

# How power engineers can be more relevant to society?

S.Sudtharalingam, *Student Member, IEEE*

**Abstract**—Three coherent issues are discussed in this essay concerning making power engineers more relevant to society. The first issue is the relevance of the work done in the field to the overall society, which can be enhanced by improving their skill-sets and having collaboration amongst people from different areas. The second improvement to be implemented is to make power engineers become effective communicators so that the right messages get across without distortion of meaning or intent. Lastly, methods of promotion to improve the perception of society towards power engineers are presented. In conclusion, the field of power engineering needs to be more dynamic and applicable to other development areas and professionals within this field need to equip themselves with the necessary skills to face the challenges of the 21st century such as the adaption of smart grids.

**Index Terms**—Effective communication of power engineers, power engineers' relevance to society, promotion of power engineering

## I. INTRODUCTION

Imagine a day without electricity - the world would literally come to a halt. Most of us were brought up with an almost constant supply of electricity that even a short supply cut disrupts our day to day lifestyle. Electricity in essence, drives the economy. Ever since we discovered electricity and ways of transporting them effectively, many new appliances have been introduced, of which we cannot imagine living without. The electricity consumption per capita in most developed nations is sky-rocketing as this is driven by the increased number of electrical appliances in each household over the years. In the UK for instance, the consumption of electricity due to electrical appliances owned by consumers in 2007 have more than quadrupled the amount in 1970[1] whereas the overall domestic energy consumption in the UK has seen an increase of 36% between the years 1971 and 2001[2]. We seek to have a better lifestyle and more comfort at our homes as incomes rise and standard of living improved. Hence, the average temperature in our homes today is set higher by nearly 50% compared to what it was more than 30 years ago[1]. Given that most of our heating is supplied by natural gas, the increasing depletion rate of this resource makes our current lifestyle not sustainable in the longer run. Are we willing to change? For most of us the answer is probably not especially if we can afford to pay for higher energy bills. Although society acknowledges the importance of electricity and other energy forms, they might not know what goes behind the scenes and how power engineers relate to the process of making our lives more comfortable.

We need to first know what power engineers do in order to see how relevant they can be to society. Two decades ago, the field of power engineering was a very dull one as there were not many challenges, neither were there much

funding available for innovation and improvements to occur. When Kyoto Protocol was formed in 1997, nations around the world started looking into ways to reduce greenhouse gases with a special focus on carbon dioxide. This is when power engineering was revived from its boring state. This field started developing rapidly with various research, development and implementation projects around the globe. With increasing funding towards renewable and sustainable power engineering, engineers qualified in this field have many doors open for their career opportunity. Working behind the scenes, one of the actively sought missions of power engineers is striving to make electricity industry a more sustainable one. This includes working in a power plant, distribution or transmission company, electrical goods manufacturing company, electrical waste management company or in consultancies that run projects for government or private companies looking for solutions to related problems. All these correlate with the academic world in order to make power generation, distribution and consumption a sustainable process for the future.

So, how can power engineers be more relevant to society? This will be discussed by addressing three coherent issues. The first issue is regarding the relevance of the work done in the field to the society on the whole by having collaboration and developing relevant skill-sets in other areas such as business and management. The second issue is to make power engineers become effective communicators. Communication is vital as we need the right messages get across without distortion of meaning or intent. The third issue is related to promotion of the power engineering field in general. Here, ways to get involved with the community as well as improve the reputation of power engineers in the eyes of the public will be discussed. In the conclusion section, the summary of the discussion will be presented.

## II. RELEVANCE TO SOCIETY

To be relevant to society, power engineers must be able to produce work of quality and at the same time relate their work to the public. Therefore, it is important to get their work peer reviewed from people in the industry. Currently, there are various societies established for professionals in the field to meet, discuss important issues and work on a project together whilst at the same time providing good networking opportunities for their members. These organisations have emerged around the world at different levels which include local, national, regional or global. Two of the largest societies that are specific to power engineers are the Power and Energy Society (PES) under the Institute of Electrical and Electronics Engineers(IEEE) and CIGRE(International Council on Large Electric Systems),

which attracts members from all nationalities. Besides these organisations, there are many conferences organised for power engineers where they can exchange ideas and increase the rate of innovation in the field which then not only advances the field of power engineering but can have a knock-over effect on other fields.

