

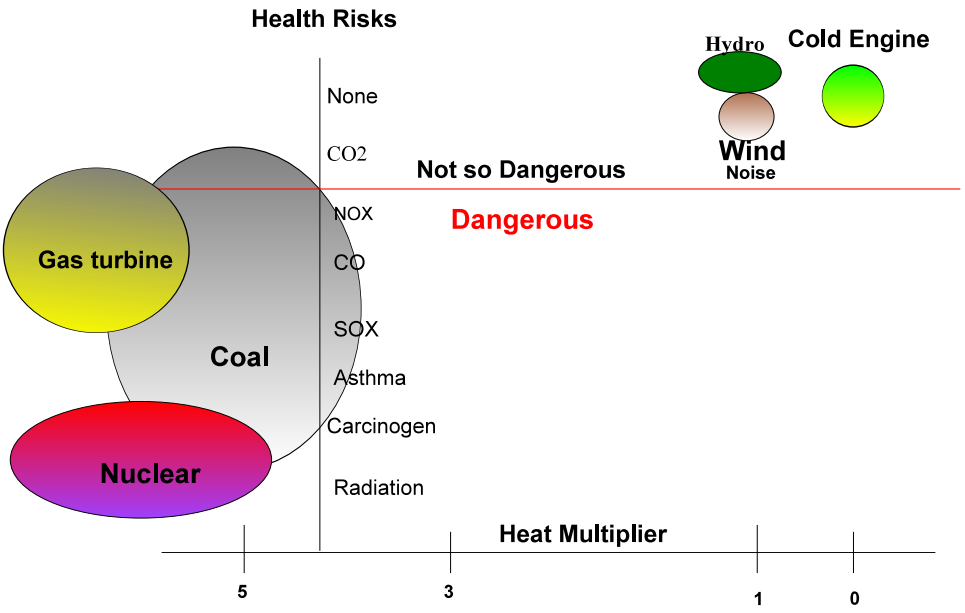
Total Cost and Operating Costs

The Second Chart compares **Total Costs (x axis) and Operating Costs (y axis).**
As the following chart indicates the cold Engine has the lowest Capital Cost and lowest Operating Costs by a factor of 3 to 6. Hydro does have a lower operating cost but a much higher total cost.

Pollution



Cold Engine Cleanest of Clean Electricity



The **The third chart compared pollutants, The x axis is the heat multiplier**. **The y axis is health risks** or specific pollutants from none then CO2, CO, NOx and so on down the list to radiation the most deadly if in large doses.

In the above chart we look at power plants and pollution graphically. First the pollution and the heat multiplier. Wind and hydro have a heat multiplier of 1. Some plants like coal release 5 to 10 times this amount into the air. The cold engine like a heat pump has a heat multiplier of 0.

Comparisons of Fuel Sources

In Alberta there are currently three different categories of power plants; coal, gas turbines and wind. Now that the electricity market has been opened to competition the successful power generating company boils down to two factors; Cost and Reliability. Let's examine each of our competitors with this in view.

Coal

The cost of building a coal fires power plant is very large. The erection time is about ten years. A open pit mine must be built and the coal must be crushed, refined, stored and dried. The plant requires a water supply for the cooling tower. The fuel costs are considerable. A coal power plant requires a large year round on site staff and must shut down for 4 to 12 weeks a year for cleaning, maintenance and repair. When a coal fires power plant shuts down over 100 Mega watts of power are lost to the grid. This is a significant loss during peak summer demand and causes considerable power problems. A less then exemplary reliability record. A coal fired power plant requires 12 plus hours to start up. This makes coal useless for

emergency and peek power generation. Location is important coal need a mine, a water supply and a HV Grid.

A coal fired power plant is the most deadly fuel causing more cancers and deaths than any other type of power plant. Carbon credits are required. Government subsidies are required. Cost of Electricity (COE) for coal varies between 7 cents to 12 cents a kilo watt hour in 2007 dollars according to a US DOE study. A water supply and a coal mine is required. A HV grid also is needed.

