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Opinion on the Draft Law: Further Development of the Greenhouse Gas Reduction Rate

1. Preliminary Remark

Years ago, Germany committed itself to become completely climate neutral up to 2050. However, many decision-makers are probably unaware of the consequences of a complete phase-out of nuclear and fossil fuel supplies and how to ensure a secure energy supply when all conventional power plants are shut down.

Meanwhile, the European Union also wants to follow the German example, and in November 2019 the newly elected EU Parliament decided with 65% of their votes to declare the *European climate emergency*. The only question is, what will cause such a state of emergency, human-caused climate change or a failed energy policy?

Before a climate emergency is declared or draft laws are discussed to regulate something that may not be regulated at all, first the causes and basis of climate change should have been clarified reliably. However, unfortunately there is some bigger competition between different research groups to outdo each other predicting horror scenarios with the "success" that such predictions attract particular media attention and that our decision-makers feel obliged to quickly react, believing they can still save the world. Many of these studies and presented scenarios by no means are based on a secured physical foundation but rather represent computer games that reflect what was previously fed in. Therefore, there exist considerable doubts about a scientifically untenable thesis of a purely human-caused climate change, and it is completely wrong to assume that 97% of climate scientists, or even more, would assume only anthropogenic global warming.

Not without any reasons meanwhile there are different associations and petitions of scientists around the world calling for a more objective and scientifically proven view of climate change, especially free of ideology or belief. These are not climate deniers or cross-heads, but realists who also consider natural causes of climate change and can justify this.

Natural laws and scientific theories are not determined by votes as in politics, but arise from observations and findings, which must be consistent in themselves.

That is how climate and energy policy can only stand and gain acceptance among the population, when this policy is based on reliable knowledge and not on speculations or belief. Meaningful deliberations on a draft law for the further reduction of greenhouse gases therefore require, first of all, clarification of:

- what fossil fuels can contribute to the observed CO_2-increase in the atmosphere at all, and
- how far such a contribution then can have an impact on the climate.

In addition, it has not yet been clarified

- where sufficient electricity will come from, when Germany wants to replace coal, gas, oil, and nuclear energy by 2050 in order to realize a zero-emissions policy,
- how a real comparative emission balance sheet looks like, which includes the more than 10 times larger material requirement and a more than 1,000 times larger area for renewable energy sources,
- the impact on the economy, the social system and the environment, and
- how such a zero-emission policy can be paid.

Therefore, first this report refers to some basic relations of climate effects, based on the current state of scientific knowledge, and further points to the feasibility and the expected consequences of a progressive energy transition policy. To this end, Section 2 recalls the international agreements on phasing-out of fossil fuels. Section 3 identifies some key correlations and influencing factors that affect our climate and lead to a significantly different assessment of the CO_2 impact on our climate than claimed by the Intergovernmental Panel on Climate Change (IPCC - World Climate Council) [1]. Section 4 lists the current energy consumption of Germany, broken down to differ-

ent energy suppliers. Section 5 gives an idea of the necessary installation measures that would be required for the desired climate neutrality and at the same time shows the inconsistency of a purely green energy policy. Section 6 discusses the expected costs of an energy transition policy, and Section 7 gives a final assessment for an exit from fossil energy, listing the consequences for the future energy supply, climate and environment.

2. Agreements of Phasing out of Fossil Fuels

1997 the Member States of the United Nations Framework Convention on Climate Change (UNFCCC) signed a first agreement to reduce greenhouse gas emissions, known as Kyoto Protocol [2]. Although due to a lengthy ratification process this agreement did not enter into force until 2005, many politicians around the world announced soon to abandon fossil fuels and to limit their use in order to reduce global warming, which some climate experts believe, is solely caused by anthropogenic greenhouse gases.

In accordance with this agreement, all Member States obliged

- to reduce emissions of CO_2 by at least 5% till 2012 compared to the 1990 level,
- and for the period 2012-2020, the EU countries were expected to save 20% emissions by 2020.

The German government additionally committed to

- save 20% by 2012 and even 40% by 2020.
- According to a national agreement (National Climate Change Agreement), Germany wants to stop all fossil fuel emissions till the mid of the 21st century.

If emissions from one of the industrialised countries or the EU exceed the planned savings, that country may acquire CO_2-certificates from another participating country capable of surpassing the saving quota. In this way, climate protection should be implemented on a market-oriented basis and especially economically.

In 2018, the IPCC then published a "*Special report on possible impacts of global warming of 1.5°C above pre-industrial levels and related greenhouse gas emission passways*" [3]. This report is a sequel of previous 'Assessment Reports', which besides many alarmistic exaggerations also presents Representative Concentration Pathways (RCPs) for reducing anthropogenic CO_2 emissions to restrict global warming to 1.5°C over the 21st century. A temperature increase less than 2°C, better only 1.5°C, was recommended and resolved by the members of the UNFCCC on the 21st Conference of Parties (COP 21). This decision is known as the Paris Agreement [4] from December 2015 and is understood as the succeeding consent of the Kyoto Protocol from 1997.

The underlying emission curves in the IPCC's Special Report, which have been accepted by most UNFCCC Member States, are simulations with simple climate models, which are based on unrealistic and speculative assumptions when calculating the CO_2 climate sensitivity (temperature increase at doubled CO_2 concentration) and also interpreting the carbon cycle (see also section 3).

