HelioHydroElectric Potential Prefeasibility Study Iran, Turkmenistan, Kazakhstan

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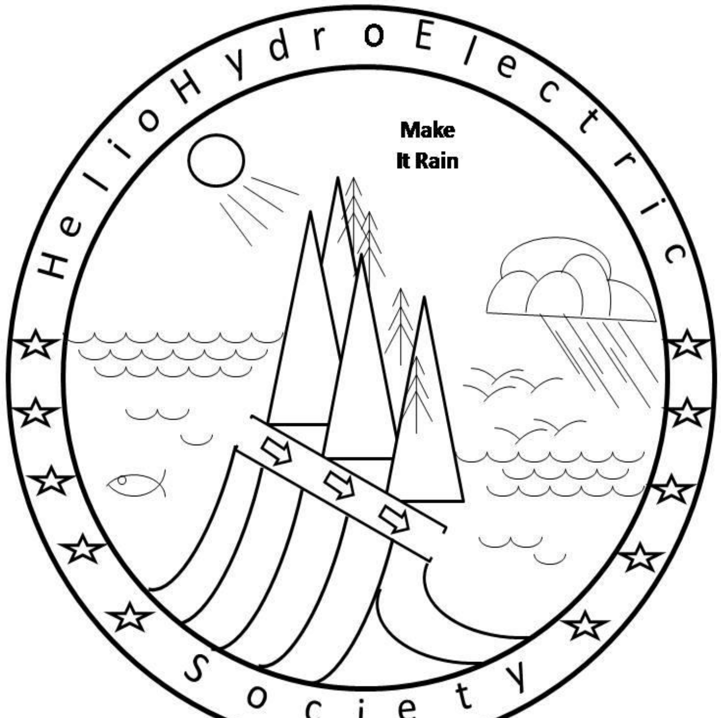
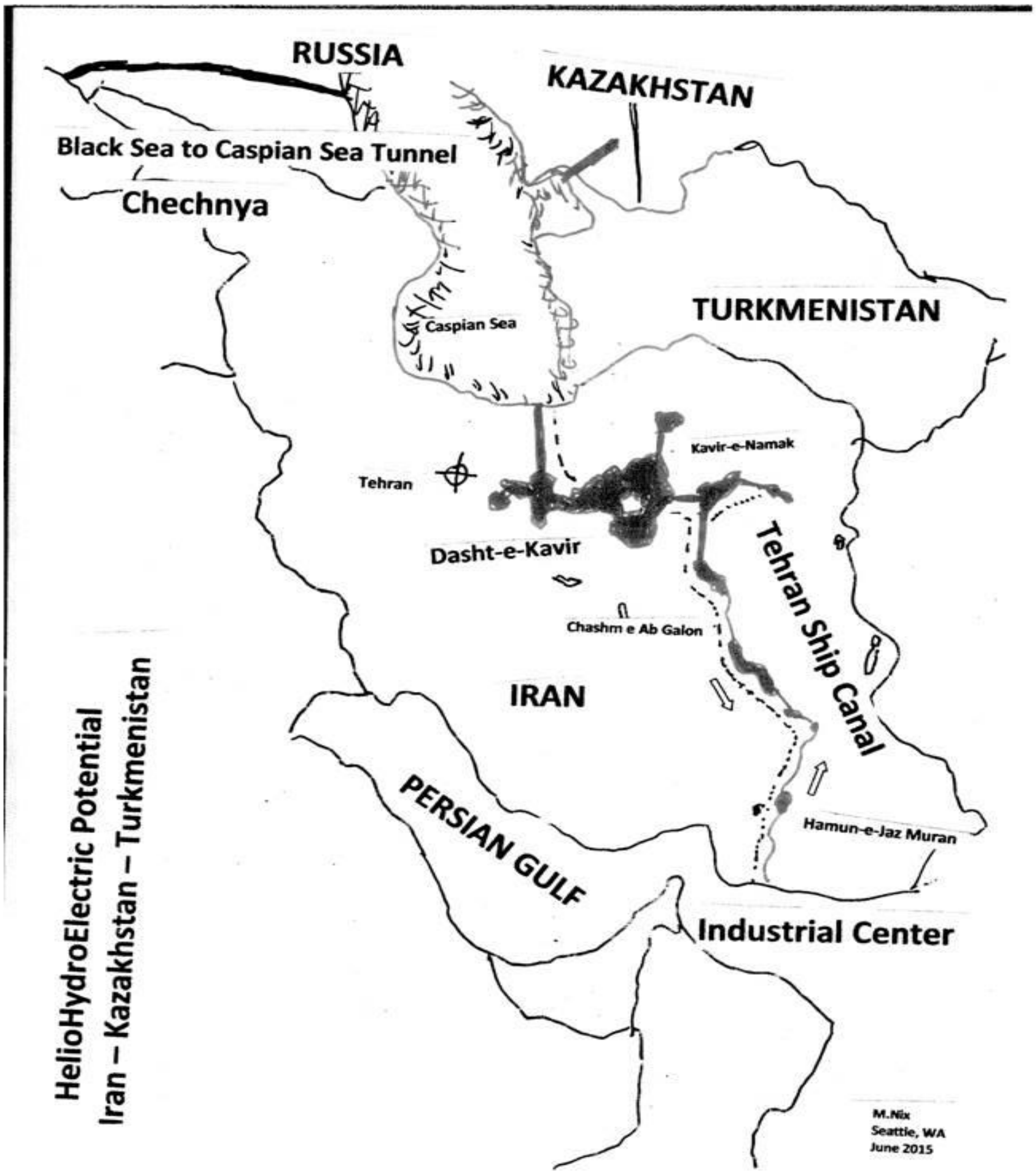
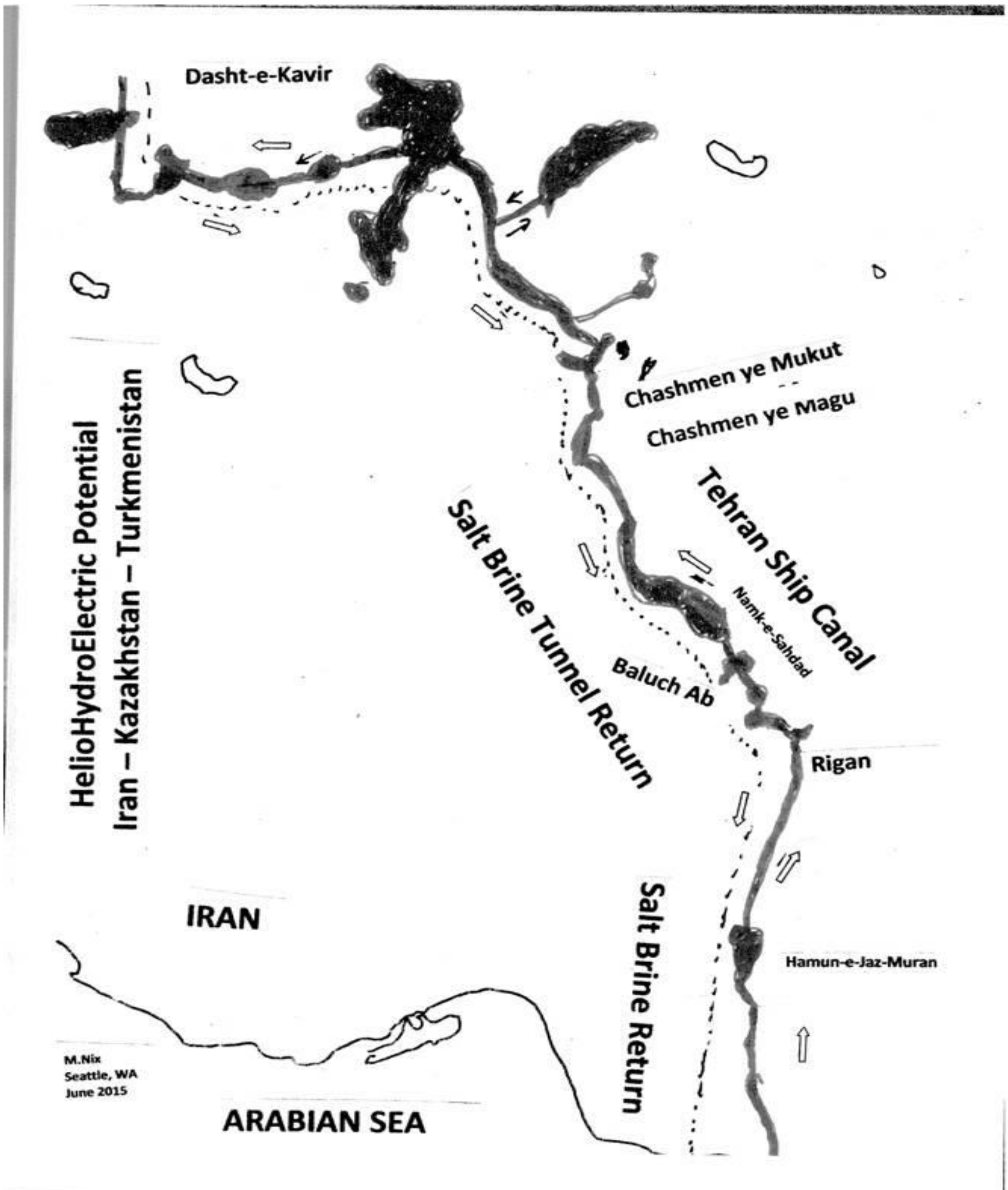
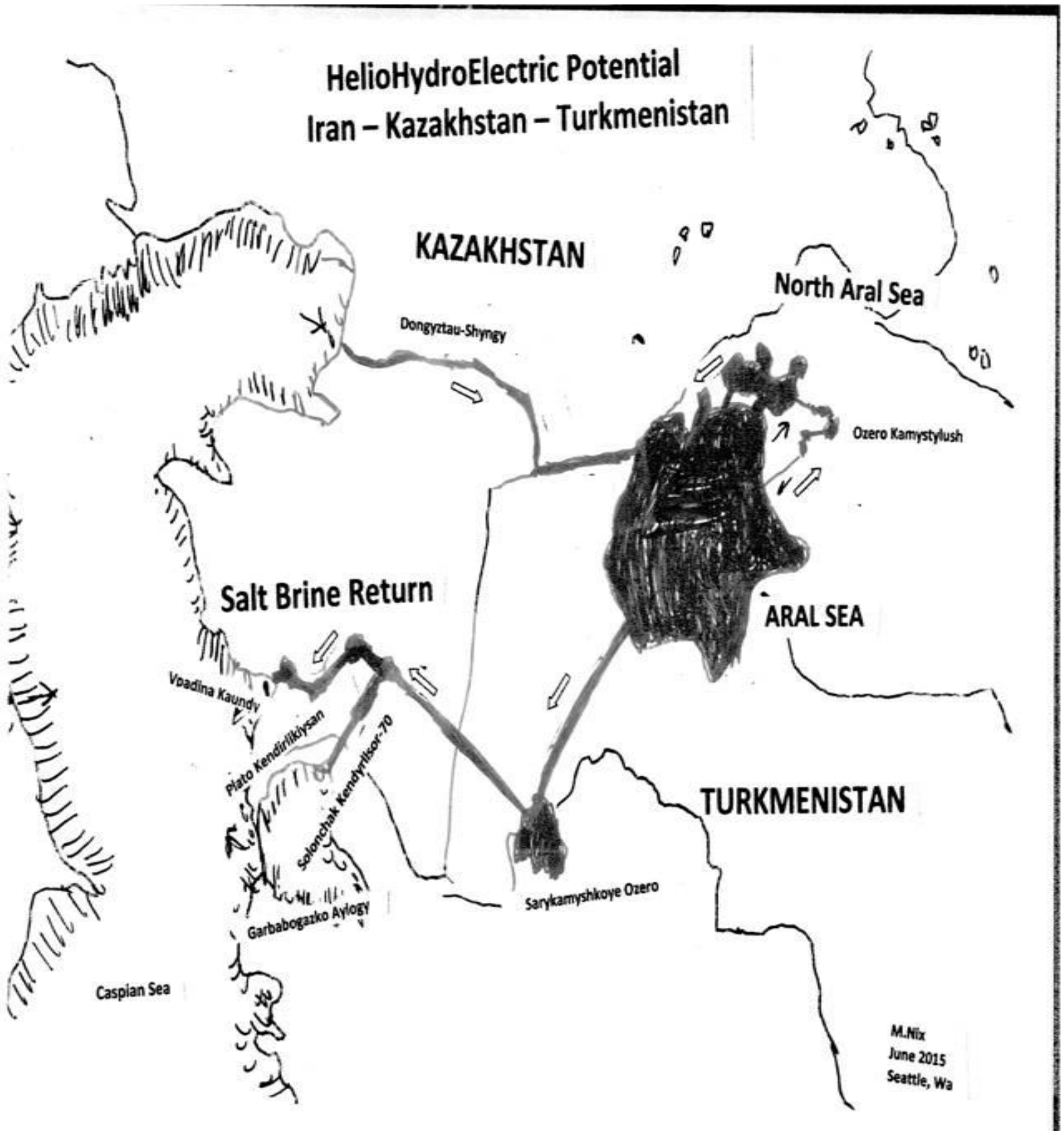
ABSTRACT: HelioHydroElectric is a little known solar engineering technology, using salt/sea water and solar power to create evaporation ponds for artificial rain in deserts. Iran, Turkmenistan and Kazakhstan have large resources. Located in these nations are endorheic dry salt lakes. These can be flooded using solar powered pumps with salt/sea water to create clouds from evaporation. The additional rainfall would increase vegetation, thus removing carbon dioxide from the atmosphere. HelioHydroElectric technology is the only technology that can actually remove carbon dioxide from the atmosphere. The additional rainfall in Iran, Turkmenistan, and Kazakhstan will increase agriculture and provide new living space. It is proposed that the Dasht-e-Kavir, and the Caspian and Aral Sea be flooded with seawater. Development of HelioHydroElectric has the potential of also solving energy supply problems in Iran, by spurring development of solar technology, energy self-production, and conservation. Iran is the mist of a drought, caused squarely by Carbon Dioxide emissions. This drought will continue unless Carbon Dioxide is removed. It is hoped this paper will spur conversations and funding for a full feasibility study.




