Executive Summary and the Cold Engine Solution - 2019

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Global Crisis - 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, floods and unusual weather conditions strike randomly. **The climate is warming and mankind is contributing 7.6 x 10^{20} Joules each and every year.** All this while World leaders stick their head in the sand and pursue phoney solutions.

The False Problem - What is the Real Problem?

If world leaders pursue the WRONG problem and Wrong solution, mankind will suffer the consequences which is 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 thought 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 wiped out. **This is mankind's greatest fear, persueing false solutions.**

The Question is 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. Dr Davidson and her scientific and environmental collogue are expressing the scientific consensus that GHG's are the cause of global warming.

The GHG premise is flawed.

Dr Davidson and her collogues have 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 noises 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.**

Yet it is the ignorant scientists and environmentalist who advise world governments on the heat change in the environment and possible solution to climate change. In a paper entitled *"Lies, Smoke and Mirrors of the GREAT SWINDLE"* I have identified the fifteen lies scientists and environmentalist have sold the world on this subject. This article can be found on the web at www.turbogenpower.com As long as scientists and environmentalist continue these lies the world will never solve this problem. The intense politicking of scientists and environmentalist have caused the world to waste billions of dollars on meaningless and useless *"voodoo solutions*". Nothing more than tax payer money pits. No wonder a backlash from the public is developing towards the scientists who are wasting tax payers money on 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 *voodoo 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 meteorologist collect on the subject. Unfortunately meteorologist have not bothered to study applied thermodynamics either.

The Real Heat Problem

The real problem is that Mankind and Nature are heating the environment at an enormous rate. Natures heat appears to be from the earth's core outwards. Mankind's heat is from heat engines. I have chosen to deal with this subject in three papers. **Causes of Global Warming**, - **Global Warming by Man**, (both attached) and **Executive Summary and the Cold Engine** (the solution). This article deals with possible solutions to replace heat engines with focus on the Cold Engine and compares the cold engine to all other electrical power sources. The object is to select a pollution free prime mover to produce electricity.

Man Made Heat

To address the man made 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.turbogenpower.com/pollution.html**

2016 World --- Man Made Heat —

Energy Source	**- Quantity --** US DOE web page	**Heat Released**
Oil	81 million bbl per day	1.8 x 10^{20} Joules per year
Gas	3,552 Billion cm	1.37 x 10^{20} Joules per year
Electricity	24 trillion kilowatt-hours	5.8 x 10^{20} Joules per year

The total heat is 7.6 x 10^{20}. How big a number is 7.6 x 10^{20} The full number is 760,000,000,000,000,000,000 Joules per year. As you can see man is heating the environment at an astonishing rate. Conventional solutions like hydro, wind or solar will not even drop a zero off the heat released. Herein lies the dilemma all heat engines including hydro, wind and solar heat the environment.

The Answer Is the Cold Engine

Since all conventional electricity sources including hydro, solar, and wind 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.turbogenpower.com will explain refrigeration in detail. The best reference for a cold engine theory is the White Paper on the web page www.turbogenpower.com . The direct web address for this paper is; http://www.turbogenpower.com/A%20White%20Paper%202.pdf .

Market Pain and Opportunity

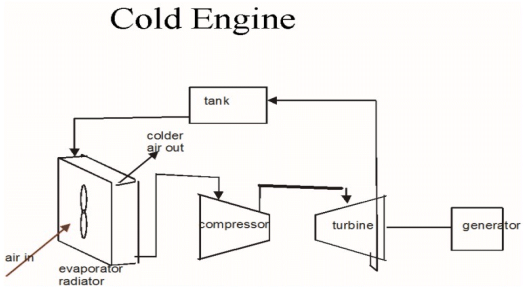
In 2012 rolling black outs cost multi millions of dollars of lost production in Leduc, Alberta as well as in the case of one company, Fiber-X, the start up costs, cost more millions. Two years later Fiber-X closed its plant in Leduc and moved to Kuwait. Alberta is in a crisis, AESO has forecast that Alberta will need 1,200 additional Mega watts of generating capacity in the next 8 years. At the current price this amounts to a market of $600 to $700 million dollars each and every year. The total market for electricity in Alberta is between $7 to $8 billion annually.

Ontario is in a crisis, looking to replace 12 Giga watt of nuclear generating capacity in the next 20 years. This has a market value of $7 to $8 billion annually. Herein lies the problem and the opportunity. **The Pain is the ever rising costs of Clean Electricity.**

The Solution ----- A Cold Engine Power Plant
A cold engine power plant is a refrigeration system, heat pump, connected to a turbine generator set. A cold engine is the solution to pollution. The Cold Engine produces no CO2, no heat, no pollution and is very economical.