Besides improving the technical aspects, we need to ensure that the innovations and research accomplished are relevant to society. One way of going about this is to always have members from different communities to evaluate the work done to see if the application can be extended to other areas. If power engineers can apply their knowledge more effectively in other fields, they would be more relevant to a wider group of the society. One common method of going about this is by having collaborations[3] with other industries, academics and governments. In recent years, projects which involve collaborations with many different areas have increased which in turn improved the innovation in different fields and most importantly, improved the relevance of those projects to the society. The reasoning behind is the simple fact that the total number of people interested in a three-area cross divisional collaboration will be more than that of a single field.

In addition to collaboration, business and market related skill sets are growingly important for power engineers. In a world where almost everything is driven by market forces, it is thus vital to have the business aspect incorporated in an innovation or any project proposals. By having the end in mind, we can set a series of targets that will be economically feasible and at the same time technologically viable. Engineers always have to balance these two aspects of things in their design of product or offer of their engineering services. To overcome this business aspect, engineers can either get advice from an expert from the business area or be trained to understand the business and market in which they operate so that they can incorporate such aspects in their work. Universities nowadays have all types of management and language courses that students can choose to take on top of their engineering subjects. Sometimes, a range of modules developed by different fields are all intertwined together, creating a whole new course which tends to attract a lot of students due to the transferable skills developed. The purpose is simple - to create an all rounded engineer who is able to not only be technically sound but also able to incorporate other variables in their decision making process or analysis. This also increases the employability of engineers. For example, power engineers can choose to work in a range of other fields such as finance, teaching, management consulting or even in different engineering fields. The applicability of the skills developed by power engineers in the future covers a wide area and this proves the relevance of power engineers in contributing to the economy, in any chosen field.

### III. EFFECTIVE COMMUNICATION

Another area where power engineers can be relevant to society is in the way that they distribute information to relevant parties. They need to understand their target au-

dience so that they can gauge the level of technical depth to go into, whilst not losing their audiences' engagement. For instance, engineers need to be able to convey details and educate end consumers when smart grids are implemented as more and more people will adopt smart appliances, electric vehicles as well as participate in demand side management. The easiest medium to pass information to the public is through the media. Simple and clear messages have to be delivered and they should not allow journalists to 'spice up' the report as this is inaccurate reporting and can potentially turn out to be a 'Chinese whispers'<sup>1</sup> phenomenon. In addition, reading habit needs to be instilled into power engineers to broaden the knowledge in other areas as well as communicate effectively. A study by Tenopir,C.[4] showed that engineers have a different interest in reading compared to their counterparts, with only 4.8% of their reading attributed to current issues, making them slightly disintegrated from things happening around them. Hence, they do not appear to be excellent communicators due to the inability to relate to other things. Because of this, most articles we see have the opinions of politicians or business leaders, rather than the engineer who was actually responsible for the advancement in innovation or research that is being reported about. People tend to believe the media as that is the most accessible source of information, written in simple terms and sometimes a bit witty, albeit the possibility of giving distorted meaning attached to them.

To address this communication barrier, power engineers must be trained to communicate effectively during their early years as an engineer and this starts at university. Parallel communication guidance with their technical learning[5] will go a long way when they step into their chosen career. Due to lack of emphasis on the importance of good communication skills, most of the graduates do not develop the necessary skills; making it difficult for them to cope with certain aspects of their job that requires communication, let it be writing or verbal. In the UK, this issue has been looked into in the past few years and as a result, a few courses have been set up within the academic community and universities to promote effective technical communication. A few years back, Sense About Science was established to help with the transition between the scientific community and the wider public in terms of communicating science [6]. They also organise workshops for postgraduate students enabling them to become better communicators by teaching them techniques to convey information about their field to a non-expert. With the changing communication media and the extensive usage of the virtual world, engineers should take this as a stepping stone to widen their influence on the society, by distributing materials online. Interactive communications is a growing phenomenon which is supported by the advances in computers and increasing speeds of broadband which can be adopted. With interesting information to share

<sup>1</sup> Information is distorted when passed from one person to the other, and the original message can be marginally or even drastically different when it reaches the final person.

and access to the public, power engineers can convey information in a basic and factual manner and not letting that information being hyped up by the media.

#### IV. PROMOTION

Promotion is another important aspect to make power engineers more visible and relevant to the current society. In the UK, organisations such as Engineers Without Borders (EWB) use the expertise of different engineers to help out in local communities around the world, especially in under developed nations. For example, in 2009 there are a few electrification projects to develop and install renewable-based electricity generation in the Philippines and Laos[7] of which the expertise of power engineers is needed. These projects not only promote the importance of engineering to the society, but allow professionals in the field to give back to community. The volunteers involved in the project can get locals to help out, exposing them to challenges that power engineers face. These activities can act as promotion for kids to take up engineering as a career in the future. Children in developing nations used to aspire to be doctors as they get to save lives. Following these projects, kids these days might aspire to grow up to be a power engineer and help solve the world's energy problem!

