Arctic Cooling Engineering the Summary. 2016/8/22,9/21

Imminent Methane Catastrophe Risk in **East Siberia Arctic Shelf** by sea water warming has been being warned.Now Arctic Ice retreat had become **positive feedback**,which could not stop spontaneously,but by man made **Arctic Cooling Engineering**.Without which,we could not intercept global extinction.This report is the overview by non-expert author.

[０] : ARCTIC METHANE CATASTROPHE RISK that IPCC never tell.

⑴***Global warming is inevitable and 5 billion until 2043 , , may die if nothing is done in time ,and they are hidden from worldwide population .. says Jucelino Luz***

http://www.jucelinodaluz.com.br/aquecimento-global-inevitavel.htm

The coming 2043 would not due to CO2 global warming in rather slow tempo,but to rapid collapse by Arctic methane catastrophe.

⑵Decisive recognition on coming awful future.

It is very few who could disclose **livelihood reality** in coming awful future in climate hell.

What will climate change do to our planet ?.by Richard Girling.Sunday Times,5/11,2007.

http://www.timesonline.co.uk/tol/news/science/article1480669.Ece<now not available>

Now above site is shut down,while following sites are available .

http://www.planetextinction.com/documents/What%20will%20climate%20change%20do%20to%20our%20planet.pdf

http://www.777true.net/What-will-climate-change-do-to-our-planet.pdf

6℃ Increase： Life on Earth ends with apocalyptic storms, flash floods, hydrogen sulphide gas and methane fireballs racing across the globe with the power of atomic bombs; only fungi survive.

This precious report might be incomplete,however there has been nothing,but this which could disclose livelihood reality in coming climate hell of 1,2,3,4,5℃ rise world.

Then note almost climate science society,educational institutions and media never disclose the coming awful climate reality. They entirely have insidiously been silent !!!.

Now the big Syrian refugee have become global concern.However once full scale climate hell would have come,the scale of refugee from devastated famine regions would be far massive than that of Syrian at now.Scale of disaster would have grown up rapidly hereafter.

⑶Any novels could describe final hell stage of climate.

It is only above site that had described final hell stage of climate the fireball earth.

⑷**ARCTIC METHANE CATASTROPHE RISK that IPCC never tell.**

So called gradual *global warming* by CO2 rise would not directly perish mankind,but initially external induced and finally self run away Arctic Methane Catastrophe by CH4 toward fireball earth could do.Which has been hiding by IPCC the our tax organization.Then self run away(**vicious positive feedback**)is two stage of ice cover loss,which accelerate more sun heat input the ocean that accelerate more ice cover loss.Then second is CH4 eruption by **ocean sea flor warming**,which accelerate global warming by strong Green House Gas effect. The 2nd stage could not stop once they would have worked on .But earlier 1st stage of **ice loss** could be intercepted by **Arctic Cooling Engineering.**The our aim is just at here !!.

⑸***Just do NOT tell them the monster exists:The Arctic Methane Monster***

http://arctic-news.blogspot.jp/2013/10/just-do-not-tell-them-the-monster-exists.html

Now global warming as worsened climate change by massive CO2 emission has become aware for everyone at now.While **Arctic Methane Catastrophe Risk** has been now not well known to general.Almost established media,but some conscience websites has been warning.Certainly this is rather difficult field for amateur,so the hiding conspiracy has been going on.However the only strong group in UK has been working on toward global warning with engineering and policy planning.

http://ameg.me/

http://arctic-news.blogspot.jp/

http://geo-engineering.blogspot.jp/

⑹***Save the Arctic sea ice while we still can!*** 2015/03/06

http://arctic-news.blogspot.jp/2015/03/save-the-arctic-sea-ice-while-we-still-can.html

Fortunately researchers are increasingly confident that a stratospheric aerosol haze, produced from sulphur dioxide, SO2,could provide significant cooling of the Arctic for modest expenditure of the order of a few billion dollars per year.This type of cooling could be replaced by cloud brightening using ultra-fine seawater droplets when the technology is ready for large-scale deployment within a year or two.

＊red characters are by author

Note World military budget＝1.7T$/y,World Oil spending＝26T$/y !!

[１] : What is Arctic Ocean ?!.

Our imminent task are two,one is urgent 80%CO2 reduction to stop global warming.
This is the absolute necessary condition for climate salvation,however not sufficient.
And the 2nd is urgent Arctic Cooling Geo-Engineering,which needs not only engineering knowhow,but also Arctic geography and proper climate.However those are far from author.

