

# WIND MANIA



The wind mania and its climatic consequences

Manfred Brugger

WIND  
MANIA



# AGENDA

About me and the book

Introduction

Climate

Water vapor and the water cycle

Wind energy

Wind energy and climate

Summary

# Growian

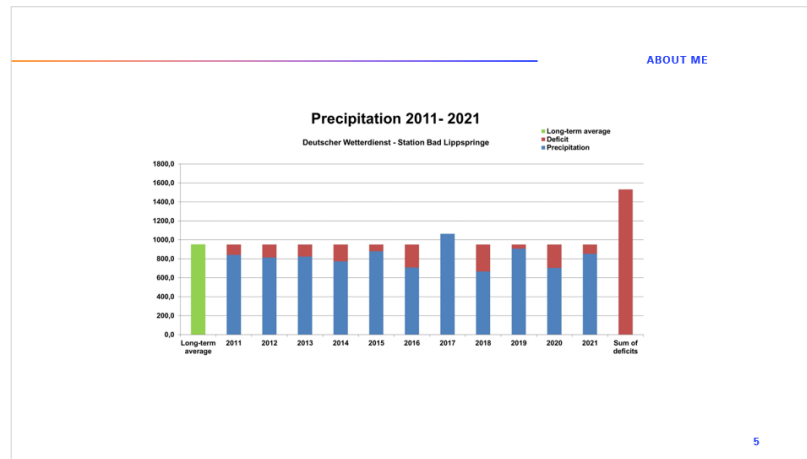
Location:	Kaiser-Wilhelm-Koog
Hub height:	100 m
Rotor diameter:	100 m
El. Rated power:	approx. 3 MW
Commissioning:	1983
Shutdown:	1987
Dismantling:	1988

**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

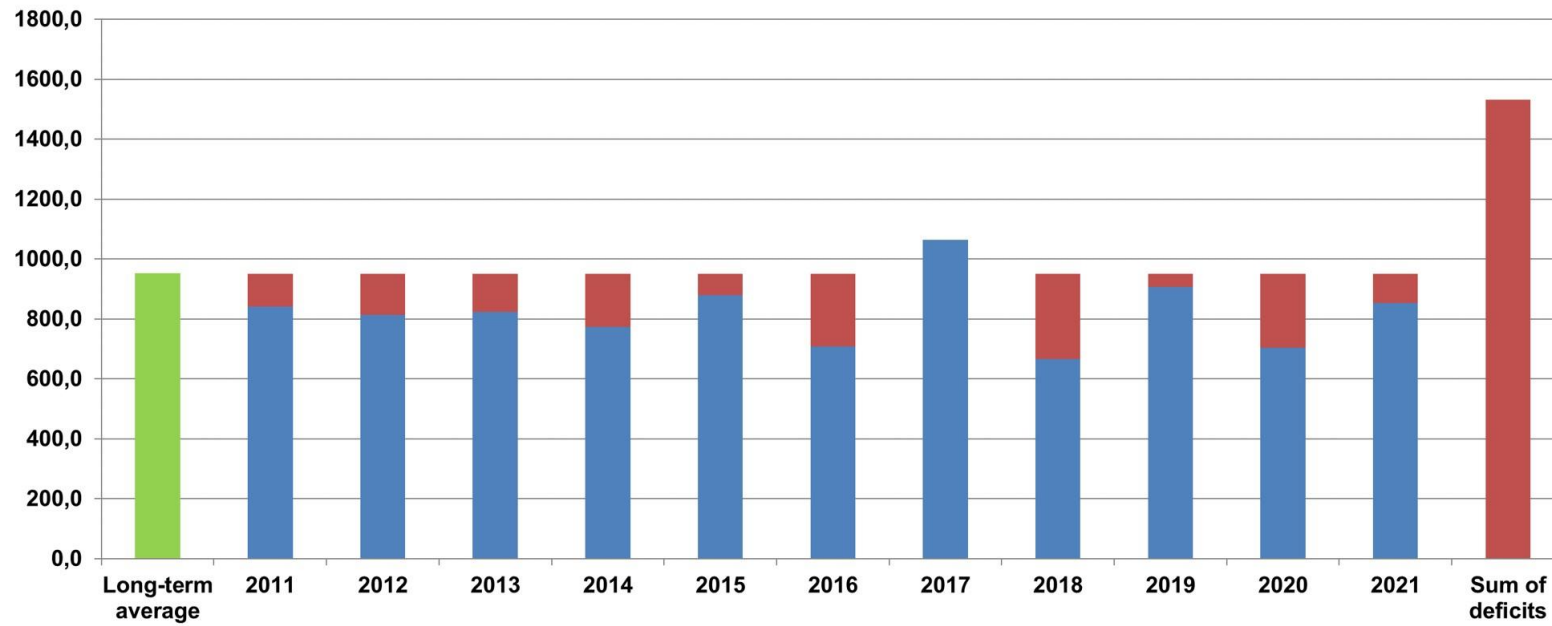


At approx. 825 kW/km<sup>2</sup>, the Paderborn district has the **third highest** density of wind turbines in Germany...

# 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

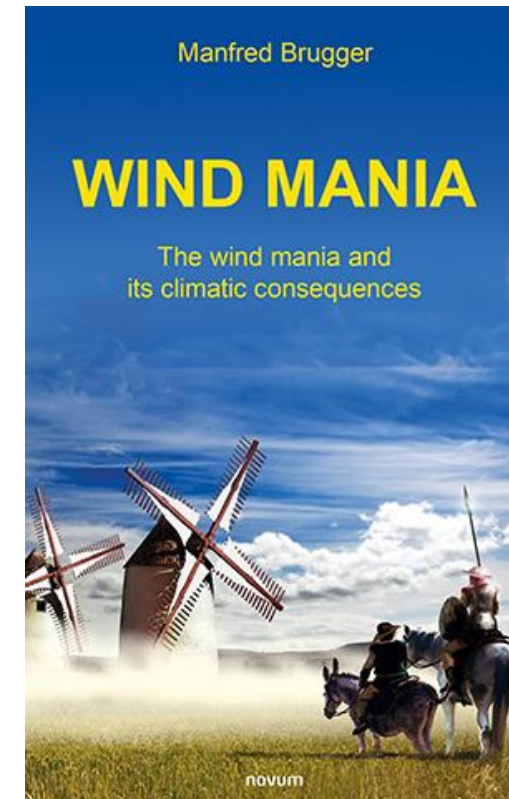
Chapter 3: Humanity and energy

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“



## 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 Kalko (FA Wind)

Herausgegeben von der Fachagentur Windenergie an Land e.V.

Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages

Gefördert durch:



aufgrund eines Beschlusses des Deutschen Bundestages

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

# Funding projects

„erausgegeben von der Fachagentur Windenergie „

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 Originalzitaten basierenden Beispiele stammen aus dem Forschungsbericht „Der Kampf gegen Windmühlen“.

Gefördert durch:



Bundesministerium  
für Umwelt, Naturschutz, nukleare Sicherheit  
und Verbraucherschutz

aufgrund eines Beschlusses  
des Deutschen Bundestages

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

# 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<sub>2</sub>** 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 %.**



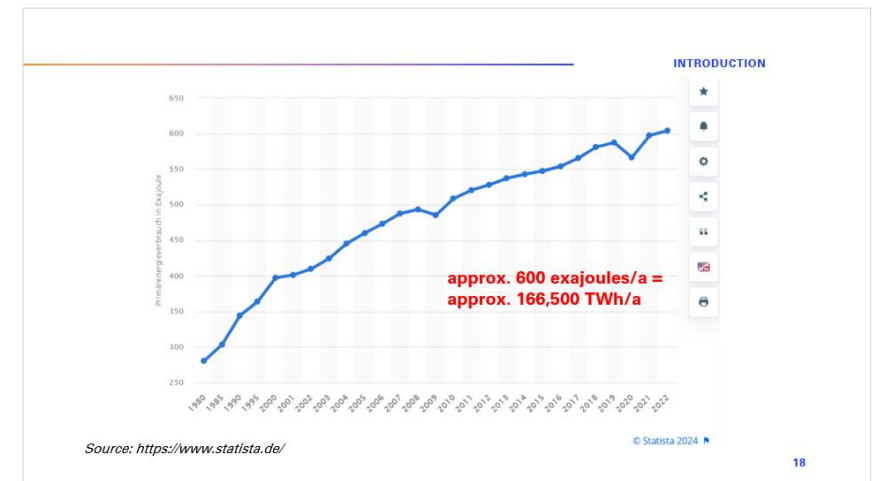
*Image source: Tagesschau*



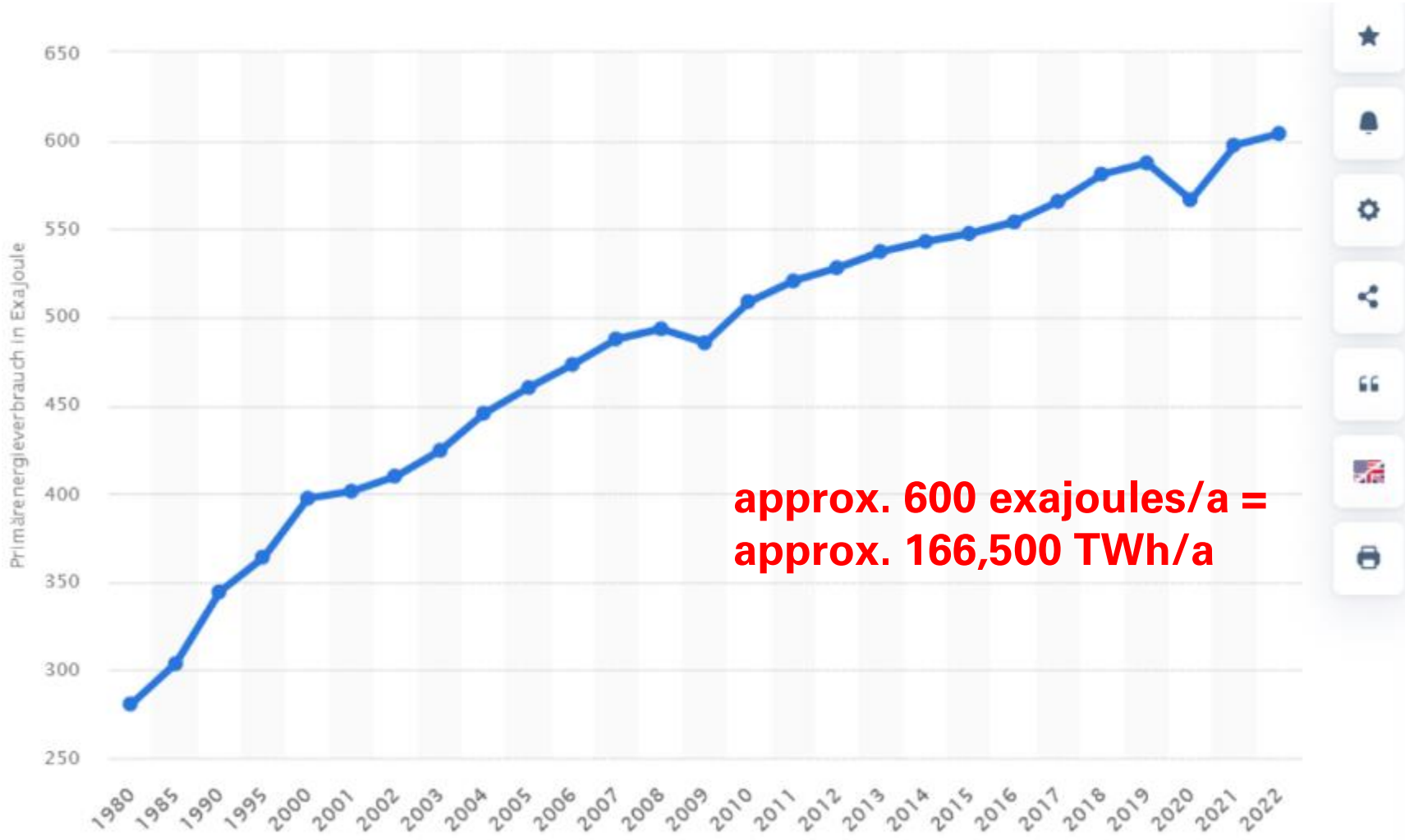
# The last 20 years

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*

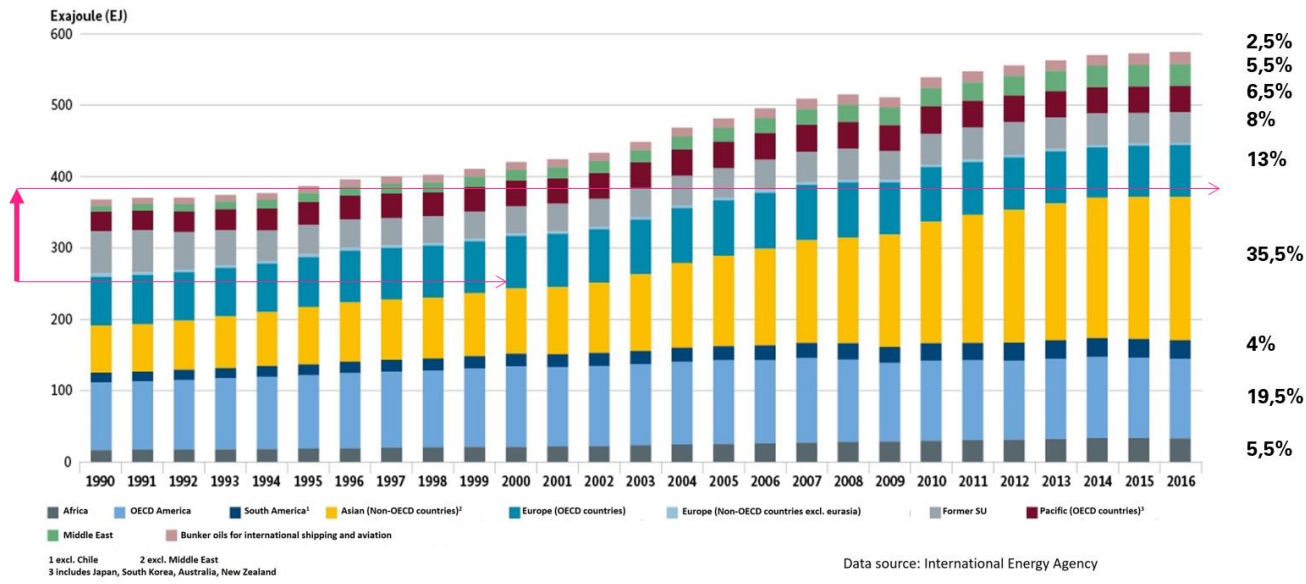


Source: <https://www.statista.de/>

# Primary energy consumption

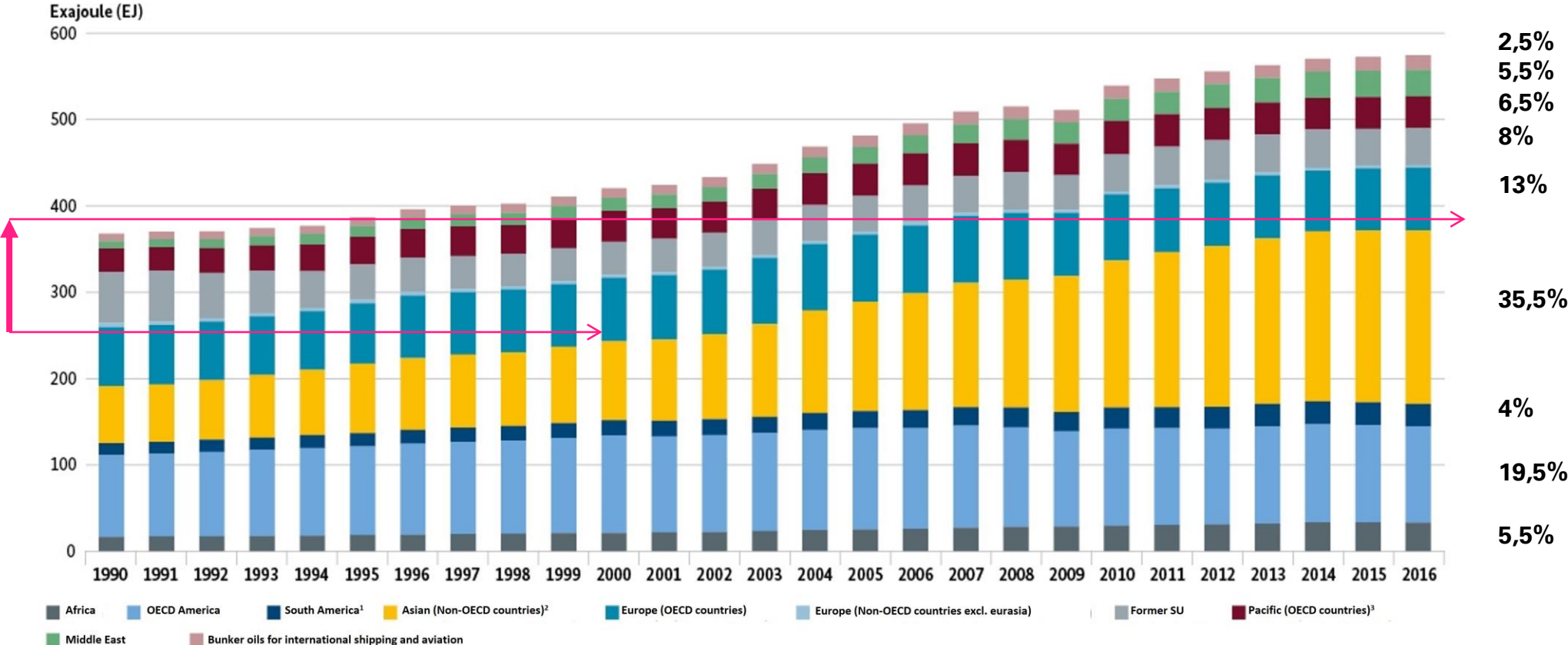
INTRODUCTION

### Global primary energy consumption



Source: International Energy Agency

# Global primary energy consumption



1 excl. Chile 2 excl. Middle East  
3 includes Japan, South Korea, Australia, New Zealand

