Energy-Debates: Analysing Stakeholders, Interests and Contradictions

A Swiss perspective on a global issue

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"Time for a revolution" titles *Spiegel online*[i] on an article under the keyword "energy-debate". A closer look shows a passionate plea for burning more gas to compensate the gap in Germany's energy supply due to the planned shutdown of nuclear power plants. Propaganda or information?

Working myself in the energy sector, I consider such examples as problematic and it motivated me to think about the *key elements to be taken into consideration to ensure constructive, solution oriented energy debates*. As this topic is very complex for a ten-page paper, the first question was how to reduce complexity without omitting important details. My approach is to focus on *stakeholders*, their *interests* and *contradictions* in this communication system. However, the issue is also influenced by contextual and quantitative factors as for example the foreseeable end of the age of fossil fuel, demographic growth, etc. These factors cannot be left aside, specifically because my aim is to produce a paper that is interesting for specialists with a technical background as well as for specialists in the field of social sciences and also for a generally interested readership.

Discussing energy issues is discussing change, because change is taking place in the energy sector, whether we like it or not: Change in the fields of technology and policy but also concerning areas like privileges and social inequality. The question, if tensions might originate from it can be left open. As energy is a global issue overall, it requires a holistic approach and – even more important – a long-term perspective, a vision of our planet's future. Splitting energy debates into separate discussion fields like nuclear power, alternative energies, CO_2-emissions, sustainability, climate change, etc., can be an open door for propagandist promoting short-term or individual interests.

Direct use of solar radiation is the most efficient and least problematic energy supply for human activities. But society today is to a large extent using technologies based on more problematic fuels. Therefore, energy debates must centre on technological challenges, but not only: Energy is a public issue in which states have an important role to play. Probably the most crucial element of this role is *maintaining the power balance between stakeholders*. This implies measures to ensure that the value of technical infrastructure is maintained in the common interest of society. Another important role of states is to provide information allowing public debates to be based on facts, not on propaganda. This implies the encouragement of research and cooperation with other states to shape and coordinate policies.

So far, the findings seem not to be quite as revolutionary as announced by Spiegel-Online[ii]. This changes rapidly if we start considering the *potential of energy debates to change ways of thinking* from fear-oriented ("the cake is too small for all of us", e.g. the peak-oil example, p. 4) towards solutions and perspectives ("the cake is big enough for all of us", e.g. the example of abundantly available energy trough solar radiation, p. 4). Energy debates have a potential to be a catalyst for social change, towards a more peaceful future. The challenge will be to raise awareness that we have to make a choice.

2. Contextualisation and Quantitative Considerations

Even though the focus here is on stakeholders, contextualisation is crucial in conflict analysis[iii]. In order to keep this paper compact, I refrain from going into details in this section, which is mainly a summary of basic knowledge in technically oriented professions[iv]. Some aspects and examples described might be specific for Switzerland and not fully apply for other countries.

Historically, firewood together with human power was the main energy source for many centuries. Domestic animals, hydraulic and wind-power were important elements that came later, before the age of fossil fuel (coal, oil, gas). All the mentioned energy sources (or energy carriers, fuels) were in one way or another related to solar radiation: Wood, coal, petroleum, gas, etc. as different forms of biomass; Wind and hydraulic power as climatic elements.

A differentiation needs to be made in the field of biomass. This fuel exists in two fundamentally different forms: Fossil – stocked over centuries underground – or as "freshly" harvested vegetation. Any use of biomass fuels emits CO_2. But the fossil form emits CO_2 that was *absorbed centuries ago* and therefore increases the amount of CO_2 in the atmosphere. Furthermore, it is considered as non-renewable because the thermodynamic process of transforming fossil fuel into heat is irreversible. On the other hand, fresh biomass is considered to be renewable, as what's harvested can be regrown, and it leaves the amount of CO_2 in the atmosphere without significant changes. But this doesn't mean that it is completely unproblematic, as for example the upcoming discussions about land grabbing[v] or the problem of erosion illustrate.