Engineering was never a popular and is usually seen as boring and geeky subject. This perception needs to be changed to encourage more students to get into the line of power engineering. According to Joos, G[8], there is a gap in the power engineering field as many senior professionals are near retirement. With the field changing rapidly and many senior power engineers retiring, new talents are needed. More promotion has to be done to encourage students to pursue their studies in this area. Promotion via schools as a starting point is necessary. By having open days at universities and allowing high school students to visit power engineering departments and perhaps carry out an interesting experiment will help their understanding process. One major problem students have with engineering is they do not know what for each of the subdivision of engineering field entails. Hence, power engineering societies should aim to tackle this lack of professionals by promotion at the grassroots stage - before their pre-university studies. One way of doing this is to allow students to have a 'buddy' who studies engineering at university. This will allow students to get to know the field better before plunging into it blindly and regretting their choice which many do during the course of their university study.

Another interesting way of promotions is through weblogs. Technorati, a blog search engine reported that the number of blogs in the year 2006 was 60 times more than what it was in 2003[9]. With a new blog set up every second of the day (based on Figures in 2006)[9], they are fast gaining popularity and can potentially be used as a source of information dissemination. By encouraging power engineers make opinions on certain topics such as new governmental policies available on their personal websites, the

wider public can get a better understanding of things that are going on in the field. This will not only be informative but allow bloggers to improve his or her profile as a power engineer. As Thomas Friedman[10] described the world as becoming flat, the internet is the latest platform that power engineers should use to narrow the gap between people in the power engineering field and the general society.

#### V. CONCLUSION

In conclusion, to make power engineers more relevant to society, there are three underlying elements that should be addressed. Work done in the power engineering field should be applicable to other fields so that the wider society can benefit. Further, power engineers should be equipped with adequate skill-sets to enable them to deal with different groups of people and a variety of problem sets. Having reached an ideal solution is not sufficient if information cannot be relayed effectively, thus requiring power engineers to be effective communicators. Power engineers need to be aware of things happening around them, by reading more for knowledge other than just work or research which will help make them better communicators. A lot of these skills should be developed whilst still fresh in the field, via academic institutions and engagement in projects or volunteering work. The power engineering society should also increase the awareness of work achieved in this field in the eye of the public as well as encourage more people to join as many professionals are retiring in the near future. Making this field more accessible and challenging at the same time, people's perception of power engineers will change and this is important in order for power engineers to be more relevant and continue contributing to the betterment of mankind. Wouldn't that be what we all want?

#### REFERENCES

- [1] BERR, "Energy consumption in the united kingdom: domestic data tables," 2008.
- [2] NationalStatistics, "Domestic energy consumption per household: by final use," 2004.
- [3] J. Fedorowicz, I. Laso-Ballesteros, and A. Padilla-Melndez, "Creativity, innovation and e-collaboration," *International Journal of e-Collaboration*, vol. 4, no. 4, 2008.
- [4] C. Tenopir, "Communication patterns of engineers, <http://trblist.tamu.edu/>."
- [5] P. Hirsch, D. Kelso, B. Shwom, J. Troy, and J. Walsh, "Redefining communication education for engineers: How the nsf/vantherc is experimenting with a new approach," in *American Society for Engineering Education Annual Conference & Exposition*, 2001.
- [6] "<http://www.senseaboutscience.org.uk/>," 2009.
- [7] EWB, "Engineers without borders, <http://www.ewb-uk.org/>," 2009.
- [8] G. Joos, "Training future power engineers," *IEEE Power and Energy Magazine*, 2005.
- [9] Technorati, "State of the blogosphere, april 2006 part 1: On blogosphere growth, <http://technorati.com/weblog/2006/04/96.html>," 2006.
- [10] T. Friedman, *The World Is Flat*. Penguin Books, 2005.

## VI. BIOGRAPHY



Sohasini Sudtharalingam is currently a postgraduate student in Electrical Engineering at Imperial College London, under the Dorothy Hodgkin Postgraduate Scholarship. Her current research interest is in the area of the technical, economical and policy aspects of microgeneration in the UK, focusing on micro combined heat and power units. She graduated with Ho-

nours in Electrical and Electronics Engineering with Management (MEng) at Imperial College London in 2007 and received the Willis Jackson Medal and Award for excellence in final year studies. Prior to that, she completed her pre-university studies in Malaysia, where she is from.