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U.S. Tech-Geopolitics against the “European Green Deal” (EGD)¹

The European climate protection law obliges member states to reduce their greenhouse gases by at least 55% below 1990 levels within the next 7 years and to become completely "climate neutral" by 2050 (EC 2021). While the aim of “climate neutrality” does not take into account the shifting of measurements overseas through imported goods in the production-based emissions assessment. Two years after the EC had launched its “Fit for 55” agenda, it is already foreseeable today that its climate targets will not be met. That’s partly because the program has been a big (self-)deception from the start rather than a formal commitment to a major socio-ecological turnaround. However, due to the “clean tech” initiative announced by the U.S. government a year ago, the “European Green Deal” (EGD) could prove to be a failure all along the line.

Core elements and false promises of the “European Green Deal”

The "Fit for 55"- program of the EU (EC 2021) should be described as a major "(self-)deception" (Mahnkopf 2021, 2022a) because it does not aim at socio-ecological transformation of EU economies and societies, which would not only involve the use of renewable energy sources instead of fossil fuels and certainly not the massive expansion of electric vehicles, but a massive reduction of human intervention into non-human nature. First, with regard to the preservation and restoration of biodiversity in the Union, the EGD provides only vague and insufficient regulations. Further, it takes no serious steps to transform the disastrous effects of the "Common European Agricultural Policy" on soils, groundwater, marine fauna and flora, as well as the climate, as environmental organisations and representatives of smallholder farming have been demanding for decades. Nor does the EU programme contain any concrete measures or planned legislation that would be suitable for initiating a "circular economy". In such an economy, all materials would have to be used and reused again and again, and only when this is no longer possible, would they have to be recycled to the greatest possible extent and with the least possible use of energy.

The core elements of the European Green Deal can therefore be named as follows:

1. With the help of state-imposed law, markets are created, secured, and expanded: These are markets for emissions, e-mobility or the application of algorithmically controlled machines in almost all areas of life and the economy. This is being done through traditional elements such as the protection of intellectual property rights and the "soft power" of free trade and investment protection agreements, diplomacy and "development aid", but increasingly also through the "hard hand" of sanctions and security policy, which does not even shy away from military operations to secure access to "critical raw materials".

¹ Parts of the arguments presented here have been incorporated into a paper being considered for publication in: Albo/ Colin Leys (eds.) *Socialist Register 24: A New Global Geometry*, London: Verso.

2) Control of these "future markets" is of course to be carried out through the mechanism of supply and demand, i.e., left to price formation on more or less free markets (because some of them are dominated by large oligopolies). For markets alone are believed to produce the necessary technical innovations that will allow to remain on the path of capitalist growth dynamics.

3) Technological innovations are seen as proven means to achieve an "increase in efficiency" on the material side of all production processes, i.e., to be able to produce, transport and sell the same amount or even more products and services not only with less energy input, but also with less raw material input. An intended (even though very unlikely) "side" effect is that the targeted efficiency improvements not only help to reduce material and operating costs but could also lead to a reduction in labour costs per unit of production in the medium term.

4) In addition, the voluntary change of consumer behaviour and lifestyle is also being promoted. This implies that behavioural changes that could actually initiate a "socio-ecological transformation" should not be enforced by imposing prohibitions or interfering into private rights.

The EU's Green Deal is thus not about an "ecologically imperative" reduction of energy consumption per capita, but merely about covering a continuing increase in energy consumption from sources other than (only) fossil fuels. From the point of view of France, Finland, Sweden, and other member states of the Union, this also includes the expansion of nuclear energy. In this respect, the EGD does not hold out the prospect of change. For such a change would - by now even according to the assessment of the International Energy Agency (IEA 2021) - require that most of the fossil resources still available remain in the ground. Instead, measures are to be used that have always existed in the history of capitalist economies, particularly state-subsidised development and conquest of markets. Regarding the export of "environmentally friendly" technologies "made in Europe", which was considered possible not that long ago, the creation of jobs had also been expected, at least in the few member states where "green technologies" had been developed, produced and exported.

The declared goal of the European Commission's "Green Deal" is to enable "climate neutrality" of economies and societies by accelerating the development of energy-saving production processes and technologies. The target of economic growth is not questioned. What is also not considered is that in a very short time the consumption of raw materials used in industry, transport, housing, but also for social and technical infrastructures will have to be drastically reduced. Since "decarbonisation" and "digitalisation" are always named as twin goals of the European GND, we must rather assume that the proposed "energy turnaround" will be accompanied by a highly conflictual run on raw materials of all kinds. After all, digital substitutes for analogue processes and products, whether in the military or civilian sector, require large quantities of "critical minerals", just like the technologies for the generation and distribution of renewable energy and e-mobility.