Electricity brought a significant change about a century ago: It allows fairly cheap transport of important quantities of energy and also its fine-distribution (to remote areas, buildings, individual rooms, etc.). Electricity by itself is not a source but a *form* of energy. The age of electricity started with the use of well-known energy-sources to generate electrical energy: Hydraulic power and the burning of fossil fuels.

In the middle of the 20th century, nuclear power appeared. It operates basically with the same type of steam turbines used in thermic power plants. Only the heating process is different, as the energy source is uranium and similar nuclear materials. Nuclear power polarizes. Therefore it would not help this paper to go beyond generalities in this matter: Those against it point at technical risks and the problem of nuclear waste; those promoting it describe the technology as efficient and CO_2-free. In terms of renewability it is clear that the natural uranium used in the process is not renewable. Some count on recycling, but this hasn't been proven to be safely feasible at an industrial level.

The most recent topic in the discussion is what is termed "alternative energy". There is a multitude of forms and technologies subsumed in this genre. In most cases they are rooted in the more or less direct use of solar radiation. Let's add here that the sun provides earth with as much energy every hour as human civilization uses every year[vi]. Alternative energies range from very low-tech to very high-tech applications. Low-tech can mean for example designing and orienting buildings in a way that allows directly for the use of solar radiation (heating through windows, via convection, etc.), which usually does not causes high extra costs. Solar heating and warm-water applications demand a little more technology, while photovoltaic, wind-power and similar systems usually need more important investments[vii]. Geothermic energy – the use of heat from inside our planet – is often cited among alternative energies, but is still in the experimental phase to keep it short here.

History shows how different communities of specialists arose in line with the emerging of different technologies. This fragmentation of community's means that debates are frequently limited to only a few specific aspects of energy, like for example nuclear power plants, alternative energies, CO_2 emissions, climate change, electricity grids, etc. This is not problematic per se, but it can be an open door for propaganda, as will be discussed in chapters 5 and 6.

In quantitative terms, a word has to be said about energy consumption first. According to statistics published by the *Swiss Federal Office of Energy* (SFOE, for the Situation in Switzerland) and by the *International Energy Agency* (IEA, for the situation worldwide), energy supply and consumption are constantly rising. Both have approximately doubled in the last 40 years, which correlates to a certain degree with the demographic development, to keep it very simple at this point[viii].

Two factors make it difficult to establish transparency in quantitative terms for the energy sector. First is the question of *valuing assets*. Energy-projects require high start-up investments, specifically for technical infrastructure. These assets represent values even years or decades after the initial investment. Depending on the different interests involved it can be advantageous to devalue the investment fast (which creates hidden reserves) or to keep high values on the books (for example to hide the need for new investments, for modernizing infrastructure, etc.).

The second question is closely related to the first. It concerns *maintenance*, which has a very important influence on the value of assets. Good maintenance can ensure assets to keep their value over long periods while omitting it can quickly destroy them. But maintenance is not free: It costs money to keep value valuable. This particularity makes it possible – from a short-term perspective – to give a false impression of high profitability through omitting maintenance[ix].

These examples give evidence that decisions on investments in the energy sector (as probably also in many other public domains) appear to be different – if not opposite – according to their rootedness in a short- or a long-term perspective. This can be best illustrated with an example: Energy saving technologies demand higher investments at the start but are cheaper to operate during their lifecycles. It now needs a technical director with very good communication skills to find an agreement with a financial director who believes that higher profits could be achieved by investing in stock markets. The example also gives an idea on how *externalities*[x] complicate calculations and transparency even more.

Regardless the difficulties in estimating assets in the energy sector, it is possible to get an idea about its *volume* by combining end-consumer prices and energy consumption. For 2010, the SFOE calculates this value for Switzerland at up to CHF 30.5 billion, representing 5.1% of the GDP or close to CHF 4000 per capita. This is just to give an idea about the economic importance of the energy sector in general.