These models prognosticate a significantly too high cumulative CO_2 increase over the 21st century, respectively a considerably too small allowed emission rate, which exclusively is traced back to anthropogenic emissions, and they also predict a much larger temperature increase than observed. In particular, any natural changes of the CO_2 concentration and temperature are almost completely excluded. Instead, only human-induced emissions of CO_2 and other greenhouse gases are blamed for the imminent demise of our planet.

3. Influence of CO_2 on Climate

Fortunately, humans were able to take advantage of fossil fuels that were mainly produced in the paleontological period of the late Carbon and early Perm (about 300 million years ago), without which today's industrialization would not have been conceivable. By using these fossil fuels only a vanishing fraction - over the last 270 years less than 1% of the natural emissions - is fed to the natural carbon cycle between the atmosphere, biosphere and oceans. For the flora the current concentration of 0.04% or 400 ppm (parts per million) of CO_2 is rather a lower limit, as plants can only absorb CO_2, that is vital to them, from the atmosphere and use photosynthesis to produce the basic hydrocarbon compounds that make life possible on the Earth. In doing so, they also gratefully assimilate the anthropogenic CO_2 as additional fertilization. *A CO_2-free atmosphere would be the end of all life and the death of the Earth's biosphere*.

3.1 Reasons of CO_2- and Temperature Rise

Paleoclimatic studies of ice cores, stalactites, fossil plant residues or current studies of temperature and CO_2 concentration data show that especially volcanic activities and elevated temperatures lead to a natural CO_2-increase in the atmosphere. This is due to the outgassing of oceans and the release of CO_2 by the dissimilation of flora and fauna, which are increasing exponentially with temperature. Today's anthropogenic emissions from fossil fuels and land use change account for just 4.3% of the CO_2-concentration in the atmosphere, and compared to the increase of about 120 ppm over the Industrial Era, this corresponds to a human-induced contribution of 15%. With a further constant emission rate and temperature this fraction does not rise significantly over the today's 400 ppm, but stabilizes within a few decades at a new equilibrium (Salby 2013 [5], Harde 2017a [6], Harde 2019 [7], Berry 2019 [8], Harde & Salby 2021 [9], Berry 2021 [10]).

Carbon cycle: The carbon-cycle models advocated by the IPCC are based on an accumulation of anthropogenic CO_2 in the atmosphere with residence times of more than 100,000 years. But such models are in clear contradiction to basic physical laws, measurements of CO_2 isotopologues with an average residence time in the atmosphere of only a few years (Harde & Salby 2021 [9]), and they are at odds with an absorption rate scaling proportional with the CO_2 concentration in the atmosphere (Salby 2013 [5], Harde 2017a [6]) and not with the emission rate as assumed by the IPCC.

Greenhouse effect: However, the great danger of CO_2 is seen in its infrared-active properties to absorb the longwave (heat) radiation emanating from the earth's surface and to radiate part of it back to the Earth. This contributes to reduced net radiation and is commonly known as the atmospheric greenhouse effect, which is blamed for global warming. For example, the IPCC assumes that the increase of the CO_2 concentration over the last century of 90 ppm is responsible for the warming of more than 1°C. But this is in contradiction to an observed drop in temperature in the 40s to 70s, which can well be explained by the solar influence, while CO_2 concentration continued to increase during this period (see Soon et al [11], Harde 2022 [12]).

The sensitivity of the climate to an increase of CO_2 is expressed by a particularly important measure in climate science, the so-called equilibrium-climate sensitivity (ECS). It represents the temperature increase for a hypothetically assumed doubling of CO_2. IPCC models specify an average value of 3°C with an uncertainty of 1.5 to 4.5°C (Sixth Assessment Report - AR6). However, a more nuanced view shows that, on the one hand, the highly overlapping and saturated absorption bands of CO_2 and water vapour and, on the other hand, the strongly attenuating influence of convection and evaporation as negative feedback and a significantly reduced effect of the greenhouse gases under cloud cover result in a climate sensitivity almost five times smaller than assumed by the IPCC (Lindzen&Choi, 2011 [13]; Harde, 2014 [14]; Harde, 2017b [15]). Altogether, this only leads to a temperature increase by CO_2 of less than 0.3°C over the last century.

Solar influence: On the other hand, contrary to the assumptions of the IPCC, the Sun, which also largely dictated our climate before industrialization, contributes to a further warming of almost 0.6°C over the past century. This contribution is explained by the slight increase in solar activity, especially over the second half of the last century, and its repercussions on cloud formation, as well as internal oscillations. Current results confirm that the cosmic background radiation entering the atmosphere has a direct influence on cloud formation (Svensmark et al., 2017 [16]). This radiation is slightly attenuated with increased solar activity and thus increased solar magnetic field, which leads to a decrease in condensation nuclei in the atmosphere and ultimately to reduced cloudiness, as was also observed via satellite measurements over the 80s and 90s. This in turn contributes to an increase in solar heating in the form of a positive feedback (for details see, Harde 2022 [12]).

Natural and Anthropogenic Contribution: This allows the measured warming over the last century to be reconciled in very good agreement with all other observations and calculations. It shows that the solar influence was contributing about two thirds and CO_2 only one third to the warming over this period (Harde 2017b [11], Harde 2022 [12]). A very topical discussion on anthropogenic or natural influences is given in Connolly et al., 2021 [17].

