“It is not too much to tell the people the truth” (Ingeborg Bachmann)

Energy transition between infantile fantasies and disillusionment

By Bruno Kern

The world In a "pincer grip"

The end of the fossil fuel age has now finally begun. It has been noted even in the boardrooms of large oil companies. "Peak-oil” appears to have been reached already. And also the other major fossil energy sources (natural gas, coal) are dwindling faster than one could assume a few years ago. The *Energy Watch Group* estimates that by 2050 annual oil production will fall to just one-third of today’s annual figure. As for natural gas production, they estimate that from 2035 onwards a prolonged period of stagnation is to be expected. Thereafter, beginning in 2045, the production volume will fall rapidly. And even with regard to coal, from 2035 onwards we should expect a steep drop in production. All fossil fuels taken together, peak production is forecast to be reached in 2025 (Minqi Li 2008: 148ff).
At the same time the climate crisis is coming to a head. In recent years, it has been found that the positive feedback effect (i.e. the phenomenon that climate changes have the effect of accelerating themselves, e.g. the speed at which the polar ice melts) has been underestimated. More and more scientists therefore believe that the original target – reducing global CO_2-emission by 50% of the figure for the reference year 1990 – must be met much earlier than 2050, the originally targeted date, in order to keep climate changes within controlable limits (they suggest: around 2030). Moreover, it must be considered that focusing on climate changes is a truncated view of the problem. Climate change should be seen as a part of a comprehensive biosphere crisis. The rapid decline in the number of living species, the loss of food resources in the sea and the loss of arable land have also to be considered for future crisis scenarios.
The situation in which we now find ourselves can be appropriately called a "pincer-grip crisis" (see Sarkar 2009, 318ff): We are, as it were, caught between imminent climate catastrophes, on the one hand, and exhaustion of fossil fuels and other essential resources such as mineral raw materials on the other. If we do not simultaneously keep both sides of the dilemma under advisement, then we will inevitably run into a dead end and seek "solutions" that completely miss the essence of the situation. Paradigmatic examples thereof are two prominent studies, whose basic weakness consists in the fact that they have both lost sight of one or the other horn of the dilemma: The "Hirsch Report”, that Robert Hirsch has produced on behalf of the U.S. Department of Energy, recommends a peak oil strategy that completely ignores the problem of climate change. The proposed solutions focus on stretching the fossil fuel era, i.e. to maintain the fossil fuel based infrastructure as long as possible, for example, by producing fuel through coal liquefaction. Completely different from that is the more prominent “Stern Report”, submitted by Nicholas Stern on behalf of the British government. His models for financing the measures to contain climate change assume further economic growth, that is only possible on the basis of further unlimited availability of fossil energy. Both studies are blind in one eye. Their proposed solutions are therefore unrealistic and useless.

Eco-Capitalist Illusions

People desperately try to blind themselves to the conclusion that the collapse of its fossil energy base would shake the foundations of our industrial societies as a whole. At present, it is still illusionists who make up the intellectual mainstream. Their credo is that everything can be technologically controlled and that prosperity can be increased and protected by intelligent means.

