

### **1. Overview**

It was noted that students learn many key concepts in Physics class that prepares them for a career in engineering. The concept of resonance for example has application in designing bridges and reference was made to the collapse of the Tacoma narrows bridge in 1940. Cranes are in use on many building sites and operate in accordance with the laws of equilibrium. The concept of the moment of a force is important in Physics and essential in civil engineering. In the topic of Mechanics, students learn about tension in a rope and so can understand how pulleys offer advantage when trying to lift heavy loads. The process of representing situations on a diagram, and identifying forces and setting up and solving equations and interpreting solutions, is routinely applied across most topics in physics, and serves as a valuable set of skills in engineering. In their study of electricity, students learn about Joule's law and how a transformer works and what role it plays in electric power distribution. The principles of electric motors and generators are also studied. Physics students have the opportunity, to do laboratory experiments and become familiar with taking measurements and drawing and interpreting graphs, all of which align with engineering.

### **2. Eamonn Lannoye shared his experience as an engineer in electric power research**

Eamonn is Managing Director of Electric Power Research Institute (EPRI). He works with over 450 utilities around the world from his base in Dublin. He emphasized that the electricity distribution network, referred to as the national grid, strives to optimize reliability, affordability, and sustainability. Transformers are a critical component of their operation and unfortunately there is a worldwide shortage of transformers. He emphasized that people don't like to live where wind generation is optimal, and so, one of the challenges is getting electricity from generator to consumer.

The lack of consistency of output of renewables necessitates "pumped storage" facilities like Turlough hill, etc.

### **3. Video of engineers, Elaine, Jennifer and Leanne explaining their work**

Elaine Galloway told us about her work in electrical and electronic engineering. Jennifer Keenahan told us about her work in civil engineering and she illustrated it with 3 examples of the use of computational fluid dynamics, in bridge monitoring, coastal defences and helicopter rotor-down-wash effect. Leanne Leonard highlighted the difference between a level-7 course in engineering that prepares one for a role as a site engineer and a level-8 course that prepares one to be a consultant engineer.

### **4. Ken Keohane shared his experience as an engineer in the pharmaceutical sector**

Ken is a senior manager in ThermoFisher Scientific in Cork. As an engineer, he worked initially in medical devices. Then he moved to the UK and worked in the food industry. Since returning to Ireland nearly 20 years ago he has worked mostly in the pharmaceutical industry, with Glaxo, Smith, Kline who in recent times were taken over by ThermoFisher. As an engineer one is constantly evolving and adapting.