Since only about 15% of the global CO_2 increase is of anthropogenic origin, just 15% of 0.3°C, i.e., less than 0.05°C remains, which can be attributed to humans in the overall balance. In view of this vanishingly small contribution, of which the Germans are only involved with 2.1%, it is absurd to assume that an exit from fossil fuels could even remotely have an impact on our climate. Changes of our climate can be traced back to natural interaction processes that exceed our human influence by orders of magnitude.

3.2 Doubtful Model Assumptions

The official climate models are based on such dubious assumptions that almost half of all anthropogenic emissions would remain in the atmosphere and at least 15% even for many thousands of years, and that natural climate changes did not play a role over the Industrial Era. The Little Ice Age is used as a reference , over which the climate is supposed to have been in a stable equilibrium. Such assumptions inevitably lead to a significant overestimation of the human impact on our climate. This can also be seen in the forecasts for our current temperature development, which are all too high due to these models with a significantly too large climate sensitivity, this despite the neglect of natural influences.

These models are then used to determine which anthropogenic emissions are still permissible in order to meet the lowered Paris target of 1.5°C. By the end of the century, 700 billion tonnes of CO_2 will be granted worldwide for this purpose, a contribution smaller than the natural emissions of 730 billion tonnes over one year. Of these 700 billion tonnes still permitted, almost 40% is already produced and exhaled by humans. With each breath we take, we increase the CO_2-concentration in the exhaled air by about a factor of one hundred. That amounts to approx. 1 kg per person and per day. With an expected average population of 9 billion people over this century, that is about 263 billion tonnes over 365 days and 80 years, or 38%. This raises the legitimate question of whether humans and their exhaled CO_2 still belong to nature or are to be regarded as external perturbations. In any case, from 2100 onwards, the breathing of humans and livestock must be stopped to save the world according to the IPCC calculations. But perhaps some part can be credited to people, since at least their nutrition comes from the natural CO_2 cycle, which otherwise would also be part of this cycle.

3.3 Settled Climate Science?

We certainly have to look for ways to stop unbridled consumption and waste of resources without jeopardizing the very foundations of our prosperity and our economic system. But when meanwhile many independent studies show that there is only a negligible influence of human emissions on climate change, then an urgent paradigm shift is needed.

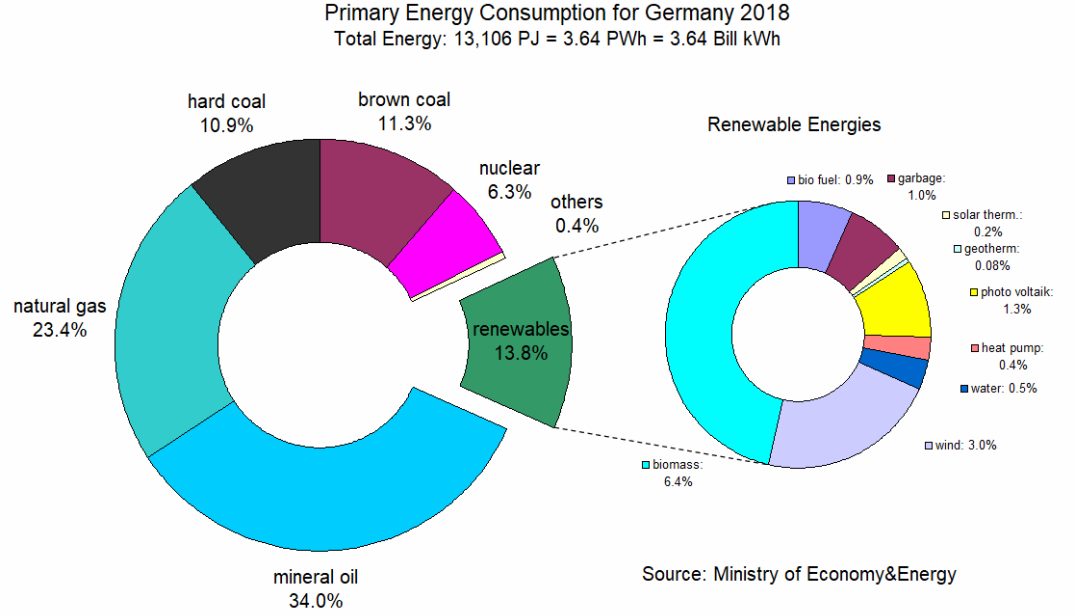
Scientists who today point to serious inconsistencies in the anthropogenic global warming theory (AGW theory) or question unilateral interpretations of this are publicly discredited, excluded from research funds, research contributions in journals are suppressed and, as recently repeated in Australia, were even placed on leave or dismissed from their university. After all, this is called "*settled climate science*", represented by an allegedly overwhelming majority of climate scientists. Doubts about the harmful influence of CO_2 on the environment and the climate are not allowed, because it is about nothing less than saving our planet.

But scientifically recognized ideas had to be corrected several times afterwards, because they were too much based on belief and not on facts, let's think of Darwin's development theory or Wegener's theory of continental drifts. What we call truths also depends to a large extent on our state of knowledge. That is why climate science, which has developed more to an ideology and a worldview than a serious science, calls for a fundamental review of the hypotheses and a shift away from the meanwhile widely established climate industry. Science must not be misled by commerce, politics or ideology. Rather, it is the genuine task of universities and state-funded research institutions to investigate contradictory issues and to ensure independent, free research that gives us honest answers, even when these answers are often complex and do not fit into a desired political context.