The authoritative establishment prophets in today's public discourse on alternative energy – from Ernst Ulrich von Weizsäcker to Franz Alt – have been talking us for years into believing that the necessary reduction targets (for instance, 90% reduction in CO_2 emissions in the OECD countries by 2050) can be met without loss in prosperity. Indeed, they even suggest that the reduction targets can be met along with substantial gains in prosperity – through greater energy efficiency and the use of renewable energies.
The intellectual capers that one cuts to escape the simple realization that our level of prosperity must be drastically lowered, are ludicrous. As for the oh so promising resource efficiency revolution, Fred Luks has made a nonsense of it with a simple calculation: If resource consumption in the industrial nations is to fall by 2050 by a factor of 10 (which is a consensus), and if these nations at the same time want a modest annual economic growth of 2 percent, then *resource productivity* (i.e. the amount of goods and services produced per unit of a particular resource used) will have to rise by a factor of 27. A three percent annual economic growth would then require a 43-fold increase in resource productivity. Gains in resource productivity too are subject to the law of diminishing marginal returns. That is, the more potential for resource efficiency increase (e.g. through technological and managerial innovations) has already been made use of, the less additional resource efficiency increase can be achieved by further utilization of such potential. This has also been confirmed by empirical data: One has observed in industrialized countries such as Germany and Japan that after impressive increases in energy efficiency (the ratio of energy input to gross national product) since the mid-seventies, no appreciable efficiency gains could be achieved in recent times. A substantial part of that efficiency increase has simply been due to improved fuel quality – a factor which, anyway, won't be able to help us much in future. In Germany, one has observed stagnation in this regard since about 2000, in Japan, already since the early nineties (Minqi Li 2008: 161-162). The world's most accurate study on the subject is probably that of Lightfoot and Green. They estimate the *global* potential of resource efficiency increase until the end of this century – calculated from the reference year 1990 – to be 250 to 330 percent (cf. Minqi Li 2008: 162). This is very modest compared to what Weizsäcker (1995) would have us believe. In the mid 1990s he boldly spoke of a potential of a 400 percent increase in resource efficiency in the *OECD countries*, in other words, of an increase by a factor of 4. He even thought this could be achieved in a much shorter time, i.e. by 2050. We have to note that he thought this could be achieved in the OECD countries that were actually already very much developed in regard to resource efficiency. The following data makes the matter clearer: For Germany, one could register for the period 1990 to 2008 a resource efficiency increase of only 40 percent (that corresponds to a factor of 1.4), although the country enjoyed in this period the rare opportunity of scrapping a whole lot of old resource-inefficient industries and replacing them with ultramodern resource-efficient ones. In order to blur this absurdity, Weizsäcker and people like him always limit themselves in their books to impressive isolated examples. According to Ted Trainer, even here, in case of about 50 percent of the products cited in the examples, the resource efficiency claims are based on pure assumptions akin to faith.
Thereby, intellectual honesty is being sacrificed at the altar of pragmatism, namely, to the consideration of political acceptance. Instead of taking an honest inventory of what really is achievable by which means and at what price, all such questions are being subordinated to the question what one could demand of the European public used to a high standard of living. In this sense, the former Attac activist and currently green member of the European Parliament Sven Giegold advocated finally giving up the (in his words) "adolescent" resistance to mass motorization and air traffic as a hopeless effort. Instead, he opined, we simply have to rely on technical solutions, on electric cars and fuel cell powered aircraft (Giegold 2009). He prefers not to ask himself farther whether all that would at all be possible if an honest energy balance of each of these technologies were worked out. Weizsäcker speaks out openly what it is about:

„To ask Europeans, Americans and Japanese to dress in sackcloth and ashes and renounce prosperity and progress, is a strategy doomed to failure. So, in order to be politically accepted by the public, the new way of running the economy should have the character of a new model of prosperity "(1992, 12).

Here it becomes abundantly clear for whom Weizsäcker's new model of prosperity is meant and for whom not. Viewed globally, a small elite is claiming for itself also the rest of the dwindling resources, which it wants to use for the last part of its prosperity party. Seen in the cold light of day, the "resource-saving", "intelligent" and "ecology-compatible" prosperity of the elite is chauvinistic brutality. As of today, seen globally, the number of people who have ever sat in an airplane makes only 6% of humanity, while in Nigeria poor people are risking their life illegally tapping oil pipelines, and the first climate war is raging in Sudan (Welzer 2008: 94-99)

A sober look at the reality

Nowadays, however, one can also notice a tendency to be disillusioned. Compared to the illusions of the environmental prophets of the establishment, the stated policy objectives of governments look quite modest. For example, Obama's ambitious plan for curbing global warming has set the goal that by 2025, 25% of the U.S. electricity demand will be met by renewable energies. One may be allowed to ask: what about the remaining 75%? In Germany too, the skeptical voices are becoming louder, especially the voices of those who themselves have the greatest interest in the development of renewable energies. For example, Dietmar Schütz, president of the federal association of renewable energy industries, put on record that by 2020 they could produce 200 billion KWh by means of renewable energy technologies. Assuming a slight decline in consumption, this would correspond to about 35% of the total electricity consumption in Germany (cf. *die Tageszeitung*, 24.4. 2008). Recognition of the limited potential of renewable energies led many serious environmentalists, such as James Lovelock, to mutate into supporters of nuclear energy.