Gas

The major and overwhelming disadvantage of gas power plants is the cost of fuel which varies radically over the year. The cost of fueling a gas fired power plant is dependent upon the price of natural gas. In Edmonton in the 1960's a gas fires power plant (Rossdale) was shut down because the cost of fuel made the plant unprofitable. Even today a gas fired power plants cannot run 24 / 7, 365 days a year because the price of gas prohibits operations when the price of electricity falls below 10 cents a kilo watt hour. Dow chemical has a gas fired power plant northeast of Edmonton and Dow will not even consider start up until the price if electricity reaches 10 cents a kilowatt hour. The Alberta Government pays Dow $8,000,000 (subsidy) a year to maintain the plant on standby should its power ever be needed. A very profitable arrangement for Dow.

Gas fired power plants produce more CO2 and more heat into the environment than any other power plant. Carbon credits are required. Government subsidies are required. Cost of Electricity (COE) for gas varies between 8 cents to 15 cents a kilo watt hour in 2007 dollars according to a US DOE study. Gas fired power plants are very unreliable because of price fluctuation in gas and electricity prices causing huge down time. Location is important for safety, and near a pipeline also a HV grid is needed.

Wind

Wind turbines have major disadvantages, high erection cost and high maintenance cost. Try putting a mechanic 100 feet into the air for a repair. Wind is not reliable. During a heat wave, wind power is notoriously absent according to AESO in Alberta. These factors including down time eliminate wind as any useful long term large power source.

Wind does heat the environment downstream when the electricity is consumed. Government subsidies are required. Cost of Electricity (COE) for wind varies between 17 cents to 18 cents a kilo watt hour according to an Ontario Government study in 2013 dollars. Wind has huge down time, some estimate it as high as 50% to 75%. Location is important for a supply of reliable wind, generally a HV grid is needed.

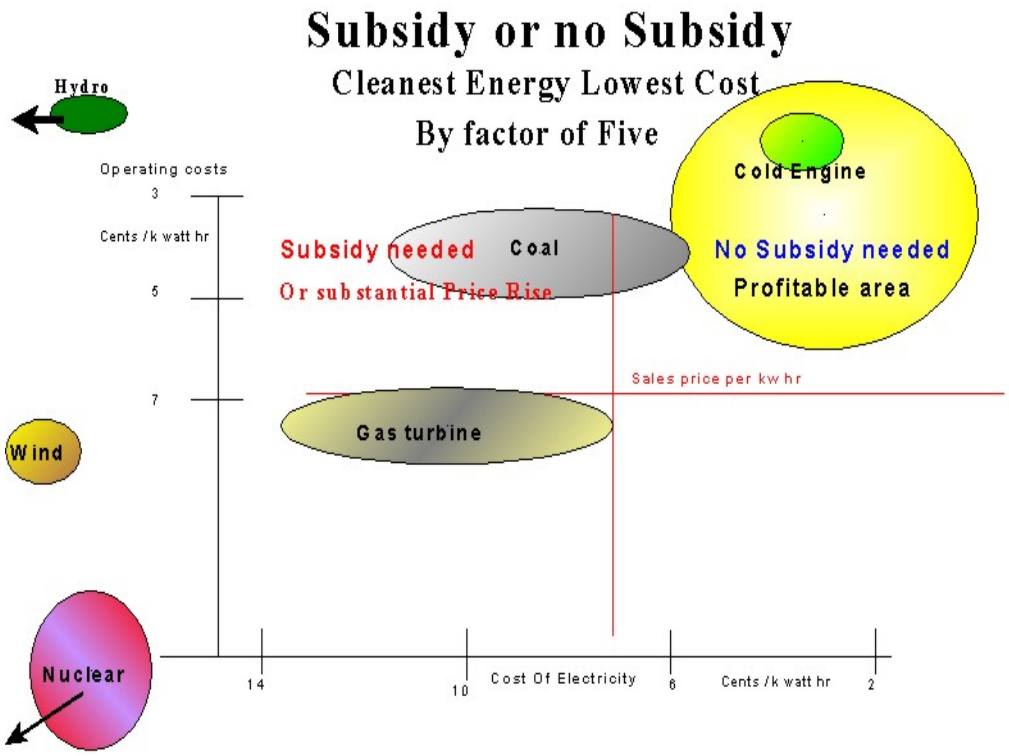
Cold Engine

The cold engine has the lowest erection cost of all power plants. The erection time for a cold engine power plant is less than one year. The cold engine can be started up and shut down at the push of a button, and is remotely operated via the internet. The cold engine requires no staff on site. The cold engine consumes no fuel, and with redundancies can run 24/7, 365 days a year, year after year. Location is not important, a cold engine can be located in the city on a power node, eliminating a need for a HV grid. This makes the cold engine the most reliable and economical power plant available today. The cold engine has one additional advantage, it is portable and can be moved, similar to a small service rig. Try moving a coal fired power plant or even a gas plant?

