

The Coming Change in the Chemical Industry

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As we look forward we see that there will be a shift from petroleum-based feed stocks to that of renewable resources driven by both improved economics and improved environmental footprints for chemicals and materials production. Process technology and products will be required to be even more "green" without sacrificing and even lower manufacturing costs. Renewable resources offer lower fundamental costs than petroleum and have other benefits such as reduced volatility and domestic availability. Use of tools such as life cycle inventory (LCI) and analysis to aid in process development will help drive down the environmental impact.

While bio-based resources are likely to require some form of biotechnology or bio-processing in their transformation to useful chemical products, it is unlikely that biotechnology alone will allow success. In most cases large scale chemical processing skills will also be required. Success will require an integration of knowledge and skills from industries which typically have been separated. A change in skills for those involved in the business of process development will be required. Movement away from the typical "silo" technical approach will be required. Improved use of stage-gate methods of development will be required. A keen focus on process models and economics from earliest stages of development will be required. Embracing methodologies like LCI will allow improved excellence in process development.

Using the development of polylactic acid, a recently commercialized large-scale polymer derived from annually renewable resources, as a source of examples, I will discuss these issues.