4. Energy Consumption in Germany

Let us look at Germany's energy balance and efforts to become 'climate neutral' by 2050. Over the past few years, the Primary-Energy-Consumption (PEC) in Germany was relatively constant. In 2017 these were 13,525 PJ and in 2018 13,106 PJ = 3.64 PWh (Peta Watt·hours) = 3.64 Trillion kWh (Federal Ministry of Economics and Energy [18]). The transport sector accounted for just over a quarter of this with 0.98 PWh (Federal Environment Agency [19]). Due to transmission losses and a limited conversion efficiency of energy from one form to another, the typical losses of PEC to the End-Energy-Consumption (EEC) are 35%. Here we use the figures of 2018, which meanwhile are largely confirmed and did not change significantly over following years.

Presently by far the largest fraction of energy supply is provided by fossil fuels such as mineral oil, natural gas and coal, while the so-called *Renewable Energy* only contributes 13.8% with biomass as its largest share, accounting for 6.4%. But experts believe that further expansion of biomass is significantly limited. The same applies

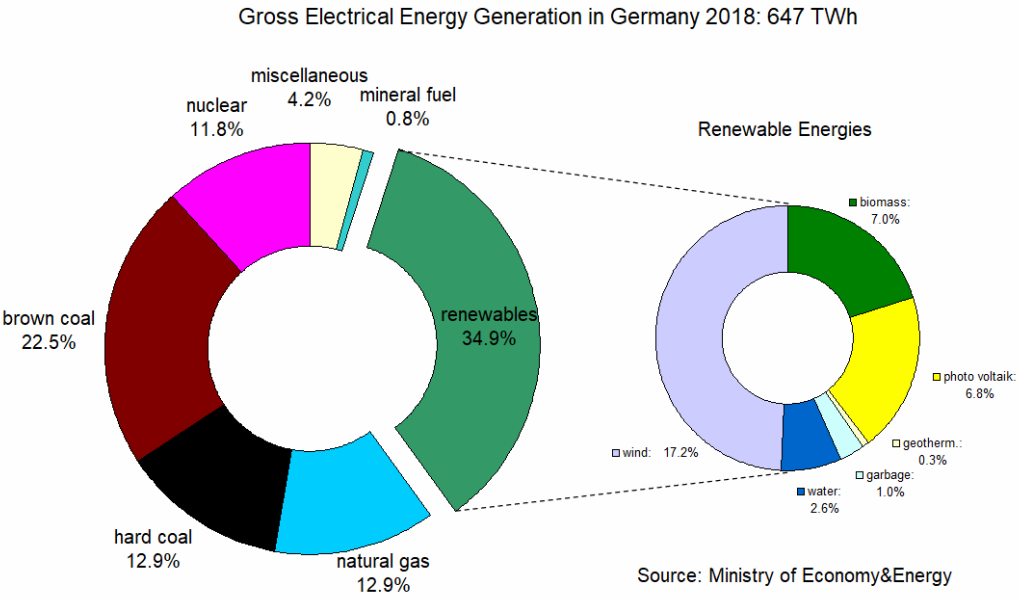


to hydropower. This raises the fundamental question, how far wind power and photovoltaic - in 2018 together 4.3% - are really able to replace fossil fuels and also nuclear energy as reliable sources. In 2018, renewables recorded an increase of just 0.6%.

For generating electrical energy, the proportion of renewables improved by 1.7% in 2018 and rose to 34.9%. But even increasing the number of Wind Power Plants (WPPs), which are actually generating 60 GW of the power, and raising this to 100 GW till 2030, as planned by the German Network Agency, renewable energy can only cover 300 TWh when assuming the same consumption of 647 TWh per year as actual:

- 17.2% x 100 GW/60 GW by wind energy → 185.5 TWh, and
- 17.7% of other renewables → 114.5 TWh.

That's less than 50% of the electrical energy needed and only 16% of the primary energy.



Realistically, we even have to expect that reduction of fossil and nuclear energy will significantly increase the demand for electrical energy, and the question remains, how the lack of energy can be generated by renewables and how this can be financed.

It is all the more surprising - apart from the basic remarks in Section 3 - to demand and promote with the new draft law a greenhouse gas reduction quota of 22% and a corresponding increase in electricity-generated fuels by 2030, when at the same time not even 50% of all electricity can be generated by renewables.

5. Required Installations for Climate Neutrality

It is intended that under emissions trading the energy suppliers and industry with higher CO_2-emissions have to bear further substantial costs - unless they were already migrated -, and finally these costs have to be paid by the customers. Additional significant costs have been incurred and will be incurred by the taxpayer as a result of the Federal Government's decision to take eight nuclear power plants off the grid in short term and the remaining nuclear power plants by 2022, this as response to the earthquake and tsunami that destroyed the Fukushima nuclear power plant in March 2011.

The lack of energy had to be replaced by new coal and gas power plants, so that the planned emission savings were no longer feasible - on the contrary - emissions even increased temporarily again. Indeed, with phasing out nuclear energy, Germany strongly differs from France, the United States and even Sweden, which actually practices the exit from the exit and is investing in the renewal of its nuclear power stations.

Till the end of 2021, nuclear energy was still contributing 6.3% to the PEC of 3.64 billion kWh, and domestic coal still supplies 22.2%. But in times of growing climate hysteria and climate demonstrations like "Fridays for Future," the federal government decided, also to exit from coal till 2038.