The cold engine produces NO pollution and NO CO2. The cold engine is also the only environmental neutral means of generating power without heating the environment. No carbon credits are required. No government subsidies are required. Cost of Electricity (COE) for a cold engine varies between 4.3 cents to 4.6 cents a kilo watt hour. Location is not important. A cold engine can be located in the city eliminating the

need for a HV grid.

The following chart graphically identifies the subsidy area.



To get the elephant off the governments back the power plant must be in the no subsidy area, (yellow). The above chart graphically identifies the no subsidy area.

The Man Made Pollution Problem

Now we are in a position to analyze the pollution problem. The real pollution problem is that heat engines emit hot gasses and pollutants into the air. These gasses are N2 85%, CO2 10%, and water vapor 5%. The hot gasses heat the atmosphere and the pollutants causes health problems even death. The gasses (CO2 included) are not the problem like the environmentalist say, they are simply the delivery boys delivering the heat and pollutants into the atmosphere. Pumping CO2 into the ground is a total waste of resources. Let nature recycle the CO2.

The environmentalists do not believe the heat and the pollutants are the problem. They believe that the gasses are the problem and wont to pump CO2 into the ground after it has lost its heat and pollutants. That is like shutting the barn door after the horses have left.

Climate Change

Environmentalist claim that it is the heat engine that are causing climate change. Heat engines do release mammoth amounts of heat into the environment but no where near the amount of heat / energy which the Earth is currently channeling into larger storms, earthquakes, volcanoes and the extension of the ring of fire through the arctic, and other earth movement like the shifting of the magnetic pole. These are all worry some problems for mankind but have nothing to do with heat engines. Heat engines produce heat, the energy needed to produce real climate changes is electromagnetic and come from the Earth. By observing the ever increasing number and size of every kind of storm it is obvious these Earth changes are accelerating and have nowhere yet reached their crescendo.

Climate Change Mechanism

The primary issue in understanding climate change is to realize that the molten core of the earth is spinning

and contains molten iron. As such it is a dynamo collecting mammoth amounts of energy from the electromagnetic radiation from the sun and other stars. The earth cannot store this energy, rather it broad casts it's availability to all plants, animals and living organisms (for their use), convert the energy into heat in the earths core, also earthquakes, activate the ring of fire, and creates larger and larger storms. This excess energy will not lie dormant, the earth will channel it into its usual activities but only on a larger scale like mammoth storms and large earthquakes.

The understanding and solution to this problem need to be discussed and understood with the general public. First the process the earth uses to get these energies needs to be understood. The only person with this knowledge is the author of this paper. Second, since energy cannot be destroyed or created, it needs to be redirected. Again the author of this paper is one of a few thousand people who know how to redirect electromagnetic energy. This process is actually available to be learned by anyone from the internet, but no search engine will find the correct information. In California mental focus technique have been employed by a few thousand people for over 30 years to moderate the impact of earthquakes quite successfully. This technique has proven quite successfully, to date. This technique can only be found in Lazaris metaphysics.

The ever increasing size of storms of the last few years indicate that the earth is going through radical change, the shifting of the north pole, a new ring of fire through the arctic, more powerful storms and earthquakes. Some of the North American continent will shift and split, islands and some costal areas around the world will sink and the magnetic pole will settle down into a new position north east of Japan. The mammoth amounts of energy needed to effect these changes will come from electromagnet radiation from the sun and stars transferred into the dynamo which is the earth. Mankind, if wise, can learn to channel and use some of this energy and moderate the storms and death toll.

The earth is building up to a time of catastrophic earth changes. These changes can be redirected and moderated, saving millions of lives with a little effort and mental focus by mankind

The Solution To Man Made Pollution
The solution ro man made pollution is simple, reverse the cycle and use a closed system. The cold engine cycle removes heat from the air at the plant site. The cold engine cycle is a closed system which eliminates any pollutant from being emitted into the atmosphere.

Miss Diagnosis of the Problem
None of this is rocket science. It is basic common sense. So where or how did the environmentalist screw up so badly? I checked every conclusion the environmentalists reached, all of them were wrong. Then I looked into their education, and could find no science or engineering training.