If one looks at the situation impartially, one must face four *fundamental problems*:

1. The potential of renewable energies is fundamentally limited. Renewable just does not mean inexhaustible.
2 In addition to the growing scarcity of energy from fossil sources, we are at the same time facing a scarcity of some other raw materials, which constitutes additional barriers to developing the technological prerequisites and the necessary infrastructure for renewable energies.
3. Given the fact that the time slot available to us is narrow, given also the fact that our resource base (fossil fuels and other raw materials) is rapidly eroding, it is doubtful whether we can really translate the theoretically existing potential into reality.
4 The discussion on renewable energies is mostly limited to electricity generation,[1] although it accounts for only one-fifth of our total energy consumption.[2] A more serious problem, however, is

[1] Many energy transition scenarios have their weakness just in the fact that they focus on a part of the problem – mostly on electricity supply – and blend out the other problems. Thus, biomass of the "second generation", that will primarily be needed for room-heating, will not be available to the same extent for generating electricity. They also underestimate the effect of using up agricultural land for energy production: In future, we shall have to ensure our food supply from our own agricultural land and will not be able to outsource it overseas. We must also consider that for ecological reasons and also because petroleum is running out, agriculture of the future will need more acreage; it cannot be so intensive as today, it will be extensive. In addition to all that, the effects of climate change will limit our possibilities. In South-West Europe, but also, e.g., in Brandenburg, much agricultural land will be lost. Already today, cultivation of energy crops is noticeably competing with food production, also in Germany. Energy transition scenarios are, therefore, only credible and useful if they do not single out particular problems, but think in connection with other relevant problems.

[2] However, the growing share of electricity from renewable sources was largely offset by a corresponding increase in total consumption – an example of the so-called rebound effect. In 2010 alone, electricity consumption in Germany rose

the energy that we need over and above electricity, particularly for mobility, which is also of vital importance to our globalized capitalist-industrial society. In the form known to us, mobility is hard to imagine without the fossil energy base.

Feasible or viable? The renewables as "parasites" of the remaining fossil energy base

The potentials of so-called renewable energies (mainly energy from wind, sun and biomass) are often claimed to be so high that one cannot help wondering why they have not long ago prevailed over the conventional energies. Is really only the villainous nuclear energy lobby respectively the fossile energy lobby to blame? That does not seem to be the case. On the contrary! The calculations presented by the renewables lobby are highly dubious. Its energy balance estimates usually do not consider all the costs from A to Z. The *prerequisites* of energy production and the *required infrastructure* as a whole are not considered in the energy balance calculation.[3] One who e.g. wants to honestly draw up the energy balance of a photovoltaic module must begin with the pro rata energy cost of production of the excavator which was used to bring sand to the silicon factory. In this context, the term "emergy" (embodied energy) was coined in the technical literature. One of those few who calculated energy balance in this way is Howard T. Odum, who then promptly came to the result that the energy balance of photovoltaic cells (based on monocrystalline silicon) was negative. In its controversy with the operators of nuclear power plants, the anti-nuclear-energy movement has justifiably demanded of the former a similarly honest energy balance in order to debunk the argument that nuclear power is the way out of the climate crisis. But then one also ought to have the intellectual honesty to open this account for the "renewable" energies too. In regard to this matter, economist Nicholas Georgescu-Roegen differentiates between feasible and viable energy technologies. "Viable" are only those energy technologies that can reproduce themselves. That means, e.g. the photovoltaic energy technology would be viable, only if all the equipments of the second generation photovoltaic power plants, from A to Z (from the excavator etc. to the copper wire etc.), required to produce and supply this type of energy could be produced by using photovoltaic energy only. It should be remembered that for the production of even simple semiconductor cells temperatures between 400 and 1400 degrees Celsius are required. Richard Heinberg writes skeptically: "Clearly, conventional silicon-crystal cells have so far had a relatively low return for the energy invested in their manufacture, even though promoters of the technology staunchly claim a favorable figure (typically, they exclude from their analyses the energy expended in transportation as well as that embodied in production facilities)." (Heinberg 2004, 145) Also the more recent technologies such as thin film solar cells on the basis of non-crystaline silicon, light-sensitive color pigments etc. do not help much. With an effectiveness degree of maximum 7 percent, they will probably survive only as a niche product.

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by 6%! That means, the relative increase in the share of renewable energies did not bring any ecological benefit. And it would be a flaw in reasoning, if one would simply make a linear extrapolation of the impressive growth rates of the past two years into the future. The successes to date – 20% share of the renewables in electricity generation – means nothing more than that the basically limited potential is being tapped faster.

