

Lake Moreis, if it had to be heated by just one degree °C.

*Intellectual property of Prof. Dr Sc. Antonio Lo Cascio
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1. INTRODUCTION.

This article is intended to reflect on the link between our energy consumption in relation to the energy linked to one or more natural processes that have affected the Earth. For example, can our global energy consumption change the temperature of the oceans? To answer this question, we can start from a well-documented natural event that affected our planet. Lake Moreis, in Egypt, lends itself particularly well to this exercise: 60 to 70 m deep, it was dried up 4,200 years ago by global warming, at least in the equatorial regions. This warming also dried up the Nile, suppressing its floods for around twenty years. The result was a major famine which was the cause of the fall of the Old Kingdom.

Here are its main characteristics of the lake which will be used in the article:

Area	600 km ²
Length	50 km
Width	12 km
Altitude	47 m
Depth	
· Maximum	18 m
· Average	4 m
Volume	978,600,000 m ³ \approx 1 km ³

The lake is the very smallest point in the Fayoum Governorate, number 15.



Governorates of Egypt.

1. [Matrouh](#) 2. [Alexandria](#) 3. [Beheira](#) 4. [Kafr El Sheikh](#) 5. [Dakahlia](#) 6. [Damietta](#) 7. [Port Said](#) 8. [North Sinai](#) 9. [Gharbia](#) 10. [Monufia](#) 11. [Qalyubia](#) 12. [Sharqia](#) 13. [Ismailia](#) 14. [Giza](#) 15. [Faiyum](#) 16. [Cairo](#) 17. [Suez](#) 18. [South Sinai](#) 19. [Beni Suef](#) 20. [Minya](#) 21. [New Valley](#) 22. [Asyut](#) 23. [Red Sea](#) 24. [Sohag](#) 25. [Qena](#) 26. [Luxor](#) 27. [Aswan](#)

For information on the historical context, see Davina Bristow's documentary here:

[The Dark Hours of Ancient Egypt \[1\]](#)

France 5, Science Large Format, History, 2018, 1 h 24 min

Source Wikipedia

2. SOME ESSENTIAL DATA.

OCEANS

The surface of the oceans corresponds to 70% of the earth's surface!

The volume of water calculated over 100 m depth is 35,000,000 km³ of water.

LAKE

Its surface area being 600 km², its volume, over its average depth of 4 m, is 2.4 km³.

To be able to compare it to the volume taken into consideration for the oceans, it must be corrected to 100 m depth.

V corrected to 100 m = 600,000,000 m² x 100 m = 60,000,000,000 m³ = 60 km³.

OCEANS / LAKE REPORT

The value of the ratio between the volume of the Oceans and that of the Lake is approximately 583,333.

3. QUANTITY OF ENERGY TO HEAT THE LAKE.

La surface du Lac Moréis est de 600 km² et son volume corrigé est de 60 km³.

However, to increase a liter of water by just one degree °C [2] requires 1,000 calories or 1 kilocalorie.

And for 1 m³ you will need 1,000 kilocalories.

For Lake Moréis alone, 60,000 billion kilocalories would be needed!

Which divided by the number of kJ provided by one liter of fuel (36,775 kJ) gives the total liters needed to warm all the lake water by a single degree Celsius: 1,631,543,168 liters of fuel. More than a billion and a half liters!

If we consider the increase in lake water temperature by one degree over a year, we will have the number of liters of fuel per year that will have to be burned.

This number of liters divided by the average annual mileage of a car gives the number of cars that must always drive on the land equivalent of the surface of the lake to give the total number of cars per year "necessary":

1,631,543,168 liters of fuel/year: 5,000 km/year = 326,309 cars/year

Therefore, to produce this quantity of energy it would take the equivalent of approximately 326,000 cars which would each have to travel 5,000 km/year, always on the same surface area of 600 km².

Even assuming that the efficiency of a heat engine is 100% (at best it does not even reach 38%! In this case alone the world production of energy, referring to the calculations for the lake which is of 25.70 years (see the demonstration in the next section) would have to be multiplied by 2.63, which gives 67.59 times the world's energy production! That is to say, it would take almost 68 years of world production for each current year! (BP, 2022, <https://www.connaissancedesenergies.org/bp-statistical-review-world-energy-2022-les-chiffres-cles-de-lenergie-dans-le-monde-220629>) and that all this thermal energy goes entirely into the lake and not into the atmosphere.

The values cited below are a minimum since the thermal efficiency of a motor is of course less than 100% (close to 38% in the best case).

However, the ratio between oceans/lake is equivalent to approximately 583,333.

This means that for the entire surface of the oceans we would need 583,333 times more cars, 190,166,558,000 for just 1 degree of increase/year over a depth of 10 m.

If I now calculate "only" for 10 m depth it is because calculating for the starting 100 m depth would be completely insane.

The reason is obvious. All values should be multiplied by a thousand.

So, among other things, "we need" 190,000 billion cars.

This represents, therefore, a little more than 190 billion cars with as many drivers (don't forget that there are only 7 billion inhabitants on Earth, babies included).

However, there are just over 1 billion cars on Earth. So, they are just short of 189 billion to be able to increase the temperature of the oceans by this single fateful degree.

Explain to me, Greta and company, how is it possible to reach this stage with 1/190 (the 0.005%) of the cars "necessary" for this ecological disaster?

The so-called air pollution "caused" by cars is a result of the greenhouse gases we are constantly hearing about.

And can someone also explain to me how the ancient Egyptians, 4,200 years ago, managed to cause this local "ecological disaster" of global significance?