Where Does the Heat Come from?
The question arises as to the amount of heat available to a cold engine. According to Cimco Refrigeration, "The cold engine is a refrigeration system, Heat Pump, combined with a turbine in the hot gas discharge stream and a significant amount of heat is generated in the ammonia refrigeration system and with the heat of condensation will provide an abundant heat source for the turbine ...", to power the generator. Web site http://www.turbogenpower.com/cimcoLetter.htm

What does a Cold Engine look like?



Advantages of the Cold Engine Power Plant.

1. Net generation to grid 7.4 mega watts.
2. Release no pollution into air, water or soil.
3. Heat multiplier of zero. Release no heat into the environment .
4. Produce no CO2.
5. Reliable run 24 / 7 – 365 days a year.
6. COE of less the 4.5 cents per kilowatt hour.
7. Capital Cost to build less than 1.2 million per mega watt generator.
8. Replication Revenues sufficient to Replicate itself profitably in 3 to 5 years.
9. Eliminates need for H V Grid - saves 20 + % of electricity bill in Alberta, more in BC.

What is the Grid?
The Grid is a high voltage power line that runs from the generating plant to the City. The City then distributes the electricity to households. Grid fees are a surcharge added to the electricity generated to cover the price of the Grid. For example Edmonton receives electricity from a coal plant in Wabamun, a relatively short distance. Fort McMurray receive electricity from Three Hills a much longer distance with much higher grid fees. Each grid surcharge is individually priced and the City say Edmonton adds up the grid fees and distributes them on average to households. Alberta has relatively short Grid line as compared to BC. BC Grid lines run from the Peace River down to Vancouver and than across to Victoria Island. These are very long and expensive grids with much higher fees, many times that of Edmonton. Edmonton Grid fee is 25% of the electricity bill. BC grid fees are much higher. Ontario is facing the same problem as BC much higher grid fees from hydro power in Northern Ontario.

Grid fees are an important consideration in choosing power sources. The Cold Engine has NO grid fees because it is nothing more then an Ice Rink with a turbine. Ice rinks can be safely built and operated in Cities. All other power plants are site specific and require a high voltage grids to deliver the electricity. The Cold engine will save grid fees of between 20% to 50% depending on location.

The grid fees alone will amount to industries and households's electricity bill dropping significantly.

How Do You Compare Different Heat Source for Power Plants

Background, in the 1990's the provinces and states got together to lower the rising costs of electricity by creating a free market in electricity . They did this by breaking up the electrical monopolies into: producers/ generators, grids, local distributors / cities and marketeers. In each case a non profit corporation was created to electronically buy and sell electricity, in Alberta it is the AESO, in BC it is Powerex.

History

The Ontario Experience

Ontario is in a crisis, looking to replace 12 Giga watt of nuclear generating capacity in the next 20 years. This has a market value of $7 to $8 billion annually. Ontario has known for over 30 years that it would have to replace 12 giga watts of aging nuclear generating capacity. The nuclear plants were originally funded by Ontario and the Federal governments.

When Ontario broke up the electricity monopoly in the mid 1990's, creating Hydro One as the generating arm of Ontario Hydro. Hydro Once petitioned the Ontario Government to write off 50% of the remaining debt from the original nuclear construction costs, on the grounds that Hydro One could never show a profit if it did not do so. This illustrated the unrealistic high costs of nuclear power. This was confirmed in 2014 when Ontario went to France to have France bid on building nuclear power plants. Ontario studied and rejected Nuclear plants from France as too expensive.

Ontario offered a consortium the opportunity to build gas turbine power plants. All cities and municipalities in Ontario refused to allow such a massive Gas project to be built in their municipality. After about 6 years and escalating costs Ontario backed out and the consortium financiers in New York City sued Ontario and received over one billion $ dollars in damages.

Ontario went to wind but refused to fund the construction costs but offered a kilo watt hour incentive of $0.60 per Kw hour, after built. Ontario finally did a Cost Of Electricity Analysis of wind. **The COE analysis should have been done before wasting a Billion $ dollars**. The Cost of Producing Electricity or COE for wind came out at 16 to 18 cents a kilo watt hour in about 2012 . That meant a price rise in electricity by a factor of 3.

