

Evolution of electric power systems

Education

National

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 3 min read



Whichever technology is used, engineers were and will always be involved in the improvement of the electric power system.

Imagine your favourite TV show or football game is about to begin, in the peak of summer, and the electricity trips. There's no light, no cooling and none of the appliances work.

We take electricity supply for granted, assuming that it has been there forever and that the technology has not changed. However, electric power systems are historically a rather new development.

Experimentation of domestic electric arrangements started in 1882 with Thomas Edison's invention of the light bulb and his Electric Light Company.

The first power systems were born. These were steam powered direct current (DC) generators that provided electricity that was then delivered at a low voltage via cables to customers to light up their homes. Domestic electric light became popular very quickly, and more and more customers were connected to the DC voltage power system.

With the increase in electrical power delivered at low voltages, new challenges arose, such as drastically increased losses over the cables.

The invention of the transformer in 1886 brought the perfect solution. With a transformer, electric power can be transformed to a higher or lower voltage. This allowed the implementation of high-voltage power transmission systems.

However, transformers require alternating current (AC) for their operation. Thus, from then on, AC generators were used for electric power generation.

This technology is still in use today. However, evolution in the power systems continues, and the electricity demand increases constantly. Therefore the size of electricity systems has to grow in power and cover larger areas.

Large power systems are also interconnected to improve stability and load sharing. For instance, the Maltese electric power system was interconnected to the Italian electric power system in 2015. Italy's power system is, in turn, connected to the European electric power systems.

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In this manner, it is possible to deliver power from one area to another while ensuring that enough electric power arrives to the location where it is most needed.

Another evolutionary milestone was the introduction of renewable electric energy generation. So far, electric power was mainly generated by fossil fuel power stations where oil, gas or coal is burned. However, burning these fuels causes considerable pollution and is not sustainable since these fossil fuels will not be available forever.

Therefore, there is a need to use alternative sources of energy for electric energy generation. This can be achieved by using hydroelectric power plants, wind generators and photovoltaic systems.

While in Malta photovoltaic systems are more popular as a lot of sunlight is available during the day, in northern European countries wind power is prevalent.

Whichever technology is used, engineers were and will always be involved in the improvement of the electric power system. Mechanical engineers keep researching and developing new and more efficient turbines.

Electrical engineers develop new power electronic devices like photovoltaic inverters to allow the integration of all electric energy sources to the electric power grid.

At the University of Malta's Faculty of Engineering all basic engineering principles are taught in both undergraduate and postgraduate courses. Moreover, many practical research projects are constantly being developed at the faculty, pushing technology development a small step further each time.

Engineering Projects Exhibition

The upcoming 27th edition of the annual Engineering Projects Exhibition will showcase the projects carried out by undergraduate engineering students during the final year of their four-year Bachelor of Engineering (Honours) degree programme and also those of postgraduate engineering students.

Projects will be on display in the various laboratories at the Faculty of Engineering on the Msida campus which will be open to the public on Friday from 5 to 8pm and on Saturday from 9am to noon.

There are 94 exhibits this year. These include a wide selection of topical areas related to the biomedical field, renewable energy, the environment, electronic products, robotics, transportation, manufacturing processes, new materials and surface treatments.

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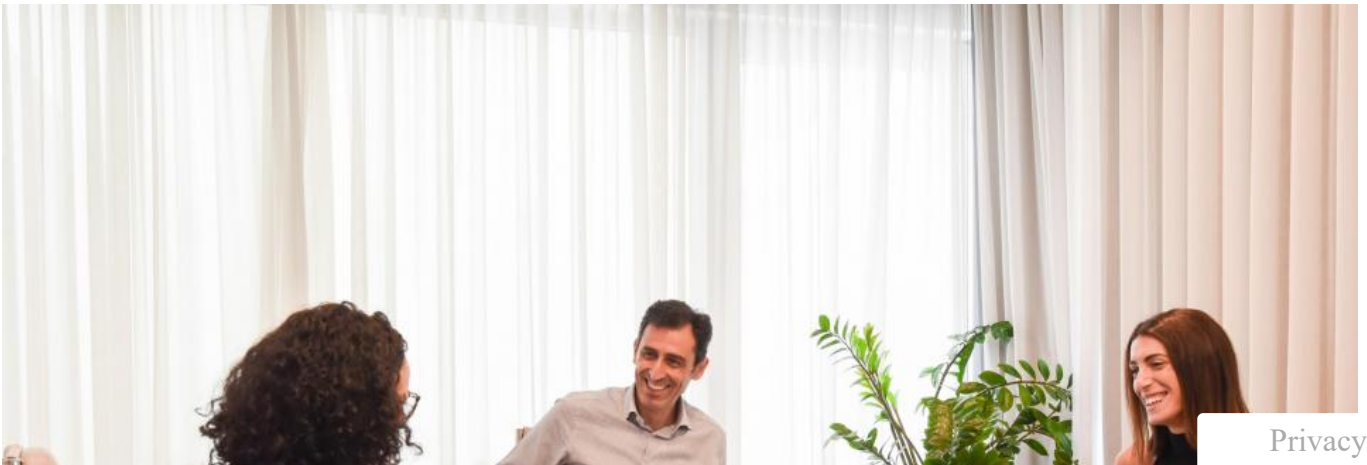




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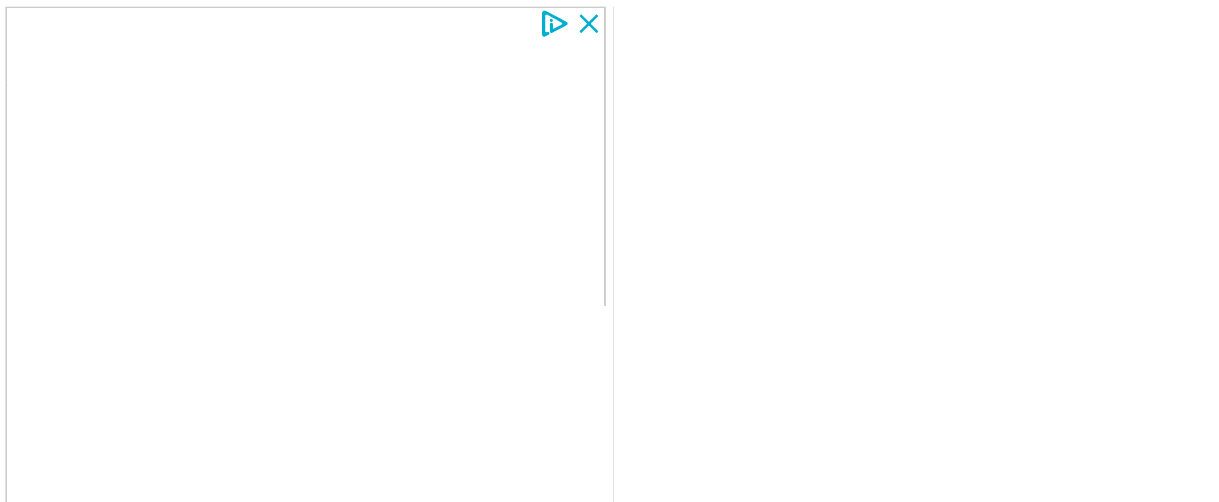
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