

Investments needed for new sustainable technologies

The role of science and technology on sustainability is a diagnostic and strongly remedial one. Scientists and engineers need to be better recognised at a society-wide level for the crucial work they do in terms of sustainability.

The role of science, technology and engineering has almost been overlooked in the last 25 years in the social and political debates related to sustainability, environmental protection and climate change. The attention has been placed on areas such as social awareness, economy, management and education, all of which are important, but rarely on science, technology and engineering as one of the most important solution-providing factors in sustainability.

Science has sometimes been given credit only for its diagnostic role in pointing out and demonstrating numerous issues facing the environment and climate change in the 20th and 21st centuries. It is positively referred for showing the problems and providing scientific measuring results to demonstrate the problems such as average global temperature increase and other numerous associated issues. However, from that point the ball (recognition) seems to stop rolling. Although it is good to credit science, technology and engineering for their diagnostic role, this is only half of their contribution. The other and most important part is left hiding in the dark.

Simple research would show that there are an incredibly high number of studies from numerous centres around the world that have produced many voluminous reports about economy, social awareness, management, education, and way of life as solutions to the climate change issues and sustainability. A huge amount of money has been spent in various countries on these studies that, although valuable, mostly repeat the same ideas and are inflationary on results and conclusions. Studies on why and how technology can solve the issues of climate change and sustainability are just a few and almost non-existent.

Almost ignored

In numerous socio-political international gatherings on sustainability where I have participated, the role of science, technology and engineering has been almost ignored. Other aspects have been extensively discussed, yet again in an inflationary way, but science and technology has rarely been in the contributory picture.

Some well-known speakers with social and economic backgrounds have in many cases publicly considered the role of science and technology a delayed, inefficient or non-affecting factor in solving the pressing climate change issues. Instead they have opted to create and establish arbitrary new laws and regulations as the only remedial actions available without consulting science and engineering.

This seems to be a good non-starter as well as ironic. They refer to scientific studies to provide evidence for global warming and as a basis to establish action plans to remedy the problems. However these actions, that originated from science in the first place, do not include, as they should, science and technology as an important problem solver and as a solution provider.

I have counteracted publically these concepts about science and technology in all these social-political meetings, debating vigorously on these issues, and I can say that, modesty left aside, I have successfully changed the mind of several of these personalities in terms of the role of science and technology.

SIPS 2016

In my numerous plenary and keynote lectures around the world in the last several years, I have firmly stressed the role of science and technology not only as a diagnostic but also as a strong remedial power in dealing with sustainability and climate change issues, providing concrete and long term solutions. Our yearly flagship event the 'Sustainable Industrial Processing World Summit (SIPS)' (www.flogen.org) is dedicated wholly to this purpose: Achieving sustainability primarily through science, technology and engineering, without ignoring other socio-political factors,



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and raising the level of recognition in wider society of scientists and engineers. I am happy to announce that SIPS 2016 will be held from 6 - 10 November 2016 at Hainan Island, China, with a significant copper element to the programme.

In our last world summit (SIPS 2015: www.flogen.org/sips2015/) held very successfully in October 2015 in Antalya, Turkey, we had as Guests of Honour two Nobel Prize Laureates in Chemistry (Prof. Dan Shechtman and Prof. Ei-ichi Negishi) and Lord John Prescott of the UK, leader of the British Delegation in the Council of Europe in Strasbourg, member of European parliament, UK Deputy Prime Minister for 10 years in a row and member of British parliament for 40 years.

An economist by training, Lord Prescott gave a powerful speech on the subject of science, technology and politics, tackling some of the issues I mentioned above. A very interesting part of his speech was the difference between the exact sciences and economics and how economics has played its role on sustainability and how science plays it. He said: "The scientists tell us, you know, you put two materials together and presumably it is predictable, when the politicians get together around with the economists and bankers, leave the bankers alone for the moment, they can use the same materials, but not guarantee you to get the same results. And sometimes, very often you don't. Politicians and economists then come along and say: 'Oh, it is due to externalities'. The science method is robust and will continue to be so".