HelioHydroElectric Potential
Iran – Kazakhstan – Turkmenistan
RUSSIA
KAZAKHSTAN
Black Sea to Caspian Sea Tunnel
Chechnya
Caspian Sea
TURKMENISTAN
Kavir-e-Namak
Tehran
Dasht-e-Kavir
Tehran Ship Canal
Chashm e Ab Galon
IRAN
PERSIAN GULF
Hamun-e-Jaz Muran
Industrial Center
M.Nix
Seattle, WA
June 2015


HelioHydroElectric Potential
Iran – Kazakhstan – Turkmenistan
Dasht-e-Kavir
Chashmen ye Mukut
Chashmen ye Magu
Tehran Ship Canal
Salt Brine Tunnel Return
Namk-e-Sahdad
Baluch Ab
Rigan
Salt Brine Return
Hamun-e-Jaz-Muran
IRAN
M.Nix
Seattle, WA
June 2015
ARABIAN SEA



INTRODUCTION: Proposed is the pumping of salt/seawater inland to Iran, Kazakhstan, and Turkmenistan to flood existing dry salt lakes. The resulting evaporation will create clouds, and thus artificial rain. This technology, known as HelioHydroElectric technology, will create more vegetation in the desert, region and in mountains, thus reversing Global Warming. It will stimulate the local economy. Solar pumping technology is now very well developed. This Prefeasibility study is mostly to study the potential for construction of such a project. It is hoped that funding for a complete Feasibility study can be located so as to determine the environmental impact, climate impact, and economic impact along with construction plans and cost. Israel, Jordan and Palestine are presently constructing the Red to Dead Sea project, so as to add additional moisture to the region. Egypt has under study the Qattara Depression project. This is being reviewed elsewhere.

METHODOLOGY: Calculations were conducted to get a general idea of the power consumption required for pumping this large volume of salt/seawater. It should be noted that locating geologic information for these sites is difficult. The author is unfamiliar with the region, and apologizes for any misspellings of locations. Sites were identified. Surface area of these dry lakes was estimated, along with elevation. The evaporation rate is unknown for these locations; however, it was assumed that 1% of the surface area would evaporate per day. Evaporation rate data is unknown; however, it was assumed that each square foot of surface of flooded water had 2,000 btus per day of solar energy. Water boils at 212 degrees. The heat of evaporation is 972 btus/lb. Numerous factors are involved with evaporation rate, including reflection from sunlight, altitude, cloud cover, temperature, and so on. Despite the lack of geologic data, still a lot can be determined, and hopefully it will spur further research. (source of data: Wikipedia)

Haman E Juz Munan

Surface Area (Miles)	**Elevation (Feet)**	**Square Feet Area**	**Estimate Evaporation Rate/Day**
		Surface Area x 5280 X 5280	**(1% per day)**
100 square miles	**1,000 ft.**	**2,787,840,000 sq. ft.**	**27,878,400 cu.ft./day**

Evaporation Rate/Hour	**Evaporation Rate/Minute**	**Evaporation Rate/Second**	**Weight Water/lb.**
(Divide by 24)	**(Divide by 60)**	**(Divide by 60)**	**62.42769 lb./cu.ft**
1,161,600 cu.ft./hr.	**19,360 cu.ft/min.**	**322 cu.ft./sec.**	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	**Foot Pounds per Hour**	**Foot Pounds per Minute**	**Foot Pounds per Second**
1,739612,160,000	**72,483,840,000**	**1,208,064,000**	**2,092,800**
X 0.00001569623374	**X .000376616097**	**X .0225969658**	**X 1.35581795**
27,305,359 Watts	**27,298,863 Watts**	**27,298,622 Watts**	**27, 241,818 Watts**

RIGARI

Surface Area (Miles)	**Elevation (Feet)**	**Square Feet Area**	**Estimate Evaporation Rate/Day**
		Surface Area x 5280 X 5280	**(1% per day)**
100 square miles	**3,000 feet**	**2,787,840,000 sq. ft.**	**27,878,400 cu.ft./day**

Evaporation Rate/Hour	**Evaporation Rate/Minute**	**Evaporation Rate/Second**	**Weight Water/lb.**
(Divide by 24)	**(Divide by 60)**	**(Divide by 60)**	**62.42769 lb./cu.ft**
1,161,600 cu.ft./hr.	**19,360 cu.ft/min.**	**322 cu.ft./sec.**	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	**Foot Pounds per Hour**	**Foot Pounds per Minute**	**Foot Pounds per Second**
5,218,836,480,000	**217,451,520,000**	**3,624,192,000**	**60,278,400**
X 0.00001569623374	**X .000376616097**	**X .0225969658**	**X 1.35581795**
81,916,077 Watts	**81,896,597 Watts**	**81,895,866 Watts**	**81,725,454 Watts**

Balach Ab

Surface Area (Miles)	Elevation (Feet)	Square Feet Area Surface Area x 5280 X 5280	Estimate Evaporation Rate/Day (1% per day)
100 square miles	3,000 ft.	278,784,000 sq. ft.	27,878,400 cu.ft./day

