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**On Climate Neutrality**

"Climate neutrality" in the entire EU (European Union) can be achieved as early as 2030 by 2035, if the EU wants it and does so with smart political decisions on its own and without the burden of mammoth conferences, such as the recent one in Glasgow.

As an experienced auditor at the corporate level, publicly appointed and sworn expert for many years and additionally EUROCERT certified expert since 2012, and a critical observer of climate policy since the Paris Agreement, I will show you the way to get there. Interested readers will find my contact details in my other pages: [www.Schiedsurteil.de](http://www.Schiedsurteil.de) [www.Mietnebenkosten.com](http://www.Mietnebenkosten.com) [www.Waermelieferung.de](http://www.Waermelieferung.de) [www.Heizkostenverordnung.de](http://www.Heizkostenverordnung.de) [www.Baurevision.com](http://www.Baurevision.com)

With this contribution I wish to initiate a technical discussion, without ideological blinkers, that could build up a strong pressure on politically actors to make decisions for really reaching climatic neutrality in the European Union. And I am looking for contributors with good ideas who are also prepared to translate the results of their work into other EU languages. If you are interested in contributing to the costs, even with a small contribution I would be grateful if you to pay to IBAN DE88 4401 0046 0211 6824 64. Account holder: Adolf Krohn.

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Saving the world's climate and thus ensuring the survival of mankind our planet cannot be accomplished by what was discussed in the earlier mass events in Kyoto and Paris or by the attempts of the 2021 Glasgow conference. In Glasgow, compromises are emerging of non-binding declarations to phase out coal burning. Central again is the desire for money transfers from the rich to the poor countries, which in fact has taken place since Paris. But the transfer of money has money has done nothing for the global climate. The central cause of the climate catastrophe deplorably, is the increase in the world's population to 16 billion people in 2100, an increase of 5 billion in the last 70 years, has been completely ignored.

At the end of this article, I will show that what the EU intends to accomplish on its way to climate neutrality can be implemented in other regions long before the EU and mitigate the climate catastrophe. But the crisis cannot be fully prevented simply because of the unbridled growth of the world's population of which the UN estimates that it will reach as much as 16 billion people in 2100 – unless, drastically speaking the world of viruses stops this with infections against that, in contrast to Corona, no vaccine is invented.

Money transfer from the rich industrialized countries to the poor developing countries as practiced repeatedly after Paris, will not be effective because no control of use of these funds has been agreed upon – and, judging from previous experiences with uncontrolled development aid, it would just bring additional sales to the worldwide manufacturers of expensive cars and other luxury goods. The world climate will not benefit. In fact, the outlook for the global climate has worsened significantly since the Paris Agreement.

It looks like that without increasing pressure from young people in various organizations, not much will happen politically. We already hear the battle cry of the youth: "We are here, we are loud, because you are stealing our future". This is a far better description of the situation than anything that the full-time functionaries of other large organizations have produced so far with their ideological fixations.

The unrestrained multiplication of the world population to an extrapolated 16 billion humans in 2100, of which we already have about 8 billion remains THE substantial cause for the climatic disaster which is developing. This increase of the world population is mainly taking place in the developing countries and is being driven by money transfers from the rich to the poor countries which rather accelerates this growth.

Examples:

Madagascar had 9 million inhabitants in 1980 and in 2020 already 22 million

Afghanistan had a population of 19 million in 2002 and 33 million in 2020.

Ethiopia had 34 million inhabitants in 1980 and in 2020 already 99 million

Egypt had 41 million inhabitants in 1980 and in 2020 already 99 million

Sudan had 19 million inhabitants in 1980 and in 2020 already 44 million

DR Congo had a population of 25 million in 1980 and 87 million in 2020.

Indonesia had a population of 147 million in 1980 and 261 million in 2020

Bangladesh had a population of 80 million in 1980 and 156 million in 2020.

Pakistan had a population of 80 million in 1980 and 209 million in 2020

India had 699 million inhabitants in 1980 and in 2020 already 1367 million

Brazil had 119 million inhabitants in 1980 and in 2020 already 212 million

Senegal had 6 million inhabitants in 1980 and in 2020 already 19 million

Mali had 7 million inhabitants in 1980 and in 2020 already 23 million

Algeria had 19 million inhabitants in 1980 and in 2020 already 43 million

Burundi had in 1980 = 4 million inhabitants and in 2020 already 13 million

Rwanda had a population of 5 million in 1980 and 13 million in 2020.

In Rwanda, the genocide between 1994 and 1996 led to a short population decline of about 1.3 million people. The loss was more than compensated in the following years.

It is legitimate and understandable that some poor countries, as shown in Glasgow, misuse climate change for problems of their own making with the intention to obtain as much capital from the rich countries as possible without giving anything in return. However, it is also true that each of the nearly 8 billion people, if they have something to cook, emits climate-damaging gases during cooking and, after digestion, methane gas, which is 10 times more dangerous for the atmosphere. India rightly pointed out in Glasgow that it would not be possible to sign an agreement on the abandonment of coal burning. This is basically true for all poor countries that have neither gas or oil, but which have coal or can buy it cheaply on the world market. Australia, Indonesia, and Russia, with about 900 million tons of coal exports do not want to do without it. Also, the coal importers such as China, India, Japan, and South Korea with approx. 800 million tons cannot and do not yet want to do without this energy.