Geopolitical motives therefore play a major role in the European GND. Through the targeted expansion of technologies for the generation of renewable energy - with the aim of electrifying industry, transport and housing as much as possible - the energy security of the

bloc should be strengthened, i.e., the dependence on energy imports from abroad is to be reduced. Above all, companies based in one of the member states are to be made "fit" to compete with other "global players", especially Chinese and US companies. Thus, the fixation of GND policy on a partial replacement of fossil fuels with renewables has, like the hype around digitalisation, already pushed the race for mineral commodity to new dimensions: prices for many of these commodities have skyrocketed, geopolitical conflicts over access to "critical minerals" are intensifying, while some (as copper) are even experiencing physical shortages.

Actually, the EGD merely initiates a shift of ecological destruction from the "output side" of the system to the "input side": from emissions, which necessarily increase under conditions of unlimited capitalist accumulation dynamics and which far exceed the absorptive capacity of the atmosphere, to the forced plundering of agricultural and mineral raw materials and water resources, needed as input for the accumulation process. Therefore, today even the last "frontier" is being considered: the deep sea with its hard-to-reach raw materials.

Roll-back of EU energy policy in response to the war in Ukraine

Since the adoption of the REPOwer EU programme in March 2022 (EC 2022), ostensibly an alternative less answer to the Russian war of aggression in Ukraine (EC 2022), the "European Green Deal" already had turned from a ("self-) deception" into programme that poorly masks an energy policy backward roll (cf. Mahnkopf 2022b). After the US forced off the North Stream II pipeline from Russia to Germany in February 2022, an ever more stringent sanctions regime was set in motion. Scheduled as "punishment" for the Russian aggression the sanctions so far have not had very serious negative effects on Russia, but all the more so on EU member states. The consequences of this "economic war", which we are forbidden to call that, are putting the brakes on the "European Green Deal" before it actually gets off the ground.

It was decided by the European Commission that more coal may be burnt in the EU for a period of 5-10 years and that coal will now be imported into the EU from Australia, South Africa and Colombia instead of from Russia, thus on significantly longer routes and associated with thus higher transport costs and more emissions resulting from transport.

In addition, nuclear energy is now vigorously expanded in a whole series of European states - in Hungary, the Czech Republic, Slovakia, Belgium, even in Sweden, in France anyway and also in the UK. This even though it has been demonstrated that nuclear power lacks both "technical and economic foundation" (DIW 2023). Decisions to expand nuclear power in Europe came after a hot summer in 2022, in which the levels of rivers (as well as dams) dropped dramatically, and it became apparent that even if nuclear power plants do not (yet) bring their destructive potential to bear in a large nuclear fallout, they create increasingly more problems as they might no longer be cooled appropriately. Also, no consideration is given to where the fuel rods for old and new nuclear power plants in Europe will be sourced in the future - if not from the duopoly of two Russian and one Chinese company that cover most of the business in Europe (Meyer 2022). Nor does anybody seem to care what will

happen if renewables, as promised, would be vigorously expanded by 2030, creating an overcapacity in the electricity grids during summer. The most likely consequence would be that electricity from renewable sources would have to be switched off, simply because nuclear power plants cannot be switched off.

In its RePowerEU programme, the EU Commission still assumed that only €210 billion would be needed for "energy independence from Russia" by 2027, and that this sum could easily be raised through a combination of public and private funds. A large part of these funds was to go to the development of renewable energy sources; only €12 billion were earmarked for oil and gas supplies. However, EU member states have earmarked billions in 2022 alone for new fossil-fuel infrastructure and private investment, the re-commissioning of coal-fired power plants in Germany and the Netherlands, and further billions in oil and gas supplies in 2022 and 2023 (Hancock 2022). In March 2023 the EC approved \$ 750bn in state support for businesses affected by the sanction regime imposed on Russia and for measures under the "Next GenerationEU"-program, heart of the EGD (FT August 2, 2023)

In addition to pipeline-gas from Norway LNG imports from the U.S. have increased two fold, inputs from Qatar 23 per cent and (ironically) LNG from Russia with 12 per cent during the last year (Institute for Energy Economics and Financial Analysis 2023). In addition, representatives from the EU are travelling around to get more LNG from states such as Qatar, Azerbaijan or Egypt, which conform just as little to Western notions of "liberal democracies" as Russia. They even began to persuade governments in Senegal, Nigeria and Mozambique to commit to new gas projects. However, in their efforts to replace (formerly cheap) gas from Russia by more expensive LNG, the EU is also responsible for the fact that numerous countries of the global south have to step back from LNG and burn more coal since they were (and still are) unable to pay the higher prices which have been pushed up in the wake of the so-called "gas war" between the west and Russia. Actually, to free itself from Russian gas (and oil), which in the future will be piped to the south and east, the EU participates in building more "climate bombs"². The bloc now is competing with big and solvent Asian countries such as China, Japan and India for LNG supplies on volatile global energy markets and thus could have to face prices doubling or even tripling in the coming winter of 2023/2024.³