Evaporation Rate/Hour (Divide by 24)	Evaporation Rate/Minute (Divide by 60)	Evaporation Rate/Second (Divide by 60)	Weight Water/lb. 62.42769 lb./cu.ft
1,161,600 cu.ft./hr.	19,360 cu.ft./min.	322 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
5,218,836,480,000	217,451,520,000	3,624,192,000	60,278,400
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
81,916,077 Watts	81,896,591 Watts	81,895,866 Watts	81,725,454 Watts

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Namakzar-e-Shabad

Surface Area (Miles)	Elevation (Feet)	Square Feet Area Surface Area x 5280 X 5280	Estimate Evaporation Rate/Day (1% per day)
1,000 square miles	4,000 ft.	27,878,400,000 sq. ft.	278,784,000 cu.ft./day

Evaporation Rate/Hour (Divide by 24)	Evaporation Rate/Minute (Divide by 60)	Evaporation Rate/Second (Divide by 60)	Weight Water/lb. 62.42769 lb./cu.ft
11,616,000 cu.ft./hr.	193,600 cu.ft/min.	3,226 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
69,584,486,000,000	2,899,353,600,000	48,322,560,000	805,209,600
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
1,091,963,853 Watts	1,091,954,553 Watts	1,091,944,888 Watts	1,091,703,176 Watts

Chashmeh-Y-Ab-E-Arm

Surface Area (Miles)	Elevation (Feet)	Square Feet Area Surface Area x 5280 X 5280	Estimate Evaporation Rate/Day (1% per day)
2,000 square miles	4,000 ft.	55,756,800,000 sq. ft.	557,568,000 cu.ft./day

Evaporation Rate/Hour (Divide by 24)	Evaporation Rate/Minute (Divide by 60)	Evaporation Rate/Second (Divide by 60)	Weight Water/lb. 62.42769 lb./cu.ft
23,232,000 cu.ft./hr.	387,200 cu.ft/min.	6,453 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
139,168,972,800,000	5,798,707,200,000	96,645,120,000	1,610,668,800
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
2,184,428,726 Watts	2,183,909,106 Watts	2,183,889,777 Watts	2,183,744,759 Watts

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Chashmen-Ye-Magu

Surface Area (Miles)	Elevation (Feet)	Square Feet Area Surface Area x 5280 X 5280	Estimate Evaporation Rate/Day (1% per day)
100 square miles	4,000 ft.	2,787,840,000 sq. ft.	27,878,400 cu.ft./day

Evaporation Rate/Hour (Divide by 24)	Evaporation Rate/Minute (Divide by 60)	Evaporation Rate/Second (Divide by 60)	Weight Water/lb. 62.42769 lb./cu.ft
289,935,360,000 cu.ft./hr.	4,832,256,000 cu.ft/min.	80,371,200 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
6,958,448,640,000	289,935,360,000	4,832,256,000	80,371,200
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
109,221,436 Watts	109,195,455 Watts	109,194,488 Watts	108,967,273 Watts

Dasht-e-Kavir-East

Surface Area (Miles)	Elevation (Feet)	Square Feet Area	Estimate Evaporation Rate/Day
		Surface Area x 5280 X 5280	(1% per day)
20,000 square miles	4,265 ft.	557,568,000,000 sq. ft.	5,575,680,000 cu.ft./day

Evaporation Rate/Hour	Evaporation Rate/Minute	Evaporation Rate/Second	Weight Water/lb.
(Divide by 24)	(Divide by 60)	(Divide by 60)	62.42769 lb./cu.ft
5,575,680,000 cu.ft./hr.	232,320,000 cu.ft/min.	3,872,000 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
1,483,889,172,000,000	61,828,715,520,000	1,030,478,592,000	17,174,554,990
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
23,291,471,290 Watts	23,285,930,840 Watts	23,285,724,740 Watts	23,285,261,660 Watts

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Dasht-e-Kavir West

Surface Area (Miles)	Elevation (Feet)	Square Feet Area	Estimate Evaporation Rate/Day
		Surface Area x 5280 X 5280	(1% per day)
5,000 square miles	4,265 ft.	139,392,000,000 sq. ft.	1,393,920,000 cu.ft./day

Evaporation Rate/Hour	Evaporation Rate/Minute	Evaporation Rate/Second	Weight Water/lb.
(Divide by 24)	(Divide by 60)	(Divide by 60)	62.42769 lb./cu.ft
58,080,000 cu.ft./hr.	968,000 cu.ft./min.	16,133 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
370,972,293,100,000	15,457,178,800,000	257,619,648,000	4,293,660,800
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
5,822,867,824 Watts	5,821,482,680 Watts	5,821,431,186 Watts	5,821,422,384 Watts