[3] Annette Schlemm (available at: www.streifzuege.org) gives for photovoltaic electricity on the basis of mono-crystalline silicon an energy payback time of 4.6 years. For that on the basis of polycrystalline silicon, she assumes the figure to be 3.2 years. One should in each case add another year for the other necessary components (such as aluminum mounting system). However, Schlemm, like most others, takes as the basis of her calculation an average of 1500 hours of sunshine a year. Such conditions may prevail in Andalusia; in Germany, we do not get even half of that. For German conditions, therefore, (following Schlemm's calculation) the energy payback times for photovoltaic solar electricity systems must be doubled. Moreover, Schlemm rejects the concept of "emergy" (embedded energy) as nonsensical, because, she argues, then one would logically have to calculate back "to the Big Bang". But despite her relatively optimistic assumptions, she has been forced to conclude that the transition to the renewable energies will necessarily entail the end of our growth economy.

Only wind energy, which however is not suitable for the generation of base load electricity, undoubtedly has a positive energy balance. Its EROEI figures are all positive, ranging between 2 and 50 – EROEI being the acronym for energy return on energy invested. In other words, in their whole lifespan, wind turbines generate 2 to 50 times as much energy as was in all invested in building them. Wind energy, however, presents a difficult problem, that of storage. In Germany, for example, wind energy is on the whole, and on average, available for only 16% of the time. The storage technologies known and tested till today are all problematic. Hydroelectric power plants fed with pumped water (Pumped water storage), which have a very high degree of efficiency, go with enormous encroachment on the countryside. For power plants with compressed air storage – in any case, suitable only for short-term storage – often the prerequisites do not exist, which is why until now only two such things exist in the world. Storage by means of liquid hydrogen has until now shown a modest efficiency of about 20%. Also wind-gas (Hydrogen produced by using wind energy is here mixed with carbone dioxide to get methane as a result) is not suitable, because it can only be produced at a loss of 70 to 80 percent of the originally produced wind energy.

But above all, suitable wind energy sites are limited. It takes a throughout-the-year average wind speed of at least 6 meter per second for a site to be suitable. Czich thinks about 17% of the current electricity consumption of Germany can be covered through onshore wind energy. He therefore advocates expansion of offshore wind power plants up to a depth of 55 meters under the water surface, which however is seemingly utopian by today's standards. He also advocates an integrated grid system that would cover one third of the global landmass. Studies on this subject estimate the potential of wind energy in Germany as a whole to be at the most 25% of current electricity consumption.

Thomas Krupka, the CEO of Solon (a former leading producer of photovoltaic modules), is one of many who have drawn attention to the problem of the dwindling resource base that puts a limit on the development of renewable energies. The 2008 increases in the prices of raw materials such as copper and steel gave a foretaste of what their absolute shortage in the foreseeable future could mean. Incidentally, referring to this problem, Krupka has rejected large-scale electricity production in the Sahara by means of solar power plants as something on which we could pin our hopes. He pointed, e.g., at the possibility of sandstorms quickly "blinding" the modules, the consequent drastic fall in yield, and the correspondingly shorter life span of the modules (*die Tageszeitung*, 13. 11. 2008).[4] The problem of raw material needs also affects solar-thermal power plants, the latest photovoltaic technologies, as well as wind turbines. After all, about 150 tons of steel are required for an average wind turbine. Just recently, some studies have pointed to the shortage of rare metals such as indium, but also to the shortage of lithium that is used in batteries (See *Spiegel online*, 10. 4. 2009). Particularly for generators of wind turbines, neodymium is very important. With regard to wind energy, James Howard Kunstler asks: "How do we get exotic ores, chromium, titanium, from the few places that possess them to the foundries where the alloys are manufactured in order to manufacture wind turbines? What do we use to power the furnaces? "(Kunstler 2005, 128)

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[4] In connection with the *Desertec* project, Franz Garnreiter (www.linksnet.de/files/pdf/Desertec-fg-200908.pdf) has – besides many other points of criticism – pointed at the gigantic "materials battle" that solar thermal power plants of this type (parabolic trough technology) would require: A solar thermal power plant comparable in terms of capacity to a conventional large-scale power plant (8 terawatt hours per year) takes more than 25 km^2 (that is 250,000 tons!) of high-tech silver-coated mirror glass and over 400 km of absorber tubes. But the whole *Desertec* project in the Sahara has been planned to be larger by a factor of 90. That means, the said figures are to be multiplied by 90. Then come the steel pylons, the transmission cables for high-voltage direct current etc. From this gigantic input of materials one hopes to finally get, by 2050, a 15% contribution to the total electricity generation for the EU. Ted Trainer points, in addition, to the heat storage problem in solar thermal power generation systems in desert areas: Short-term (48 hours) storage using brine is of course no problem, and the losses are small. But bridging the relatively long sunless periods in winter is not possible in this way (Trainer, 47).