An even bigger "nail in the coffin" for a the EGD will be the economic and technological "log-in effects" resulting from the expansion of gasification, transport and reliquefaction infrastructures for LNG in Germany, Spain, France, Italy as well as in the UK and in Turkey. Already during Donald Trump's presidency the large German gas market was a much desired

² That's how journalists from "The Guardian" have called the 200 or so new large oil and gas projects that have been started since 2022, adding at least another billion CO₂ to the 36.5 billion tons calculated 2021 (Carrington/ Taylor 2022). According to the IEA in 2023 across the world new oil and gas approvals have increased 25 per cent in relations to 2022 and most of these are gas projects on the basis of very expensive liquification and regasification infrastructure, leading to an increase of even more export capacity between 2025-2027 than LNG imports are expected (IEA 2023a).

³ In August 2023, the prospect of strikes at LNG projects in Australia were enough to drive the price for LNG up by 40 per cent.

target for the growing U.S. fracking industry and thus, there was already considerable diplomatic pressure in 2018 to build up LNG infrastructure in Germany, in parallel with the construction of LNG terminals from Texas to Philadelphia (Euroaktiv.com with Reuters 2018). Today, Germany, which had no LNG import capacity before 2022, is among the EU member states investing so heavily in additional LNG infrastructure, that large amounts of overcapacity should be expected in the coming years. Obviously, the state-subsidised construction of terminals, liquefaction and re-gasification plants in both the USA and in Europe, as well as the connection of new pipelines to the existing gas network, cause high costs for the public sector and for private investors. The latter are therefore keen to ensure that the plants are used for as long as possible through long-term contracts of at least 20 years - so that their investments don't turn into "stranded assets". But this can be very expensive for the public coffers. By 2030, current planned import capacity in Europe will exceed 400 bcm, while demand could shrink to just 150 bcm, if, as scheduled in the EGD, renewable energy sources of electricity will make up a large share of Europe's energy mix (Institute for Energy Economics and Financial Analysis 2023).

As an interim conclusion we can sum up that, since weaponizing energy supplies in the course of the war in Ukraine, the EU has enabled almost 50 fossil fuel infrastructure projects and expansions, and mobilised considerable sums for energy-intensive industries and for the electricity sector. The financial and social costs that might result from European companies migrating to the USA, where energy prices are significantly lower, cannot even be estimated today. Furthermore, this development gives rise to a whole series of problems, which are likely to make a transformation towards massive expansion of renewable energy sources in Europe difficult, if not impossible.

During the last year, the U.S. administration has tightened its protectionist industrial policy, justified by the need to contain its systemic rival, China. However, the "Chips and Science Act" and the subsequent "Inflation Reduction Act" launched in 2022 by the Biden government not only affect the system rival, but also allies and trading partners alike.

US industrial policy – a geopolitical attack on China which hits Europe

Both, the "Chips and Science Act" (CSA) and the "Inflation Reduction Act" (IRA) are about to build a ring of protectionism around the US which is supposed to attack China but also alarmed allies in Europe.

The "Chips and Science Act" against the backdrop of the U.S.' "permanent arms industry" – and moves towards "technological sovereignty" in the EU

The CSA derives its meaning from the fact that the expected "new golden age" of technological innovation will be entirely driven by "dual use technologies" such as sensors, image recognition, satellite communication, robotics, large data bases and powerful computers, to be applied in advanced manufacturing, mobility, energy production and many other areas, but most importantly in modern war fighting.

Today, for many countries, semi-conductors are a matter of national security, as large swathes of the economy increasingly rely on the functionality they provide. But most importantly, modern war fighting simply will not work without cutting-edge semi-conductors, cloud computing, sophisticated algorithms, and equipment for autonomous driving, flying, and killing. Thus, there is an all-out struggle for AI-dominance in the tech-industry and it seems to be quite clear that the biggest winner will be companies that make the weapons that will be used by all combatants: the companies that dominate the market for training large AI models and those that produce graphical processing units (GPUs). Even if the U.S. remain the global leader in “breakthrough” AI innovation, China has become the world’s top high-tech manufacturer, a severe competitor in key technologies, and it leads in AI implementation and might be surpassing the U.S. in quantum communication. This is obviously a big challenge regarding the dual-use- dimensions of these technologies.