As a result, Germany is concentrating entirely on renewable energies through wind power and solar installations, for a transient period also on natural gas. But with the objective of zero CO_2-emissions in 2050 not only nuclear power and coal, yet also the largest energy suppliers, mineral oil with 34% and natural gas with 23.4% have to be replaced. How can this work?

Renewable energy is expensive, volatile and therefore at least not yet reliable and not sufficiently available. The same applies to the grid to be adapted for this purpose. Some basic comments on this have already been given by Prof. Lüdecke at the hearing of 17/11/2020 (Lüdecke 2020 [20]), which need not be repeated here, but they will be supplemented here in some aspects.

5.1 Wind Power as a Substitute for Conventional Energy Sources

Biomass and water are already largely exhausted, and photovoltaic cannot contribute much more to the supply, especially not over the winter season. So wind power remains!

In 2018, Germany had 30,520 WPPs (BWE [21]), which were generating 111 TWh = 111 Bill kWh of electric energy (3.0% of PEC). To cover the missing 85.9% (mineral oil 34.0%; natural gas 23.4%; coal 22.2%; nuclear 6.3% - see above diagram), equivalent to 3.13 PWh, this would require 857,570 additional WPPs, each delivering 3.65 GWh over one year or in average 417 kW. This average power is not more than 20% of a wind turbine with a nominal power of 2 MW. But these 20% can only be realized with a priority feed into the electrical grid and with conventional power plants in stand-by operation (see also Lüdecke 2020 [20]).

Since the power generated by wind turbines is directly dictated by the highly varying weather conditions and is far from coincidence with daily and seasonal power consumption, the electrical grid can only be operated with a complex storage technology for renewables, e.g., with hydrogen or methane storage systems, in order to compensate for the large variations between generation and consumption of electrical power over longer periods. So far, appropriate storage technologies are not yet available for use, but if they are available in a timely manner, the conversion process back and forth with an estimated efficiency of 25 to 30% will further reduce the overall efficiency of the wind power supply as mixture of direct and stored energy to about 10% of the nominal power.

When mineral oil and natural gas are no longer available for transport and heating, there are significant additional demands for electrical energy and related storage technologies, which with the low conversion efficiency requires further WPPs.

Assuming that suitable storage techniques are available up to 2050 and that the final energy consumption will not further increase over the next years or can even be reduced by a higher conversion efficiency from PEC to EEC, in 2050 Germany will need about 1.5 to 2 million WPPs with a nominal output of 2 MW, this as a consequence of the above considerations for a sufficient energy supply. In an emergency case, it could be even more.

This means that over the next 30 years, 60,000 new WPPs per year, or 165 WPPs per day, have to be installed and connected to the grid.

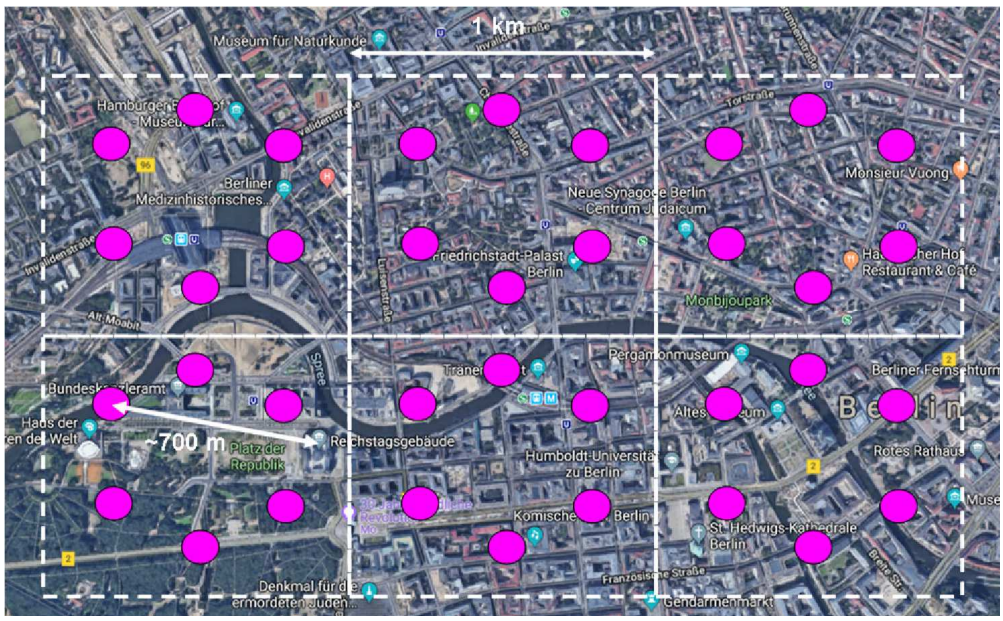
Germany is known for its short planning periods and approval procedures for buildings or reallocation of usable

areas. Expropriation of land in favour of the public and for the protection of public safety (see also the EEG draft law) will certainly not be an obstacle in the future.

Germany covers a total area of 360,000 km^2, i.e., in average each km^2 of forests, parks, nature reservoirs, farmlands, lakes or residential areas and cities will be covered by 5 to 6 wind mills. For the connection to the grid about 1 Mio km of wires - underground and/or overland lines - together with maintenance ways to the plants have to be installed.