An interesting figure appears in the IEA Statistics: *The TPES/capita* (Total Primary Energy Supply related to the population). For 2009, the IEA has published this value (in tons of oil equivalent) for 137 countries. It starts from 0.14 (Eritrea), climbs up to 3.45 for Switzerland, 7.03 for the USA and ends up around 16 for special cases like Iceland or Qatar, which is 112 times higher than Eritrea. Striking is that the eleven countries with the lowest TPES/capita[xi] are found among the very poorest countries according to the Human Development Index (HDI) of the United Nations[xii]. It is not the aim of this paper to prove correlations between energy consumption and wealth, human development,

poverty or violence. But as such correlations appear to be possible I feel that it's fair to mention it here.

This leads to another important element: The limited availability of fossil fuels. A debate is taking place on the question of whether we have passed *peak oil*, meaning that half of the fossil fuel reserves are already consumed. The two diagrams on the next page illustrate this better than many words[xiii]. By looking at this foreseeable end of the age of fossil fuel and taking also into consideration that, in 2009, 67.5% of the energy consumption worldwide was fossil fuel (75.8% in 1973)[xiv], it appears very clearly that change is on its way. The only uncertainty is when and how. This constellation is probably one of the most important drivers influencing our future, not only on the level of energy issues but also concerning the global political and economic situation.

For the sake of completion it can be added, that not only *consumed* energy is relevant but also the energy that is *saved*. Therefore, if we talk about technologies and policies we have to consider also efforts to reduce consumption and losses of energy, for example by improving the efficiency of technical systems, by insulating buildings, etc.

