

C-214 Case 19 3M: The Innovation Engine

between new business opportunities. At any given time, 3M has around 1,500 products in the development pipeline. McNerney stated that was too many, and he indicated that wanted to funnel more cash to the most promising ideas—those with a potential market of \$100 million a year or more—while cutting funding to weaker development projects.

In the same vein, he signaled that he wanted to play a more active role in resource allocation than had traditionally been the case for a 3M CEO, using cash from mature businesses to fund growth opportunities elsewhere. He scrapped the requirement that each division get 30% of its sales from products introduced in the past four years, noting that “To make that number, some managers were resorting to some rather dubious innovations, such as pink Post-it Notes. It became a game, what could you do to get a new SKU?”¹⁸

Some longtime 3M watchers, however, worried that by changing resource allocation practices McNerney might harm 3M’s innovative culture. If the company’s history proves anything, they say, it’s that it is hard to tell which of today’s tiny products will become tomorrow’s home runs. No one predicted that Scotch Guard or Post-it Notes would earn millions. They began as little experiments that evolved without planning into big hits. McNerney’s innovations all sound fine in theory, they say, but there is a risk that he will transform 3M into “3E” and lose what is valuable in 3M in the process.

In general, though, securities analysts greeted McNerney’s moves favorably. One noted that “McNerney is all about speed,” and that there will be “no more Tower of Babel—everyone speaks one language.” This “one company” vision was meant to replace the program under which 3M systematically spun off successful new products into new business centers. The problem with this approach, according to the analyst, was that there was no leveraging of best practices across businesses.¹⁹

McNerney also signaled that he would reform 3M’s regional management structure, replacing it with a global business unit structure that would be defined by either products or markets.

At a meeting for investment analysts, held on September 30, 2003, McNerney summarized several achievements.²⁰ At the time, the indications seemed to suggest that McNerney was helping to revitalize 3M. Profitability, measured by return on invested capital, had risen from 19.4% in 2001 and was projected to

hit 25.5% in 2003. 3M’s stock price had risen from \$42 just before McNerney was hired to \$73 in October 2003 (see Exhibit 5 for details).

Like his former boss, Jack Welch at GE, McNerney seemed to place significant value on internal executive education programs as a way of shifting to a performance-oriented culture. McNerney noted that some 20,000 employees had been through Six-Sigma training by the third quarter of 2003. Almost 400 higher level managers had been through an Advanced Leadership Development Program set up by McNerney and offered by 3M’s own internal executive education institute. Some 40% of participants had been promoted on graduating. All of the company’s top managers had graduated from an executive leadership program offered by 3M.

McNerney also emphasized the value of five initiatives that he put in place at 3M: indirect cost control, global sourcing, e-productivity, Six-Sigma, and the 3M Acceleration program. With regard to indirect cost control, some \$800 million had been taken out of 3M’s cost structure since 2001, primarily by reducing employee numbers, introducing more efficient processes that boost productivity, benchmarking operations internally and leveraging best practices. According to McNerney, internal benchmarking highlighted another \$200 to \$400 million in potential cost savings over the next few years.

On global sourcing, McNerney noted that more than \$500 million had been saved since 2000 by consolidating purchasing, reducing the number of suppliers, switching to lower cost suppliers in developing nations, and introducing dual sourcing policies to keep price increases under control.

The e-productivity program at 3M embraced the entire organization, and all functions. It involves the digitalization of a wide range of processes, from customer ordering and payment, through supply chain management and inventory control, to managing employee process. The central goal is to boost productivity by using information technology to more effectively manage information within the company, and between the company and its customers and suppliers. McNerney cited some \$100 million in annual cost savings from this process.

The Six-Sigma program overlays the entire organization, and focuses on improving processes to boost cash flow, lower costs (through productivity

enhancements), and boost growth rates. By late 2003, there were some 7,000 six sigma projects in process at 3M. By using working capital more efficiently, Six-Sigma programs had helped to generate some \$800 million in cash, with the total expected to rise to \$1.5 billion in by the end of 2004. 3M has applied the Six-Sigma process to the company's R&D process, enabling researchers to engage customer information in the initial stages of a design discussion. According to Jay Inlenfeld, VP of R&D, Six-Sigma tools "Allow us to be more closely connected to the market and give us a much higher probability of success in our new product designs."²¹

Finally, the 3M Acceleration program is aimed at boosting the growth rate from new products through better resource allocation, particularly by shifting resources from slower-growing to faster-growing markets. As McNerney noted: "3M has always had extremely strong competitive positions, but not in markets that are growing fast enough. The issue has been to shift emphasize into markets that are growing faster."²²

Part of this program is a tool termed 2X/3X, 2X is an objective for two times the number of new products that were introduced in the past, and 3X is a business objective for three times as many winning products as there were in the past. 2X focuses on generating more "major" product initiatives, and 3X on improving the commercialization of those initiatives. The process illustrated in Exhibit 3 is 3M's "stage gate" process, where each gate represents a major decision point in the development of a new product, from idea generation to post launch.