There is a clear link of this population growth. Without a reduction in population growth in the developing countries, it will not be possible to prevent the global climate crisis. In the rich countries there were and there are many "social romantics"- people having „romantic” view on social developments, who believe that, for example, education can help to reduce population growth in less-developed countries. In these understandable considerations it is overlooked that the way to the improvement of education, and reduction of population growth took several hundred years even in Europe. On this long way, the West has achieved a way of life with cars, airplanes, and air conditioning – which also is the understandable goal of the people in the poor countries.

There are ways for developing countries to achieve orderly living conditions. But presently, many resort to emigration and flight. The understandable desire for Western lifestyles in the poor people suffering from poverty leads families in Central Africa, for example, to pooling all their money and even taking out loans to enable at least one family member to escape to Europe. This is often connected with the dream of later family reunion, transferring the rest of the family to the supposed paradise – with such family reunifications having been extended by political dreamers of a certain political direction in Germany to grandparents and other relatives. I estimate that on the 4000 kilometers from Central Africa to the Libyan coast died of thirst, 99 % of the vagrants were killed by two- or four-legged predators or for other reasons failed before reaching the coast. Out of the 1% share of refugees reaching the Libyan coast, who, despite professional support by escape helpers with the support of drones for sighting a ship would only reach dilapidated boats with little fuel in the tank, many are intercepted and returned by the Libyan coast guard. Even more drown as fuel supply is too low or the boat too decrepit. Only very few arrive in and possibly eke out a living as poorly paid seasonal workers in plantations in Italy, and young girls serve as prostitutes, including in Germany. The attractiveness of boats for refugees has a long history since it took place off the coasts of Vietnam. And, here, also, many Vietnamese were caught before reaching the offshore or drowned off the coast when cruising. At some point the whole haunting was put to an end by the Vietnamese. The luring ships were pushed out of sight of refugees by extending territorial waters to 12 miles out of visibility for refugees. Drones to search a ship which would be waiting outside the territorial waters of 12 miles offshore had not yet been invented.

Terrible wars, which had a regulating function on the number of people in Europe over centuries besides viruses and hunger, do not longer have that effect. While wars took place in the last decades in many developing countries, they did no longer have a substantial effect on population numbers. Large wars between the most populous countries are different than in WW II because of the threat of atomic weapons and they do no longer play a role for the population development. That role was taken over by viruses like the Spanish flu 1918/1919, Ebola, HIV and at present Corona. But vaccines that are being developed and made available at an ever-faster rate, will very likely ensure that viruses no longer regulate the world's population as did the Plague (the Black Death) in the Middle Ages. Beginning in the year 1348, the Plague killed about a third of the population of Europe.

On another end, even if the EU, when adopting an ingenious strategy, becomes climate neutral in the next 15 years, there are many countries that will suffer from climate change: Bangladesh, many island states, but also parts of Indonesia, the Netherlands and the northern German coastal regions will probably have to be abandoned in the next 50 years despite highly developed hydraulic engineering. The effects of climate change will not be able to be stopped at the EU's external border, contrary to the many, probably somewhat simple-minded politicians who are speaking out loud. Some politicians in Germany, arguing on this simple-minded level, recommend national measures, requesting to get out of coal production as soon

as possible and even far before that to give up nuclear energy even though atomic reactors do not cause emissions and although France wants to have this recognized as so-called green energy. There is certainly only a minority in Germany that believes that the effects of climate catastrophe will be prevented by German customs officers from crossing the border. But it is as well simple-minded if citizens believe that if they conclude a supply contract with the electricity supplier for ecologically generated electricity (hydroelectric, wind, solar) at higher prices, that such electricity will also come from the respective socket they use. They neglect that the electricity drawn from the public grid comes through the European interconnected grid (RG Continental Europe [UGTE]), into which the nuclear power plants, coal-fired power plants, but also the hydroelectric power plants, solar and wind power plants operated in Europe feed the electricity they generate. It is quite easy find out about this on the Internet, but many of the "ecologically purchasing citizens" who are probably just dreaming and who buy their good conscience through higher prices, have never done this online research. One might compare that to the disregard sale of indulgences which has appealed to the same regions of people's brains.

Germany's citizens are kept in the dark about the fact that Germany only wants to phase out its own coal production. The import of hard coal for the operation of our coal-fired power plants, with almost 26 million tons in 2020 for the purpose of combustion, continues. Another 107 million tons of lignite from our own production were still burned in a climate-damaging way in 2020. These facts are known, but the dreamers and those whose only profession seems to demonstrate in the streets, never want to really find out, similarly to their disregard of numbers concerning the use of electricity generated with nuclear energy from nuclear power plants in France, Belgium, the Czech Republic, etc., which is supplied to Germany via the European interconnected grid. The import of nuclear energy from France will inevitably increase after the shutdown of the last of our nuclear power plants. Politicians in Germany, for ideological reasons mixed with election tactics, made the decision in 2012 to shut down the last nuclear power plants in 2022. France decided to build new nuclear power plants in 2021. Back in 2012, the CDU candidate in the state elections in Baden- Württemberg failed to win votes the votes over the promised closure of nuclear power plants because of Fukushima. Voters probably knew for the most part that Baden-Württemberg was not threatened by a Pacific tsunami like the one in Fukushima. But what happened was that the Green party won the elections - a different kind of tsunami, sweeping the CDU candidate out of the office in 2012. They won through a costly, inconclusive, and additionally climate-damaging election campaign which appealed to the mindset of "angst".