Data source: International Energy Agency

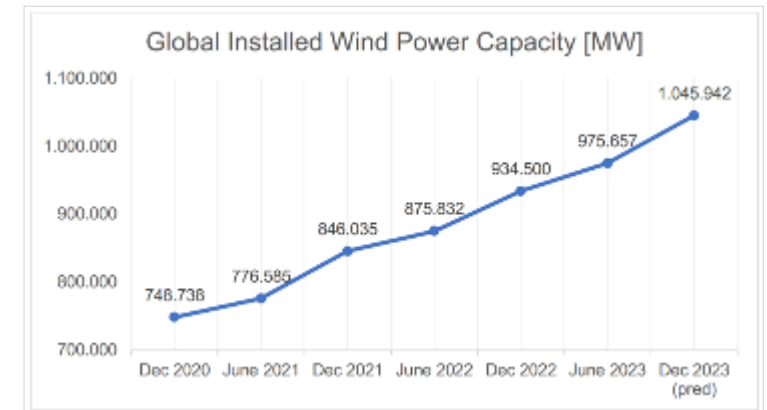
# The last 20 years

**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:

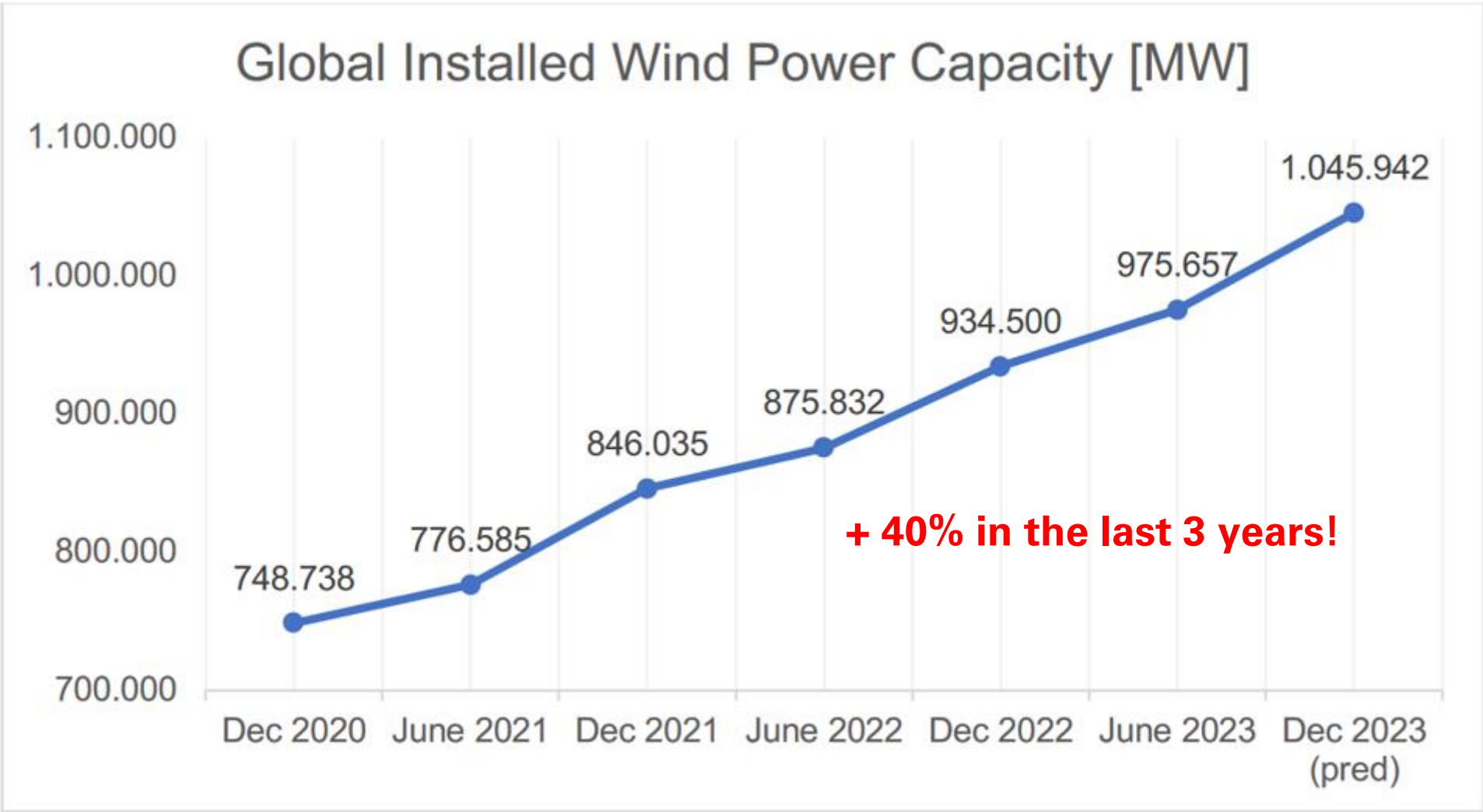
**Increase of around 6,000 %.**

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**



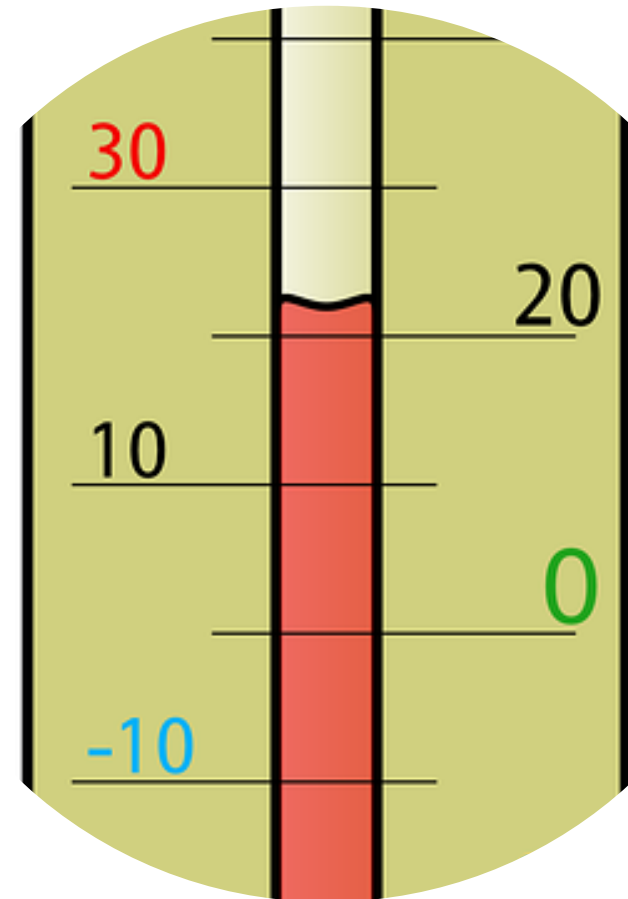
# Temperature

**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

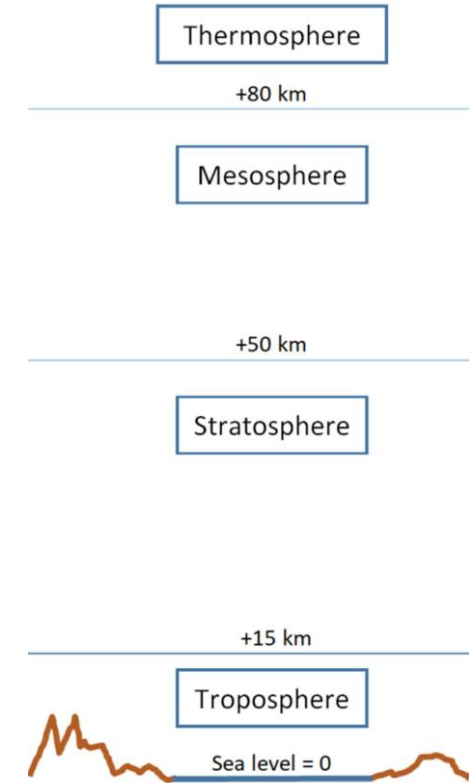
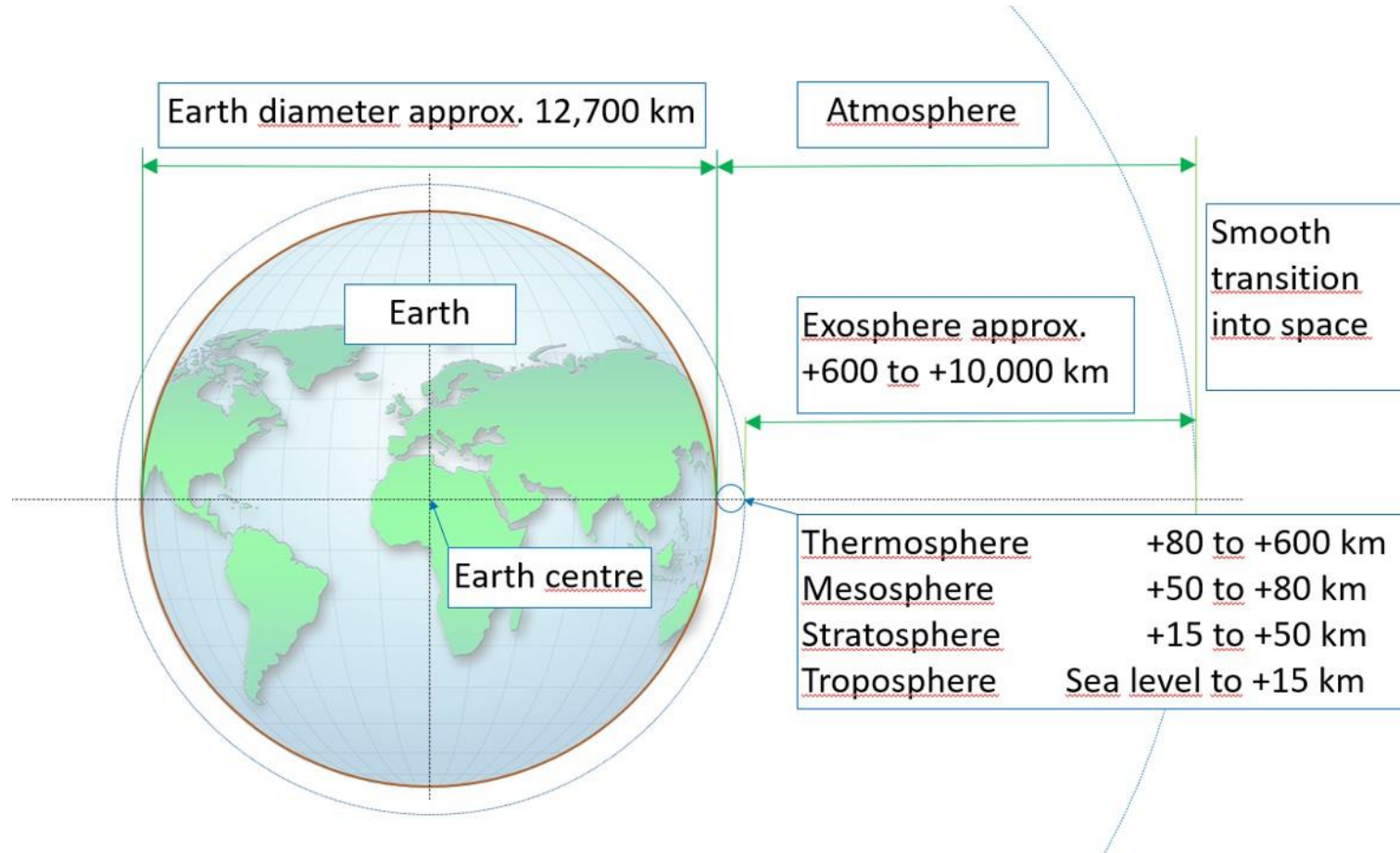
A distinction is made between 5 layers:

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



*Image source: Studyflix*

## CLIMATE



# Air pressure

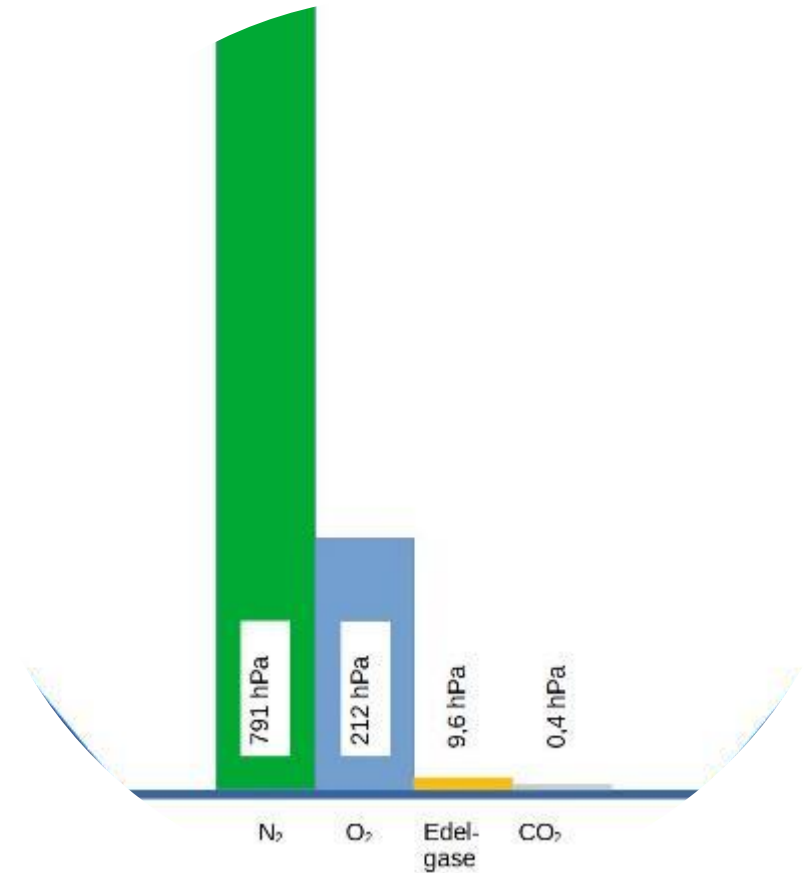
**78 % nitrogen**

**21 % oxygen**

**1 % noble gases (argon)**

and **trace gases**, of which  
**0.04 % CO<sub>2</sub> (400 ppm)**

plus **water vapor, 3 g/m<sup>3</sup> up to 30 g/m<sup>3</sup>**  
**(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.

