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Key Factors in Successfully Bringing Innovative Technologies to Market

A technology is deemed "innovative" if it creatively meets a new or existing need and offers performance, cost, or energy advantages. However, innovation does not guarantee success or market penetration. While the innovative characteristics of a technology are advantageous, there are more factors involved in success and the ability to capture significant market share.

By Joan Steiger, BlueTech Research

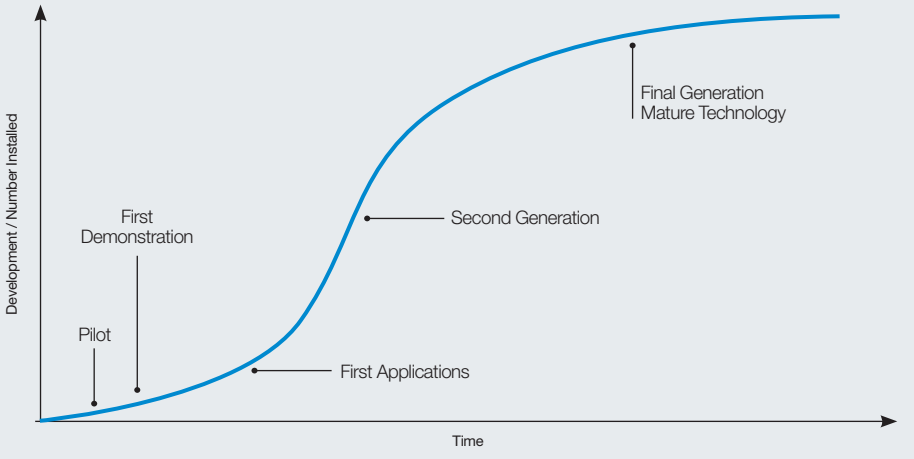
Denny Parker, director of technology at Brown and Caldwell, knows this firsthand. Throughout his career, Parker conducted extensive research within this field, particularly in technology development as well as testing and validation for new processes. He researched technologies that his firm wanted to make available for clients, including a number of his own inventions. In a 2011 Water Environment Research article, *Introduction of New Process Technology into the Wastewater Treatment Sector*, Parker analysed the life cycle of successfully introduced wastewater treatment innovations.

The curve he developed for market penetration had an S shape as it followed the technology through piloting, demonstration, full-scale application and refinement, and finally to mature technology status. In previous work with the S curve, Parker and his associate, Henryk Melcer, noted that many innovative companies fail to gain a market foothold because, after piloting their technologies, they are unable to obtain a completely successful first demonstration and lack the capital for investments necessary to further development.

Innovators and early adopters are key players in moving from bench or pilot studies to the full-scale demonstration stage. In a general analysis of commercial product introduction, Everett Rogers, author of the 2003 book Diffusion of Innovations, shows a normally distributed curve when plotted against sales per unit time. From this, it is readily apparent that the familiar S curve is generated by accumulating product introductions with time. Roger's work showed the diffusion of new technologies with a focus on the characteristics of those who adopt the technology.

Parker noted that when the S curve is viewed in combination with Rogers curve, it illuminated a very interesting fact: innovators serve as gatekeepers to demonstration of new technologies, while early adopters are important in the diffusion of the technology and influence other decision makers within

Figure 1: S Curve for life cycle of new process introduction showing development and cumulative number of installations versus time



Innovators and early adopters are key players in moving from bench or pilot studies to the full-scale demonstration stage.

Early adopters help diffuse new technology and influence decision makers in their networks.

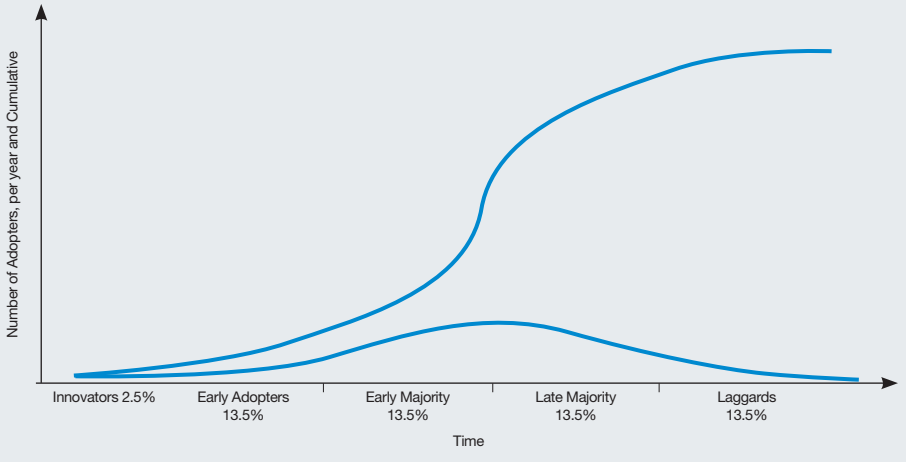
their networks. As such, the role of innovators and adopters becomes essential when trying to take a technology to the wastewater market. They make the choices that ultimately decide the fate of the technology and whether it is chosen for demonstration. These early adopters include such entities as utilities and government institutions, but are more accurately the individual leaders within those organizations.

Highlighting the importance of early adopters points to the question of how they created a compelling business case evaluation. What influences and reasons led to the ultimate decision? Were they more social, economic, or technical? Did the national government play any role in influencing decision makers or providing direct support?

To learn more about the role of innovators and adopters and to answer these questions, don't miss the "Innovative Utilities and Early Adopters" panel in the WEFTEC® 2013 Innovation Pavilion.

Moderated by Denny Parker, the discussion will include how utilities successfully pushed technology adoption and will address the process of technology validation with a focus on testing. Featured panellists include Sudhir Murthy of DC Water, Aik Num Puah of Singapore PUB, and Booky Oren of Booky Oren Global Water Technologies, who all served as early adopters of innovative technologies.

Figure 2: Diffusion of technology with time, adoptions per year and cumulative with time, along with classes of adopters (after Rogers, 2003).



Parker has discovered key elements to successfully bringing an innovative technology to market. These points are summarized below:

1. Government funding played a large role in the development of new technologies in bench-scale, university settings and in demonstration plants. Without such assistance, private equipment or process companies can exploit only a few of the developments they generate or that are presented to them as opportunities.

2. Technologies with rigorous marketing and advertising campaigns were effective and led to explosive rates of growth as compared to technologies and processes that did not have strong marketing tactics. Marketing support typically comes from vendors offering the technologies, but in the case of unpatented technologies, government or foundation check-offs or acknowledgements and conference technical presentations can also play key roles in bringing the technology to the marketplace.

3. Transparency of information allows potential users and consultants to fairly evaluate the new technologies, assess the benefits, and evaluate the risks involved in comparison to current technologies.

4. Numerous market drivers influence new technology introductions, including economic and sustainability goals for utilities, tightening regulations, population or load growth, the push to intensify treatment that is site constrained, and replacement of aging infrastructure.

5. The cycle for new process technology introductions can be excessive and can last five to ten years before implementation. Part of this is the long study, design, and construction cycle times for major capital projects at wastewater treatment plants. Because of this, it can take a long time to learn from the earliest applications and to make improvements in the next generation of the treatment process. New regulations put into place during this time can either adversely or positively affect the pace of new technology adoption.