The problem of the time slot becoming ever narrower can also be clearly demonstrated on the basis of wind energy. The projected theoretical potentials are partly impressive. In the U.S., for instance, the most optimistic estimates suggest that one could produce about half of the country's total electricity consumption by means of wind turbines.[5] But there is a big gap between this theoretical potential and the status quo. To date, about 1% of the global electricity consumption is generated by wind turbines. Richard Heinberg points out that if the Americans wanted to generate by 2030 about 20% of their electricity consumption by harnessing the power of wind, then they would have to build till then every year about 20,000 state-of-the art wind turbines, quite apart from the necessary expansion of the other infrastructures (e.g. transmission capacity). That would entail a substantial reallocation of economic resources in a relatively short time and under high energy expenditure – an energy expenditure under the circumstances of a fast collapsing fossil energy base: "Given the energy investment required for turbine construction and other infrastructure development necessary for the transition to the renewables, as petroleum begins to peter out there would be no surplus energy available to maintain the economy in conventional ways." (Heinberg 2004, 141f.)

One Million Electric Cars or the Arithmetic Skills of an Ex-Minister

The illusory character of the current discussion becomes abundantly clear when we debate the subject of mobility. The high losses of fertile arable land through soil erosion, expansion of the deserts etc. are known to all even superficially informed persons. There is no doubt that production of biomass directly competes with food production for the world population. The current worldwide boom in growing bio-fuels on plantations ultimately means that worldwide 800 million car owners (with higher purchasing power) compete with the two billion people, who live below the poverty line.

As regards production of bio-fuels, even the Wall Street Journal (5. 12. 2006) now seems to have accepted the point of view of critical ecologists and, citing Prof. David Pimentel, who teaches environmental policy, points out "that [in the USA] expanding corn production for bio-fuels would deplete water resources and pollute soils with added fertilizer and chemicals. It would also require huge volumes of conventional energy for farming equipment and ethanol-conversion facilities – a toll that could *nullify gains from the less polluting fuel produced* " (emphasis added).Not taken into account here is that production of fertilizers and other agricultural chemicals too requires consumption of large amounts of fossil fuels and other non-renewable resources. Already in earlier studies, the EROEI of corn-ethanol was calculated to be only 1.3 and 1.1, that of biodiesel from palm oil only 1.06 (Odum quoted in Heinberg 2004, 152 f). The Chinese author Minqi Li makes it clear: Even if the human race would not grow any more food and devote the entire area of arable land to energy production, the energy yield would not amount even to half of what oil and natural gas are yielding today (Minqi Li, 157).

The German "Greens" are currently ingratiating themselves with the establishment – up to the point of embarrassment – by presenting themselves as the savior of the automobile industry. As a part of their "Green New Deal" they have formulated the vision of having one million electric cars on German roads by 2020. Jürgen Trittin, former federal environment minister and at that time willing executor of the "automobile-Chancellor" Schröder, replied to the question where the electricity for the e-cars would come from: "By then, 50% of our electricity needs would be met by renewable

[5] It is typical for many energy transition scenarios, such as the Greenpeace study of April 2011, that they completely ignore the issue of suitable locations! One should be careful when specifying the energy payback time. Usually, it is calculated on the basis of *peak* usage data. Honestly, however, one ought to calculate it on the basis of real *average* usage data. In Germany, for example, at the best locations in the interior, it is 35%, in average locations it is 11%. While further developing this technology, it has to be borne in mind that – except for offshore locations – rather unfavorable conditions have to be accepted, because the best sites were naturally considered first.

energy technologies. There we already have the half" (interview on 9th May 2009 at the television channel Phoenix).