Premier Winn raised electricity prices in 2017 accordingly and the Public rebelled while the poor people went broke or bankrupt. This rebellion caused Premier Winn to back down and lose the nsxt election. Now Ontario has decided to go to Hydro electricity with very long grid lines like BC. This will also prove to be a multi Billion $ dollar disaster. Obviously Ontario did not consider a COE analysis for Hydro worthwhile. Ontario prefers to spend multi Billion $ dollars and then discover it is another Billion $ dollar mistake. Well so much for the impulsive politicians with quick and easy answers that the people of this country elect.

The B C Experience

The B C Government broke up the electrical monopoly, B C Hydro, and now allows wind and gas. B C built a considerable number of wind turbines, cost unknown, possibly $800 million. **No COE analysis was done before wasting multi millions $ dollars on wind**. Wind turbines costs $2 million per mega watt to build plus grid costs. B C found wind to be "erratic and unreliable" as did Alberta. On average Wind only runs 1 hour in every 5 hours. The Billions $ spent on wind turbines proved to be money down the proverbial drain. To solve this problem the B C government went to B C Hydro who came up with a new Hydro Dam called Site C in northern B C. Web page https://www.sitecproject.com/sites/default/files/site-c-fact-sheet-july-2017_0.pdf

If you go to Site C web site you will read the reason for building Site C - "erratic and unreliable" wind power. To solve the "erratic and unreliable" wind turbine problems B C is willing to invest an additional $8.5 Billion dollars in a hydro dam which will only run 50% of the time. The hydro dam cost about $9 million dollars per mega watt generator, which again only runs one hour in every two hours. Turbogenpower made a proposal to the B C

Government which will save them over $8 Billion dollars but their has been no response. Ontario is now heading down this same money pit road.

Ottawa

In the summer of 2012 Ottawa issued new pollution guideline for coal fired power plants and banned the construction of new coal-fired power plants. Washington, under Oboma, made the same announcement in 2014. Trump reversed Obomas decision in 2017. Coal produces over 40% of the electricity in North America, with an estimated North American market of $520 billion annually. Coal is being shut down because it has a history of being the most deadly but cheapest means of producing power. In Canada, CAPE ([1]) estimates that coal adds $7 billion yearly in health related cost.

Note (1) CAPE is Canadian Physicians for the Environment

The Politicians Folly

I fully understand the political dilemma that Premier Winn and every other politician is dealing with. Where do you find Analysis who have a history of being able to do quick and dirty analysis, on a timely basis, which will lead to the correct path to walk down. These men are few and far, far between. These men are born with this ability. No amount of education can create these men. I just so happen to be one. **My company Turbogenpower has spent the last 15 years studying the factors, manmade and natural, that cause the ambient temperature to rise. Turbogenpower does do consulting.** If you wonder how good I am, just read this report and judge for yourself.

All Premiers, Prime Ministers, and Presidents have advisors, experts, scientists, bureaucrats, lawyers, auditors, and consultants that they turn too before making Billion $ dollar decisions. Unfortunately when it comes to climate change , all these experts, world wide, have been wrong, particularly the Scientists.

Scientific Opinions

Scientist have no knowledge of the stoichiometrics of combustion, working fluids, and the thermodynamics of heat flow. Engineers do. Only Engineers are taught these subject. Scientists are not taught any of these subjects. Without this knowledge scientist's opinions on the heating of the environment are always wrong. **If you wish to see the 15 lies Scientist, collectively, have sold the world on climate change go to http://www.turbogenpower.com.**

When it comes to climate change there is only one company that has a realistic understanding of the problems and solutions, and that company is Turbogenpower.

Conclusions From History

It is apparent that politicians have no idea in how to analyze power plants, neither do their bureaucrats, scientists, and hydro companies. Then the politicians turn to scientists who come up with "bone headed" ideas which will waste more billions of taxpayers $ and never work like; carbon credits, carbon is the problem, send CO2 into wells, CO2 is the problem etc. If you wish to see the **fifteen lies scientists have sold the World on heating the environment go to web site** www.turbogenpower.com .

Technical Considerations - The heat Multiplier

The Heat Multiplier is the amount of heat released into the environment to produce one unit of electricity. Wind does not release much heat at the wind site but when the electricity is consumed in the city it is converted into heat, 0 + 1 = 1, for a heat multiplier of 1. This is also true for Hydro. Now consider the cold engine, at the plant site heat is removed from the air to generate electricity and in the city the electricity is converted into heat when consumed. -1 + 1 = 0, for a heat multiplier of 0.

Why is the Heat Multiplier SO Important?
Consider the U S which produced 4 trillion kilowatt hours of electricity in 2016. Consider the heat released into the environment if all the US electricity was exclusively generated from one of the listed sources.