What a successful step forward to save the planet, and what a great step back to nature!

A look to the city map of Berlin with the government quarter (left lower square) shows us that the distance from the Chancellor's Office (Bundeskanzleramt) to the Parliament (Reichstag) is about 700 m. So the future chancellor will be able to admire three WPPs on each side (magenta points) at work - as far as they turn - on the way to parliament. And so every German citizen, who is on his way to work, in the office, in his free time or when falling asleep, is always accompanied by infrasound spheres. On every square km of this country there are on average 5 - 6 wind turbines. If we remove the areas and roads that have already been built on, virtually every hectare (10,000 m^2) of land or water that has not yet been cleared, must be provided with a turbine, the connection network and access roads, if we want to be supplied alone by renewables in the future.



We don't have to argue about the minimum distance between WPPs and residential areas, Germany will be a single wind farm with the paddle wheels in our front gardens. The devastating effects they have on health, fauna and flora, but also on the local climate through soil dehydration and increased temperature via turbulence effects, are already shown by initial studies (Wu&Archer, 2020 [22]).

Unfortunately, such a scenario is the logical consequence of the current energy and climate policy, which is completely unrealistic, but to which there is hardly any alternative, unless energy import from neighbouring countries, if they could supply us with their renewables.

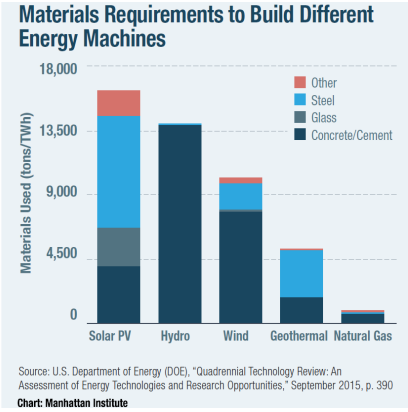
Every politician and every citizen who calls for such climate neutrality for Germany and the further expansion of renewables must be aware of the serious consequences for people and the environment.

It is absolutely clear that without a reliable and sufficient energy supply, Germany and other countries that take such a path will end in anarchy:

- a collapsing economy and industry,
- rapidly rising unemployment, cold housing and jobs,
- collapsed traffic and transport sector,
- dramatic consequences for agriculture and the health system,
- etc.

5.2 Emissions from Green Technology

Unfortunately, it is a common fallacy that renewables would not cause emissions. A serious record of emission savings must also include emissions produced for the production, operation and disposal of wind turbines, solar panels or batteries, even when they are often out of sight and are appearing in quarries, mines or mineral extraction plants all over the world.



Material requirements: The main difference to conventional power plants is that in terms of the energy generated by a system, the green technologies not only require a significantly higher area, but also a much higher material exertion and thus also energy expenditure (see M.P. Mills 2020 [23]).

This is evident from a graph from the Manhattan Institute, based on data from the US Department of Energy showing that green technologies at least require 10 times as much material. At the top are solar systems.

This becomes immediately clear, e.g., considering a single 100 MW natural gas turbine, which is not larger than a residential building and produces sufficient electricity for 75,000 households. When replacing this single gas turbine by wind power plants, depending on the size of the WPPs (2 to 5 MW per plant), this requires between 20 and 50 wind turbines to achieve the same nominal power.

However, since in average only 10% of the required power can be fed into the grid due to availability, conversion and storage losses, 200 to 500 wind turbines are ultimately necessary to replace one gas turbine.

Depending on the circumstances, about 300,000 t (tonnes) of iron ore, 1 million t of concrete and 10,000 t of fibreglass composites are required for such a "wind farm". In addition to conventional building materials, there is a considerably higher demand for copper, cobalt and rare earths, which typically only occur in concentrations well below 1% in the respective ores and must be extracted from them. For example, for the extraction of 1 t of copper, in average 200 t of copper ore must be mined and crushed, then freed from rock and slag in smelting furnaces before pure copper is finally available for electro-technical use via electrolytic refining. However, in order to be able to mine a mineral at all, about 5 t of soil or rock must be removed for each tonne of ore.

The average demand of copper for a 2 MW wind turbine (with infrastructure) is specified with 15 t (Wind Fair [24]) and corresponds to about 7.5 t per MW. For the entire wind farm, these are 7,500 t of copper. For this purpose a total of 1.5 million t of copper ore must be mined and 7.5 million t of waste must be moved. Similar considerations apply to cobalt and rare earths, which are needed in much smaller quantities for construction, but which have an even lower concentration in their ores. The extraction and supply of all these materials is carried out almost exclusively using fossil fuels.

A frequently used factor for the efficiency of a power plant is the *Energy return time*. It indicates how much time it takes before a power plant has generated as much energy as was necessary to construct it, to transport it, to set it up and to operate it. For WPPs, values between 3 and 12 months are published. Referring to the *Annual regular work assets* (for WPPs about 20% of the nominal power, i.e. for a 2 MW plant about 3.6 GWh) this is between 0.9 and 3.6 GWh. However, this does not include the energy for extraction and production of the materials; also the set-up of storage units as well as the conversion losses into hydrogen or methane and back-conversion to electricity are not taken into account. In addition, when further energy expenditures for the complex and extensive electrical distribution grid, the later dismantling of the plants as well as the disposal is taken into account, the return time is more likely of the order of the lifetime of WPPs with currently 20 years.