Arctic Region Map

http://www.lib.utexas.edu/maps/islands_oceans_poles/arctic_region_2000.jpg

THE ARCTIC OCEAN AND THE OCEAN CURRENTS

http://www.jeanlouisetienne.com/en/images/encyclo/imprimer/18.htm

You could sea ocean currents in Arctic.

Arctic Wind Distribution(see *Wind* in below).this is not sufficient information at now.

https://en.wikipedia.org/wiki/Climate_of_the_Arctic

Methane Hydrade Distribution in Arctic

http://arctic-news.blogspot.jp/2012/05/proposal-to-extract-store-and-sell.html

Shakova et al, 2010a estimate that some 50 Gt of methane could erupt at any moment on the East Siberian Arctic Shelf (ESAS).　　**Below value are told not so reliable.

Global Methane Reservoir	1000～5000GtC
Atmosphere	**5GtC**
East Siberian Arctic Shelf	1400～1700GtC
Arctic permafrost reservoir	400GtC
Arctic Ocean	1000～2000GtC

∗Radiative forcing by CH emission(GtC)can predict global temperature rise/year as follows.
However,the value(ΔF) is now **not verified** at here.<at p25/35 in following site>

http://www.777true.net/GLOBAL-DECLARATION-WAR-on-CARBON-with-Geo_Engineering_Part_C.pdf

∗It is told ΔF=1.6W/m^2 with temperature rise about 0.03℃/y at now(2016).

(a)Temperature Rise/year by Radiative Forcing(ΔF) : $dT/dt = \Delta F/C_G$.<C_G＝55.8J/sTm^2>

Radiative Forcing= ΔF (50GtC)＝3.80W/m^2.　→　dT/dt＝0.07℃/year.

Radiative Forcing= ΔF (1000GtC)＝19.75W/m^2.→　dT/dt＝0.35℃/year.

∗C_G＝55.8J/℃m^{2}s≡Global Heat Capacity/<global area x year time in second>

(b)**Global Debt Heat Input/year**(≡ΔQ)

＝1.6W/m^2×4π(6.38x10^{6}m)^2×(3600x24x365sec)＝2.58x10^{22}J.　<ΔF＝1.6W/m^2:IPCC data>

(c)**Observed global temperature rise/year**(≡ ΔT/Δt)≒0.03℃/y.

ΔT/Δt(＝dT/dt)≒0.02～0.04℃/y. in various data,

(d)**Global Heat Capacity**:C_G≒8.6x10^{23}J/T.<land & atmosphere are neglegible as 1/1000>

The huge energy is stored in global oceans of surface 361.3x10^{12}m^{2}with depth about 600m. ∗ sea water density＝10^{3}kg/m^3, specific heat＝4.18KJ/Kg. C_G(600m)＝9.06x10^{23}J/T.

Sea Ice Animations.<a best video was lost at here **!>**

https://www.youtube.com/watch?v=l0Ivkq4ML-s

https://www.youtube.com/watch?v=UaKqhRTqSlg

https://www.youtube.com/watch?v=Fw7GfNR5PLA

https://www.youtube.com/watch?v=UVzCOoQY28Y

https://www.youtube.com/watch?v=mGZbiWy47bA

These animations tell us *some* actuality of **sea ice dynamism**.Then note that mean sea ice thickness is told mere about 2m,it is the thinness that causes sea ice vulnerability for wind and ocean current disturbance.Then some way of 1 dimensional sea water spreading could be effective to stabilized ice surface by thicker ice making.

[２] : How to Cool Arctic.

⑴Insolation Cut by Cloud Making in Arctic Summer Season.

Cloud generating is determined by **aerosol density** which becomes cloud condensation nuclei(**CCN**) in conditions of {temperature,pressure,humidity and wind velocity}.Following machines are aerosol emitting one toward higher sky.Those could cover large area by an unit..This method may be best performance in cost and effectiveness.Our destiny would depend on success of this machine !!!.

***How to Cool Arctic*.**

http://arctic-news.blogspot.jp/p/how-to-cool-arctic.html

Climate 'tech fixes' urged for Arctic methane 17 March 2012

http://www.bbc.com/news/science-environment-17400804

Depending on the size and location, Prof Salter said that in the order of 100 towers would be needed to counteract Arctic warming.