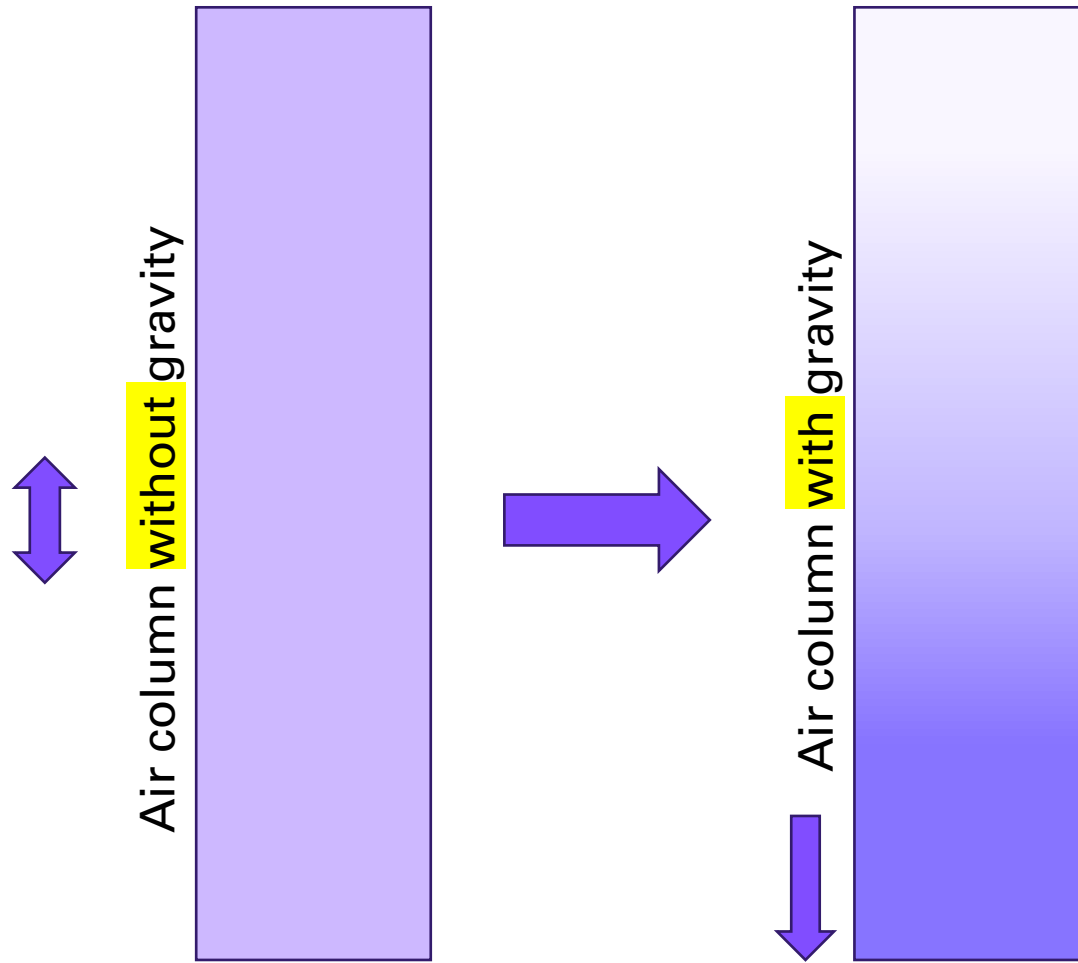
The atmosphere is therefore not a greenhouse either!

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:**

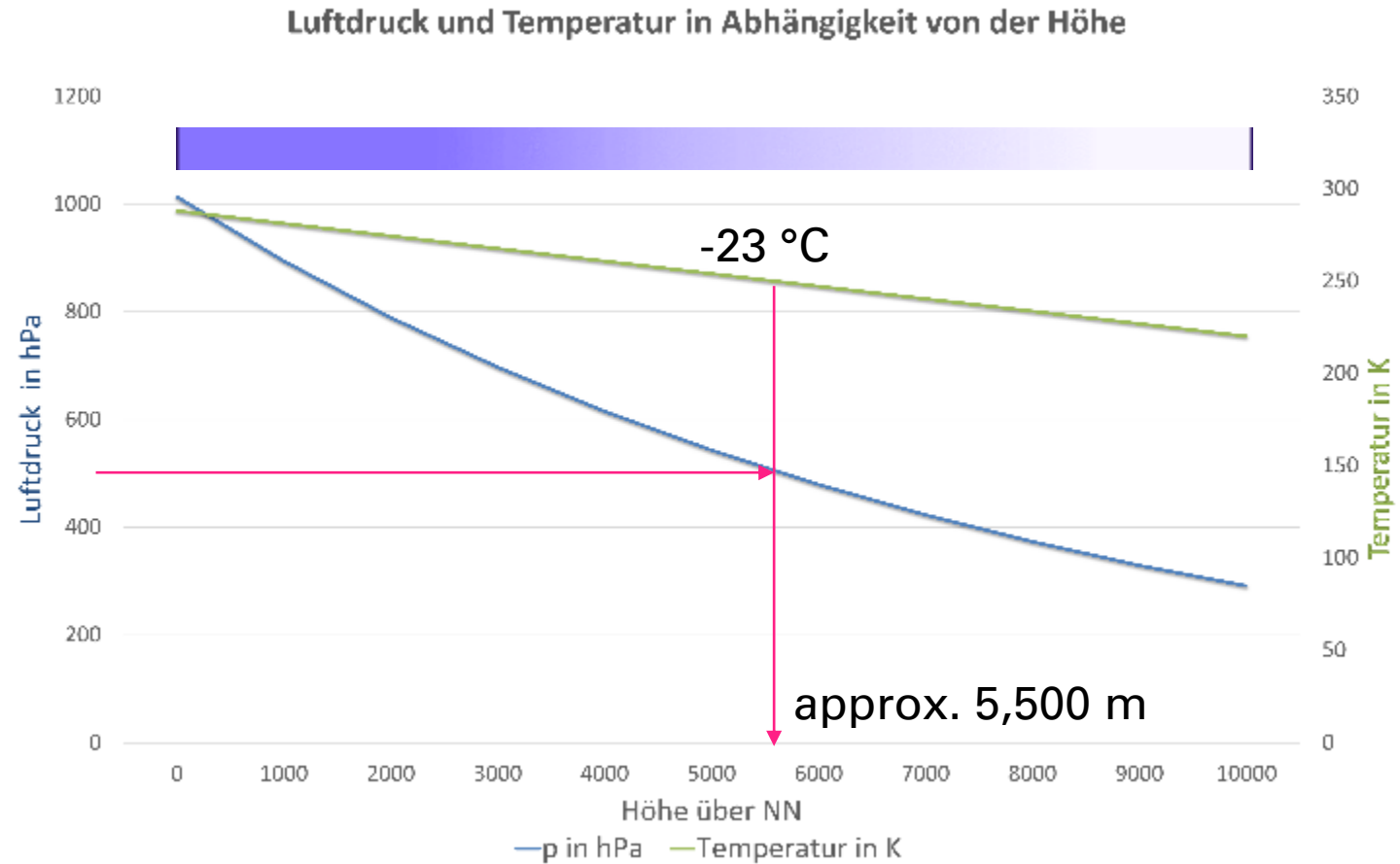
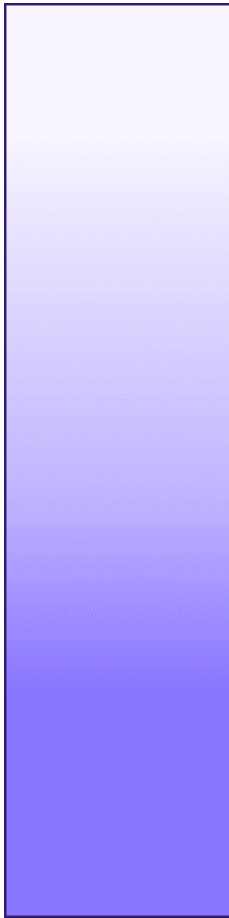
(no energy exchange)

- ⇒ 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

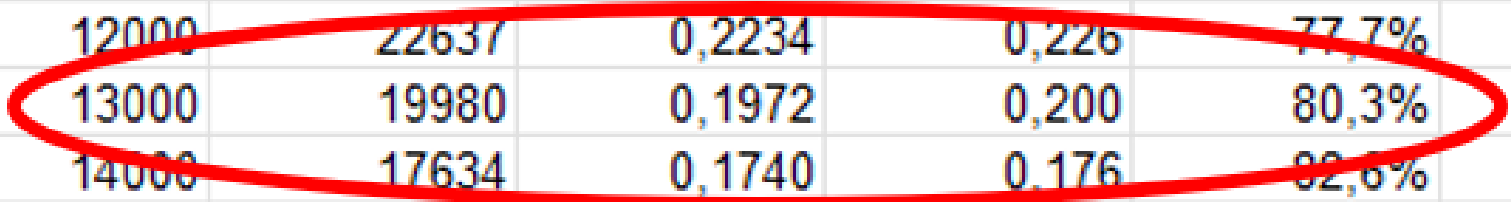
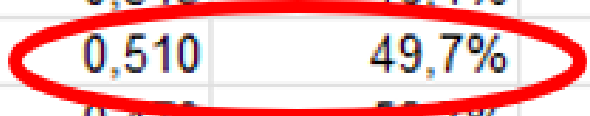


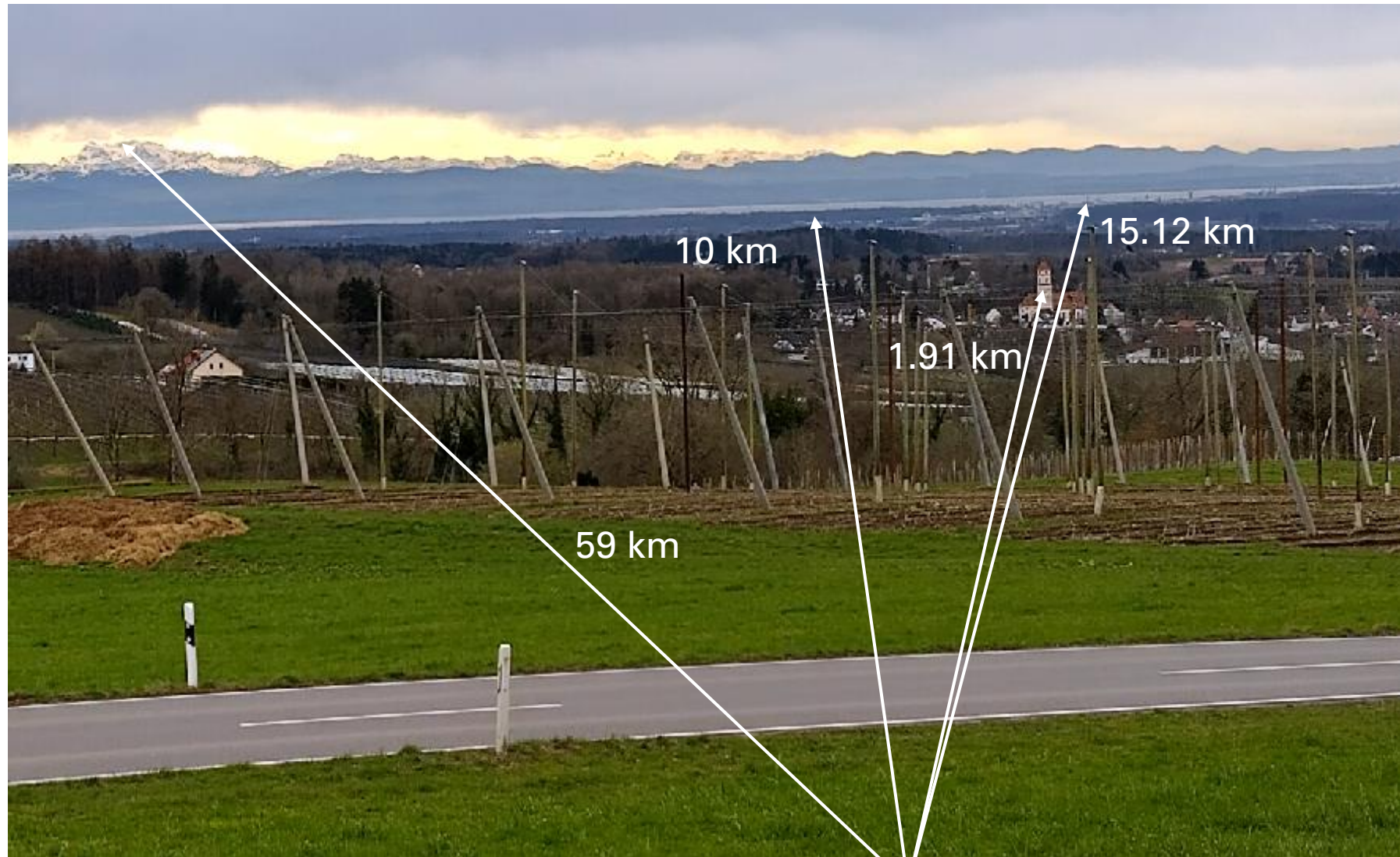


p0	101325 Pa									Temperatur in K
Rho0	1,29 kg/m³				$p(h) = p0 * e^{-(\rho0 * g * h)/p0}$					
g	9,81 m/s²					Stoffmengenanteile in kg/m³				
To	288 K					N2	O2	CO2	Sonstige	
h in m	p(h) in Pa	exp	p(h) in bar	Abnahme Druck		78,00%	20,80%	0,04%	1,16%	
0	101325		1,013			1,006200	0,268320	0,000516	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	65002	0,6675	0,657	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

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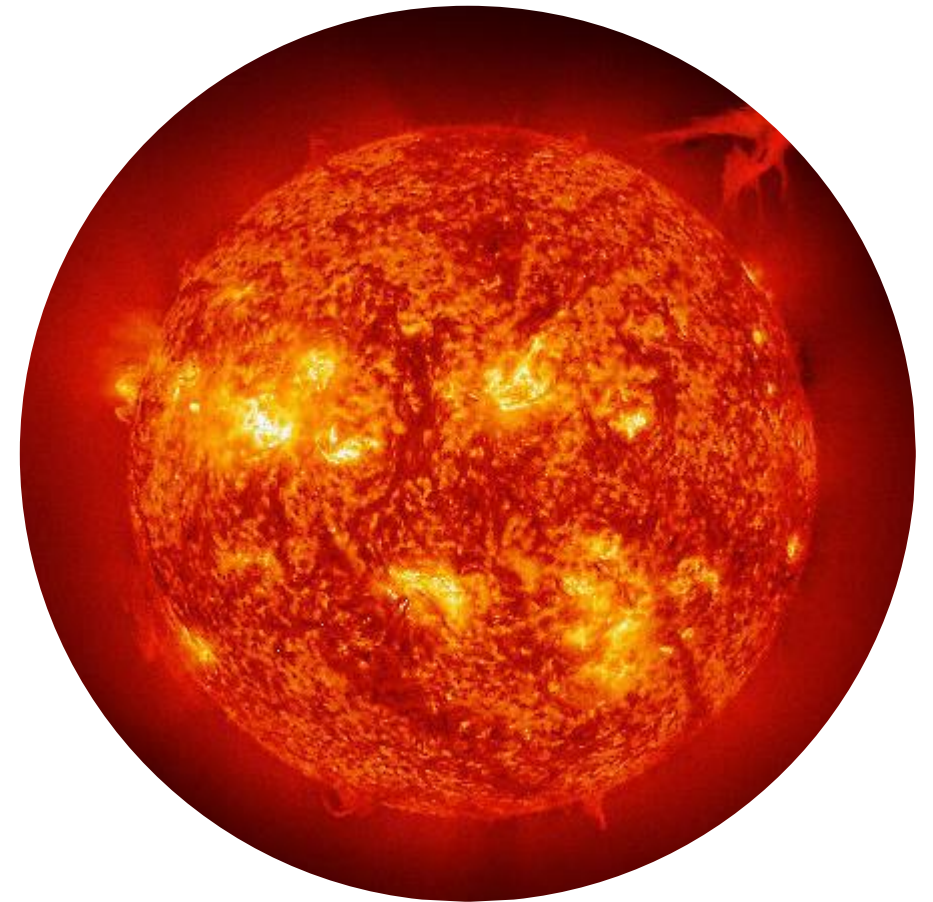
○

