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Workshop Bioenergy Protocol

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1. Limits

In contrast to oil, coal and gas, bio-energy is an unlimited resource as it can be produced without restrictions. A huge potential is theoretically available. - At least globally. However, potential for energy decreases if no demand is assumed

Inefficient use of Swiss forests

It is general knowledge that the Swiss forests are not used sufficiently. There is a higher production of wood than demand. Why should we not use more wood for the production of bio-energy? Even though we could approximately double the production of wood from our forests from 2.5% to 5% it is not done. From that point of view this source of energy shows still a certain potential.

Energy production in Switzerland

In Switzerland, mistakes were made in the building of numerous small local power plants instead of fewer bigger ones. Costs could be reduced and the electric power output could be increased. Costs of transportation might be lower than the gain of productivity. In some converting systems of power production, it makes sense to have longer transportation ways because in another area power stations have a much higher efficiency. As an example, a wind plant is offshore much more efficient than on the continent.

2. Food

Economical targets and political regulations often do not match

It is a very frustrating fact for those trying to reduce the energy consumption that car manufacturers have to fulfil the demands of the customers. Unfortunately, our society is not ready to accept less strong motors that would make a great contribution to decrease the energy consumption. Scientists proved to be possible to reduce the fuel consumption by 50%, by constructing environmentally friendlier engines. However, these engines come to a higher prize than the customers are willing to pay. As long as no regulations, such as taxation in air transportation, are set by the government there will be no change in people's behaviour. Politics are also an obstacle. Political targets are often not the same as economical targets. Energy production must not compete with food production. Often fuels are imported from areas that export fuels themselves. Whereas Brazil is the Nr.1 regarding the production and export of bio-ethanol, they depend on the import of primary energy themselves. Because Brazil exported such large quantities of ethanol gained out of sugar, suddenly sugar became rare and prizes doubled.

3. Reduction of CO_2-pollution and social acceptance

Artificial photosynthesis to reduce the share of CO_2 in the atmosphere?

Would it be possible to make a different approach with the cultivation of micro-organisms that could be used for the production of renewable resources? Another solution to increase the diversion rate of CO_2 could be genetically modified plants that would carry out photosynthesis more efficiently. - Or what about the creation of new plants for energy crops that would be more promising?

These are only two suggestions of many. However, most of these promising suggestions only work in theory. One big disadvantage of genetic products is the criticism and distrust by side of the people. In contrary to genetically modified medical products that are mostly accepted, genetically transformed plants still evoke fears by side of the citizens. If the society does not support certain technologies, it is very difficult to find sufficient funds to finance the researches.

What's more, why spend lots of money for new researches if there are quite efficient converters already available nowadays. – The very old technology of solar converters achieves quite good results. If we really look for alternatives, they should have an important advantage over the solutions already available.

4. Primary energy efficiency

Bio-fuel to substitute petrol for the car industry?

The transportation sector is the field where the sources of energy are the hardest to substitute. However, it is also a sector where we have a constantly increasing demand of petrol. Subsequently the question arises whether it would be possible to use biomass (wood) to eventually produce bio-fuel for cars. Although some sorts of agricultural resources could be used for the production of bio-fuel, bio-fuel itself is only the second best option. The central idea of energy production is to evaluate the maximum primary energy efficiency of a resource and to choose the method with the lowest opportunity costs. In case of bio-fuel these costs are relatively high compared with other possible uses of wood. One might argue that biomass has the lowest costs in the heating sector, has the highest CO_2-substitution potential and would create a lot of new work places in Switzerland. On the other hand, one must not forget that all inefficient production lines have the highest creation of employment and inefficiency is a prize too high to pay for new working places. Instead of starting entirely from scratch and developing a new power production basing on bio-fuels, economically, it makes much more sense to invest in another more efficient way to divert wood into energy (e.g. heat).

5. Costs

For an apartment building you would end up with heating costs for oil around 10-11 Rp/kWh, whereas by using wood pellets, costs can be reduced to 6-8 Rp/kWh. Prizes of heating sources interdepend because wood, oil and gas substitute each other. Wood needs to be cheaper than oil, because the investment costs are higher and the efficiency is slightly lower. In the long rusn, heating with wood becomes cheaper than heating with oil and gas. The problem is that gas is currently too cheap, and therefore many people prefer heating with gas instead of wood. Natural gas should be even more expensive than oil,

because it has the highest efficiency and lowest investment costs. If that was realised by new regulations, the incentive to heat with wood would increase.

6. Summary

The limitless availability, the smaller or even no emission of CO_2 and the creation of new employment are the mayor advantages of bio-energy. Bio-energy is not the only solution, but it could have a significant impact on our energy- and CO_2-problems. In the future, bio-energy might play a mayor role in the power production. However, it can not cover the entire energy need of the world. Together with other renewable energies as solar energy, wind and hydropower, it could save the sustainable energy production in the future. In that way, the entire primary energy consumption now mostly consisting of oil and gas could be substituted.

But always remember: Society seems only willing to change if there is an impact in form of a natural catastrophe. So, let's have our plans and ideas ready to bring them up after the next crisis. But, please, do not cause the catastrophe yourself!