The Earth could never produce so many cars, nor contain them and, above all, to drive them would require so many motorists, who currently number only around 1 billion.

4. FINALITY.

Why did I write this article?

Following this RTBF report:

"Biodiversity - The reproduction and survival of sea turtles threatened by global warming, where the reporter strongly insisted on the necessity of these studies due to the ongoing warming of the oceans."

According to a study published on Wednesday 02/08/2023 by [The Royal Society Open Science Journal \[3\]](#), rising ocean temperatures endanger the survival of sea turtle populations by warming their nesting sites on beaches around the world. .

The naive person who receives this "alert" message, each time highlighted, finds it difficult to remain indifferent to the fate of these poor turtles or other animals.

Indeed, the real, subliminal message is: "The ocean is warming because of the Anthropocene", mainly because of our excess of energy generating greenhouse gas emissions responsible for warming. The message is simplistic and never nuanced.

It's also an almost daily message!

We should not worry about greenhouse gases, but only about the energy produced by our societies, because, indeed, it must be produced to support humanity.

Let's start with energy production/consumption data regularly updated by BP and on which everyone agrees:

www.connaissancedesenergies.org/bp-statistical-review-world-energy-2022-les-chiffres-cles-de-lenergie-dans-le-monde-220629

We see that in 2021, global primary energy consumption amounted to 5.95×10^{20} J which, taking into account the number of seconds in a year, corresponds to 1.89×10^{13} W and for a surface terrestrial from 5.1×10^8 km² to 3.7×10^{-2} W/m².

*In 2021, global primary energy consumption amounted to **5.95 x 10²⁰ J**.*

Le Flux géothermique ou flux de chaleur [4]: Quantity of energy evacuated by the Earth, expressed per unit of surface and per unit of time. The average flux is 65mW.m⁻² at the surface of the continents and 101mW.m⁻² at the surface of the ocean floor, or 87mW.m⁻² for the entire globe (**Pollack et al, 1993**).

$$65 \text{ mW/m}^2 = 65 \cdot 10^{-3} \text{ W/m}^2 = 6.5 \cdot 10^{-2} \text{ W/m}^2$$

These two values are negligible compared to the energy flux of 171 W/m² received from the Sun to the earth's surface and then dissipated according to different mechanisms to maintain an approximately constant temperature (www.science-climat-energie.be/2020/12/11/leffet-de-serre-et-le-bilan-energetique-de-la-terre/).

Let's return to the data concerning the warming of Lake Moréis.

The global consumption of BP 2021 (= primary energy) was equal to 595 exajoules (= 5.95×10^{20} J as indicated above), or, by rounding, $600 \cdot 10^{18}$ J, which gives, after conversion into kcal, at $1.4 \cdot 10^{15}$ kcal, or 1.4×10^{18} cal.

For the lake we saw that the increase of 1°C requires $6 \cdot 10^{18}$ cal.

Warming the water volume of all oceans at 10 m depth requires $36 \cdot 10^{19}$ cal.

It would therefore take approximately 25.7,101 times - therefore 25.70 times - more energy than that produced and consumed over a single year to increase the temperature of the oceans by a single degree over just 10 m depth. .

Verification :

$$\begin{aligned} 595 \text{ exajoules, or +/-} &= 600 \cdot 10^{18} \text{ J} \\ 10.000 \text{ J} &= 2.390057 \cdot 10^1 \text{ kcal} \\ 600 \cdot 10^{18} \text{ J} &= 6 \times 2.390057 \cdot 10^{14} \text{ kcal} = 1.434034 \cdot 10^{15} = 1,4 \cdot 10^{15} \text{ kcal} \\ 36 \cdot 10^{19} / 1,4 \cdot 10^{18} &= 25,7 \cdot 10^1 \text{ or } \mathbf{25,70} \end{aligned}$$

This result shows that our energy production is tiny compared to natural energy production likely, for example, to warm the surface layer of the oceans and is not exponential, as shown by the regular increase in consumption. of energy. In recent years (compare for example the BP tables).

This result of 25.7 is a minimum, because, as mentioned above, the thermal efficiency of a motor is not 100%.

5 ADDENDUM (with the collaboration of Prof. A. Prétat)

The climatic evolution of Lake Moréis is part of the global framework of a fluctuation linked to the Bond cycle (event no. 3) 4200 and BP ago.

The Bond cycles linked to the last ice age and the Holocene firstly reflect signs of strong climatic instability showing very rapid warming of a few 10°C, leading in a few decades to almost interglacial conditions.

The warming is therefore brutal, it is followed by a progressive cooling in stages with the growth of cold-based caps.

The literature regarding the Bond cycles and associated Heinrich events is immense. These cycles are related to the Dansgaard-Oeschger cycles (Upper Pleistocene) and they appear to be caused by the same cause.

The CO₂ content has no recognized role in these cycles. Let us therefore remember that a sudden and significant warming initially affected Lake Moréis.

NOTES

[1] <https://www.france.tv/documentaires/histoire/997065-les-heures-sombres-de-l-egypte-antique.html>

[2] Between 14,5 et 15,5 °C at [normal atmospheric pressure](#) (101.325 [Pa](#), 1.013,25 [hPa](#) = 1,01325 [bar](#) = 1 [atm](#) = 760 [Torr](#)).

[3] <https://royalsocietypublishing.org/doi/10.1098/rsos.221002>

[4] <https://eduterre.ens-lyon.fr/thematiques/energie/geothermie/geothermie>