Specific False Conclusion Reached by Environmentalists.

- When the ice in the arctic and antarctic melt the oceans will rise. (Archimedes Principle says no rise?)
- The only heat source to the Earth is sun light. (The largest heat source is the molten core. Sunlight is only a small fraction of the electromagnetic radiation from the sun to the Earth)
- There is no drain (sink) in the Oceans. (Wrong evaporation is a drain (sink))
- Radio active forcing is a scientific law because we the environmentalist voted it in. This is defiantly NOT science. (Why not vote out gravity as a law of nature and step off cliffs?)
- Man made CO2 is the major cause of environmental warming i.e the green house effect. This definitely is NOT science. (No research just their opinion with no supporting evidence. ??)
- Pumping CO2 into the ground will help solve this problem. (More likely it is a total waste of money?).
- Carbon taxes will cause companies to produce less CO2. (Wrong companies simply pass the cost on to the public).

- Man's heat engines are the major cause of environmental warming. (One of many sources, we need to identify the other large sources, example earths molten core, electromagnetic radiation from the sun, etc)

The Problem Behind The Problem – the "Straw Problem"
Eventually I began to wonder about their education. What were they trained in? Upon digging deeper I found all the important engineering needed to adequately do their job was never taught to them in their university curriculum. What they appear to have been taught instead is statistics, politics (polling and propaganda), religion (cults and true believers). Environmentalists even admit to this in their definition of radio active forcing, **"Most (a poll) scientists believe (a cult of true believers) in radio active forcing as a law of science."** This definitely is NOT science. No science, hypothesis or study has ever been undertaken to show this to be true. (No research just their opinion with no supporting evidence??)

About this time I began to wonder how the universities of the world had screwed up so badly? I began to look for other areas of inadequate university education. I found it elsewhere; in particle physics, in astronomy, in the social science, even in medicine. Now I wonder about the value of universities and their role in society? Who oversees the Universities? What checks and balances do we have on their squandering of public monies? This led me to quantify or define what constitutes an expert? Then I realized few university professor have the qualifications of an expert in any subject area. Professors do not even study their craft - teaching? What is their craft if not teaching? What does a professor do other than teach? And where was he trained to teach? The answer is the professor has no training as a teacher.

Most professors have never worked in industries or even in the environmental field. Few professors have any relevant experience or success in their chosen field of expertise. This is a major problem for society if we cannot trust our universities to adequately do their job. When addressing the environmental problems the universities, with no engineering experience or analytical abilities, created a "straw problem", CO2. and then invented a phony law to support the "straw problem", radioactive forcing.

Unfortunately attacking the "straw problem" is a waste of money and will do nothing for the real problem. The most amazing feat was to get ALL the universities of the world to buy into the "straw problem" and phoney science. This is the most amazing feat performed by academia in the past 100 yeas. Historically there has only been one greater deception propagated on mankind. That was when the Pope set himself up as being the only person allowed to talk to God and become the SOLE arbitrator of ALL subjects including science.

Who bought into the "Straw Problem"?
Large business bought in because they saw money in it. Politicians bought in to cloak themselves in platitude of motherhood, and attack their opponents. Bureaucrats bought in to increase the size and power of their bureaucracies. Environmental professors bought in to maintain their job, and in doing so they had to create false facts and false studies. Then they made their students into true believers, shouting the virtues of their phoney science, while shouting down all opposition. Universities bought in, a second time, to raise revenues by teaching a NEW false science. There is only one motivating force driving this deceptive process – GREED.

What is a Expert?
An expert is a person with general subject matter knowledge and specific knowledge in the speciality. Experience in the speciality and success in working in the speciality. Without experience or success in the speciality the man in not an expert. Few professors have any experience outside of teaching.

The Proper Education of Environmentalist
To truly analyze the heating of the Earth here is what their education should have covered. Training in

Engineering analysis, thermodynamics, heat sources and sinks. Training in electromagnetic theory that include motors, generators, transformers and electro dynamos. These subjects are only taught in engineering schools.