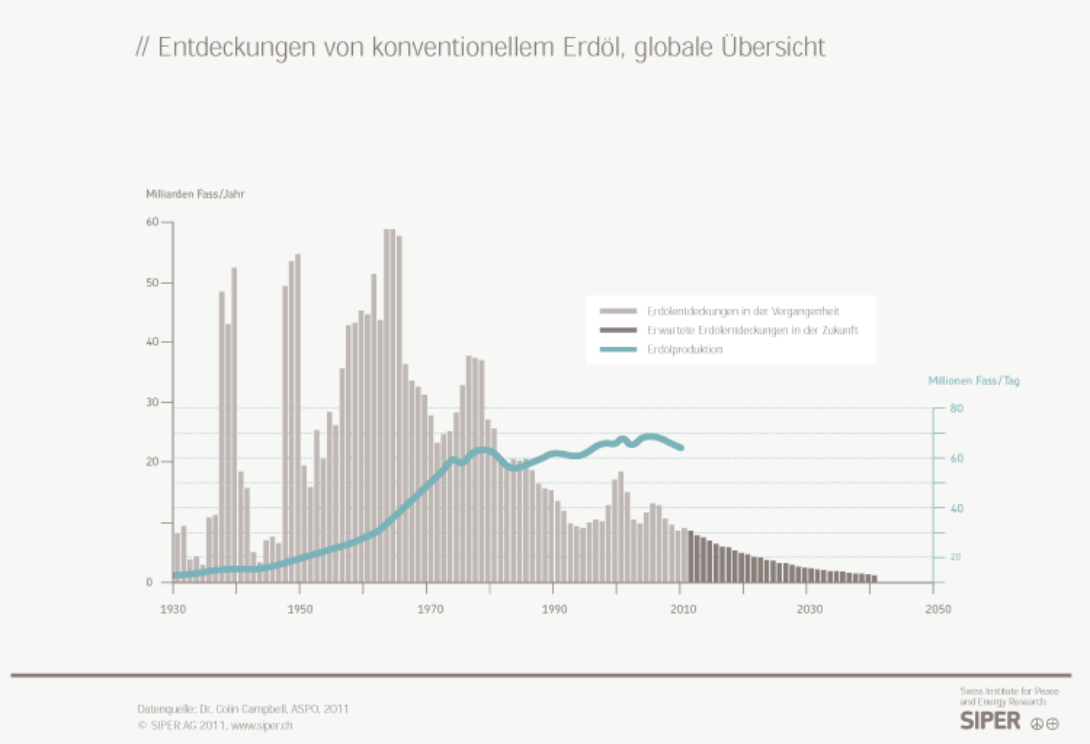

Figure 1: Discovered new oil fields in relation to fuel production

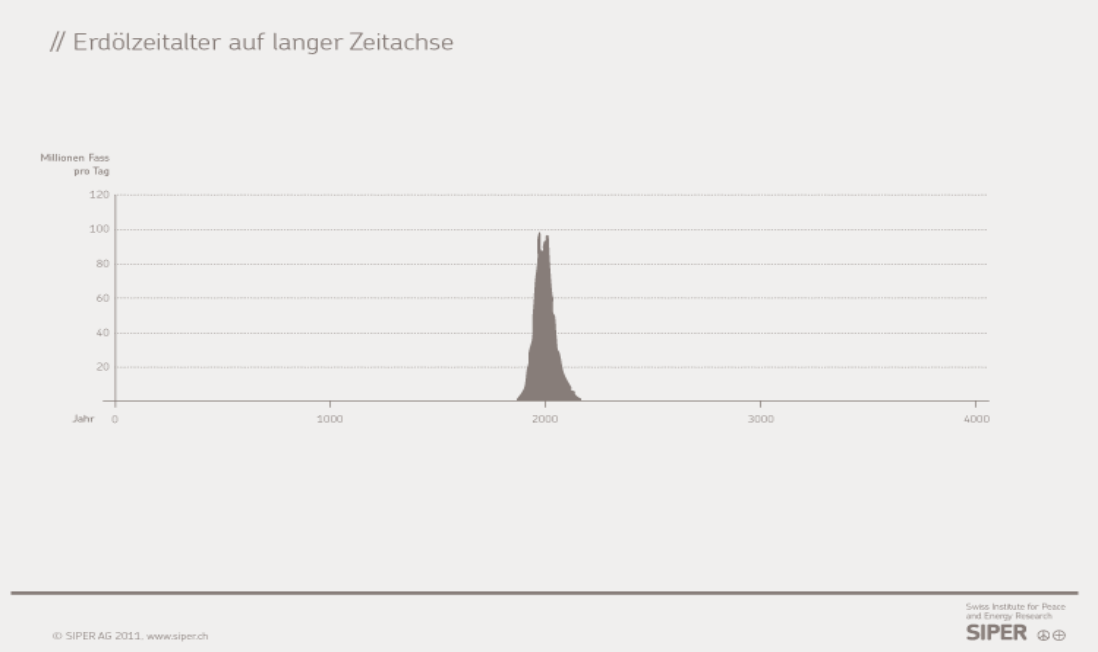

Figure 2: Consumption of fossil fuel on a timeline stretched over 4000 years.

3. Conflict-theoretical Considerations

First thing to ask here: Is there really a conflict? Switzerland has never known a serious scarcity of energy[xv]. So if there was a conflict, the subject was probably not or not only energy. But then, why is Spiegel online talking about a *revolution*[xvi]? Are there some underlying, some hidden root-causes? Do foreign actors play a role? As questions rise, attempts to find answers end up looking like speculation. Are people nervous because they are afraid deep inside? Afraid of depending on the good will of other nations, other people? Depending on resources that will not be available in the future? Are we afraid of losing jobs, privileges; afraid of resource wars; afraid of wind turbines changing horizons and landscapes?

System theoreticians could argue that there is a *conflict system* with a huge number of sub-systems. But does this help any further? It helps at least to discover a society looking for ways to shape its future. And it helps to identify what at least one subject of the conflict must be: Change. This again helps to orient the discussion to some important, factual questions like: What has to be changed? When? Which direction? How? And so on.

This all is just brainstorming. Apparently, the topic is a little too big to fit easily in the classical framework of conflict-analytical tools. But fortunately there is a perspective of analysis left unexploited yet: Let's have a look at *interests*.

