

**Cold Engine Proposal
A Business Opportunity
To
Eliminate Pollution, CO2 and Heat
From the Environment
And Create Energy Independence**

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A Joint Venture Business Between
Turbogenpower and its Joint Venture Partners

Invest in the Cold Engine
Become a Joint Venture Partner

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Do The Right Thing

Table of Prime Movers vs Pollution vs Cost
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Key Observation

- Heat from Power Plant in Joules / year = power produced in M watts - hrs / year x 3,600 sec / hr x 1,000,000 joules / M watt x heat multiplier.
- If we focus on carbon only we totally miss the ballpark. We should be focusing on HEAT RELEASED as well as Co2 produced.
- When it comes to heating the environment only a heat multiplier of ZERO will lower the heat release into the environment.

Electricity

Replication vs Cost of Electricity vs Heat vs Pollution vs Heat Multiplier

Prime Mover	Replication **	COE *** cents / k w hr	Availability and reliable	Heat released	Pollution	Heat Multiplier
Cold Engine	4+ yrs	7 cents	100%	none	none	<u>0</u> ****
Nuclear	never	\$10	75%	YES	Deadly	15
Solar *	never	over \$10.	10% not reliable	YES	lead , acid lithium for storage	1
Wind *	never	20 cents	20% not reliable	YES	lead , acid lithium for storage	1
Hydro	never	\$1.70	50%	YES	destroys habitat	1
Gas *	never	13 - 20 cents	20% not reliable	YES	Co2	8
Coal	never	8 cents	85%	YES	Co2 , carcinogenic	5

* indicated the source is unpredictably and unreliable.

** Replication is the time it takes for the plant to recover its build costs plus operating costs.

*** COE is the cost of electricity as defined by US DOE National Labs.

**** A cold engine has a heat multiplier of ZERO because it removes one unit of heat from the air for every unit of electricity produced.

**This Table illustrated that when it comes to doing the right thing
there is only ONE choice –
The Cold Engine**

Clean Energy

Consider the old adage - Do the right thing. But when it comes to Clean Energy what is the right thing? Everyone has a different opinion and none except thermodynamic engineers have ever studied heat engines.

The above table, is a summary of engineering data simplified for a lay audiences. A quick study of the table will indicate that the politicians and scientist have got it totally wrong.

Carbon does not heat the environment. It is the heat exhausted from heat engines and electricity which heats the environment. Co₂ is just another exhaust gas but not all Co₂ is a problem. Only the hot Co₂ because it burns the leaves and then rises into the atmosphere and comes down as acid rain. Co₂ at ground level is a food for plants and trees.

The life giving cycle - : Man and animals consume O₂ and produce fertilizer and Co₂ for plants and trees to consume. Plants and trees consume fertilizer and Co₂ and in turn produce food , fiber and O₂ for man and animals to consume. It is an essential part of THE **CYCLE of life** which allows plants and animals to flourish. This key understanding leads to the first observation at the top of the table.

Key Observation

- **If we focus on carbon only we totally miss the ballpark. We should be focusing on HEAT RELEASED as well as Co₂ produced.**

The second understanding is that all heat engines have gross inefficiencies. The efficiency of a heat engine can be as low as 5% to 20% depending on the design, What this means is that for every unit of power produces a heat engine release 5 to 20 units of heat into the air. This is called the "heat multiplier".

In this discussion we use the term heat multiplier in place of efficiency. The heat multiplier is the inverse of the efficiency. For example a coal fired power plant has an overall efficiency of about 20% which give it an heat multiplier of 5. In layman's terms this meant that for every unit of electricity produced the plant releases 5 units of heat into the environment. This leads to the second observation.

Key Observation

- **When it comes to heating the environment only a heat multiplier of ZERO will lower the heat release into the environment.**

So why is it that the only way to reduce the heat from electricity is a prime mover with a heat multiplier of ZERO?
It is simple mathematics. Consider that the world in 2020 released **8.13 times 10 to the power 20 joules of heat from electricity into the atmosphere** in that year. Now the weighted average of the heat multiplier for the world is 6.8. So if the world were able to produce ALL its electricity from hydro and wind the amount of heat releases in 2020 would drop by $8.13 / 6.8$ times $10 \text{ to the power } 20 = \mathbf{1.2 \text{ times } 10 \text{ to the power } 20}$. This decrease in heat is not even a drop in the ocean.

On the other hand if the world used cold engine electricity the world production of heat in 2020 would drop to 0.0 Joules a year. This leads to the obvious conclusion that the only way to reduce mankind's heat from electricity is to convert to cold engine electricity.