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# The sun

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

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



# Heat capacity

**Air:** 1.01 kJ/kg\*K

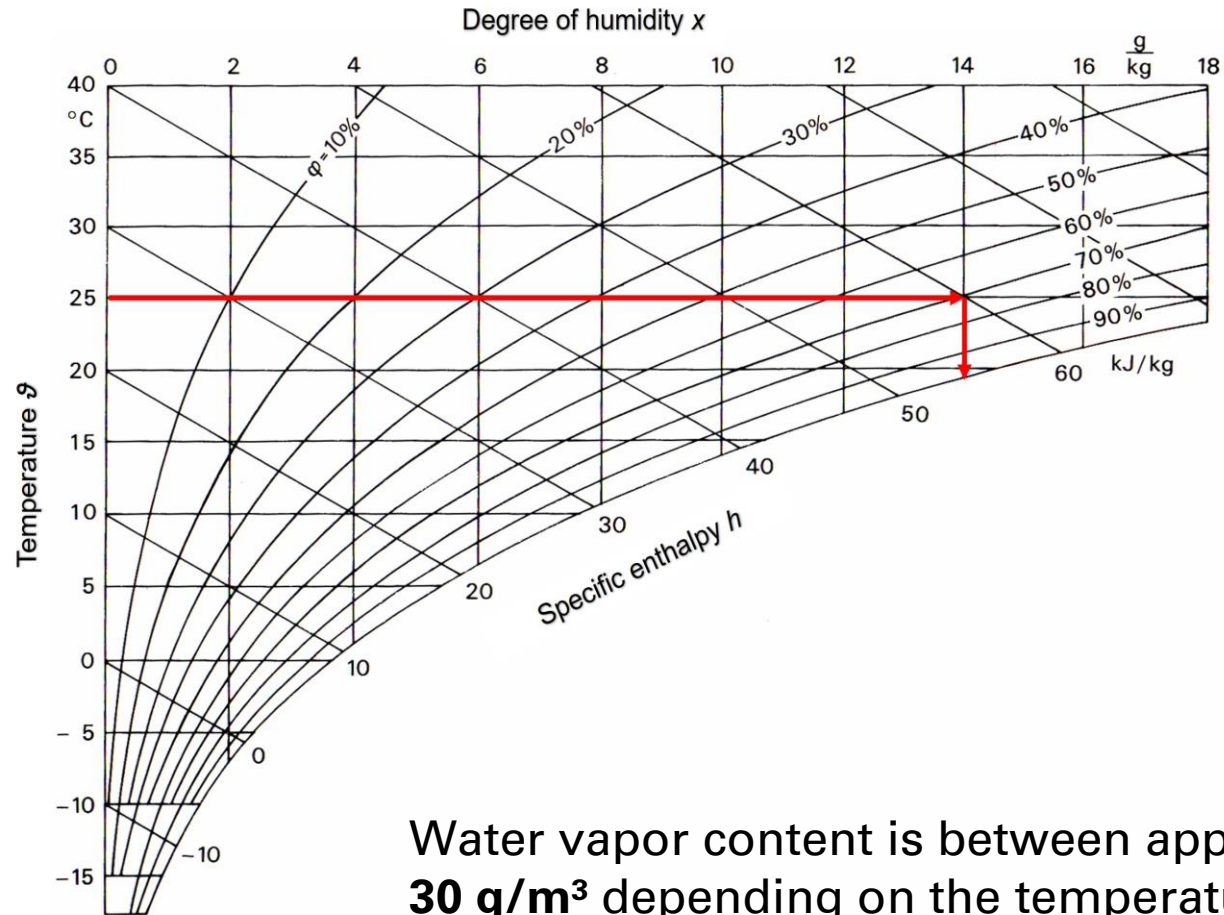
**Water:** 4.20 kJ/kg\*K

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

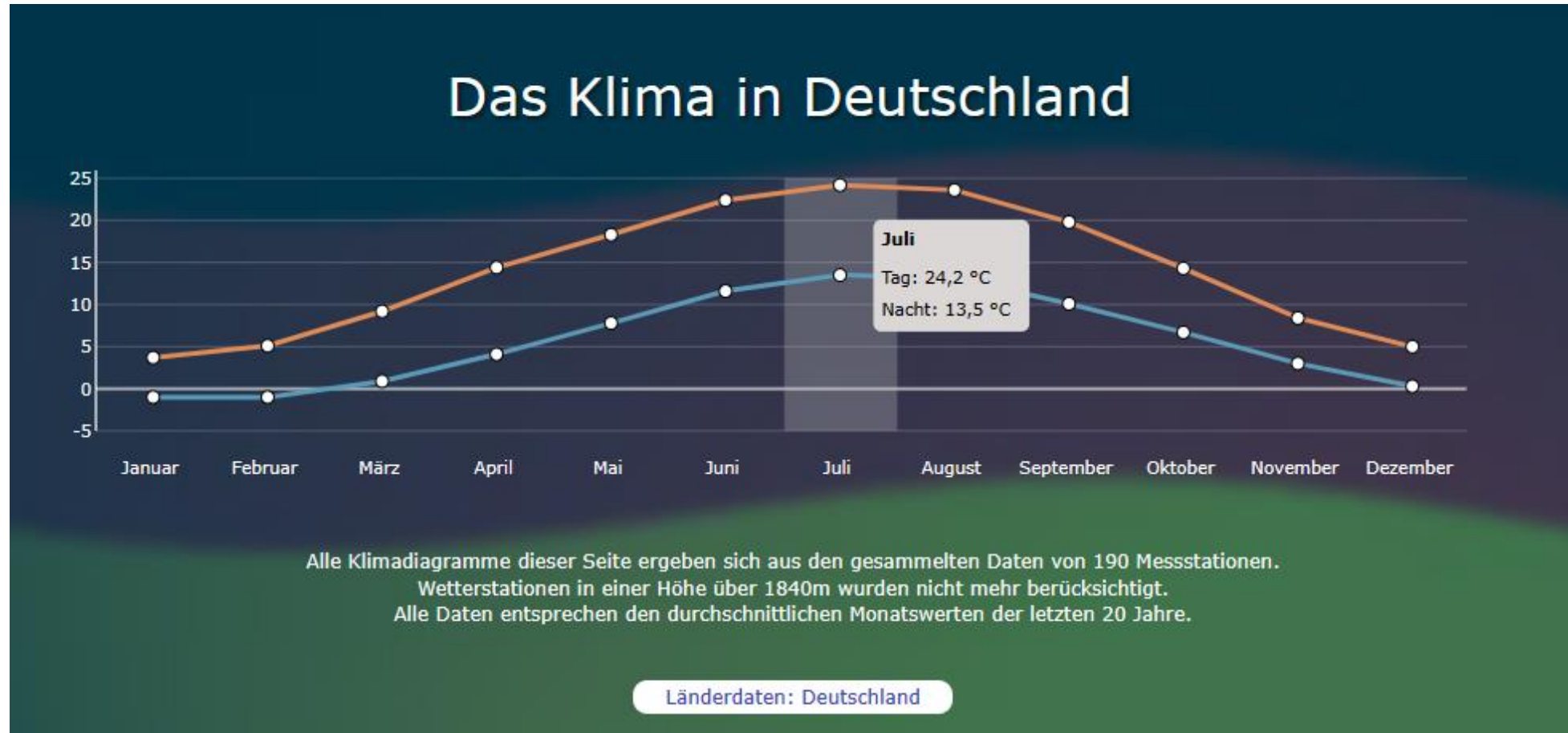
*Image source: By Regionalplaner - Own work, CC BY-SA 3.0,  
<https://commons.wikimedia.org/w/index.php?curid=27966176>*



# Rel. humidity

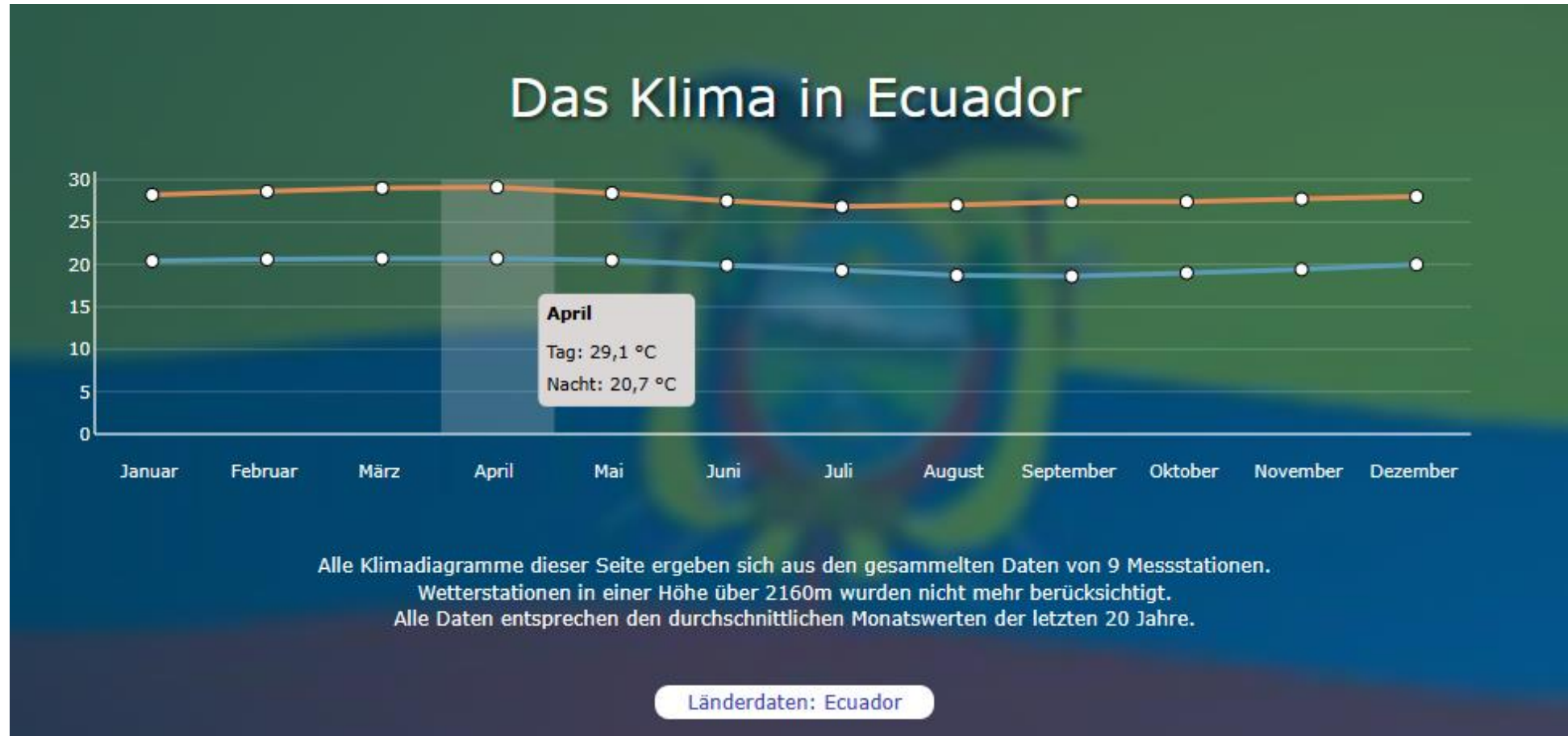


# Germany





# Ecuador



# Latent heat

The amount of water stored in the atmosphere is approx. **13,000 km<sup>3</sup>**!

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

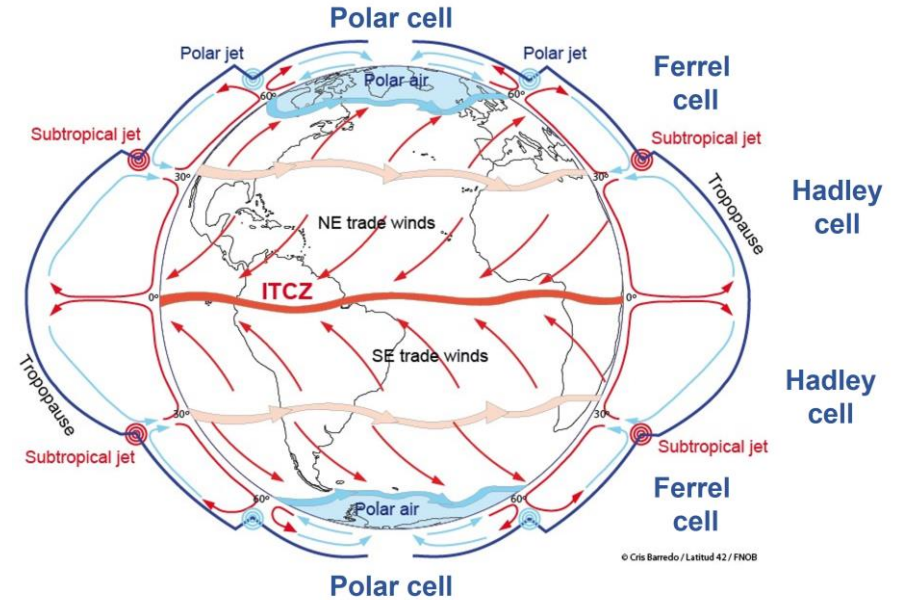
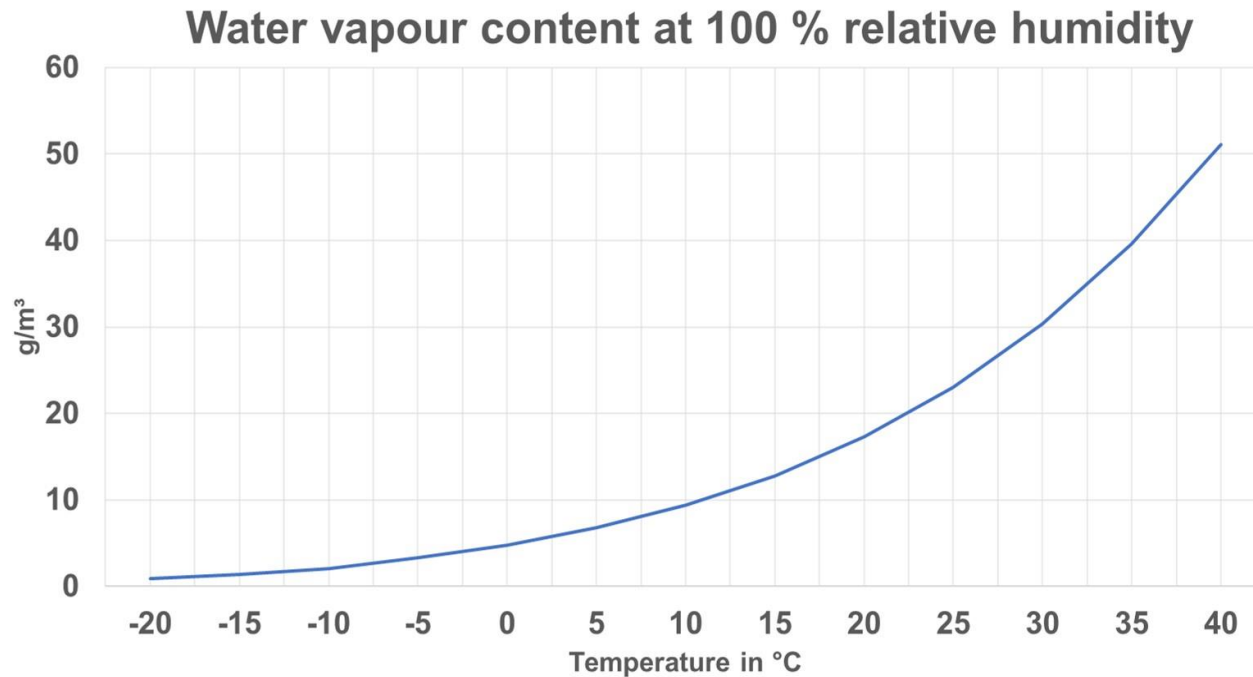
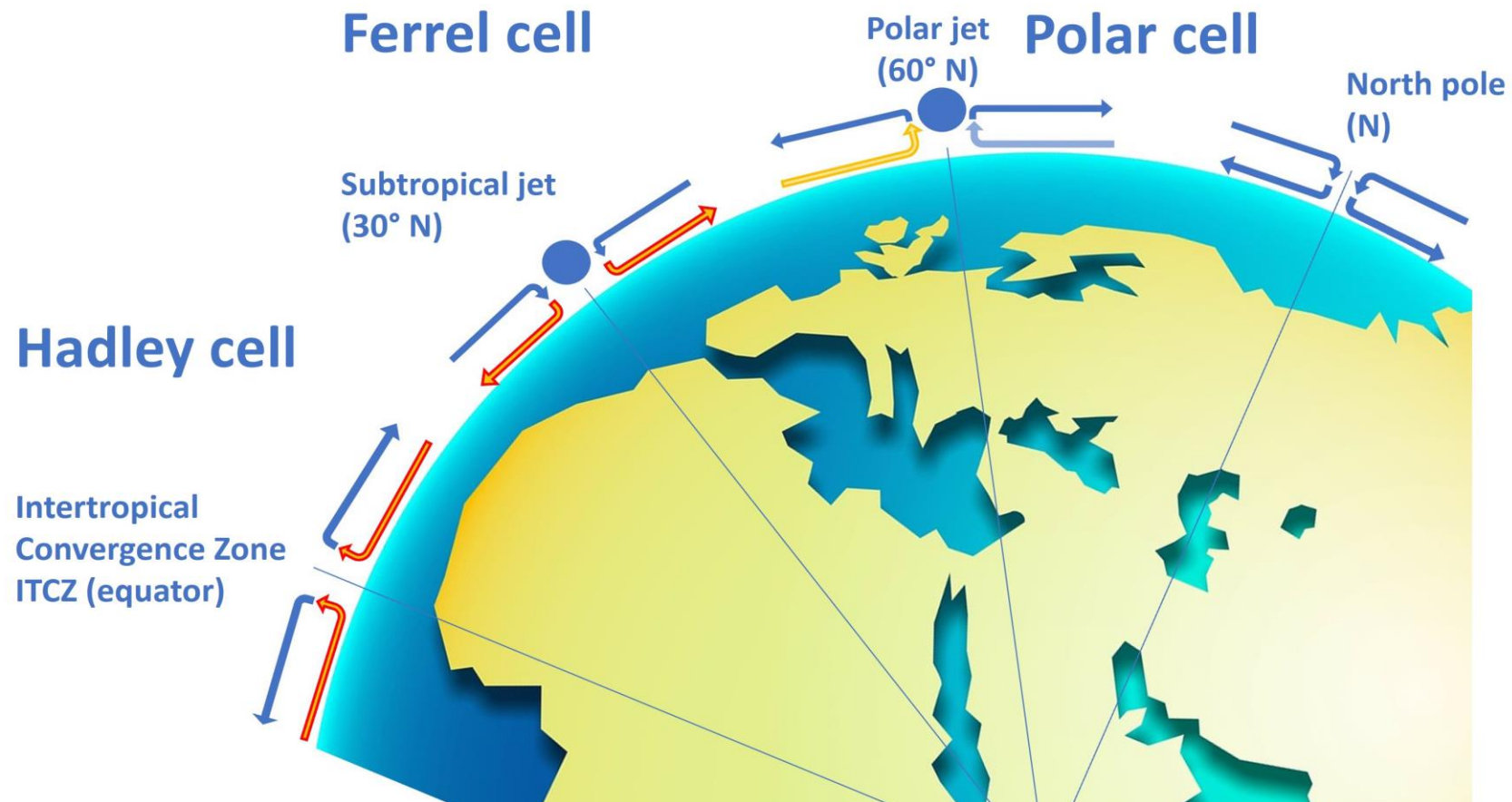
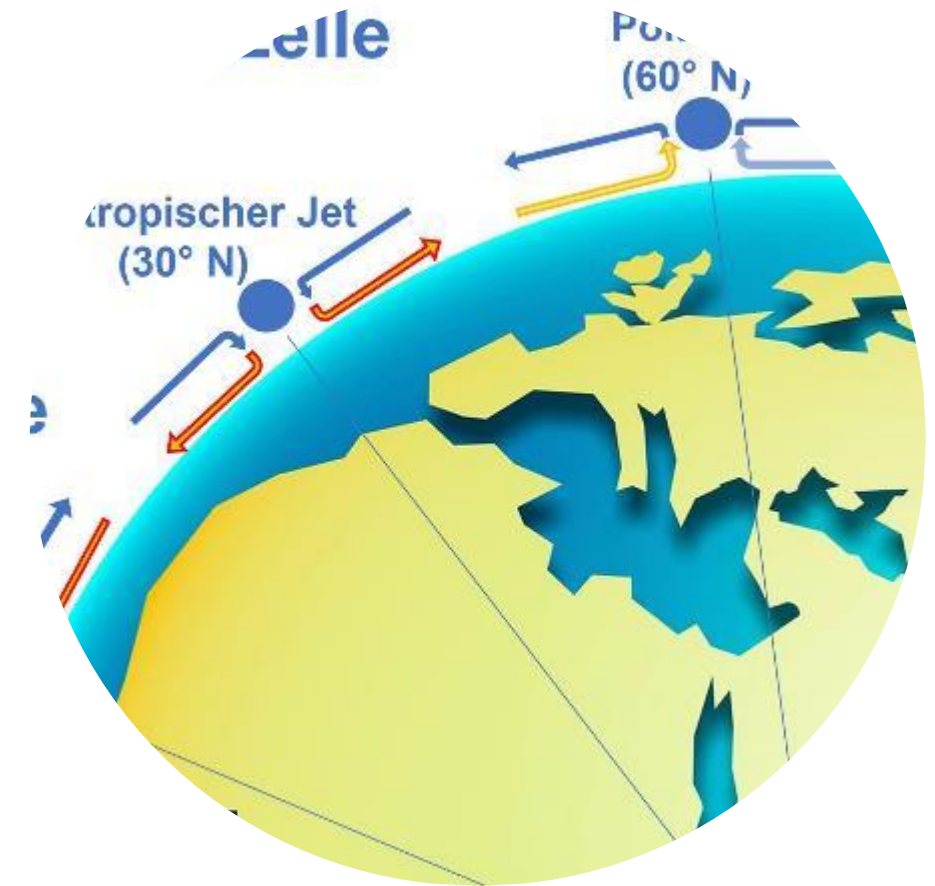
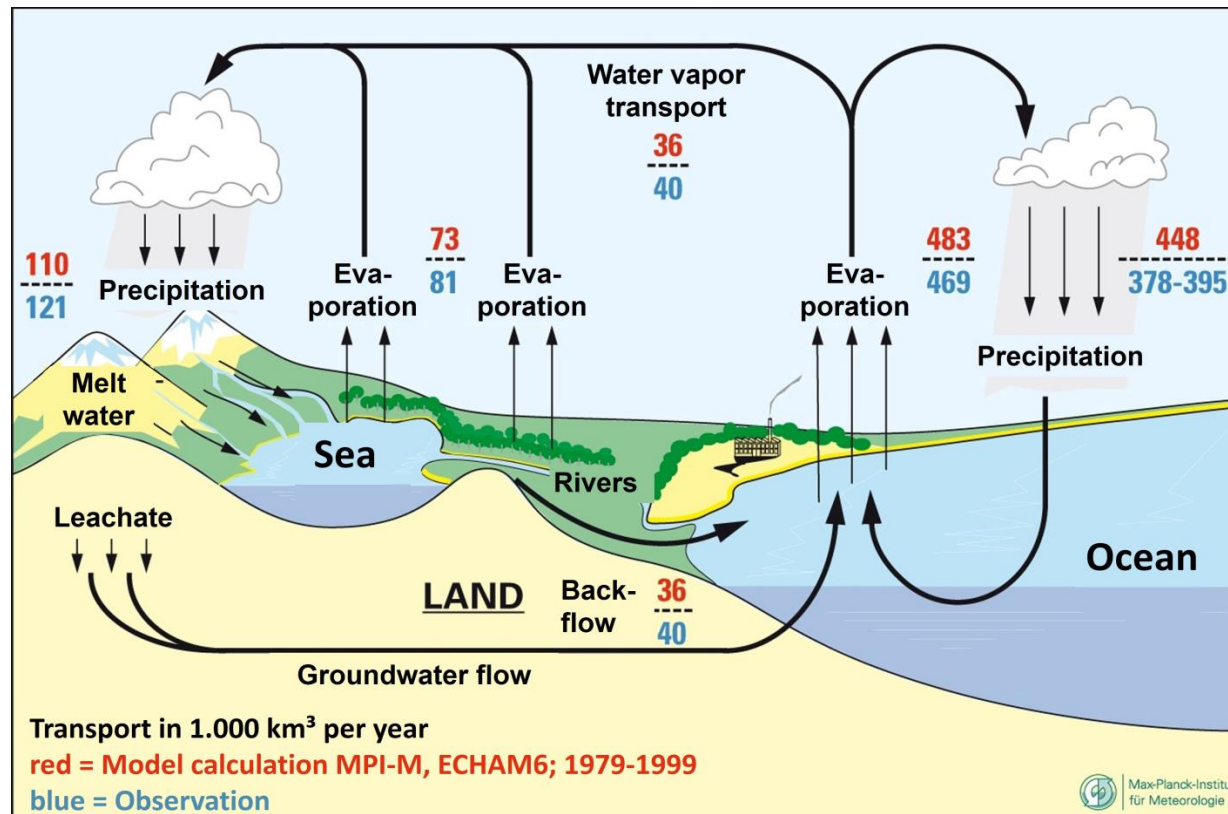