The way out is sought through the compelling but not necessarily intelligent idea of increasing gas imports from Russia with the second gas pipeline through the Baltic Sea, which has been completed in the meantime. The argument is that this additionally imported natural gas will be used as "bridge energy" until sufficient renewable energy is available. Combustion at the expense of the climate as a recompense for shutting down nuclear power plants that do not produce climate gases? This is simple-mindedness of which one might think that it only characterizes politicians of a certain stripe. But what is even more serious is that the acting politicians have consciously accepted the dependence on a Russian despot. Or still more seriously, they may not even have noticed that the natural gas storage facilities in Germany are just enough to meet the consumption of 80 days and that 50% of these storage facilities in Germany are owned by the Russian monopolist of Gazprom. Natural gas storage facilities for a consumption of not less than 6 months are absolutely necessary for balancing consumption peaks, e.g., in the winter half-year. Germany has facilities of its own for 40 days storage, which have probably not been sufficiently filled due to political planning that involves Russian interest in Gazprom. It is almost inconceivable that no one has

considered an increase of the storage capacities in the numerous salt domes in northern Germany which could gas for to a two-year consumption and would thus reduce the vulnerability to being blackmailed. If the pipeline goes into operation as planned, Germany will be dependent on the Russian despot for 62% of its natural gas imports. This despot can not only play at the gas tap, but it is well known that he has been causing unrest in Europe for many years with his hybrid warfare in Ukraine that took a great number of casualties. Even a passenger plane from the Netherlands with 325 people on board was mistakenly shot down by a Russian missile as part of his hybrid warfare over Ukraine. The fact that he is now allowing refugees to be imported from Belarus especially for the purpose of bringing them to the Polish border is a clear mark that he wishes to continue his special warfare against the EU's external border, and it shows the extreme danger of this dependence. Also, the ruler of Belarus - another despot - while playing with the fate of the refugees at the Polish border, is already playing with the gas tap, which he can probably only dare to do with connivance from Moscow. For Germany, intensive storage expansion should be a mandatory prerequisite before putting the new gas pipeline into operation. Salt domes are more than abundant in Lower Saxony for the construction of gas storage facilities. But demonstrators who just make it their profession to obstruct will travel nationwide for the purpose of preventing these underground non-visible storage facilities (as they have done against using them for atomic waste). However, if German politicians decide to start construction of these storage facilities, they could also control these demonstrations by new legal rules. There is much less risk in solar farms and wind farms in North Africa that have been contemplated for many years even without international legal safeguards, than depending on a despot in Russia.

Other ideas of national unilateralism include reducing private transport by increasing the use of regional public transport. In the last federal election campaign in 2021, the fact was not addressed that regional public transport only works to a limited extent even in metropolitan areas, and that it is almost completely absent outside metropolitan areas. Those who think of the good old stagecoach days should be reminded that the four pulling horses also produced methane gas during their digestive processes which is 10 times more harmful to the atmosphere than emissions from fossil fuels - not to mention the passengers who then need 14 days to travel from Hamburg to Munich and who also necessarily release methane gas into the atmosphere via digestion for two weeks.

There is also the new talk about green hydrogen. One might say that those who bring this up just do it for the purpose of obtaining research subsidies, because according to current knowledge it will never be possible to produce sufficient quantities of this fuel at market prices in the EU. And setting up a sufficient and safe infrastructure for charging vehicles for the highly subsidized e-cars at some point in time that enables them to carry out long-distance journeys will still take time. So far, there is only infrastructure for regional transport. And the battery technology that is required for long-haul has not yet been invented. According to the current state of science, it cannot even be ruled out that the battery technology required for long distances > 700 km will come up against physical limits and will therefore never be developed. What remains then would be the expansion of hydrogen technology or the continued use of the already developed, ever better and more climate-friendly internal combustion engines. Hydrogen, however, can only be produced economically in the Sahel with solar power or in comparable regions with high solar radiation, such as Egypt, but not in Germany, and by no means in a climate-neutral way.

All these measures were among those discussed in Glasgow, which altogether are not even worth the i-dot on the word climate catastrophe against the background of the increase of the world population by 210 per cent in only 70 years. The world population in 1950 was 2.54 billion and by 2020 it is already 7.79

billion - an increase of 5.25 billion people in just 70 years, each of whom emits harmful greenhouse gases at the expense of the climate. According to the UN's projections the world population will break through the 10 billion mark as early as 2050, with a figure of 11 to 16 billion people on the horizon by 2100.