Sea-going hardware for the cloud albedo method of reversing global warming

http://rsta.royalsocietypublishing.org/content/366/1882/3989.full#sec-7

"Albedo Yachts" and Marine Clouds: A Cure for Climate Change?

http://www.scientificamerican.com/article/albedo-yachts-and-marine-clouds/

http://www.777true.net/How-to-Make-Clouds-for-Intercept-solar-heat-in-Arctic.pdf

http://www.777true.net/Arctic-Cooling-by-spreading-sea-water-to-make-cloud-in-order-to-cut-insolation.pdf

⑵**Building Thicker Sea Ice by Spreading Water in Winter Arctic.**

Now author has not sufficient knowledge also on this theme,however it is suggestion of additional possibility. This method may be very higher cost than cloud making method, however could be effective and certain for **target local area(emergent dangerous area)**.

Arctic geoengineering

https://en.wikipedia.org/wiki/Arctic_geoengineering

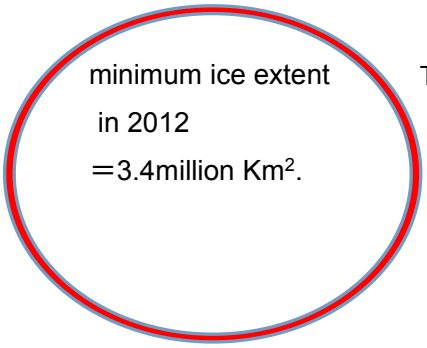
⑷***Building thicker sea ice****[edit]*

It has been proposed to actively enhance the polar ice cap by spraying or pumping water onto the top of it which would build thicker sea ice. As ice is an insulator, water on the surface of the ice tends to freeze more quickly than that below. River water could be used for this purpose, as salt water tends to resist freezing, and may end up perforating the resulting ice sheet.

Thickening ice by spraying seawater onto existing ice has been proposed.[broken citation] Sea ice is an effective thermal insulator, and thus freezing takes place much more rapidly on the top surface of the ice sheet than on the bottom. Thicker sea ice is more structurally stable, and is more resistant to melting due to its increased mass. An additional benefit of this method is that the increased salt content of the melting ice will tend to strengthen downwelling currents when the ice re-melts

⑸**1 dimensional thick ice wall building intercepting Arctic sea warming**(author).

The full area wide spreading is impossible and may be not necessary.Author has been thinking of **1dimensional lines spreading at where necessary** to stop ice melt invasion. For an example,7000Km line would be accomplished 100 troops with each 70Km duty in winter Arctic. Circle is an idea,other many variation would be possible.



The surrounding length might be about
＝2π(3.4x10^6Km^2/π)^(1/2)～7000Km..
70Km/troop＝7000Km/100troops.
It is **sea water pumping & spreading** for ice building in sever cold winter operation.

The most danger area which needs urgent insolation input cut may be shallow as East Siberian Arctic Shelf. Such area is most ice thin one.Something effective water **spreading strategy** at that area is necessary.

The fundamental idea of ice making by spreading water is that spreading amount could make **delay time** in ice extent melting,which turn to make earlier beginning of ice freezing toward more extent(also thickness) recovery in winter.

[３] : Water Spreader for Thicker Ice Making.

Methane catastrophe in ESAS could be avoided by making thicker ice by spreading water. Aim of this chapter is a coarse scale estimation of geo-engineering by simplest assumption. Following are non expert author's easy opinion.By anyhow,the designers must know details of climate and geography toward optimized construction design.It is most vulnerable region such as East Siberian Arctic Shelf that needs urgent Arctic Cooling Engineering.This work must be co-operated by both experts on **machine design** and and on **Arctic detailed information**.

⑴The fundamental idea for "how much spreading water"?.

If we could spread water amount as much as 1 month melting ice,we could make the same delay of ice melting and the more quick recovery of ice freezing in winter.This sequential year by year process could be good positive feedback to **recover** the stable ice extent and thickness.This fundamental idea is applicable also for cloud making method.

⑵Arctic Global Operation(Arctic Ice Parameters for an engineering):

The conclusion at ⑵ could not be realizable,it is too expensive !!.

