

## Guest Editorial

# Industry and Sustainability

This themed issue focuses on ‘Sustainable Industry’ from the perspective of research advances and technological solutions. Starting with a high level policy context, it is clear that the roles and responsibilities of industry are broader than technology and go way beyond what happens within industry.

People have been thinking about the issues and options encompassed in the word ‘sustainability’ for decades. An important example is the “Limits to Growth” report from the Club of Rome (1). This organisation started as an informal group of “scientists, educators, economists, humanists, industrialists, and national and international civil servants” and the 1972 report was for its ‘Project on the Predicament of Mankind’.

Today, the language and approach to sustainability focuses on solutions and opportunities as well as understanding “predicaments” and “problems”. In 2015 world leaders adopted the Sustainable Development Goals which are at the core of the United Nations (UN) 2030 agenda for sustainable development (2); that is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (3).

Sustainability has many facets, each with layers, interactions and tensions. One dimension is trade-offs in terms of what is sustainable from environmental, public health, economic and societal perspectives. Another is balance between short-term options and long-term consequences. A third dimension is impacts and solutions on local, national and global scales. A fourth element is people, behaviour and accountability across individual citizens, organisations, companies and policymakers.

## Sustainable Industry

One lens for seeing the key role of industry in sustainability looks within companies. There are

opportunities to pursue sustainable options – and challenges in pursuing them – all along a value chain. The specifics depend on company size and business area, but many companies are including an explicit narrative about sustainability in their strategy and identity.

Companies are building thinking about sustainability into their business models and operations. Products and components can be designed for reuse or recycling, to last longer or to be lighter. Companies are committing to using energy from renewable sources, to reducing the use of water in manufacturing, to working together through industrial symbiosis and colocation of raw material sourcing, component production, manufacturing and waste management.

In terms of the science and technology innovation focus of this journal there are many promising research advances: catalysis to increase energy efficiency, reduce dependence on platinum group metals, recycle carbon dioxide or enable nitrogen fixation; green chemistry; reducing the use of solvents or improving their recycling or disposal; and bio-based feedstocks enabling reduction in energy use and environmental impacts associated with raw material extraction or production.

## The Voice of Industry

The importance of industry in the sustainability agenda lies also in informing, influencing and implementing policy. Many issues fit under the ‘sustainability-related policy’ umbrella – from broad areas like energy, climate, air, food and water to specific topics like chemicals regulation and waste management. Industry can also influence research and innovation policy as an advocate for funding for research and development on sustainable technologies.

Leaders in industry are being proactive in making the business as well as the environmental case for sustainability and at the same time policymakers increasingly recognise the need to include a business perspective and its value in identifying realistic options.

This is visible for climate change where Christiana Figueres, the UN diplomat at the heart of the 2015 21st Conference of the Parties (COP-21) process and the Paris Agreement, has been unequivocal about the importance of having industry at the table: “We’re delighted that at every COP, we are able to open that door more and more to the recognition of business” (4).

On the industry side there are perspectives from groups like the World Business Council for Sustainable Development chaired by Paul Polman, Unilever CEO: “The reality is, if we don’t tackle climate change we won’t achieve economic growth” (5). Or the Risky Business project quantifying the economic risks of climate change, such as a likely US\$35 billion increase in the annual average price tag associated with hurricanes and other coastal storms in the USA (6).

Another example of the industry-policy-sustainability interplay is the May 2016 United Nations Environmental Programme resolution on Sound Management of Chemicals and Waste (7), calling on the private sector to play a significant role in financing and capacity building and inviting industry to join other stakeholders in supporting the Global Partnership on Waste Management.

This is paralleled by the Responsible Care® initiative from the International Council of Chemical Associations and by participation of industry in the development of regulation like the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) or the US Toxic Substances Control Act (TSCA) and in new areas like microplastics and persistent pharmaceutical pollutants.

Industry is critical in collecting and reporting data to enable development and implementation of environmental regulation. This is costly so there may need to be incentives or imperatives for companies to invest in monitoring and reporting systems and to make information available to policymakers and agencies.

## Sustainable Solutions

Sustainability challenges like climate, water, energy and air are related in what is often called a nexus. This gives cause for optimism in that solutions in one

area can often have a positive impact on another. An example is transport where reducing the number of journeys, increasing engine efficiency, switching to non-fossil fuels or using electric vehicles usually reduces both carbon dioxide emission and air pollution.

To be truly sustainable, opportunities to develop and deploy environmentally sustainable solutions must also be societally and economically sustainable. The division of risk, responsibility and reward between the public and private sectors will vary by issue, place and time. What is clear is that industry is pivotal in achieving sustainable development, because of what companies do and because of what leaders in industry say.

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