Image source:  
<https://www.insightsonindia.com>

# Weather cells

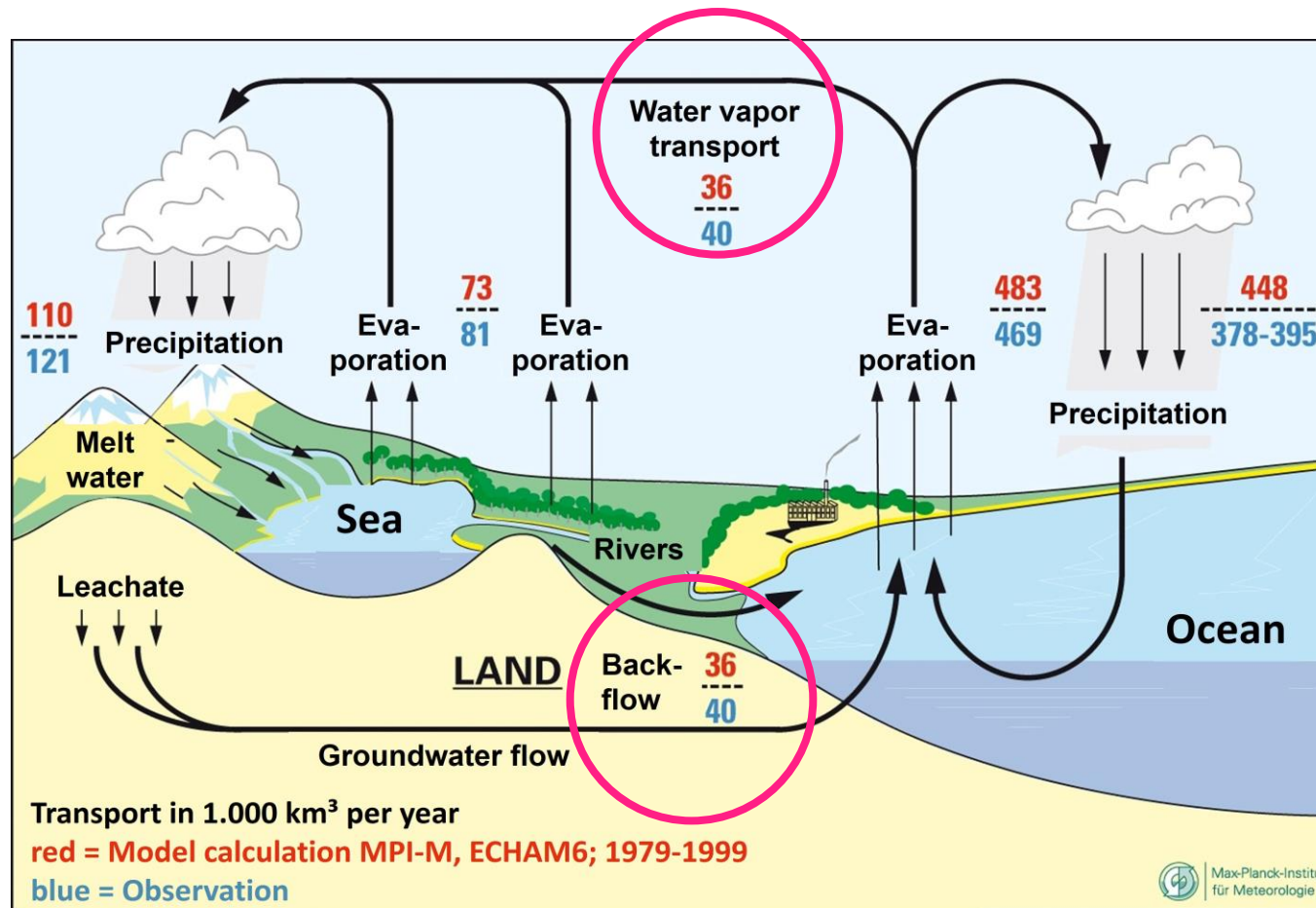


# Water cycle



# Water cycle

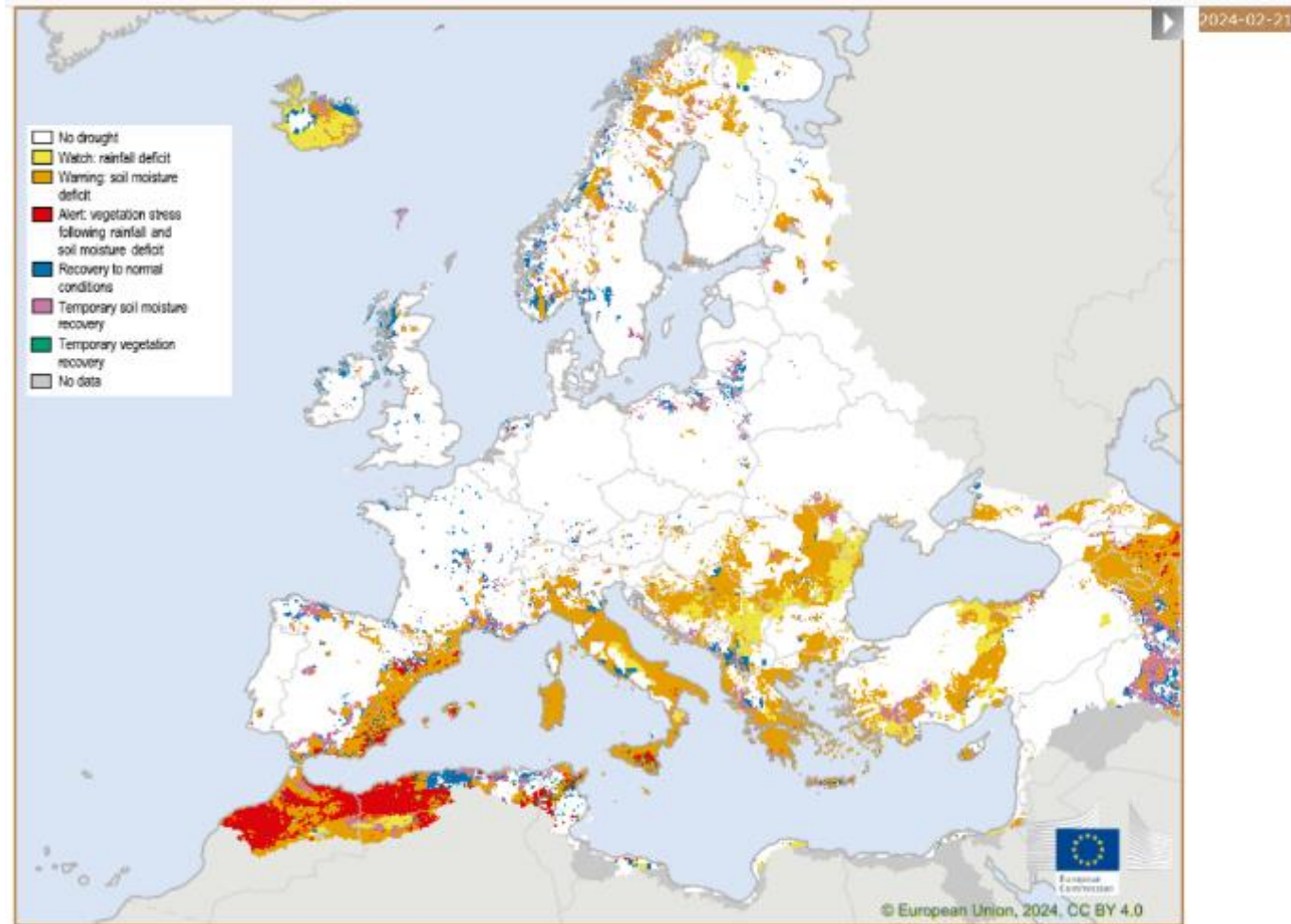
## WATER VAPOR AND THE WATER CYCLE



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



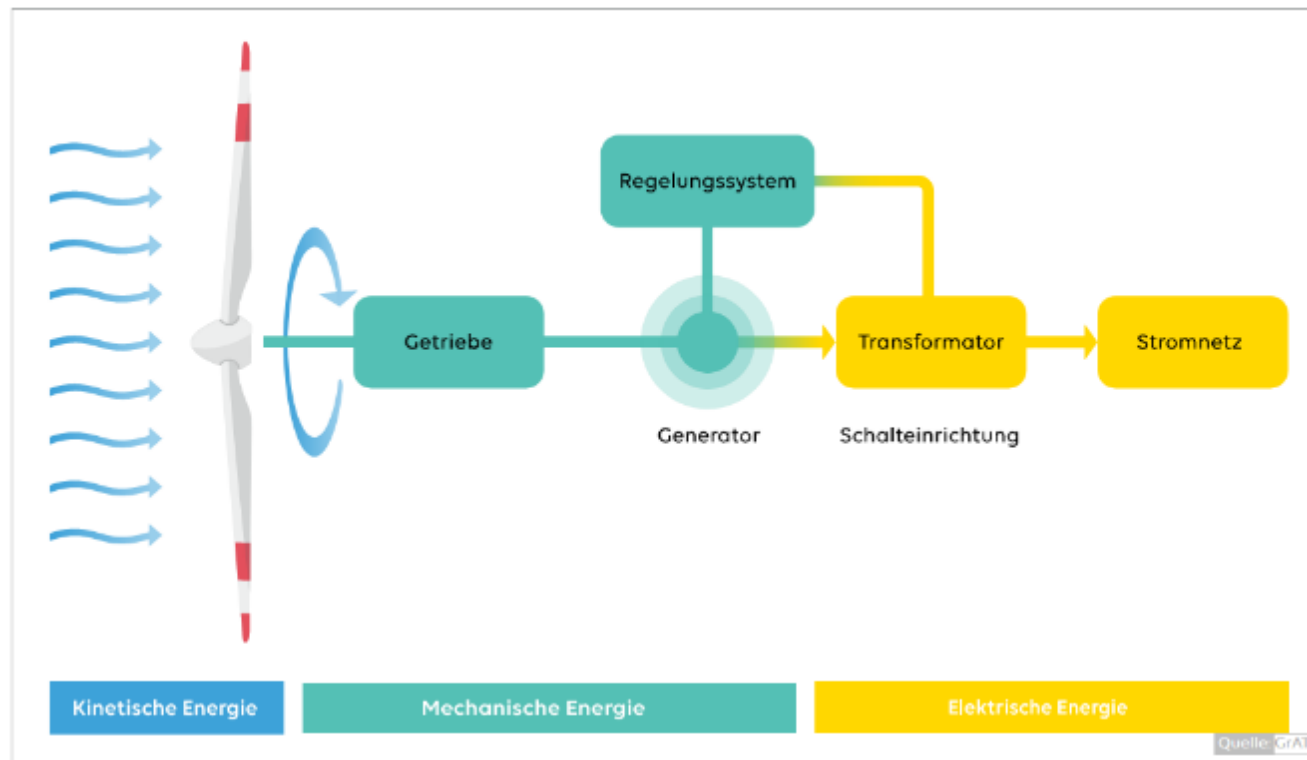
# WIND ENERGY





# 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 m<sup>2</sup>.**

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.  $15 \text{ g/m}^3$  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 m<sup>2</sup>.**

