

WIND MANIA



The wind mania and its climatic consequences

Manfred Brugger



AGENDA

- About me and the book
- Introduction
- Climate
- Water vapor and the water cycle
- Wind energy
- Wind energy and climate
- Summary

Growian

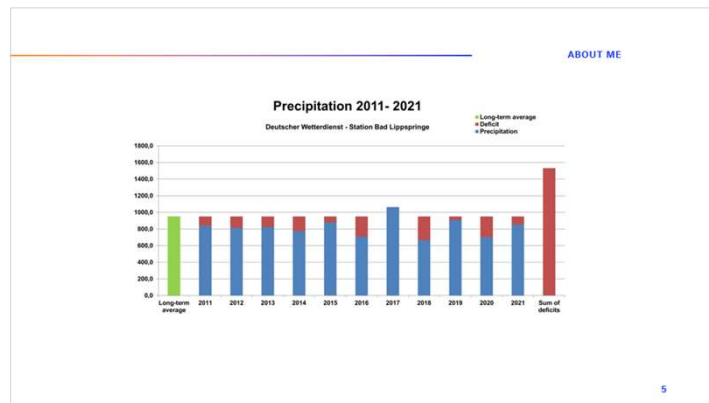
Location:	Kaiser-Wilhelm-Koog
Hub height:	100 m
Rotor diameter:	100 m
El. Rated power:	approx. 3 MW
Commisioning:	1983
Shutdown:	1987
Dismantling:	1988

I thought wind energy was great and a very good idea!



The change....

"**Before we're left high and dry**" was the title of a 2020 report in the Paderborn water works

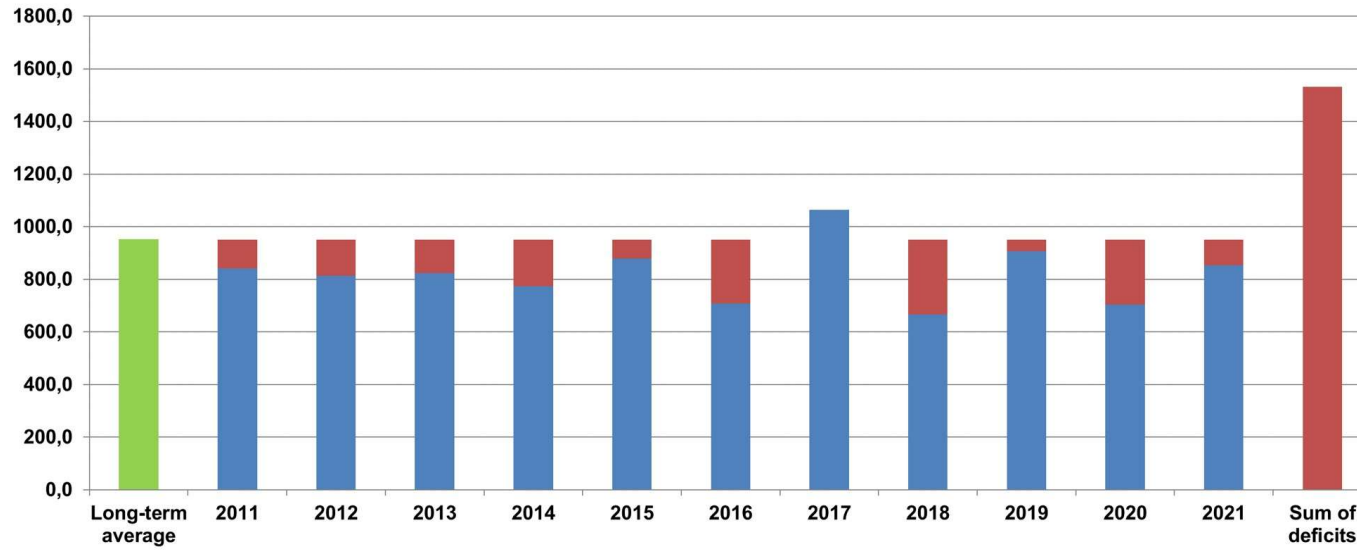


At approx. 825 kW/km², the Paderborn district has the **third highest** density of wind turbines in Germany...

Precipitation 2011- 2021

Deutscher Wetterdienst - Station Bad Lippspringe

Long-term average
Deficit
Precipitation



The first paper

I produced and published my first paper "**Windwahn**
- Der Windwahn und seine klimatischen
Konsequenzen" in March 2022.



The book

The book is divided into 5 chapters with 24 points.

Chapter 1: The Earth's atmosphere

Chapter 2: Earth, sun and moon system

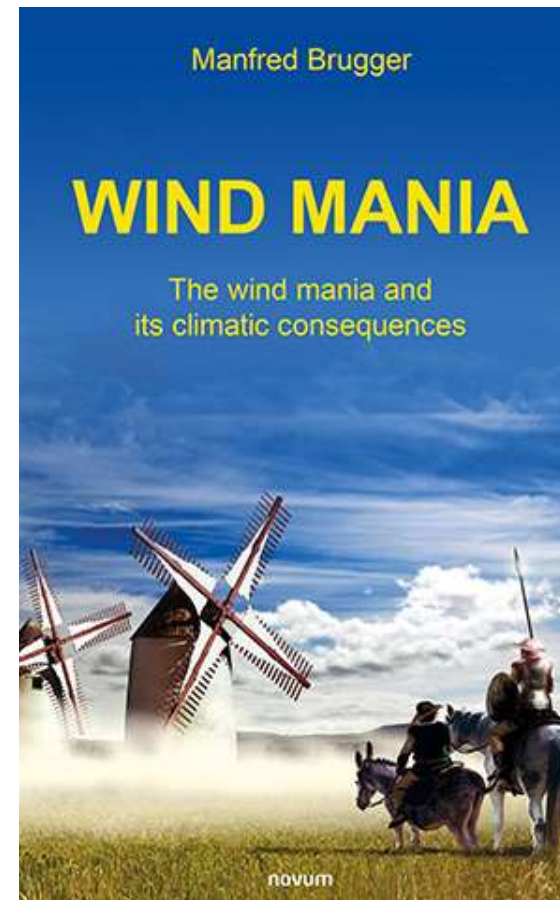
Chapter 3: Humanity and energy

Chapter 4: Wind and weather

Chapter 5: Sun instead of fossil

147 references invite you to browse.

<https://buch.manfred-brugger.de>



Website



Funding projects

„Herausgegeben von der Fachagentur Windenergie an Land“



Der Kampf gegen Windmühlen

Erzählungen und Argumentationsstrategien von Windenergiegegnern und -gegnerinnen auf Twitter und Facebook im April und Mai 2021

Stefan Schweiger, Jenny Zorn, Julia Janik, Matthias Wolf (Ruhr-Universität-Bochum)
bearbeitet von Iwona Kallok (FA Wind)

Herausgegeben von der Fachagentur Windenergie an Land e.V.

Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages

Gefördert durch:



Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz

aufgrund eines Beschlusses des Deutschen Bundestages

Source: <https://www.fachagentur-windenergie.de/>

Funding projects

„erausgegeben von der Fachagentur Windenergie e

FACHAGENTUR
WINDENERGIE AN LAND

ARGUMENTATIONS
LEITFADEN

Falsche Argumente erkennen.

Oder: Wie diskutiere ich mit Windenergiegegnern?

Windenergiekritiker sind eine kleine Gruppe, aber oft lautstark – in Veranstaltungen genauso wie auf Social Media. Ihre Beiträge haben Publikum, manchmal kapern sie eine ganze Diskussion. Deshalb ist es wichtig, argumentativ nicht haltbaren Meinungen zu widersprechen oder auf Fehler hinzuweisen. Dann können auch erfolgreiche Debatten geführt werden, wenn das Gegenüber nicht einlenkt.

In diesem Leitfaden werden häufig auftauchende Fehlschlüsse in der Argumentation verschlagwortet sowie Beispiele und mögliche Gegenstrategien aufgelistet. Diese eignen sich nicht nur für die Diskussion um Windenergie, sondern helfen auch in anderen Debatten. Alle Ideen sowie die auf Originalzitate basierenden Beispiele stammen aus dem Forschungsbericht „Der Kampf gegen Windmühlen“.

Source: <https://www.fachagentur-windenergie.de/>

Gefördert durch:



Bundesministerium
für Umwelt, Naturschutz, nukleare Sicherheit
und Verbraucherschutz

aufgrund eines Beschlusses
des Deutschen Bundestages

To the madness

I know it borders on **madness** to fight against the mainstream, the common **narratives**, but above all against **money** and thus the **power of the factual**.

But I am not indifferent to where society and our state are heading.

No one will ever be able to hold anything against me or ask me, what did you do about it?

The book was and is my duty.





INTRODUCTION

The last 20 years

Introduction

"We must always repeat what is true, because error is always being preached around us, not by individuals, but by the masses. In newspapers and encyclopaedias, in schools and universities, error is everywhere at the top, and it is comfortable and at ease in the feeling of the majority that is on its side."

Source: Goethe, J. W., Conversations. With Peter Eckermann, December 16, 1828



The last 20 years

According to the Soil Atlas 2015, around 77 hectares (equivalent to the area of around 100 soccer pitches) lose their natural function **every day** in Germany due to conversion. Today, these figures have probably already increased significantly. Worldwide, **24 billion tons of soil are** lost every year.

Global forest areas (approx. 31% of the Earth's land area) have shrunk by around **100 million hectares**.

Decrease of approx. 2.5 %.

Image source: Zeit



The last 20 years

The CO_2 content in the atmosphere rose from around **370 ppm to 410 ppm:**

(Increase:

1960 approx. 1.3 ppm/a

1990 approx. 2.9 ppm/a

2021 approx. 4.5 ppm/a)

Increase of around 11 %.

Image source: University of Tübingen



The last 20 years

The **world's population** has increased from **6 to 8 billion** people:

Increase of around 33 %.



Image source: Tagesschau

The last 20 years

Total **annual primary energy consumption** has **increased** from around **400** to **600 exajoules** (84.3 % fossil, German share 1.5 %), almost exclusively in Asia:

Around 50 % increase.

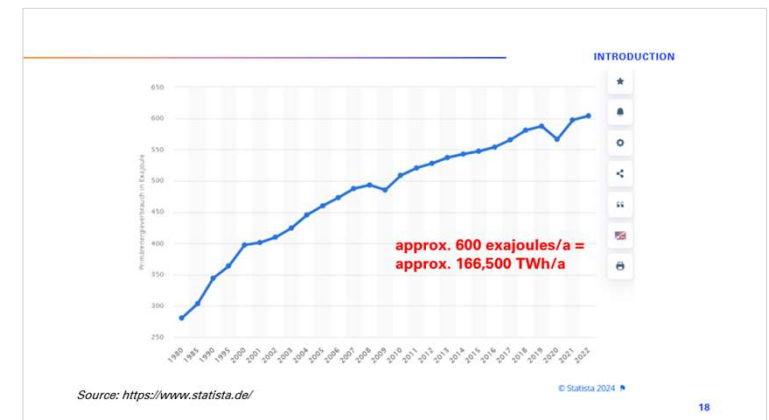
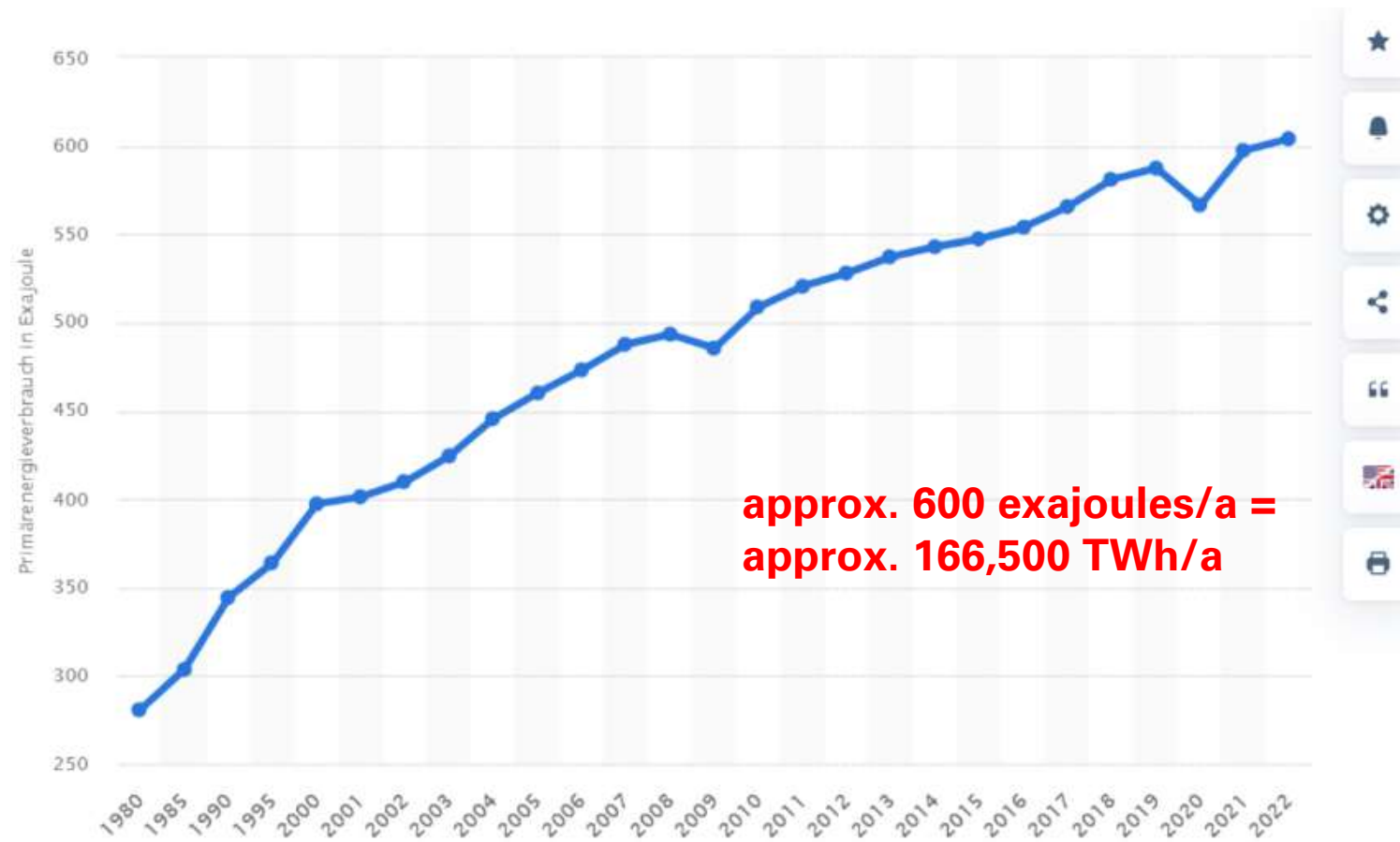