It is understandable that with this extreme increase of the world population, chances become spatially slim for rain forest areas, but also for wild animals. The fact that rainforests in Brazil are being cleared to sell cultivated soybeans as cattle feed to Europe is just as well known as the development of palm oil plantations in Indonesia, which are being planted after deforestation to produce palm oil for export to mainly Europe. This is not to blame the people who live there, and who have to make an income. In the two countries the population has increased in only 40 years, to around over 200 million humans. Considerable funds, especially from Germany, have flowed to both countries to protect certain forest areas – without any results, as has been shown through an on-site-research in 2021. In total, 480 million people need to be fed in both countries. When it comes to feeding 480 million people in Indonesia and Brazil, the preservation of virgin forests can no longer be of any significant importance. It is utterly hypocritical that developed countries demand the primeval forests (lungs of the world) to be preserved: It is these countries which themselves import both the wood of the former primeval forests but also the soybeans. In the importing countries, the soybeans in turn serve as cattle feed for the domestic livestock industry and then they export large quantities of meat worldwide. This meat production in turn requires digestion processes that are connected to the formation of methane gas, which is more dangerous for the climate by a factor of 10 than CO<sub>2</sub>. There are new ideas in the political environment which aim at reducing national meat consumption via the price, to switch to organic meat or to prescribe meat-free days. All this will certainly not help the global climate – neither would it help if organic farmers pray together with their animals before slaughter. Our reduced meat consumption will certainly not change the rapidly increasing overpopulation which is the main cause of the climate catastrophe.

Another problem that is already showing effects is the thawing of permafrost soils which releases large quantities of harmful climate gases such as methane or carbon dioxide. Permafrost soils account for about 25% of the Earth's surface. According to current knowledge, this thawing process will continue unless effective countermeasures are taken. There is nothing on this in the repeatedly commented Glasgow papers referring to the 1.5-degree target – whose content is largely “waste-paper” as that target cannot be achieved with the declarations of intent they include. But it could nevertheless be possible as will be shown in the following.

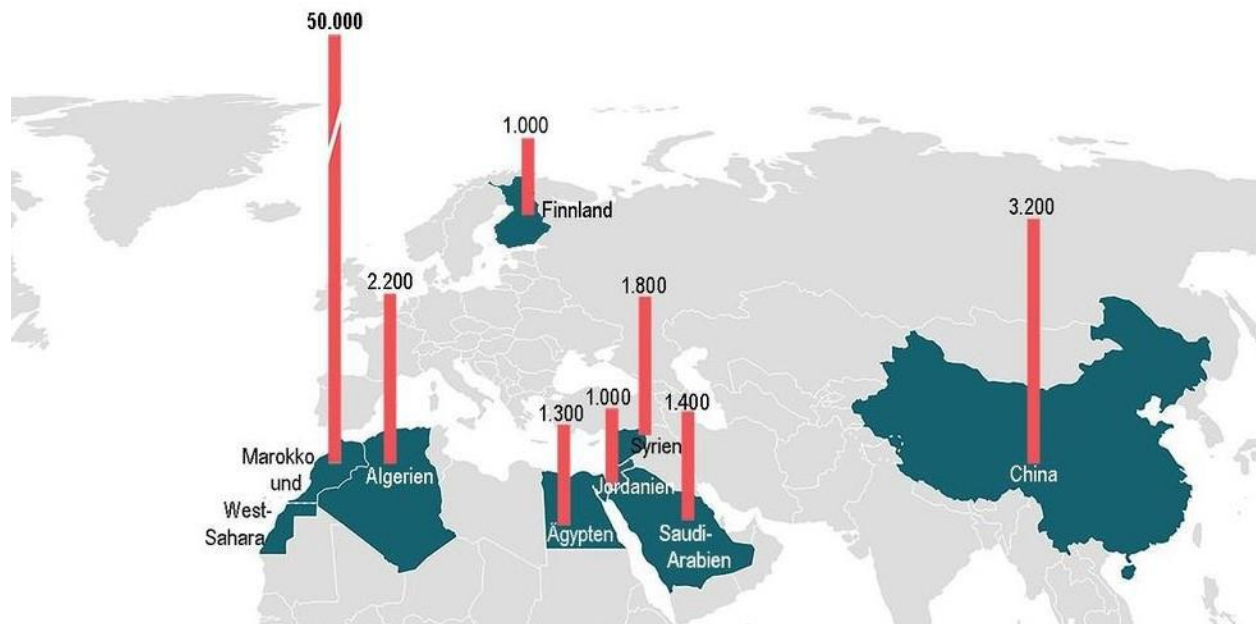
The EU will someday find out that mammoth conferences like in Kyoto, Paris or 2021 in Glasgow will lead to success and it will discover (perhaps only after 50 years or later) that this was a misconception. At that time the North Sea will already have taken large parts of the coastal regions including parts of Hamburg, Bremerhaven, and Wilhelmshaven. The Netherlands might have been reduced to half of itself in spite of its highly recognized and well-developed hydraulic engineering. What will be left of many countries like Bangladesh and Indonesia will be remainders only, not to mention the many island states, which shall completely disappear and will only be traced in old atlases. There are already scenarios around which calculate that the sea level might rise by up to 7 meters if the ice is lost due to global warming.