In the past, U.S. corporations often became technological monopolies with greater purchasing power and higher returns than their European competitors because they were able to “take big risks”. This was due to the fact, that the promotion of risky technological innovation was often financed and organised by the US military, in cooperation with a select number of firms. This was the case with the “Apollo”-program and the “DARPA”-project, which resulted in the “ARPANET”, the forerunner of the internet, based on a cooperation of Silicon Valley corporations with the U.S. government, U.S. military and U.S. elite universities.⁴ Due to their dual-use dimension, these state-financed innovation programs turned out to be highly successful. And this, the Biden administration seems to assume, could also be the case today: if the U.S. were to win the most recent geo-political scramble on the production of semi-conductors, so-called “clean technologies”, and on the “critical minerals” needed to produce these technologies.

Part and parcel of this strategy is “the permanent rearmament of the U.S.” since the end of WW II (see Mandel 1974/1999), since this was and still is the most important lever for absorbing surplus capital and at the same time the most important motor for technological innovations. After all, the arms industry is completely independent of the limited absorption capacity of the market, since its client and its customer is the state. Therefore, this industry does not pose any risk in the form of an economic crisis; the only danger it poses is the wars that will be fought with the new weapons, sooner or later.

Not surprisingly, according to the Stockholm-based International Peace Research Institute, in 2022 world military spending reached an all-time high of \$ 2,24 tr and the US made up the lion’s share of it, with more than \$ 877 bn in 2022, representing nearly 40 per cent of the world’s military spending and three times the amount China has spent (SIPRI 2022). Against this backdrop, the U.S. can still claim to be the enforcer and the guardian of global capitalism (Giddens/Panitch 2012), above all because its “permanent arms industry” goes hand in hand with a much stronger contribution by the state to the financing of R&D in advanced technology.

⁴ See for today’s parallel: *Financial Times*, Monday 30, July 2023 “How Silicon Valley is helping the Pentagon in the AI arms race”.

Thus, a main aim of the U.S. CSA is to fund semiconductor research, but it also includes “guardrails” intended (among other things) to prevent companies from building factories in China⁵. U.S. self-sufficiency in chip production seems, however, to be an illusion, since at the same time when it wants to compete with China in advanced chip production the country would have to increase its production of low-value chips which it recently has begun to import (Hufbauer/ Hogan 2022). In response to the declaration of an open “Chip War” (Miller 2022), triggered by U.S. export restrictions, China is concentrating on producing less miniaturised chips which can find wide use in the “Internet of Things”, 5G telecommunication equipment and the growing market for electric vehicles.

The European response to the CSA has been quite different. While domestic companies are committed to the U.S. enforced sanctions regime as best as they can, German politicians are trying to lure as many chip producers as possible into the country. While its citizens and public finance must face a cost-of-living crisis, big players in the chip business, among them the U.S. giant Intel, have been offered billions of Euros in financial support. In Germany, where already more than 20 chip factories are running, Intel will build two factories in the small city of Magdeburg and will receive € 6,6bn in state aid from the EU and the German government (not the €10bn the company was originally seeking), which will cover 40 per cent of the expected total costs. However, Intel will produce cutting-edge chips for AI for exports, which will probably not be used in Europe’s key industries, as they need less advanced chips fitting the manufacturing technology in the car industry, industrial automation and manufacturing of medical devices (Chazan 2023).

Politicians justify this wasting of public funds by pointing out that Europe would be less vulnerable to future conflicts over chips if it can double its (ridiculous) share of the global semiconductor market from 10 per cent to (still not impressive) 20 per cent by 2030. However, materials for the chip production most needed in Europe itself are just as critical as the chips themselves and until now not available in Europe at acceptable prices.

Parallel to the “chip race” a “race on telecommunication technology” is being rolled out and again many (but still not all) European countries are following U.S. advice to ban the Chinese market leader Huawei on security grounds. As with the 5G standard, Huawei is on the way to set also the next standard 6G. But meanwhile China has retaliated against the multiple sanctions on Huawei technology and the smaller firm ZTE by edging Sweden’s Erikson out of its huge domestic market.

Thus, it becomes possible that in the near future we may face two versions of tomorrow’s mobile telephony and this indeed would be a strong sign for a deglobalized world economy, since this development is accompanied by growing tensions over the control of physical

⁵ When it comes to spending on R&D the US is, however, no longer the undisputed leader it was in the post-WW II time. Its share of GDP spent on R&D has fallen since the turn of the millennium (from 40 per cent in 2000 to 31 per cent in 2020), while its share of GDP in China has risen (from only 5 per cent in 2000 to 25 per cent in 2020) (Kornblue/Tréhu 2023).

infrastructures, such as global subsea telecommunication cables, which involve Chinese companies or directly connect the US to mainland China or Hongkong.