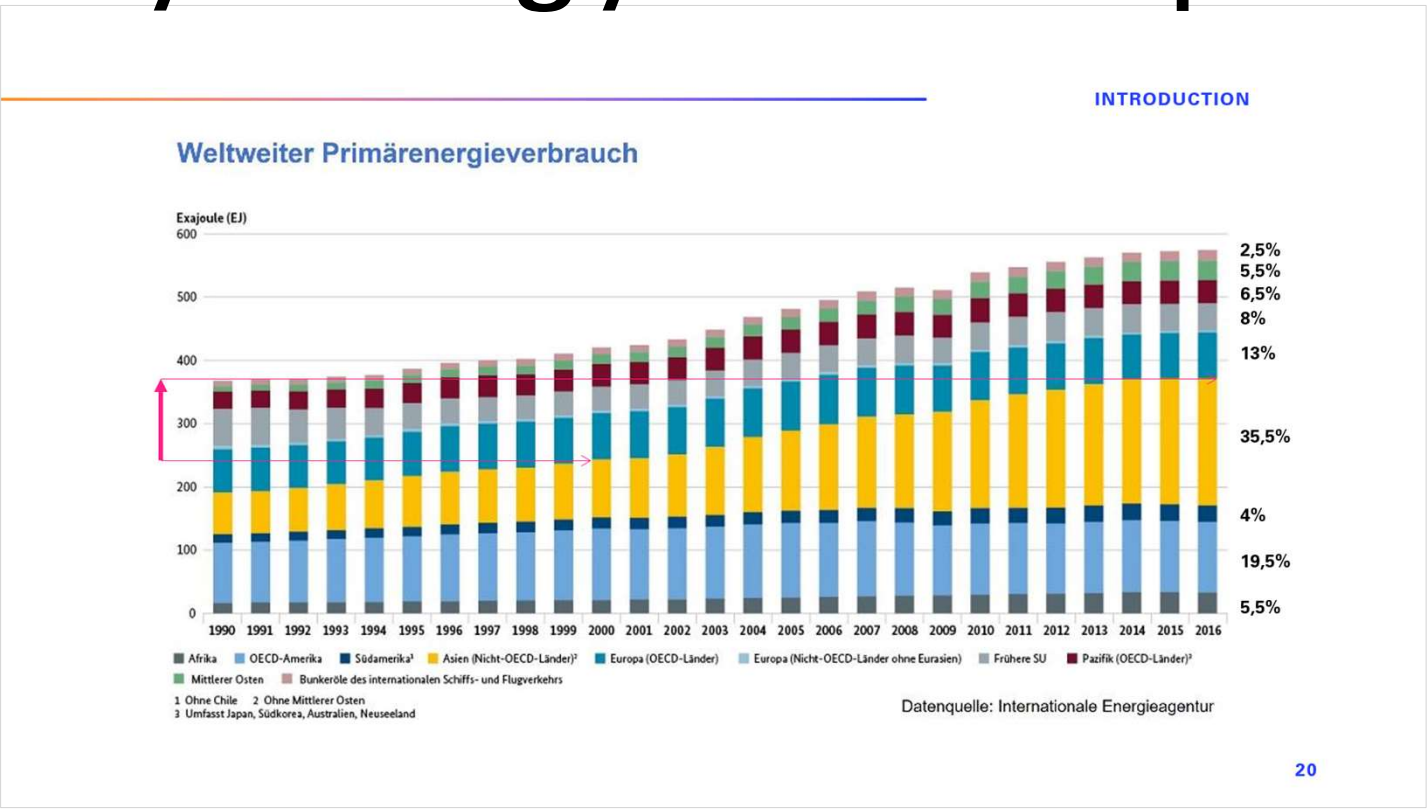
Image source: BMWI



Source: <https://www.statista.de/>

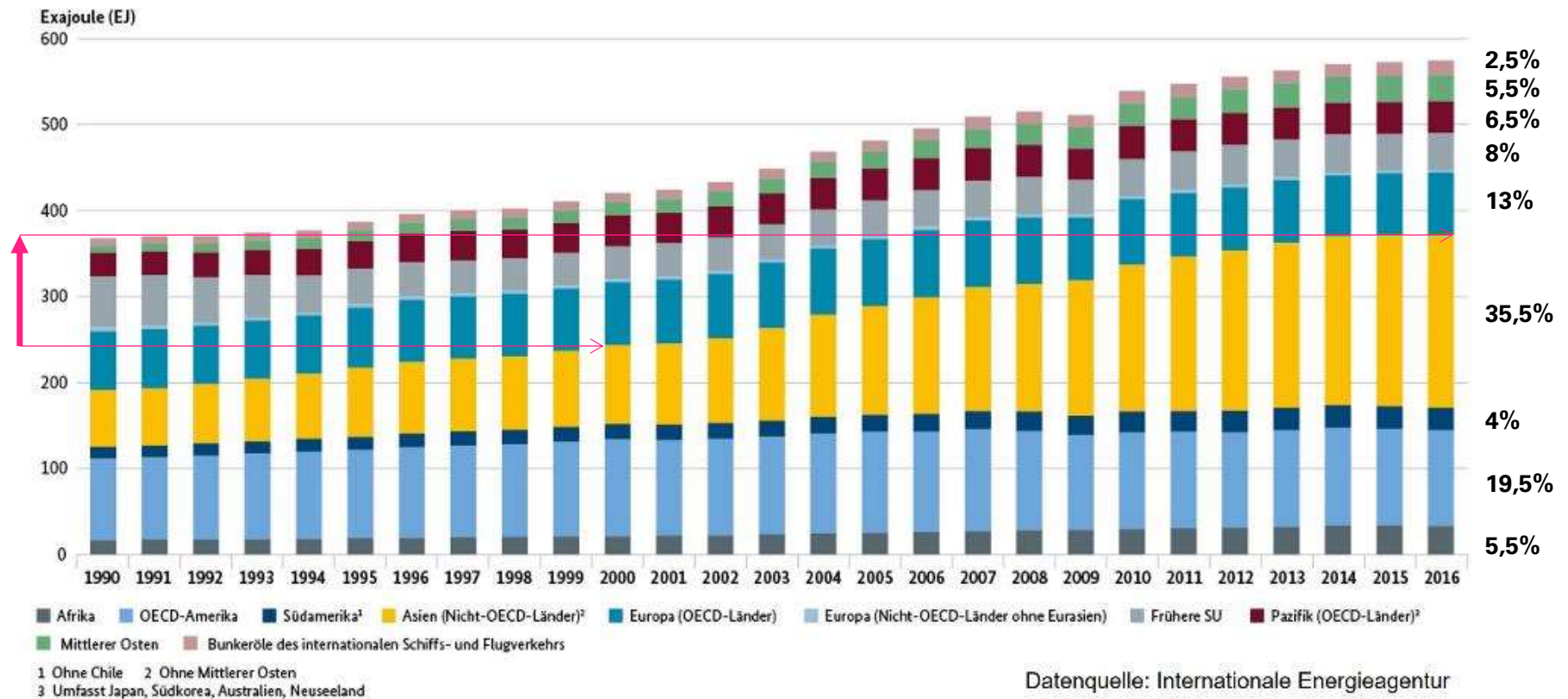
© Statista 2024

Primary energy consumption



Source: International Energy Agency

Weltweiter Primärenergieverbrauch



The last 20 years

Global installed wind energy capacity has increased from approx. **17.4 GW to 1,046 GW** (as at the end of 2023), which corresponds to a factor of around 60:

Increase of around 6,000 %.

Wind power output is set to increase by a further **50 %** by **2026**. This corresponds to a factor of 75.

Increase of around 7,500 %,

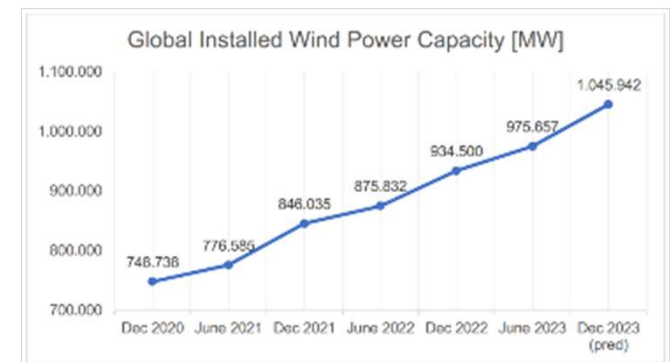
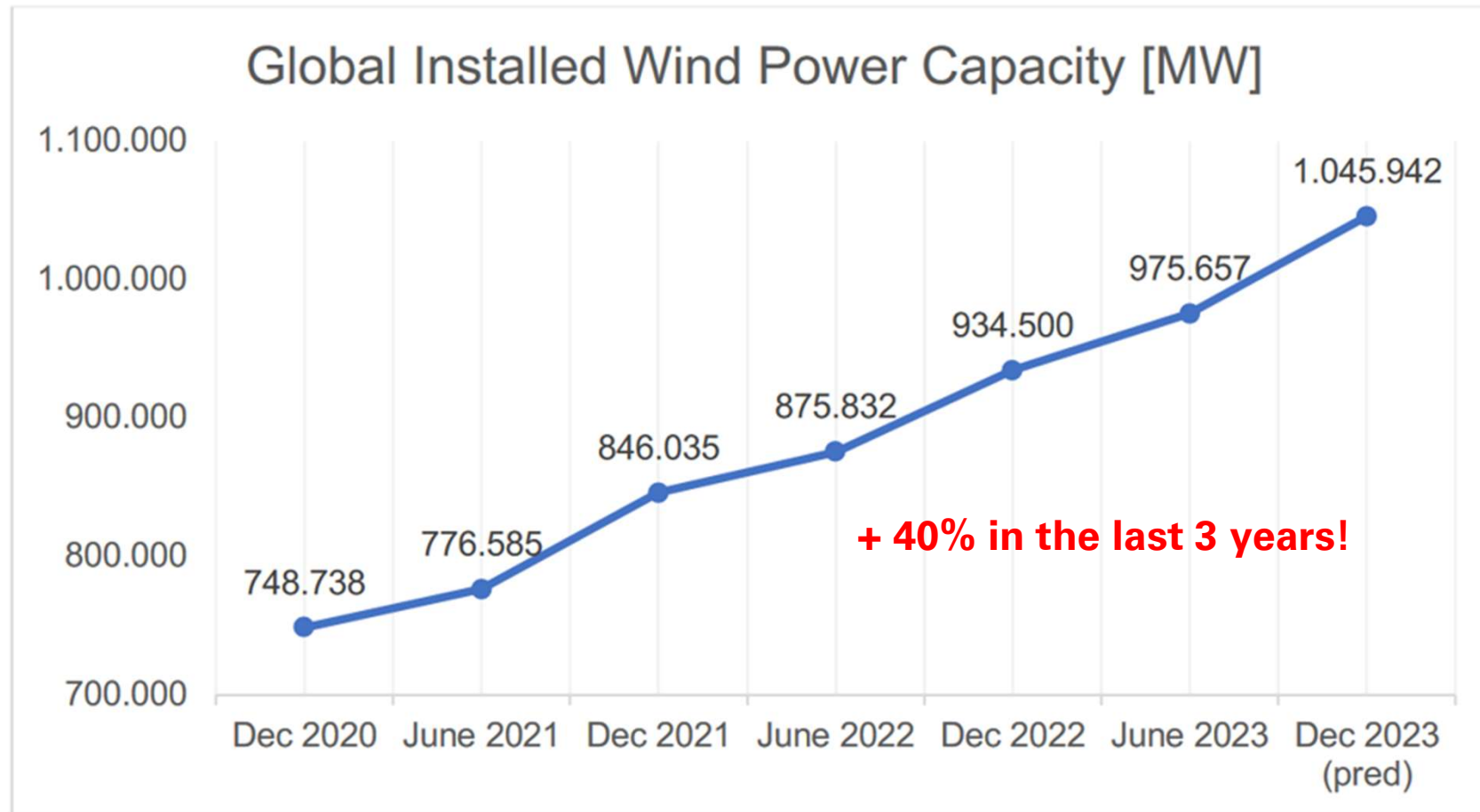


Image source: World Wind Energy Association





CLIMATE

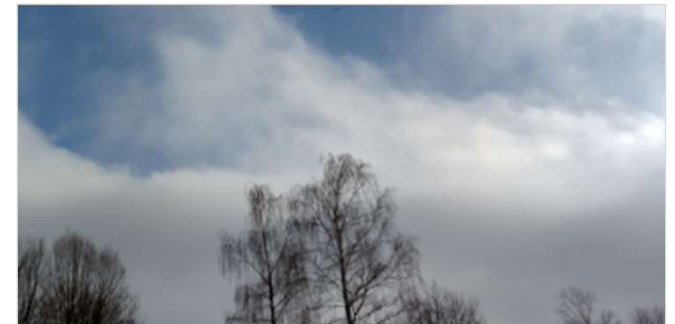
Change, transformation or simply ignorance?

Weather and climate

We use the term **weather to** describe the current thermodynamic state of the troposphere in a particular area.

Climate is the average of the thermodynamic processes (weather) in the atmosphere over a period of at least **30 years**, determined using meteorological methods.

And now comes the big question: climate change?



Climate change????

And the answer is: **yes, the climate has definitely changed**, but whether it has changed, we don't yet know for sure - nor why!

The climate codex that so-called climate journalists have imposed on themselves does nothing to change this.

**Climate change -> Climate crisis
Global warming -> global heating
Climate skeptics -> Climate deniers**



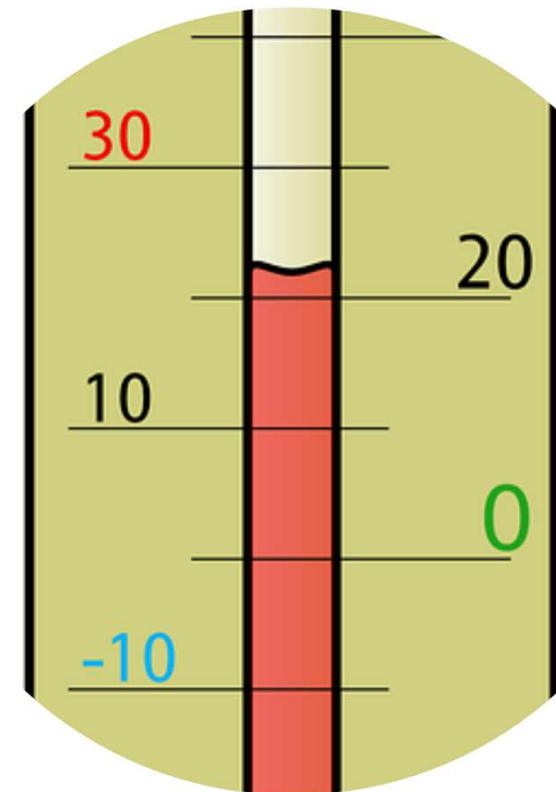
Temperature

Temperature describes the energetic heat state of a substance in °C or K.

Heat describes the **kinetic energy** of the atoms and molecules forming the substance. The higher the temperature, the faster the particles vibrate.

As a result, all substances with temperatures above absolute zero emit thermal radiation.

Expansion, change of aggregate state, increase in pressure

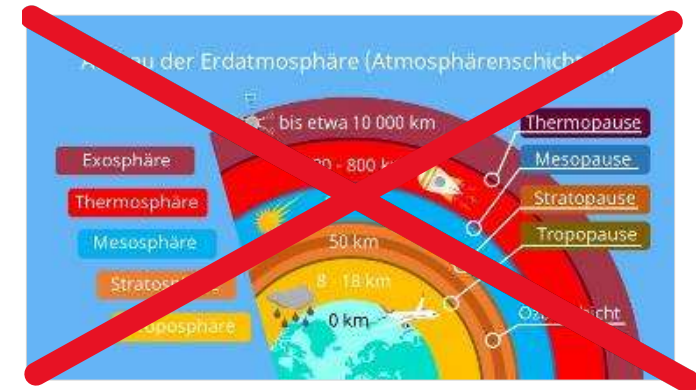


The atmosphere

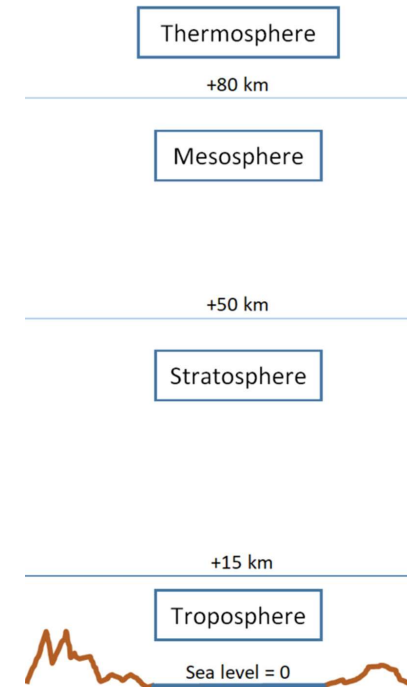
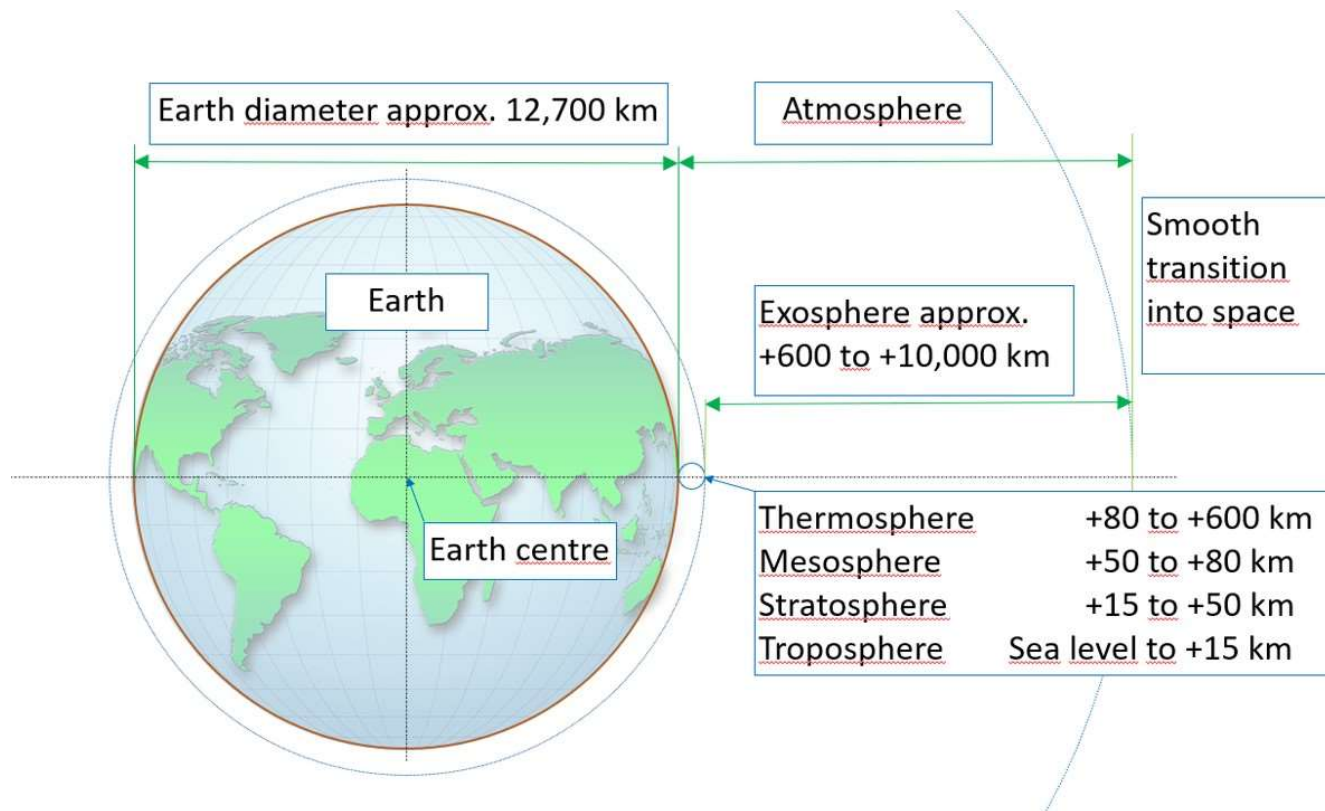
A distinction is made between 5 layers:

- Troposphere -> Tropopause
- Stratosphere -> Stratopause
- Mesosphere -> Mesopause
- Thermosphere -> Thermopause
- Exosphere -> *Space*

Image source: Studyflix



CLIMATE



Air pressure

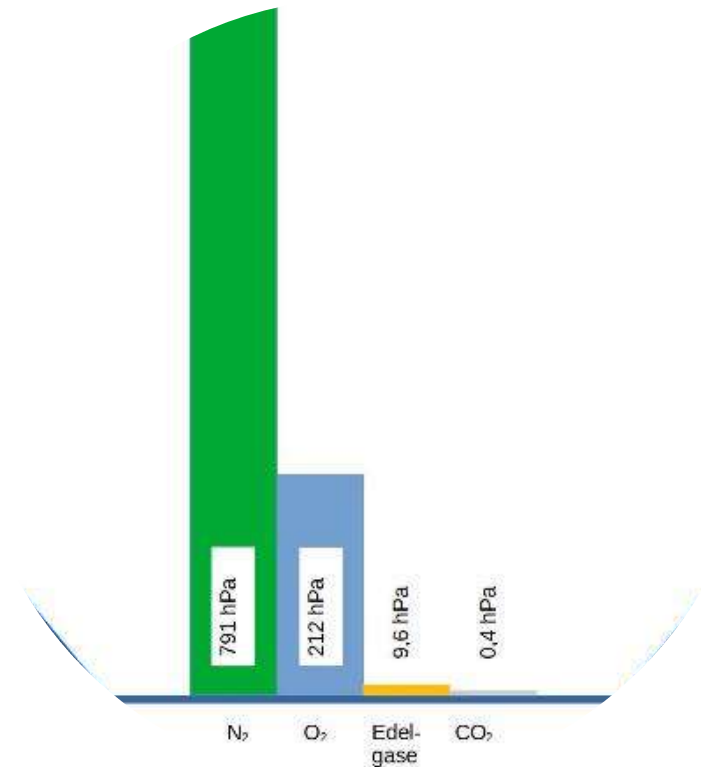
78 % nitrogen

21 % oxygen

1 % noble gases (argon)

and **trace gases**, of which
0.04 % CO₂ (400 ppm)

plus **water vapor, 3 g/m³ up to 30 g/m³**
(3,000 to 30,000 ppm)



The atmosphere

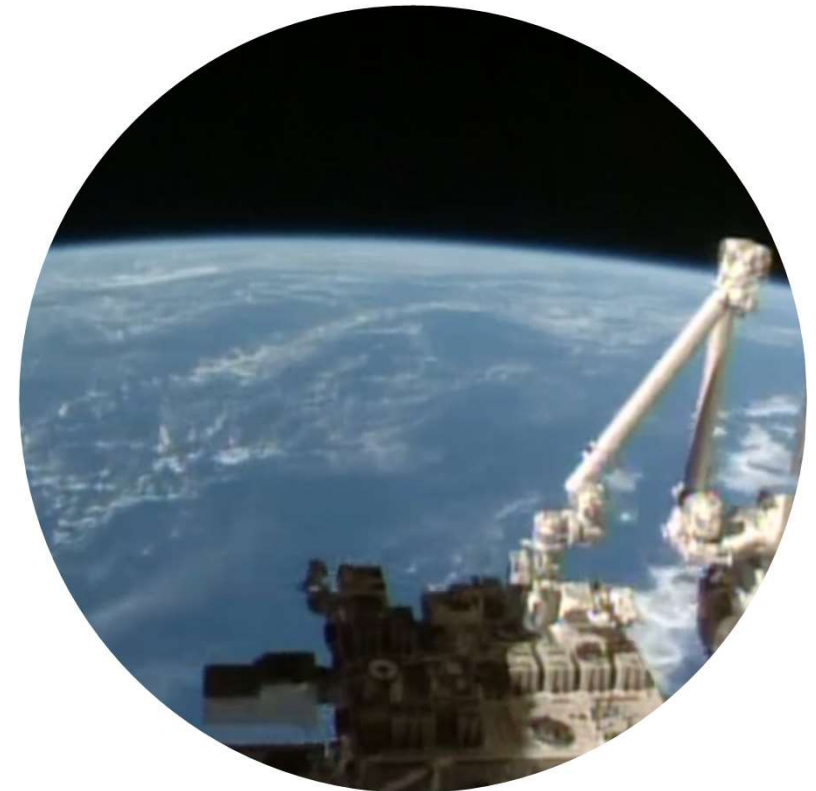
... is an envelope of air that is open at the top and gets thinner and thinner. It is bound to the earth by gravity.

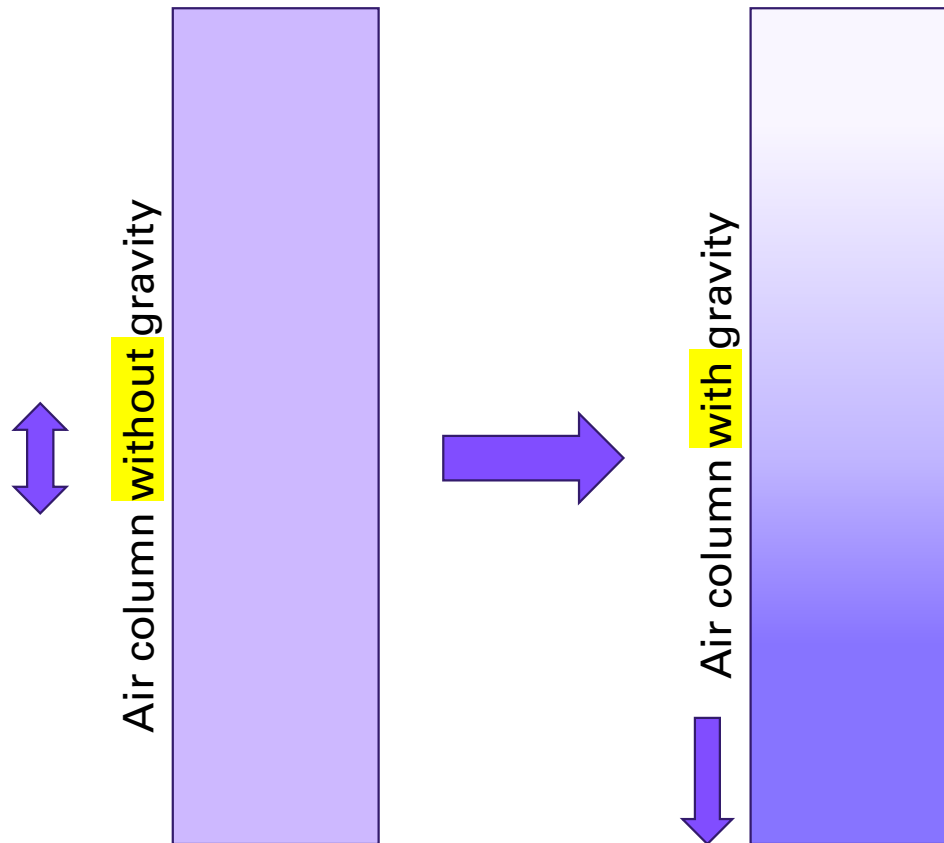
The atmosphere is therefore not a greenhouse either!

The surface temperature of the earth measured from the outside is 255 K (-18°C).

However, it is actually 288 K (+15 °C) on average.

What is the reason for this?



**Adiabatic change of state:**

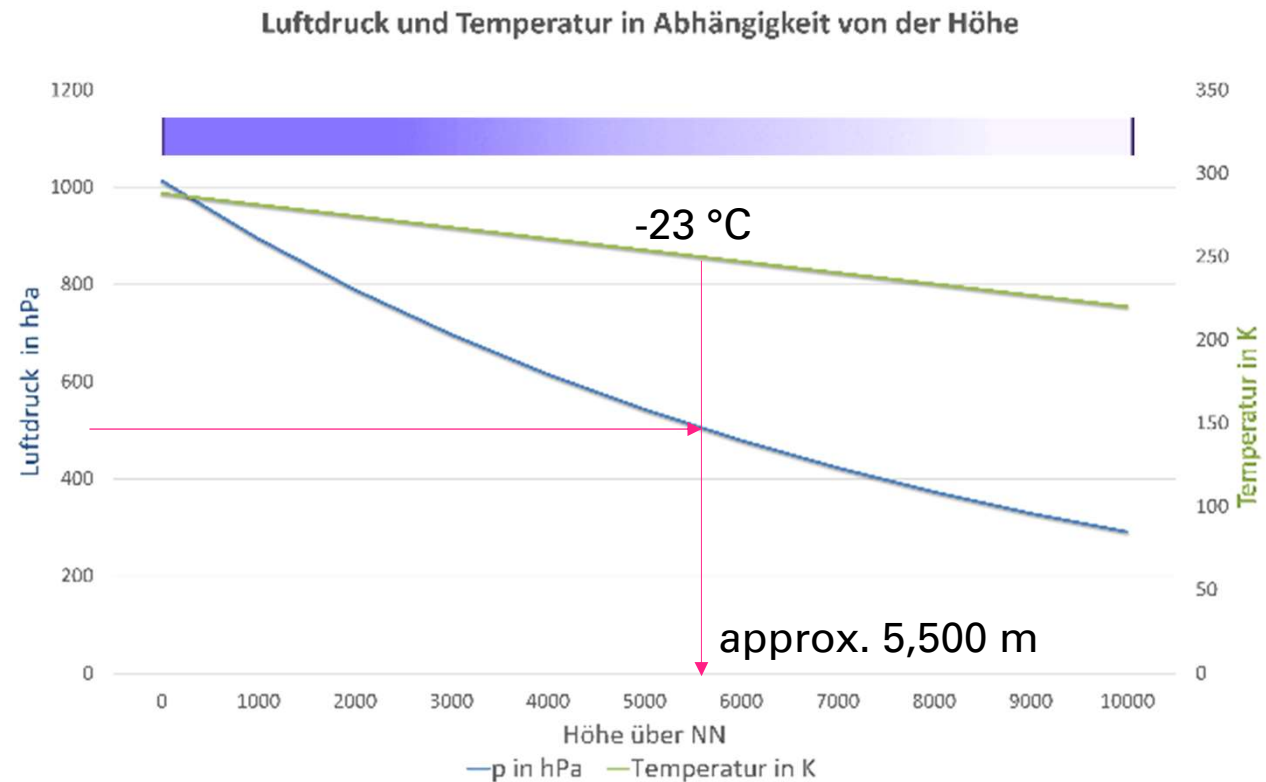
(no energy exchange)

- ⇒ Increase in density in the direction of the earth's surface
- ⇒ **Compression** ⇒ **Warming**
- ⇒ Decrease in density with height
- ⇒ **Decompression** ⇒ **Cooling down**

(6.5 to 10 K / 1,000 m altitude)

Thought experiment according to D. Hebert (2004), source Langeheine, J. Energy policy in Germany

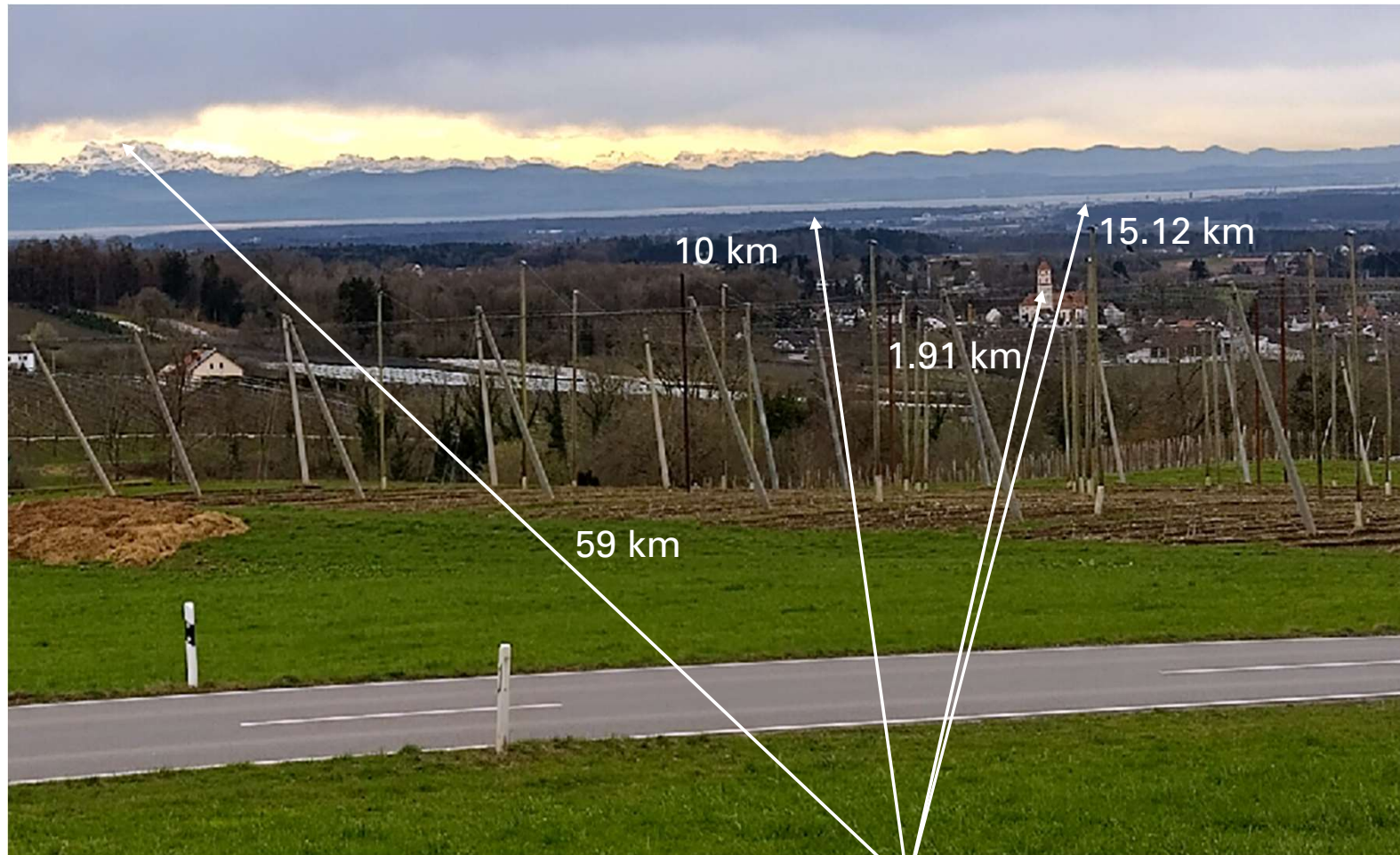
Air pressure and temperature



p0	101325	Pa									Temperatur in K
Rho0	1,29	kg/m³				$p(h) = p_0 * e^{-(p_0 * g * h) / p_0}$					
g	9,81	m/s²				Stoffmengenanteile in kg/m³					
T₀	288 K					N2	O2	CO2	Sonstige		
h in m	p(h) in Pa	exp	p(h) in bar	Abnahme Druck		78,00%	20,80%	0,04%	1,16%		
0	101325		1,013			1,006200	0,268320	0,000516	0,014964		288
1	101312	0,9999	1,013	0,0%	0,000125	1,006074	0,268286	0,000516	0,014962		288,0
100	100067	0,9876	1,001	1,2%	0,012412	0,993711	0,264990	0,000510	0,014778		287,3
1000	89428	0,8826	0,894	11,7%	0,117410	0,888062	0,236817	0,000455	0,013207		281,2
1500	84015	0,8292	0,840	17,1%	0,170839	0,834302	0,222480	0,000428	0,012408		277,8
2000	78929	0,7790	0,789	22,1%	0,221034	0,783795	0,209012	0,000402	0,011656		274,4
2500	74151	0,7318	0,742	26,8%	0,268191	0,736346	0,196359	0,000378	0,010951		271,0
3000	69662	0,6875	0,697	31,2%	0,312492	0,691770	0,184472	0,000355	0,010288		267,6
3500	65445	0,6459	0,654	35,4%	0,354112	0,649892	0,173305	0,000333	0,009665		264,2
4000	61483	0,6068	0,615	39,3%	0,393212	0,610550	0,162813	0,000313	0,009080		260,8
4500	57761	0,5701	0,578	43,0%	0,429946	0,573589	0,152957	0,000294	0,008530		257,4
5000	54264	0,5355	0,543	46,4%	0,464455	0,538865	0,143697	0,000276	0,008014		254,0
5500	50979	0,5031	0,510	49,7%	0,496876	0,506244	0,134998	0,000260	0,007529		250,6
6000	47893	0,4727	0,479	52,7%	0,527333	0,475597	0,126826	0,000244	0,007073		247,2
7000	42270	0,4172	0,423	58,3%	0,582829	0,419757	0,111935	0,000215	0,006243		240,4
8000	37307	0,3682	0,373	63,2%	0,631809	0,370474	0,098793	0,000190	0,005510		233,6
9000	32927	0,3250	0,329	67,5%	0,675038	0,326977	0,087194	0,000168	0,004863		226,8
10000	29061	0,2868	0,291	71,3%	0,713192	0,288586	0,076956	0,000148	0,004292		220,0
11000	25649	0,2531	0,256	74,7%	0,746866	0,254704	0,067921	0,000131	0,003788		
12000	22637	0,2234	0,226	77,7%	0,776586	0,224799	0,059946	0,000115	0,003343		
13000	19980	0,1972	0,200	80,3%	0,802817	0,198405	0,052908	0,000102	0,002951		
14000	17634	0,1740	0,176	82,6%	0,825968	0,175111	0,046696	0,000090	0,002604		
15000	15563	0,1536	0,156	84,6%	0,846401	0,154551	0,041214	0,000079	0,002298		
16000	13736	0,1356	0,137	86,4%	0,864435	0,136405	0,036375	0,000070	0,002029		
17000	12123	0,1196	0,121	88,0%	0,880352	0,120390	0,032104	0,000062	0,001790		
18000	10700	0,1056	0,107	89,4%	0,894400	0,106255	0,028335	0,000054	0,001580		
19000	9444	0,0932	0,094	90,7%	0,906798	0,093780	0,025008	0,000048	0,001395		
20000	8335	0,0823	0,083	91,8%	0,917741	0,082769	0,022072	0,000042	0,001231		
25000	4464	0,0441	0,045	95,6%	0,955947	0,044326	0,011820	0,000023	0,000659		
30000	2391	0,0236	0,024	97,6%	0,976407	0,023739	0,006330	0,000012	0,000353		
40000	686	0,0068	0,007	99,3%	0,993233	0,006808	0,001816	0,000003	0,000101		
50000	197	0,0019	0,002	99,8%	0,998059	0,001953	0,000521	0,000001	0,000029		
80000	5	0,0000	0,000	100,0%	0,999954	0,000046	0,000012	0,000000	0,000001		