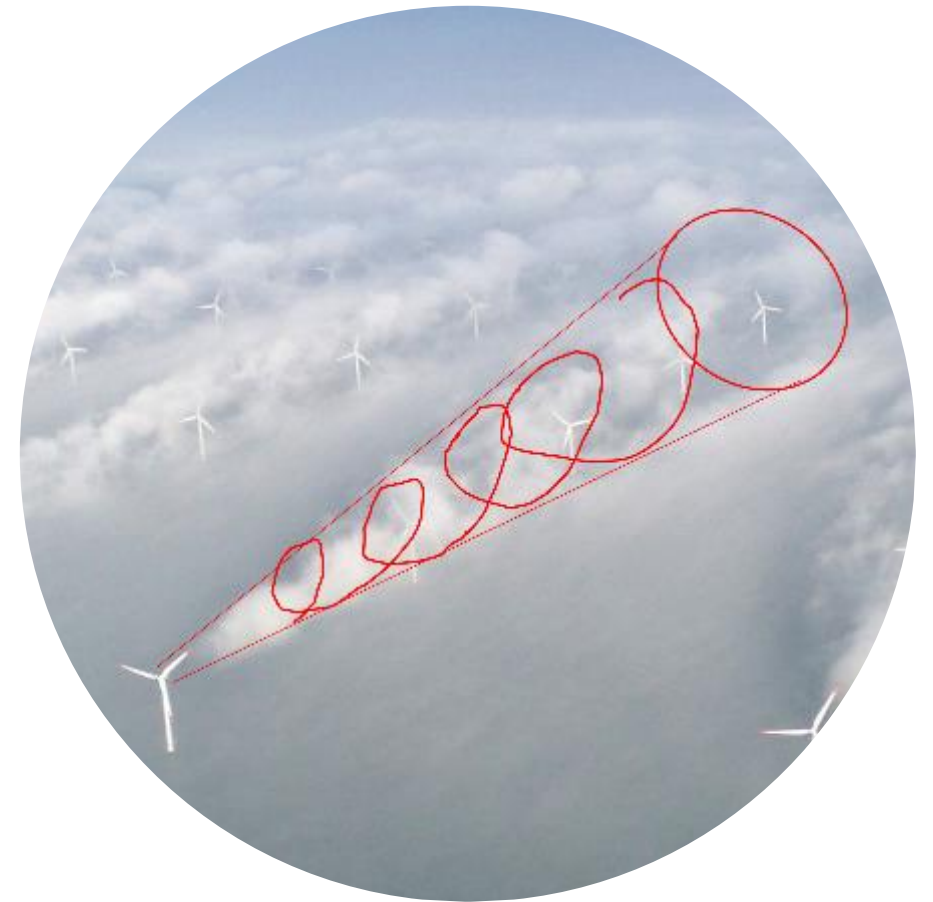
Assumption wind speed:  
is reduced from            **14 m/s to 7 m/s**

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

With a water content of only  $10 \text{ g/m}^3$  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  **$3,500 \text{ l/s} = 210 \text{ m}^3/\text{min}$  or  $12,600 \text{ m}^3/\text{h}$**

**And that's just one wind turbine! And:  
Repowering will exacerbate the situation.**



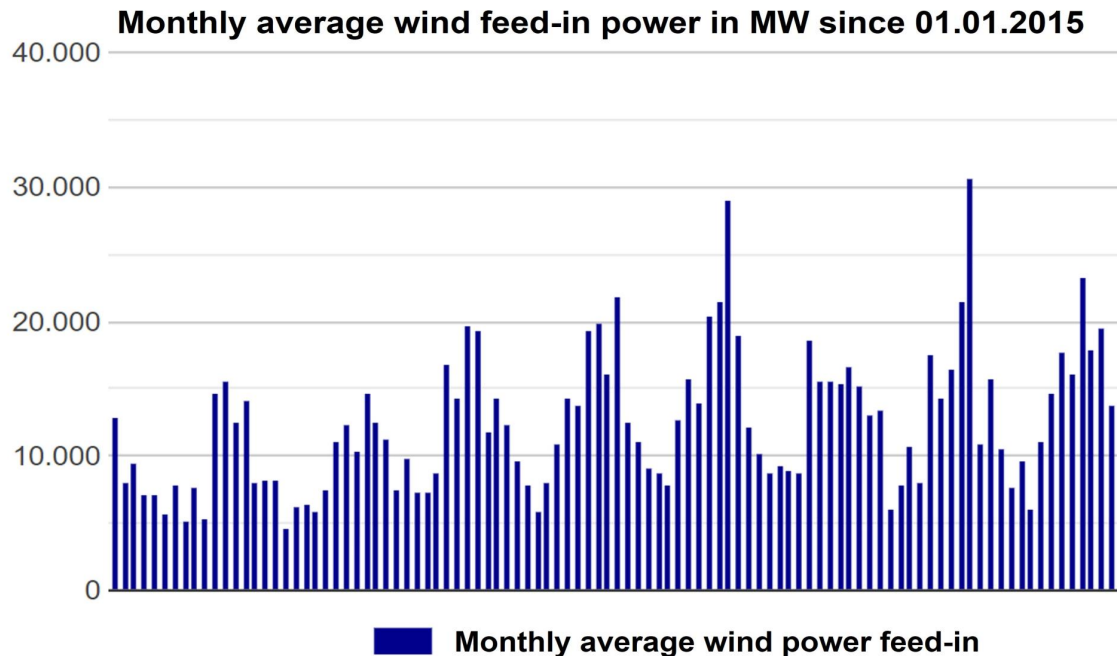
# Wind energy

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

*Source: Federal Network Agency and German Wind Energy Association*



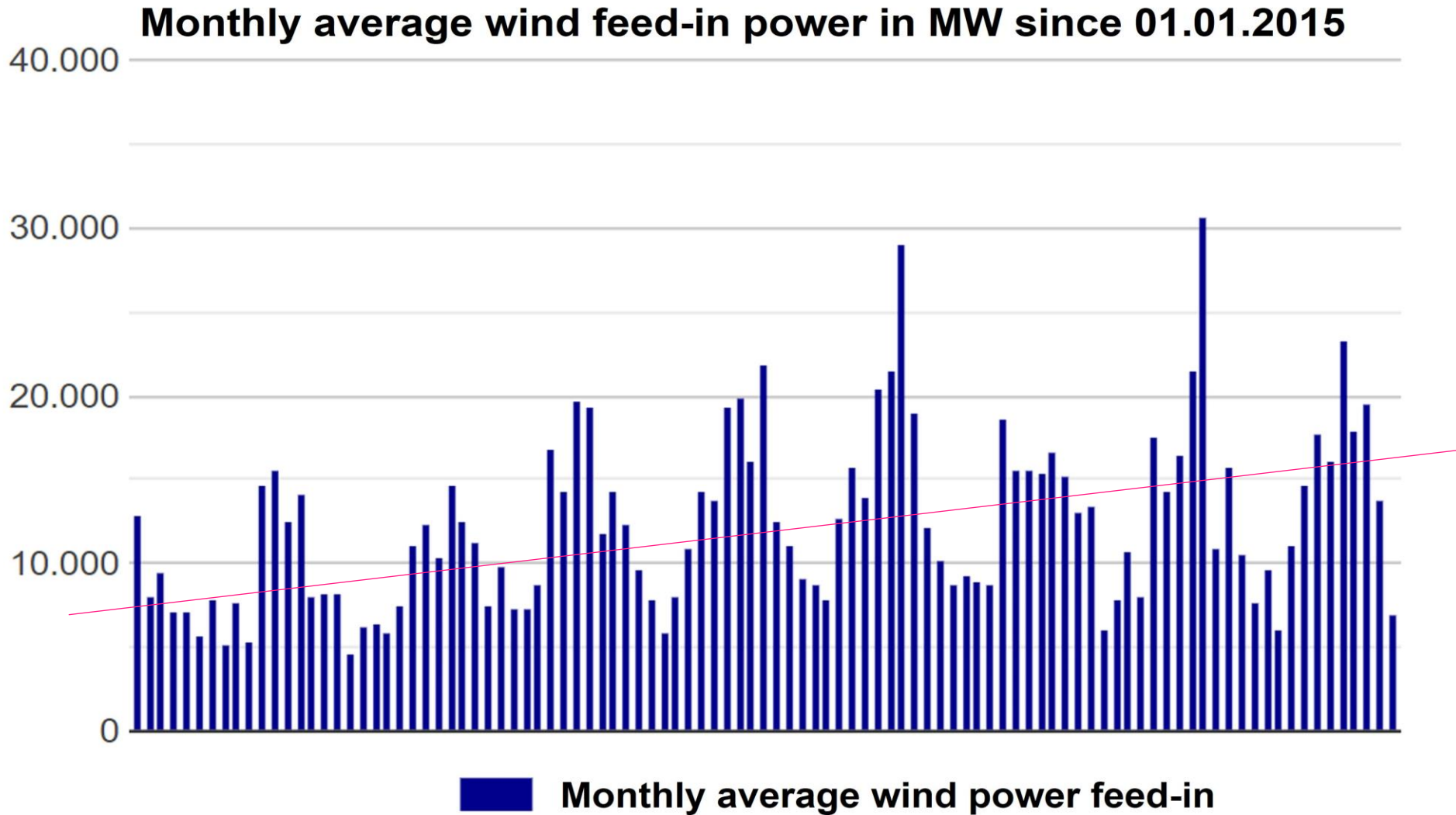
# Wind power per month since 01.01.2015



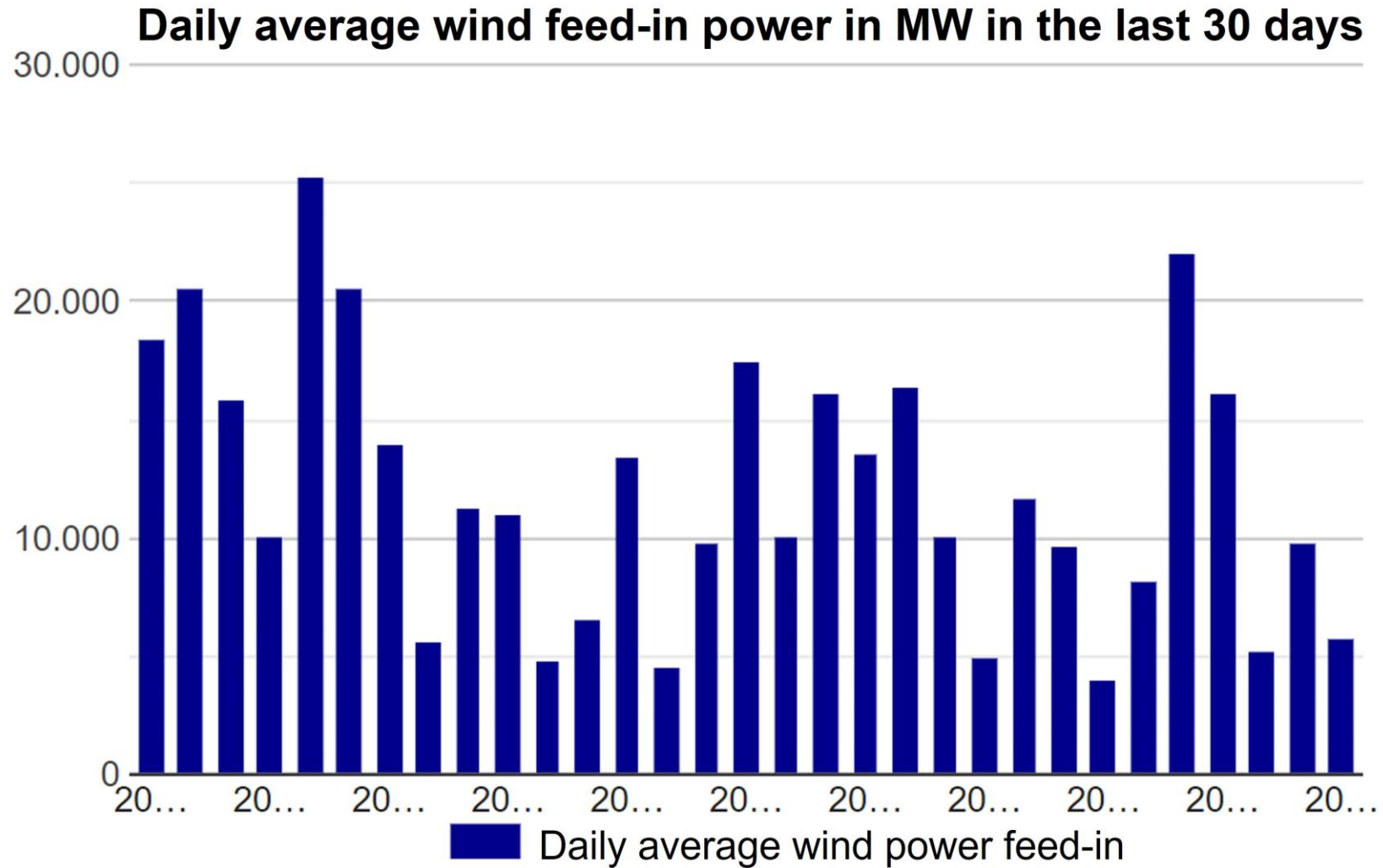
The seasonal fluctuations are clearly visible.  
It is also easy to see that never exceed **30 GW at peak values.**

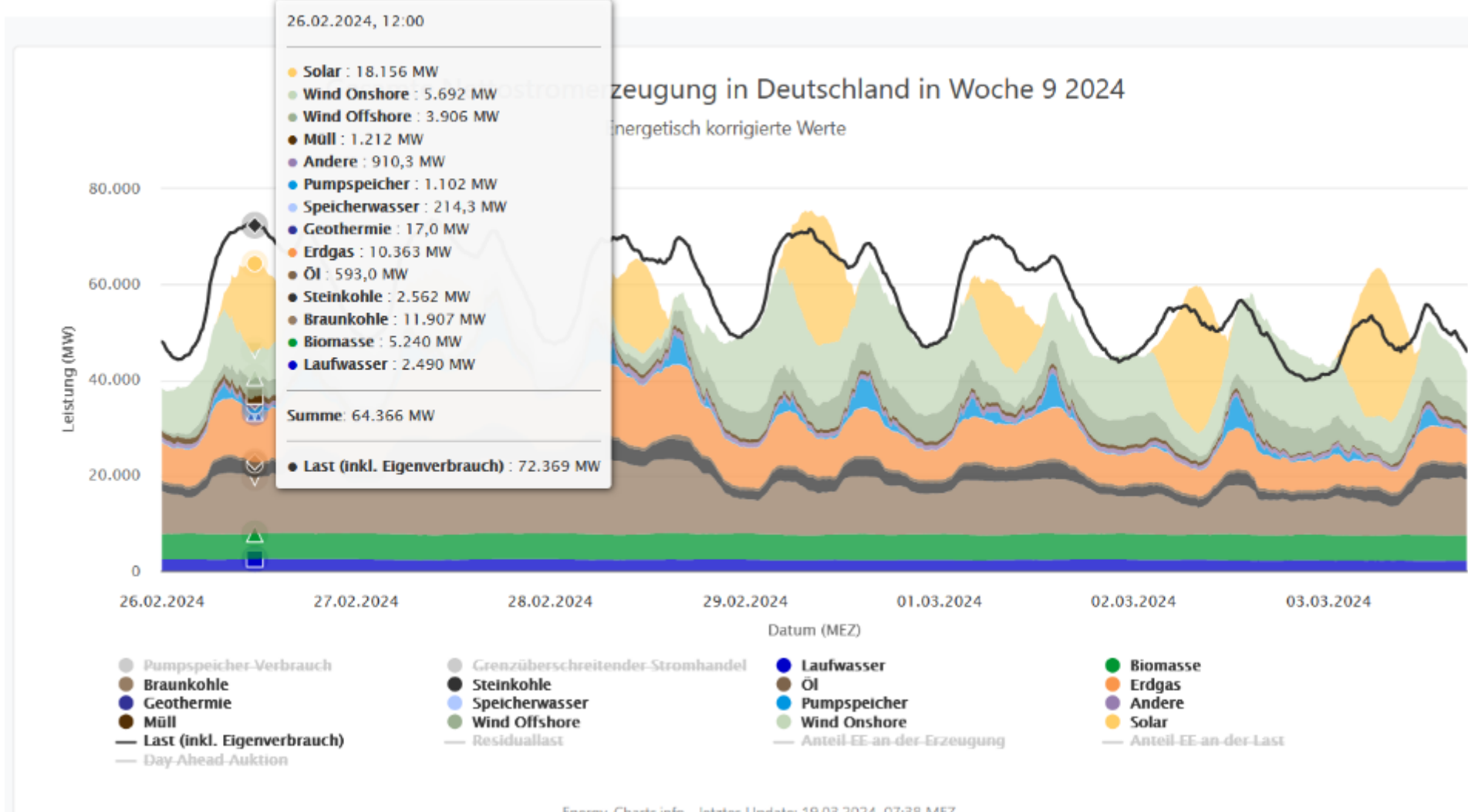
And this despite an installed capacity of more than **60 GW!**