The latter will not only bear disadvantages. In Greenland, in the Antarctica and Siberia quite a few mineral resources would become extractable - of which some are already known, and many more are assumed to be in the ground. With their commencement well before 2020, the thawing of permafrost soils has increasingly developed new attractive agricultural areas which may become Russia's new breadbasket

before 2040. The agricultural land that is progressively lost in the Southern hemisphere due to drought would thus be replaced by newly created fertile soil in the areas of thawing permafrost.

Things can also turn out differently, though if, for example, the Gulf Stream which is a gigantic warm water heating system for Northern Europe and Canada, is disturbed by the warming of the oceans and takes a different course. Temperatures in Scandinavia, Canada and parts of Russia would drop seriously. The Potsdam Institute for Climate Impact Research has long warned that the Gulf Stream system could topple through climate change, with serious consequences for humanity. Then permafrost would reoccur. In the southern hemisphere, agricultural land would be lost to drought, and in the north, no new land would be created on the permafrost soils, and land already cultivated would be abandoned because of the cold. It can be assumed that a serious change in the Gulf Stream would also affect other ocean currents. The world population would necessarily decrease in this scenario. Perhaps only 2 billion people would survive such a consequence of the climate catastrophe. Nobody can really predict this, but what can be predicted is that the climate catastrophe will come if the world population continues to grow and reaches or exceeds 16 billion in 2100 already.

If policies do not change, Africa, which has been unable to feed its population adequately for years, will double its population to 2.5 billion people by 2050 and the proportion of hungry people will increase sharply. It is conceivable that insufficient food supplies will intensify warlike conflicts. All this will be unavoidable and any great efforts that national governments will take are doomed to fail because of the doubling of the population. From today's perspective, it can also be assumed that the terrorism spreading in the Sahel and Nigeria, for example, by IS (Islamic State) and Boko Haram, will continue to develop expansively. In that regard there only is one positive development which is that the "Frente Polisario" has largely been defeated militarily by Morocco; scattered remnants in Algeria, camped out in refugee camps, are meaningless. The Kingdom of Morocco will not take any risks in the foreseeable future because it will want to protect the phosphate deposits of about 50 billion tons in Morocco and the Western Sahara, a big issue of economic interest in the region.



Morocco can and will also defend the oil deposits and fish wealth suspected off its coasts effectively, and it will use military force against terrorist attacks.

There is one which, while not preventing the rise in temperature in our atmosphere not completely perhaps slowed down it considerably, even below the 1.5-degree target set in Paris. The EU can achieve climate-neutrality, even with the inclusion of rising consumption levels, if it succeeds in using part of the more than sufficient solar energy in the Sahel to generate electricity. The electricity generated with solar energy can be fed into the European interconnected grid with low losses through HVDC transmission lines (HVDC = voltage direct current). A simple investigation in the Internet (“Verbundnetz Europa”) will show that even Turkey and Northern Africa are integrated in the grid. With the solar energy supplied by the sun in the Sahel, the entire world demand for electricity, in many cases, could be covered by solar energy alone. This would mean to fully revive the “Desertec” project which had been in the making in the early 2000s and was laid off, among others, for security reasons (see below). In this it would make sense if a portion of the electricity generated by solar power were converted into hydrogen directly on site and, if necessary, transported to Europe by ship. Other than the palavering in certain political circles who dream about producing “green hydrogen” on a national base, the sources in Northern Africa would actually and almost limitlessly be available and produced in a climate-friendly way.

Technical solutions for solar power generation on a large scale through various types of processes are at a mature stage. There are significant production plants already in Spain, Portugal, Morocco, and many other countries. When it comes to wind-energy, perspectives are very promising in Africa which is well suited for large wind farms in many of its regions, and they have already been built in various African countries.

Solar plants in Germany have been mainly highly subsidized - which means that large sums of money are wasted as there is no remedy whatsoever against the low amount of sunshine hours and the low intensity of the radiation. Germany has a lot of experience with this subsidy insanity - just look at the history of subsidies for the extraction of hard coal since about 1965 with about 300 billion DM. From an economic point of view, hard coal mines should have been closed permanently as early as 1965 when the first free shifts were introduced for the purpose of reducing output. However, the plants continued to operate and employed mainly guest workers from abroad. The plants, for employment reasons, had to stay open which also meant to keep the pumps running forever for getting rid of the water to prevent that the Ruhr region turns into a lake district. And what also was done in recent years was to fill the shafts instead of intensively investigating how they could be converted into gigantic pumped-storage plants using the shafts and the existing rivers in the Ruhr region. Research on this at the Ruhr University in Bochum and research by the University of Duisburg can be found on the Internet.