3000	69002	0,6073	0,637	31,2%
3500	65445	0,6459	0,654	35,4%
4000	61483	0,6068	0,615	39,3%
4500	57761	0,5701	0,578	43,0%
5000	54264	0,5355	0,543	46,4%
5500	50979	0,5031	0,510	49,7%
6000	47893	0,4727	0,479	52,7%
7000	42270	0,4172	0,423	58,3%
8000	37307	0,3682	0,373	63,2%
9000	32927	0,3250	0,329	67,5%
10000	29061	0,2868	0,291	71,3%
11000	25649	0,2531	0,256	74,7%
12000	22637	0,2234	0,226	77,7%
13000	19980	0,1972	0,200	80,3%
14000	17634	0,1740	0,176	82,6%
15000	15563	0,1536	0,156	84,6%
16000	13736	0,1356	0,137	86,4%



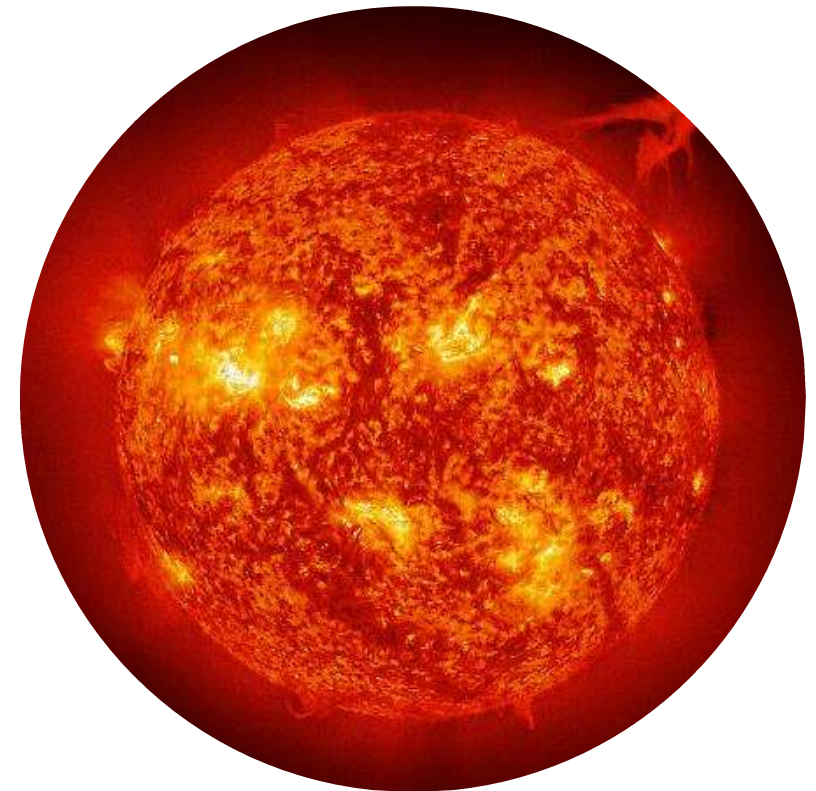
WATER VAPOR AND THE WATER CYCLE



The sun

Surface temperature:	5,800 K
Radiant power:	63,000 kW/m ²
Solar constant at the outer edge of the earth's atmosphere:	1,365 W/m ²
Energy input to the earth:	3.835 million EJ/a
	438 EJ/h
Primary energy consumption:	approx. 600 EJ/a

Image source: <https://phys.org/news/2022-07-exploring-mystery-magnetic-helicity-solar.html>



Heat capacity

Air: 1.01 kJ/kg*K

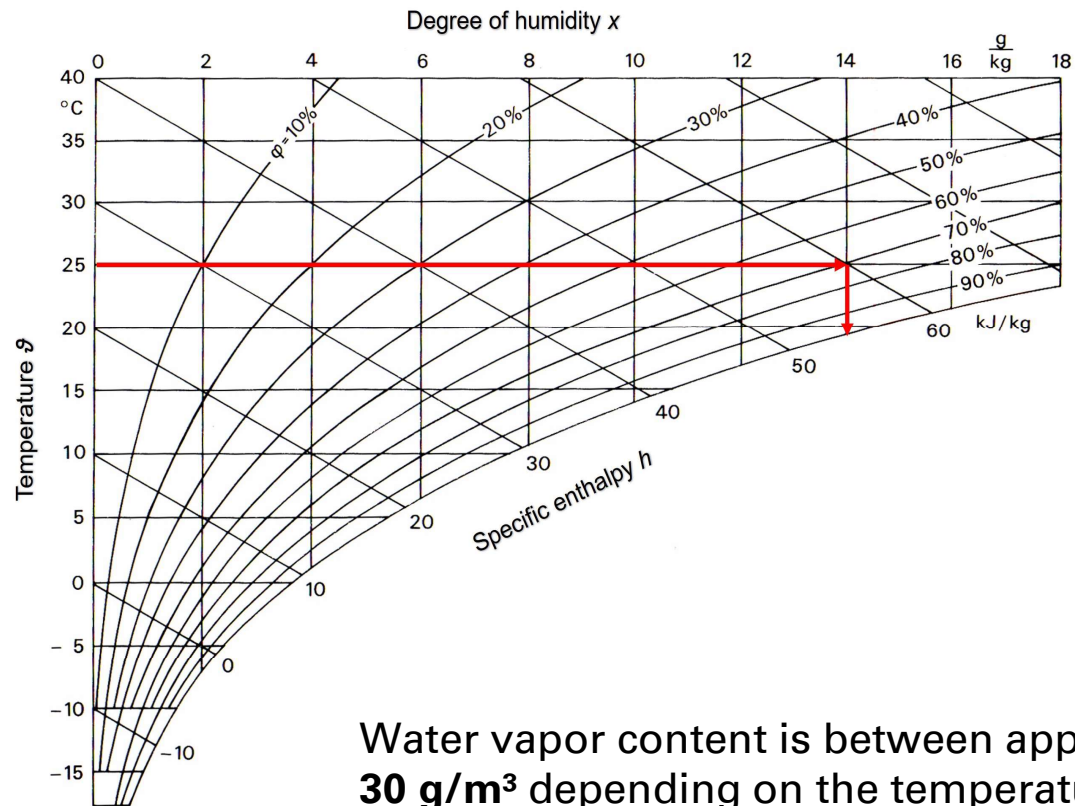
Water: 4.20 kJ/kg*K

Heat of evaporation: 2,460 kJ/kg
(water at 15°C)

*Image source: By Regionalplaner - Own work, CC BY-SA 3.0,
<https://commons.wikimedia.org/w/index.php?curid=27966176>*

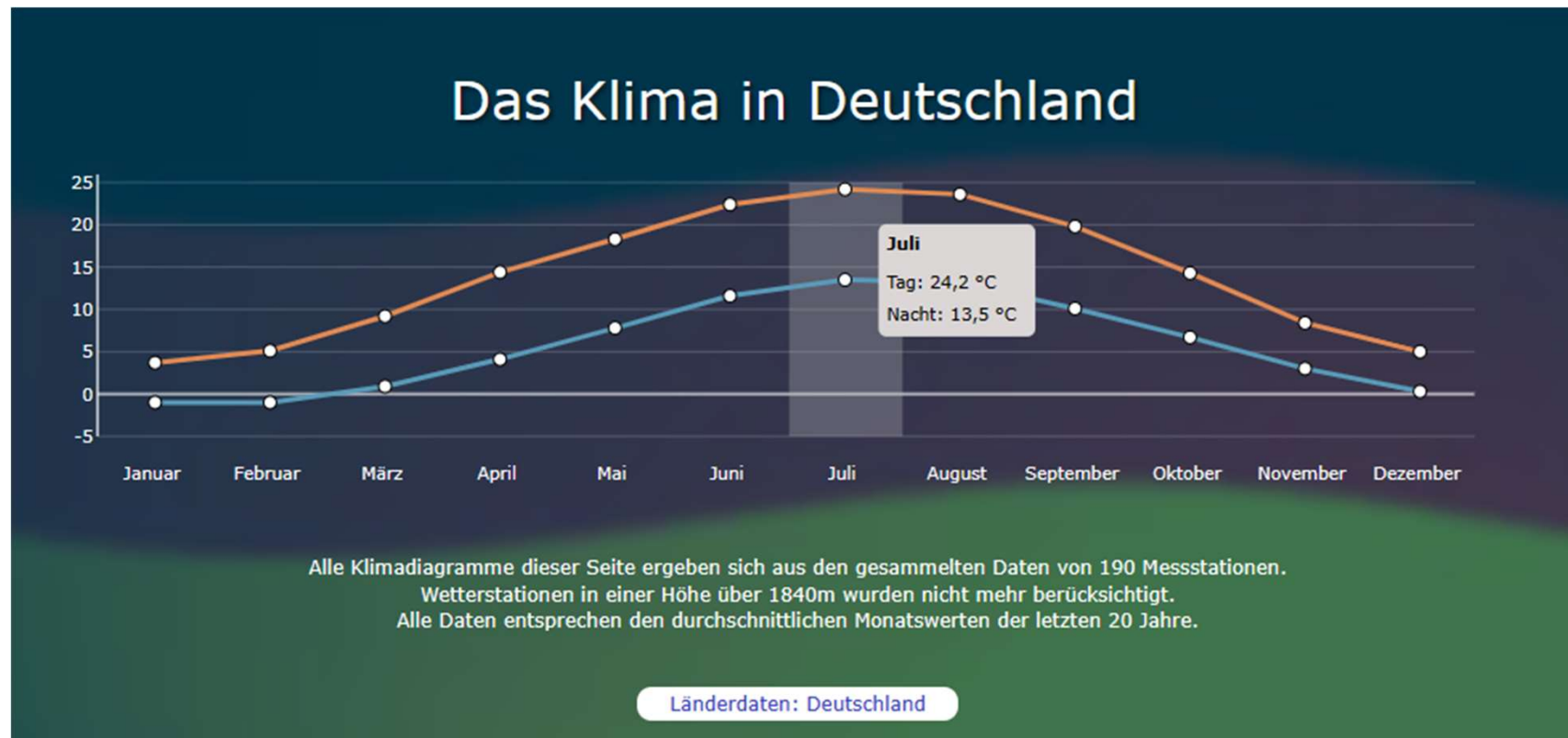


Rel. humidity



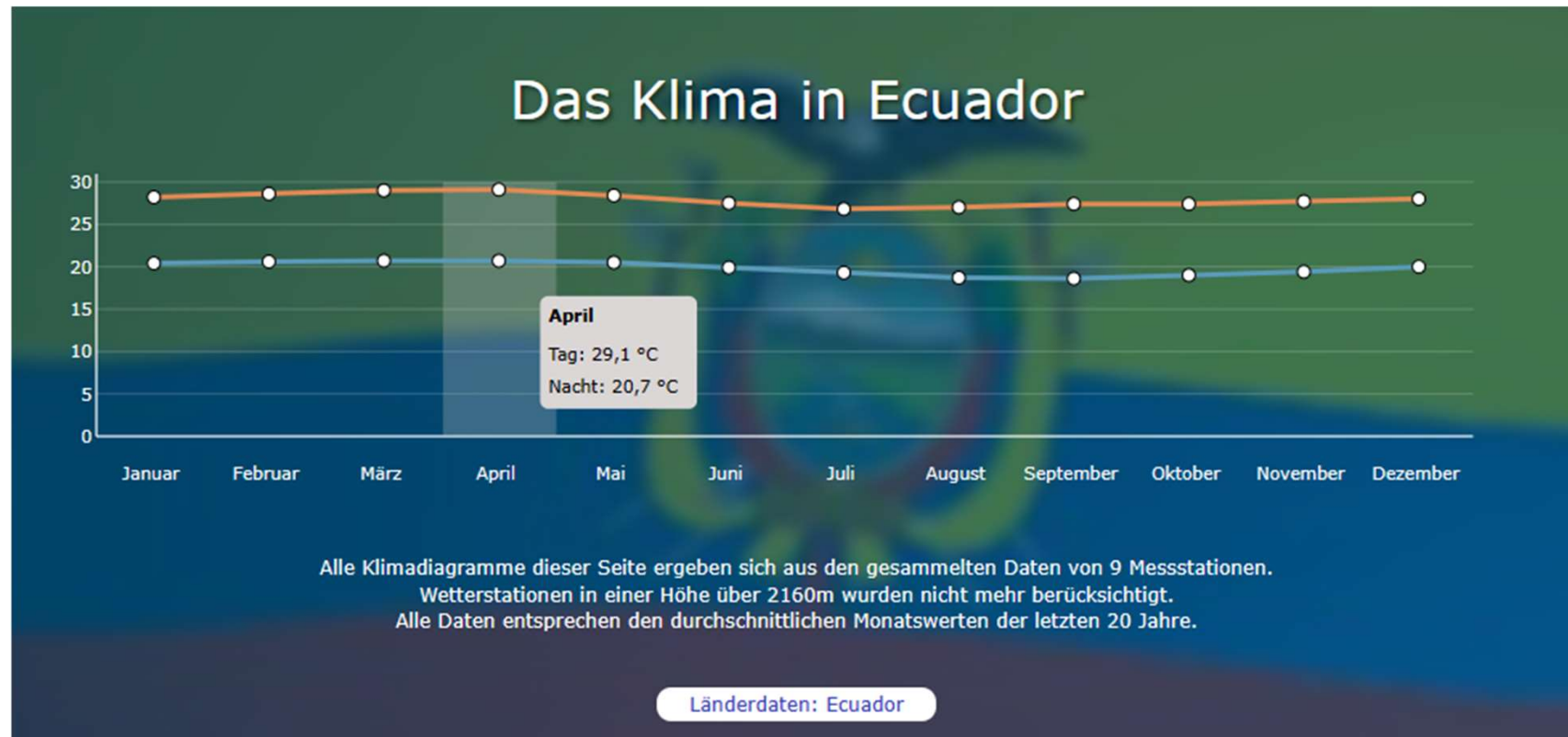
Water vapor content is between approx. 3 g/m^3 and 30 g/m^3 depending on the temperature

Germany



<https://www.laenderdaten.info>

Ecuador



<https://www.laenderdaten.info>

Latent heat

The amount of water stored in the atmosphere is approx. **13,000 km³**!

Multiplied by the heat of evaporation, the stored or latent heat is **32,000 EJ**.

The atmospheric water is circulated around 38-39 times.

This results in a heat transport of **1,250,000 EJ**.