*Arctic Area＝14,056,000 km^2＝14.056,x10^6 km^2＝π(2111Km)^2

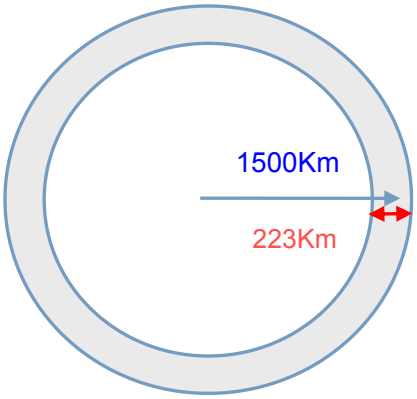
*minimum ice extent in 2012＝3.4x$10^6$$Km^2$＝π(1040Km)^2

*Max Ice Volume(1979～2001)＝30x1000Km^3.

*Max mean ice thickness＝2.14m.

*ice melting season＝(4.5～9.5)～4Months.

*Recent seasonal ice volume change＝[5、23]x1000Km^3



***Ice melting mean speed/month**

＝(23－5)/4M＝**4500Km^3/M**

＝4.5x1000Km^3/3600sx24x30＝**1.7x$10^6$$m^3$/s**.

*The area＝[4.5x1000Km^3/M]/2.14m＝2.1x$10^6$$Km^2$/M

*Loop width≡[2.1x10^6Km/M]/2πx1500Km＝223Km。

⑶operation months＝4Months and necessary amount of pumping units.

Pumping Velocity for 4Months＝(1.7x$10^6$$m^3$/s)/4＝4.3x$10^5$$m^3$/s

100nationsx42500units → V_P＝**0.1**m^3/s＝6m^3/min.

*Pumping speed V_P＝**0.1**m^3/s＝6m^3/min is rather strong.

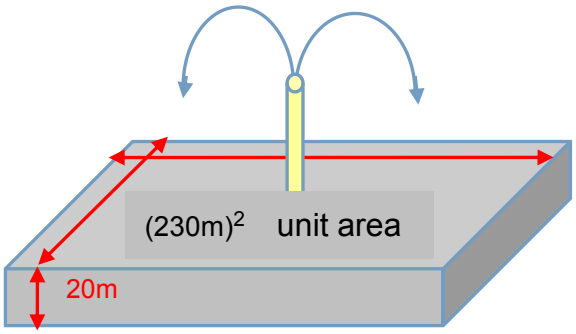
*Certainly this is outrageous big number(geo-engineering !),

⑷**Pump locations design.**

1 month mean ice melting＝4.5x1000Km^3/M＝2mx225kmx10000km

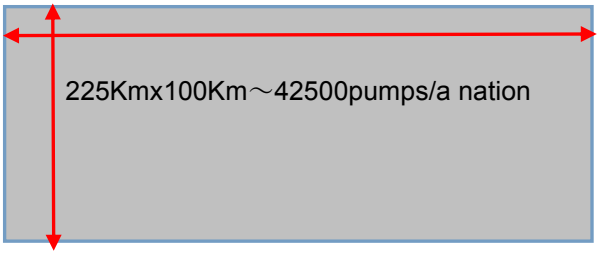
100nations → 2mx225kmx100Km

42500pumps → total spreading amount/unit＝1.06x10^{6}m^3＝20mx(230m)^2.



In Arctic winter,spreaded water is expected to be frozen instantly. While we also expect water spreading could be sufficient extent with thickness such as figure left.. The actual implementation needs something good technology.

Above is mere an ideal conception example,but not to assure realizable effective design.



⑸**How much pump cost is ?**<now author don't know exact cost>.

If the cost is 20000$(by mass production),the total pump cost is 90x10^9$＝90T$.

Note World military budget＝1.7**T$**/y,World Oil Spending＝26**T$**/y !!

口径(mm)	出力(kW)	型式
200	7.5～55	CN200-P
250	15～75	CN250-P
300	15～75	CN300-P
350	18.5～75	CN350-P
400	18.5～75	CN400-P
500	30～75	CN500-P
600～800	37～250	仕様点設計いたします。

http://www.shinmaywa.co.jp/pump/products/setsutop.html

			power	diameter		VP	cost
21465955	TO-7GE 60HZ	775-7174	**5.5Kw**	**φ10 c m**	15m	**1m^3/min**	￥413,918

https://www.monotaro.com/g/01444016/

⑹**Performance of "*Fire Engine Pump*".**

A fire fighting engine is very useful model in our case of spreading water.