After such run time, a wind farm must be typically renewed, hence the name "*Renewable Energy*". While some of the higher-quality materials can be recycled, significant material replacement and the provision of conventional energy are still required.

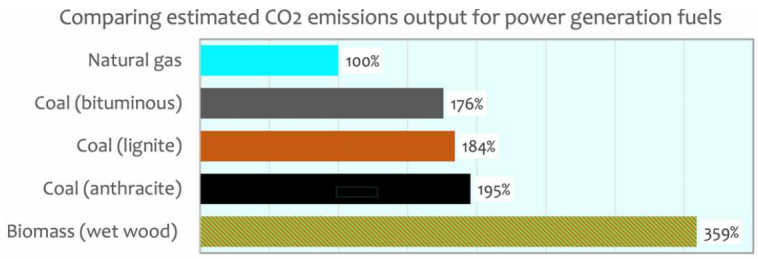
Therefore, it is not really appropriate to call this a particularly cheap and emission-free technology, which ultimately requires up to 500 wind turbines plus storage and grid for the replacement of a 100 MW gas turbine and which does not produce much more energy than is required for its overall production. In addition, under the current planning till 2050, the amount of disused solar panels, much of which are unrecoverable, doubles the tonnage of today's global plastic waste, along with several million tons of non-recyclable plastics from disused wind turbine blades each year. By 2030, more than 10 million tonnes of batteries per year will also become waste [23].

For this reason alone there arises the question how useful it is to shut down a conventional power plant that op-

erates with a significantly higher efficiency and therefore also less CO_2 emissions than excavators and caterpillars used in mining, foundation or grid expansion. For the environment and also the climate further operation of a conventional power plant is the much gentler option than setting quotas for electricity-generated fuel.

Biomass: In this context, it is also instructive to point at the paradox of wood biomass as CO_2-neutral energy source . Due to the extensive grants Germany has become the world's largest sales market for wood pellets. Between 1999 and 2008 alone, around 100 000 pellet plants were installed in private households. Coal-fired power plants are also being converted to pellet operation and entire forests are being cut down for this purpose, since up to 850,000 t of wood per year is needed to operate a single power plant block.

Such plants are considered to be climate neutral, as the idea is that the combustion of wood is only part of the CO_2 cycle. Without doubts it is true that trees that are burned have previously absorbed CO_2 from the atmosphere and thus do not emit additional CO_2 into the environment, such as the consumption of coal and oil. But for an overall balance it must also be taken into account that at the same calorific value of biomass emits two times more CO_2 than coal and even 3.6 times more than natural gas.



Also the short-term release of these emissions and the slow re-growth of biomass over 50 to 100 years, which reduces the absorption of CO_2 over this period, have to be taken into account.

Recent research shows that the uptake of CO_2 by the biosphere is significantly higher than previously thought, and it confirms that this increased uptake is mainly due to the increased CO_2-concentration in the atmosphere (Haverd et al., 2019 [25], see also Harde [6, 7]).

Although such biomass power plants and heating systems are now producing significantly more CO_2 than before, energy companies and homeowners are allowed to claim that they have reduced their emissions. Cars which will be supplied with a wood gasification unit in the future, will also contribute to the greenhouse gas reduction rate for the transport sector, and owners can still expect funding from the state. Therefore, it must already be allowed to ask, *how useful support programmes and laws are to save emission quotas, which are downright counterproductive to the intended objectives*.

6. Expected Costs of an Energy Transformation

Already the current costs for purchasing emission certificates and particularly the immense expenses for replacing the nuclear power plants that have already been shut down, as well as the many local restructuring measures have already developed to one of the most expensive energy supplies worldwide for industry and customers. While at the turn of the millennium the price of electricity for households in Germany was not more than 13.9 €C/kWh, it climbed up to an all-time record of 31.47 €C/kWh in 2020 (Electricity Report [26], Society for Consumer Information [27]). This is an increase of 125%, which is primarily caused by a tripling of government charges such as taxes and fees for renewable energy from 5.2 to 16.8 cents.

More than half of these government charges contribute to the price of electricity (52.4%). But obviously this is not enough. The decision to further levy on CO_2, in 2021 with an initial price of 25 €/t CO_2 and further rising to 35 €/t by 2025, this will have a direct raising of the electricity prices. A further significant increase of up to 180 €/t is already intensively discussed.

However, all this is not nearly enough to realize an energy transition as planned. According to a recent study of 2017 (Ausfelder et al. [28]), which was carried out by various German institutes on behalf of the Federal Government, a reduction of CO_2 emissions by 90% till 2050 will cost additional 4.5 trillion €, and a reduction of 100%, as envisaged under the German Climate Change Agreement, is expected to require another 3 trillion € (see also Vahrenholt & Tichy [29]). Together, this is more than 3 times as much as the current debts of the Federal Republic

of Germany with 2.35 trillion (10^{12}) € and about 21 times the normal state budget (360 billion €).

Without a further increase in current debts, which is already leading to an irresponsible burden for future generations (there will not always be a zero-interest-rate policy, and a state cannot live on credit forever, unless it seeks a national bankruptcy and currency reform), these extra costs for implementing the energy transition will be borne by the consumer.

With around 40 million households, this leads to an additional charge of € 188,000 per household or € 520 per month and per household over 30 years (excluding additional interests), this in addition to the high energy costs that already exist.

