While the term green has become synonymous with carbon footprint, a more holistic definition sees it as the net impact any process has on the environment. This is a better definition when dealing with electric power since even seemingly carbon-free methods of generation are not necessarily green. CO₂ emissions are the most pressing factor in how green power is, with phasing out fossil fuels and being net carbon neutral the main focus of the UK parliament’s recently announced climate emergency. For this reason, I will exclude traditional CO₂ intensive means of generation as they can be regarded as definitively not green.

Various studies have shown that the environmental damage done by erecting wind farms is made up for after 6 months of being used to replace fossil fuel-based generation, for solar panels, this is a slightly longer period of 2 years. Solar is relatively passive in installation and operation with minimal effect on the eco-systems surrounding it. Wind turbines are less passive with an estimated 3 bird deaths per megawatt generated and double this for bats due to collisions. These numbers are low but the presence of danger on typical migration paths could potentially displace entire eco-systems, this has been observed and raises concerns about the placement of wind turbines so as not to disrupt the delicate network of wildlife in the surrounding area. Wind turbines also cause disruption as a result of noise, one study found an increase in stress levels among geese the closer they were to wind turbines, thought to be as a result of noise levels. It follows then that wildlife will naturally move to a distance of over a kilometre away from these turbines, again displacing entire eco-systems. Careful planning can easily overcome this issue and it is imperative that it is overcome since animals play such a vital role in maintaining woodland, particularly birds through seed dispersion.

Another supposedly green method of generation is hydro-electric. The huge volumes of concrete required in damming rivers of course is notable but can be made up for over the lifetime of the generator. What cannot be made up for is the effect on the environment immediately around the dam. In Northern Ireland, the beautiful Silent Valley national park was formed as a result of damming the Kilkeel river and earns its name due to the tranquillity of the area, this tranquillity however is due to a lack of wildlife which is a direct result of the damming of the river. While this dam was for water treatment, a similar effect has been observed with the Aswan High Dam in Egypt which is a hydro-electric project that has resulted in reduced fertility of riverside agricultural lands of the Nile. The dam is also blamed for coastline erosion and raises serious concerns around how much humans have a right to shape the natural world as well as the long-term effects of future developments.

Electricity generation through renewables is most certainly the way forward to a greener future but it is important that CO₂ emissions are not the only factor considered in whether a solution is good for the environment. The disturbance of many delicate natural phenomena, eco-systems and processes must also be considered.

At the other end of the spectrum is the consumer. How green is it to switch to electric powered products? The large issue here being electric vehicles. Battery production means electric vehicles can have nearly twice the carbon footprint of their internal combustion counterparts during manufacturing. After this, the equation for mapping carbon footprint largely depends on how green your supply is. However, batteries do not last forever, and it is expected that electric vehicle batteries reach the end of their useful life after around 10 years. Battery technology needs to develop substantially in order to be a genuine solution above simply buying a used car as regards being green. Comparing like for like however, a new electric car will ultimately rely on a green energy supply to be greener than a new
internal combustion car. This must include complete social responsibility by generation companies with a long-term view of all environmental impacts of the energy mix.