＊max flow velocity＝3800L/minute＝3.8m^3/m(normal＝2m^3/m)

＊max extension hose length＝1.8Km(diameter=180mm,max flow rate=4m^3/m)

http://www.city.kawasaki.jp/840/page/0000021198.html

☞:This is case for **fire fighting operation**. Piston **dragging long length hose** may becoming technical problem.However the overcoming may be not so serious.

[４]：Methane Risk in East Siberian Arctic Shelf(ESAS) could be evaded !!!.

This is also **very coarse scale estimation** of Geo-Engineering on ESAS.

Now author has no answer for how much ice wall size is best effective.

This is the most essential problem on building ice wall rampart.

But following is an estimation of pump unit amount for an assumed ice wall size.

⑴**Where and how much size of ESAS ??**

http://arctic-news.blogspot.jp/p/potential-for-methane-release.html

http://www.motherjones.com/environment/2013/08/arctic-methane-hydrate-catastrophe

*Simulation Area＝rectangular of 4000Km×500Km

*round length for ice wall＝10000Km.

This is mere a possible assumption.

*ice wall width and depth＝0.1Km×20m.

Above value has no validity,but authors opinion.

***Total ice wall volume**＝20Km^3.

＊the ice volume ratio＝(20Km^3/4M)/4500Km^3＝1/900.

*10nationsx3860units → V_P＝**0.05**m^3/s＝3m^3/min.

(**Arctic Global Operation**.):

***Ice melting mean speed**

＝(23－5)/4M

＝4500Km^3/M

(ESAS):⑵**Unit Pump Speed**＝V_P

V_T＝20Km^3/(4×30×24×3600s)＝1930m^3/s

V_P＝V_T/(10x3860units)＝**0.05**m^3/s＝**3**m^3/m.

(ESAS):⑶**Unit Pump Area**＝S_P

total Water spreading area S_T＝10000×0.1＝1000Km^2/s

S_P≡S_T/(10nations×3860units)＝0.026Km^2＝$(0.16Km)^2$.

L_U≡10000Km/(10n×3860u)＝260m.(unit length)

L_H≡100m. (unit width)

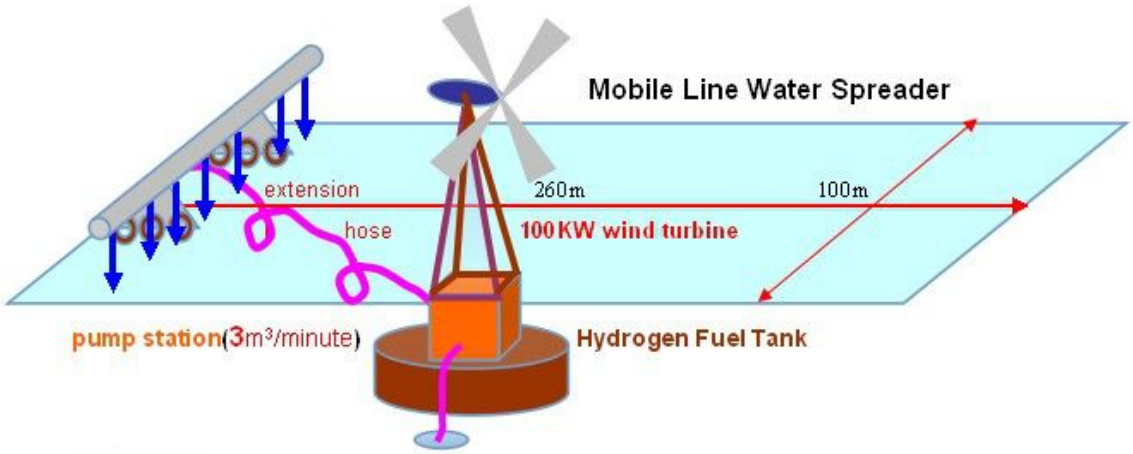
＊**spreaded water height/minute**＝(3m^3/m)/(260mx100m)＝0.7cm/h

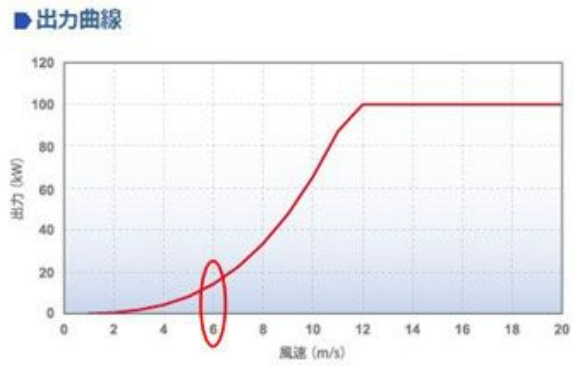
＝0.168m/day＝5m/momth＝20m/4months.