Why is electromagnetic theory important?
The molten core of the Earth with its electromagnetic fields is a dynamo that captures enormous amounts of electromagnetic energy from the sun and stars, stores it, converts some into heat in the molten core and transforms some into ever more powerful storms and transfers much to humans and all living animals and plants. This is a complex process that is not understood or even studied. It is the electromagnetic currents from the Earths core that create storms. The larger the stored electromagnetic energy in the Earth the larger the storm. A category 5 hurricane can be transformed into a tropical storm in very little time by draining it of its electromagnetic energy. This principle also applies to tornadoes, which can be dissolved in minutes. It is this stored electromagnetic energy within the Earth that causes continents to move, volcanoes to erupt and earthquakes.

Bureaucratic Obstacles and Hurdles
True story, a few year ago I took this project to Premier Ed Stelmach (Alberta). He said "Lets do it." and gave it to his Minster of Energy who said "Lets do it." who gave it to a senior bureaucrat who called me a week later and said "We can't because air is not a resource which comes out of the ground and is therefor not within our mandate." Well it was clear who runs whom the premier or the bureaucrat. I understand the bureaucrat's position, he is not allowed to run off willy nilly without a mandate. Yet few ministers and premiers realize this and change the mandate so the bureaucrat can proceed. Ministers and Premiers seldom follow up on a request to ensure the bureaucrats did follow through.

There are many gaps and conflicts between ministries. Energy says "It did not come out of the ground and is not a resource." Environment say, "It is a resource and not a pollution issue." In fact for a solution to pollution to work it will take many ministries working together. The point of this discussion is that a solution to pollution needs a bureaucrat home that can work with many miniseries, (Energy, Environment, Utilities Commission, Infrastructure) without conflicts. Where should this home be? In the Premiers office, in the Cabinet?

Climate Change and Emissions Management Corporation - CCEMC
Recently Alberta created CCEMC to deal with the pollution problem. They even made it a non profit to keep it outside of political interference. Unfortunately the bureaucrats would have trusted the universities to have done their job correctly and have CCEMC staffed at the executive level with environmentalists (true believers and propagandists). What a disaster this will be. An independent non profit organization with $100's of millions of dollars to spend each year with no political oversight or accountability? In 2014 CCEME solicited me to attend their little conference on environmental issues and pay them $800. I told them I would if they would allow me to present a paper on environmental issues, They refused of course. **No dissenting voices allowed.** I had no intentions of listening to their propaganda for 8 hours and pay them.

Here are my concerns and questions about CCEMC
- What if CCEME is part of the problem and not the solution?
- Did CCEME analyze the real problem or does it support the "straw problem"?
- What if none of the solutions to the "straw problem" address the real problem?
- Does CCEME have any fundamental knowledge of the real problem or where to find the real solution?

What is the straw problem created by the universities and environmentalists? It is the gas CO2 that is the problem not the pollutants and not the heat. This is like the King shooting the messenger rather than acknowledging the defeat. Can you imagine taking all the CO2 that man and animals exhale along with all

the CO2 from heat engines and pumping it underground? At what expense? All this does is add a very large surcharge to the cost of living. This will never even keep up with the new power plants required to keep the economies of the world growing.

If CO2 is really the problem there is a low cost way to convert CO2 into O2 and wood. Plant trees using volunteers along every country road. One tree will remove tons of CO2 each year for over a hundred years. Nature has a very elegant way of recycling CO2 into O2 and wood so man and animals will have a new supply of O2. The last thing mankind should do is interfere or take over this process. Yet these people call themselves environmentalists? Unfortunately the straw problem has to be addressed head on else the environmentalists would simple shout down any opposition to their phoney approach.

Turbo Gen Power's Proposal

One: Fund the cold engine proof of concept.
Cost; $1,700,000 Grant.
Duration; 10 to 12 months.
Outcome; proof of concept.
Revenues; $1,000,000 each year.

Two: Fund an industrial size cold engine power plant, once the concept is proven.
Cost; $4,300,000.
Duration; 8 to 12 months.
Outcome; a 2 mega watt generator.
Revenues; $4,200,000 each year.

Three: Fund a fabrication facility and an additional 20 mega watts of generators.
Cost; loan guarantee or private public partnership for future electricity ($8 to $10 million).
Duration; 36 months
Outcome; an additional 20 mega watts of generators.
Revenue; $10,000,000 each year.

Four: Facilitate expansion with a private, public partnership for future electricity.
Cost; a loan guarantee or a private public partnership for future electricity.
With such a short capital cost recovery period the company will have no problem repaying all loans.