4. Stakeholders and their Interests

The following selection and definitions of stakeholder categories represents my personal choice. Possibly, other researchers might have done it differently. Principally, everybody can be subsumed in the category of **Energy Consumers**. This is important for some conclusions but it is too reductionist. So I introduced a second category, the **Producers & Distributors** (including importing, transforming and storing of energy or energy carriers). In a next step I looked at 3rd–parties on the producer side of the system and identified the **Investment Sector** as a third stakeholder-category (limited here to purely profit-oriented money investments, in infrastructure, commodities, etc.). As a forth category, **Other 3rd-Parties** like contractors, researchers, etc. are identified.

In order to reduce complexity, the above mentioned four categories could be seen as representing the whole system adequately. And it becomes already clear that many individuals are related to more than one of these categories. But reflection showed that the **Political System** (including politicians, lobbyists, activists, i.e. defending environmental protection, "service public", market liberalisation, etc.) need to be considered as a fifth category to really get to substantial conclusions.

Two remarks have to be added at this point. Firstly it is important to note that all categories *include direct employees as well as individuals hired trough subcontracts (indirect employees).* Secondly it becomes obvious that limiting energy debates within geographical delimitations does not make sense, as many of the mentioned sub-systems are globally interconnected.

Like the selection of stakeholders above, the following selection of stakeholder *interests* is based on personal estimations and some trial-and-error experiences. The different categories of interests that I found might need the following additional information to be sufficiently precise:

- The interest of *reliable energy supply at cheap/affordable price* is a special case: Related basically to consumers, it connects also to all the other stakeholder categories because, as it has been mentioned, everybody is an energy consumer somehow. But what at a first glance appears to be a connector has an ambivalent character: It can also lead to healthy competition in best or violence in worse cases.
- *Sustainable energy supply* can include long-term orientation and/or avoiding environmental degradation and/or avoiding waste problems and/or compliance with social standards, etc.
- *Job security / Good working conditions* can be oriented towards salaries but also towards safety, health protection, team spirit, etc.
- *Profit* includes the question of long- or short-term orientation as a *negotiable element*
- *Technological superiority* can be seen as an element of competition as well as an element of sustainability

In Table 1 (next page), different stakeholders and different interest categories are put in a matrix to illustrate the types and degrees of correlations in this system. As empirical surveys on these correlations are out of reach for this paper, I had to use heuristics based on my own observations and experience for these steps.

After treating the special case of *reliable energy supply* (as mentioned above; indexed by [1)] in Table 1), I differentiated two *degrees of accuracy* for correlations between stakeholder- and interest-categories:

- Cases where correlation exists probably to a major extent but not necessarily for every single case (indexed by **X** in Table 1)
- Cases where correlation may exist to a certain extent, with exemptions (not specified) to be considered (indexed by [2)] in Table 1)

A little example shall illustrate this better: The table shows correlation of the second type – might exist to a certain extent with (unspecified) exceptions – between the *producers / distributors* and the two interests of *sustainable energy supply* and *profit*. This simply means that some producers / distributors might have sustainability as their core interest while others might be more focussed on profit.

A third step was to isolate some specific *types of correlation* between stakeholder- and interest-categories:

- Cases where correlation exist in general, but not related specifically to the energy question (indexed by [3)] in Table 1)
- Cases where correlation might exist via politicians, lobbyists, activists, etc. defending interests of other stakeholders (indexed by [4)] in Table 1)

Table 1: Overview with stakeholders and their interests (own presentation)

Stakeholders / Interests	Consumers	Producers & Distributors	Investment Sector	3rd-Parties like contractors, researchers, etc.	Political system (politicians, lobbyists, activists, etc.)
Reliable energy supply at cheap / affordable prices	1)				
Sustainable energy supply	**X**	2)		2)	2)
Job security / Good working conditions	3)	**X**	3)	**X**	**X**
Profit		2)	**X**	2)	4)
Technological superiority		**X**		**X**	

X) Applies probably to a major extent but not necessarily for every single case
1) Applies also to other stakeholders in the sense that all individuals generally are energy-consumers
2) May apply to a certain extent, with exemptions to be considered
3) Applies in general, but not related specifically to the energy question
4) Might apply if politicians, lobbyists, activists, etc. are defending interests of other stakeholders

5. Primary Conclusions

Exploring this matrix enables the identification of three interest categories with five or four entries, what can be interpreted as a potential to bridge or connect different stakeholder-groups: The fields of *working conditions, sustainability and profit*.