The “Inflation Reduction Act” – a U.S. equivalent to the EGD?

How does the second pillar of state-led industrial policy in the U.S., the “Inflation Reduction Act” (IRA), fit into this picture? At first glance it seems to be a huge labour market and infrastructure program and very welcomed by European politicians due to its seemingly “green envelope”.

To end the economic deindustrialisation of the past decades and “to make the U.S. the world’s “preeminent manufacturing power again” (Khanna 2023), U.S. companies but also companies from allied countries in the EU, Australia, Japan, South Korea and India should be encouraged to move the production of valuable component parts, be it semiconductors, display screens, batteries, sensors, wafers or solar cells to the U.S., in order to cut all sorts of Chinese assembled parts. However, according to the International Energy Agency, the production of all sorts of modules for “renewable energy production” and battery storage (necessary for electronic vehicles) is dominated by Chinese companies with between 75 per cent and 90 per cent; in some of the material used in batteries and some niche products China’s market share is even close to 100 per cent. Furthermore, many of the metals needed to produce modules, wafers and cells are extracted and/or produced by Chinese firms in and outside of China (IEA 2023b). Thus, U.S. self-sufficiency in battery cells and solar module production in the near future seems to be quite improbable.

More convincing, therefore, are readings of the subsidy packages that place them in the tradition of “military Keynesianism” as pursued by the U.S. during the Cold War period (Anderson 2023). But at the same time, this program is also reminiscent of the time when the U.S. under Roosevelt was preparing for its imminent participation in the war against Hitler’s Germany, under the famous slogan which became so popular thanks to a great propaganda poster of French graphic designer Jean Carlu from 1942 with the title: “America’s Answer! – Production”.

Obviously, fears are justified that production will be shifted from the EU to the US. Since the IRA is, among other things, designed to boost the US car industry, it probably will impact car producers in Europe, especially the German ones, and cause these to move even more production of batteries and electric vehicles to North America. However, the US as most EU member states, Japan and South Korea face the same problem: finding qualified personnel in the near future, particularly engineers and technicians, but also skilled workers to modernise its infrastructure, build transmission infrastructure across states, do all the jobs left by robotics and AI, but first of all build all the new factories announced during the last year by U.S.-based as well as by German and South Korean investors.

In the U.S. case, even greater doubts are warranted, whether it would be really possible that the country could “once again become a manufacturing superpower” (Khanna 2023). Since it lacks even more machinists, carpenters, contractors and technicians to build all the new fabrication facilities than it is the case in Europe (or in Japan); the country also don’t have

the amount of college graduates in semiconductor-related fields, such as engineering. Vocational programs were downsized from the 1970s on, while high-end software engineers in Silicon Valley designed chips in order to create “intellectual property” for the GAFAM complex. Against this backdrop, it is quite questionable whether it will be possible to build up a qualified 21st century workforce within a short period of time, which would be a precondition for withdrawing production away from foes and friends and “re-shore” as many jobs as possible back to the U.S..

The impact of U.S. industrial policy on a “clean” turn-around in energy production

Even though the purpose of the IRA is advertised as a stimulus for “green growth”, which could enable U.S.-based firms to profit from a shift towards so-called “clean technologies”, what is foreseeable so far is that “advanced manufacturing jobs in rust-belt regions will not be very “green” at all. Fixing the U.S.’ rotten infrastructure requires huge quantities of material and fossil energy to build factories, streets, bridges, modern power lines etc. that will further increase CO2 emissions. Also, the planned expansion of chip production will be anything but “clean” because it will require large amounts of energy, most of which will come from fossil sources, and gigantic amounts of water. These types of costs will increase even further when the sourcing and processing of mineral inputs for chip production are also factored in.

In Europe, however, the IRA is likely to diminish the chances of success of an already unambitious “Green Deal” which, in the context of geopolitically motivated sanctions against Russia, has shrunk to a rather hollow promise anyway. This is because there is a risk that investments in e-mobility, until now making up the largest part of total energy transition investment in Europe (Galgózi/Akgüc 2023), will be made in the USA (and Mexico) rather than at European locations⁶. This will occur quite apart from the fact that companies in particularly energy-intensive sectors are also considering to relocate simply because of lower energy prices in the USA.

