

Reducing emissions: The development and construction of a solar-boat and a solar-canoe *by J. Weckler*

CO₂ and other such emissions, also caused by today's combustion engines, are on the one hand responsible for global warming with the consequence of floods and storms (example: Hurricane Katrina destroyed New Orleans) – and on the other hand smog and is leading to a melting down of the pole-caps and so to an increase of the ocean-level. It is necessary to develop alternative kinds of driving power, which work without those negative consequences. (science for humanity)

One possibility are electro-engines with a high efficiency in combination with rechargeable batteries, which can be charged with renewable energies. With this technology the operation works without harmful emission.

So the 'Pupils' Physics Club' decided to build out of an old boat driven by a combustion engine a solar-boat.

The pupils had to deal during the planning with problems as efficiency, water resistance, power transmission, electro-engines, behaviour of the different accumulator models, solarpanel-types and so on.. During the building handcraft skills and the dealing with the different materials were asked. Finally the cooperation between the different teams was vital, they wanted to come to a result. Finally measurement technology was in demand: Determine the specific energy-consumption in dependence of the velocity, the Force in dependence of the Power and picking of the loading and/or unloading-curves of the accumulators.

We created a solar boat with a solar roof with a power of 330 Watts that offers protection furthermore at sun and rain. Because of the size of the boat more students could be included in the job and also younger students in particular up to the class 5, since on the boat also accumulated jobs, that were not as difficult. Besides the boat was equipped with a set for examine waters so that it stands also for biology/chemistry course for investigations availablely.

In order to advertise solar emission-free mobility, the Pupils' physics Club drove with their solar boat to the 'Hessian day' and for the Frankfurter museum bank celebration. By a cooperation with the 'exhibition crew' of the MS-Einstein (exhibition on a ship), the photo effect was shown to interested persons in practical use at a test-drive with the solar-boat. The photo effect, described in 1905 by Einstein for the first time in theory correctly, today becomes to a hope carrier for an emission-free mobility and further a more human transformation of energy.





The solar-boat of the 'Pupils Physics Club' drives towards the 'MS-EINSTEIN' in order to demonstrate further visitors of the 'Einstein-Exhibition' the 'Photo-Effect' in practical use.

Caused by our experience to converse a combustion-engined boat into a solar-boat we came to the conclusion, that we should build a 'faster' boat for taking part on the German Solar-boat Championships. The boat, we built has its advantages (capacity: 10 persons), but because of its shape it isn't able to go very fast with little power. Also a teacher asked us, whether we could build a solar canoe for his use. A further point is, that in developing countries often canoes or boats similar to canoes are equipped with combustion engines. So it would be interesting to demonstrate, that an emission-free and energy-saving canoe, a solar canoe, is possible.

So we bought a second hand canoe. Such one has a certain capacity of transports and also a shape with a low water-resistance. Now we are working to equip this canoe with a solar-driven engine.

Instructions given above apply accordingly.



