# Energy in the 21st Century

## Module Coordinator
Dr Craig Meskell, School of Engineering

### What will you learn from this Elective?
Many believe that the risks of climate change are so significant that it is imperative that GHG emissions are dramatically reduced. About 2/3 of emissions are due to energy generation and conversion. About ½ of energy use is based on electricity, but this share must grow if energy supply is to be decarbonized. It is not clear that the trend towards low carbon electrical power generation is inexorable. There are many questions which are hotly contested. What are the practical limits of specific low carbon technologies? How much energy do we need? How expensive is low carbon power and is it a price that people can afford? What happens when the wind doesn’t blow, or at night when solar cells don’t work? The question of how the global community, and we in Ireland, should generate power for our sophisticated, comfortable, liberal civilization is a cross-disciplinary question, touching on economics, earth science, physics, sociology, even morality. But converting an energy source into a useable power supply at a large enough scale to transform a society is an engineering task. We will discuss the possibilities of power generation technologies that will be available in your lifetime, from a practical engineering viewpoint considering the social, economic and environmental constraints. We will explore how wind, solar, nuclear, tidal and even fossil fuel power sources work. This course is about the performance of machines and technology in the energy sector.

### Student Workload
114 hours student effort:
- Lectures: 24 hours
- Assignments: 40 hours
- Reading & study: 50 hours

### Assessment Components
1) A 2 hour exam during the end of semester session. This exam is 25 short questions drawn from a pool of approximately 150, the style and content of which you will be familiar with from the online self assessment MCQ. (50%)
2) There are 3 computer based assignments (50%).

### Indicative Reading List
- Online tool to make a plan to decarbonize Ireland’s energy supply.