Replacing fossil energy carriers by renewable sources is a grand challenge of the present century. The nuclear catastrophe in Japan and the Arabic Spring with the resulting debate in Europe are excellent examples for the fact that a society needs more than one option for ascertaining its energy supply system.

Thus even when short supply scenarios and climate change arguments are not sufficient to induce the serious effort diversifying the energy supply all these stimuli together should do. Unfortunately, when it comes to renewable energies we today and within the foreseeable future only can generate primary electricity in grid-dimensions. Generating energy carriers or storing and transporting renewable energy are largely impossible. Biomass, the natural solution, exhibits serious limitations when used as renewable resource in world scale dimensions. If at all available in relevant quantities, it may best be used as a material source for molecular building blocks in chemical manufacturing.

We thus need a suite of chemical processes transforming electricity in energy carriers of at best the same structure as we use today. This simple concept finds its scientific limitations in our inability to split water as the universal hydrogen source and to effectively create hydrogenation products from CO$_2$. The contribution reviews our options and highlights the areas of substantial knowledge. Using the examples of water electrolysis and CO$_2$ hydrogenation to methanol the value will be demonstrated of in-situ analytics as a toolbox supporting experimentally the development of energy-related sustainable catalysis concepts.

THURSDAY, SEPTEMBER 1, 2011
COOKIES AND COFFEE -- 2:45 P.M.
SEMINAR -- 3:00 P.M.
SARKEYS ENERGY CENTER, ROOM M-204

THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office before the event.