Powerful HVDC lines have been in use for decades and are also essential for the operation of the European interconnected grid in Europe. Since 2016, Turkey has been connected to the European interconnected grid via three 400 KV lines, mainly as a feeder, without using HVDC technology. With the longest HVDC lines in Europe, hydropower-generated Norwegian electricity is delivered via submarine cables to Holland and to Germany. The North-link HVDC line with a submarine cable length of 516 km between Wilster, Germany and Tonstad, Norway did not go into operation until 2021. But the HVDC line from Eemshaven, Netherlands to Fedaa, Norway with 580 Km of submarine cable length has been in operation since 2008. A third line between Norway and Germany is planned. Also in the North Sea, 12 HVDC lines for connecting wind farms are already in operation at Tennet and three more are under construction. Without the many HVDC lines in the interconnected grid, we would probably have been sitting in the dark for a long time when there was no wind in Germany. HVDC lines are operated on all continents. They are less costly than submarine cables, but many of these are currently under construction. The longest submarine cable in the world was put into operation in China in 2012 with a length of 2059 km. Above-ground cables are much more common around the world and distribute the electricity from the huge dam projects that have



been built in Africa, Brazil, and China, for example, into the power grids. HVDC lines from Africa to Europe have neither been laid as yet nor are there any factual plans to build them, but they are required if the EU wants to feed significant amounts of solar energy from North Africa into the European interconnected grid. Calculated line losses of 14% over a distance of 5,000 km from Africa to Europe are economically justifiable because of the low price of solar and wind energy in Africa. There are already HVDC connections between Italy and Greece and from Italy to Corsica and Sardinia, which could be extended through the Mediterranean to Africa if necessary. A connection via Sicily or Gibraltar can be realized easier than the HVDC lines in the North Sea between France and Ireland, Norway and England, Denmark and the Netherlands, Italy and Montenegro or the HVDC lines crossing the Baltic Sea between, e.g., Sweden and Lithuania.

Technologies for low-cost hydrogen production on site in Africa from solar power are also technically mature. This is the only one economically feasible way for the EU to obtain hydrogen from solar power. The use of solar energy from the Sahel in Africa was already fundamentally thought of from the early 2000s and the Desertec consortium was built for this in 2009, but the plan failed in 2014 due to, among others, security concerns and the limiting of financial resources from the partners, of which there was a big participation from large German groups. There were also many social romantics in Germany who already wanted to assign development aid to Africa for distributing the electricity that had not yet been produced. The withdrawal of corporations from financing may also have been influenced as part of a risk assessment which took account of the increasing terrorist activities. The climate catastrophe, which subsequently became more of a topic of discussion, was probably not a focal issue at the time, but the absence of military power for protecting their investment would still deter private-sector companies.

If the EU, building on the ideas from 2009 to 2014, wants to achieve its own climate neutrality, this can succeed if, for example, Mauritania would be integrated into a development partnership. Mauritania has a total area of 1,030,700 square kilometers and between the Western Sahara and Mali there are areas of about 300,000 square kilometers which are very sparsely populated, excellent for solar use, but also for wind farms. The EU could easily raise, probably even without interest, the initial capital in excess of some 100 billion euros that would be needed for the construction of huge solar plants of no less than 5,000 square kilometers, including the line connections to Europe. Further investments in solar power generation must follow. Of course, wind plants can also be realized in Africa which, depending on their location, produce comparably energy much more effectively than offshore plants in the North Sea, and they could be built much more cheaply and without the constant harassment by professional demonstrators who are active everywhere in Germany. Such significant investments and the dependencies of the EU on a functioning energy supply presuppose that, within the framework of the envisaged development partnership with Mauritania, the EU is contractually assured through a binding, permanent exclusive right of use under international law for the very sparsely populated areas between Western Sahara and Mali, including the port of Nouadhibou which is to be destined to ship the hydrogen overseas. But it must not be overlooked that for enabling the EU to use a maximum of 50,000 square kilometers of the approximately 300,000 square kilometers of usable area for solar and wind energy production in the long run, protective areas along the Malian and Algerian borders have to be built with a width of not less than 100 km for providing fully automated defense of the facilities against anticipated terrorist attacks. The technology has already been developed at EADS, Munich and reliably protects the borders in Saudi Arabia, among other countries, against terrorist attacks.

In the following a contribution is reproduced where the entire solar potential of the Sahara is depicted by Al-Habaibeh, head of the Innovative and Sustainable Environmental Technologies (iSBET) research group at Trent University. Al-Habaibeh looks at the global demand which will be just below 1 billion gigawatt

hours in 2022 even if the EU massively engages in local production of hydrogen to provide an alternative to e-mobility (of which one must say that the plan has not yet been fully thought through: Even though hydrogen propulsion, unlike electric propulsion, can be fully employed for longer distances, it is highly questionable if a safe infrastructure for refilling the gas tanks can be built).

Here are the big plans Al-Habaibeh has for the Sahara whose potential, according to the researcher, is enormous. His paper in the specialist journal "The Conversation" says<sup>1</sup>:

*The sun in the Sahara is strong enough to provide sufficient solar energy for the entire planet. With its area of 9.2 million square kilometers, the Sahara would be the fifth largest country on Earth, ahead of Brazil and just behind China and the USA. According to calculations by the U.S. space agency Nasa, each square meter receives between 2,000 and 3,000 kilowatt hours (kWh) of energy per year. With an area of 9,200,000 km<sup>2</sup>, that would be 23 billion gigawatt hours per year (based on an average of 2500 kWh). That would be more than 35,000 times Germany's electricity generation in 2017.*

