

Reflection 5

Andrius Maneikis

900312-0012

Everything has limits, so does the earth capacity. Since human population is continuously growing, the demand for resources to sustain such growth is increasing as well. Also the consumption is growing and resources are being exhausted in even hastier pace where future generations will have to pay. In addition, today's technologies produce inadequate amount of waste and pollute environment far beyond allowable limits. Therefore it is important to adapt our lifestyle to sustainable consumption without sacrificing growth or compromising on life quality. That is why engineers must step in by developing new greener technologies which will help to eliminate waste and significantly reduce pollution.

Since electricity became an inseparable part of modern lifestyle it is very important that the electricity would be clean and produced from sustainable resources. As it is today most of the electricity is produced by burning fossil fuels. It is about to change when upcoming green generation like renewables will dominate. Generation like solar or wind will spread and will be closer to a consumer, meaning less transmission losses and greater efficiency. In my opinion the greatest change will be in a transportation sector where a great deal of harm is done to the environment because of the exhaust fumes. Electric cars charged by aforementioned type of energy will contribute greatly to sustainable environment. Also implemented smart electricity consumption in households will help to reduce the amount of electricity used.

All this renewable energy requires completely new approach how the grid is organized and poses many challenges. For example how to keep the balance between production and consumption while wind production is so volatile and solar power only available during daylight. It is also important to keep the grid stable and maintain voltage between the limits. These are key issues that shall be addressed in order to have fully functioning system where renewables dominate. One of the solution is to implement the dynamic loads that would adapt (consume less or more) to the current price level which is governed by simply demand and supply law. From technical perspective this requires not only strong electrical grid but also good communication lines. Which opens up new fields for network security and how to organize massive data efficiently and secure. Also sophisticated protection schemes which are now only implemented in transmission grid shall be introduced to distribution grid as well. Therefore, renewable energy opens up many new possibilities and challenges for electrical engineers.

In KTH there is a great deal of courses with regard to electrical power. KTH not only gives good fundamental background of the related field but also provides courses that are relatively new and relevant to today's trends. It also introduced project courses that the students are able to get a grasp of problems which are closely related to reality and the topics mentioned earlier. KTH also rises student's awareness of the sustainability issues and provides some knowledge how to approach them. In my opinion the former is equally important because as the latter.