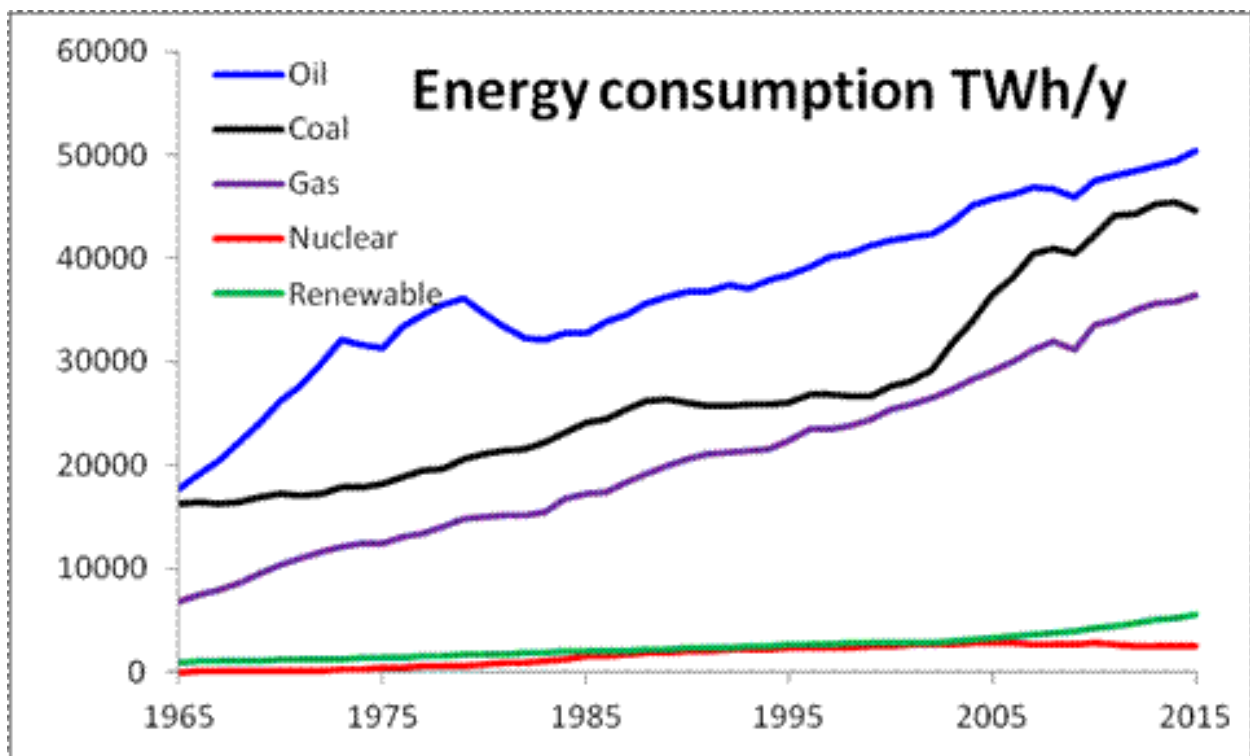


## SUSM 675: SUSTAINABLE ENERGY

Instructor: Larry Swatuk

### Overview

In the high-modern era, the 'energy transition' was conceived as a move from 'traditional' fuels (e.g. biomass) to 'modern' fuels, especially carbon-based, but also nuclear and hydro. Solar and wind power fell somewhere in between these two dominant groups of energy forms and sources. Nuclear power production foundered following disasters at Three Mile Island in the United States and Chernobyl in the Ukraine. Despite on-going debate regarding the safety of nuclear power, there is recently a return to it as a viable, non-carbon based, source of energy.



As the graph above shows, world energy use clusters around oil, coal and gas. This reliance has been a central cause of the 'greenhouse effect' resulting in dramatic shifts in the global climate. While climate change will have its most dramatic and negative effects across the tropics, countries of the Global South have long lived with another negative impact of over-reliance on fossil fuels: as primarily non-producers, these countries have had a very difficult time providing for their energy needs. Put differently, almost none of the least developed countries have ever recovered from the 1970s spike in oil prices led by the creation of the OPEC oil cartel. Many Global South countries are only a few days or weeks away from complete economic standstill every time the price of oil spikes.

What this has led to across the Global South is not the energy transition as initially envisioned during the era of high modernity. Rather, what may be seen across the Global South is what is called 'backward fuel switching', i.e. the widespread abandonment of so-called 'modern' fuels, and the readoption of traditional forms of energy, especially fuelwood. There are numerous negative effects of backward fuel switching. But there are also accidental benefits, especially since the world has recognized the need to shift to a new sort of 'energy transition' – away from non-renewable forms of energy production toward renewables such as biomass, solar, wind, in situ micro-hydro and geothermal. Many areas of the Global South have already made this transition, just not by choice.

This course

- surveys the state of the world's energy profile,
- examines a variety of aspects of the consequences of fossil fuel dependence,
- studies particular interventions employing renewables, in particular biogas and micro-hydro, and
- focuses on energy policy and planning in select countries around the world, with an aim toward identifying best practice.

### **Objectives**

At the conclusion of this course, the student will (i) understand energy in its various forms; (ii) be able to identify and assess appropriate energy mixes for particular cases and places; (iii) have a general understanding of the complexity of energy policy at various scales, from the local to the global; (iv) participate meaningfully in discussions related to SDG7.

### **Assessment of Performance**

The student will be evaluated equally across two criteria: participation and research. 50% of the grade will go to course participation. As a reading course, the student and the instructor will meet every week and discuss readings specifically assigned to speak to the topics identified above. 50% of the grade will go to the preparation and delivery of a research paper on a topic to be identified by the student and agreed upon with the instructor.

### **Readings**

The readings are uploaded to the Learn page for the course.