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The Challenges of Running an International Science and Technology Prize

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The inaugural nominations for the UK's flagship technology prize, the Queen Elizabeth Prize for Engineering (QEPE) closed on Friday. Setting up a new global engineering prize to reward and raise the profile of ground breaking engineers whose innovations are of global benefit to humanity has an additional potential benefit: it is a potent tool for national branding which underlines a country's commitment to science and engineering.

If the QEPE prize becomes successfully established and international renowned, it will also raise Britain's international profile as an infrastructure powerhouse, and is most likely to benefit not only engineering but other sectors of science and technology, such as the Cambridge biotechnology cluster and the engineering challenges surrounding the UK's expanding high speed rail network.

Setting up and running a successful international prize can be a delicate business; one must never lose sight either of the need to be strictly fair and impartial on a geographic basis, or of the way in which a prize emanating from a particular country specifically reflects the values of that country.

In the case of Technology Academy Finland (TAF), which runs the Millennium Technology Prize (MTP), we have seen how, during the decade since the prize's inauguration, it has had tangible benefits to the Finnish technologically-driven economy, including increasing the exchange to and from Finland of scientists who are able to add value to the economy. The Finnish economy is built on exports, and many Finnish companies sell products and services to Asian countries. This area of the economy has been boosted by an influx of Asian scientists into Finland.

For example, the Chinese scientist Xia-Chang Zhang came to Finland over a decade ago to study at the Helsinki University of Technology 10plus years ago to do his doctorate, and subsequently invented a flexible battery which led to the foundation of Finnish company Enfucell. In the years since the MTP's inauguration, we have also seen increased possibilities for Finnish scientists to work in countries such as China and Japan.

Running an international science and technology prize draws attention to a country's domestic scientific goals, boosts national science and technology branding and a country's reputation abroad. Such a prize can also associate a country's economy with high-tech innovations to attract investment and retain its skilled elite. In addition, it can help a country in benchmarking itself against others internationally, and thereby prompt an internal debate about how a country is performing in high-tech sectors.

The challenges of setting up prize criteria and selection processes to create a successful prize are many, but fall into two main categories. The first is the most important, that the scientific and technological community needs to be onboard and to have faith that the prize is run by experts in the field. The selection committee needs to be composed of highly regarded scientists from a broad range of disciplines, regions of the world and with a good gender mix. It's important that these scientists are able to reach decisions independently of both their background affiliations and, to a certain extent, of each other. Also, the country in question needs to commit to the prize for the long-term and build its reputation year by year, ensuring that the prize is credible with scientists and technology experts, and that the judging process remains robust.

Scientists and technological pioneers enjoy prizes and their attendant PR initiatives, as these enable them to gain the recognition they deserve. However, it can be disastrous if a prize gains a reputation for being primarily a PR exercise, and this can happen if a committee plays it safe by awarding the prize only to well known 'media-friendly' scientists, rather than making a sober assessment on science grounds as to who deserves the award, regardless of whether they are labouring in obscurity or are celebrated figures.

A track record of picking winners who are not yet big names in the scientific community, but who go on to become major figures (as the first MTP prize winner Tim Berners-Lee did) is important in establishing a prize's credibility. Other MTP winner names such as Shuji Nakamura - the developer of blue and white laser, and subsequently LED, lights - Robert Langer - who invented biomaterials for controlled drug release - and Michael Grätzel - who won the award for his work on solar cells - have also gone on to produce greater innovations subsequent to their win. This year the prize was split between Japanese scientist, Dr Shinya Yamanaka - who was well known within the stem cell community but less well known outside it - for his groundbreaking work in developing stem cells from a non embryonic source, and the more widely known open source computer programmer Linus Torvalds, the inventor of Linux.

The second category of challenges relate to ensuring that a prize stands out internationally by genuinely reflecting something about its country of origin, as it presents a unique opportunity to portray the country to the world, and is of immense value for a country's national branding and reputation abroad.

Through the establishment of an engineering prize, the UK seems to be seeking to portray itself internationally as an infrastructure powerhouse, reminding the world that it was the birthplace of the industrial revolution. The MTP sets out to draw attention to Finland's highly educated workforce, strong innovation system and high R&D expenditure, and it has allowed us to showcase Finland's record of generating high-tech companies such as Vaisala, Kone and Beneq.

Future jobs are likely to be created by high-tech innovations in the future. It is essential that any modern economy is associated

with these values to attract investment and retain its highly skilled elites.

Prizes also help to draw attention to a country's domestic scientific goals. They can have a powerful impact internally, promoting important scientific developments to consumers, companies and universities. The track record of the MTP in picking winning innovations which have had a major worldwide impact - from dye-sensitive solar cells to biomaterials for controlled drug releases - has created a sense of excitement in Finland and raised the profile of science in the country.

It is helpful for countries to benchmark themselves against others to prompt an internal debate about how a country is performing in high-tech sectors. If, for instance, there were several years when a Finn was not shortlisted for the prize (we had our first Finnish prize winner this year in Mr Torvalds) there would be questions legitimately asked about whether the Finnish government was doing enough to support the technology and science sector. Prizes create a healthy awareness of the international competition.

Science prizes can also boost national economies by helping to create excitement about science among young people, and provide an accessible way for schools to focus on science and technology. Finland has attempted to build on this enthusiasm through the high-profile Millennium Youth Camp, which encourages the brightest young people worldwide to aim towards careers in science and technology. Thirty young people from 22 countries attended the 2012 camp for all-expenses paid one week of lectures, workshops and visits to places of technological and scientific interest in Finland.

However, for a prize to be effective, it must truly reflect the values that people usually associate with a country. If the prize represents values not normally associated with a country, it won't capture the public imagination. Finland's prize emphasises its environmental record - reckoned by the Centre for Global Development to be among the strongest in the world - and its flourishing clean-tech sector. The prize is credible because its values are those that are associated with Finland's brand. I look forward to seeing how the QEPE enhances and develops brand Britain, already on a roll due to the country's Olympic Games success.

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