

Perspectives on Global Issues Workshop

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Summary:

The workshop on sustainability was interesting and applicable for my research and directly useable in my classes. As a faculty member in Mechanical Engineering Technology I am very excited to include research involving sustainability and specifically renewable energy.

Several items on sustainability learned from the workshop which were directly applicable to my field involved the Energy Landscape Morbach with windmills and photovoltaics for power generation and a biogas plant for heat and Trier University of Applied Science at Birkenfeld the zero emission university.

In Morbach I was impressed by the wind farms and the amount of energy the wind generators yield for the price. The payback time for the initial investment was a little over a year. That is significant; the payback time on initial investment is often a deal breaker in many municipalities and governments. The motivation and level of achievement of producing energy from renewable resources was impressive and shows that their site is a significant positive model on how to generate energy by renewable resources.

Trier's zero emission university was also very impressive in what they set out to do and their level of accomplishment: including solar energy, zero-emission water concepts, zero-emission heat and energy concepts and energy efficient buildings. The amount of photovoltaics installed across campus is significant where nearly zero roof space was spared from photovoltaic panels. Even with the amount of coverage in high demand times (such as winter) they actually cannot produce enough energy on their own and have to take from the grid. That was disappointing. They also have a biomass heat and energy power station which utilizes both biomass and previously used wood (from old furniture for example). It was interesting that while burning the biomass and wood to produce heat they did release emissions into the atmosphere. They did have zero impact on the environment from the perspective that the biomass and wood was already created (i.e. they did not go cut trees or mine coal for the source material), but from an emissions standpoint they did not have zero emissions due to the burning of the biomass and wood.

One main concept learned via this workshop regarding sustainability overall for engineering and science is to start with the idea of sustainability from the onset of the process, project, design, building, etc. It is more difficult, but not impossible, to go back and retrofit sustainable concepts into an already built project. Starting with the idea of sustainability is much easier to implement throughout a project and allows for a wide variety of different avenues to pursue.

These points I will take back to my classroom, both in Machine Design and Engineering Materials to reinforce sustainability in science and engineering. In both courses there are design concepts and segments of each that will include sustainable ideas and approaches. From devices

designed specifically for energy harvesting to engineering improvements on existing devices, buildings and processes, sustainability and renewable energy concepts will be emphasized.

The workshop helped me expand my view and knowledge in the area of sustainability. I am always excited to incorporate more global and diverse topics in my lectures I feel this workshop will benefit my students and my department greatly.

Final thoughts on the workshop include some unanticipated outcomes and benefits. The workshop included faculty from across disciplines at Kennesaw State University and basically secluded us in a close environment. From our initial meeting at the airport, the bus ride to the European Academy Otzenhausen and all the lectures, meals and field trips we were together. Meeting other faculty and learning about their backgrounds, departments, research and projects at KSU was invaluable. Having the overarching concept of sustainability was a great link but networking all together was a great experience and has intangible benefits. Getting to know other faculty, particularly at your own institute in fields that usually would not touch yours, is exceptional and enriching both in professional and personal growth.