⑷**Mobile Line Spreading** by near 24 hours cycle.

1/12 area lump spreading＝.0.7cm/h×12＝16.8cm/h(＝0.11mm/m) <max ice height>

This very small thickness(/minute) means **instant water freezing in winter Arctic**,.





By 6m/s weak wind, the turbine could get about 15KW energy. Surplus enegy could be saved as H2 gas one.

http://www.torishima.co.jp/jp/pm/wind.html

This is mobile water spreader with many splasher holes.The spreader move side to side by 24(?)hours cycle.The moving speed is very slow as 22m/hours＝0.36m/minute.In initial setting,spreader line may be very cold to freeze injected water instantly.Thereby **heating spreader pipe line** is necessary,which could be possible by **pump engine heat**.Author estimates pump engine output power **15KW?**(**3**m^3/minute),half of which may be heat loss.This heat could be supplied for **home heating & lighting for the operators** in pumping station.

⑸**Pumping Output Power＝15KW?(3**m^3/minute):

Substantial Energy for pumping **3**m^3 water/minute by 10m lifting is

＊3000Kg×9.8m/s^2×10m/60s＝**4.9KW.**

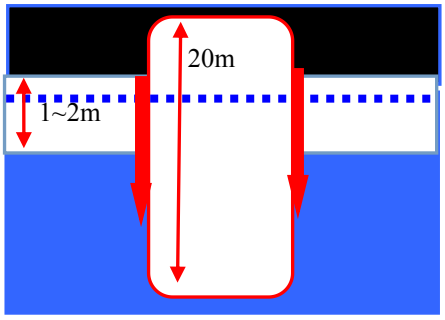
＊3000Kg×9.8m/s^2×5m/60s＝**2.45KW.**

Maybe **long hose caring** water may take larger loss energy.Then **siphon feeding** could be effective to reduce water-lifting length. Total fuel cost is too expensive as **56B$/y(15KW!!)**.

This cost must be reduced to 0 by 100Kw **WIND TUrBINE system**(cost～1000$?/unit).

Surplus power could be saved as H2 gas energy for fuel.

⑹:Ice Cracking by becoming heavier ice block.



Making 20m thickness is to cause sudden(?)ice block going down at some times by **own weight increasing**.

Our aim is increasing ice stability against **ice cracking**.

Does this design aim realy become effective ?.

Less thickness with wider area spreading is to cause higher Machine Cost

A know-how on **construction(or cracking)dynamics of ice layer** is necessary !!.

⑺**Machine Storing Base(station) in summer time。**

⒜unit spread machine size＝[100m(length)×3m?(width)].

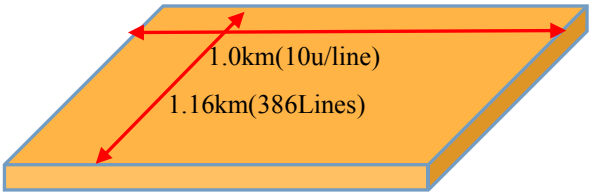
Machine Storing Area＝100m(length)×3m?(width)＝300m^2.

Storig Base Area in rest summer time＝<300m^2×3860units)＝(1070m)^2

～100m(length)×10units×3m?(width×(386lines)＝1000mx1160m.

⒝size of **3860 units Storing Base(station)Area in summer time＝1000m×1160m**.

It should be **mobile floats** with strong durability against **storms**.Floats fixing by throwing anchor could be dangerous to methane clathrate in the sea flor.The mobile floats must have sail or propeller.

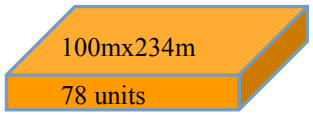


(c)**Line Distributed Stations(Base).**

1000km length is troublesome to set many machines,thereby we should design many stations to reduce machine carry length within **10km**<then amount of floats increase>.

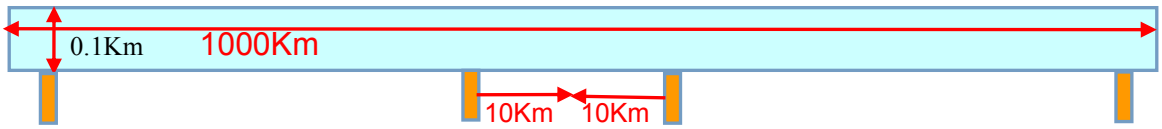
EXAMPLE) 3860 units is divided by **50 stations with** 78units.