Heat Released into the Environment from US Electricity Production
Power Plants – Heating In US - 4 trillion kilowatt hours in 2016 - U S DOE web site

Energy Source	Heat Multiplier	Joules / year Released
Coal	5	7.4 x **10** ^{19} Joules / year
Gas	9	13.2 x **10** ^{19} Joules / year
Nuclear	15 to 35	22 to 44.x **10** ^{19} Joules / year
Wind / Solar / Hydro	1	1.5 x **10** ^{19} Joules / year
Cold Engine	0	**0.0** Joules / year

Now lets compare a cold engine with 0 joules per year to the next best, hydro with **1.5 x 10** ^{19} **Joules** / year. This is a hands down win for the cold engine. After studying the above table the solution is clear.

The only way to stop the heating of the environment by power plants is a total replacement with cold engine power plants. Hydro, wind and solar will hardly make a dint in reducing heat to the environment. Nuclear will increase the heating of the environment by a factor of 15 to 30.

The Three Essential Criteria
Of all the criteria there are three which are essential; Reliability, Pollution and Replication. Still the power plant must be affordable and keep the price of electricity, without subsidies, down. Historically there has never been a power plant built in the World that has not been heavily subsidized by Governments. **The reason for this is because no power plant to date has the ability to replicate itself, except one - the Cold Engine.**

The Only Clean, Reliable Energy Source that can Replicate itself.
The Cold Engine is the only reliable, clean, and economical source of electricity. The cold engine consumes no fuel, requires no staff on site, is remotely operated via the internet, and has the lowest erection cost and time (less then 3 months) of all power plants. A cold engine is nothing more than a refrigeration system with a turbine added. A cold engine power plant with redundancies can run 24/7, 365 days a year, year after year. This makes the cold engine the most reliable and economical clean power plant available today. The cold engine is portable and can be moved, similar to a small service rig. Try moving a gas plant? A cold engine takes less then one year to recoup its equipment costs, accountants call it capital costs recovery or CCR.
The cold engine produces NO pollution and NO CO2. The cold engine is the only environmental neutral means of generating power without heating or polluting the environment. No carbon credits or government subsidies are required. Once built the cold engine can replicate itself in 5 years. Cost of Producing Electricity (COE) for a cold engine varies between 4.5 cents to 5.0 cents a kilo watt hour. By far the lowest of all power plants.

The Cold Engine is by far the lowest cost of electricity, COE. No other power source is even close.

Rejections
Coal is rejected because of health issues and pollution i.e. acid rain and heat released, combined with deaths and high health costs plus government regulations.

Solar is rejected because it is unrealistic, unreliable and very, very expensive and very small.

Wind is rejected because it is “erratic and unreliable”. Wind is nothing more than a billion $ money pit, as Alberta, B C and Ontario have found. AESO in Alberta has commented year after year that wind is notoriously absent when peek power is needed. After all wind only produces power one hour in five. Wind farms buy coal electricity to fill 4 out of 5 hours.

Nuclear is rejected because it is too expensive and releases radioactive water into the soil, lakes, rivers and food chain. The greatest problem with Nuclear is that radiation like heat cannot be stopped. Radiation flows everywhere into the cement, steel, equipment, soil, water, but most important into the food chain, a scary thought. Consider the Savanna River in the US which is near a nuclear storage dump. There are crocodiles and turtles in this river that are too HOT to touch. The water contains sufficient amounts of radiation that cities down stream cannot use it for drinking water. This is a growing threat to habitable areas of the US, radioactive HOT SPOTS. This is a fact that the US government likes to keep hidden from public view.

Gas Turbines are rejected because of the mammoth amounts of heat released into the air, also the subsidies and high price of its electricity. Gas does produce dangerous gas like CO, Nox, Sox and CO2. These hot gasses mix with moisture and come down as acid rain. Acid rain contaminates the soil lowering crop yield. Gas turbines will shut down when the price of gas increases or the price of electricity drops. Gas Turbines require subsidies to be on standby and also require a higher electricity price to operate. For example Alberta has a number of Standby Electricity Contract to have gas power plant on standby. How many contracts? I do not know, possibly 20 . Dow Chemical has one of these contracts and received $8 million dollars yearly but will only sell electricity at $0.10 a kilo watt hour, while electricity was selling for $0.07 a kilo watt hour. **A very lucrative deal for Dow.** Alberta spends hundred’s of millions of tax dollars $ down this proverbial drain on standby contracts.