*Source: Windjournal.com*









# 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

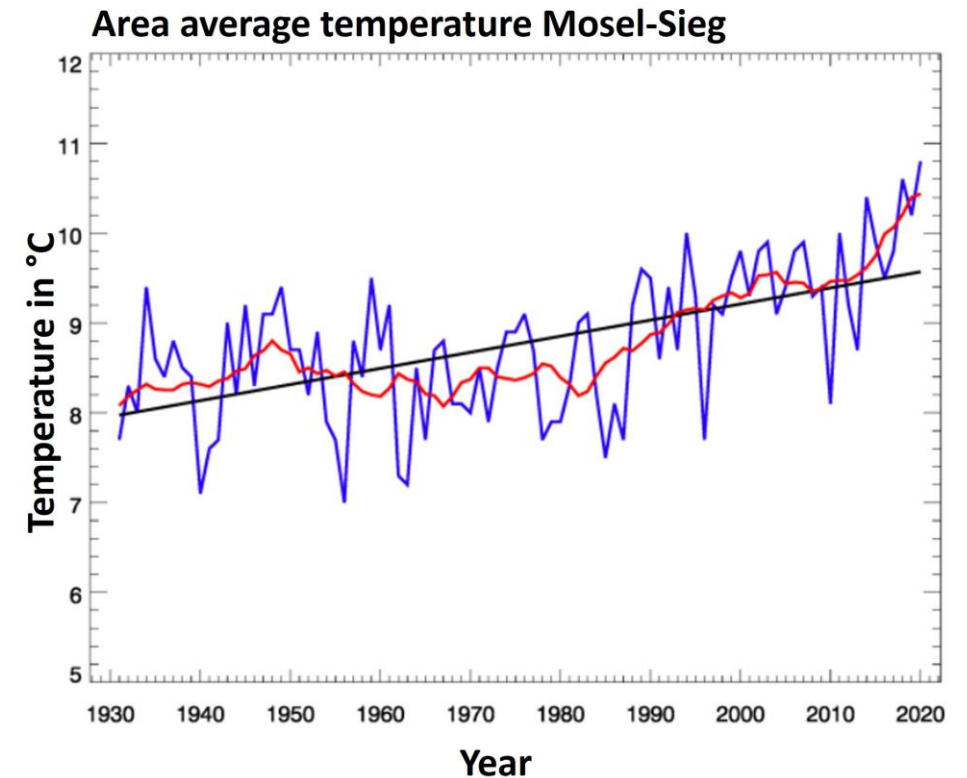
- Wind made the largest contribution from alternative sources in **2022 with 123 TWh and in 2023 with 139 TWh.**
- This corresponds to a share of **0.74 %** or **0.83 %** of global primary energy consumption of **166,500 TWh**
- **Hydrogen production in Germany from wind energy** is also invalid in view 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*



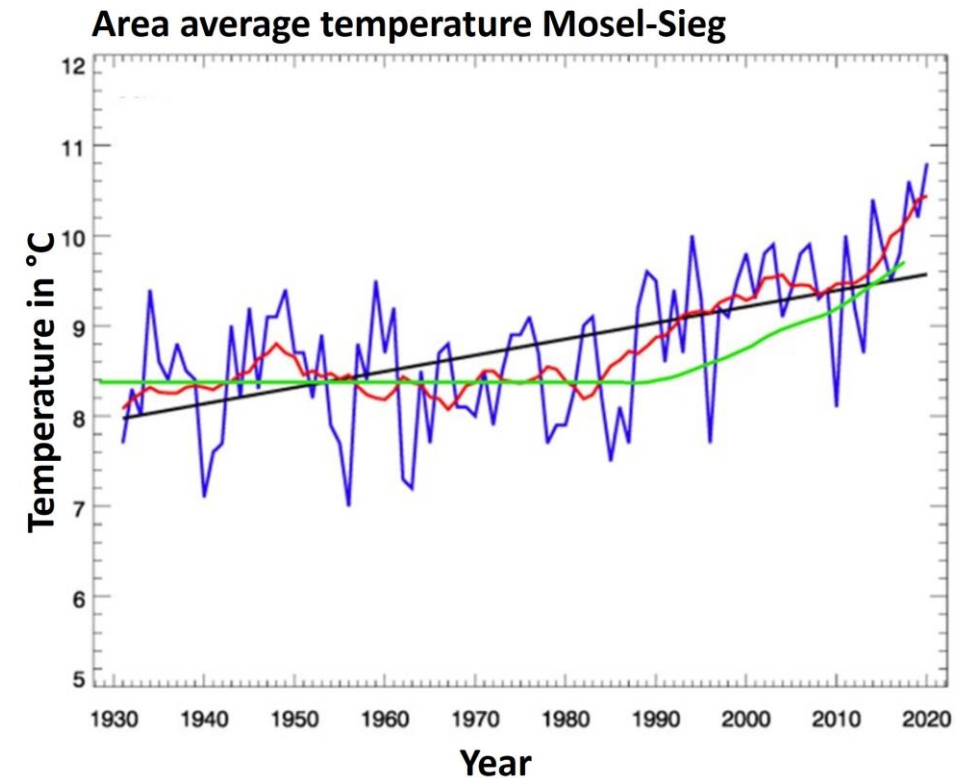
# Climate effects

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 CO<sub>2</sub>

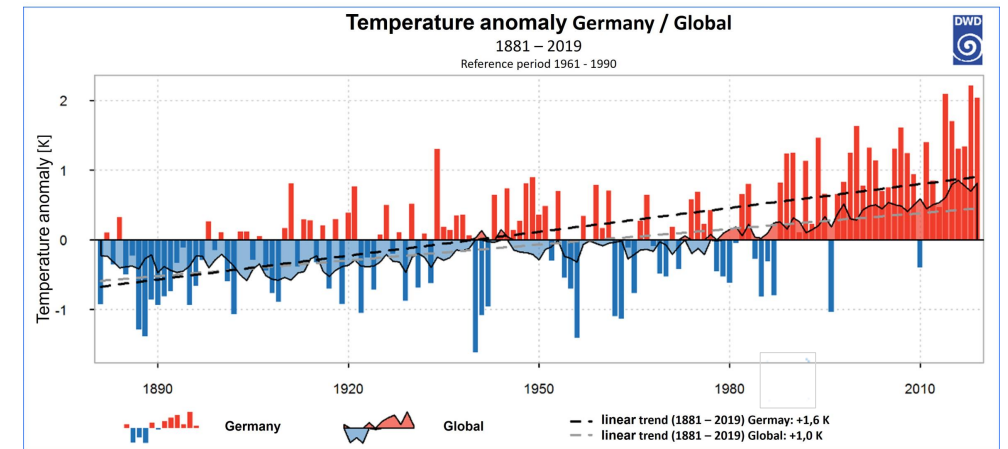
*Source: KLIWA Monitor Report 2021*



# 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!

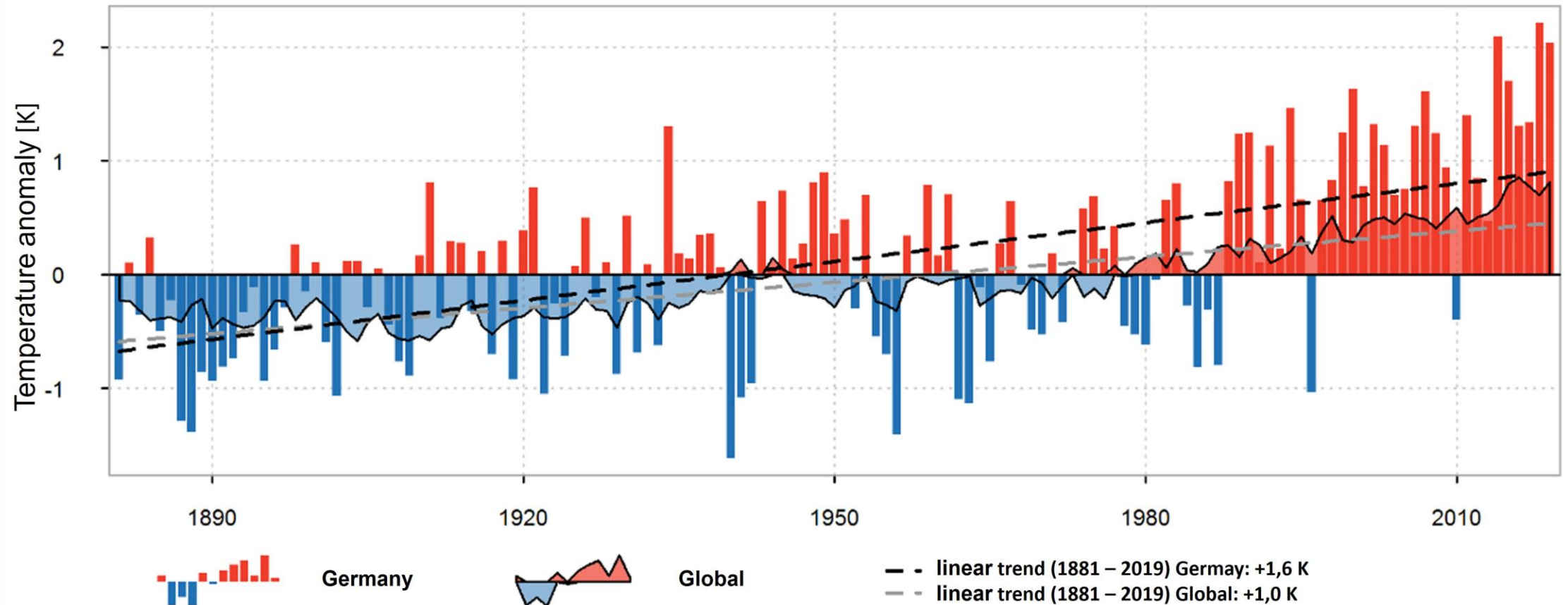


*Source: German Weather Service DWD*

# Temperature anomaly Germany / Global

1881 – 2019

Reference period 1961 - 1990



Source: German Weather Service DWD

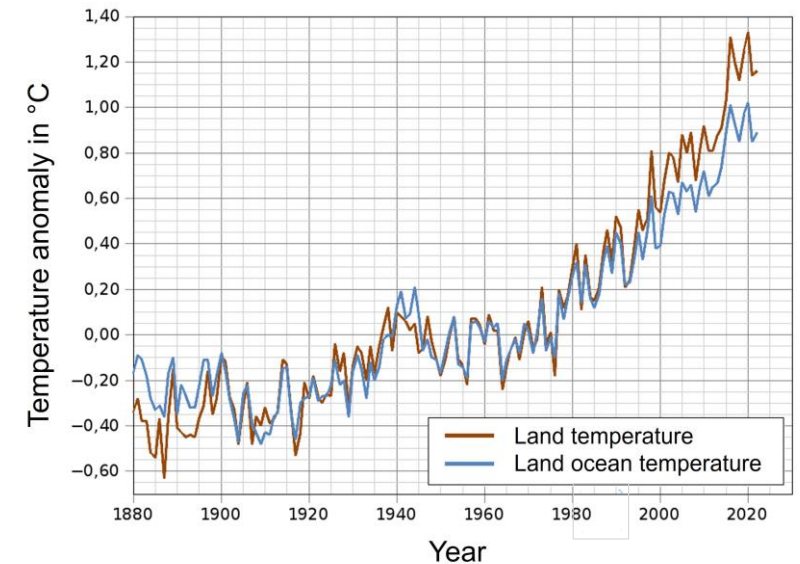


# Climate effects

This graph can be found on the [sonnentaler.net](http://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!**

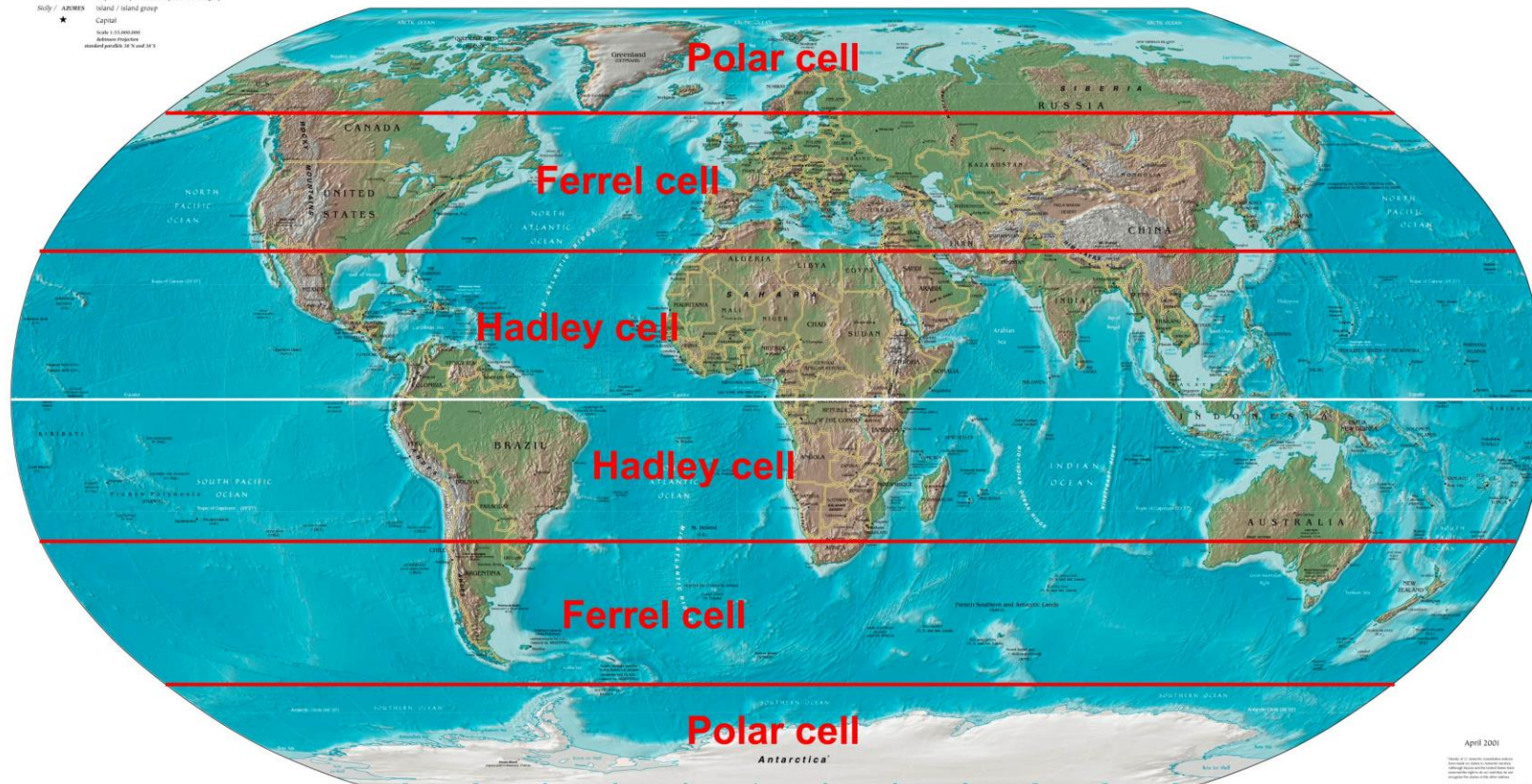
Why doesn't anyone ask the question?  
Why Europe in particular?