Other initiatives aimed at boosting 3M's organization growth rate through innovation include Six-Sigma process, leadership development programs, and technology leadership. The purpose of these initiatives was to help implement the 2X/3X strategy.

As a further step in the Acceleration Program, 3M decided to centralize its corporate R&D effort. Prior to the arrival of McNerney, there were 12 technology centers staffed by 900 scientists that focused on core technology development. The company is replacing these with one central research lab, staffed by 500 scientists, some 120 of whom will be located outside the United States. The remaining 400 scientists will be relocated to R&D centers in the business

units. The goal of this new corporate research lab is to focus on developing new technology that might fill high-growth "white spaces", which are areas where the company currently has no presence, but where the long-term market potential is great. An example is research on fuel cells, currently a major research project within 3M.

Responding to critics' charges that changes such as these might impact on 3M's innovative culture, Inlenfeld noted that "We are not going to change the basic culture of innovation at 3M. There is a lot of culture in 3M, but we are going to introduce more systematic, more productive tools that allow our researchers to be more successful."²³

For example, Inlenfeld repeatedly emphasized that the company remained committed to basic 3M principles such as the 15% rule and leveraging technology across businesses.

By late 2003, McNerney noted that some 600 new product ideas were under development, and that collectively they were expected to reach the market and generate some \$5 billion in new revenues between 2003 and 2006, up from \$3.5 billion 18 months earlier. Some \$1 billion of these gains was expected to come in 2003.

C19-5 GEORGE BUCKLEY TAKES OVER

In mid-2005, McNerney announced that he would leave 3M to become CEO and chairman of Boeing, a company on whose board he had served for some time. He was replaced in late 2005 by another outsider, George Buckley, the highly regarded CEO of Brunswick Industries. Buckley, a Brit with a Ph.D. in electrical engineering, describes himself as a scientist at heart. Over the next year, in several presentations, Buckley outlined his strategy for 3M, and it soon became apparent that he was sticking to the general course laid out by McNerney, albeit with some important corrections.²⁴

Buckley did not see 3M as an enterprise that needed radical change. He saw 3M as a company with impressive internal strengths, but one that had been too cautious about pursuing growth opportunities.²⁵

C-216 Case 19 3M: The Innovation Engine

Buckley's overall strategic vision for 3M was that the company must solve customer needs through the provision of innovative, differentiated products that increase the efficiency and competitiveness of customers. Consistent with long-term 3M strategy, he saw this as being achieved by taking 3M's multiple technology platforms and applying them to different market opportunities.

Controlling costs and boosting productivity through Six-Sigma continued to be a major thrust under Buckley. This was hardly a surprise; Buckley had pushed Six-Sigma at Brunswick. By late 2006, some 55,000 3M employees had been trained in Six-Sigma methodology. 20,000 projects had been completed, and some 15,000 were under way. 3M was also adding techniques gleaned from Toyota's lean production methodology to its Six-Sigma tool kit. As a result of Six-Sigma and other cost control methods, between 2001 and 2005, productivity measured by sales per employee increased from \$234 to \$311, and some \$750 million were taken out of overhead costs.

However, Buckley departed from McNerney's playbook in one significant way: He removed Six-Sigma from the labs. The feeling of many at 3M was that Six-Sigma rules choked those working on innovation. As one 3M researcher noted, "It's really tough to schedule innovation."²⁶ When McNerney left 3M in 2005, the percentage of sales from new products introduced in the last five years had fallen to 21%, down from the company's long-term goal of 30%. By 2010, after 5 years of Buckley's leadership, the percentage was back up to 30%. According to many in the company, Buckley has been a champion of researchers at 3M, devoting much of his personal time to empowering researchers and urging them to restore the luster of 3M.

Buckley stressed the need for 3M to more aggressively pursue growth opportunities. He wanted the company to use its differentiated brands and technology to continue to develop core businesses and extend those core businesses into adjacent areas. In addition, like McNerney, Buckley wanted the company to focus R&D resources on emerging business opportunities, and he too seemed to be prepared to play a more proactive role in this process. Areas of focus include filtration systems, track and trace information technology, energy and mineral extraction, and food safety. 3M made a number of acquisitions since 2005 to achieve scale and acquire technology and other assets in these

areas. In addition, it increased its own investment in technologies related to these growth opportunities, particularly nanotechnology.