Extension into Kazakhstan and Turkmenistan: The Caspian Sea is below sea level. Thus little energy would be required to pump sea water inland. The ocean has higher salinity than the Caspian Sea. However, the additional evaporation from the Caspian Sea will put more fresh rainwater into the sea, thus offsetting. The Ural Sea is now officially dry, with no water. The water has been diverted for agriculture. However, the Ural Sea is not that high above sea level. It takes more energy to move water uphill than across the land. Thus, flooding the Ural Sea with ocean water is not that energy intensive, just that the pipe/canal has to be long. Development of HelioHydroElectric in this region would provide the nations of Kazakhstan and Turkmenistan extensive rainfall, thus reversing Global Warming. There are two routes for providing ocean water to the Caspian Sea: Via Chechnya, in Russia and via Iran. It is proposed that the Tehran Ship Canal be extended to the Caspian Sea. It is proposed that a deep underground tunnel be built from the Caspian Sea to return Salt Brine, thus allowing the HelioHydroElectric project to last from generation to generation. There are ways of separating more dense salt water from less dense water.

Aral Sea (Ural Sea)

Surface Area (Miles)	**Elevation (Feet)**	**Square Feet Area**	**Estimate Evaporation Rate/Day**
		Surface Area x 5280 X 5280	**(1% per day)**
26,300 square miles	**138 ft.**	**733,320,192,000 sq. ft.**	**7,332,019,200cu.ft./day**

Evaporation Rate/Hour	**Evaporation Rate/Minute**	**Evaporation Rate/Second**	**Weight Water/lb.**
(Divide by 24)	**(Divide by 60)**	**(Divide by 60)**	**62.42769 lb./cu.ft**
305,500,800 cu.ft./hr.	**5,091,680 cu.ft./min.**	**84,861 cu.ft./sec.**	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	**Foot Pounds per Hour**	**Foot Pounds per Minute**	**Foot Pounds per Second**
63,137,483,740,000	**2,630,728,489,000**	**43,845,474,820**	**730,755,043**
X 0.00001569623374	**X .000376616097**	**X .0225969658**	**X 1.35581795**
990,774,697 Watts	**990,774,695 Watts**	**990,774,695 Watts**	**990,770,804 Watts**

Sarykamyshkoye

Surface Area (Miles)	Elevation (Feet)	Square Feet Area	Estimate Evaporation Rate/Day
		Surface Area x 5280 X 5280	(1% per day)
1,930 square miles	49 ft.	53,805,312,000 sq. ft.	538,053,120 cu.ft./day

Evaporation Rate/Hour	Evaporation Rate/Minute	Evaporation Rate/Second	Weight Water/lb.
(Divide by 24)	(Divide by 60)	(Divide by 60)	62.42769 lb./cu.ft
22,418,880 cu.ft./hr.	373,648 cu.ft/min.	6,227 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
1,645,152,200,000	68,547,967,490	1,142,466,125	19,039,675
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
25,822,678 Watts	25,816,267 Watts	25,816,267 Watts	25,814,333 Watts

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Caspian Sea

Surface Area (Miles)	Elevation (Feet)	Square Feet Area	Estimate Evaporation Rate/Day
		Surface Area x 5280 X 5280	(1% per day)
143,200 square miles	-92 ft.	3,992,186,880,000 sq. ft.	39,921,868,800 cu.ft./day

Evaporation Rate/Hour	Evaporation Rate/Minute	Evaporation Rate/Second	Weight Water/lb.
(Divide by 24)	(Divide by 60)	(Divide by 60)	62.42769 lb./cu.ft
1,663,411,200 cu.ft./hr.	27,723,520 cu.ft./min.	462,058 cu.ft./sec.	

(Evaporation Rate X 62.42769 X Elevation)

Foot Pounds per Day	Foot Pounds per Hour	Foot Pounds per Minute	Foot Pounds per Second
229,183,464,400,000	9,549,311,017,000	159,155,183,600	2,652,582,566
X 0.00001569623374	X .000376616097	X .0225969658	X 1.35581795
-3,597,317,227 Watts	-3,596,461,515 Watts	-3,596,429,684 Watts	-3,596,371,443 Watts

Note: Caspian Sea is below sea level. Thus generates electrical power.

SUMMARY OF RESULTS

	POWER	FLOW RATE	EVAPORATION RATE
Kolwa	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Hoshab	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Mayran Salt Swamp	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Hamun-E-Mashkel	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Namaksar	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Daqq-Palagan	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Gowd-E-Zereh	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Hamun-I-Lora	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Jahil-E-Pozak	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Daryacheh-Ye-Hamun	**Watts**	**cu.ft./sec.**	**cu.ft./day**
Daqq-E-Tundt	**Watts**	**cu.ft./sec.**	**cu.ft./day**
TOTAL:	**WATTS ***	**cu.ft. /sec.**	**cu.ft./day**

.* Total does not include inefficiencies, such as transmission loses, water turbine efficiencies, electric motor heat loss, friction in pipes or canals, and so on.

Amount of rain fall generated per day (at 1% evaporate rate per square mile) :
3,170,901,280 cu.ft./day
1,128,840,856,000 cu.ft./year
7.6 cubic miles of rainfall/year
Covering 38,016 square miles with 1 foot of rainfall per year.
5,204 Mega Watts of power necessary for pumping salt/seawater at 100% efficiency.
Equivalent to approximately 5 large power plants.