It obviously can't be due to the CO<sub>2</sub>.  
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

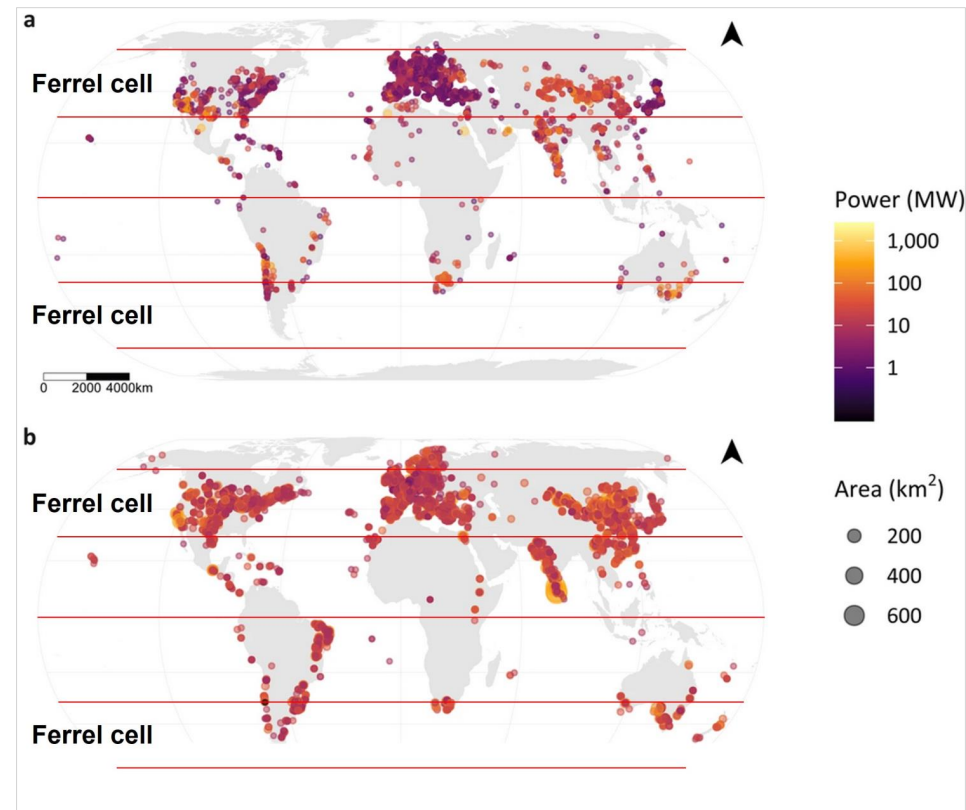
Physical Map of the World, April 2001

AUSTRALIA Independent state  
 BERMUDA Dependency or area of special sovereignty  
 COUNTRY / ADDRESS Island / island group  
 ★ Capital  
 Scale 1:10,000,000  
 Addressing irregularities  
 standard parallels 14° N and 34° S



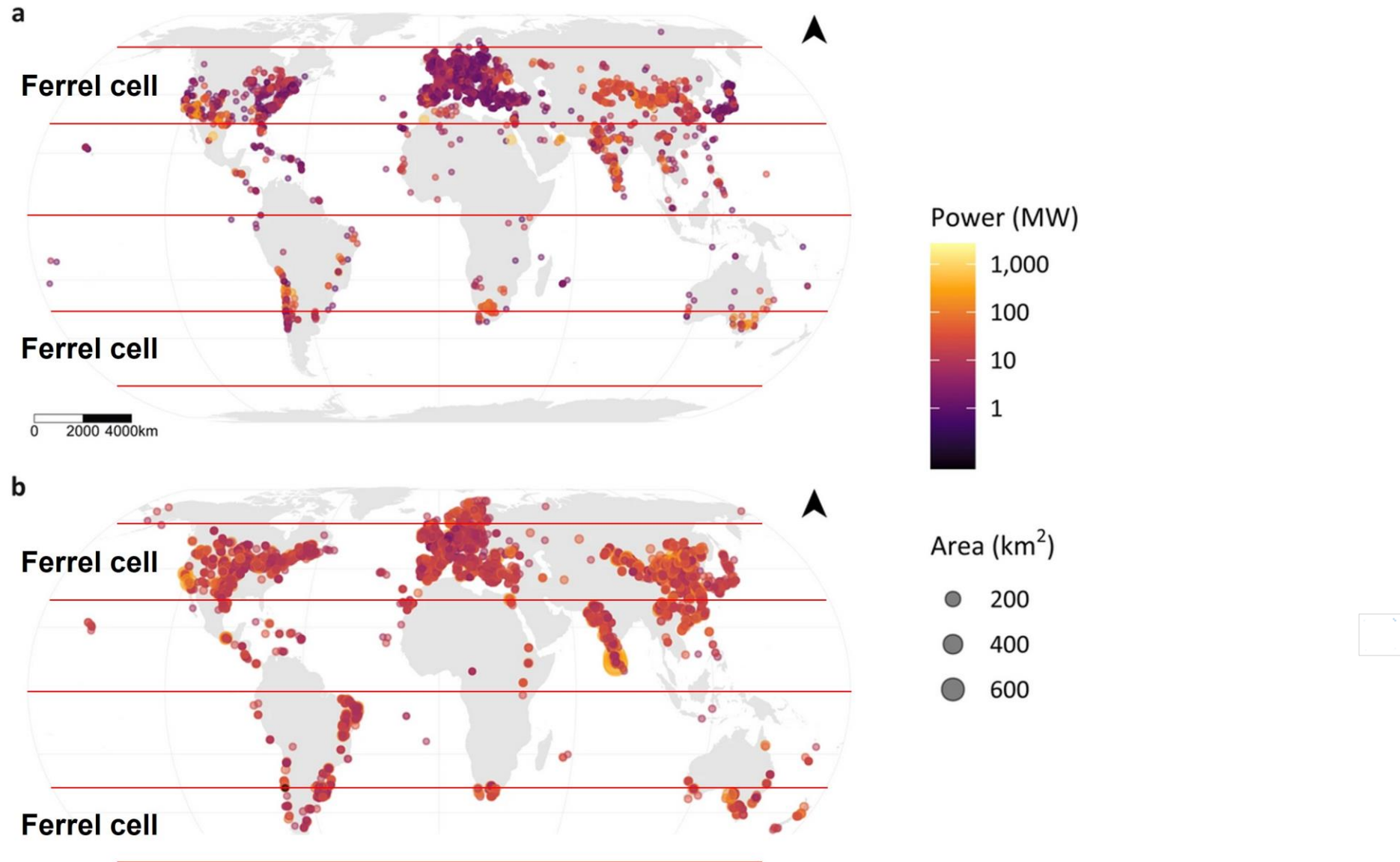
# Photovoltaics and wind energy

Photovoltaic farms



Wind farms

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



Source: [nature.com/scientificdata](http://nature.com/scientificdata)

Shift of the 40°C mark  
to the north



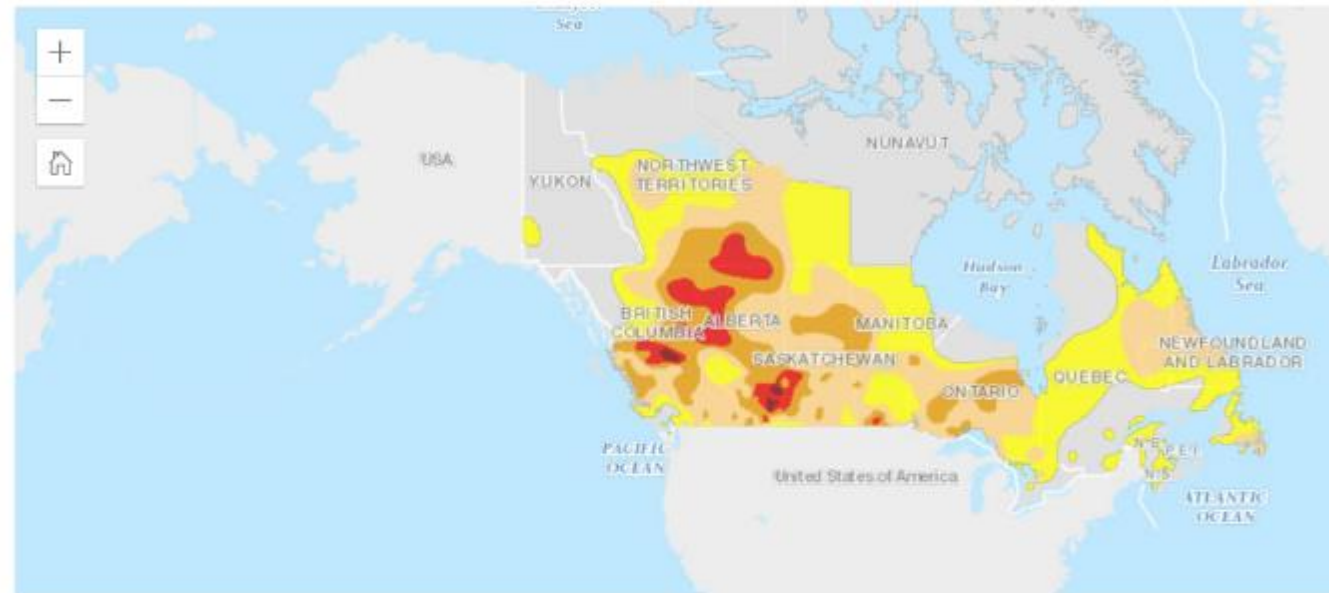


# SUMMARY



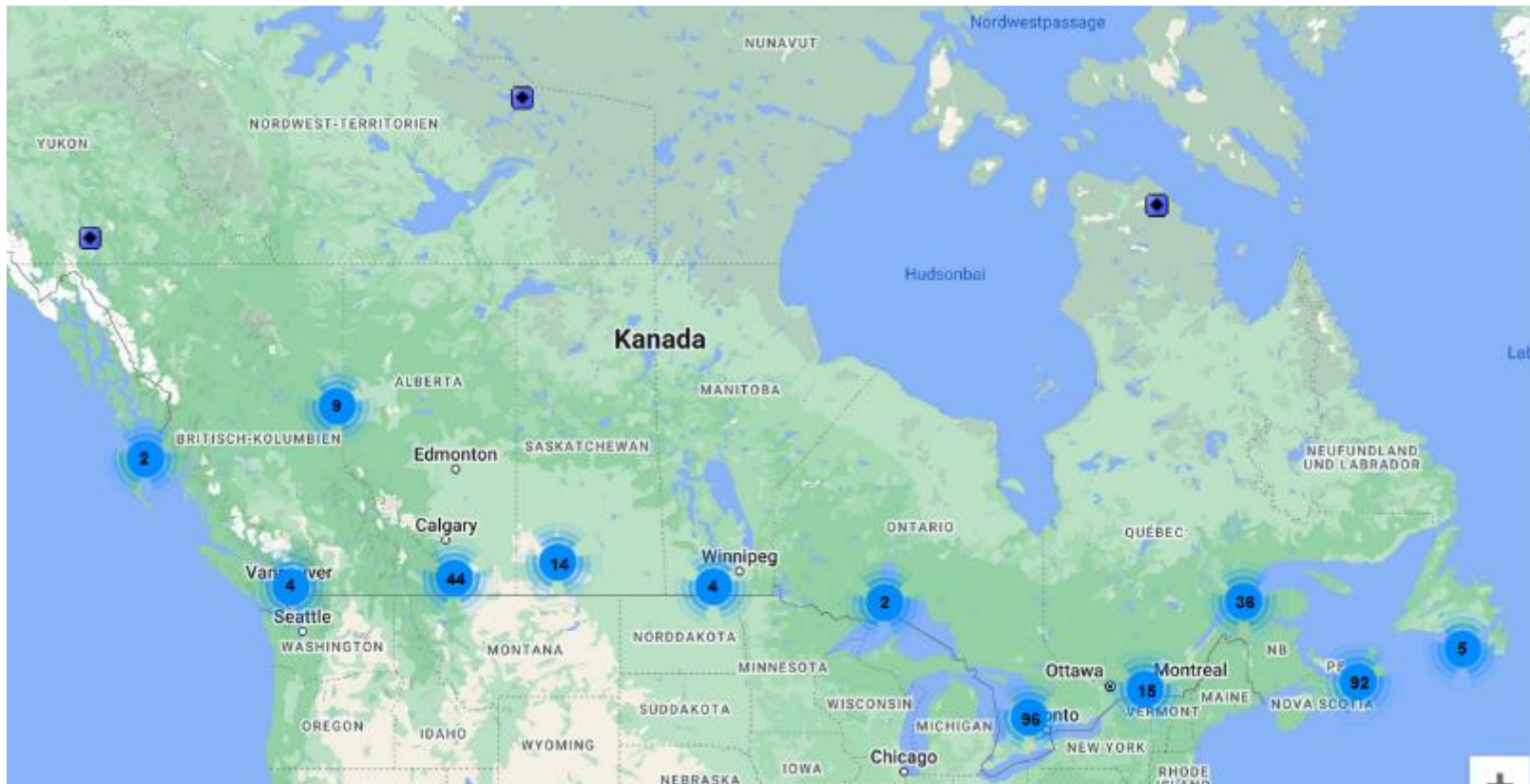
# Extreme weather Canada

Drought conditions as of February 29, 2024





# Windpower Canada



# 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, 27.02.2024, 13:49 - von FOCUS-online-Redakteur Florian Reiter



Eine Windfarm nahe des Ortes Vega in Texas

Paul Souders/Getty Images



FOCUS online Redakteur Florian Reiter

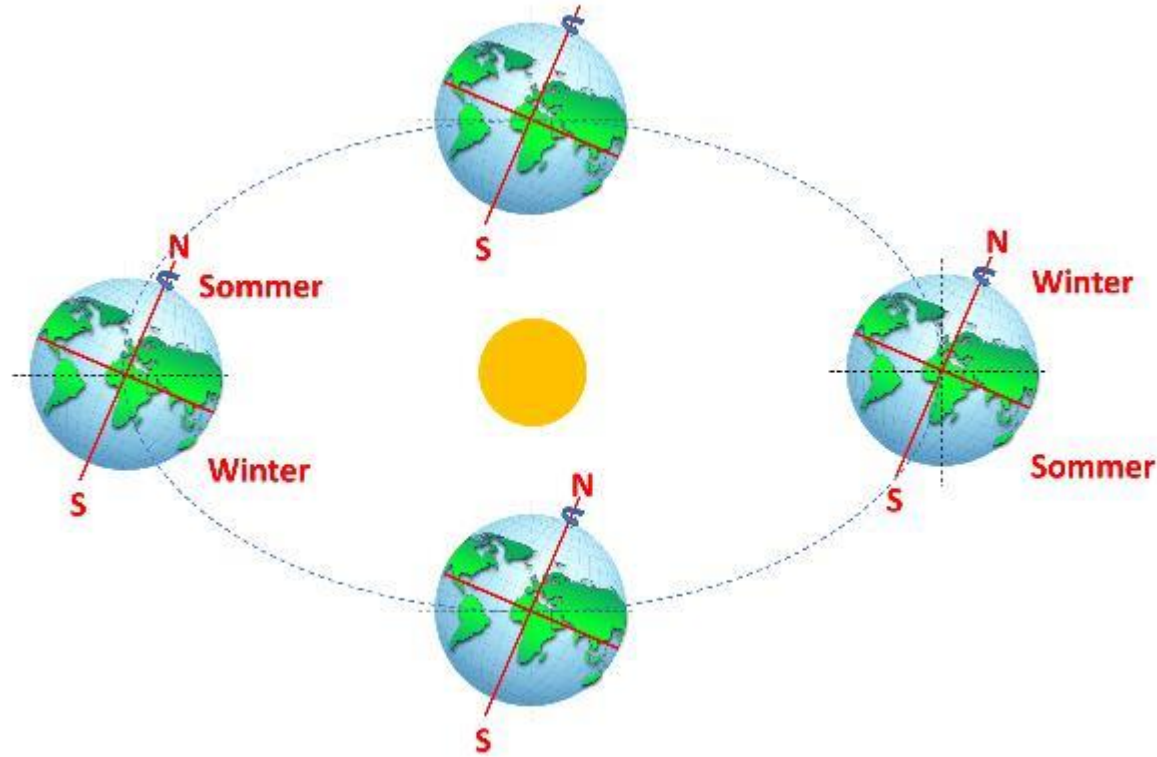


[https://www.focus.de/earth/analyse/mit-solar-an-die-spitze-der-oelstaat-texas-zeigt-dem-rest-der-usa-wie-energiewende-geht\\_id\\_259708882.html](https://www.focus.de/earth/analyse/mit-solar-an-die-spitze-der-oelstaat-texas-zeigt-dem-rest-der-usa-wie-energiewende-geht_id_259708882.html)

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

Manfred Brugger  
windmania@manfred-brugger.de  
buch.manfred-brugger.com