Energy in liquid, easily transportable and easy to handle form is an essential pre-requisite for the maintenance of mobility in the currently known style. Hydrogen has long been considered the ideal substitute for liquid fuel. A fuel cell-driven engine actually has an efficiency of 60%, outperforming gasoline engines significantly. However, hydrogen is only a storage medium not a source of energy. There are basically two feasible ways of hydrogen production: producing it from hydrocarbons – today, concretely, from methane – or from water by means of electrolysis, whereby, in principle, it is always possible to perform the electrolysis using renewable energies. In both processes, the power consumption amounts to about 5 kWh per cubic meter, in the subsequent generation of electricity from hydrogen too some energy is lost. In the event that the electricity for electrolysis comes from renewable sources, then, asks Benjamin Dessus, how much net hydrogen-energy can result at all, considering that large-scale production of hydrogen requires permanent energy supply in considerable quantities (*Le monde diplomatique* 14.1.2005). In this sense, Richard Heinberg emphasizes:

"The Second Law of Thermodynamics insures that hydrogen will be a net-energy loser every time since some usable energy is lost whenever it is transformed …Given the already low net energy from renewables as well as the net energy losses from both the conversion of electricity to hydrogen and the subsequent conversion of hydrogen back to electricity, it is difficult to avoid the conclusion that the 'hydrogen economy' touted by well-meaning visionaries will by necessity be a much lower-energy economy than we are accustomed to". (Heinberg 2004, 149)

Then there are the considerable infrastructure and safety problems, for which hardly any solutions are yet in sight. Because of the extremely high pressure that has to be contained, a hydrogen car with fuel cell technology requires a tank that is reinforced with extremely strong carbon fibers. Here, the lead joints are a major safety risk. Hydrogen is highly inflammable and corrosive. Each refueling act would not only be a high safety risk, but would also be associated with additional energy expenditure. The energy consumption for transporting the fuel (in tankers fitted for high compression pressure), in relation to the transferred energy quantity, alone would make hydrogen uneconomical at almost any distance.[6] The résumé of the already mentioned author Minqi Li is: Due to the physico-chemical properties of the element, a hydrogen economy in a big way is unthinkable. Taking into account the necessary conversion processes, liquefaction, transportation etc., there remain for final consumption only10 to maximally 20% of the energy invested (Minqi Li, 158)

There simply is no way around it: As any form of energy is finite and subject to the physical law of entropy, as even seemingly abundantly available energy must first be made available – with a lot of difficulty and high energy expenditure – we will have to develop a different relationship with mobility as a whole. It presumably does not correspond to the human scale, to be able to travel to almost any point on the earth within 24 hours.

An Economy of "Enough"

Given the growing scarcity of energy and given the fact that the growing shortage cannot nearly be compensated for through the use of renewable energies, through more energy efficiency etc., we have to face the situation that we must in the near future manage with considerably less net energy. But then, the capitalist economic system with its accumulation logic (continued accumulation of capital at ever higher levels) cannot be kept going any more. It requires a highly differentiated international division of labor with correspondingly high and cheap transport capacities (necessarily

[6] Heinberg states that to transport the amount of energy that is contained in a tanker filled with gasoline, would require 21 similar tankers if hydrogen were used as the medium!

based mainly on fossil fuels) as well as ever more energy-intensive production. But not only capitalism, our industrial society altogether becomes unsustainable. In the face of this situation, our task can only be to forestall the collapse as far as possible and to consciously steer the unavoidable deindustrialization process.
Those who want to secure the basis of life in the world must strive to create an economy and culture of “enough”. They must say goodbye to our pseudo prosperity with its parasitic character. As the saying goes, you cannot eat the cake and have it too. We cannot enjoy the prosperity offered by the industrial societies and also protect the biosphere.
In refreshing contrast to the ecological welfare-chauvinism of, e.g., Ernst Ulrich von Weizsäcker, Jeremy Rifkin makes it clear that nothing less than our industrial society and the associated lifestyle and habits are at stake:

“Those wedded to … the industrial age will no doubt regard these observations about solar technology as pessimistic. Many will consider it inconceivable that urban life, industrial production, and all the creature comforts that make up the so-called American Dream are antithetical to the Solar Age. However, ecologists and economists like Georgescu-Roegen, Daly, Odum, Bookchin, and Ophuls would argue that to ignore the historical reality in front of us … is sheer madness and will lead to an even greater fall for humankind, perhaps an irreversible one. Regardless of which course we follow, the coming transition is sure to be accompanied by *suffering and sacrifice*. ” (Rifkin 1980: 203. Emphasis added)