The most entries are in the category of *job security and good working conditions*. Only human? Yes, but there is more to discover in it: We are talking about different *types* of jobs. Technical and commercial jobs are less concerned by a heated up energy discussion because they are oriented mainly towards the *executing* of decisions and not vitally threatened by technological shifts (as the demand for energy remains). In contrast, we find lobbyists, activists, politicians, researchers and others in similar functions with the principal aim of *influencing* decisions. For them, the continuation of the debate is vital. But not only for them! Discussion – even if it's hot, loud and emotional – also gives room for ideas and concepts to compete. In my opinion, participatory ways of decision-making are likely to favour the best-suited solutions – assuming that the balance of power is equal.

Another element likely to be a connector is *sustainability*. But it also appears that this interest could easily conflict with the goal of profitability. As the example of the technical and the financial director showed (chapter 2), and as it will be shown again in the next chapter, the risk of conflicting interests leading to escalation can be reduced by privileging a long-term perspective.

According to the matrix, two groups of stakeholders – the Producers / Distributors and 3rd-Parties – seem to have exactly the same set of interests. This is true in cases where cooperation is established between actors of the two categories. Only the fact, that they are "connected" by the interest of technological superiority raises awareness about the very important element of *competition that exists inside* these categories. In fact, harsh competition in the energy business leads to propaganda likely to drag attention away from solution oriented and objective debates. A thin line separates information from propaganda, which frequently is characterized by a tendency to separate "Us" from "The Others". Another propaganda mechanism is the creation of "make-belief-debates" within red lines[xvii].

6. Attitudes, Behaviour, Contradictions and the Element of Power

In the field of conflict transformation, analysing attitudes and behaviour is a classical way to reveal contradictions, underlying causes of conflicts and also hidden agendas[xviii]. Let's start with a frequently observable contradiction on a very personal level: The actor concerned about the steadily increasing global energy consumption whilst not being ready to reduce individual consumption. Why are we waiting for somebody else to take the first step? Why not recognize that change can be a chance? Why not contribute with good ideas, use home-grown energy, or save it for later?

In general, I see the clash of short-term vs. long-term perspectives as the most important issue to address. It can be found explicitly or implicitly in all the categories of interests. Personally, I see more advantages in privileging long-term orientation because energy (as well as fossil fuels, climate and many more) should be seen as belonging to the *"commons"*[xix]. And I see no sense in transforming such resources into short-term profits, as doing so carries a risk of punishing future generations.

Now, let's remember the remarks on technological competition and propaganda in the last chapter. Competition can have a contradictory element when it *creates* discrimination. But it can also be a connector by improving technologies and policies with a potential to *avoid* discrimination. What looks like a dilemma can be clarified by privileging long-term orientation: The more technologies are based on the direct use of solar radiation, the more they can be considered as sustainable, as avoiding discrimination. With one important exemption: The production of bio-fuel that can be very harmful for people when they are chased off from their land to allow the establishment of huge cash-crop monocultures. This example shows that discussing the energy-question requires first of all a *vision*. How should our planet look in 200, 500 years? How could people live peacefully on the planet at that time? And why not include the question of social inequality? Developing answers to these questions helps decide what makes sense right here and now, on the way to our energy-future. Examples like the propaganda-article mentioned in the very beginning of this paper indicate that not everybody agrees on privileging long-term orientation. Individuals could conclude from this that their main task is to distinguish propaganda from facts.