Development partnership would imply that Mauritania also benefits, and this must be negotiated between the EU and Mauritania. If the more densely populated of Mauritania South of Atar in the direction of Senegal is upgraded both economically and socially, this can have a model function for many more countries in Africa. Well-founded partnerships, starting from the example of Mauritania, can lead to a pacification in other African countries through sufficient energy supply and thus trigger positive economic development throughout the region. If other countries in neighboring Africa can use the pipeline systems built by the EU to and from Europe for electricity trading at its operating costs, and if a stable supply network for electricity comes into existence for all countries in Africa, the EU will have achieved a worthwhile goal addition to achieving climate neutrality. The countries of Morocco, Algeria, Tunisia, and Western Sahara are already hook up to the European interconnected grid via an AC link in Spain. But reinforcement by one or more HVDC lines is mandatory if the EU will push the use of solar energy in Africa. It would make sense for a grid company to be established in North Africa after the European model and to enter into close cooperation with the European interconnected grid.

Africa has the opportunity, when it makes diligent use of the efforts to produce and employ solar energy, and also because of the gigantic reserves of natural resources, to develop economically and to limit the poverty factor of the unrestrained population increase. But this will take decades even with the greatest effort. There is a lasting effect of the devastating impact produced by Catholic missionaries who have haunted the minds of many people in Africa: They and were and still are directed against birth control. We had this effect in Europe for many decades along the same lines.

Economic advancement without defeating the spread of terrorism militarily will also not be possible. However, Africa must also find its own way, and this must be a way that is compatible with its rich culture. The politically stable Kingdom of Morocco has set an example by pushing the "Frente Polisario," back into the Algerian refugee camps with great military success and terminating their year-long explosive attacks on phosphate production facilities in the Western Sahara.

The EU's negotiations with Mauritania, if ever they are taken up, will be difficult and a realization the development partnership may not be come about at all. However, the EU can alternatively focus on the area of the Western Sahara, which is more than sufficient for the EU's energy supply. But it will have to wait until the phosphate deposits have been extracted in some of the mining areas and then negotiate

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<sup>1</sup> Al-Habaibeh, A. (2018. "Should we turn the Sahara Desert into a huge solar farm?". *The Conversation*. <https://theconversation.com/should-we-turn-the-sahara-desert-into-a-huge-solar-farm-114450>

with Morocco. Good results would have the additional advantage that via the Spanish enclave of Ceuta on the African coast, the HVDC lines to Europe can be routed overland in Morocco at very low cost.

While solar power generation in Africa theoretically covers the whole of EU's needs for achieving climate neutrality, the quantities to be fed into the European interconnected grid must be weighed up, following the consumption structure within the EU. It certainly does not make sense to take the electricity generated with hydropower in Norway or Switzerland or the electricity from offshore wind farms off the European grid. As the burning of hard coal and lignite, on the other hand, should be ended in the very short term since it is the most climate-damaging form of electricity generation, not only in Germany but in the EU, attaining progress in provision of solar energy from Africa or at least paving the way is one stringent prerequisite. Without coal fired plants, the imports of hard coal by Germany of almost 26 million tons in 2020 also be terminated. It remains to be seen, then, whether the many onshore wind turbines have a future without subsidies when calculated against the advantage to be drawn from African solar power.

It is without doubt that there are risks that must be taken account of when investing in Africa. But that goes with any investment. In the EU, there are the risks of professional demonstrators who travel a long way for their own pleasure and who are basically against everything and may delay decision-making by politicians. In Africa, the risk of terrorist attacks on plants is somewhat more serious, but this can be controlled through monitoring.

Closer to home we have the fact that burning natural gas or refining crude oil will remain just as indispensable for our industrial production as it is for heating our homes for some time because average temperatures in many countries of the EU will stay low in the cold season. No demonstrations will reduce the cold in the winter. The best way out of burning natural gas or refining crude oil will be to heat the buildings and run the cars with hydrogen using the condensing technology – a fully developed procedure that is available anywhere - or directly with electricity that has been produced in Africa with solar or wind energy in a cheap and climate-friendly way and fed into the European Interconnected Grid via HVDC lines. The already existing grid structure in the European Interconnected Grid with its connection to parts of Asia and Africa, together with the different feed-ins of electricity from all directions of the compass, whether generated from coal combustion, nuclear fission, hydropower, or wind and solar energy represents a wide spread of risks. This can be significantly improved if the EU creates the legal conditions for additional significant shares of the electrical energy required in the EU to be produced in Northern Africa and transported to Europe by HVDC lines. As said above, line losses of 14% over a distance of 5,000 km, which will quite naturally occur, will have no significance in economic terms.

There will be considerable opposition within the EU:

France, with a total of 56 nuclear power plants on the grid, will rightly worry that selling electricity from France to other countries via the interconnected grid will become less profitable and that the desired further expansion of climate-neutral nuclear power generation will also be jeopardized. France, however, would also have advantages because of its traditional ties to Northern Africa.

Poland, whose backbone in power generation is hard coal that is abundant and being mined intensely, will fear business disadvantages if CO<sub>2</sub> levies will increase the cost of climate-damaging hard coal combustion versus climate-neutral power generation from Northern Africa.