This reminded me of three similar stories in this direction:

In a meeting I participated in 2013, a well-known institute forecasted that copper prices will increase steadily and considerably in 2014 and in the next 5 years. At exactly the same meeting one year later, in 2014, the prediction given by the same institute was that the

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Lord Prescott with Dr. Florian Kongoli at the conclusion of Lord Prescott's Speech at SIPS 2015

prices of copper, which had already gone down considerably in 2013, will decrease steadily and considerably in the next 5 years. Imagine that based on such 'predictions' copper companies plan their capital investments on expansions or new plants, and the predicted copper price is one determining factor in those decisions!

Queen Elizabeth II of England once visited an economic institute sometime after the economic crisis of 2008. When the Director of the institute was explaining to her its work about analysing the economic data and predicting the economy of the future, the Queen asked a short question: "If, as you say, you predict the economy, why you did not predict the economic crisis of 2008?" The reply of the Director was: "Your majesty, if we would have known, we would have predicted it".

Thirdly, a recent Nobel Prize Laureate in Economics declared in his major speech in a meeting where I was present about a year ago that for any bad prediction on the economy by economists, the people to be blamed are not economists but politicians.

The above very well illustrate Lord Prescott's idea of putting the blame on "externalities" for any inability of economics to properly predict economic phenomena. Lord Prescott said that there is evidence that more and more people will use this as a reason to justify why they are not able to achieve the objectives of sustainability.

Lord Prescott went even further in his speech, saying that "The natural law of economics has not worked, certainly not to achieve sustainability, and as one economist has said, was probably the largest failure of the market operating system to keep it in balance."

Science and technology are generally exact in prediction and are never as far away as the economists in predicting various phenomena. Furthermore for any possible failure, scientists, technologists and engineers cannot blame externalities or anybody else for their failure except themselves. However, science and technology are not problem-free. They have their own issues, although of a different character.

Real sustainability

Sometimes sustainability is a foreign concept for the scientific community in everyday work, and many scientists consider it as a political subject instead

of a scientific one. Sometimes some scientific inventions or technological breakthroughs are claimed to be sustainable in their local field, but because they miss the big picture they are not sustainable. This issue will be the subject of a different article. Scientific achievements can be used in a positive sustainable way or in a negative non-sustainable way. For example, the dynamite invented by Alfred Nobel to be used in mining of minerals was eventually used also as an explosive in the wars that followed.

Due to its very nature there are exact sciences and technology that can provide long term and sustainable solutions for climate change and global warming. It was science and technology and their respective inventions that saved the world at the end of the last 50 years of the 20th century against apocalyptic and correct predictions at that time of resource (food and water) depletion. Since climate change is caused mainly by carbon dioxide going into the atmosphere through burning of oil, coke, coal and natural gas, scientific research can develop new alternative technologies that either do not produce

carbon dioxide, capture carbon dioxide and use it for beneficial purposes, or improve the risk factor of existing carbon-free technologies such as nuclear to make them acceptable to society.

Science and technology make it possible to achieve all the above not only without sacrificing the current achievements of the society in quality of life or other aspects, but also improving and developing further the current achievements. That is why science and technology should not be in the shadows as it is right now and should gain its prime role among other disciplines, because finding and applying scientific and new technological solutions to effectively solve the issues of sustainability and climate change is the right way to go.

Politics itself can be used in a positive sustainable or negative non-sustainable way. Politics can force the use of the sustainable inventions of science of technology in a wrong and non-sustainable way, as it did with dynamite. That is why Lord Prescott mentioned that the most useful role of politics is to determine the right legal frameworks for the development and use of scientific inventions in right direction.

I have consistently strongly advocated that the winning formula to be successful and reach sustainability is a close cooperation between science, technology and engineering, politics, economy and society in equal levels and as equal partners, leaving no-one behind. Such a close and strong cooperation will assure generous investments in financial resources from the economic sector and human resources from the political sector in scientific and technology research as the best short and long term solution to the sustainability issues we face today.

www.flogen.org/sips2016/
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The full SIPS 2015 speech of Lord John Prescott can be read at:
<http://www.flogen.org/awards.php?spage=1&sp=1&sp2=Prescott>

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