Technical Issues of the Cold Engine

In July of 2010 David approached A world class refrigeration company and asked permission to discuss the technical issues involved in producing a cold engine power plant. For the next six months David met biweekly with two of the three most senior refrigeration design engineers in the company. This company built the world class ice rinks. The three engineers present during these biweekly meetings were David Graham, Wayne ???? (Edmonton), and Wayne ???? (Vancouver). The Company has issued a Letter of Support for private viewing but publically wishes to remain anonymous. The engineers in these meeting signed a non disclosure letter with Turbo Gen Power to protect the technical details of the cold engine.

The first issue discussed: *"Is a large ammonia refrigeration system able to produce sufficient heat to run a small power plant?"* The answer is "Yes". But here are the numbers. In metric the standard thermodynamic refrigeration cycle reference is a mass flow rate of 1 Kg / s. For an ammonia cycle between -20 C and +20 C with a compression ratio of 4.5, the heat of evaporation is 1146 kw / kg. The compressor consumes and adds 213 kw / kg of heat. The condenser receives 1359 kw/ kg. The heat loss through the compressor motor casing is estimated at 110 kw. This leaves approximately 1259 kw / kg of heat to go into the turbine, which will replace the condenser.

Consider a large 2000 hp compressor with a mass flow of 8.71 kg / s, the heat available to convert into power is 10,968 kw / s. With additional losses in the turbine and generator of 205 kw / kg one can expect approximately 7,100 kw net to grid after subtracting the 213 kw / kg power necessary to run the compressor.

One large compressor cold engine can generate approximately 7.1 Mega watts to grid. *Yes there is sufficient heat to run a small power plant.*

The most important question discussed was: *"What kind of turbine will handle both liquids and gas and also meet our needs? "* The turbine question David had been researching since 2005. He had found a novel but simple design that would handle both liquids and gas and was extensively tested in the early 20 th century. But it had never made it into the power market for many reasons, one being its small capacity, in the 150 Kilo watts to 6 Mega watt range. This is understandable considering that a single coal fired boiler employs one turbine to handle 110 Mega watts of power.

David has built one small turbine of this type and lab tested it in an open system using air. It ran admirably as a turbine. This is the turbine pictured on his web page (running). The turbine built by David is too small and not attached to a refrigerator system and was not originally designed for ammonia. The proof of concept requires an ammonia system. Unfortunately there is not and never has been a small ammonia refrigeration system. An ammonia compressor alone starts at about $120,000. This is the reason the proof of concept is so expensive.

What happened in those six months is quite remarkable, these engineers came up with a practical solution to solve the pollution issues associated with the electrical power generating industry. In fact their approach totally eliminates all pollution from future cold engine power plants. These four engineers made the cold engine a reality, although it has yet to be built.

The Risk

What are the risk of blending two well established technologies, refrigeration and turbines, into one? The joining process is relatively simple. The core question is how much power will we get out? We do know we will get power out, the question is how much power do we need to make it a profitable venture?

Conclusion

There are three problems that need to be addressed. **First the "straw problem"** what are we to do with the phony science and phoney experts created and supported by the universities? What do we do to oversee the universities do their job correctly? **This is the greatest problem facing society today**. Without solving this problem our universities will become nothing more then a colossal money pit, squandering more and more resources, creating confusion and fostering dissent while supporting their position with elitism, coverups, false facts, and phoney science. This is a very depressing future should we allow our universities to continue to take us down his road. The tail should not wag the dog. Something radical needs to be done to correct this situation.

The **second is man made pollution.** Are governments of the world ready to move on a realistic proposal to solve the pollution problem that arise from power plants and save their economies $ billions in health, electricity fees, subsidies, and hundreds of thousands of lives? Or are the people and government willing to continue to let the power plants continue to cause illness to millions and death to 100,000's of people each year while the environmentalists attack the "straw problem"?

The cost of a real solution to pollution from heat engines is a small fraction of the wasted yearly expenditure of attacking the "straw problem" and subsidizing the electrical industries. As of this date Jan 2015, the only company on the leading edge of a realistic solution to pollution from heat engines is Turbo Gen Power. The simplest solution is to properly fund Turbo Gen Power's research.

Third is earth changes. Does mankind wish to continue to experience ever more powerful storms, and earthquakes, and watch millions of people die? Or are they willing to learn. to grow, to expand their consciousness? If so there are hundreds of people in North America who can teach them how to moderate the

impact of earth changes in their communities. The author is one of these people.

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