Going deeper in the search for contradictions – or open questions – let's start with the idea, that energy is a public interest. In reality – or in contrast to this public nature – energy supply today is organised to substantial extent through the private sector[xx]. The role of states and public administrations may vary from one country to another but it is usually a mainly regulative role nowadays. The contradiction could be formulated as follows: States have to guarantee the supply of energy for their populations and economies[xxi], while they have to leave this duty to the free market. But can the market really be free under such circumstances? Shouldn't we talk about market failure[xxii] when talking about natural monopolies, of which energy is one? We are back at the financial aspects, at the external costs of energy – and on the way to discuss the role of states in supplying vital goods to its population. Time to come to an end here to avoid overstretching this paper.

At least one question remains unanswered: As none of the stakeholders can cope with the whole complexity of the energy question, it appears that there is no alternative to participatory decision making in this field. But *who* should be included in this process? Is it enough to stay with a Swiss point of view for Switzerland, considering only the stakeholders mentioned in chapter 4? Or what about including for example the population of Libya, where Switzerland bought important percentages of its crude during many years of the Ghadaffi-Regime?[xxiii]

Questions like this show again that energy issues have a strong potential to unite – as well as to divide. This contradiction is probably the crucial one. The dividing of people has been at the origin of violence long enough, with propaganda as an important tool to profit from it. *Sharing* could be a valid alternative, and energy offers itself as a perfect subject to find out and to learn more about this attitude. Because it is very concrete: Once internalized that we are mainly solar powered and that we have more than sufficient solar power, nobody needs to fight anymore to get a bigger share of a scarce resource. Sure, this will take a while. And sure, we will see and hear a lot of propaganda promoting "solutions" with the argument of short-term profitability. Time to make a choice. Or, what was it that Spiegel-Online called for? Time for a revolution?

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Other Internet sources as well as newspapers and similar are indicated in the footnotes

Endnotes

[i] 2011, March 15

[ii] So is for example the urge to cooperate and network with other states in the centre of an article presenting the country report for Switzerland, established by the International Energy Agency (SEV-Bulletin 8/2012)

[iii] From the huge body of literature on conflict analysis, I consider the German tradition with for example the systems theory of Niklas Luhmann or also the theories of Johan Galtung as particularly interesting for this paper. But it is not limited only to these sources (see bibliography)

[iv] Here, the Club of Rome could be cited to represent the body of literature, specifically it's 1979 report „Energy, the Countdown" (see biblography or http://www.clubofrome.org)

[v] Newspapers report frequently on this newer phenomenon. Examples: ZEIT ONLINE, 27.4.2012, Wie reiche Investoren die Ressourcen Afrikas zu Geld machen; LE TEMPS, 4.10.2011, Ces terres éthiopiens loués "à bas prix".

[vi] According to an article by Oliver Morton in Nature 443, 19-22 (7 September 2006); Abstract retrieved through http://www.nature.com/nature/journal/v443/n7107/full/443019a.html (1.9.2012).

[vii] Comparing prices is complicated by a number of subsidies to encourage investments in alternative energies. Information on the situation in Switzerland are available at http://www.swissolar.ch for example (1.9.2012)

[viii] For more details please refer to the following quantitative considerations or to the following sources:
http://www.bfe.admin.ch/themen/00526/00541/00542/00631/index.html?lang=de; 6.6.2012
http://www.iea.org/stats/index.asp; 6.6.2012

[ix] And sure there are temptations to put such book-profits into private pockets as the example of the privatisation of British Rail illustrates. In a recent article, The Guardian states, "The only people who don't see the need to renationalize the [british] railways are profiteering firms and their supporters in parliament" (http://www.guardian.co.uk/commentisreee/2012/mar/10/rail -privatisation-failed-nhs/print; 16.9.2012). More detailed information can be found for example in an article entitled "British Rail Privatisation: What went wrong?", written in May 2002 by Brendan Martin (found through Google, 16.9.2012).

[x] Definition of externality, according to http://economics.about.com/cs/economicsglossary/g/externality.htm (7.6.2012): An externality is an effect of a purchase or use decision by one set of parties on others who did not have a choice and whose interests were not taken into account. Classic example of a negative externality: pollution, generated by some productive enterprise, and affecting others who had no choice and were probably not taken into account. Example of a positive externality: Purchase a car of a certain model increases demand and thus availability for mechanics who know that kind of car, which improves the situation for others owning that model.