A sustainable economy that protects the elementary foundations of life must not only not grow, it must actually contract – with the aim of attaining an acceptable level of "steady state" (Daly) – in other words, reaching a stationary equilibrium. Naturally, this is not compatible with the growth logic inherent in capitalism. The required economic disarmament can only be carried out through *conscious planning*. This has been convincingly shown, above all, by Saral Sarkar in his two books listed below, in which he critically deals with the views of Herman Daly, Harry Shutt, Elmar Altvater, the "market socialists", and other economists. The raw materials and energy scarcity and the absolute necessity of complying with minimum environmental standards inevitably lead to the breakdown of entire industrial sectors. Here, "market-oriented" laws for controlling the process must necessarily fail. The (limited) control mechanisms of the market only work well under conditions of high productivity and sufficiently large supplies of resources.[7] Steering demand by means of fiscal policy, for instance through taxes, can only aggravate social divisions and can have the effect that unecological behavior remains the privilege of a rich elite. Free trade with limited tradable pollution certificates can, under capitalist conditions, only lead to blatant misallocation of resources. Steering of resources supply, and quantitative regulation of energy and raw materials must go along with price controls and an indicative framework planning that steers production and consumption. What, how and how much is to be produced cannot any longer be left to the chaos of particular profit interests. That must be consciously organized – in as democratic and participatory a manner as possible. The illusions about energy efficiency and renewable energies that are being stirred up through plenty of media support seem like helpless defense efforts against the unavoidable conclusion that only an ecological-socialist order can save the world.

Literature:

[7] The market mechanism is efficient only in a situation, in which both producers and consumers can react equally flexibly to price signals. But due to scarcity of resources we shall in future have to deal with sellers' markets. In such a situation, market logic would require that prices rise to a level where certain goods are available in sufficient quantities only to the rich.

- Giegold, Sven (2009) „Freiheit, Auto, Nachhaltigkeit“, in: *Le monde diplomatique*, 13. 9. 2009
- Hirsch, Robert L., Robert Hirsch on peak oil mitigation, in: Global Public Media 2005 www.netl.doe.gov / Publications / others / pdf / Oil_Peaking_NET.pdf.
- Heinberg, Richard, 2004: The Party's Over – Oil, War and the Fate of Industrial Societies, Forest Row (UK): Clairview.
- Kunstler, James Howard, 2005: The Long Emegency. Surviving the End of Oil, Climate Change, and Other Converging Catastrophes of the Twenty-First Century, New York.
- Lightfoot, H. Douglas / Green, Christopher, 2001: Energy Efficiency Decline Implications for Stabilization of Atmospheric CO2 Content. Centre for Climate and Global Change Research, Report No. 2001-7, McGill University, Montreal.
- Luks, Fred, 1997: Der Himmel ist nicht die Grenze (“The sky is not the limit”) , in: Frankfurter Rundschau, 21
January 1997.
- Minqi Li, 2008: The Rise of China and the Demise of the Capitalist World Economy, London.
- Odum, Howard T., 1996: Environmental Accounting. Emergy and Decision Making, New York.
- Rifkin, Jeremy, 1980: Entropy - A New World View, New York: Viking Press.
- Sarkar, Saral, 2012: The Crises of Capitalism - A Different Study of Political Economy, Berkeley (USA): Counterpoint.
- Saral Sarkar, 1999: Eco-Socialism or Eco-Capitalism? – A Critical Analysis of Humanity’s Fundamental Choices. London: Zed Books.
- Saral Sarkar / Bruno Kern, 2008: Eco-Socialism or Barbarism – An Up-to-Date Critique of Capitalism (Broschure, Can be ordered with *Initiative Ökosozialismus*, Mainz, Germany).
- Stern, Nicholas, Stern Review: Der wirtschaftliche Aspekt des Klimawandels (aus dem Internet)
- Trainer, Ted, 2007: Renewable Energy Cannot Sustain a Consumer Society, Heidelberg.
- Weizsächer, Ernst Ulrich von, 1992: Erdpolitik. Ökologische Realpolitik an der Schwelle zum Jahrhundert der Umwelt english transaliton: Earth Politics), Darmstadt.
- Welzer, Harald: Klimakriege. Wofür im 21. Jahrhundert getötet wird, Frankfurt 2008.

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