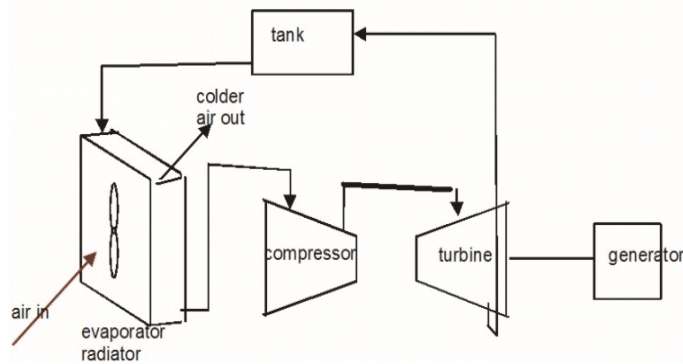
What is a Cold Engine?

A cold engine is a refrigerator system with a turbine generator set added. A cold engine has a heat multiplier of ZERO because it removes one unit of heat from the air for every unit of electricity produced, $-1 + 1 = 0$.

Will the Cold Engine Run?

In July of 2012 three P. Eng. with solid experience in thermodynamics, heat engines and refrigeration sat down every Friday afternoon for six months to discuss the feasibility and design issues of the cold engine. The first question resolved was would the cold engine run and was there enough heat to make a power plant? The answer was: YES

Cold Engine



the cold engine will run. In 2006 a miniature turbine generator of the cold engine was built. It runs like a bat out of hell and can be viewed on the upper right of the web page . And YES there is enough heat to power up tp to a 10 Mega watt generator. The question that could not be answered was how much of the heat supplied to the turbine could be converted into power. Only by building a cold engine and testing it can this question be answered.

On January 19 of 2013 Wayne Dilk V P West of Cimco Refrigeration a P. Eng. wrote the following, attached, letter of support for the cold engine to David Graham CEO and P. Eng. of Turbogenpower.

When P. M. Trudeau received the cold engine proposal, it was dismissed out of hand. The question is WHY? Was it because Scientists have NEVER grasped the significance of refrigeration which is a heat pump which pumps heat from the ice box into the kitchen? Refrigeration is older than the steam turbine. Refrigeration has been around since the 1850. Yet Scientists STILL claim refrigeration is theoretically impossible because it has an efficiency greater then 100%, usually between 300% and 700% These pea brained individuals cannot grasp the concept of an engine that has a infinite source of heat, temperature in the air, for fuel and will run until it breaks down. Certainly NO Scientist has EVER grasped the CONCEPT and SIGNIFICANCE of a heat pump. **To this day, scientist DENY the very existence of the heat pump.**

Politicians and Scientists do not believe the cold engine is possible but Engineers know that the cold engine is real and can be done. After all it is simply a heat pump with a turbine generator set attached.

Cold Engine Advantage

The cold engine has numerous advantages.

- An Engine that does not heat the environment.
- An Engine that does not pollute the environment. It is a closed system.
- An Engine that has a infinite supply of heat in the air for fuel.
- An Engine that never needs refueling.
- An Engine that will run until it breaks down.
- An Engine with a heat multiplier of ZERO.
- Cold engine electricity is extremely profitable.
- A reliable Engine that can run 24 / 7 - 365 days a year.
- Lowest capital cost.
- Lowest operating cost.
- The only engine which can replicate itself.

KEY advantage

In concept the cold engine is simple. Attach a turbine generator set to the exhaust of a large refrigeration system and generate power. The key advantages are low cost , an unlimited power supply, reliability and energy independence. **What more could you ask for?** The concept is simple but the building is complex. Only Turbogenpower, with the help of CIMCO refrigeration can make it run reliably. David Graham and his company Turbogenpower is the inventor and owner of the technology.

Companies that consume large amounts of electricity and gas for heating can eliminate both electricity and gas as a source of environmental pollution and heat, by converting to cold engine electricity and cold engine electrical heating.

A company can further reduce its electrical bill by more than 50% by having the cold engine power plant built on or near their facilities. This eliminates grid fees and local distribution fees.

Magic of The Cold Engine – Energy Independence.

The magic of the cold engine is that heat from the air can be used over and over again. *How is this possible you ask?* Consider, the cold engine removes one unit of heat from the air for every unit of power it generates and when the electricity is consumed it is converted back into heat in the air. This allows the heat to be used over and over again, as many times as you want. In fact the cold engine will make any state or country, large or small, **Energy Independent**. This is the magic of the cold engine. Now consider Europe who wish to be **Energy Independent**. How can you not LOVE the Cold Engine?