IRA subsidies are available for battery plants and for the production of solar modules and wind turbines alike. But the IRA’s biggest impact is expected to be on technologies that have yet to achieve scale such as “Carbon Capture and Storage” technologies and bio-energy, both the most problematic energy technologies next to nuclear and fossil fuels. CCS technologies are seen as having great growth potential for the U.S. because they will allow liquefied natural gas, which will be extracted in raucous quantities, to be labelled as a “clean” energy source. Bio-energy might also see a huge increase under the IRA schedule since it is already framed as an even “cleaner” alternative and could be used as an alternative to fossil fuels in industries such as steel making or aviation. For both technologies subsidies could wipe out nearly half the project cost and thus definitely pose a threat to the EU, since the U.S.

⁶ Even though divisions within the European car industry are enormous. While Spain and France were posting double digit gains in electric vehicles, the German car industry saw slight negative growth in e-mobility. This is, of course, largely because it still wants to stick to the internal combustion engine.

incentives are so comprehensive as to make it hard to compete in the section of a “green hydrogen supply chain”.

In Europe, hardly any critical voices are to be heard that would even broach the issue of indirect consequences of a further expansion of US biogas production, let alone criticise this production loudly. Some provisions of the IRA with regard to “bio-energy” will, however, incentivise much more processing of corn-fed ethanol in order to produce bio-fuels. Another provision offers tax credits for processing manure (in huge biodigesters) generated by massive livestock and poultry farms, into methane, which could be used for different industrial purposes. Critics argue that both provisions will lead to an expansion of intensive animal farming, generating more manure in the Great Lakes and Midwest regions of the U.S., which already struggle with farm-related pollution washing into rivers and lakes and degrading the quality of water further (Schneider 2023).T

The Biden administration is advertising the IRA-agenda as a contribution to a “clean transition”, a term that, especially in the EU, has been equated with a transition from “brown/fossil” to “green” forms of energy: But U.S. government leaves no doubt that it wants fossil fuel producers in the U.S. to drill more wells and pump more oil and gas, at least for the next decades, when export facilities for LNG on the Gulf Coast will be further expanded. LNG output in the U.S. is on track for a massive expansion in the coming years. More LNG exports, which from the perspective of the EGD definitely cannot be claimed to be “clean”, will make the U.S. the world’s largest LNG exporter by far and thus will give it more weight in the global energy trade.

It fits into this picture, that the U.S. President in 2023 gave the green light to ConocoPhillip’s Willow project in Alaska’s North Slope to add more oil production to the national one, a project which environmental associations have struggled to prevent for so long. But anyhow, national oil production in the U.S. is set to grow by more than double in 2023 alone and the Willow project, like new deep-sea drilling projects in the Gulf of Mexico, will pump oil and emissions for decades -- during a period when the U.S. announced it will reduce its carbon footprint with the help of its “clean energy” agenda based on the CSA and the IRA. Exxon Mobile even plans to double the amount of oil produced from its U.S. shale holdings within the next 5 years. But also, other representatives of the small community of BIG ENERGY companies are about to build new “carbon bombs”. [source?]

The EU, on the other hand, is condemned to ramp up its renewable energy capacity tremendously if it wants to achieve a breakthrough at least in the core area of its Green Deal agenda, i.e. with regard to the electrification of the economy, mobility and housing in the member states. For this to have at least a (small) chance of realization, it would be necessary to expand electricity supply by around four times until 2030, while transmission grids will need to grow three times at least, and appropriate storage capacity must be built up. But if supply for the electrification of so many areas as well as the “digitalisation” of nearly all sorts of military, economic and social activities should be provided at the same time, then the supply of much needed, but increasingly very expensive minerals would also have to increase tremendously.

The EU “Green Deal” agenda under the threat of “de-coupling” from China

Until 2011 the EU could call itself a “world leader” in renewable energy investment, due to its large solar power manufacturing capacity. But in 2021 investment collapsed to about half of its 2011 peak (Galgózi/Akgüc 2023). Today 75 per cent of the world’s solar modules and 77 per cent of all batteries for EV are produced in China⁷. Also, the wind industry’s supply chain and infrastructure upgrades such as cables are concentrated in China. During the last decade, China has invested ten times more than the EU in new PV supply capacity. Therefore, today its share in all solar PV manufacturing equipment (including the production of polysilicon, ingots, wafers, cells and modules) already exceeds 80 per cent (IEA 2022; 2023a; 2023b).⁸ In short, investments in China have helped to bring down costs for solar PV for the EU as well as for the US and for many poorer countries in the global south which, without these imports from China, would have to rely on far more environmentally destructive energy sources such as wood and coal.