In order to achieve climate neutrality by 2035, as demanded by "Fridays for Future" and also by the Alliance 90/The Greens at their Party Congress on 17 November 2019, even burdens for each budget of € 1,040 per month would have to be charged.

For schoolboys and schoolgirls, who visit demonstrations to have some action and to participate in an event without really understanding for what they are demonstrating, this still may be excused, but politicians, who are undoubtedly often misadvised unilaterally or deliberately by lobby groups, including scientific representatives and organisations, should seriously review their political decisions, as they are ultimately responsible for the consequences of their policies.

Yet all these upcoming expenditures are far from a guarantee of an ever realizable zero-emission supply of sufficient and reliable energy as presupposition for an industrialized country.

7. Closing Remarks

An energy transformation away from fossil fuels to so-called clean energy is based on the idea that humans with their CO_2emissions can control the climate and thus also save the world. This is an absolute delusion. Since there is weather on Earth and thus also climate, which is determined by internal and external natural influences as well as feedbacks. We would have to control the Earth's orbit or solar activity to have a significant impact on our climate. Over millions of years, even with much larger variations in the CO_2 concentration or temperature than currently observed, the climate was always stabilizing itself by internal control processes.

So far, there is no real evidence for the hypothesis of exclusively anthropogenic global warming. Just opposite, we have many indications that the whole biosphere is developing more successfully at higher CO_2 levels and also at slightly higher temperatures (Wong [30]; Morison&Lawlor [31]; Zhu et al . [32]; CO_2 Coalition [33]).

Nevertheless, larger groups of our population, the media and especially our political representatives are now indoctrinated by some organizations and associations, which either of ideological conviction, of political interests or against better knowledge have decided to spread out, the only way to save the Earth, is *to stop all CO_2 emissions*,

- this only based on extensive speculations and hypotheses,
- irrespective of the unimaginable burden on consumers and the industry, and
- regardless of the catastrophic consequences for the economy, the social system and the environment.

At the same time, countries such as China or India are replacing our saved CO_2 emissions within a few months with their further rising rates. And to justify the use of green energy, the emissions released overseas from the extraction of materials are often embezzled.

A real climate delusion has developed, which is spread by the media, many politicians and now also by our educational institutions all over the world. It is the belief that we live in a world threatened by perhaps the most important and harmless molecule that nature has given us, the carbon dioxide molecule (see CO_2 Coalition [33] and Jay Lehr [34]). Instead of being grateful for this gift, which only allows us to survive on our planet, some people have decided to demonize CO_2.

Nearly half of the residents living in developed countries, meanwhile, believe in the narrative of an endangered planet and demand a changing economic and social system. These people have only experienced a steadily increasing prosperity and secure care, but have never suffered from misery and renunciation as found in many countries of the world. All too easily, they forget that it is only a secure and inexpensive energy supply that has enabled our current standard of living, which so many people from developing countries yearn for.

Obviously, we are controlled by a human instinct that wants to be served again and again. When we have survived horror, deprivation and suffering, we are displacing all of this and, above all, we remember the positive events. When we are living as well as ever before, we are displacing what has been achieved and are particularly receptive to disasters and horror scenarios.

But the claimed strong influence of CO_2 on our climate with its consequences of a dramatic increase in temperature and unprecedented sea level rise, as regularly disseminated by the IPCC, has led to great doubts among a growing number of scientists and climate experts about the IPCC's representations. Most scientists do not deny a greenhouse effect, but the size of the anthropogenic part of it and its dramatic impact on our climate.

It would be an irresponsible environmental and climate policy to continue to ignore serious, peer-reviewed scientific publications that show a much smaller human impact on the climate than previously thought, while at the same time shutting down a well-working conventional energy supply without having an adequate replacement. Our economy and quality of life depend sensitively on a reliable, adequate and affordable energy supply. This cannot be replaced by millions of wind turbines that destroy our nature and shred trillions of birds and insects.

Instead, a real alternative energy supply should be considered. So, the latest and extremely safe nuclear power plant technology (Generation IV) helps to significantly reduce our demand for oil, gas and coal - not for climate reasons but for resource savings -, and this technology is also able to process nuclear fuel assemblies from older nuclear power plants to solve the problem of radioactive disposal (Institute f. Solid-State Nuclear Physics [35]; Joint Research Centre [36]; Ruprecht & Lüdecke [37]).

That is why there is an urgent need to refrain from a law which requests further saving of CO_2 emissions in order to avert further damage to the economy and the entire German population. Even the previous version of the EEG law (Erneuerbares-Energie-Gesetz)have led to a swamp of regulations and subsidies and is not based on physical or technical foundations. This has nothing to do with a free market economy, only with an ideological subsidy policy, which has driven the energy prices up to the forefront worldwide. In order to further speed up this destructive process, even the use of renewable energies is now intended to serve as "public safety", as stated in the new draft EEG law. Does this public safety serve to replace a secure energy supply by volatile energy with devastating effects on people, fauna and flora?

It is imperative that future decisions on energy and climate policy are questioned more critically and are again based on facts and reliable findings.

On the occasion of the G8 summit in Heiligendamm in 2007, Federal Chancellor Helmut Schmidt made an apt comment:

Up to now the reasons for the diverse climate changes have not been sufficiently researched. And there is absolutely no reason to believe that this will not continue. But to get upset about it and to think that this change could be stopped by the human being by a joint decision in Heiligendamm, that is pure hysteria, this is stupid stuff.

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