WATER PIPE DIAMETER OR CANAL SIZE: Assuming the flow rate of the water in the pipe and/or canal is 1 ft. per second, the canal size would be . If a pipe is used, the pipe diameter would be about 66 feet in diameter. It is undetermined the amount of concrete required for building, however, this can be calculated. Construction cost, labor and schedules can also be determined as part of the Feasibility study. It should be noted that canals can silt up in a dust storm. Pipes can handle pressure better and have faster flow rates. It is recommended, that consideration be given to locating canal/pipes along borders of nations. Good borders make for good neighbors.

.* Power requirements do not include inefficiencies such as transmission loses, water turbine efficiencies, electric motor heat loss, friction in pipes or canals, and so on.

Amount of rain fall generated per day (at 1% evaporate rate per square mile) :
2,787,840,000 cu.ft./day
992,471,040,000 cu.ft./year
6.7 cubic miles of rainfall/year
Covering 35,600 square miles with 1 foot of rainfall per year.

122 Mega Watts of power necessary for pumping salt/seawater at 100% efficiency.
Equivalent to approximately about 1/10 of a large power plant.

FLUSHING SALT BRINE: It is proposed that an underground tunnel or pipe be built, using either cut-and-cover technology, or deep bore tunneling. The construction of these Salt Brine Tunnels will flush salt from the evaporation lakes, thus extending their useful lives. The ocean is approximately 3% salt. Concentrated salt brine (i.e. 27%) can then be piped back to the ocean. There are ways of separating concentrated salt brine from fresh water. These Salt Brine Tunnels would parallel the planned canal/pipes, and would be smaller diameter. The major purpose of these smaller diameter pipes is transportation of concentrated salt.

MICROCLIMATE EFFECT: It should be noted that once these salt dry lakes are flooded with salt water, the evaporation from rain water builds up in the surrounding mountains and plains. Fresh rain water is locked up in plants, fresh water lakes, and underground aquifers. Plants and trees also add moisture to the air. Each year, the evaporation is cumulative. The first year, for example, one cubic mile of fresh rain water is added to the environment, the next year another cubic mile, the year following another cubic mile. Gradually moisture builds up in the local environment.

I**MPACT ON KASHMIR:** The evaporation from these HelioHydroElectric projects will not only restore vegetation in local mountains, but also provide more rain water to the Kashmir region. The development of HelioHydroElectric will solve the conflict between India, Pakistan and China. Water from Kashmir flow to Pakistan, India or China. By dividing the region according to watershed, it will solve land claims. Watershed management is very important to provide flood management and to manage water during dry seasons. Pakistan should manage its own watershed, while China and India should manager theirs. Iran's involvement in HelioHydroElectric development will add additional rainfall to the Kashmir region, thus aiding resolution of the conflict.

IMPACT BY IRAN: It should be noted that Pakistan is also considering HelioHydroElectric development. Proposed is a diversion tunnel from the Indus River flood dry salt lakes in Afghanistan and Pakistan. Also, salt water from the Arabian Sea would be pumped inland to flood these dry salt lakes along the border of Iran and Pakistan and Afghanistan. (It should be noted that Afghanistan is bound to export 910 cubic feet of water per second to Iran along the Helman river). The Rann of Kutch region is also proposed to be flooded. By adding additional seawater for evaporation, this will provide more rain water for Pakistan, Afghanistan and India. A separate Prefeasibility study is being prepared for Pakistan, Afghanistan and India.

IMPACT ON GLOBAL WARMING: The additional rainfall in the desert should increase the amount of vegetation. The vegetation will remove carbon dioxide from the atmosphere. With the upcoming treaty conference in Paris, in December, a HelioHydroElectric Treaty can be developed between India, Pakistan, Iran and Afghanistan. The Treaty would offset carbon dioxide emission.

POWER REQUIREMENTS: The power requirements to pump this large volume of seawater inland are huge. However, this is not impossible. Based on these calculations, close to1/4 to 1/3 of the entire electrical power produce by Pakistan would be needed. Pakistan generates on average 22,000 Megawatts of electrical. While it is beyond the scope of this Prefeasibility study, it is believed by the author that with rapid development of solar energy, and energy conservation was implemented, it would make this electrical power available for salt water pumping. It could supplement and solve the energy crisis in Pakistan. There have been electricity shortages. There are numerous technologies that can be implemented, including Photovoltaic panels on residential and commercial buildings. (These make the meter run backwards.) The list is nearly endless in solar technologies that can be implemented to achieve electricity conservation: solar hot water, solar cooking, solar salt water distillation, solar lighting, micro wind turbines, paddle wheel systems on canals, solar greenhouses, rain barrels, solar smelters, solar water pumping, solar powered air conditioning, night sky radiation refrigeration, biomass conversion, biofuels, energy efficient appliances and so on. This technology would employ people in Pakistan, and would be a new export industry. A lot of the problem of electrical supply is lack of capacity in the distribution and transmission lines. With better load management, energy self-production, and conservation, it would make electricity available for the HelioHydroElectric projects. The goal would be to have people “make their own energy”. Good models to follow are the efforts of Denmark, Netherlands, and Germany.