S＝100m(length)×3m(width)×78units＝$(153m)^2$＝(100m×234m).



Someone told mega float *"town"* price/unit area＝1000\$/m^2, which causes very high price 2.3B\$/(100m×234m). Author hopes it is 100\$/m^2 by **mass product effect**.After all,the total cost of floats becomes high as **1.2T\$.**This is not impossible,However we must survey **alternative cheaper method**.

(c)size of Covering Area for each nation＝1000Km×0.1km.



*above is 50 stations. max length for machine carry

(8)**The very coarse Total Cost Estimation**.

(ESAS): Total Pump Cost＝S_P~ **initial machine cost=2T\$＋annual cost=0.3T\$/y**

This is cheap cost for ***saving planet earth !!!***

If the unit(V_P＝**3**m^3/m) cost is 20000\$.

＊Machine Cost＝20000\$x(10nationsx3860units)＝772x10^6\$＝77Billion\$.

＊Station Floats(100mx234m)Cost＝＜100\$？/1m^2×23400m^2＞×50＝1.2T\$

＊15Kw Pump Fuel Cost＝0.0014\$/s×10nationsx3860units×(4x30x24x3600)＝56B\$/y

☞:56B\$/26T\$/y＝3% CO2 increasing！。This could be reduced to **0!!!** **by** employing.

100Kw wind turbine(～10000\$?).The total cost＝10000\$×10nationsx3860units＝40B\$/y.

*cost for soldiers/y＝10nations?x386?×50000\$?＝19B\$/y.

***Note World Military Budget**＝1.7T\$/y,**World Oil Spending**＝26T\$/y !!

This is possible cost,so we must urgently go to the action !!!.

＊Fuel Cost＝0.0014$/s×10nationsx3860units×(4x30x24x3600s)＝56B$

Diesel fuel cost 138¥/L＝1.4$/L

Diesel oil heat energy＝38.2MJ/L

Diesel Engine efficiency＝0.4

Fuel consumption for Pump Wattage＝15Kw/(0.4x38.2MJ/L＝15.3MJ/L)＝0.001L/s.

Pump 15KWattage Fuel Cost/s＝1.4$/L×0.001L/s＝0.0014$/s.

[５]：Provisional Conclusion.

Arctic Cooling by Cloud Making is told **few billion $/year**,so the price mentioned here is too higher cost.Also the technical method mentioned here is very primitive,but not sophisticated. However,we must survey **many alternative method of Arctic Cooling Engineering** to **assure the success**.Or we would be extincted by Arctic Methane Catastrophe.

＊The unprecedented project of Arctic Cooling might have good effect.

Above all,it is a realization of **global unite** to save this planet,which would mean favorable historical transition from perpetual struggles to global peace realization.Another is economic system transition trial from decadent competitive capitalism to cooperative and constructive international socialism.It is worthy to endeavor for coming another **stable world**,even though it would cost higher spending. This is nothing,but the final trial.

☞:As also you may notice,this report has **decisive defect on ice layer dynamics in Arctic** which belong to the experts.Author wish their joining on the study.

Also not **Arctic Cooling in Global** must be done by **Cloud Making Method !!!.**

Both urgent operation in local ESAS and Global Arctic are necessary.

APPENDIX-1: Ice making by freezing spreading water.

⑴**In case of Center Pivot Irrigation for agriculture**.

http://www.upton.com.au/services/centre-pivot-irrigation/

https://en.wikipedia.org/wiki/Center_pivot_irrigation

Average size is told 400m hand length.

160 Acre Center Pivot Example Estimating Annual Irrigation Operation Costs

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_024179.pdf

Grand Total Estimated Annual Cost = $15,055.

⑵Setting on pumping units at designed position when(Nov)ice surface had become stable.

Setting off pumping units before beginning ice melt. This operation needs big labor. Machine must be fueled in the operation going on. Machine must be cared in strong wind and blizzard times.

⑶**Storing Bases in the rest time of summer<**mentioned in **[3]**：⑹>

⑷Ice thickness increasing is to drop down ice volume with sea surface top of 12% volume

Ice density＝ρ(ice)＝0.917g/cm^3.

sea water density＝ρ(SW)＝1.02～1.035g/cm^3..