The Proposal

The plan is to raise \$25 million to build and test a small, 6 to 10 M watt, Cold Engine Power Plant in Edmonton. Once the primary testing is complete, in about 1 year, to Raise an additional \$25 Million to build and test a full sized 25 M watt Cold Engine. Once tested the project is ready for a mammoth and rapid expansion in both Edmonton and Los Vegas.

Once the full sized unit is tested, the next phase begins, to mass produce cold engine power plants and sell only the electricity. The power plant itself will never be sold outside of the joint venture agreement. This will contain the secrets of the cold engine to remain secret for a very long time which allows the joint ventures and its partners to expand gradually alone with their huge profits. To further maximize growth the joint venture will operate inside a non profit corporation.

The Organization

This venture is structure as a Joint Venture between Turbogenerator and the Joint Venture Partners. The investors constitute the aggregate of the Joint Venture capital. Investors will receive units in the Joint Venter. One Unit will cost \$500,000 dollars. The Joint Venture will be run inside a non profit organization, this will delay taxes and accelerate expansion. Only when monies are taken out of the non profit do they become taxable to the J V partners. The Term Sheet delineates the relationship between Turbogenerator and the JV partners. The key component of the term sheet is the replication process, item 7 and 8.

Replication occurs when the generating capacity doubles. At this point each Unit Holder receives an additional unit in the JV. This also happens at two other points. When the TEST cold engine is attached to the grid each Unit Holder will receive an additional three Units. Also when the full sized cold engine power plant comes onto the grid, each Unit Holder will receive an additional two Units.

Item 8 in the JV Agreement is an early investment incentive. The first \$200 Million in capital raised shall be investors in the Primary Bonus Plan. This Plan will receive 10% of the Gross Profits from the sale of electricity from all the JV's in Nevada. These incentives are designed to cover the higher risks the early investors take.

Proof of Concept

The proof of concept investors take the greatest risk but in turn will receive the greatest reward. A possible 12 fold increase in units within two years. Investors in the first full sized unit, have a much lower risk but still receive a possible three fold increase in units. Investors in the Primary Bonus Plan will receive 10% of the gross profits of all cold engine electricity sold in Nevada.

Opportunity

Better yet is the opportunity to invest in the cold engine technology at the earliest stage. Once governments come to understand that the cold engine is the ONLY solution to heat from heat engines and that the conversion costs are very reasonable, they will move to embrace the technology. This embrace will be slow in coming but that will allow Turbogenerator and its joint venture partners to expand at a leisurely rate to meet demand. Since the cold engine will never be sold out right the technology with its many secrets will remain within Turbogenerator. The joint venture partners will receive 50% of the gross profits within a nonprofit structure and the technology will forever remain with Turbogenerator.

Profitability

The cold engine power plant is extremely profitable. Replication is a doubling of the generating capacity and is very much an indicator of how long it will take for the investment to double, all else being equal. Once started, Replication takes 4 to 5 years.

Market Size

The electricity market in Canada is worth 54 Billion \$, in the US 240 Billion \$, in the world 1,800 Billion \$. In 40 years time the joint venture partners may well control a market of over 1,000 Billion \$ annually. More simply a Trillion \$ operation.

Government as Investor

Any government be they a country, state, province, city or municipality can invest in the cold engine at little or NO costs by guaranteeing a loan or municipal bonds. This is how it works, say a state or country wants an investment in clean cold engine power plants BUT doesn't have tax dollars to pay for it. They approach Turbogenerator and work out an agreement. Then the state or city and Turbogenerator go to obtain municipal bonds to build the power system from the New York bond issuing company. The bonds are issued and the money raised. Turbogenerator gets the money to build the power system. Once built Turbogenerator pays back the bonds over time and the state or city guarantees the bonds. Once the power system is fully complete the state or city will receive 15% of the gross profits from the power system yearly.

The Cold Engine A New Business Model

A business within a non profit corporation

A Joint Venture with Turbogenerator

Replication of generating capacity							
Inside non profit						Not Taxable	
Progression if double in 4+ years							
	initial						
year	0	5	10	15	20	25	30
build	1	1	1	3	4	10	16
operating	0	1	2	3	6	10	20
total	1	2	3	6	10	20	36
							64

Taxable return to partners			
Profit out to partners	1	2	4

When money comes out