In times of cost decline in solar production, the EU did not invest, and the US also showed only a minor increase at very low level. No wonder that in 2021 investment in renewable energy technology in China was 20 per cent higher than in the U.S. and the EU combined (IEA 2023a). Meanwhile, prices for important inputs for renewable energy technologies such as critical minerals, semi-conductors and even bulk materials like steel and cement have risen, causing wind turbines to cost 35 per cent more today than three years ago. However, in 2022 China topped its enormous spending on “low-carbon” energy transition technologies with an impressive investment of \$ 546 bn in its energy transition, including a huge amount of money invested in E-mobility. This amount of investment makes up nearly three quarters of the investment the other nine countries in the list of the top-10 together were spending, with the result that half of the world’s spending on renewable energy technologies recently took place in China (BloombergNET 2023). According to calculations from BloombergNET, the EU would have to double the pace of emission reductions and might have to mobilise as

⁷ While the share of the U.S. is around 6 per cent and the five European countries Poland, Germany, Hungary, Sweden and France together account for 11 per cent of battery production (Bhutadal/Pake 2023).

⁸ Certainly, the manufacturing process of solar PV (and also other sorts of renewable energy technology, not to mention the production of all sorts of digital devices) consumes a lot of energy, which until today in China is generated by coal power plants. However, IEA correctly points to the fact, that solar panels only need to operate for 4-8 months to offset their manufacturing emissions (IEA 2022). Thus, a frequently formulated accusation against China does not stand up to scrutiny: Occasionally, the protectionist legislation of the U.S. is justified because it promises truly “clean technologies”, while China’s “green technologies” exports are criticised for not being “clean” due to their reliance on coal-powered electricity.

Another criticism of the “clean character” of the “green technologies” produced in China is also characterised by obvious double standards: In particular, the German foreign minister Annalena Baerbock, like her cue-givers in the US, misses no opportunity to point to violations of human rights and core labour standards in the factories in Xinjiang, where most parts of the renewable energy technologies are produced. These advocates of a “value-based foreign policy” never voice a simultaneous criticism of forced labour in US prisons or the use of child labour (mostly from Nigeria) in Italian agriculture, which is often carried out under intolerable conditions for less than half of the minimum wage.

much as \$ 32bn of investment to deliver the target. To get closer to its proposed CO2 reduction targets for 2030, solar and wind power generation capacity over the next 7 years would need to triple.

Given these constraints, it does not sound very plausible to avoid the cheap offers “made in China” and insist again on a strategy of “doing it at home”, today labelled as “re-shoring” or “de-risking”. With a growing energy infrastructure, demand for high-voltage electric cables connecting offshore wind projects to European countries is also rising very fast, while supply has been delayed. This is due, first, to scarcity of raw materials such as copper, but also to a lack of converter stations and skilled labour to lay the cables at the bottom of the sea (Millard 2023).

Thus, it becomes a matter of “energy security” to rely on Chinese companies for raw materials such as copper for high-voltage cabling and converter stations, instead of excluding, as current plans imply, Chinese firms’ involvement in central national infrastructure projects. With semiconductors alone, which will be produced in double amounts than recently (particularly in Germany), no solar panel nor wind turbine can be set in motion. Finally, the EGD agenda will entirely evaporate into wishful thinking if constraints should force the EU to do it without the cheap components from China (or Chinese-owned companies from Vietnam and Malaysia) (see also Sgarvatti/Tagliapietra/Trasi 2023).

The first step into this direction is already taken with the EU’s “Net Zero Industry Act (NZIA)” of March 2023, which states that the bloc should be able to meet at least 40 per cent of its requirements in the five key sectors solar, wind, heat pumps, batteries and electrolyzers on the basis of domestic manufacturing capacity. Among other requirements the act obliges governments to mark down public tenders for renewable energy technologies if companies source from a single country that accounts for more than 65 per cent of the EU market share for the product. Obviously, this would disadvantage solar companies which rely on supply chains dominated by Chinese firms, ignoring that in 2022 a record installation of solar PV in the EU was only due to a doubling of imports from China. According to IEA estimates the price for panels produced on the basis of a European solar supply chain would be more than a third higher than the Chinese equivalent.

In its NZIA-plan the EC also suggests that public sector investment should override a scheduled project's adverse impacts on the environment if authorities concede. And indeed, this could be one of the most important outcomes of the new ruling applied in the EU as a response to the new US military focused industry policy: following a seemingly “de-risking” strategy of decoupling as much as possible from Chinese imports, but at the same time ruining the already quite damaged natural environment in the EU further, for the sake of our growing energy demand. This is to be expected in particular due to prospects that the entire North Sea will be turned into a “green power station”, ignoring conflicts which will arise from the use of the sea for fish stocks or the effects of air turbulence from the rotors on ocean currents and the resulting climate changes. Similar trade-offs will result from the far cheaper installations of on-shore wind parks, e.g. if wind turbines will be placed in the middle of heretofore protected natural habitats on the basis of the new “EU clean tech draft plan”.