Ice float in sea＝1.03/0.917＝1.12.

12% volume is over sea surface.

$$1+\Delta V=\rho(SW)/\rho(ice).$$

$$\rho(SW)\,V(SW)=\rho(ice)\,V(ice).$$

$$1+\Delta V=V(ice)/V(SW)$$

$$=\rho(SW)/\rho(ice).$$

APPENDIX-2:

These are time estimation(about few decades<2050)for catastrophic point.by current trend.

Global warming is inevitable and 5 billion until 2043 , , may die if nothing is done in time ,and they are hidden from worldwide population .. says Jucelino Luz

http://www.jucelinodaluz.com.br/aquecimento-global-inevitavel.htm

Global Extinction within one Human Lifetime as a Result of a Spreading Atmospheric Arctic Methane Heat wave and Surface Firestorm

http://arctic-news.blogspot.jp/p/global-extinction-within-one-human.html

Following are model estimation by author.

http://www.777true.net/Arctic-Ice-Vanishing-within-15years-toward-Methane-Catastrophe.pdf

http://www.777true.net/Rapid-Temeperature-Rise-in-Arctic-a-simple-verification.pdf

APPENDIX-3:

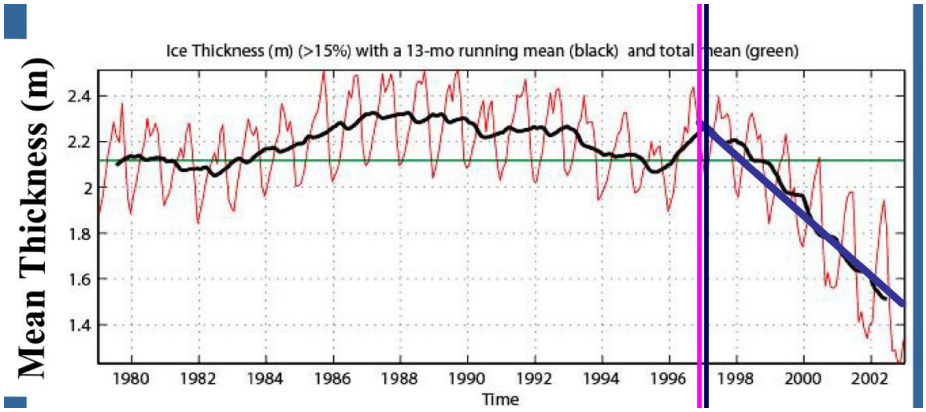
Arctic Sea Ice Blog

http://neven1.typepad.com/blog/

Arctic Sea Ice area thickness and volume trends.png

https://commons.wikimedia.org/wiki/File:Arctic_Sea_Ice_area_thickness_and_volume_trends.png

The thickness is about 1~2m.



Arctic methane catastrophe scenario is based on new empirical observations

Critics of new Nature paper on costs of Arctic warming ignore latest science on permafrost methane at everyone's peril(the Guardian UK).

https://www.theguardian.com/environment/earth-insight/2013/jul/31/artic-methane-catastrophe-empirical-evidence

"The mechanism which is causing the observed mass of rising methane plumes in the East Siberian Sea is itself unprecedented and hence it is not surprising that various climate scientists, none of them Arctic specialists, failed to spot it. What is actually happening is that the summer sea ice now retreats so far, and for so long each summer, that there is a substantial ice-free season over the Siberian shelf, sufficient for solar irradiance to warm the surface water by a significant amount – up to 7C according to satellite data. That warming extends the 50 m or so to the seabed because we are dealing with only a polar surface water layer here (over the shelves the Arctic Ocean structure is one-layer rather than three layers) and the surface warming is mixed down by wave-induced mixing because the extensive open water permits large fetches. So long as some ice persisted on the shelf, the water mass was held to about 0C in summer because any further heat content in the water column was used for melting the ice underside. But once the ice disappears, as it has done, the temperature of the water can rise significantly, and the heat content reaching the seabed can melt the frozen sediments at a rate that was never before possible. The authors who so confidently dismiss the idea of extensive methane release are simply not aware of the new mechanism that is causing it."

Wadhams thus describes the previous research dismissing the methane.

if the IPCC's projections are too conservative? Could humans, together with many other species, go extinct within the next few decades?

http://arctic-news.blogspot.jp/2014/11/ipcc-too-conservative.html