[xi] Eritrea (0,14), Bangladesh (0.18), Senegal (0,23) Nepal (0,34), Yemen (0,32) Cambodia, Cameroon and the DR Congo (all 0.35), Congo (0,38), Benin, Ghana (both 0,39). Attention has to be drawn to the fact that the IEA statistics doesn't cover all countries worldwide!

[xii] From rank 135 of 187 for Ghana to rank 187 for the DR Congo, according to http://hdr.undp.org/en/statistics/; 1.9.2012

[xiii] Original diagrams available under http://www.siper.ch/energie/energie-wissen/infografiken/

[xiv] According to IEA, Key World Energy Statistics, p. 28

[xv] The beginning of industrialisation can be seen as an exception, when excessive deforestation provoked landslides, floods and similar problems. The rather severe forestry legislation in Switzerland, obliging reforestation after logging, can be seen as a result of this.

[xvi] 15.3.2011, see introduction to the abstract

[xvii] As an example for such make-belief debates within red lines, the interdiction of light bulbs in the EU could be cited: Where producers of alternative products to light bulbs may praise the measure as *the* solution to the whole energy crisis, it should be seen in the light of some facts: According to Kemmler (2011: 21) for example in Swiss households lightning represents only 2.1% of the overall energy consumption. So, the interdiction of light bulbs cannot solve more than a very small part of the global energy problem. Information on how propaganda works can be found for example in Chomski (2007: 35): "Gute Propaganda erfindet einen Slogan dem alle zustimmen können ohne wissen zu müssen, was er bedeutet, weil er nämlich nichts bedeutet. Sein Wert besteht gerade darin, von der wirklich bedeutungsvollen Frage abzulenken". Which could be re-translated (by myself): *Good propaganda invents a slogan that everybody can agree on without necessarily understanding what it means because it doesn't have a meaning anyway. It's the core value of such slogans that they distract from the really meaningful question*.

[xviii] The triangle of attitudes, behaviour and contradictions has been developed by Johan Galtung through different publications (see bibliography)

[xix] According to http://www.onthecommons.org (1.9.2012), commons include everything that we inherit and create together, from water and forests to knowledge and the Internet. Other definitions are available through http://commons.ch/english/why-commons (1.9.2012)

[xx] The Biography of Marc Rich – The King of Oil – is a good source to discover more details on this issue.

[xxi] Art 89 of the Swiss Constitution: Bund und Kantone setzen sich im Rahmen ihrer Zuständigkeiten ein für eine ausreichende, breit gefächerte, sichere, wirtschaftliche und umweltverträgliche Energieversorgung sowie für einen sparsamen und rationellen Energieverbrauch (http://www.admin.ch/ch/d/sr/101/a89.html; 20.9.2012). In the universal declaration of human rights, energy cannot be found explicitly but implicitly in article 25, stating that „Everybody hast a right to a standard of living adequate fort the health and well-being of himself and his family [...]“; http://www.ohchr.org/EN/UDHR/Pages/UDHRIndex.aspx, 22.6.2012

[xxii] According to http://www.dictionaryofeconomics.com/article?id=pde2008_M000056&q=failure&topicid=&result_number=1 (7.6.2012) Market failure occurs when there are too few markets, non-competitive behaviour, or non-existence, leading to inefficient allocations. Many suggested solutions for market failure, such as tax-subsidy schemes, property rights assignments, and special pricing arrangements, are simply devices for the creation of more markets. This remedy can be beneficial but, if the addition of markets creates either non-convexities or thin participation, then adding markets will simply lead to market failure from monopolistic behaviour. Examples are natural monopolies and informational monopolies. To achieve a more efficient allocation of resources in the presence of such fundamental failures one must explore non-market alternatives.

[xxiii] IEA, 2012, Oil & Gas Security / Switzerland, p. 6: „Although Libya's share was dominant before 2008, efforts for diversification of supply sources have been made since, resulting in reductions of oil imports from Libya“.