Image source: By Regionalplaner - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=27966176>



Sun and rain

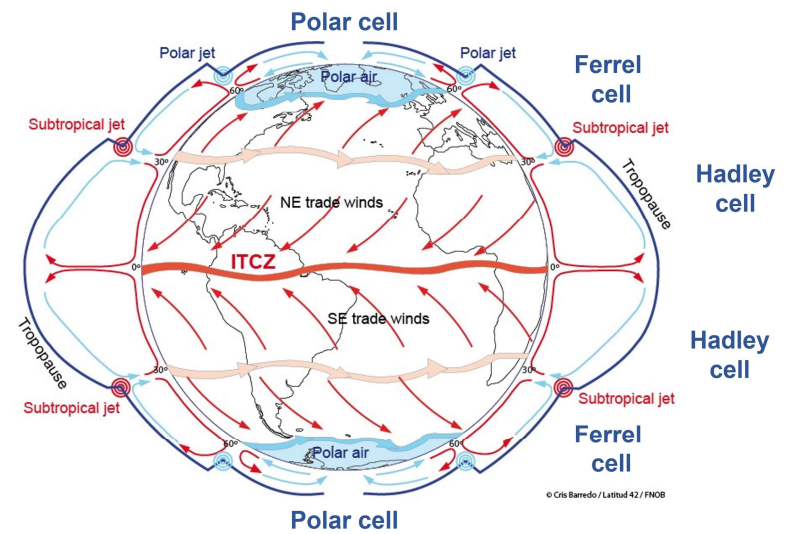
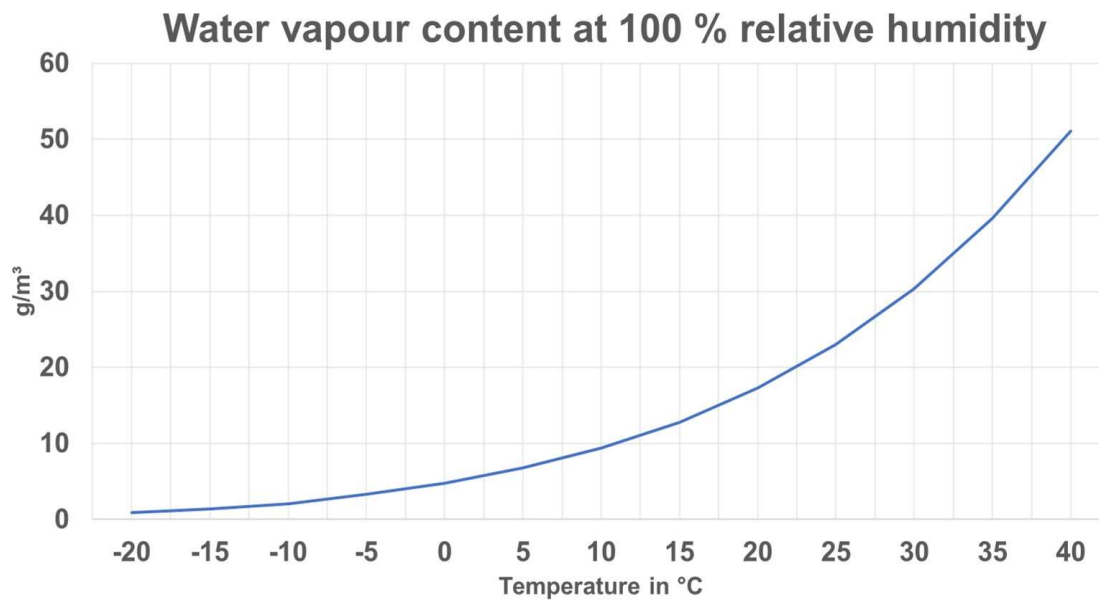
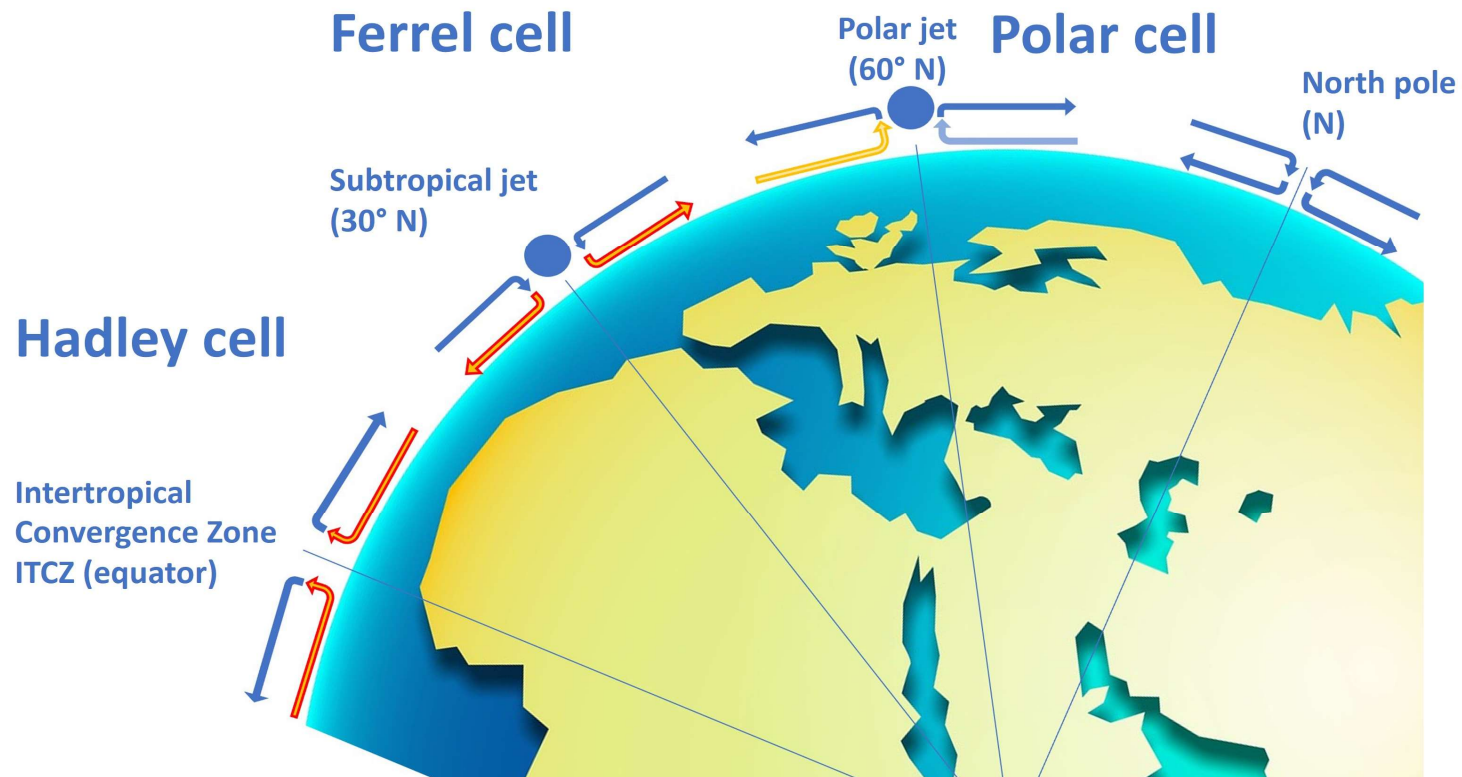
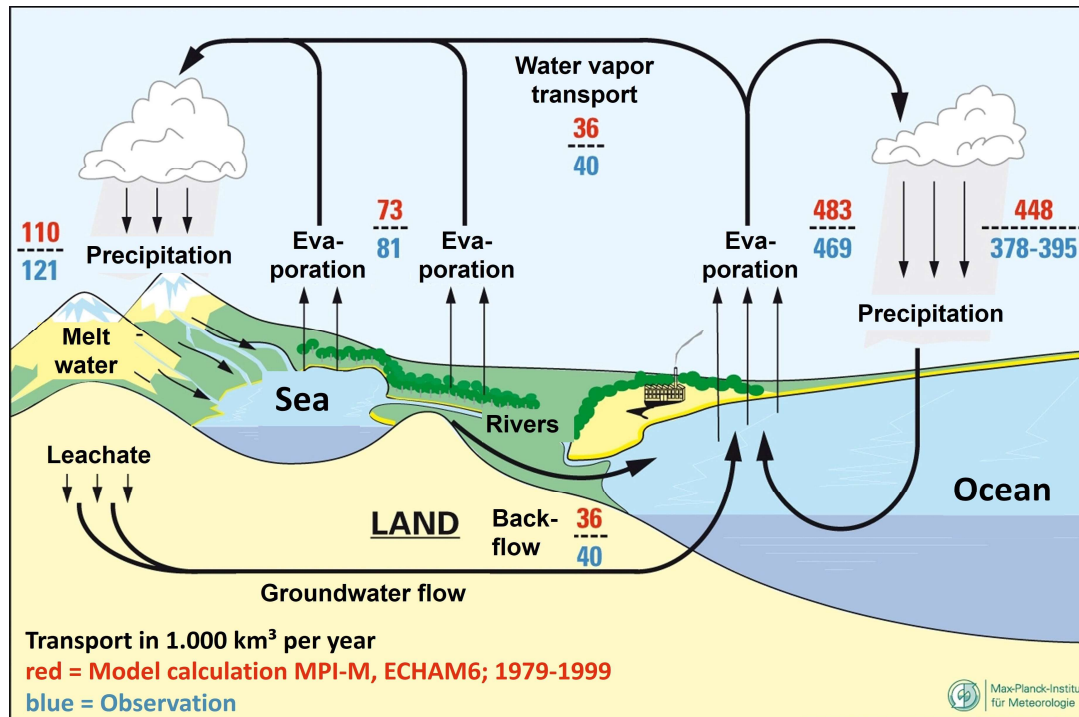


Image source:
<https://www.insightsonindia.com>

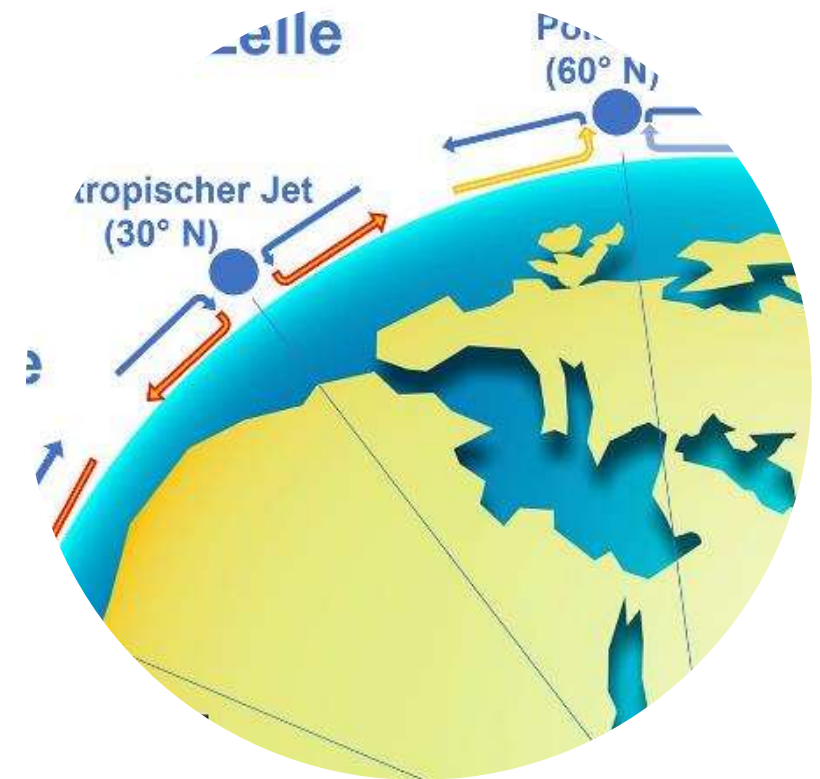
Weather cells



Water cycle

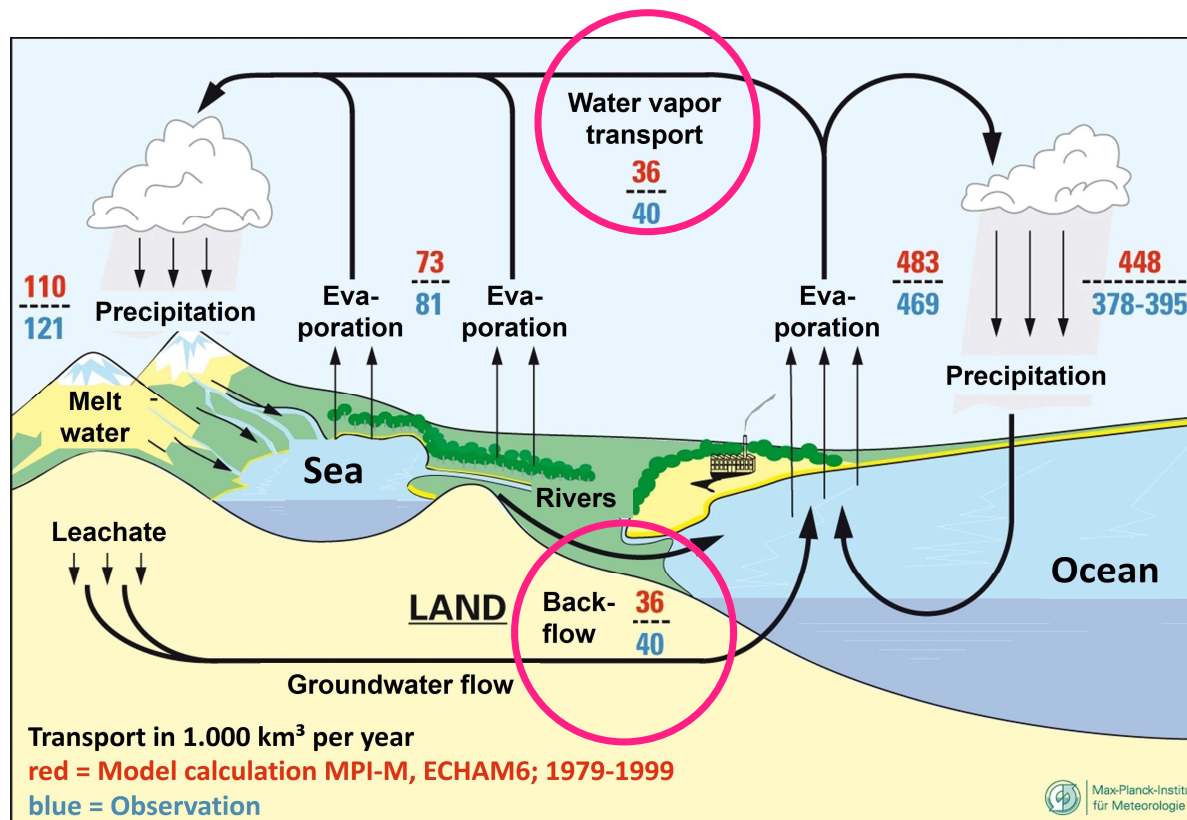


<https://www.zamg.ac.at>



Water cycle

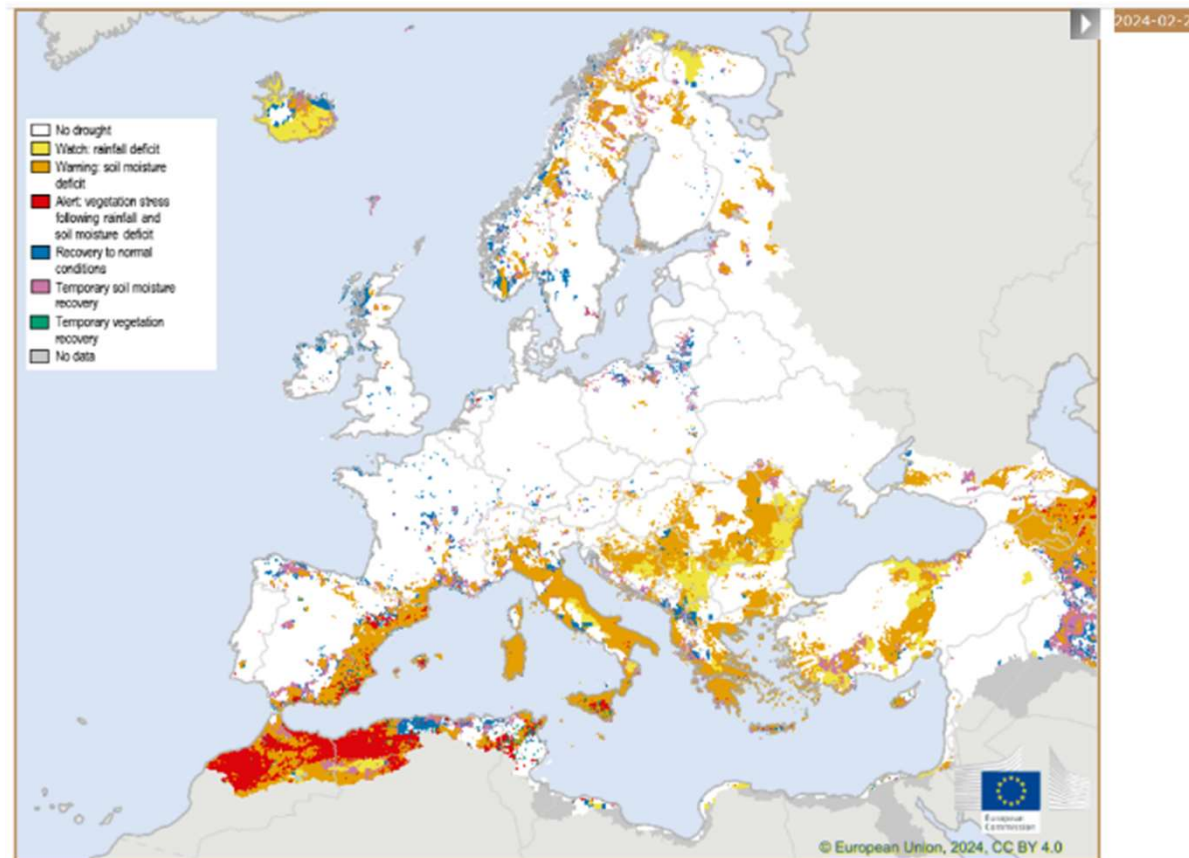
WATER VAPOR AND THE WATER CYCLE



Only about **7.5 to 8.5 %** of all evaporating water reaches the land from the oceans!