Buckley made selective divestitures of businesses not seen as core. Most notably, in November 2006, 3M reached an agreement to sell its pharmaceutical business for \$2.1 billion. 3M took this step after deciding that a combination of slow growth and high regulatory and technological risk made the sector an unattractive one that would dampen the company's growth rate.

Finally, Buckley was committed to continuing internationalization at 3M. 3M doubled its capital investment in the fast-growing markets of China, India, Brazil, Russia, and Poland between 2005 and 2010. All of these markets are seen as expanding two to three times as fast as the United States.

Judged by the company's financial results, the McNerney and Buckley eras did seem improve 3M's financial performance. The first decade of the twenty-first century was a difficult one, marked by sluggish growth in the United States, and in 2008–2009, a steep recession triggered by a global financial crisis. 3M weathered this storm better than most, bouncing out of the recession in 2010 with strong revenue and income growth, helped in large part by its new products and exposure to fast-growing international markets. For the decade, revenues expanded from \$16 billion in 2001 to \$26.66 billion in 2010; earnings per share expanded from \$1.79 to \$5.63; and ROIC increased from the mid-teens in the 1990s to the mid-20s for most of the decade.

C19-3 INGE THULIN: BACK TO THE FUTURE

In early 2012, George Buckley retired after a successful tenure during which he had skillfully navigated 3M through the great financial crisis of 2008–2009. The company's COO, Inge Thulin, replaced him. Thulin was originally from Sweden and first joined 3M in 1979. Fluent in five languages, Thulin has worked for 3M in Europe, the Middle East, Canada, and Hong Kong. Within the company he is seen as one of the chief architects of 3M's successful international business, which he oversaw as executive vice president for

international operations. He is also seen as an insider who knows 3M's culture intimately, and who places a high value on innovation. In his first shareholder meeting, he reaffirmed this, stating that "innovation is the center of our plan," and committing the company

to increasing R&D spending to 6% of company sales by 2017, up from 5.4% of sales in 2012. More generally, Thulin stated that he would continue to follow the road map laid out by Buckley, with whom he worked closely.

REFERENCES

- J. C. Collins and J. I. Porras. *Built to Last*, Harper Business, New York, 1994.
- M. Conlin. "Too Much Doodle?," *Forbes*, October 19, 1998, pp. 54–56.
- M. Dickson. "Back to the Future," *Financial Times*, May 30, 1994, p. 7.
- J. Hallinan. "3M's Next Chief Plans to Fortify Results with Discipline He Learned at GE Unit," *The Wall Street Journal*, December 6, 2000, p. B17.
- E. Von Hippel et al. "Creating Breakthroughs at 3M," *Harvard Business Review*, September–October, 1999.
- R. Mullin. "Analysts Rate 3M's New Culture," *Chemical Week*, September 26, 2001, pp. 39–40.
- 3M. 2002. "A Century of Innovation, the 3M Story." <http://www.3m.com/about3m/century/index.jhtml>
- 3M investor meeting, September 30, 2003. Archived at http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=MMM&script=2100.
- T. Stüdt. "3M—Where Innovation Rules," *R&D Magazine*, April, Vol. 45, 2003, pp. 20–24.
- D. Weimer. "3M: The Heat Is on the Boss," *Business Week*, March 15, 1999, pp. 82–83.
- J. Useem. "(Tape) + (Light Bulb) = ?," *Fortune*, August 12, 2002, pp. 127–131.
- M. Gunther, M. Adamo, and B. Feldman. "3M's Innovation Revival," *Fortune*, September 27, 2010, pp. 73–76.

NOTES

¹3M Annual report, 2017. <http://investors.3m.com/financials/annual-reports-and-proxy-statements/default.aspx>.

²J. Aguilar. "3M's enterprise resource planning rollout helps lift 2Q sales," *Morningstar*, July 24, 2018.

³M. Dickson, "Back to the Future," *Financial Times*, May 30, 1994, p. 7. <http://www.3m.com/profile/looking/mcknight.jhtml>.

⁴<http://www.3m.com/about3M/pioneers/drew2.jhtml>.

⁵<http://www.3m.com/about3M/innovation/scotchgard50/index.jhtml>.

⁶3M. "A Century of Innovation, the 3M Story." 2002. <http://www.3m.com/about3m/century/index.jhtml>.

⁷*Ibid.*, p. 33.

⁸*Ibid.*, p. 78.

⁹*Ibid.*

¹⁰*Ibid.*, p. 42.

¹¹E. Von Hippel et al. "Creating Breakthroughs at 3M," *Harvard Business Review*, September–October, 1999.

¹²M. Scholz. "The Three-Step Process That's Kept 3M Innovative for Decades," *Fast Company*, July 10, 2017.

¹³<http://www.3m.com/about3M/history/mcknight.jhtml>.