Hydro is rejected because of high initial costs, long grid lines and its destruction of fisheries and valleys. Hydro may appear to be clean but it heats the environment when the electricity generated is consumed in the city. Hydro has many other problems, flooded valleys, melting glaciers, and destroyed fisheries. In South America many dams have no water to generate power because of the shrinking glaciers. Dams destroys fisheries by preventing salmon and other fish from swimming upstream. Salmon sustain the Pacific costal of North America. In the US dams have totally killed the Salmon and many other fisheries. The Great Hover Dam drove many Indian tribes into starvation in the 1930's. No state or federal government came to their aid. The Indian’s simply starved. A long forgotten issue, covered up to this day by the US while extolling the virtues of the Hover Dam. Dams can only produce power 50% of the time because of low water levels and smaller flows into them.

The Phoney Solution

Lowering the production of carbon dioxide hides the real problem in Canada since over 50% of Canada’s electricity comes from hydro. Why **because hydro electricity heats and pollutes the environment, destroying habitant and fisheries**. Hydro’s availability varies greatly from site to site, for example site C on the Peace river is only available 50% of the time according to B C Hydro. The Solution is not hydro, solar or wind or any pork barrel tax but the cold engine which has a heat multiplier of ZERO and can run 24 / 7 - 365 days a year. A cold engine is available 100% of the time, unlike Hydro.

Hydro also comes with huge construction costs and expensive grid lines as well as mammoth damage to the environment, like destroyed fisheries, forests and valley. Habitant which animals need. Construction costs of hydro are not included in current Hydro electricity pricing because they are never payed back to the provinces. Grid fees are so high in B C, Ontario, and Quebec that they are rolled into the general electricity prices in place of construction costs. Grid fees are estimated to be over 80% of the electricity bill. The cold engine on the other hand has no grid fees and no destroyed habitant, because it is built in the city.

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.

Eventually all aging power plants have to be replace 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 conventual power plants the Elephant will grow and consume ever larger and larger parts of the budget. This dilemma Ontario is currently facing.

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. A year ago 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. Trudeau's government has produced nothing more than billion dollar money pits which delays real progress on industrial development since taking office.

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

The Solution to Pollution from Heat Engines

Start with 15 Million and then increase that to 100 million a year for five years. That is all it will take. To invest in anything other than the cold engine is waste of money, nothing more than a money pit. Eventually to solve the real problem of heating the environment by man, we have to invest in the cold engine. We might as well start now, and stop wasting money on half baked solutions.

How Big is the Market for Clean Power?

At 8.5 cents a kw - hr, the market for clean electricity in Canada is $54 Billion, in the US $440 Billion. The world market is 1,840 Billion.

Cities and Municipalities

Cold engine electricity is so economical that the gross profits constitute near half the revenues, before taxes. If a Canadian Government, federal or provincial, where to provide funds for its development and assign it share of the profits to cities and municipalities, these cities and municipalities would receive a revenue stream of $13.5 billion yearly, once the conversion to cold engine electricity is complete in Canada. Cities can begin this process with as little as a 6 million dollar investment themselves.

The solution will not come from governments like Ontario, Alberta, BC or even Ottawa. These governments have no idea what they are doing and listen only to *voodoo scientists* and lame brain popular ideas which are nothing more then Billion dollar money pits.

The solution will come from cities with small demonstrable cold engine power plants. Over time these cold engine power plants will become more numerous and replace all existing sources of power for the city. The question is

"Why?"

- Cold Engine Power plants in the city will **save grid fees of about 25%** of the electricity bill.
- Cold Engine Power plants in the city will produce **huge dollar returns for the city**, lowering taxes.
- Cold Engine Power plants will **reduce carbon production** enormously.
- Cold Engine Power plants will eventually **reduce to ZERO the heat** from electricity generation and consumption in the city.
- Cold Engine Power plants will **eliminate outages** from grid failures and power shortages.
- Cold Engine Power plants in the city will **lower electricity prices** to business and households.

Costs

What will it cost a city to begin this process? Answer about 6 million for a small 4 Mega watt cold engine power plant. A full sized cold engine power plant will cost 9 million and produce 8 to 9 Mega watts of power. Once the city sees the return from a cold engine power plant it will proceed as fast as possible to power the whole city with cold engine electricity.

Environmental Benefits

What will one cold engine power do for the City environment?

City Proposal

plant size	**4 Mega watts**	**8 Mega watts**	
Costs	6 million	9 million	
carbon reduction	35,040	70,080	tonnes / year
heat reduction	1.26×10^{14}	2.52×10^{14}	Joules / year
return at 8%	$480,000	$720,000	

Conclusion

Cities who desire to save the planet can begin by building cold engine power plants in their city and at the same time reduce the cost of electricity and grid fees. 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.

The Start

Lets start with a phone call and then a meeting.

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