It rains off, evaporates again and is transported further by the **wind**.

European drought monitor



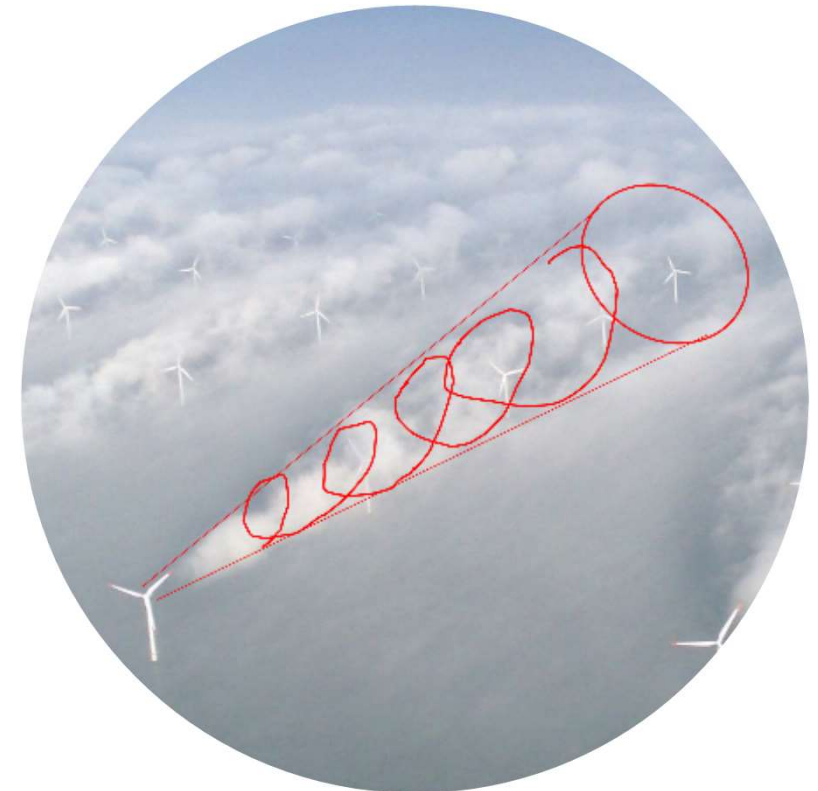
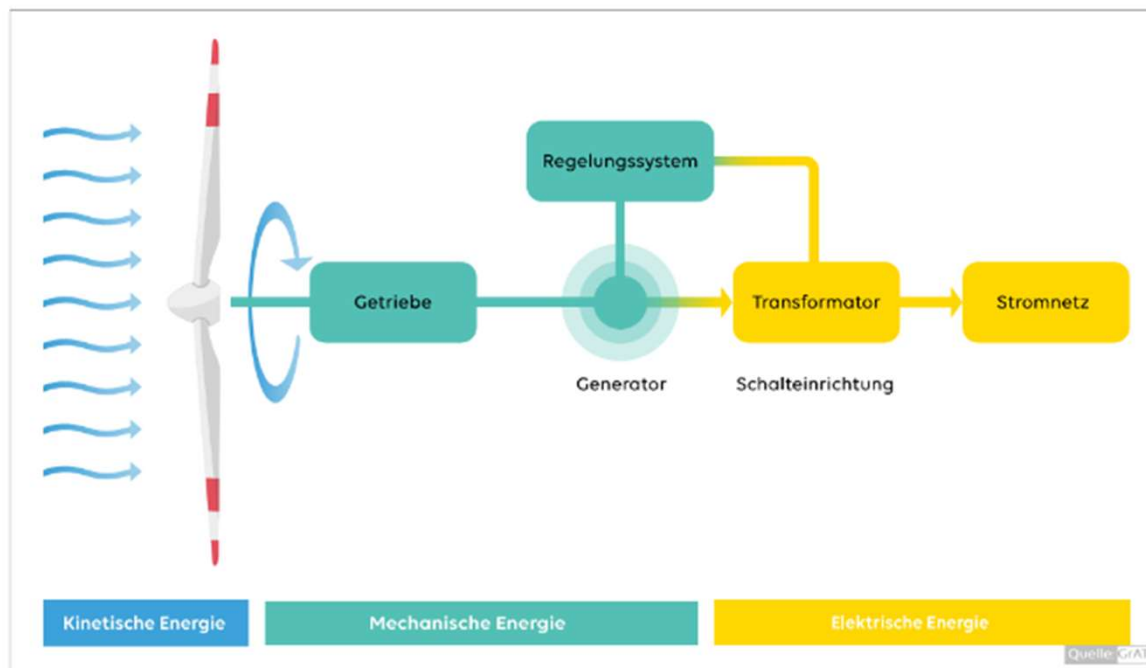
<https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1153>

WIND ENERGY



Source ewe.com

Wie wird der Strom in einem Windrad erzeugt?



Wind energy

m : flowing air mass

v : Wind speed

E_{kin} : Kinetic energy

$$E_{kin} = \frac{1}{2} m v^2$$

Since the volume and thus the air mass cannot change when passing the wind turbine, the **generation of electrical energy** results from the **decrease in kinetic energy**, i.e. from a decrease in the speed of the flowing air mass.

Wind turbines are therefore wind brakes.

Wind energy output

r: Rotor diameter

v: Wind speed

ρ : Air density

P: Power

$$P = (\pi * r^2 * \rho * v^3) / 2$$

The rotor diameter and the speed are essential parameters for the rated power of the wind turbine:

Double the diameter - 4 times the power

Twice the speed - 8 times the power

Three times the speed - 27 times the power

Water transportation

Vestas V172-7.2 MW

Rotor diameter **172 m.**

Rotor area approx. **23,200 m².**

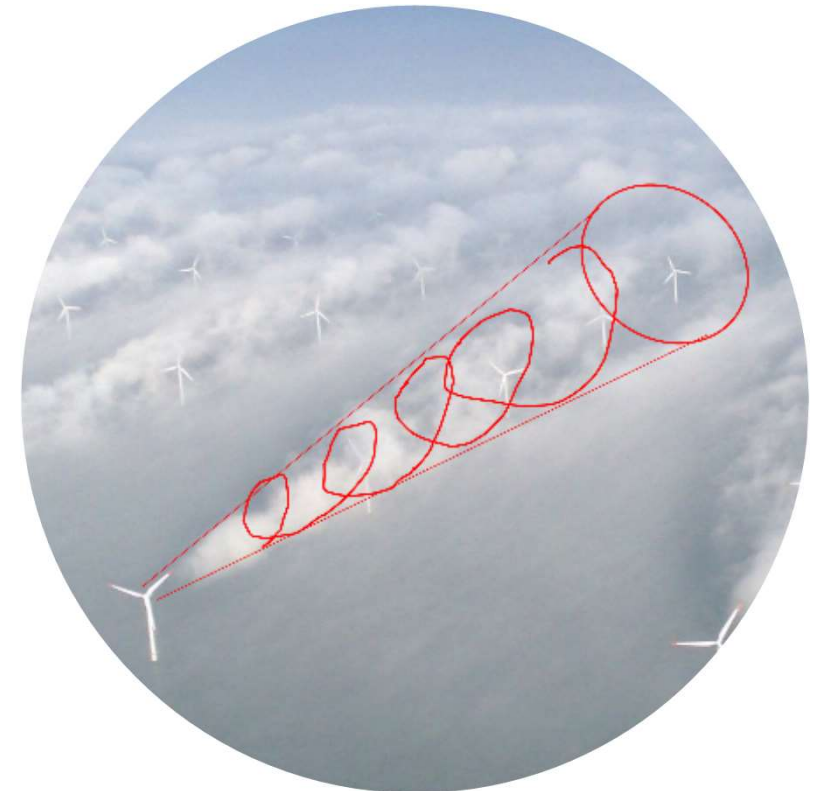
Assumption wind speed:
is reduced from **14 m/s to 7 m/s**

$23,200 \text{ m}^2 * 7 \text{ m/s} = 162,400 \text{ m}^3/\text{s}$ of air mass

With a water content of approx. 15 g/m^3 air:

$162,400 \text{ m}^3/\text{s} * 15 \text{ g/m}^3 = 2,436,000 \text{ g/s} = 2,436 \text{ kg/s}$

or **$2.436 \text{ m}^3/\text{s} = 146 \text{ m}^3/\text{min}$ or $8,770 \text{ m}^3/\text{h}$**



Water transportation

MySE 16-260

Rotor diameter **260 m.**

Rotor area approx. **50,000 m².**

Assumption wind speed:
is reduced from **14 m/s to 7 m/s**

$50,000 \text{ m}^2 * 7 \text{ m/s} = 350,000 \text{ m}^3/\text{s}$ of air mass

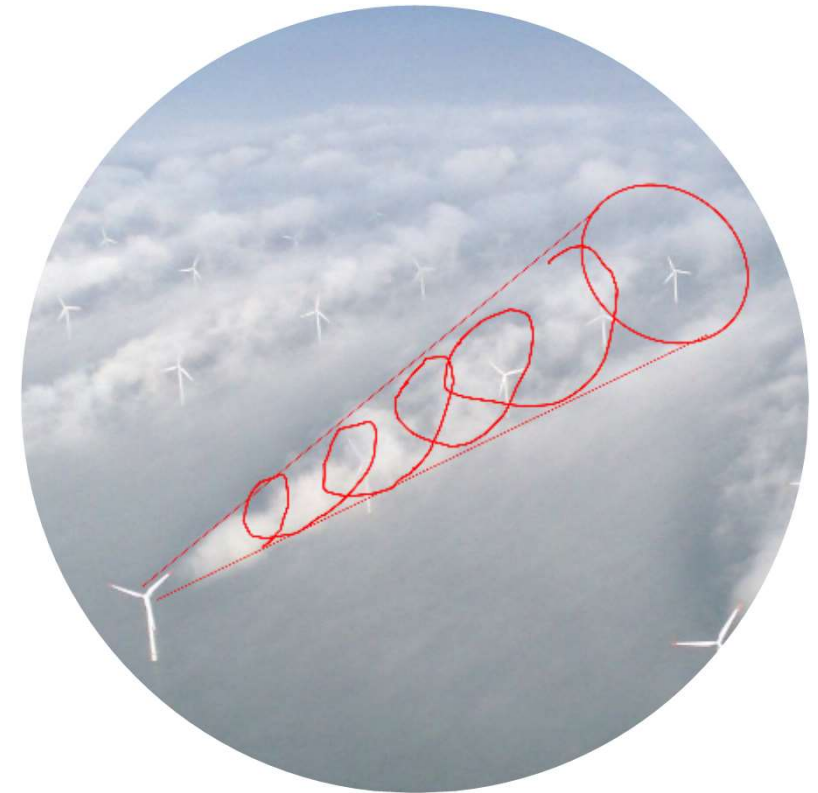
With a water content of only 10 g/m^3 air:

$350,000 \text{ m}^3/\text{s} * 10 \text{ g/m}^3 = 3,500,000 \text{ g/s} = 3,500 \text{ kg/s}$

or **3,500 l/s = 210 m³/min or 12,600 m³/h**

And that's just one wind turbine! And:

Repowering will exacerbate the situation.



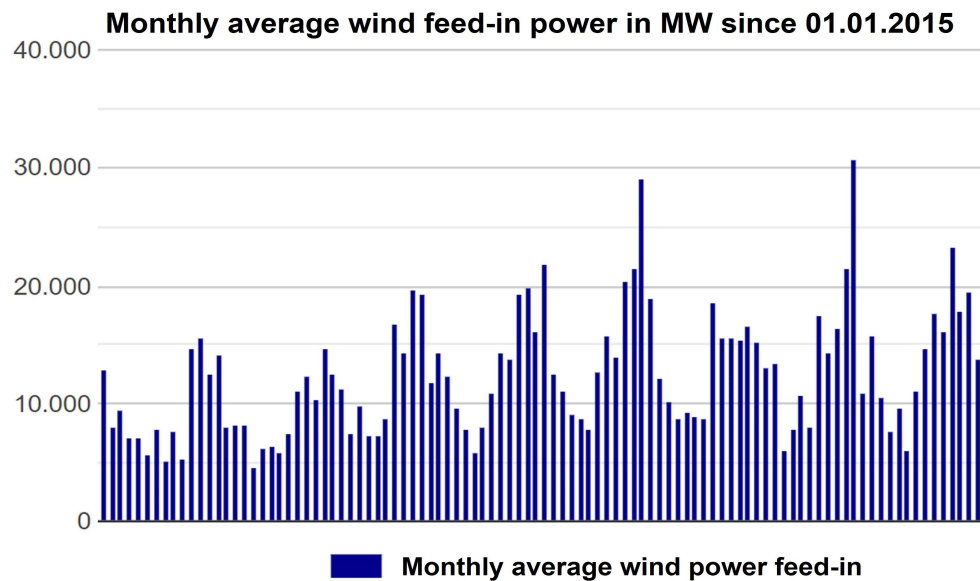
Wind energy

Onshore installed capacity: approx.	61 GW
Number of onshore turbines:	28,667
Onshore generation:	118.7 TWh
Average output per h: 118,700 GWh / 8,760 h =	13.55 GW
Offshore generation:	23.5 TWh
22 % of the installed capacity	

Source: Federal Network Agency and German Wind Energy Association



Wind power per month since 01.01.2015

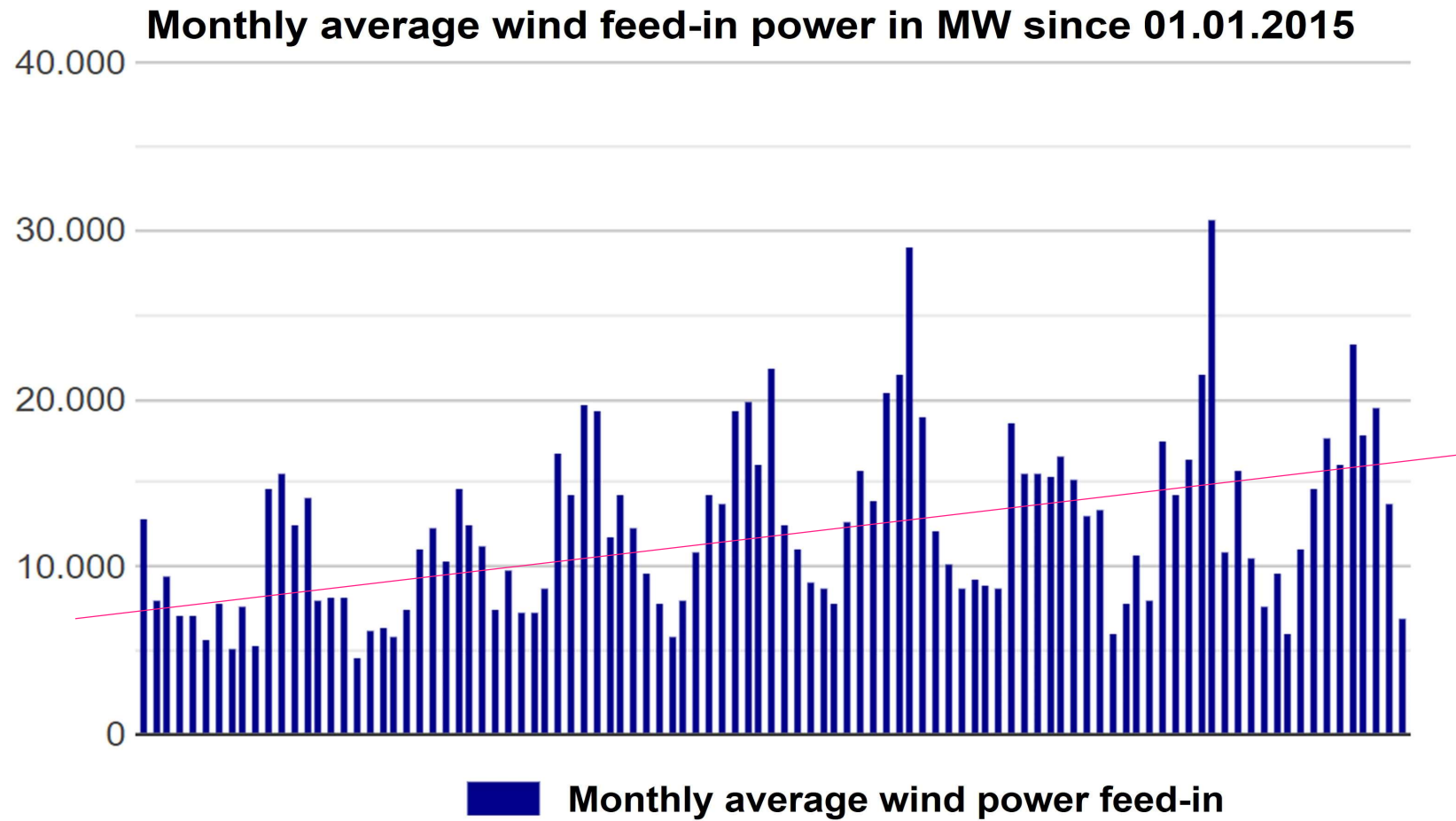


The seasonal fluctuations are clearly visible.

