

## We Don't Make Waste We Make a Range of Products!



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### What is “green” chemistry?

“Green” chemistry is the concept of making chemical processes and products environmentally compatible. It reaches across the lifecycle of almost all articles in use today – since almost everything contains chemicals – using renewable resources as feedstocks; clean manufacturing involving the least hazardous substances, minimal auxiliaries, low energy and water use, and producing minimal waste; safe products that ideally are designed to release their components at end-of-life (zero waste). It is more essential than ever as we are running out of traditional resources, more and more people want the products, legislation and the costs of waste and pollution are very high, consumer demands for safer and more environmentally compatible products are greater than ever leading to increasing demands from producers and users for greener and more sustainable products.

Therefore, “green” chemistry goes beyond traditional chemistry, its environmental chemistry since not only its purpose is to decrease the environmental pollution but also to eliminate what causes pollution? Do you think that the major principle of “green” chemistry – “It is better to prevent waste than to treat or clean it up after it is formed” – became a part of people’s mentality, that society, legislators, corporations follow this principle?

I think that the principle has much broader significance than was originally intended. To me it’s no longer simply designing manufacturing processes that minimize waste, it’s a complete shift in attitude to the point where “waste” as defined as something no-one wants, is no longer acceptable in any quantity. Use must be made of everything that’s made in a manufacturing process – there can be a main product but all the other, admittedly less desirable products of the process, must have value somewhere – perhaps for recycling within the process or within the site for another application, or within

a business park to another neighboring company that can use them. We don’t make waste; we make a range of products!

### What role national governments play in developing new “green” solutions in the given sphere?

REACH (Registration, Evaluation and Authorization of Chemicals) is the world-leading legislation that is challenging the use of dangerous chemicals and will force substitution with safer chemicals. China’s version of REACH is now on the way and similar legislation is being considered in many places. Many countries have had “green” chemistry research programs though they are often not maintained. Legislation is a powerful driver though we need to make sure the laws don’t inhibit good “green” chemistry, e.g. restrictions on the use of waste as feedstock. Some private investors are moving into the area and an increasing number of companies are investing in “green” chemistry research – probably more than government schemes now.

Profit is a major motivation for a company; if “green” chemistry was much more costly and it was economically unreasonable to develop it, do you think companies would rather lobby their interests than participate in so-called “green” competition? At what point and why it became profitable to develop “green” chemistry?

“Green” chemistry becomes profitable when the combination of consumer demand (and in some cases willingness to pay more for “greener” products – the premium being paid for “green PE” (derived from bioethanol) is a good example of this and shows that a value can be placed on “green”) and charges for inefficient and dirty manufacturing become high enough (waste disposal charges, fines for pollution, increasing costs of traditional e.g. petrochemical feedstocks). Lobbying to hinder legislation certainly happens – REACH was affected by this – and this reflects the traditional view that environmental legislation is simply an additional cost burden and reduces the competitiveness of companies or regions; a more positive and increasingly justifiable view is that customers will increasingly favor suppliers who have verifiably “greener” products and supply chains. How else will such giants as Unilever and Procter and Gamble achieve their “green” targets? The chemical industry needs to recognize that “greener” manufacturing is becoming a marketing advantage.

### What are the latest technological trends? Can you elaborate on some recent breakthroughs?

The recent breakthroughs are probably mostly in the use of renewable resources (e.g. products derived from polysaccharides, low temperature pyrolysis of biomass) and production of “greener” products (e.g. new bio-solvents). Generally the last 12 months has seen an increase in interest in “green” chemistry; in Brazil the industry association says they want to be world leading in “green” chemistry; at corporate level GSK have said something similar; Unilever and P&G have set ambitious targets on the use of renewable resources/ reducing environmental footprint; other companies including GE, and Dow are clearly moving in the same direction; retailers are increasingly demanding “greener” products that will require new “green” and sustainable supply chains.