BIOFUEL PRODUCTION: These flooded salt lakes also have another gift: algae. Algae can be converted to biofuels. Thus creating a new energy source. The Iranian airlines are exceptionally interested in BioJet fuels made from algae.

NATURAL GAS OPTION FOR SEAWATER PUMPING: Natural gas is often used for irrigation pumping. There are sufficient natural gas supplies in the region. Often times it is a waste product from oil production, where natural gas is flared. Natural gas can be used for pumping seawater for the HelioHydroElectric project. The goal is to make this project sustainable from generation to generation in the future. If natural gas is utilized, plans should be implemented for eventual conversion to solar and wind energy. This can be done. For example, solar energy can break down water to hydrogen. It is feasible to convert coal power plants, natural power plants (and even nuclear power plants) to be powered by solar energy. The technology exists. It is unknown if the amount of carbon dioxide generated by natural gas combustion would be offset by the additional vegetation grown, but this can be determined. It will be necessary to use natural gas for construction materials for the project. Concrete for pipes and canals would be need natural gas to power the factories. It should be noted that the heat of exhaust (as from a natural gas generator) or steam from a cooling tower, can evaporate salt water so that it adds additional rainfall to the region.

BETTER LOAD MANAGEMENT OF EXISTING ELECTRICAL SYSTEM: It will be impossible to achieve electrical stability with traditional “flat rates”, where everyone pays the same. All electrical power does not cost the same to generate. Nuclear power being the most expensive, while hydro power is often the lowest. Often times the various energy sources for generation for electrical power is averaged, mixing the cost together. By going to a “the more you use, the more you pay” rate structure, it will encourage “mega wasters” to conserve. For example, the first 500 Kilowatts would be 3 cents per Kilowatt, the second 500 Kilowatts would be 6 cents, the next 500 Kilowatts 9 cents, and so on. A low income grandmother, for example, who only uses a small amount for a light and a refrigerator, would only pay a few dollars a month. However, someone with a large mansion, who consumes nearly 100,000 Kilowatts, would pay on upwards to $1000 a month. It would give the mansion owner an incentive to install solar panels, or implement conservation measures. It would employ people installing the equipment. Another option for business would be Time of Day Metering, where in day, when there are shortages of electrical power, a business would pay say, 50 cents per Kilowatt. But at night when electrical is very available, the business could pay only 5 cents per Kilowatt. This gives business a financial incentive to implement conservation and energy self production. It is beyond the scope of this Prefeasibility study to discuss load management, but this could be a method to make electricity available for the large amount of electricity required for pumping for the HelioHydroElectric project.

MILITARY INVOLVEMENT: Iran spends considerable funds on the military. The military should review spending so as to implement dual-use. Dual-use means technology that can be used to stimulate the economy while providing for national defense. For example, a national Bicycle Trail System, where bicycles are separate from car traffic, would conserve fossil fuels. It would provide a low cost, none carbon, form of transportation. It would stimulate the economy. The military can use its corps of engineers to build these projects. The military can assist with manpower on constructing these HelioHydroElectric project. The Medical Corps for example could build and distribute solar cookers and solar salt water distillers to low/no income people. Thus improving the health of children nationwide. The military for example, can assist in better watershed management, such as reforestation. There needs to be recognition that Global Warming is a threat to the security of Iran. What we need is a Declaration of War on Global Warming, not “nation vs. nation”. This can be done. It is beyond the scope of this Prefeasibility study to discuss the involvement of the Iranian military. The Iranian Military does have valuable resources that can be applied.

CONCLUSION: The nation of Iran is strongly encouraged to explore a fossil-fuel-less and a none-nuclear energy future. Instead Iran should explore what other nations have done with development of solar energy and wind energy. HelioHydroElectric development could be that catalyst for such a future. It would create a more equable society where people make their own energy, and a cleaner future. This over emphasis on fossil fuels is adding carbon dioxide to the atmosphere, which is threatening the future of Iran from Global Warming. Iran is creating and exporting extensive Carbon Dioxide. As long as this Carbon Dioxide is being added to the atmosphere, the severe drought will continue. Furthermore, nuclear power plants have a known problem of being dangerous. The explosion of one nuclear power plant would spread radiation, affecting the health of nearly 1.8 billion people. While Nuclear power plants last only 50 years, the proposed HelioHydroElectric project will last for generations. Nuclear power plants are threat to the security of Iran. Heavy dependence on dangerous and polluting energy sources will create a society that is violent. However, going to a renewable energy society will make for a healthy economy, plus, and a more free society.

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