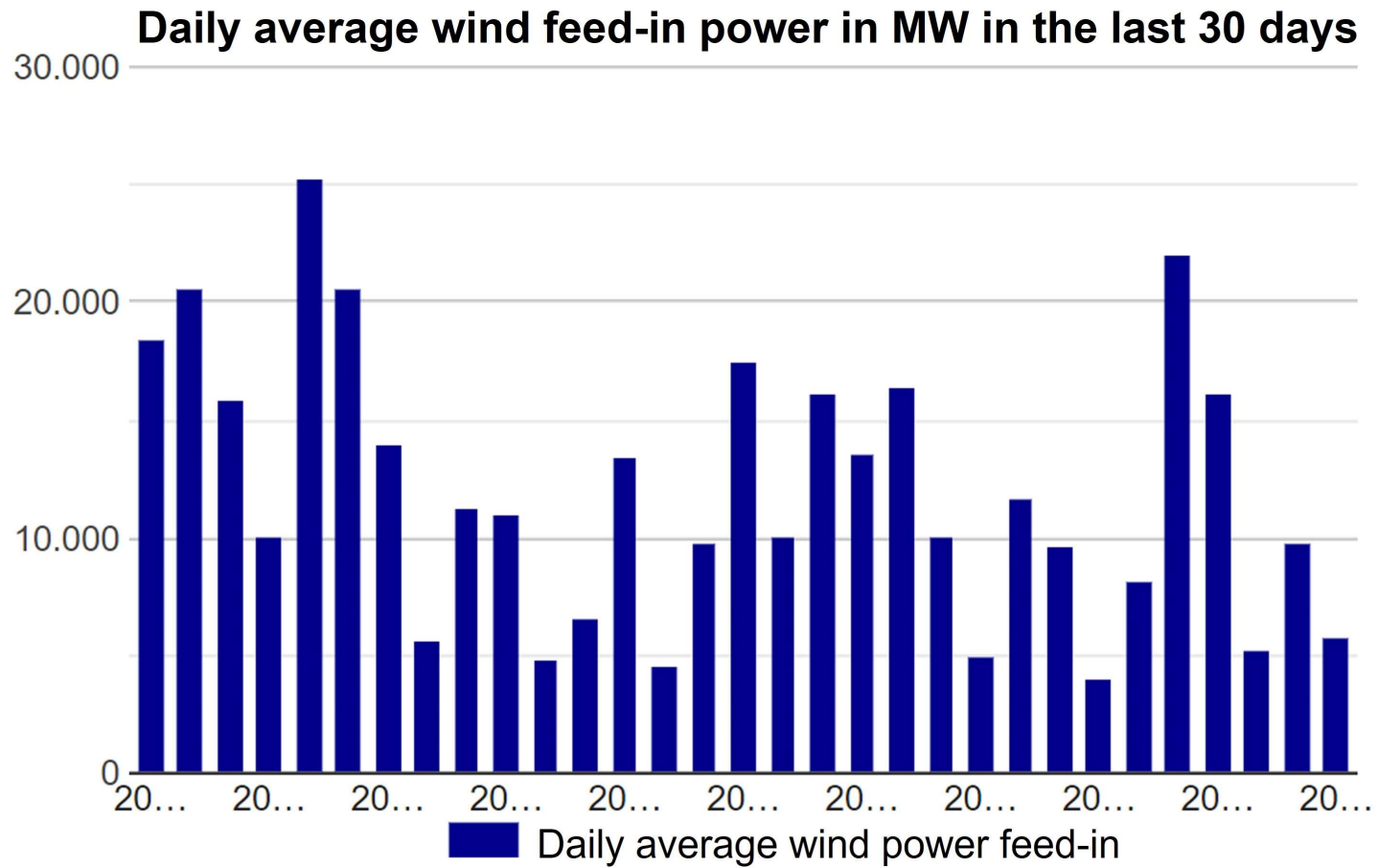
It is also easy to see that never exceed **30 GW at peak values**.

And this despite an installed capacity of more than **60 GW!**

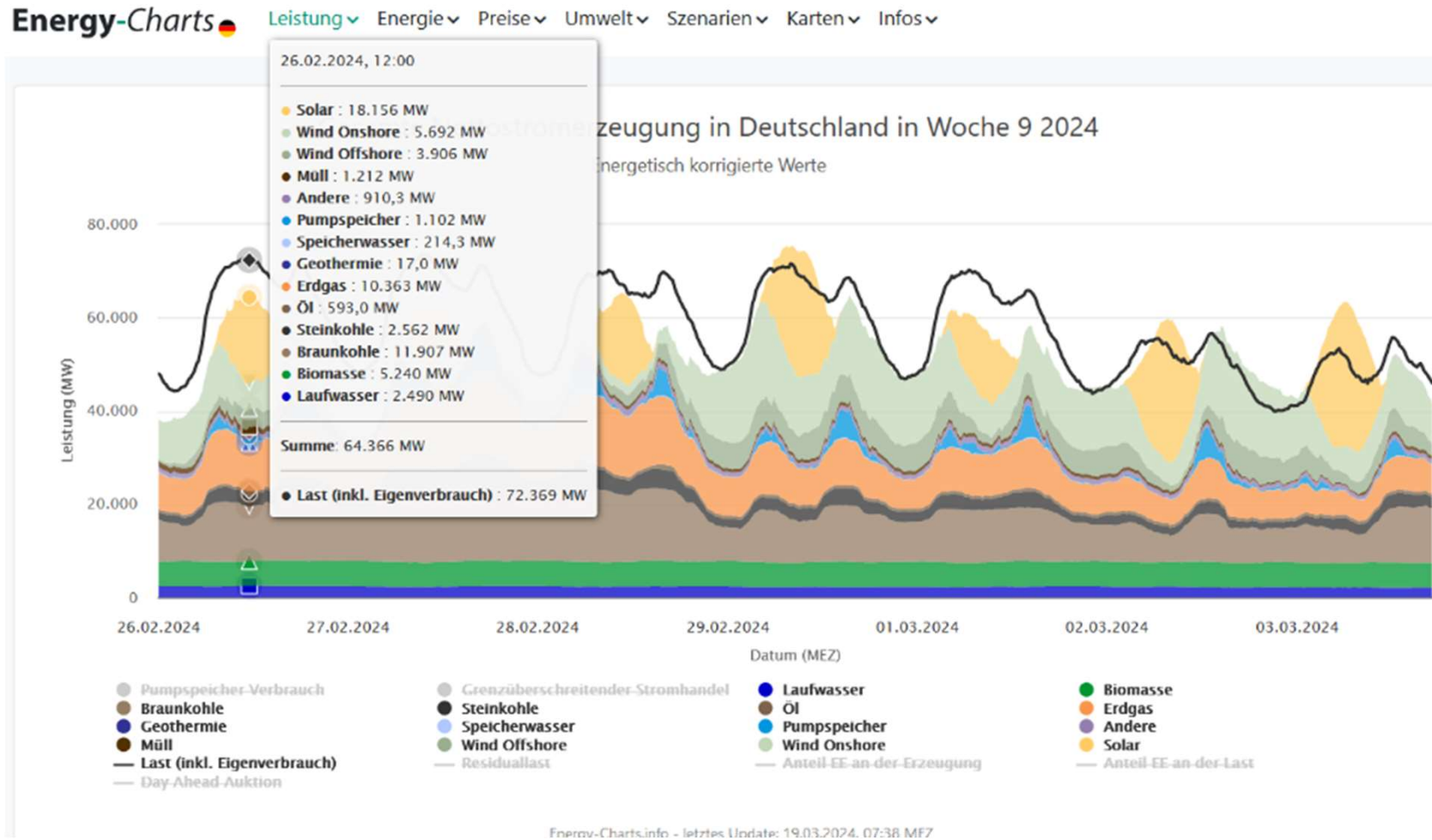
Source: Windjournal.com



Source: Windjournal.de



Source: Windjournal.de



<https://www.energy-charts.info>

Interim conclusion 1

- In view of these figures, any further expansion of wind power plants **makes absolutely no sense.**
- More turbines only increase the **phantom power** and flush money from the **consumers into the wind millers' coffers!**
- More turbines mean **massive destruction of nature** and destruction of economic capital.
- When setting up in a protected forest, both the access route and the power connection must be observed.
- The climatic effect only comes into play when the wind is blowing properly!
- Not to mention the infrasound.

Interim conclusion 2

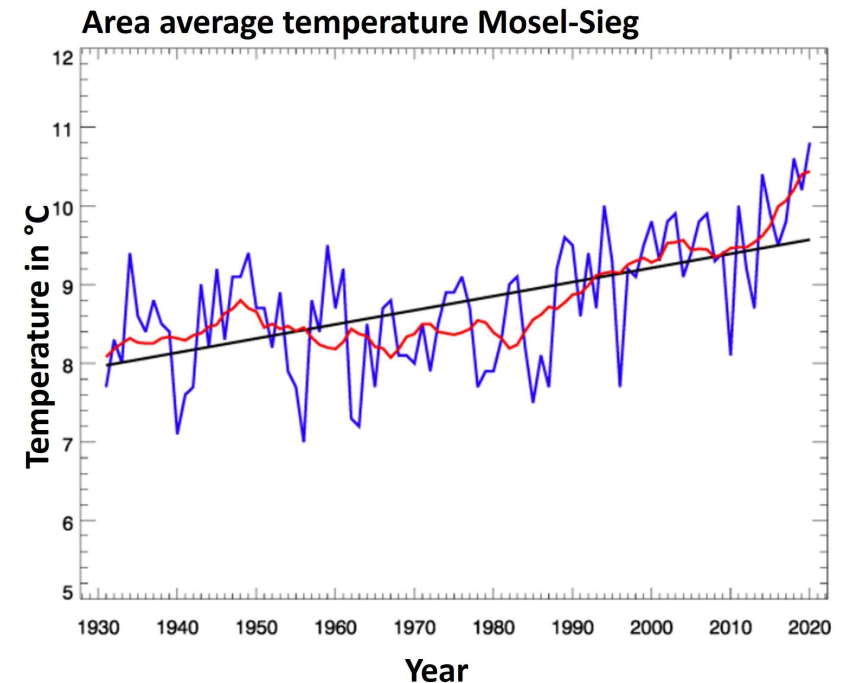
- Wind made the largest contribution from alternative sources in **2022 with 123 TWh and in 2023 with 139 TWh.**
- This corresponds to a share of **0.74 %** or **0.83 %** of global primary energy consumption of **166,500 TWh**
- **Hydrogen production in Germany from wind energy** is also invalid in view of these figures and the discussion about it is window dressing!
- **Hydrogen production** with wind energy outside of Germany is pure eco-imperialism.

Climate effects

The climate monitor report published at the end of 2021 gives examples of temperatures for three regions.

A **linear trend line** has been drawn in the graph, suggesting a continuous temperature increase over 90 years.

Source: KLIWA Monitor Report 2021



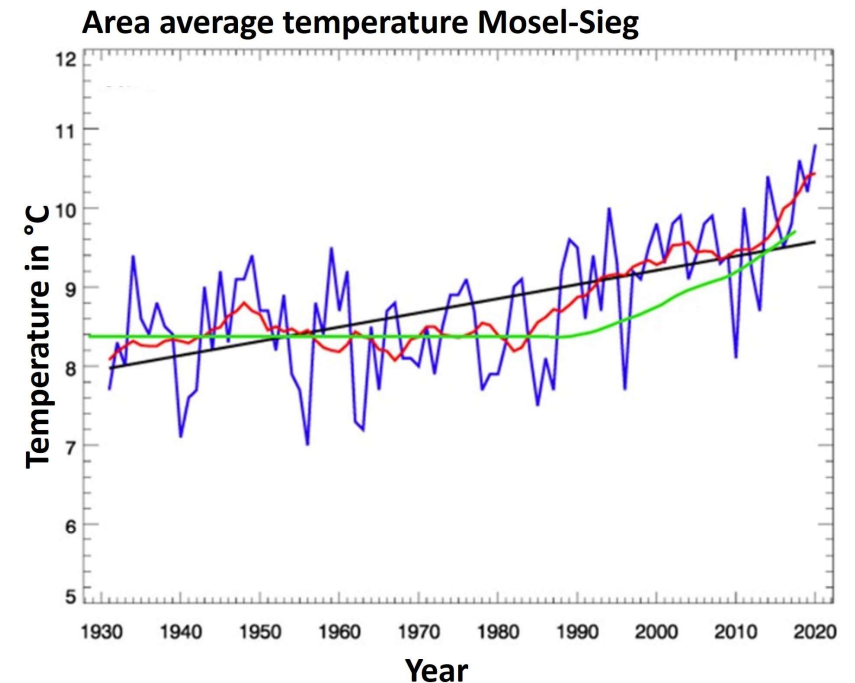
Climate effects

The green line shows the actual course.

According to this, the temperature has remained constant for around 60 years, with a clear increase only becoming apparent from **1990/2000** onwards.

This observation applies worldwide and obviously cannot be explained by CO₂.

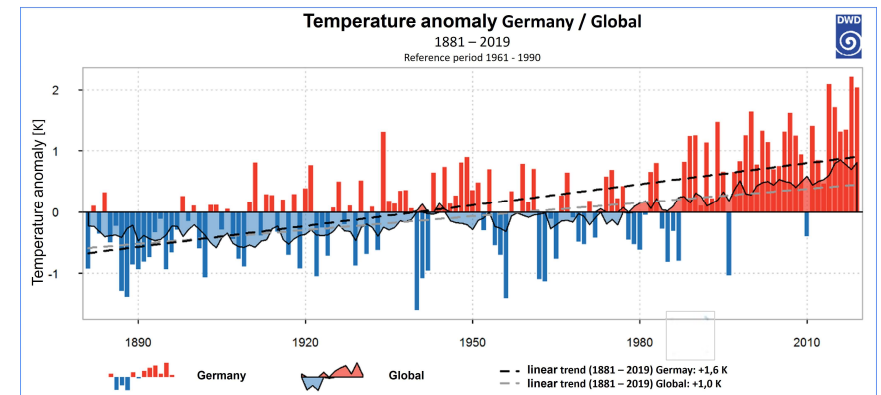
Source: KLIWA Monitor Report 2021



Climate effects

It is also very interesting that the temperature anomalies in Germany in particular have been considerably more pronounced in recent decades than is the case with the global trend. But nobody asks a critical question about this either!

That would be the original task of science!

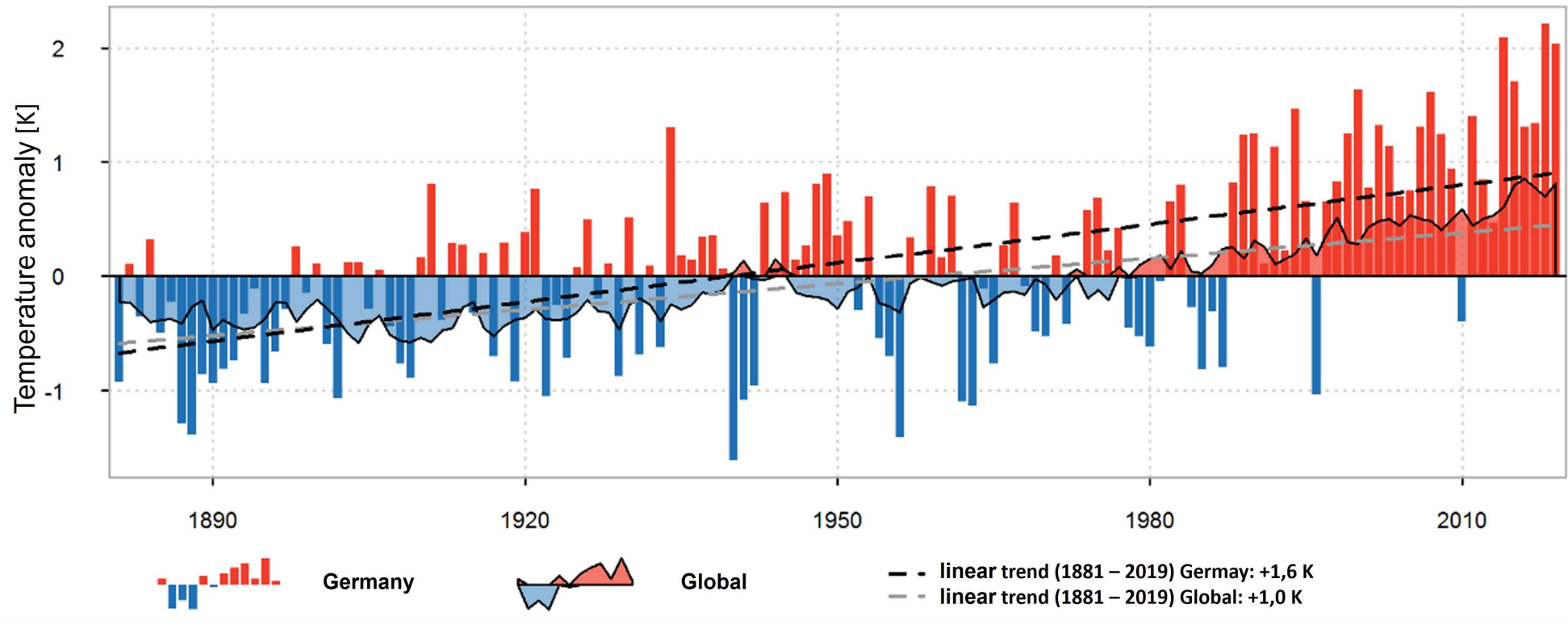


Source: German Weather Service DWD

Temperature anomaly Germany / Global

1881 – 2019

Reference period 1961 - 1990



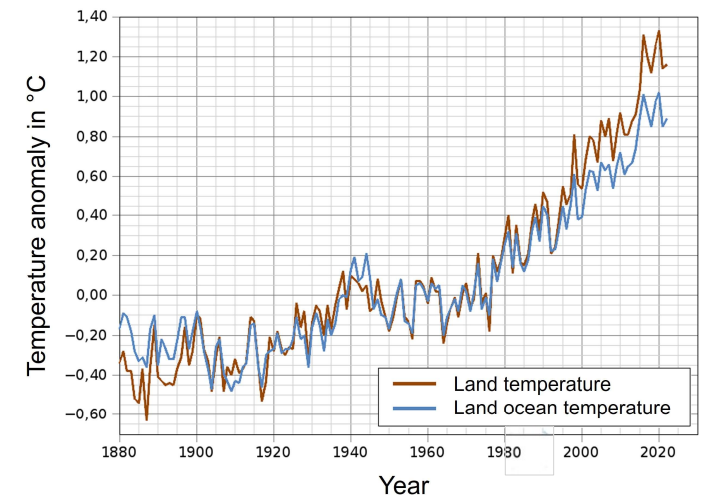
Source: German Weather Service DWD

Climate effects

This graph can be found on the sonnentaler.net website.