Germany, which is known for elements of political show-mastery (plastic waste-value separation, subsidies for hard coal and solar energy, subsidies for bicycle-riding etc.), will have to explain to the citizens that it will not only stop coal production but also the import of coal for the purpose of burning in power plants. This shows how ridiculous the occupation of Hambach Forest has been and which eventually

the woodland to be cleared as part of the Hambach surface lignite mine: The quantity of lignite in question was negligible against the background of imports of hard coal. In 2020, this was still almost 26 million tons of hard coal that Germany imported and burned in a climate-damaging way alongside the 107 million tons of lignite mined in Germany. The rationale of the protesters is comparable to the mindset which led to the decision to close all German nuclear power plants. This closure was decided primarily for election tactical reasons in for supporting the Green party in the 2012 state elections in Baden-Württemberg. A closure decision for election tactical reasons was certainly only possible because this met the interests of many simple-minded professional ecologists - a mindset with which the citizens in Germany have also been successfully duped into believing that plastic waste can be recycled for decades and that cancelling the closure decision for the nuclear plants that are still in operation will mean that Germany will be overwhelmed with atomic waste.

The EU will have to expose the garbage jugglers who tell people that most of the plastic waste is recycled as a resource. In fact, significant amounts of plastic waste are incinerated. An ingenious deceptive plot from Germany was the claim that shredded plastic waste can be gasified after being blown into the blast furnaces for steel production and that this gas draws the oxygen from the ore during combustion. The concept of reduction gas as a valuable material from plastic waste was born. It did not live long. More tragic than the incineration, however, was the export of the waste to poor countries. As a result, significant portions of this plastic waste ended up back in the world's oceans after a long climate-damaging transport across the oceans, either via rivers or directly if the shipping companies found that dumping the waste into the oceans can spare them the long route to the destination countries. Ships for dumping, where the bottom is opened on the high seas to dispose of or better dump the loaded waste have been around for some time. And when the waste really reached its destination in the developing countries and was burned there, it polluted the climate one more time after the long transport. The EU will have to find solutions to burn plastic waste in a technologically complex way without climate pollution, and if this works, the plastic waste disposed of in the world's oceans will also have to be collected, dried, and burned directly. There was already a patent granted for a technique that collects the plastic waste from in the sea. The inventor did not dare, however, to attach a ship to the plant for drying and incineration, most probably for fear of some violent ideologists. The EU has already successfully promoted research projects with many million €, e.g., with the waste economy region Trier (A.R.T). The result is a process for treating household waste with harmless proportions of plastic waste. Instead of direct incineration, which is harmful to the climate, this waste is effectively pretreated and reduced, and the result is a granulated fuel with an energy content equivalent to that of lignite. Such a process with significantly reduced climate damage should not only be financially supported by the EU, but also supported in an appropriate form, e.g., from the income from CO<sub>2</sub> levies on more climate-damaging processes.

Provided that the EU creates the legal framework for its own climate neutrality, it is also conceivable that individual states will become active more quickly than others. And even if agreements for climate-neutral energy generation in Mauritania or Morocco cannot be reached on an EU level, individual large-scale projects could be implemented and secured under international law. Because of the complex grid structure in the European interconnected grid, the climate-friendly energy generated through these projects could be fed into the grid at different grid points. Building one or two very large solar or wind energy parks no smaller than 1,000 square kilometers every year in, for example, Mauritania or the Western Sahara, could be done by Germany alone. Other countries would follow if the investment pays off. Whether this is enough in terms of risk distribution must be decided by the experts at the grid operators, with the involvement of those with political responsibility. The line losses for the possible line lengths through the Mediterranean Sea are less than 10% if they are implemented as HVDC lines. If these

cables are routed via Gibraltar, Sardinia, Corsica and Sicily, the share of submarine cables and the total costs can be significantly reduced.

Let us assume that the EU has achieved climate neutrality by 2035, and that in addition hydrogen is produced in a climate-neutral way in Africa and used by the European steel industry, as an example, for production conversion and replacement of coke. But even with this, there is one factor missing for producing a significant impact on the global climate: The decisive factor will be whether the EU's activities are emulated in other densely populated areas of the world. Only with this a more positive development will be able to take place in the regions that have not yet been flooded by the rise of the ocean levels.

It remains to be seen whether the world population will develop up to 16 billion by the year 2100. If the maximum forecast of 16 billion people on Earth remains, it will be very tight for wildlife and forests on our planet. This with the latent risk that the Gulf Stream will seek other paths after a temperature increase significantly above the 1.5 degrees C that was desired in Paris, and that large regions which are currently populated in the Northern half of the Earth will only be habitable to a limited extent because of the cold, and areas in the South because of drought.

According to my estimation, there will still be people on Earth then, but significantly fewer. Nobody can really predict what our Earth will look like if other ocean currents in the world's oceans change along with the Gulf Stream, and if the current water surface of 71% perhaps increases to 78% due to the rise in sea level. It is considered very likely that if the world population continues to rise without restraint, the feared climate catastrophe with its effects on the weather will occur. What the Germans have seen with the catastrophe in 2021 in the Ahr valley or in the Eifel was rather a very small foretaste of what is still to come.