Anyhow, under the banner of a “clean” or “green” transformation both in the US and in the EU the vast amount of investment is flowing into the larger market for electric vehicles, where again, China is dominating the battery supply chain. The concept of reducing reliance on China for geopolitical aims and objectives formulated in Washington and at the same time maintaining access to highly competitive and affordable technologies simply will not work out. Given this context, it is foreseeable that the EU will follow “green washing strategies” already set in motion in the U.S.. Here, airlines are joining forces with farmers, biofuel refinery owners and international big oil companies to push for tax credits for so-called “renewable diesel” and for aviation fuel on the basis of corn ethanol, even though the carbon intensity of corn ethanol, which is causing land use change emissions, is often no less than that of gasoline. Also, a push towards CCS technologies can be expected both in the U.S. and the EU. In the U.S. big oil corporations have already started to invest in these technologies. In the future they could apply the “transformative” tax credits provided under the IRA and simply buy out other companies’ “clean energy tax credits”. In the EU as well, more money is provided by the EC for CCS-projects; recently 72 projects are running or planned across the Union in which app. 80 MT CO₂ are supposed to be stored by 2030 (International Association of Oil & Gas Producers 2023).

Within the scope of this article, it is not possible to elaborate in detail on the geopolitical consequences which will arise from the intensifying “scramble on scarce minerals”, necessary for all sorts of “clean/green” technologies including those with dual-use for civilian and military purposes. But surely is not an exaggeration to state that the control of supply chains for raw and processed minerals (such as copper, lithium, cobalt, nickel, rare earth elements, but also iron, uranium and aluminium) which are needed for chip production, renewable energy technologies, military equipment as well as for many basic infrastructures of modern industrial societies in the near future will probably become as important as secure access to cheap oil and gas always has been and still is. Because a lack of supply for one or two important raw materials or components today can disrupt the entire value chain, reducing the resilience of advanced industrial economies to an amount which was unthinkable in the high time of fossil fuel capitalism.

However, both the US and the EU are both lacking domestic supply of raw materials and processing capacities. China on the other hand has a strong grip on many of the most needed raw materials and dominates processing capacities to an even greater amount. At present, many political leaders at both the national and the European level, following their U.S. keyword generators, give the impression that western states would be able to subsidize without limits firms which are needed to build up strategically “critical supply chains”. As a precondition for this, in a short period of time mining and processing of all “critical minerals” would have to be restarted and expanded either domestically or in “like-minded countries” of the global south. But again, it is exceedingly puzzling how these intentions might be implemented in confrontation rather than in cooperation with China – which accounts for 60 to 100 per cent of global refining capacity for most of the minerals needed to realize all the “clean tech”-visions; which controls mines in Africa and Mongolia; which has financed and built highways, railroads and harbours across “Eurasia” (including huge parts of Africa) to

export the raw materials to be processed in China and which itself harbours many of the most needed minerals.

Conclusion

At a time when the world is shifting from an era of imagined abundance of natural resources into an era of scarcity and even depletion of minerals and water, abandoning cooperation for the sake of technological sovereignty and geopolitical dominance is a recipe for massive violent conflicts about “the rest what is left”, for chaos and disaster.

A “green pathway” into the foreseeable difficult future of modern industrialized countries would not only require greenhouse gases to be drastically reduced in the short time of two decades at most. It would equally require the large-scale and rigorous protection of the biosphere and biodiversity to ensure that future generations of humans and countless other creatures will still be able to inhabit the planet in times to come. But most of all, it would require reducing energy consumption instead of attempting to cover a growing energy demand by more but difficult to produce electricity supply. If renewable energy technologies will deliver huge quantities of cheap electricity there might be a considerable substitution of fossil energy sources; otherwise, renewable energy technologies will simply help to cover a still growing demand for fossil fuels combined with environmentally very harmful technologies of geo-engineering. However, embarking on an economic model that could bring less resource and material use and more well-being for all sorts of species populating the planet, would require a profound shift in production and reproduction patterns, finally the end of modern capitalism as it has existed for 250 years.

The new U.S. industrial policy is essentially not “green” at all, but "tech geopolitics" in times of an emerging multipolar world, which the U.S. is not willing to adapt to. For the EU it might manoeuvre the bloc into a constellation of "deindustrialisation without ecological effects" - and this under conditions where it presumably must bear the main burden of the war in Ukraine.

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