It also shows that the land temperature and the land-ocean temperature have been diverging for around 20 years.

It probably can't be global radiation, because this affects the whole earth.



Source: Free University of Berlin

European Environment Agency



Of all the continents in the world, Europe is warming up the fastest!

Why doesn't anyone ask the question?
Why Europe in particular?

It obviously can't be due to the CO₂.
Or is it because it is the smallest continent?

Or is it because we are tapping too much energy from the climate system?

Weather cells

Physical Map of the World, April 2001

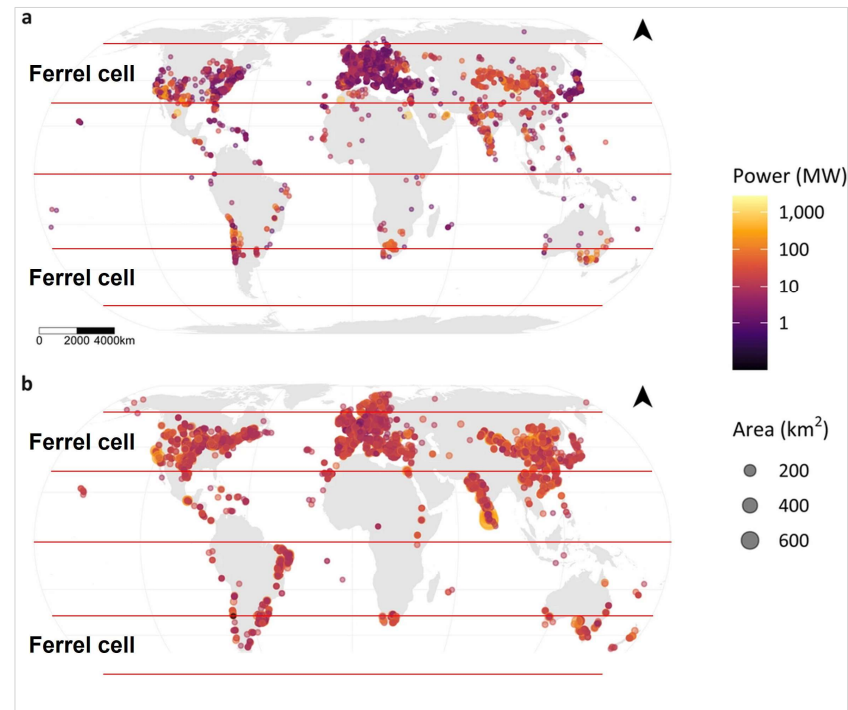
AUSTRALIA Independent state
Bermuda Dependency or area of special sovereignty
SOLY / AZORES Island / island group
★ Capital
Scale: 1:25,000,000
Billionth of a degree
Standard meridian: 30° W and 30° E



April 2001

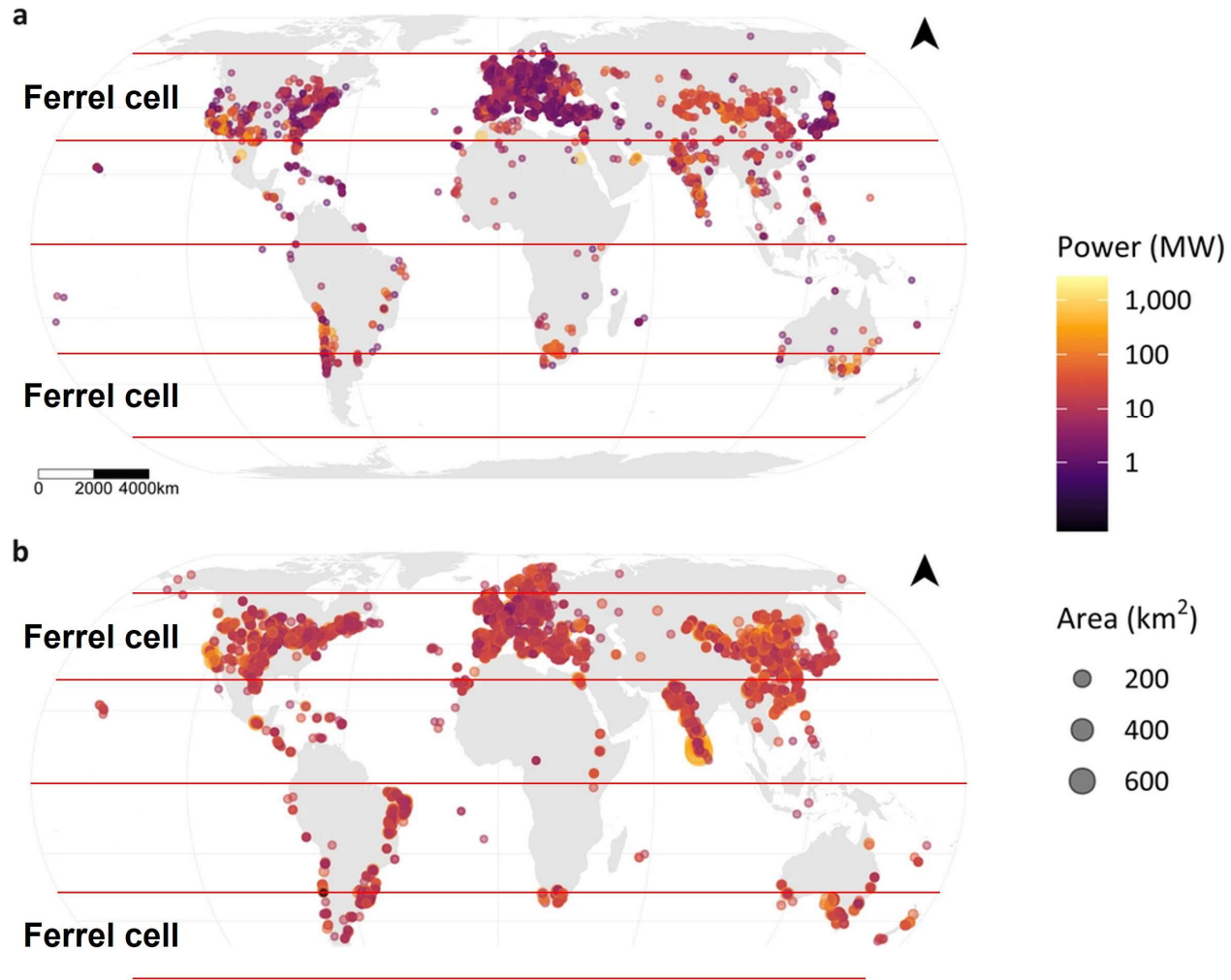
Photovoltaics and wind energy

Photovoltaic farms



Wind farms

Source: [nature.com/scientificdata](https://www.nature.com/scientificdata)



Source: nature.com/scientificdata

Shift of the 40°C mark
to the north

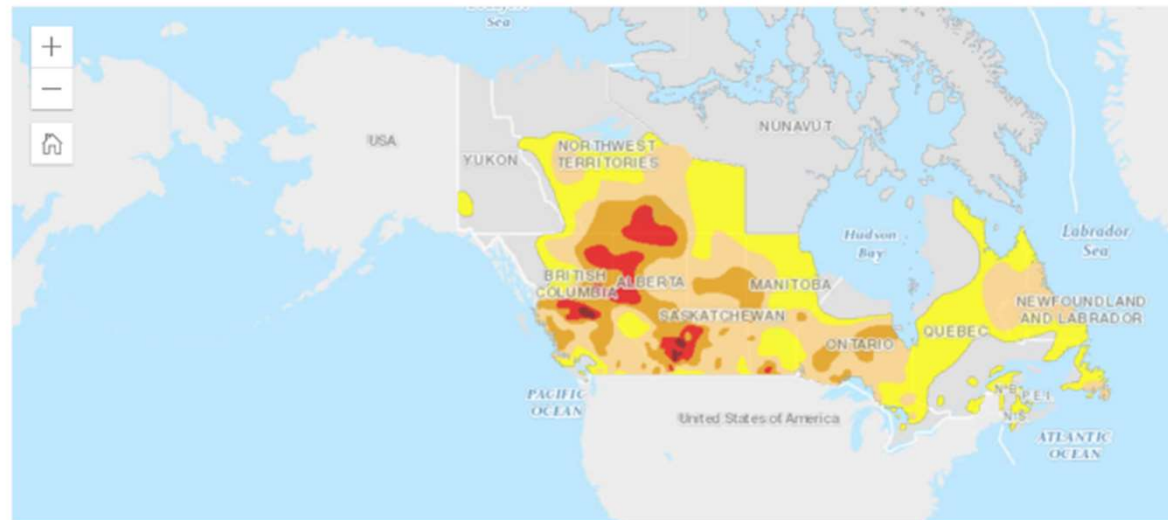


SUMMARY



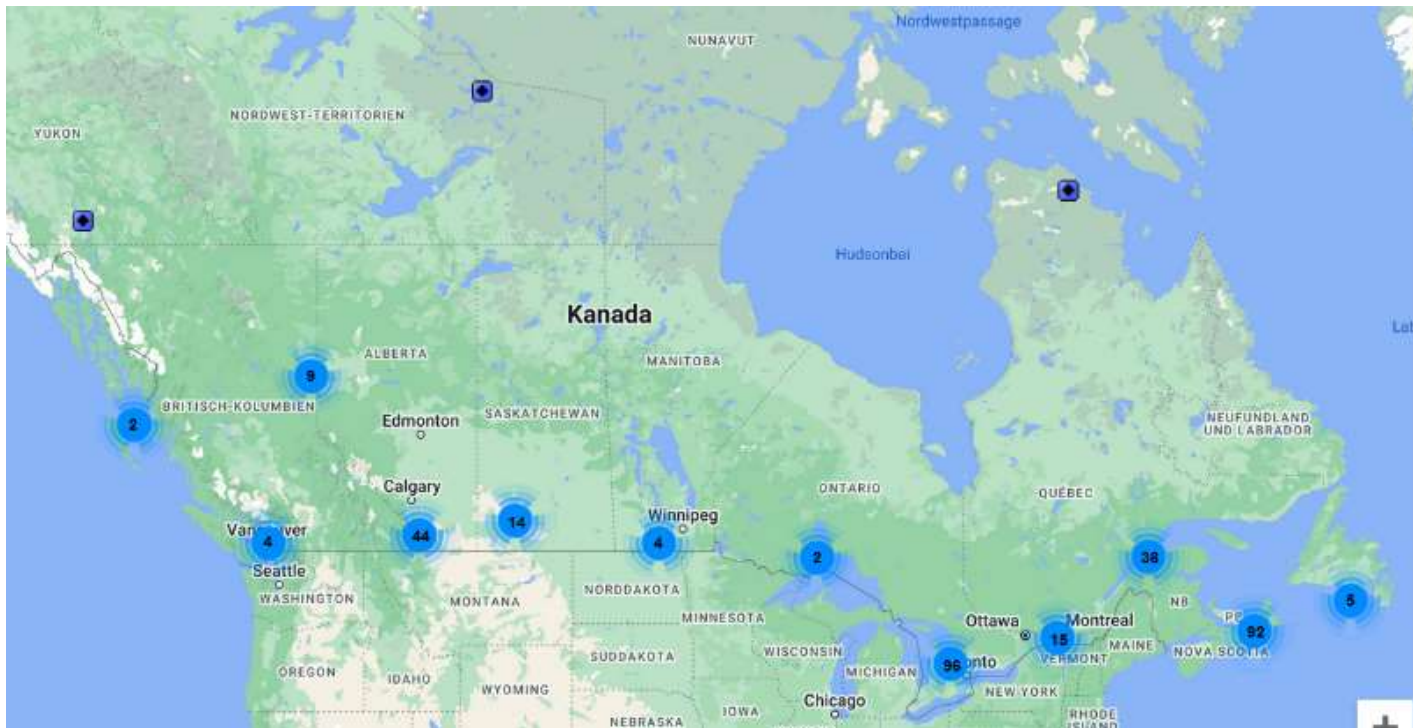
Extreme weather Canada

Drought conditions as of February 29, 2024



<https://agriculture.canada.ca>

Windpower Canada



https://www.thewindpower.net/country_maps_en_14_canada.php

Extreme weather Australia



<https://climateextremes.org.au/stateof2022/>

Windpower Australia



<https://reneweconomy.com.au/large-scale-wind-farm-map-of-australia/>

Extreme weather Texas

Expert says Texas' recent cold isn't climate change-linked, but 2023's heatwave was

By Adela Uchida | Thu, January 18th 2024 at 5:53 PM

Updated Thu, January 18th 2024 at 10:03 PM



While this week's extreme cold temperatures in Texas were likely not caused by climate change according to one expert, the record-breaking summer heat in 2023 that strained the power grid was attributable to climate change, which is expected to make such extreme heat more common. (CBS Austin)

<https://cbsaustin.com/news/local/expert-says-texas-recent-cold-isnt-climate-change-linked-but-2023s-heatwave-was>

Wind and PV in Texas

Mit Wind und Solar an die Spitze

Der Ölstaat Texas zeigt dem Rest der USA, wie Energiewende geht

Dienstag, 27.07.2024, 13:49 | von FOCUS-online-Redakteur Florian Reiter



Eine Windfarm nahe des Ortes Vega in Texas

Paul Souclers/Getty Images



FOCUS online Redakteur Florian Reiter

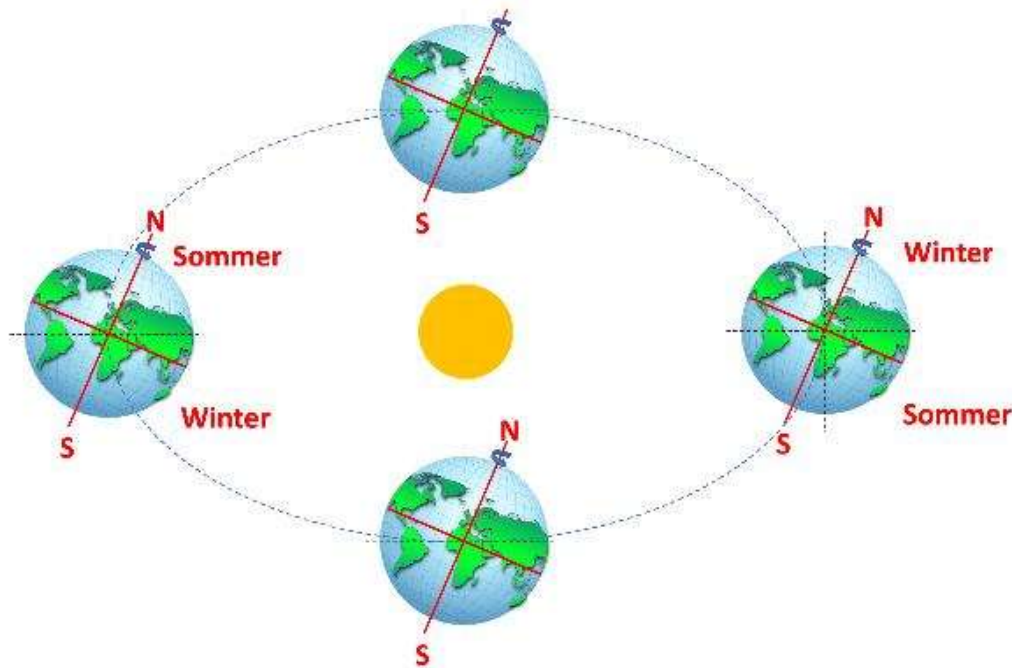


https://www.focus.de/earth/analyse/mit-solar-an-die-spitze-der-oelstaat-texas-zeigt-dem-rest-der-usa-wie-energiewende-geht_id_259708882.html

SUMMARY



Spaceship Earth



Earth's rotation:

1x per day around the axis results in a Rotational speed at the equator of **1,662 km/h**

Earth around the sun:

1x per year results in a Speed of **107,600 km/h**

Our **solar system** rotates around the center of the Milky Way galaxy at a speed of **960,000 km/h**

WIND MANIA

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THANK YOU VERY MUCH

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